

A1 GENERAL INFORMATION

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1 IMPORTANT SAFETY NOTICE

1-1 GENERAL DESCRIPTION

1. The vehicle is a machine comprising a great number of parts. Basically speaking, the vehicle is potentially hazard. However, one can handle it safely if he has the required knowledge.
2. Correct service methods and repair procedures are very vital for assuring not only the safety and reliability of a vehicle, but also the safety of service personnel concerned.
3. The methods and procedures contained in this manual describe in a general way the techniques which the manufacturer has recommended. Thus, they will contribute to ensuring the reliability of the products. The contents of the servicing operations come in a wide variety of ways. Moreover, techniques, tools and parts necessary for each operation are different widely from each other.
4. This manual does not cover all details of techniques, procedures, parts, tools and handling instructions which are necessary for these operations, for such coverage is impossible. Hence, any one who obtains this manual is expected first to make his responsible selection as to techniques, tools and parts which are necessary for servicing the vehicle concerned properly. Furthermore, he must assume responsibility for his actions in connection with his own safety.
5. Therefore, one should not perform any service if he is not capable of making responsible selection and/or if he can not understand the contents herein described, for this manual has been prepared for experienced service personnel.

1-2 WARNINGS, CAUTIONS AND NOTES

1. All these symbols have their specific purposes, respectively.

WARNING

- This symbol means that there is the possibility of personal injury of the operator himself or the nearby workers if the operator fails to follow the operating procedure prescribed in this manual.

CAUTION

- This symbol means that there is the possibility of damage to the component being repaired if the operator fails to follow the operating procedure prescribed in this manual.

NOTE

- To accomplish the operation in an efficient manner, additional instructions concerning the operation are given in this section.

1-3 GENERAL WARNINGS**1-3-1 WARNING OVER THE WHOLE SERVICE OPERATIONS**

1. Always wear safety glasses for eye protection.
2. Use safety stands whenever a procedure requires you to be under the vehicle.
3. Be sure that the ignition switch is always in the "LOCK" position, unless otherwise required by the procedure.
4. Set the parking brake when working on the vehicle.
5. Operate the engine only in a well-ventilated area to avoid the danger of carbon monoxide.
6. Keep yourself and your clothing away from moving parts, when the engine is running, especially from the fan and belts.
7. To prevent serious burns, avoid contact with hot metal parts such as the radiator, exhaust manifold, tail pipe, catalytic converter and muffler.
8. Do not smoke while working on a vehicle.
9. To avoid injury, always remove rings, watches, loose hanging jewelry, and loose clothing before beginning to work on a vehicle.
10. Keep hands and other objects clear of the radiator fan blades! The electric cooling fan is mounted on the radiator and can start to operate anytime by a rise in coolant temperature or turning "ON" of the air conditioner switch in the case of vehicles equipped with an air conditioner. The electric cooling fan is also mounted on the condenser for air conditioner and starts to operate anytime when the air conditioner switch is turned "ON". For this reason care should be taken to ensure that the electric cooling fan motor is completely disconnected when working under the hood.

A1-3

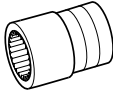
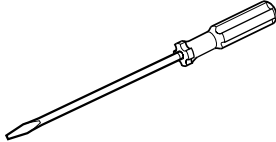
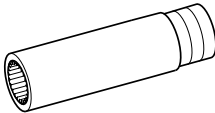
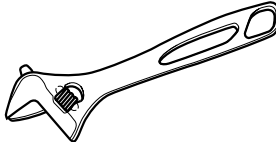
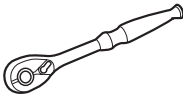
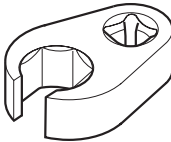
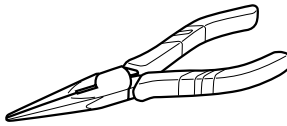
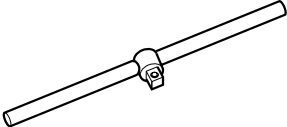
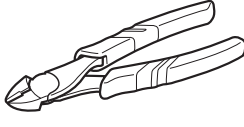
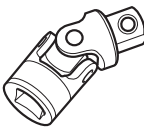
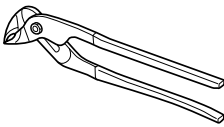
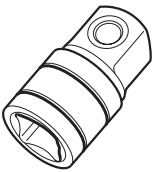
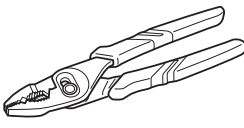
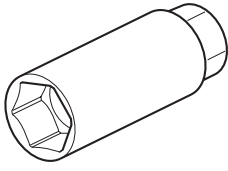
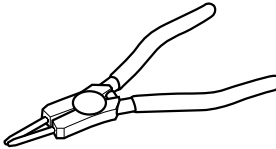
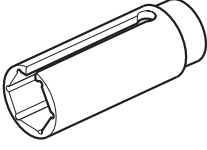
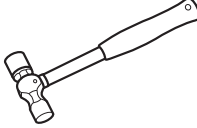
2 HOW TO USE THIS MANUAL

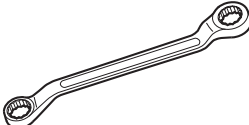
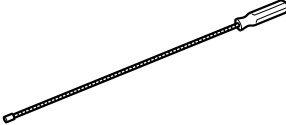
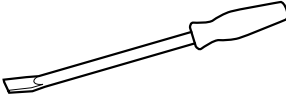
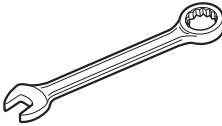
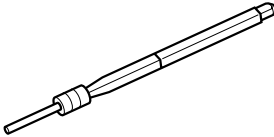
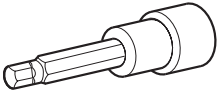
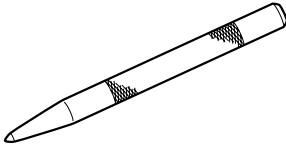
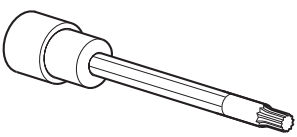
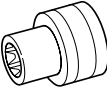
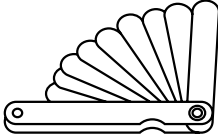
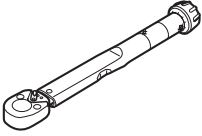
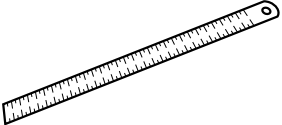
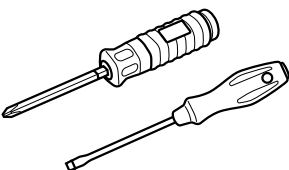
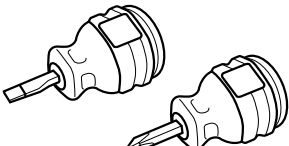
2-1 ARTICLES TO BE PREPARED

When SSTs, tools, measuring instruments, and various kinds of oils and lubricants need to be prepared before operations, they are described as preparation tools in a table at the beginning of each item.

However, general tools that SUBARU to use (refer to the standard tool list shown below), jacks, and fixtures that are considered standard equipment in the service shop are usually omitted.

STANDERD TOOLS

	Socket 9.5sq (7, 8, 10, 12, 14, 17, 19, 21, 22) 12.7sq (12, 14, 17, 19, 21, 22, 23, 24, 26, 27, 30, 32, 36)		Baby screwdriver
	Deep socket 9.5sq. (8, 10, 12, 14) 12.7sq. (12, 14, 17, 19, 21, 22, 24, 27, 30)		Crescent wrench
	Ratchet handle (9.5sq., 12.7sq.)		Crow foot wrench (10, 12, 14, 17., 19)
	Spinner handle (12.7sq.)		Longnose pliers
	Sliding T-handle (9.5sq.)		Nipper
	Universal joint (9.5sq., 12.7sq.)		Water pump pliers
	Socket adapter (6.3sq., 9.5sq., 12.7sq.)		Combination pliers
	Plug wrench 9.5sq. (16, 20.8)		Internal snap ring pliers (ϕ 2.0, ϕ 1.2)
	Oxygen sensor socket		Combination hammer

	Extention bar 9.5sq. (30mm, 75mm, 100mm, 150mm, 270mm) 12.7sq. (75mm, 150mm, 270mm, 600mm)		Stainless scrapers
	Long offset wrench (8×10, 10×12, 12×14, 14×17, 17×19, 19×21, 22×24, 24×27)		Magnet hand
	Spanner wrench (6×7, 8×10, 10×12, 12×14, 14×17, 17×19)		Handy bar (330mm, 420mm, 600mm)
	Combination wrench (10, 12, 14, 17)		Knock pin punch ($\phi 3$, $\phi 4$, $\phi 5$)
	Hexagon bit socket 9.5sq. (4, 5, 6, 8, 10, 12) 12.7sq. (14)		Centering punch
	T-type long torx bit socket 12.7sq. (T55)		A set of files (5pieces)
	T-type torx wrench 9.5sq. (E10, E14)		Thickness gauge (9 pieces, 5 pieces on one side and 11 pieces on the other)
	Ratchet-equipped preset type torque wrench 9.5sq. (5 - 25, 10 - 50) 12.7sq. (20 - 100, 30 - 140, 40 - 200)		Square (150mm, 300mm)
	Screwdriver		Oil jug
	Stubby screwdriver		

2-2 REMOVAL AND INSTALLATION PROCEDURES

1. Block diagrams are posted so as to show the installed state of each part.
2. In the components diagram, the applying points of the grease, lubricant and sealer are indicated by arrows. Also, tightening torques and non—reusable parts are indicated. The meaning of each code is given below the components diagram.

3. The removal and installation (Disassembling and assembling) procedure list is shown just beneath of components figure.

The removal (Disassembling) procedure, the installation (Assembling) procedure and parts name are described in the sequence from left side of list. And the alphabet written before a part name links with alphabet in the figure.

4. In principle, reverse the removal (Or disassembly) procedure to install (Or assemble) the parts.

NOTE

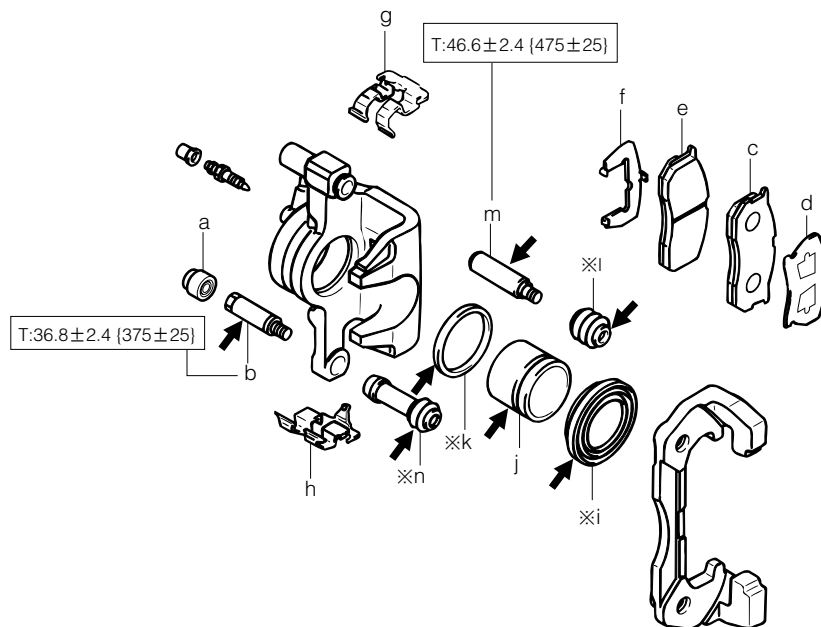
- Only in cases where the installation (Or assembly) can not be carried out by reversing the removal (Or disassembly) procedure, the installation (Or assembly) procedure is provided.

5. In cases where a special procedure is required for the operation, a marking "▼▲" is provided in front of the removal (Or disassembly) procedure. Furthermore, explanation is given in the "Main points of Removal (Disassembly)" or the "Main points of Installation (Assembly)."

The marking "▼"shows that there are the "Main points of Removal (Disassembly)," whereas "▲" shows that there are the "Main points of Installation (Assembly)."

2-2-1 ENTRY EXAMPLE

(1) Components



W13C5006S24

➡ : Rubber grease

※: Non—reusable part

Unit:N·m{kgf·cm}

(2) Disassembly and assembly procedures

1 a Cap, cylinder slide pin	8 h Plate, disc brake pad guide
2 b Pin, cylinder slide, No.1	9 i Boot, cylinder
▲ 3 c Pad, disc brake, No.2	▼ 10 j Piston, disc brake
4 d Shim, anti squeal, No.1	11 k Seal, piston
▲ 5 e Pad, disc brake w/ indicator. No.1	12 l Boot, pin
6 f Shim, anti squeal, No.1	13 m Pin, cylinder slide, No.1
7 g Plate, disc brake pad guide	14 n Bush, cylinder slide

2-3 DESCRIPTION OF SERVICE STANDARD VALUE

The necessary service standard value for inspection and service operation are described with bold letter in the text as standard and allowable limit. The details of terms are described in the section for definition of terms.

2-4 CONTENTS NOT DESCRIBED IN THIS MANUAL

The description of the next elemental operation may omit in this service manual, but please perform in an actual operation.

1. Jacking operation and lifting operation
2. Cleaning and cleansing of removed parts to perform at need
3. Visual inspection
4. Basic check and adjustment after installation

2-5 DEFINITIONS OF TERMS

SPECIFIED VALUE	This mark shows the standard value at the time of the check or adjustment.
ALLOWABLE LIMIT	This mark shows the maximum or minimum value at the time of the check or adjustment.
DEVIATION	This value refers to the difference between the maximum clearance and the minimum clearance.
WARNING	This symbol means that there is the possibility of personal injury of the operator himself or the nearby workers if the operator fails to follow the operating procedure prescribed in this manual.
CAUTION	This symbol means that there is the possibility of damage to the component being repaired if the operator fails to follow the operating procedure prescribed in this manual.
NOTE	Supplementary explanation which facilitates the operation is posted separately from the explanation. Because of difficulties in measurements to determine specified values, there may be cases where the specified values for simple measurement methods are indicated if malfunctions are unlikely to take place actually.

3 ABBREVIATION CODES

The abbreviation codes that appear in this manual stand for the following, respectively.

ABBREVIATION CODE	ORIGINAL WORD	ABBREVIATION CODE	ORIGINAL WORD
2WD	Two Wheel Drive	LIN	Local Interconnect Network
4WD	Four Wheel Drive	LSPV	Load Sensing Proportioning Valve
ABS	Anti-lock Brake System	LWR	Lower
ABV	Air Bypass Valve	MIL	Malfunction Indicator Lamp
A/C	Air Conditioner	MP	Multipurpose
ACC	Accessory	M/T	Manual Transmission
API	American Petroleum Institute	N/A	Natural Aspiration
A/T	Automatic Transmission	NOx	Nitrogen Oxides
ATDC	After Top Dead Center	OPT	Option
ATF	Automatic Transmission Fluid	O/D	Overdrive
Ay	Assembly	O/S	Oversize
BDC	Bottom Dead Center	PCV	Positive Crankcase Ventilation
BTDC	Before Top Dead Center	PR	Ply Rating
BVSV	Bimetal Vacuum Switching Valve	PTO	Power Take Off
CAN	Controller Area Network	RH	Right Hand
CD	Compact Disc	RHD	Right Hand Drive
CO	Carbon Monoxide	RR	Rear
DLC	Data Link Connector	S/A	Sub-Assembly
DLI	Distributor Less Ignition	SAE	Society of Automotive Engineers
DTC	Diagnostic Trouble Code	SRS	Supplemental Restraint System
DVVT	Dynamic Variable Valve Timing	SST	Special Service Tool
EBD	Electronic Brake force Distribution	STD	Standard
ECU	Electronic Control Unit	SW	Switch
EFI*	Electronic Fuel Injection	T	Torque
EGR	Exhaust Gas Recirculation System	T/C	Turbocharger
EPS	Electronic controlled Power Steering	TDC	Top Dead Center
ESA	Electronic Spark Advance	TRC*	Traction Control System
EX	Exhaust	UPR	Upper
F/L	Fusible Link	U/S	Undersize
FR	Front	VCV	Vacuum Control Valve
GND	Ground	VSC*	Vehicle Stability Control
HC	Hydro Carbon	VSV	Vacuum Switching Valve
IG	Ignition	VTV	Vacuum Transmitting Valve
IN	Intake	W/	With
ISC	Idle Speed Control	WVTA	Whole Vehicle Type Approval
ISO	International Organization for Standardization	Ⓑ	Bolt
ITC	Integrated Timing Controller	Ⓢ	Screw
LCD	Liquid Crystal Display	Ⓝ	Nut
LED	Light Emitting Diode	Ⓦ	Washer
LH	Left Hand	©	Clip
LHD	Left Hand Drive		

*: "EFI", "TRC", and "VSC" are registered trademarks of Toyota Motor Corporation.

4 HOW TO GRASP SPECIFIED TIGHTENING TORQUE FOR GENERAL STANDARD BOLT AND NUT

4-1 DETERMINING PROCEDURE FOR TIGHTENING TORQUE FOR GENERAL STANDARD BOLTS AND NUTS

4-1-1 DETERMINING PROCEDURE FOR TIGHTENING TORQUE FOR BOLTS

Determine the strength division of bolts, based on the table below.

Then, obtain the value, based on the tightening torque table.

4-1-2 DETERMINING PROCEDURE FOR TIGHTENING TORQUE FOR NUTS

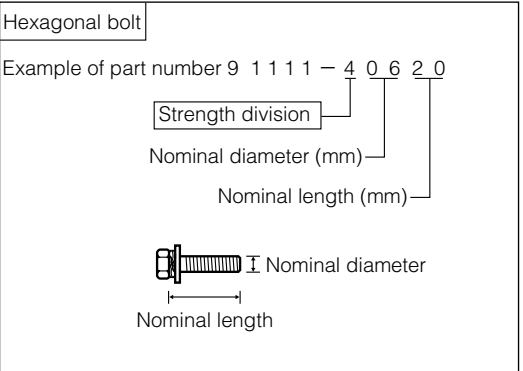
Determine with the aforesaid method, based on the mating bolt.

4-1-3 IDENTIFICATION

Identification of strength division by checking bolts themselves

Classification (Strength division)	Shape of head (how to know strength division)	
	Bolt without collar	Bolt with collar
4 T	 	 
5 T	 	—
6 T	— —	 
7 T	 	—

Identification by part number



4-1-4 TIGHTENING TORQUE TABLE FOR GENERAL STANDARD BOLTS

Strength divisin	Nominal diameter (mm)	Pitch (mm)	Standard tightening torque (N·m{kgf·cm})	
			Bolt without collar	Bolt with collar
4 T	6	1.0	5.4 {55}	5.9 {60}
	8	1.25	13 {130}	14 {145}
	10	1.25	25 {260}	28 {290}
	12	1.25	47 {480}	53 {540}
	14	1.5	74 {760}	83 {850}
	16	1.5	113 {1150}	—
5 T	6	1.0	6.4 {65}	—
	8	1.25	16 {160}	—
	10	1.25	32 {330}	—
	12	1.25	59 {600}	—
	14	1.5	91 {930}	—
	16	1.5	137 {1400}	—
6 T	6	1.0	7.8 {80}	8.8 {90}
	8	1.25	19 {195}	20.5 {210}
	10	1.25	39 {400}	43 {440}
	12	1.25	72 {730}	79 {810}
	14	1.5	109 {1100}	123 {1250}
7 T	6	1.0	11 {110}	12 {120}
	8	1.25	25 {260}	28 {290}
	10	1.25	52 {530}	58 {590}
	12	1.25	95 {970}	103 {1050}
	14	1.5	147 {1500}	167 {1700}
	16	1.5	225 {2300}	—

4-2 PROCEDURE FOR TIGHTENING

4-2-1 TIGHTENING TOOL

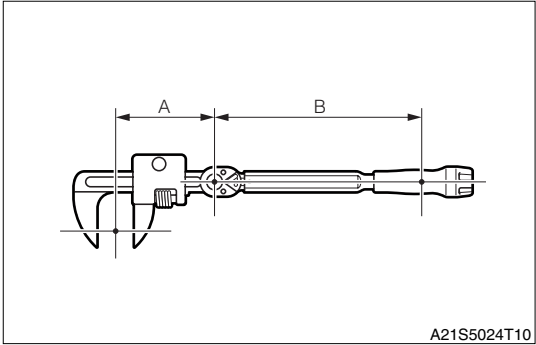
To control the torque indicated in this manual, use the torque wrench (equivalent item) as shown in the table.

Use the most appropriate torque wrench in combination with an extension tool (such as an extension bar, etc.), according to the work and space, etc.

4-2-2 WHEN AN EXTENSION TOOL IS USED

- 1. When tightening with the SST or a tool connected to the torque wrench for a drive-end extension, a higher tightening torque will result, if tightened until the reading on the torque wrench indicates the specified torque.
- 2. This manual contains specified torques only. When using the SST or an extension tool, the torque wrench reading must be computed using the following formula.
- 3. Calculation formula: $T' = T \times B / (A + B)$

Codes	Meaning	Unit
T'	Torque wrench reading	N·m{kgf·cm}
T	Specified tightening torque	N·m{kgf·cm}
A	Length of the SST or a tool	cm
B	Torque wrench length	cm



A21S5024T10

5 UNIT

As for the units, the SI units (International unit system) have been posted. (The hitherto – employed units, too, are posted.)

Example: $33.25 \pm 13.25 \text{ N} \cdot \text{m}$ { $340 \pm 135 \text{ kgf} \cdot \text{cm}$ }

5-1 NEW UNIT BECAUSE OF THE INTRODUCTION OF THE SI UNIT

1. SI unit is the international unit system established by aiming to proceed the communication in technology smoothly by unifying the former unit system which were different internationally each other into one value by one unit. The specification value is described in accordance with SI unit system in this service manual.

ITEM	SI unit	Conventional units	Conversion table
Force	N	kgf	$1 \text{ kgf} = 9.80665 \text{ N}$
Torque	$\text{N} \cdot \text{m}$	$\text{kgf} \cdot \text{cm}$	$1 \text{ kgf} \cdot \text{cm} = 0.0980665 \text{ N} \cdot \text{m}$
Pressure	kPa	kgf/cm^2	$1 \text{ kgf/cm}^2 = 98.0665 \text{ kPa}$
		mmHg	$1 \text{ mmHg} = 0.133322 \text{ kPa}$
Spring constant	N/mm	kgf/mm	$1 \text{ kgf/mm} = 9.80665 \text{ N/mm}$
Volume	ℓ	cc	$1000 \text{ cc} = 1 \ell$
Power	kW	PS	$1 \text{ PS} = 0.735499 \text{ kW}$

5-2 PREFIX USED IN SI UNIT

The following are typical prefixes used in SI Unit (10 to the power of n).

M (mega)	10^6
k (kilo)	10^3
h (hecto)	10^2
da (deca)	10^1
d (deci)	$10^{-1} = 0.1$
c (centi)	$10^{-2} = 0.01$
m (milli)	$10^{-3} = 0.001$
μ (micro)	$10^{-6} = 0.000001$

6 GENERAL SERVICE INSTRUCTION

6-1 JACK UP OR LIFT UP

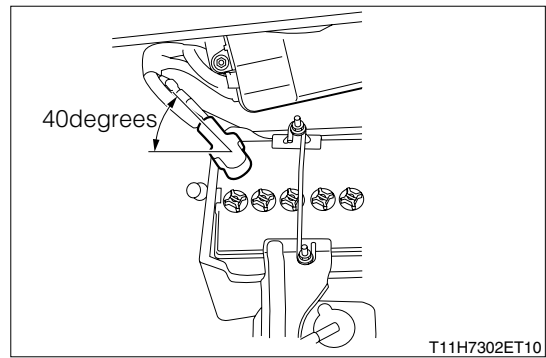
1. When only front section or rear section of a vehicle is jacked up, be sure to place chocks at the wheels so as to insure safe operations
2. When the vehicle has been jacked up, be sure to support the vehicle at the specified section using the safety stands.
3. When the vehicle is to be lifted up, be sure to set the supporting pad of the lift at the specified location, and lift up the vehicle. After lifting up the vehicle, be sure to apply the protective safety device.

6-2 INSTALLATION AND REMOVAL OF BATTERY TERMINAL

1. Disconnect the battery negative (–) terminal prior to repairing the electrical system, mounting/dismounting the engine, etc.
2. When connecting/disconnecting the battery terminal, turn the IG switch to "OFF" ("LOCK" position), and loosen the terminal nut completely. Do not pry the battery terminal off.
3. When the battery terminal is removed, clock, radio setup and the memory of diagnosis will be erased. Record the contents of the memory before disconnecting the battery terminal so that it can be restored as required after the work is complete.

4. When connecting the battery terminal, connect the positive (+) terminal first so that the terminal wire will be placed in the marked area of the illustration, and tighten to the specified torque.

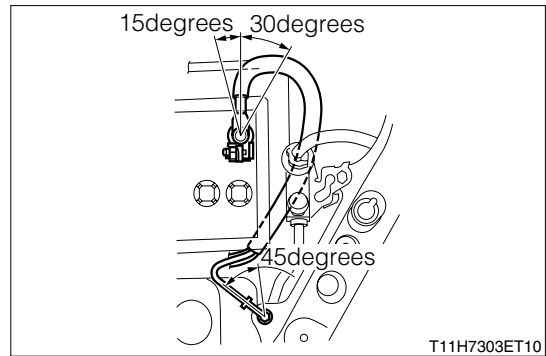
TIGHTENING TORQUE: $6.4 \pm 1.4 \text{ N} \cdot \text{m}$
 $\{65 \pm 14 \text{ kgf} \cdot \text{cm}\}$



5. When connecting the battery negative (−) terminal, connect the terminal so that the terminal wire will be placed in the marked area of the illustration, and tighten to the specified torque.

TIGHTENING TORQUE: $6.4 \pm 1.4 \text{ N} \cdot \text{m}$
 $\{65 \pm 14 \text{ kgf} \cdot \text{cm}\}$

6. Securely install the cover, etc. on the terminal after work is complete.



6-3 CONNECTING/DISCONNECTING THE EARTH

1. When the earth was removed, check that the earth is securely in place and then turn "ON" the IG switch.

6-4 REPAIRING OF FUEL SYSTEM

1. Do not work near open flames.
2. Be certain to place a suitable container, a cloth, etc. under the connected section of the fuel line before disconnecting the fuel line.
3. Before the fuel line is disconnected, be sure to release the inner pressure of the fuel tank by detaching the fuel filler cap.
4. Be sure to prevent the fuel from splashing with a cloth or the like, when the union bolt or other connected section of the fuel line is loosened or slackened.
5. Tighten each connecting section to the specified torque.
6. Attach the specified clips to each connecting section.

6-5 USE OF THE SST

1. Utilize the SST (Special tool) effectively in order to improve efficiency and accuracy of work operation.

6-6 REMOVAL, DISASSEMBLY

1. In case for the operation at the complicate place, the stamping and mating mark shall be put at the place where there is no influence to the function, so that the assembling operation becomes easy.
2. At every time when each parts are removed, check the condition when it was assembled, deformation, breakage, roughness and existence of scratch.
3. Arrange the removed parts in order, and divide them to the parts to replace and parts to reuse.
4. Each parts to be reused shall be performed enough cleaning and cleansing operation.

6-7 CHECK AND MEASUREMENT OF PARTS

1. As regards those parts to be used again, perform thorough checks and measurements, as required.

6-8 INSTALLATION, ASSEMBLING

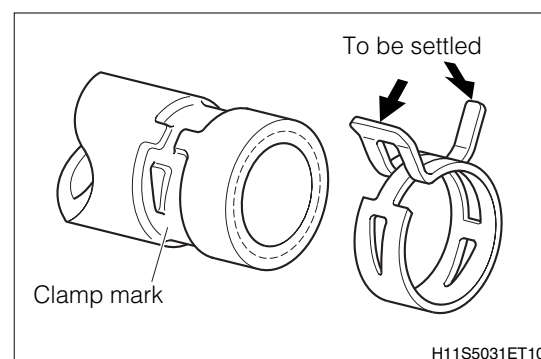
1. Assemble the good parts with correct procedure following the specified standard (Value for the adjusting , tightening torque).
2. Use the genuine parts when replace the parts.
3. Ensure to apply the seal packing and grease by a place.
4. Ensure to use new packing, gasket or the like, cotter pin etc.
5. When use the seal bolt, apply the specified liquid gasket and seal lock agent on.
6. As for bolts and nuts, use the specified ones. Unless otherwise specified, the side for which the torque is indicated should be tightened to the specified torque, using a torque wrench. If there is no means to prevent the turning at the opposite side, be sure to prevent turning with box wrenches, spanners or the like.

6-9 ADJUSTMENT, OPERATION CONFIRMATION

1. Adjust with the specified service standard value by using the gauge and the tester.

6-10 HANDLING OF HOSE OR THE LIKE

1. Check the plug depth and clamp position before removing the hose.



2. When disconnecting hose, plug the hose using SST (plug—set hose) to prevent grease and oil, etc. and cooling water, etc. from leaking.

Shape	Item name
	Plug—set hose

CAUTION

- Before using SST, make sure that it is free from attachment of foreign object such as dirt, dust, or iron powder. If not, clean the pipe thoroughly.
3. When re-using the hose, install the clamps so that they match the clamp marks remaining on the hose.

CAUTION

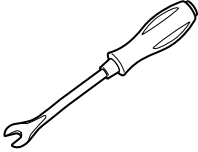
- Replace the clamps if they are deformed or flattened.
 - Replace the hose with a new one if the hose has a loose fitting with the joint.
4. Ensure that the spring type clamp is properly seated after installation.
 5. Ensure to insert the fuel hose, water hose or the like without coming out or leakage.
 6. When removing the fuel hose, be careful not to allow the fuel to splash to the surrounding parts. (Utmost attention must be paid to the engine mount rubber, etc., for their quality will deteriorate if they are exposed to gasoline based liquid.)

6-11 TOUCH UP

1. When removed the bolt or the like during body fitting operation and others, the scratch of the paint finishing surface on the body and bolt shall be repaired by the body color.

6-12 REMOVAL/INSTALLATION OF CLIP AND CLAW

1. To detach/attach the clips or claws, use the clip clamp tool or tools, such as screwdrivers.

Shape	Item name
	Clip clamp tool, angle short, small—size
	Clip clamp tool, angle short, medium—size

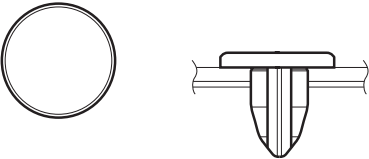
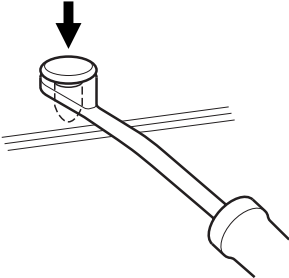
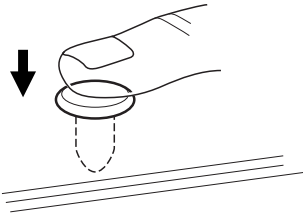
CAUTION

- In order not to damage the clips or parts, wrap protective tapes to the tool.
2. The following symbols are used in the main points of the removal and installation (disassembling and assembling) in this manual.

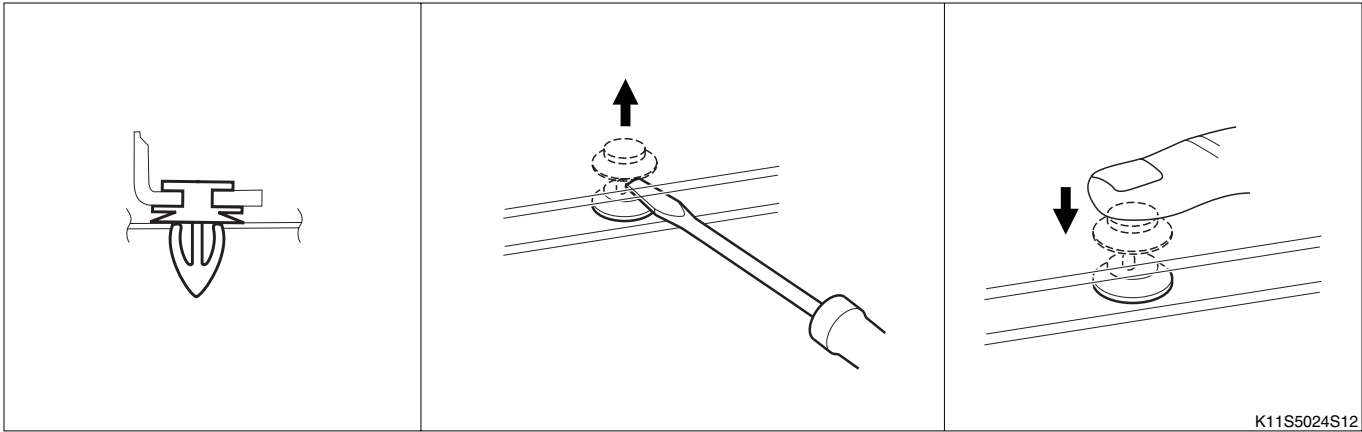
Symbol	Explanation of symbol
	Shows the position of the clip.
	Shows the position of the pawl.

K11S5029ES10

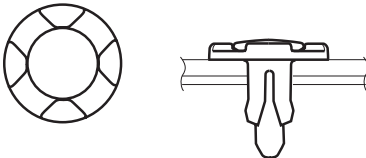
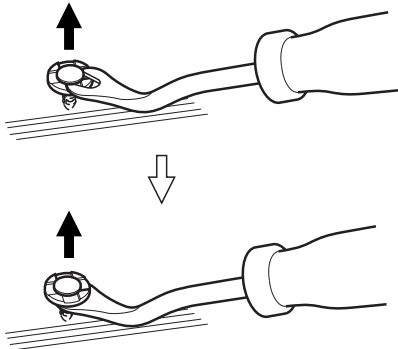
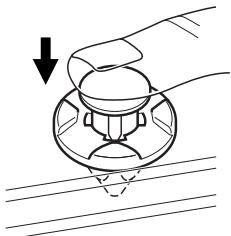
3. As for the clips that can be seen, detach/attach them by referring to the following table.
4. As for the claws and the clips that cannot be seen, detach/attach them by referring to the cross sectional views that are given in the main points of the removal and installation (disassembling and assembling) in this manual.

Shape(Example)	Removal/Installation(Example)	
	Removal	Installation
		

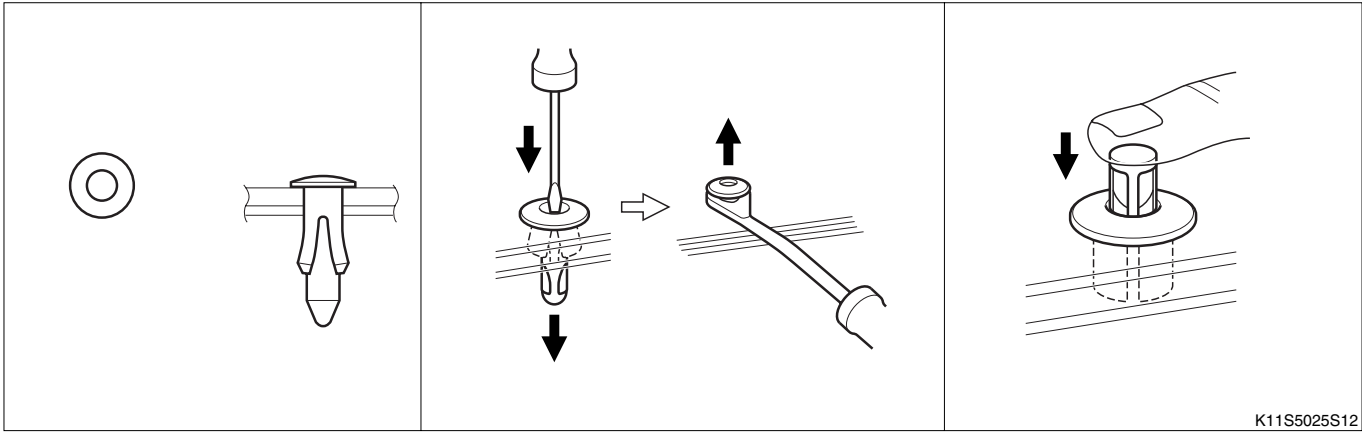
K11S5023ES15



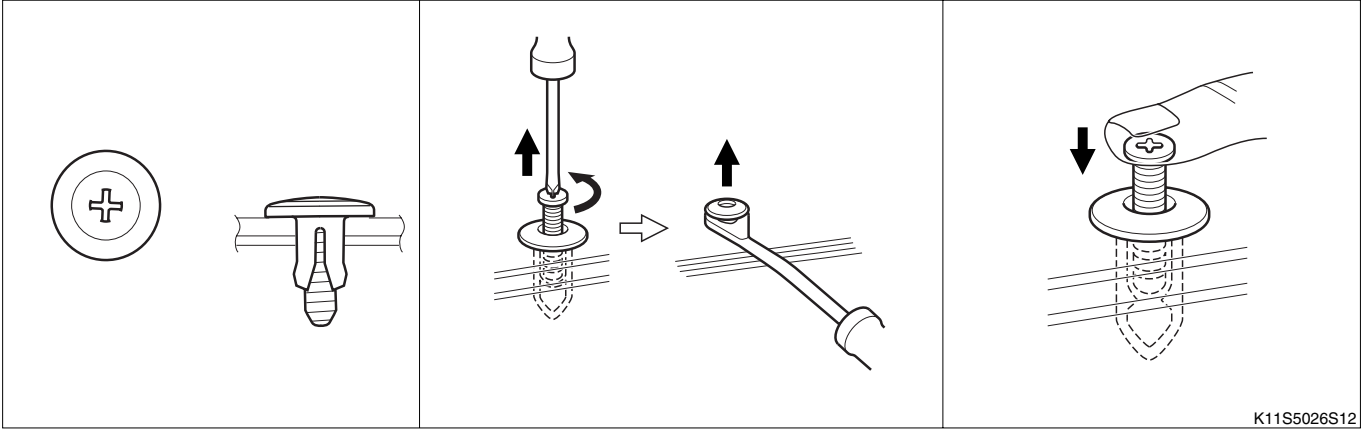
K11S5024S12

Shape(Example)	Removal/Installation(Example)	
	Removal	Installation
		

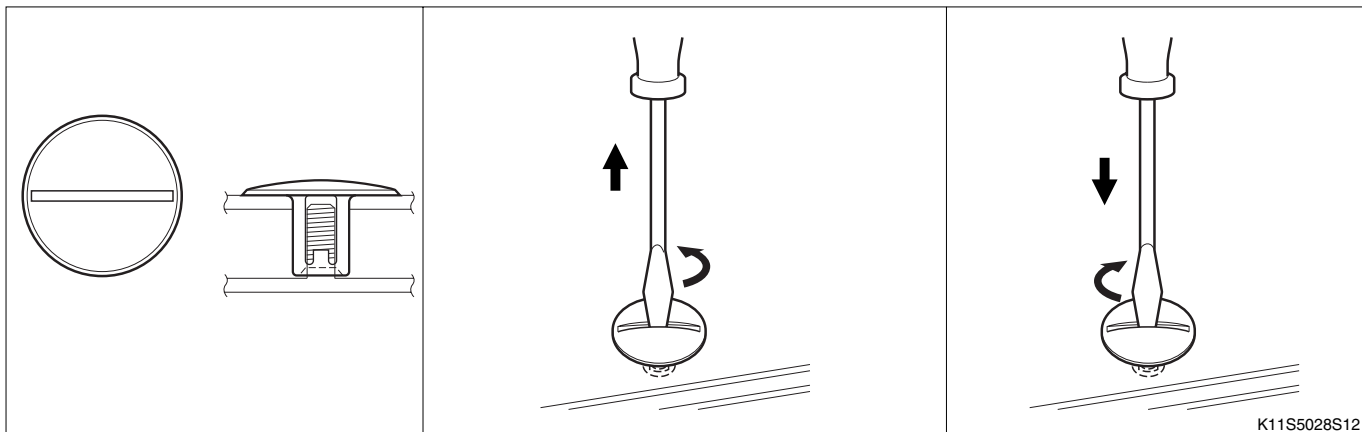
K11S5027ES15



K11S5025S12

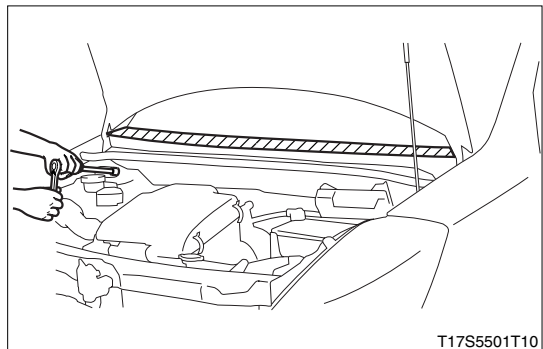


K11S5026S12



6-13 INSTALLATION AND REMOVAL OF COWL TOP VENTILATOR LOUVER

1. When performing a work operation by removing the cowl top ventilator louver, be sure to protect the bottom part of the windshield glass with cloth.



7 SUPPORTING POINTS FOR JACK, RIGID RACK AND LIFT

7-1 INSTRUCTIONS ON USE OF GARAGE JACK

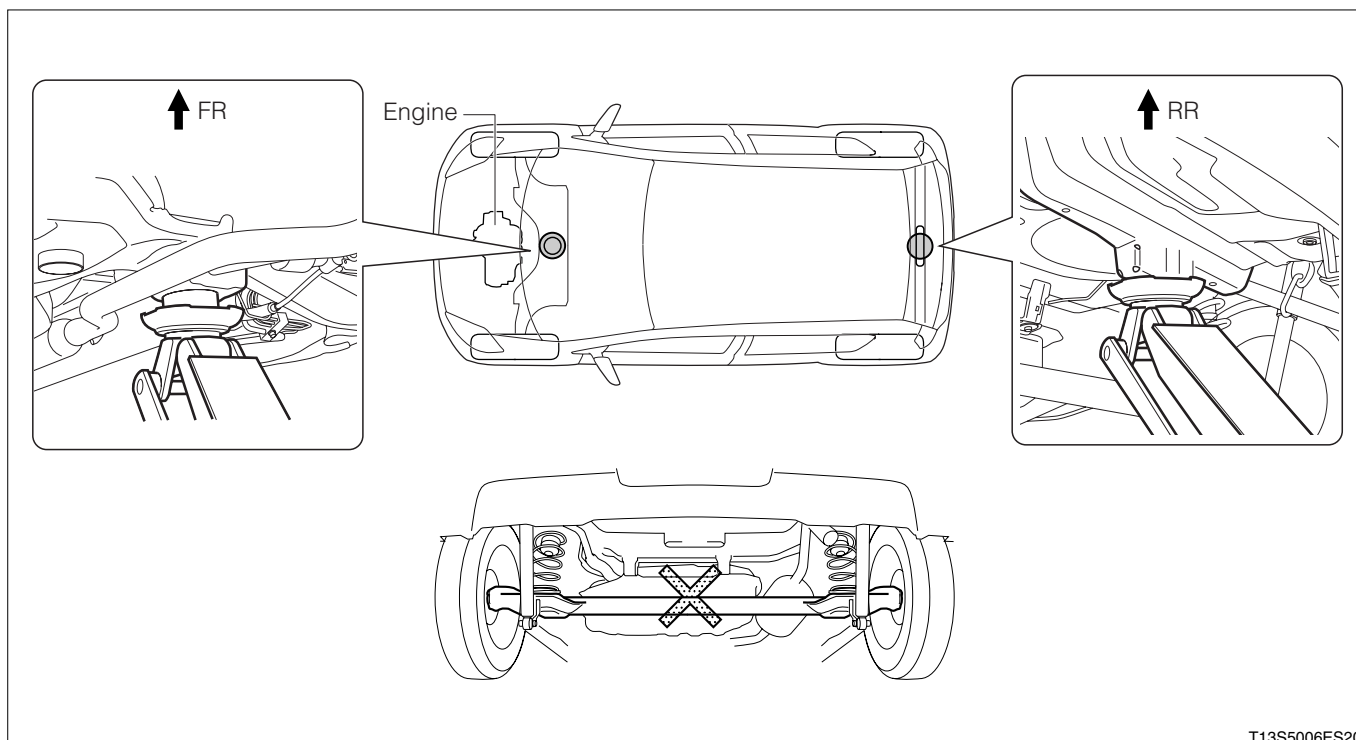
1. When jacking up a vehicle and using a rigid rack or lifting up the vehicle, the vehicle must be in an unloaded state.
2. When a heavy component (engine, transmission, suspension, axle, etc.) is removed from the front or rear section, the center of gravity of the vehicle moves. Therefore, be sure to support the specified position, using a transmission jack or the like.
3. Perform the operation on a flat ground, while placing chocks in place.
4. Securely support the specified positions when using a garage jack and rigid rack.
5. When using a rigid rack, use the one with a rubber attachment so that the body may not be damaged.
6. When jacking up or down a vehicle, be very careful not to allow the garage jack to deviate from the jacking up points.
7. When jacking up the front wheels, release the parking brake and place chocks at the rear side of the rear wheels. After supporting the vehicle with a rigid rack, place chocks at both sides of the rear wheels.
8. When jacking up the rear wheels, place chocks at the front side of the front wheels. After supporting the vehicle with a rigid rack, place chocks at both sides of the front wheels.
9. If the vehicle is supported by a garage jack only, never perform the operation or leave the vehicle in that state. Be sure to support the vehicle with a rigid rack.
10. If you jack down the vehicle when the front wheels of the vehicle only have been jacked up, release the parking brake and place chocks at the front side of the rear wheels.
11. If you jack down the vehicle when the rear wheels of the vehicle only have been jacked up, place chocks at the rear side of the front wheels.

7-2 JACKING UP POINTS

2WD vehicles

Front side: Front suspension member center protruding section

Rear side: Rear floor cross member center section



T13S5006ES20

CAUTION

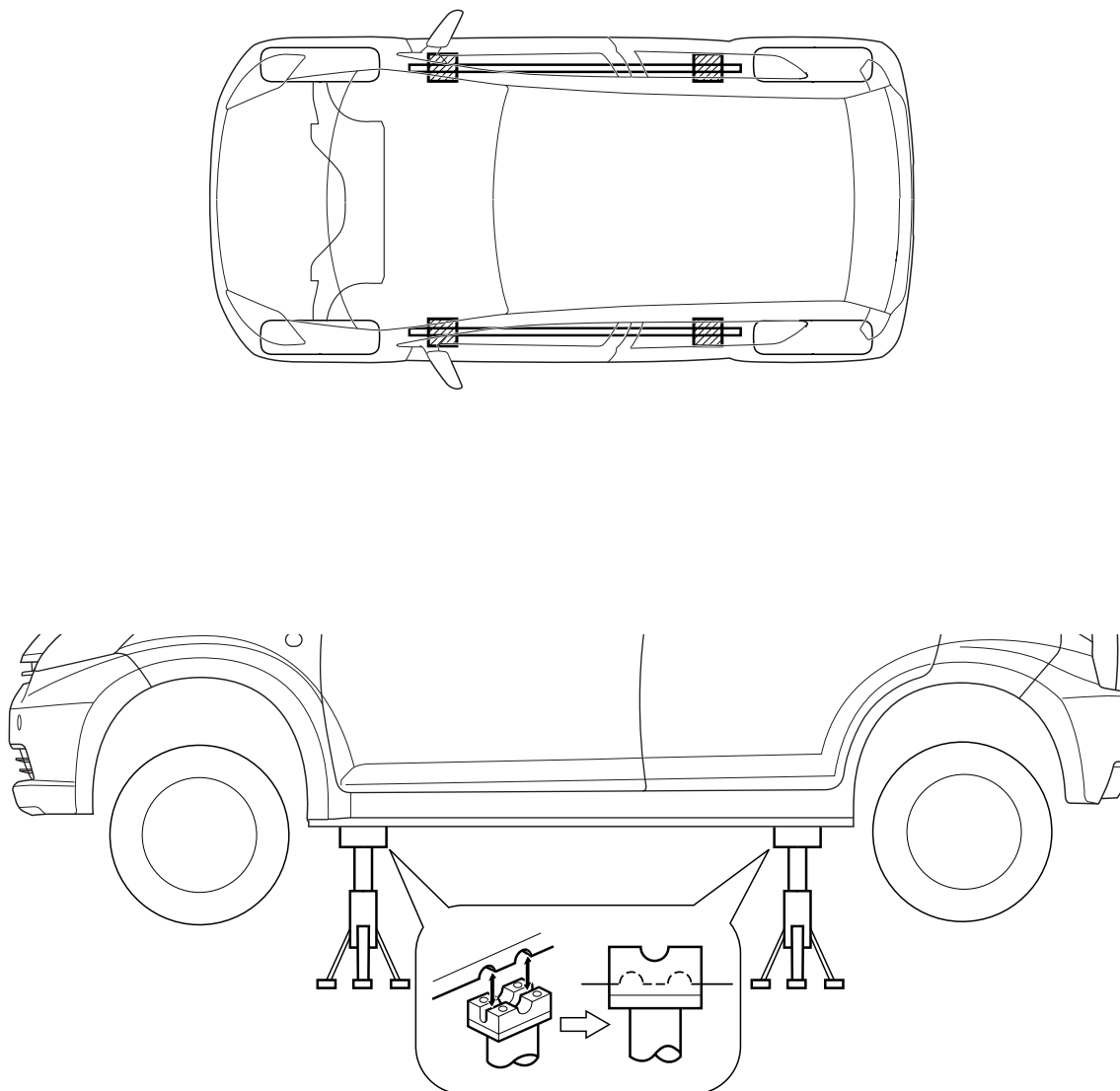
- Never apply a jack to the rear suspension intermediate beam section. Failure to observe this instruction may hamper the controllability due to beam deformation or breakage.

7-3 SUPPORTING POINTS OF SAFETY STANDS

1. There are four jacking points; one at the front, one at the rear, one at the right side and one at the left side.

CAUTION

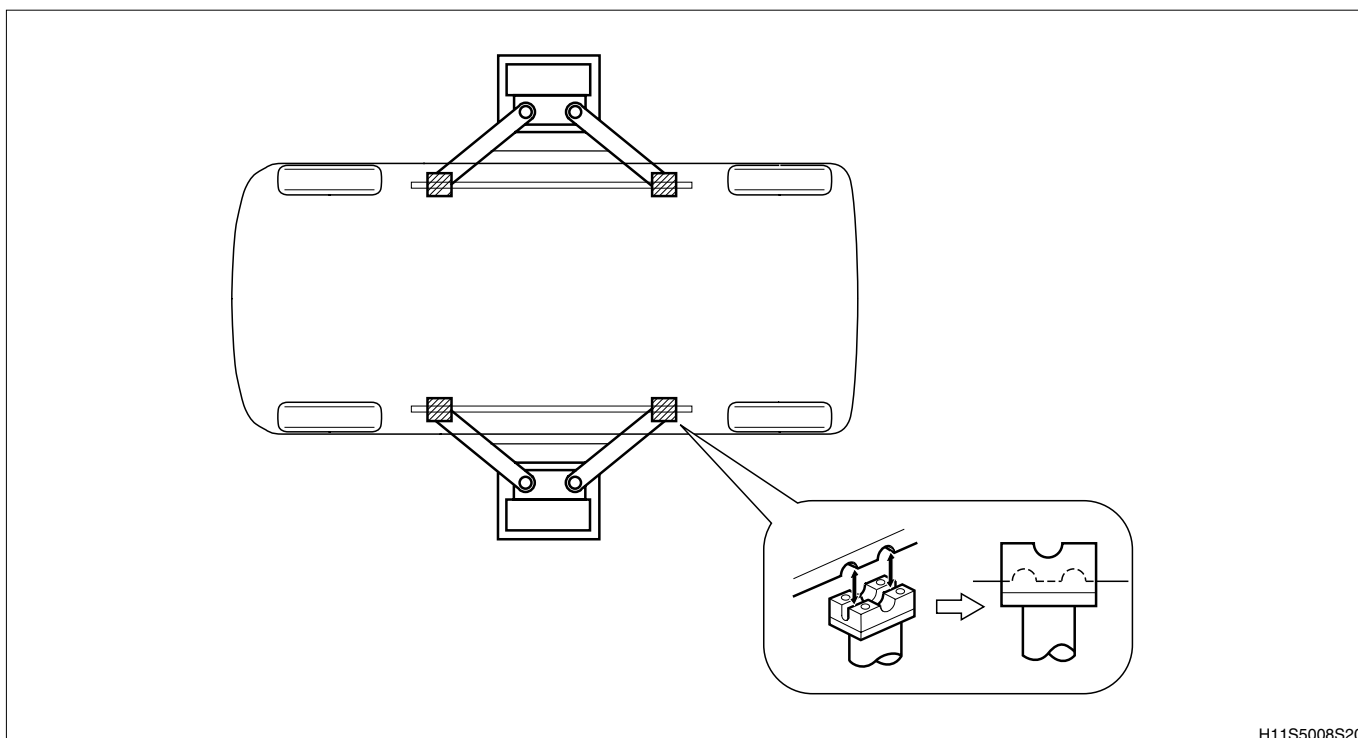
- Since the strength of the jacking points has been enhanced by spot-welding the reinforcement, never support the vehicle by applying a jack at a point other than those supporting points.



7-4 SUPPORTING POINTS OF LIFTS

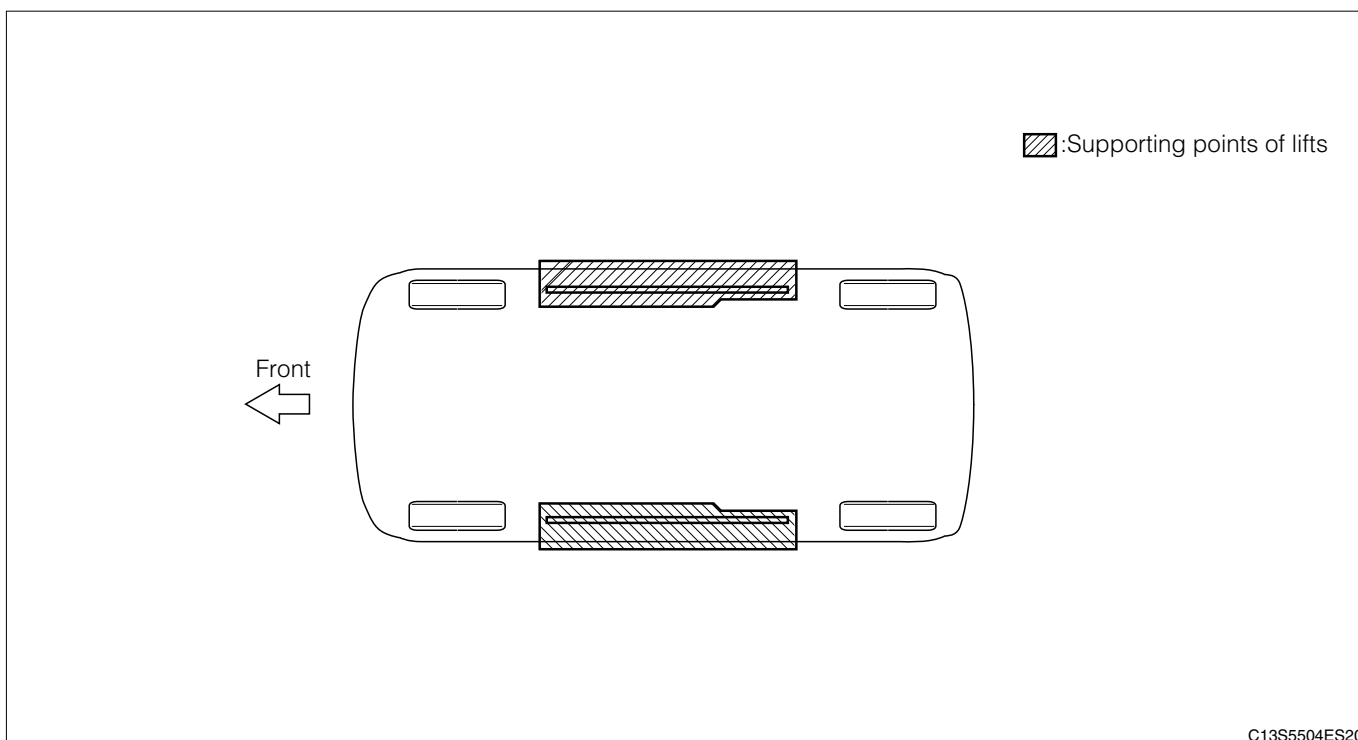
7-4-1 SUPPORTING POINTS OF LIFTS

1. Align the lift support platform with the rigid rack supporting point.



7-4-2 PLATE TYPE

1. Drive the vehicle onto the center of the supporting platforms both at the right and left.
2. Since the vehicle is heavier at the front than the rear, lift up the vehicle at the front wherever possible.



8 TOWING INSTRUCTIONS

8-1 TOWING INSTRUCTIONS(ONLY FOR EMERGENCY)

1. Be certain to transfer the vehicle by using the flat deck truck when the running system and/or driving system seems to be abnormal.

A1-19

8-2 TOWING WITH ROPE (ONLY FOR EMERGENCY)

1. When towing, remove the front bumper hole cover.
2. Install the towing hook.
3. Install the rope.

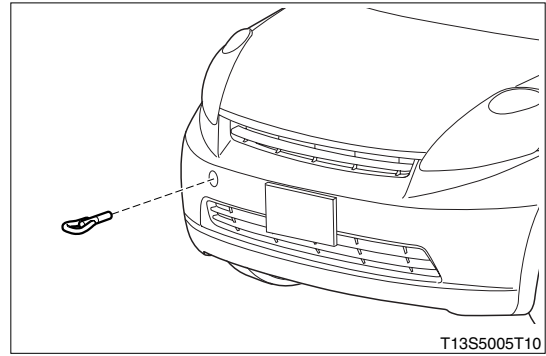
4. Release the parking brake and set the IG switch to "ACC". Set the shift lever to the neutral position.

CAUTION

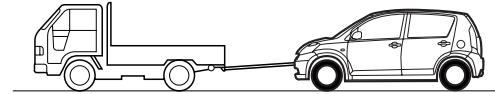
- Do not tow with the rope when the running system and/or driving system seems to be abnormal.
- When drive with engine stopping, brake efficiency become less due to no functioning of the brake servo system. Depress the brake pedal more powerfully than the usual.

8-3 USING FLAT BED TRUCK

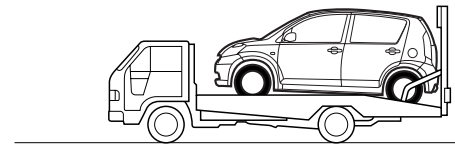
1. Transfer the vehicle with applying parking brake and fixing the vehicle firmly.



Towing by means of a rope



Transport on a track



8-4 WHEEL LIFT TYPE

CAUTION

- Do not allow anyone to be in the vehicle being towed.

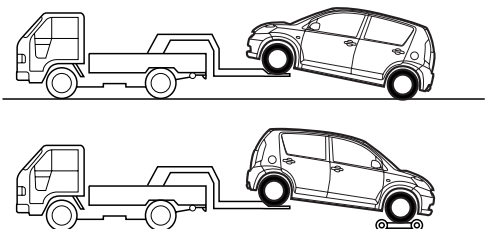
8-4-1 TO TOW WITH REAR WHEELS ON GROUND(2WD VEHICLES ONLY)

1. Release the parking brake.

8-4-2 TO TOW WITH FRONT WHEELS ON GROUND(2WD VEHICLES ONLY)

1. Use a towing dolly.
2. If a towing dolly is not available, and turn IG switch to "ACC" position, and then put the shift lever into neutral range.

Wheel lift type



9 SERVICE INSTRUCTIONS FOR FOUR WHEEL DRIVE VEHICLES

9-1 SPEEDOMETER TESTER

1. Ensure to set the free rollers on the floor of front wheel side by making it fit with wheel base and front tread of a vehicle.

NOTE

- Various dimensions shall be according to the following table.

2. Position the vehicle in such a way that the front wheels may come on the speedometer tester; and the rear wheels on the free rollers. Perform the speedometer test operations.

CAUTION

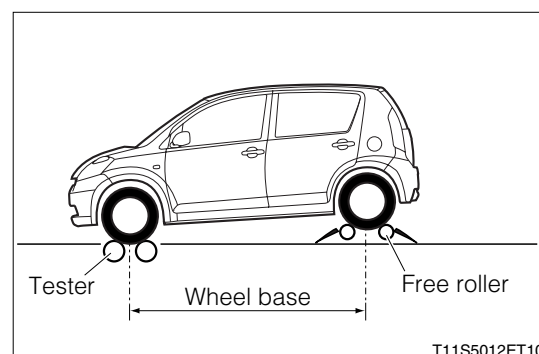
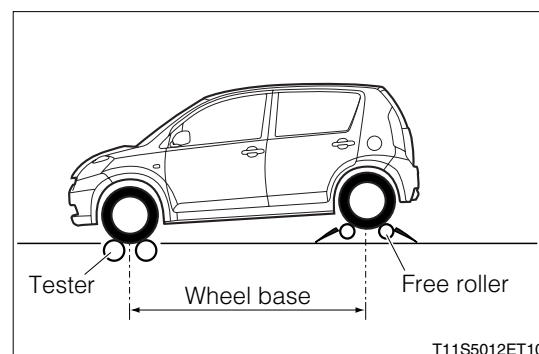
- The axle of the free roller must be set in parallel with the roller of each tester in order to prevent the vehicle from deviating in a transverse direction and to avoid uneven application, etc.
- Never perform sudden clutch operation or quick acceleration and deceleration.

9-2 BRAKE TEST

1. Ensure to set the free rollers surely on the floor by mating to wheel base of the vehicle and tread of wheel to be measured (front wheel or rear wheel).

NOTE

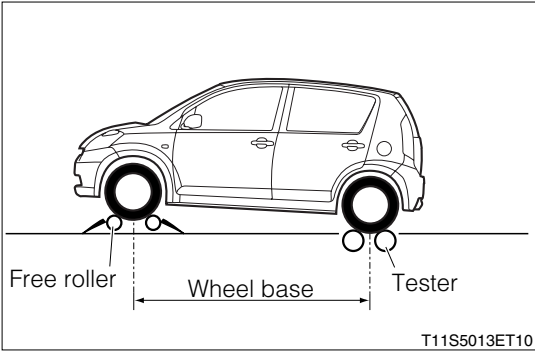
- Various dimensions shall be according to the following table.



2. Position the vehicle in such a way that the wheels to be measured (front wheels or rear wheels) may come on the brake tester; and the wheels on the other side (rear wheels or front wheels) on the free rollers. Perform the brake test operations.

CAUTION

- There may be such case that the vehicle drift to backward at the point around wheel locking and then get out from the tester and free rollers. Therefore, confirm backward whether any human is or not before depressing the brake pedal.
And also the brake pedal shall be kept depressing when vehicle drift to backward.
- The axle of the free rollers has to be set in parallel with the roller of each tester to prevent the drift to the side direction of the vehicle or pull of brake.



	2WD	
	13' Tire	14' Tire
Wheel base (mm)	2430	
Front tread (mm)	1467	1457
Rear tread (mm)	1474	1464

10 DIAGNOSTICS INSTRUCTIONS

10-1 HOW TO PROCEED DIAGNOSIS

1. Each electronic control system equipped on the vehicle is an important clue at performing trouble shooting. Also this system has self—diagnosis function to inspect the malfunction portion which occurred in corresponding system, and battery back up (The function that power source for diagnosis code memory is supplied even if IG switch is "LOCK") is equipped for self—diagnosis function of electronic control system with, and is designed so that diagnosis code is memorized to each system. As the function of diagnosis code memory is different by each system, perform the confirmation / elimination of code memory according to the right operation procedure after confirming equipped diagnosis code memory function.

▷1. Bringing malfunctioning vehicle in garage

▼ Proceed to ▷2.

▷2. Diagnosis through interview

1. Thoroughly obtain information from the customer concerning the conditions, environment and phenomena in which the malfunction took place.

▼ Proceed to ▷3.

▷3. Confirmation and recording of diagnosis code

▼ Proceed to ▷4.

▷4. Erasure of diagnosis code

1. Erase the diagnosis code.

▼ Proceed to ▷5.

▷5. Reconfirmation of malfunctioning phenomena

1. Confirm the phenomenon to grasp the malfunctioning situation.

▼ Proceed to ▷6.

▷6. Reconfirmation of diagnosis code

1. Perform reconfirmation of the diagnosis code.

▼ If an abnormality code is outputted, proceed to ▷7.

▼ If a normal code is outputted, proceed to ▷8.

▷7. Trouble-shooting check according to diagnosis code

▼ Proceed to ▷10.

▷8. Basic check

1. Perform basic checks.

▼ Proceed to ▷9.

▷9. Trouble-shooting according to malfunction phenomena

1. Estimate the cause for the malfunction phenomenon and perform trouble-shooting.

▼ Proceed to ▷10.

▷10. Repair or replace

▼ Proceed to ▷11.

▷11. Confirmation test

1. Ensure that the malfunction phenomena claimed by the customer concerning the vehicle has been completely solved and that it has been recovered to the normal.

▼ If it is OK, finish the trouble shooting.

▼ If it is NG, go back to ▷5 and perform the checks again.

10-1-1 SYMPTOM CONFIRMATION

1. When conducting a trouble shooting, the operator cannot pinpoint the cause for the malfunction, unless he actually confirms the phenomenon. For this purpose, it is indispensable to reproduce the malfunctioning phenomenon by creating conditions and environments that are similar to those where the malfunction actually took place, based on the information obtained through the inquiry with the customer. As for phenomena which cannot be reproduced easily, it is necessary to produce running conditions that are close to those when the malfunction took place (Road surface condition, weather condition, and driving condition), based on the information obtained through the inquiry with the customer. To this end, it is of great importance to try to reproduce the malfunction persistently by applying external factors, such as vibration (Moving wire harnesses and relays by hand), heat (Applying hot air), and water (Applying moisture). Furthermore, while the malfunction phenomenon is being reproduced, it is essential to check diagnosis codes indicated before and after the confirmation of the malfunction phenomenon. Checking whether the code that was indicated before the confirmation is outputted or not is also an important step for confirming the malfunction phenomenon.

10-1-2 CUSTOMER PROBLEM ANALYSIS

1. As for the vehicle where malfunctions occurred, confirm first the malfunction phenomenon, and study the cause and then eliminate the cause. There is a possibility that the vehicle does not return to the normal condition even if many operations are performed without studying the cause. The diagnosis through interview is to collect information from the customer before confirming the malfunction phenomena. The diagnosis through interview provides very important clues in reproducing malfunction phenomena. Since the information obtained by the diagnosis through interview is referred to during the trouble shooting, it is imperative to make the inquiry of the customer, centering on the items related to the malfunction.

10-1-3 HOW TO REPRODUCE

The following shows how to reproduce the malfunction phenomenon hard to reproduce with the vehicle stopped by applying external factors (Vibration, heat, water, etc.).

(1) Vibration method (When it is presumed that failure occurs due to vibration)

① Harness

Check to see if malfunction takes place by lightly swinging the wire harness vertically and laterally.

CAUTION

- In the case of harnesses, focus on checking the neck of the connector, a fulcrum of vibration, body pass-through section.

② Connector

Lightly swing the connector vertically and laterally.

(2) Hot/cold temperature method (When it is presumed that failure occurs at hot/cold temperatures)

With a hair dryer or refrigerant, heat or cool the parts of the system thought to be responsible for the malfunction. See if the malfunction is reproduced.

CAUTION

- When heating, do not heat the part beyond +60°C (Temperature at which the part can be touched by hand).
- Do not open the cover for the sensor, ECU, etc. to directly heat or cool the electronic components.

(3) **Water spray method (When it is presumed that failure occurs on rainy or humid days)**

Apply water to the vehicle and see if the malfunction takes place.

CAUTION

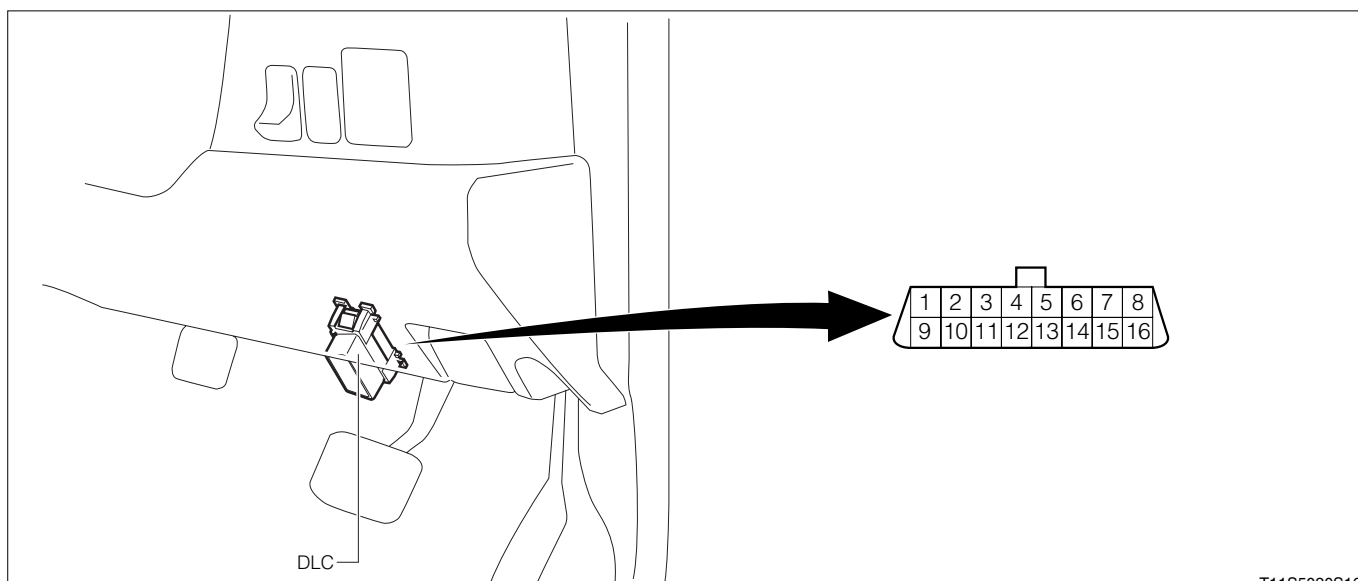
- Do not apply water directly to electronic parts.

NOTE

- If rain leak takes place inside the vehicle, the rainwater may go along the harness, entering the inside of the parts. This should be kept in mind especially when the vehicle has had rain leak before.

(4) **Others (When it is presumed that failure occurs due to excess electrical load)**

Increase the electric load by operating the electric parts, such as the heater blower, headlamps, and rear defogger. See if the malfunction takes place.

11 DATA LINK CONNECTOR(DLC)**11-1 ARRANGEMENT OF DLC TERMINAL**

T11S5020S16

Terminal No.	Terminal code	Terminal name	Terminal No.	Terminal code	Terminal name
1	BAT	Battery power supply	9	—	—
2	—	—	10	SIO	Diagnostic tester communication
3	CANL	CAN communication LO	11	CANH	CAN communication HI
4	ECU-T	ECU-T check terminal	12	—	—
5	EFI-T	EFI-T check terminal	13	E	Body earth
6	—	—	14	EPS-TS	EPS-TS check terminal
7	—	—	15	—	—
8	REV	Engine revolution speed signal	16	—	—

11-2 HOW TO SHORT-CIRCUIT THE DLC

Connect the engine control system inspection wire (SST:09991—87404— 000).

Use the short-circuit terminal (SST:09991—87403—000) and engine speed sensing terminal (SST:09991—87402— 000) to perform system check for each system.

11-3 HOW TO SHORT-CIRCUIT USING THE SST.

1. Diagnostic code output of the engine control system
.....Short circuit between 5 (EFI-T) — 13(E)
2. Oxygen sensor operation check of the engine control system
.....Short circuit between 5 (EFI-T) — 13(E)
3. Engine speed check of the engine control system
.....Measure between 8(REV) and the body earth.
4. Diagnostic code output of the electric power steering
.....Short circuit between 14 (EPS-TS) — 13(E).
5. Diagnostic code output of the ABS system
.....Short circuit between 4 (ECU-T) — 13(E).
6. Diagnostic code output of the SRS airbag system
.....Short circuit between 4 (ECU-T) — 13(E)
7. Operation check of the ITC computer and the hazard lamp system
.....Short circuit between 4 (ECU-T) — 13(E).
8. Diagnostic code output of the immobilizer system
.....Short circuit between 4 (ECU-T) — 13(E).
9. Diagnostic code output of the CAN communication system
.....Short circuit between 4 (ECU-T) — 13(E).
10. Diagnostic code output of the LIN communication system
.....Short circuit between 4 (ECU-T) — 13(E)
11. Diagnostic code output of the meter system
.....Short circuit between 4 (ECU-T) — 13(E).

11-4 HOW TO CONNECT WITH THE DIAGNOSIS TESTER(DS-21)

Connect the engine control system inspection wire (SST:09991-87404-000).

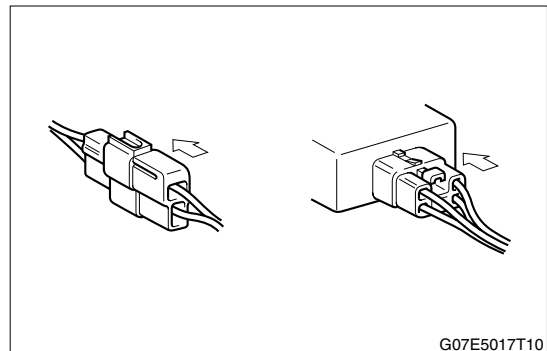
NOTE

- A terminal to communicate with the diagnosis tester (DS-21) is installed to the DLC (Vehicles side).

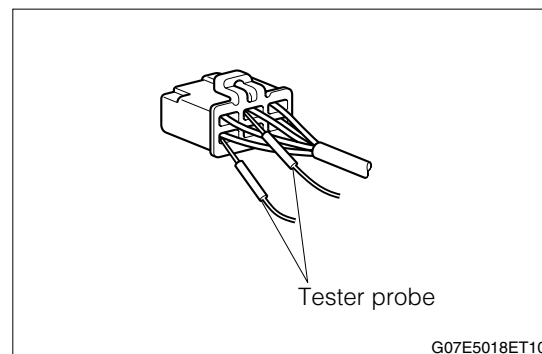
12 INSTRUCTIONS FOR SYSTEM INSPECTION

12-1 HANDLING INSTRUCTION OF CONNECTOR

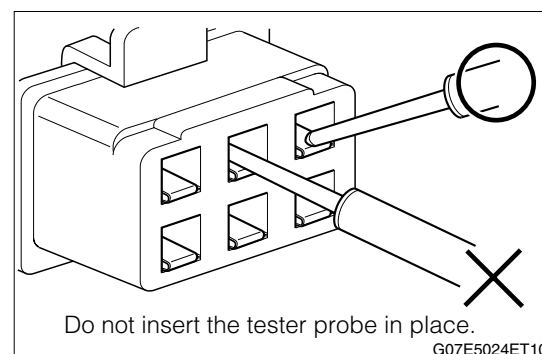
1. Connection or disconnection of the connector and each terminal shall be performed basically after the removal of negative terminal of the battery.
However, there may be the case that diagnosis code is erased when remove the negative terminal of battery, so confirm the diagnosis code first before the removal of battery negative terminal when need to confirm.
2. When disconnecting connectors, be sure to hold the connector itself with the connector unlocked.
Never pull harnesses. When connecting connectors, be sure to positively insert the connectors, until you hear a clicking sound and the lock is engaged.



3. When inserting tester probes into a connector, insert them from the rear side of the connector.



4. For water—proof connectors which cannot be accessed from behind, take good care not to deform the connector terminals.
5. Never touch the terminal of connector directly by hand.
6. When a tester probe is applied to a terminal to which voltage is applied, care must be exercised so that two tester probes may not come in contact with each other so that short circuit may not take place.



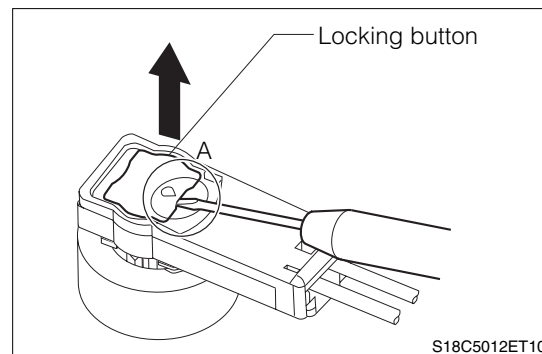
12-2 CONNECTOR REMOVAL/INSTALLATION PROCEDURE

12-2-1 CONNECTOR WITH LOCKING BUTTON

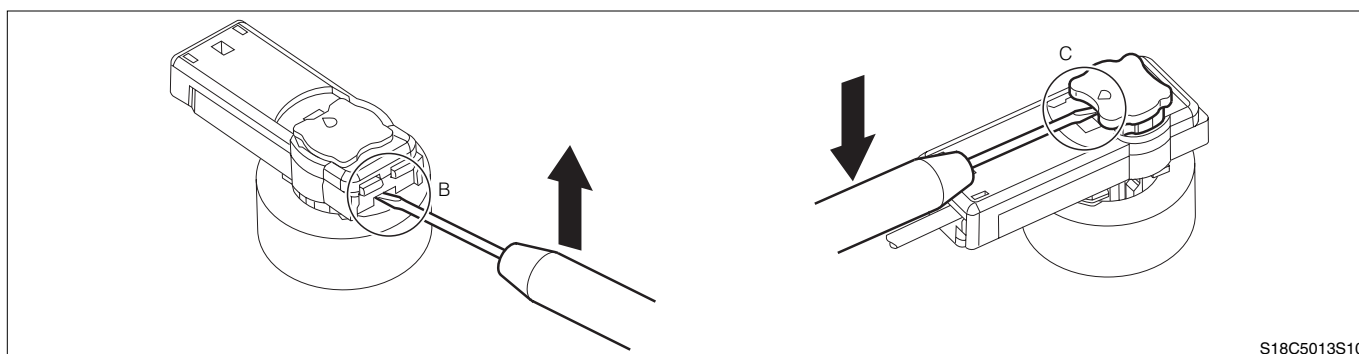
(1) Type 1

① Points of removal

1. Insert a flat screwdriver with a thin forward end (Approx. 2 mm wide) into the locking button at the point A. Raise the locking button, utilizing lever principle, until you hear a clicking sound, thus unlocking the connector.

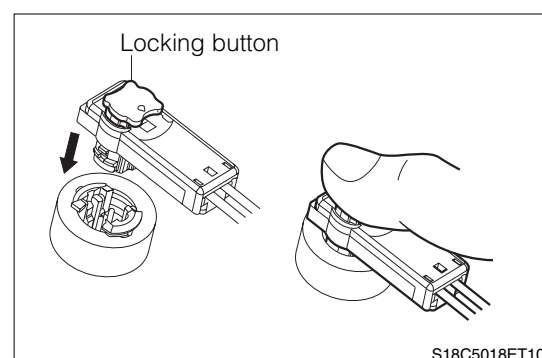


2. Insert a flat screwdriver with a thin forward end (Approx. 2 mm wide) at the point B or C. Pry the point with the screwdriver in the arrow direction, utilizing lever principle, thus removing the connector.



② Points of installation

1. Insert the connector firmly as far as it goes. Push and lock the connector, until the locking button clicks.

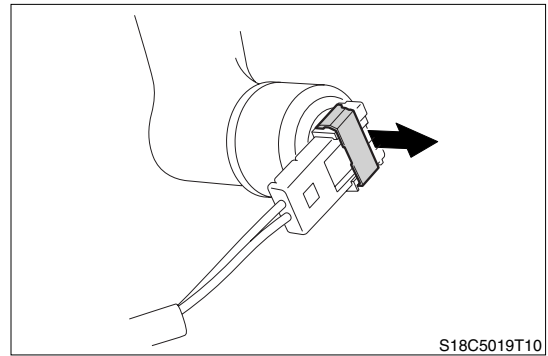


A1-27

(2) Type 2

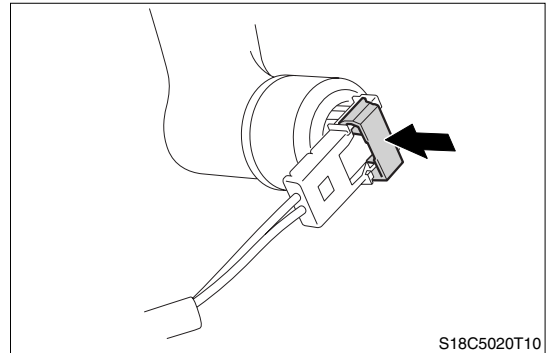
① Points of removal

1. With a flat screwdriver with a thin forward end, pull out the locking button in the arrow direction, thus unlocking the lock. Then, remove the connector.



② Points of installation

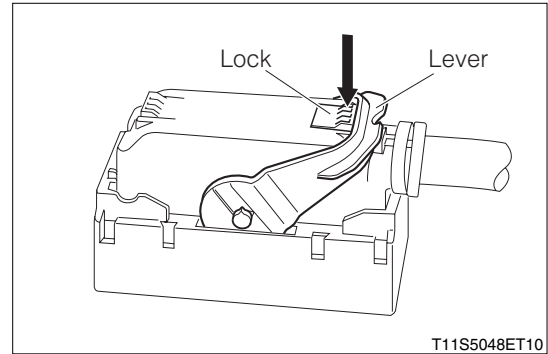
1. Insert the connector firmly as far as it goes. Push and lock the connector, until the locking button clicks.



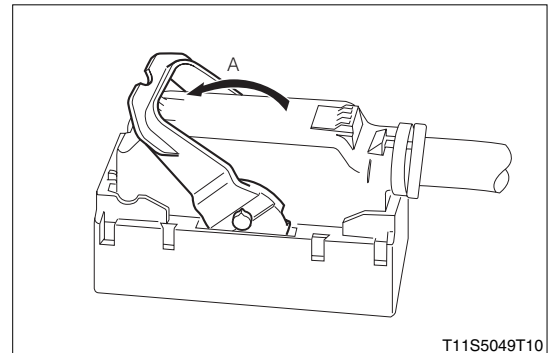
12-2-2 CONNECTOR WITH LEVER LOCK

(1) Points of removal

1. Push the lock of the lever section in the arrow direction, thus unlocking the lock.

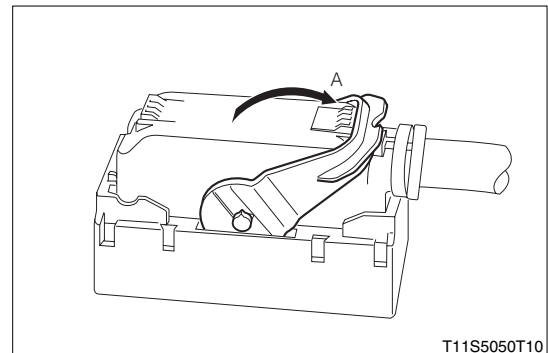


2. Turn the lever securely in the direction A to remove the connector.



(2) Points of installation

1. Insert the connector to the mating side. Turn the lever in the direction A to lock the connector.



12-3 CHECK PROCEDURE OF WIRE HARNESS AND CONNECTOR

Perform the inspection of wire harness and connector portion in the distinctive system inspection in accordance with next points.

12-3-1 CONTINUITY INSPECTION

1. Remove the connector of corresponding harness on both ends.
2. Measure the electrical resistance between corresponding terminals of connector on both end.

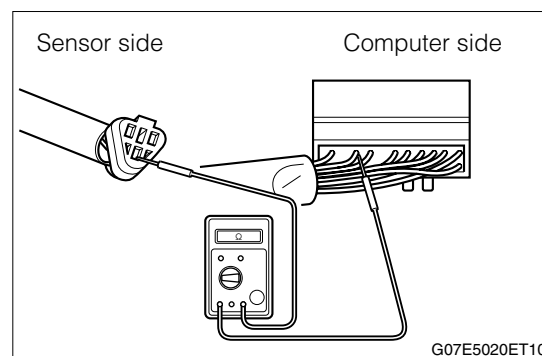
SPECIFIED VALUE: Not more than 1Ω

CAUTION

- Measure the electrical resistance while shaking wire harness in top and down and right and left lightly.

NOTE

- In case of open circuit, as it is seldom that open circuit happen in central part of wiring harness, and most of part the open circuit happen are connector area. Particularly, check the connector of the sensor portion carefully.



12-3-2 SHORT CIRCUIT INSPECTION

1. Remove the connector of corresponding harness on both end.
2. Measure the electrical resistance between corresponding terminal of connector and body earth connecting. In addition to above, perform the inspection with the connector of each side.

SPECIFIED VALUE: Not less than $1M\Omega$

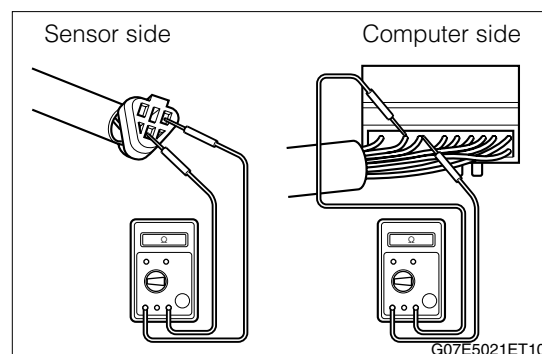
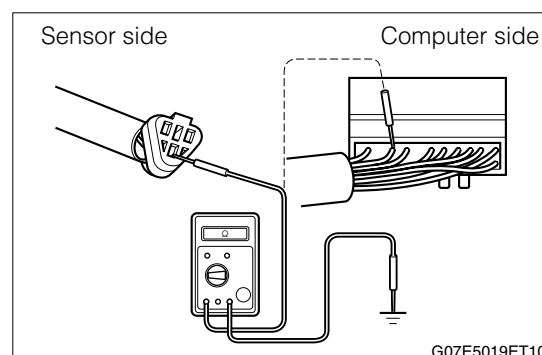
CAUTION

- Measure the electrical resistance while shaking wire harness in top and down, and right and left lightly.
3. Measure electrical resistance between terminals in same connector with the connector of corresponding terminal (Except between each power supply lines or earth lines). In addition to above, perform the inspection at the connector of both sides.

SPECIFIED VALUE: Not less than $1M\Omega$

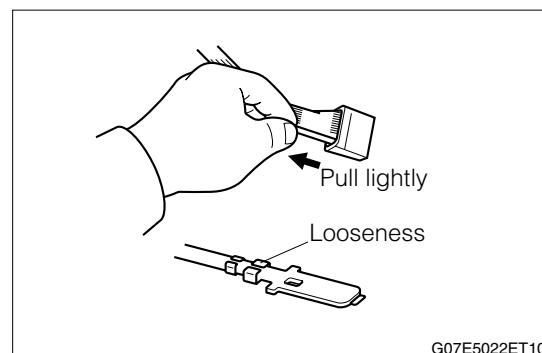
CAUTION

- There may be short circuits due to wiring in the vehicle compartment which is pinched by the body or faulty clamps.



12-3-3 VISUAL INSPECTION, CONTACT FORCE INSPECTION

1. Remove the connector of corresponding harness on both end.
2. Check visually the rust generation or mixing of the foreign material at connector terminal portion.
3. Check whether there are looseness, damage at the staking portion and check coming out from the coupler by pulling the wire harness lightly.



4. Prepare the same male terminal as that of the connector terminal. Insert it into the female terminal and check the pulling force.

The terminal having a smaller pulling force, compared with other terminals, may cause poor contact.

CAUTION

- If the terminal section has rust formation, admission of foreign matters or poor contact pressure between the male terminal and the female terminal, the contact condition may change by disconnecting and reconnecting the connector once, thus resulting in No malfunction.

Therefore, if the check of the wire harness and connector reveals that there is no malfunction, confirm the malfunction phenomenon. At this time, if no malfunction phenomenon is reproduced, most likely the poor contact between the male terminal and the female terminal was causing the malfunction.

12-4 CIRCUIT INSPECTION OF COMPUTER UNIT

Perform computer unit circuit inspection. If it is malfunction, repair the corresponding connector, circuit, and if normal, change the computer unit.

1. Visual check of connector portion, contact force inspection

Check the connector of computer unit according to visual check and the contact force check point described in former page.

2. Computer unit earth connecting inspection

Remove the connector of computer unit, and then measure the applied voltage between each power source terminal, each earth connector and body earth connecting.

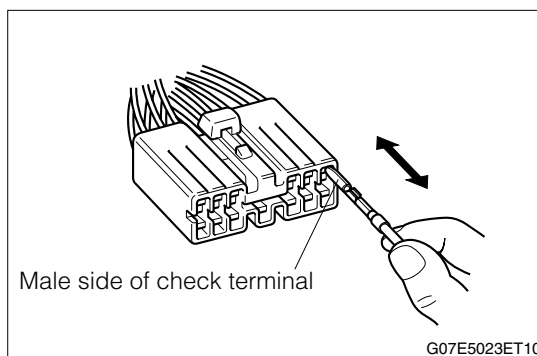
SPECIFIED VALUE: Voltage of each power supply terminal

CAUTION

- At the computer unit circuit check, there may be cases when the malfunction disappears by removing and installing the connectors, due to change of contact condition. Accordingly, when the result of computer unit circuit check is normal, judge that computer unit is malfunctioned after confirming the malfunction again by connecting the computer unit connector.

12-5 HANDLING INSTRUCTION OF SYSTEM

1. The computer unit, sensors, etc. are precision parts. Be very careful not to give strong impacts to those parts during the installation and removal. Never use those parts which impacts have been given (For example, in case where the parts were dropped on the floor).
2. When the test is carried out on rainy day or the vehicle is washed, care must be exercised so that no water may be admitted and the computer unit, connectors, sensors, actuators, etc. may not get wet.
3. In cases where the computer unit was judged to be malfunctioning and the vehicle has been remedied by replacing it, install the removed computer unit (Which has been judged to be malfunctioning) again to confirm that the original malfunction is reproduced. Then the computer unit can be finally judged to have been malfunctioning.



13 INSTRUCTIONS FOR RADIO INSTALLATION

CAUTION

- For those motor vehicles equipped with an amateur wireless set for business use or a mobile telephone, these devices may affect the electronic control system depending upon the installation position of such devices although full care has been taken to protect the electronic control system from external radio disturbance. Hence, be sure to pay attention to the following points.

1. Install the antenna as far away as possible from electronic control system.
2. As the electromagnetic wave is radiated from antenna feeder, set the antenna feeder within the distance at least not less than 300 mm apart from computer unit and ECU harness. Do not arrange both line in parallel for long distance.
3. Never bind the antenna feeder together with the engine harness with binding tape.
4. Regulate the antenna and the feeder to get rid of radio interference.
5. Never install a strong mobile communication system (Exceeding 10 kW).

14 HANDLING INSTRUCTIONS ON CATALYTIC CONVERTER-EQUIPPED VEHICLES

1. Use only unleaded gasoline to catalytic converter—equipped vehicles.
2. Utmost care must be paid as to the following points, for the catalyst will be damaged if a large amount of unburned gasoline flows into the catalytic converter.
 - (1) Do not operate the engine with the fuel in the fuel tank almost empty.
 - (2) The spark jump test must be limited to cases where such test is absolutely necessary. Also, be sure to finish the test in the shortest possible time.
 - (3) The spark check of the spark plug and engine compression pressure measurement must be performed with the fuel pump relay and injector connector disconnected and fuel injection stopped.
3. Do not dispose the waste catalyst along with parts contaminated with gasoline or oil.

15 PRECAUTION FOR VEHICLES EQUIPPED WITH SRS AIRBAG AND SEAT BELT PRETENSIONER

15-1 INSTRUCTIONS FOR SERVICE OPERATION

Be sure to perform the service operation for the vehicle equipped with the airbag and seat belt pretensioner according to the correct procedure and method, otherwise, the airbag or pretensioner may occur the malfunction and lead serious accidents during the service operation. Be sure to perform the service operation according to the correct procedure and method described in this manual.

15-1-1 DISCONNECTING THE POWER SUPPLY

1. Check the diagnosis code, and then disconnect the battery negative (—) terminal with the IG switch in "LOCK" position. Wait for 60 seconds to start work operation.
 - (1) The SRS airbag system is provided with a backup condenser (For the squib). Therefore, allow approx. 60 seconds for the backup condenser to discharge after the battery negative (—) terminal is removed. (Natural discharge)
 - (2) If work is started within 60 seconds, the air bag and the pretensioner may be activated.
 - (3) The memory of some systems will be erased when the battery negative (—) terminal is removed. Therefore, record memory contents of each system, as required, and input them after the work operation is complete.
2. Turn the IG switch to "LOCK" and connect the battery negative (—) terminal.

15-1-2 PRECAUTION PRIOR TO SERVICE OPERATION

1. For electrical checks, ensure that a digital circuit tester is used that meets the following standard.

WARNING

- If the tester to be used exceeds the specified value, the airbag and the pretensioner may be activated or damaged.

SPECIFIED VALUE: About 50 mA (0.05A) or less

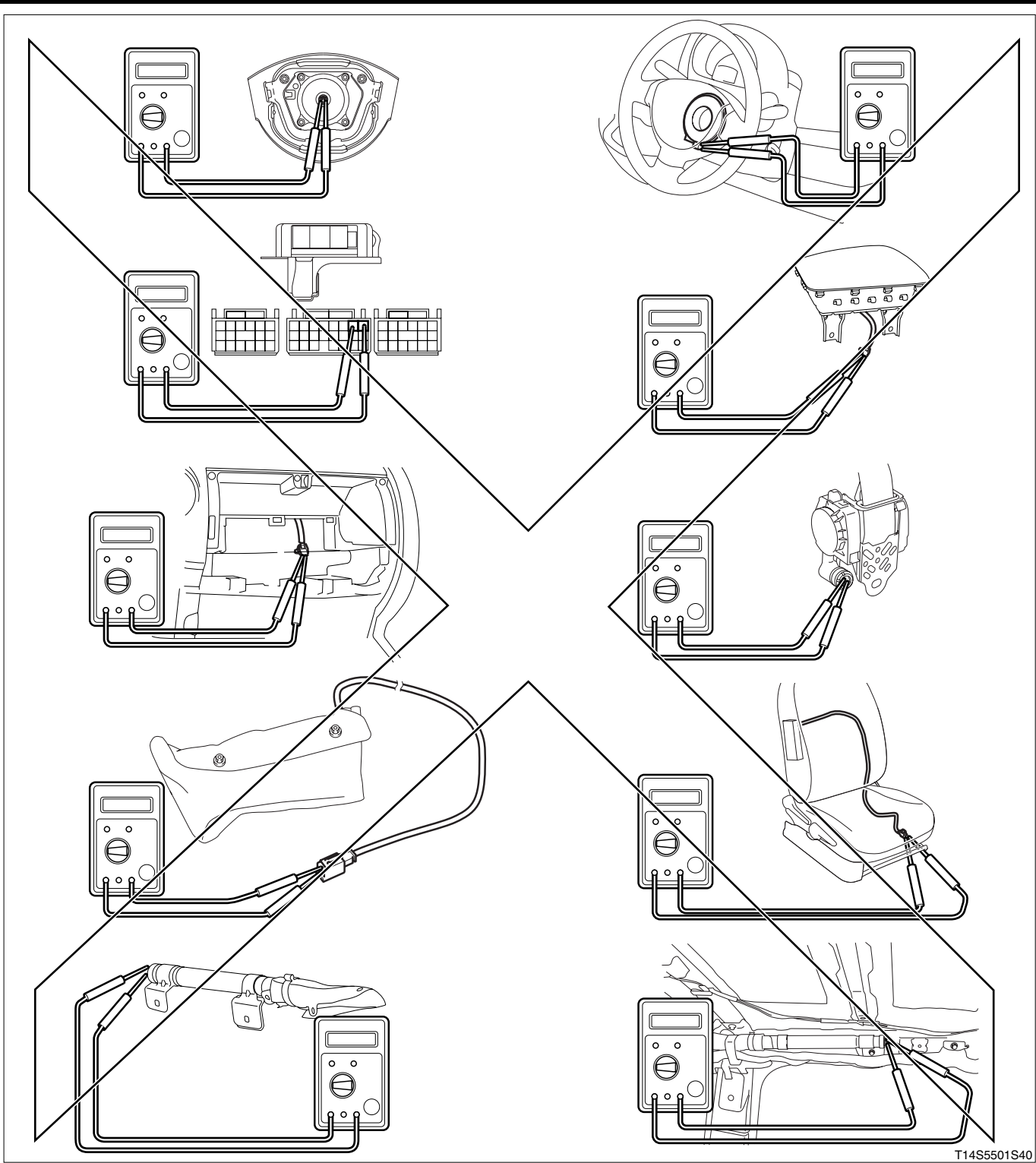
NOTE

- Always measure the current value of the tester to be used before starting work operation to ensure that the tester satisfies the specified value.
- When performing the current measurement for the tester, use the minimum range of the resistance (Ω).

2. When any of the components is removed from the air bag system (Including disconnection of the connector), ensure that the connector is removed in advance so that no accident will be caused inadvertently.
3. Follow instructions given on the label. Replace a stained or damaged label with a new one.
4. Never disassemble.
5. If the part has been dropped or exhibits a crack, dent or chips, replace with a new part.
6. Never use the parts from other vehicles. Always install a new part for replacement.
7. Do not expose parts directly to high temperatures or fire.
8. Even if the airbag and/or the pretensioner have not been activated in a collision, always perform diagnostic checks.
9. Do not apply grease. Prevent detergent, oil, water, etc. from adhering. If this happens, wipe it off immediately with dry cloth.
10. Store in places which are less likely to be exposed to electrical noise, and are not exposed to high temperatures (85°C or higher atmospheric temperatures), or high humidity.
11. Ensure that the airbag is activated with the SST, when the vehicle or the single part is discarded.
12. Never measure the resistance of the air bag components.

WARNING

- This is very dangerous, for the tester's current may activate the air bag and the pretensioner.



15-1-3 CAUTIONS WHEN DISCARDING THE AIR BAG AND THE PRETENSIONER**(1) Before deployment**

1. Never scrap the system before activated and deployed.
2. The activation and deployment should be performed at an outdoor flat place where safety can be ensured. Avoid performing this operation in a residential area whenever possible.
3. Since the activating and deploying sound is fairly large, inform persons in the vicinity of the event before those devices are activated.
4. Use the SST and keep at least 5m away from the airbag and the pretensioner to perform a deployment operation.
5. Static electricity may activate deployment. Therefore touch steel frame, vehicle body, etc. that creates earth with bare hands to remove static electricity.
6. During deployment operation, carefully prevent the deployment side from facing down.

(2) After operation

1. The temperatures of some portions exceed a few hundred °C. Therefore, leave them at least 30 minutes after they are deployed.
2. Do not splash water.
3. Wear dust protective goggles and gloves during operation.
4. Place in a clear durable plastic bag and seal the bag to be scrapped.
5. After completion of the operation, be sure to wash your hands with water.

15-1-4 CAUTION TIPS FOR BODY REPAIR AND PAINT

1. When repairing components located close to the airbag system, ensure that the system will not be exposed to a strong hammering shock or high heat.
2. When using an electric welder, remove the air bag system before starting work.
3. When the system is expected to be exposed to a shock or high heat, remove the components from the airbag system before starting work.
4. When coating near the airbag system components is to be dried, ensure that temperature will not exceed 85°C.
5. If the airbag system components have external damage or deformation, replace with new ones.

15-1-5 CASES WHERE THE AIRBAG AND THE PRETENSIONER NEED CHECKING

1. When the vehicle is damaged in a collision, including cases where no deployment or activation has occurred.
2. When the diagnostic code is outputted.

15-1-6 CAUTIONS FOR THE AIRBAG AND THE PRETENSIONER

Be sure to put the pad Ay and front passenger's seat airbag unit with the deployment surface facing upward during the operation though it is temporary operations. Never stack the pad Ay.

WARNING

- If the airbag should be deployed with the metal side facing upward, a serious accident may result.

15-1-7 CAUTIONS FOR SPIRAL CABLE

When the spiral cable is installed, or the steering wheel is installed/removed, be sure to perform centering.

CAUTION

- If the steering wheel is operated without centering, the spiral cable may be cut.

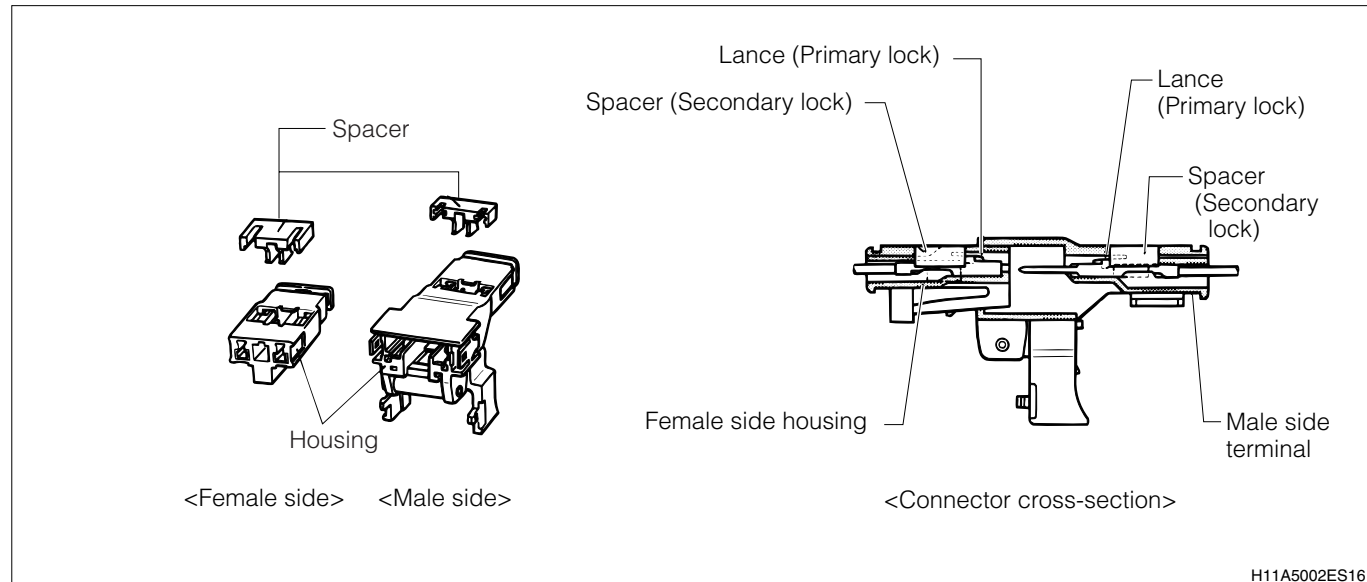
15-1-8 CAUTIONS FOR WIRE HARNESS AND CONNECTOR

All the connectors and the dedicated branch harnesses of the airbag system are colored in yellow, with the exception of exposed portions in the engine compartment. These connectors are special and require special care in handling in order to prevent any damage.

(1) Connector mechanism

① Terminal double lock mechanism

1. The mechanism provides better gripping force of the terminal so as to prevent the terminal from falling.
2. The connector has a two-piece construction consisting of a housing and a spacer, which doubly secures the terminal with the use of the lance (Primary lock) and the spacer (Secondary lock).

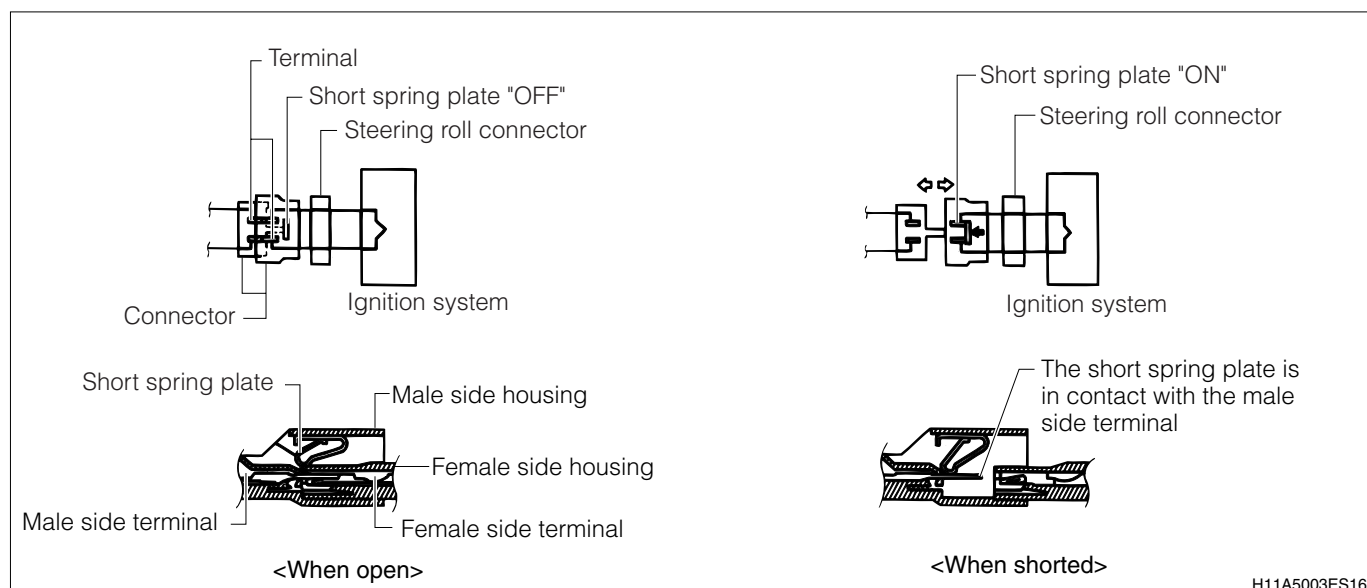


② Terminal short mechanism

1. The mechanism that automatically creates a short-circuit between the terminal on power supply side of the airbag and the terminal on the earth side, when the connector is removed.
2. The short spring plate is installed inside the connector, which creates a closed circuit on the airbag side (Potential difference between the terminals is not created), thereby preventing wrong operation during servicing.

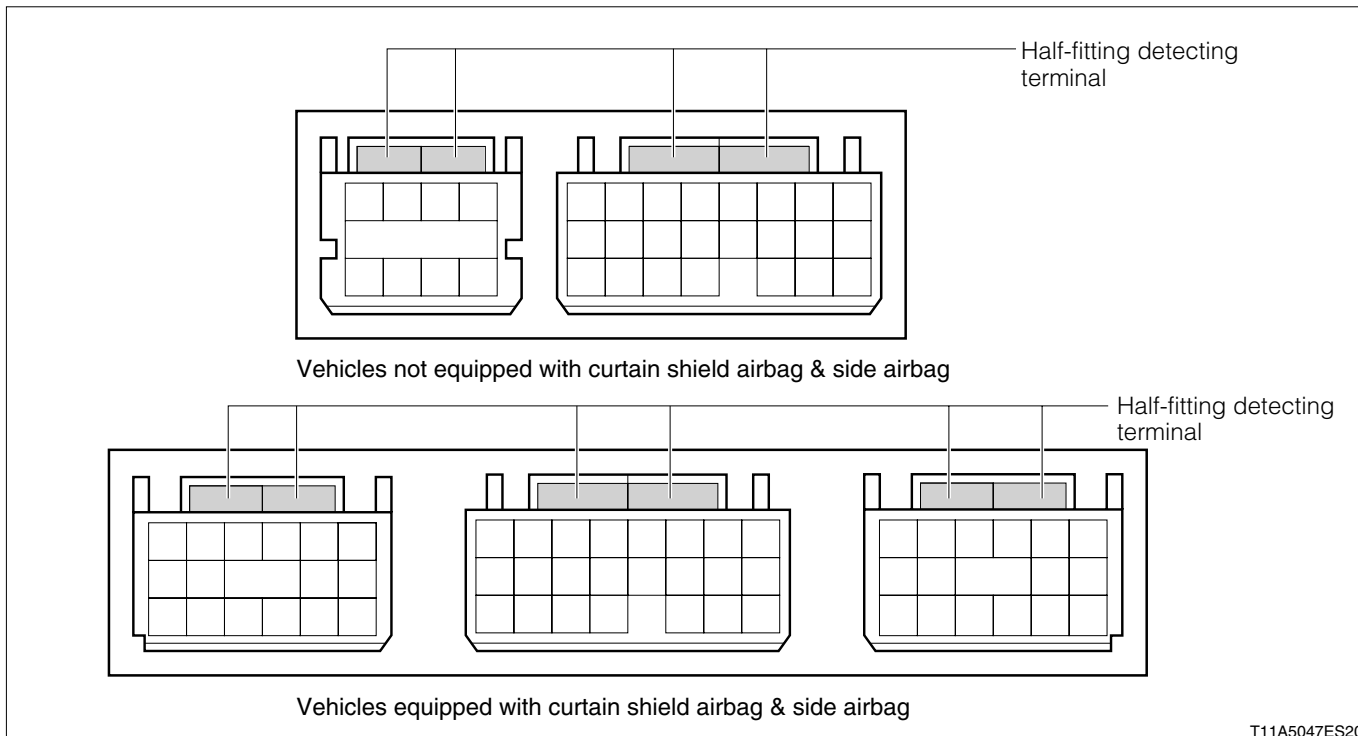
CAUTION

- When checking the harness, the terminal's short-circuit mechanism might lead to incorrect diagnosis, such as a short-circuit condition between the harnesses. When checking the harness, insert the airbag deployment SST (Part number: 09082-87710-000, 09082-00760-000) into the connector to be checked, and check the harness while the SST is connected. If this checking finds faulty condition in the harness, insert an insulator between the short spring plate and the terminal, or remove the short spring plate, and then proceed to checking.



③ Half fit detecting mechanism

1. This is a mechanism which detects whether the airbag ECU is firmly connected with the vehicle side harness connector.
2. When the IG SW is turned "ON" with the connector half-fit, the airbag warning lamp will remain illuminated.
3. When the airbag system is normal and the connector is firmly connected, the airbag warning lamp is turned off.



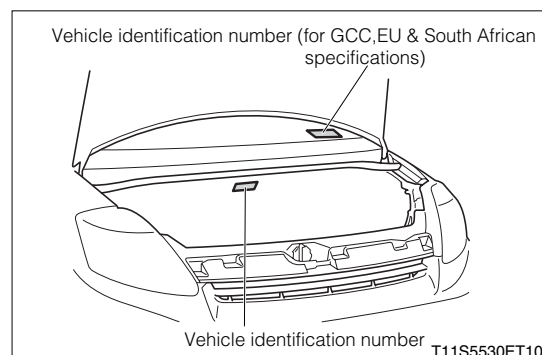
16VEHICLE IDENTIFICATION

16-1 BODY COLOR CODE

Body color name	Color code
White	W09
Pearl white I	W16
Brigth silver metallic	S28
Black mica metallic	X07
Shining Red	R40
Champagne metallic opal	T17
Mint blue metallic opal	B57
Gray metallic	S30
Yellow green mica metallic	G43
Maroon mica	R56
Yellow metallic	Y08

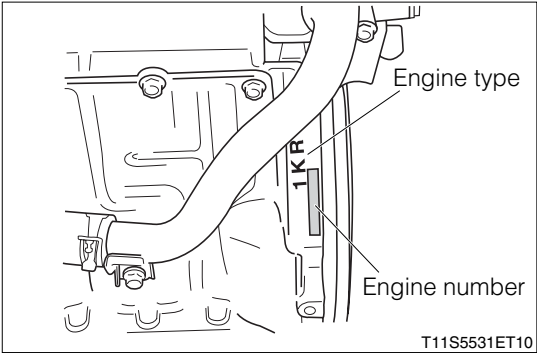
16-2 VEHICLE IDENTIFICATION NUMBER

1. The vehicle identification number is stamped on the position as shown in the illustration.



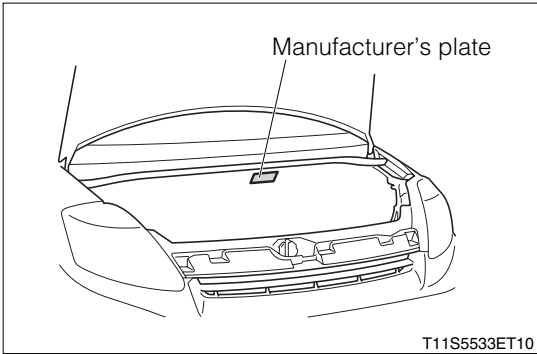
16-3 ENGINE TYPE AND ENGINE NUMBER

1. The engine type and engine number are given on the places as shown in the illustration.
- 1KR engine



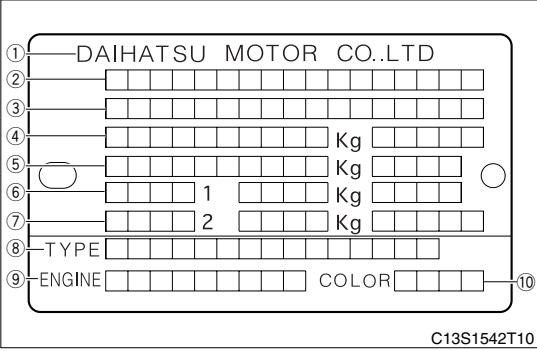
16-4 MANUFACTURER'S PLATE POSITION

1. The manufacturer's plate is given on the place as shown in the illustration.



16-4-2 CONTENTS OF MANUFACTURER'S PLATE

No.	Contents of indication
①	Manufacturer's name
②	Authorized number of WVT A
③	Vehicle identification number
④	Gross vehicle weight
⑤	Gross combination weight
⑥	Maximum permissible front axle weight
⑦	Maximum permissible rear axle weight
⑧	Vehicle model
⑨	Engine type
⑩	Body colors



A2 MAINTENANCE

MAINTENANCE REQUIREMENTS -----A2-1
MAINTENANCE SCHEDULE-----A2-1
SCHEDULE FOR SEVERE DRIVING ----A2-4

1 MAINTENANCE REQUIREMENTS

1. The scheduled maintenance service is important to ensure trouble-free, safe and economical driving. Failure to perform the scheduled maintenance may cause an accident or serious damage.
2. If you conduct the periodical maintenance, SUBARU car owners may reduce the chance of accidents or car problems. Furthermore, it becomes possible for you to find at an earlier stage malfunctions which may lead to serious damages. Consequently, potential vehicle damage can be prevented or the degree of the damage can be minimized.
3. Therefore, all of the persons who are concerned with servicing the Daihatsu vehicles should offer the periodical maintenance service to SUBARU car owners in order that they may be protected from accidents or unexpected problems.
4. To prevent malfunctions in advance, however, conducting the periodical maintenance service only is insufficient. It is essential that owners themselves perform maintenance, such as the pre-starting check described in the owner's manual, so that the vehicle exhibits no abnormal change or phenomenon. Hence, please explain to owners about the necessity of maintenance performed by them.
5. However, malfunction may occur on those vehicles which are always checked by their owners. For instance, if a part instructed to be replaced periodically should be used beyond the replacement intervals and the life of the part has expired, there are cases where malfunction occurs suddenly despite the fact that no malfunction had taken place until yesterday. To prevent such malfunction in advance, be sure to replace parts recommended to be replaced periodically at the specified replacement intervals.
6. This section describes those items of the scheduled maintenance service recommended by the Daihatsu and their intervals. Be sure to observe the maintenance schedule.

2 MAINTENANCE SCHEDULE

1. For improved maintenance, the maintenance schedule has been simplified.

NOTE

- Perform the periodical maintenance at the specified mileage or the time whichever comes first, unless otherwise specified.

2. Continue to perform the periodical maintenance after 90,000 km (54,000 miles) at the same intervals as before 90,000 km.
3. If the vehicle should be operated under severe driving conditions, operated occasionally, operated in dusty areas, repeating short trip, operated under extremely cold climate and/or on salted roads, it is necessary to perform some maintenance items more frequently than the regular maintenance schedule.
4. This maintenance schedule has been prepared based on requirements mentioned in the owner's manual which are to be performed by the Daihatsu owner thoroughly.

○.....Check or inspect ●.....Change or replace

Section	Item	What to do Inspection interval	× 1000 km	15	30	45	60	75	90	
			× 1000 miles	9	18	27	36	45	54	
			Years	1	2	3	4	5	6	
Engine	Air cleaner element	Cleaning Check ● Damage Change		○	○	●	○	○	●	
	Engine oil & oil filter	Change (Use API SH or higher*1)		●	●	●	●	●	●	
	Fuel line & connections (Including fuel hoses)	Check ● Crack ● Tightness ● Leakage ● Damage			○		○		○	
	Coolant (Long life coolant)	Change	Every 2 years							
	Drive belt (Alternator, water pump, power steering)	Check ● Tension ● Crack ● Damage		○	○	○	○	○	○	
	Spark Plug	except for irid-ium plug	Clean & check ● Condition ● Gap ● Damage			○		○		○
		for irid-ium plug	Change	Every 90,000km(54,000 miles)						
Exhaust emission control system	Charcoal canister	Check ● Function ● Damage				○			○	
	Evaporative emission hoses	Change	Every 8 years							
	Exhaust pipe & muffler mounting	Check ● Tightness ● Damage			○		○		○	

*1: Replace every 12,000 km(7,200miles) / 1 year, whichever comes first when API SG multi grade oil is used.

○.....Check or inspect ●.....Change or replace

Section	Item	What to do Inspection interval	× 1000 km	15	30	45	60	75	90
			× 1000 miles	9	18	27	36	45	54
			Years	1	2	3	4	5	6
Power transmitting system	Clutch	Check ● Free travel ● Reserve travel ● Damage		○	○	○	○	○	○
	Clutch fluid	Change	Every 2 years						
	Manual transmission	Check & Change ● Oil			○		○		●
	Drive shaft boots	Check ● Damage			○		○		○

A2-3

Suspension system	Suspension arm (Front) Control arm (Rear) Dust boots Spring Stabilizer	Check • Tightness • Rattle • Damage		○		○		○
Steering system	Steering linkage Gear box Dust boots	Check • Free play (Steering wheel) • Tightness • Rattle • Damage		○		○		○
	Wheel alignment	Check • Toe-in			○			○

○.....Check or inspect

●.....Change or replace

Section	Item	What to do Inspection interval	× 1000 km	15	30	45	60	75	90
			× 1000 miles	9	18	27	36	45	54
			Years	1	2	3	4	5	6
Brake system	Brake pedal & parking brake	Check • Free play (Brake pedal) • Reserve travel (Brake pedal) • Working travel (Parking brake) • Tightness • Rattle • Damage			○		○		○
	Disc & disc pad	Check • Wear • Damage		○	○	○	○	○	○
	Brake hose, tube and P & B valve	Check • Leakage (Fluid level, connection) • Loose clamp • Damage			○		○		○
	Brake fluid	Change	Every 2 years						
	Brake drum & lining	Check • Wear • Damage			○		○		○
	Master & wheel cylinder	Check • Leakage			○		○		○
Chassis & body	Wheel hub nut, other bolts & nuts	Check • Tightness		○	○	○	○	○	○

3 SCHEDULE FOR SEVERE DRIVING

Severe driving conditions

- 1: Pulling a trailer
- 2: Repeated short trips
- 3: Driving on rough roads
- 4: Driving dusty roads
- 5: Driving in extremely cold climate and/or on salted roads

○.....Check or inspect

●.....Change or replace

Section	Item	What to do Inspection interval	× 1000 km	7.5	15	22.5	30	37.5	45	52.5	60	67.5	75	82.5	90
			× 1000 miles	4.5	9	13.5	18	22.5	27	31.5	36	40.5	45	49.5	54
			Years	0.5	1	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6
Engine	Air cleaner element	Cleaning Check ● Damage Change	○:Every 5,000 km (3,000 miles) ●:Every 15,000km (9,000 miles) / 1 year												
	Engine oil & oil filter	Change (Use API SH or higher*1)		●	●	●	●	●	●	●	●	●	●	●	●
	Timing belt	Change	Every 50,000 km (30,000 miles)												
Exhaust emission control system	Exhaust pipe & muffler mounting	Check ● Tightness ● Damage			○		○		○		○		○		○
Steering system	Steering linkage Gear box Dust boots	Check ● Free play (Steering wheel) ● Tightness ● Rattle ● Damage			○		○		○		○		○		○
Brake system	Disc & disc pad	Check ● Wear ● Damage		○	○	○	○	○	○	○	○	○	○	○	○
	Brake drum & lining	Check ● Wear ● Damage			○		○		○		○		○		○

*1: Replace every 5,000km(3,000miles) / 0.5 year, whichever comes first when API SG multi grade oil is used.

B1 ENGINE

1KR-----B1-1

ENGINE -----B1-1

ARTICLES TO BE PREPARED -----B1-1

BASIC CHECK AND ADJUSTMENT ---B1-1

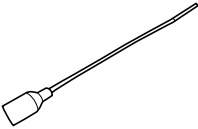
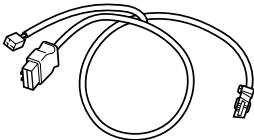
B1-1

1KR

1 ENGINE

1-1 ARTICLES TO BE PREPARED

SST

Shape	Part No.	Part name
	09991-87402-000	Wire, tacho-pulse pick up
	09991-87403-000	Wire, diagnosis check
	09991-87404-000 (09991-87401-000)	Wire, engine control system inspection

Instrument

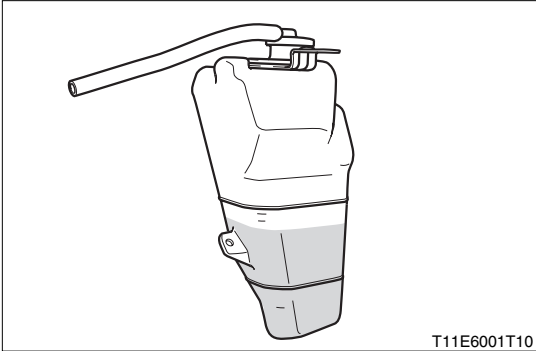
Radiator cap tester, Radiator cap tester adapter, MityVac, Belt tension gauge, Compression gauge, Tachometer, Timing light, Torque wrench, Micrometer, Thickness gauge, Voltage tester, Sound scope, Plug gap gauge

1-2 BASIC CHECK AND ADJUSTMENT

1-2-1 CHECK OF COOLING WATER LEVEL AND WATER LEAKAGE

(1) Water level

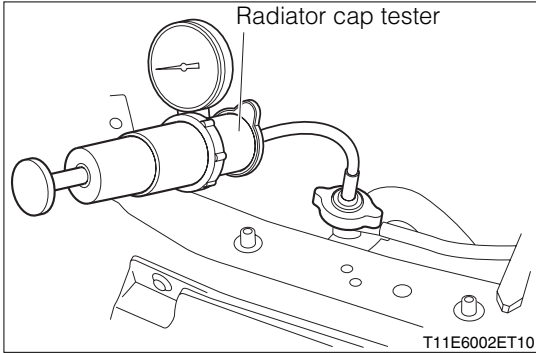
1. Check that the cooling water level is between the upper limit (FULL) and the lower limit (LOW) of the reservoir tank.



(2) Water leakage

1. With the engine idling, visually check that there is no water leakage from the radiator, radiator hose, water pump, water bypass pipe, water bypass hose, heater hose, etc.
Moreover, apply pressure, using a radiator cap tester. Under this condition, check that no water leakage is present.

SPECIFIED VALUE: Specified value for check
122.7kPa {1.25kgf/cm²}

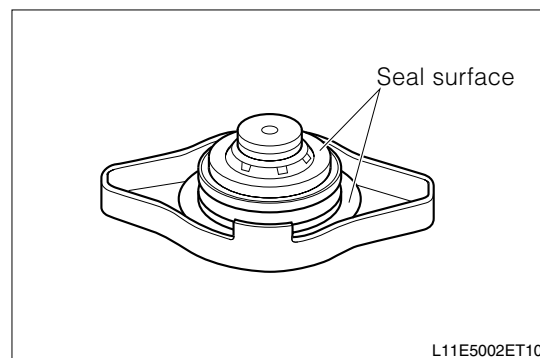


NOTE

- There may be a small amount of cooling water leaking from the vapor hole and the drain hole of the water pump. However, this is not an abnormality.

(3) **Function check of radiator cap**

1. Remove the radiator cap. Then, visually check the valve seat surface for smear and damage. Also, move the negative pressure valve by your hand and check that it opens and closes.

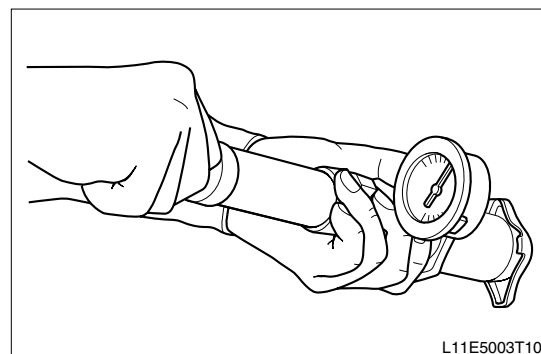


2. Check the valve opening pressure of the cap, using a radiator cap tester.

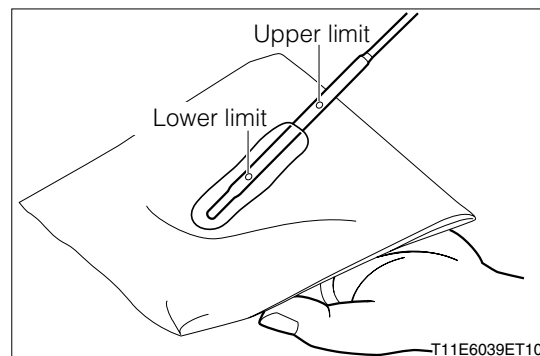
SPECIFIED VALUE: $108.0 \pm 14.7 \text{ kPa} \{1.1 \pm 0.15 \text{ kgf/cm}^2\}$

CAUTION

- Liberally apply water to the cap seal surface before the installation to the tester.

**1-2-2 CHECK OF ENGINE OIL LEVEL**

1. Stop the engine. Perform the check on a level place.
2. Pull out the oil level gauge. Wipe out the oil adhered to the gauge and insert it again.
3. Check that the oil level is between the lower limit (L) and the upper limit (F).
4. Check the condition of smear and that there is no white turbidity in the engine oil by observing the oil adhered to the oil level gauge.

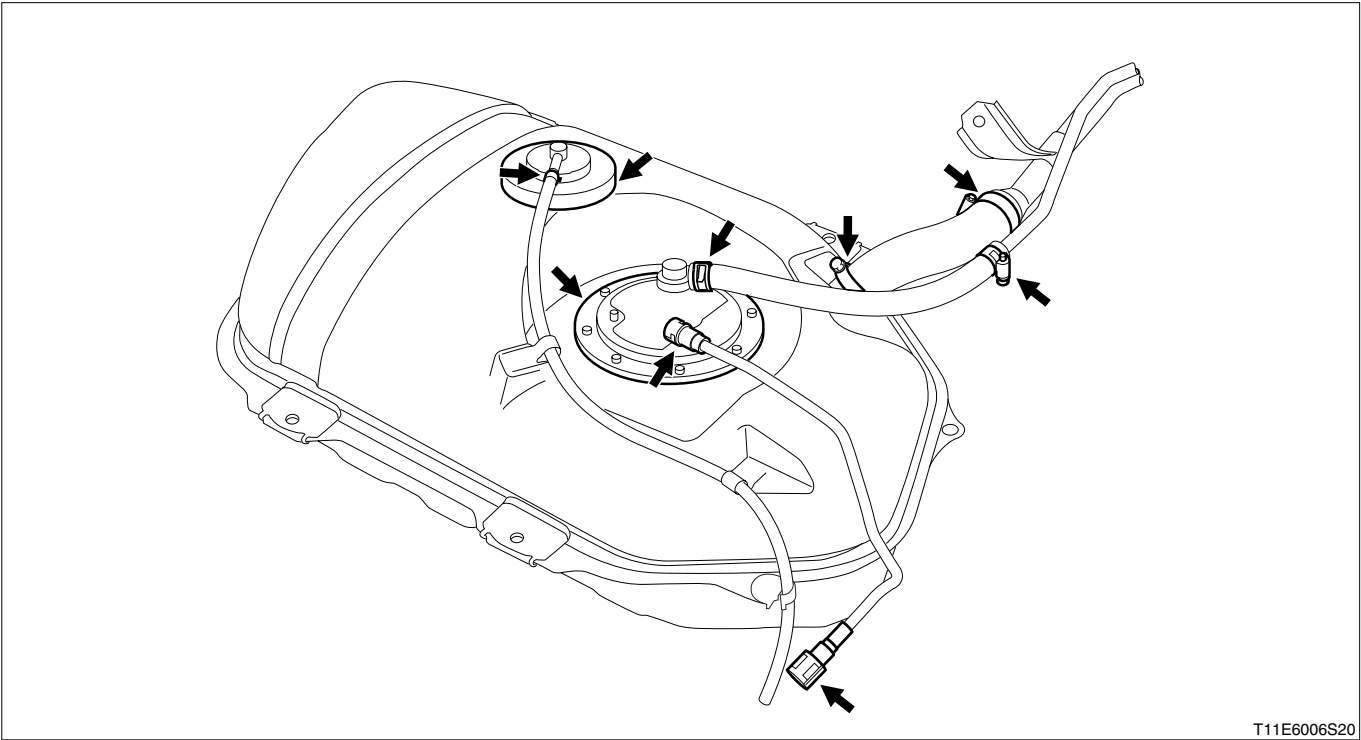
**1-2-3 ENGINE OIL LEAKAGE CHECK**

1. Visually check that there is no oil leakage from the cylinder head cover, oil pan and drain plug.

B1-3

1-2-4 FUEL LEAKAGE CHECK

- 1. Visually check the fuel tank main body, fuel pump, hoses and pipes for fuel leakage.
- 2. Visually check that there is no crack and damage in the fuel hoses and pipes. Also, check that the installation of the clamp for each hose and pipe is not loosened.



T11E6006S20

1-2-5 CONDITION OF AIR CLEANER ELEMENT

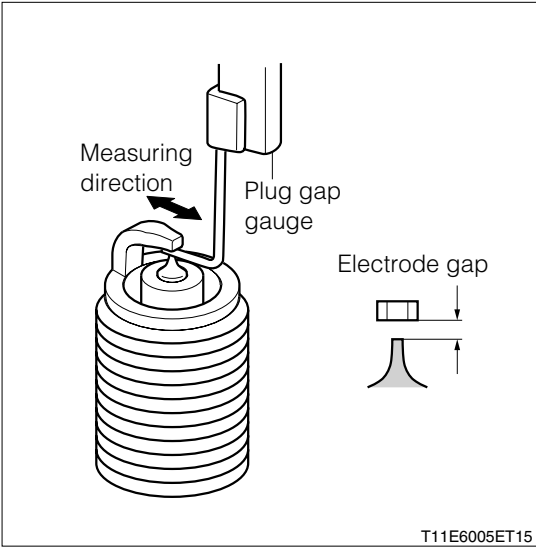
- 1. Remove the air cleaner element. Then, visually check that there is no smear, clog or damage.
- 2. In cases where the air cleaner element exhibits smear or clog, clean by blowing compressed air.

1-2-6 CHECK OF SPARK PLUG

- 1. Ensure that the designated plugs are used. Also, check that the plug exhibits no smoldering and the plug is not burnt excessively. Check to see if the gap between the electrodes is normal.

WARNING

- Be very careful not to get scalded, for the spark plug is very hot.



T11E6005ET15

Spark plug specifications

	Vehicle mounted with Type 1KR-FE engine	
	DENSO	NGK
Manufacturer	DENSO	NGK
Type	SK20HR11	ILFR6C11
Kind	Iridium	Iridium
Electrode gap (mm)	1.0 - 1.1	1.0 - 1.1

1-2-7 CHECK AND ADJUSTMENT OF TENSION (DEFLECTION AMOUNT) OF V-BELT FOR ALTERNATOR

(1) Check

1. Check the V-ribbed belt for cracks, deterioration and significant wear.
2. Check the tension of the V-ribbed belt, using a belt tension gauge.

NOTE

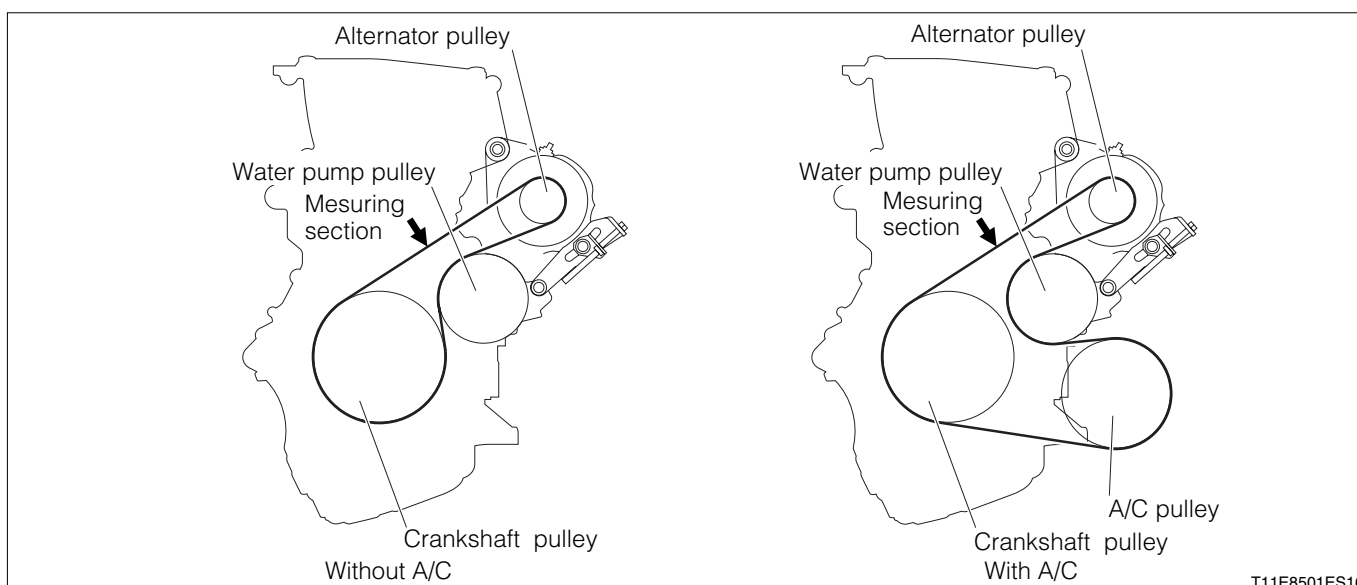
- The check can be performed by measuring the deflection amount of the V-belt.

Specified value

	When a new part is installed	During inspection
Tension value (N{kgf})	780 ± 98 { 79.6 ± 10.2 }	490 ± 100 { 50 ± 10.2 }
Deflection amount (mm) (Pushing force 100N{10.2kgf})	5.8-7.0	8.0-11.0

NOTE

- When checking the deflection amount of the belt, push a point between the alternator pulley and the crankshaft pulley with a force of 100 N (10.2 kgf). Under this condition, measure the deflection amount.
- In cases where the tension is measured after the belt has been assembled, the measurement should be performed after cranking two turns.
- When the belt is replaced with a new one, the belt tension should be adjusted to the mid-value of the specified value for "When a new part is installed."
- If the engine has once started, the belt tension should be adjusted to the mid-value of the specified value for "During inspection."



T11E8501ES16

(2) Adjustment

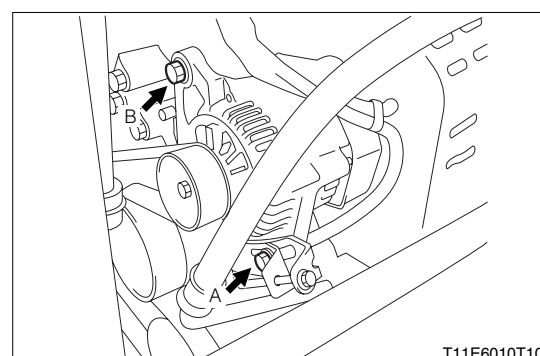
1. Loosen the bolts (B) for retaining the alternator.
2. Loosen the bolts (A) for retaining the adjusting bar.
3. After loosening, lightly tighten the bolts (A) by hand.
4. Adjust the tension by turning the adjusting bolt of the adjusting bar.
5. Tighten the bolts (A) for retaining the adjusting bar.
6. Tighten the bolts (B) for retaining the alternator

TIGHTENING TORQUE:

Bolt A
 $34.0 \pm 6.8 \text{ N} \cdot \text{m}$
 $\{347 \pm 69 \text{ kgf} \cdot \text{cm}\}$

Bolt B
 $54.0 \pm 10.8 \text{ N} \cdot \text{m}$
 $\{551 \pm 110 \text{ kgf} \cdot \text{cm}\}$

7. Confirm the belt tension.



T11E6010T10

1-2-8 CHECK AND ADJUSTMENT OF VALVE CLEARANCE

(1) Specified value

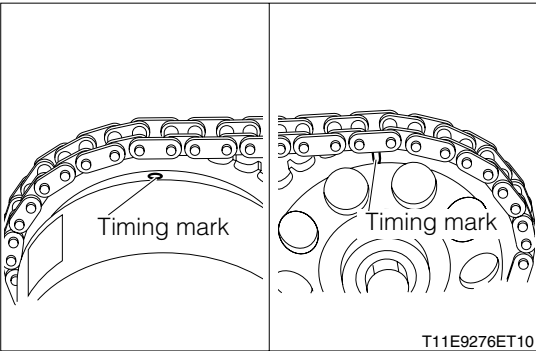
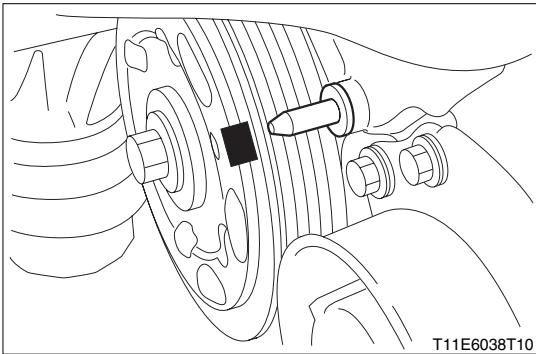
		Valve clearance (mm)	
Vehicle mounted with Type 1KR-FE engine	IN	During cold period	0.18 ^{+0.055} _{-0.035}
	EX		0.31 ^{+0.055} _{-0.035}

(2) Check

NOTE

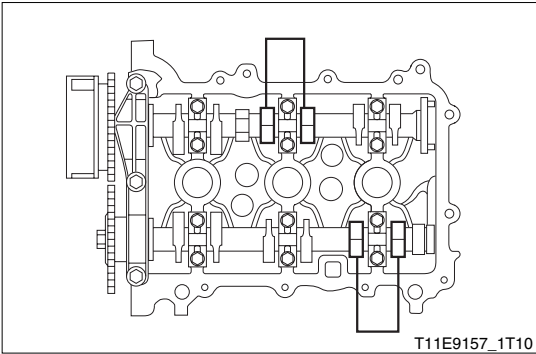
- For the removal and installation procedures of each part, refer to the section under "Removal and Installation of Camshaft."
Refer to Page B2-8.

- Set the No.1 cylinder to the top dead center under the exhaust stroke.
 - Turn the crankshaft pulley in the normal direction, until the timing mark (0 degrees) of the crankshaft pulley is aligned with the timing point of the timing chain cover Ay.
 - Ensure that the timing mark of the camshaft timing sprocket is at the top position.
If the timing mark is not at the top position, turn the pulley one turn so that the timing mark comes at the top.



- Using a thickness gauge, check the valve clearances shown in the right figure.

Cylinder No.1		Cylinder No.2		Cylinder No.3	
IN	EX	IN	EX	IN	EX
—	—	○	—	—	○



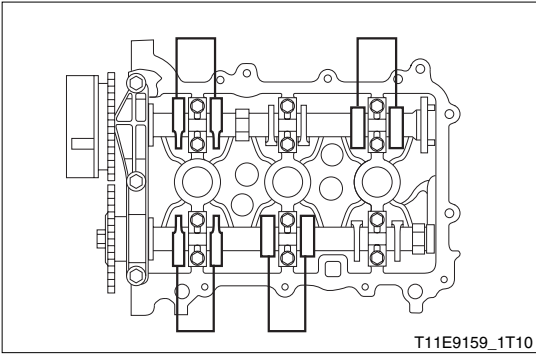
- Turn the crankshaft once so that the cylinder No.1 comes to the compression top dead center. Then, check the valve clearance at a position indicated in the figure on the right.

Cylinder No.1		Cylinder No.2		Cylinder No.3	
IN	EX	IN	EX	IN	EX
○	○	—	○	○	—

- If the clearance deviates from the specified value, replace the shim in the following procedure and adjust it to the specified value.

NOTE

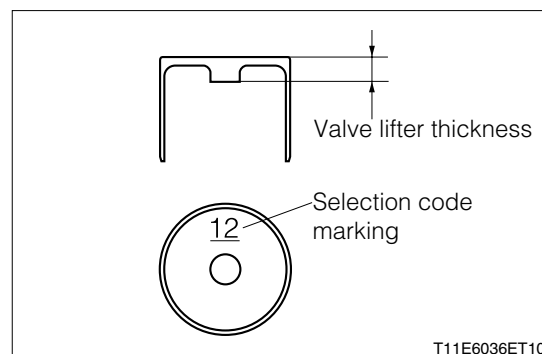
- Record the position of the valve where the clearance deviates from the specification, as well as the their measurement results.



(1) Remove the camshafts No.1 and No.2.

Refer to Page B2-8.

(2) Using a micrometer, measure the thickness of the shim that has been removed.



T11E6036ET10

(3) Select the shim, using the following formula given below, so that the valve clearance becomes the specified value.

Intake Valve

(Thickness of shim to be selected)

$$= (\text{Thickness of removed shim}) + [(\text{Measured clearance}) - 0.18 \text{ mm}]$$

Exhaust Valve

(Thickness of shim to be selected)

$$= (\text{Thickness of removed shim}) + [(\text{Measured clearance}) - 0.31 \text{ mm}]$$

Shim thickness (mm)

No.	Shim thickness (mm)	No.	Shim thickness (mm)	No.	Shim thickness (mm)	No.	Shim thickness (mm)
12	5.120	28	5.280	44	5.440	60	5.600
14	5.140	30	5.300	46	5.460	62	5.620
16	5.160	32	5.320	48	5.480	64	5.640
18	5.180	34	5.340	50	5.500	66	5.660
20	5.200	36	5.360	52	5.520	68	5.680
22	5.220	38	5.380	54	5.540	—	—
24	5.240	40	5.400	56	5.560	—	—
26	5.260	42	5.420	58	5.580	—	—

(4) Apply engine oil to the circumference of the selected valve lifter. Insert it into the lifter hole.

LUBRICANT: Engine oil

CAUTION

- After insertion, ensure that the valve lifter turns smoothly.

(5) Assemble the camshafts No.1 and No.2.

Refer to Page B2-8.

5. Install the cylinder head cover.

1-2-9 STARTING CONDITION OF THE ENGINE AND ABNORMAL NOISE

- When starting the engine, check that it starts up immediately without any abnormal noise and rotates smoothly.

1-2-10 COMPRESSION CHECK

- Warm up the engine.
- Turn the IG switch to the "LOCK" position.
- Remove all of the IG coils and spark plugs.
- Remove the fuel pump relay.
- Remove all of the connectors of the injector.

CAUTION

- Shutdown the fuel injection by performing the operations of Steps 4 and 5 above, thus preventing the catalyst from being damaged by unburned gas, etc.

B1-7

- 6. Install the compression gauge.
 - 7. Fully open the throttle valve and turn the starter. At this time, measure the compression pressure.
- SPECIFIED VALUE: 400 rpm, Difference between cylinders within 147 kPa{1.5kgf/cm²}

	Vehicle mounted with Type 1KR-FE engine
Specified value (kPa{kgf/cm ² })	1422{14.5}
Limit value (kPa{kgf/cm ² })	1079{11.0}

- CAUTION**
- Be sure to use a fully-charged battery. The measurement should be carried out in the shortest possible time.

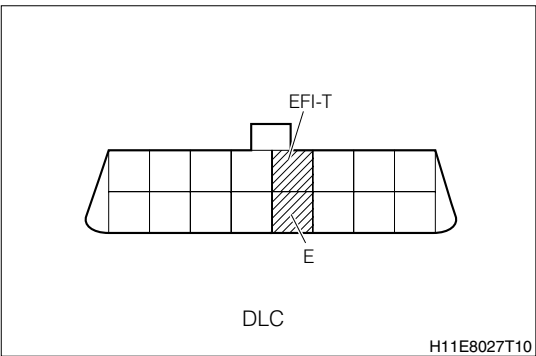
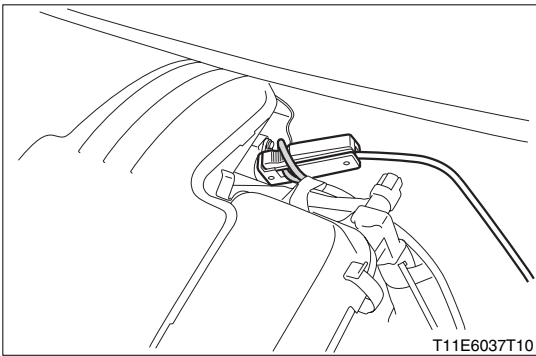
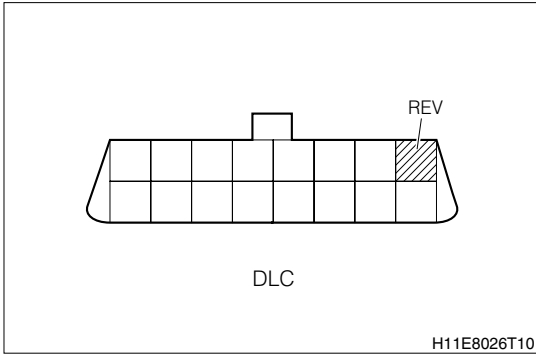
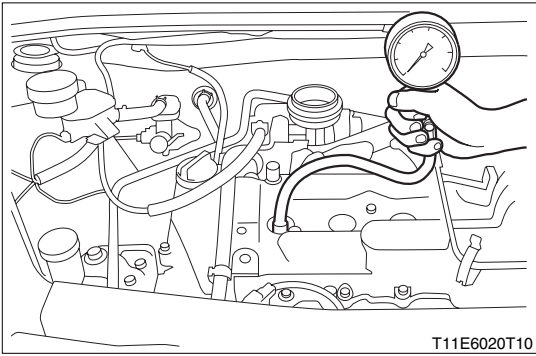
1-2-11 CHECK OF IGNITION TIMING

- 1. Install an engine tachometer to the terminal "REV" of the DLC, using the SST.
- SST: 09991-87402-000
09991-87404-000

- NOTE**
- The SST 09991-87404-000 is a harness for extension use. This does not have to be used.
- 2. Warm up the engine (Until the fan motor makes one turn).
 - 3. Install the clip of a timing light at a position indicated in the figure.

- 4. Short the terminals "EFI-T" and "E" of the DLC, using the SST.
- SST: 09991-87403-000
09991-87404-000

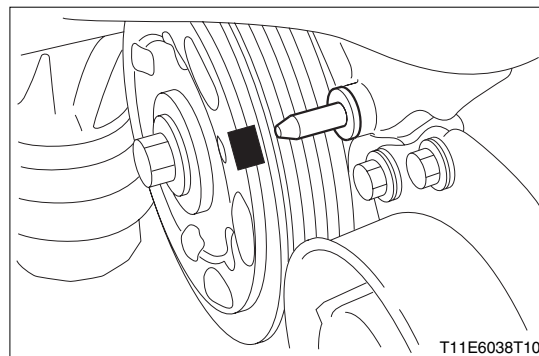
- CAUTION**
- Be sure to short the correct terminals. If wrong terminals are shorted, it will lead to malfunction.
- NOTE**
- The SST 09991-87404-000 is a harness for extension use. This does not have to be used.



5. Check the ignition timing.

SPECIFIED VALUE: 10 degrees $\pm$ 2 degrees(BTDC)**NOTE**

- If the reference pin of the timing chain cover is in the range of the painted section of the crankshaft pulley, then the injection timing is at the specified value.
- The specified value is given as a guide for the inspection. No adjustment is required.
- Engine revolution speed
800 $^{+100}_{-50}$ rpm(M/T)



6. Release the short of the DLC.

7. Raise the engine revolution speed. At this time, ensure that the ignition timing advances.

1-2-12 CHECK OF IDLE SPEED

CAUTION

- Be sure to mount an air cleaner.
- Warm up the engine.
- Do not apply electric load (Headlamp, etc.).
- Turn "OFF" the air conditioner.(Air conditioner-equipped vehicles)
- Perform the measurement with the shift position in the P or N range.
- The inspection should be carried out under a condition where each vacuum pipe is not disconnected and exhibits no rupture, etc.

1. Install an engine tachometer to the terminal "REV" of the DLC, using the SST.

SST: 09991-87402-000
09991-87404-000**NOTE**

- The SST 09991-87404-000 is a harness for extension use. This does not have to be used.

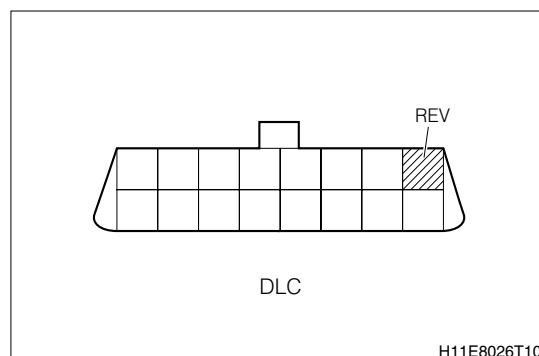
2. Check that the idle speed is within the specified value.

SPECIFIED VALUE: 800 $^{+100}_{-50}$ rpm(M/T)**NOTE**

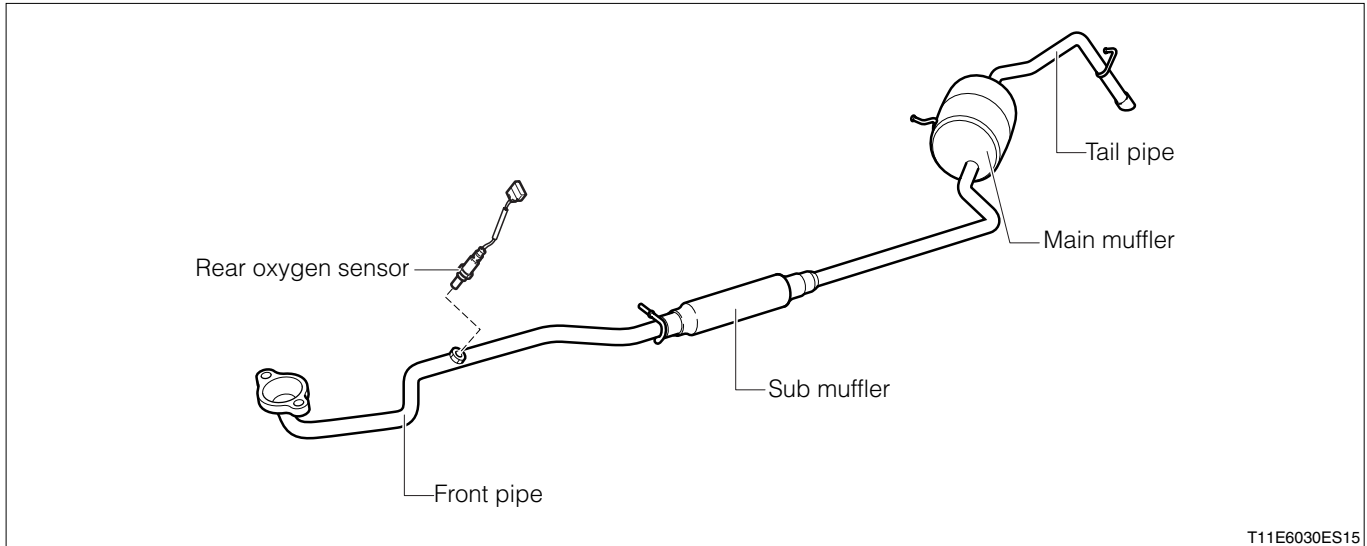
- It is not necessary to adjust the idle speed because of the ISC.

1-2-13 CONDITION OF LOW SPEED AND ACCELERATION

- When the engine is accelerated gradually from idling while conducting the running test, check that the revolution rises smoothly without any binding of the accelerator pedal and any abnormality, such as engine stall and knocking.



1-2-14 INSTALLATION CONDITION OF EXHAUST PIPE AND MUFFLER



1. Check that the installation section and the connecting section of the exhaust pipe exhibit no looseness by moving them using a tool or by hand.
2. Check to see if the bolts and nuts securing the exhaust pipe are tightened to the specified torque, using a torque wrench, etc.
3. Check the hanger of the support for deterioration, damage and installation conditions.
4. Check the exhaust pipe for damage and corrosion.
5. Check to see if the exhaust pipe are liable to come in contact with other parts.
6. Start the engine. Check that no exhaust gas is leaking from the connecting section, etc.

1-2-15 FUNCTION CHECK OF EXHAUST PIPE AND MUFFLER

1. Change the engine speed. At this time, check that there is no abnormality in the noise-reduction function of the muffler.

1-2-16 O₂ SENSOR FEEDBACK CONTROL CHECK

1. Warm up the engine.
2. Keep the engine speed at more than 2500 rpm for two minutes, thus warming up the O₂ sensor.

- Short the terminals "EFI-T" and "E" of the check connector, using the SST.

SST: 09991-87402-000
 09991-87403-000
 09991-87404-000

CAUTION

- Be sure to short the correct terminals. If wrong terminals are shorted, it will lead to malfunction.

NOTE

- The SST 09991-87404-000 is a harness for extension use. This does not have to be used.

- Maintain the engine speed above 2000 rpm and depress the brake pedal.

- Check the condition of the engine check lamp.

SPECIFIED VALUE: Flashing
 (Confirmation of O₂ sensor feedback)

- Short the terminals "EFI-T" and "E" of the DLC, using the SST. Then, confirm that the diagnosis codes No.25 and No.26 are not memorized. (Confirmation of learning value A/F)

SST: 09991-87403-000
 09991-87404-000

1-2-17 CONDITION OF EXHAUST

- Warm up the engine.
- Ensure that the idling speed is at the specified value.
 Refer to Page B1-8.

- Visually check that the color of the exhaust gas is not white or black smoke.

1-2-18 CHECK OF CO AND HC CONCENTRATIONS

- Warm up the engine.
- Check the CO and HC concentrations during idling, using a measuring instrument.

SPECIFIED VALUE: 0.2% or less (CO concentration)
 200 ppm or less (HC concentration)

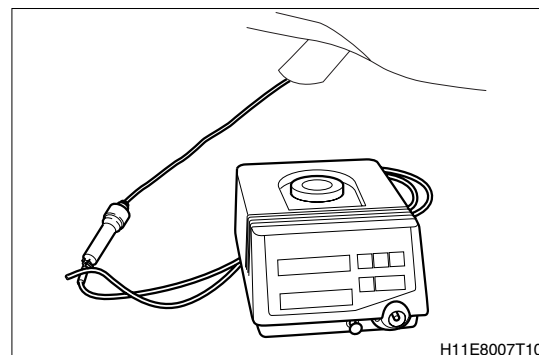
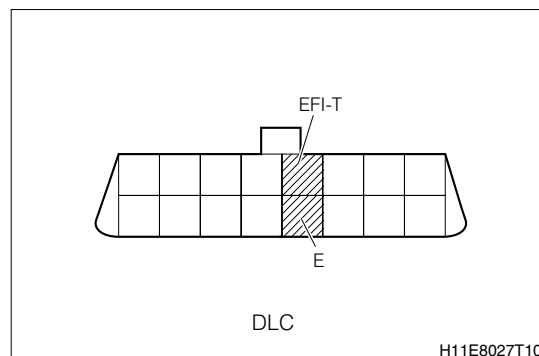
NOTE

- The specified values above are given as a guide for the inspection. No adjustment is required.

1-2-19 IDLE-UP CHECK

CAUTION

- Be sure to mount an air cleaner.
- Warm up the engine.
- Perform the measurement with the shift position in P or N range.
- The inspection should be carried out under a condition where each vacuum pipe is not disconnected and exhibits no rupture, etc.



B1-11

(1) Check of air conditioner idle-up

1. Install an engine tachometer to the terminal "REV" of the DLC, using the SST.

SST: 09991-87402-000
09991-87404-000

NOTE

- The SST 09991-87404-000 is a harness for extension use. This does not have to be used.

2. Warm up the engine.
3. Check whether the engine speed is within the specified value when the air conditioner switch is turned "ON" during idling.

SPECIFIED VALUE: 950^{+100}_{-50} rpm(M/T)

NOTE

- The engine revolution speed above is given as a guide for the inspection. No adjustment is required.

(2) Electric load idle-up check

1. Install an engine tachometer to the terminal "REV" of the DLC, using the SST.

SST: 09991-87402-000
09991-87404-000

NOTE

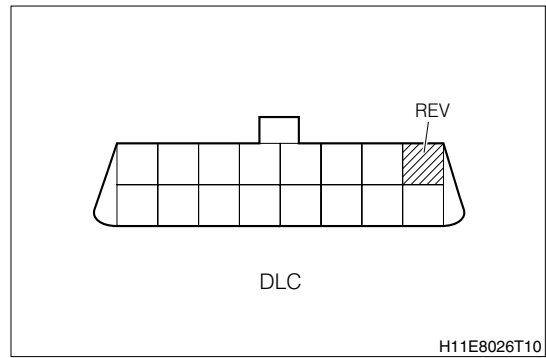
- The SST 09991-87404-000 is a harness for extension use. This does not have to be used.

2. Warm up the engine.
3. Check whether the engine speed is within the specified value when the defogger switch, blower switch and headlamp switch are turned "ON"

SPECIFIED VALUE: 800 ± 50 rpm(M/T)

NOTE

- The engine revolution speed above is given as a guide for the inspection. No adjustment is required.



1-2-20 CHARCOAL CANISTER CHECK

(1) RHD vehicles

1. Check the charcoal canister for damage, such as dents.
2. With a MityVac connected, carry out continuity check and airtightness check for the check valve.

(1) Continuity check of tank port→atmosphere port

Apply a positive pressure of 5.9kPa (0.05 kgf/cm²) to the tank port with the purge port plugged (e.g. with your fingers).

SPECIFIED VALUE: Air continuity exists between the tank port and the atmosphere port.

(2) Continuity check of atmosphere port→tank port

Apply a negative pressure of 2.9kPa (0.03 kgf/cm²) to the tank port with the purge port plugged (e.g. with your fingers).

SPECIFIED VALUE: Air continuity exists between the atmosphere port and the tank port.

(3) Continuity check of atmosphere port→purge port

Apply a positive or negative pressure of 1kPa (0.01 kgf/cm²) to the purge port with the tank port plugged (e.g. with your fingers) to allow air to flow.

SPECIFIED VALUE: There is no rise in the pressure.

(2) LHD vehicles

1. Check the charcoal canister for damage, such as dents.
2. With a MityVac connected, carry out continuity check and airtightness check for the check valve.

(1) Continuity check of tank port→atmosphere port

Apply a positive pressure of 5.9kPa (0.05 kgf/cm²) to the tank port with the purge port plugged (e.g. with your fingers).

SPECIFIED VALUE: Air continuity exists between the tank port and the atmosphere port.

(2) Continuity check of atmosphere port→tank port

Apply a negative pressure of 2.9kPa (0.03 kgf/cm²) to the tank port with the purge port plugged (e.g. with your fingers).

SPECIFIED VALUE: Air continuity exists between the atmosphere port and the tank port.

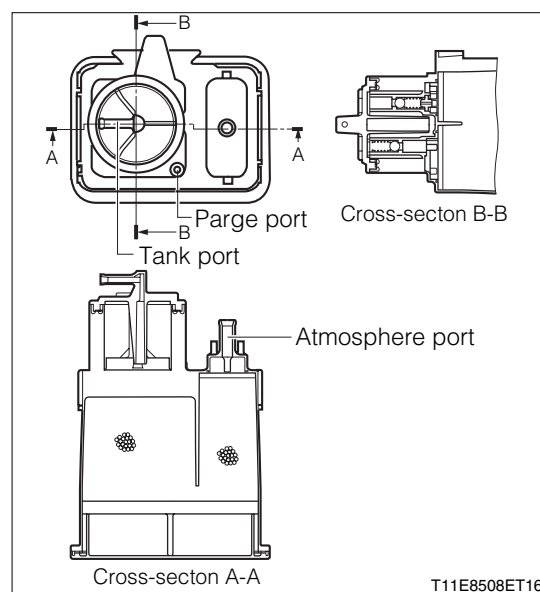
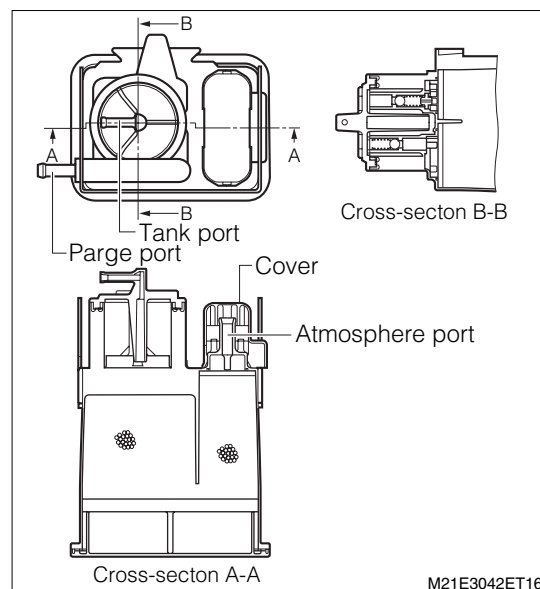
(3) Continuity check of atmosphere port→purge port

Apply a positive or negative pressure of 1kPa (0.01 kgf/cm²) to the purge port with the tank port plugged (e.g. with your fingers) to allow air to flow.

SPECIFIED VALUE: There is no rise in the pressure.

1-2-21 DAMAGE CHECK OF PIPINGS OF FUEL EVAPORATIVE EMISSION CONTROL SYSTEM

1. Check the hoses and pipes for damage.



B1-13

1-2-22 DAMAGE CHECK OF PIPINGS OF BLOW-BY GAS RECIRCULATION SYSTEM

1. Check the ventilation hoses for cracks, damages and clogs.
2. Perform the following checks for the PCV valve.
 - (1) Start the engine.
 - (2) With the engine idling, ensure that the operation sound is emitted as the hose on the intake manifold side of the PCV valve is pinched and released.

1-2-23 INSTALLATION CONDITION DAMAGE OF CATALYST DEVICE

1. Check that the installation of the main body of the exhaust emission control device, such as the catalyst, exhibits no looseness, using a wrench or the like.
2. Visually check the catalyst main body for damage. (This check may be omitted if there are no deformation or damage on the heat shield plate.)

1-2-24 FUNCTION CHECK OF CONTROL SYSTEM DURING DECELERATION

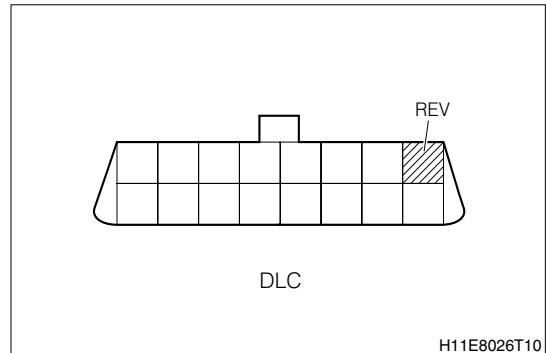
1. Install an engine tachometer to the terminal "REV" of the DLC, using the SST.

SST: 09991-87402-000

09991-87404-000

CAUTION

- When the SST (Engine control system inspection wire) is not used, the operation should be carried out with the DLC taken off from the bracket. After completion of the operation, be certain to install the DLC to the bracket.
2. Warm up the engine.
 3. Confirm the operation sound of the injector with a sound scope or a screwdriver.
 4. Raise the engine speed to 3000 rpm.
 5. Return the throttle lever. At this time, ensure that the operation sound of the injector stops for a moment and is emitted again.



1-2-25 EXHAUST GAS RECIRCULATION SYSTEM CHECK

1. Short the terminals "EFI-T" and "E" of the DLC, using the SST. Then, confirm that the diagnosis code No.79 is not memorized.

SST: 09991-87403-000

09991-87404-000

NOTE

- The engine control computer judges whether the exhaust gas recirculation system is normal or not under the following conditions.
 - After the engine has warmed-up completely, fully close the accelerator pedal from the constant-speed running at 60 km/h to decelerate for 5 seconds or more by engine brake. After the IG switch is turned "OFF" for more than 10 seconds, once again perform the running and decelerating under the same conditions.
2. Ensure that there are no cracks, damages and leakage in the EGR-related pipings.
 3. Ensure that there is no looseness or leakage in the installation of the stepper motor for the EGR.
 4. Confirm the operation of the stepper motor for the EGR, following the procedure given below.
 - (1) Release the short of the DLC.
 - (2) Remove the fuel pump relay.
 - (3) Disconnect the connector of the injector.

CAUTION

- Shutdown the fuel injection by performing the operations of Steps (2) and (3) above, thus preventing the catalyst from being damaged by unburned gas, etc.
- (4) Crank the engine.
- (5) Ensure that the stepper motor for the EGR is operating when cranking, using a sound scope or a long screwdriver.

WARNING

- Be very careful not to get scalded, since the temperature of the valve section of the stepper motor for the EGR is very high.

1-2-26 CHECK OF EXHAUST GAS PURIFICATION SYSTEM

(1) Check of onboard type diagnostic tester

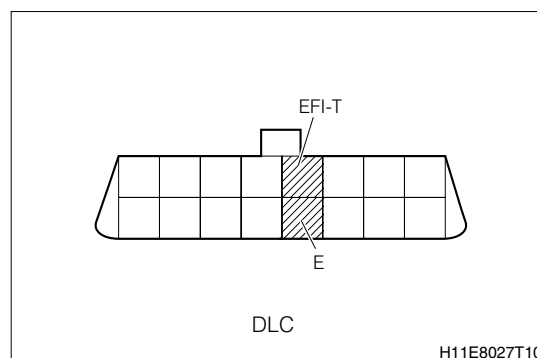
① Check of engine check lamp

1. Confirm the engine check lamp condition with the IG switch turned ON.
2. Check the diagnosis code.
Refer to Page B8-23.

3. If the abnormality code is outputted, perform the trouble shooting for the abnormality code.

NOTE

- If an abnormality code is outputted although the engine check lamp is not presently illuminating, it is assumed that abnormalities, such as poor contact, took place at the harness, connector, etc. but they are functioning properly now. Therefore, as a precautionary measure, perform the trouble shooting for the outputted abnormality code.



B2 ENGINE MECHANICAL

1KR -----	B2—1
CYLINDER HEAD GASKET-----	B2—1
REMOVAL AND INSTALLATION-----	B2—1
TIMING CHAIN-----	B2—5
REMOVAL AND INSTALLATION-----	B2—5
CAMSHAFT -----	B2—10
REMOVAL AND INSTALLATION-----	B2—10
ENGINE ASSY -----	B2—20
REMOVAL AND INSTALLATION-----	B2—20

B2-1

■ 1KR

1 CYLINDER HEAD GASKET

1-1 REMOVAL AND INSTALLATION

WARNING

- No fire should be brought near when servicing the fuel system.
- When removing the fuel hose, prevent the fuel from splashing.
- When the coolant is hot, do not remove the radiator cap, drain plug or water hose.

1-1-1 ARTICLES TO BE PREPARED

Instrument

Torque wrench

Lubricant,adhesive,others

Engine oil

1-1-2 OPERATION BEFORE REMOVAL

1. Drain the engine oil.

2. Drain the coolant.
3. Remove the engine Ay.
Refer to Page B2-20.

4. Remove the air cleaner hose No.1.
Refer to Page B3-1.

5. Remove the air cleaner Ay W/element.
Refer to Page B3-1.

6. Remove the exhaust manifold stay.
Refer to Page B4-1.

7. Remove the oil pan Ay.
Refer to Page B5-7.

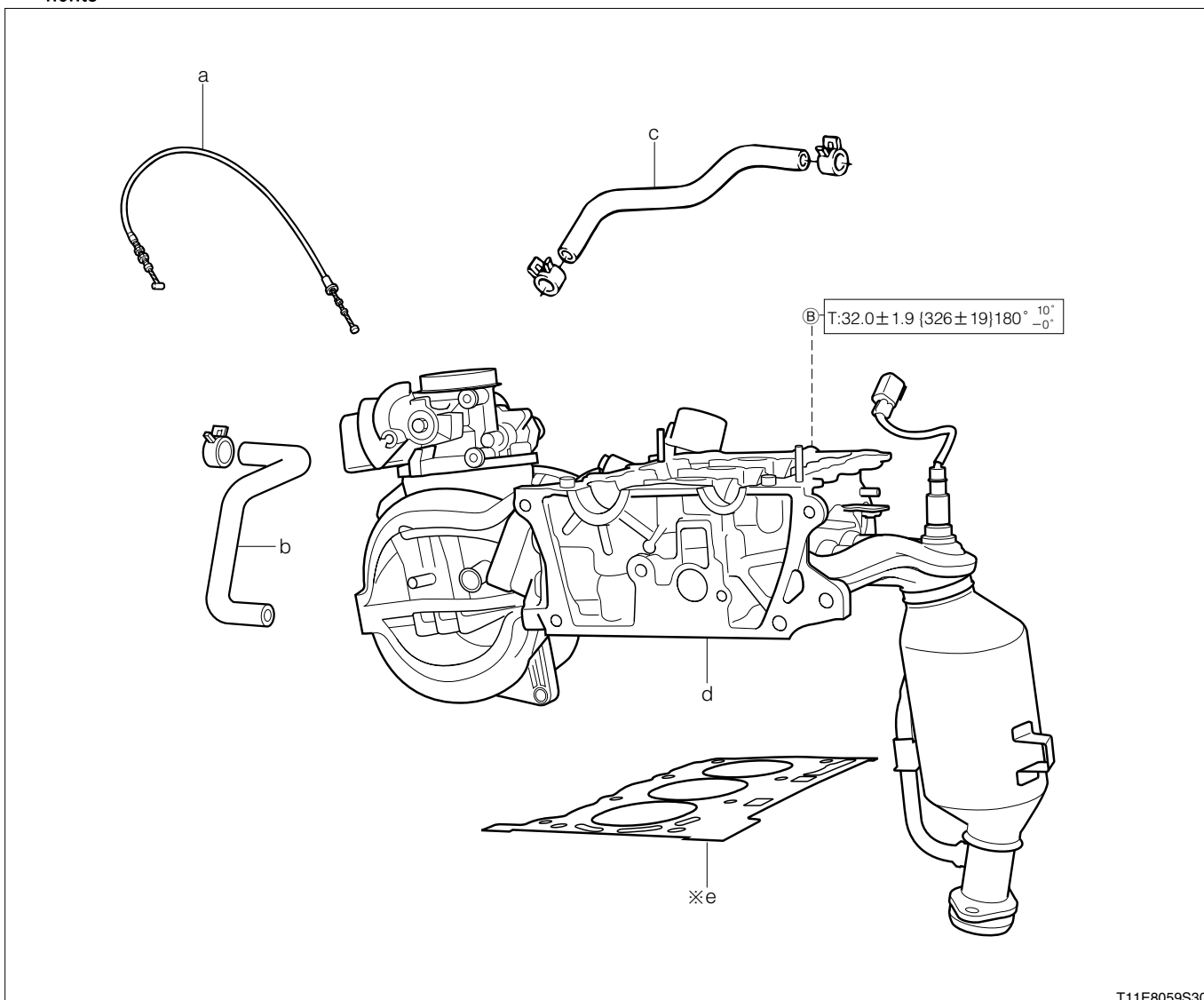
8. Remove the timing chain Ay.
Refer to Page B2-5.

9. Remove the camshaft Ay.
Refer to Page B2-10.

10. Remove each connector, clamp and hose.

1-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



※:Non - reusable parts

Unit:N·m{kgf·cm}

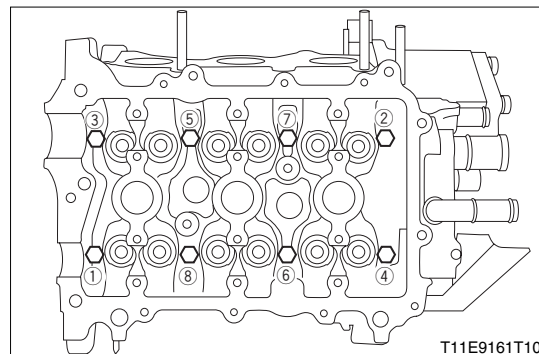
(2) Removal and installation procedures

- ▲ 1 a Cable Ay, accelerator control
- ▲ 2 b Hose, booster vacuum
- 3 c Hose, water No.1
- ▼ ▲ 4 d Cylinder head Ay (With intake manifold & exhaust manifold)
- ▲ 5 e Gasket, cylinder head

1-1-4 POINTS OF REMOVAL

(1) Head Ay, cylinder

1. Remove the head Ay together with the intake manifold Ay and the exhaust manifold converter S/A by removing the attaching bolts in the sequence shown in the right figure.



1-1-5 POINTS OF INSTALLATION

CAUTION

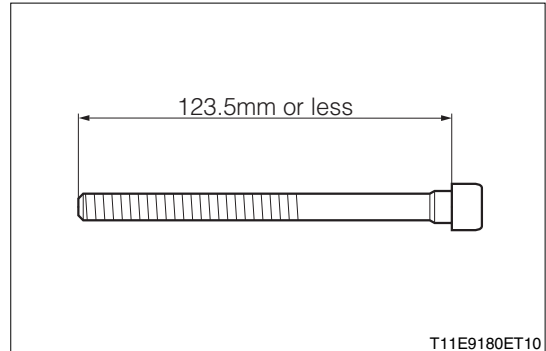
- Never use fire during the work.
- Wear safety goggles during the cleaning so as to protect your eyes.

(1) Head Ay, cylinder/Gasket cylinder head

1. Install the gasket to head Ay.

- (1) Measure the nominal length of the cylinder head bolt shown in the figure on the right. Replace any cylinder head bolt if it is beyond the application limits.

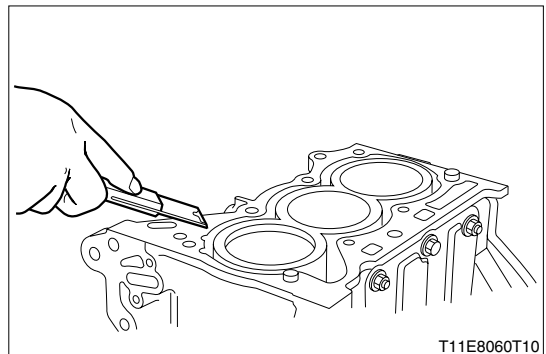
ALLOWABLE LIMIT: 123.5mm



- (2) Clean the gasket mounting surface of the cylinder block Ay and cylinder head Ay and completely remove foreign objects, oil, etc., using a scraper.

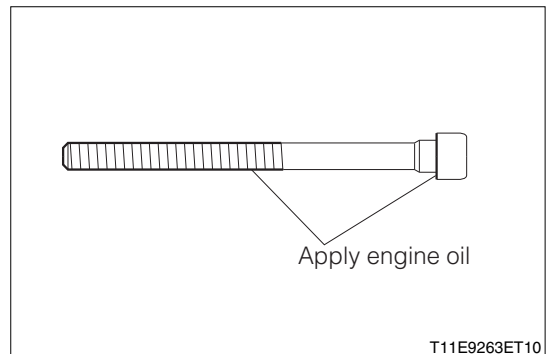
CAUTION

- Be very careful not to allow scraping debris of the gasket to fall into the water jacket and oil hole. Remove when dropped.

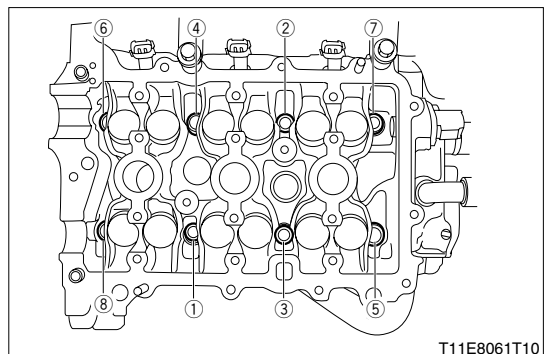


- (3) Mount a plate washer to the head Ay. Apply engine oil to the threaded portion of the bolts and seating surface on the bolt side. Then, perform the assembling operations.

LUBRICANT: Engine oil



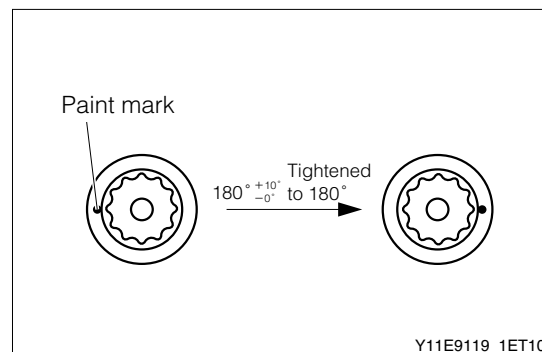
- (4) To assemble the cylinder head Ay, tighten the bolts over 2 or 3 stages in the sequence shown in the figure on the right. Then, tighten them to the specified torque.



- (5) After tightening to the specified torque, retighten them 180^{+10}_{-0} degrees in the same sequence.

NOTE

- It is recommended to put a paint mark on the top of the head bolts in the same direction. After tightening 180 degrees in the sequence above, ensure that all the bolt marks, which have been turned 180 degrees, are facing the same direction.



(2) Hose, booster vacuum

1. Install the vacuum booster hose.
Refer to Page E1-31.

(3) Cable Ay, accelerator control

1. Install the accelerator control Cable Ay.
Refer to Page B3-2.

1-1-6 OPERATION AFTER INSTALLATION

1. Install each connector, clamp and hose.
2. Install the camshaft Ay.
Refer to Page B2-10.
3. Install the timing chain Ay.
Refer to Page B2-5.
4. Install the oil pan Ay.
Refer to Page B5-7.
5. Install the exhaust manifold stay.
Refer to Page B4-1.
6. Install the air cleaner Ay W/element.
Refer to Page B3-1.
7. Install the air cleaner hose No.1.
Refer to Page B3-1.
8. Install the engine Ay.
Refer to Page B2-20.
9. Replenish the engine oil.
Refer to Page B5-2.
10. Replenish the coolant.
11. Check for any leakage of oil, coolant water and fuel. Perform the engine tune-up.
Refer to Page B1-1.

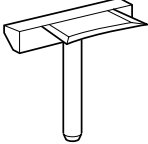
B2-5

2 TIMING CHAIN

2-1 REMOVAL AND INSTALLATION

2-1-1 ARTICLES TO BE PREPARED

SST

Shape	Part No.	Part name
	09223-87202-000	Replacer,crankshaft front oil seal
	09091-1C100-000 (09032-00100-000)	Cutter,oil pan seal

Hexagonal rod wrench(Width across flats:2.5mm)

Instrument
Torque wrench

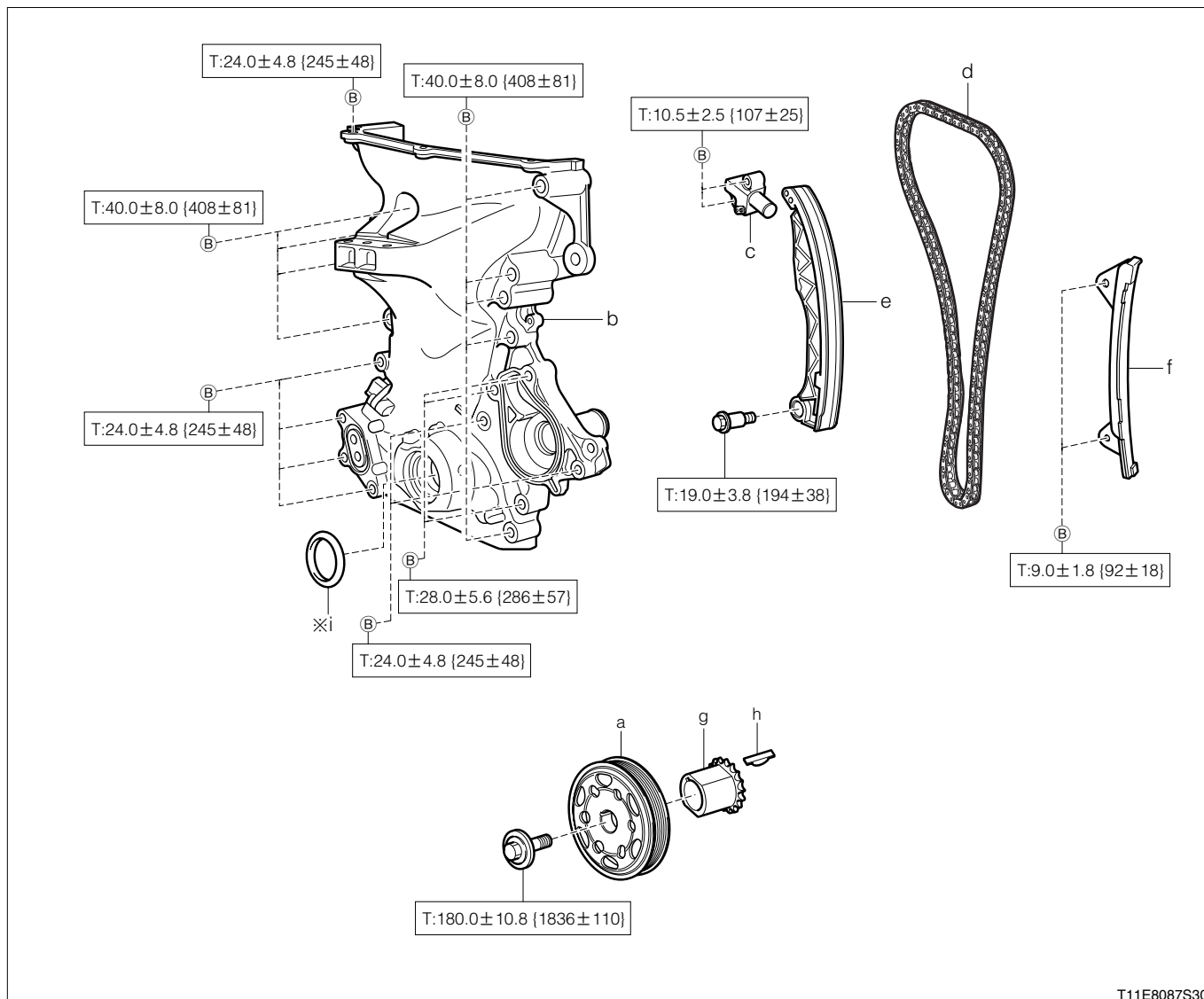
Lubricant,adhesive,others
Engine oil,Three Bond1207B,Three Bond1207C

2-1-2 OPERATION BEFORE REMOVAL

1. Drain the engine oil.
Refer to Page B5-2.
2. Remove the air cleaner Ay W/element.
Refer to Page B3-1.
3. Remove the engine Ay.
Refer to Page B2-20.
4. Remove the water pump Ay.
Refer to Page B6-2.
5. Remove the coil Ay, W/ignitor.
Refer to Page B10-1.
6. Remove the cylinder head cover.
Refer to Page B2-1.
7. Remove the oil filter Ay W/bracket.
Refer to Page B5-3.
8. Remove the oil pan Ay.
Refer to Page B5-7.

2-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



※:Non - reusable parts

Unit:N·m{kgf·cm}

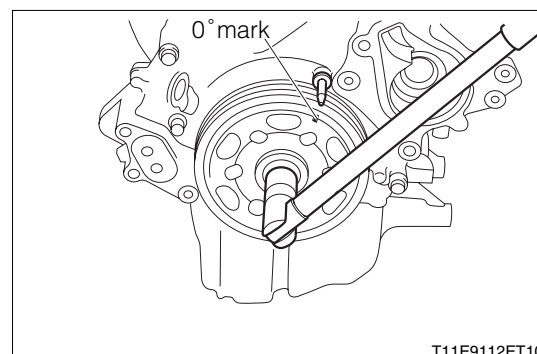
(2) Removal and installation procedures

▼	1	a Pulley Ay, crankshaft	6	f Guide, timing chain
▼ ▲	2	b Cover Ay, timing gear	7	g Sprocket, crankshaft timing
▲	3	c Tensioner S/A, Timing chain	8	h Key, woodruff
▼ ▲	4	d Chain, timing	▲ 9	i Seal, type T oil
	5	e Arm, timing chain tension		

2-1-4 POINTS OF REMOVAL

(1) Pulley Ay, crankshaft

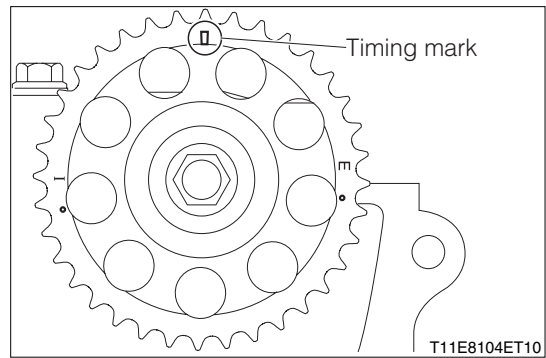
1. Turn the pulley Ay in the normal direction, until the timing mark (0 degrees) of the pulley Ay is aligned with the timing pointer of the timing chain cover Ay. (Set the No.1cylinder to the top dead center under the compression stroke.)



T11E9112ET10

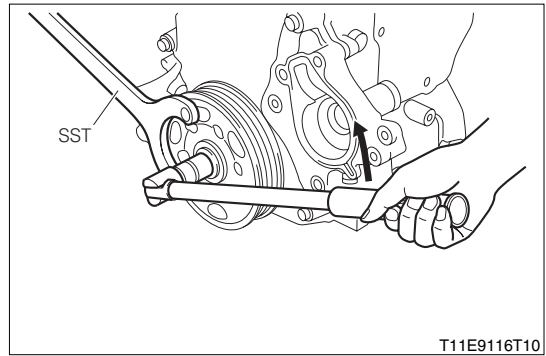
2. Ensure that the timing mark of the camshaft timing sprocket is at the top position.

If the timing mark is not at the top position, turn the pulley Ay once so that the timing mark comes to the top position. (Set the No.1 cylinder to the top dead center under the compression stroke.)



3. While preventing rotation, using the SST, remove the pulley Ay.

SST: 09278-87201-000



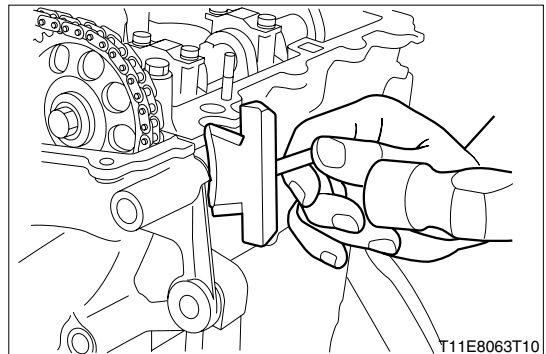
(2) Cover Ay, timing chain

1. Remove the attaching bolts and nuts of the cover Ay.
2. Remove the cover Ay by inserting the SST between the cover Ay and the cylinder head Ay.

SST: 09091-1C100-000

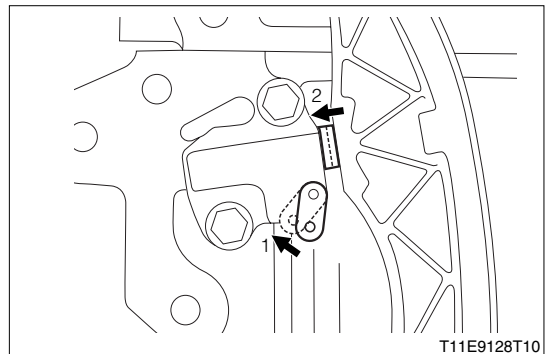
CAUTION

- Be very careful not to scratch the joint surface.



(3) Chain, timing

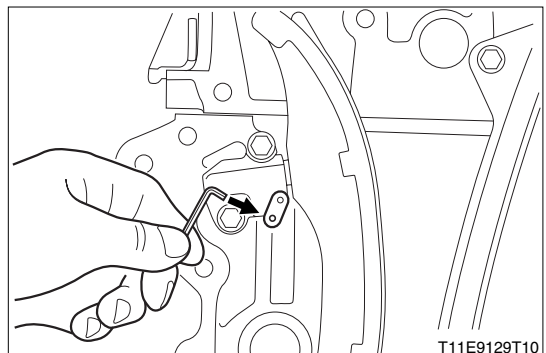
1. With the lock released by moving the stopper plate of the timing chain tensioner S/A clockwise, insert a plunger as far as it will go.



2. With the plunger locked, insert a hexagonal wrench into the hole of the stopper plate and the lower part of the timing chain tensioner S/A. (The plunger will be locked.)

TOOL: Hexagonal rod wrench(Width across flats:2.5mm)

3. Remove the timing chain tensioner S/A by removing the bolts and nuts.
4. Remove the chain.



2-1-5 POINTS OF INSTALLATION

(1) Seal, type T oil

1. Install the seal to the timing chain cover Ay in the sequence shown below.

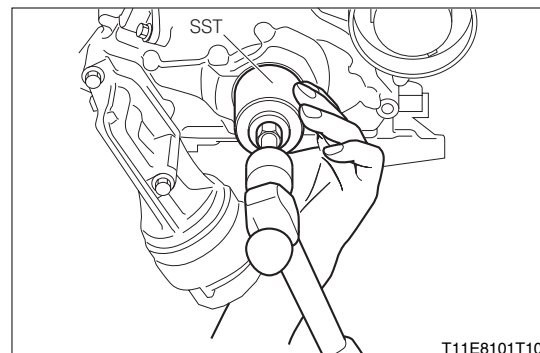
- (1) Apply engine oil to the lip section of the seal.

- (2) Drive the seal vertically, using the SST.

SPECIFIED VALUE:

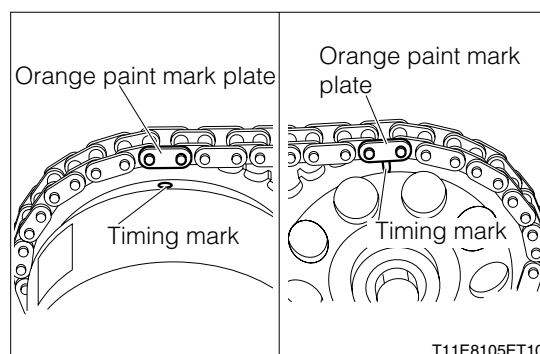
Press-fitting amount
Protruding amount from end surface of timing chain cover Ay
Within 0.5mm
Press-fitting depth from end surface of timing chain cover Ay
Within 1mm

SST: 09223-87202-000

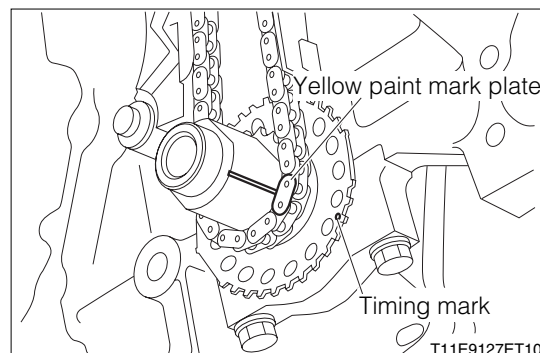


(2) Chain, timing

1. Install the timing chain tension arm and timing chain guide.
2. During the installation, align the two orange mark plates of the chain with the timing mark of the camshaft timing sprocket as shown in the figure.

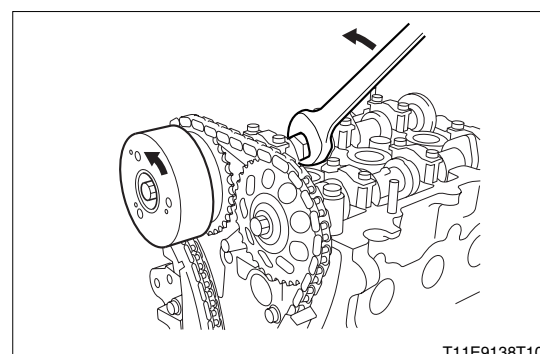


3. During the installation, align the yellow mark plate of the chain with the timing mark of the crankshaft timing sprocket.

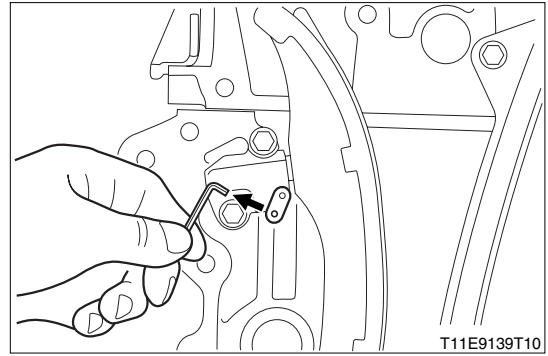


(3) Tensioner S/A, timing chain

1. Slightly turn the camshaft counterclockwise (Reverse rotation), using the hexagonal section of the camshaft, so as to give a slack to the chain at the tensioner side. Under this state, install the tensioner.

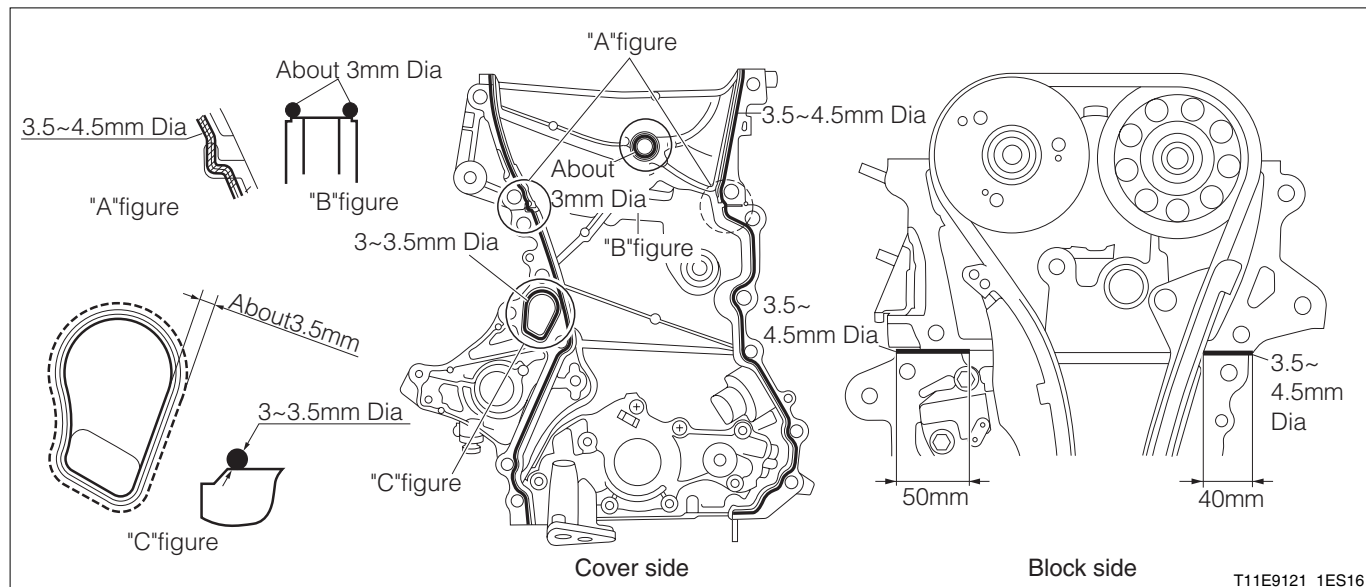


2. Pull out the hexagonal rod wrench of the tensioner and turn the crankshaft two turns to move the chain tensioner Ay.



(4) Cover Ay, timing chain

1. Assemble the timing chain cover gasket to the cover Ay.
2. Apply liquid gasket to the position in the figure and install the cover Ay.



CAUTION

- Completely remove foreign matters and oil from the installation surface.
- Perform the assembling within three minutes after application of the liquid gasket.

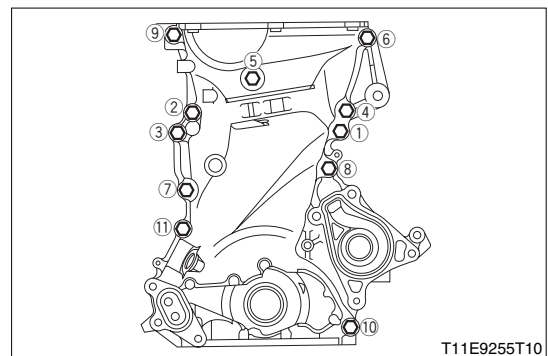
3. Tighten the bolts in the sequence shown in the figure.

CAUTION

- Perform the assembling within three minutes after application of the liquid gasket.

(1) Wipe off any liquid gasket that has oozed out.

SPECIFIED VALUE: Permissible oozing amount: within 1.5mm



2-1-6 OPERATION AFTER INSTALLATION

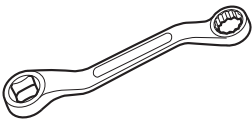
1. Install the oil pan Ay.
Refer to Page B5-7.
2. Install the oil filter Ay W/bracket.
Refer to Page B5-3.
3. Install the cylinder head cover.
Refer to Page B2-1.
4. Install the coil Ay, W/ignitor.
Refer to Page B10-1.
5. Install the water pump Ay.
Refer to Page B6-2.
6. Install the engine Ay.
Refer to Page B2-20.
7. Install the air cleaner Ay W/element.
Refer to Page B3-1.
8. Replenish the coolant.
9. Replenish the engine oil.
Refer to Page B5-2.
10. Check for any leakage of oil, coolant water and fuel. Perform the engine tune-up.
Refer to Page B1-1.

3 CAMSHAFT

3-1 REMOVAL AND INSTALLATION

3-1-1 ARTICLES TO BE PREPARED

SST

Shape	Part No.	Part name
	09249-B1010-000	Adaptor,torque wrench

Tool

Hexagonal rod wrench(Width across flats:2.5mm),Hexagon wrench (Width across flats : 10mm)

Instrument

Torque wrench

Lubricant,adhesive,others

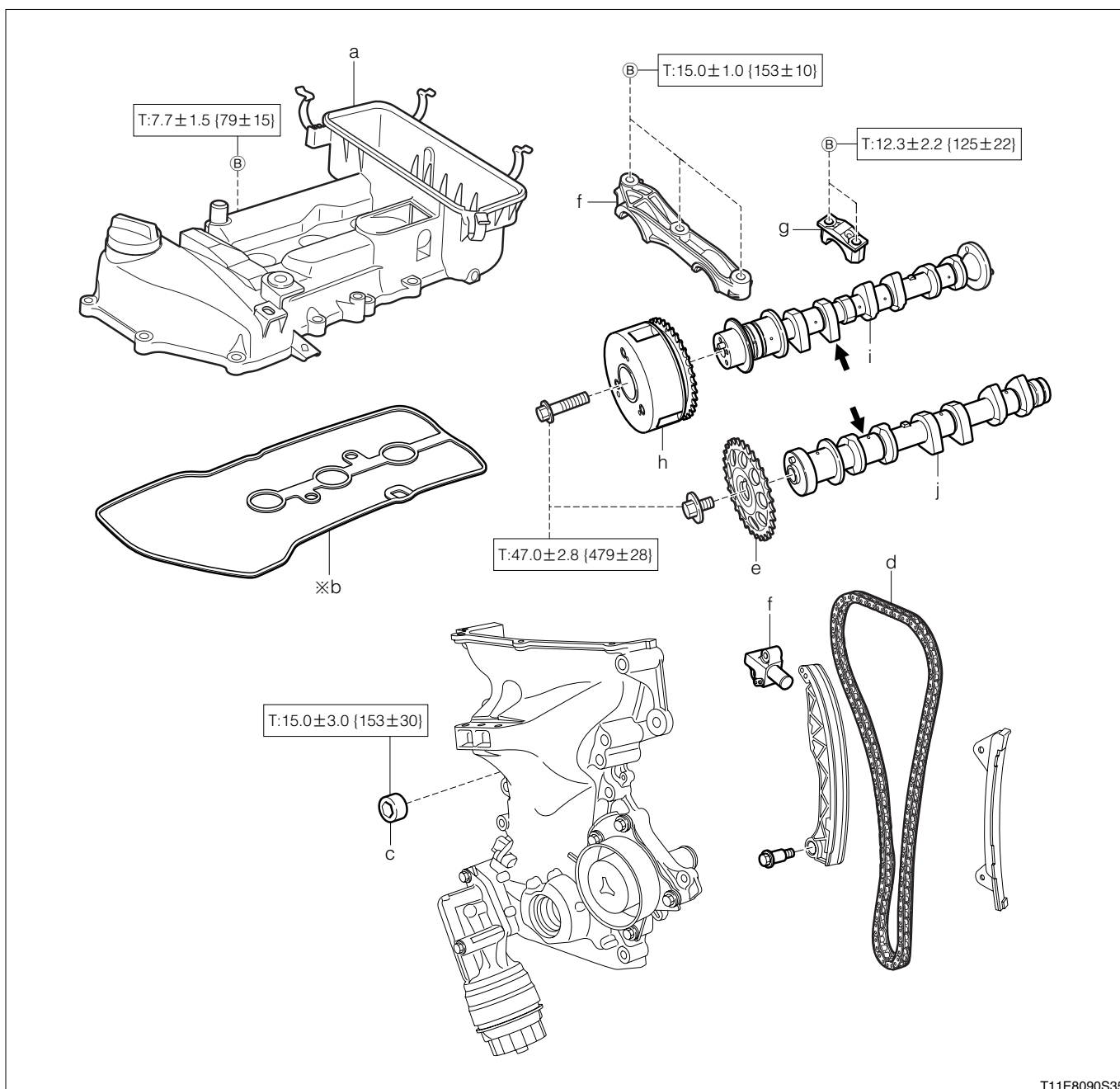
Engine oil,Three Bond1324,Three Bond1207B

3-1-2 OPERATION BEFORE REMOVAL

1. Remove the negative (-) terminal of the battery.
Refer to Page J5-1.
2. Remove the air cleaner Ay W/element.
Refer to Page B3-1.
3. Remove the V-ribbed belt
Refer to Page B1-1.
4. Remove the coil Ay, W/ignitor.
Refer to Page B10-1.

3-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



T11E8090S35

➔: Engine oil

Unit: N·m{kgf·cm}

※: Non-reusable parts

(2) Removal and installation procedures

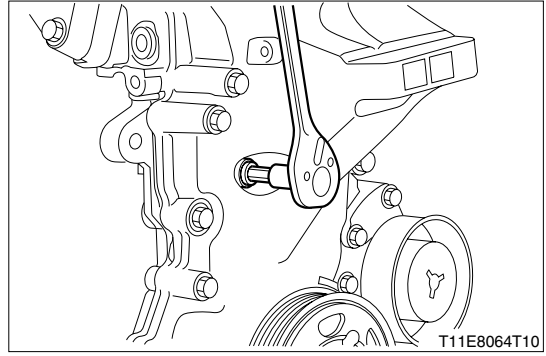
▲ 1	a	Cover, cylinder head	▼ ▲ 6	f	Cap, camshaft bearing No.1
2	b	Gasket, cylinder head cover	▼ ▲ 7	g	Cap, camshaft bearing No.2
▼ ▲ 3	c	Plug, service hole screw	▲ 8	h	Sprocket Ay, camshaft timing (DVVT controller)
▲ 4	d	Chain, timing	▼ ▲ 9	i	Camshaft Ay, No.1
▼ ▲ 5	e	Sprocket, camshaft timing	▼ ▲ 10	j	Camshaft Ay No.2

3-1-4 POINTS OF REMOVAL

(1) Plug, service hole screw

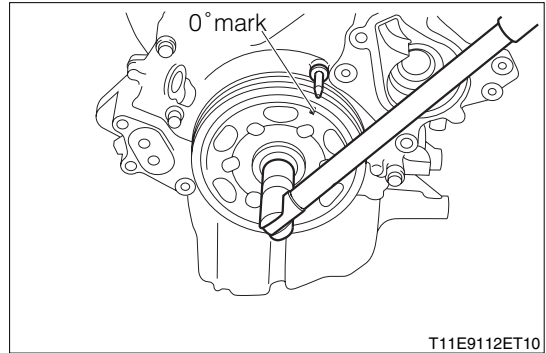
1. Remove the plugs, using a hexagon wrench.

TOOL: Hexagon wrench (Width across flats : 10mm)



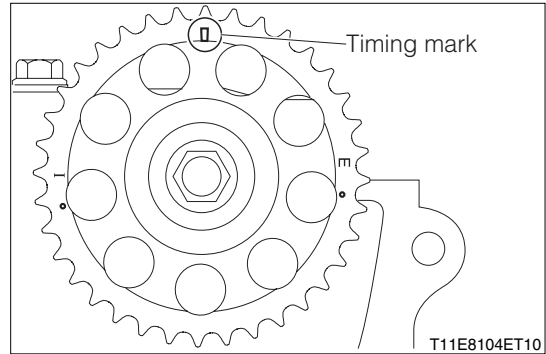
(2) Sprocket, camshaft timing

1. Turn the pulley Ay in the normal direction, until the timing mark (0 degrees) of the pulley Ay is aligned with the timing pointer of the timing chain cover Ay. (Set the No.1 cylinder to the top dead center under the compression stroke.)



2. Ensure that the sprocket is at the top position.

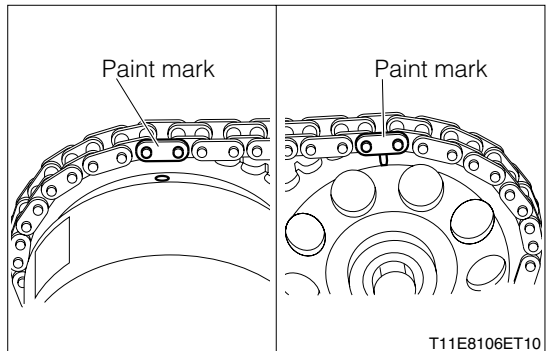
If the timing mark is not at the top position, turn the pulley Ay once so that the timing mark comes to the top position. (Set the No.1 cylinder to the top dead center under the compression stroke.)



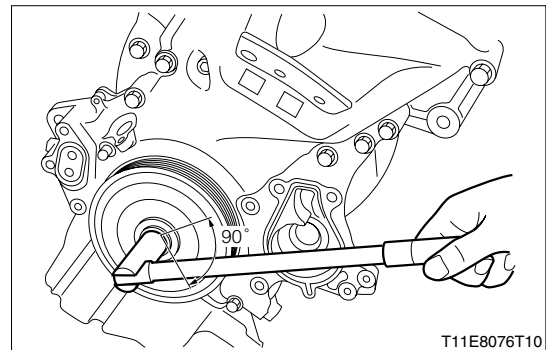
3. Put a paint mark on each plate of the timing chain that is aligned with the mating marks of the sprocket and camshaft timing sprocket Ay (DVVT controller).

NOTE

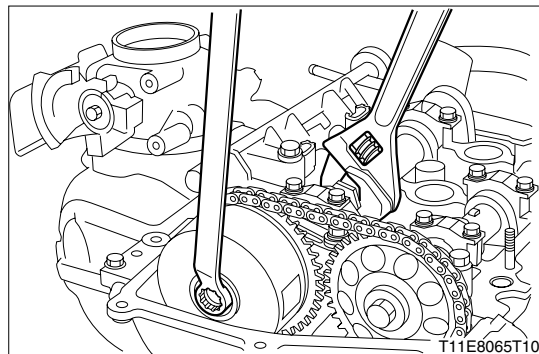
- The timing chain has two orange mark plates and one yellow mark plate. Therefore, in cases where the orange mark plates are aligned with the cam sprocket side and the yellow mark plate with the crankshaft side, the above operation is not required.



4. Turn the crankshaft 90 degrees (Crank angle) in the engine rotation direction from the top dead center under the compression stroke of the cylinder No.1 so that the lifted valve will not interfere with the piston when removing the camshaft Ay.



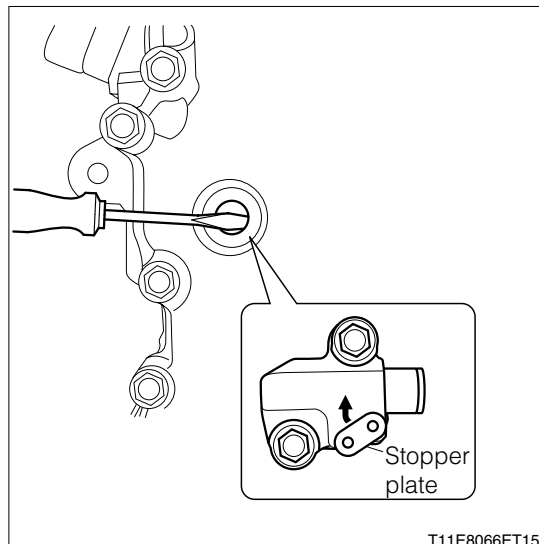
5. Loosen the attaching bolts of the sprocket Ay using the hexagonal section provided for servicing of the camshaft.



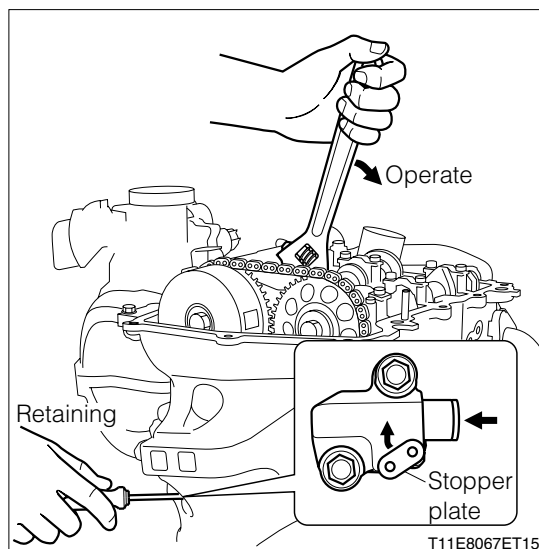
6. Move the stopper plate of the timing chain tensioner S/A from the plug in the clockwise direction, using a flat screwdriver. Then, maintain the released condition.

NOTE

- By this operation, the plunger of the timing chain tensioner S/A will be unlocked.
- If any difficulty is encountered in releasing the lock of the stopper plate, slightly turn it in a right-and-left direction, using the hexagonal section provided for servicing of the camshaft Ay.



7. Slightly turn the camshaft Ay clockwise (Normal direction), using the hexagonal section provided for servicing of the camshaft Ay, so that the timing chain pushes the plunger section of the timing chain tensioner S/A.



8. While maintaining the above condition, remove the flat screwdriver from the plug and insert a hexagonal wrench into the hole of the stopper plate.

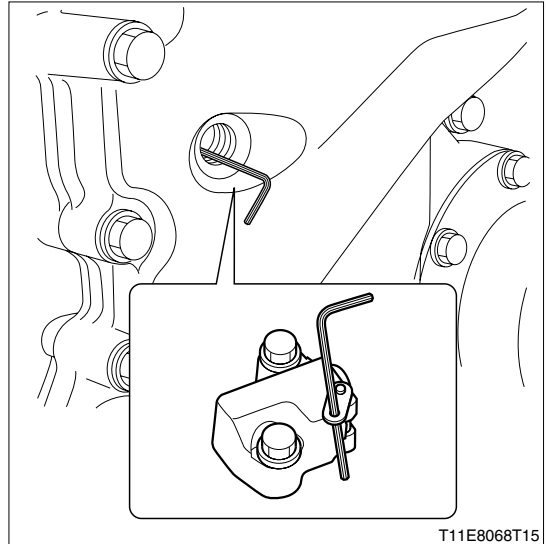
TOOL: Hexagonal rod wrench(Width across flats:2.5mm)

CAUTION

- Maintain the camshaft Ay using the hexagonal section for servicing.
- Secure the hexagonal wrench so that it would not come out by means of a tape or the like.

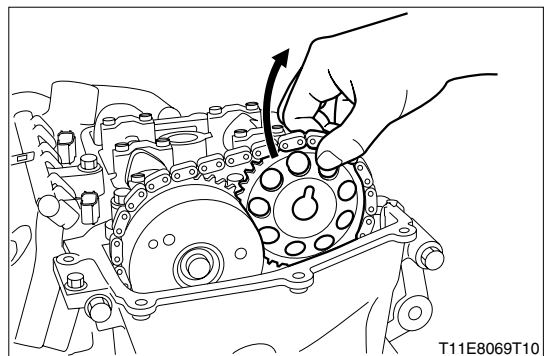
NOTE

- By this operation, the plunger of the timing chain tensioner S/A will be held in a pushed state.



T11E8068T15

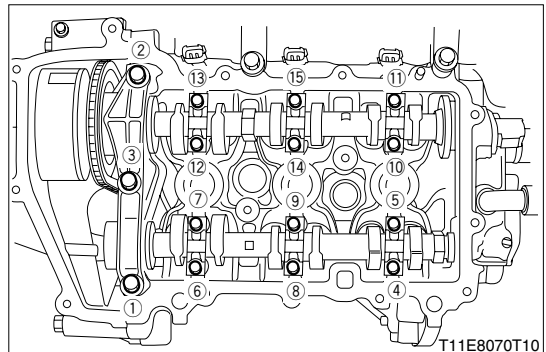
9. Remove the sprocket from the No.2 camshaft Ay.



T11E8069T10

(3) Camshaft bearing No.1/No.2 caps

1. Remove the bolts in the sequence shown in the right figure.

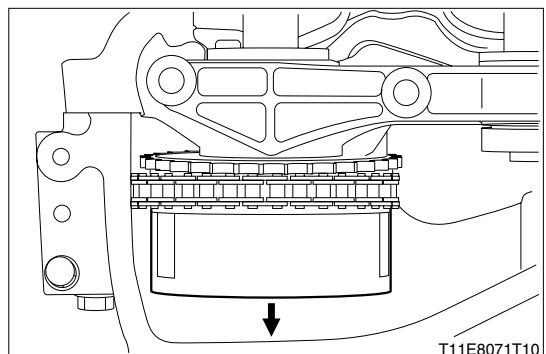


T11E8070T10

2. Remove the camshaft bearing cap No.1/No.2.

(1) Slide the camshaft timing sprocket to the engine front side until the camshaft bearing No.1 cap is pulled out.

(2) Remove the camshaft bearing cap No.1/No.2.



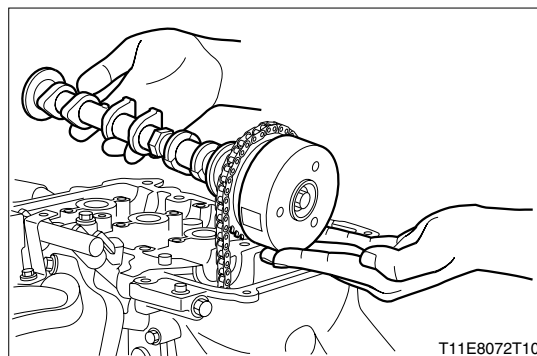
T11E8071T10

(4) Camshaft Ay, No.1/No.2

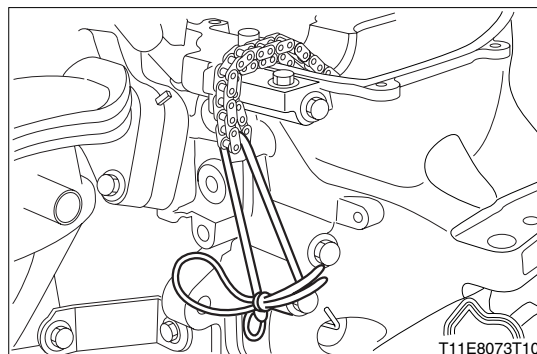
1. Remove the camshaft Ay, No.1/No.2.

NOTE

- Remove the No.1 camshaft Ay together with the camshaft timing sprocket.
- Also, during the installation, temporarily assemble the camshaft timing sprocket to the No.1 camshaft Ay.



2. After removing the camshaft Ay, hold the timing chain by a cord, etc. so that it would not fall.



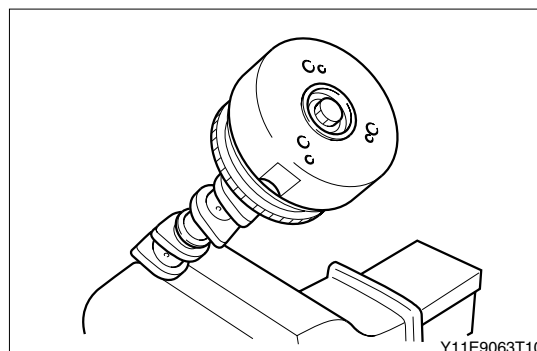
3-1-5 INSPECTION

(1) Check of camshaft timing sprocket Ay

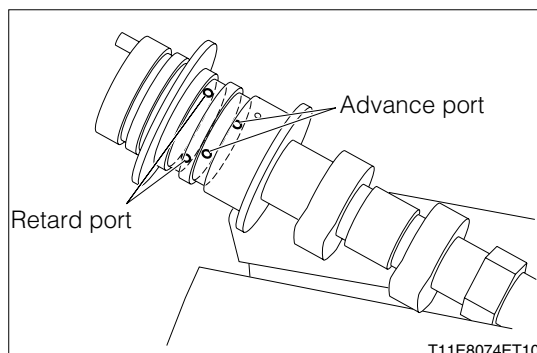
CAUTION

- Do not disassemble the camshaft timing sprocket Ay (DVVT controller).

1. Secure the hexagonal section provided for servicing the No.1 camshaft assembly to a vice.
2. Install the camshaft timing sprocket Ay and tighten the attaching bolts to the specified torque.



3. Hold one of the two advanced timing side ports (The figure on the right) of the No.1 camshaft Ay with your fingers or block the advanced timing side port by a tape, etc.



4. Using an air tool, apply air pressure through another port at the timing advance side.

CAUTION

- Care must be exercised as to splashing oil.

NOTE

- The most retard timing lock is disengaged.

5. At this time, ensure that the most retard timing angle lock of the camshaft timing sprocket Ay is disengaged and the camshaft timing sprocket Ay can be freely moved by the hand without any binding in the range of about 30 degrees.

CAUTION

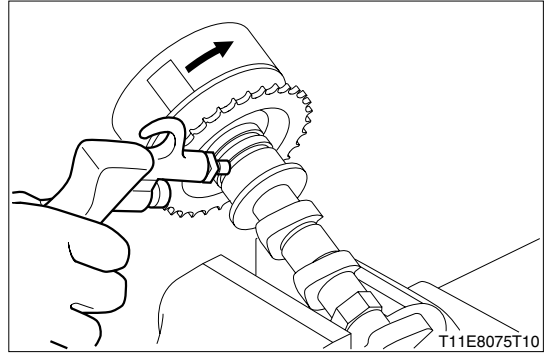
- The camshaft timing sprocket Ay is locked when it comes at the most retard angle position.

6. After the inspection, lock the camshaft timing sprocket Ay at the most retard timing position.

3-1-6 POINTS OF INSTALLATION

(1) Camshaft Ay, No.1/No.2

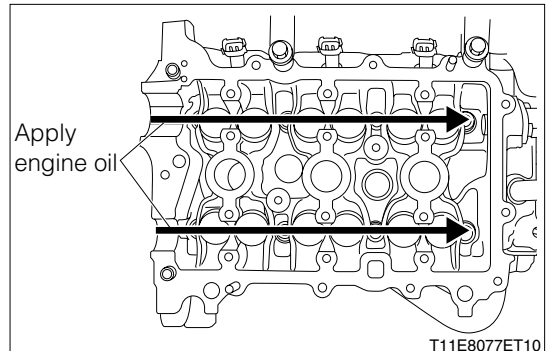
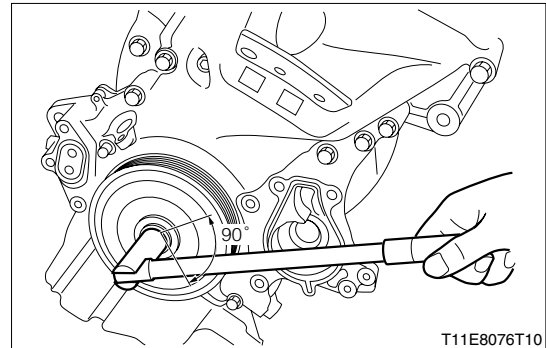
1. Turn the crankshaft about 90° (Crank angle) in the engine rotation direction from the top dead center under the compression stroke of the cylinder No.1 so that the lifted valve will not interfere with the piston when installing the camshaft.



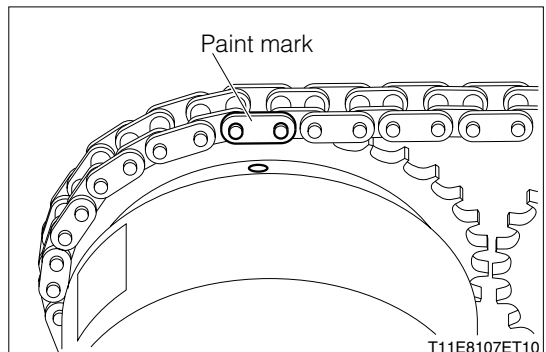
2. Install the camshaft Ay, No.1/No.2.

- (1) Apply engine oil to each of cam sections of the camshaft Ay, journal sections of the cylinder head Ay and the top of the valve lifter.

LUBRICANT: Engine oil



- (2) Perform the installation in such a way that the timing mark of the camshaft timing sprocket Ay (DVVT controller) and the paint mark of the timing chain are aligned with the timing mark that has been applied during the removal operation.

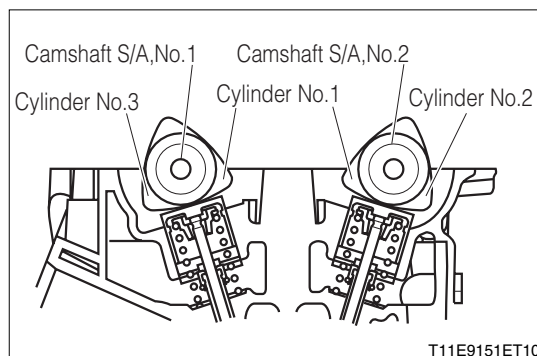


- (3) Set the No.1 camshaft Ay so that the cam noses of the No.1 cylinder and No.3 cylinder may press the valve lifters.

Set the No.2 camshaft Ay so that the cam noses of the No.1 cylinder and No.2 cylinder may press the valve lifters.

NOTE

- The timing mark of the camshaft timing sprocket and the camshaft timing sprocket Ay (DVVT controller) would come to the top position.

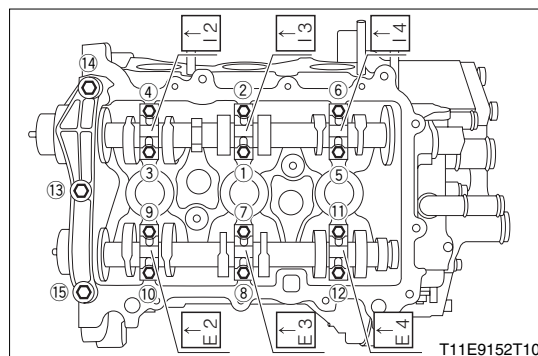


(2) Cap, camshaft bearing No.1/No.2

- Set the camshaft bearing No.1/No.2 caps. Then, tighten the attaching bolts to the specified torque in the sequence shown in the right figure.

CAUTION

- The front marks (Arrow marks) indicated on the top of camshaft bearing No.1/No.2 caps are facing towards the engine front side.
- Refer to the following table for the installation positions of the stamped No.'s indicated on the top of the camshaft bearing No.1/No.2 caps.



Installation positions of camshaft bearing No.2 cap

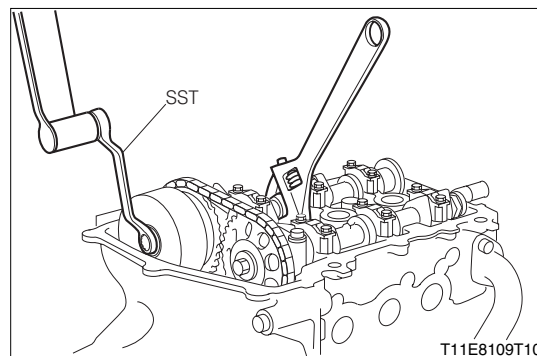
Stamping No.	Installation position	
	Intake/exhaust	Cylinder No.
I2	Intake side	Cylinder No.1
I3		Cylinder No.2
I4		Cylinder No.3
E2	Exhaust side	Cylinder No.1
E3		Cylinder No.2
E4		Cylinder No.3

(3) Sprocket Ay, camshaft timing (DVVT controller)

- Tighten the sprocket Ay attaching bolts, by means of the SST, using the hexagonal section provided for servicing of the No.1 camshaft Ay,
SST: 09249-B1010-000

NOTE

- To perform the tightening operation by extending the overall length, using a torque wrench in combination with the SST, determine the torque wrench readings by using the calculation formula.

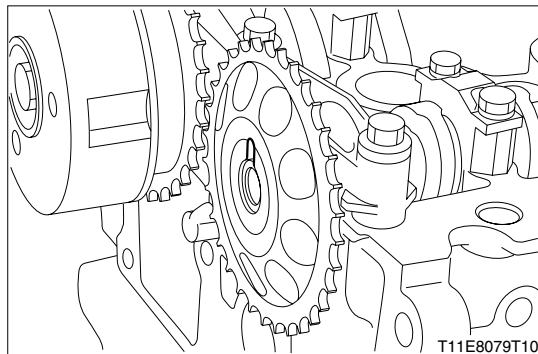


(4) Sprocket, camshaft timing

- Perform the assembling in such a way that the knock pin of the No.2 camshaft Ay would fit into the groove.

NOTE

- The mating mark of the gears would face exactly upward.

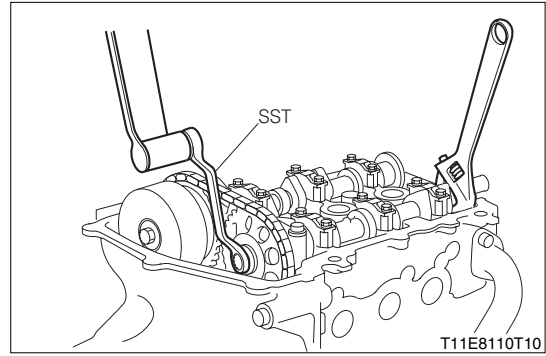


2. Tighten the sprocket attaching bolts by means of the SST, using the hexagonal section provided for servicing of the No.2 camshaft Ay.

SST: 09249-B1010-000

NOTE

- To perform the tightening operation by extending the overall length, using a torque wrench in combination with the SST, determine the torque wrench readings by using the calculation formula.

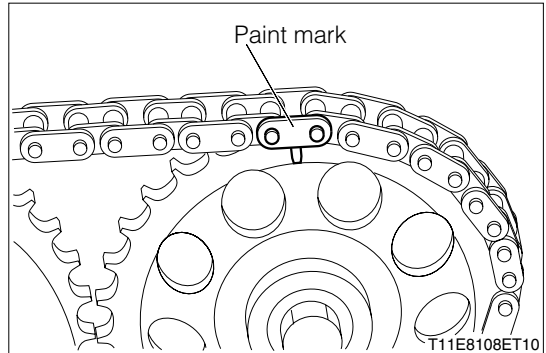


(5) Chain, timing

1. Perform the installation in such a way that the timing mark of the camshaft timing sprocket Ay and the paint mark of the timing chain are aligned with the timing mark that has been applied during the removal operation.
2. Pull out the hexagonal wrench from the timing chain tensioner S/A.

NOTE

- Slightly turn the camshaft Ay counterclockwise (Reverse rotation), using the hexagonal section provided for servicing of the camshaft Ay, so as to give a slack to the chain at the timing chain tensioner S/A side. Under this state, remove the hexagonal wrench.



(6) Plug, service hole screw

1. Clean the plugs and the bolt holes of the timing chain cover Ay. Then, apply liquid gasket to the threaded portion of the plugs before the installation.

ADHESIVE: Three Bond1324

TOOL: Hexagon wrench (Width across flats : 10mm)

(7) Cover, cylinder head

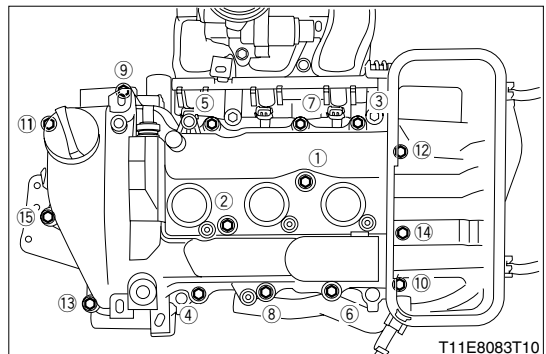
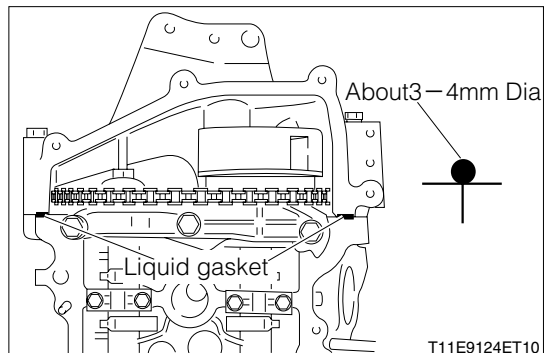
1. Clean the cylinder head cover, cylinder head Ay and timing chain cover Ay.
2. Insert the cylinder head cover gasket to the gasket groove and central boss of the coil Ay with ignitor.
3. Apply liquid gasket to the mating surfaces of the cylinder head Ay and the timing chain cover Ay, as shown in the figure.

The guide of the application amount is about 3.5 ± 0.5 mm Dia.

ADHESIVE: Three Bond1207B

4. The cover Ay attaching bolts should be assembled in the sequence shown in the right figure within three minutes after application of the liquid gasket.

After tightening all bolts to the specified torque, ensure again that the bolts ① and ② are tightened to the specified torque.



3-1-7 OPERATION AFTER INSTALLATION

- 1. Install the coil Ay, W/ignitor.
Refer to Page B10-1.
- 2. Install the V-ribbed belt and adjust the tension.
Refer to Page B1-1.
- 3. Install the air cleaner Ay W/element.
Refer to Page B3-1.
- 4. Connect the negative (-) terminal of the battery.
Refer to Page J5-1.
- 5. Check for any leakage of oil, coolant water and fuel. Perform the engine tune-up.
Refer to Page B1-1.

4 ENGINE ASSY

4-1 REMOVAL AND INSTALLATION

WARNING

- No fire should be brought near when servicing the fuel system.
- When removing the fuel hose, prevent the fuel from splashing.
- When the coolant is hot, do not remove the radiator cap, drain plug or water hose.
- When the oil is hot, do not remove the drain plug or oil cooler hose.

4-1-1 ARTICLES TO BE PREPARED

Instrument

Torque wrench

Lubricant,adhesive,others

Engine hanger No.1 (Replacement parts),Engine hanger No.2 (Replacement parts),Engine hanger attaching bolt (Replacement parts),Wooden block

4-1-2 OPERATION BEFORE REMOVAL

1. Remove the fuel pressure.
Refer to Page B7-1.
 2. Remove the battery and battery carrier.
Refer to Page J5-2.
 3. Disconnect the engine wire from the fuel injection computer Ay, and pull it into the engine compartment.
 4. Disconnect the hose leading to the charcoal canister Ay.
 - (1) RHD vehicles
Refer to Page B9-1.
 - (2) LHD vehicles
Refer to Page B9-1.
 5. Disconnect the vacuum hose Ay from the brake booster Ay.
Refer to Page E1-22.
 6. Disconnect the accelerator control cable Ay at the throttle body side.
 7. Remove the front bumper cover.
Refer to Page I2-1.
 8. Remove the front bumper reinforcement S/A and hood lock support.
Refer to Page I1-1.
 9. Remove the air cleaner cap S/A and air cleaner No.1 hose.
Refer to Page B3-1.
 10. Remove the wheel disc. (Front)
 11. Remove the engine undercover RH and engine undercover LH.
 12. Drain the coolant.
 13. Disconnect the water hose No.1 and water hose No.2 from the heater radiator Ay.
 - (1) RHD vehicles
Refer to Page K1-10.
 - (2) LHD vehicles
Refer to Page K1-17.
 14. Remove the radiator Ay.
Refer to Page B6-4.
- CAUTION**
- Suspend the cooler condenser Ay on the vehicle side, using a cord, etc., without cutting its piping.
15. Remove the front exhaust pipe Ay.
Refer to Page B4-2.
 16. Remove the V-ribbed belt
Refer to Page B1-4.

17. Remove the front drive shaft Ay RH and front drive shaft Ay LH.

Refer to Page D2-8.

18. Remove the floor shift ay, transmission.

Refer to Page F2-10.

19. Disconnect the fuel hose from the fuel delivery pipe Ay.

Refer to Page B7-3.

20. Remove the compressor Ay W/magnet clutch.

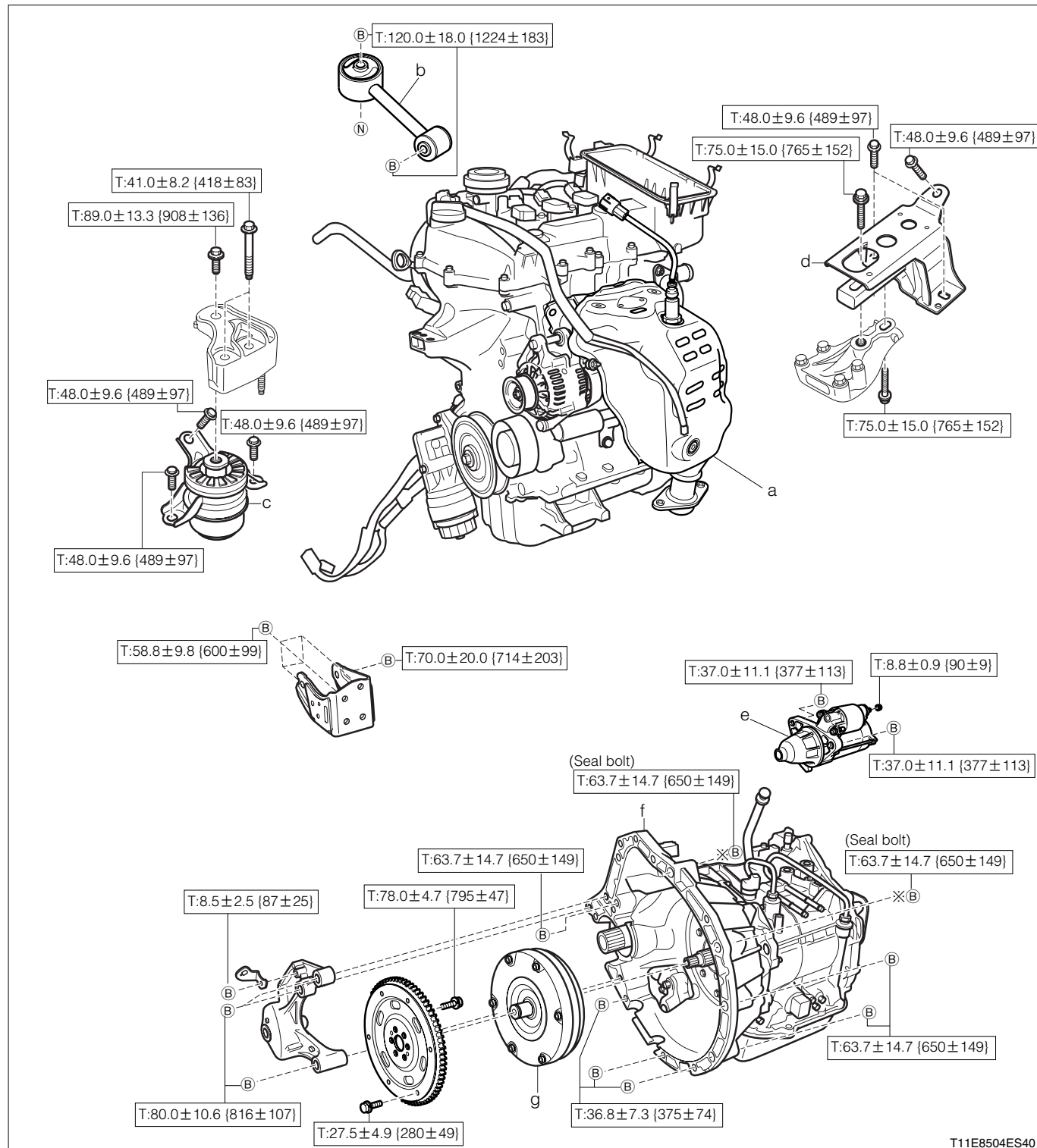
Refer to Page K1-20.

- (1) Remove the compressor Ay by removing the attaching bolts of the compressor Ay without disconnecting its piping.
- (2) Suspend the compressor Ay on the vehicle side, using a cord, etc.

B2-23

4-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



※:Non - reusable parts

Unit: N · m { kgf · cm }

Illust : automatic transaxle Ay

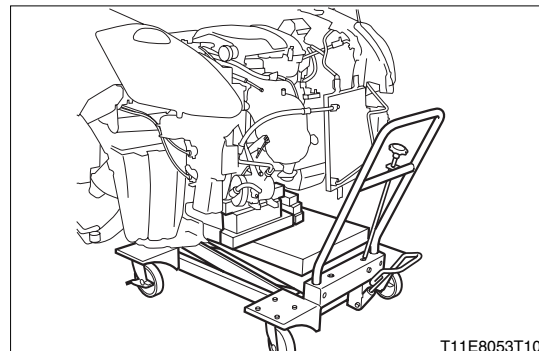
(2) Removal and installation procedures

▼ ▲ 1	a Engine Ay, w/transaxle Ay, automatic	▼ ▲ 6	f Transfer Ay
▼ ▲ 2	b Rod S/A, engine mounting control	▼ ▲ 7	g Converter Ay, torque
▼ ▲ 3	c Insulator S/A, engine mounting, RH		
▼ ▲ 4	d Insulator S/A, engine mounting, LH		
▼ ▲ 5	e Starter Ay		

4-1-4 POINTS OF REMOVAL

(1) Engine Ay, W/ transaxle Ay

1. Set the engine lifter at the position shown in the figure.

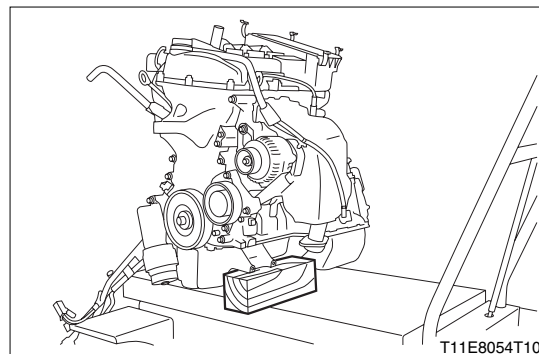


2. With wooden blocks or the like, support the engine assembly transaxle assembly in such a way that their balance is well kept.

- (1) Put a wooden piece, etc. on the installation position of the compressor Ay with magnet clutch on the left side of the engine block Ay.

CAUTION

- Do not apply wooden blocks to the crankshaft pulley.

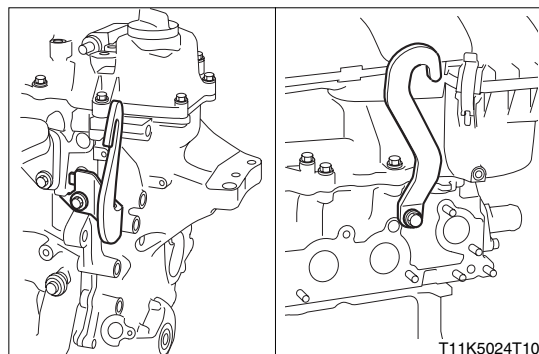


3. Install the engine hanger in the position shown in the right figure.

NOTE

- The engine hangers No.1 and No.2 and bolts with washers are supplied parts.

TIGHTENING TORQUE: $28.0 \pm 8.4 \text{ N} \cdot \text{m}$
 $\{286 \pm 85 \text{ kgf} \cdot \text{cm}\}$



(2) Rod S/A, engine mounting control.

1. Remove the Rod S/A.

(3) Insulator S/A, engine mounting, RH

1. Remove the insulator S/A.

CAUTION

- Make sure that the engine assembly is supported in a well balanced way during the removal.

(4) Insulator S/A, engine mounting, LH

1. Remove the insulator S/A.

CAUTION

- Make sure that the engine assembly is supported in a well balanced way during the removal.

(5) Engine Ay, W/ transaxle Ay

1. By operating the engine lifter, remove the engine assembly with the transaxle assembly installed to it.

CAUTION

- Make sure that no connectors or hoses are left connected or that they are not interfering with other parts during the removal.
- Perform the removal in such a way that it would not interfere with the suspension lower arm S/A and the parts in the engine compartment.

NOTE

- When no engine lifter is used, move the vehicle side (Two-post lift, etc.) up and down to perform the following operations.

(6) Starter Ay

1. Remove the starter Ay
Refer to Page B11-1.

(7) Transaxle Ay

1. Remove the transaxle Ay from the engine Ay.

4-1-5 POINTS OF INSTALLATION

(1) Transaxle Ay

1. Install the transaxle Ay to the engine Ay.

(2) Starter Ay

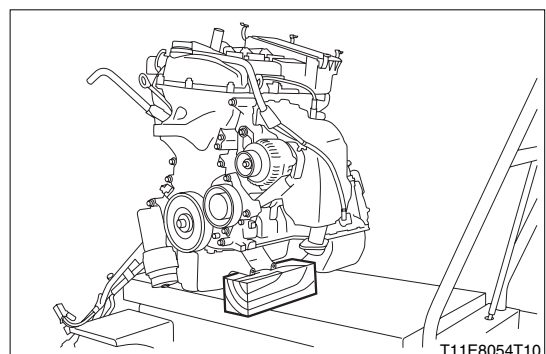
1. Install the starter Ay.
Refer to Page B11-1.

(3) Engine Ay, W/ transaxle Ay

1. Support the engine Ay with the transaxle Ay, using wooden blocks, etc., in a such a way that their balance is well kept.
 - (1) Put a wooden piece, etc. on the installation position of the compressor Ay with magnet clutch on the left side of the engine.

CAUTION

- Do not apply wooden blocks to the crankshaft pulley.



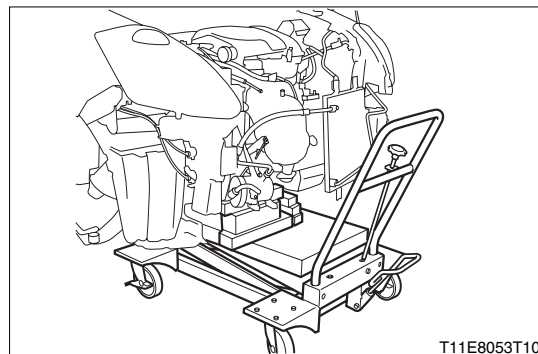
2. By operating the engine lifter, lift the engine assembly together with the transaxle assembly to the vehicle mounting position.

NOTE

- When no engine lifter is used, move the vehicle side (Two-post lift, etc.) up and down to perform the following operations.

CAUTION

- Perform the installation in such a way that it would not interfere with the suspension lower arm S/A and the parts in the engine compartment.

**(4) Insulator S/A, engine mounting, LH**

1. Install the insulator S/A.

(5) Insulator S/A, engine mounting, RH

1. Install the insulator S/A.

(6) Rod S/A, engine mounting control.

1. Install the Rod S/A.

(7) Engine Ay, W/ transaxle Ay

1. Install each harness, connector and clamp.
2. Route the engine wire in the vehicle interior to connect it to the fuel injection computer Ay.
3. Install the earth wires of the engine section and transaxle case section.

4-1-6 OPERATION AFTER INSTALLATION

1. Install the compressor assembly. Adjust the V-belt tension.
Refer to Page K1-20.
2. Install the front drive shaft Ay RH and front drive shaft Ay LH.
Refer to Page D2-4.
3. Install the front exhaust pipe Ay.
4. Install the radiator Ay to the vehicle.
Refer to Page B6-4.
5. Connect the fuel hose to the fuel delivery pipe Ay.
Refer to Page B7-3.
6. Connect the water hose No.1 and water hose No.2 to the heater radiator Ay.
 - (1) RHD vehicles
Refer to Page K1-10.
 - (2) LHD vehicles
Refer to Page K1-17.
7. Install the engine undercover RH and engine undercover LH.
8. Install the wheel disc. (Front)
9. Install the air cleaner cap S/A and air cleaner hose No.1.
Refer to Page B3-1.
10. Install the front bumper reinforcement S/A and hood lock support.
Refer to Page I1-1.
11. Install the front bumper cover.
Refer to Page I2-1.
12. Remove the floor shift ay, transmission.
Refer to Page F2-10.
13. Install the accelerator control cable Ay to the throttle body Ay.
14. Install the brake booster Ay to the vacuum hose Ay.
Refer to Page E1-22.
15. Connect the hose leading to the charcoal canister Ay.
 - (1) RHD vehicles
Refer to Page B9-1.
 - (2) LHD vehicles
Refer to Page B9-1.

16. Connect the harness wire at the vehicle side and the engine side.

17. Install the battery and battery carrier.

Refer to Page J5-2.

18. Fill cooling water.

19. Remove the engine hanger.

20. Check for any leakage of oil, coolant water and fuel. Perform the engine tune-up.

Refer to Page B1-1.

B3 INTAKE SYSTEM

1KR-----	B3-1
AIR CLEANER-----	B3-1
REMOVAL AND INSTALLATION-----	B3-1
THROTTLE BODY-----	B3-2
REMOVAL AND INSTALLATION-----	B3-2
INTAKE MANIFOLD GASKET-----	B3-4
REMOVAL AND INSTALLATION-----	B3-4

B3-1

■ 1KR

1 AIR CLEANER

1-1 REMOVAL AND INSTALLATION

1-1-1 ARTICLES TO BE PREPARED

Instrument

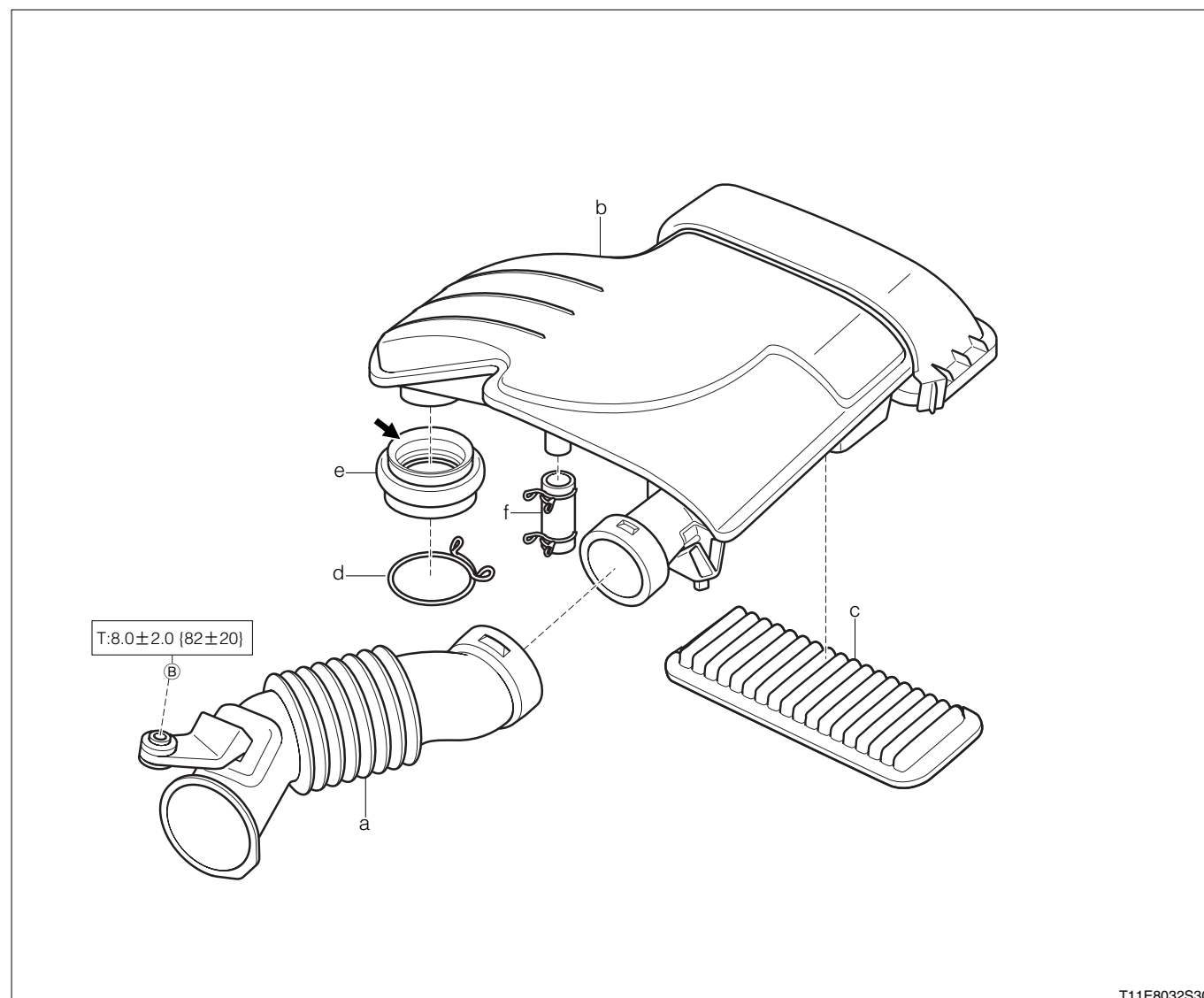
Torque wrench

Lubricant, adhesive, others

Engine oil, Cloth

1-1-2 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



➡: Engine oil

Unit: N·m[kgf·cm]

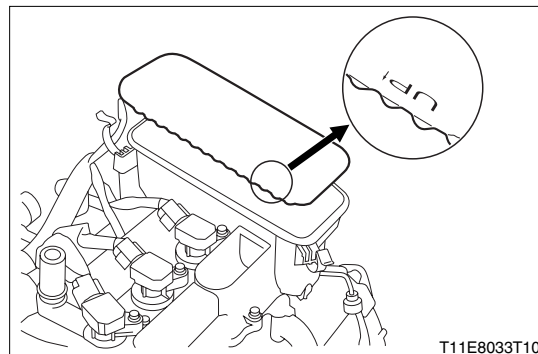
(2) Removal and installation procedures

- ▲ 1 a Hose, air cleaner No.1
- ▲ 2 b Cap S/A, air cleaner
- ▲ 3 c Element S/A, air cleaner
- 4 d Clamp
- 5 e Support air cleaner cap
- 6 f Hose, ventilation No.2

1-1-3 POINTS OF INSTALLATION

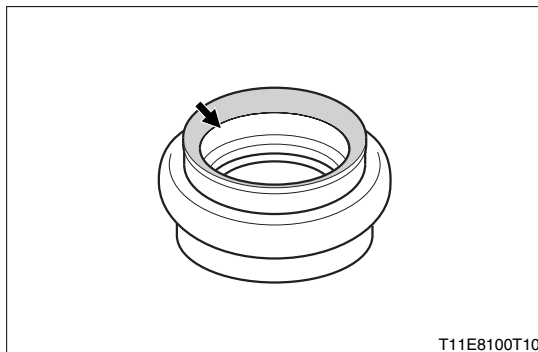
(1) Element S/A, air cleaner

1. Install the element S/A to the cylinder head cover Ay in the direction shown in the figure.

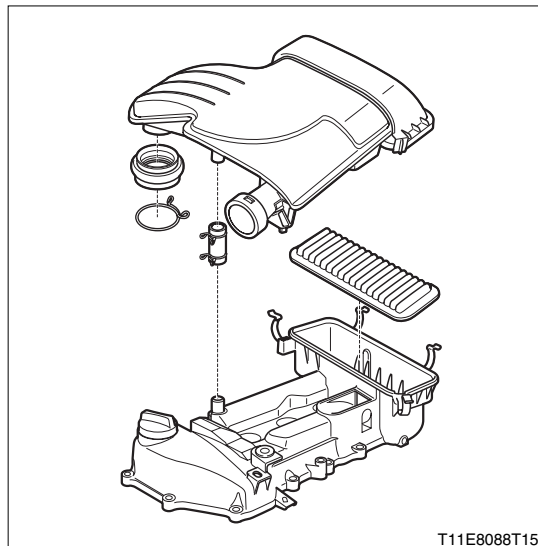


(2) Support, air cleaner cap

1. Apply engine oil to the air support.
LUBRICANT: Engine oil

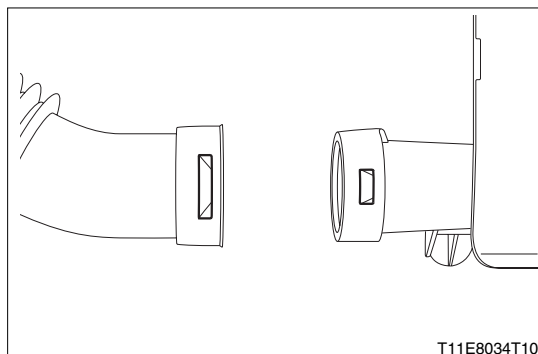


2. Assemble the clip to the ventilation No.2 hose in such a way that the clip faces toward the right side of the vehicle.
3. Assemble the ventilation hose No.2, to which the clip has been installed, to the cylinder head cover Ay.
4. Press in the air cleaner cap support to the ventilation hose No.2 and the cap S/A to the grommet of the cylinder head cover Ay.
5. Assemble the clip to the support in such a way that the clamp faces toward the left side of the vehicle.



(3) Hose, air cleaner No.1

1. Fit the protruding section of the air cleaner inlet seal to the recessed section of the hose.
2. Install the radiator support S/A with bolts.



2 THROTTLE BODY

2-1 REMOVAL AND INSTALLATION

WARNING

- Make sure that no foreign matter is admitted into the throttle body Ay and intake manifold Ay during the operation.

B3-3

2-1-1 ARTICLES TO BE PREPARED

Instrument

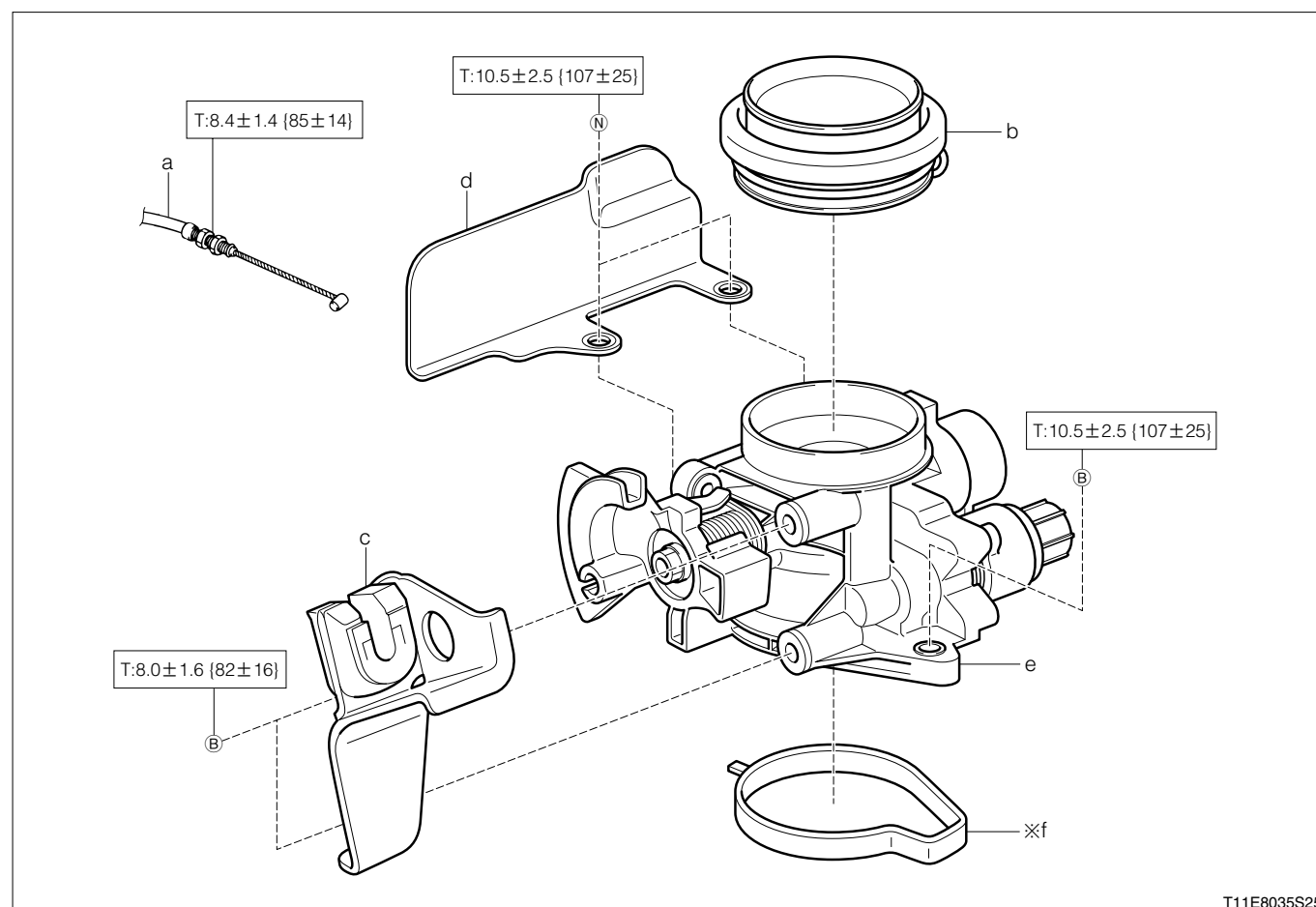
Torque wrench

2-1-2 OPERATION BEFORE REMOVAL

1. Remove the air cleaner hose No.1.
Refer to Page B3-1.
2. Remove the air cleaner filter element S/A and air cleaner cap S/A.
Refer to Page B3-1.

2-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



T11E8035S25

※:Non - reusable parts

Unit:N·m[kgf·cm]

(2) Removal and installation procedures

▲ 1	a Cable Ay, accelerator control (Throttle body side)	6	f Gasket, throttle body
▲ 2	b Support air cleaner cap		
3	c Bracket, accelerator control cable		
4	d Bracket, throttle body		
▲ 5	e Body Ay, throttle		

2-1-4 INSPECTION

(1) Body Ay, throttle

1. Perform the following checks for the throttle body Ay.
 - (1) There shall be no excessive play at the throttle shaft.
 - (2) Each port should not be clogged.
 - (3) The throttle valve should open or close smoothly.
 - (4) There should be no gap between the stop screw and the lever when the throttle valve is located at the fully-opened position.

2-1-5 POINTS OF INSTALLATION

(1) Body Ay, throttle

1. Clean the installation surface of the throttle body Ay and intake manifold Ay and install the throttle body Ay gasket.

(2) Support air cleaner cap

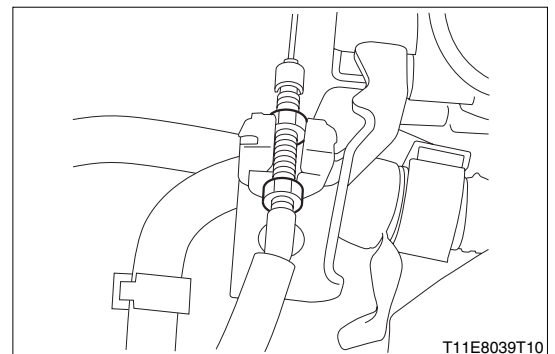
1. Assemble the throttle body Ay to the air cleaner cap support with the clip facing to the right of the vehicle.

(3) Cable Ay, accelerator control (Throttle body side)

1. Install the cable Ay. After adjusting the play of the accelerator pedal, tighten the nuts to the specified torque.

SPECIFIED VALUE: 1 - 5mm(Play of accelerator pedal: Depressing surface)

TIGHTENING TORQUE: $8.4 \pm 1.4 \text{ N} \cdot \text{m}$
 $\{85 \pm 14 \text{ kgf} \cdot \text{cm}\}$



2-1-6 OPERATION AFTER INSTALLATION

1. Install the air cleaner filter element S/A and air cleaner cap S/A.
Refer to Page B3-1.
2. Install the air cleaner hose No.1.
Refer to Page B3-1.
3. Perform the adjustment tune-up.
Refer to Page B1-1.

3 INTAKE MANIFOLD GASKET

3-1 REMOVAL AND INSTALLATION

3-1-1 ARTICLES TO BE PREPARED

Instrument

Torque wrench

B3-5

3-1-2 OPERATION BEFORE REMOVAL

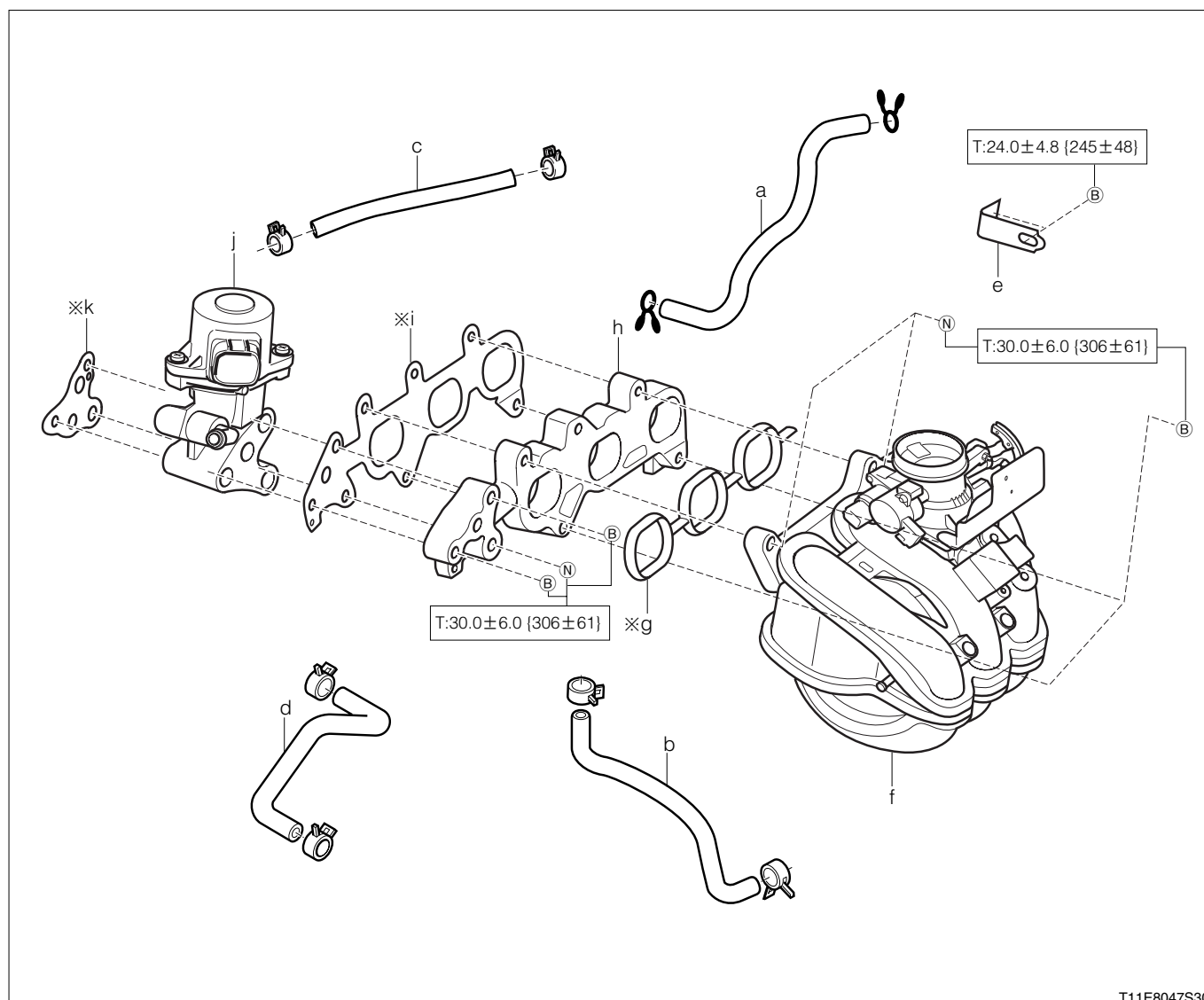
WARNING

- Do not remove the radiator cap or drain plug, water hose when the coolant is hot.

1. Drain the coolant.
2. Remove the air cleaner hose No.1.
Refer to Page B3-1.
3. Remove the air cleaner filter element S/A and air cleaner cap S/A.
Refer to Page B3-1.
4. Remove the throttle body Ay.
Refer to Page B3-2.

3-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



T11E8047S30

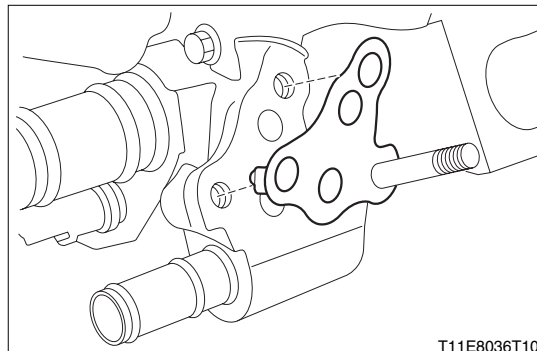
(2) Removal and installation procedures

1	a	Hose, ventilation No.1 (For intake manifold - head cover/PCV)	7	g	Gasket, intake manifold to head
▲ 2	b	Hose, fuel evaporative feed No.2	▲ 8	h	Insulator, intake manifold No.1
3	c	Hose, water (For EGR valve)	▲ 9	i	Gasket, intake manifold to head No.2
4	d	Hose Ay, vacuum (For brake booster)	▲ 10	j	Valve Ay, EGR No.1
5	e	Stay, intake manifold	▲ 11	k	Gasket, EGR valve
▲ 6	f	Manifold Ay, intake			

3-1-4 POINTS OF INSTALLATION

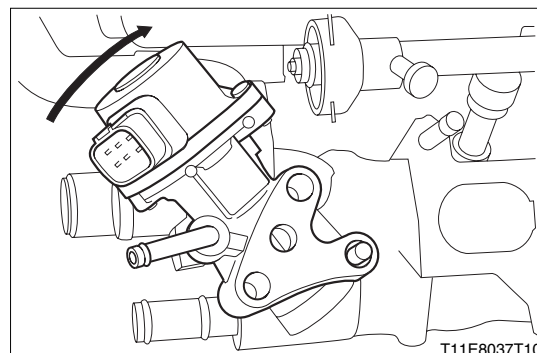
(1) Gasket, EGR valve

1. Clean the installation surface of the No.1 EGR valve Ay and cylinder head Ay.
2. Install the gasket to the cylinder head Ay.



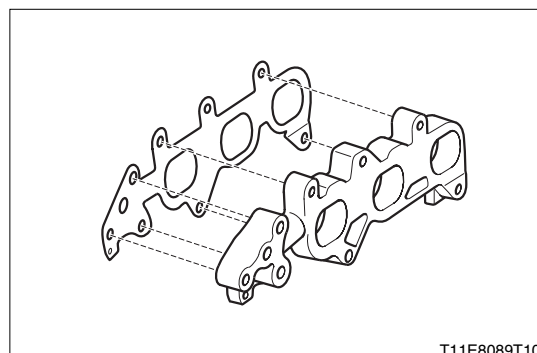
(2) Valve Ay, EGR No.1

1. Insert the valve Ay, while turning it in the arrow direction, being very careful not to allow it to interfere with the cylinder head cover Ay. Then, temporarily install the valve Ay to the cylinder head Ay.



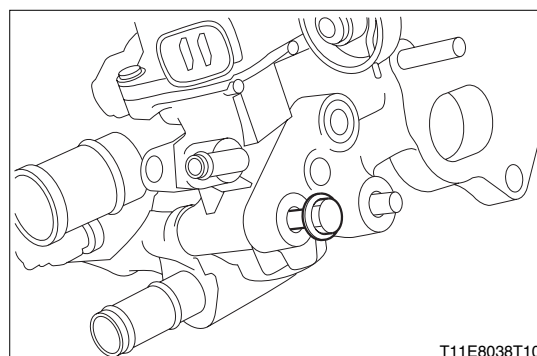
(3) Intake manifold-to-head No.2 gasket, intake manifold No.1 insulator

1. Clean the gasket installation surface of the cylinder head Ay and intake manifold Ay.
2. Install the intake manifold No.1 to the cylinder head Ay with an insulator interposed.



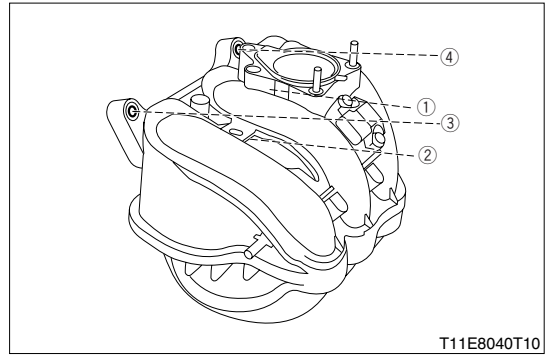
(4) Manifold Ay, intake

1. Temporarily tighten the No.1 EGR valve Ay with the bolts shown in the figure.

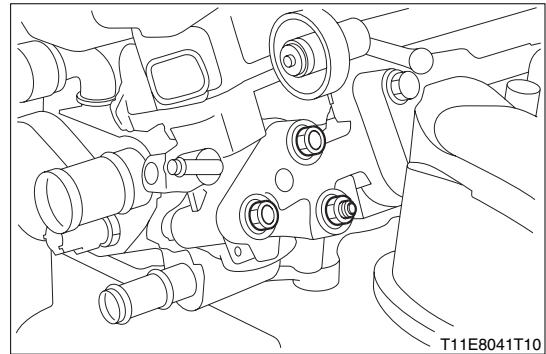


B3-7

2. Install the manifold Ay and tighten the bolts and nuts in the sequence shown in the right figure.

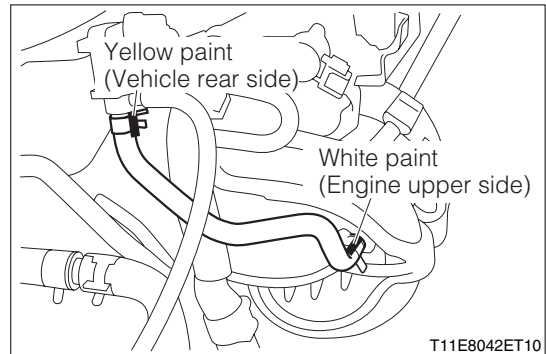


3. Tighten the EGR valve Ay No.1 .



(5) Hose, fuel evaporative feed No.2

1. Assemble the hose as shown in the figure.
2. Perform the assembling in such a way that the clamp on the VSV side faces the rear of the vehicle and the clamp on the manifold side faces the lower side of the vehicle.



3-1-5 OPERATION AFTER INSTALLATION

1. Install the throttle body Ay.
Refer to Page B3-2.
2. Install the air cleaner filter element S/A and air cleaner cap S/A.
Refer to Page B3-1.
3. Install the air cleaner hose No.1.
Refer to Page B3-1.
4. Replenish coolant and perform water leakage check.
Refer to Page B1-1.

B4 EXHAUST SYSTEM

1KR-----	B4-1
EXHAUST MANIFOLD GASKET -----	B4-1
REMOVAL AND INSTALLATION-----	B4-1
EXHAUST PIPE -----	B4-2
REMOVAL AND INSTALLATION-----	B4-2

B4-1

1KR

1 EXHAUST MANIFOLD GASKET

1-1 REMOVAL AND INSTALLATION

WARNING

- Do not carry out the operation while the exhaust manifold converter S/A is still hot.

1-1-1 ARTICLES TO BE PREPARED

Instrument

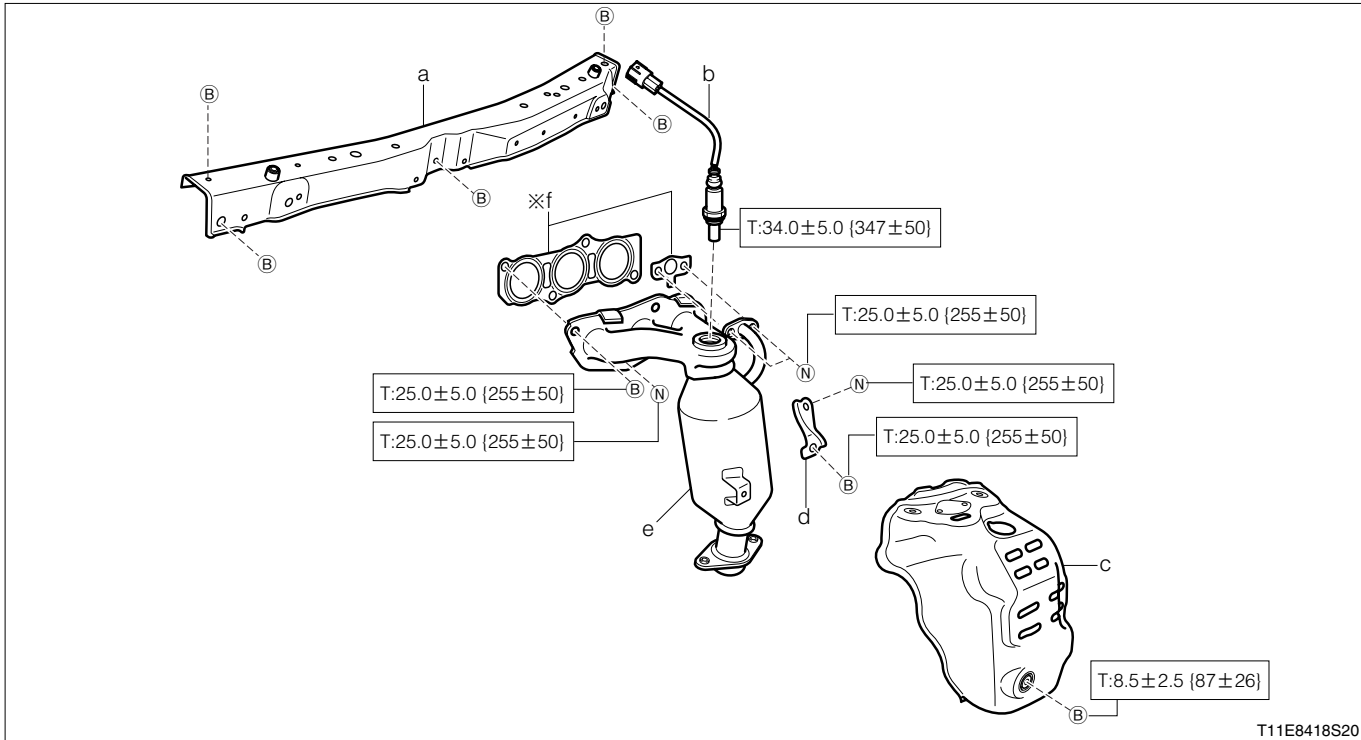
Torque wrench

1-1-2 OPERATION BEFORE REMOVAL

1. Remove the front bumper cover.
Refer to Page I2-1.
2. Remove the front exhaust pipe Ay.
Refer to Page B4-2.

1-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



※:Non - reusable parts
Unit:N·m{kgf·cm}

(2) Removal and installation procedures

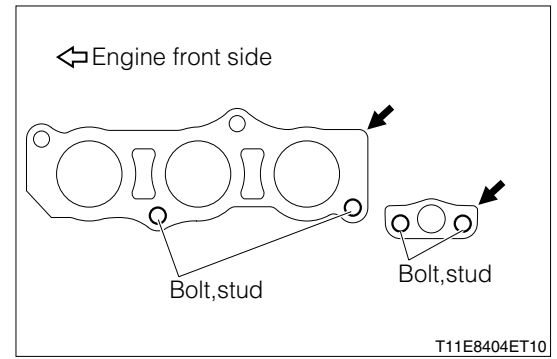
1	a Radiator support upper	▲ 6	f Gasket, exhaust manifold to head
2	b Sensor, oxygen		
3	c Insulator, exhaust manifold heat		
4	d Stay, exhaust manifold		
▲ 5	e Converter S/A, exhaust manifold		

1-1-4 POINTS OF INSTALLATION

(1) Gasket, exhaust manifold to head

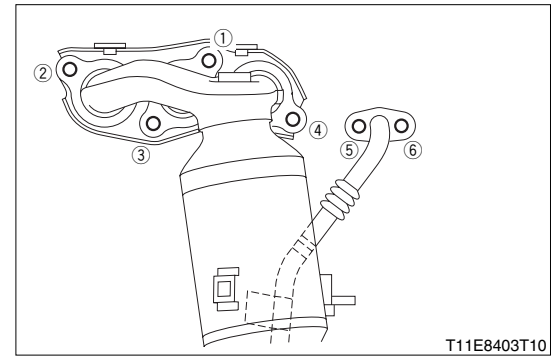
1. Clean the gasket installation surfaces of the cylinder head and exhaust manifold converter S/A.

2. Perform the installation so that the arrow section will come to the right upper side facing towards the installation surface of the cylinder head Ay.



(2) Converter S/A, exhaust manifold

1. Tighten the attaching bolts and nuts of the converter S/A in the sequence shown in the right figure.



1-1-5 OPERATION AFTER INSTALLATION

1. Install the front exhaust pipe Ay.
Refer to Page B4-2.
2. Install the front bumper cover.
Refer to Page I2-1.

2 EXHAUST PIPE

2-1 REMOVAL AND INSTALLATION

WARNING

- Do not carry out the operation while the front exhaust pipe Ay is still hot.

2-1-1 ARTICLES TO BE PREPARED

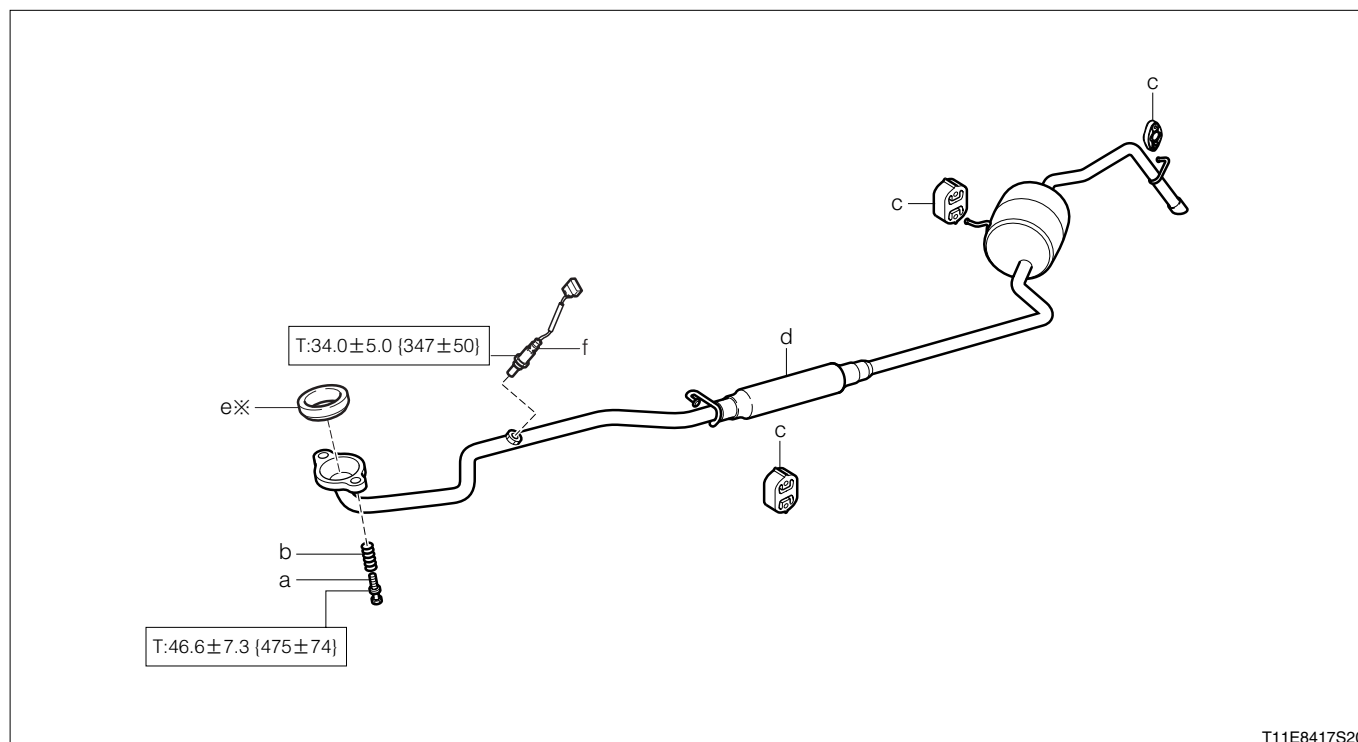
Instrument

Torque wrench

B4-3

2-1-2 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



※:Non - reusable parts

Unit:N·m(kgf·cm)

(2) Removal and installation procedures

1	a Bolt, exhaust pipe support	6	f Sensor, oxygen
2	b Spring, exhaust manifold		
3	c Support, muffler, No.2		
4	d Pipe Ay, exhaust, front		
5	e Gasket, exhaust pipe		

B5 LUBRICATION SYSTEM

1KR -----	B5—1
LUBRICATION SYSTEM -----	B5—1
FUNCTION CHECK-----	B5—1
ARTICLES TO BE PREPARED -----	B5—1
ENGINE OIL -----	B5—2
REPLACEMENT -----	B5—2
OIL FILTER-----	B5—3
REPLACEMENT -----	B5—3
OIL PUMP -----	B5—5
REPLACEMENT -----	B5—5
CRANKSHAFT FRONT OIL SEAL -----	B5—6
REMOVAL AND INSTALLATION-----	B5—6
OIL PAN-----	B5—7
REMOVAL AND INSTALLATION-----	B5—7

B5-1

1KR

1 LUBRICATION SYSTEM

1-1 FUNCTION CHECK

WARNING

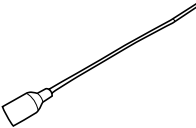
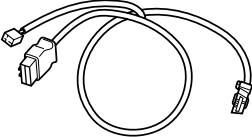
- Never carry out the operation while the engine and engine oil are still hot, for there are hazard potentials for getting scald.

1-2 ARTICLES TO BE PREPARED

Instrument

Tachometer, Oil pressure gauge, Torque wrench

SST

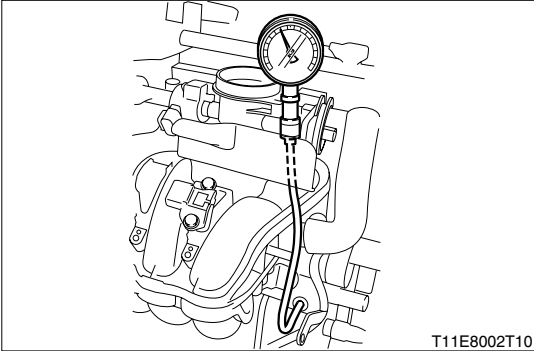
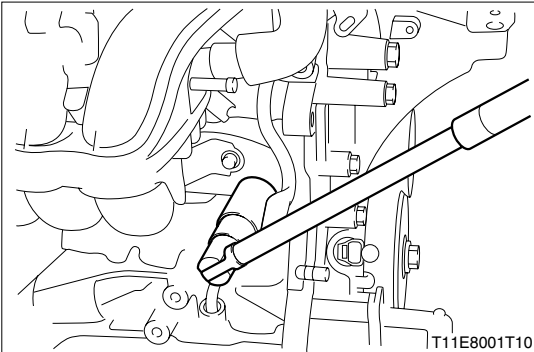
Shape	Part No.	Part name
	09991-87402-000	Wire, tacho-pulse pick up
	09991-87404-000 (09991-87401-000)	Wire, engine control system inspection

Lubricant, adhesive, others

Three Bond1104

1-2-1 OIL PRESSURE

1. Check the engine oil amount.
Refer to Page B1-2.
2. Remove the engine oil pressure switch.
 - (1) Disconnect the connector for the engine oil pressure switch.
 - (2) Remove the engine oil pressure switch.
3. Install the oil pressure gauge (Thread diameter PT1/8).



4. Install the engine tachometer.

- (1) Install an engine tachometer to the terminal REV of the DLC, using the SST.

SST: 09991-87402-000

09991-87404-000

5. Warm up the engine.

6. Measure the pressure at each engine speed.

SPECIFIED VALUE: At 750rpm
 30kPa or more
 {0.3kgf/cm² or more}
 At 3000rpm
 200kPa or more
 {2.0kg/cm² or more}

7. Remove the oil pressure gauge (Thread diameter PT1/8).

8. Install the engine oil pressure switch.

- (1) Clean the threaded portion of the oil pressure switch and switch attaching section of the cylinder block.
- (2) Apply sealing material to the threaded portion of the oil pressure switch.

ADHESIVE: Three Bond1104

- (3) Install the oil pressure switch.

TIGHTENING TORQUE: $15 \pm 4.5 \text{ N} \cdot \text{m}$
 { $153 \pm 46 \text{ kgf} \cdot \text{cm}$ }

- (4) Connect the connector for the engine oil pressure switch.

9. Remove the engine tachometer.

10. Start the engine and check the engine oil pressure switch attaching section for oil leakage.

2 ENGINE OIL

2-1 REPLACEMENT

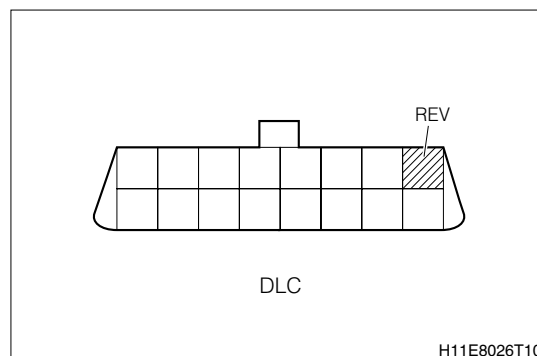
WARNING

- Never carry out the operation while the engine and engine oil are still hot, for there are hazard potentials for getting scald.

2-1-1 ARTICLES TO BE PREPARED

Lubricant, adhesive, others

Engine oil 0W-20(API Grade SG or higher), Engine oil 5W-30(API Grade SG or higher)



B5-3

2-1-2 REPLACING PROCEDURE

- 1. Remove the oil filler cap.
- 2. Drain the engine oil by removing the drain plug of the oil pan.
- 3. Install the drain plug with a new gasket interposed.

TIGHTENING TORQUE: 29.5±5.9N·m{301±60kgf·cm}

- 4. Fill engine oil.

NOTE

- About 3.1ℓ (With oil filter)

LUBRICANT: Engine oil 0W—20(API Grade SG or higher)
Engine oil 5W—30(API Grade SG or higher)

- 5. Install the oil filler cap.
- 6. Ensure that there is no oil leakage by operating the engine for three minutes or more.
- 7. Check the oil level.
Refer to Page B1-2.

3 OIL FILTER

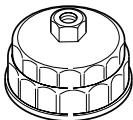
3-1 REPLACEMENT

WARNING

- Never carry out the operation while the engine and engine oil are still hot, for there are hazard potentials for getting scald.

3-1-1 ARTICLES TO BE PREPARED

SST

Shape	Part No.	Part name
	09228-87201-000	Wrench oil filter

Lubricant,adhesive,others

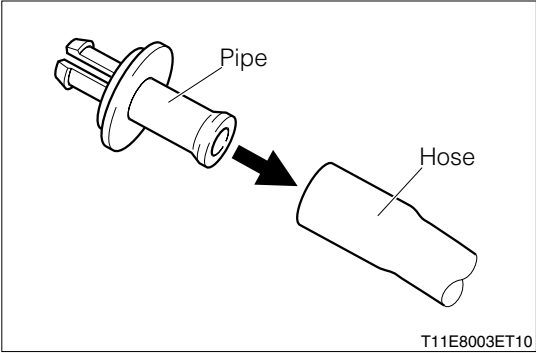
Vinyl hose,Engine oil

3-1-2 REPLACEMENT PROCEDURE

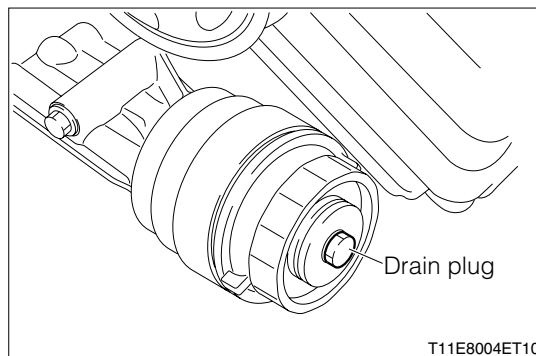
- 1. Remove the oil filter element.
(1) Connect the hose to the supplied drain pipes.

NOTE

- Use a 15mm hose.



(2) Remove the oil filter drain plug.



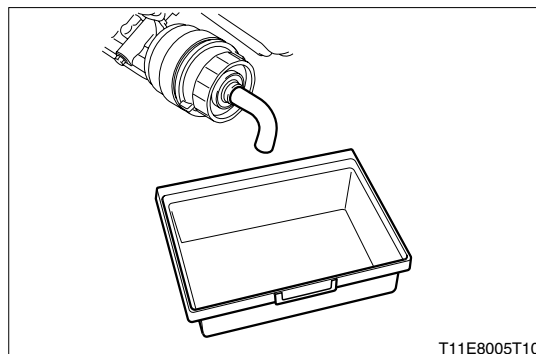
(3) Insert the pipes with the hose attached.

CAUTION

- Insert the hose under a condition that the O-ring (For drain plugs) is attached to the oil filter cap side.

NOTE

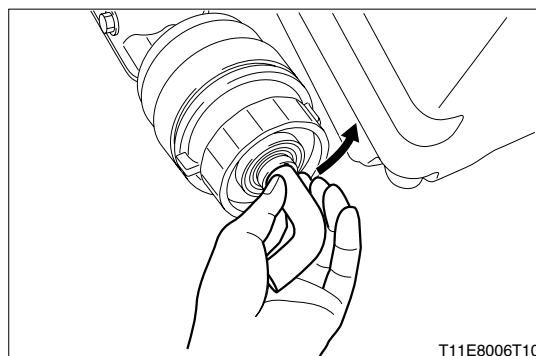
- Since the oil will be drained through the hose, put the hose end to a tray in advance.



(4) Ensure that the oil has been drained. Then, remove the pipe and O-ring (For drain plugs).

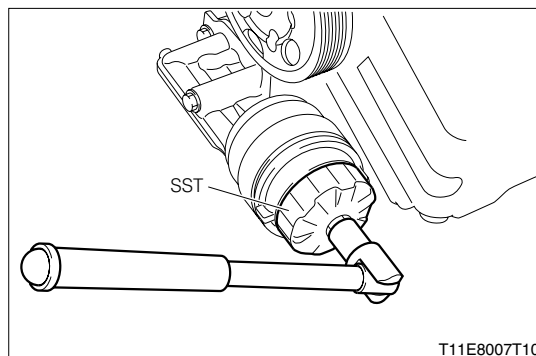
CAUTION

- During the removal, be sure to bend the pipe to the side.



(5) Remove the oil filter cap, using the SST.

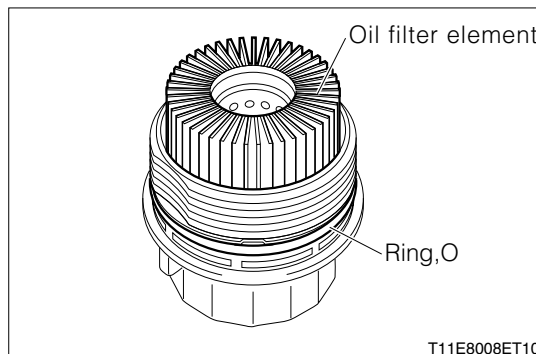
SST: 09228-87201-000



(6) Remove the oil filter element and O-ring (For caps) from the oil filter cap.

CAUTION

- To avoid scratching the O-ring groove, remove the O-ring (For caps) by hand without using any tools.



B5-5

2. Install the oil filter element.

- (1) Clean the inside section, threaded portion and O-ring groove section of the oil filter cap, using brake cleaner.
- (2) Apply a small amount of engine oil to a new O-ring (For caps) and install the oil filter cap.

LUBRICANT: Engine oil

CAUTION

- Install the oil filter cap, being very careful not to damage the O-ring.
- (3) Set a new oil filter element to the oil filter cap.
 - (4) Remove any smear or foreign matters from the installation surface and inside section on the engine side.
 - (5) Again, apply a small amount of engine oil to the O-ring (For caps) and install the oil filter cap.

CAUTION

- Care must be exercised so that the O-ring (For caps) may not be caught-in.

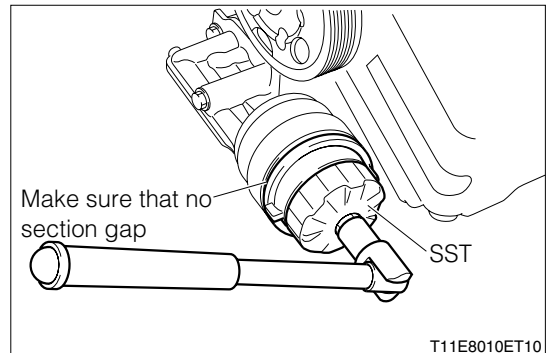
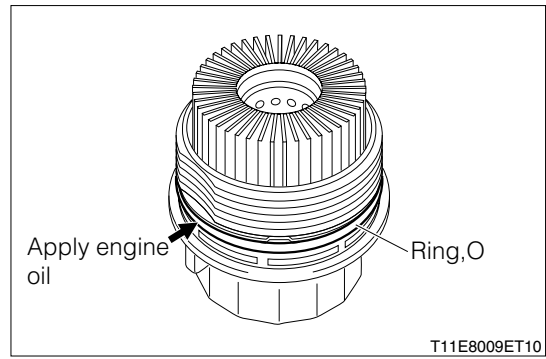
- (6) Tighten the oil filter cap, using the SST.

SST: 09228-87201-000

TIGHTENING TORQUE: $25.0 \pm 5.0 \text{ N} \cdot \text{m}$
{ $255 \pm 51 \text{ kgf} \cdot \text{cm}$ }

CAUTION

- After tightening the oil filter cap, ensure that there is no gap.



- (7) Apply a small amount of engine oil to a new O-ring (For drain plugs) and install it to the oil filter cap.
- (8) Remove the smear and foreign matters from the installation surface.
- (9) Install the oil filter drain plug to the oil filter cap.

TIGHTENING TORQUE: $12.5 \pm 2.5 \text{ N} \cdot \text{m}$
{ $128 \pm 26 \text{ kgf} \cdot \text{cm}$ }

CAUTION

- Care must be exercised so that the O-ring (For caps) may not be caught-in.

3. Replenish engine oil.

Refer to Page B5-2.

4. Oil leakage check

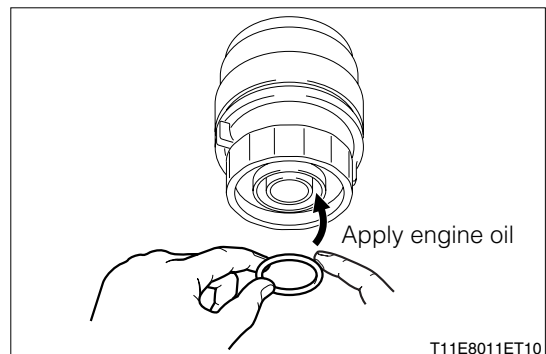
- (1) Start the engine. Ensure that there is no oil leakage from the joint sections of the oil filter cap and oil filter drain plugs.

4 OIL PUMP

4-1 REPLACEMENT

1. The oil pump is built in the timing chain cover Ay. Therefore, replace the timing chain cover Ay at the time of the replacement.

Refer to Page B2-5.



5 CRANKSHAFT FRONT OIL SEAL

5-1 REMOVAL AND INSTALLATION

5-1-1 ARTICLES TO BE PREPARED

SST

Shape	Part No.	Part name
	09223-87202-000	Replacer,crankshaft front oil seal

Instrument

Torque wrench

Lubricant,adhesive,others

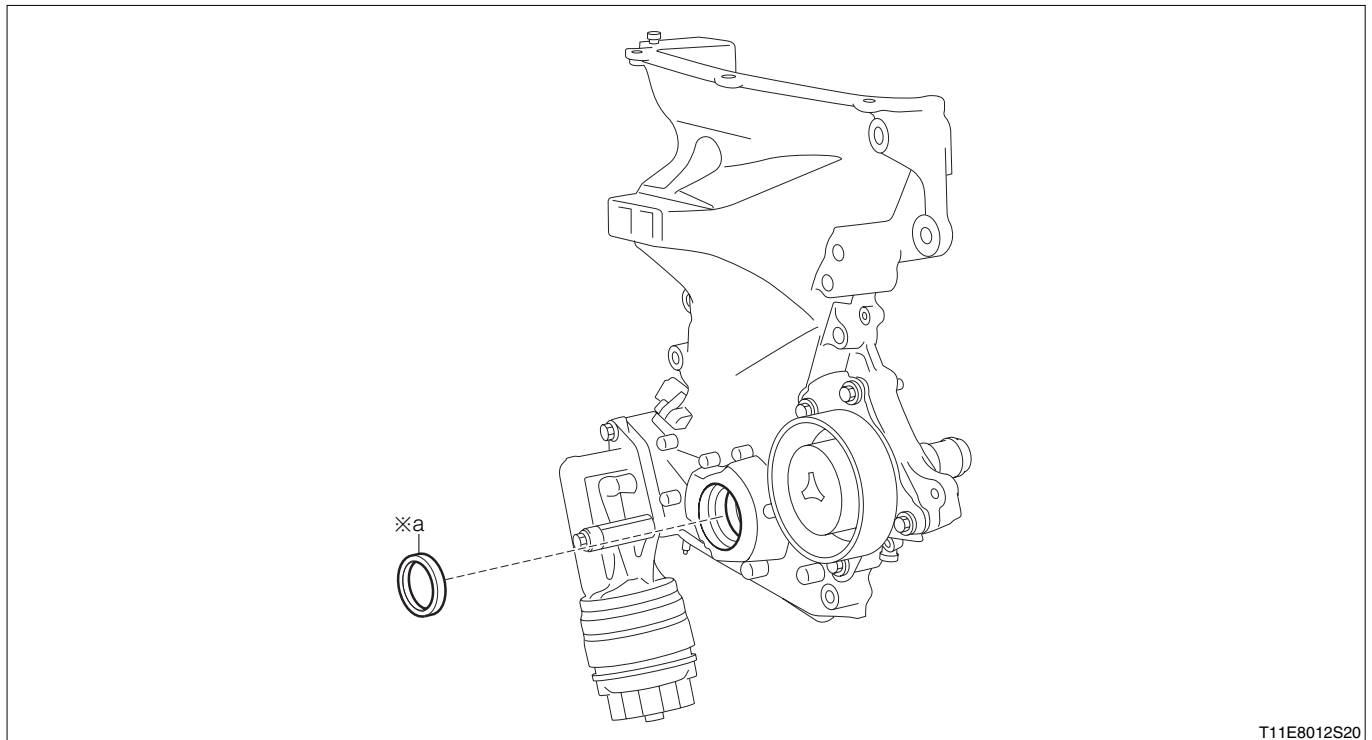
Engine oil

5-1-2 OPERATION BEFORE REMOVAL

1. Drain the engine oil.
Refer to Page B5-2.
2. Remove the crankshaft pulley Ay.
Refer to Page B2-5.

5-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



※:Non - reusable parts

(2) Removal and installation procedures

- ▼ ▲ 1 a Seal, type T oil

T11E8012S20

B5-7

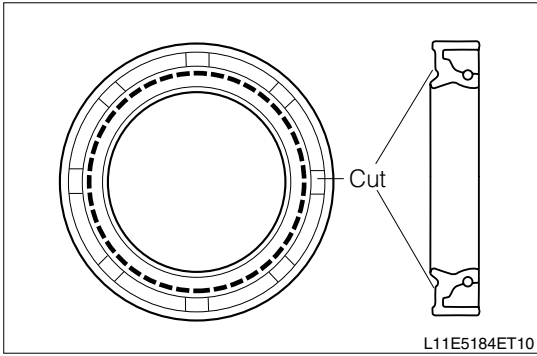
5-1-4 POINTS OF REMOVAL

(1) Seal, type T oil

- 1. Cut the lip section of the seal by a cutter, etc. Then, remove the seal by prying it by a screwdriver, etc.

CAUTION

- Wind the screwdriver with a tape, etc. to prevent the surroundings from being damaged.
- 2. After removing the seal, ensure that there is no scratch on the chamfering section of the crankshaft Ay. (If there is any scratch, repair it with sand paper #400.)



5-1-5 POINTS OF INSTALLATION

(1) Seal, type T oil

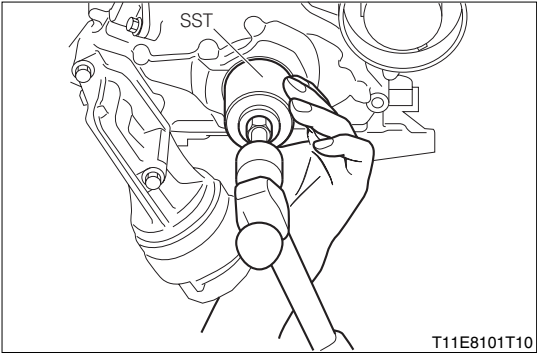
- 1. Install the seal, following the procedure given below.
(1) Apply engine oil to the lip section of the seal.

LUBRICANT: Engine oil

- (2) Drive in the seal vertically, using the SST.

SPECIFIED VALUE: Press-fitting amount
Protruding amount from end surface of chain cover Ay
Within 0.5mm
Press-fitting depth from end surface of chain cover Ay
Within 1mm

SST: 09223-87202-000



5-1-6 OPERATION AFTER INSTALLATION

- 1. Install the crankshaft pulley Ay.
Refer to Page B2-5.
- 2. Fill engine oil.
Refer to Page B5-2.
- 3. Start the engine and ensure that there is no oil leakage from the type T oil seal.

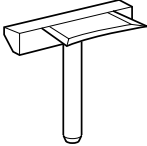
6 OIL PAN

6-1 REMOVAL AND INSTALLATION

WARNING

- Never carry out the operation while the engine and engine oil are still hot, for there are hazard potentials for getting scald.

SST

Shape	Part No.	Part name
	09091-1C100-000 (09032-00100-000)	Cutter,oil pan seal

Instrument

Torque wrench

Lubricant,adhesive,others

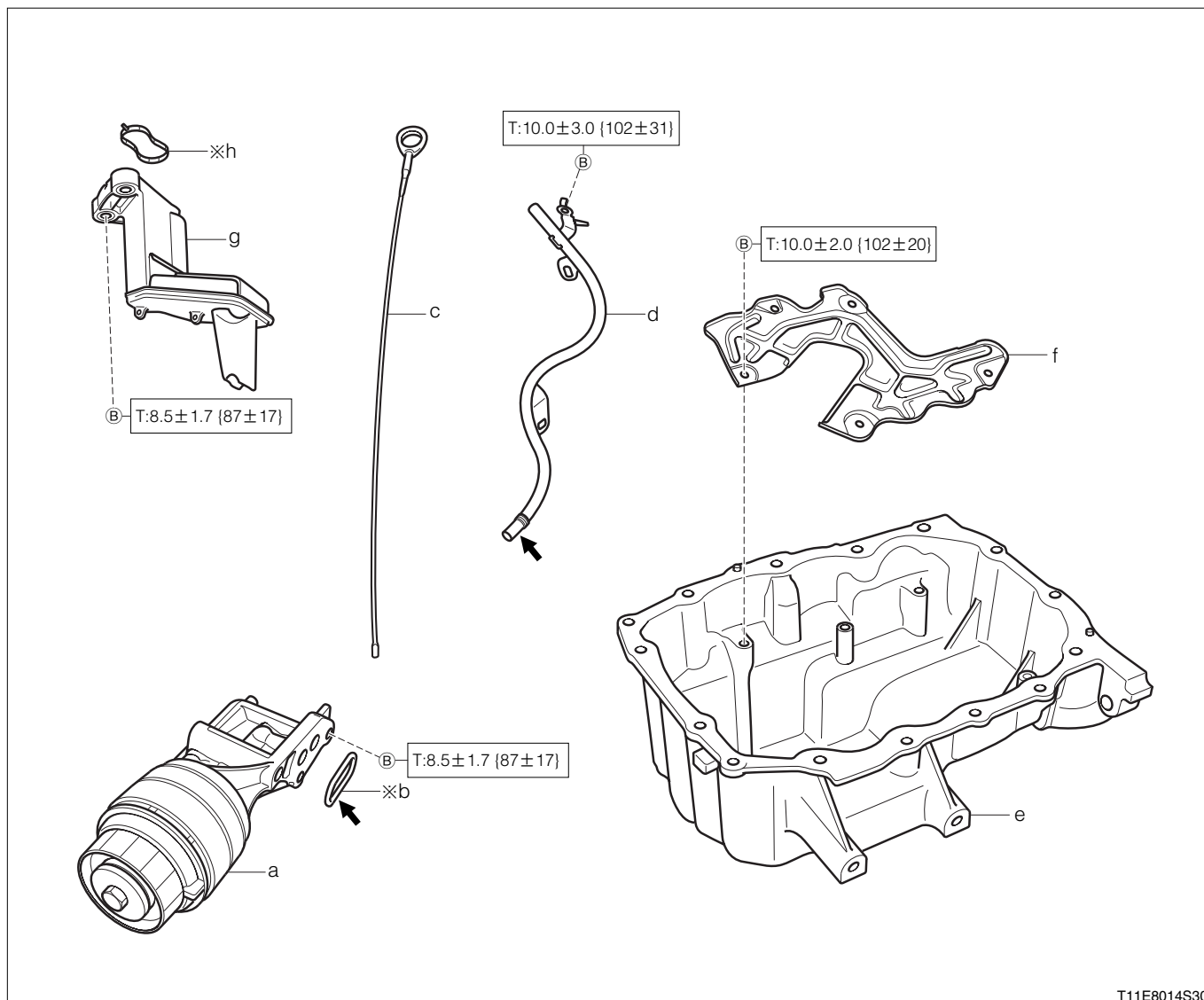
Three Bond1280E,Engine oil

6-1-1 OPERATION BEFORE REMOVAL

1. Drain the engine oil by removing the drain plug and gasket.
Refer to Page B5-2.
2. Remove the front exhaust pipe Ay.
Refer to Page B4-2.

6-1-2 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



T11E8014S30

➡: Engine oil

Unit: N·m[kgf·cm]

※: Non-reusable parts

(2) Removal and installation procedures

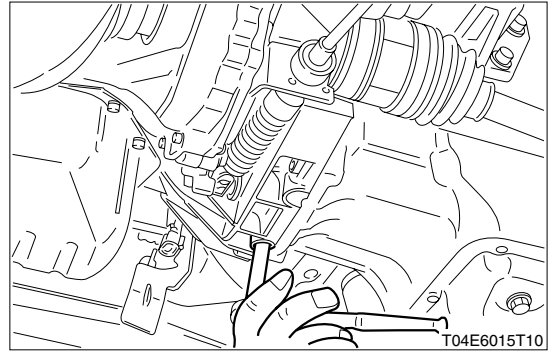
1	a	Oil filter Ay with bracket	6	f	Plate, oil pan baffle
2	b	Gasket, oil filter	7	g	Strainer S/A, oil
3	c	Gauge Ay, oil level	8	h	Gasket, oil strainer
4	d	Guide, oil level gage			
▼ ▲ 5	e	Pan S/A, oil			

B5-9

6-1-3 POINTS OF REMOVAL

(1) Pan S/A, oil

1. Remove the attaching nuts on the back section of the pan S/A from the service hole at the lower side of the transmission.
2. Remove the attaching bolts and nuts of the pan S/A.

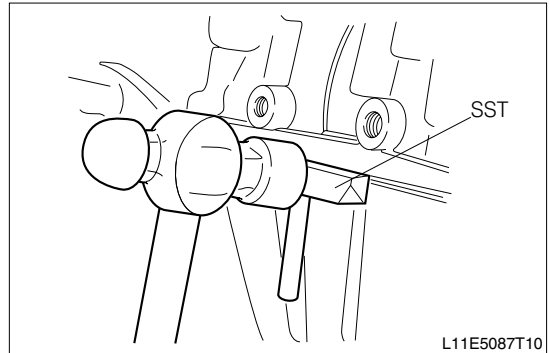


3. Remove the oil pan S/A by inserting the SST between the pan S/A and the cylinder block Ay.

SST: 09091-1C100-000

CAUTION

- Be very careful not to scratch the joint surface.
- Be very careful not to deform the flange section.



6-1-4 POINTS OF INSTALLATION

(1) Pan S/A, oil

1. Clean the pan installation surface of the cylinder block Ay.
2. Apply liquid gasket to the pan S/A at the bold-line section in the figure.

NOTE

- The guide of the diameter of the liquid gasket is 3.5 ± 0.5 mm Dia.

ADHESIVE: Three Bond1280E

CAUTION

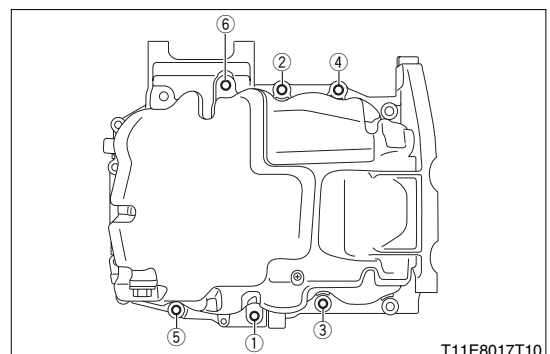
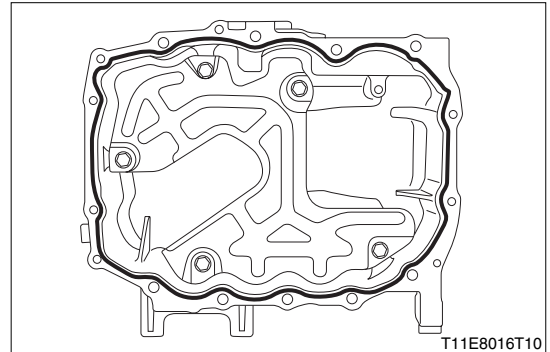
- Application of the gasket should be started and finished at the seal surface with the block on either the intake side or the exhaust side. Be sure to avoid the seal surface with the chain cover on the front and back of the engine and oil seal retainer.
3. Install the pan S/A to the cylinder block Ay in the sequence show in the figure.

NOTE

- As for the tightening of the remaining sections, it may be done in any order.

CAUTION

- Perform the assembling within three minutes of application of the gasket. Moreover, perform the tightening within 15 minutes.



6-1-5 OPERATION AFTER INSTALLATION

1. Install the front exhaust pipe Ay.

Refer to Page B4-2.

2. Replenish engine oil.

Refer to Page B5-2.

3. Start the engine. Ensure that there is no oil leakage form the joint sections of the oil pan S/A and oil filter Ay with brackets.

B6 COOLING SYSTEM

1KR-----	B6—1
THERMOSTAT-----	B6—1
REMOVAL AND INSTALLATION-----	B6—1
WATER PUMP-----	B6—2
REMOVAL AND INSTALLATION-----	B6—2
RADIATOR-----	B6—4
REMOVAL AND INSTALLATION-----	B6—4

B6-1

1KR

1 THERMOSTAT

1-1 REMOVAL AND INSTALLATION

WARNING

- Do not remove the radiator cap or drain plug when the coolant is hot.

1-1-1 ARTICLES TO BE PREPARED

Instrument

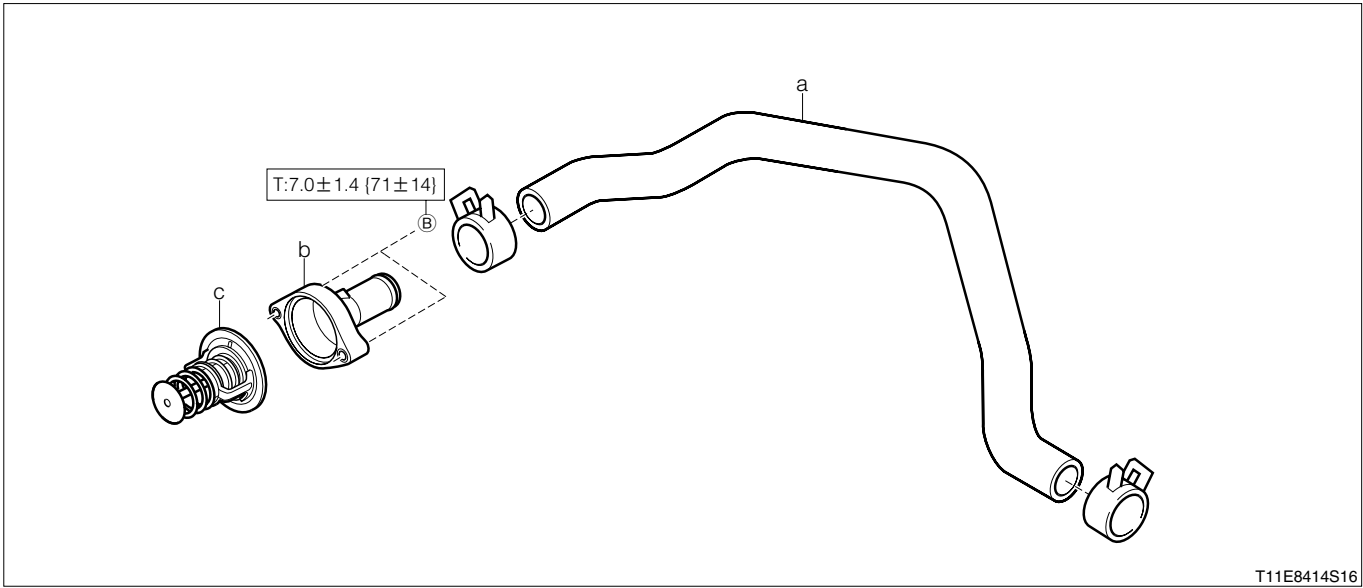
Torque wrench

1-1-2 OPERATION BEFORE REMOVAL

1. Drain the coolant.

1-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



Unit: N · m {kgf · cm}

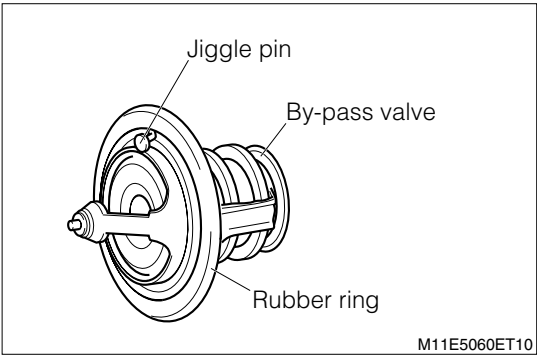
(2) Removal and installation procedures

- 1 a Hose, radiator No.2
- ▲ 2 b Inlet, water
- ▲ 3 c Thermostat

1-1-4 INSPECTION

(1) Visual inspection

1. With the valve closed completely at a room temperature (20℃), ensure that the spring has a play.
2. Check the rubber ring for damage.
3. Check if the bypass valve and jiggle pin move smoothly.



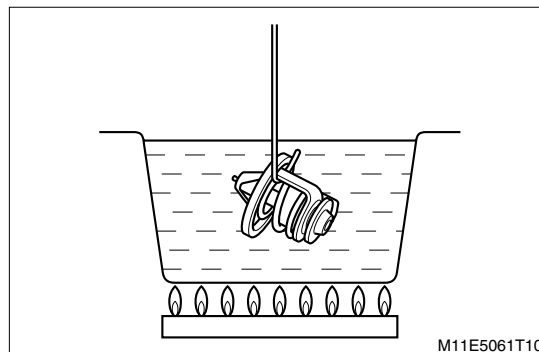
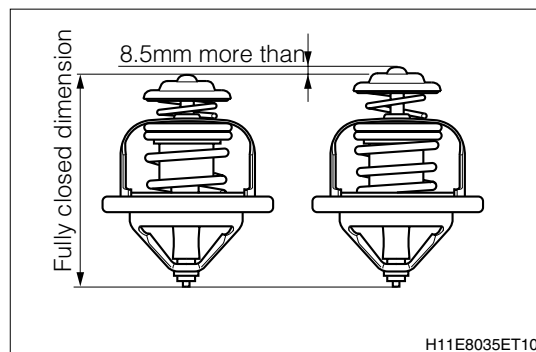
(2) Open valve temperature check

1. Measure the fully-closed dimensions before heating.
2. Put the thermostat in water and raise the water temperature gradually. Measure the temperature at the point when the valve starts to open.

SPECIFIED VALUE: $82 \pm 2.0^{\circ}\text{C}$

3. Further raise the temperature and pull out the thermostat at 95°C or above. Quickly measure the lift amount of the bypass valve.

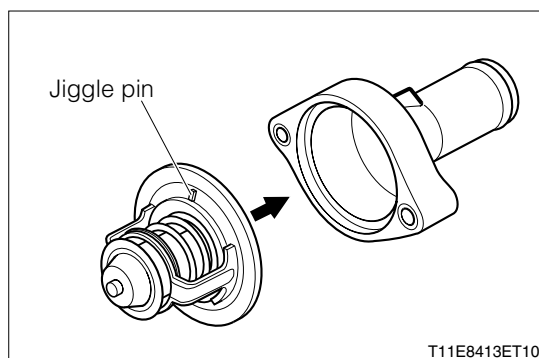
SPECIFIED VALUE: 8.5mm or more

**1-1-5 POINTS OF INSTALLATION****(1) Thermostat, water inlet**

1. Assemble the thermostat to the water inlet as shown in the right figure.

CAUTION

- Assemble the water inlet to the cylinder head so that the jiggle pin of the thermostat will come to the upper side.

**1-1-6 OPERATION AFTER INSTALLATION**

1. Fill coolant and perform the water leakage check.
Refer to Page B1-1.

2 WATER PUMP**2-1 REMOVAL AND INSTALLATION****Instrument**

Torque wrench

2-1-1 OPERATION BEFORE REMOVAL

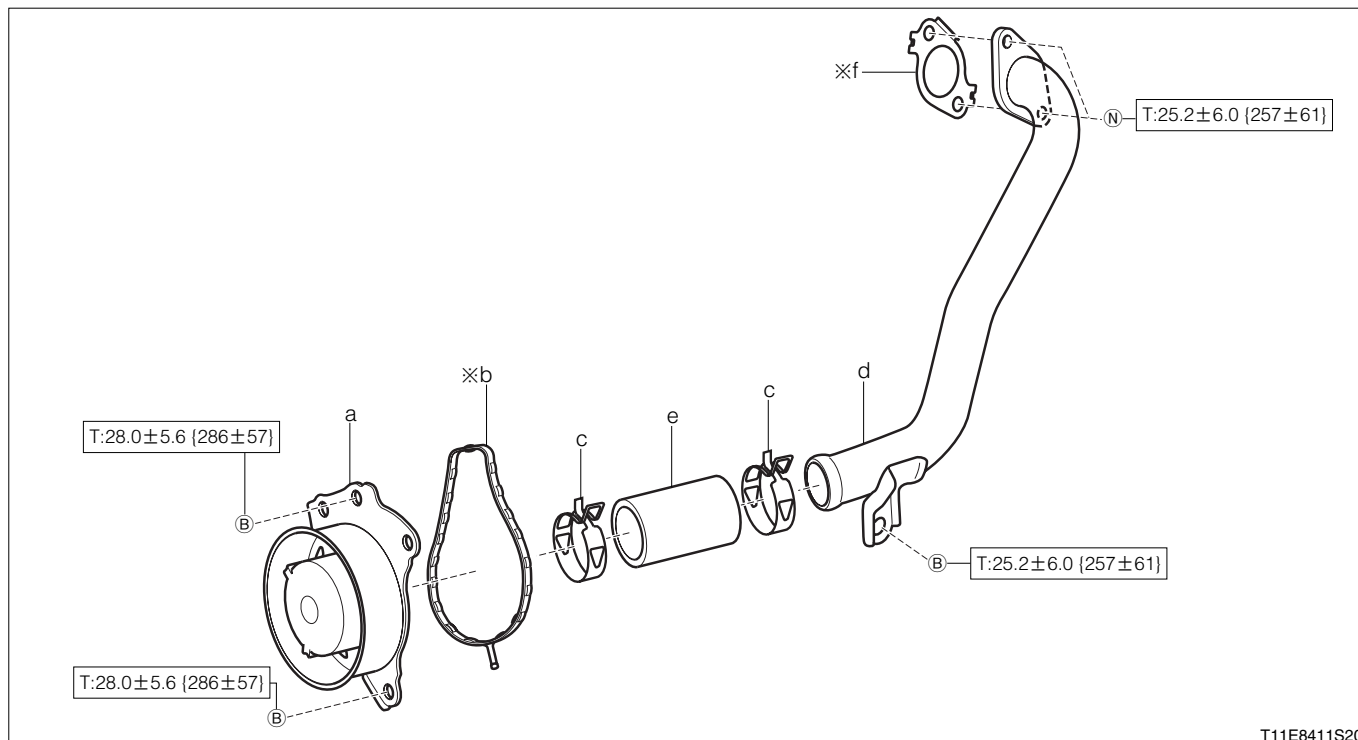
1. Remove the disc wheel. (Front)
2. Remove the engine under cover.
3. Drain the coolant.
4. Remove the exhaust manifold converter S/A. (Only when removing and installing the water bypass pipe)
Refer to Page B4-1.

5. Remove the V-ribbed belt

B6-3

2-1-2 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



T11E8411S20

※:Non - reusable parts

Unit:N·m(kgf·cm)

(2) Removal and installation procedures

- ▲ 1 a Pump Ay, water
- 2 b Gasket, water pump
- 3 c Clip
- ▲ 4 d Pipe, water by-pass
- 5 e Hose, water by-pass
- ▲ 6 f Gasket

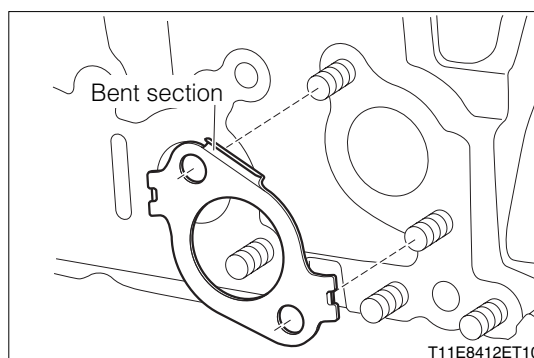
2-1-3 INSPECTION

1. Check if the pulley rotates smoothly by turning it with hand.
2. Check the blades of the pump Ay for deformation and wear.

2-1-4 POINTS OF INSTALLATION

(1) Gasket

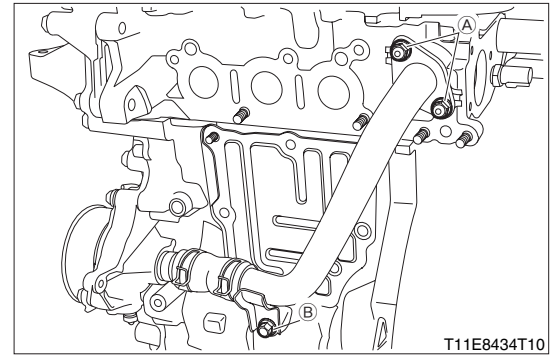
1. Install the gasket as shown in the right figure.



(2) Pipe, water by-pass

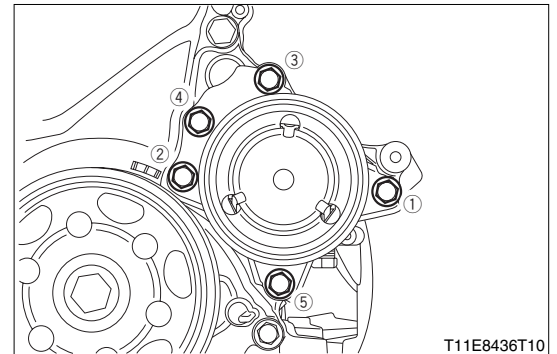
1. Temporarily tighten the bolt (B) to set the stay to the block.

2. After tightening the nut ①, connect the pipe by tightening the bolt ②.



(3) Pump Ay, water

1. Clean the installation section of the pump Ay. Then, install the water pump gasket.
2. Install the pump Ay by tightening the bolts in the sequence shown in the right figure.



2-1-5 OPERATION AFTER INSTALLATION

1. Install the V-ribbed belt and adjust the belt tension.
Refer to Page B1-4.
2. Install the exhaust manifold converter S/A. (Only when removing or installing the water bypass pipe)
Refer to Page B4-1.
3. Install the engine under cover.
4. Install the disc wheel. (Front)
5. Fill coolant and perform the water leakage check.
Refer to Page B1-1.

3 RADIATOR

3-1 REMOVAL AND INSTALLATION

3-1-1 ARTICLES TO BE PREPARED

Instrument

Torque wrench

3-1-2 OPERATION BEFORE REMOVAL

WARNING

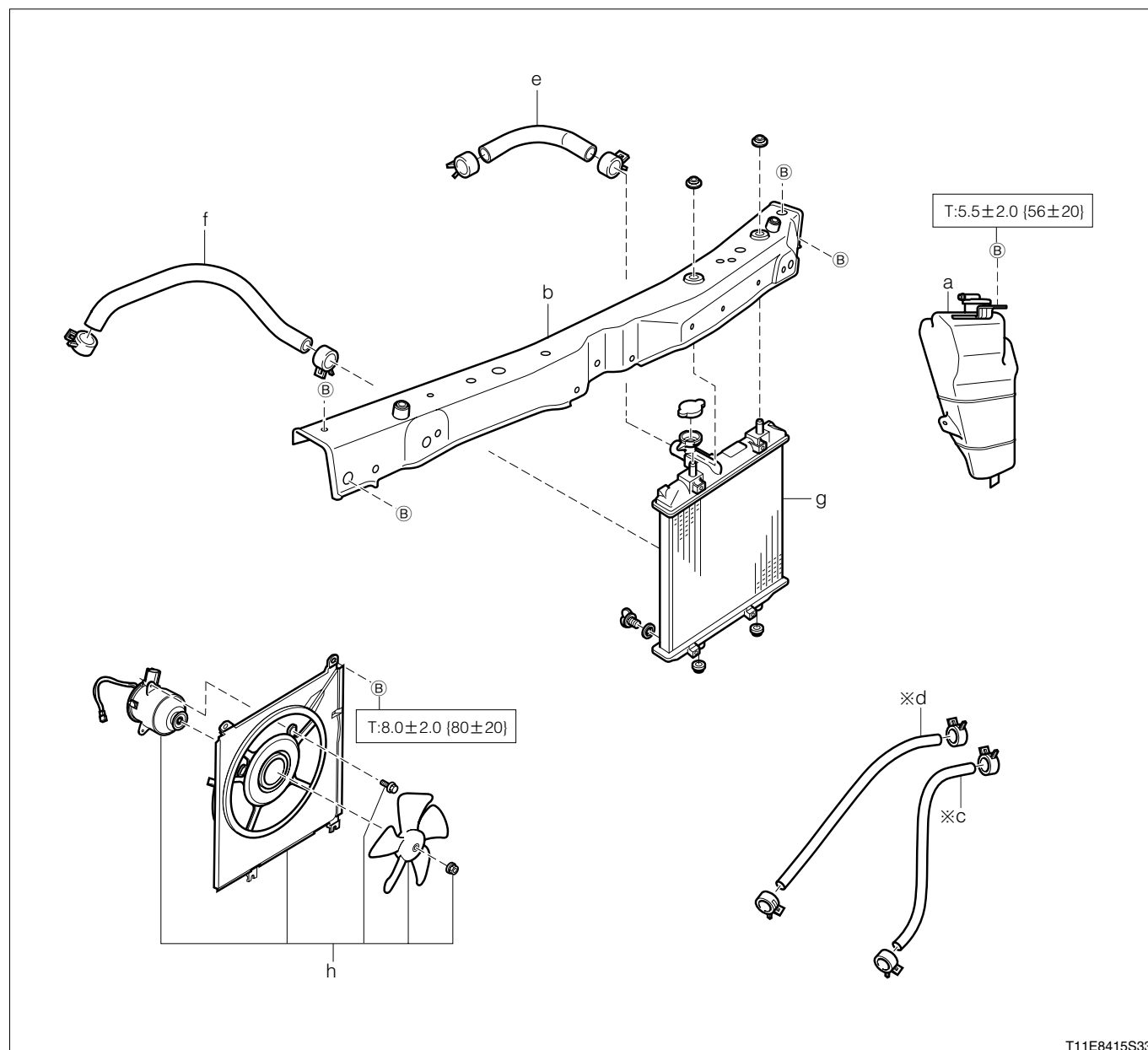
- Do not remove the radiator cap or drain plug when the coolant is hot.

1. Drain the coolant.
2. Disconnect the negative (-) terminal of the battery.
3. Remove the front bumper cover.
Refer to Page I2-1.

B6-5

3-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



※:Non - reusable parts

Unit:N·m{kgf·cm}

(2) Removal and installation procedures

1	a	Tank Ay, radiator reserve	▲ 6	f	Hose, radiator No.2
2	b	Radiator support upper	▼ ▲ 7	g	Radiator Ay
▲ 3	c	Hose, oil cooler inlet(A/T)	▲ 8	h	Fan Ay, w/motor
▲ 4	d	Hose, oil cooler outlet(A/T)			
▲ 5	e	Hose, radiator No.1			

3-1-4 POINTS OF REMOVAL

(1) Radiator Ay

1. Disconnect the connector for the fan Ay with motor.
2. Remove the radiator Ay together with the fan Ay with motor

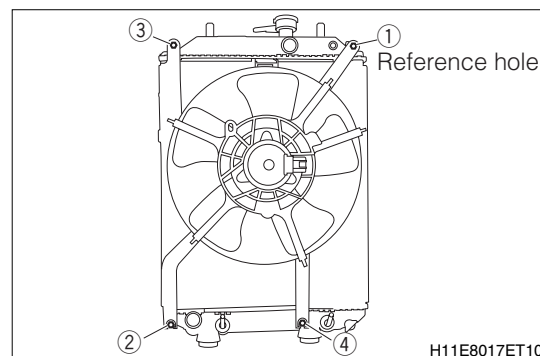
CAUTION

- Be careful not to scratch or damage the fin when removing the radiator Ay.

3-1-5 POINTS OF INSTALLATION

(1) Fan Ay, w/motor

1. Install the fan Ay to the radiator Ay.
2. Temporarily tighten the bolt to the reference hole 1.
3. Tighten the bolts ②→③→④→① to the specified torque.

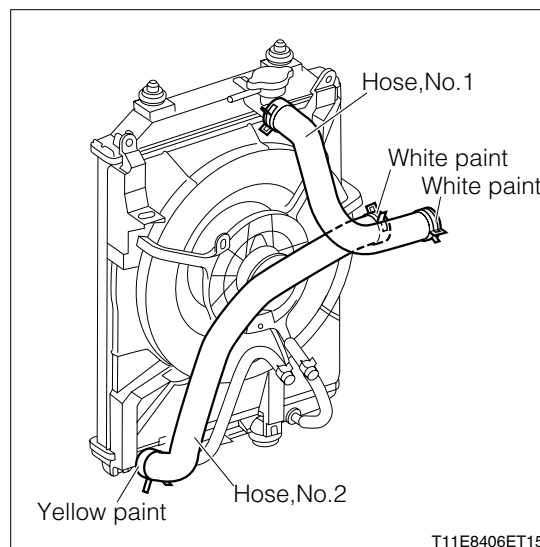


(2) Radiator hose No.1, radiator hose No.2 (Radiator side)

1. Connect the hose No.1 at the radiator side to the radiator Ay.
At this time, perform the installation in a such way that the tab of the clamp would face left of the vehicle.
2. Connect the hose No.2 at the radiator side to the radiator Ay so that its identification paint would face downward of the vehicle.
At this time, perform the installation in a such way that the tab of the clamp would face downward of the vehicle.

Identification mark

Hose, No.1 (Radiator side)	Not provided
Hose, No.2 (Radiator side)	Yellow



(3) Radiator Ay

1. Install the radiator Ay to the vehicle.

CAUTION

- Be very careful not to allow the vehicle harness to come in contact with the core (Including the tank staked section). (Water leakage will be caused by electro-corrosion.)
- Be careful not to scratch or damage the fin when removing the radiator Ay.

(4) Radiator hose No.1, radiator hose No.2 (Engine side)

1. Connect the hose No.1 at the engine side so that its identification paint would face upward of the vehicle.
At this time, perform the installation in a such way that the tab of the clamp would face upward of the vehicle.
2. Connect the hose No.2 at the engine side so that its identification paint would face upward of the vehicle.
At this time, perform the installation in such a way that the tab of the clamp would not interfere with the EGR valve and heater hose.

Identification mark

Hose, No.1 (Engine side)	White
Hose, No.2 (Engine side)	White

B6-7

3-1-6 OPERATION AFTER INSTALLATION

1. Install the front bumper cover.

Refer to Page I2-1.

2. Connect the negative (-) terminal of the battery.

3. Fill coolant and perform the water leakage check.

Refer to Page B1-1.

B7 FUEL SYSTEM

1KR-----	B7-1
FUEL SYSTEM-----	B7-1
INSTRUCTIONS FOR SERVICE OP- ERATION-----	B7-1
FUEL SUCTION TUBE-----	B7-1
REMOVAL AND INSTALLATION-----	B7-1
REPLACEMENT-----	B7-2
FUEL TANK-----	B7-3
REMOVAL AND INSTALLATION-----	B7-3
FUEL PUMP-----	B7-7
REMOVAL AND INSTALLATION-----	B7-7
INJECTOR-----	B7-9
REMOVAL AND INSTALLATION-----	B7-9

B7-1

■ 1KR

1 FUEL SYSTEM

1-1 INSTRUCTIONS FOR SERVICE OPERATION

WARNING

- Never allow a fire to be brought near the jobsite during the operation.
- Be sure to take a precautionary measure to prevent fuel from being splashed.

1-1-1 FUEL PRESSURE REMOVAL OPERATION

1. When you perform operations for the fuel system, remove the fuel pressure, following the procedure given below.

- (1) Turn OFF the IG switch.
- (2) Remove the fuel pump relay.
- (3) Start the engine. Keep on running the engine, until the engine stops naturally.
- (4) Turn OFF the IG switch. Install the fuel pump relay.

CAUTION

- Care must be exercised, for there is a residual pressure in the fuel line.

2 FUEL SUCTION TUBE

2-1 REMOVAL AND INSTALLATION

WARNING

- Never allow a fire to be brought near the jobsite during the operation.
- Be sure to take a precautionary measure to prevent fuel from being splashed.

2-1-1 POINTS OF REMOVAL

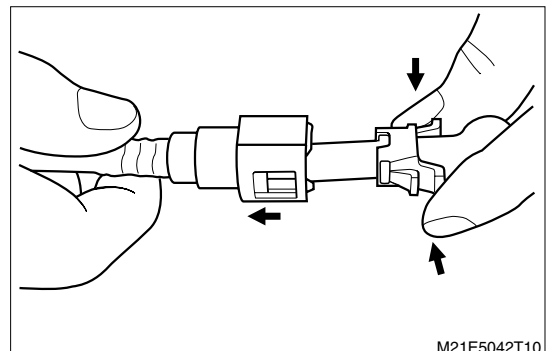
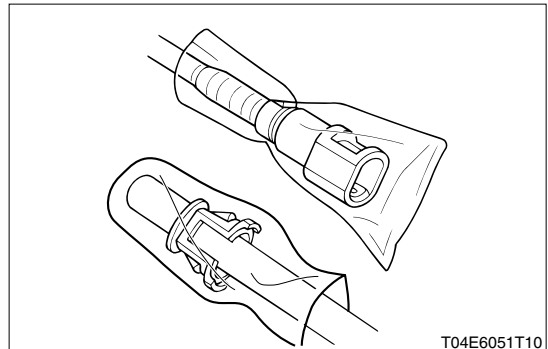
CAUTION

- When mud etc. gets to the tube, clean it prior to the removal.
- Make sure to perform the operation by hand without using any tools so that no scratch may be made to the tube etc.
- If there is a seizure between the connector and the tube, push and pull back with the retainer held by hand. Pull out the tube from the connector after they can move freely.
- Cover the disconnected tubes and connectors with a plastic bag etc. so that they may not be scratched or no foreign matter be admitted.

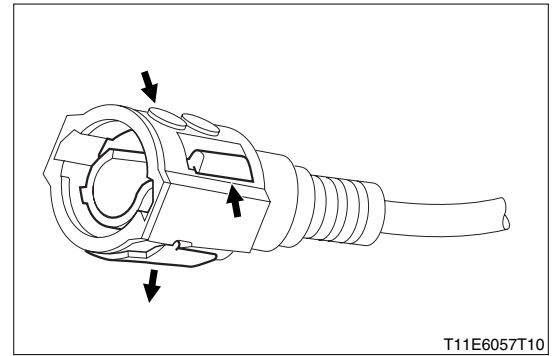
1. As for the fuel pump side, hold both ends of the retainer. Pull out the connector with the lock in an unlocked state.

CAUTION

- When the retainer is removed from the tube, be sure to replace it by a new retainer, for the retainer is a non-reusable part.



2. As for the body tube side, release the lock and pull out the connector by pressing down the retainer, while pushing the protruding section of the retainer.



2-1-2 POINTS OF INSTALLATION

1. With the connector aligned with the axis of the mate fuel pipe, push in the retainer until a clicking sound occurs.

If the connection is very stiff, apply a small quantity of new engine oil to the tip-end of the pipe.

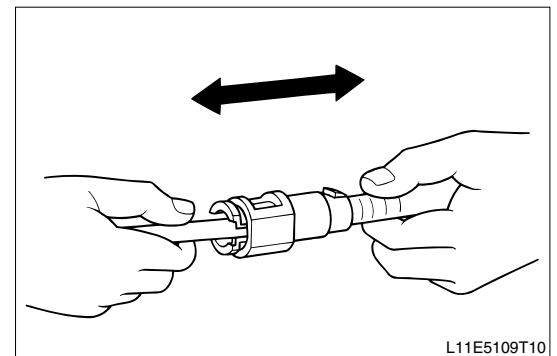
CAUTION

- Make sure that no scratch or foreign article gets to the pipe connecting section.

Retainer color

Fuel pump side	White
Body tube side	Orange

2. After completion of the assembly, pull the connector and the mate fuel pipe so as to ensure that they are connected securely.



2-1-3 OPERATION AFTER INSTALLATION

1. With the fuel pressure applied, check the fuel system for leakage.

2-2 REPLACEMENT

2-2-1 REPLACEMENT PROCEDURE

1. Remove the connector and the mate fuel pipe, following the aforesaid procedure. As for the fuel pump side, remove the retainer from the pump.
2. With the connector aligned with the axis of the corresponding fuel pipe, push in the connector securely, until you hear a sound of the retainer.

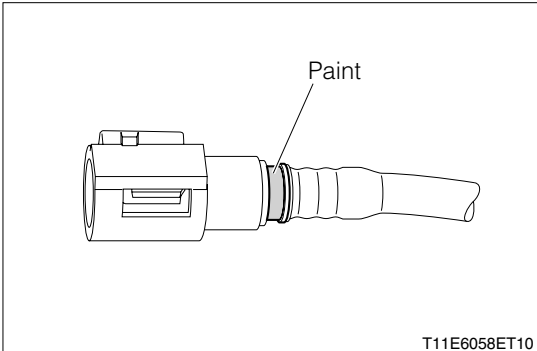
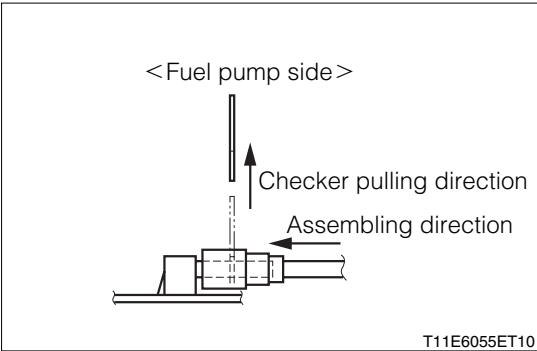
3. Pull out the checker in the vertical direction in relation to the assembled direction.

Checker color

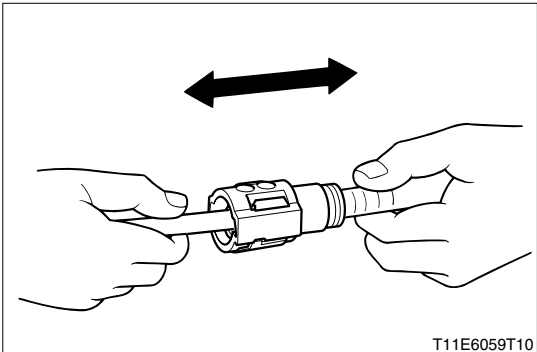
Fuel pump side	Red

Tube identification paint

2WD vehicle	Not provided



4. After completion of the assembly, pull the connector and the mate fuel pipe so as to ensure that they are connected securely.



2-2-2 OPERATION AFTER REPLACEMENT

1. With the fuel pressure applied, check the fuel system for leakage.

3 FUEL TANK

3-1 REMOVAL AND INSTALLATION

WARNING

- Never allow a fire to be brought near the jobsite during the operation.
- Be sure to take a precautionary measure to prevent fuel from being splashed.

3-1-1 ARTICLES TO BE PREPARED

Instrument

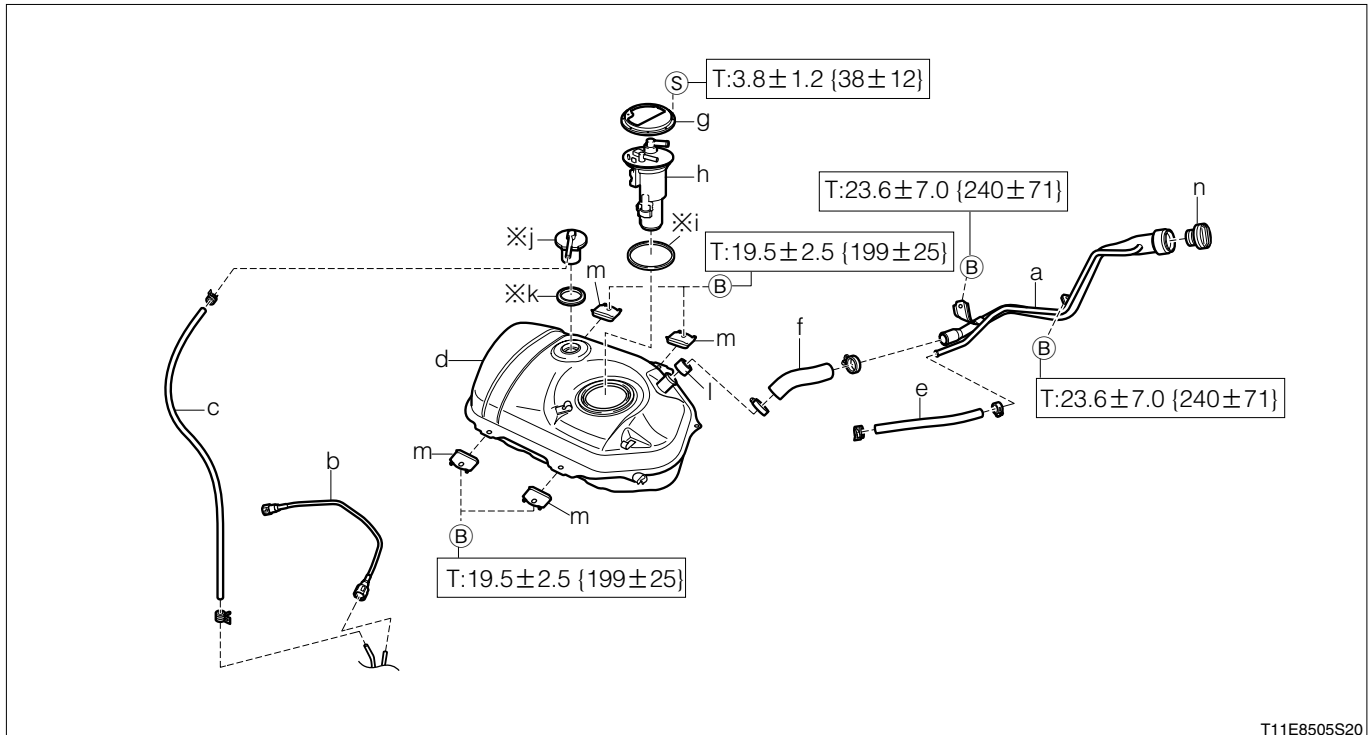
Torque wrench

3-1-2 OPERATION BEFORE REMOVAL

1. Remove the fuel pressure.
Refer to Page B7-1.
2. Disconnect the battery negative (-) terminal.
3. Remove the pressure inside the fuel tank by removing the fuel filler cap.

3-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



※:Non - reusable parts

Unit:N·m{kgf·cm}

T11E8505S20

(2) Removal and installation procedures

1 a Pipe S/A, fuel inlet, upper	▲ 10 c Hose, fuel (Valve Ay side)
▼ ▲ 2 b Tube S/A, fuel suction (Floor tube side)	▲ 11 g Bracket, fuel pump No.1
▲ 3 c Hose, fuel (Floor tube side)	▲ 12 h Pump Ay, fuel w/motor & bracket
▼ ▲ 4 d Tank S/A, fuel	▲ 13 i Gasket, fuel pump
▲ 5 e Hose, fuel tank breather (In l et side)	▼ ▲ 14 j Valve Ay, fuel cut off
▲ 6 f Hose, fuel tank to filler pipe (Inret side)	▼ ▲ 15 k Gasket, fuel tank breather tube
▲ 7 f Hose, fuel tank to filler pipe (Tank Ay side)	▲ 16 l Valve S/A, fuel tank filler check
▲ 8 e Hose, fuel tank breather (Pump Ay side)	17 m Reinforcement, fuel tank flange, No.1
▼ ▲ 9 b Tube S/A, fuel suction (Fuel pump side)	18 n Cap Ay, fuel tank

3-1-4 POINTS OF REMOVAL

(1) Tube S/A, fuel suction (Floor tube side)

1. Remove the fuel suction tube S/A.
Refer to Page B7-1.

(2) Tank S/A, fuel

1. Remove the fuel tank S/A attaching bolts.
2. Make a gap between the fuel tank S/A and the body by lowering the fuel tank S/A slightly. Proceed to remove the fuel pump connector and harness clamp.
3. Remove the fuel tank S/A.

(3) Tube S/A, fuel suction (Fuel pump side)

1. Remove the fuel suction tube S/A.
Refer to Page B7-1.

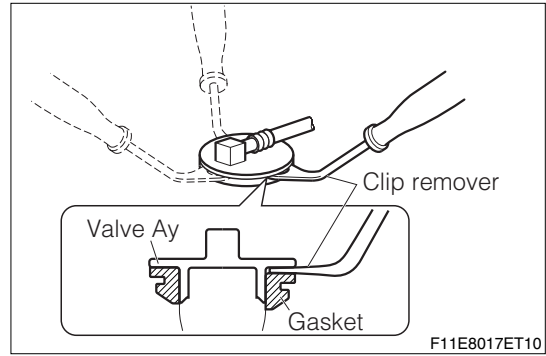
(4) Gasket, fuel tank breather tube, Valve Ay, fuel cut off

1. Insert the clip remover into between the valve Ay and the gasket, and gradually push up the valve Ay to remove the valve Ay.

CAUTION

- Since the fuel cut-off valve Ay is made of resin, forcible removal and installation may often break the valve Ay. Therefore, perform the operation carefully to assure the sealing performance.

2. Remove the gasket.



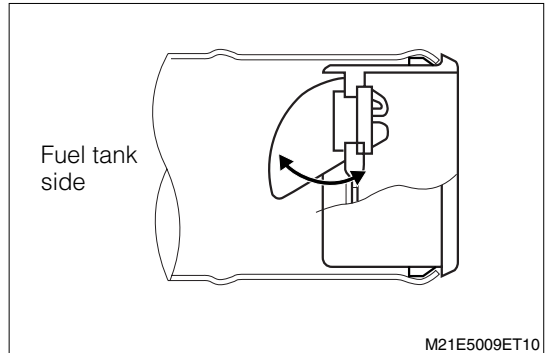
3-1-5 POINTS OF INSTALLATION

(1) Valve S/A, fuel tank check

1. Install the fuel tank filler check valve S/A in the direction shown in the right figure.

CAUTION

- The insertion should be made securely until the pawl rides over the spool.
- After completion of the assembly, ensure that the valve opens or closed smoothly.



(2) Gasket, fuel tank breather tube, Valve Ay, fuel cut off

1. Assemble the new gasket to the fuel tank Ay.
2. Insert the new valve Ay in such a way that the port faces to the direction indicated in the right figure.

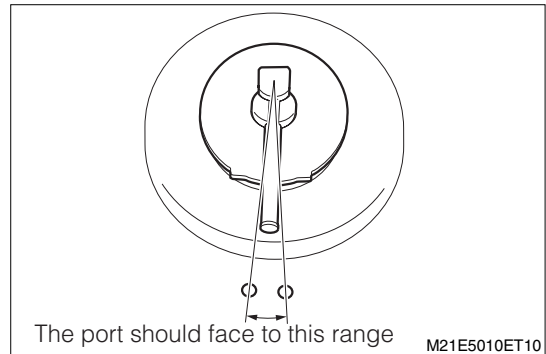
CAUTION

- Do not deform the fuel tank by applying an undue force during the press-fitting.
- Be sure to use the new valve Ay and gasket.

NOTE

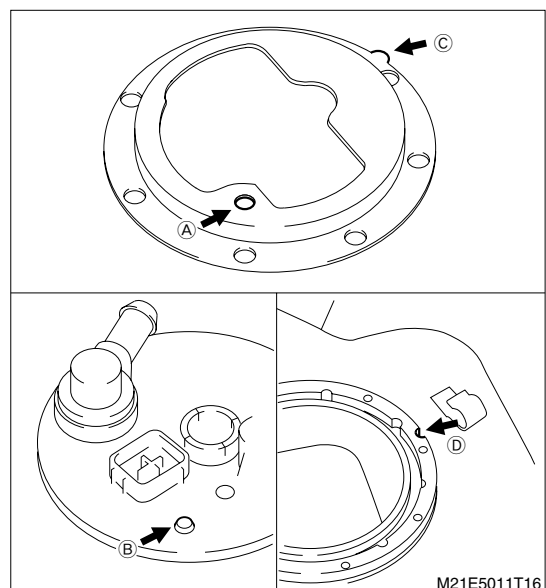
- It is permissible to use white kerosene as a lubricant. However, do not submerge the valve main body in it.

3. Ensure that the insertion has been made to such an extent that the flange section of the valve Ay firmly contacts the gasket without any gap.



(3) Gasket, fuel pump, pump Ay, fuel W/ motor&bracket, bracket, fuel pump, No.1

1. Install the fuel pump Ay.
 - (1) Install the fuel pump to the fuel tank with a new fuel pump gasket interposed.
 - (2) Install the fuel pump bracket with the fuel pump bracket hole (A) aligned with the fuel pump's projected point (B) and the fuel pump bracket and fuel tank mate marks (C and D) aligned with each other.
 - (3) Tighten the fuel pump bracket to the specified torque.

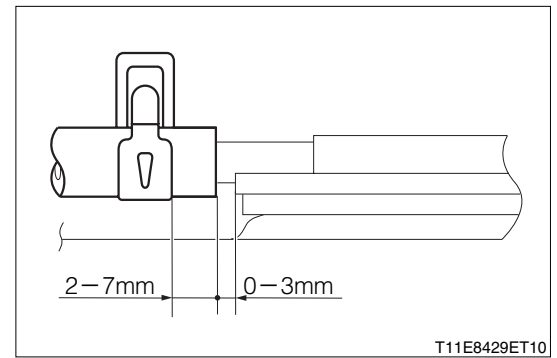


(4) Hose, fuel (Valve Ay side)

1. Install the hose in such a way that the side having no mark comes to the fuel cut off valve Ay side.

CAUTION

- Install the hose as indicated in the right figure.



(5) Tube S/A, fuel suction (Fuel pump side)

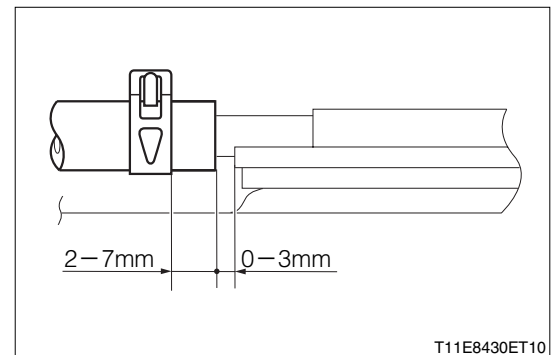
1. Install the tube S/A to the fuel pump Ay.
Refer to Page B7-1.

(6) Hose, fuel tank breather (Pump Ay side)

1. Install the hose to the fuel pump Ay.

CAUTION

- Install the hose as indicated in the right figure.



(7) Hose, fuel tank to filler pipe (Tank Ay side)

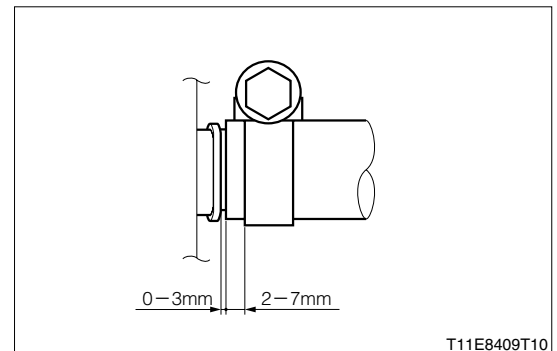
1. Connect the hose to the fuel tank Ay in such a way that the marking side of the hose faces upward.

CAUTION

- Install the hose, as indicated in the right figure.

Identification mark

2WD vehicle	Yellow

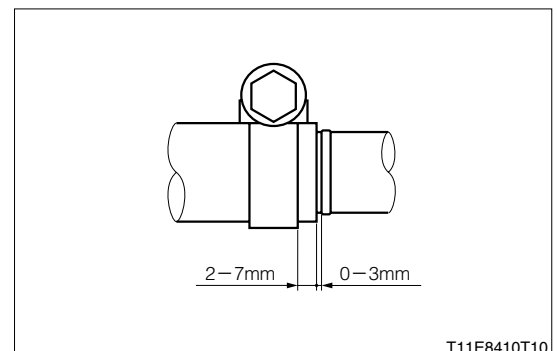


(8) Hose, fuel tank to filler pipe (Inret side)

1. Connect the hose at the inlet side to the fuel inlet upper pipe S/A.

CAUTION

- Install the hose, as indicated in the right figure.

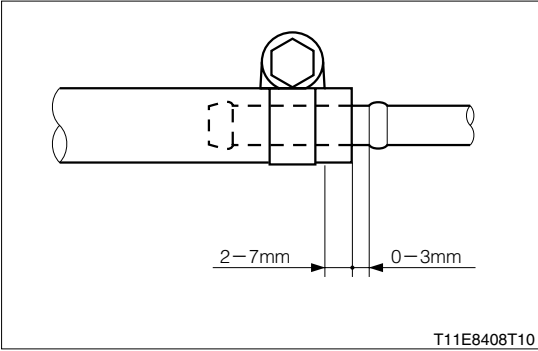


(9) Hose, Fuel tank breather (Inlet side)

- 1. Connect the hose at the inlet side to the fuel inlet upper pipe S/A.

CAUTION

- Install the hose, as indicated in the right figure.



(10) Tank S/A, fuel

- 1. Install the fuel tank S/A.
 - (1) With the fuel tank being brought toward the body side, install the fuel pump connector and harness clamps.
 - (2) Install the fuel tank. Tighten the bolts to the specified torque.

(11) Hose, fuel (Floor tube side)

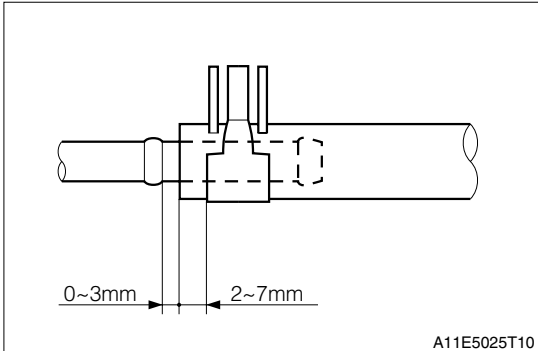
- 1. Install the hose in such a way that the side having a mark comes to the floor tube side.

CAUTION

- Install the hose, as indicated in the right figure.

Identification mark

2WD vehicle	Yellow



(12) Fuel suction tube S/A (Floor tube side)

- 1. Install the tube S/A at the floor tube side.
Refer to Page B7-1.

3-1-6 OPERATION AFTER INSTALLATION

- 1. Remove the cap Ay, fuel tank.
- 2. Install the battery negative (-) terminal.
- 3. Turn the IG switch to the ON position.
- 4. Check the fuel system for leakage with the fuel pressure applied.

4 FUEL PUMP

4-1 REMOVAL AND INSTALLATION

WARNING

- Never allow a fire to be brought near the jobsite during the operation.
- Be sure to take a precautionary measure to prevent fuel from being splashed.

4-1-1 ARTICLES TO BE PREPARED

Lubricant, adhesive, others

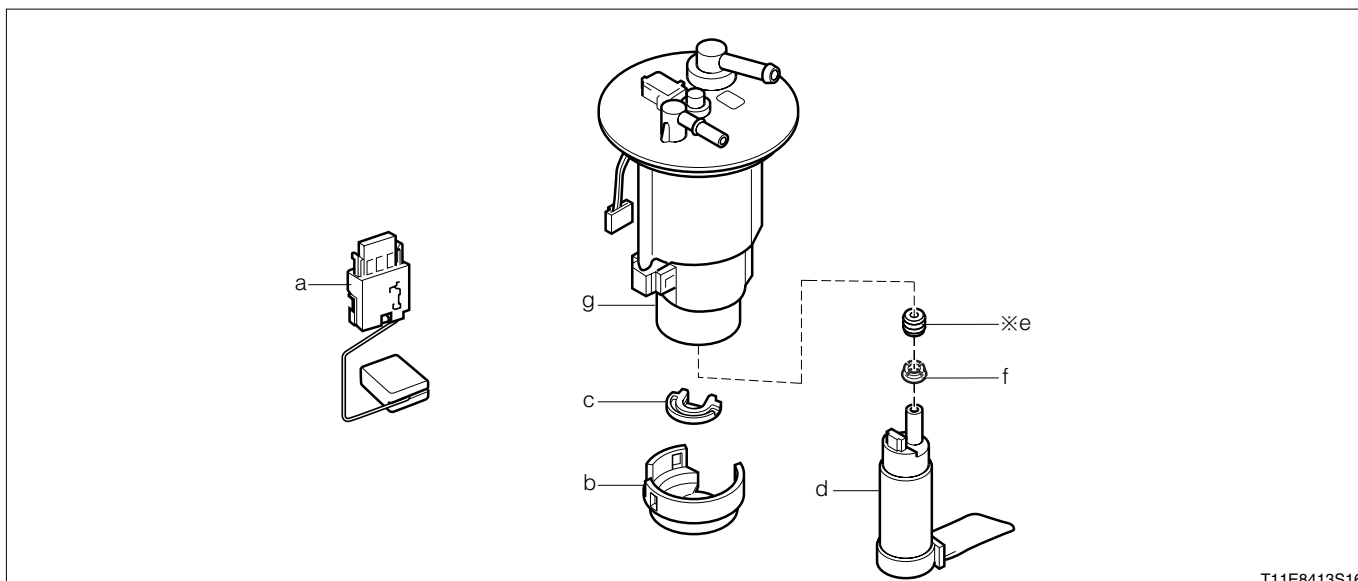
Butyl tape

4-1-2 OPERATION BEFORE REMOVAL

- 1. Remove the carpet Ay, floor front, board, rear floor, front Rh.
Refer to Page I2-47.
- 2. Remove the cover , rear floor service hole. Then, disconnect the connector.

4-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



※:Non-reusable parts

(2) Removal and installation procedures

▼	1	a	Gage Ay, fuel sender	6	f	Spacer
	2	b	Bracket	7	g	Filter Ay, fuel W/flange
	3	c	Cushion			
▼ ▲	4	d	Pump Ay, fuel W/filter			
	5	e	Grommet, fuel			

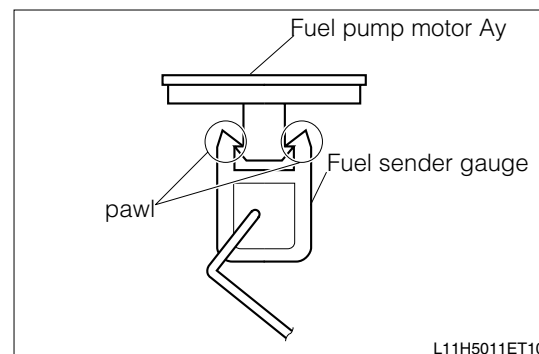
NOTE

- As for the five parts of b bracket, c cushion, e grommet, f spacer and g filter Ay, fuel, W/flange, they are available as the fuel filter kit.

4-1-4 POINTS OF REMOVAL

(1) Fuel sender gage

- Remove the fuel sender gauge Ay, while opening the two claw sections of the gauge with your finger and pushing them downward.



(2) Pump Ay, fuel W/filter

- Disconnect the connector of the pump section.
- Remove the fuel pump Ay W/filter.

B7-9

4-1-5 POINTS OF INSTALLATION

(1) Pump Ay, fuel W/filter

1. Install the spacer and fuel grommet to the pump Ay.

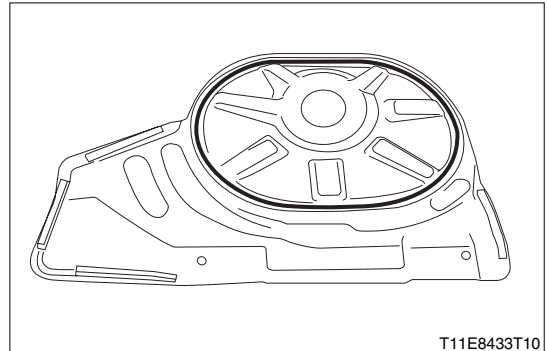
CAUTION

- Never reuse the grommet, fuel

2. Install the pump Ay to the fuel filter Ay with flange.
3. Install the connector of the pump section.
4. Install the fuel pump Ay with motor & bracket to the fuel tank Ay.
Refer to Page B7-5.

4-1-6 OPERATION AFTER INSTALLATION

1. Start the engine. Visually check whether there is oil leaking from the fuel pump, hoses and pipes.
2. Affix a butyl tape to the position shown in the right figure.
3. Connect the connector and install the rear floor service hole cover.
4. Install the carpet Ay, floor front, board, rear floor, front Rh.
Refer to Page I2-47.



5 INJECTOR

WARNING

- Never allow a fire to be brought near the jobsite during the operation.
- Be sure to take a precautionary measure to prevent fuel from being splashed.

5-1 REMOVAL AND INSTALLATION

5-1-1 ARTICLES TO BE PREPARED

Instrument

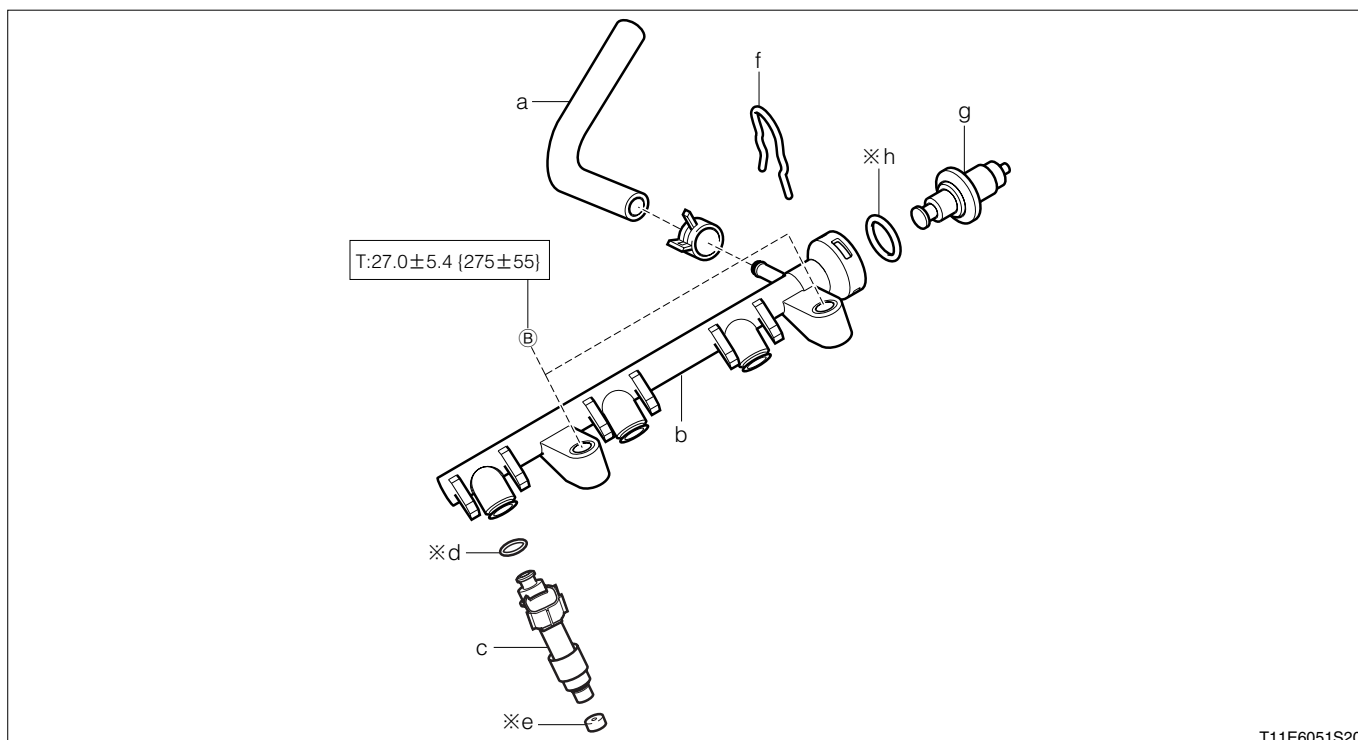
Torque wrench

5-1-2 OPERATION BEFORE REMOVAL

1. Remove the fuel pressure.
Refer to Page B7-1.
2. Disconnect the battery negative (-) terminal.
3. Remove the case, air cleaner.
Refer to Page B3-1.

5-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



※:Non-reusable parts

Unit:N·m{kgf·cm}

(2) Removal and installation procedures

▲ 1	a Hose, fuel	6	f Holder, fuel pressure regulator
▲ 2	b Pipe, fuel delivery	7	g Damper Ay, fuel pressure pulsation
▲ 3	c Injector Ay	8	h Ring, O
4	d Ring, O		
5	e Insulator, injector vibration		

5-1-4 INSPECTION

1. Perform the unit inspection of the injector.
Refer to Page B8-30.

5-1-5 POINTS OF INSTALLATION

(1) Injector, Pipe Ay, fuel delivery

1. With the connector of the injector directed toward the external direction of the cylinder head, install the injector, fuel delivery pipe to the cylinder head.

CAUTION

- When installing the delivery pipe, care must be exercised to ensure that no damage is made to the O-rings and grommets.

2. After completion of the assembly, turn the injector by hand. Ensure that the injector turns smoothly.

CAUTION

- After the confirmation, ensure that the connector of the injector has not been assembled in a turned state (Not inclined).

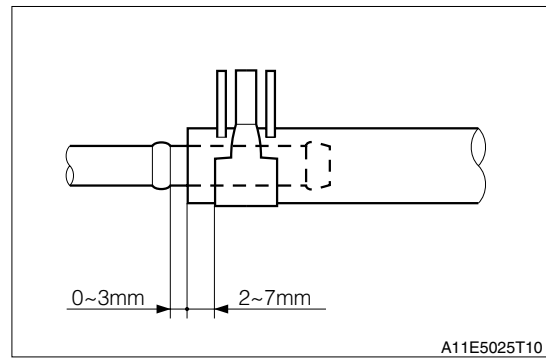
B7-11

(2) Hose, fuel

1. Connect the hose to the fuel delivery pipe.

CAUTION

- Install the hose, as indicated in the right figure.



5-1-6 OPERATION AFTER INSTALLATION

1. Install the case, air cleaner.

Refer to Page B3-1.

2. Install the battery negative (-) terminal.
3. Turn the IG switch to the ON position.
4. Check the fuel system for leakage with the fuel pressure applied.

B8 ENGINE CONTROL SYSTEM

1KR -----	B8—1
ENGINE CONTROL COMPUTER -----	B8—1
REMOVAL AND INSTALLATION-----	B8—1
ENGINE REVOLUTION SENSOR-----	B8—2
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CAMSHAFT POSITION SENSOR -----	B8—3
REMOVAL AND INSTALLATION-----	B8—3
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ENGINE WATER TEMPERATURE SENSOR -----	B8—5
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B8-1

1KR

1 ENGINE CONTROL COMPUTER

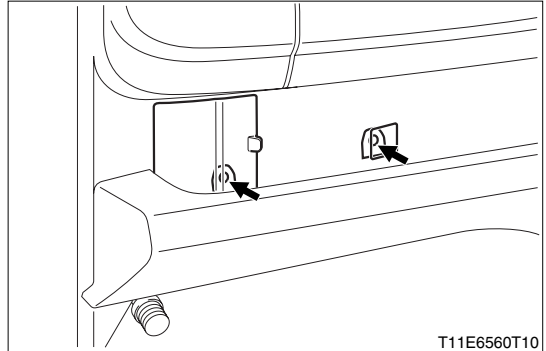
1-1 REMOVAL AND INSTALLATION

1-1-1 OPERATION BEFORE REMOVAL

1. Disconnect the negative (-) terminal of the battery.
2. Remove the No.1 instrument panel under cover.
3. Remove the fuse box opening cover and lower instrument cover.

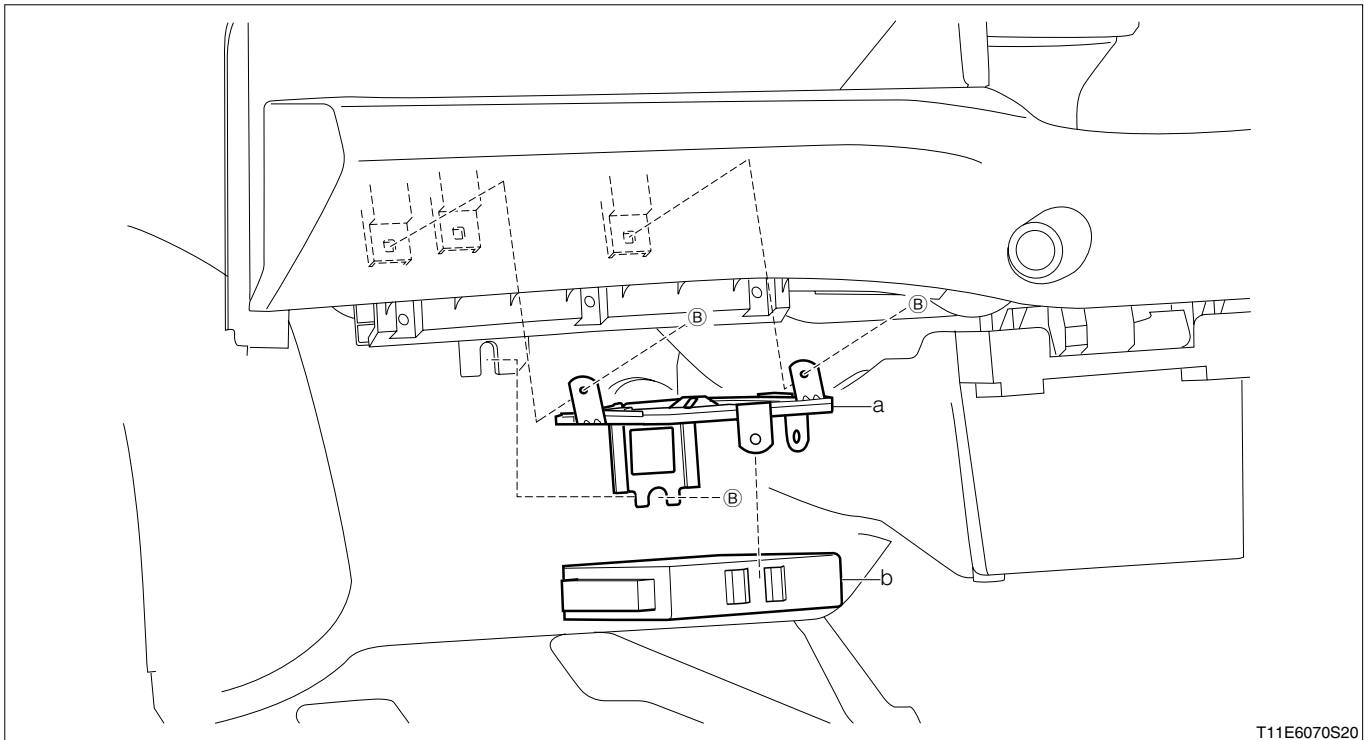
NOTE

- There are bolts fixing the EFI ECU in the back of the removed cover.
4. Remove the connector of the fuel injection computer Ay.



1-1-2 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



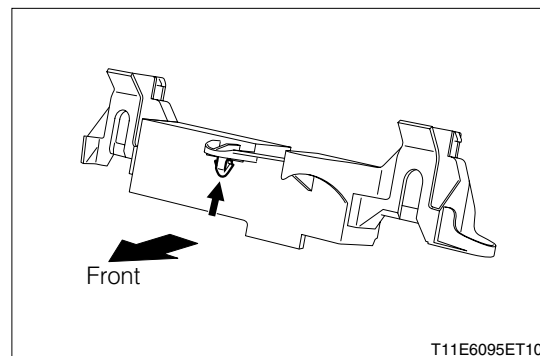
(2) Removal and installation procedures

- 1 a Bracket, computer
- ▲ 2 b Computer Ay, fuel injection

1-1-3 POINTS OF INSTALLATION

(1) Computer Ay, fuel injection

1. Decide the installation position of the fuel injection computer Ay with the temporary maintaining clip on the vehicle side and install the bolts.



1-1-4 OPERATION AFTER INSTALLATION

1. Connect the connector to the fuel injection computer Ay.
2. Install the fuse box opening cover and lower instrument cover.
3. Install the No.1 instrument panel under cover.
4. Connect the negative (-) terminal of the battery.

2 ENGINE REVOLUTION SENSOR

2-1 REMOVAL AND INSTALLATION

2-1-1 ARTICLES TO BE PREPARED

Instrument

Torque wrench

Lubricant, adhesive, others

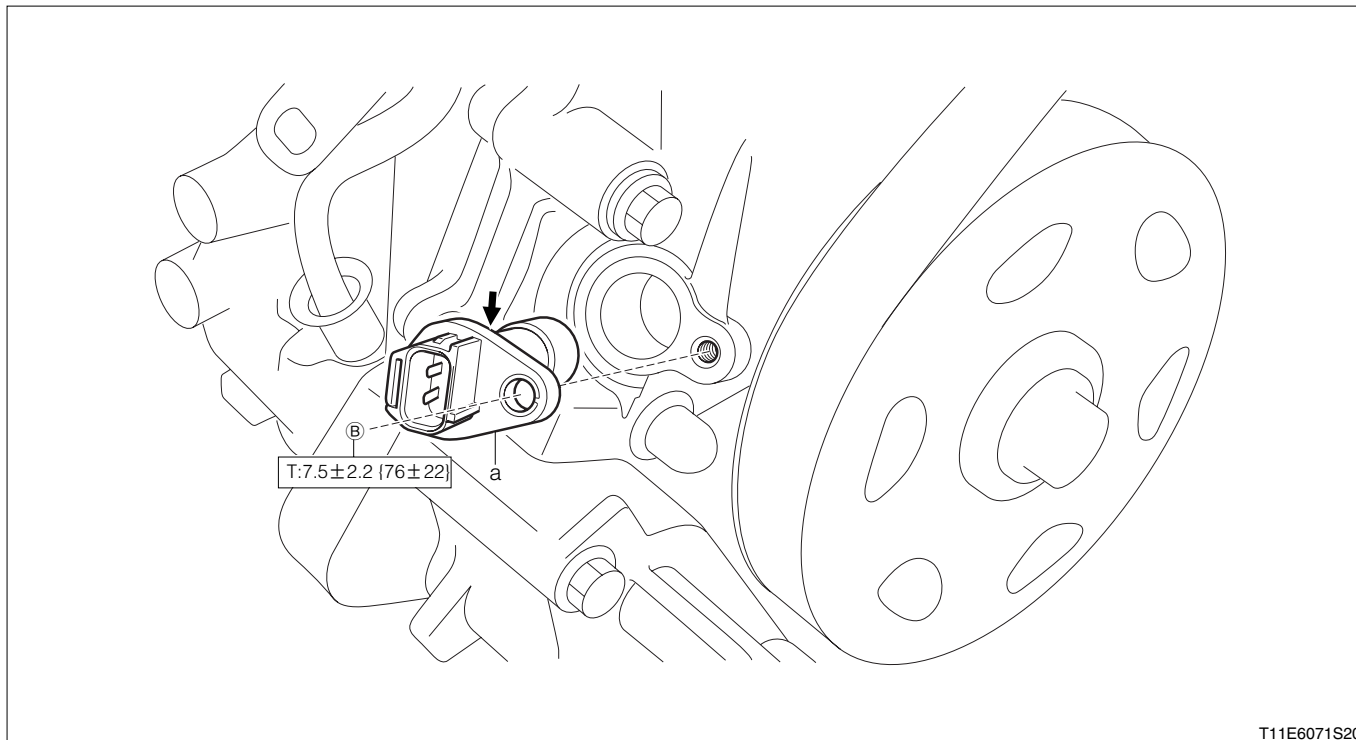
Engine oil

2-1-2 OPERATION BEFORE REMOVAL

1. Disconnect the negative (-) terminal of the battery.
2. Remove the connector of the crank position sensor Ay.

2-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



→: Engine oil

Unit: N · m {kgf · cm}

B8-3

(2) Removeal and installation procedures

- ▲ 1 a Sensor Ay, crank position

2-1-4 POINTS OF INSTALLATION

(1) Sensor Ay, crank position

1. Apply engine oil to the O-ring of the sensor Ay.

LUBRICANT: Engine oil

2-1-5 OPERATION AFTER INSTALLATION

1. Connect the connector of the crank position sensor Ay.
2. Connect the negative (-) terminal of the battery.

3 CAMSHAFT POSITION SENSOR

3-1 REMOVAL AND INSTALLATION

3-1-1 ARTICLES TO BE PREPARED

Instrument

Torque wrench

Lubricant,adhesive,others

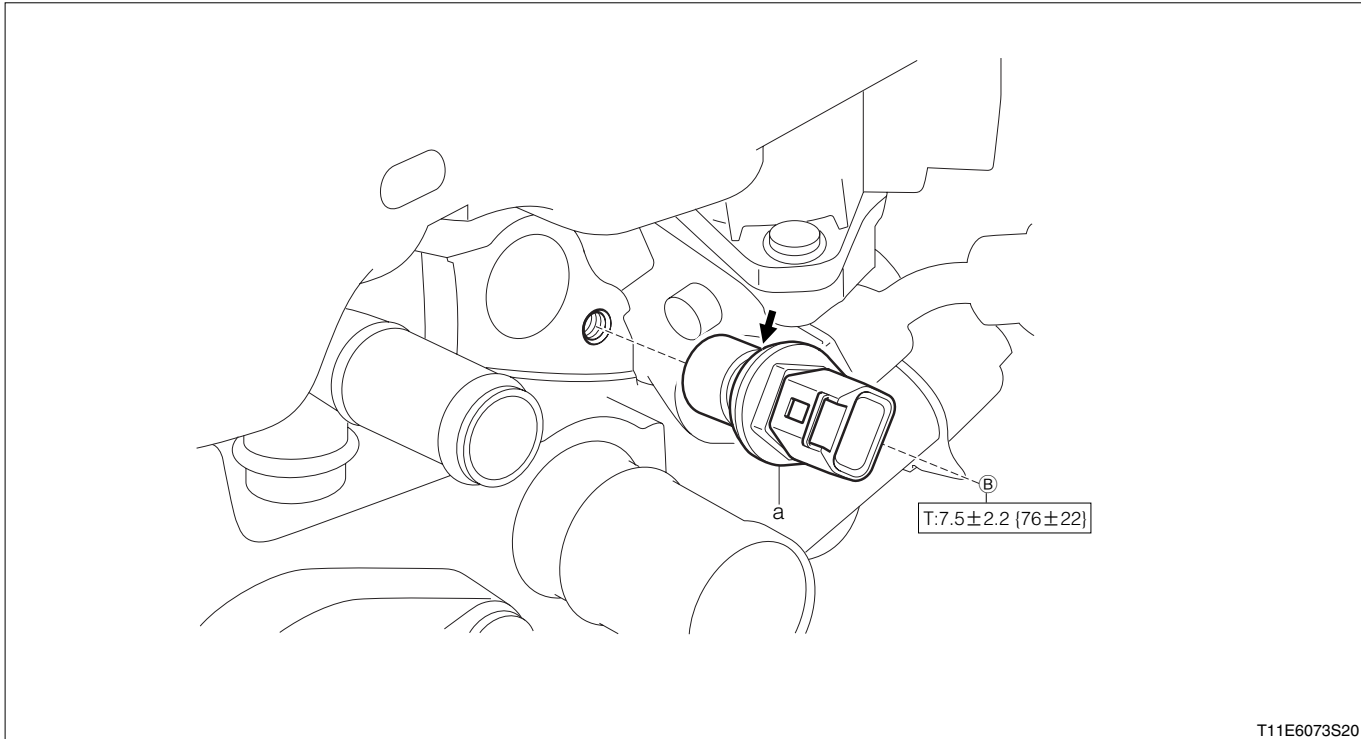
Engine oil

3-1-2 OPERATION BEFORE REMOVAL

1. Disconnect the negative (-) terminal of the battery.
2. Remove the connector of the cam position sensor Ay.

3-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



T11E6073S20

➡:Engine oil

Unit: N·m{kgf·cm}

(2) Removeal and installation procedures

- ▲ 1 a Sensor Ay, cam position

3-1-4 POINTS OF INSTALLATION

(1) Sensor Ay, cam position

1. Apply engine oil to the O-ring of the sensor Ay.

LUBRICANT: Engine oil

3-1-5 OPERATION AFTER INSTALLATION

1. Connect the connector of the cam position sensor Ay.
2. Connect the negative (-) terminal of the battery.

4 KNOCK SENSOR

4-1 REMOVAL AND INSTALLATION

4-1-1 ARTICLES TO BE PREPARED

Instrument

Torque wrench

4-1-2 OPERATION BEFORE REMOVAL

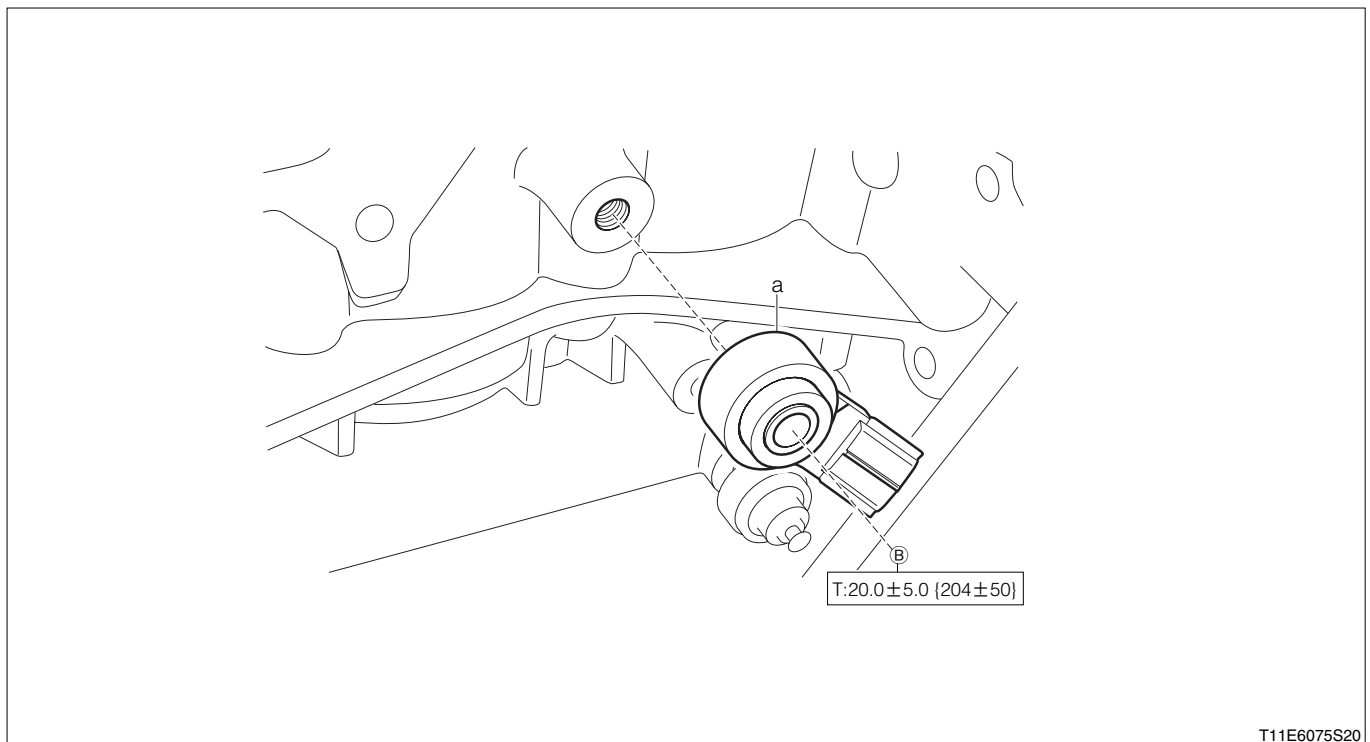
1. Disconnect the negative (-) terminal of the battery.
2. Remove the intake manifold Ay.

Refer to Page B3-4.

3. Remove the knock control sensor.

4-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



Unit: N·m {kgf·cm}

T11E6075S20

(2) Removal and installation procedures

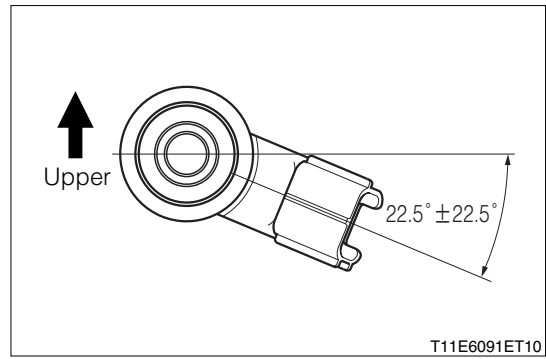
- ▲ 1 a Sensor, knock control

B8-5

4-1-4 POINTS OF INSTALLATION

(1) Sensor, knock control

1. When installing the sensor to the engine Ay, install within the position shown in the figure.



4-1-5 OPERATION AFTER INSTALLATION

1. Connect the connector of the knock control sensor.
2. Install the intake manifold Ay.
Refer to Page B3-4.

3. Connect the negative (-) terminal of the battery.

5 ENGINE WATER TEMPERATURE SENSOR

5-1 REMOVAL AND INSTALLATION

5-1-1 ARTICLES TO BE PREPARED

Instrument

Torque wrench

5-1-2 OPERATION BEFORE REMOVAL

1. Disconnect the negative (-) terminal of the battery.
2. Drain the cooling water.

NOTE

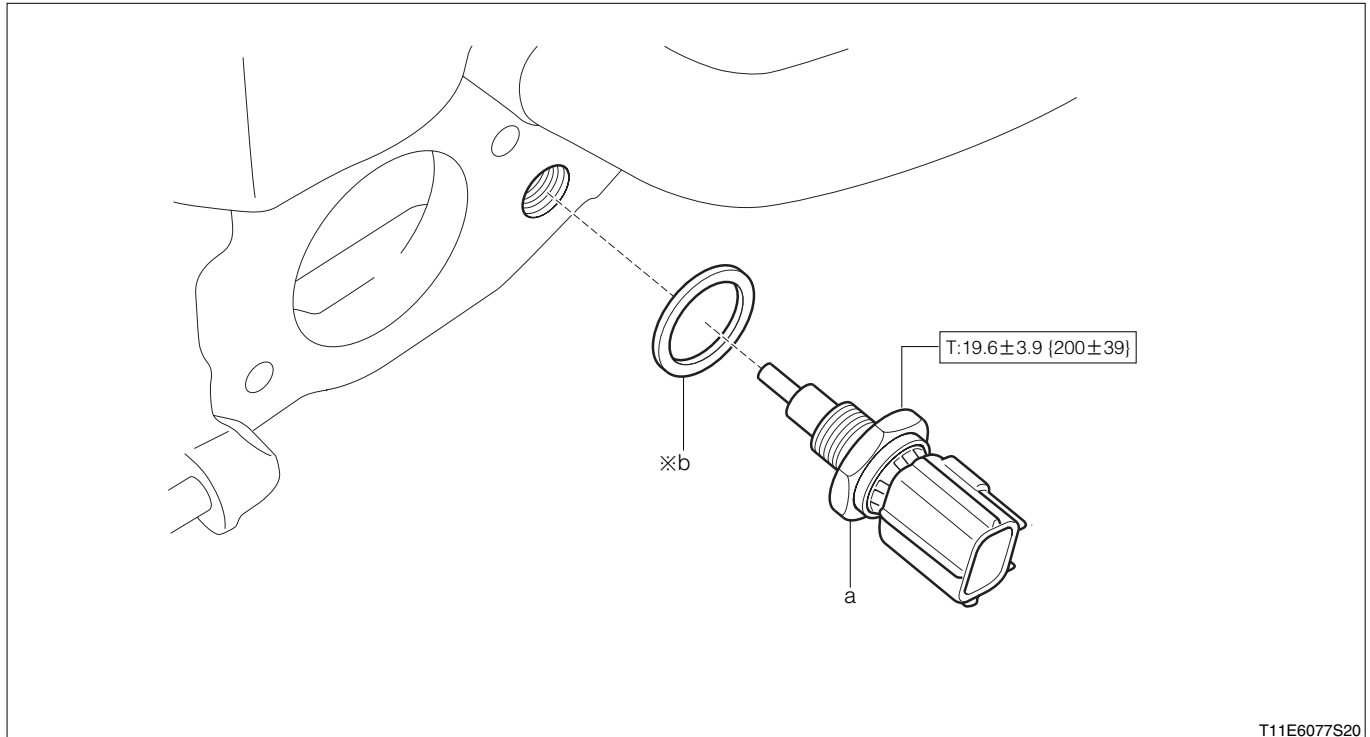
- Drain some amount of coolant from the water inlet so that it would not leak.

3. Remove the No.1 radiator hose (Engine side).
4. Remove water inlet.
Refer to Page B6-4.

5. Remove the connector of the water temperature sensor.

5-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



※: Non-reusable parts

Unit: N·m {kgf·cm}

(2) Removal and installation procedures

- 1 a Sensor, water temperature
- 2 b Gasket

5-1-4 OPERATION AFTER INSTALLATION

1. Connect the connector of the water temperature sensor.
2. Install the No.1 radiator hose (Engine side).
3. Install the water inlet.

Refer to Page B6-4.

4. Fill cooling water.
5. Connect the negative (-) terminal of the battery.
6. Start the engine and perform air-bleeding of the coolant.
7. Stop the engine and check for coolant leakage.

6 OIL CONTROL VALVE

6-1 REMOVAL AND INSTALLATION

6-1-1 ARTICLES TO BE PREPARED

Instrument

Torque wrench

Lubricant, adhesive, others

Engine oil

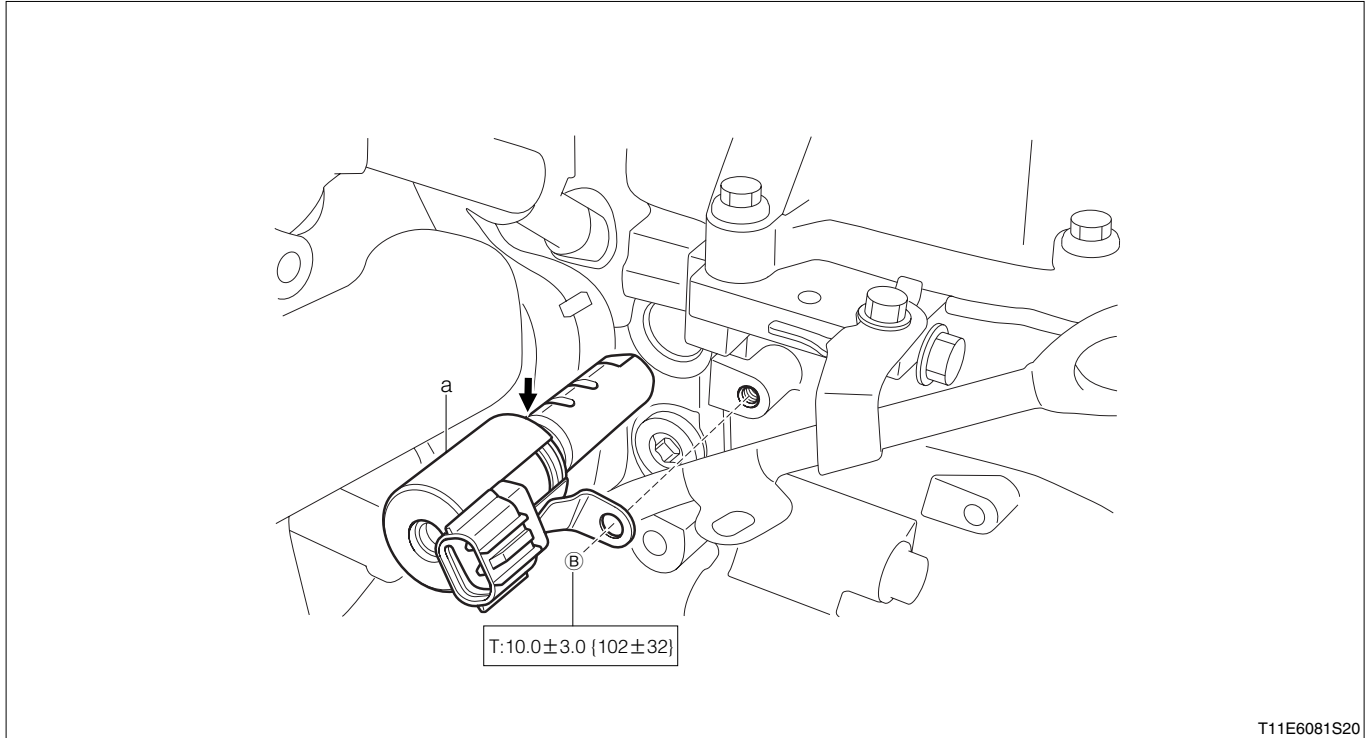
B8-7

6-1-2 OPERATION BEFORE REMOVAL

1. Disconnect the negative (-) terminal of the battery.
2. Remove the air cleaner case S/A.
Refer to Page B3-2.
3. Remove the ventilation hose Ay.
4. Remove the connector of the cam timing oil control valve Ay.

6-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



(2) Removal and installation procedures

- ▲ 1 a Cam timing oil control valve Ay

6-1-4 POINTS OF INSTALLATION

(1) Cam timing oil control valve Ay

1. Apply engine oil to the O-ring of the valve Ay.
LUBRICANT: Engine oil

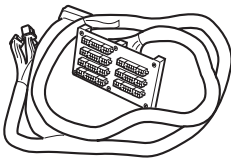
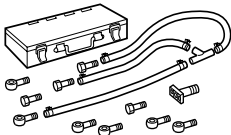
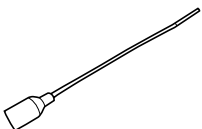
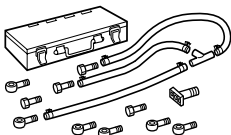
6-1-5 OPERATION AFTER INSTALLATION

1. Connect the connector of the cam timing oil control valve Ay.
2. Install the ventilation hose Ay.
3. Install the air cleaner case S/A.
Refer to Page B3-2.
4. Connect the negative (-) terminal of the battery.

7 ENGINE CONTROL SYSTEM

7-1 ARTICLES TO BE PREPARED

SST

Shape	Part No.	Part name
	09842-97209-000	Sub-harness,EFI computer check
	09268-41047-000 (09268-41045-000)	Tool set,injection measuring
	09842-30070-000	Wire,EFI inspection
	09991-87402-000	Wire,tacho-pulse pick up
	09991-87403-000	Wire,diagnosis check
	09268-87701-000	Gauge,EFI fuel pressure
	09268-87702-000	Tool set,measuring

Instrument

Tachometer, Timing light, Compression gauge, Sound scope, Electrical tester, Oscillo scope

WARNING

- If the vehicle is driven with the SST (EFI computer check sub harness, etc.) connected there is a possibility of causing malfunction and may be very dangerous. Therefore, remove it without fail before running.

7-2 HANDLING INSTRUCTIONS OF CONTROL SYSTEM

7-2-1 INSTRUCTIONS ON USE OF THIS SERVICE MANUAL

1. This service manual has been compiled in such a way that the manual may be used both in regions where the type certification is implemented based on the EU exhaust emission approval, and other regions.
2. Hence, with regard to the assignment, reading, erasing of diagnostic trouble codes and those steps of checks, repairs and confirmation, the service manual contains the procedures for both cases: One is a procedure that uses the diagnosis tester (DS-21/DS-II) or the OBD II generic scan tool, and the other is a procedure that does not use this tester or tool.
Therefore, the following instructions given below must be observed.
3. About Use of diagnosis tester (DS-21/DS-II) or OBD II Generic Scan Tool
 - (1) Regions where type certification is implemented based on EC exhaust emission approval: Make sure to use the diagnosis tester (DS-21/DS-II) or the OBD II generic scan tool.
 - (2) Other regions: You may use or not use the diagnosis tester (DS-21/DS-II) or the OBD II generic scan tool. You may perform the operation, employing whichever method that will be easier to you.
4. Instructions to be followed concerning Diagnosis Trouble Codes
Diagnosis trouble codes, such as P0105/31 (Four-digit code/two-digit code) are posted additionally.
 - (1) Regions where type certification is implemented based on EC exhaust emission approval
Make sure to use only four-digit trouble codes (E.G.P0105) whose have been assigned according to the ISO regulations.
 - (2) Other regions:
You may perform the operation using the four-digit code, employing the diagnosis tester (DS-21/DS-II) or the OBD II generic scan tool. Or you may perform the operation using the two-digit codes (E.G.31), without the use of the tester or tool. You may perform the operation, employing whichever method that will be easier to you.
Or you may perform the operation using the two-digit codes (E.G.31), without the use of the tester or tool.
You may perform the operation, employing whichever method that will be easier to you.

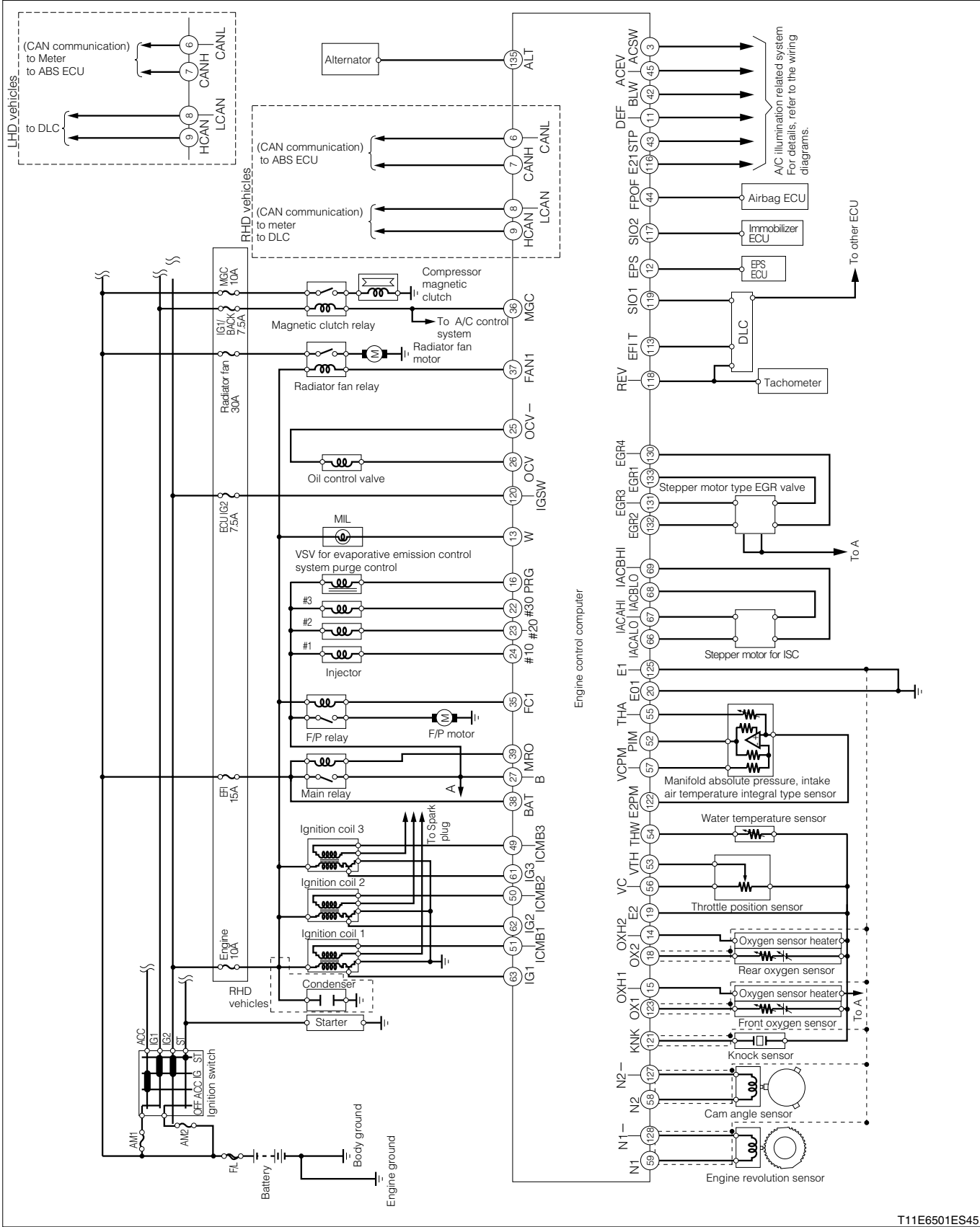
NOTE

- The OBD II generic scan tool means a scan tool complying with the ISO 14230 (KWP2000) format.
- In cases where the OBD II generic scan tool is employed, not all diagnostic trouble codes (Four-digit codes) can be read out. It should be noted that only those diagnostic trouble codes in which "zero" follows after "P", for example, P0XXX, can be read out.
- The accuracy of the two-digit codes in diagnosing malfunctioning components is slightly inferior to that of the four-digit codes.
- Hereinafter, those regions where the type certification is implemented based on the EU exhaust emission approval, is referred to as the "EU specifications".

7-2-2 PRECAUTIONARY MEASURES DURING TROUBLE-SHOOTING

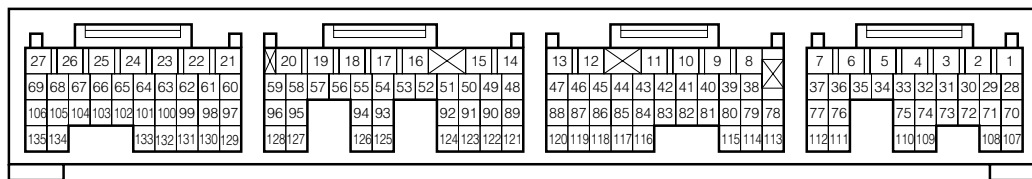
1. Before the diagnosis information memorized in the EFI ECU memory is confirmed, never disconnect the connector from the EFI ECU, the battery negative (-) terminal, the EFI ECU earth wire from the engine, or the main fuse.
2. The diagnosis information memorized in the EFI ECU memory can be erased by using the diagnosis tester (DS-21/DS-II) or the OBD-II generic scan tool in the same way as the check. Therefore, before using the tester, read its instruction manual so as to understand the functions furnished and how to use it.
3. Priority in trouble-shooting
 - (1) If the priority in trouble-shooting for a number of diagnostic trouble codes is given in the concerned DTC flow chart, make sure to follow the priority.
 - (2) If not given, follow the priority given below and perform the trouble-shooting for each diagnostic trouble code (DTC).
 - (1) DTC other than DTC P0171/25, DTC P0172/26 (Too lean/too rich in fuel system), and DTC 0300/17, DTC P0301-P0303/17 (Misfire found)
 - (2) DTC P0171/25, DTC P0172/26 (Too lean/too rich in fuel system)
 - (3) DTC 0300/17, DTC P0301-P0304/17 (Misfire found)

7-3 SYSTEM WIRING DIAGRAM
7-3-1 FOR EU SPECIFICATIONS



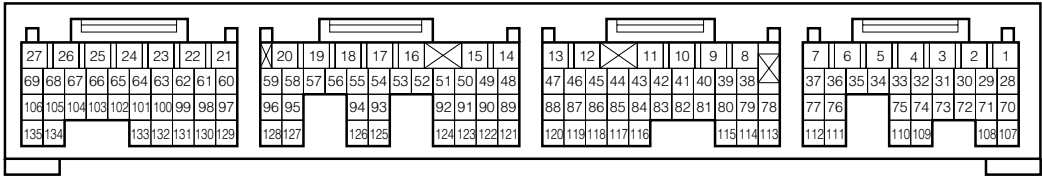
7-4 ARRANGEMENT OF VEHICLE HARNESS SIDE CONNECTOR TERMINALS

7-4-1 FOR EU SPECIFICATIONS



H11E6091S10

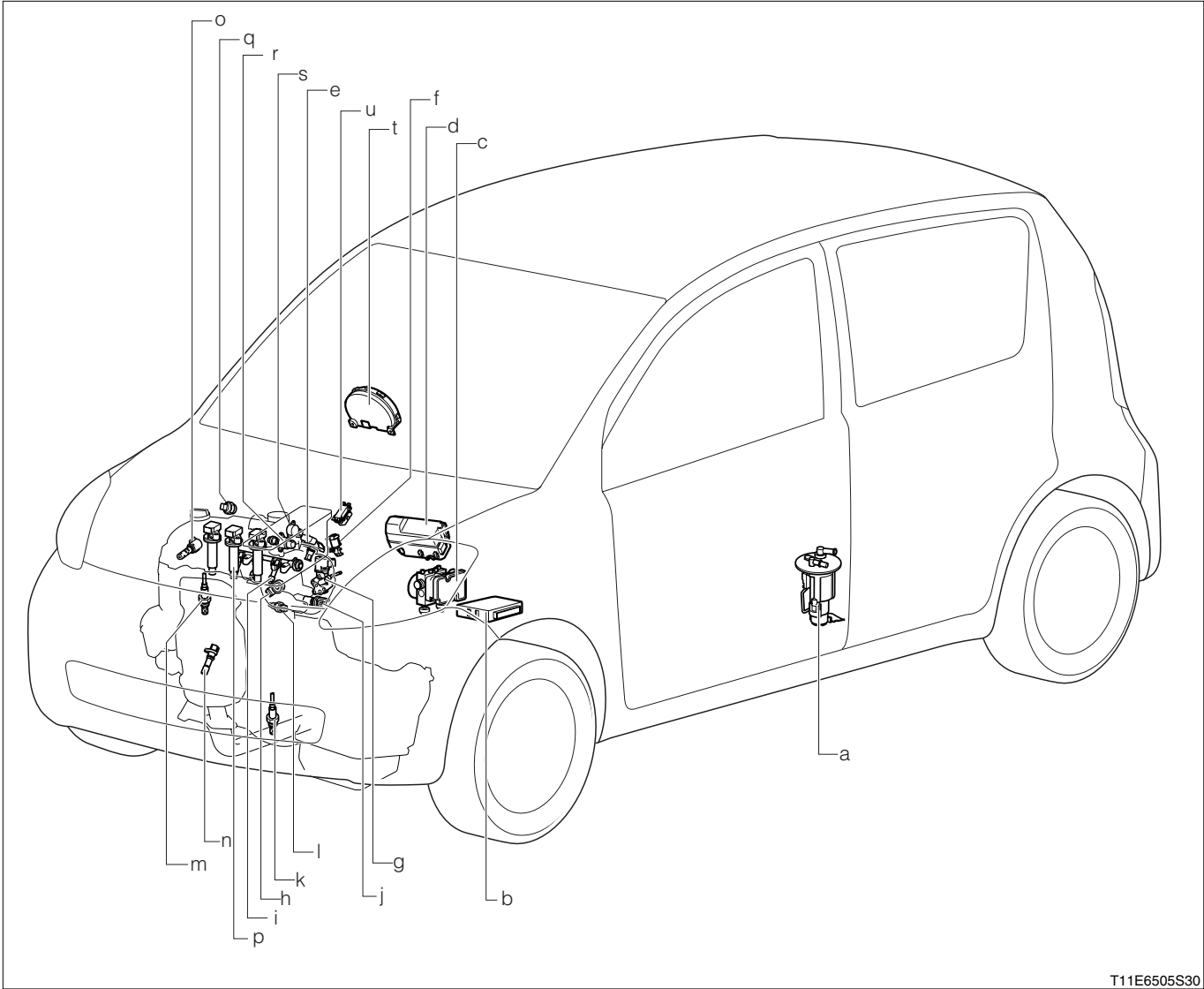
Terminal No.	Terminal code	Terminal name	Terminal No.	Terminal code	Terminal name
1	—	—	31	—	—
2	—	—	32	PBSW	Brake negative pressure switch
3	ACSW	Air conditioner switch	33	—	—
4	—	—	34	—	—
5	—	—	35	FC1	Fuel pump relay driving
6	CANL	CAN communication LO (1)	36	MGC	Magnetic clutch relay driving
7	CANH	CAN communication HI (1)	37	FAN1	Radiator fan relay driving
8	LCAN	CAN communication LO (2)	38	BAT	Backup power supply
9	HCAN	CAN communication HI (2)	39	MRO	Main relay driving
10	—	—	40	—	—
11	DEF	Defogger signal	41	—	—
12	EPS	EPS ECU	42	BLW	Heater blower signal
13	W	Engine check lamp	43	STP	Stop lamp signal
14	OXH2	Rear oxygen sensor heater	44	FPOF	Airbag fuel pump OFF request signal
15	OXH1	Front oxygen sensor heater	45	ACEV	Air conditioner evaporator temperature sensor
16	PRG	VSV for evaporative emission control system purge control	46	—	—
17	—	—	47	—	—
18	OX2	Rear oxygen sensor signal	48	—	—
19	E2	Sensor system earth	49	ICMB3	Ion current combustion control signal (#3)
20	E01	Power system earth	50	ICMB2	Ion current combustion control signal (#2)
21	—	—	51	ICMB1	Ion current combustion control signal (#1)
22	#30	Injector (#3)	52	PIM	Manifold absolute pressure sensor
23	#20	Injector (#2)	53	VTH	Throttle position sensor
24	#10	Injector (#1)	54	THW	Engine water temperature sensor
25	OCV—	Oil control valve driving (+)	55	THA	Intake air temperature sensor
26	OCV+	Oil control valve driving (+)	56	VC	Sensor power supply
27	+B	EFI ECU power supply	57	VCPM	Sensor power supply (Exclusively for manifold absolute pressure sensor)
28	—	—	58	N2+	Cam angle sensor(+)
29	—	—	59	N1+	Engine revolution sensor(+)
30	—	—	60	—	—



H11E6091S10

Terminal No.	Terminal code	Terminal name	Terminal No.	Terminal code	Terminal name
61	IG3	Ignition coil (#3)	99	—	—
62	IG2	Ignition coil (#2)	100	—	—
63	IG1	Ignition coil (#1)	101	—	—
64	—	—	102	—	—
65	—	—	103	—	—
66	IACALO	Stepper motor 1 for ISC	104	—	—
67	IACAH1	Stepper motor 2 for ISC	105	—	—
68	IACBLO	Stepper motor 3 for ISC	106	—	—
69	IACBHI	Stepper motor 4 for ISC	107	STSW	Starter switch
70	—	—	108	—	—
71	—	—	109	—	—
72	—	—	110	—	—
73	—	—	111	—	—
74	—	—	112	—	—
75	—	—	113	EFI T	EFI-T check terminal
76	—	—	114	—	—
77	—	—	115	—	—
78	—	—	116	E21	Body sensor earth
79	—	—	117	SIO2	Immobilizer communication
80	—	—	118	REV	DLC (REV terminal)
81	—	—	119	SIO1	DLC (Diagnostic device)
82	—	—	120	IGSW	Ignition switch
83	—	—	121	KNK	Knock sensor
84	—	—	122	E2PM	Sensor earth (Exclusively for manifold absolute pressure sensor)
85	—	—	123	OX1	Front oxygen sensor
86	—	—	124	—	—
87	—	—	125	E1	Calculation system earth
88	—	—	126	—	—
89	—	—	127	N2—	Cam angle sensor(—)
90	—	—	128	N1—	Engine revolution sensor(—)
91	—	—	129	—	—
92	—	—	130	EGR4	Stepper motor type EGR valve 4
93	—	—	131	EGR3	Stepper motor type EGR valve 3
94	—	—	132	EGR2	Stepper motor type EGR valve 2
95	—	—	133	EGR1	Stepper motor type EGR valve 1
96	—	—	134	ALTC	Alternator voltage control output
97	—	—	135	ALT	Alternator cut control output
98	—	—			

7-5 LOCATION OF COMPONENTS



	Part name
a	Fuel pump
b	Engine control computer
c	ABS actuator
d	Relay block
e	Manifold absolute pressure/ intake air temperature integral type sensor
f	VSV for evaporative emission control system purge control
g	Stepper motor type EGR valve
h	Knock sensor
i	Injector
j	Cam angle sensor
k	Rear oxygen sensor
l	Engine water temperature sensor
m	Oxygen sensor
n	Engine revolution sensor
o	Oil control valve
p	Ignition coil
q	Brake negative pressure switch
r	Stepper motor for ISC
s	Throttle position sensor
t	Combination meter
u	DLC

7-6 HOW TO PROCEED WITH TROUBLE SHOOTING

7-6-1 GENERAL INFORMATION

1. The engine and engine control system of this vehicle are controlled by the EFI ECU. Furthermore, the vehicle is provided with the on-board diagnosis system.
Therefore, when any abnormality takes place in the input/output systems (Sensors, actuators, harnesses, connectors, etc.) of the engine control system, the EFI ECU memorizes the system concerned and informs the driver by making the malfunction indicator lamp (MIL) illuminate or flash.
2. Also the malfunction is informed to the operator by means of the malfunction indicator lamp (MIL).
When trouble-shooting the engine, it is imperative for you to get the general idea of the onboard diagnostic system, and fully understand the precautionary measures in trouble-shooting, the items diagnostic system, and fully understand the precautionary measures in trouble-shooting, the items to be observed and how to use testers.
3. Then, conduct the trouble-shooting following the flow chart that indicates the correct procedure for the engine troubleshooting.

(1) On-board diagnostic system of vehicles for EU specifications

1. The vehicles for Europe have the following functions that comply with the 1999/102/EC (Generally called Euro-OBD) standards.
2. When the ignition switch is turned "ON", the malfunction indicator lamp (MIL) goes on. When no malfunction has been detected, the lamp will go out after the engine has started. (Check for a blown bulb)
3. While the engine is running, if the EFI ECU detects any malfunction in the emission control system/components that will affect the emissions from the vehicle, or in the power train control components, or if any malfunction is detected in the EFI ECU itself, the EFI ECU illuminates or flashes the MIL (Only when misfire is detected which will damage the catalyst). Then, the EFI ECU memorizes the malfunction area. (DTC by ISO15031-6/SAEJ2012)

4. If that malfunction will not occur in three successive running, the MIL is automatically turned off. However, the DTC will be recorded in the EFI ECU memory.

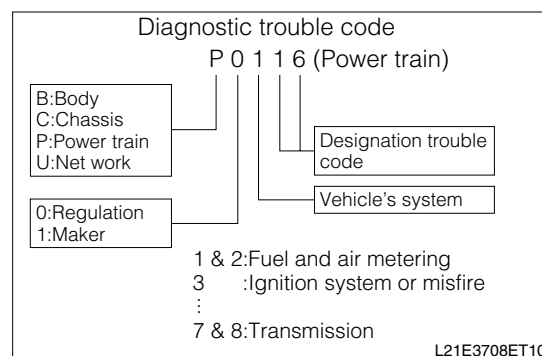
NOTE

- The MIL is illuminated only by the malfunction that affects the emissions from the vehicle. (Only items bearing a circle ("○" mark) in the MIL column.)
5. It is possible to read out various data from the engine ECU by connecting the OBD Ⅱ generic scan tool which complies with the ISO 14230 format or diagnosis tester (DS-21/DS-Ⅱ) to the DLC of the vehicle. You can perform trouble-shooting efficiently by checking these data (DTC, freeze-frame data, current data, oxygen sensor monitor data, etc.).
6. The DTC is composed of the ISO standard code (Specified by ISO 15031-6) and the manufacturer's designation code. The ISO standard code should be set pursuant to the ISO. On the other hand, the manufacturer's designation code can be freely set forth by the manufacturer within a specified limit.

DTC No.	De	Malfunction evaluation method	MIL
P0105/31	Manifold pressure pressure	1 trip	!
P0110/43	Intake air malfunction	1 trip	!
P0115/42	Engine co malfunction	1 trip	!
P0116/42	Engine coo circuit mance	2 trip	!
P0120/41	Throttle/P switch "A"	1 trip	!

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7. Many DTC have a two trip detection logic which assures avoidance of wrong detection and functions only when a malfunction is surely occurring. However, another diagnosis mode is provided, in which only a one-time final confirmation test is necessary for a service mechanic to confirm that the malfunction has been completely remedied after the repair.



L21E3708ET10

DTC No.	De	Malfunction evaluation method	MIL
P0141/24	Oxygen sens malfunction	2 trip	!
P0171/25	Fuel trim (Air-fuel malfunction)	2 trip	!
P0172/26	Fuel trim (Air-fuel malfunction)	2 trip	!

L21E3709ET10

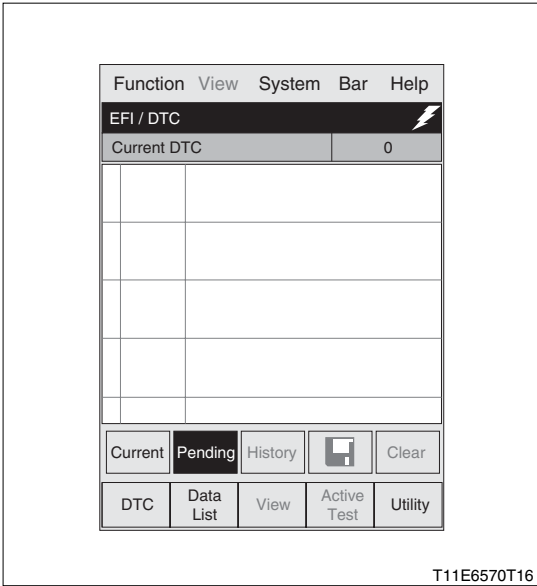
- (1) In case DS-21 or OBD Ⅱ generic scan tool, the "Continuous monitoring results" of "Vehicle communication in CARB mode" must be selected.

Vehicle communication

Indication of malfunction code
Erasing of malfunction code
Data display for freeze frame data
Indication of current data
Front O₂ sensor test results
Rear O₂ sensor test results
Continuous monitoring results
select function

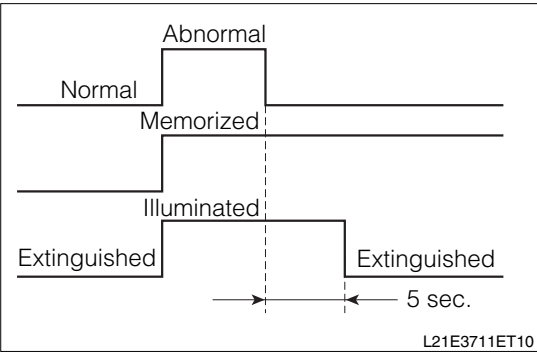
L21E3710ET10

- (2) In the case of the DS-II diagnosis tester, select the "Pending" of "DTC" in CARB mode.
- 8. When a malfunction is detected, the engine and running conditions at that moment are memorized as a freeze-frame data in the EFI ECU memory.
- 9. Two trip detection logic
When a malfunction is detected for the first time, that malfunction is temporarily memorized in the engine ECU memory. (First running). If the same malfunction is detected again during the second running, the MIL is illuminated and the DTC is determined. (Second running). (However, the ignition switch should be turned off between the first running and the second running.)



(2) On-board diagnostic system of vehicles for other regions

- 1. When the ignition switch is turned "ON", the MIL goes on. When no malfunction has been detected, the lamp will go out after the engine has started. (Check for a blown bulb)
While the engine is running, if the ECU detects any malfunction in the engine control system/components, or if any malfunction is detected in the EFI ECU itself, the EFI ECU illuminates the MIL.
- 2. In addition to the illumination of the MIL, the corresponding diagnostic trouble code (DTC) is memorized in the engine ECU memory. When the malfunction has been remedied or the system returns to its normal state, the MIL automatically goes out. However, the DTC remains memorized in the engine ECU memory.
- 3. It is possible to read out various data from the engine ECU by connecting the diagnosis tester (DS-21/DS-II) to the DLC of the vehicle. You can perform troubleshooting accurately and efficiently by checking these data (DTC, freeze-frame data, current data, oxygen sensor monitor data, etc). Only when diagnosis tester (DS-21/DS-II) is used.
- 4. The DTC (Diagnostic trouble code) is set to a four-digit code in accordance with ISO standard. Furthermore, the conventional two-digit code is also provided. The four-digit code can be read out by the diagnosis tester (DS-21/DS-II). The two-digit code has been set forth by the DMC itself. This code can be read by observing the flashing pattern of the MIL.
- 5. Some DTC have a two trip detection logic which assures avoidance of wrong detection and functions only when a malfunction is surely taking place.



DTC No.	Detection item
4-digit code P0105/31	2-digit code Manifold absolute pressure/barometric pressure circuit malfunction
P0110/43	Intake air temp. circuit malfunc.

L21E3712ET10

6. When a malfunction is detected, the engine and running conditions at that moment are memorized as a freeze-frame data in the EFI ECU memory.

7. Two trip detection logic

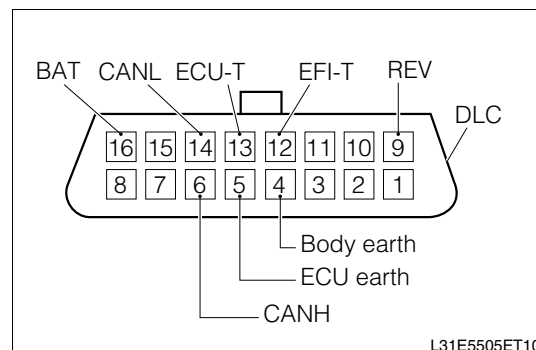
When a malfunction is initially detected, that malfunction is temporarily memorized in the engine ECU memory. (First running) If the same malfunction is detected again during the second running, the MIL is illuminated and the DTC is determined. (Second running)

(However, the ignition switch should be turned off between the first running and the second running.)

DTC No.	De	Malfunction evaluation method	MIL
P0141/24	Oxygen sens malfunction	2 trip	!
P0171/25	Fuel trim (Air-fuel malfunction)	2 trip	!
P0172/26	Fuel trim (Air-fuel malfunction)	2 trip	!
L21E3709ET10			

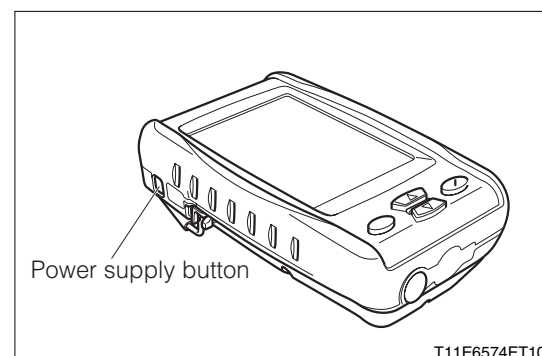
7-6-2 DLC, COMMON DESTINATIONS

- The vehicle engine EFI ECU uses the ISO15765 protocol. As regards the position, connector shape and pin arrangement, the DLC is regulated in accordance with the ISO 15031-3 (SAEJ1962).



NOTE

- With the cable of the diagnosis tester connected to the DLC, turn "ON" the ignition switch. If the tester will not turn on, conduct the following checks and repair any malfunctioning parts.
 - Connect the diagnosis tester to another vehicle.
 - Set the ignition switch to "ON".



7-6-3 CONNECTING PROCEDURE FOR SST (EFI COMPUTER CHECK SUB-HARNESS)

- When the EFI ECU terminal voltage is measured with the EFI ECU connector connected to the engine ECU, connect the SST, following the procedure given below.

NOTE

- The terminal number of the SST connector is the same as the EFI ECU connector.

- Turn "LOCK" the ignition switch. Disconnect the battery negative (-) terminal with the ignition switch turned "LOCK".

NOTE

- Be sure to memorize the diagnostic trouble code before disconnecting the battery negative (-) terminal. Otherwise, the diagnostic trouble code(s) will be erased by disconnecting the battery negative (-) terminal.

- Remove the No.1 instrument panel under cover.
- Remove the fuse box opening cover and lower instrument cover.

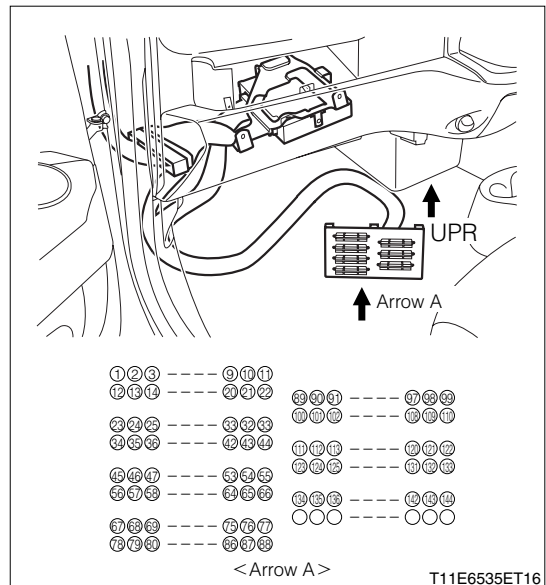
5. Connect the following SST between the wire harness connectors and the EFI ECU connectors.

SST: 09842-97209-000

6. Reconnect the battery negative (-) terminal.

CAUTION

- When disconnecting or reconnecting the EFI ECU connectors, be sure to disconnect the battery negative (-) terminal with the ignition switch and all accessory switches in the off state.
- When installing a new battery, care must be exercised not to mistake the battery polarity. Failure to observe this caution could cause EFI ECU malfunction.
- Before using the SST, be sure to check to see if short circuit or open wire exists between the terminals of the SST.



7-6-4 TROUBLE-SHOOTING PROCEDURE

(1) Discription

1. The engine control system is equipped with diagnosis functions whose are capable of diagnosing malfunctioning sections. These functions give important clues in trouble-shooting. The flow chart on the next page shows how to proceed with trouble-shooting by using these diagnosis functions.

The flow chart shows how the diagnostic trouble code check can be used effectively. Moreover, when its results are fully reviewed, you can determine whether you are going to do the trouble-shooting according to diagnostic trouble codes or the trouble-shooting according to malfunctioning phenomena.

The diagnosis of this system is equipped with a battery back-up function (A function which supplies power for diagnosis memory even if the ignition switch is turned "LOCK".)

NOTE

- When no diagnosis tester (DS-21/DS-II) or OBD-II generic scan tool is used, the DTC or freeze-frame data in the flow chart can not be read out.

➤1. Bringing malfunctioning vehicle in garage

- ▼ Go to ➤2.

➤2. Diagnosis through interview

1. Thoroughly obtain information from the customer concerning the conditions, environment and phenomena in which the malfunction took place.

- ▼ Go to ➤3.

▷3. Normal operation confirmation of diagnosis code indication of LCD in meter.

1. Short-circuit the terminals 4(ECU-T) and 13(E) of the DLC, using SST.

SST: 09991-87403-000

09991-87404-000

2. Ensure that the LCD in the meter indicates the diagnosis codes (Including the normal codes).

SPECIFIED VALUE: Will indicate

NOTE

- It is also fine when codes other than the CAN related ones are outputted.

▼ If it is OK, proceed to ▷4.

▼ When it is NG, perform the following checks for the meter and if there is no problem, replace the meter.

- (1) Check of harness for meter - DLC and DLC - body earth
- (2) Meter power supply system and earth system check

▷4. Confirmation of diagnosis code of LCD in meter (CAN-related)

1. Ensure that the CAN related diagnosis code (Code 0051 - 0053) is not indicated in the LCD in the meter.

SPECIFIED VALUE: Code 0051- 0053 are not indicated.

▼ If it is OK, proceed to ▷5.

▼ When it is NG, refer to the section of CAN communication system.

▷5. Confirmation and record of engine check lamp condition

1. Confirm and record the lighting of the engine check lamp when turning "ON" the IG switch and after starting the engine.

	When IG switch is "ON"	After starting the engine	Judgment
Engine check lamp	Illuminated	Extinguished	a
	Illuminated	Illuminated	b
	Extinguished	Extinguished	c

▼ In case of a, go to ▷6.

▼ In case of b, go to ▷6.

▼ In case of c, perform the following operations and if there is no problem, replace the meter.

- (1) Harness and connector check between battery and meter
- (2) Harness and connector check between meter and EFI ECU
- (3) EFI ECU power supply system and earth system check

▷6. Confirmation and recording of diagnosis code

1. Short-circuit the terminals 5(EFI-T) and 13(E) of DLC, using the SST.

SST: 09991-87403-000

09991-87404-000

2. Confirm and record the diagnosis code outputted from the engine check lamp in the meter.

NOTE

- If the data during malfunctioning may be confirmed by the diagnosis system, record the data during malfunctioning before canceling the diagnosis code.

▼ Go to ▷7.

▷7. Malfunction phenomena confirmation

1. Confirm the malfunction phenomena and confirm the abnormal situation.

▼ Go to ▷8.

▷8. Erasure of diagnosis code

1. Erase the diagnosis code.

▼ Go to ▷9.

▷9. Confirmation of reproduction of malfunction phenomena

1. Confirm whether the malfunction phenomena can be reproduced.

▼ If the malfunction phenomena can be reproduced, proceed to ▷10.

▼ If the malfunction phenomena cannot be reproduced, proceed to ▷11.

▷10. Reconfirmation of diagnosis code

1. Perform reconfirmation of the diagnosis code.

▼ If an abnormality code is outputted, proceed to ▷12.

▼ If a normal code is outputted, proceed to ▷11.

▷11. Basic check

1. Perform basic checks.

Refer to Page B8-30.

▼ Go to ▷13.

▷12. Trouble-shooting check according to diagnosis code

1. Perform trouble-shooting concerning the diagnosis code outputted.

Refer to Page B8-53.

▼ Go to ▷14.

▷13. Trouble-shooting according to malfunction phenomena.

1. Estimate the cause for the malfunction phenomenon and perform trouble-shooting.

Refer to Page B8-48.

▼ Go to ▷14.

▷14. Canceling method of diagnosis

1. Cancel the diagnosis code.

▼ Go to ▷15.

▷15. Confirmation and recording of diagnosis code

1. Confirm and record the diagnosis code.
 - ▼ If a normal code is outputted, proceed to ▷16.
 - ▼ If an abnormal code is outputted, go back to ▷7 and perform the checks again.

▷16. Confirmation test

1. Ensure that the malfunction phenomena claimed by the customer concerning the vehicle has been completely solved and that it has been recovered to the normal.
 - ▼ If it is OK, finish the trouble shooting.
 - ▼ If it is NG, go back to ▷3 and perform the checks again.

7-7 INQUIRY

1. In your attempt to remove the causes for a malfunction of the vehicle, you will not be able to remove the causes unless you actually confirm the malfunctioning phenomenon. No matter how long you continue operations, the vehicle may not resume the normal state unless you confirm the malfunctioning phenomenon. The inquiry with the customer is a vital information collecting activity which is to be conducted previous to the confirmation of malfunctioning phenomenon.
2. This inquiry will provide you with an important clue in an effort to reproduce the malfunctioning phenomenon. Furthermore, the information obtained by the inquiry can be referred to during the trouble-shooting. Hence, instead of making general questions, it is necessary to focus your questions on the items related to the malfunction.
3. The main points of the inquiry given below are the most important points in analyzing the malfunction. In some cases, the information about malfunctions whose took place in the past and about the history of previous repairs, which seem to have nothing to do with the current malfunction, may prove to be helpful in solving the malfunction.

Hence, it is important to obtain as much information as possible and keep them accurately in mind as reference information when trouble-shooting the malfunctioning phenomenon.

[INQUIRY SHEET]

Inquiry sheet									
Name of customer			Vehicle model		Engine - N/A, T/C, S/C, carburetor, EFI, LPG		Transmission - 4M/T, 5M/T, 2WD, 4WD 2A/T, 3A/T, 4A/T		
Details of vehicle	Frame No.		Registration date		Date of malfunction		Running distance km		
	Equipment:								
	[Sex] of customer (driver)		[Age]	[Occupation]	[Places where vehicle is mainly used]		[Parking place]		
	Male	Female	Approx.		Urban district/suburb/seacoast/mountain/others		Outdoor/indoor		
Symptom	Poor starting		• No initial explosion takes place. • Explosion is incomplete although initial explosion takes place • Hard starting (cold engine, hot engine, always) • No cranking takes place. • Other ()						
	Faulty idling		• Fast idling ineffective • Idling speed too low • Idling speed too high • Idling unstable (cold engine, hot engine, always) • Other ()						
	Poor drive-ability		• Hesitation (during start, during acceleration, during deceleration, during a certain period) • Knocking • Backfire • Lack of power • Poor acceleration • Poor blow • Other ()						
	Engine stall		• During idling (during warming up, after warming up) • At time of starting • During running () • Immediately after vehicle stops (Re-start possible, Re-start impossible) • Under loaded state (Air conditioner, electric load, power steering) • Other ()						
From when malfunction has started?			• Since vehicle was purchased as a new car • Recently (since what year/ month)						
Frequency of occurrence			• At all times • Under a certain condition () • Sometimes						
Meteorological conditions	Weather		• At all times						
	Temperature		• Fine • Cloudy • Rain • Snow • Other () • Temperature (about °C) (Spring, summer, autumn, winter)						
Engine condition			• When cold • After warming-up • During warming-up (Water temperature about °C)						
Road			• Urban district • Suburb • Highway • Mountainous road (Uphill, downhill)						
Driving conditions			• No relation • During racing under no load • During running (Vehicle speed: km/h, Engine speed: rpm, MT Which gear?) • During turn (right curve, left curve)						
Other situations									

State of malfunction indicator lamp (MIL)		• Illuminated or flashing at all times • Illuminated or flashing sometimes • Will not go on.	
Indication of DTC		During checking	• Normal • Malfunction code ()
• Reading out by using OBD II generic scan tool		2nd time	• Normal • Malfunction code ()
• Reading-out of MIL flashing pattern by shorting terminal T			

L21E3717ES40

7-8 CONFIRMATION, RECORD AND ERASURE OF DIAGNOSIS CODE

7-8-1 CHECKING METHOD OF DIAGNOSIS

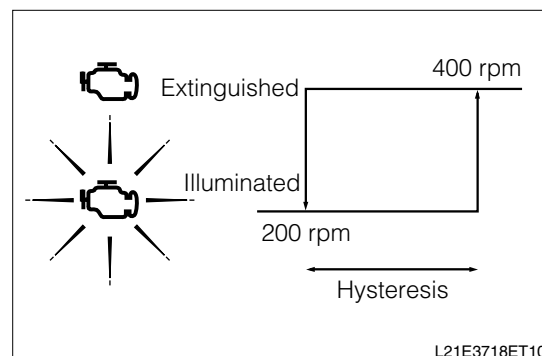
1. Prior to the check, check the malfunction indicator lamp (MIL), following the procedure given below.
2. Check of malfunction indicator lamp

(1) Ensure that the malfunction indicator lamp goes on when the ignition switch is turned "ON", but with the engine not running.

NOTE

- If the malfunction indicator lamp (MIL) fails to go on, perform the trouble-shooting for the combination meter.

- (2) Ensure that the malfunction indicator lamp goes out when the engine starts. If the lamp remains illuminated or is flashing, the diagnosis system is detecting a malfunction. Therefore, a DTC is memorized in the EFI ECU. If no DTC is memorized in the EFI ECU, perform the trouble-shooting for the malfunction indicator lamp circuit.



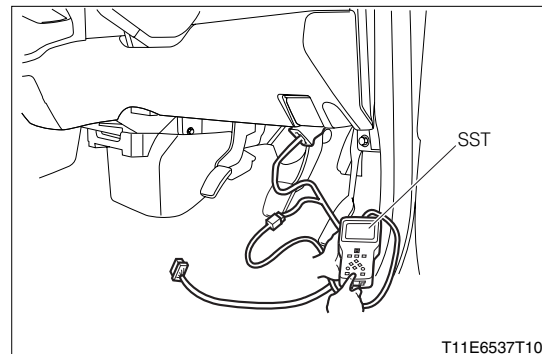
(1) **Check of DTC, using DS-21 diagnosis tester:**

1. Prepare the DS-21 diagnosis tester.
2. Connect the DS-21 diagnosis tester to the DLC located at the lower section of the instrument panel on the driver's seat side. At this time, the DS-21 tester should be connected to the DLC with the following SST interposed.

SST: 09991-87404-000

NOTE

- When DS-21 diagnosis tester is used, refer the instruction manual for tester.

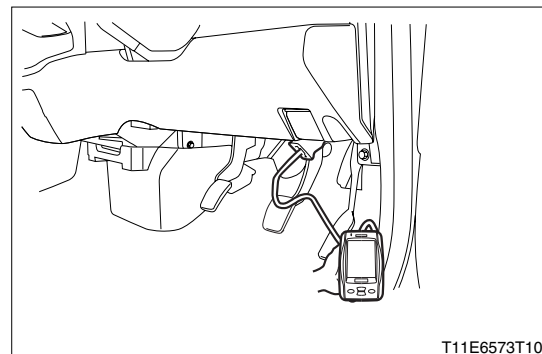


(2) **Check of DTC, using DS-II diagnosis tester or OBD II generic scan tool**

1. Prepare the DS-II diagnosis tester or OBD II generic scan tool.
2. Connect the DS-II diagnosis tester or the OBD II generic scan tool directly to the DLC located at the lower section of the instrument panel on the driver's seat side.

NOTE

- When DS-II diagnosis tester or OBD-II generic scan tool is used, refer the instruction manual for each tester.



(3) **Check of DTC without using diagnosis tester (DS-21/DS-II) or OBD II generic scan tool**

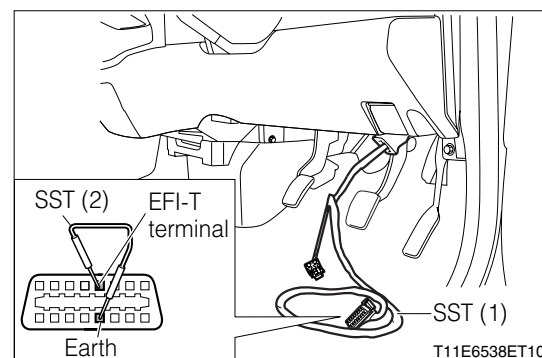
1. With the ignition switch turned "LOCK", connect the following SST to the DLC located at the lower section of the instrument panel on the driver's seat side.

SST: 09991-87404-000SB08_0001

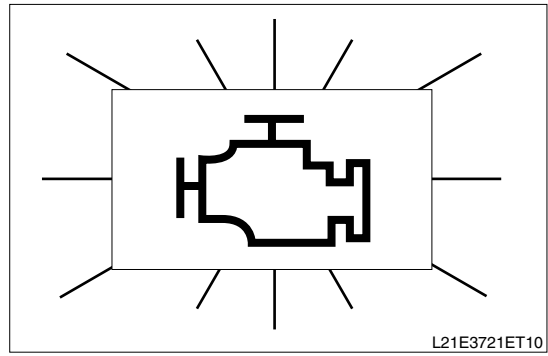
2. Short circuit the DLC terminals 5 (EFI-T) and 13 (E), using the SST.

SST: 09991-87403-000SB08_0002

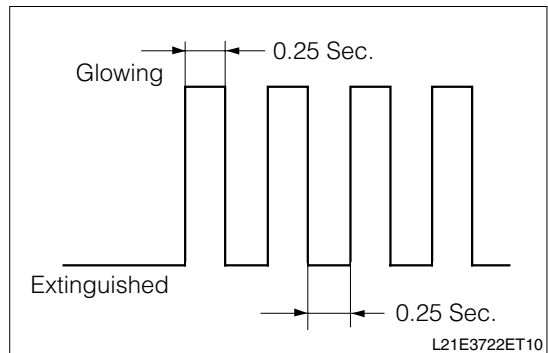
3. Turn the ignition switch to the "ON" position. At this time, be careful not to start the engine.



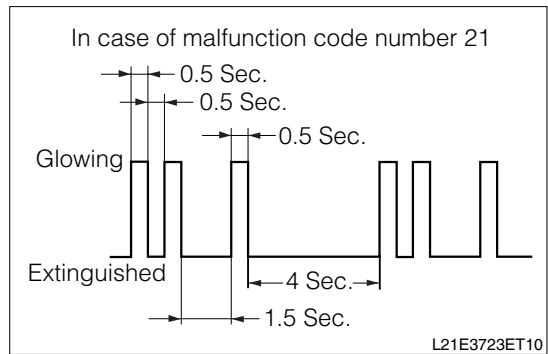
4. Read out the diagnostic trouble code (DTC) by observing the flashing number of the malfunction indicator lamp.



5. The illustration shows an example of the flashing pattern of the normal code. The malfunction indicator lamp glows for 0.25 second, right after the ignition switch has been turned "ON". After a lapse of 0.25 second, the malfunction indicator lamp again glows for 0.25 second. Then, this pattern will be repeated.



6. The illustration shows an example of the flashing pattern of the code No. 21. The diagnostic trouble code is composed of two digits. These two numbers are indicated by blinking of the malfunction indicator lamp. Four seconds after the ignition switch has been turned "ON", the malfunction indicator lamp indicates first the number of the tens digit of the diagnostic trouble code by glowing the same times as the number. The lamp glows for 0.5 second each time and then it is extinguished for 0.5 second. After a pause of 1.5 seconds, the lamp indicates the number of the units digit of the diagnostic trouble code by glowing the same times as the number. The lamp glows for 0.5 second each time and then it is extinguished for 0.5 second. Then, this pattern will be repeated after a pause of 4 seconds.



7. The illustration shows an example of the flashing pattern of the codes No. 21 and 31. In cases where plural malfunction codes have been detected, the two-digit diagnostic trouble codes are indicated in the sequence of the code number, starting from a smaller number. Each diagnostic trouble code is indicated in the above described pattern. A pause of 2.5 seconds occurs between the outputs of respective diagnostic trouble codes, thus separating one from the others. After all of the plural diagnostic trouble codes that have been detected are indicated, the malfunction indicator lamp is extinguished for four seconds. Then, the detected plural diagnostic trouble codes will be indicated again.
8. For the details of malfunctions, refer to the diagnosis code chart.
9. After completion of the check, disconnect the jump wire and turn "LOCK" the ignition switch. Then, disconnect the SST from the DLC.

NOTE

- In cases where plural malfunction codes have been detected, the indication will be made progressively, starting from the smaller number to the larger number.
 - In cases where the diagnosis tester (DS-21/DS-II) or the OBD II generic scan tool is not used, it is impossible to take a reading of unidentified two-trip DTC from the SST connector.
 - When malfunctioning phenomena are to be reproduced without using the diagnosis tester (DS-21/DS-II) or OBD II generic scan tool, follow the procedure given below to detect the DTC.
- (1) It is assumed that two trip detection logic is used for the DTC detection.
 - (2) Therefore, after a malfunctioning phenomenon is first reproduced, turn "LOCK" the ignition switch.
 - (3) Then, repeat the same reproduction procedure once again.
 - (4) When the malfunction is reproduced again, the malfunction indicator lamp goes on and the DTC is memorized in the engine ECU.

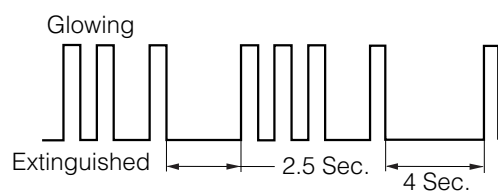
NOTE

- The diagnosis codes are for reading out use.

NOTE

- When malfunctioning phenomena are to be reproduced with the DS-21 diagnosis tester or OBD II generic scan tool connected to the DLC, the "Continuous monitoring results" function can be used. (In the case of the diagnosis tester (DS-21/DS-II), select the "Continuous monitoring results" of the "Vehicle communication" in CARB mode.) This function makes it possible to indicate the DTC when the malfunctioning phenomenon is first reproduced. (Request of onboard monitoring test results of ISO 15031-5 Continuous monitoring system.)

In case of malfunction code number 21 and 31



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Vehicle communication

Indication of malfunction code
Erasing of malfunction code
Data display for freeze frame data
Indication of current data
Front O₂ sensor test results
Rear O₂ sensor test results

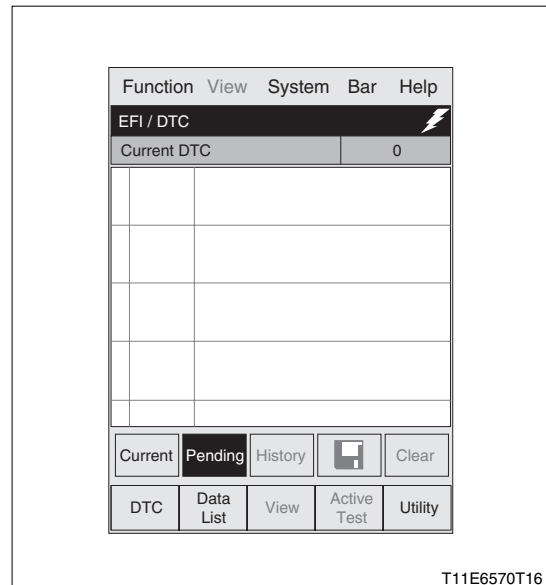
Continuous monitoring results

select function

L21E3710ET10

NOTE

- In the case of the DS-II diagnosis tester, select the "Pending" of "DTC" in CARB mode.



7-8-2 CANCELING METHOD OF DIAGNOSIS

1. The DTC and freeze-frame data can be erased through the following methods.

- (1) The diagnosis tester (DS-21/DS-II) or OBD II generic scan tool is used to erase the DTC. (For the operating procedure, refer to the instruction manual.)
- (2) The power supply to the EFI ECU is shut off to erase the DTC without using the diagnosis tester (DS-21/DS-II) or OBD II generic scan tool. (Disconnect the battery negative (-) terminal or detach the EFI fuse.)

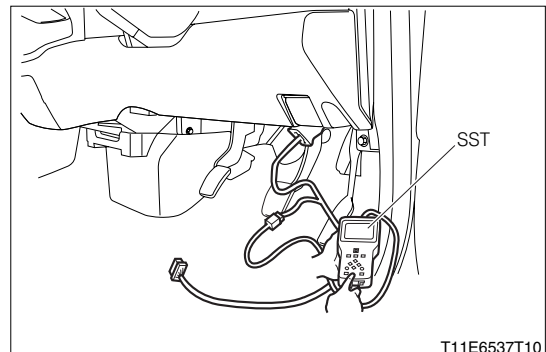
(1) When DS-21 diagnosis is used:

1. In the same way as the check of DTC, connect the diagnosis tester (DS-21/DS-II) to the DLC with the following SST interposed.

SST: 09991-87404-000

NOTE

- When DS-21 diagnosis tester is used, refer the instruction manual for tester.

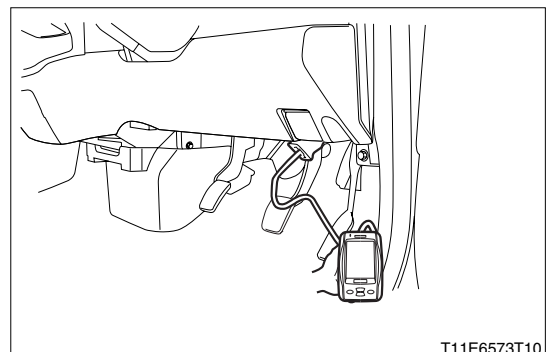


(2) When DS-21 diagnosis tester or OBD II generic scan tool is used:

1. In the same way as the check of DTC, connect the DS-II diagnosis tester or the OBD II generic scan tool directly to the DLC.

NOTE

- When DS-II diagnosis tester or OBD II generic scan tool is used, refer the instruction manual for each tester.



(3) **When diagnosis tester (DS-21/DS-II) or OBD II generic scan tool is not used:**

1. Erasure by disconnecting EFI fuse

To erase the diagnostic trouble codes (DTC) memorized in the ECU after malfunctions have been repaired, disconnect the EFI fuse from the relay block for at least 60 seconds with the ignition switch turned "LOCK". (When ambient temperature is about 20°C.)

NOTE

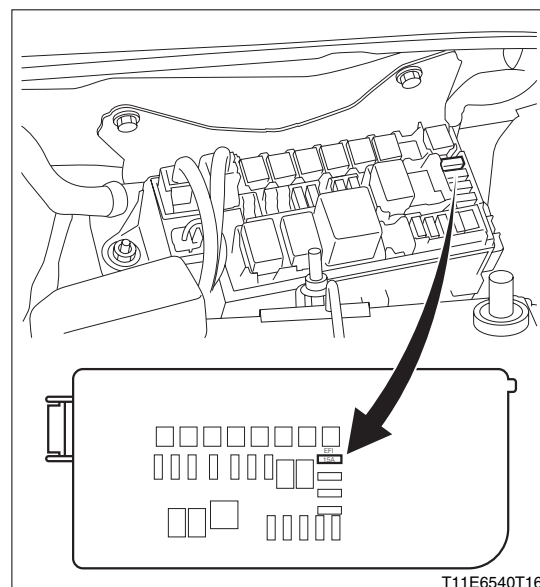
- It is possible to complete this erasing for approximately 60 seconds. In some cases, however, it may take longer. Furthermore, the erasing can be made by disconnecting the circuit, such as the battery power supply and fusible link. In cases where the battery negative (-) terminal is to be disconnected, record the radio channels in advance. After completion of the operation, set the radio channels the same as before.
- In cases where the same malfunction (DTC) cannot be detected again during the 40 cycles of the engine warming-up, the DTC and freeze-frame data will be automatically erased from the ECU memory. (Only in the case of vehicles with EU specifications)
- Warming-up cycle
- The warming-up cycle refers to a driving cycle that sufficiently allows the water temperature to rise by at least 22°C above the temperature at the time of engine starting and to reach at least 70°C.
- Driving cycle
- The driving cycle consists of the engine starting and engine stopping.

7-9 SYMPTOM CONFIRMATION

7-9-1 CONFIRMATION OF REPRODUCTION OF MALFUNCTIONING PHENOMENA

1. In the course of trouble-shooting, the operator can not pinpoint the cause for the malfunction unless he confirms the phenomenon. For this purpose, it is indispensable to reproduce the malfunctioning phenomenon by creating conditions and environments that are similar to those customer.
2. As for phenomena whose can not be reproduced easily, it is necessary to produce running conditions that are similar to those when the malfunction occurred (Road surface condition, weather condition, driving condition). For this end, it is of great importance to try to reproduce the conditions that are similar to those when the malfunction occurred (Road surface condition, weather relays by hand), heat (applying hot air) and water (Applying moisture).
3. Vibration, heat or moisture can constitute causes for malfunction that are difficult to reproduce.
4. Therefore, with the vehicle in a stationary state, you can perform the following malfunction reproduction simulation tests given below.

Moreover, if you presume a section (Part) which can cause a malfunction and connect a tester, etc. to that section so as to confirm the malfunctioning phenomenon, you can also achieve a function to that section so as to confirm the malfunctioning phenomenon, you can also achieve a function evaluation of that section (Part).



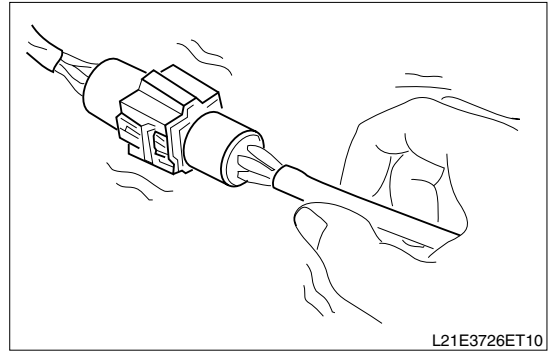
(1) Malfunction reproduction simulation test methods

① Vibration method:

1. When vibration is thought to be the main cause

(1) Connector

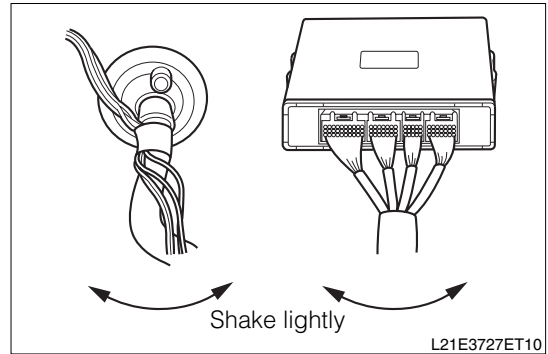
Lightly shake the connector vertically and laterally.



(2) Wire harness

Lightly shake the wire harness vertically and laterally.

The points to be checked are connector joints, the vibrating point and the section where the wire harness is passing through the body.

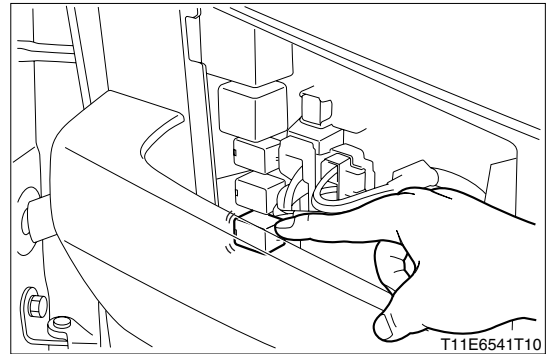


(3) Parts, sensors

With your finger, apply light vibrations to a part of the sensor which is presumed to be the cause for the malfunction. Check to see if the malfunction is reproduced.

NOTE

- Be careful not to apply too strong vibration to a relay, for it can cause an open wire in the relay.



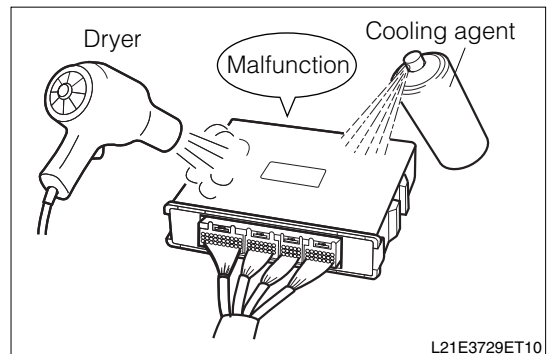
② Cool/hot method:

1. When a suspected section is likely causing the malfunction when it is cold or hot.

(1) Heat a component which is presumed to be causing the malfunction by using a dryer or the like. Check to see if the malfunction occurs.

CAUTION

- Do not heat the section beyond 60°C. (Temperature limit to assure that no damage be made to the component.)
- Do not directly heat the parts inside the ECU.



③ Water applying method:

1. When the malfunction is believed to occur on rainy days or under humid conditions. Apply water to the vehicle. Check to see if the malfunction occurs.

NOTE

- Never apply water directly to the engine compartment. By applying water to the front of the radiator, you can indirectly change the temperature and humidity.
- Never apply water directly to the electronic parts.
- If rain leaks into the vehicle compartment, rain may get into the inside of the ECU through the wire harnesses. If the vehicle has experienced any rain leakage before, utmost attention must be paid in respect to this point.

7-9-2 RECHECK AND MAKING RECORD OF DTC/FREEZE-FRAME DATA

1. By checking the DTC/freeze-frame data after confirming the reproduction of the malfunctioning phenomenon, it is possible to judge whether the system related to the DTC that was indicated before confirmation of the reproduction is now functioning properly or not. Then, you are to proceed to one of the following three steps.
 - (1) When a DTC was indicated at the time of checking the DTC and the same DTC is indicated after the confirmation of reproduction of the malfunction, it indicates that the malfunction is still persisting in the diagnosis circuit. Proceed to the trouble-shooting according codes.
 - (2) When no abnormal code is indicated, although the occurrence of malfunction was observed during the confirmation of reproduction of malfunction, a malfunction other than those related to the diagnosis system is likely taking place. Proceed to the trouble-shooting according to malfunctioning phenomena.
 - (3) When no malfunction is observed during the confirmation of reproduction of malfunction, and the normal code is indicated at the check of the DTC, it is presumed that an abnormality, such as poor contacts at the harnesses and connectors, occurred in the past, but now they are functioning properly. Check the harnesses and connectors of those systems related to the DTC that was indicated before the confirmation of reproduction of the malfunctioning phenomenon.

7-10 BASIC CHECK

7-10-1 BASIC ENGINE CHECK FLOW CHART

1. When the ECU is detecting no DTC during the reproduction test of malfunctioning phenomena and when no abnormality is found by the visual inspection, it is necessary to progressively perform the trouble-shooting for circuits which are most likely causing the malfunctions.
2. In many cases, sections causing malfunctions can be narrowed down quickly and effectively by performing the basic engine check indicated in the following flow chart. Therefore, it is very important to perform this check for the engine trouble-shooting.

(1) Basic engine check

▷1. Check the battery voltage.

1. Is the battery voltage 11 V or more with the engine in a stopped state?
 - ▼ If it is OK, go to ▷2.
 - ▼ If it is NG, charge the battery or replace it.

▷2. Check the engine cranking.

1. Does the engine crank?
 - ▼ If it is OK, go to ▷3.
 - ▼ If it is NG, go to "Matrix Table for Trouble-Shooting According to Malfunctioning Phenomena".
Refer to Page B8-48.

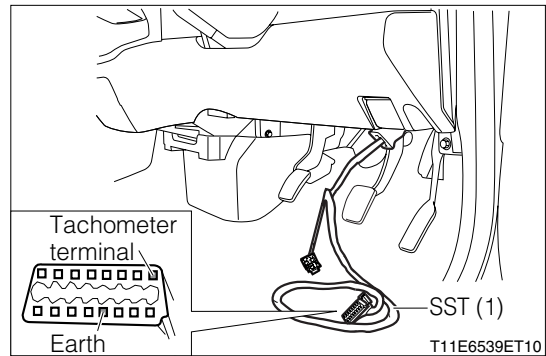
▷3. Check the engine starting.

1. Does the engine start?
 - ▼ If it is OK, go to ▷4.
 - ▼ If it is NG, go to ▷6.

➤4. Check the engine idle speed.

1. Warm up the engine, until the engine water temperature reaches 90°C or more.
2. Turn "LOCK" all electric load switches (Including A/C switch).
3. Set the transmission to neutral.
4. When the DS-21 diagnosis tester is used:
 - (1) Connect the DS-21 tester to the DLC with the SST interposed.
 SST: 09991-87404-000

5. When the DS-II diagnosis tester or OBD II generic scan tool is used:
 - (1) Connect the DS-II diagnosis tester or OBD II generic scan tool to the DLC directly.
6. Check the engine idle speed.



7. When the diagnosis tester (DS-21/DS-II) or general-purpose tester is not used, connect a tachometer to the Tachometer terminal.

- (1) Install an engine tachometer to the terminal "REV" of the DLC, using the SST.

SST: 09991-87402-000
09991-87404-000

NOTE

- The SST 09991-87404-000 is a harness for extension use. This does not have to be used.

SPECIFIED VALUE: 800^{+100}_{-50} rpm

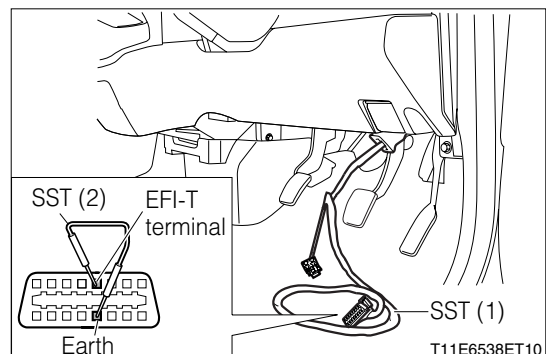
▼ If it is OK, go to ➤5.

▼ If it is NG, go to "Matrix Table for Trouble-Shooting According to Malfunctioning Phenomena".

Refer to Page B8-48.

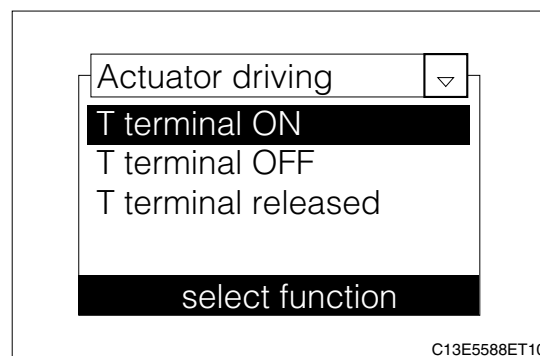
➤5. Check the ignition timing.

1. When the diagnosis tester (DS-21/DS-II) is not used:
 - (1) Connect the terminal T of the SST connector to the earth terminal, using a jump wire.
 SST: 09991-87404-000(1)
09991-87403-000(2)



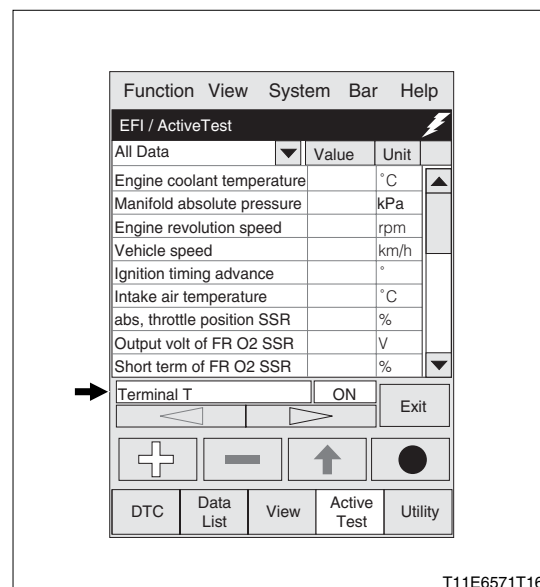
2. When the DS-21 diagnosis tester is used:

- (1) Select the "Engine adjustment" on the course menu so as to connect the EFI- T terminal.

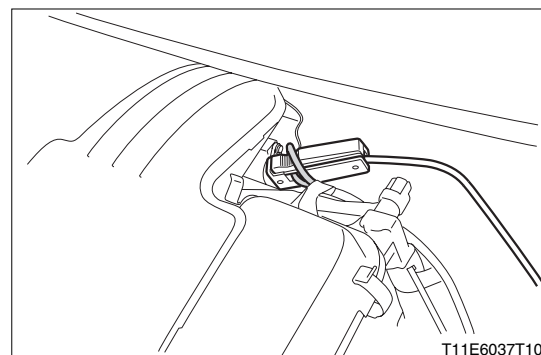


3. When the DS-II diagnosis tester is used:

- (1) Select the "Terminal T" of "Active Test" so as to connect the EFI-T terminal.



4. Attach the clip of the timing light to the wire harness for timing light connection wire.



5. Is the timing mark of the crankshaft within a range of the indicator for ignition timing check provided on the timing chain cover?

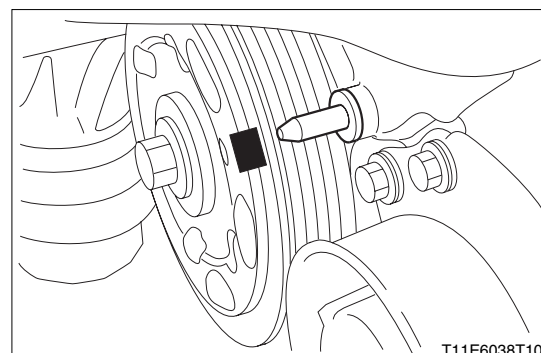
SPECIFIED VALUE: 10 degrees ± 2 degrees (BTDC)

6. Are the check results OK?

▼ If it is OK, go to "Matrix Table for Trouble-Shooting According to Malfunctioning Phenomena".

Refer to Page B8-48.

▼ If it is NG, check the timing chain for wrong assembling. Also, check the plunger protruding amount of the tensioner.



▷6. Fuel pressure check (Simple check).

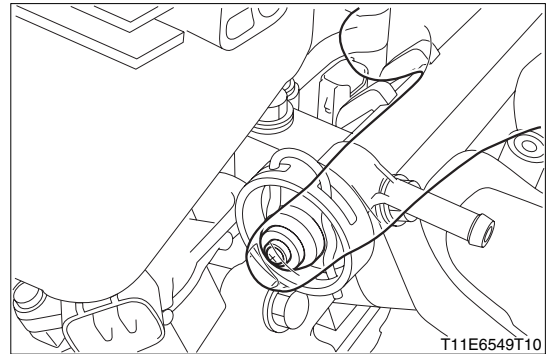
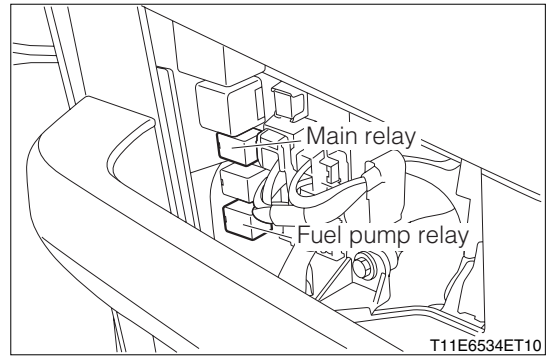
1. When DS-21 diagnosis tester or DS-II diagnosis tester is not used:

(1) Ensure that the fuel tank is filled with sufficient fuel.

(2) Remove the fuel pump relay and connect a jump wire, as indicated in the illustration.

SST: 09991-87403-000

(3) Ensure that the IG switch is turned "ON" and the pulsation damper exhibits pulsation.



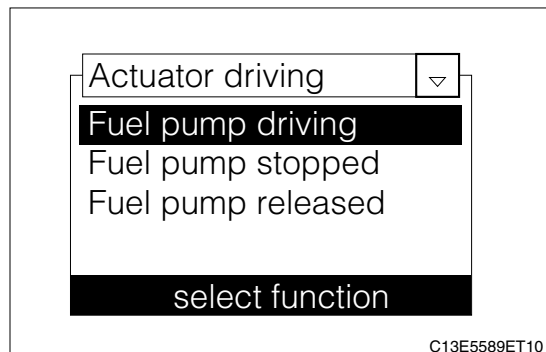
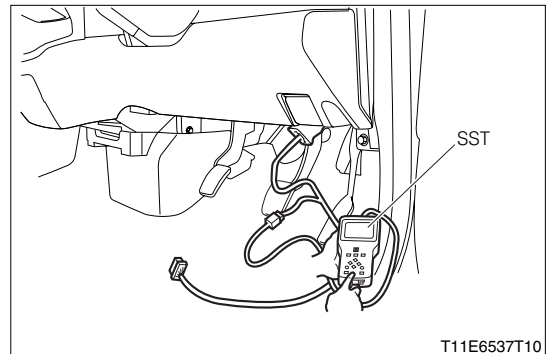
2. When DS-21 diagnosis tester is used:

(1) Connect the DS-21 diagnosis tester to the DLC with the SST interposed.

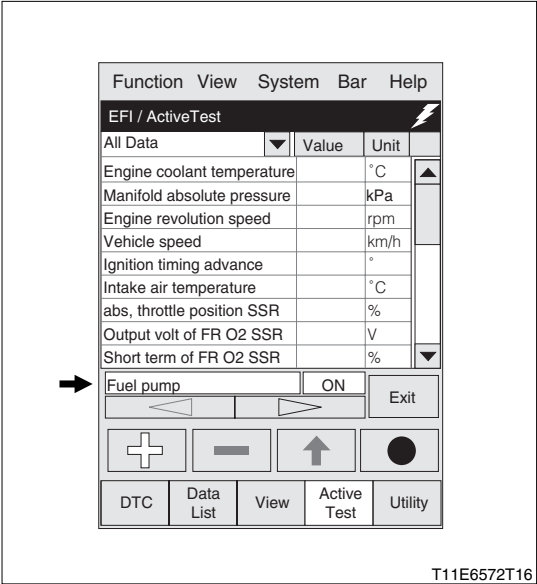
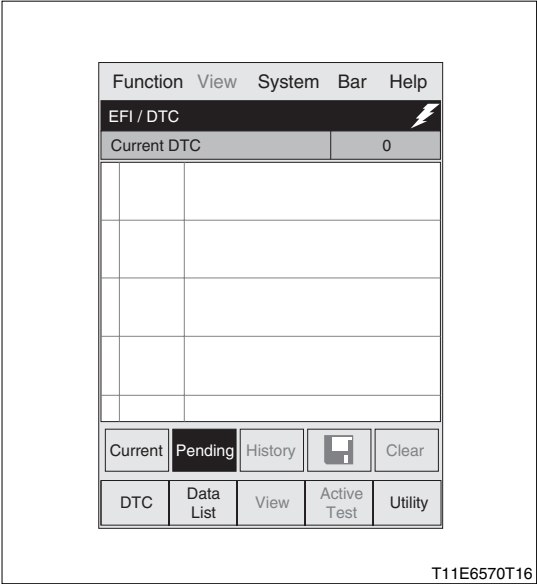
SST: 09991-87404-000

(2) Turn "ON" the ignition switch. Then, select the "Fuel pump" of the "Actuator driving" among the individual functions so as to drive the fuel pump.

(3) Does the pulsation damper exhibit pulsation?



3. When DS-II diagnosis tester is used:
- (1) Connect the DS-II diagnosis tester to the DLC.
 - (2) Turn "ON" the ignition switch. Then, select the "Fuel Pump" of the "Actuator driving" so as to drive the fuel pump.
 - (3) Does the pulsation damper exhibit pulsation?
 - ▼ If it is OK, go to Σ>7.
 - ▼ If it is NG, go to "Check of Fuel Pump and F/P Regulator".
- Refer to Page B8-184.



▷7. Spark check.

1. Remove the fuel pump relay from the relay block.
2. Remove the ignition coils and spark plugs (All cylinders #1, 2, 3).
3. Disconnect the fuel pump relay
4. Disconnect the connector of the injector.

CAUTION

- Stop the fuel injection by the operations at Steps 3 and 4 above so as to prevent the catalyst from being damaged by unburnt gas, etc.
 - When there is no fuel, the injector injection must be avoided wherever possible, as this may damage the injector.
5. Install the spark plug to the ignition coil. Connect the ignition coil connector to the ignition coil.
 6. Ground the spark plug.
 7. Crank the engine. At this time, check to see if each spark plug sparks.
 8. Are sparks jumping?
 - ▼ If it is OK, go to ▷8.
 - ▼ If it is NG, go to Check of ignition System.

▷8. Confirmation of operation of fuel injector.

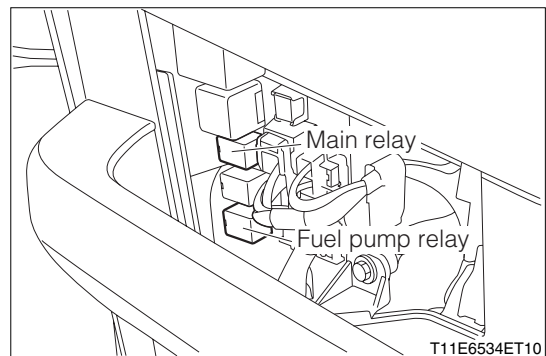
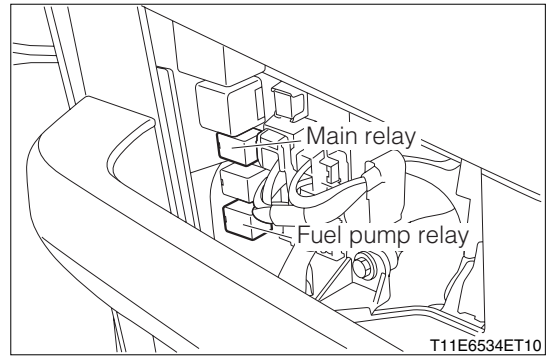
1. Install the spark plugs, ignition coils and fuel pump relay. Connect the connector of the ignition coil.
 2. Using a sound scope, check each injector for operation sound while the engine is being cranked or idling.
 3. Can you hear operator sound of all injectors?
 - ▼ If it is OK, go to ▷9.
 - ▼ If it is NG, go to "Check of Fuel Injector Circuit".
- Refer to Page B8-184.

▷9. Inspection of compression pressure.

1. Warm up the engine.
2. With the IG switch turned "LOCK", remove all of the ignition coils and spark plugs.
3. Temporarily remove the main relay and fuel pump relay.
4. Insert a compression gauge into the spark plug hole.
5. Depress the accelerator pedal fully.
6. While cranking the engine, measure the compression pressure.
7. Repeat the steps 4, 5 and 6 to perform the measurement for all cylinders.

NOTE

- Be sure to use a fully-charged battery. Also the measurement should be performed in the shortest possible length of time.
8. Are the check results OK?
 - ▼ If it is OK, go to ▷10.
 - ▼ If it is NG, perform the checks, referring to the section ENGINE MECHANICAL.



➤ 10. Inspection of idle CO and HC concentrations.

1. Warm up the engine completely.

NOTE

- Warm up the engine, until the fan motor starts to operate.

2. Measure CO and HC concentrations at idle speed.

SPECIFIED VALUE:

CO concentration	Not to exceed 0.2 %
HC concentration	Not to exceed 200 ppm

3. Are the check results OK?

▼ If it is OK, go to "Matrix Table for Trouble-Shooting According to Malfunctioning Phenomena".
Refer to Page B8-48.

▼ If it is NG, perform the checks, referring to the section ENGINE MECHANICAL.

(2) Check of wire harnesses and connectors

1. Check of open wire

This is caused by detached wire harness, poor contact inside the connector, detached connector terminal, and so forth.

NOTE

- The wires are rarely cut at the center. In most cases, an open wire occurs at the connectors. Particularly, the connectors of the sensor and actuator should be checked very carefully.
- Poor contact is caused by rust formation at the connector terminal, foreign substances adhered to the terminal, or drop in the contact pressure between the male and female terminals of the connector.
- Simply disconnect the connector once, and then, reconnect it. It may change the contacting condition, thus returning to the normal operation. Hence, if no abnormality was found when the wire harness and connector were checked during the trouble-shooting, and if the malfunction ceases to exist after completion of the checks, then the wire harness or connector was most likely causing the malfunction.

2. Check of short circuit

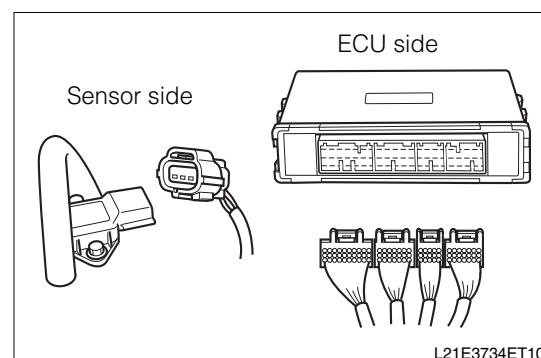
This is caused by a short circuit between the wire harness and the body ground or by an internal short circuit of the switches, etc.

NOTE

- If a short circuit is present between the wire harness and the body ground, thoroughly check to see if the wire harness is caught in the body, if the wire is rubbed and the insulator section is ruptured, thus contacting other parts, and if the wire is clamped properly.

3. Continuity check (Check for open wire)

- (1) Disconnect the connector on both sides of the EFI ECU and sensor.



- (2) Measure the resistance between the relevant terminals of the connector.

SPECIFIED VALUE: Resistance: 1 Ω or less

NOTE

- Lightly shake the wire harness in a longitudinal direction as well as in a horizontal direction when the resistance is measured.
- In the case of non-waterproof connectors, the test probe should be inserted into the connector from each wire harness side.
- In cases where the waterproof connector is checked without removing the waterproof rubber, be very careful not to deform the connector terminal when applying the test probes.

4. Continuity check (Check for short circuit)

- (1) Disconnect the connector on both sides.
- (2) Measure the resistance between the relevant terminal of the connector and the body ground. Moreover, be sure to check for the connectors on both sides.

SPECIFIED VALUE: Resistance: 1 M Ω or more

NOTE

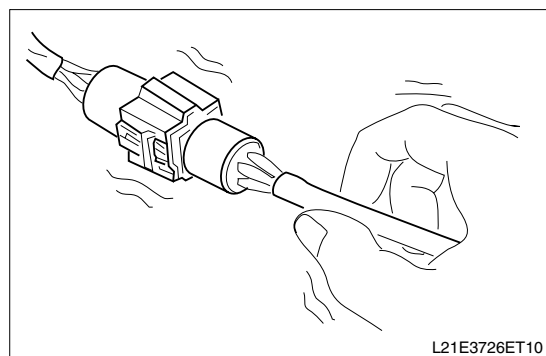
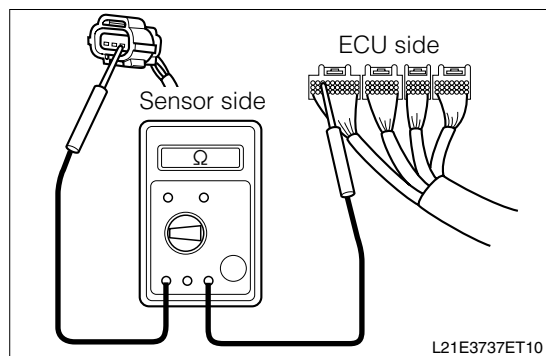
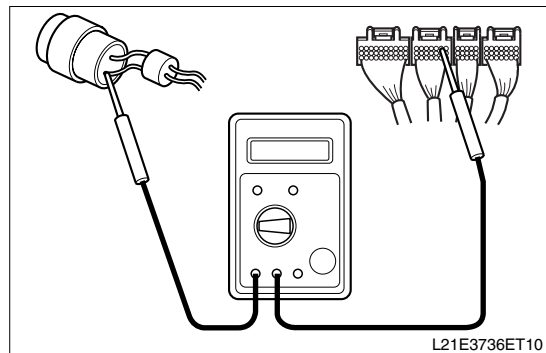
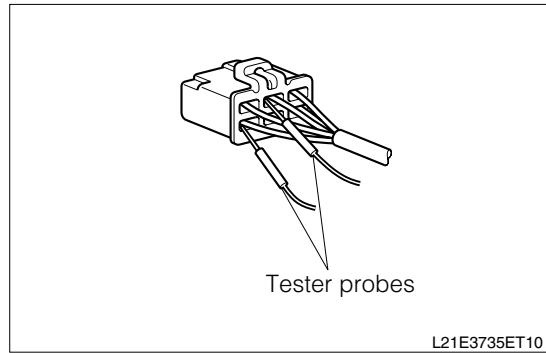
- Lightly shake the wire harness in a longitudinal direction as well as in a horizontal direction when the resistance is measured.

5. Check of EFI ECU and its circuit

- (1) The EFI ECU and its circuit can be checked by measuring the voltage and resistance at the EFI ECU connector. In order to narrow down the cause further after the cause has been decided to a certain system, it is imperative to measure the voltage and resistance of the external route of the EFI ECU.
- (2) The measurement of the voltage and resistance is conducted during the system check, following the procedure given below.

CAUTION

- The EFI ECU cannot be checked by itself. Never connect a voltmeter or an ohmmeter to the EFI ECU with the connector disconnected from the EFI ECU.
- When conducting the continuity test or measuring the resistance, turn "LOCK" the ignition switch once. Then, disconnect the connector at the EFI ECU.



6. Voltage check

(1) Installation of SST

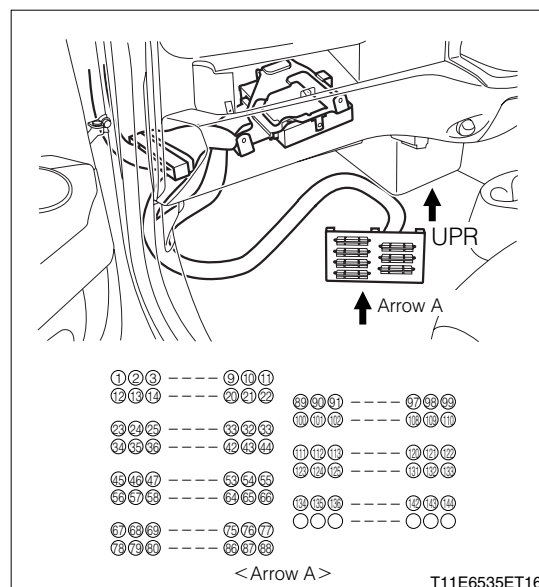
First, install the SST between the engine ECU and the vehicle harness.

For the installation procedure, refer to the section under.

- (2) Measure the voltages between the respective terminals of the SST connectors.
- (3) Check to see if the measured values conform to the specification in accordance with the following table "Characteristics of ECU Output".

NOTE

- Make sure that the battery voltage is 11 V or more with the ignition switch turned "ON", for each terminal voltage is affected by the battery voltage.



7. Resistance check

(1) Installation of SST

First, install the SST between the engine ECU and the vehicle harness. However, the SST connector at the ECU side should not be connected.

For the installation procedure, refer to the section under "Connecting Procedure for SST".

- (2) Measure the resistances between the respective terminals.
- (3) Check to see if the measured resistances conform to the specification in accordance with the following table "Standard Resistances".

NOTE

- Make sure that the ignition switch is turned "LOCK" during the measurement.
- The following table shows the resistance at the time when the temperature of parts is 20°C.

STANDARD RESISTANCES

System to be checked	Terminals	Circuit	Standard resistance
Front oxygen sensor system	15 (OXH1) - 27 (+B)	Front oxygen sensor and main relay	6.7 - 7.7 Ω
Rear oxygen sensor system	14 (OXH2) - 27 (+B)	Rear oxygen sensor and main relay	11.7 - 14.5 Ω
Engine revolution sensor system	59 (N1+) - 128 (N1-)	Engine revolution sensor system	1850 - 2450 Ω
Camshaft position sensor system	58(N2+) - 127(N2-)	Camshaft position sensor system	1850 - 2450 Ω
Injector system	24 (#10) - 27 (+B)	No.1 - 3 fuel injector	11.6 - 12.4 Ω
	23 (#20) - 27 (+B)		
	22 (#30) - 27 (+B)		
VSV for evaporative emission control system purge control system	16 (PRG) - 27 (+B)	Evaporative emission purge control valve	30 - 34 Ω
Ground system	125 (E1) - Body ground	Ground	10 Ω or less
	19 (E2) - Body ground		
	122 (E2PM) - Body ground		
	116 (E21) - Body ground		

7-10-2 CHECK AND REPAIR BY CHART ACCORDING TO DTC

(1) Scan tool data (ECU DATA)

1. The following data values given below are representative values obtained under the "normal condition".

However, there are cases where the system is functioning normally even if the measured value is different from the values listed here. Therefore, no judgment as to whether any malfunction is occurring or not should be made only on the basis of these data under the "normal condition".

NOTE

- The data monitor value may vary significantly, depending on slight difference in the measurement, difference in the measurement environment, deterioration due to passage of time in the vehicle, and so forth. Therefore, it is difficult to indicate the definite reference values. Hence, there are cases where malfunctions are occurring even when the measured value is within the reference value.
- With regard to minor phenomenon, such as hesitation and rough idling, it is necessary to make total evaluation, based on all the data monitor items, by sampling the data of the vehicle of the same type under the same conditions and comparing them.
- In the case of the OBD II generic scan tool, it is possible to take a reading of the values with an ✖ mark in the following table.
- When checking the data under a condition where the engine is "idling" or "racing", the shift lever should be placed in the "neutral", the A/C switch should be turned "OFF", and all accessory switches should be turned "OFF".

Items specified by CARB

	DS-21 diagnosis tester display	Signal name	Vehicle condition	Reference values under normal condition
✖1	FUEL SYSTEM	FSYS	At idle speed after warming up	O ₂
✖2	CALC LOAD	LOAD	At idle speed after warming up	1.7 - 2.2 %
			At 2500 rpm with no load after warming up	5.0 - 6.3 %
✖3	COOLANT TEMP	ECT	Cold start - Warming up running	Value should be rising gradually
			When engine has warmed up completely	80 - 102°C
			During fail-safe function (At time of starting)	20°C
			During fail-safe function (After starting)	80°C
✖4	SHORT FT	SHRT	At idle speed after warming up	- 20 - 20 %
✖5	LONG FT	LONG	At idle speed after warming up	- 16 - + 16 %
✖6	ENGINE SPEED	RPM	When engine is running at constant speed	There should be no remarkable variation
			At idle speed after warming up	750 - 900 rpm
✖7	VEHICLE SPEED	VS	During running (Compared with speedometer)	There should be no remarkable variation
✖8	IGN ADVANCE	ITA	At idle speed after warming up	- 5 - 15°
			When idle switch is "OFF"	Changes should be made according to running conditions
✖9	INTAKE AIR TEMP	IAT	When engine is running	Changes should be made according to running conditions
✖10	MAIN ABS PRESS	MAP	When ignition switch is "ON"	80 - 110 kPa
			At idle speed after warming up	21 - 48 kPa
			During fail-safe function	34 - 72 kPa
✖11	THROTTLE POS	TP	When acceleration pedal is operate	Changes should be made according to pedal operation
✖12	OXYGEN SENSOR S1	O ₂ FP	At idle speed after warming up	- 5 - + 5 %
		O ₂ FV		0.0 - 1.0 V
✖13	OXYGEN SENSOR S2	O ₂ RP	When engine is running at 2000 rpm, for 3 minutes or longer after warming up.	20 - 77 %
		O ₂ RV		0.1 - 0.9 V
✖14	MIL ON RUN DIST	DWM	When there is no DTC	0 km

Items specified by DMC

	diagnosis tester (DS-21/DS-II) display	Signal name	Vehicle condition	Reference values under normal condition
1	BATTERY VOLTAGE	BAT	When engine is running at 5000 rpm (25 °C)	Approx. 14 V
2	ELECTRIC LOAD	DSW	When light, heater blower, defogger or radiator fan is "ON"	OFF→ON
3	AIR CONDITIONING	AC	When air conditioner switch is set to "ON"	OFF→ON
4	CTP SWITCH	IDL	When throttle valve is switched from fully closed state to opened state	ON→OFF
5	INJ PULSE WIDTH	TAU	Cold start - Warming up running	Value should be decreasing gradually
			At idle speed after warming up	1.2 - 1.8 ms
6	ISC DUTY RATIO	ISC	When ignition switch is "ON"	0%
			Cold start - Warming up running	Value should be decreasing gradually
			At idle speed after warming up	5 - 15 %
			When air conditioner switch is set to "ON"	20 - 60 %
			When light, heater blower or defogger is "ON"	7 - 19 %
			At idle speed after warming up	2 - 14%
7	ACTUAL DIS ANGLE OF IN CAM	VT	During vehicle running	The value changes, depending on driving conditions.
			At idle speed after warming up	0°CA
8	TARGET DISP ANGLE OF IN CAM	VTT	During vehicle running	The value changes, depending on driving conditions.

NOTE

- The items with a (✕) mark is provided only for the EU specifications. Therefore, in the case of the non-EU specification vehicles, no indication will be made.

(2) Scan tool data (ECU DATA)

- The following data values given below are representative values obtained under the "normal condition".

However, there are cases where the system is functioning normally even if the measured value is different from the values listed here. Therefore, no judgment as to whether any malfunction is occurring or not should be made only on the basis of these data under the "normal condition".

NOTE

- The data monitor value may vary significantly, depending on slight difference in the measurement, difference in the measurement environment, deterioration due to passage of time in the vehicle, and so forth. Therefore, it is difficult to indicate the definite reference values. Hence, there are cases where malfunctions are occurring even when the measured value is within the reference value.
- With regard to minor phenomenon, such as hesitation and rough idling, it is necessary to make total evaluation, based on all the data monitor items, by sampling the data of the vehicle of the same type under the same conditions and comparing them.
- In the case of the OBD II generic scan tool, it is possible to take a reading of the values with an ✖ mark in the following table.
- When checking the data under a condition where the engine is "idling" or "racing", the shift lever should be placed in the "neutral", the A/C switch should be turned "OFF", and all accessory switches should be turned "OFF".

Items specified by CARB

	DS-21 diagnosis tester display	Signal name	Vehicle condition	Reference values under normal condition
*1	FUEL SYSTEM	FSYS	At idle speed after warming up	O ₂
*2	CALC LOAD	LOAD	At idle speed after warming up	1.7 - 2.2 %
			At 2500 rpm with no load after warming up	5.0 - 6.3 %
*3	COOLANT TEMP	ECT	Cold start - Warming up running	Value should be rising gradually
			When engine has warmed up completely	80 - 102°C
			During fail-safe function (At time of starting)	20°C
			During fail-safe function (After starting)	80°C
*4	SHORT FT	SHRT	At idle speed after warming up	-20 - 20 %
*5	LONG FT	LONG	At idle speed after warming up	-16 - +16 %
*6	ENGINE SPEED	RPM	When engine is running at constant speed	There should be no remarkable variation
			At idle speed after warming up	750 - 900 rpm
*7	VEHICLE SPEED	VS	During running (Compared with speedometer)	There should be no remarkable variation
*8	IGN ADVANCE	ITA	At idle speed after warming up	-5 - 15°
			When idle switch is "OFF"	Changes should be made according to running conditions
*9	INTAKE AIR TEMP	IAT	When engine is running	Changes should be made according to running conditions
*10	MAIN ABS PRESS	MAP	When ignition switch is "ON"	80 - 110 kPa
			At idle speed after warming up	21 - 48 kPa
			During fail-safe function	34 - 72 kPa
*11	THROTTLE POS	TP	When acceleration pedal is operate	Changes should be made according to pedal operation
*12	OXYGEN SENSOR S1	O ₂ FP	At idle speed after warming up	-5 - +5 %
		O ₂ FV		0.0 - 1.0 V
*13	OXYGEN SENSOR S2	O ₂ RP	When engine is running at 2000 rpm, for 3 minutes or longer after warming up.	20 - 77 %
		O ₂ RV		0.1 - 0.9 V
*14	MIL ON RUN DIST	DWM	When there is no DTC	0 km

Items specified by DMC

	diagnosis tester (DS-21/DS-II) display	Signal name	Vehicle condition	Reference values under normal condition
1	BATTERY VOLTAGE	BAT	When engine is running at 5000 rpm (25 °C)	Approx. 14 V
2	ELECTRIC LOAD	DSW	When light, heater blower, defogger or radiator fan is "ON"	OFF→ON
3	AIR CONDITIONING	AC	When air conditioner switch is set to "ON"	OFF→ON
4	CTP SWITCH	IDL	When throttle valve is switched from fully closed state to opened state	ON→OFF
5	INJ PULSE WIDTH	TAU	Cold start - Warming up running	Value should be decreasing gradually
			At idle speed after warming up	1.2 - 1.8 ms
6	ISC DUTY RATIO	ISC	When ignition switch is "ON"	0%
			Cold start - Warming up running	Value should be decreasing gradually
			At idle speed after warming up	5 - 15 %
			When air conditioner switch is set to "ON"	20 - 60 %
			When light, heater blower or defogger is "ON"	7 - 19 %
			At idle speed after warming up	2 - 14%
7	ACTUAL DIS ANGLE OF IN CAM	VT	During vehicle running	The value changes, depending on driving conditions.
			At idle speed after warming up	0°C A
8	TARGET DISP ANGLE OF IN CAM	VTT	During vehicle running	The value changes, depending on driving conditions.

NOTE

- The items with a (✕) mark is provided only for the EU specifications. Therefore, in the case of the non-EU specification vehicles, no indication will be made.

(3) DTC chart specifications

1. For details of the checking of each code, refer to the DTC chart for each code.

Codes specified by ISO/SAE

DTC No.	Diagnosis Items	Diagnosis contents	Malfunction evaluation method	Warning indication
P0010/74	Oil control valve control system malfunction	When malfunction takes place in the control voltage for the oil control valve.	1 trip	○
P0011/73 P0012/73	Variable valve timing control system (advanced timing angle) Variable valve timing control system (retarded timing angle)	When abnormalities take place two times consecutively in the valve timing control. · Oil control valve abnormality, admission of foreign matters in the oil passage	1 trip	○
P0016/62	Valve chain timing defective	When differences between the cam angle sensor and the engine speed sensor have been detected five times successively Extension of the timing chain	5 trip	—
P0016/75	Variable valve timing control system (valve timing)	When abnormalities take place two times consecutively in the valve timing control. · Deviation of the valve timing	2 trip	○
P0105/31	Manifold absolute pressure/barometric pressure circuit malfunction	When abnormality takes place in the signal from the intake manifold pressure/intake temperature integrated sensor (Manifold absolute pressure sensor section) circuit: · Malfunction of the sensor, or open wire or short circuit in the intake manifold pressure/intake temperature integrated sensor (Manifold absolute pressure sensor section) circuit.	1 trip	○
P0110/43	Intake air temperature sensor circuit malfunction	When malfunction takes place in the signal from the intake manifold pressure/intake temperature integrated sensor (Intake air temperature sensor section): · Malfunction of the sensor, or open wire or short circuit in intake manifold pressure/intake temperature integrated sensor (Intake air temperature sensor section) circuit.	1 trip	○
P0115/42	Engine coolant temperature sensor circuit malfunction	When abnormality takes place in the signal from the engine coolant temperature sensor: · Malfunction of the sensor, or open wire or short circuit in engine coolant temperature sensor circuit.	1 trip	○
P0116/42	Engine coolant temperature sensor circuit malfunction	When abnormality takes place in the signal from the engine coolant temperature sensor: · Malfunction of the sensor, or open wire or short circuit in engine coolant temperature sensor circuit.	2 trip	○
P0120/41	Throttle/pedal position sensor/switch	When abnormality takes place in the signal from throttle/pedal position sensor: · Malfunction of the sensor, or open wire or short circuit in throttle/pedal position sensor/switch circuit.	1 trip	○
P0130/21 P0133/21	Oxygen sensor circuit malfunction (Bank 1 sensor 1)	When abnormalities take place two times consecutively in the signal from the oxygen sensor: · Malfunction of the sensor, or open wire or short circuit in oxygen sensor circuit.	2 trip	○

P0135/23	Oxygen sensor heater circuit malfunction (Bank1 sensor1).	When abnormalities take place in the signal from the oxygen sensor heater: · Open wire or short circuit in oxygen sensor heater circuit.	2 trip	○
P0136/22 ^{*1}	Rear oxygen sensor circuit malfunction (Bank 1 sensor 2)	When abnormalities take place two times consecutively in the signal from the rear oxygen sensor: · Malfunction of the sensor, or open wire or short in the rear oxygen sensor circuit.	2 trip	○
P0141/24 ^{*1}	Oxygen sensor heater circuit malfunction (Bank 1 sensor 2)	When abnormalities take place in the signal from the oxygen sensor heater: · Open wire or short circuit in oxygen sensor heater circuit.	2 trip	○
P0171/25	Fuel trim system too lean (Air-fuel ratio lean malfunction, bank 1)	When the air-to-fuel ratio deviates two times consecutively to the lean side due to abnormality of the fuel trim system: · Abnormal combustion pressure, malfunctioning injector or oxygen sensor	2 trip	○
P0172/26	Fuel trim system too rich (Air-fuel ratio rich malfunction, bank 1)	When the air-to-fuel ratio deviates two times consecutively to the rich side due to abnormality of the fuel trim system: · Abnormal combustion pressure, malfunctioning injector or oxygen sensor	2 trip	○
P0300/17 ^{*1}	Random/multiple cylinder misfire detected	When malfunction takes place in the signal from the Ion current combustion control system	2 trip	MIL flashing during misfire detection.
P0301/17 ^{*1}	Misfire detected			○
P0302/17 ^{*1}	Cylinder 1			
P0303/17 ^{*1}	Cylinder 2 Cylinder 3			
P0325/18	Knock sensor 1 circuit malfunction	When malfunction takes place in the signal from the knock sensor: · Malfunction of the sensor, or open wire or short circuit in the signal system	1 trip	—
P0335/13	Engine revolution sensor circuit malfunction	When malfunction takes place in the signal from the engine revolution sensor: · Malfunction of the sensor, or open wire or short circuit in engine revolution sensor circuit.	1 trip	○
P0340/14	Camshaft position sensor circuit malfunction	When malfunction takes place in the signal from the camshaft position sensor. · Malfunction of the sensor, or open wire or short-circuit in the sensor circuit.	1 trip	○
P0350/16 ^{*2}	Ignition system circuit malfunction	When the ignition signal is not inputted continually.	1trip	○
P0401/79	Stepper motor type EGR valve system malfunction (Function)	When abnormalities take place in the flow rate of EGR gas:	2 trip	○
P0403/79	Stepper motor type EGR valve system malfunction (Open wire)	When abnormalities take place in the stepper motor type EGR valve detection signal: · Open wire or short circuit in the signal system	1 trip	○
P0420/27 ^{*1}	Catalyst deterioration	When, after warming up the engine, and while the vehicle speed is 50km/h, the voltage of the rear oxygen sensor signal is high and a state of slow response continues for 40 seconds or more, and when these abnormal signals are detected twice or more	2 trip	○

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P0443/76	Evaporative emission control system purge control valve circuit malfunction	When malfunction takes place in the detection signal of the evaporative emission control system purge control valve: · Open wire or short circuit in evaporative emission control system purge control circuit.	2 trip	○
P500/52	Vehicle speed sensor circuit malfunction	When malfunction takes place in the signal from the vehicle speed sensor. · Sensor malfunction, open wire or short circuit of the signal system	1 trip ^{※2} 2 trip ^{※1}	○
P0505/71	Idle control system malfunction	When malfunction takes in the signal from the valve for ISC. · Open wire or short in valve for ISC circuit	1 trip	○
P0560/61 ^{※1}	Backup power supply system	When an abnormality occurs in the ECU backup power system · Open circuits, short circuits, etc. of the backup power supply system	1 trip	○
U0167/81	Immobilizer signal malfunction	When the rolling codes can not be exchanged between the EFI ECU and the immobilizer ECU or the rolling codes are not matched.	1 trip	—

NOTE

- 1 trip: 1 trip detection logic
- 2 trip: 2 trip detection logic
- MIL: Malfunction indicator lamp
- When the "O" mark is shown in the MIL column, the lamp will go on for that DTC number, but when the "—" mark is shown, the lamp will not go on for that DTC number. Therefore, it is possible to read out the DTC number by using the diagnosis tester (DS-II) or the OBDII generic scan tool. As for the DTC number bearing the mark, the MIL will go on except the EU specifications.
- Diagnosis code with the marking ✕1: Rear oxygen sensor equipped vehicles only
- Diagnosis code with the marking ✕2: Rear oxygen sensor not equipped vehicles only

Codes specified by DMC

DTC No.	Diagnosis Items	Diagnosis contents	Malfunction evaluation method	Warning indication
P0535/44	A/C evaporator temperature sensor circuit malfunction	When malfunction takes place in the signal from the A/C evaporator temperature sensor. · Malfunction of the sensor, or open wire or short circuit in A/C evaporator temperature sensor circuit.	1 trip	—
P1399/36✕1	Ion current combustion control system malfunction	When malfunction takes place in the signal from Ion current combustion control system.	2 trip	○
P2226/32✕1	Atmospheric pressure sensor circuit malfunction	When the signals from the atmospheric pressure sensor are not outputted continuously over a certain length of time after starting.	1 trip	○
U0121/86	ABS communication failure	When the communication signal from the ABS actuator cannot be received: · Open wire or short circuit between EFI ECU and ABS actuator.	1 trip	○
U0156/87	Combination meter communication failure	When the communication signal from the combination meter cannot be received: · Open wire or short circuit between EFI ECU and combination meter	1 trip	○
U0001/88	Communication history error	When there is no communication establishment history with all the CAN communication making-up ECU. · Open wire, etc. in the wiring of the CAN communication terminal of the EFI ECU.	1 trip	○

NOTE

- 1 trip: 1 trip detection logic
- 2 trip: 2 trip detection logic
- MIL: Malfunction indicator lamp
- When the "O" mark is shown in the MIL column, the lamp will go on for that DTC number, but when the "—" mark is shown, the lamp will not go on for that DTC No. Therefore, it is possible to read out the DTC No. by using the diagnosis tester (DS-II) or the OBDII generic scan tool. As for the DTC No. bearing the mark, the MIL will go on except the EU specifications.
- DTC No. with ✕1 mark: For EU specifications

(4) Fail-safe function

1. When any of the following DTC has been detected, the EFI ECU enters the fail-safe mode in order to make it possible for the vehicle to drive for evacuation and to ensure safety. When the malfunction is remedied to a normal condition, the fail-safe control will be released.
2. However, the diagnosis results will remain memorized. Hence, it is necessary to determine whether the malfunction still persists or not.

Fail-safe specifications

Detected item	Fail-safe operation	Fail-specifications
Manifold absolute pressure sensor signal system	When abnormality takes place in the signal from the intake manifold pressure/intake temperature integrated sensor (Intake manifold pressure section) :	· The pressure estimated by the throttle opening and engine revolution speed is set as the intake manifold pressure. If the signal from the throttle position sensor is also faulty, the signal from the intake manifold pressure/intake temperature integrated sensor is set at a constant value. · If both the throttle opening angle and engine revolution speed exceed their set values, the fuel is cut.
Ignition system	When malfunction takes place in the ignition signal:	The fuel injection of the cylinder in which abnormality is taking place in the ignition signal is cut.
Water temperature sensor signal system	When malfunction takes place in the signal from the water temperature sensor:	The signal from the water temperature sensor is set to a constant value.
Throttle position sensor signal system	When malfunction takes place in the signal from the throttle position sensor:	The signal from the throttle position sensor is set to a constant value.
A/C evaporator temperature sensor signal system	When malfunction takes place in the signal from the A/C evaporator temperature sensor.	The air conditioner will be cut.
Atmospheric pressure sensor circuit malfunction	When malfunction takes place in the signal from the atmospheric pressure sensor:	The signal from the atmospheric pressure sensor is set to a constant value.
Knock sensor system	When abnormality takes place in the signal from the knock sensor circuit	The ignition timing is retarded.
Intake air temperature sensor signal system	When malfunction takes place in the signal from the intake manifold pressure/intake temperature integrated sensor (Intake air temperature sensor section):	The signal from the intake manifold pressure/intake temperature integrated sensor (Intake temperature sensor) is set to a constant value.
Stepper motor system for ISC	When malfunction signal takes place in the stepper motor for ISC:	· The energizing control to the stepper motor for ISC is cut off. · The fuel injection is cut off.
Oil control valve system	When malfunction takes place in the oil control valve control voltage.	Oil control valve energizing control is prohibited.
Rear oxygen sensor system	When malfunction takes place in the signal from the rear oxygen sensor:	The feedback control is turned to open control.
Stepper motor type EGR valve system	When malfunction takes place in the flow rate of EGR gas. · When the wiring to the stepper motor for EGR is disconnected or shorted.	The energizing control of the stepper motor for EGR is cancelled after the EGR valve is brought to a fully shut condition.
Immobilizer signal circuit malfunction	· When abnormality occur in the wiring and reading-out of the rolling codes into/from the immobilizer ECU during immobilizer communication. · When the rolling codes can not be exchanged between the EFI ECU and immobilizer ECU or rolling codes are not matched.	Prohibition of fuel injection and ignition.

7-11 TROUBLE SHOOTING ACCORDING TO MALFUNCTION PHENOMENA

7-11-1 DESCRIPTION

1. Here, checking procedures when there is no abnormal code indication of the diagnosis but there is a malfunction taking place are described.
2. As for the trouble shooting according to the malfunction phenomena, first organize the contents of the diagnosis by interview, basic check and EFI ECU circuit check results. Then, narrow down and decide the check priority of the possible causes by cross-checking it with the list of possible causes according to malfunction phenomena. On that basis, perform trouble shooting sequentially for each system and parts by following the directions provided in the list.

WARNING

- If the vehicle is driven with the SST (EFI computer check sub harness, etc.) connected, there is a possibility of causing malfunction and may be very dangerous. Therefore, remove it without fail.

NOTE

- When performing checks for each component, make sure to check the harness and connectors that are connected to it.
- As for the reason why no malfunction is detected by diagnosis even when the malfunction phenomena is reproduced, it is possible that there is a malfunction taking place out of the range of the code output conditions of the diagnosis, or there is a malfunction taking place out of the diagnosis circuit.

7-11-2 LIST OF POSSIBLE CAUSES ACCORDING TO MALFUNCTION PHENOMENA

(1) Poor startability

Malfunction phenomena		Possible causes		
		System	Components	Malfunction mode
No initial explosion	Power supply system		EFI ECU power supply circuit	Open wire and short circuit
			Ignition switch	Will not turn "ON"
			Main relay	
	Engine earth system		Engine earth*	Open wire, defective earth
	Fuel system		Fuel pump relay	Will not turn "ON"
			Fuel line, Fuel filter	Clogging
			Injector	Will not inject, constant injection
			Fuel pump	Will not operate
	Ignition system		Engine fuse*	Fuse melt down
			Ignition coil	Will not generate sparks
			Spark plug	
			Ignition timing	Deviated
	Control system		Engine revolution sensor	"NE signal" is not outputted.
			Camshaft position sensor	Defective output signal
There is initial explosion but no complete explosion.	Fuel system		Fuel pump relay	Will not turn "ON"
			Fuel line, Fuel filter	Clogging
			Injector	Leakage, Will not inject, constant injection
			Fuel pump	Will not operate
	Ignition system		Spark plug	Misfire
	Intake system		Air hoses, etc.	Leakage
	Control system		Intake manifold pressure/intake temperature integrated sensor	Characteristics deviated, open wire, short circuit
			Water temperature sensor	
			Engine revolution sensor	Defective output signal
			Camshaft position sensor	
			Oil control valve	Malfunction
			Stepper motor type EGR valve	Defective closing
Hard to start	During cold period	Intake system	Throttle body	Defective opening, does not open
		Control system	Water temperature sensor	Characteristics deviated, open wire, short circuit
	During hot period	Fuel system	Injector	Leakage
		Intake system	Stepper motor for ISC	Defective opening, will not open
	At all times	Fuel system	Fuel pump relay	Will not turn "ON"
			Fuel line, Fuel filter	Clogging
			Injector	Leakage
		Ignition system	Spark plug	No smoldering
		Intake system	Stepper motor for ISC	Defective opening
		Control system	Stepper motor type EGR valve	Defective closing

※: If the IG switch is turned "ON" under the condition of defective grounding of the engine earth connection (Between the 125 (E1) connection earth and the engine block), the "ENGINE fuse (10A)" can melt down.

(2) Idling malfunction

Malfunction phenomena	Possible causes		
	System	Components	Malfunction mode
Fast idle not working	Intake system	Stepper motor for ISC	Defective opening, will not open
	Control system	Water temperature sensor	Open wire and short circuit
Idling speed is high.	Intake system	Air hoses, etc.	Leakage
		Throttle body	Defective closing
		Stepper motor for ISC	Constantly open
	Control system	Intake manifold pressure/intake temperature integrated sensor	Characteristics deviated, open wire, short circuit
		Water temperature sensor	
		Throttle position sensor	Characteristics deviated
		Defogger switch	Constantly "ON"
		Stop lamp switch	
		Heater blower signal	
Idling speed is low.	Intake system	Air hoses, etc.	Clogging
		Throttle body	
	Control system	Intake manifold pressure/intake temperature integrated sensor	Characteristics deviated
		Water temperature sensor	
		Defogger switch	Will not turn "ON"
		Stop lamp switch	
		Heater blower signal	
When idling hunting takes place.	Intake system	Air hoses, etc.	Leakage
		Throttle body	Constantly open
		Stepper motor for ISC	
	Control system	Intake manifold pressure/intake temperature integrated sensor	Characteristics deviated
		Camshaft position sensor	Defective output signal
Unstable idling	Fuel system	Oil control valve	Malfunction
		Injector	Leakage, Will not inject
	Intake system	Fuel pump	Malfunction
		Throttle body	Suction
	Ignition system	Ignition coil	Poor connection
		Spark plug	Misfire
	Control system	Intake manifold pressure/intake temperature integrated sensor	Malfunction, poor connection
		Oxygen sensor	Malfunction, poor connection
		Stepper motor type EGR valve	Defective closing

(3) Engine stall

Malfunction phenomena	Possible causes		
	System	Components	Malfunction mode
The engine stalls after a while from starting.	Fuel system	Fuel pump relay	Will not turn "ON"
		Fuel line, fuel filter	Clogging
		Fuel pump	Will not operate
	Control system	Water temperature sensor	Characteristics deviated
		Camshaft position sensor	Defective output signal
		Oil control valve	Malfunction
The engine stalls when pressing on the accelerator.	Control system	Stepper motor type EGR valve	Defective closing
		Intake manifold pressure/intake temperature integrated sensor	Characteristics deviated
		Water temperature sensor	
		Camshaft position sensor	Defective output signal
The engine stalls when releasing the accelerator.	Intake system	Oil control valve	
	Intake system	Throttle body	Malfunction
		Intake manifold pressure/intake temperature integrated sensor	
When the air conditioner is turned "ON"	Control system	Stepper motor type EGR valve	Characteristics deviated
		Stepper motor for ISC	Defective closing
The engine stalls but can be restarted.	Intake system	Stepper motor for ISC	Constantly closed
		EFI ECU power supply circuit	Poor connection
		Ignition switch	
		Main relay	
	Intake system	Stepper motor for ISC	Constantly closed
	Ignition system	Ignition coil	Poor connection
	Control system	Intake manifold pressure/intake temperature integrated sensor	Poor connection
		Engine revolution sensor	
		Stepper motor type EGR valve	Malfunction

(4) Defective running

Malfunction phenomena	Possible causes		
	System	Components	Malfunction mode
Hesitation takes place when accelerating.	Fuel system	Fuel line, fuel filter	Clogging
		Injector	Flow rate decrease
		Fuel pump	
	Ignition system	Ignition coil	Ignition missing
		Spark plug	Misfire
		Ignition timing	Deviated
	Control system	Intake manifold pressure/intake temperature integrated sensor	Characteristics deviated, open wire, short circuit
		Water temperature sensor	
		Throttle position sensor	
		Knock sensor	Open wire and short circuit
Back fire, after fire	Fuel system	Injector	Flow rate decrease
		Ignition coil	Poor connection
		Spark plug	Misfire
	Ignition system	Ignition timing	Deviated
		Intake manifold pressure/intake temperature integrated sensor	Malfunction
		Water temperature sensor	Characteristics deviated
		Camshaft position sensor	Defective output signal
		Oil control valve	Malfunction
		Stepper motor type EGR valve	
Insufficient output	Fuel system	Fuel line, fuel filter	Fuel pressure will not rise.
		Injector	Flow rate decrease
		Fuel pump	Fuel pressure will not rise.
	Ignition system	Spark plug	Misfire
		Intake manifold pressure/intake temperature integrated sensor	Characteristics deviated, open wire, short circuit
	Control system	Water temperature sensor	
		Throttle position sensor	Characteristics deviated
		Camshaft position sensor	Defective output signal
		Oil control valve	Malfunction
		Stepper motor type EGR valve	
Emits black smoke.	Fuel system	Injector	Constant injection
	Control system	Intake manifold pressure/intake temperature integrated sensor	Characteristics deviated, open wire, short circuit
		Water temperature sensor	Characteristics deviated
		Throttle position sensor	
Hunting takes place while running.	Fuel system	Fuel line, fuel filter	Clogging
		Injector	Malfunction
	Ignition system	Ignition coil	Poor connection
		Throttle position sensor	Characteristics deviated
	Control system	Camshaft position sensor	Defective output signal
		Oil control valve	Malfunction
Abnormal knocking takes place.	Control system	Intake manifold pressure/intake temperature integrated sensor	Characteristics deviated, open wire, short circuit
		Throttle position sensor	Characteristics deviated
		Knock sensor	Characteristics deviated, open wire, short circuit
		Stepper motor type EGR valve	Malfunction

7-12 TROUBLE SHOOTING ACCORDING TO DIAGNOSIS CODE

7-12-1 DTC NO.P0016/62 VALVE CHAIN TIMING FAULTY

(1) Output conditions

- 1. When deviations between the camshaft position sensor and the engine speed sensor have been detected 5 times consecutively

(2) Checking points

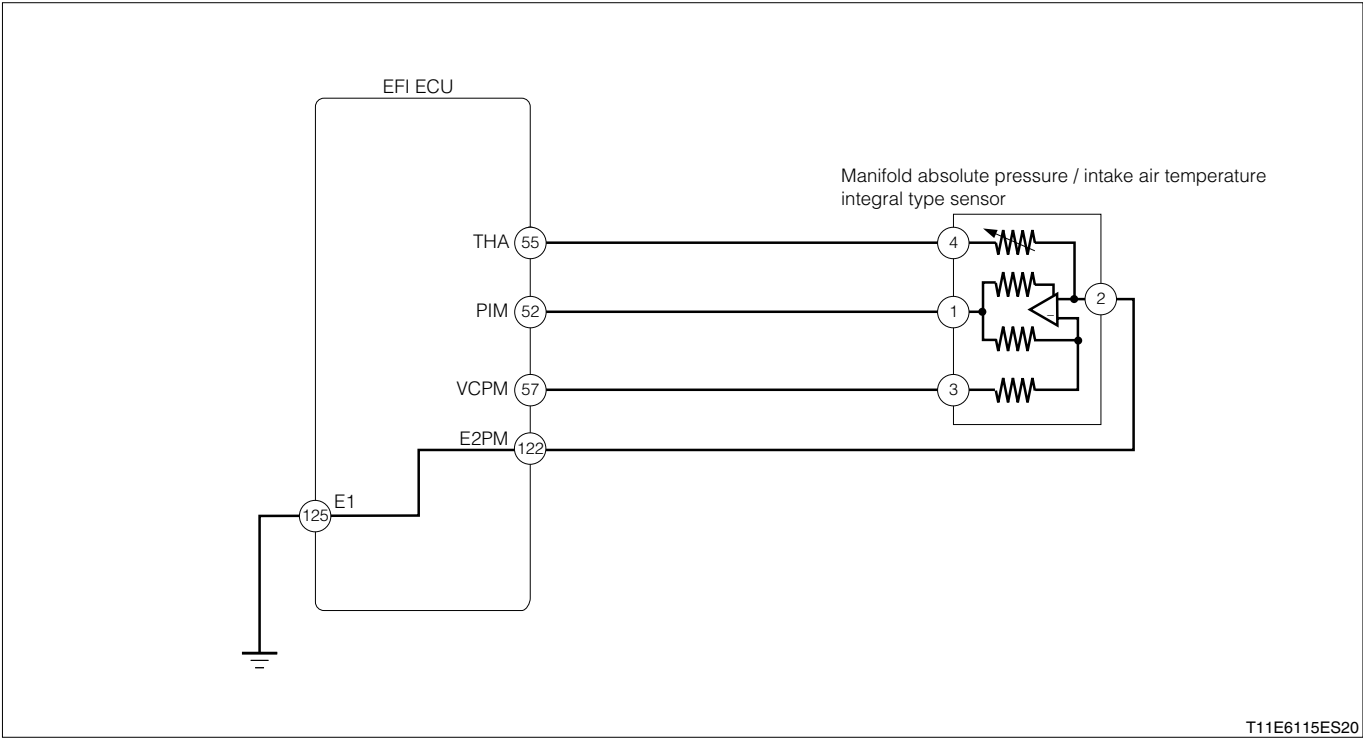
- 1. Is the timing chain extended?

(3) Check procedure

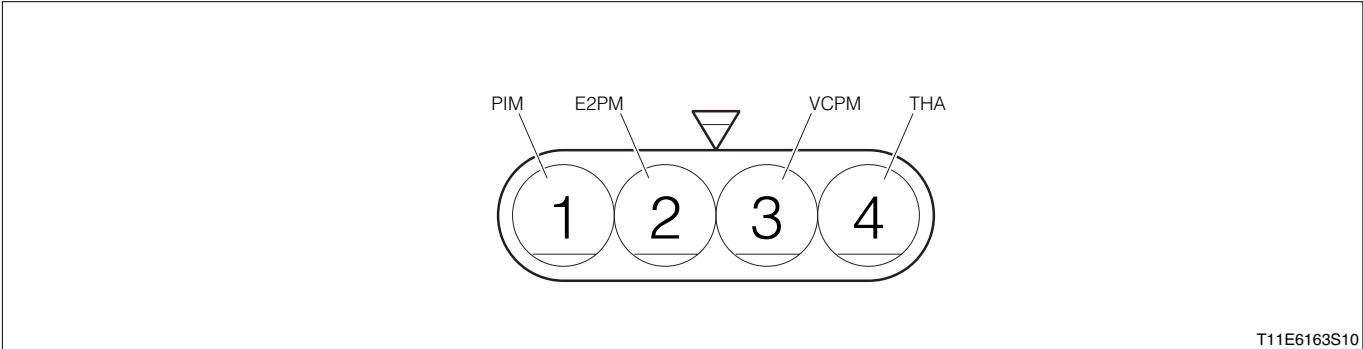
- 1. Check the timing chain for extension.

7-12-2 DTC NO.P0105/31 MANIFOLD ABSOLUTE PRESSURE/BAROMETRIC PRESSURE CIRCUIT MALFUNCTION

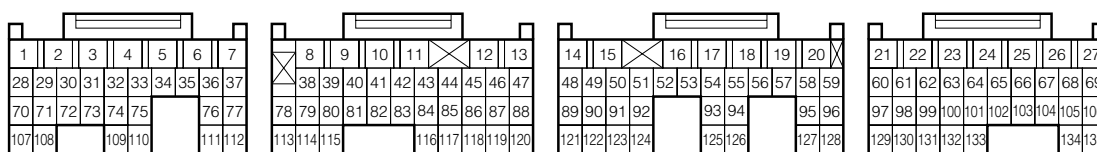
(1) System diagram



Manifold absolute pressure/intake air temperature integral type sensor connection vehicle harness side connector



EFI ECU connection vehicle harness side connector



H11E6051S10

(2) Circuit description

1. The manifold absolute pressure sensor detects the intake manifold pressure as a voltage.
2. Since the Manifold absolute pressure, intake air temperature integral type sensor (Manifold absolute pressure sensor section) does not use the atmospheric pressure as a criterion, but senses the absolute pressure inside the intake manifold (The pressure in proportion to the present absolute vacuum 0), it is not influenced by fluctuations in the atmospheric pressure due to high altitude and other factors. This permits it to control the air-fuel ratio at the proper level under all conditions.

(3) Diagnosis code output conditions

1. When the signals from the manifold absolute pressure/intake air temperature integral type sensor (Manifold absolute pressure sensor section) are not outputted continuously over a certain length of time:

NOTE

- After confirming DTC P0105/31, use the OBD II generic scan tool or diagnosis tester (DS-21/DS-II) to confirm the "Manifold abs. pressure" from "CURRENT DATA".
- If the ECU detects DTC P0105/31, it operates the fail-safe function, keeping the ignition timing and injection volume constant and making it possible to drive the vehicle.

(4) Trouble area

1. Open wire or short circuit in manifold absolute pressure sensor circuit
2. Manifold absolute pressure, intake air temperature integral type sensor (Manifold absolute pressure sensor section) sensor
3. EFI ECU

(5) Checking points

1. Are the signals from the manifold absolute pressure/intake air temperature integral type sensor (Manifold absolute pressure sensor section) inputted to the EFI?
2. Is the harness between the manifold absolute pressure/intake air temperature integral type sensor (Manifold absolute pressure sensor section) and the EFI ECU normal?
3. Is the power supply voltage of the manifold absolute pressure/intake air temperature integral type sensor (Manifold absolute pressure sensor section) normal?
4. Is the output of the manifold absolute pressure/intake air temperature integral type sensor (Manifold absolute pressure sensor section) normal?

(6) Inspection procedure

① When using diagnosis tester (DS-21/DS-II) or OBD II generic scan tool:

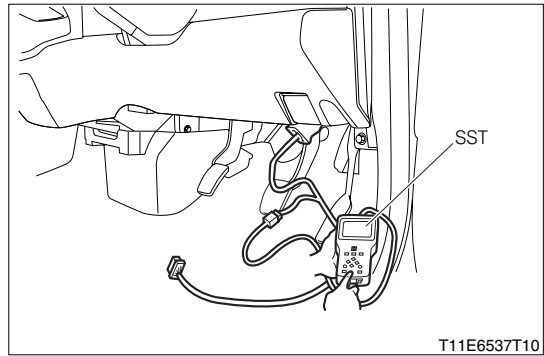
▷1. Check of output value of sensor.

1. The IG switch turned "LOCK".

2. Diagnosis tester connect the DLC.

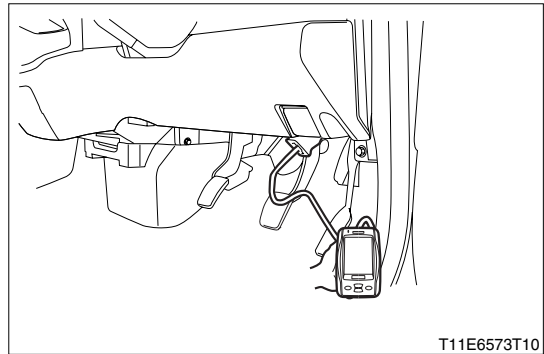
- (1) In case of DS-21, connect the DS-21 diagnosis tester to DLC through the SST.

SST: 09991-87404-000



- (2) In case of DS-II, connect the DS-II diagnosis tester directly to DLC.

- (3) In case of the OBD II generic scan tool, connect the OBD II generic scan tool directly to DLC.



3. After turning "ON" the IG switch, turn "ON" the main switch of the tester.

4. Read the "Manifold abs. pressure" value of the diagnosis tester (DS-21/DS-II) or OBD II generic scan tool.

SPECIFIED VALUE: Atmospheric pressure (Approx. 100 kPa)

▼ If it is OK, check the EFI ECU circuit.

▼ If it is NG, go to >2.

>2. Check of voltage of manifold absolute pressure/intake air temperature integral type sensor

1. Remove the manifold absolute pressure/intake air temperature integral type sensor connector.

2. With the IG switch turned "ON", measure the voltage between the following terminals given below.

- (1) Between the sensor connection vehicle harness side connector 3 (VCPM) and the sensor connection vehicle harness side connector 2 (E2PM)

SPECIFIED VALUE: 4.5 - 5.5V

NOTE

- If no voltage appears, check the EFI ECU power supply circuit.

▼ If it is OK, go to >3.

▼ If it is NG, check the EFI ECU circuit.

>3. Check of manifold absolute pressure/intake air temperature integral type sensor unit

1. Check the manifold absolute pressure/intake air temperature integral type sensor unit.

Refer to Page B8-201.

2. Are the check result OK?

▼ If it is OK, go to >4.

▼ If it is NG, replace the manifold absolute pressure/intake air temperature integral type sensor

▷4. Check of wire harness continuity

1. After turning "OFF" the main switch of the tester, turn "LOCK" the IG switch.
2. Check the continuity between the following terminals given below.
 - (1) Between the sensor connection vehicle harness side connector 1 (PIM) and the EFI ECU connection vehicle harness side connector 52 (PIM)
 - (2) Between the sensor connection vehicle harness side connector 2 (E2PM) and the EFI ECU connection vehicle harness side connector 122 (E2PM)
 - (3) Between the sensor connection vehicle harness side connector 3 (VCPM) and the EFI ECU connection vehicle harness side connector 57 (VCPM)

SPECIFIED VALUE: Continuity exists.

▼ If it is OK, replace the Manifold absolute pressure, intake air temperature integral type sensor.

▼ If it is NG, repair or replace the harness or connector.

② When not using diagnosis tester (DS-21/DS-II) or OBD II generic scan tool:

▷1. EFI ECU signal check

1. Connect the SST.

SST: 09842-97209-000

2. Perform voltage measurements between the following terminals when the IG switch is "ON".

- (1) Between SST 52 (PIM) - 122 (E2PM)

SPECIFIED VALUE: 3.1 - 4.1 V(Room temperature)

▼ If it is OK, check the EFI ECU circuit.

▼ If it is NG, proceed to ▷2.

▷2. Check of wire harness continuity

1. Perform continuity check between each of the following terminals.

- (1) Between sensor connection vehicle harness side connector 1 (PIM) - ECU connection vehicle harness side connector 52 (PIM)
- (2) Between sensor connection vehicle harness side connector 2 (E2PM) - ECU connection vehicle harness side connector 122 (E2PM)
- (3) Between sensor connection vehicle harness side connector 3 (VCPM) - ECU connection vehicle harness side connector 57 (VCPM)

SPECIFIED VALUE: Continuity exists.

▼ If it is OK, proceed to ▷3.

▼ If it is NG, repair the harness and connectors.

▷3. Intake manifold pressure/intake temperature integrated sensor voltage check

1. Remove the connector of the intake manifold pressure/intake temperature integrated sensor.
2. Perform voltage measurement between the following terminals when the IG switch is "ON".

- (1) Between sensor connection vehicle harness side connector 3 (VCPM) - sensor connection vehicle harness side connector 2 (E2PM)

SPECIFIED VALUE: 4.5 - 5.5V

▼ If it is OK, proceed to ▷4.

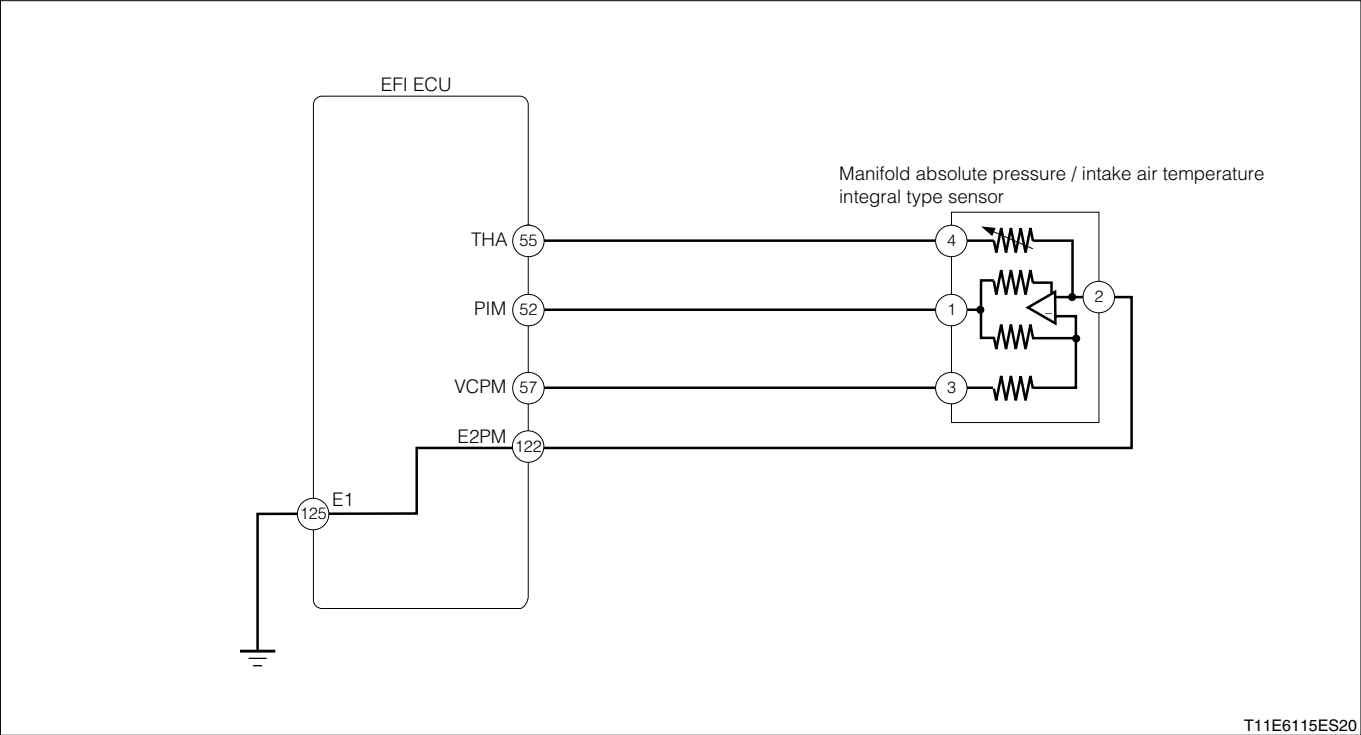
▼ If it is NG, check the EFI ECU circuit.

➤4. Intake manifold pressure/intake temperature integrated sensor unit check

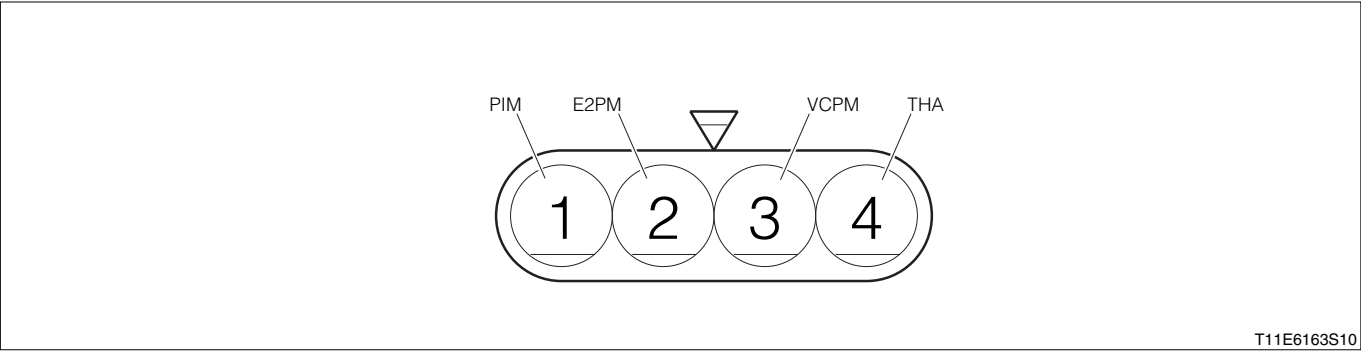
- 1. Perform unit check of the intake manifold pressure/intake temperature integrated sensor.
Refer to Page B8-201.
- 2. Are the check result OK?
 - ▼ If it is OK, check the connecting condition of each connector.
 - ▼ If it is NG, replace the intake manifold pressure/intake temperature integrated sensor.

7-12-3 DTC NO.P0110/43 INTAKE AIR TEMPERATURE (IAT) SENSOR CIRCUIT MALFUNCTION

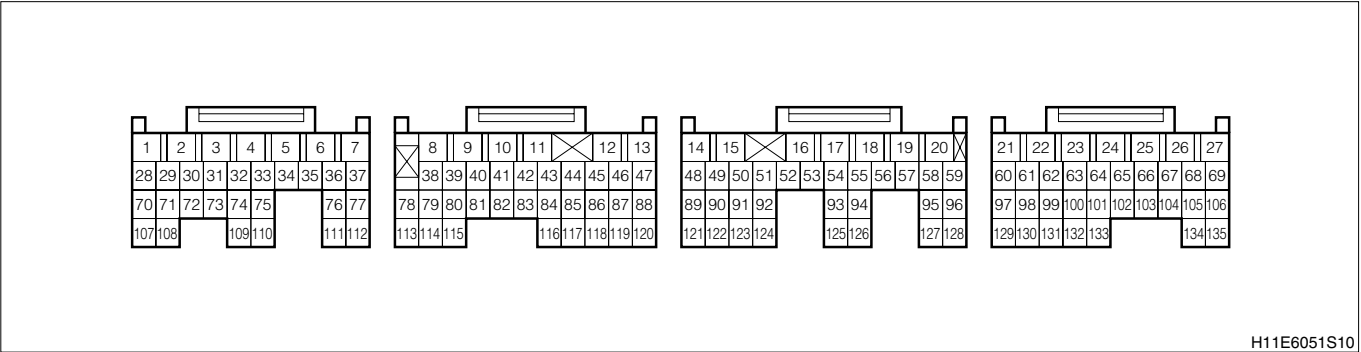
(1) System diagram



Manifold absolute pressure/intake air temperature integral type sensor connection vehicle harness side connector

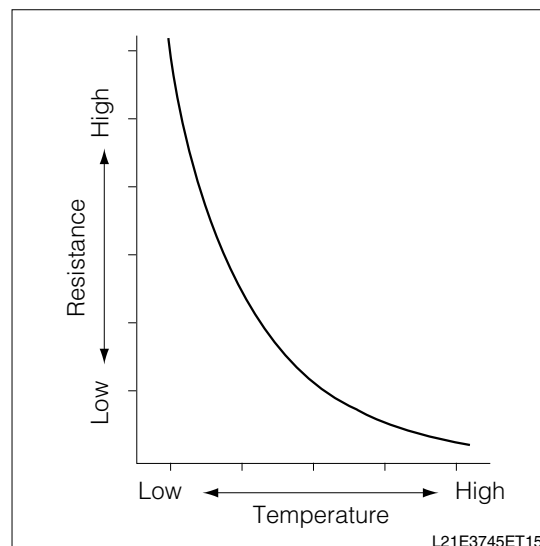


EFI ECU connection vehicle harness side connector



(2) Circuit description

1. The Manifold absolute pressure, intake air temperature integral type sensor (Intake air temperature sensor section), which detects the intake air temperature, is located at the intake manifold. A thermistor built in the sensor changes the resistance value according to the intake air temperature. The lower the intake air temperature, the greater the thermistor resistance value, and the higher the manifold absolute pressure, intake air temperature integral type sensor (Intake air temperature sensor section), the lower the thermistor resistance value. When the resistance value of the manifold absolute pressure, intake air temperature integral type sensor (Intake air temperature sensor section) changes in accordance with changes in the intake air temperature, the potential at terminal THA also changes. Based on this signal, the EFI ECU increases the fuel injection volume to improve driveability during cold engine operation.



(3) Diagnosis code output conditions

1. When the signals from the manifold absolute pressure/intake air temperature integral type sensor (Intake air temperature sensor section) are not outputted continuously after starting over a certain length of time:

(4) Trouble area

1. Open wire or short circuit in the Manifold absolute pressure, intake air temperature integral type sensor (Intake air temperature sensor section) circuit
2. Manifold absolute pressure, intake air temperature integral type sensor (Intake air temperature sensor section)
3. EFI ECU

(5) Checking points

1. Are the signals from the intake manifold pressure/intake air temperature integral type sensor (Intake air temperature sensor section) inputted to the EFI ECU?
2. Is the harness between the manifold absolute pressure/intake air temperature integral type sensor (Manifold absolute pressure sensor section) and the EFI ECU normal?
3. Is the output of the manifold absolute pressure/intake air temperature integral type sensor (Intake air temperature sensor section) normal?

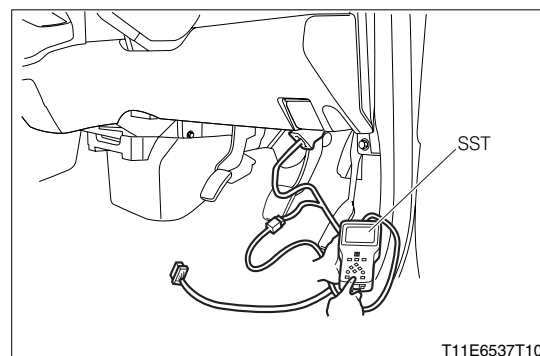
(6) Inspection procedure

① When using diagnosis tester (DS-21/DS-II) or OBD II generic scan tool:

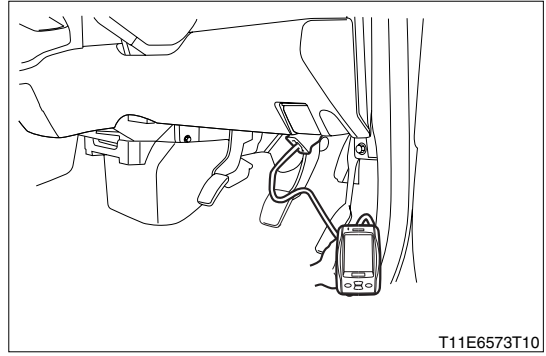
➤1. Check of sensor output value.

1. The IG switch turned "LOCK".
2. Connect the diagnosis tester to DLC.
 - (1) In case of DS-21, connect the DS-21 diagnosis tester to DLC through the SST.

SST: 09991-87404-000



- (2) In case of DS-II, connect the DS-II diagnosis tester directly to DLC.
- (3) In case of the OBD II generic scan tool, connect the OBD II generic scan tool directly to DLC.



3. After turning "ON" the IG switch, Turn "ON" the main switch of the tester.
 4. Read the "Intake air temperature" of the diagnosis tester (DS-21/DS-II) or OBD II generic scan tool.
- SPECIFIED VALUE: Measured ambient temperature

- ▼ If it is OK, check the EFI ECU circuit.
- ▼ If it is NG, go to >2.

>2. Confirmation of IAT sensor output value.

1. Read the "Intake air temperature" of the diagnosis tester (DS-21/DS-II) or OBD II generic scan tool.
- ▼ When -40°C , go to >3.
 - ▼ When 140°C or above, go to >5.

>3. Check of open wire in harness or inside EFI ECU (1).

1. After turning "OFF" the main switch of the tester, turn "LOCK" the IG switch.
 2. Remove the manifold absolute pressure/intake air temperature integral type sensor connector.
 3. Short circuit between the following terminals given below, using SST.
- SST: 09991-87103-000

- (1) Between the sensor connection vehicle harness side connector 4 (THA) and the sensor connection vehicle harness side connector 2 (E2PM)

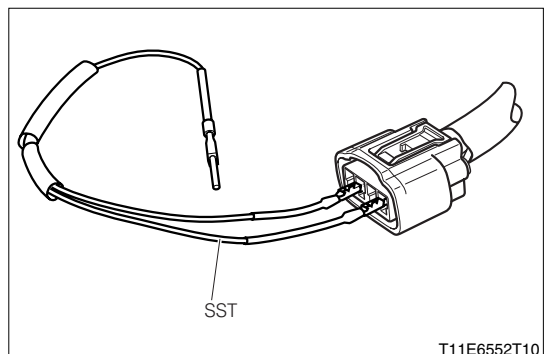
4. After turning "ON" the IG switch, turn "ON" the main switch of the tester. Read the "Intake air temperature" of the diagnosis tester (DS-21/DS-II) or OBD II generic scan tool.

SPECIFIED VALUE: 140°C or above

- ▼ If it is OK, carry out the following operations given below.

- (1) Check the connector or the connection state of the terminal of the manifold absolute pressure/intake air temperature integral type sensor.
- (2) If there is no abnormality, replace the manifold absolute pressure/intake air temperature integral type sensor.

- ▼ If it is NG, go to >4.



▷4. Check of open wire in harness or inside EFI ECU (2).

1. After turning "OFF" the main switch of the tester, turn "LOCK" the IG switch.
2. Set the SST (Sub-harness).
SST: 09842-97209-000

3. Release the short circuit of the connector of the manifold absolute pressure/intake air temperature integral type sensor.
4. Short circuit between the following terminals given below.
(1) Between SST 55 (THA) and 122 (E2PM)
5. After turning "ON" the IG switch, turn "ON" the main switch of the tester. Read the "Intake air temperature" of the diagnosis tester (DS-21/DS-II) or OBD II generic scan tool.
SPECIFIED VALUE: 140°C or above

▼ If it is OK, the harness between the manifold absolute pressure, intake air temperature integral type sensor (Intake air temperature sensor section) and the EFI ECU is open. Repair or replace the harness.

▼ If it is NG, check the ECU connector or terminal for connecting condition. If they are satisfactory, replace the EFI ECU.

Refer to Page B8-1.

▷5. Check of short in harness or inside EFI ECU (1).

1. After turning "OFF" the main switch of the tester, turn "LOCK" the IG switch.
2. Disconnect the connector of the manifold absolute pressure, intake air temperature integral type sensor.
3. After turning "ON" the IG switch, turn "ON" the main switch of the tester.
4. Read the "Intake air temperature" of the diagnosis tester (DS-21/DS-II) or OBD II generic scan tool.
SPECIFIED VALUE: -40°C

▼ If it is OK, replace the manifold absolute pressure, intake air temperature integral type sensor.

▼ If it is NG, go to ▷6.

▷6. Check of short in harness or inside EFI ECU (2).

1. Perform continuity check between each of the following terminals.
 - (1) Between sensor connection vehicle harness side connector 2 (E2PM) - ECU connection vehicle harness side connector 122 (E2PM)
 - (2) Between sensor connection vehicle harness side connector 4 (THA) - ECU connection vehicle harness side connector 55 (THA)
- SPECIFIED VALUE: Continuity exists.

▼ If it is OK, repair or replace the harness or connector.

▼ If it is NG, check or replace the EFI ECU.

② When not using diagnosis tester (DS-21/DS-II) or OBD II generic scan tool:

B8-61

➤1. EFI ECU voltage check

1. Connect the SST.

SST: 09842-97209-000

2. Perform voltage measurement between the following terminals when the IG switch is "ON".

(1) Between SST 55 (THA) - 122 (E2PM)

SPECIFIED VALUE: 0.15 V - 4.85 V (Changes according to the intake temperature)

▼ If it is OK, check the EFI ECU circuit.

▼ If it is NG, proceed to ➤2.

➤2. Check of wire harness continuity

1. Perform continuity check between each of the following terminals.

(1) Between sensor connection vehicle harness side connector 2 (E2PM) - ECU connection vehicle harness side connector 122 (E2PM)

(2) Between sensor connection vehicle harness side connector 4 (THA) - ECU connection vehicle harness side connector 55 (THA)

SPECIFIED VALUE: Continuity exists.

▼ If it is OK, proceed to ➤3.

▼ If it is NG, repair the harness and connectors.

➤3. Intake manifold pressure/intake temperature integrated sensor unit check

1. Perform unit check of the intake manifold pressure/intake temperature integrated sensor.

Refer to Page B8-201.

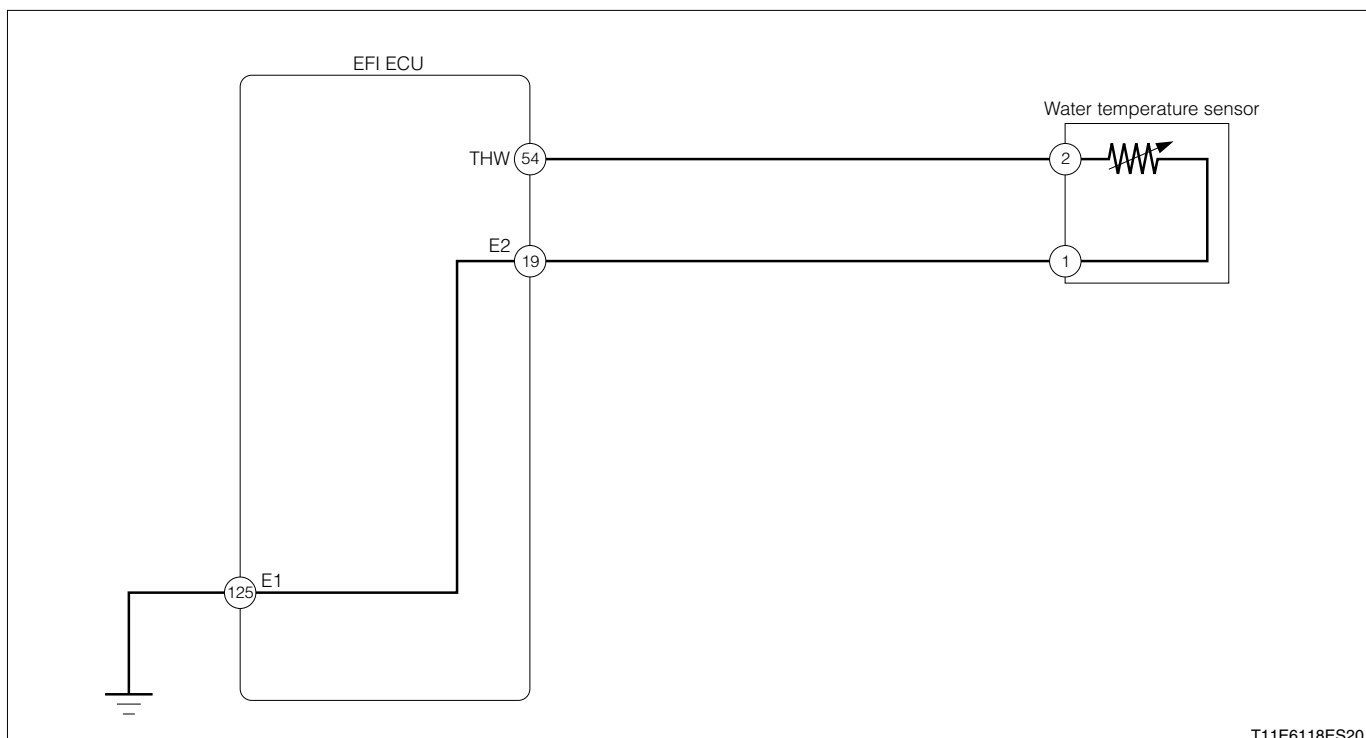
2. Are the check result OK?

▼ If it is OK, check the connecting condition of each connector.

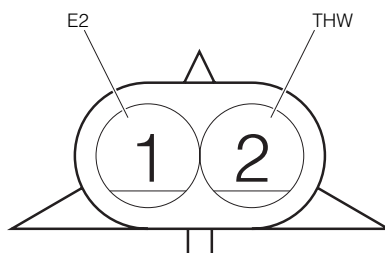
▼ If it is NG, replace the intake manifold pressure/intake temperature integrated sensor.

7-12-4 DTC NO.P0115/42 ENGINE COOLANT TEMPERATURE SENSOR (ECT) CIRCUIT MALFUNCTION

(1) System diagram

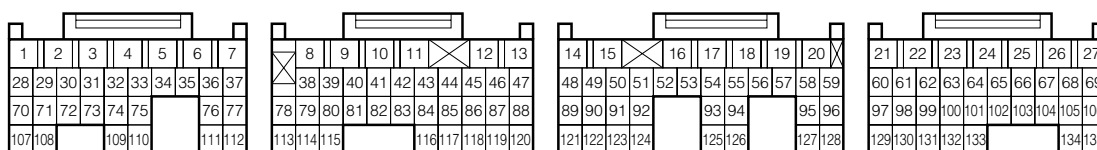


Water temperature sensor connection vehicle harness side connector



T11E6166S10

EFI ECU connection vehicle harness side connector



H11E6051S10

(2) Circuit description

1. A thermistor built into the engine coolant temperature sensor changes the resistance value according to the engine coolant temperature. The structure of the sensor and connection to the EFI ECU is the same as in the DTC P0110/43 (Intake air temperature sensor circuit malfunction).

(3) Diagnosis code output conditions

1. When the signals from the water temperature sensor are not outputted continuously after starting over a certain length of time:

(4) Trouble area

1. Open wire or short circuit in the engine coolant temperature sensor circuit
2. Engine coolant temperature sensor
3. EFI ECU

(5) Checking points

1. Are the signals from the water temperature sensor inputted to the EFI ECU?
2. Is the harness between the water temperature sensor and the EFI ECU normal?
3. Is the output of the water temperature sensor normal?

(6) Inspection procedure

① When using diagnosis tester (DS-21/DS-II) or OBD II generic scan tool:

NOTE

- Read the freeze frame data, using the diagnosis tester (DS-21/DS-II) or OBD II generic scan tool. Because the freeze frame data records the engine conditions when the malfunction was detected, when troubleshooting the freeze frame data is useful to determine whether the vehicle was running or stopped, the engine warmed up or not, the air-fuel ratio lean or rich, etc. at the time of the malfunction.

➤1. Check of output value of sensor.

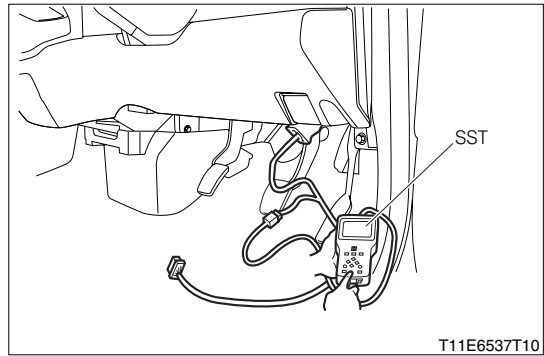
1. The IG switch turned "LOCK".

B8-63

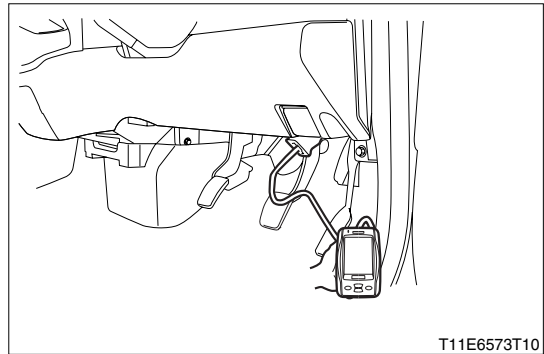
2. Connect the diagnosis tester to DLC.

- (1) In case of DS-21, connect the DS-21 diagnosis tester to DLC through the SST.

SST: 09991-87404-000



- (2) In case of DS-II, connect the DS-II diagnosis tester directly to DLC.
- (3) In case of the OBD II generic scan tool, connect the OBD II generic scan tool directly to DLC.



3. After turning "ON" the IG switch, turn "ON" the main switch of the tester.

4. Read the "Engine coolant temperature" of the diagnosis tester (DS-21/DS-II) or OBD II generic scan tool.

SPECIFIED VALUE: The same as the actual engine cooling water temperature

- ▼ If it is OK, check the EFI ECU circuit.
- ▼ If it is NG, go to [▷2](#).

▷2. Confirmation of sensor output value.

1. Read the "Engine coolant temperature" of the diagnosis tester (DS-21/DS-II) or OBD II generic scan tool.

- ▼ When -40°C , go to [▷3](#).
- ▼ When 140°C or above, go to [▷5](#).

▷3. Check of open wire in harness or inside EFI ECU (1).

- 1. After turning "OFF" the main switch of the tester, turn "LOCK" the IG switch.
- 2. Disconnect the connector of the engine coolant temperature sensor.

3. Short circuit between the following terminals given below, using SST.

- (1) Between the water temperature sensor connection vehicle harness side connector 1 (E2) and the water temperature sensor connection vehicle harness side connector 2 (THW)

SST: 09991-87103-000

4. After turning "ON" the IG switch, turn "ON" the main switch of the tester.

5. Read the "Engine coolant temperature" of the diagnosis tester (DS-21/DS-II) or OBD II generic scan tool.

SPECIFIED VALUE: 140°C or above.

- ▼ If it is OK, check the engine coolant temperature sensor sensor connector or terminal for connecting condition. If they are satisfactory, replace the engine coolant temperature sensor sensor.

Refer to Page B8-5.

- ▼ If it is NG, go to >4.

>4. Check of open wire in harness or inside EFI ECU (2).

1. After turning "OFF" the main switch of the tester, turn "LOCK" the IG switch.
2. Set the SST (Sub-harness).

SST: 09842-97209-000

3. Disconnect the jump wire from the engine coolant temperature sensor sensor connector.

4. Short circuit between the following terminals given below.

- (1) Between SST 54 (THW) and 19 (E2)

5. After turning "ON" the IG switch, turn "ON" the main switch of the tester.

6. Read the "Engine coolant temperature" of the diagnosis tester (DS-21/DS-II) or OBD II generic scan tool.

SPECIFIED VALUE: 140°C or above?

- ▼ If it is OK, the harness between the engine coolant temperature sensor sensor and the EFI ECU is open. Repair or replace the harness.

- ▼ If it is NG, check the EFI ECU connector and terminal for connecting condition. If they are satisfactory, replace the EFI ECU.

Refer to Page B8-1.

>5. Check of short in harness or inside EFI ECU (1).

1. After turning "OFF" the main switch of the tester, turn "LOCK" the IG switch.

2. Disconnect the connector of the engine coolant temperature sensor sensor.

3. After turning "ON" the IG switch, turn "ON" the main switch of the tester.

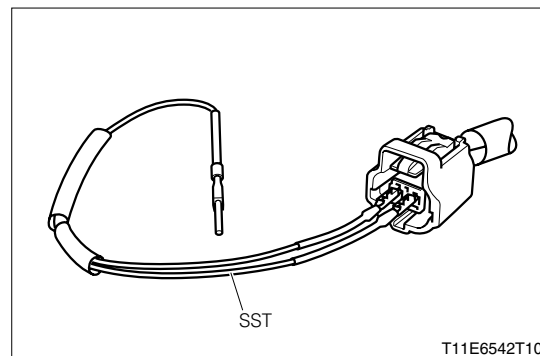
4. Read the "Engine coolant temperature" of the diagnosis tester (DS-21/DS-II) or OBD II generic scan tool.

SPECIFIED VALUE: -40°C

- ▼ If it is OK, replace the engine coolant temperature sensor.

Refer to Page B8-5.

- ▼ If it is NG, go to >6.



▷6. Check of short in harness or inside EFI ECU (2).

1. Perform continuity check between each of the following terminals.

- (1) Between sensor connection vehicle harness side connector 1 (E2) - ECU connection vehicle harness side connector 19 (E2)
- (2) Between sensor connection vehicle harness side connector 2 (THW) - ECU connection vehicle harness side connector 54 (THW)

SPECIFIED VALUE: Continuity exists.

▼ If it is OK, repair or replace the harness or connector.

▼ If it is NG, check or replace the EFI ECU.

② When not using diagnosis tester (DS-21/DS-II) or OBD II generic scan tool:

▷1. EFI ECU signal check

1. Connect the SST.

SST: 09842-97209-000

2. Perform voltage measurement between the following terminals when the IG switch is "ON".

- (1) Between SST 54 (THW) - 19 (E2)

SPECIFIED VALUE: 0.15 V - 4.85 V (Changes according to the water temperature)

▼ If it is OK, check the EFI ECU circuit.

▼ If it is NG, proceed to ▷2.

▷2. Check of wire harness continuity

1. Perform continuity check between each of the following terminals.

- (1) Between sensor connection vehicle harness side connector 1 (E2) - ECU connection vehicle harness side connector 19 (E2)
- (2) Between sensor connection vehicle harness side connector 2 (THW) - ECU connection vehicle harness side connector 54 (THW)

SPECIFIED VALUE: Continuity exists.

▼ If it is OK, proceed to ▷3.

▼ If it is NG, repair the harness and connectors.

▷3. Water temperature sensor unit check

1. Perform unit check of the water temperature sensor.

Refer to Page B8-202.

2. Are the check result OK?

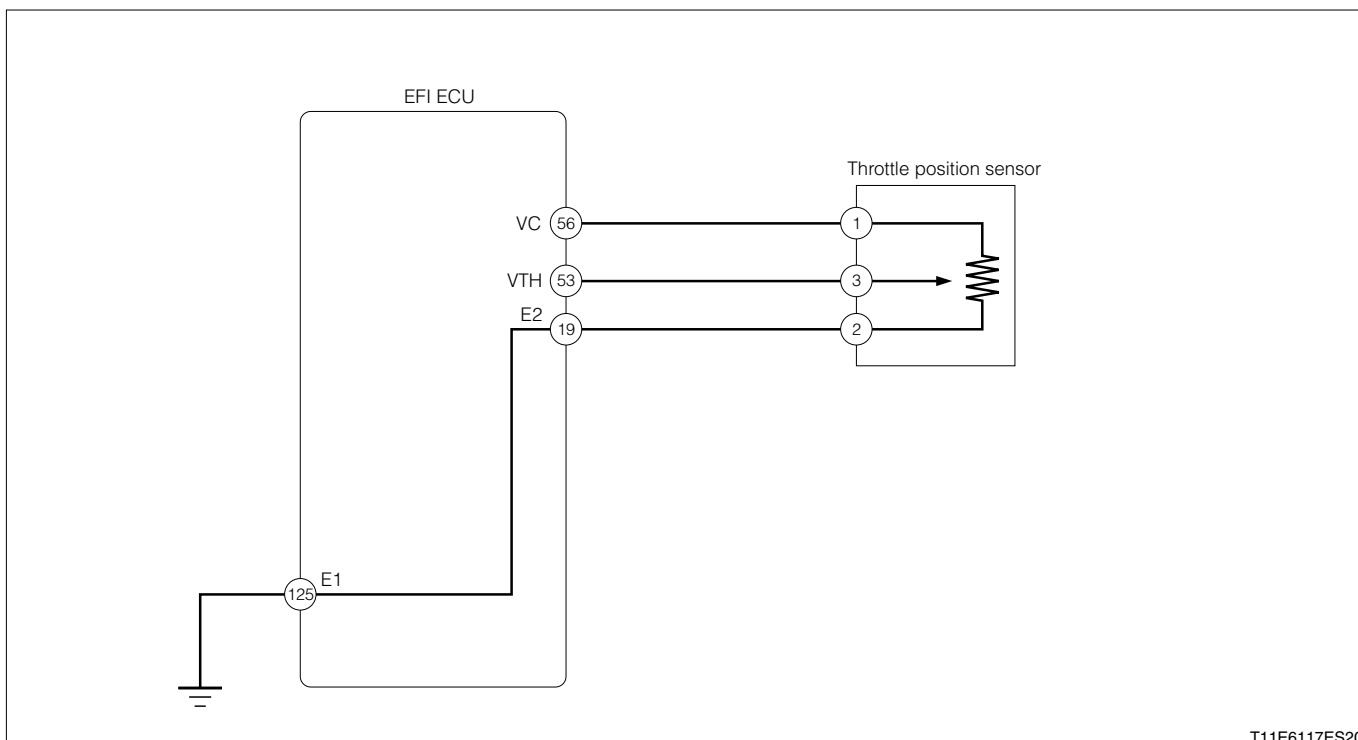
▼ If it is OK, check the connecting condition of each connector.

▼ If it is NG, replace the water temperature sensor.

Refer to Page B8-5.

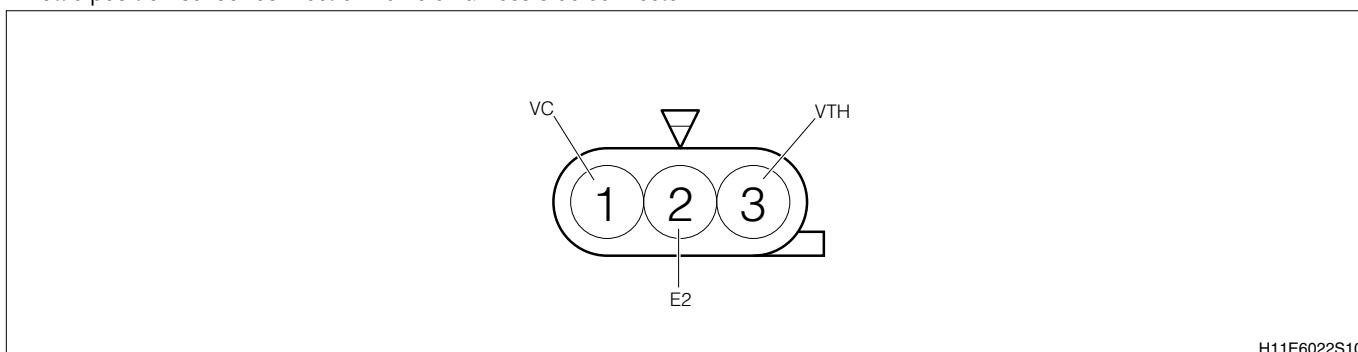
7-12-5 DTC NO.P0120/41 THROTTLE/PEDAL POSITION SENSOR

(1) System diagram



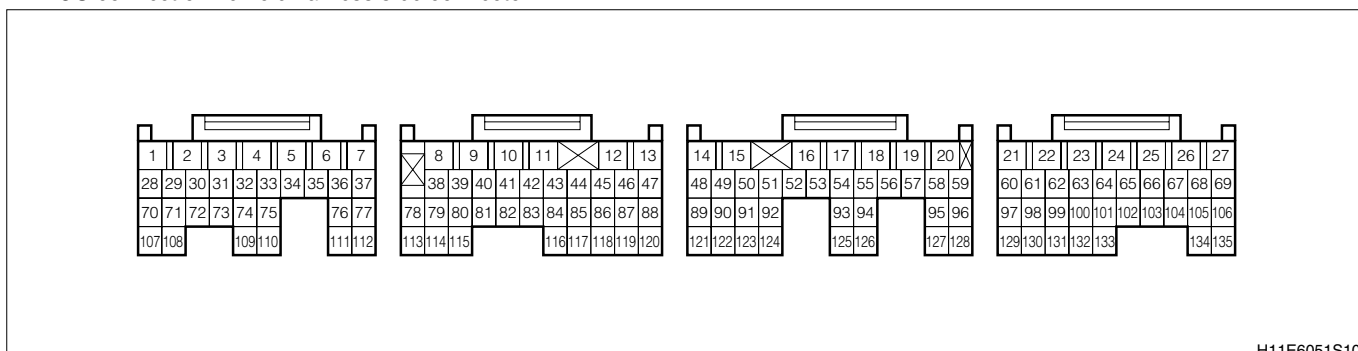
T11E6117ES20

Throttle position sensor connection vehicle harness side connector



H11E6022S10

EFI ECU connection vehicle harness side connector



H11E6051S10

(2) Circuit description

1. The throttle position sensor is mounted in the throttle body and detects the throttle valve opening angle. When the throttle valve is fully closed, a voltage of approximately 0.4 - 0.8 V is applied to terminal VTH of the EFI ECU. The voltage applied to the terminals VTH of the EFI ECU increases in proportion to the opening angle of the throttle valve and becomes approximately 3.5 - 5.0 V when the throttle valve is fully opened. The EFI ECU judges the vehicle driving conditions from these signals input from terminal VTH, uses them as one of the conditions for deciding the air-fuel ratio correction, power increase correction and fuel-cut control etc.

(3) Diagnosis code output conditions

1. When the signals from the throttle position are not outputted continuously after starting over a certain length of time.

(4) Trouble area

1. Open wire or short circuit in the throttle position sensor circuit.
2. Throttle position sensor
3. EFI ECU

(5) Checking points

1. Are the signals from the throttle position sensor inputted to the EFI ECU?
2. Is the harness between the throttle position sensor and the EFI ECU normal?
3. Is the power supply voltage of the throttle position sensor normal?
4. Is the output of the throttle position sensor normal?

(6) Inspection procedure

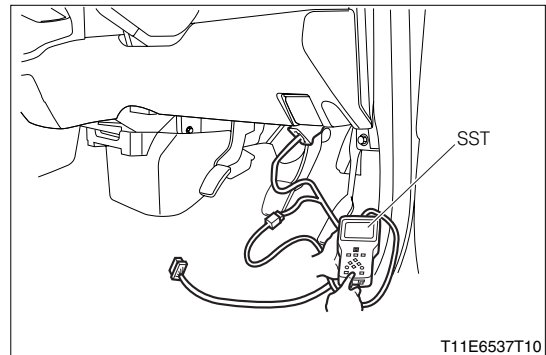
① When using diagnosis tester (DS-21/DS-II) or OBD II generic scan tool:

➤1. Check of output value of sensor.

1. The IG switch turned "LOCK".
2. Connect the diagnosis tester to DLC.

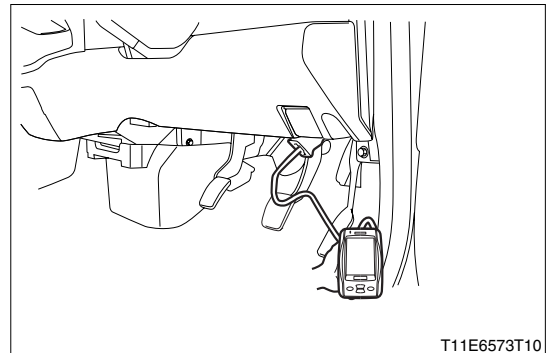
(1) In case of DS-21, connect the DS-21 diagnosis tester to DLC through the SST.

SST: 09991-87404-000



(2) In case of DS-II, connect the DS-II diagnosis tester directly to DLC.

(3) In case of the OBD II generic scan tool, connect the OBD II generic scan tool directly to DLC.



3. After turning "ON" the IG switch, turn "ON" the main switch of the tester.

4. Read the "Abs. throttle position SSR" of the diagnosis tester (DS-21/DS-II) or OBD II generic scan tool.

Throttle valve	Throttle valve opening [%]
Fully closed	0.0
Fully open	100.0

5. Are the check results OK?

▼ If it is OK, check the EFI ECU circuit.

▼ If it is NG, go to ➤2.

▷2. Check of power supply voltage.

1. After turning "OFF" the main switch of the diagnosis tester (DS-21/DS-II) or OBD II generic scan tool, turn "LOCK" the IG switch.
2. Disconnect the connector of the throttle position sensor.
3. With the IG switch turned "ON", measure the voltage between the following terminals given below.
 - (1) Between the throttle position sensor connection vehicle harness side connector 1 (VC) and the body earth

SPECIFIED VALUE: 4.5 - 5.5V

4. Is the voltage within the specified value?

▼ If it is OK, go to ▷3.

▼ If it is NG, go to ▷5.

▷3. Check of linear throttle sensor.

1. Check the throttle position sensor.
Refer to Page B8-203.
2. Are the check results OK?
 - ▼ If it is OK, go to ▷4.
 - ▼ If it is NG, replace the throttle body Ay.

▷4. Check of input signal.

1. Set the SST (Sub-harness).
SST: 09842-97209-000
2. The IG switch turned "ON".
3. Measure the voltage between the SST connector 53 (VTH) and 19 (E2) under the following condition given below.

Throttle valve	Specified value [V]
Fully closed	0.4 - 0.8
Fully open	3.2 - 5.0

4. Is the measured value within the specified value?

▼ If it is OK, check or replace the EFI ECU.

▼ If it is NG, check between the following terminals for open wire or short.

- (1) Between the EFI ECU and the throttle position sensor (VTH line)

➤5. Check of power supply voltage ECU side.

1. Turn "LOCK" the IG switch.
2. Set the SST (Sub-harness).

SST: 09842-97209-000

3. The IG switch turned "ON".
4. Check the voltage between the following terminals given below.

(1) Between SST 56 (VC) and 19 (E2)

SPECIFIED VALUE: 4.5 - 5.5V

5. Is the measured value within the specified value?

NOTE

- If no voltage appears, check the EFI ECU power supply circuit.

▼ If it is OK, check between the following terminals for open wire or short.

(1) Between the EFI ECU and the throttle position sensor (VC line)

▼ If it is NG, check or replace the EFI ECU.

② When not using diagnosis tester (DS-21/DS-II) or OBD II generic scan tool:

➤1. EFI ECU signal check

1. Connect the SST.

SST: 09842-97209-000

2. Turn the IG switch to the "ON" position.
3. Perform voltage measurements between the following terminals.

(1) Between SST 56(VC) - 19 (E2)

(2) Between SST 53(VTH) - 19 (E2)

SPECIFIED VALUE:

Measuring terminals	Specified value
56(VC) - 19(E2)	4.5 - 5.5V
53(VTH) - 19(E2)	It increases in proportion to the throttle opening in the range of 0.2V - 4.8V when the throttle lever is fully opened from the fully closed state.

▼ If it is OK, check the EFI ECU circuit.

▼ If it is NG, proceed to ➤2.

➤2. Check of wire harness continuity

1. Perform continuity check between each of the following terminals.

(1) Between sensor connection vehicle harness side connector 1 (VC) - ECU connection vehicle harness side connector 56 (VC)

(2) Between sensor connection vehicle harness side connector 2 (E2) - ECU connection vehicle harness side connector 19 (E2)

(3) Between sensor connection vehicle harness side connector 3 (VTH) - ECU connection vehicle harness side connector 53 (VTH)

SPECIFIED VALUE: Continuity exists.

▼ If it is OK, proceed to ➤3.

▼ If it is NG, repair the harness and connectors.

➤3. Throttle position sensor unit check

1. Perform unit check of the throttle position sensor.

Refer to Page B8-203.

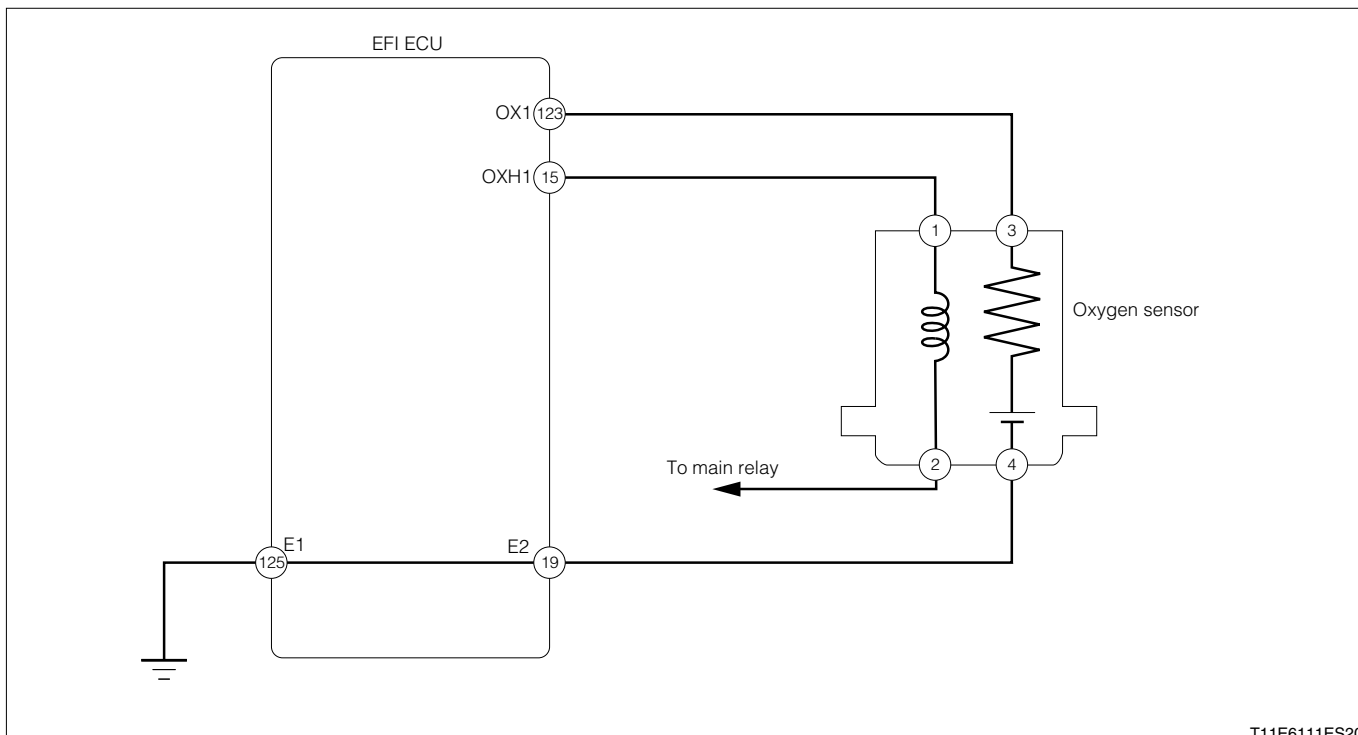
2. Are the check result OK?

▼ If it is OK, check the connecting condition of each connector.

▼ If it is NG, replace the throttle body Ay.

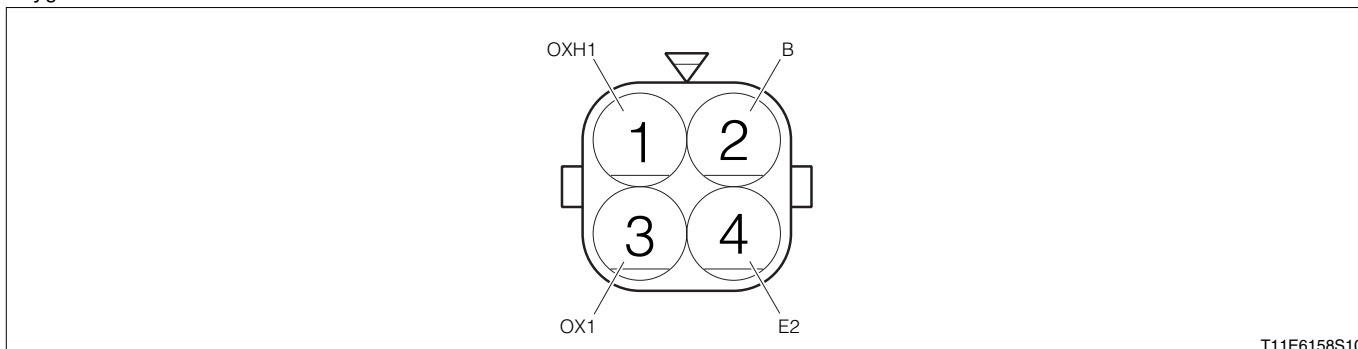
7-12-6 DTC NO.P0130/21 OXYGEN SENSOR CIRCUIT MALFUNCTION (BANK 1 SENSOR 1)

(1) System diagram



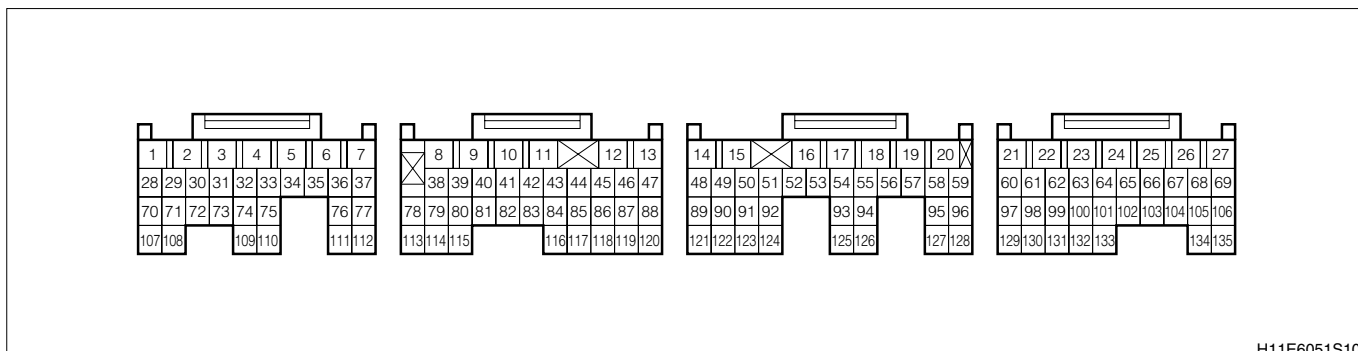
T11E6111ES20

Oxygen sensor connection vehicle harness side connector



T11E6158S10

EFI ECU connection vehicle harness side connector



H11E6051S10

(2) Circuit description

1. The front oxygen sensor (Bank 1, sensor 1) detects the concentration of oxygen contained in the exhaust gas according to the magnitude of the electromotive force that is being generated in itself. When the air-to-fuel ratio becomes richer than the stoichiometric ratio, a greater electromotive force (Approx. 1 volt) is applied to the EFI ECU. Conversely, when the ratio becomes leaner than the stoichiometric ratio, a smaller electromotive force (Approx. 0 volt) is applied to the EFI ECU. In this way, the EFI ECU determines whether the air-to-fuel ratio is rich or lean. Based on this evaluation, the injection time is controlled.

(3) Diagnosis code output conditions

1. When no rich signal is sent even once from the oxygen sensor even if the condition continues in which the engine revolution speed is more than 3000 rpm and the power increase compensation is continued over the specified value after the engine warming-up

(4) Trouble area

1. Air induction system
2. Fuel pressure
3. Injector
4. Open wire or short circuit in the oxygen sensor circuit
5. Oxygen sensor
6. EFI ECU

(5) Checking points

NOTE

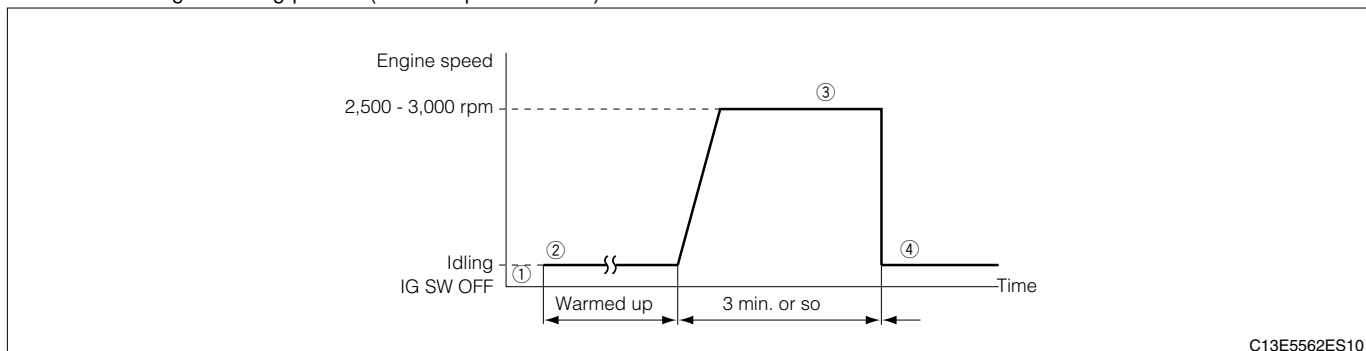
- When this code is outputted concurrently with another code, carry out the check for that code first.

1. Is the signal from the oxygen sensor inputted to the EFI ECU?
2. Is the harness between the oxygen sensor and the EFI ECU normal?
3. Is the output of the oxygen sensor correct? (If there are no causes for "Lean A/F" (The oxygen concentration in the exhaust gas is too high), the oxygen sensor is judged as defective.)
4. Check the oxygen sensor heater system for open wire or short.

NOTE

- Sensor 1 means a sensor which is located near the engine block.
- Using the diagnosis tester (DS-21/DS-II) or OBD II generic scan tool, confirm the output voltage of the oxygen sensor (Bank 1, sensor 1) from the current data. If the output voltage of the oxygen sensor (Bank 1, sensor 1) is 0.1 V or less, most likely the circuit of the oxygen sensor (Bank 1, sensor 1) is open or shorted.

Confirmation engine racing pattern (For EU specifications)



- (1) Step ①; Using the DS-21, with the IG switch turned "LOCK", connect the DS-21 diagnosis tester to DLC through the SST. Turn "ON" the IG switch and the main switch of the tester. Set the tester to the "Continuous monitoring results" of the CARB mode.

SST: 09991-87404-000

- (2) Step ①; Using DS-II, with the IG switch turned "LOCK", connect the DS-II diagnosis tester to DLC. Turn "ON" the IG switch and the main switch of the tester. Set the tester to the "Continuous monitoring results" of the CARB mode.
- (3) Step ②; Start the engine. Keep on warming the engine for more than five minutes until the engine cooling water temperature reaches 90°C or above.
- (4) Step ③; Race the engine for about three minutes at 2500 to 3000 rpm.
- (5) Step ④; After one minute of idling, press the F1 key of the tester. Check to see if the DTC P0130/21 is outputted.

NOTE

- If the condition in this test is not strictly followed, detection of the malfunction will not be possible.
- If you do not have the diagnosis tester (DS-21/DS-II), turn the ignition switch "LOCK" after performing steps ② to ④, then perform steps ② to ④ again.

(6) Inspection procedure

① When using diagnosis tester (DS-21/DS-II) or OBD II generic scan tool:

NOTE

- Read the freeze frame data, using the diagnosis tester (DS-21/DS-II) or OBD II generic scan tool. Because the freeze frame data records the engine conditions when the malfunction was detected, when troubleshooting the freeze frame data is useful to determine whether the vehicle was running or stopped, the engine warmed up or not, the air-fuel ratio lean or rich, etc. at the time of the malfunction.

▷1. Check of DTC.

1. Check other codes (Those other than DTC P0130/21) outputted?

▼ If an output is made, proceed to the trouble shooting for the outputted code concerned.

▼ If no output is made, proceed to ▷2.

▷2. Wiring harness check

1. With the IG switch turned "LOCK", set the SST (Sub-harness). However, the SST connectors at the EFI ECU side should remain disconnected.

SST: 09842-97209-000

2. Disconnect the oxygen sensor connector.

3. Check the harness and connector between the following terminals for open wire and short.

- (1) Between the sensor connection vehicle harness side connector 3 (OX1) and SST 123 (OX1)

SPECIFIED VALUE: Continuity exists.

- (2) Between the sensor connection vehicle harness side connector 3 (OX1) and the body earth

SPECIFIED VALUE: No continuity exists

4. Are the check results for open wire and short OK?

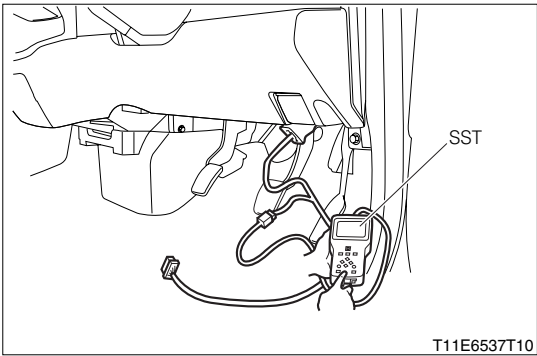
▼ If it is OK, go to ▷3.

▼ If it is NG, repair or replace the harness or connector.

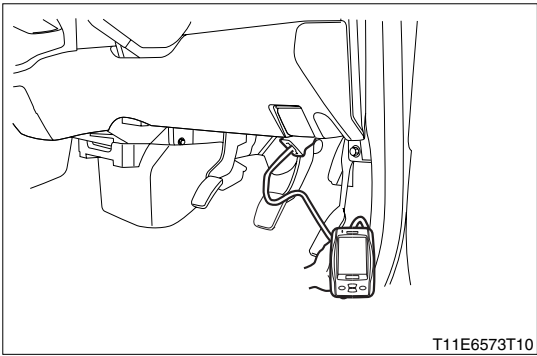
▷3. Check of output voltage of sensor.

1. Connect the oxygen sensor and SST connectors, respectively.

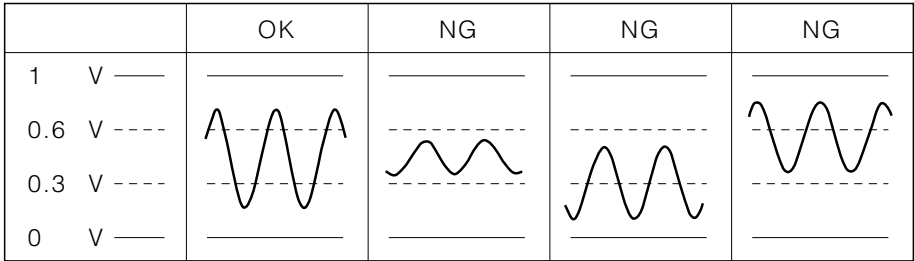
- 2. Connect the diagnosis tester to DLC.
 - (1) In case of DS-21, connect the DS-21 diagnosis tester to DLC through the SST.SST: 09991-87404-000



- (2) In case of DS-II, connect the DS-II diagnosis tester directly to DLC.
 - (3) In case of the OBD II generic scan tool, connect the OBD II generic scan tool directly to DLC.



- 3. Turn "ON" the main switch of the tester.
- 4. Warm up the engine at 2500 rpm for about 90 seconds.
- 5. Check the output voltage of oxygen sensor during idling.
SPECIFIED VALUE: The voltage varies repeatedly between a range from a voltage below 0.3 V and to a voltage above 0.6 V. (See the diagram below.)



- 6. Are the check results OK?
 - ▼ If it is OK, in the case of the EU specification vehicles, go to >10.
 - ▼ If it is OK, in the case of the general specification vehicles, go to >11.
 - ▼ If it is NG, in the case of the EU specification vehicles, proceed to >4.
 - ▼ If it is NG, in the case of the general specification vehicles, proceed to >5.

>4. Check of misfire.

- 1. Check to see if any misfire is occurring by monitoring the DTC and data list.
- 2. Are the check results OK?
 - ▼ If it is OK, go to >5.
 - ▼ If it is NG, perform troubleshooting for misfire. (Go to troubleshooting of DTC P0300/17, P0301 - 0304/17.)

Refer to Page B8-145.

▷5. Check of air induction system.

1. Check the following items given below:

- (1) Check of the engine oil level gauge, oil filler cap and PCV hose for disconnection.
- (2) Check of parts of the air induction system between the cylinder head and the throttle body for disconnection, looseness, or cracks.

2. Are the check results OK?

▼ If it is OK, go to ▷6.

▼ If it is NG, repair or replace the induction system.

▷6. Check of fuel pressure.

1. Check the fuel pressure.

Refer to Page B8-200.

2. Are the check results OK?

▼ If it is OK, go to ▷7.

▼ If it is NG, check and repair fuel pump, fuel pipe line and filter.

▷7. Check of injector injection.

1. Check the injector unit.

Refer to Page B8-205.

2. Are the check results OK?

▼ If it is OK, go to ▷8.

▼ If it is NG, replace the injector.

Refer to Page B7-9.

▷8. Check of gas leakage of exhaust system.

1. Check that there is no gas leakage in the exhaust gas-related system.

Refer to Page B1-9.

2. Are the check results OK?

▼ If it is OK, go to ▷9.

▼ If it is NG, repair or replace the defective point.

▷9. Check of output voltage of sensor.

1. Warm up engine completely.

2. Disconnect the connector of the oxygen sensor with IG switch turned "LOCK".

3. Disconnect the oxygen sensor connector.

4. Connect a voltmeter to the connector terminal of oxygen sensor.

5. Hold the engine racing speed for 3 minutes at 2000 rpm. At this time, ensure that the reading of the volt meter is within the specified value.

SPECIFIED VALUE: The voltmeter exhibits an output voltage of 0.2 V or more at least one time.

6. Are the check results OK?

▼ If it is OK, check or replace the EFI ECU.

▼ If it is NG, replace the oxygen sensor. (Bank 1, sensor 1)

Refer to Page B4-1.

▷10. Perform confirmation engine racing pattern.

1. Again conduct the check of engine racing pattern.
2. Confirm whether Code No. P0133/21 has been outputted again.
 - ▼ If it is OK, check or replace the EFI ECU.
 - ▼ If it is NG, go to ▷11.

▷11. The past situation of vehicles operation is investigated.

1. Confirm the past vehicle running situation.
2. Did the vehicle run out of fuel in the past?
 - ▼ If it is YES, DTC P0130/21 is caused by running out of fuel.
 - ▼ If it is NO, check the EFI ECU circuit.

② When using diagnosis tester (DS-21/DS-II) or OBD II generic scan tool:

▷1. Oxygen sensor feedback control check

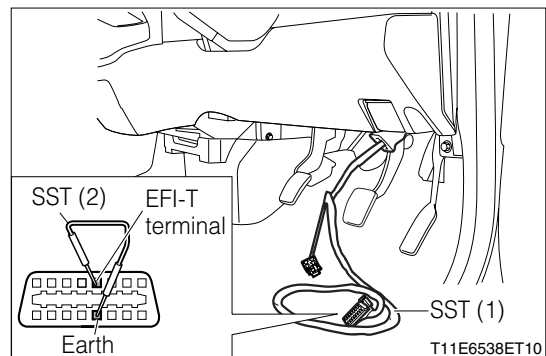
1. Start the engine.
2. Activate the oxygen sensor by maintaining the engine at 3000rpm for four minutes.
3. Connect the SST and short-circuit the EFI-T terminal.
SST: 09991-87404-000(1)
09991-87403-000(2)
4. Maintain the engine revolution speed at 2000rpm or more and step on the brake pedal.
5. Check if the engine check lamp in the meter blinks.
SPECIFIED VALUE: It blinks.

NOTE

- The blinking interval will change by the condition of activation of the oxygen sensor.
- ▼ If it is OK, the oxygen sensor system is normal.
- ▼ If it is NG, proceed to ▷2.

▷2. Oxygen sensor signal check

1. Connect the SST.
SST: 09842-97209-000
2. Activate the oxygen sensor by maintaining the engine at 3000rpm for four minutes.



3. Perform output check between the following terminals using an oscilloscope.

(1) Between SST 123 (OX1) - SST 125 (E1)

Time axis	200ms / DIV
Voltage axis	500mV / DIV
Measuring condition	Air conditioner "OFF", no electric load, maintaining 3000rpm

Air conditioner "OFF": Conditions in which all of the air conditioner switch (ACSW), blower switch (BLW) and magnet clutch (MGC) are "OFF".

NOTE

- The waveform cannot be specified, but ensure that a waveform as in the right figure (One such example) shows up.

4. Confirm the following points.

- (1) The waveform is showing up with the oxygen sensor activated.
- (2) The waveform 0 ↔ 1V is showing up.

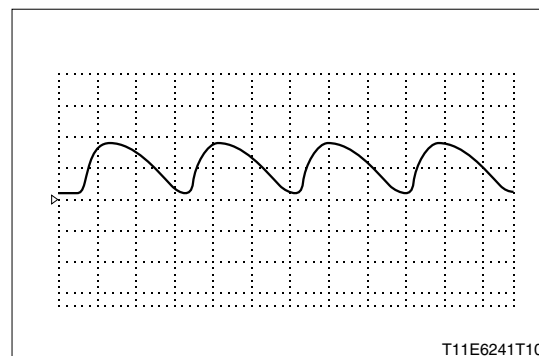
NOTE

- As for the oxygen sensor signal, the correct output cannot be confirmed without using the oscilloscope.

▼ If it is OK, proceed to Σ3.

▼ If it is NG, replace the oxygen sensor.

Refer to Page B4-2.



➤3. Check of wire harness continuity

1. Perform continuity check between each of the following terminals.

- (1) Between sensor connection vehicle side connector 3 (OX1) - ECU connection vehicle harness connection side connector 123 (OX1)
- (2) Between sensor connection vehicle side connector 4 (E2) - ECU connection vehicle harness connection side connector 19 (E2)

▼ If it is OK, replace the EFI ECU.

Refer to Page B8-1.

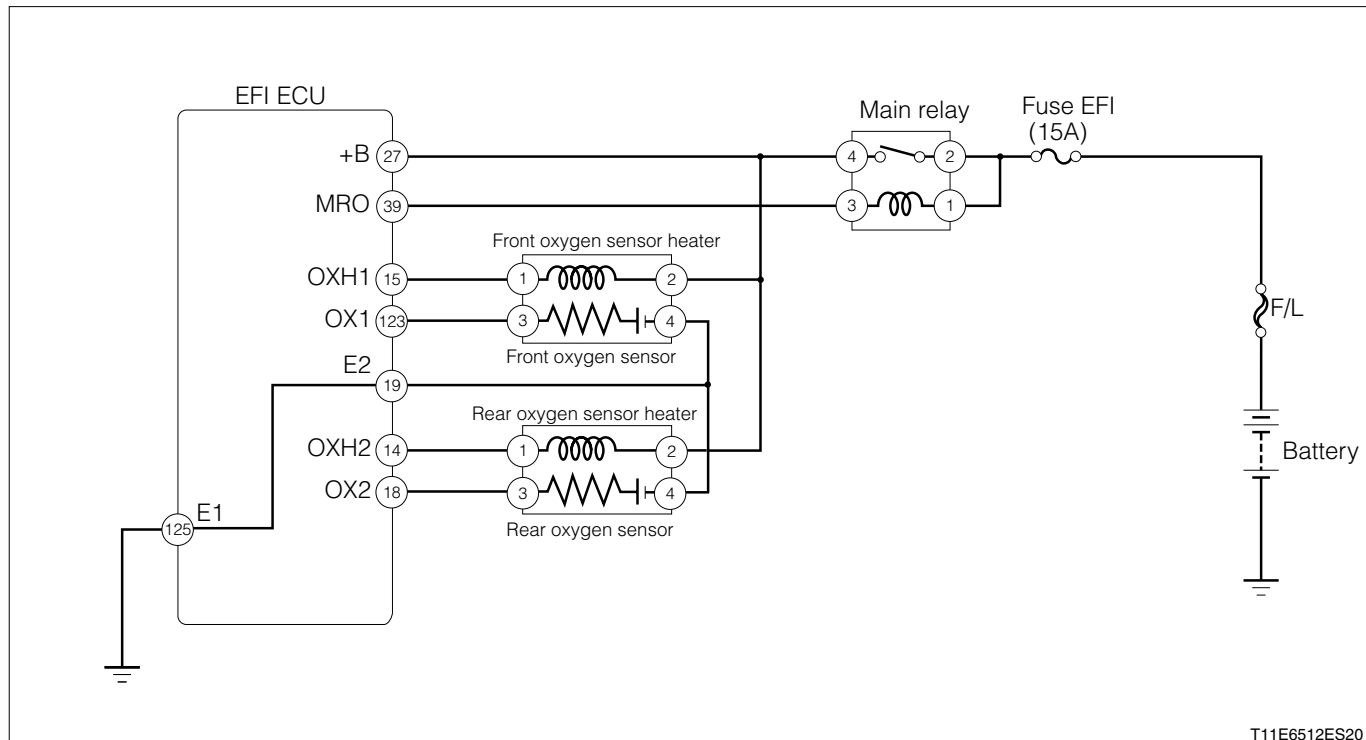
▼ If it is NG, perform checking or repairing of the harness of the defective sections.

7-12-7 DTC NO.P0135/23 OXYGEN SENSOR HEATER CIRCUIT MALFUNCTION

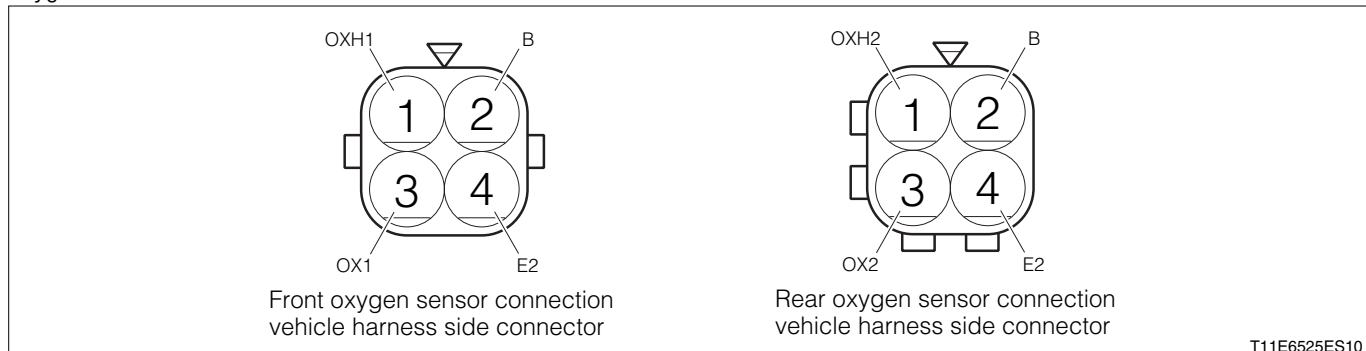
DTC NO.P0141/24 REAR OXYGEN SENSOR HEATER CIRCUIT MALFUNCTION

(1) System diagram

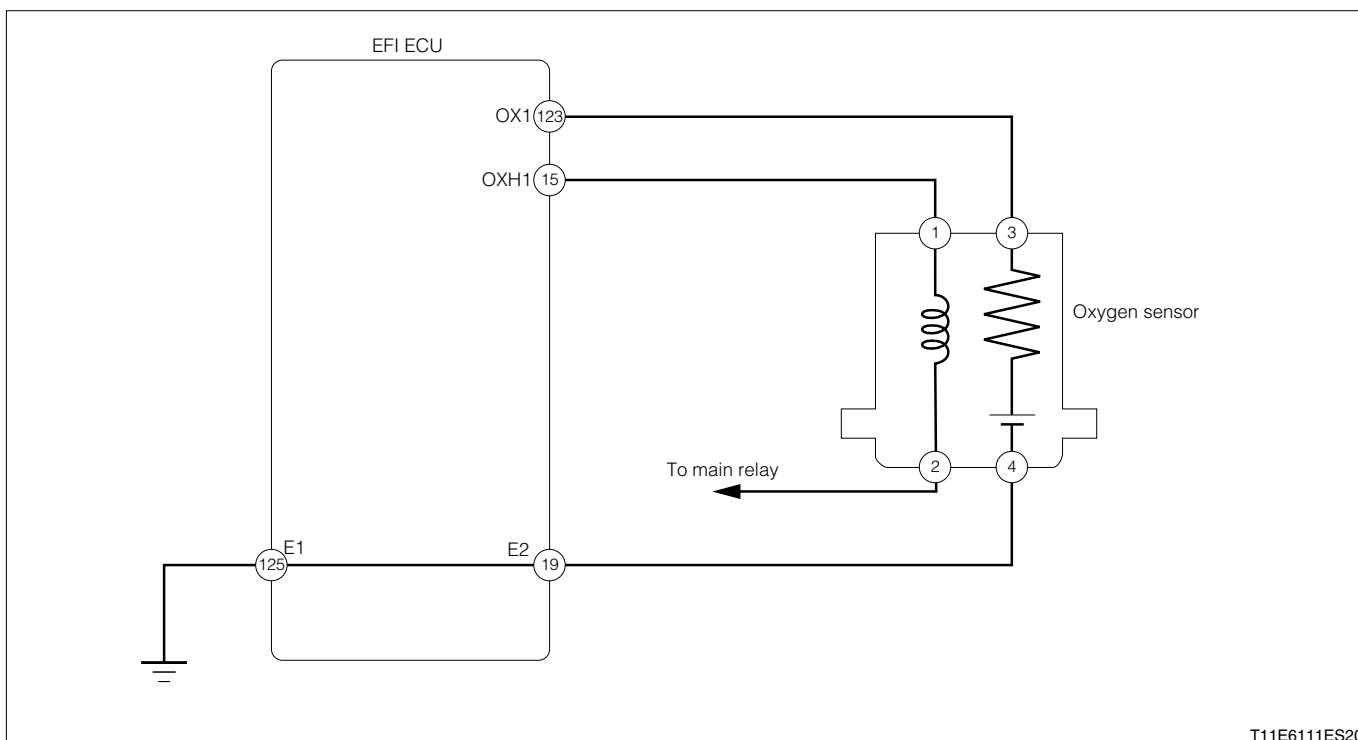
① For EU specifications



Oxygen sensor connection vehicle harness side connector

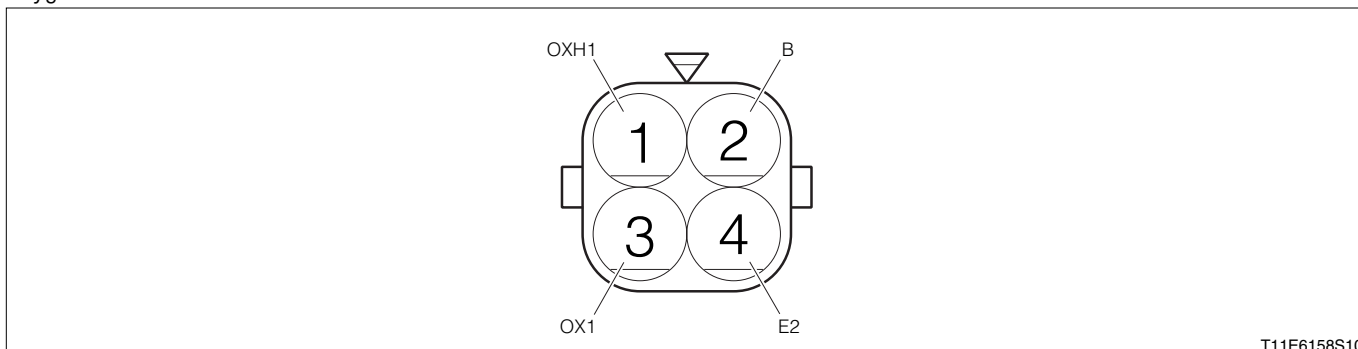


② For general specifications



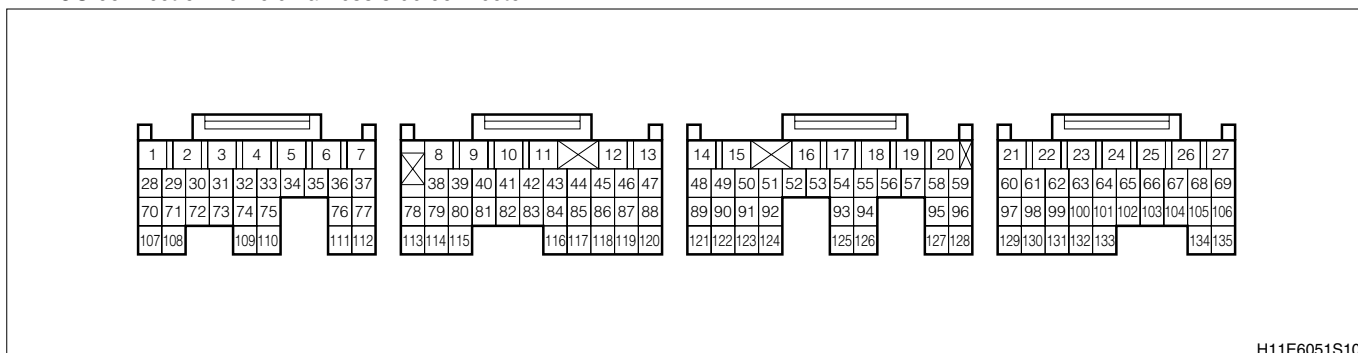
T11E6111ES20

Oxygen sensor connection vehicle harness side connector



T11E6158S10

EFI ECU connection vehicle harness side connector



H11E6051S10

(2) Diagnosis code output conditions

1. When an open wire or short is present in the oxygen sensor heater system,

(3) Trouble area

1. Open wire or short circuit for the oxygen sensor heater circuit
2. Oxygen sensor heater
3. EFI ECU

(4) Checking points

NOTE

- When this code is outputted concurrently with another code, carry out the check for that code first.

1. Is the signal from the oxygen sensor inputted to the EFI ECU?
2. Is the harness between the oxygen sensor and the EFI ECU normal?
3. Is the output of the oxygen sensor correct? (If there are no causes for "Lean A/F" (The oxygen concentration in the exhaust gas is too high), the oxygen sensor is judged as defective.)
4. Check the oxygen sensor heater system for open wire or short.

(5) Inspection procedure

NOTE

- Read the freeze frame data, using the diagnosis tester (DS-21/DS-II) or OBD II generic scan tool. Because the freeze frame data records the engine conditions when the malfunction was detected, when troubleshooting the freeze frame data is useful to determine whether the vehicle was running or stopped, the engine warmed up or not, the air-fuel ratio lean or rich, etc. at the time of the malfunction.

▷1. Check of output voltage of ECU.

1. Set the SST (Sub-harness).
SST: 09842-97209-000
2. Conduct the voltage measurement between the next terminals under the following conditions given below.
 - (1) Between SST 15 (OXH1) and the body earth
 - (2) Between SST 14 (OXH2) and the body earth

	Measurement conditions	
	IG switch "ON"	After engine started
Front Oxygen sensor heater	Battery voltage	Below 1.0 V/ Immediately after
Rear Oxygen sensor heater.	Battery voltage	Below 1.0 V/After more than 3 minutes

3. Are the check results OK?
 - ▼ If it is OK, check or replace the EFI ECU.
 - ▼ If it is NG, go to ▷2.

➤ 2. Unit check of oxygen sensor.

1. Check the front and rear oxygen sensor heater units.

(1) Front oxygen sensor

Refer to Page B8-202.

(2) Rear oxygen sensor

Refer to Page B8-203.

2. Are the unit check results OK?

▼ If it is OK, check the harness and connector between the following terminals for open wire and short.

(1) Between the main relay and the EFI ECU

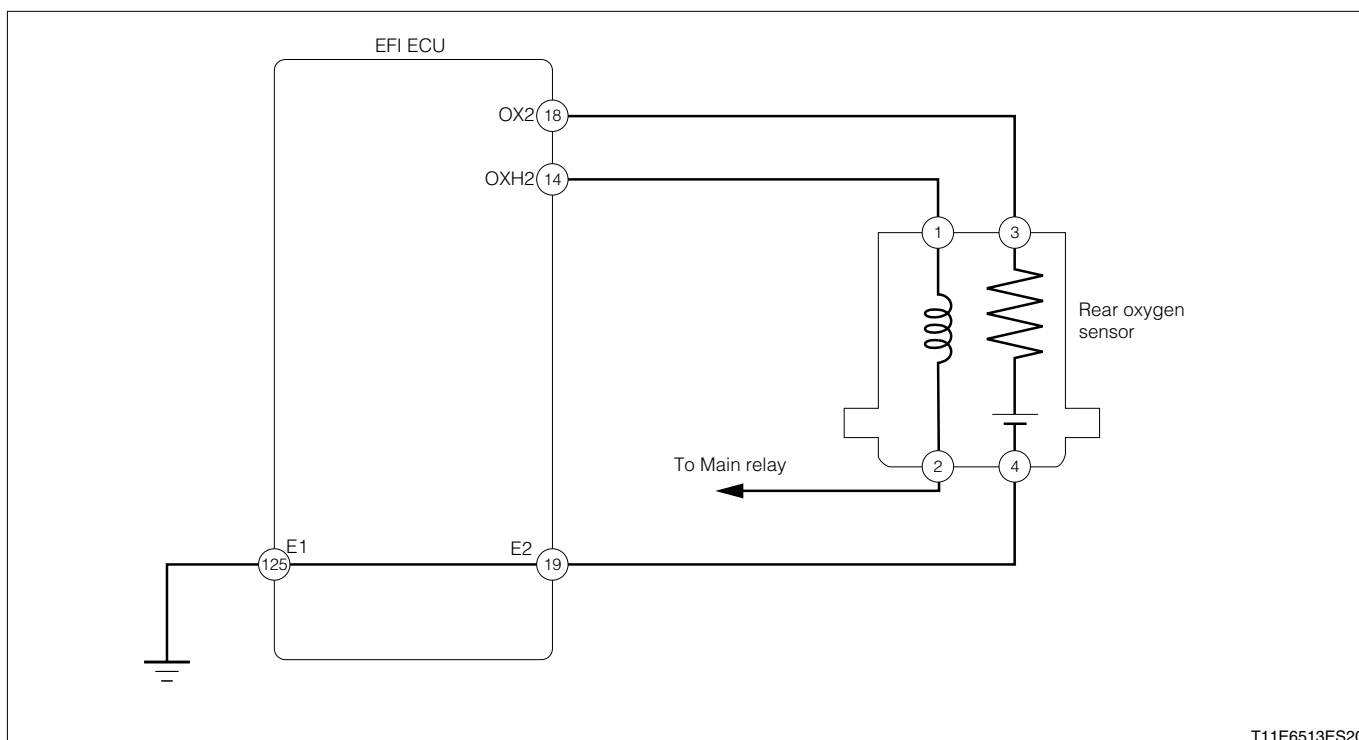
(2) Between the front oxygen sensor and the EFI ECU

(3) Between the rear oxygen sensor and the EFI ECU

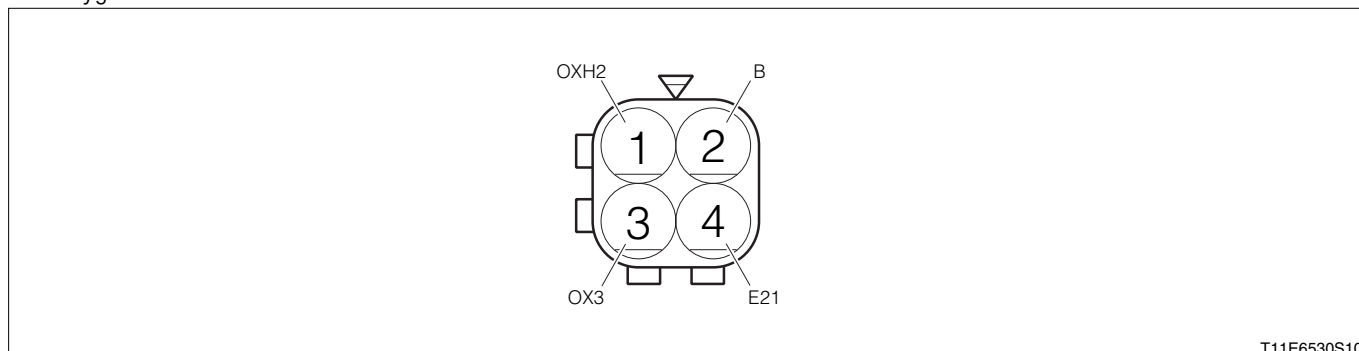
▼ If it is NG, replace the defective oxygen sensor.

7-12-8 DTC NO.P0136/22 REAR OXYGEN SENSOR CIRCUIT MALFUNCTION (BANK 1 SENSOR 2)

(1) System diagram

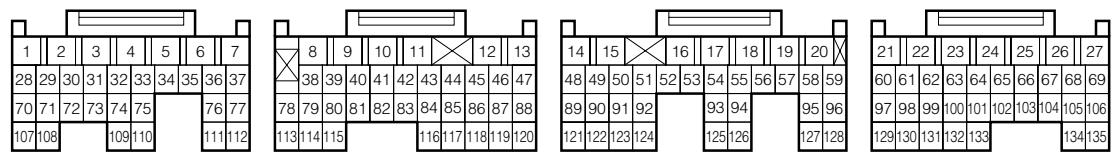


Rear oxygen sensor connection vehicle harness side connector



B8-81

EFI ECU connection vehicle harness side connector



H11E6051S10

(2) **Circuit description**

- 1. Refer to DTC P0130/21 (Oxygen sensor circuit malfunction (Bank 1 sensor 1)).

(3) **Trouble area**

- 1. Open wire or short circuit in the rear oxygen sensor circuit
- 2. Rear oxygen sensor
- 3. EFI ECU

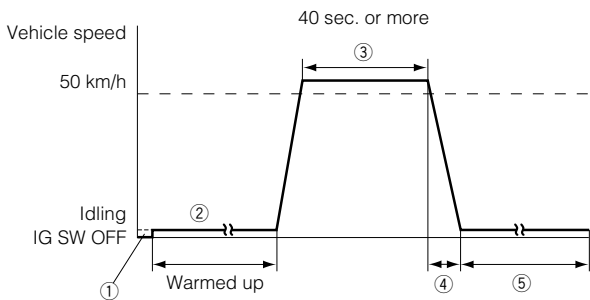
(4) **Checking points**

NOTE

- When this code is outputted concurrently with another code, carry out the check for that code first.

- 1. Is the signal from the rear oxygen sensor inputted to the EFI ECU?
- 2. Is the harness between the rear oxygen sensor and the EFI ECU normal?
- 3. Is the output of the rear oxygen sensor normal?

Confirmation driving pattern



C13E5563ES10

- (1) Step ①; Using DS-21, with the IG switch turned "LOCK", connect the DS-21 diagnosis tester to DLC through the SST. Turn "ON" the IG switch and the main switch of the tester. Set the tester to the "Continuous monitoring results" of the CARB mode.

SST: 09991-87404-000

- (2) Step ①; Using DS-II, with the IG switch turned "LOCK", connect the DS-II diagnosis tester to DLC. Turn "ON" the IG switch and the main switch of the tester. Set the tester to the "Continuous monitoring results" of the CARB mode.
- (3) Step ②; Start the engine. With all switch turned "OFF", keep on warming the engine for more than five minutes until the engine coolant temperature reaches 90°C or above.
- (4) Step ③; Accelerate the vehicle until the vehicle speed reaches 50 km/h or more in the 1st → 2nd gear. Keep on running the vehicle at that speed for at least 40 seconds.
- (5) Step ④; Under this condition, release the foot off from the accelerator pedal so as to decelerate the vehicle. Maintain the idling state.
- (6) Step ⑤; After one minute of idling, press the F1 key of the tester. Check to see if the DTC P0130/21 is outputted.

NOTE

- If the conditions in this test are not strictly followed, detection of the malfunction will not be possible.
- If you do not have diagnosis tester (DS-21/DS-II), turn the ignition switch "LOCK" after performing steps ② to ④, then perform steps ② to ④ again.

(5) Inspection procedure

① When using diagnosis tester (DS-21/DS-II) or OBD II generic scan tool:

NOTE

- Read the freeze frame data, using the diagnosis tester (DS-21/DS-II) or OBD II generic scan tool. Because the freeze frame data records the engine conditions when the malfunction was detected, when troubleshooting the freeze frame data is useful to determine whether the vehicle was running or stopped, the engine warmed up or not, the air-fuel ratio lean or rich, etc. at the time of the malfunction.

▷1. Check of DTC.

- Are other codes (Those other than DTC P0136/22) outputted?
 - ▼ If the output is made, proceed to the Item of the relevant diagnosis code.
 - ▼ If no output is made, proceed to ▷2.

▷2. Wiring harness check

1. The IG switch turned "LOCK".
2. Set the SST (Sub-harness). However, the SST connectors at the ECU side should remain disconnected.

SST: 09842-97209-000

3. Disconnect the oxygen sensor connector.
4. Check the harness and connector for open wire or short.
 - (1) Between the oxygen sensor connection vehicle harness side connector1 (OX2) and SST 18 (OX2)

SPECIFIED VALUE: Continuity exists.

- (2) Between the oxygen sensor connection vehicle harness side connector1 (OX2) and the body earth

SPECIFIED VALUE: No continuity exists

5. Are the check results for open wire and short OK?

▼ If it is OK, go to ▷3.

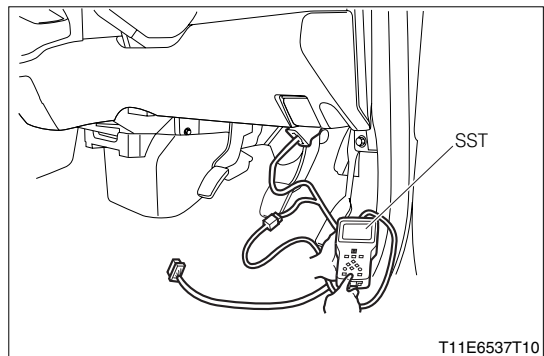
▼ If it is NG, repair or replace the harness or connector.

▷3. Check of output voltage of sensor.

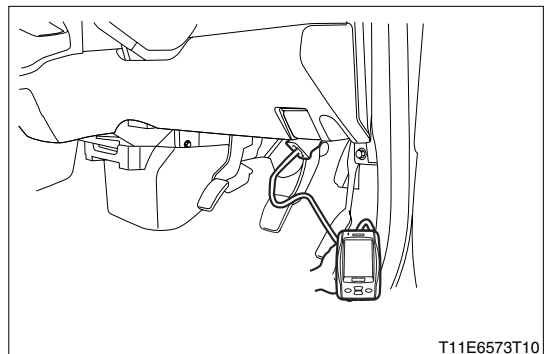
1. Connect the rear oxygen sensor and SST connectors, respectively.
2. Connect the diagnosis tester to DLC.

- (1) In case of DS-21, connect the DS-21 diagnosis tester to DLC through the SST.

SST: 09991-87404-000



- (2) In case of DS-II, connect the DS-II diagnosis tester directly to DLC.
- (3) In case of the OBD II generic scan tool, connect the OBD II generic scan tool directly to DLC.



3. Warm up the engine.
4. Turn "ON" the main switch of the tester.
5. Race the engine at 4000 rpm for three minutes by depressing the accelerator pedal.
6. Under the condition of step 5, release the foot off from the accelerator pedal so as to allow the engine to idle.
7. Read the output voltage of the oxygen sensor between Steps 5 to 6.

SPECIFIED VALUE: The voltage should become 0.4 V or below and 0.55 V or more, respectively, at least one time.

8. Are the check results OK?

▼ If it is OK, check the EFI ECU circuit.

▼ If it is NG, go to ⤵4.

⤵4. Check of output voltage of sensor.

1. Warm up engine completely.
2. IG switch turned "LOCK".
3. Disconnect the connector of the rear oxygen sensor.
4. Connect a voltmeter to the connector terminal of oxygen sensor.
5. Hold the engine racing speed for 5 minutes at 2000 rpm. At this time, ensure that the reading of the volt meter is within the specified value.

SPECIFIED VALUE: The voltmeter exhibits an output voltage of 0.2 V or more at least one time?

6. Are the check results OK?

▼ If it is OK, check or replace the EFI ECU.

▼ If it is NG, replace the oxygen sensor. (Bank 1, sensor 2)

Refer to Page B4-2.

② When not using diagnosis tester (DS-21/DS-II) or OBD II generic scan tool:

⤵1. Check of wire harness continuity

1. Perform continuity check between each of the following terminals.
 - (1) Between sensor connection vehicle harness side connector 1 (OX2) - ECU connection vehicle harness side connector 18 (OX2)
 - (2) Between sensor connection vehicle harness side connector 2 (E2) - ECU connection vehicle harness side connector 19 (E2)
- ▼ If it is OK, proceed to ⤵2.
- ▼ If it is NG, repair the harness and connectors.

⤵2. Rear oxygen sensor continuity check

1. Perform continuity check between each of the following terminals.
 - (1) Between rear oxygen sensor side connector 1 (OX2) - rear oxygen sensor body
 - (2) Between rear oxygen sensor side connector 2 (E2) - rear oxygen sensor body

SPECIFIED VALUE: No continuity exists.

▼ If it is OK, proceed to ⤵3.

▼ If it is NG, replace the rear oxygen sensor.

Refer to Page B4-2.

▷3. Rear oxygen sensor signal check

1. Stop the vehicle.
2. Continue racing of 2000rpm or above for about five minutes from the state in which the rear oxygen sensor is cooled.
3. Perform output voltage measurements of the rear oxygen sensor during this time (Between the rear oxygen sensor side terminals).

SPECIFIED VALUE: It becomes 0 V(During cold period) → 0.65 V or above (When detecting rich state after warm-up).

4. Stop the engine and perform the output voltage measurements between the following terminals.
(1) Between rear oxygen sensor side connector 1 (OX2) - rear oxygen sensor side connector 2 (E2)

SPECIFIED VALUE: 0.55V or less.

NOTE

- Measure them under the condition in which the rear oxygen sensor is detecting oxygen (Lean condition).

▼ If it is OK, proceed to ▷4.

▼ If it is NG, replace the rear oxygen sensor.

Refer to Page B4-2.

▷4. Rear oxygen sensor unit check

1. Perform unit check of the rear oxygen sensor.
Refer to Page B8-203.

▼ If it is OK, check the oxygen sensor system.

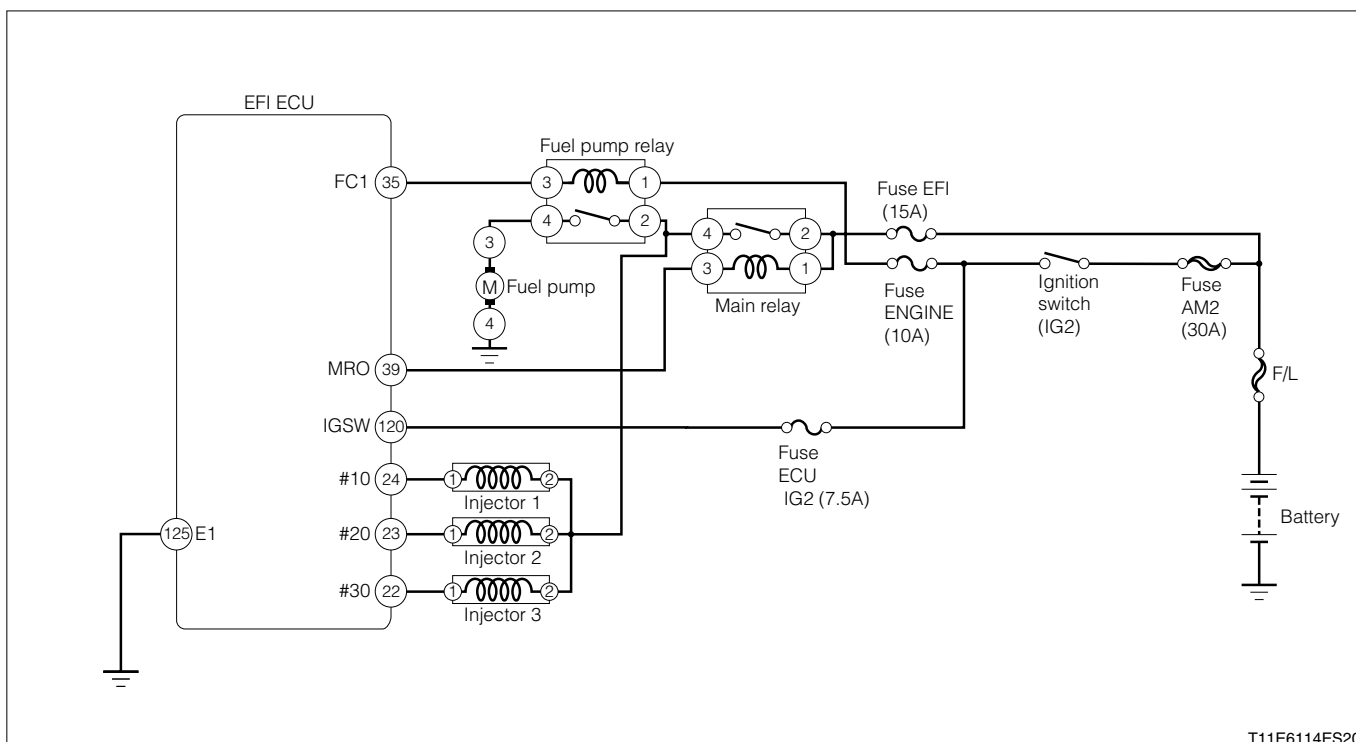
▼ If it is NG, replace the rear oxygen sensor.

Refer to Page B4-2.

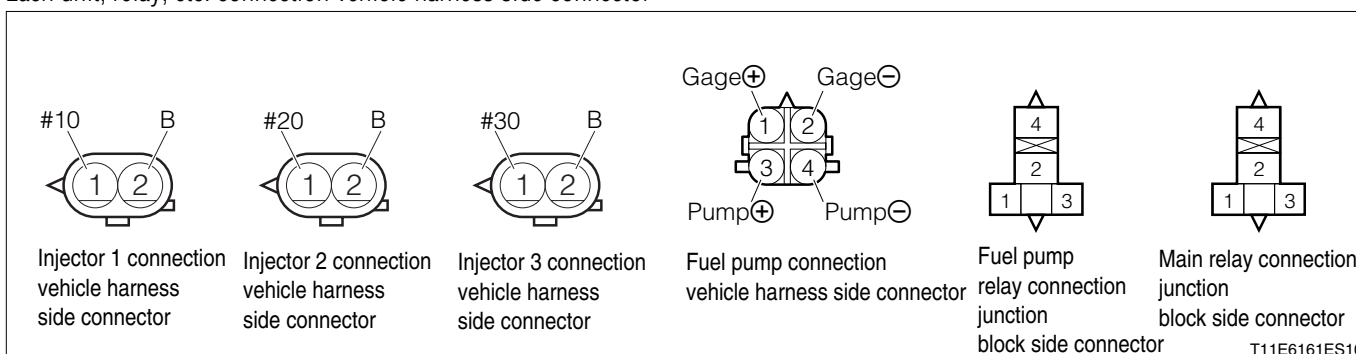
7-12-9 DTC NO.P0171/25 FUEL TRIM SYSTEM TOO LEAN (AIR-FUEL RATIO LEAN MALFUNCTION, BANK 1)

DTC NO.P0172/26 FUEL TRIM SYSTEM TOO RICH (AIR-FUEL RATIO RICH MALFUNCTION, BANK 1)

(1) System diagram

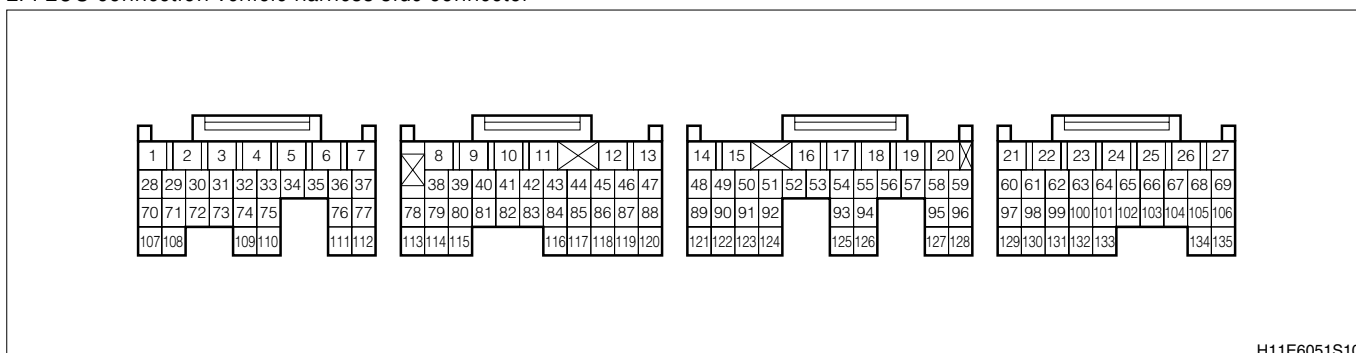


T11E6114ES20



T11E6161ES10

EFI ECU connection vehicle harness side connector



H11E6051S10

(2) Circuit description

1. The fuel trim means the feedback compensation value that will compensate the basic injection time. The fuel trim comes in two kinds: the short-term fuel trim and the long-term fuel trim.
2. The short-term fuel trim is a short-term fuel compensation to be carried out to maintain the air-to-fuel ratio at the stoichiometric air-to-fuel ratio. The signal from the oxygen sensor indicates whether the current air-to-fuel ratio is rich or lean than the stoichiometric air-to-fuel ratio. Hence, if the air-to-fuel ratio is rich, the fuel injection amount will be reduced. Conversely, if the air-to-fuel ratio is lean, the fuel injection amount will be increased.
3. The long-term fuel trim is overall fuel compensation over a long period of time in order to compensate a continues deviation of the short-term fuel trim from the central value, which will be caused by the engines inherent characteristics, the wear due to operation over a long period of time and the change in operational environment.

(3) Diagnosis code No.P0171/25 output conditions

1. The correction coefficient is stuck to the one side (Lean state of air fuel ratio) during the air fuel ratio feedback period

(4) Diagnosis code No.P0172/26 output conditions

1. The correction coefficient is stuck to the one side (Rich state of air fuel ratio) during the air fuel ratio feedback period

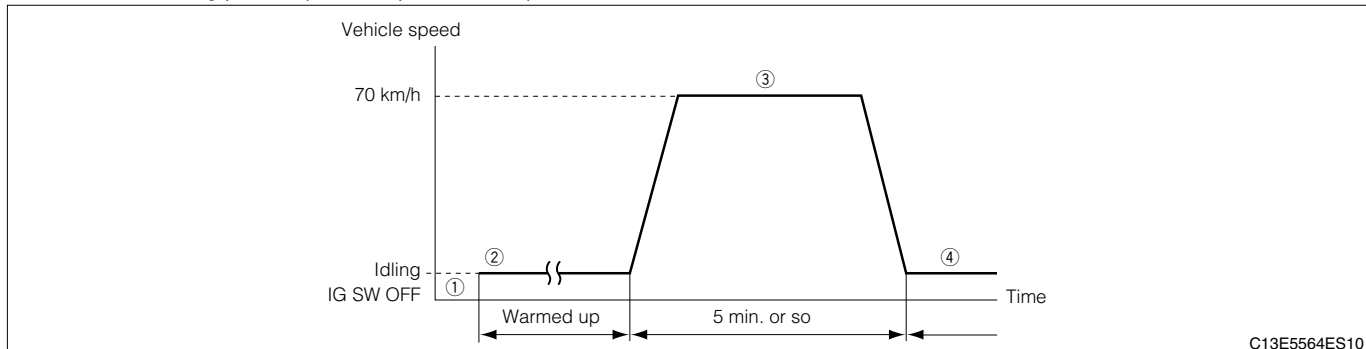
(5) Trouble area

1. Open wire or short circuit in the oxygen sensor circuit
2. Oxygen sensor
3. Engine coolant temperature sensor sensor
4. Evaporative emission purge VSV
5. EFI ECU

(6) Checking points

1. Is the fuel pressure normal?
2. Is the injector normal?
3. Is the oxygen sensor normal?

Confirmation driving pattern (For EU specifications)



- (1) Step ①; Using DS-21, with the IG switch turned "LOCK", connect the DS-21 diagnosis tester to DLC through the SST. Turn "ON" the IG switch and the main switch of the tester. Set the tester to the "Continuous monitoring results" of the CARB mode.

SST: 09991-87404-000

- (2) Step ①; Using DS-II, with the IG switch turned "LOCK", connect the DS-II diagnosis tester to DLC through the SST. Turn "ON" the IG switch and the main switch of the tester. Set the tester to the "Continuous monitoring results" of the CARB mode.
- (3) Step ②; Start the engine. Keep on warming the engine for more than five minutes until the engine cooling water temperature reaches 90°C or above.
- (4) Step ③; Run the vehicle for more than five minutes at a speed of 70 km/h with the gear selected to the 5th gear.
- (5) Step ④; After one minute of idling, press the F1 key of the tester. Check to see if the DTC P0171/0172 is detected.

NOTE

- If the conditions in this test are not strictly followed, detection of the malfunction will not be possible.
- If you do not have diagnosis tester (DS-21/DS-II), turn the ignition switch "LOCK" after performing steps ② to ④, then perform steps ② to ④ again.

(7) Inspection procedure

① When using diagnosis tester (DS-21/DS-II) or OBD II generic scan tool:

NOTE

- Read the freeze frame data, using the diagnosis tester (DS-21/DS-II) or OBD II generic scan tool. Because the freeze frame data records the engine conditions when the malfunction was detected, when troubleshooting the freeze frame data is useful to determine whether the vehicle was running or stopped, the engine warmed up or not, the air-fuel ratio lean or rich, etc. at the time of the malfunction.

▷1. Check of DTC.

1. Check other codes (Those other than DTC P0171/25 or P0172/26) outputted?

▼ If the output is made, proceed to the Item of the relevant diagnosis code.

▼ If no output is made, proceed to ▷2.

▷2. Check of air induction system.

1. Check the following items given below.

(1) Check of the engine oil level gauge, oil filler cap and PCV hose for disconnection.

(2) Check of parts of the air induction system between the cylinder head and the throttle body for disconnection, looseness, or cracks.

▼ If it is OK, go to ▷3.

▼ If it is NG, repair or replace the induction system.

▷3. Check of injector injection.

1. Check the injector unit.

Refer to Page B8-205.

2. Are the check results OK?

▼ If it is OK, go to ▷4.

▼ If it is NG, replace the injector.

Refer to Page B7-9.

▷4. Check of purge VSV for EVAP.

1. Perform the unit check of the VSV for evaporative emission purge.
Refer to Page B8-206.

2. Are the check results OK?

▼ If it is OK, go to ▷5.

▼ If it is NG, replace the purge VSV for EVAP.

▷5. Check of engine cooling coolant temperature sensor.

1. Perform the unit check of the water temperature sensor.
Refer to Page B8-202.

2. Are the check results OK?

▼ If it is OK, go to ▷6.

▼ If it is NG, replace the engine cooling coolant temperature sensor.

Refer to Page B8-5.

▷6. Manifold absolute pressure/intake air temperature integral type sensor unit check

1. Perform the unit check of the manifold absolute pressure/intake air temperature integral type sensor (Intake manifold pressure sensor section).
Refer to Page B8-201.

2. Are the check results OK?

▼ If it is OK, go to ▷7.

▼ If it is NG, replace the manifold absolute pressure/intake air temperature integral type sensor.

▷7. Check of fuel pressure.

1. Check the fuel pressure.
Refer to Page B8-200.

2. Are the check results OK?

▼ If it is OK, go to ▷8.

▼ If it is NG, check and repair fuel pump, fuel pipe line and filter.

▷8. Check of gas leakage of exhaust system.

1. Check the exhaust gas leakage.
Refer to Page B1-9.

2. Are the check results OK?

▼ If it is OK, go to ▷9.

▼ If it is NG, repair or replace the defective point.

➤9. Wiring harness check

1. IG switch turned "LOCK".
2. Set the SST (Sub-harness). However, the SST connectors at the ECU side should remain disconnected.

SST: 09842-97209-000

3. Disconnect the oxygen sensor connector.
4. Check the harness and connector for open wire or short.
 - (1) Between the oxygen sensor connection vehicle harness side connector3 (OX1) and SST 123 (OX1)

SPECIFIED VALUE: Continuity exists.

- (2) Between the oxygen sensor connection vehicle harness side connector 3 (OX1) and the body earth

SPECIFIED VALUE: No continuity exists

5. Are the check results for open wire and short OK?

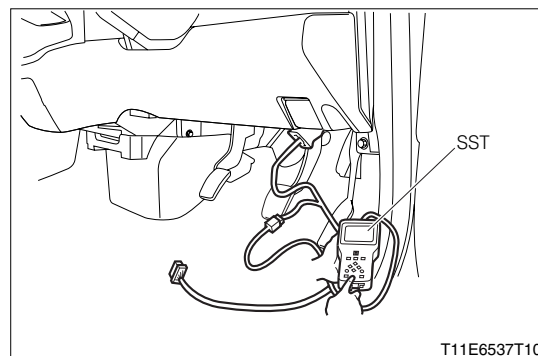
▼ If it is OK, go to ➤10.

▼ If it is NG, repair or replace the harness or connector.

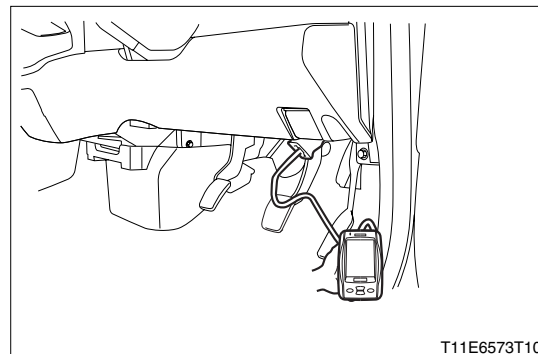
➤10. Check of output voltage of sensor.

1. Connect the oxygen sensor and SST connectors, respectively.
2. Connect the diagnosis tester to DLC.
 - (1) In case of DS-21, connect the DS-21 diagnosis tester to DLC through the SST.

SST: 09991-87404-000



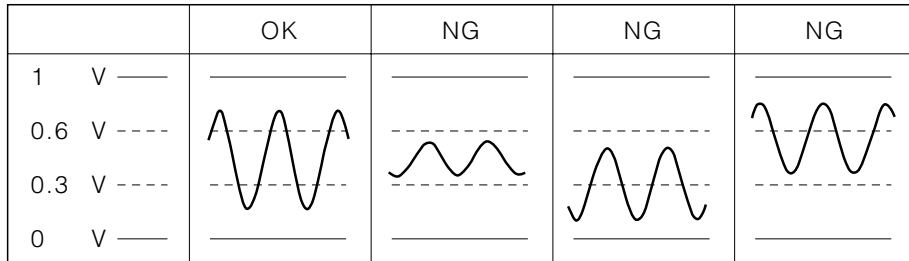
- (2) In case of DS-II, connect the DS-II diagnosis tester directly to DLC.
- (3) In case of the OBD II generic scan tool, connect the OBD II generic scan tool directly to DLC.



B8-91

3. Warm up the engine at 2500 rpm for about 90 seconds.
4. Turn "ON" the main switch of the tester.
5. Read the output voltage of oxygen sensor during idling.

SPECIFIED VALUE: The voltage varies repeatedly between a range from a voltage below 0.3 V and to a voltage above 0.6 V. (See the diagram below.)



C13E555S10

6. Are the check results OK?

▼ If it is OK, go to ⤵12.

▼ If it is NG, go to ⤵11.

⤵11. Check of output voltage of sensor.

1. Warm up engine completely.
2. IG switch turned "LOCK".
3. Disconnect the connector of the oxygen sensor.
4. Connect a voltmeter to the connector terminal of oxygen sensor.
5. Hold the engine racing speed for 3 minutes at 2000 rpm.
6. At this time, ensure that the reading of the volt meter is within the specified value.

SPECIFIED VALUE: The voltmeter exhibits an output voltage of 0.2 V or more at least one time?

7. Are the check results OK?

▼ If it is OK, check or replace the EFI ECU.

▼ If it is NG, replace the oxygen sensor. (Bank 1, sensor 1)

⤵12. Perform confirmation driving pattern.

1. Perform the confirmation running pattern.
2. Is there DTC P0171/25 or P0172/26 being output again?
▼ If the output is made, check or replace the EFI ECU.
▼ If the output is made, proceed to ⤵13.

⤵13. The past situation of vehicles operation is investigated.

1. Did the vehicle run out of fuel in the past?
▼ If erected, the diagnosis code No.P0171/25 is caused by running out of fuel.
▼ If not erected, check the EFI ECU circuit.

② When not using diagnosis tester (DS-21/DS-II) or OBD II generic scan tool:

⤵1. Oxygen sensor system check

1. Perform checking of the oxygen sensor system.
Refer to Page B8-70.

▼ If it is OK, proceed to ⤵2.

▼ If it is NG, repair the oxygen sensor system.

➤2. Fuel pressure check

1. Perform fuel pressure check.

Refer to Page B8-200.

▼ If it is OK, proceed to ➤3.

▼ If it is NG, check and repair the following portions.

- (1) Fuel pump system
- (2) Fuel line

➤3. Injector system check

1. Perform checking of the injector system.

Refer to Page B8-191.

▼ If it is OK, proceed to ➤4.

▼ If it is NG, repair the injector system.

➤4. Spark plug unit check

1. Perform unit check of the spark plug.

Refer to Page B8-204.

▼ If it is OK, replace the EFI ECU.

Refer to Page B8-1.

▼ If it is NG, replace the spark plug.

Refer to Page B10-1.

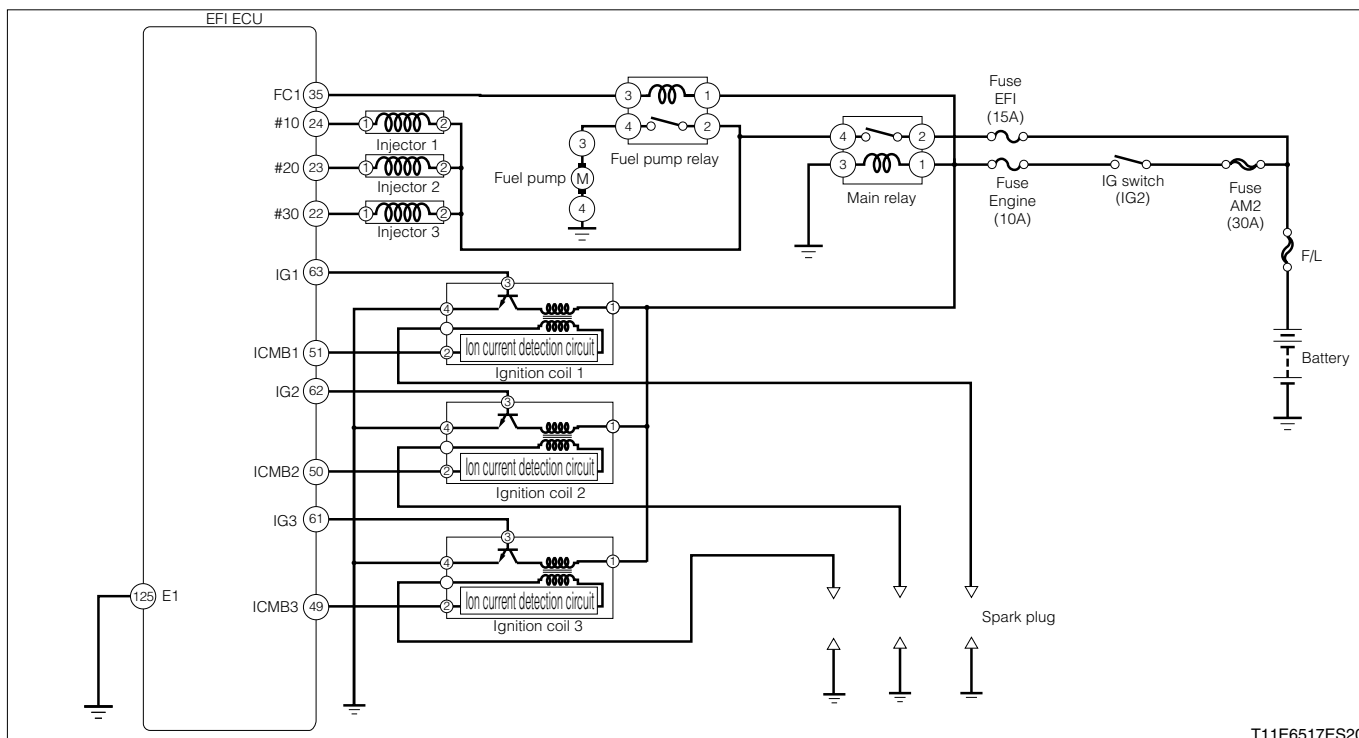
7-12-10 DTC NO.P0300/17 RANDOM/MULTIPLE CYLINDER MISFIRE DETECTED

DTC NO.P0301/17 MISFIRE DETECTED (CYLINDER 1)

DTC NO.P0302/17 MISFIRE DETECTED (CYLINDER 2)

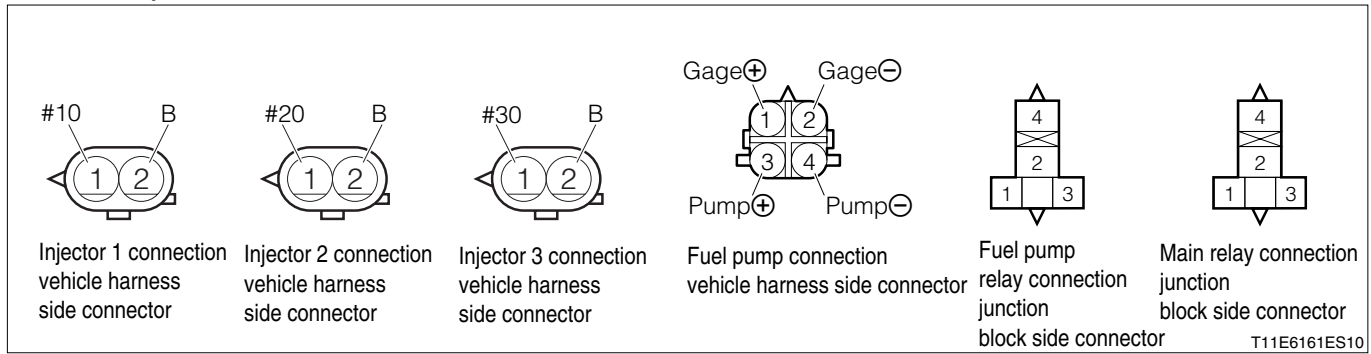
DTC NO.P0303/17 MISFIRE DETECTED (CYLINDER 3)

(1) System diagram

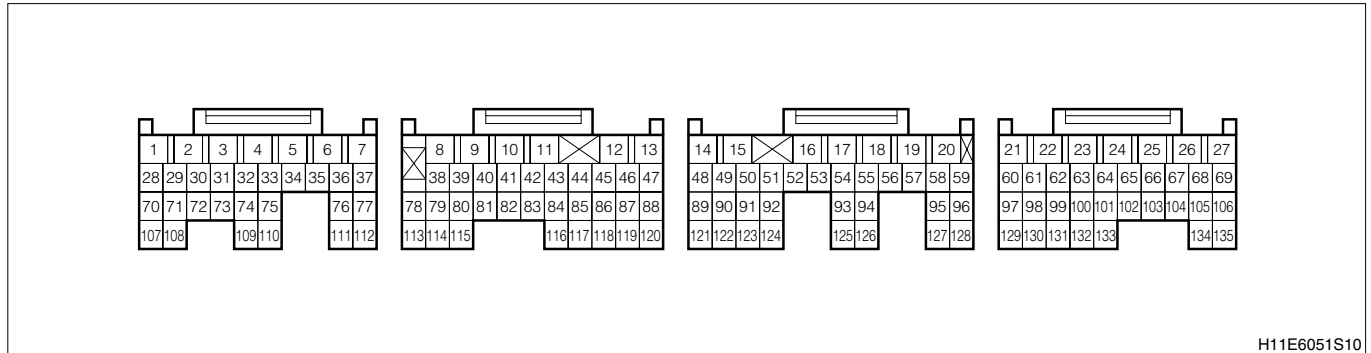


B8-93

Each unit, relay, etc. connection vehicle harness side connector



EFI ECU connection vehicle harness side connector



(2) Circuit description

① Misfire:

1. The igniter unit detects the ion current that flows in proportion to the combustion pressure. This ion current is converted into a voltage, which will be inputted to the ECU. If the voltage value is below a certain value, the EFI ECU evaluate it as a misfire and counts its occurrence numbers.
2. When the misfire rate becomes or exceeds a number that indicates deteriorated engine conditions, this state will cause the malfunction indicator lamp (MIL) to be illuminated. If such a misfire is occurring whose misfire rate is high enough that the driving condition will most likely cause the catalyst to be overheated, the malfunction indicator lamp (MIL) will flash.

(3) Diagnosis code output conditions

① P0300/17:

1. Misfiring of random/multiple cylinders is detected during any particular 400 or 2000 ignitions.

② P0301/17, P0302/17, P0303/17:

1. For any particular 400 ignitions for engine, misfire is detected which can cause catalyst overheating. (This causes MIL to blink.)
2. For any particular 2000 ignitions for engine, misfire is detected which can cause deterioration in emissions.

NOTE

- When the 2 or more codes for a misfiring cylinder are recorded repeatedly but no random/multiply cylinder misfire code is recorded, it indicates that the misfire were detected and recorded at different times.

(4) Trouble area

1. Open wire/short circuit for the ignition system circuit
2. Open wire/short circuit for the ion system circuit
3. Injector
4. Fuel pressure
5. Combustion pressure
6. Manifold absolute pressure/ intake air temperature integral type sensor
7. Engine coolant temperature sensor
8. EFI ECU

(5) Points Of Inspection

1. Is the signal from the ignition coils (Igniter section) inputted to the ECU proper ?
2. Does the ignition coils (Igniter) operate proper ?
3. Is the harness between the injector and the ECU proper ?
4. Does the injector operate proper ?
5. Is the harness between the engine coolant temperature sensor sensor and the ECU proper ?
6. Is the output of the water temperature sensor normal?

(6) Inspection procedure**NOTE**

- In order to memorize DTC of misfire, it is necessary to drive around MISFIRE RPM, MISFIRE LOAD in the data list for the following period of time.

Confirmation driving pattern

Engine speed	Time
Idling	3 minutes 30 seconds or more
1000 rpm	3 minutes or more
2000 rpm	1 minutes 30 seconds or more
3000 rpm	1 minutes or more

NOTE

- If it is the case that any DTC besides misfire is memorized simultaneously, first perform the troubleshooting for them.

NOTE

- Read the freeze frame data, using the diagnosis tester (DS-21/DS-II) or OBD II generic scan tool. Because the freeze frame data records the engine conditions when the malfunction was detected, when troubleshooting the freeze frame data is useful to determine whether the vehicle was running or stopped, the engine warmed up or not, the air-fuel ratio lean or rich, etc. at the time of the malfunction.
- When the vehicle is brought to the workshop and the misfire is not occurred, misfire can be confirmed by reproducing the condition of freeze frame data. Also, after finishing the repair, confirm that there is no misfire. (See the confirmation driving pattern)

① When using diagnosis tester (DS-21/DS-II) or OBD II generic scan tool:**▷1. Visual check of inside of engine compartment.**

1. Check the connecting conditions of the wire harnesses and connectors.
2. Check the vacuum hoses, purge hoses, fuel hoses and pipes for disconnection and breakage.
3. Are the check results OK?

▼ If it is OK, go to ▷2.

▼ If it is NG, repair or replace the defective point. Ensure that there is no misfiring. (Refer to the confirmation of the running pattern.)

▷2. Check of spark plug and spark of misfiring cylinder.

1. Warm up the engine.

2. Turn the IG switch to "LOCK".
3. Remove the fuel pump relay.
4. Let the engine idle and wait until it stops by itself.
5. Turn the IG switch to "LOCK".
6. Remove the connector of the injector.

CAUTION

- Stop the fuel injection through the above operation and prevent damaging the catalyst by the unburned gas.
7. Remove the ignition coils and spark plugs (Misfire cylinders).
 8. Install the spark plug to the ignition coil.
 9. Ground the spark plug.
 10. Crank the engine at this time, check to see if the spark plug sparks.
 11. Are sparks jumping?
 - ▼ If it is OK, go to >3.
 - ▼ If it is NG, perform the following operation.
 - (1) Replace the spark plug
 - (2) Check the ignition system and ion system.

CAUTION

- Do not use any spark plugs other than those designated.

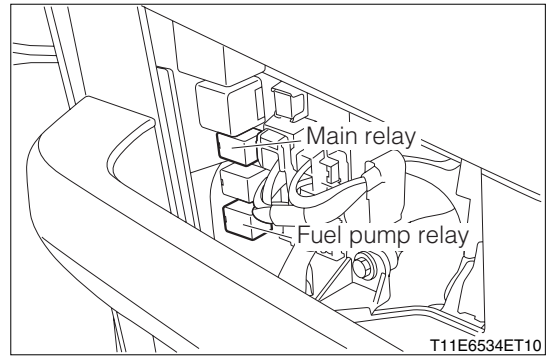
>3. Check of output signal of injector of misfiring cylinder.

1. With the IG switch turned "LOCK", perform restoration.
2. Set the SST.

SST: 09842-97209-000

3. IG switch turned "ON".
4. As for the harness between the following terminals, measure the injector voltage of the cylinder where the misfiring is occurring.
 - (1) Between SST 24 (#10) and the body earth
 - (2) Between SST 23 (#20) and the body earth
 - (3) Between SST 22 (#30) and the body earthSPECIFIED VALUE: Battery voltage

5. Observation of injector waveform with oscilloscope (Reference).
6. As for the harness between the following terminals, check the respective oscillographic waveform during the idling.
 - (1) Between SST 24 (#10) and SST 125 (E1)
 - (2) Between SST 23 (#20) and SST 125 (E1)
 - (3) Between SST 22 (#30) and SST 125 (E1)



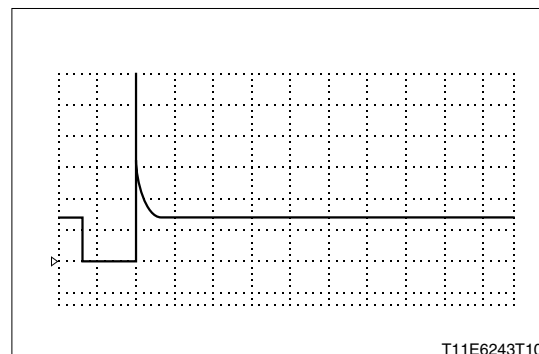
7. As an example, in case of the following measuring range and measuring conditions, it will be as in the right figure.

Time axis	2ms / DIV
Voltage axis	10V / DIV
Measuring condition	When air conditioner is "OFF" with no electric load and while idling

Air conditioner "OFF": Conditions in which all of the air conditioner switch (ACSW), blower switch (BLW) and magnet clutch (MGC) are "OFF".

NOTE

- The waveform cannot be specified, but confirm that a waveform as in the right figure (One such example) shows up



T11E6243T10

8. Confirm the following points.

(1) The voltage changes from the battery voltage to 0V while fuel injection.

9. Are the check results OK?

▼ If it is OK, go to [▷6.](#)

▼ If it is NG, go to [▷4.](#)

[▷4. Unit check of injector of misfiring cylinder.](#)

1. Turn "LOCK" the IG switch.
2. Disconnect the injector connector of the misfiring cylinder.
3. Measure the resistance between the injector terminals (Injector side).

SPECIFIED VALUE: 12 Ω at 20°C

4. Are the unit check results OK?

▼ If it is OK, go to [▷5.](#)

▼ If it is NG, replace the injector.

[▷5. Wiring harness check](#)

1. IG switch turned "LOCK".
2. Disconnect the SST connectors from the EFI ECU.
3. Check the harness and connector for open wire.
 - (1) Between the injector 1 connection vehicle harness side connector 1 (#10) and the EFI ECU connection vehicle harness side connector 24 (#10)
 - (2) Between the injector 2 connection vehicle harness side connector 1 (#20) and the EFI ECU connection vehicle harness side connector 23 (#20)
 - (3) Between the injector 3 connection vehicle harness side connector 1 (#30) and the EFI ECU connection vehicle harness side connector 22 (#30)

SPECIFIED VALUE: Continuity exists.

4. Check the harness and connector for short.

- (1) Between the injector 1 connection vehicle harness side connector 1 (#10) and the body earth
- (2) Between the injector 2 connection vehicle harness side connector 1 (#20) and the body earth
- (3) Between the injector 3 connection vehicle harness side connector 1 (#30) and the body earth

SPECIFIED VALUE: No continuity exists

5. Are the check results for open wire and short OK?

▼ If it is OK, check the EFI ECU circuit.

▼ If it is NG, repair or replace the harness or connector.

▷6. Check of ion system.

1. Perform the trouble shooting for the code No.P1300/36.
Refer to Page B8-145.
2. Are the check results OK?
 - ▼ If it is OK, go to ▷7.
 - ▼ If it is NG, repair or replace the defective point.

▷7. Check of fuel pressure.

1. Check the fuel pressure.
Refer to Page B8-200.
2. Are the check results OK?
 - ▼ If it is OK, go to ▷8.
 - ▼ If it is NG, Check and repair the fuel pump, pressure regulator, fuel pipe line and filter.

▷8. Check of injector injection.

1. Check the injector unit.
Refer to Page B8-205.
2. Are the check results OK?
 - ▼ If it is OK, go to ▷9.
 - ▼ If it is NG, replace the injector.

▷9. Manifold absolute pressure/intake air temperature integral type sensor unit check

1. Perform the unit check of the manifold absolute pressure/intake air temperature integral type sensor (Manifold absolute pressure sensor section).
Refer to Page B8-201.
2. Are the check results OK?
 - ▼ If it is OK, go to ▷10.
 - ▼ If it is NG, replace the manifold absolute pressure, intake air temperature integral type sensor.

▷10. Water temperature sensor unit check

1. Perform the unit check of the water temperature sensor.
Refer to Page B8-202.
2. Are the check results OK?
 - ▼ If it is OK, perform the following checks given below.
 - (1) Compression pressure
Refer to Page B1-1.
 - (2) Valve clearance
Refer to Page B1-1.
 - ▼ If it is NG, replace the engine coolant temperature sensor.
Refer to Page B8-5.

② When not using diagnosis tester (DS-21/DS-II) or OBD II generic scan tool:

➤1. Diagnosis code check

1. Use the SST to short-circuit DLC terminals between 5(EFI-T) - 13(E).

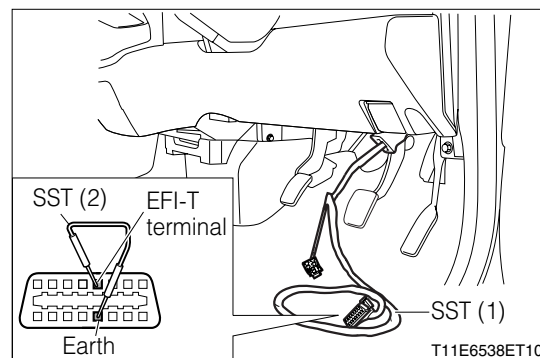
SST: 09991-87404-000(1)
09991-87403-000(2)

2. Check whether the diagnosis code other than Code No.36 is outputted or not.

SPECIFIED VALUE: No output.

▼ If it is OK, go to ➤2.

▼ In the case of NG, first check and repair a condition that caused the diagnosis code output.



➤2. Unit check of spark plug

1. Check whether the designated spark plug is used. (See Engine Turning-up section for spark plug specifications.)
Refer to Page B1-1.

2. Perform the unit check of the spark plug
Refer to Page B8-204.

▼ If it is OK, go to ➤3.

▼ If it is NG, clean or replace the spark plug. If a designated spark plug is not used, replace the spark plug with the designated spark plug.

➤3. Spark check

WARNING

- There is a hazard potential for sparks are generated. Do not place combustible materials in the vicinity.

1. Warm up the engine.
2. Set the IG switch to "LOCK".
3. Remove the fuel pump relay.
4. Idle the engine and wait until the engine stops by itself.
5. Set the IG switch to "LOCK".
6. Remove all the connectors from the injector.

CAUTION

- Operations described above will stop fuel injection, thus preventing damage to the catalyst due to non-burned gas etc.

7. Remove the spark plug and install it to the ignition coil to earth the plug.
8. Check whether the spark plug generates sparks during cranking.

SPECIFIED VALUE: Sparks are generated.

▼ If it is OK, go to ➤8.

▼ If it is NG, go to ➤4.

➤4. EFI ECU signal check (1)

1. Connect the SST.

SST: 09842-97209-000

2. Completely warm up the engine.

3. When the engine is in the starting condition, check an output waveform of an ignition signal between the following terminals using an oscilloscope.

- (1) Between SST 63 (IG1) - SST 125 (E1)
- (2) Between SST 62 (IG2) - SST 125 (E1)
- (3) Between SST 61 (IG3) - SST 125 (E1)

Time axis	100ms / DIV
Voltage axis	2V / DIV
Condition	Air-conditioner "OFF", no electrical load, idling

Air-conditioner "OFF": Set the air-conditioner switch (ACSW), blower switch (BLW), and magnet clutch (MGC) to "OFF".

NOTE

- Check that the waveform shown in the figure [Example] is displayed.

4. Check the following points.

- (1) The pulse of 0 ⇄ 5V is generated.
- (2) The waveform cycle is shortened as the engine speed increases.

NOTE

- The ignition signal can not be judged correctly if an oscilloscope is not used.

▼ If it is OK, go to ➤5.

▼ If it is NG, check the EFI ECU circuit.

➤5. Wire harness continuity check (1)

1. Check continuity between the following terminals.

- (1) Between ignition coil 1 connection vehicle harness side connector 3(IG1) - ECU connection vehicle harness side connector 63(IG1)
- (2) Between ignition coil 2 connection vehicle harness side connector 3(IG2) - ECU connection vehicle harness side connector 62(IG2)
- (3) Between ignition coil 3 connection vehicle harness side connector 3(IG3) - ECU connection vehicle harness side connector 61(IG3)

SPECIFIED VALUE: Continuity exists

▼ If it is OK, go to ➤6.

▼ If it is NG, repair or replace the faulty harness.

➤6. Ignition coil voltage check

1. Measure the voltage between the following terminals when the IG switch is "ON".

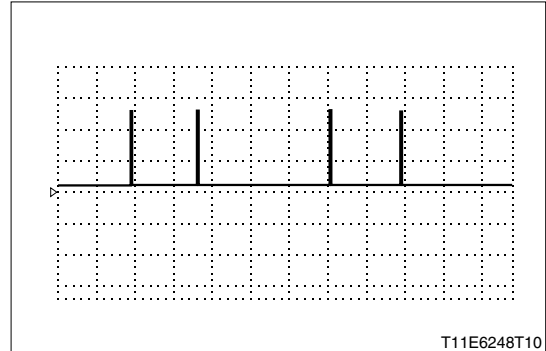
- (1) Between each ignition coil connection vehicle harness side connector 1(+B) - body earth

SPECIFIED VALUE: Battery voltage

▼ If it is OK, go to ➤7.

▼ In the case of NG, repair or replace the harness between the following terminals.

- (2) Each ignition coil - battery



➤7. Wire harness continuity check (2)

1. Check continuity between the following terminals.

- (1) Between each ignition coil connection vehicle harness side connector 4(E1) - ECU connection vehicle harness side connector 125(E1)

SPECIFIED VALUE: Continuity exists.

▼ If it is OK, replace the ignition coil.

Refer to Page B10-1.

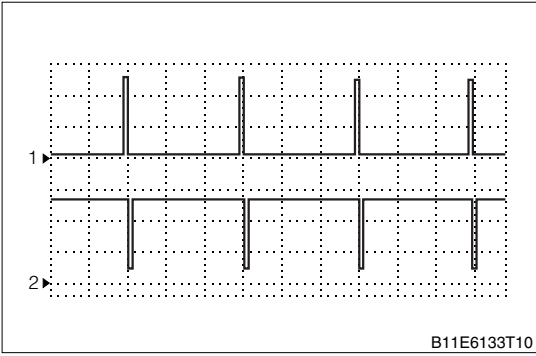
▼ In the case of NG, repair or replace the faulty harness.

➤8. EFI ECU signal check (2)

1. Completely warm up the engine.

2. While idling, check each cylinder for output waveforms of the ignition signal (1▶) and ion current combustion control signal (2▶), using an oscilloscope, respectively.

	Channel	+ side measuring terminal	− side measuring terminal
Cylinder No.1	1▶	63 (IG1)	125 (E1)
	2▶	51 (ICMB1)	125 (E1)
Cylinder No.2	1▶	62 (IG2)	125 (E1)
	2▶	50 (ICMB2)	125 (E1)
Cylinder No.3	1▶	61 (IG3)	125 (E1)
	2▶	49 (ICMB3)	125 (E1)



Time axis	50ms / DIV
Voltage axis	2V / DIV
Condition	Water temperature is 80℃ or more: air conditioner is "ON": Electric load exists: during air conditioner idle up rotation

Air conditioner is "ON": Condition where all of the air conditioner switch (ACSW), blower switch (BLW) and magnet clutch (MGC) are "ON".
Electric load exists: Conditions where the headlight (H/L) and Defogger (DEF) are both "ON".
Air conditioner idle up rotation:950⁺⁵⁰_{−150} rpm

NOTE

- Check that waveforms like those in the figure (One example) is produced.
3. Check the following points.
- (1) According to the output waveform of the ignition signal (Channel 1▶), the output waveform of the ion current combustion control signal (Channel 2▶) has been produced.
- (2) The waveform of 5↔0V has been produced.

NOTE

- Correct evaluation cannot be made for the ignition signals and ion current combustion control signals, unless you use an oscilloscope.

	Waveform (Channel 2▶) state
a	Normal
b	Clamped at 0V.
c	Clamped at 5V.
d	Clamped to the battery voltage.
e	Waveform is unstable※.

※: According to the output waveform of the ignition signal (Channel 1▶), the output waveform of the ion current combustion control signal (Channel 2▶) has not been produced.

- ▼ In the case of "a", go to ⤵9.
- ▼ In the case of "b" go to ⤵11.
- ▼ In the case of "c" go to ⤵13.
- ▼ In the case of "d" go to ⤵12.
- ▼ In the case of "e" go to ⤵16.

▷9. EFI ECU signal check (3)

1. Retain the measurement conditions in ▷8.
2. Under the following conditions, check each cylinder for output waveforms of the ion current combustion control signal, using an oscilloscope.
 - (1) Raise the engine revolution speed slowly from the idle state to 4000 rpm. Then, close the throttle opening quickly.

SPECIFIED VALUE: No waveform is outputted while fuel is cut.

▼ If it is OK, replace the EFI ECU.

Refer to Page B8-1.

▼ If it is NG, go to ▷10.

▷10. Fuel cut operation check

1. Check the output state between the following terminals using an oscilloscope.
 - (1) Between SST 24 (#10) - SST 125 (E1)
 - (2) Between SST 23(#20) - SST 125(E1)
 - (3) Between SST 22(#30) - SST 125(E1)
2. Check the operating sound of the injector using a sound scope when the fuel cut is active.

NOTE

- Check operating sound, while checking the output waveform to the injector using an oscilloscope.

SPECIFIED VALUE: The operating sound of the injector stops when the fuel cut is active.

▼ If it is OK, replace the ignition coil.

Refer to Page B10-1.

▼ In the case of NG, perform unit check of the injector.

Refer to Page B8-205.

▷11. Check of wire harness for short-circuit (1)

1. Check continuity of the cylinder whose waveform is clamped at 0V.
 - (1) Between ignition coil 1 connection vehicle harness side connector 2(ICMB1) - body earth
 - (2) Between ignition coil 2 connection vehicle harness side connector 2(ICMB2) - body earth
 - (3) Between ignition coil 3 connection vehicle harness side connector 2(ICMB3) - body earth

SPECIFIED VALUE: No continuity exists

▼ If it is OK, replace the ignition coil.

Refer to Page B10-1.

▼ In the case of NG, repair the faulty section.

▷12. Check of wire harness for short-circuit (2)

1. Check continuity of the cylinder whose waveform is clamped to the battery voltage.

- (1) Between ignition coil 1 connection vehicle harness side connector 2 (ICMB1) - battery positive (+) terminal
- (2) Between ignition coil 2 connection vehicle harness side connector 2 (ICMB2) - battery positive (+) terminal
- (3) Between ignition coil 3 connection vehicle harness side connector 2 (ICMB3) - battery positive (+) terminal

SPECIFIED VALUE: No continuity exists

▼ If it is OK, replace the ignition coil.

Refer to Page B10-1.

▼ In the case of NG, repair or replace the faulty component.

▷13. Check of wire harness for open wire

1. Check continuity of the cylinder whose waveform is clamped at 5V.

- (1) Between ignition coil 1 connection vehicle harness side connector 2 (ICMB1) - EFI ECU connection vehicle harness side connector 51 (ICMB1)
- (2) Between ignition coil 2 connection vehicle harness side connector 2 (ICMB2) - EFI ECU connection vehicle harness side connector 50 (ICMB2)
- (3) Between ignition coil 3 connection vehicle harness side connector 2 (ICMB3) - EFI ECU connection vehicle harness side connector 49 (ICMB3)

SPECIFIED VALUE: Continuity exists

▼ If it is OK, go to ▷14.

▼ In the case of NG, repair or replace the faulty component.

▷14. Check of short-circuit between the wire harnesses

1. Check whether the cylinder, whose waveform is clamped at 5V, is short-circuited to the power wire of the sensor system.

NOTE

- The power supply for the sensor system is 5V.

- (1) Between ignition coil 1 connection vehicle harness side connector 2 (ICMB1) - body earth
- (2) Between ignition coil 2 connection vehicle harness side connector 2 (ICMB2) - body earth
- (3) Between ignition coil 3 connection vehicle harness side connector 2 (ICMB3) - body earth

SPECIFIED VALUE: 0V

▼ If it is OK, replace the ignition coil and go to ▷15.

Refer to Page B10-1.

▼ In the case of NG, repair or replace the faulty component.

▷15. EFI ECU signal recheck (1)

1. Recheck the cylinder, whose waveform is clamped at 5V, under the ▷8) conditions.
2. Check that the output waveform of the ion current combustion control signal (Channel 2 ►) is not clamped at 5V.

SPECIFIED VALUE: The output waveform (Channel 2 ►) is not clamped at 5V.

▼ If it is OK, finish the troubleshooting.

▼ In the case of NG, misfire may have occurred. Identify the cause of the misfire and repair.

▷16. Harness, connector check

1. When the following actions are taken to the cylinder whose waveform is unstable , check whether the waveform will change or not.

- (1) Lightly shake the connector vertically and laterally.
- (2) Lightly shake the wire harness vertically and laterally.

SPECIFIED VALUE: There is no change in the waveform.

2. Perform the following checks.

- (1) Connector fitting condition
- (2) Loose connection of the connector and the terminal.

SPECIFIED VALUE: No fault.

▼ If it is OK, replace the ignition coil and go to ▷17.

Refer to Page B10-1.

▼ In the case of NG, repair or replace the faulty component.

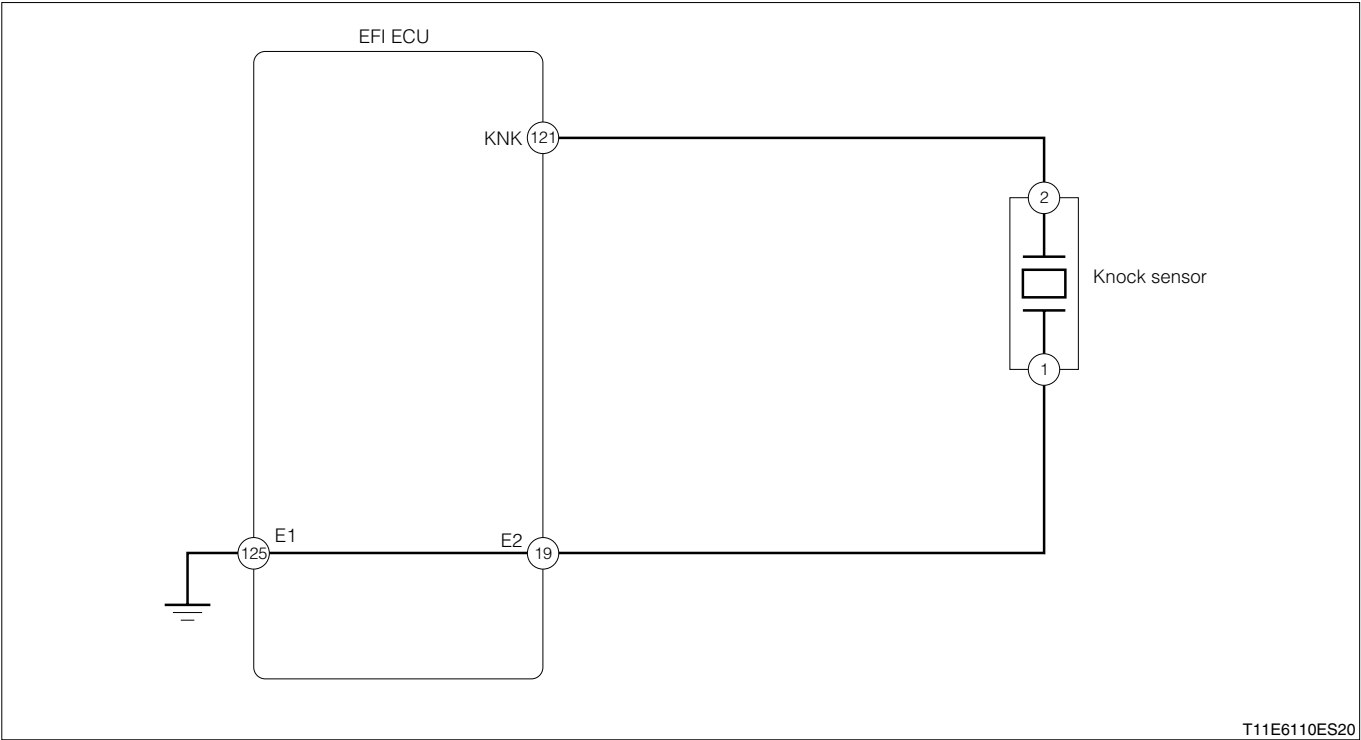
▷17. EFI ECU signal recheck (2)

- 1. Recheck the cylinder, whose waveform is unstable, under the ▷8) conditions.
 - 2. Check that the output waveform of the ion current combustion control signal (Channel 2▶) is outputted stably.
- SPECIFIED VALUE: The output waveform (Channel 2▶) is outputted stably.

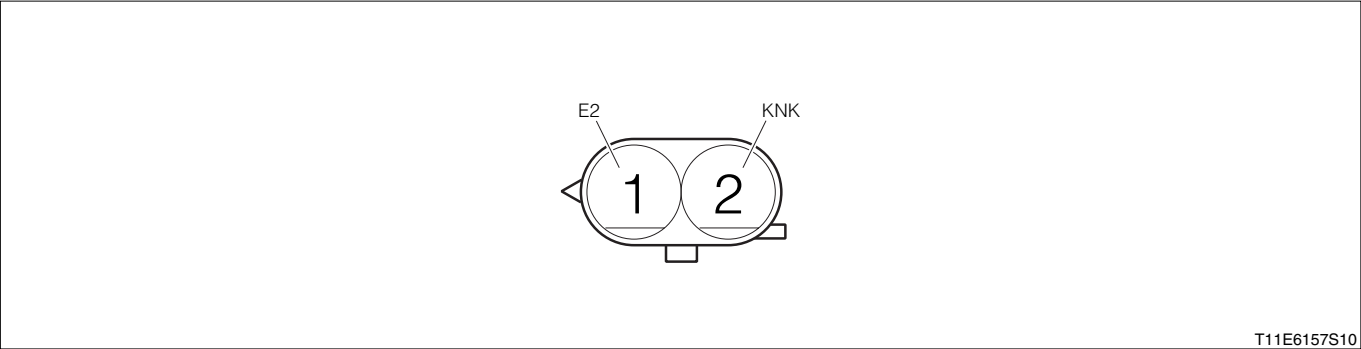
- ▼ If it is OK, finish the troubleshooting.
- ▼ In the case of NG, combustion instability may have occurred. Identify the cause of the combustion instability and repair.

7-12-11 DTC NO.P0325/18 KNOCK SENSOR 1 CIRCUIT MALFUNCTION

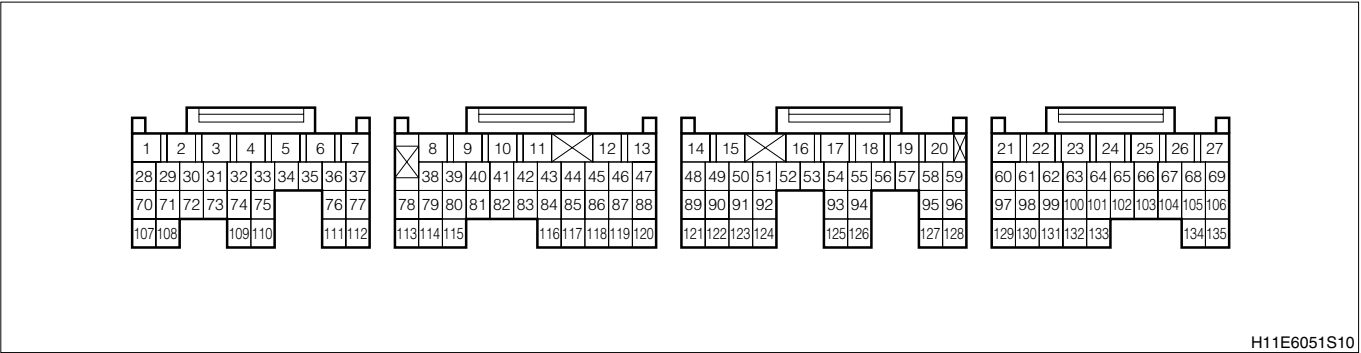
(1) System diagram



Knock sensor connection vehicle harness side connector



EFI ECU connection vehicle harness side connector



(2) Circuit description

1. The knock sensor is installed at the cylinder block. The knock sensor detects the occurrence of knocking indirectly from the cylinder block vibration that is caused by the knocking.
2. The knock sensor incorporates a piezo element, whereby the vibration inside the cylinder block is converted to an electric signal.

(3) Diagnosis code output conditions

1. When the signals from the knock sensor are not outputted continuously after starting over a certain length of time.

(4) Trouble area

1. Open wire or short circuit for knock sensor system circuit
2. Knock sensor
3. EFI ECU

(5) Checking points

1. Is the signal from the knock sensor inputted to the EFI ECU?
2. Is the harness between the knock sensor and the EFI ECU normal?
3. Is the output of the knock sensor normal?

(6) Inspection procedure**NOTE**

- Read the freeze frame data, using the diagnosis tester (DS-21/DS-II) or OBD II generic scan tool. Because the freeze frame data records the engine conditions when the malfunction was detected, when troubleshooting the freeze frame data is useful to determine whether the vehicle was running or stopped, the engine warmed up or not, the air-fuel ratio lean or rich, etc. at the time of the malfunction.

▷1. Check of continuity of knock sensor circuit.

1. IG switch turned "LOCK".
2. Set the SST (Sub-harness). However, the SST connector should remain disconnected from the EFI ECU connector.

SST: 09842-97209-000

3. Measure the resistance between the following terminals.

(1) Between SST 121 (KNK) and 19 (E2)

SPECIFIED VALUE: $200 \pm 80k \Omega$

4. Are the unit check results OK?

▼ If it is OK, go to ▷2.

▼ If it is NG, replace the knock sensor.

▷2. EFI ECU signal check

1. Connect the EFI ECU side SST connector.
2. Start the engine
3. Perform output check between the following terminals using an oscilloscope.

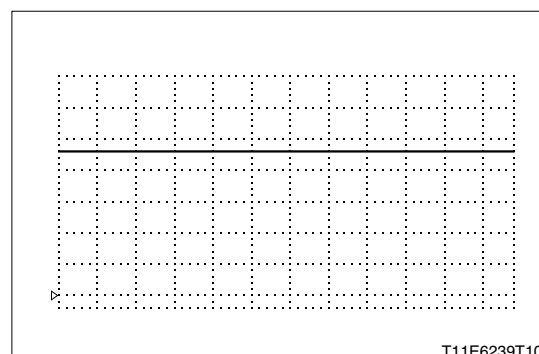
(1) Between SST 121 (KNK) and 19 (E2)

Time axis	50 μ s / DIV
Voltage axis	500mV / DIV
Measuring condition	When air conditioner is "OFF" with no electric load and while racing

Air conditioner "OFF": Conditions in which all of the air conditioner switch (ACSW), blower switch (BLW) and magnet clutch (MGC) are "OFF".

NOTE

- The waveform cannot be specified, but ensure that a waveform as in the right figure (One such example) shows up.



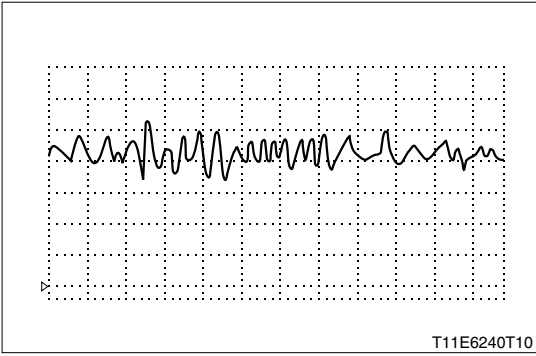
T11E6239T10

Time axis	50μs / DIV
Voltage axis	500mV / DIV
Measuring condition	When air conditioner is "OFF" with no electric load and while racing

Air conditioner "OFF": Conditions in which all of the air conditioner switch (ACSW), blower switch (BLW) and magnet clutch (MGC) are "OFF".

NOTE

- The waveform cannot be specified, but ensure that a waveform as in the right figure (One such example) shows up.



4. Is each of the waveform outputted when idling and when racing?

- ▼ If it is OK, check the EFI ECU circuit.
- ▼ If it is NG, proceed to >3.

>3. Wiring harness check

1. Check the harness and connector between the EFI ECU and the knock sensor for open wire or short.
 - (1) Between the knock sensor connection vehicle harness side connector 2 (KNK) and the EFI ECU connection vehicle harness side connector 121 (KNK)
 - (2) Between the knock sensor connection vehicle harness side connector 1 (E2) and the EFI ECU connection vehicle harness side connector 19 (E2)

SPECIFIED VALUE: Continuity exists.

- (3) Between the knock sensor connection vehicle harness side connector 2 (KNK) and the body earth
- (4) Between the knock sensor connection vehicle harness side connector 1 (E2) and the body earth

SPECIFIED VALUE: No continuity exists

2. Are the check results for open wire and short OK?

- ▼ If it is OK, go to >4.
- ▼ If it is NG, repair or replace the harness or connector.

>4. Unit check the knock sensor.

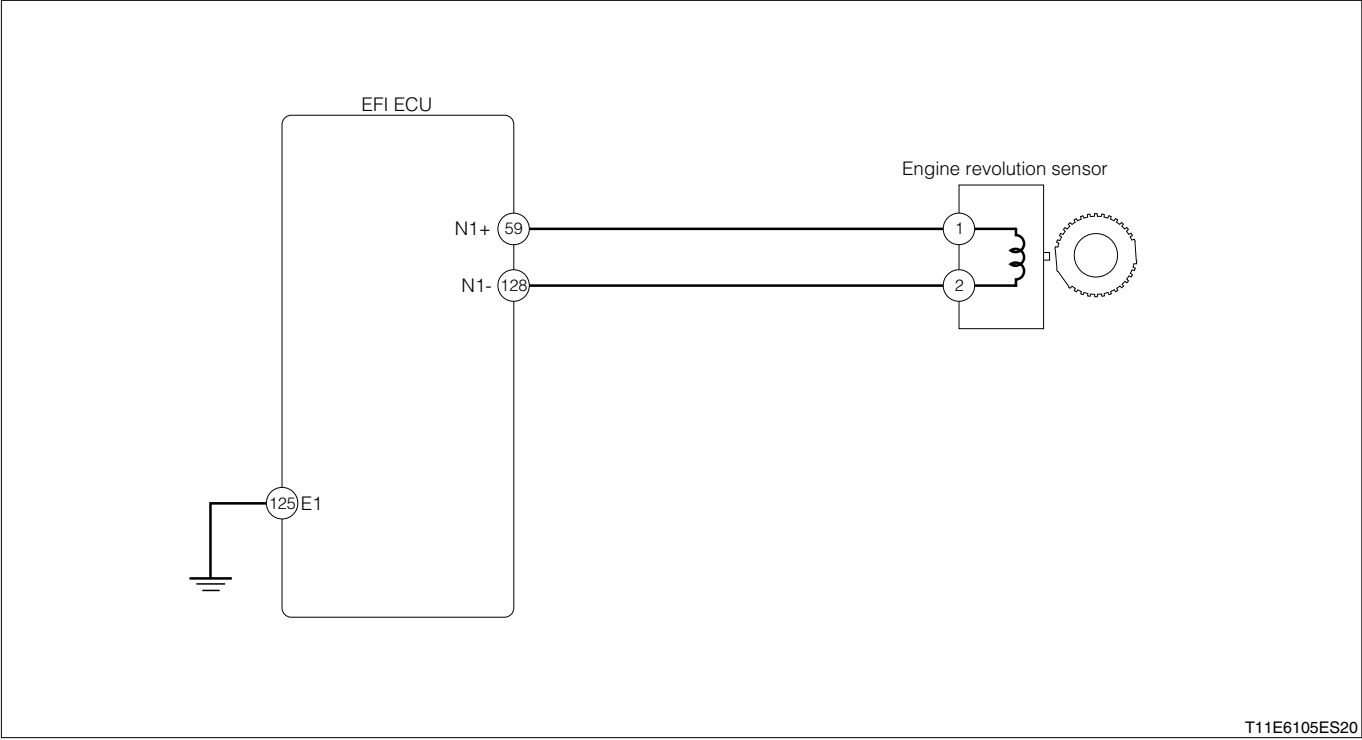
1. Perform the unit check of the knock sensor.
Refer to Page B8-203.

- ▼ If it is OK, go to >4.
- ▼ If it is NG, check the EFI ECU circuit.

- 5. Check the installation of the knock sensor.
1. Check the knock sensor for installing condition (E.G. looseness, installation angle).
 2. Are the check results OK?
 - ▼ If it is OK, check or replace the EFI ECU.
 - ▼ If it is NG, tighten the knock sensor.

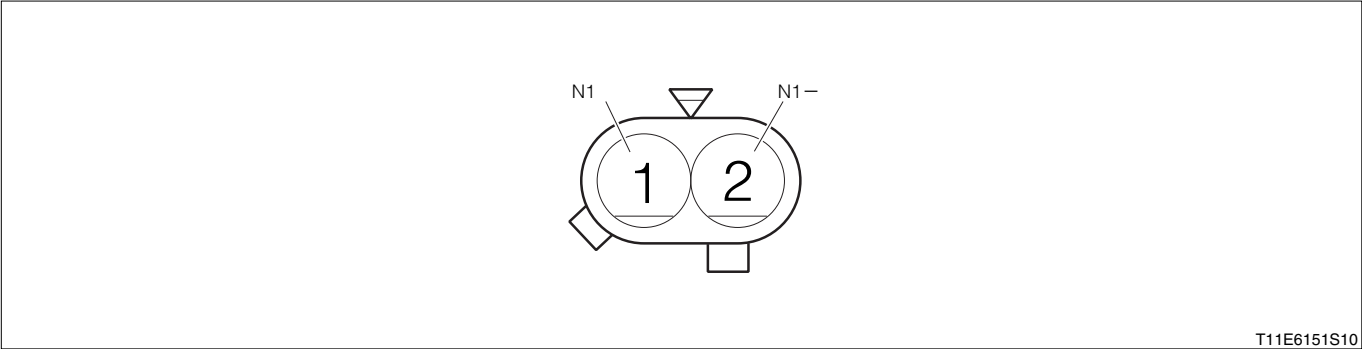
7-12-12 DTC NO.P0335/13 ENGINE REVOLUTION SENSOR CIRCUIT MALFUNCTION

(1) System diagram



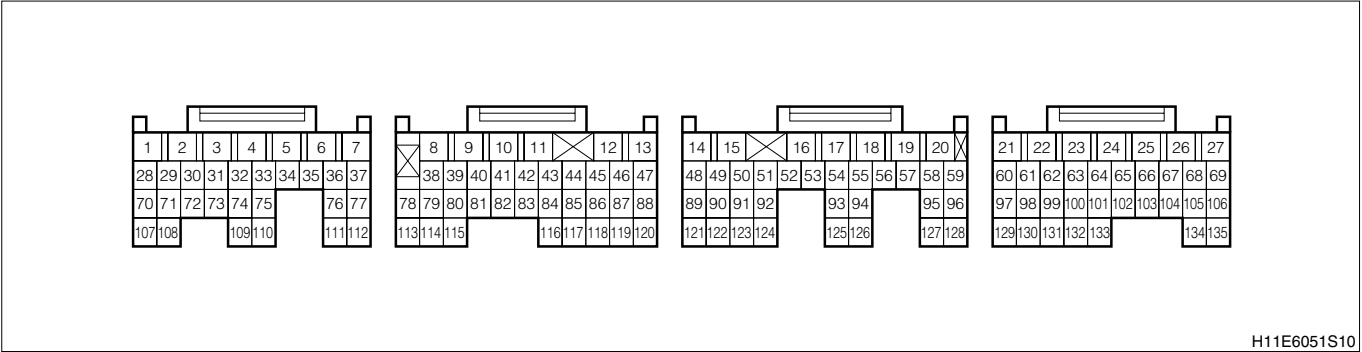
T11E6105ES20

Engine revolution sensor connection vehicle harness side connector



T11E6151S10

EFI ECU connection vehicle harness side connector



H11E6051S10

(2) Circuit description

- 1. The signal rotor is installed at the front side of the crankshaft so as to detect the crank angle. Furthermore, a pickup coil (Engine revolution sensor) is provided in relation to the projection of this signal rotor.
- 2. When the crankshaft turns, the air gap between the signal rotor projection and the engine revolution sensor varies and pulses are generated. The engine revolution is calculated based on the intervals of these pulses.

(3) Diagnosis code output conditions

- 1. No revolution signal is inputted, even once, while the cranking is continued for several seconds.

(4) Trouble area

- 1. Open wire or short circuit for engine revolution sensor system circuit
- 2. Engine revolution sensor
- 3. EFI ECU

(5) Checking points

- 1. Is the signal from the engine revolution sensor inputted to the EFI ECU?
- 2. Is the harness between the engine revolution sensor and the EFI ECU normal?
- 3. Is the output of the engine revolution sensor normal?

(6) Inspection procedure

NOTE

- Read the freeze frame data, using the diagnosis tester (DS-21/DS-II) or OBD II generic scan tool. Because the freeze frame data records the engine conditions when the malfunction was detected, when troubleshooting the freeze frame data is useful to determine whether the vehicle was running or stopped, the engine warmed up or not, the air-fuel ratio lean or rich, etc. at the time of the malfunction.

➤1. EFI ECU signal check

- 1. Connect the SST.
SST: 09842-97209-000

- 2. Perform the output check between the following terminals using an oscilloscope.

(1) Between SST 59 (N1+) - 128 (N1-)

SPECIFIED VALUE:

Time axis	10ms /DIV
Voltage axis	2V / DIV
Measuring condition	When air conditioner is "OFF" with no electric load and while idling

When air conditioner is "OFF" with no electric load and while idling

NOTE

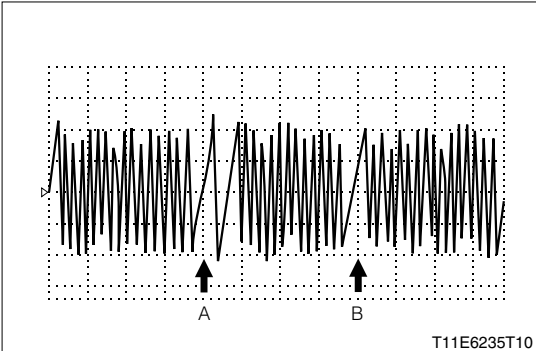
- The waveform cannot be specified, but ensure that a waveform as in the right figure (One such example) shows up.

- 3. Confirm the following points.

- (1) Each of the cylinder distinguishing signals (A) and (B) is coming out.
- (2) The wave period becomes shorter as the engine revolution speed rises.

▼ If it is OK, check the EFI ECU circuit.

▼ If it is NG, proceed to ➤2.



➤2. Check of wire harness continuity

1. Perform continuity checks between each of the following terminals.

- (1) Between sensor connection vehicle harness side connector 1 (N1+) - ECU connection vehicle harness side connector 59 (N+)
- (2) Between sensor connection vehicle harness side connector 2 (N1-) - ECU connection vehicle harness side connector 128 (N-)

SPECIFIED VALUE: Continuity exists.

▼ If it is OK, proceed to ➤3.

▼ If it is NG, repair the harness and connectors.

➤3. Engine rev sensor unit check

1. Perform unit check of the engine rev sensor.

Refer to Page B8-202.

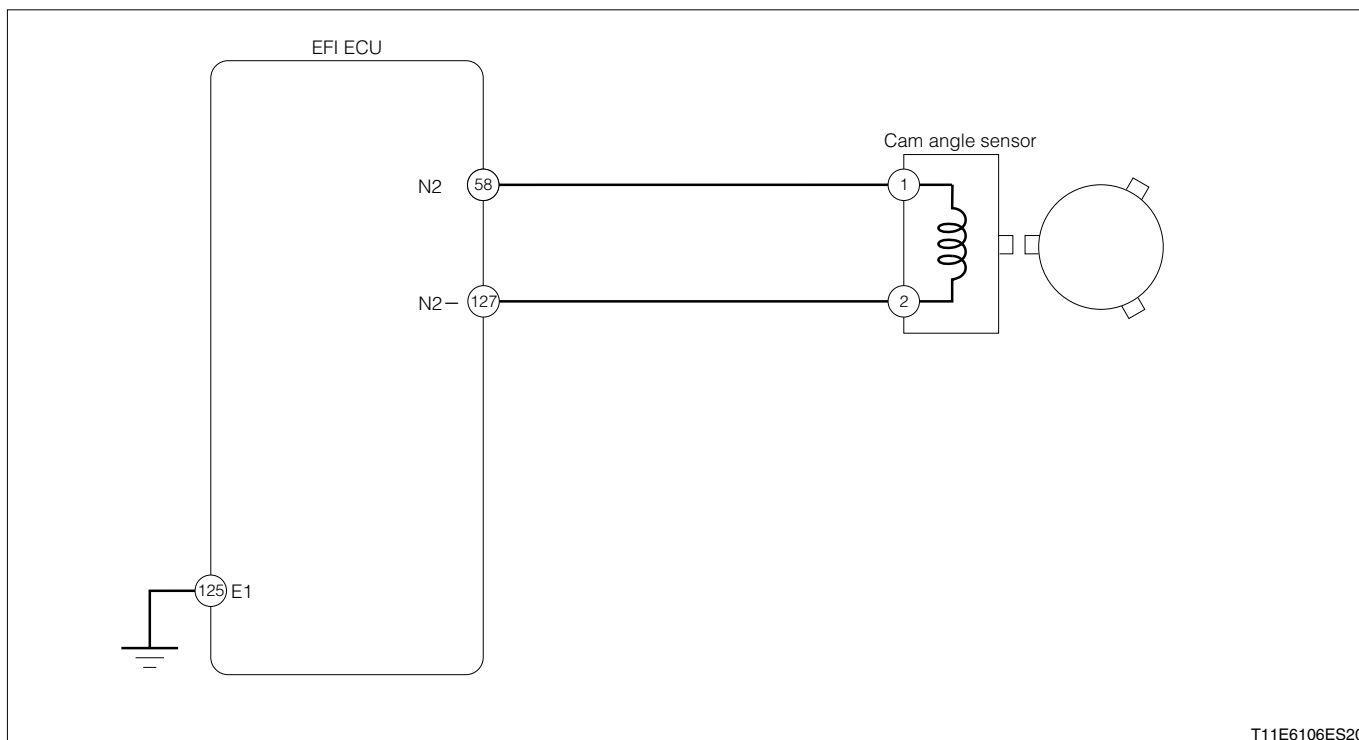
▼ If it is OK, check the connecting condition of each connector.

▼ If it is NG, replace the engine rev sensor.

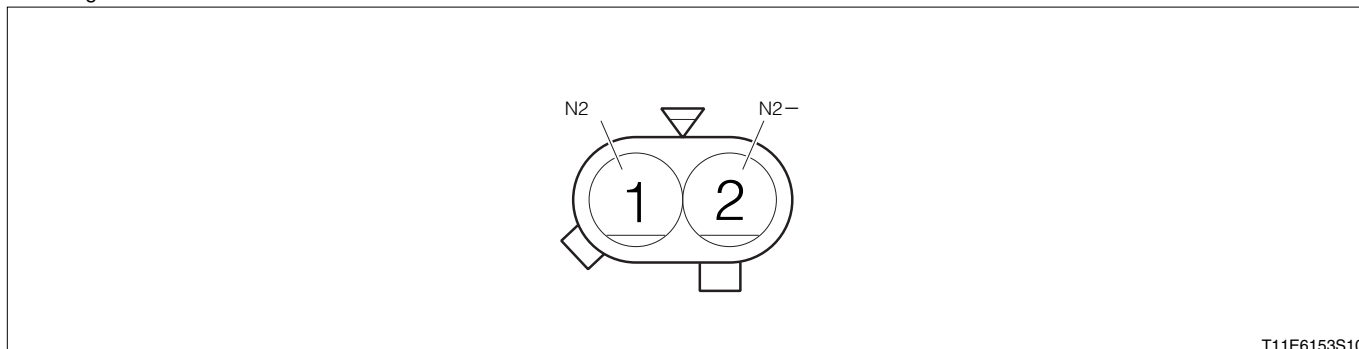
Refer to Page B8-2.

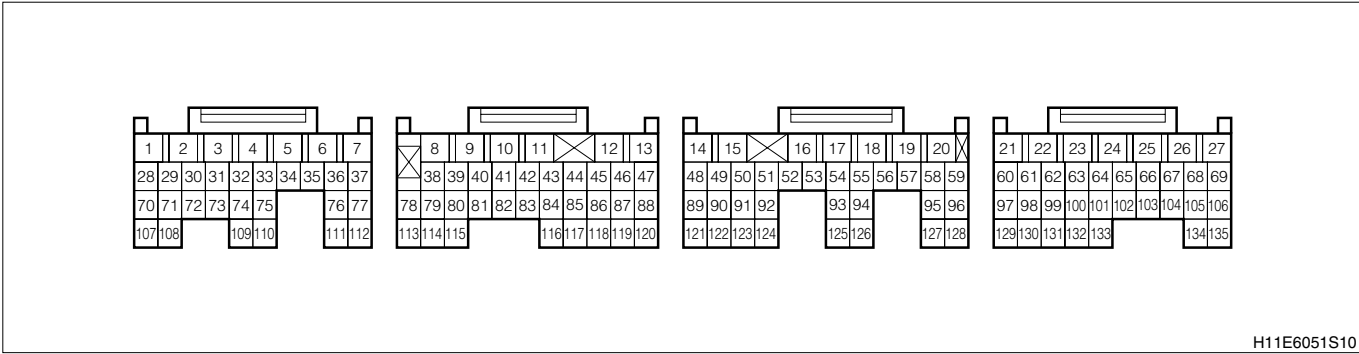
7-12-13 DTC NO.P0340/14 CAMSHAFT POSITION SENSOR CIRCUIT MALFUNCTION

(1) System diagram



Cam angle sensor connection vehicle harness side connector





(2) Circuit description

1. The cam angle sensor consists of a signal rotor and a pickup coil. The signal rotor is mounted to the intake side camshaft, using three teeth. As for the NE signal, three signals are outputted per one revolution of the engine. The phases of the camshaft and crankshaft are detected based on the signal from the cam angle sensor and the signal from the engine revolution sensor. Based on these phases, the variable valve timing is controlled.

(3) Diagnosis code output conditions

1. When the signal from the cam angle sensor is not outputted over a certain length of time after the starting,

(4) Trouble area

1. Open wire or short circuit for Camshaft angle sensor system circuit
2. Camshaft angle sensor
3. EFI ECU

(5) Checking points

1. Is the signal from the cam angle sensor inputted to the EFI ECU?
2. Is the harness between the cam angle sensor and the EFI ECU normal?
3. Is the output of the cam angle sensor normal?

(6) Inspection procedure

NOTE

- Read the freeze frame data, using the diagnosis tester (DS-21/DS-II) or OBD II generic scan tool. Because the freeze frame data records the engine conditions when the malfunction was detected, when troubleshooting the freeze frame data is useful to determine whether the vehicle was running or stopped, the engine warmed up or not, the air-fuel ratio lean or rich, etc. at the time of the malfunction.

➤1. EFI ECU signal check

1. Connect the SST.
SST: 09842-97209-000

2. Perform output check between the following terminals using an oscilloscope.

(1) Between SST 58 (N2+) - 127 (N2-)

SPECIFIED VALUE:

Time axis	50ms /DIV
Voltage axis	1V / DIV
Measuring condition	When air conditioner is "OFF" with no electric load and while idling

Air conditioner "OFF": Conditions in which all of the air conditioner switch (ACSW), blower switch (BLW) and magnet clutch (MGC) are "OFF".

NOTE

- The waveform cannot be specified, but ensure that a waveform as in the right figure (one such example) shows up.

3. Confirm the following points.

- (1) Periodic wave is showing up.
- (2) The wave period becomes shorter as the engine revolution speed rises.

▼ If it is OK, check the EFI ECU circuit.

▼ If it is NG, proceed to $\Sigma 2$.

$\Sigma 2$. Check of wire harness continuity

1. Perform continuity checks between each of the terminals.

- (1) Between sensor connection vehicle harness side connector 1 (N2+) - ECU connection vehicle harness side connector 58 (N2+)
- (2) Between sensor connection vehicle harness side connector 2 (N2-) - ECU connection vehicle harness side connector 127 (N2-)

SPECIFIED VALUE: Continuity exists.

▼ If it is OK, proceed to $\Sigma 3$.

▼ If it is NG, repair the harness and connectors.

$\Sigma 3$. Camshaft position sensor unit check

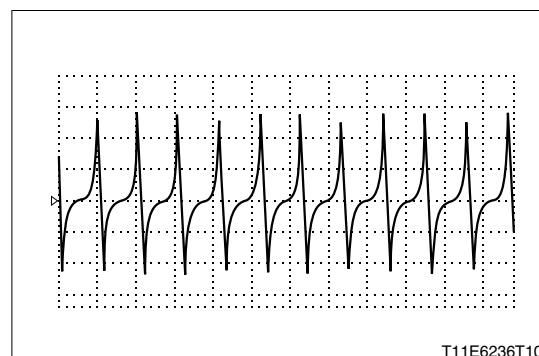
1. Perform unit check of the camshaft position sensor.

Refer to Page B8-202.

▼ If it is OK, check the connecting condition of each connector.

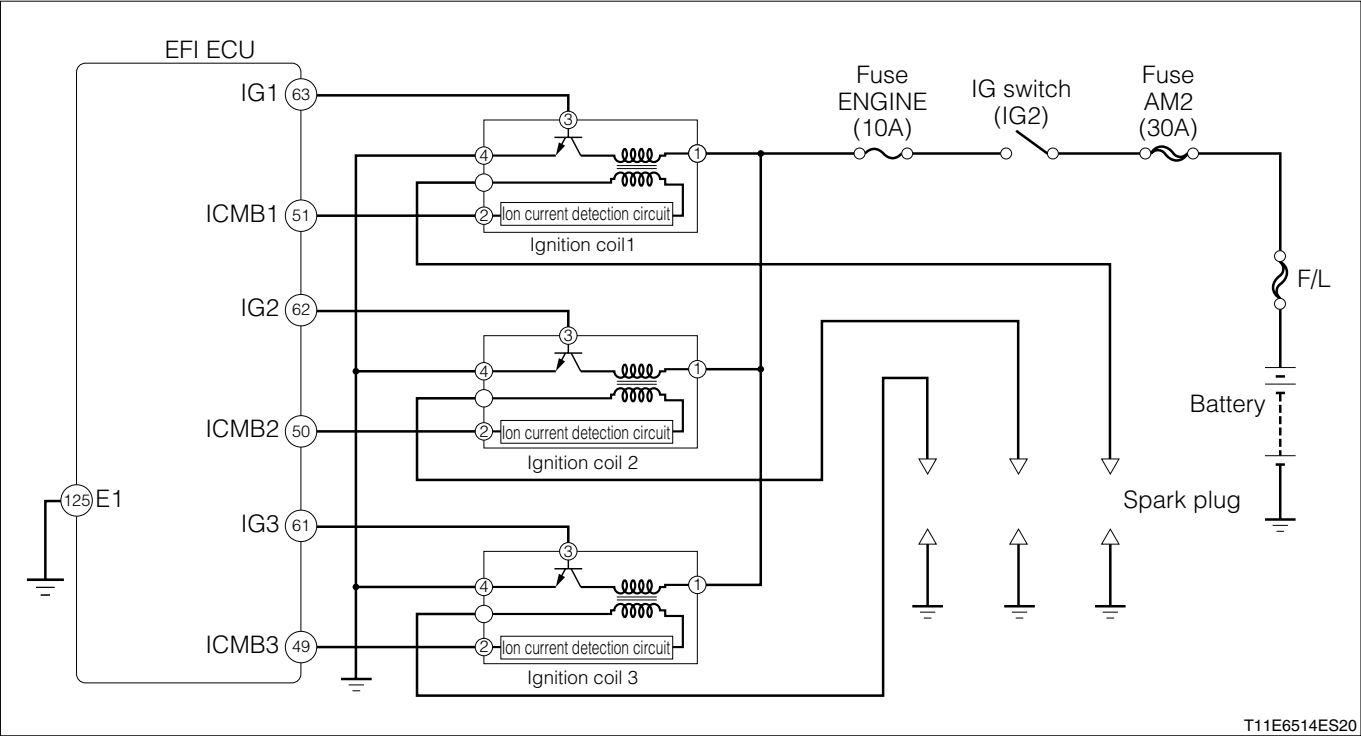
▼ If it is NG, replace the camshaft position sensor.

Refer to Page B8-3.



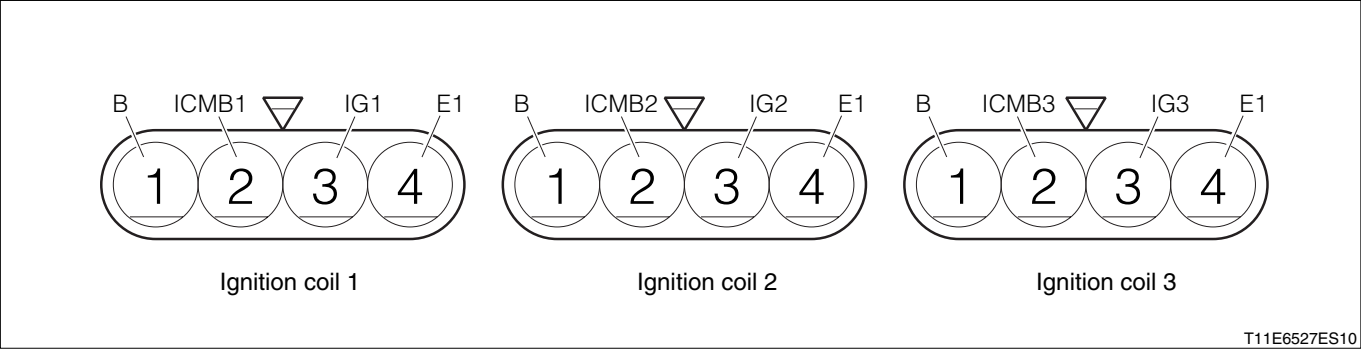
7-12-14 DTC NO.P0350/16 IGNITION SYSTEM CIRCUIT MALFUNCTION

- (1) System diagram
- ① For EU specifications



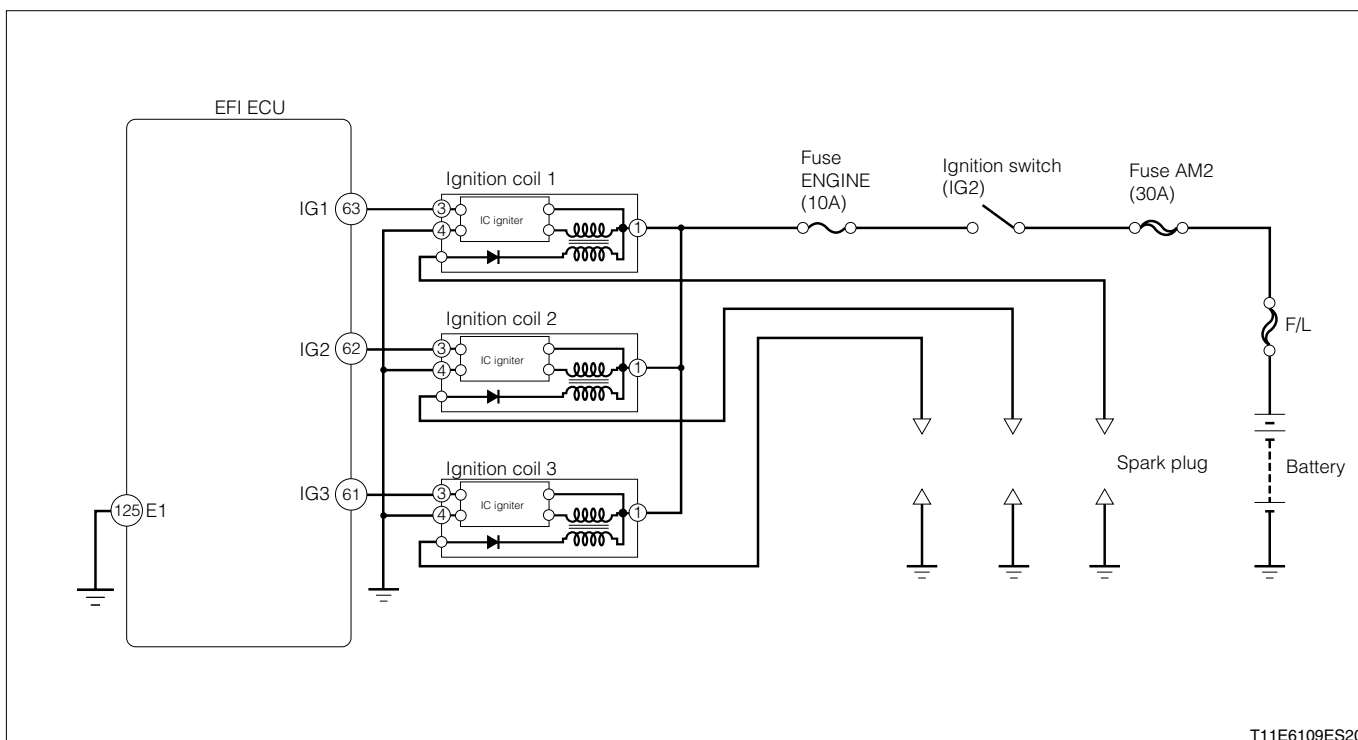
T11E6514ES20

Ignition coil connection vehicle harness side connector



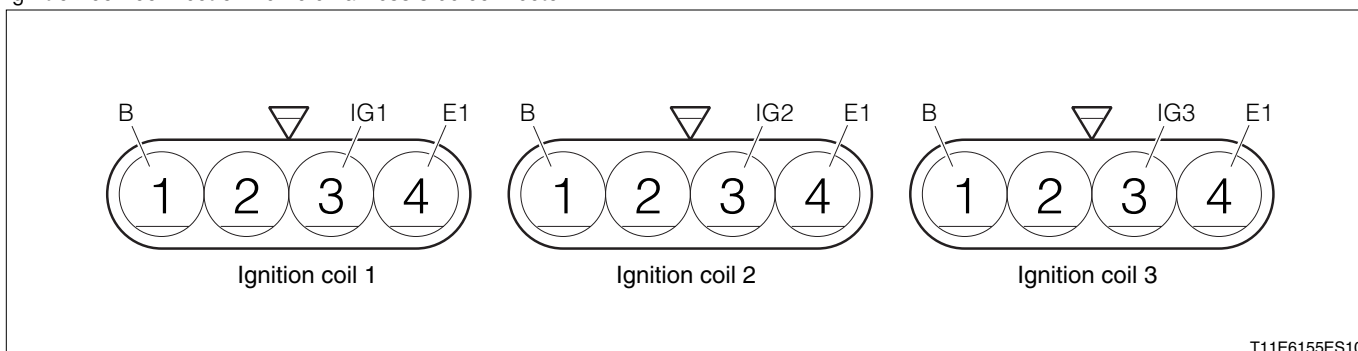
T11E6527ES10

② For general specifications



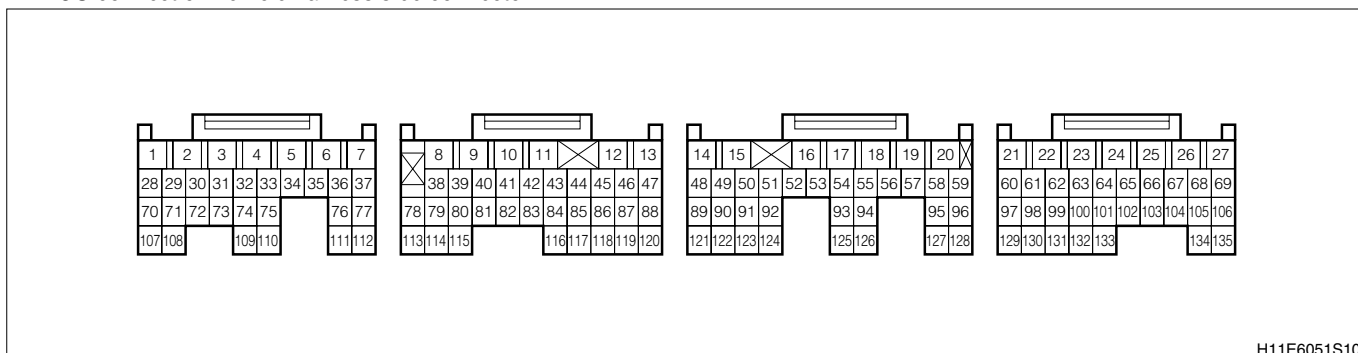
T11E6109ES20

Ignition coil connection vehicle harness side connector



T11E6155ES10

EFI ECU connection vehicle harness side connector



H11E6051S10

(2) Circuit description

1. A DLI (DistributorLess Ignition) system has been employed.
2. The DLI system has no distributor. Furthermore, the ignition coil is located just above the spark plug. Consequently, there is no ignition energy loss due to the electricity distribution, thus making it possible to directly furnish the electric energy induced at the coil. Therefore, an optimum ignition condition can be obtained at all times.

(3) Diagnosis code output conditions

1. When the ignition signal is not outputted consistently for a certain length of time after starting:

(4) Trouble area

1. Open wire/short circuit for the ignition system circuit
2. Ignition coil
3. Battery
4. EFI ECU

(5) Checking points

1. Is the power supply voltage of the ignition coil normal?
2. Is the harness between the ignition coil and EFI ECU normal?
3. Is the sparks of the spark plug proper?

(6) Inspection procedure

▷1. Spark check

1. Warm up the engine.
2. Turn the IG switch to "LOCK".
3. Remove the fuel pump relay.
4. Let the engine idle and wait until it stops by itself.
5. Turn the IG switch to "LOCK".
6. Remove the connector of the injector.

CAUTION

- Stop the fuel injection through the above operation and prevent damaging the catalyst by the unburned gas.
7. Remove the spark plug and earth it by attaching it to the ignition coil.
 8. When cranking, check if the sparks are flying in the spark plugs.

SPECIFIED VALUE: The sparks are generated.

▼ If it is OK, the ignition system is normal.

▼ If it is NG, proceed to ▷2.

▷2. EFI ECU signal check

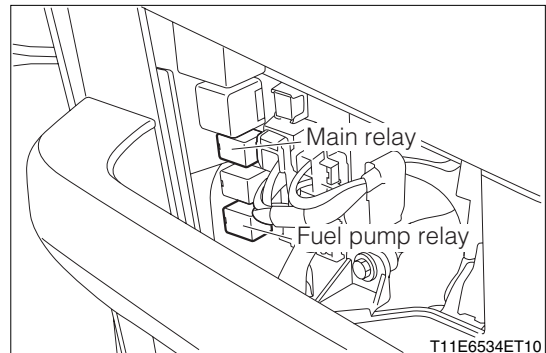
1. Connect the SST.

SST: 09842-97209-000

2. With the engine started, check the output waveform of the ignition signal between each of the following terminals using an oscilloscope.

(1) Between SST 63 (IG1) - SST 125 (E1)

(2) Between SST 62 (IG2) - SST 125 (E1)



(3) Between SST 61 (IG3) - SST 125 (E1)

Time axis	100ms / DIV
Voltage axis	2V / DIV
Measuring condition	When air conditioner is "OFF" with no electric load and while idling

Air conditioner "OFF": Conditions in which all of the air conditioner switch (ACSW), blower switch (BLW) and magnet clutch (MGC) are "OFF".

NOTE

- The waveform cannot be specified, but ensure that a waveform as in the right figure (One such example) shows up.

3. Confirm the following points.

- (1) The pulse 0 $\leftrightarrow$ 4V is generated.
- (2) The wave period becomes shorter as the engine revolution speed rises.

NOTE

- Correct judgment cannot be made concerning the ignition signal without using the oscilloscope.

▼ If it is OK, proceed to Σ 3.

▼ If it is NG, check the EFI ECU circuit.

 Σ 3. Ignition coil voltage check

1. Measure the voltage between the following terminals when the IG switch is "ON".

- (1) Between each ignition coil connection vehicle harness side connector 1 (+B) - body earth

SPECIFIED VALUE: Battery voltage

▼ If it is OK, proceed to Σ 4.

▼ If it is NG, repair or replace the harness between the following terminals.

- (2) Between each ignition coil - battery

 Σ 4. Wire harness continuity check (1)

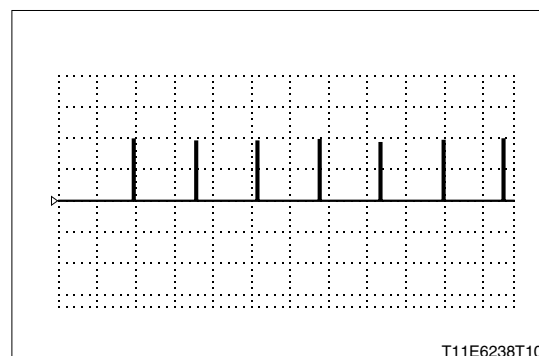
1. Perform continuity checks between each of the following terminals.

- (1) Between ignition coil 1 connection vehicle harness side connector 3 (IG1) - ECU connection vehicle harness side connector 63 (IG1)
- (2) Between ignition coil 2 connection vehicle harness side connector 3 (IG2) - ECU connection vehicle harness side connector 62 (IG2)
- (3) Between ignition coil 3 connection vehicle harness side connector 3 (IG3) - ECU connection vehicle harness side connector 61 (IG3)

SPECIFIED VALUE: Continuity exists.

▼ If it is OK, proceed to Σ 5.

▼ If it is NG, repair or replace the harness of the defective sections.



➤5. Check of wire harness continuity (2)

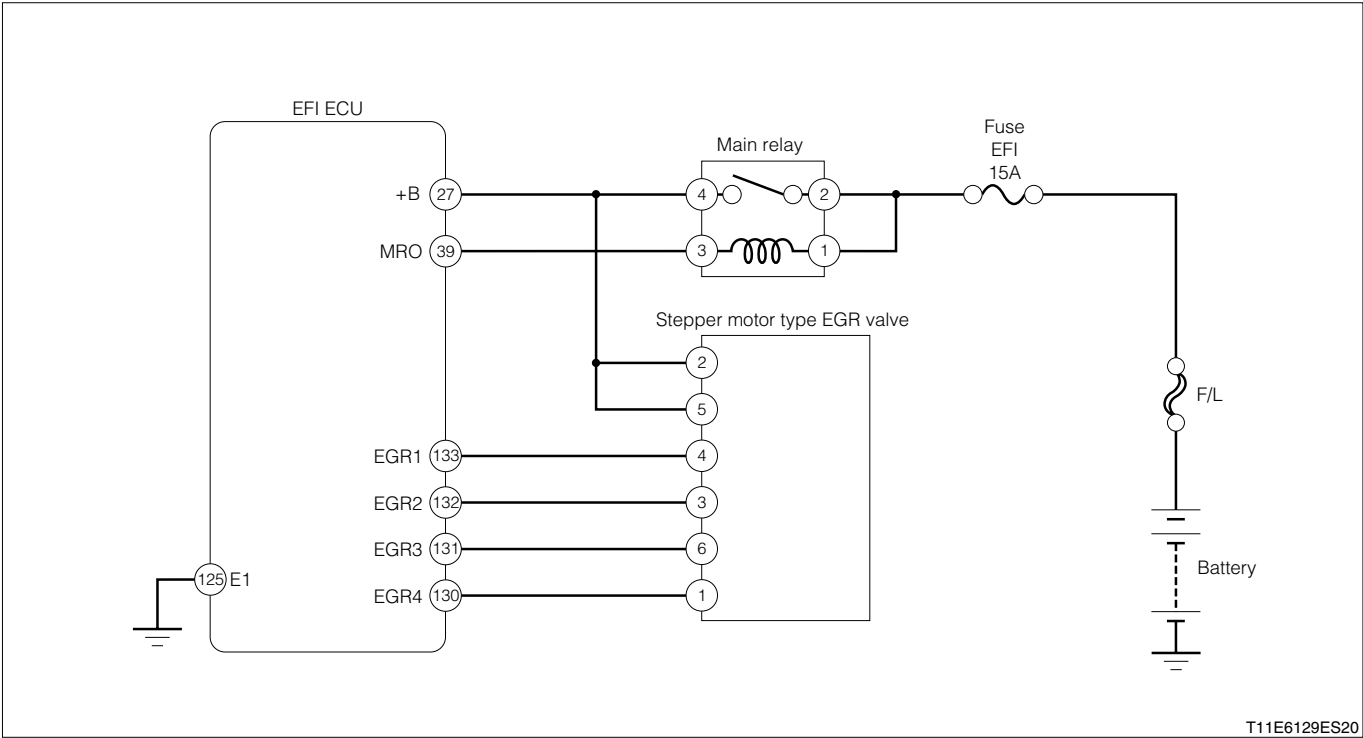
- 1. Perform continuity checks for each of the following terminals
 - (1) Between each ignition coil connection vehicle harness side connector 4 (E1) - ECU connection vehicle harness side connector 125 (E1)
- SPECIFIED VALUE: Continuity exists.

▼ If it is OK, replace the ignition coil.
Refer to Page B10-1.

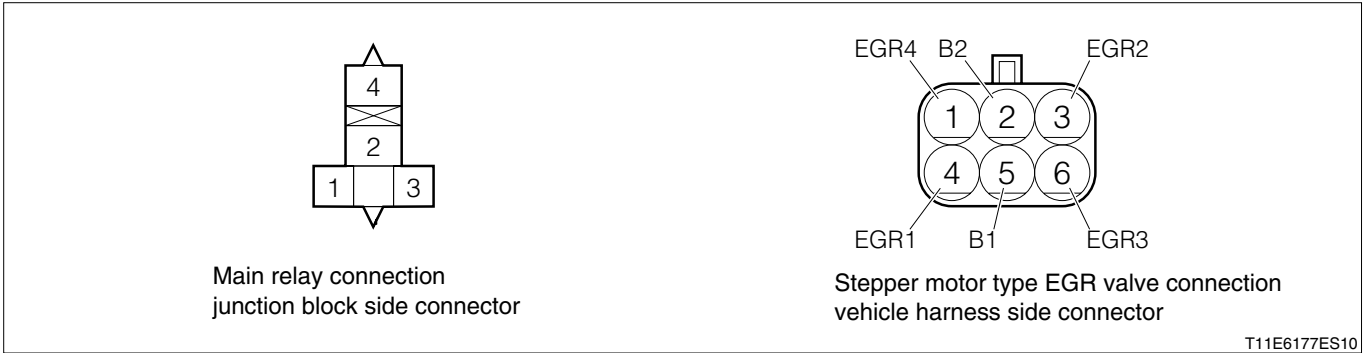
▼ If it is NG, repair or replace the harness of the defective sections.

7-12-15 DTC NO.P0401/79 STEPPER MOTOR TYPE EGR VALVE SYSTEM MALFUNCTION (FUNCTION)DTC NO.P0401/79
STEPPER MOTOR TYPE EGR VALVE SYSTEM MALFUNCTION (OPEN WIRE)

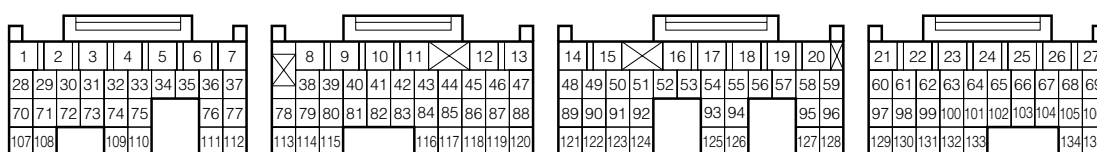
(1) System diagram



Stepper motor type EGR valve connection vehicle harness side connector



EFI ECU connection vehicle harness side connector



H11E6051S10

(2) Circuit description

1. According to the engine revolution speed and signals from the throttle position sensor, manifold absolute pressure/intake air temperature integral type sensor (The manifold absolute pressure sensor section) and water temperature sensor, the EFI ECU drives the stepper motor for EGR to determine the optimum quantity of EGR by controlling the opening of the EGR valve.

(3) No.0401/79 output conditions

1. When a flow rate abnormality of EGR gas occurs after starting
2. When an abnormality occurs in the EGR gas flow rate

(4) No.0403/79 output conditions

1. When open wire or short occurs in the stepper motor for EGR

(5) Checking points

1. Is the stepper motor for EGR operating normally?
2. Is the harness between the stepper motor for EGR and the EFI ECU normal?

NOTE

- Read the freeze frame data, using the diagnosis tester (DS-21/DS-II) or OBD II generic scan tool. Because the freeze frame data records the engine conditions when the malfunction was detected, when troubleshooting the freeze frame data is useful to determine whether the vehicle was running or stopped, the engine warmed up or not, the air-fuel ratio lean or rich, etc. at the time of the malfunction.

▷1. EGR piping check

1. Check the piping for EGR for any crack, damage or deformation.

SPECIFIED VALUE: There are no cracks and damages.

▼ If it is OK, proceed to ▷2.

▼ If it is NG, repair or replace the defective sections.

▷2. Assembling check of stepper motor type EGR valve

1. Check if any EGR gas is leaking from the joint of the stepper motor type EGR valve and the cylinder head.

SPECIFIED VALUE: There are no leakage.

▼ If it is OK, proceed to ▷3.

▼ If it is NG, repair or replace the defective sections.

▷3. Stepper motor for EGR operation check

1. Remove the fuel pump relay.
2. Remove the connector of the injector.

CAUTION

- Stop the fuel injection through the above operations 1 and 2 and prevent damaging the catalyst by the unburned gas.

3. Crank the engine.
4. Confirm whether the stepper motor for EGR is operating using a sound scope or a long screwdriver.
SPECIFIED VALUE: It is operating.

▼ If it is OK, proceed to ▷8.

▼ If it is NG, proceed to ▷4.

▷4. Connection condition check of each connector

1. Check the connecting conditions of each connector.
SPECIFIED VALUE: There are none that is half fit or pulled out.

▼ If it is OK, proceed to ▷5.

▼ If it is NG, repair the connector of the defective section.

▷5. Stepper motor for EGR voltage check

1. Remove the connector of the stepper motor for EGR.
2. Perform voltage measurement between the following terminals when the IG switch is "ON".
 - (1) Between stepper motor for EGR connection vehicle harness side connector 2 (B2) - body earth
 - (2) Between stepper motor for EGR connection vehicle harness side connector 5 (B1) - body earth
SPECIFIED VALUE: Battery voltage

▼ If it is OK, proceed to ▷6.

▼ If it is NG, perform checking or repairing of the harness and relay between the following terminals.

- (3) Between battery - stepper motor for EGR

▷6. Wire harness continuity check

1. Perform continuity check between each of the following terminals.
 - (1) Between ECU connection vehicle harness side connector 133 (EGR1) - stepper motor for EGR connection vehicle harness side connector 4 (EGR1)
 - (2) Between ECU connection vehicle harness side connector 132 (EGR2) - stepper motor for EGR connection vehicle harness side connector 3 (EGR2)
 - (3) Between ECU connection vehicle harness side connector 131 (EGR3) - stepper motor for EGR connection vehicle harness side connector 6 (EGR3)
 - (4) Between ECU connection vehicle harness side connector 130 (EGR4) - stepper motor for EGR connection vehicle harness side connector 1 (EGR4)
SPECIFIED VALUE: Continuity exists.

▼ If it is OK, proceed to ▷7.

▼ If it is NG, repair or replace the harness and the connectors.

▷7. Stepper motor type EGR valve unit check (1)

1. Perform unit check for the stepper motor section of the stepper motor type EGR valve.
Refer to Page B8-206.

▼ If it is OK, proceed to ▷8.

▼ If it is NG, replace the stepper motor type EGR valve.

Refer to Page B3-4.

▷8. EGR gas passage check

1. Check the passageway of the EGR gas for clogging.
SPECIFIED VALUE: There is no clogging.

▼ If it is OK, proceed to ▷9.

▼ If it is NG, repair the defective section of the EGR gas passage.

▷9. Stepper motor type EGR valve unit check (2)

1. Perform unit check for the valve section of the stepper motor type EGR valve.
Refer to Page B8-207.

▼ If it is OK, proceed to ▷10.

▼ If it is NG, replace the stepper motor type EGR valve.

Refer to Page B3-4.

➤10. EGR valve removal and installation check

1. Remove the stepper motor type EGR valve and the intake manifold No.1 insulator.
Refer to Page B3-4.
2. Check the EGR valve and the intake manifold No.1 insulator for any clogging and damages.

CAUTION

- Be careful not to touch the valve section by tools when removing any foreign matters.

NOTE

- Especially check the passage of the EGR gas.

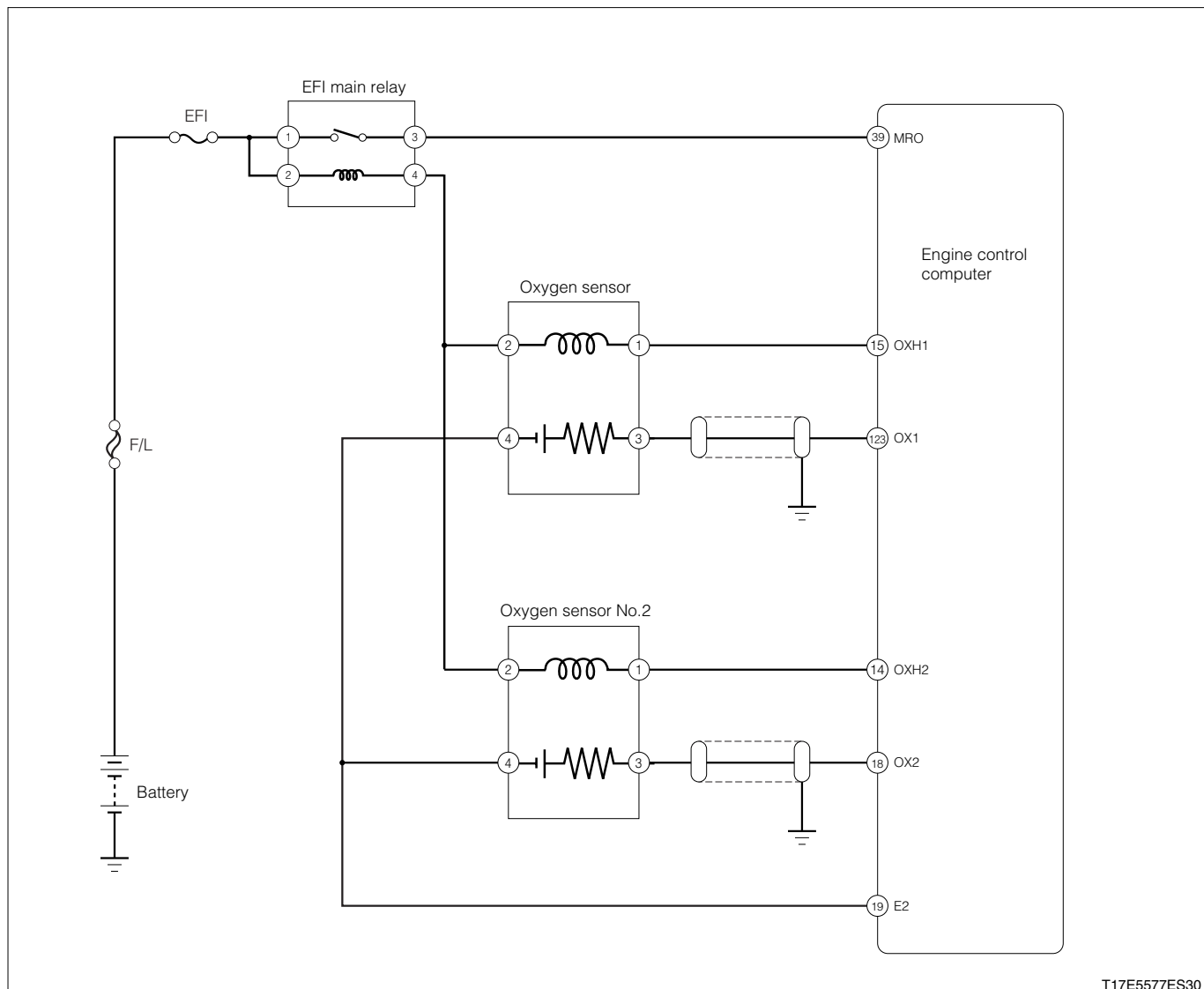
SPECIFIED VALUE: There are no clogging and damage.

▼ If it is OK, perform checking of the EFI ECU circuit.

▼ If it is NG, replace the defective sections.

7-12-16 DTC NO.P0420/27 CATALYST DETERIORATION(REAR OXYGEN SENSOR EQUIPPED VEHICLES)

(1) SYSTEM DESCRIPTION



(2) Conditions for output

1. When, after warming up the engine, and while the vehicle speed is 50km/h, the voltage of the rear oxygen sensor signal is high and a state of slow response continues for 40 seconds or more, and when these abnormal signals are detected twice or more

(3) POINTS TO CHECK

NOTE

- When this code is output at the same time as another code, perform the check starting with the other code.

Is the signal from the rear oxygen sensor being input into the EFI ECU?

Is the output of the rear oxygen sensor correct?

Is the harness between the rear oxygen sensor and the EFI ECU normal?

(4) Check procedure

▷1. EFI ECU INPUT SIGNAL CHECK

1. Connect the SST to the vehicle.

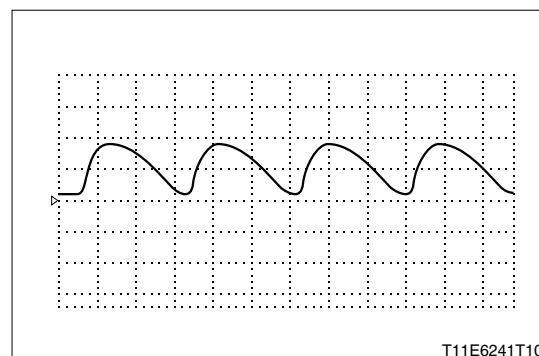
SST: 09842-97201-000

2. Check the input waveform between the following terminals, using an oscilloscope.

(1) Between SST67 (IACAHI) and SST125 (E1)

Time axis	200ms / DIV
Voltage axis	500mV / DIV
Condition	The air conditioner is turned off, there is no electric load, and the engine speed is maintained at 3000rpm

The condition under which the air conditioner is turned "ON", and the air conditioner switch (ASCW), blower switch (BLW), magnet clutch (MGC) are all set to "ON".



NOTE

- While identification of the waveform is not possible, check if the waveform as shown in the diagram (an example) is outputted.

3. Check for the following points.

- (1) The front oxygen sensor is activated and a waveform is output.
- (2) The rear oxygen sensor is activated and a waveform is output.
- (3) The waveform 0↔1V is output.

NOTE

- The correct output for the oxygen sensor signal cannot be confirmed without using an oscilloscope.
- (4) The output waveforms and voltages for the front oxygen sensor signal and the rear oxygen sensor signal are different.
 - (5) If no abnormality is found, go to ▷2.
 - (6) If an abnormality is found, go to ▷4.

▷2. Unit check of oxygen sensor

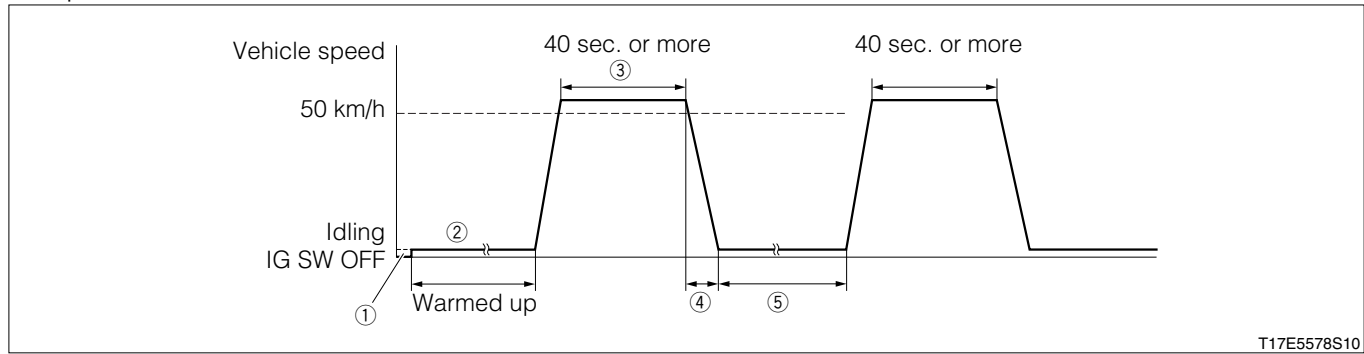
1. Perform a single unit check of the front and rear oxygen sensors.
2. FRONT OXYGEN SENSOR
3. REAR OXYGEN SENSOR
4. If no abnormality is found, go to ▷3.
5. If an abnormality is found, replace the defective oxygen sensor.

B8-123

▷3. Confirmation test

1. Use the following procedure to confirm that the diagnosis code is not output again.

Drive pattern



- (1) Check the diagnosis code and ensure that an abnormality code is not output.
- (2) Start the engine and warm it up until the radiator fan starts rotating. ②
- (3) Following the drive pattern, drive the vehicle at a vehicle speed of 50km/h or more for at least 40 seconds. ③
- (4) Decelerate to 50km/h or less. ④⑤
- (5) Accelerate again to 50km/h or more, and drive for at least 40 seconds. ⑥
- (6) Diagnosis code P0420/27 (Catalyst deterioration) is not output.

NOTE

- If the conditions for this test are not strictly followed, malfunctions will not be able to be detected.

SPECIFIED VALUE: P0420/27 (Catalyst deterioration) is not output.

- ▼ If no abnormality is found, finish the troubleshooting.
- ▼ If an abnormality is found, go to ▷4.

▷4. Exhaust gas leakage check

1. Lift up the vehicle and check for exhaust gas leakage at the front and rear of the catalyst.

SPECIFIED VALUE: Ensure that there is no leakage of exhaust gas

- ▼ If no abnormality is found, go to ▷5.
- ▼ If an abnormality is found, repair or replace the gaskets or the piping of the defective sections, and perform troubleshooting again from ▷3.

▷5. Replace exhaust manifold (three-way catalyst)

1. Replace the exhaust manifold (three-way catalyst).

(1) Exhaust manifold (three-way catalyst)

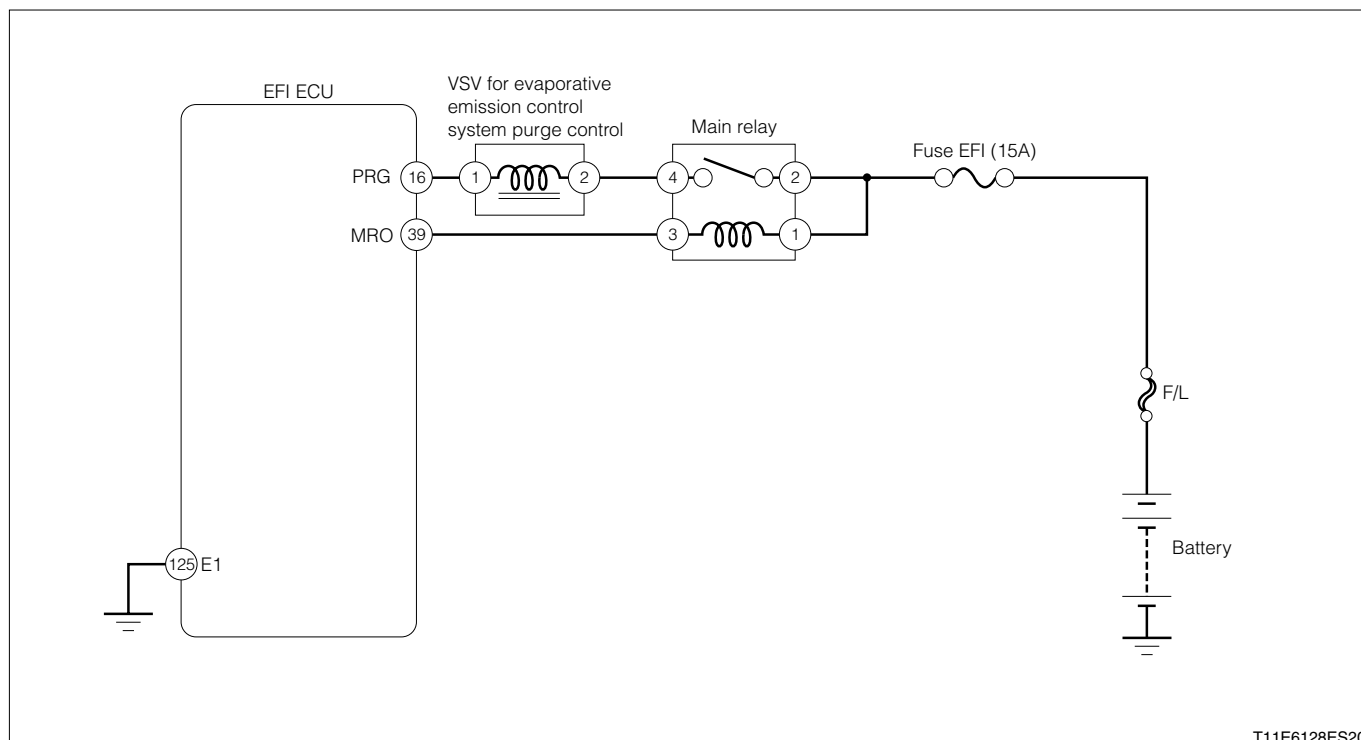
Refer to Page B4-1.

SPECIFIED VALUE: No exhaust gas leakage

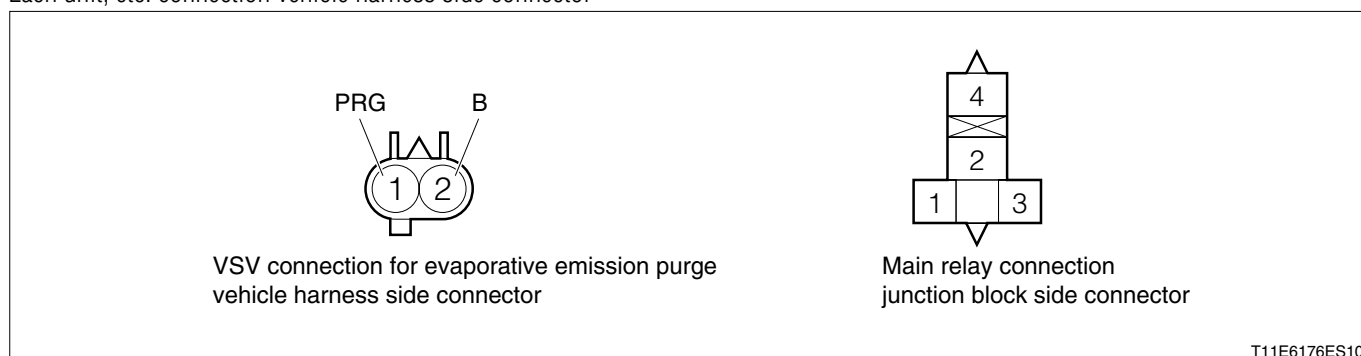
2. After completing the necessary replacements and inspections, perform troubleshooting again.

SPECIFIED VALUE: Diagnosis code P0420/27 (Catalyst deterioration) is not output.

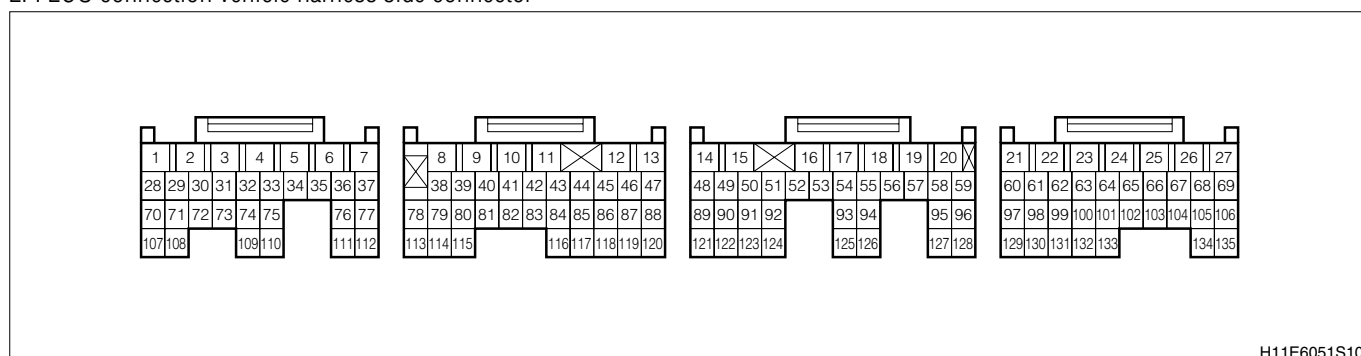
(1) **System diagram**



Each unit, etc. connection vehicle harness side connector



EFI ECU connection vehicle harness side connector



(2) Circuit description

1. When the execution conditions for the evaporative emission purging are met, the EFI ECU performs the duty control for the VSV for evaporative emission purging and purges the evaporative emissions into the combustion chamber.

(3) Diagnosis code output conditions

1. When the detection signal of the VSV for evaporative emission purge is not turned "ON" or "OFF"

(4) Trouble area

1. VSV for evaporative emission control system purge control (Purge VSV for EVAP)
2. Open wire or short circuit for the evaporative emission purge VSV control system circuit
3. EFI ECU

(5) Checking points

1. Is the harness between the VSV for evaporative emission purge and the EFI ECU normal?
2. Is the control signal of the VSV for evaporative emission purge outputted from the EFI ECU normally?
3. Is the VSV for evaporative emission purge operating normally?

(6) Inspection procedure

NOTE

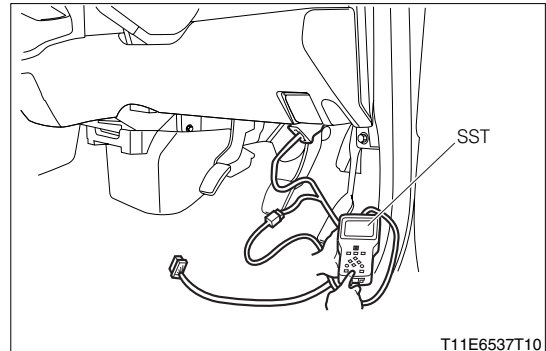
- Read the freeze frame data, using the diagnosis tester (DS-21/DS-II) or OBD II generic scan tool. Because the freeze frame data records the engine conditions when the malfunction was detected, when troubleshooting the freeze frame data is useful to determine whether the vehicle was running or stopped, the engine warmed up or not, the air-fuel ratio lean or rich, etc. at the time of the malfunction.

① When using diagnosis tester (DS-21/DS-II) or OBD II generic scan tool:

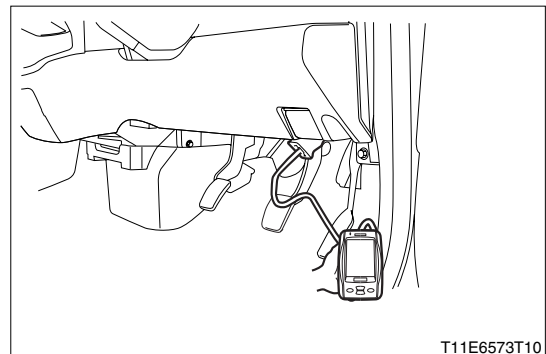
▷1. Operation check of Purge VSV for EVAP.

1. IG switch turned "LOCK".
2. Connect the diagnosis tester to DLC.
 - (1) In case of DS-21, connect the DS-21 diagnosis tester to DLC through the SST.

SST: 09991-87404-000



- (2) In case of DS-II, connect the DS-II diagnosis tester directly to DLC.
- (3) In case of the OBD II generic scan tool, connect the OBD II generic scan tool directly to DLC.



3. Disconnect the hose going to the purge VSV for EVAP from the charcoal canister.
4. Turn "ON" the IG switch, and turn "ON" the main switch of the tester.
5. Erase the DTC.
6. Confirmation of operation of the purge VSV for EVAP.
 - (1) DS-21: Select the "Purge VSV" of the "Actuator driving".
 - (2) DS-II: Select the "Purge VSV" of the "Active test".

7. When executing "ON" and "OFF" check the operation of the VSV for purging.

SPECIFIED VALUE:

VSV "OFF"	No air continuity should exist when air is blown into the hose.
VSV "ON"	Air continuity should exist when air is blown into the hose.

8. Are the check results OK?

▼ If it is OK, check the EFI ECU circuit.

▼ If it is OK, go to 2.

2. Check of purge hose and passage.

1. Execute the "VSV "Release" so as to return the purge VSV for EVAP to the original operating state.
2. Start the engine and keep the engine racing.
3. Disconnect the hose going from the purge VSV for EVAP to the intake manifold.

4. Apply your finger to the disconnected hose. Ensure that a negative pressure is applied.

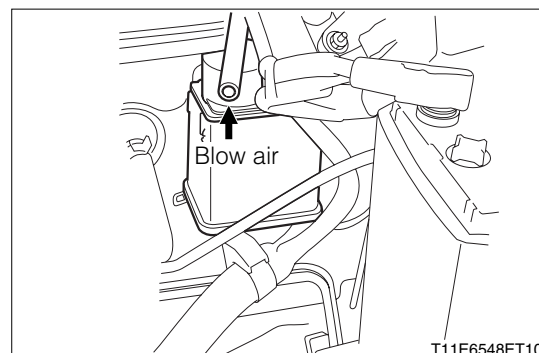
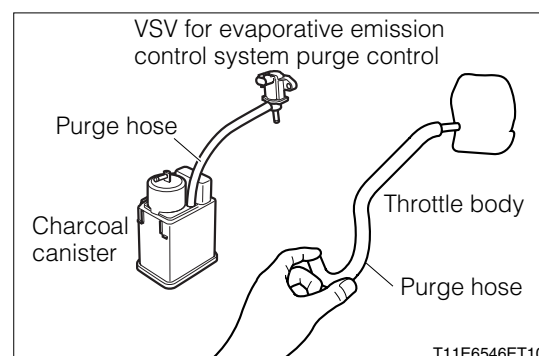
SPECIFIED VALUE: Negative pressure should be applied.

5. Check the hose for connecting state, leakage, restriction, bending and deterioration.

6. Are the check results OK?

▼ If it is OK, go to 3.

▼ If it is NG, clean, repair or replace.



3. Check of power supply voltage of Purge VSV for EVAP.

1. Turn "OFF" the main switch of the tester. Turn "LOCK" the IG switch.
2. Disconnect the purge VSV for EVAP connector.
3. With the IG switch turned "ON", measure the voltage between the following terminals given below.
 - (1) Between the VSV for evaporative emission purge connection vehicle harness side connector 2 (+B) and the body earth

SPECIFIED VALUE: Battery voltage

4. Are the check results OK?

▼ If it is OK, go to 4.

▼ If it is NG, check the harness and connector between the VSV for purging and the battery, and the main relay for open wire or short. Repair or replace, as required.

▷4. Wiring harness check

1. IG switch turned "LOCK".
2. Check the harness and connector between the following terminals for open wire and short.
 - (1) Is the control signal of the VSV for evaporative emission purge outputted from the EFI ECU normally?
SPECIFIED VALUE: Continuity exists.
 - (2) Between the VSV for evaporative emission purge connection vehicle harness side connector 2 (PRG) and the body earth
SPECIFIED VALUE: No continuity exists
3. Are the check results for open wire and short OK?
 - ▼ If it is OK, go to ▷5.
 - ▼ If it is NG, repair or replace the harness or connector.

▷5. Unit check of purge VSV for EVAP.

1. Perform the unit check of the VSV for evaporative emission purge.
Refer to Page B8-206.
2. Are the unit check results OK?
 - ▼ If it is OK, check the EFI ECU circuit.
 - ▼ If it is NG, replace the purge VSV for EVAP.

② When not using diagnosis tester (DS-21/DS-II) or OBD II generic scan tool:

▷1. Evaporative emission purge hose check

1. Check if there are any evaporative emission purge hoses pulled out or damaged
SPECIFIED VALUE: There are none pulled out nor damaged.
 - ▼ If it is OK, proceed to ▷2.
 - ▼ If it is NG, repair or replace the hose.

▷2. VSV for evaporative emission control system purge control voltage check

1. Remove the connector of the VSV for evaporative emission control system purge control.
2. Perform voltage measurement between the following terminals when the IG switch is "ON".
 - (1) Between VSV for evaporative emission control system purge control vehicle harness side connector 2 (+B) - body earth
SPECIFIED VALUE: Battery voltage
 - ▼ If it is OK, proceed to ▷3.
 - ▼ If it is NG, perform checking or repairing of the harness and relay between the following terminals.
 - (2) Between battery - VSV for evaporative emission control system purge control

▷3. Check of wire harness continuity

1. Perform continuity check between each of the following terminals.
 - (1) Between ECU connection vehicle harness side connector 16 (PRG) - VSV for evaporative emission control system purge control side connector 1 (PRG)
SPECIFIED VALUE: Continuity exists.
 - ▼ If it is OK, proceed to ▷4.
 - ▼ If it is NG, repair the harness and the connectors.

➤4. VSV for evaporative emission control system purge control unit check

1. Perform unit check of the VSV for evaporative emission control system purge control.
Refer to Page B8-206.

▼ If it is OK, proceed to ➤5.

▼ If it is NG, replace the VSV for evaporative emission control system purge control.

➤5. Connection condition check of each connector

1. Check the connecting conditions of each connector.
SPECIFIED VALUE: There are none that is half fit or pulled out.

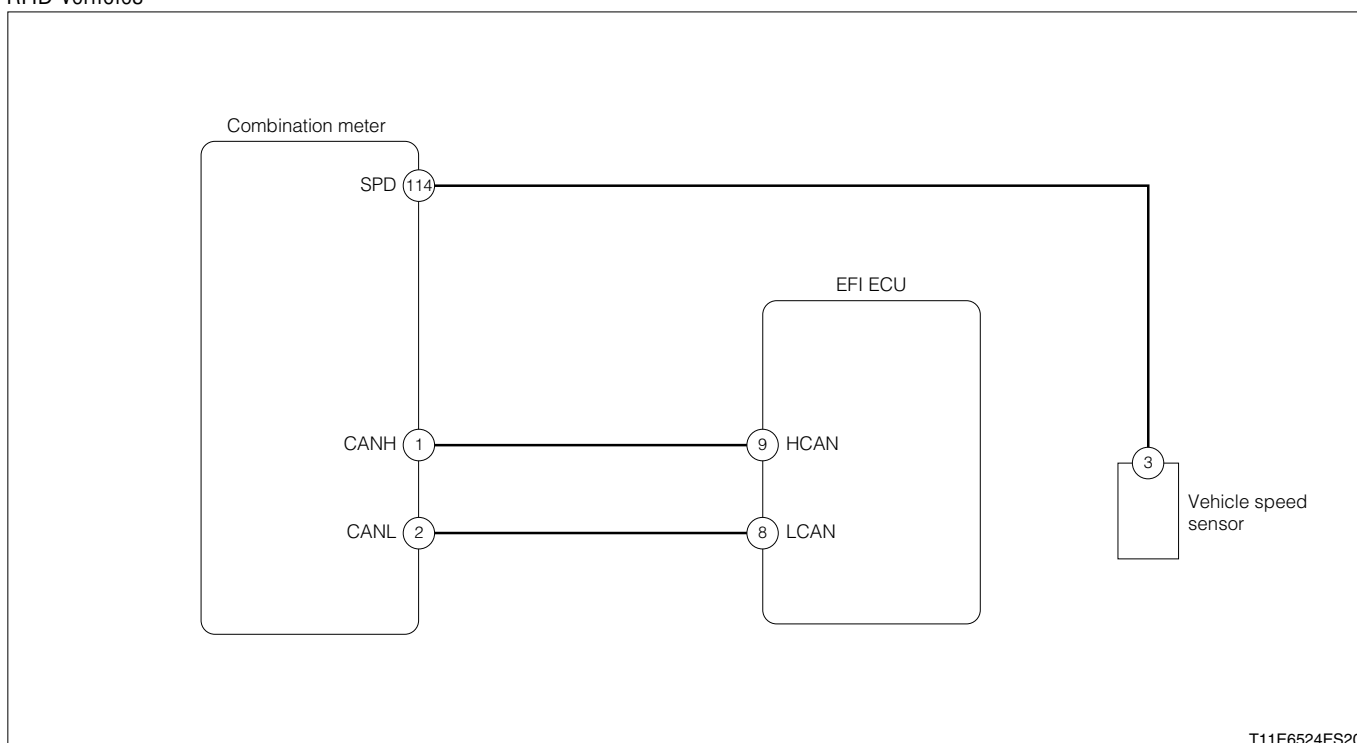
▼ If it is OK, check the EFI ECU circuit.

▼ If it is NG, repair the connector of the defective section.

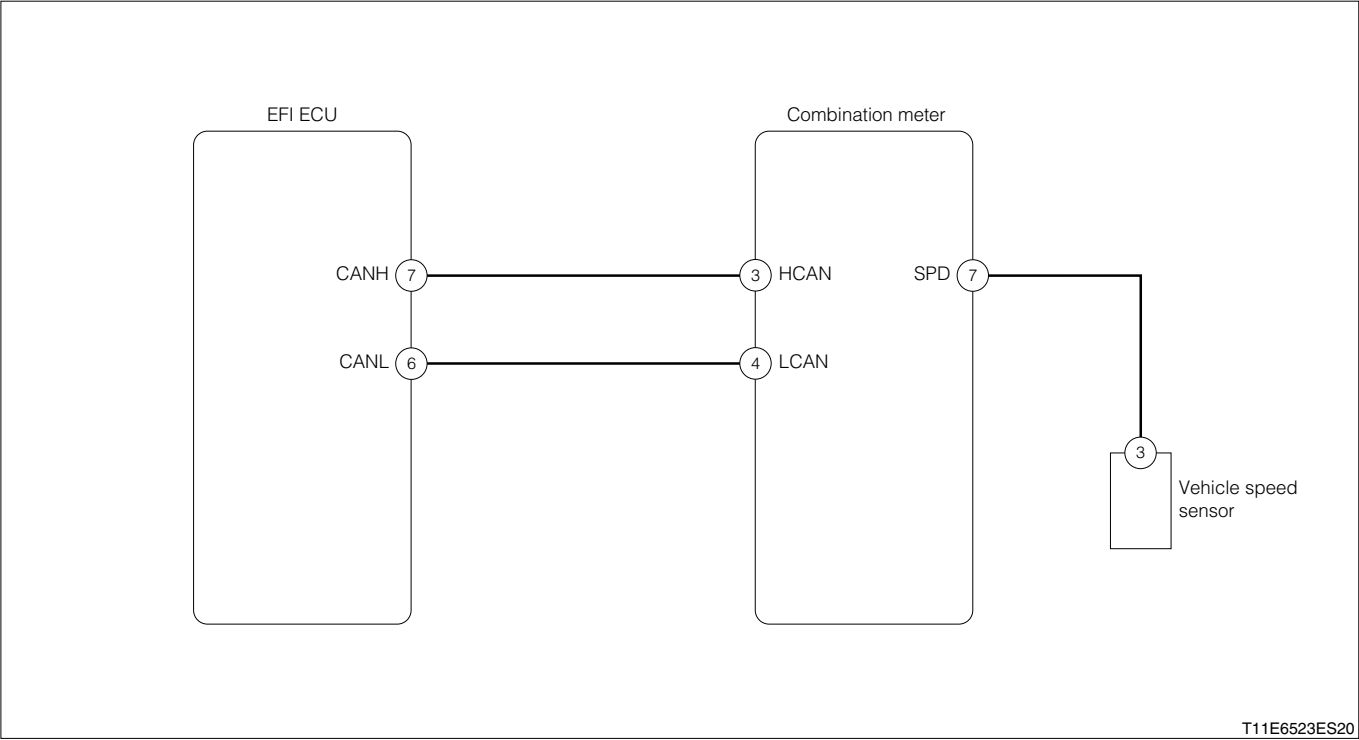
7-12-18 DTC NO.P0500/52 VEHICLE SPEED SENSOR CIRCUIT MALFUNCTION

(1) System diagram

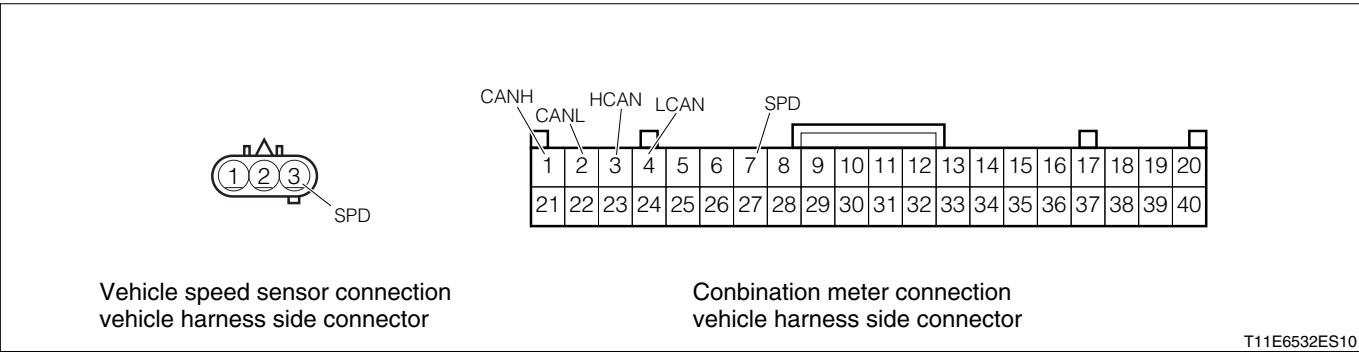
RHD vehicles



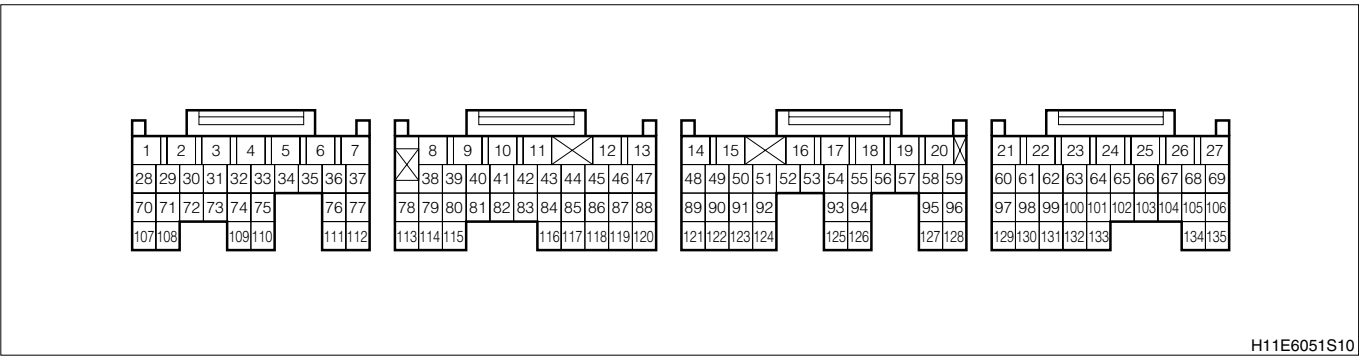
LHD vehicles



Each unit, relays connection vehicle harness side connector



EFI ECU connection vehicle harness side connector



(2) Diagnosis code output conditions

1. When no vehicle speed signal is inputted from the combination meter

(3) **Checking points**

1. Is the vehicle speed signal inputted to the combination meter?
2. Is the combination meter normal?
3. Is the CAN line normal?
4. Is the harness between the vehicle speed sensor and the combination meter normal?
5. Is the vehicle speed sensor normal?

① **When using diagnosis tester (DS-21/DS-II) or OBD II generic scan tool:**▷1. **CAN communication basic check**

1. Perform basic check of the CAN communication.
Refer to Page L2-9.

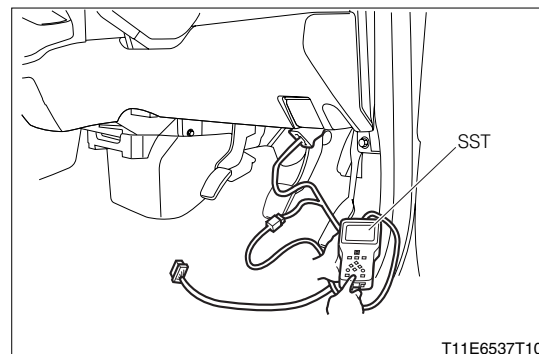
▼ If it is OK, proceed to ▷2.

▼ If NG, repair the faulty section and go to ▷2.

▷2. **Vehicle speed signal check**

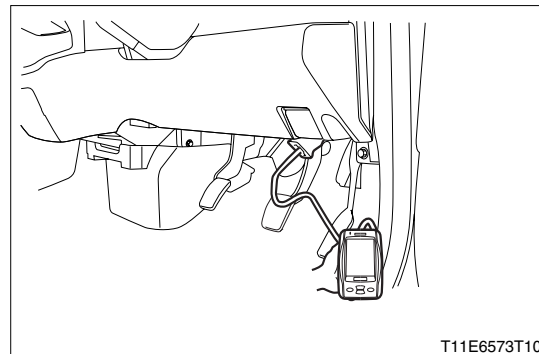
1. The IG switch turned "LOCK".
2. Connect the diagnosis tester to DLC.
 - (1) In case of DS-21, connect the DS-21 diagnosis tester to DLC through the SST.

SST: 09991-87404-000



T11E6537T10

- (2) In case of DS-II, connect the DS-II diagnosis tester directly to DLC.
- (3) In case of the OBD II generic scan tool, connect the OBD II generic scan tool directly to DLC.



T11E6573T10

3. After turning "ON" the IG switch, Turn "ON" the main switch of the tester.
 4. Read the "Vehicle speed" of the diagnosis tester (DS-21/DS-II) or OBD II generic scan tool.
 5. Check to see if the normal vehicle speed is indicated on the tool.
- SPECIFIED VALUE: The normal vehicle speed is indicated.

▼ If it is OK, proceed to ▷3.

▼ If it is NG and the vehicle is a RHD vehicle, go to ▷4.

▼ If it is NG and the vehicle is a LHD vehicle, go to ▷6.

▷3. Combination meter operation check

1. Check to see if the speedometer of the combination meter functions properly.

SPECIFIED VALUE: The normal vehicle speed is indicated.

▼ If it is OK, perform the operations in the following order.

- (1) Erase the diagnosis code and check the state for a while.
- (2) If the diagnosis code is once again outputted, replace the EFI ECU.

▼ If it is NG, proceed to ▷8.

▷4. CAN line open wire check (RHD vehicles)

1. Turn the IG switch to "LOCK".
2. Remove all connectors of the EFI ECU.
3. Perform continuity check between each of the following terminals.
 - (1) Between EFI ECU connection vehicle harness side connector 8 (LCAN) - EFI ECU connection vehicle harness side connector 9 (HCAN)

SPECIFIED VALUE: No continuity exists.

▼ If it is OK, proceed to ▷5.

▼ If it is NG, repair the defective point.

▷5. CAN line short circuit check (RHD vehicles)

1. Perform continuity check between each of the following terminals.
 - (1) Between EFI ECU connection vehicle harness side connector 8 (LCAN) - battery positive terminal
 - (2) Between ABS actuator connection vehicle harness side connector 19 (LCAN) - battery positive terminal
 - (3) Between EFI ECU connection vehicle harness side connector 8 (LCAN) - body earth
 - (4) Between EFI ECU connection vehicle harness side connector 9 (HCAN) - body earth

SPECIFIED VALUE: No continuity exists.

▼ If it is OK, proceed to ▷8.

▼ If it is NG, repair the defective point.

▷6. CAN line open wire check (LHD vehicles)

1. Turn the IG switch to "LOCK".
2. Remove all connectors of the EFI ECU.
3. Perform continuity check between each of the following terminals.
 - (1) Between EFI ECU connection vehicle harness side connector 6 (CANL) - EFI ECU connection vehicle harness side connector 7 (CANH)

SPECIFIED VALUE: No continuity exists.

▼ If it is OK, proceed to ▷7.

▼ If it is NG, repair the defective point.

▷7. CAN line short circuit check (LHD vehicles)

1. Perform continuity check between each of the following terminals.

- (1) Between EFI ECU connection vehicle harness side connector 6 (CANL) - battery positive terminal
- (2) Between ABS actuator connection vehicle harness side connector 7 (CANH) - battery positive terminal
- (3) Between EFI ECU connection vehicle harness side connector 6 (CANL) - body earth
- (4) Between EFI ECU connection vehicle harness side connector 7 (CANH) - body earth

SPECIFIED VALUE: No continuity exists.

▼ If it is OK, proceed to ▷8.

▼ If it is NG, repair the defective point.

▷8. Combination meter input signal check

1. Check the vehicle speed input signal to the combination meter.

Refer to Page J3-1.

▼ If it is OK, replace the combination meter and go to ▷2.

▼ If it is NG, proceed to ▷9.

▷9. Check of wire harness continuity

1. Perform the continuity check between the following terminals.

- (1) Combination meter vehicle harness side connector 7 (SPD) - Vehicle speed sensor vehicle harness side connector 3 (SPD)

▼ If it is OK, replace the vehicle speed sensor.

▼ If it is NG, repair the defective point.

② When not using diagnosis tester (DS-21/DS-II) or OBD II generic scan tool:**▷1. CAN communication basic check**

1. Perform basic check of the CAN communication.

Refer to Page L2-9.

▼ If it is OK, proceed to ▷2.

▼ If NG, repair the faulty section and go to ▷2.

▷2. Combination meter operation check

1. Check to see if the speedometer of the combination meter functions properly.

SPECIFIED VALUE: The normal vehicle speed is indicated.

▼ If it is OK and the vehicle is a RHD vehicle, go to ▷3.

▼ If it is OK and the vehicle is a LHD vehicle, go to ▷5.

▼ If it is NG, proceed to ▷7.

▷3. CAN line open wire check (RHD vehicles)

1. Turn the IG switch to "LOCK".
2. Remove all connectors of the EFI ECU.
3. Perform continuity check between each of the following terminals.
 - (1) Between EFI ECU connection vehicle harness side connector 8 (LCAN) - EFI ECU connection vehicle harness side connector 9 (HCAN)

SPECIFIED VALUE: No continuity exists.

▼ If it is OK, proceed to ▷4.

▼ If it is NG, repair the defective point.

▷4. CAN line short circuit check (RHD vehicles)

1. Perform continuity check between each of the following terminals.
 - (1) Between EFI ECU connection vehicle harness side connector 8 (LCAN) - battery positive terminal
 - (2) Between ABS actuator connection vehicle harness side connector 19 (LCAN) - battery positive terminal
 - (3) Between EFI ECU connection vehicle harness side connector 8 (LCAN) - body earth
 - (4) Between EFI ECU connection vehicle harness side connector 9 (HCAN) - body earth

SPECIFIED VALUE: No continuity exists.

▼ If it is OK, perform the operations in the following order.

(5) Erase the diagnosis code and check the state for a while.

(6) If the diagnosis code is once again outputted, replace the EFI ECU.

▼ If it is NG, repair the defective point.

▷5. CAN line open wire check (LHD vehicles)

1. Turn the IG switch to "LOCK".
2. Remove all connectors of the EFI ECU.
3. Perform continuity check between each of the following terminals.
 - (1) Between EFI ECU connection vehicle harness side connector 6 (CANL) - EFI ECU connection vehicle harness side connector 7 (CANH)

SPECIFIED VALUE: No continuity exists.

▼ If it is OK, proceed to ▷6.

▼ If it is NG, repair the defective point.

▷6. CAN line short circuit check check (LHD vehicles)

1. Perform continuity check between each of the following terminals.

- (1) Between EFI ECU connection vehicle harness side connector 6 (CANL) - battery positive terminal
- (2) Between EFI ECU connection vehicle harness side connector 7 (CANH) - battery positive terminal
- (3) Between EFI ECU connection vehicle harness side connector 6 (CANL) - body earth
- (4) Between EFI ECU connection vehicle harness side connector 7 (CANH) - body earth

SPECIFIED VALUE: No continuity exists.

▼ If it is OK, perform the operations in the following order.

(5) Erase the diagnosis code and check the state for a while.

(6) If the diagnosis code is once again outputted, replace the EFI ECU.

▼ If it is NG, repair the defective point.

▷7. Combination meter input signal check

1. Check the vehicle speed input signal to the combination meter.

Refer to Page J3-1.

▼ If it is OK, replace the combination meter and go to ▷2.

▼ If it is NG, proceed to ▷8.

▷8. Check of wire harness continuity

1. Perform the continuity check between the following terminals.

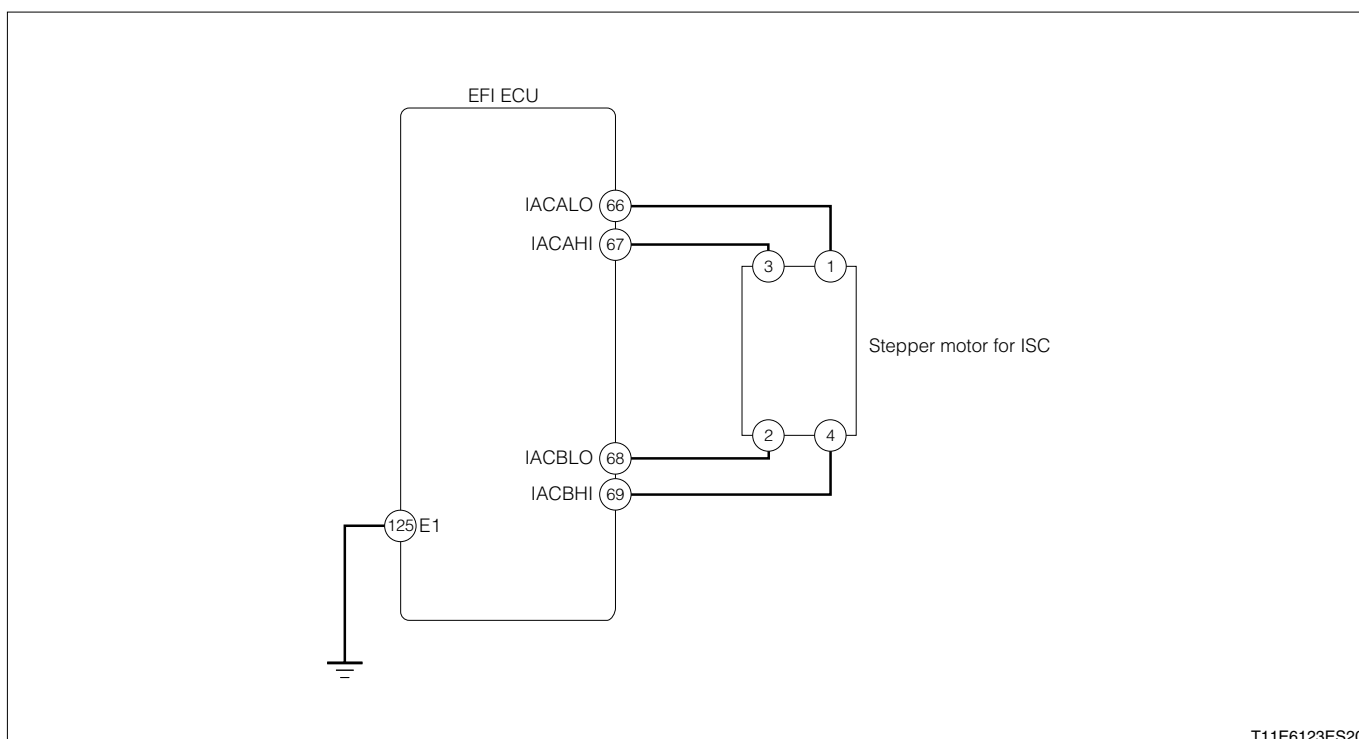
- (1) Combination meter vehicle harness side connector 7 (SPD) - Vehicle speed sensor vehicle harness side connector 3 (SPD)

▼ If it is OK, replace the vehicle speed sensor.

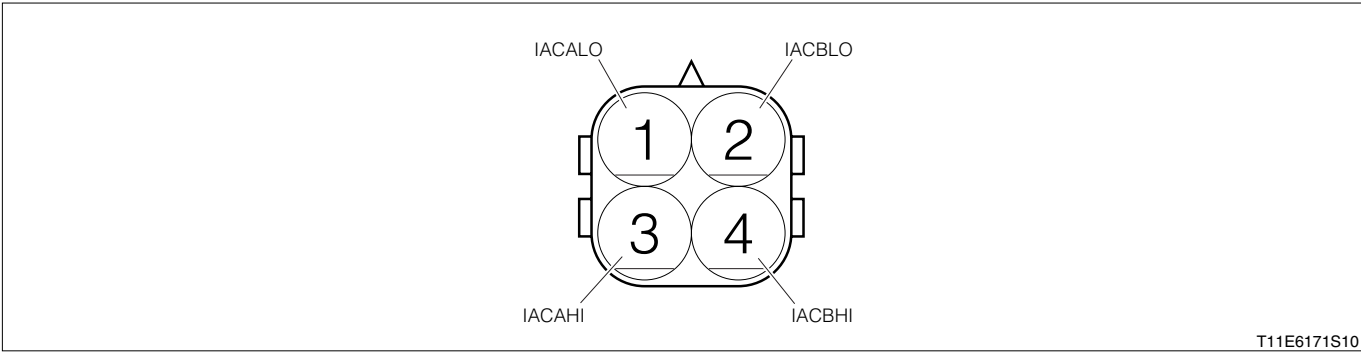
▼ If it is NG, repair the defective point.

7-12-19 DTC NO.P0505/71 IDLE CONTROL SYSTEM MALFUNCTION

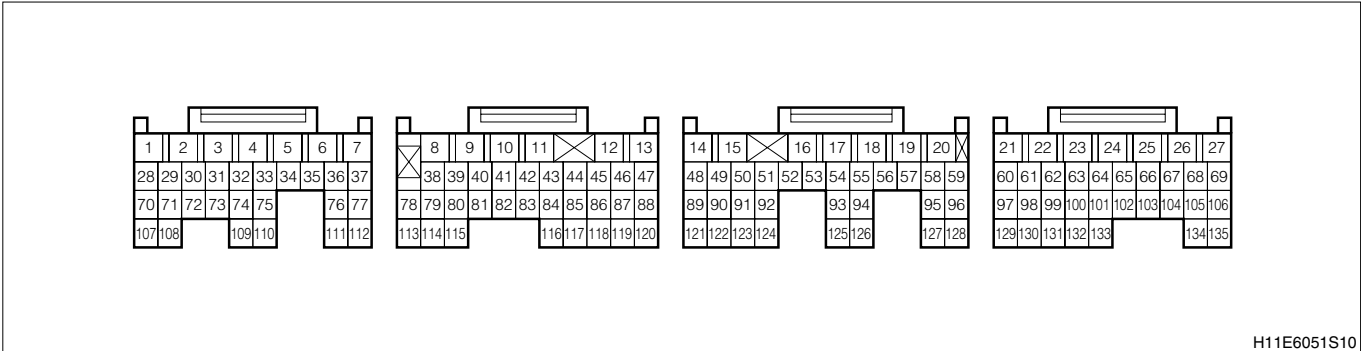
(1) System diagram



Stepper motor for ISC connection vehicle harness side connector



EFI ECU connection vehicle harness side connector



(2) Circuit description

1. The EFI ECU drives the stepper motor for ISC, thereby changing the passage area that bypasses the main passage where the throttle valve exists. As a result, the air volume being sucked during the idling is controlled.
2. The stepper motor for ISC performs a driving over 200 steps from the fully-closed position to the fully-opened position. The bypass passage is opened in the reverse direction, while the bypass passage is closed in the forward direction.

(3) Diagnosis code output conditions

1. When the signals are deviated from the specified range continuously over a certain length of time,

(4) Trouble area

1. Open wire or short circuit for ISC system circuit
2. Stepper motor for ISC
3. EFI ECU

(5) Checking points

1. Is the harness between the stepper motor for ISC and the EFI ECU normal?
2. Is the stepper motor for ISC operating normally?

(6) Inspection procedure

① When using diagnosis tester (DS-21/DS-II) or OBD II generic scan tool:

NOTE

- Read the freeze frame data, using the diagnosis tester (DS-21/DS-II) or OBD II generic scan tool. Because the freeze frame data records the engine conditions when the malfunction was detected, when troubleshooting the freeze frame data is useful to determine whether the vehicle was running or stopped, the engine warmed up or not, the air-fuel ratio lean or rich, etc. at the time of the malfunction.

▷1. Check of idle speed

1. Is the engine revolution speed high during cold period and does it get lower as the warm-up proceeds and maintain idling speed?

SPECIFIED VALUE: 750^{+100}_{-50} rpm

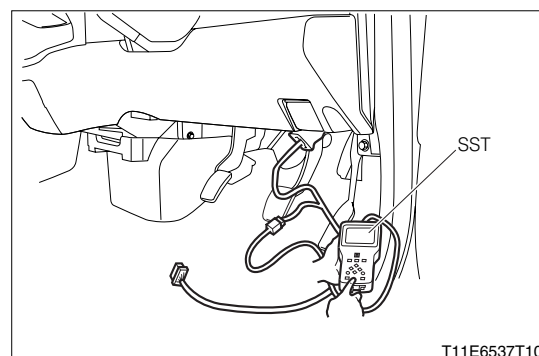
▼ If it is OK, proceed to ▷2.

▼ If it is NG, proceed to ▷3.

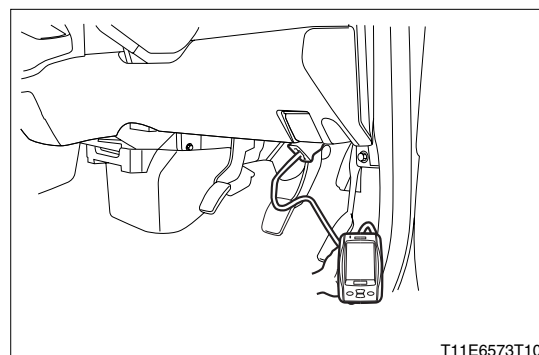
▷2. Re-confirmation of DTC.

1. The IG switch turned "LOCK".
2. Connect the diagnosis tester to DLC.
 - (1) In case of DS-21, connect the DS-21 diagnosis tester to DLC through the SST.

SST: 09991-87404-000



- (2) In case of DS-II, connect the DS-II diagnosis tester directly to DLC.
- (3) In case of the OBD II generic scan tool, connect the OBD II generic scan tool directly to DLC.



3. Turn "ON" the IG switch, and turn "ON" the main switch of the tester.
4. Erase the DTC. (As for the operation, follow the instruction manual of the diagnosis tester (DS-21/DS-II).)
5. Turn "OFF" the main switch of the tester. Turn "LOCK" the IG switch.
6. Turn "ON" the IG switch. Turn "ON" the main switch of the tester.
7. Check the DTC.

SPECIFIED VALUE: The normal code is outputted/

▼ If it is OK, the ISC system is normal.

▼ If it is NG, check the EFI ECU circuit.

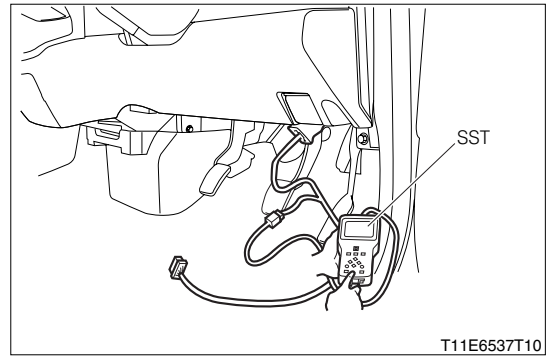
▷3. Operation check of stepper motor for ISC.

1. IG switch turned "LOCK".

2. Connect the diagnosis tester to DLC.

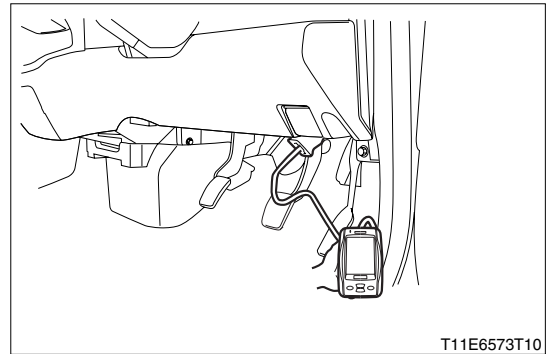
- (1) In case of DS-21, connect the DS-21 diagnosis tester to DLC through the SST.

SST: 09991-87404-000



- (2) In case of DS-II, connect the DS-II diagnosis tester directly to DLC.

- (3) In case of the OBD II generic scan tool, connect the OBD II generic scan tool directly to DLC.



3. Warm up the engine fully.

4. Turn "ON" the main switch of the diagnosis tester (DS-21/DS-II).

5. Drive the actuator during idling.

- (1) DS-21: Select the "ISC" of the "Actuator driving".

Execute the "Open" and "Close" respectively.

- (2) DS-II: Select the "ISC" of the "Active test".

Execute the "Open" and "Close" respectively.

6. Ensure that the engine revolution speed rises when the "Open" is selected. Also ensure that the engine revolution speed drops when the "Close" is selected.

SPECIFIED VALUE: The engine revolution speed will change.

▼ If it is OK, check the EFI ECU circuit.

▼ If it is NG, go to ▷4.

▷4. Check of output signal of stepper motor for ISC of ECU.

1. Turn "OFF" the main switch of the tester. Turn "LOCK" the IG switch.

2. Connect the SST.

SST: 09842-97209-000

3. Warm up the engine.

4. Perform output check between the following terminals using an oscilloscope.

- (1) Between SST 66 (IACALO) - SST 125 (E1) (Right figure 1 ►)

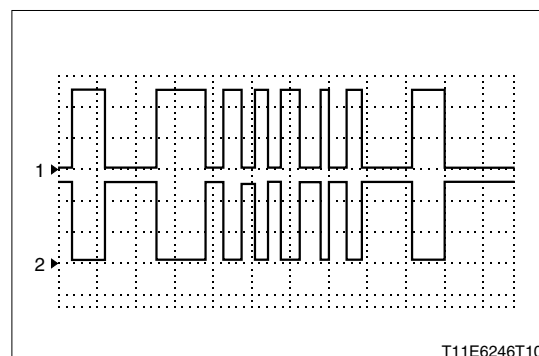
- (2) Between SST 67 (IACAHI) - SST 125 (E1) (Right figure 2 ►)

Time axis	1s / DIV
Voltage axis	5V / DIV
Measuring condition	When air conditioner is "ON" and while idling

Air conditioner "ON": Conditions in which all of the air conditioner switch (ACSW), blower switch (BLW) and magnet clutch (MGC) are "ON".

NOTE

- The waveform cannot be specified, but confirm that a waveform as in the right figure (one such example) shows up.



- (3) Between SST 68 (IACBLO) - SST 125 (E1) (Right figure 1 ►)

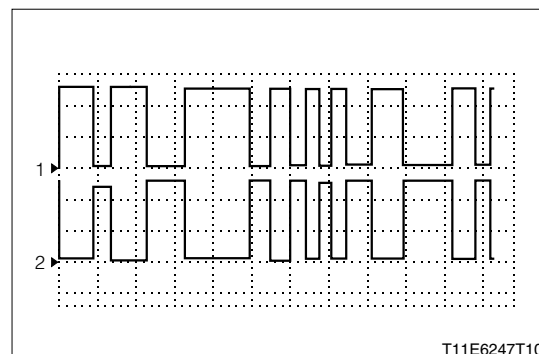
- (4) Between SST 69 (IACBHI) - SST 125 (E1) (Right figure 2 ►)

Time axis	1s / DIV
Voltage axis	5V / DIV
Measuring condition	When air conditioner is "ON" and while idling

Air conditioner "ON": Conditions in which all of the air conditioner switch (ACSW), blower switch (BLW) and magnet clutch (MGC) are "ON".

NOTE

- The waveform cannot be specified, but confirm that a waveform as in the right figure (One such example) shows up.



5. Confirm the following points.

- (1) The pulse of 0V ↔ battery voltage is generated.
- (2) The "LO" and "HI" will form waveforms in opposite phase.

▼ If it is OK, go to >5.

▼ If it is NG, replace the EFI ECU.

Refer to Page B8-1.

>5. Check of harness between valve for ISC and ECU.

1. Turn "OFF" the main switch of the tester. Turn "LOCK" the IG switch.
2. Disconnect the SST connector at the EFI ECU side.
3. Perform continuity check between each of the following terminals.
 - (1) Between stepper motor for ISC connection vehicle harness side connector 1 (IACALO) - ECU connection vehicle harness side connector 66 (IACALO)
 - (2) Between stepper motor for ISC connection vehicle harness side connector 2 (IACBLO) - ECU connection vehicle harness side connector 68 (IACBLO)
 - (3) Between stepper motor for ISC connection vehicle harness side connector 31 (IACAHI) - ECU connection vehicle harness side connector 67 (IACAHI)
 - (4) Between stepper motor for ISC connection vehicle harness side connector 4 (IACBHI) - ECU connection vehicle harness side connector 69 (IACBHI)

4. Are the check results for open wire and short OK?

▼ If it is OK, replace the throttle body Ay.

Refer to Page B3-2.

▼ If it is NG, repair or replace the harness or connector.

② When not using diagnosis tester (DS-21/DS-II) or OBD II generic scan tool:

B8-139

▷1. Check of idle speed

1. Install an engine tachometer to the terminal "REV" of the DLC, using the SST.

SST: 09991-87402-000
09991-87404-000

NOTE

- The SST 09991-87404-000 is a harness for extension use. This does not have to be used.
2. Is the engine revolution speed high during cold period and does it get lower as the warm-up proceeds and maintain idling speed?

SPECIFIED VALUE: 750^{+100}_{-50} rpm

▼ If it is OK, the ISC system is normal.

▼ If it is NG, proceed to ▷2.

▷2. Stepper motor for ISC operation check

1. Confirm whether the stepper motor for ISC is making an operation sound right after the engine is stopped using a sound scope or a long screwdriver.

SPECIFIED VALUE: It is making operation sound.

▼ If it is OK, proceed to ▷4.

▼ If it is NG, proceed to ▷3.

▷3. Check of wire harness continuity

1. Perform continuity check between each of the following terminals.

- (1) Between stepper motor for ISC connection vehicle harness side connector 1 (IACALO) - ECU connection vehicle harness side connector 66 (IACALO)
- (2) Between stepper motor for ISC connection vehicle harness side connector 2 (IACBLO) - ECU connection vehicle harness side connector 68 (IACBLO)
- (3) Between stepper motor for ISC connection vehicle harness side connector 31 (IACAHI) - ECU connection vehicle harness side connector 67 (IACAHI)
- (4) Between stepper motor for ISC connection vehicle harness side connector 4 (IACBHI) - ECU connection vehicle harness side connector 69 (IACBHI)

SPECIFIED VALUE: Continuity exists.

▼ If it is OK, proceed to ▷4.

▼ If it is NG, repair the harness and connectors and recheck it.

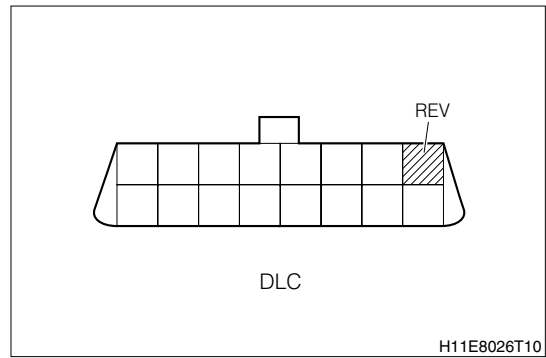
▷4. EFI ECU signal check

1. Connect the SST.

SST: 09842-97209-000

2. Perform output check between the following terminals using an oscilloscope.

- (1) Between SST 66 (IACALO) - SST 125 (E1) (Right figure 1 ►)



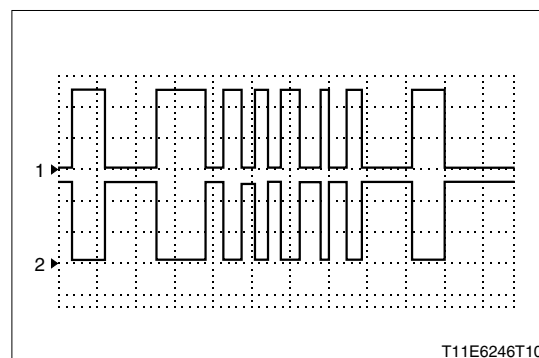
- (2) Between SST 67 (IACAHI) - SST 125 (E1) (Right figure 2 ►)

Time axis	1s / DIV
Voltage axis	5V / DIV
Measuring condition	When air conditioner is "ON" and while idling

Air conditioner "ON": Conditions in which all of the air conditioner switch (ACSW), blower switch (BLW) and magnet clutch (MGC) are "ON".

NOTE

- The waveform cannot be specified, but confirm that a waveform as in the right figure (One such example) shows up.



- (3) Between SST 68 (IACBLO) - SST 125 (E1) (Right figure 1 ►)

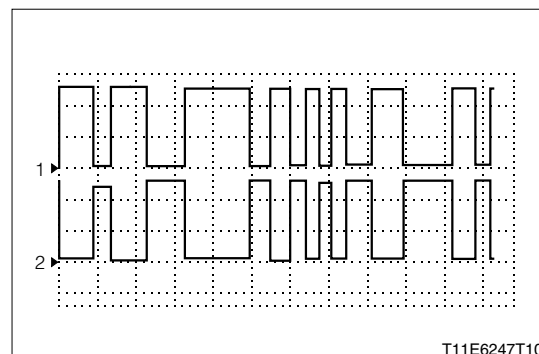
- (4) Between SST 69 (IACBHI) - SST 125 (E1) (Right figure 2 ►)

Time axis	1s / DIV
Voltage axis	5V / DIV
Measuring condition	When air conditioner is "ON" and while idling

Air conditioner "ON": Conditions in which all of the air conditioner switch (ACSW), blower switch (BLW) and magnet clutch (MGC) are "ON".

NOTE

- The waveform cannot be specified, but confirm that a waveform as in the right figure (one such example) shows up.



3. Confirm the following points.

- The pulse of 0V ↔ battery voltage is generated.
- The "LO" and "HI" will form waveforms in opposite phase.

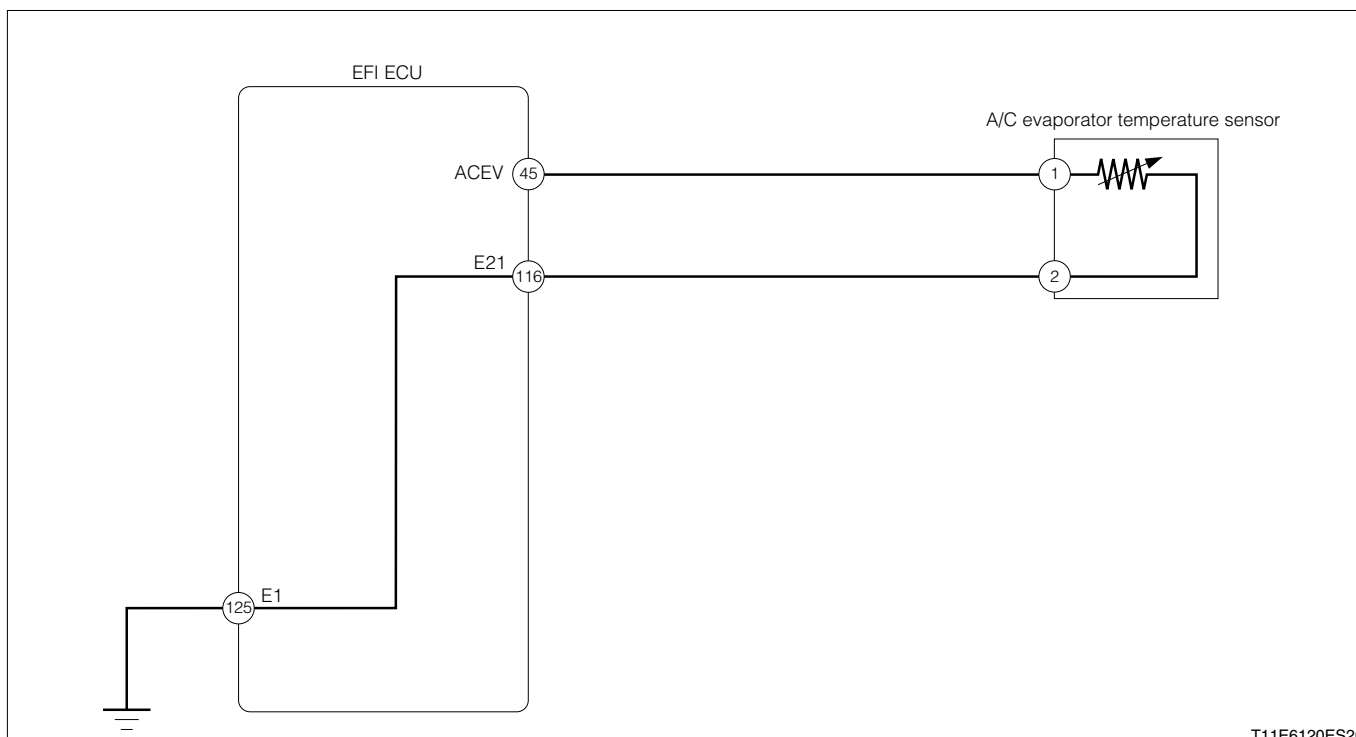
▼ If it is OK, replace the throttle body Ay.

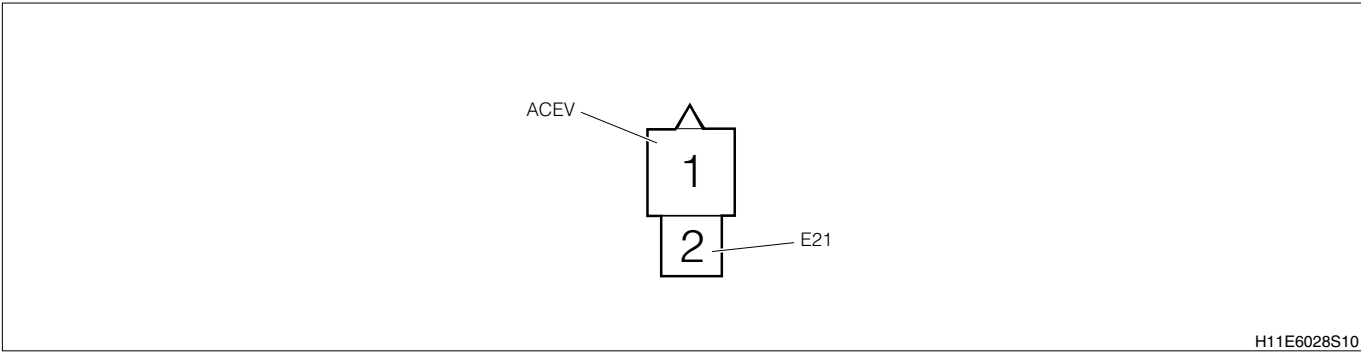
Refer to Page B3-2.

▼ If it is NG, check the EFI ECU circuit.

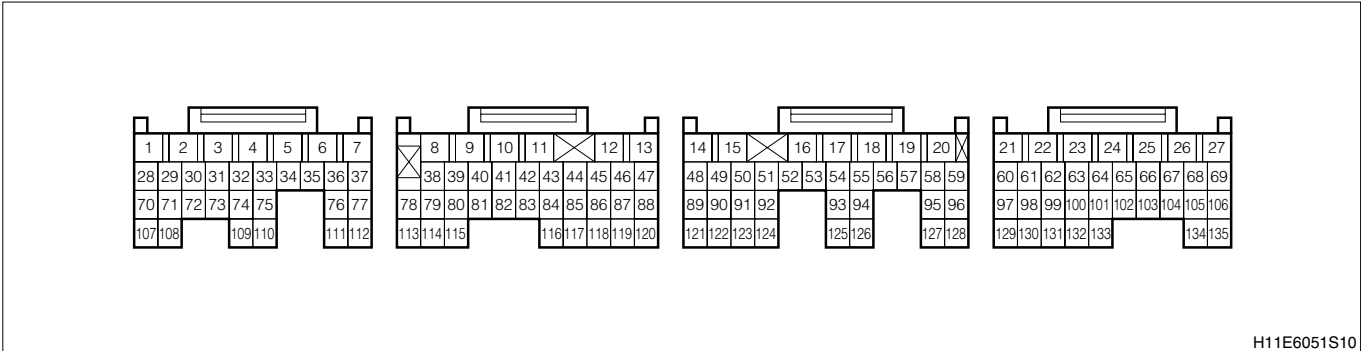
7-12-20 DTC NO.P0535/44 AIR CONDITIONER EVAPORATOR TEMPERATURE SENSOR CIRCUIT MALFUNCTION

(1) System diagram





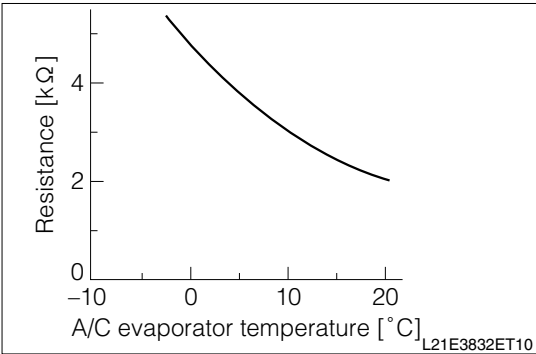
H11E6028S10



H11E6051S10

(2) Circuit description

1. This circuit, located at the rear of the evaporator of the air conditioner unit, detects the temperature of the air passing through the evaporator. A thermistor is incorporated in the sensor. This thermistor has characteristics that its resistance decreases as the temperature rise, while the resistance increases as the temperature drops. When the temperature becomes a constant value, the thermistor disengages the magnet clutch through the MGC relay, thus preventing frosting.



L21E3832ET10

(3) Diagnosis code output conditions

1. When the signals from the air conditioner evaporator temperature sensor are not outputted continuously over a certain length of time after starting with the air conditioner switch turned "ON"

(4) Trouble area

1. Air conditioner (A/C) evaporator temperature sensor
2. Open wire or short circuit for the air conditioner evaporator temperature sensor
3. EFI ECU

(5) Checking points

1. Are the signals from the air conditioner evaporator temperature sensor inputted to the EFI ECU?
2. Is the harness between the air conditioner evaporator temperature sensor and the EFI ECU normal?
3. Is the output of the air conditioner evaporator temperature sensor normal?

(6) Inspection procedure

① When using diagnosis tester (DS-21/DS-II) or OBD II generic scan tool:

NOTE

- Read the freeze frame data, using the diagnosis tester (DS-21/DS-II) or OBD II generic scan tool. Because the freeze frame data records the engine conditions when the malfunction was detected, when troubleshooting the freeze frame data is useful to determine whether the vehicle was running or stopped, the engine warmed up or not, the air-fuel ratio lean or rich, etc. at the time of the malfunction.

▷1. Check of ECU output voltage.

1. Set the SST.

SST: 09842-97209-000

2. IG switch turned "ON"

3. Measure the voltage between the following terminals.

(1) Between SST 45 (ACEV) and 116 (E21)

SPECIFIED VALUE: 0.1 - 4.8 V (Varies, depending upon the temperature.)

4. Are the check results OK?

▼ If it is NG, go to ▷2.

▼ If it is NG, check the EFI ECU circuit.

▷2. Wiring harness check

1. With the IG switch turned "LOCK", disconnect the SST connector from the ECU.

2. Perform the continuity check between the following terminals.

(1) Harness side connector 1 (ACEV) of sensor - EFI ECU 45 (ACEV)

(2) Harness side connector 2 (E21) of sensor - EFI ECU 116 (E21)

SPECIFIED VALUE: Continuity exists

3. Are the check results for open wire and short OK?

▼ If it is OK, go to ▷3.

▼ If it is NG, repair the defective point.

➤3. Unit check of A/C evaporator temperature sensor.

1. Perform the unit check of the air conditioner evaporator temperature sensor.
Refer to Page B8-204.

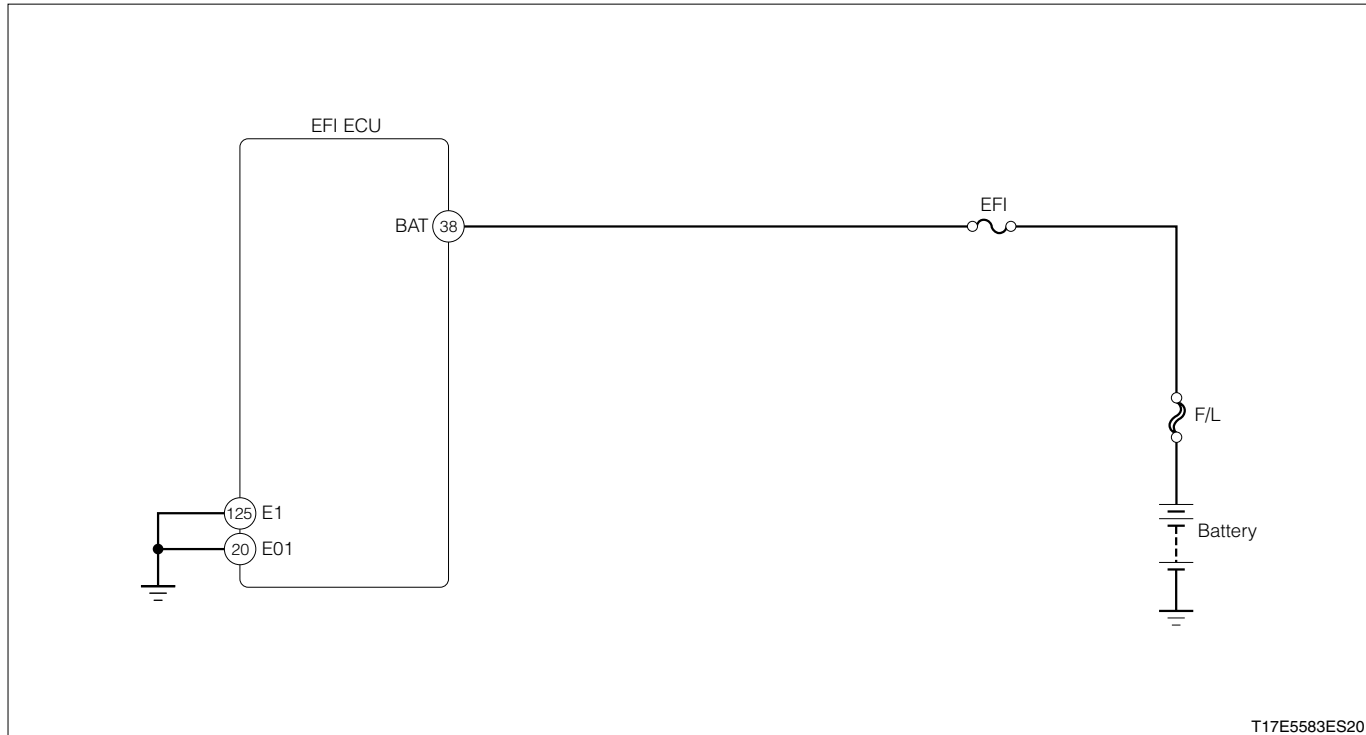
2. Are the unit check results OK?

▼ If it is OK, check or replace the EFI ECU.

▼ If it is NG, replace the A/C evaporator temperature sensor

7-12-21 P0560/61 BACK-UP POWER SOURCE(REAR OXYGEN SENSOR EQUIPPED VEHICLES)

(1) SYSTEM DESCRIPTION



T17E5583ES20

(2) Conditions for output

1. When battery power is not being supplied to the EFI ECU

(3) POINTS TO CHECK

1. Is the harness between the EFI ECU and the battery normal?

(4) Check procedure

➤1.EFI ECU voltage check

1. Disconnect the EFI ECU side connector. Then measure the voltage between the following terminals.

(1) Between the ECU connection vehicle harness side connector 38(BAT) and body earth

SPECIFIED VALUE: Battery voltage

▼ If no abnormality is found, finish the operation.

▼ If an abnormality is found, repair or replace the harnesses or connectors of the defective sections.

7-12-22 DTC NO.P1105/32 ATMOSPHERIC PRESSURE SENSOR CIRCUIT MALFUNCTION

(1) Circuit description

1. An atmospheric sensor is mounted in the ECU.

(2) Diagnosis code output conditions

1. When the signals from the atmospheric pressure sensor are not outputted continuously over a certain length of time after starting.

(3) Trouble area

1. EFI ECU

(4) Inspection procedure

① When using diagnosis tester (DS-21/DS-II) or OBD II generic scan tool:

NOTE

- Read the freeze frame data, using the diagnosis tester (DS-21/DS-II) or OBD II generic scan tool. Because the freeze frame data records the engine conditions when the malfunction was detected, when troubleshooting the freeze frame data is useful to determine whether the vehicle was running or stopped, the engine warmed up or not, the air-fuel ratio lean or rich, etc. at the time of the malfunction.

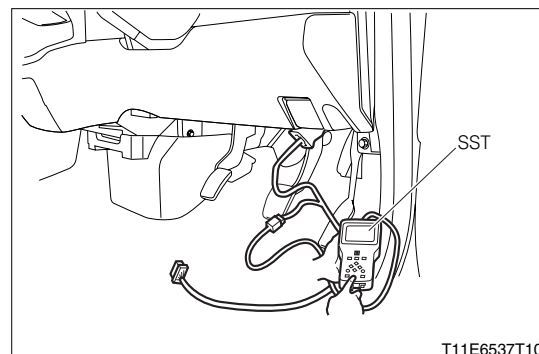
➤1. Erase the DTC

1. The IG switch turned "LOCK".

2. Connect the diagnosis tester to DLC.

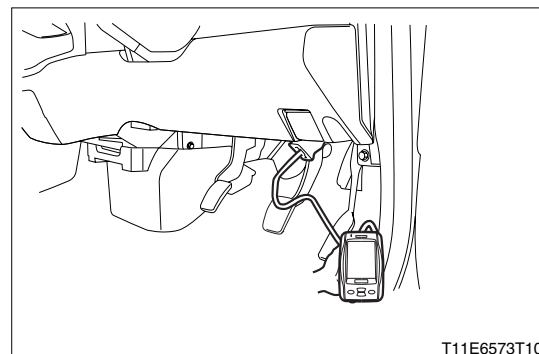
(1) In case of DS-21, connect the DS-21 diagnosis tester to DLC through the SST.

SST: 09991-87404-000



(2) In case of DS-II, connect the DS-II diagnosis tester directly to DLC.

(3) In case of the OBD II generic scan tool, connect the OBD II generic scan tool directly to DLC.



3. After turning "ON" the IG switch, Turn "ON" the main switch of the tester.

4. Cancel the diagnosis code.

5. Is No.P1105/32 indicated ?

▼ If the output is made, replace the EFI ECU.

▼ If no output is made, check the EFI ECU circuit.

② When not using diagnosis tester (DS-21/DS-II) or OBD II generic scan tool:

➤1. Erase the DTC

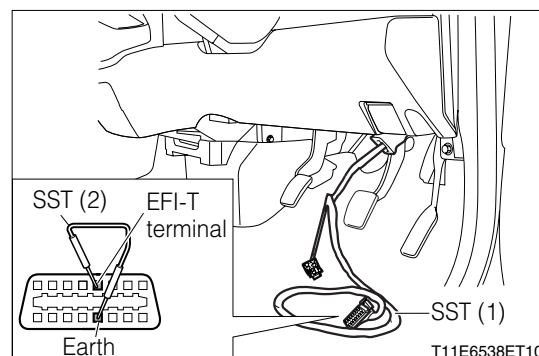
1. Remove the EFI fuse. Erase the DTC.

2. Set the EFI fuse to the original position.

3. Short circuit the DLC terminals 5 (EFI-T) and 13 (E), using the SST.

SST: 09991-87404-000SB08_0007

09991-87403-000SB08_0008

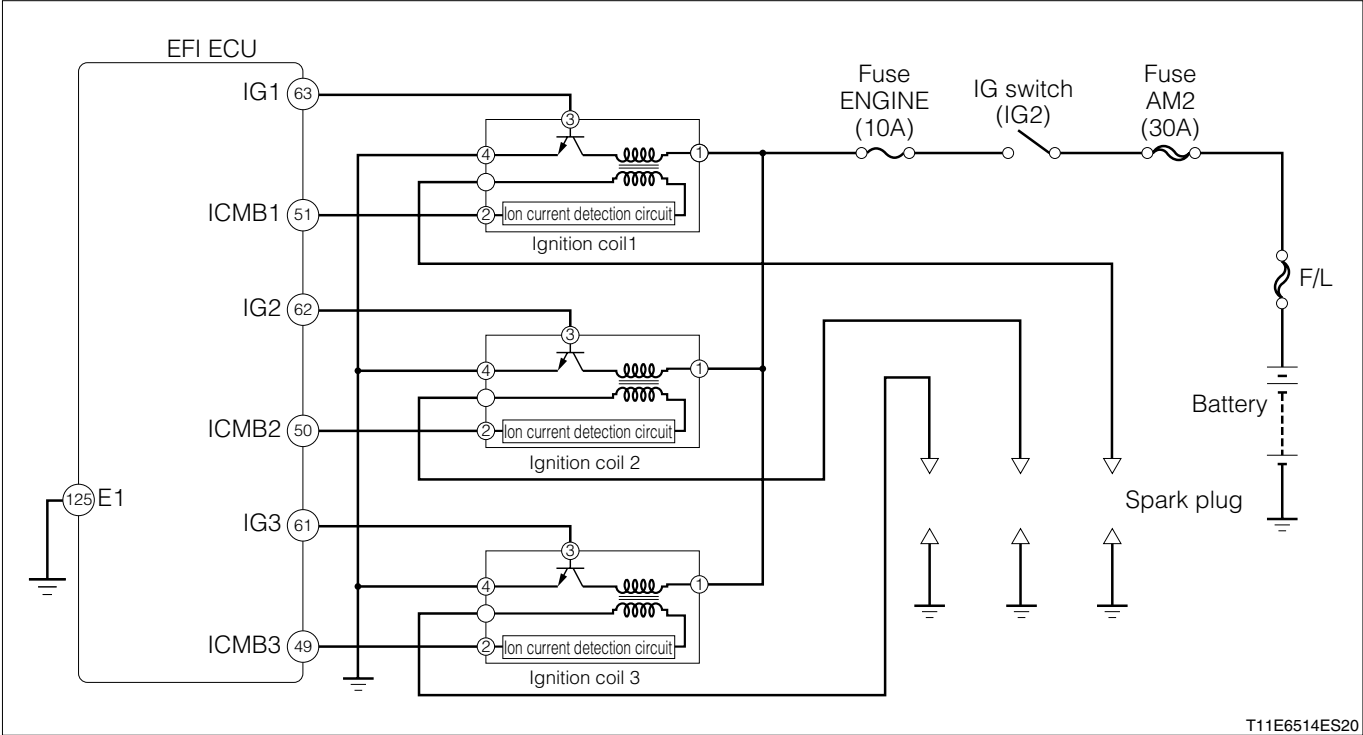


- 4. Turn "ON" the IG switch.
 - 5. Check the DTC.
 - 6. Is No.P1105/32 indicated ?
 - ▼ If the output is made, replace the EFI ECU.
- Refer to Page B8-1.

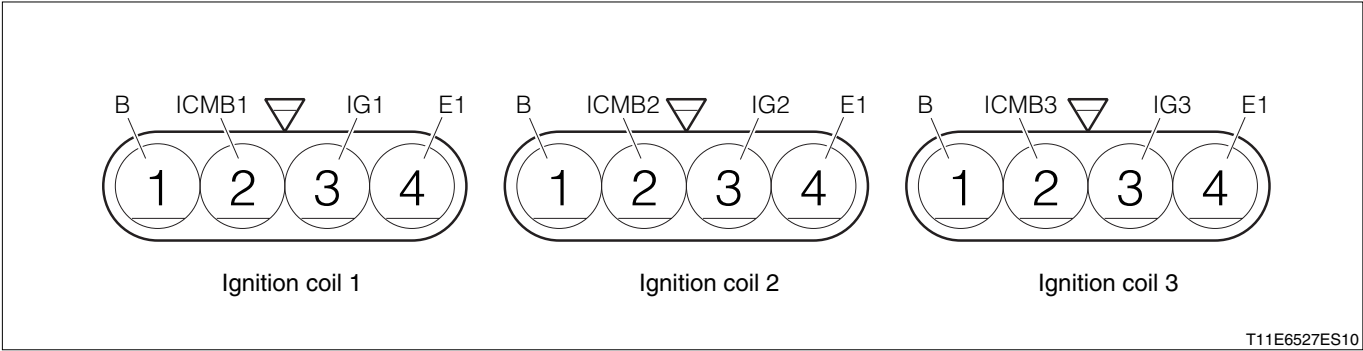
▼ If no output is made, check the EFI ECU circuit.

7-12-23 DTC NO.P1300/36 ION CURRENT COMBUSTION CONTROL SYSTEM

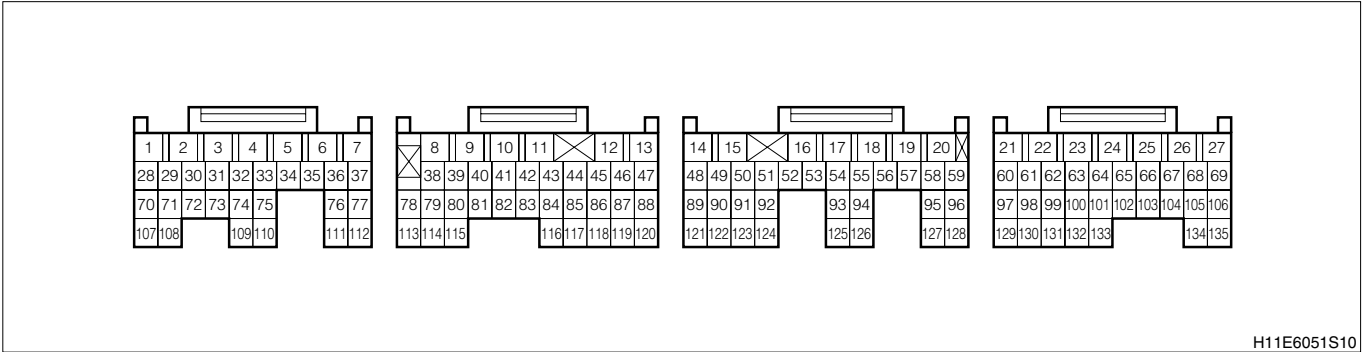
(1) System diagram



Ignition coil connection vehicle harness side connector



EFI ECU connection vehicle harness side connector



(2) Circuit description

1. This system detects any misfire of the engine by using an ion current which has the same wave-forms as those of the combustion pressure. When any misfire takes place, no ion current is produced. Therefore, if the input voltage at the ECU side is below a certain value, it is judged that a misfire took place. Since the detected ion current is very weak, it is amplified in the igniter unit.

(3) Diagnosis code output conditions

1. After the engine has been warmed up, when the signal from the ion current combustion control system is not inputted to the EFI ECU while the engine is running
2. After the engine has been warmed up, when the signal from the ion current combustion control system is inputted continuously to the EFI ECU while the engine is running
3. When the signal from the ion current combustion control system is inputted to the EFI ECU during the fuel-cut operation

(4) Trouble area

1. Open wire or short circuit for ion system circuit
2. Ignition coil
3. Spark plug
4. EFI ECU

(5) Checking points

1. Is the ignition system normal?
2. Is the signal from the ion current combustion control system normal?
3. Is the combustion system normal?
4. Is the harness between the ignition coil and the EFI ECU normal?
5. Is the ignition coil is normal?
6. Is the EFI ECU normal?

(6) Inspection procedure**NOTE**

- Read the freeze frame data, using the diagnosis tester (DS-21/DS-II) or OBD II generic scan tool. Because the freeze frame data records the engine conditions when the malfunction was detected, when troubleshooting the freeze frame data is useful to determine whether the vehicle was running or stopped, the engine warmed up or not, the air-fuel ratio lean or rich, etc. at the time of the malfunction.

➤1. Diagnosis code check

1. Use the SST to short-circuit DLC terminals between 5(EFI-T) - 13(E).
SST: 09991-87404-000SB08_0009
09991-87403-000SB08_0010
2. Check whether the diagnosis code other than Code No.36 is outputted or not.
SPECIFIED VALUE: No output.

▼ If it is OK, go to ➤2.

▼ In the case of NG, first check and repair a condition that caused the diagnosis code output.

▷2. Unit check of spark plug

1. Check whether the designated spark plug is used. (See Engine Turning-up section for spark plug specifications.)

Refer to Page B1-1.

2. Perform the unit check of the spark plug

Refer to Page B8-204.

▼ If it is OK, go to ▷3.

▼ If it is NG, clean or replace the spark plug. If a designated spark plug is not used, replace the spark plug with the designated spark plug.

▷3. Spark check

WARNING

- There is a hazard potential for sparks are generated. Do not place combustible materials in the vicinity.

1. Warm up the engine.
2. Set the IG switch to "LOCK".
3. Remove the fuel pump relay.
4. Idle the engine and wait until the engine stops by itself.
5. Set the IG switch to "LOCK".
6. Remove all the connectors from the injector.

CAUTION

- Operations described above will stop fuel injection, thus preventing damage to the catalyst due to non-burned gas etc.

7. Remove the spark plug and install it to the ignition coil to earth the plug.
8. Check whether the spark plug generates sparks during cranking.

SPECIFIED VALUE: Sparks are generated.

▼ If it is OK, go to ▷8.

▼ If it is NG, go to ▷4.

▷4. EFI ECU signal check (1)

1. Connect the SST.

SST: 09842-97209-000

2. Completely warm up the engine.
3. When the engine is in the starting condition, check an output waveform of an ignition signal between the following terminals using an oscilloscope.
 - (1) Between SST 63(IG1) - SST 125 (E1)
 - (2) Between SST 62(IG2) - SST 125 (E1)

(3) Between SST 61(IG3) - SST 125 (E1)

Time axis	100ms / DIV
Voltage axis	2V / DIV
Condition	Air-conditioner "OFF", no electrical load, idling

Air-conditioner "OFF": Set the air-conditioner switch (ACSW), blower switch (BLW), and magnet clutch (MGC) to "OFF".

NOTE

- Check that the waveform shown in the figure [Example] is displayed.

4. Check the following points.

- (1) The pulse of 0 $\leftrightarrow$ 5V is generated.
- (2) The waveform cycle is shortened as the engine speed increases.

NOTE

- The ignition signal can not be judged correctly if an oscilloscope is not used.

▼ If it is OK, go to $\triangleright$ 5.

▼ If it is NG, check the EFI ECU circuit.

 $\triangleright$ 5. Wire harness continuity check (1)

1. Check continuity between the following terminals.

- (1) Between ignition coil 1 connection vehicle harness side connector 3 (IG1) - ECU connection vehicle harness side connector 63 (IG1)
- (2) Between ignition coil 2 connection vehicle harness side connector 3 (IG2) - ECU connection vehicle harness side connector 62 (IG2)
- (3) Between ignition coil 3 connection vehicle harness side connector 3 (IG3) - ECU connection vehicle harness side connector 61 (IG3)

SPECIFIED VALUE: Continuity exists

▼ If it is OK, go to $\triangleright$ 6.

▼ If it is NG, repair or replace the faulty harness.

 $\triangleright$ 6. Ignition coil voltage check

1. Measure the voltage between the following terminals when the IG switch is "ON".

- (1) Between each ignition coil connection vehicle harness side connector 1 (+B) - body earth

SPECIFIED VALUE: Battery voltage

▼ If it is OK, go to $\triangleright$ 7.

▼ In the case of NG, repair or replace the harness between the following terminals.

- (2) Each ignition coil - battery

 $\triangleright$ 7. Wire harness continuity check (2)

1. Check continuity between the following terminals.

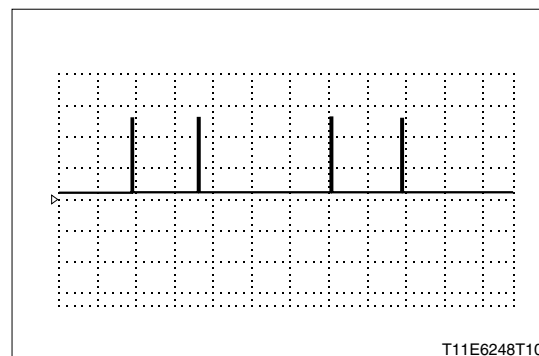
- (1) Between each ignition coil connection vehicle harness side connector 4 (E1) - ECU connection vehicle harness side connector 125 (E1)

SPECIFIED VALUE: Continuity exists.

▼ If it is OK, replace the ignition coil.

Refer to Page B10-1.

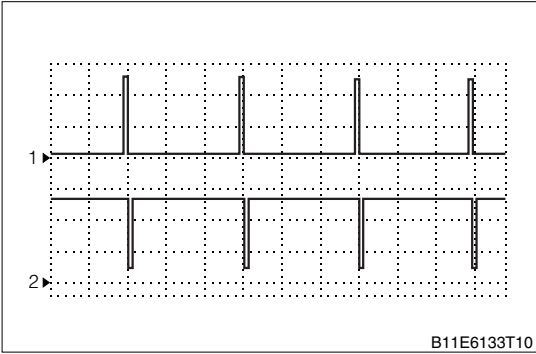
▼ In the case of NG, repair or replace the faulty harness.



➤8. EFI ECU signal check (2)

- 1. Completely warm up the engine.
- 2. While idling, check each cylinder for output waveforms of the ignition signal (1▶) and ion current combustion control signal (2▶), using an oscilloscope, respectively.

	Channel	+ side measuring terminal	− side measuring terminal
Cylinder No.1	1▶	63 (IG1)	125 (E1)
	2▶	51 (ICMB1)	125 (E1)
Cylinder No.2	1▶	62 (IG2)	125 (E1)
	2▶	50 (ICMB2)	125 (E1)
Cylinder No.3	1▶	61 (IG3)	125 (E1)
	2▶	49 (ICMB3)	125 (E1)



Time axis	50ms / DIV
Voltage axis	2V / DIV
Condition	Water temperature is 80℃ or more: air conditioner is "ON": Electric load exists: during air conditioner idle up rotation

Air conditioner is "ON": Condition where all of the air conditioner switch (ACSW), blower switch (BLW) and magnet clutch (MGC) are "ON".
Electric load exists: Conditions where the headlight (H/L) and Defogger (DEF) are both "ON".
Air conditioner idle up rotation:950⁺⁵⁰_{−150}rpm

NOTE

- Check that waveforms like those in the figure (One example) is produced.
3. Check the following points.
- (1) According to the output waveform of the ignition signal (Channel 1 ▶), the output waveform of the ion current combustion control signal (Channel 2▶) has been produced.
 - (2) The waveform of 5 ⇄ 0V has been produced.

NOTE

- Correct evaluation cannot be made for the ignition signals and ion current combustion control signals, unless you use an oscilloscope.

	Waveform (Channel 2▶) state
a	Normal
b	Clamped at 0V.
c	Clamped at 5V.
d	Clamped to the battery voltage.
e	Waveform is unstable※.

※: According to the output waveform of the ignition signal (Channel 1 ▶), the output waveform of the ion current combustion control signal (Channel 2▶) has not been produced.

- ▼ In the case of "a", go to ➤9.
- ▼ In the case of "b" go to ➤11.
- ▼ In the case of "c" go to ➤13.
- ▼ In the case of "d" go to ➤12.
- ▼ In the case of "e" go to ➤16.

▷9. EFI ECU signal check (3)

1. Retain the measurement conditions in ▷8.
2. Under the following conditions, check each cylinder for output waveforms of the ion current combustion control signal, using an oscilloscope.
 - (1) Raise the engine revolution speed slowly from the idle state to 4000 rpm. Then, close the throttle opening quickly.

SPECIFIED VALUE: No waveform is outputted while fuel is cut.

▼ If it is OK, replace the EFI ECU.

Refer to Page B8-1.

▼ If it is NG, go to ▷10.

▷10. Fuel cut operation check

1. Check the output state between the following terminals using an oscilloscope.
 - (1) Between SST 24 (#10) - SST 125 (E1)
 - (2) Between SST 23(#20) - SST 125 (E1)
 - (3) Between SST 22(#30) - SST 125 (E1)
2. Check the operating sound of the injector using a sound scope when the fuel cut is active.

NOTE

- Check operating sound, while checking the output waveform to the injector using an oscilloscope.

SPECIFIED VALUE: The operating sound of the injector stops when the fuel cut is active.

▼ If it is OK, replace the ignition coil.

Refer to Page B10-1.

▼ In the case of NG, perform unit check of the injector.

Refer to Page B8-205.

▷11. Check of wire harness for short-circuit (1)

1. Check continuity of the cylinder whose waveform is clamped at 0V.
 - (1) Between ignition coil 1 connection vehicle harness side connector 2 (ICMB1) - body earth
 - (2) Between ignition coil 2 connection vehicle harness side connector 2 (ICMB2) - body earth
 - (3) Between ignition coil 3 connection vehicle harness side connector 2 (ICMB3) - body earth

SPECIFIED VALUE: No continuity exists

▼ If it is OK, replace the ignition coil.

Refer to Page B10-1.

▼ In the case of NG, repair the faulty section.

▷12. Check of wire harness for short-circuit (2)

1. Check continuity of the cylinder whose waveform is clamped to the battery voltage.

- (1) Between ignition coil 1 connection vehicle harness side connector 2 (ICMB1) - battery positive (+) terminal
- (2) Between ignition coil 2 connection vehicle harness side connector 2 (ICMB2) - battery positive (+) terminal
- (3) Between ignition coil 3 connection vehicle harness side connector 2 (ICMB3) - battery positive (+) terminal

SPECIFIED VALUE: No continuity exists

▼ If it is OK, replace the ignition coil.

Refer to Page B10-1.

▼ In the case of NG, repair or replace the faulty component.

▷13. Check of wire harness for open wire

1. Check continuity of the cylinder whose waveform is clamped at 5V.

- (1) Between ignition coil 1 connection vehicle harness side connector 2 (ICMB1) - EFI ECU connection vehicle harness side connector 51 (ICMB1)
- (2) Between ignition coil 2 connection vehicle harness side connector 2 (ICMB2) - EFI ECU connection vehicle harness side connector 50 (ICMB2)
- (3) Between ignition coil 3 connection vehicle harness side connector 2 (ICMB3) - EFI ECU connection vehicle harness side connector 49 (ICMB3)

SPECIFIED VALUE: Continuity exists

▼ If it is OK, go to ▷14.

▼ In the case of NG, repair or replace the faulty component.

▷14. Check of short-circuit between the wire harnesses

1. Check whether the cylinder, whose waveform is clamped at 5V, is short-circuited to the power wire of the sensor system.

NOTE

- The power supply for the sensor system is 5V.

- (1) Between ignition coil 1 connection vehicle harness side connector 2 (ICMB1) - body earth
- (2) Between ignition coil 2 connection vehicle harness side connector 2 (ICMB2) - body earth
- (3) Between ignition coil 3 connection vehicle harness side connector 2 (ICMB3) - body earth

SPECIFIED VALUE: 0V

▼ If it is OK, replace the ignition coil and go to ▷15.

Refer to Page B10-1.

▼ In the case of NG, repair or replace the faulty component.

▷15. EFI ECU signal recheck (1)

1. Recheck the cylinder, whose waveform is clamped at 5V, under the ▷8) conditions.
2. Check that the output waveform of the ion current combustion control signal (Channel 2 ►) is not clamped at 5V.

SPECIFIED VALUE: The output waveform (Channel 2 ►) is not clamped at 5V.

▼ If it is OK, finish the troubleshooting.

▼ In the case of NG, misfire may have occurred. Identify the cause of the misfire and repair.

▷16. Harness, connector check

1. When the following actions are taken to the cylinder whose waveform is unstable , check whether the waveform will change or not.

- (1) Lightly shake the connector vertically and laterally.
- (2) Lightly shake the wire harness vertically and laterally.

SPECIFIED VALUE: There is no change in the waveform.

2. Perform the following checks.

- (1) Connector fitting condition
- (2) Loose connection of the connector and the terminal.

SPECIFIED VALUE: No fault.

▼ If it is OK, replace the ignition coil and go to ▷17.

Refer to Page B10-1.

▼ In the case of NG, repair or replace the faulty component.

▷17. EFI ECU signal recheck (2)

1. Recheck the cylinder, whose waveform is unstable, under the ▷8) conditions.
2. Check that the output waveform of the ion current combustion control signal (Channel 2▶) is outputted stably.

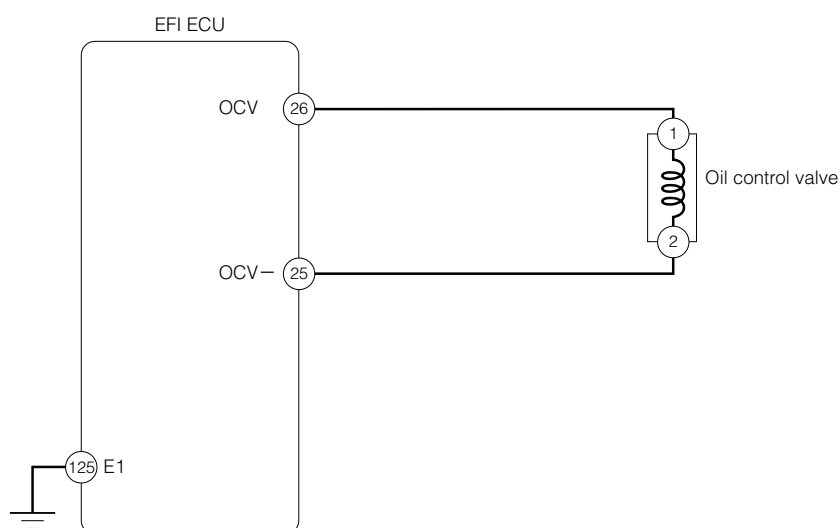
SPECIFIED VALUE: The output waveform (Channel 2▶) is outputted stably.

▼ If it is OK, finish the troubleshooting.

▼ In the case of NG, combustion instability may have occurred. Identify the cause of the combustion instability and repair.

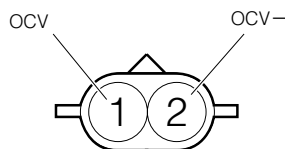
7-12-24 DTC NO.P1346/75 VARIABLE VALVE TIMING CONTROL SYSTEM (VALVE TIMING)DTC NO.P1346/75 VARIABLE VALVE TIMING CONTROL SYSTEM (ADVANCED TIMING/RETARDED TIMING)

(1) System diagram



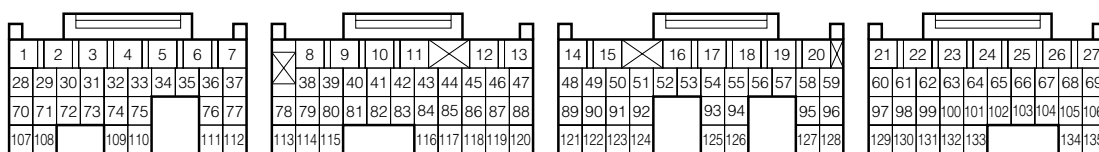
T11E6127ES20

Oil control valve connection vehicle harness side connector



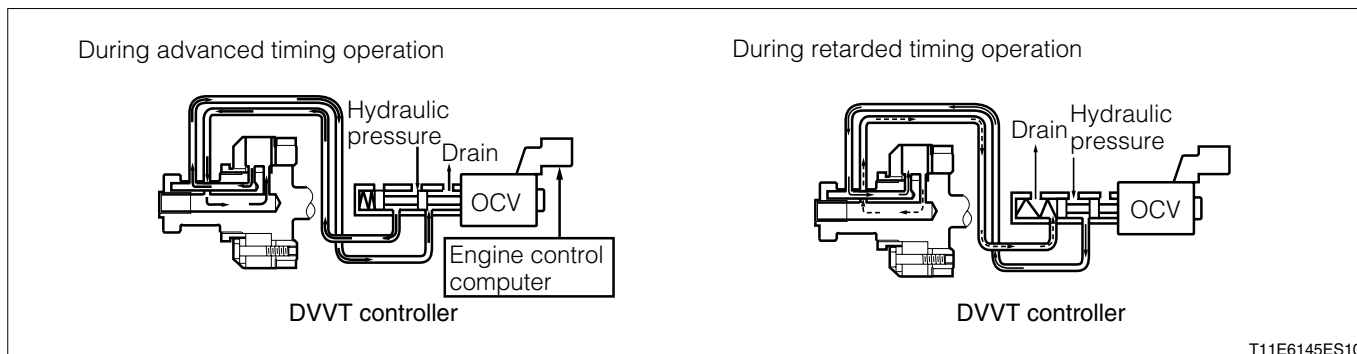
H11E6067S10

EFI ECU connection vehicle harness side connector



H11E6051S10

(2) Variable valve timing control operation outline



T11E6145ES10

- The DVVT system controls the intake valve timing to proper timing in response to the driving conditions. The engine ECU controls the OCV (Oil Control Valve) to make the intake valve timing proper. The oil pressure controlled by the OCV is supplied to the DVVT controller, and then, the DVVT controller changes the relative position between the camshaft and the crankshaft.
- No.1346/75 output conditions**
 - When a valve timing fail of the variable timing is detected
- No.P1349/73 output conditions**
 - When a valve timing fail for the advanced timing fail or retarded timing
- Checking points**
 - Is the variable valve timing controller operating normally?
 - Is the variable valve timing controller operating normally?
 - Is the timing deviated between the camshaft drive gear and the camshaft driven gear?
(Are the mating marks matched?)
- Checking Method**

NOTE

- Read the freeze frame data, using the DS-21 diagnosis tester or OBD II generic scan tool. Because the freeze frame data records the engine conditions when the malfunction was detected, when troubleshooting the freeze frame data is useful to determine whether the vehicle was running or stopped, the engine warmed up or not, the air-fuel ratio lean or rich, etc. at the time of the malfunction.

➤1. Oil control valve operation check

WARNING

- Do not put any flammable material around because sparks may be generated and is dangerous.
- Pay attention for safety since this is an operation during engine operation.

- Remove the connector of the oil control valve.
- Start the engine and perform idling.

3. Apply the battery voltage to the connector of the oil control valve.

CAUTION

- Do not mistake the voltage polarity.
- Be careful of shorting while operating (As a precaution, install a fuse at the positive side).
- Set the energizing time at one minute or less.

NOTE

- Refer to the right figure for voltage polarity.

4. Confirm the idling condition of the engine.

SPECIFIED VALUE: Rough idling or engine stall takes place.

▼ If it is OK, proceed to >2.

▼ If it is NG, proceed to >4.

>2. Check of wire harness continuity

1. Stop the engine.
2. Perform continuity check between each of the following terminals.
 - (1) Between oil control valve connection vehicle harness side connector 1 (OCV+) - ECU connection vehicle harness side connector 26 (OCV+)
 - (2) Between oil control valve connection vehicle harness side connector 2 OCV- - ECU connection vehicle harness side connector 25 (OCV-)

SPECIFIED VALUE: Continuity exists.

▼ If it is OK, proceed to >3.

▼ If it is NG, repair the harness and the connectors.

>3. Camshaft gear deviation check

1. Check the deviation between the camshaft drive gear and the camshaft driven gear.

SPECIFIED VALUE: There is no deviation.

▼ If it is OK, check the EFI ECU circuit.

▼ If it is NG, reassemble the camshaft.

>4. Oil control valve unit check

1. Perform unit check of the oil control valve.
Refer to Page B8-205.

▼ If it is OK, proceed to >5.

▼ If it is NG, replace the oil control valve.

Refer to Page B8-6.

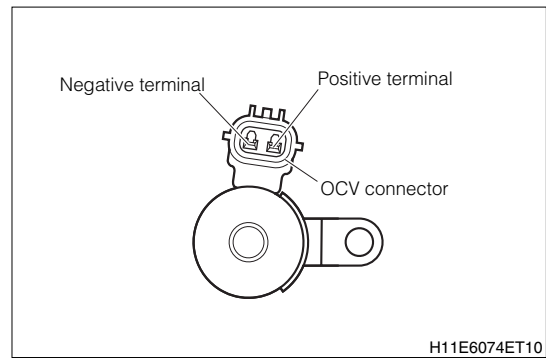
>5. DVVT actuator unit check

1. Perform unit check of DVVT actuator.
Refer to Page B2-16.

▼ If it is OK, proceed to >6.

▼ If it is NG, replace the camshaft No.2.

Refer to Page B2-10.



➤6. Oil passage check

1. Check the passageway of the engine oil.

SPECIFIED VALUE: There is no clogging.

▼ If it is OK, proceed to ➤7.

▼ If it is NG, repair the defective section of the oil passage.

➤7. Camshaft gear deviation check

1. Check the deviation between the camshaft drive gear and the camshaft driven gear.

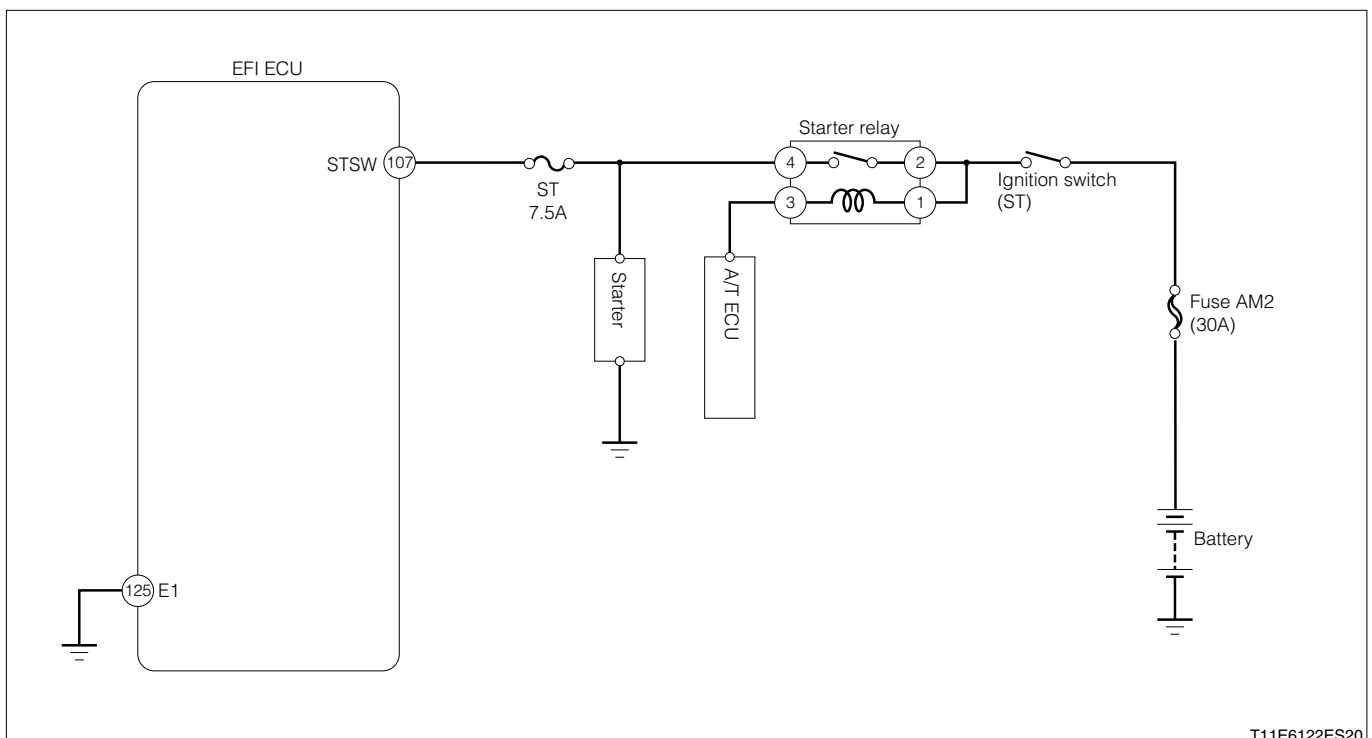
SPECIFIED VALUE: There is no deviation.

▼ If it is OK, check the EFI ECU circuit.

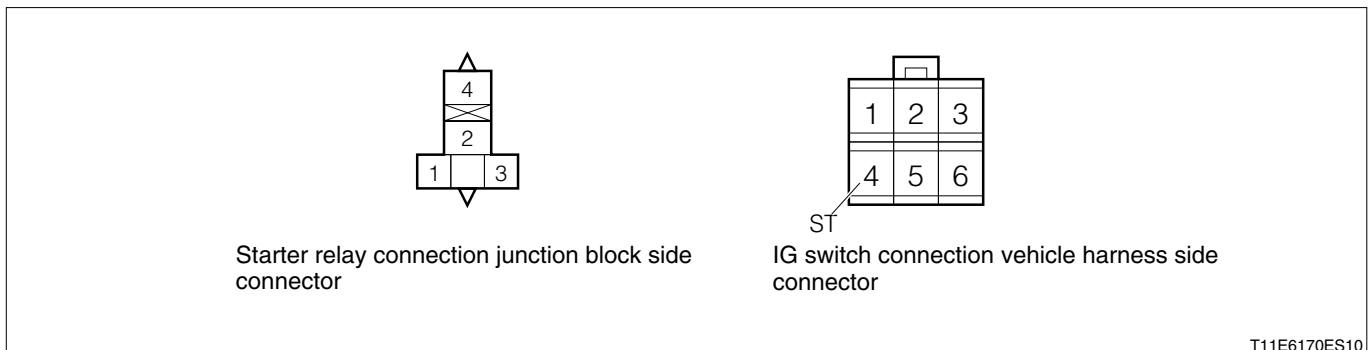
▼ If it is NG, reassemble the camshaft.

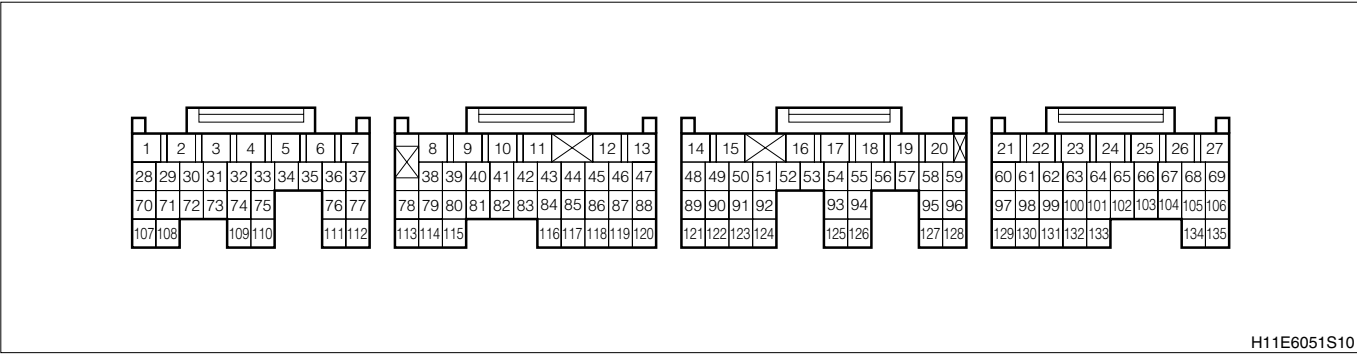
7-12-25 DTC NO.P1510/54 STARTER SIGNAL SYSTEM MALFUNCTION

(1) System diagram



IG switch connection vehicle harness side connector





- (2) **Output conditions**
1. When there is no "ON" signal even when the engine revolution speed reaches the set value or above when the vehicle speed is 0km/h:
- (3) **Checking points**
1. Is the harness between the starter and EFI ECU normal?
- (4) **Checking method**
- 1. **EFI ECU signal check**
1. Connect the SST.
SST: 09842-97209-000
 2. Perform voltage measurement between the following terminals during starting.
(1) Between SST 107 (STSW) - SST 125 (E1)
SPECIFIED VALUE: Battery voltage
- ▼ If it is OK, check the EFI ECU circuit.
- ▼ If it is NG, proceed to ➤2.

➤2. Check of wire harness continuity

1. Perform continuity check between each of the following terminals.

- (1) Between IG switch side connector 4 (ST) - ECU connection vehicle harness side connector 107 (STSW)

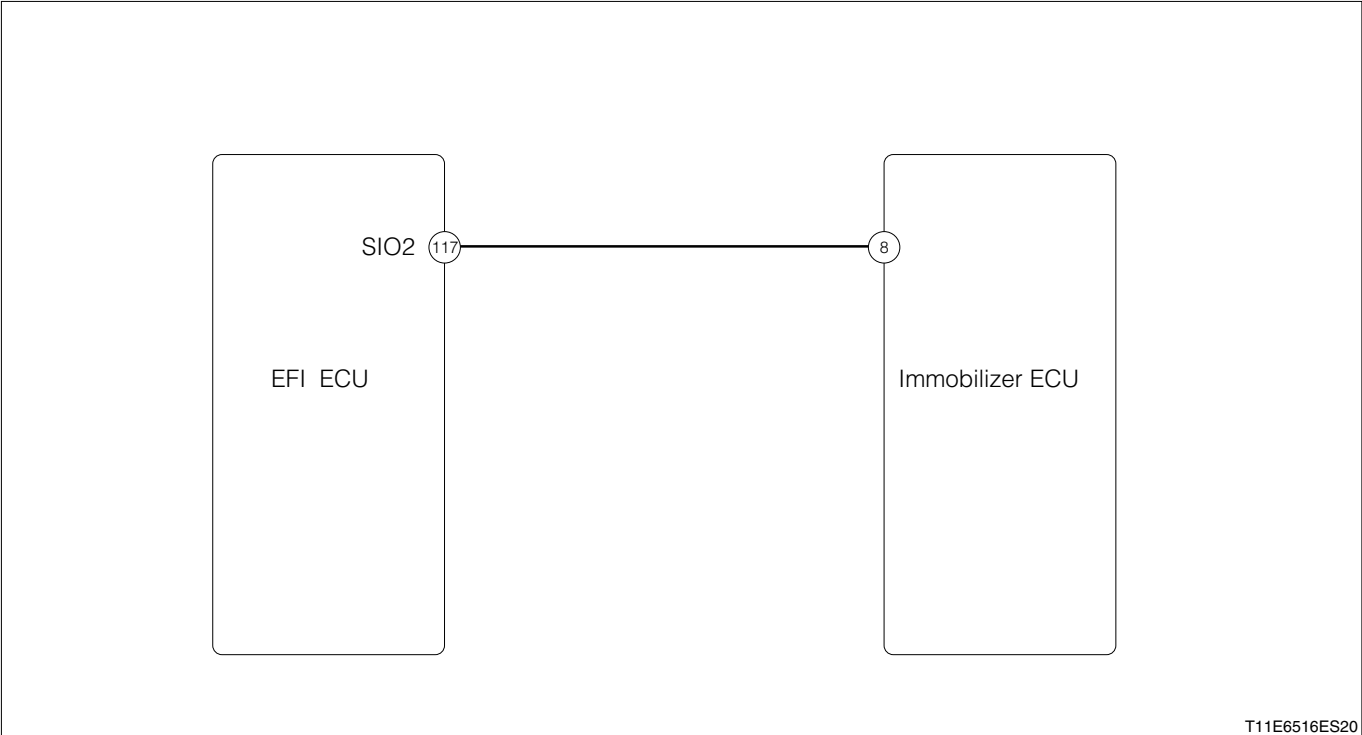
SPECIFIED VALUE: Continuity exists.

▼ If it is OK, check the vehicle speed sensor system.

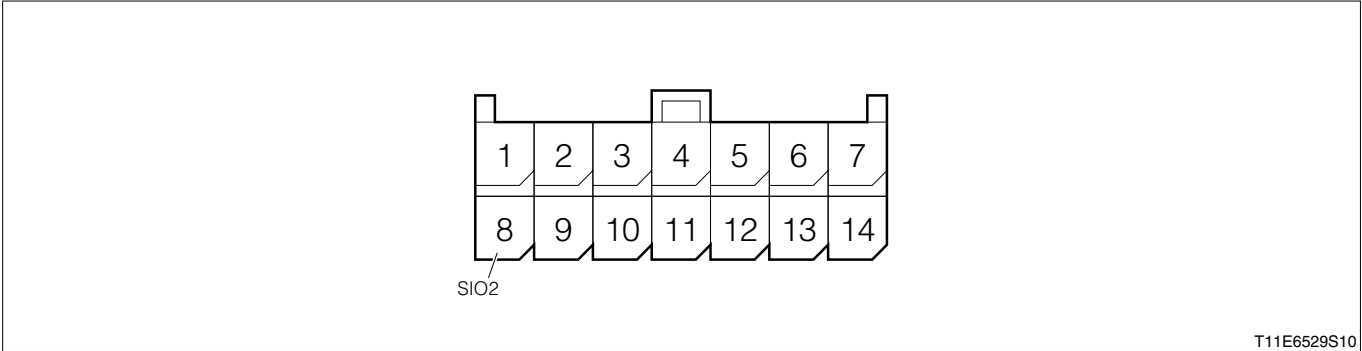
▼ If it is NG, repair the harness and connectors.

7-12-26 DTC NO.P1600/83 IMMOBILIZER SIGNAL CIRCUIT MALFUNCTION

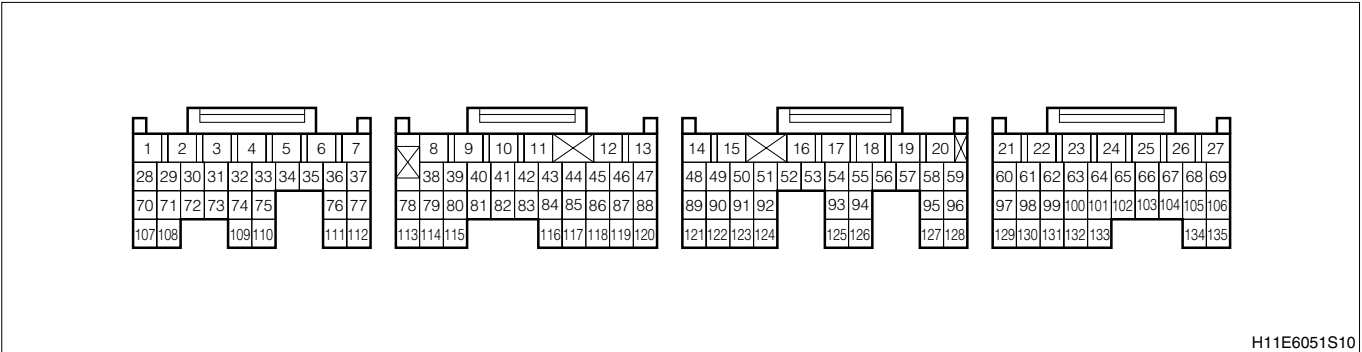
(1) System diagram



Immobilizer ECU wire harness side



EFI ECU wire harness side



(2) Circuit description

1. This circuit performs collation and updating of the rolling code in the communication between the immobilizer ECU and the EFI ECU. The engine can start only when the collation and updating of the rolling code can be done. The rolling code is collated and updated by reading out or writing to non volatile memory (E2PROM) of both ECUs.

(3) Diagnosis code output conditions

1. When the engine starts, the rolling code can not reading out or writing to the EFI ECU.

(4) Trouble area

1. EFI ECU

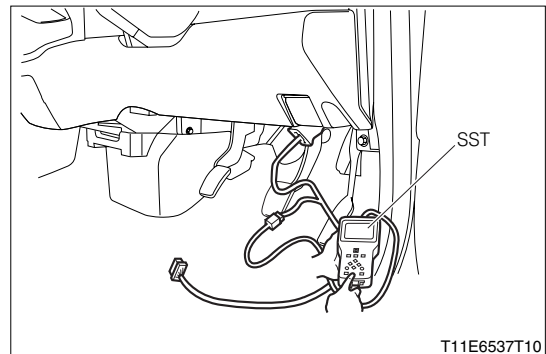
(5) Inspection procedure

① When using diagnosis tester (DS-21/DS-II) or OBD II generic scan tool:

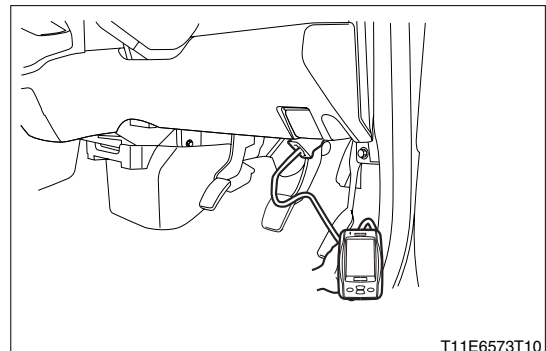
▷1. Re-confirmation of DTC.

1. IG switch turned "LOCK".
2. Connect the diagnosis tester to DLC.
 - (1) In case of DS-21, connect the DS-21 diagnosis tester to DLC through the SST.

SST: 09991-87404-000



- (2) In case of DS-II, connect the DS-II diagnosis tester directly to DLC.
- (3) In case of the OBD II generic scan tool, connect the OBD II generic scan tool directly to DLC.



3. Turn "ON" the IG switch, and turn "ON" the main switch of the tester.
4. Erase the DTC. (As for the operation, follow the instruction manual of the diagnosis tester (DS-21/DS-II).)
5. Turn "OFF" the main switch of the tester. Turn "LOCK" the IG switch.
6. Turn "ON" the IG switch. Turn "ON" the main switch of the tester.
7. Check the DTC.
8. Is P1600 indicated ?
 - ▼ If the output is made, proceed to ▷2.
 - ▼ If no output is made, proceed to ▷3.

▷2. Wiring harness check

1. Turn "LOCK" the ignition switch.
 2. Perform the continuity check between the following terminals.
 - (1) Between the EFI ECU connection vehicle harness side connector 117 (SIO2) and the immobilizer ECU connection vehicle harness side connector 8 (SIO2)
- SPECIFIED VALUE: Continuity exists.

▼ If it is OK, go to ▷3.

▼ If it is NG, repair the defective point.

▷3. Immobilizer side diagnosis code check

1. Turn "ON" the IG switch. Turn "ON" the main switch of the tester.
 2. Check the immobilizer diagnosis code.
 - ▼ If no output is made, replace the EFI ECU.
- Refer to Page B8-1.

▼ If the output is made, check the immobilizer.

Refer to Page I4-25.

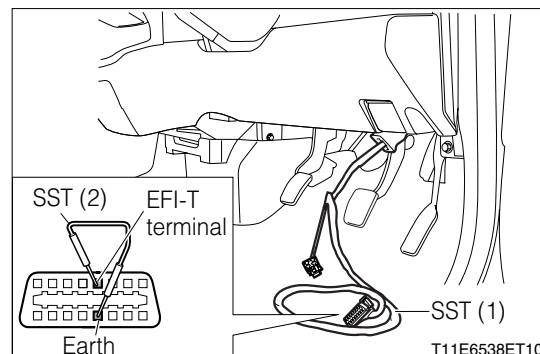
② When not using diagnosis tester (DS-21/DS-II) or OBD II generic scan tool:

▷1. Re-confirmation of DTC.

1. Remove the EFI fuse. Erase the DTC. (As for the erasing method.)
2. Set the EFI fuse to the original position.
3. Short circuit the DLC terminals 5 (EFI-T) and 13 (E), using the SST.
 - SST: 09991-87404-000(1)
 - 09991-87403-000(2)
4. Turn "ON" the IG switch.
5. Check the DTC. (Read out the flashing pattern of the MIL.)
6. Is "P1600/83" indicated?

▼ If the output is made, proceed to ▷2.

▼ If no output is made, proceed to ▷3.



▷2. Wiring harness check

1. Turn "LOCK" the ignition switch.
 2. Perform the continuity check between the following terminals.
 - (1) Between the EFI ECU connection vehicle harness side connector 117 (SIO2) and the immobilizer ECU connection vehicle harness side connector
- SPECIFIED VALUE: Continuity exists.

▼ If it is OK, go to ▷3.

▼ If it is NG, repair the defective point.

➤3. Immobilizer side diagnosis code check

1. Short between the DLC terminals 4 (ECU-T) and 13 (E), using the SST.

SST: 09991-87404-000(1)

09991-87403-000(2)

2. Turn "ON" the IG switch.

3. Is the diagnosis code of the immobilizer outputted?

▼ If no output is made, replace the EFI ECU.

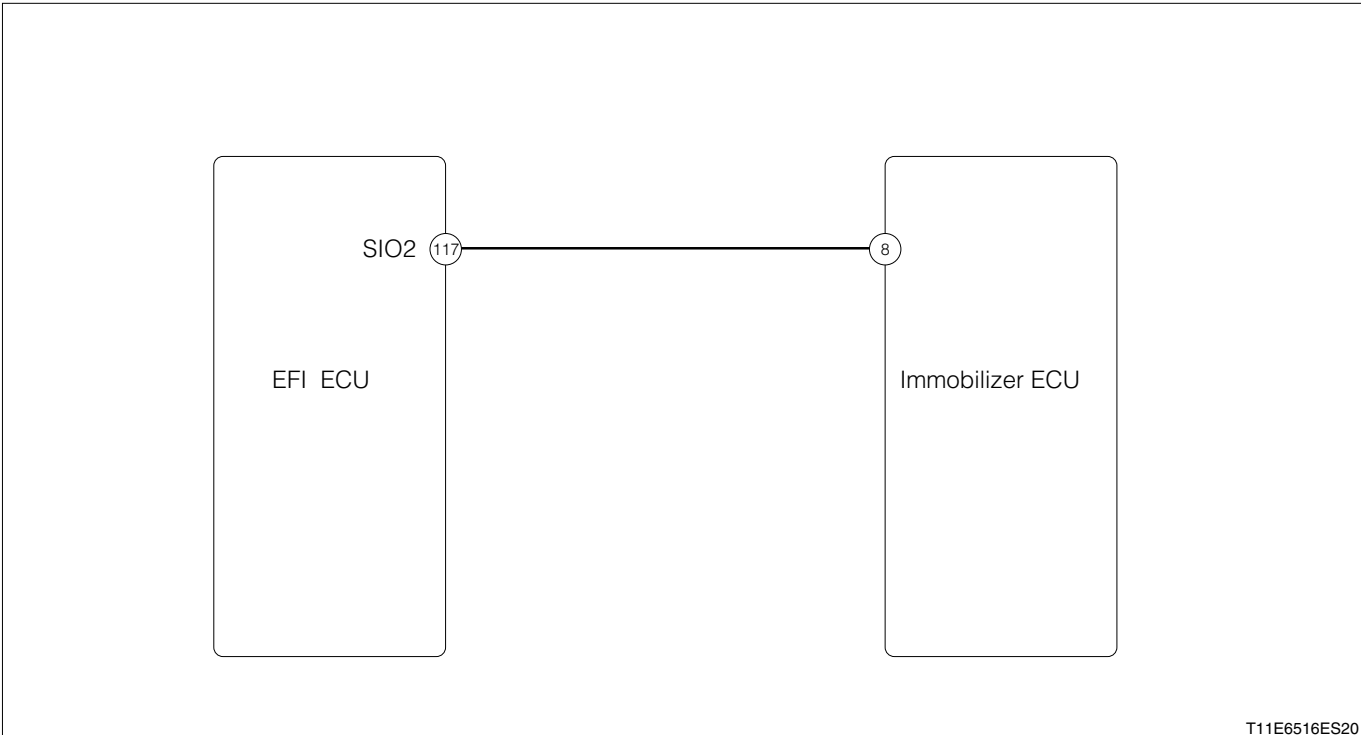
Refer to Page B8-1.

▼ If the output is made, check the immobilizer.

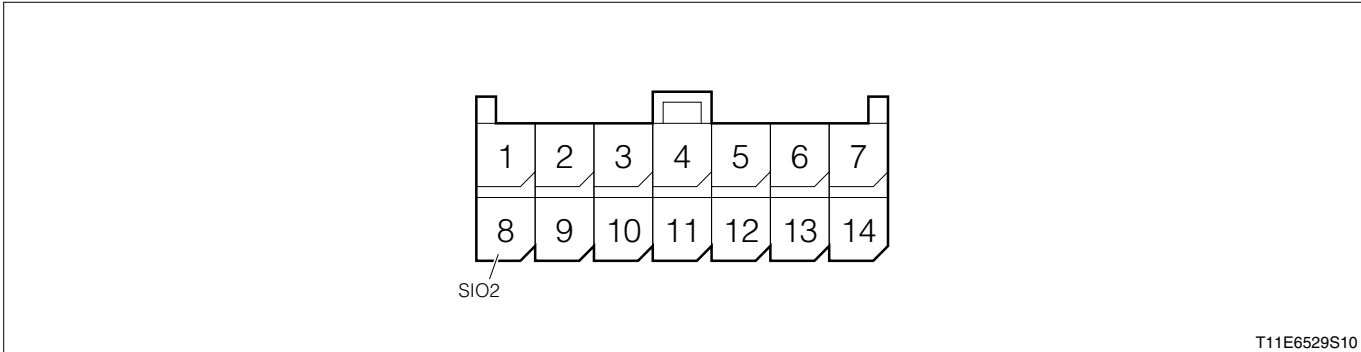
Refer to Page I4-25.

7-12-27 DTC NO.P1601/81 IMMOBILIZER SIGNAL MALFUNCTION

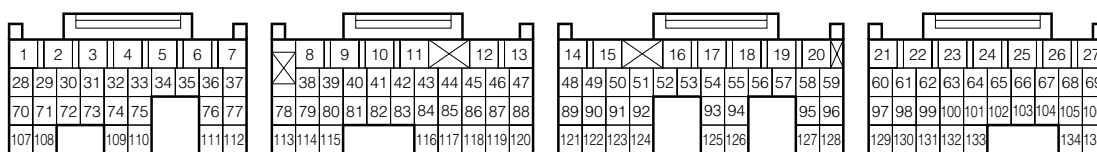
(1) System diagram



Immobilizer ECU wire harness side



EFI ECU wire harness side



H11E6051S10

(2) Circuit description

- When the ignition switch is turned "ON", communication starts between the immobilizer ECU and EFI ECU. The engine can start only when the communication between the two ECU is possible and the rolling codes are matched. In order cases, fuel injection and ignition are prohibited, thus making engine starting impossible.

(3) Diagnosis code output conditions

- When the engine starts, the rolling codes are not matched.

(4) Trouble area

- Open wire or short circuit for the immobilizer system circuit
- Immobilizer ECU
- EFI ECU

(5) Inspection procedure**➤1. Wiring harness check**

- Set the SST (Sub-harness). However, the SST connectors at the EFI ECU side should remain disconnected.

SST: 09842-97209-000

- Disconnect the immobilizer ECU connector.
- Perform the continuity check between the following terminals with the IG switch set to the "LOCK" position.

(1) Connector 8 (SIO1) at immobilizer ECU harness side - SST terminal 117 (SIO1).

SPECIFIED VALUE: Continuity exists.

▼ If it is OK, go to ➤2.▼ If it is NG, repair or replace the harness or connector.**➤2. Check of immobilizer system (1).**

- Connect the connector of the immobilizer ECU.
- Replace the EFI ECU with a new one. Connect the SST connector to the EFI ECU.
- Start the engine with the master key.

SPECIFIED VALUE: The engine starts.

▼ If it is OK, check or replace the EFI ECU.▼ If it is NG, go to ➤3.

➤3. Check of immobilizer system (2).

- 1. Replace the immobilizer ECU with a new one, with the IG switch turned "LOCK".
- 2. Start the engine with the master key.

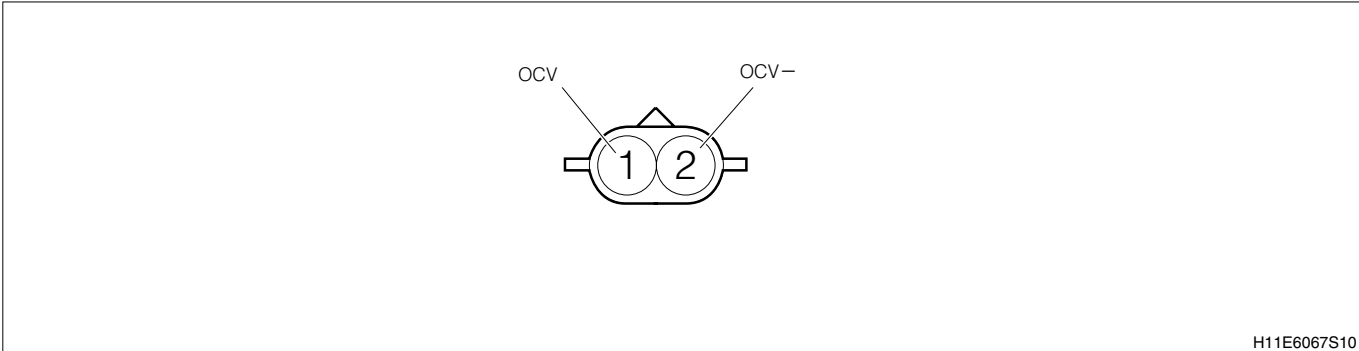
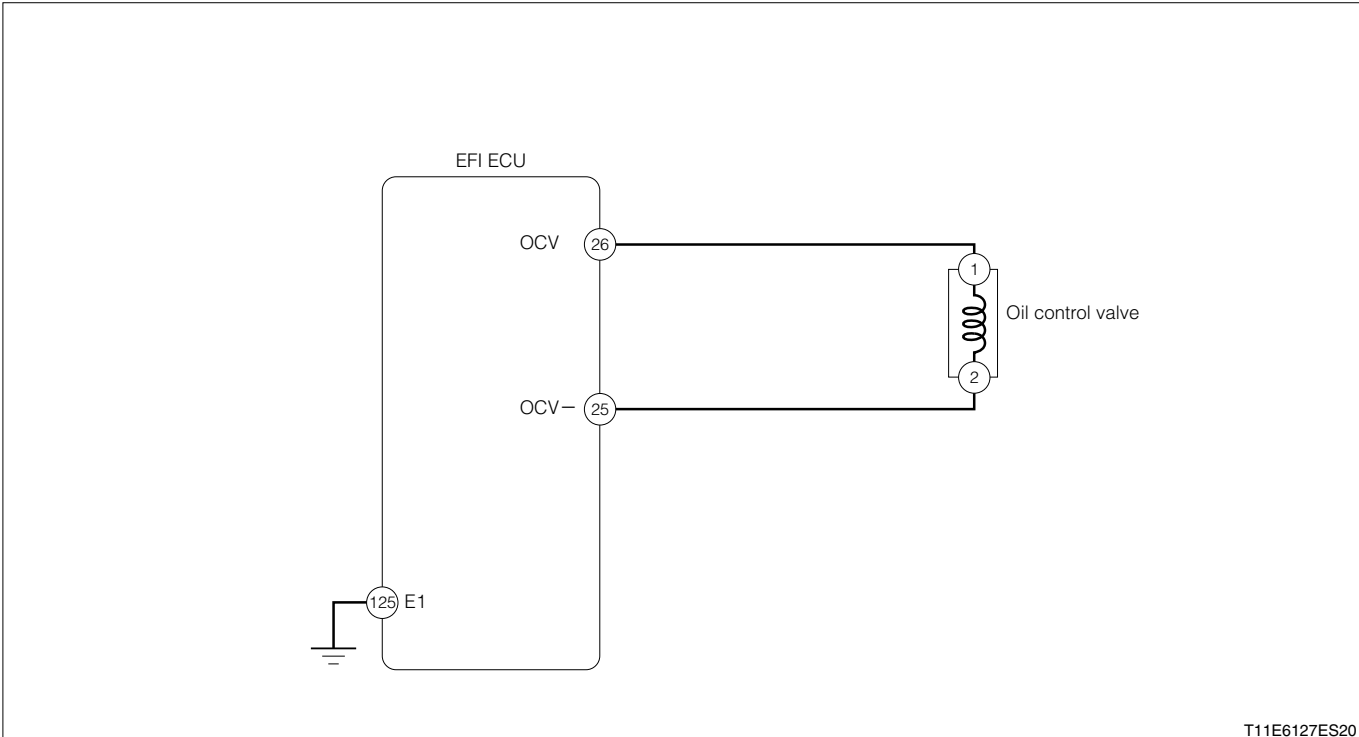
SPECIFIED VALUE: The engine starts.

- ▼ If it is OK, check the IG key, antenna coil, etc. (Refer to section "BODY ELECTRICAL SYSTEM".)
- ▼ If it is NG, check or replace the immobilizer ECU. (Refer to section "BODY ELECTRICAL SYSTEM".)

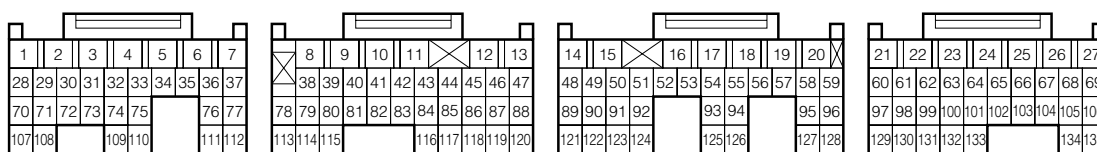
Refer to Page I4-27.

7-12-28 DTC NO.P1656/74 OIL CONTROL VALVE CONTROL SYSTEM MALFUNCTION

(1) System diagram



EFI ECU connection vehicle harness side connector



H11E6051S10

(2) **Diagnosis code output conditions**

1. When, under a condition where the battery voltage is 12V or more, one of the following conditions is continued over a certain length of time
 - (1) When the output duty ratio is 99% or more and the oil control valve voltage is below the evaluation specified value
 - (2) When the output duty ratio is 0% and the oil control valve voltage is the evaluation specified value or more

(3) **Checking points**

1. Is the control signal of the oil control valve outputted normally from the EFI ECU?
2. Is the harness between the oil control valve and the EFI ECU normal?

(4) **Checking Method**▷ **1. Oil control valve operation check****WARNING**

- Do not put any combustible in the surrounding area, for sparks are occurring and there are fire potentials.
- This is an operation to be made while the engine is running. Special care must be exercised for the safety.

1. Disconnect the oil control valve connector.
2. Start the engine and perform an idling operation.
3. Apply the battery voltage to the oil control valve connector.

CAUTION

- Do not mistake the voltage polarity.
- Pay utmost attention as for a short during the operation. (Put a fuse at the plus side as a precautionary measure.)
- Make sure that the energizing time should be within one minute.

NOTE

- For the voltage polarity, refer to the right figure.

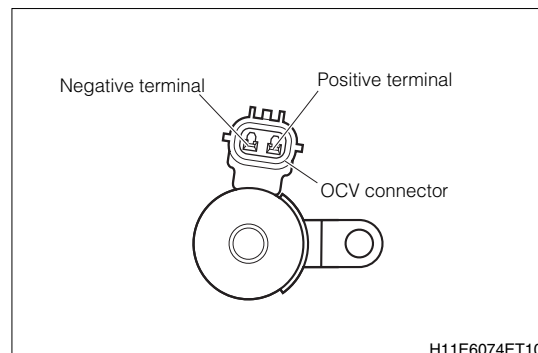
4. Confirm the engine idling condition.

SPECIFIED VALUE: Rough idling or engine stalling occurs.

▼ If it is YES, go to ▷2.

▼ If it is NG, replace the oil control valve.

Refer to Page B8-6.



H11E6074ET10

➤2. Oil control valve voltage check

1. Stop the engine and set the IG switch to the "LOCK" position.
2. Connect the SST.
SST: 09842-97209-000

3. Turn "ON" the ignition switch.
4. Check the voltage between the following terminals.
(1) Between SST 25 (OCV-) and SST 26 (OCV+)
SPECIFIED VALUE: Battery voltage

▼ If it is OK, go to ➤3.

▼ If it is NG, check the EFI ECU circuit.

➤3. Check of wire harness continuity

1. With the IG switch turned "LOCK", disconnect the SST connector from the ECU.
2. Perform continuity check between the following terminals.
(1) Between the oil control valve connection vehicle harness side connector 1 (OCV+) and the ECU connection vehicle harness side connector 26 (OCV+)
(2) Between the oil control valve connection vehicle harness side connector 2 (OCV-) and the ECU connection vehicle harness side connector 25 (OCV-)
SPECIFIED VALUE: Continuity exists.

▼ If it is OK, check the EFI ECU circuit.

▼ If it is NG, repair the harness and connector.

7-12-29 DTC NO.U0001/88 COMMUNICATION WITH CAN

(1) Output conditions

1. When all communication histories established with the CAN communication configuration ECU are not available

(2) Checking method

➤ 1. Checking the diagnosis

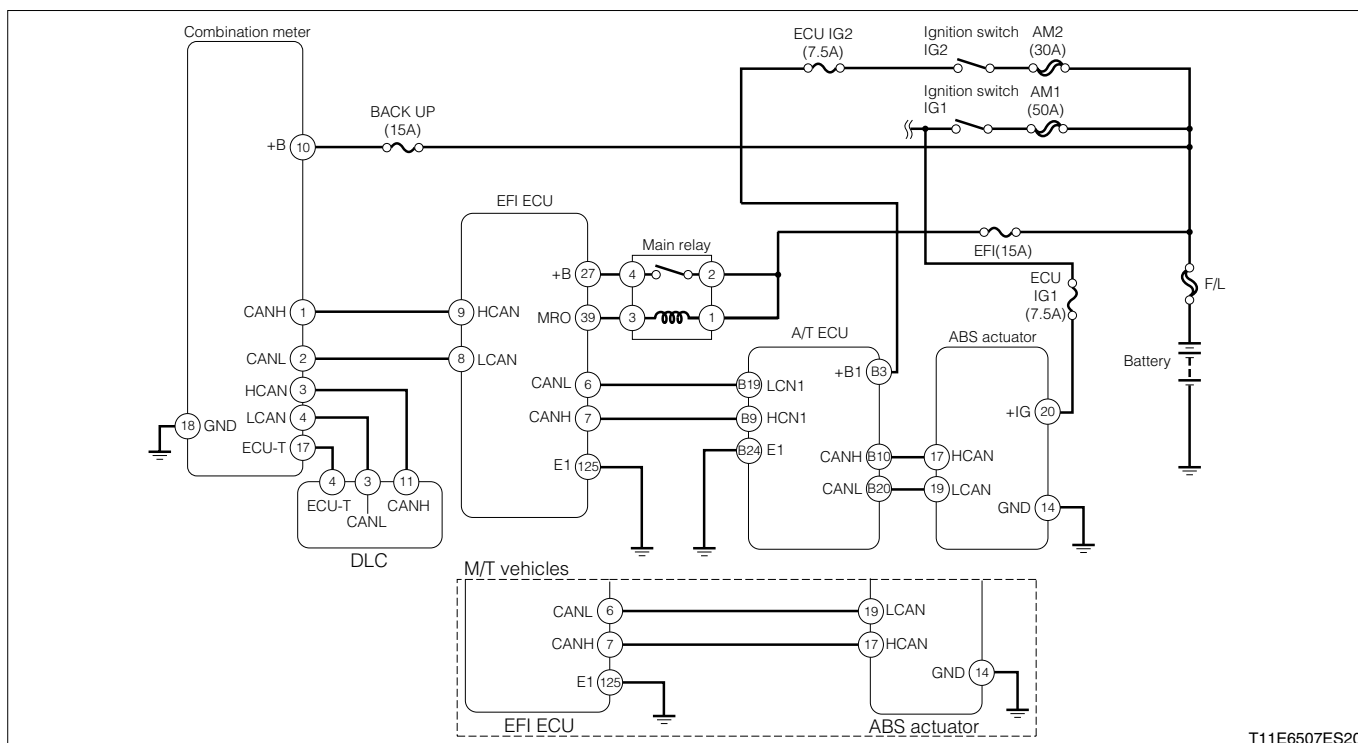
1. Erase the diagnosis code.
 2. After erasing the code, check if the diagnosis code can be read out by using the diagnosis tester.
 - (1) Check that diagnosis code U0001/88 is not outputted once again.
- ▼ If it is outputted, perform the basic check for the CAN communication.
- Refer to Page L2-9.

▼ If it is not outputted, carry out the checking of the EFI ECU circuit.

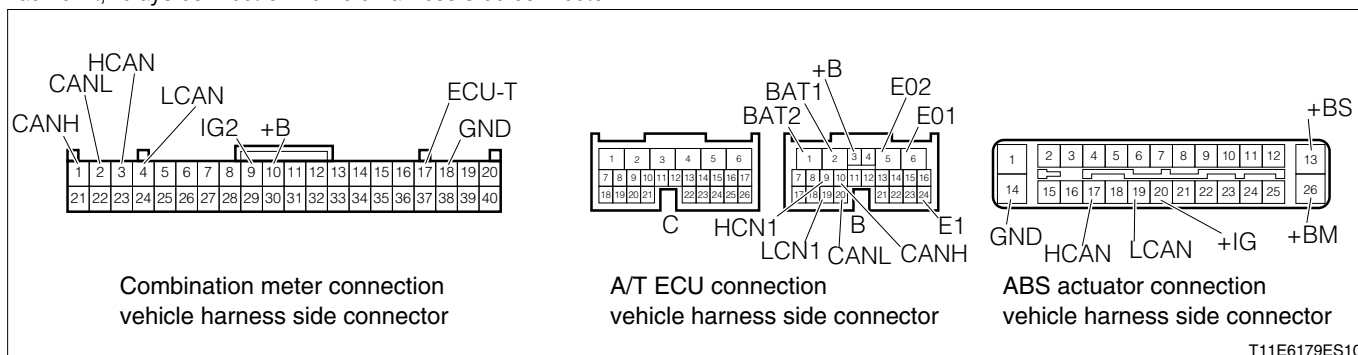
7-12-30 DTC NO.U0121/86 ABS COMMUNICATION FAILURE

(1) System diagram

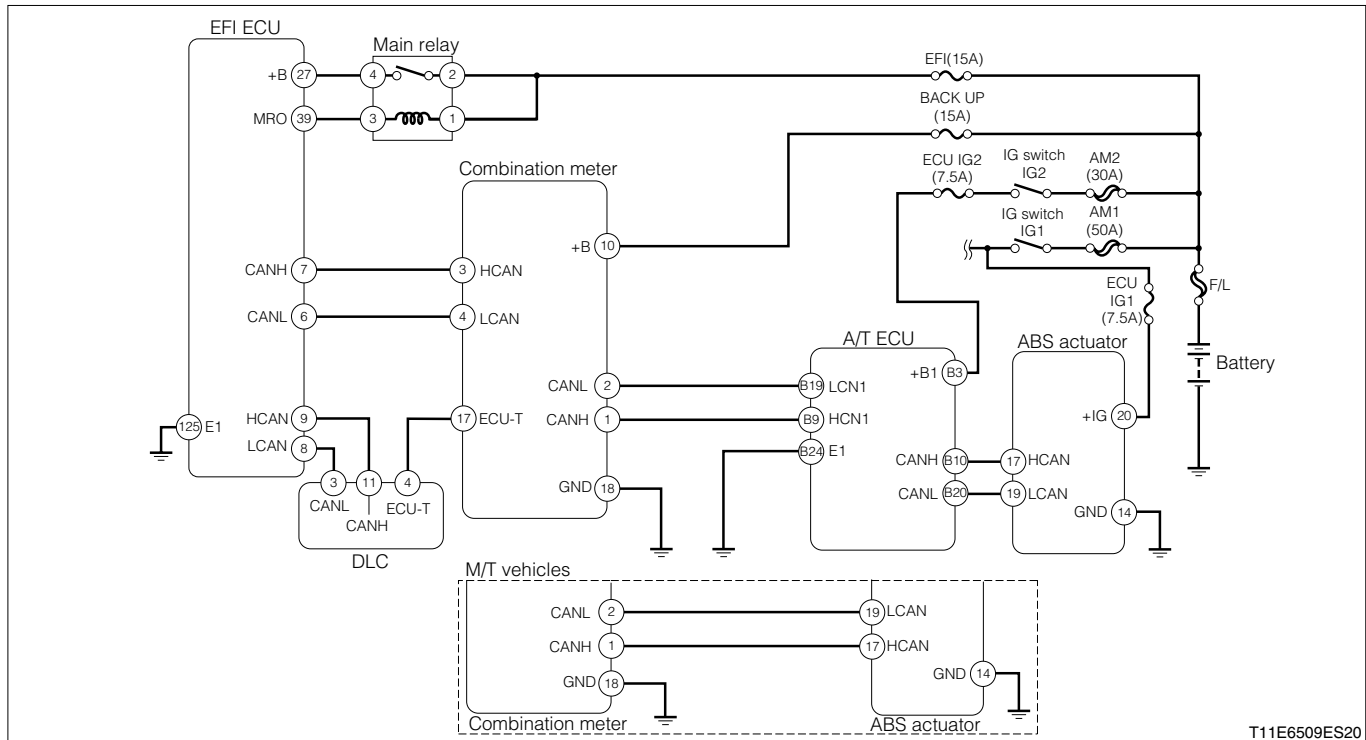
① RHD vehicles



Each unit, relays connection vehicle harness side connector

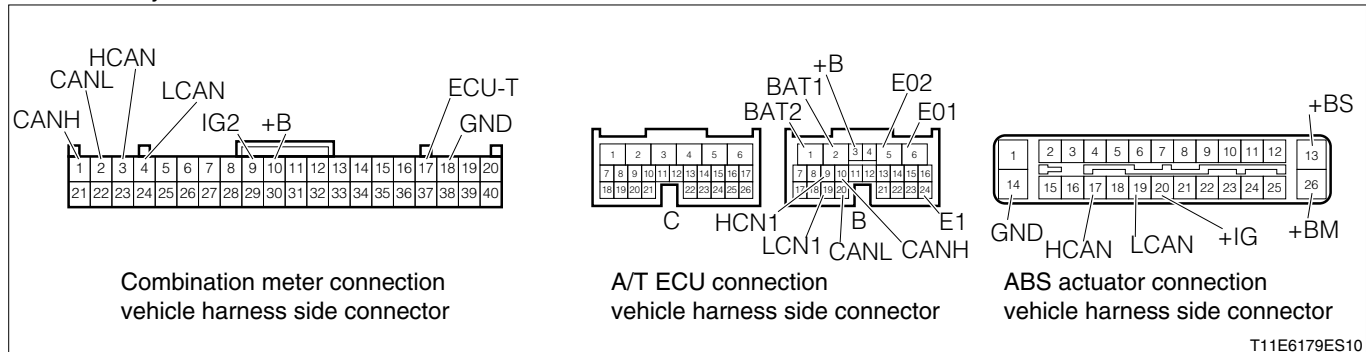


② LHD vehicles



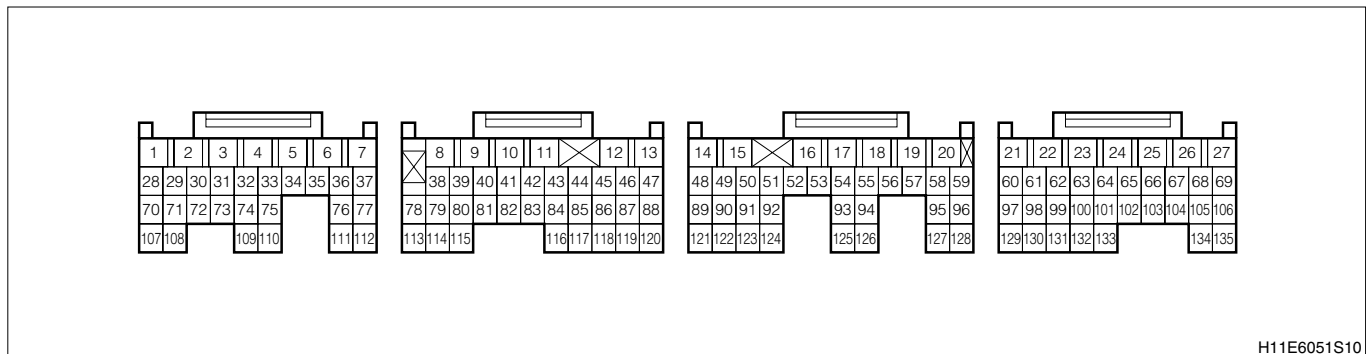
T11E6509ES20

Each unit, relays connection vehicle harness side connector



T11E6179ES10

EFI ECU connection vehicle harness side connector



H11E6051S10

(2) Diagnosis code output conditions

- When communication signal cannot be received from ABS ECU

(3) Checking points

- Is the harness between EFI ECU - ABS ECU normal?
- Is the ABS actuator normal?
- Check whether there is any poor contact at the connector section.

(4) Checking method

① When using diagnosis tester (DS-21/DS-II) or OBD II generic scan tool:

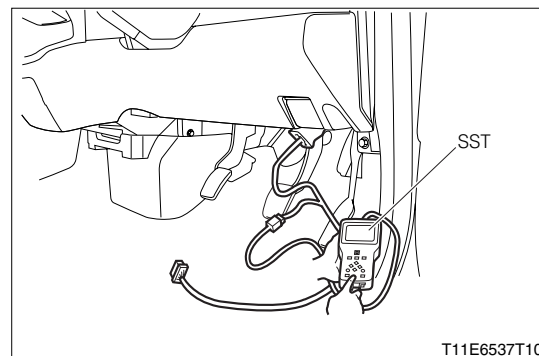
➤1. Diagnosis code confirmation (ABS related)

- IG switch turned "LOCK".

2. Connect the diagnosis tester to DLC.

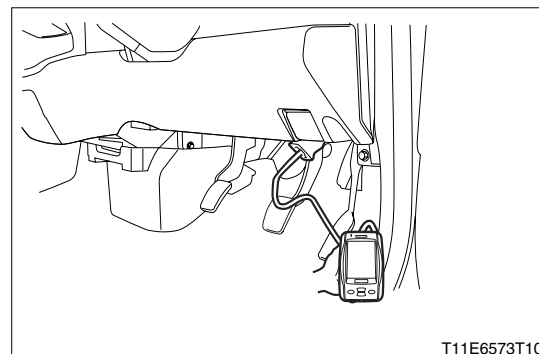
- (1) In case of DS-21, connect the DS-21 diagnosis tester to DLC through the SST.

SST: 09991-87404-000



- (2) In case of DS-II, connect the DS-II diagnosis tester directly to DLC.

- (3) In case of the OBD II generic scan tool, connect the OBD II generic scan tool directly to DLC.



3. Check to see if the diagnosis code of the ABS is outputted

(No.C0200/21 - No.C0215/24: short circuit or open wire of wheel speed sensor, No.C1235/25 - No.C1238/28: period abnormality of wheel speed sensor, No.C1237/29: Rotor tooth missing abnormality)

▼ If it is outputted, proceed to 2.

▼ If it is not outputted, proceed to 4.

2. Trouble shooting according to diagnosis code (ABS related)

1. Perform trouble shooting for the diagnosis code outputted in 1.

Refer to Page E3-16.

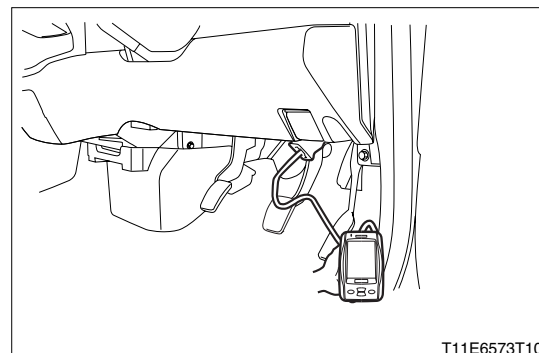
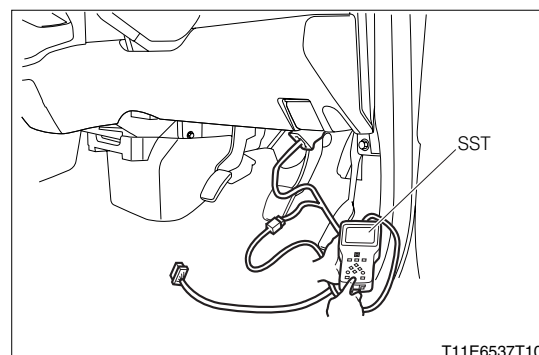
2. After completion of the repairs, connect the diagnosis tester to DLC.

- (1) In case of DS-21, connect the DS-21 diagnosis tester to DLC through the SST.

SST: 09991-87404-000

- (2) In case of DS-II, connect the DS-II diagnosis tester directly to DLC.

- (3) In case of the OBD II generic scan tool, connect the OBD II generic scan tool directly to DLC.



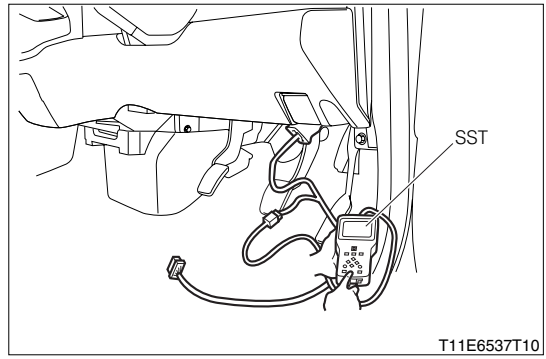
3. Confirm that the diagnosis code of ABS is not outputted.

▼ If it is not outputted, proceed to 3.

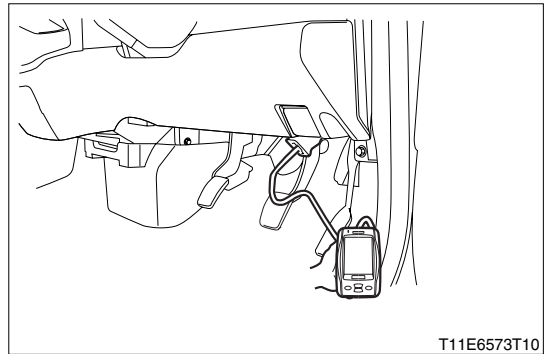
▼ If it is outputted, perform recheck for the diagnosis code outputted.

▷3. Diagnosis code reconfirmation (EFI related)

1. Connect the diagnosis tester to DLC.
 - (1) In case of DS-21, connect the DS-21 diagnosis tester to DLC through the SST.SST: 09991-87404-000



- (2) In case of DS-II, connect the DS-II diagnosis tester directly to DLC.
- (3) In case of the OBD II generic scan tool, connect the OBD II generic scan tool directly to DLC.



2. Cancel the diagnosis code of the EFI.
3. Check to see if the diagnosis code of EFI is outputted.
SPECIFIED VALUE: It is not outputted.

- ▼ If it is OK, the EFI system is normal.
- ▼ If it is NG, proceed to ▷4.

▷4. CAN communication basic check

1. Perform basic check of the CAN communication.
Refer to Page L2-9.

- ▼ If it is OK, go to ▷5 for RHD vehicles.
- ▼ If it is OK, go to ▷6 for LHD vehicles.
- ▼ If it is NG, repair or replace the defective sections.

▷5. CAN line open wire check (RHD vehicles)

1. Turn the IG switch to "LOCK".
2. Remove all connectors of the EFI ECU and ABS actuator.
3. Perform continuity check between each of the following terminals.
 - (1) Between EFI ECU connection vehicle harness side connector 6 (CANL) - EFI ECU connection vehicle harness side connector 7 (CANH)
 - (2) Between ABS actuator connection vehicle harness side connector 17 (HCAN) - ABS actuator connection vehicle harness side connector 19 (LCAN)SPECIFIED VALUE: No continuity exists.

- ▼ If it is OK, proceed to ▷7.
- ▼ If it is NG, repair or replace the defective sections.

▷6. CAN line open wire check (LHD vehicles)

1. Turn the IG switch to "LOCK".
2. Remove all connectors of the EFI ECU, combination meter and ABS actuator.
3. Perform continuity check between each of the following terminals.
 - (1) Between combination meter connection vehicle harness side connector 1 (CANH) - combination meter connection vehicle harness side connector 2 (CANL)
 - (2) Between ABS actuator connection vehicle harness side connector 17 (HCAN) - ABS actuator connection vehicle harness side connector 19 (LCAN)

SPECIFIED VALUE: No continuity exists.

▼ If it is OK, proceed to ▷7.

▼ If it is NG, repair or replace the defective sections.

▷7. CAN line short circuit check

1. Perform continuity check between each of the following terminals.
 - (1) Between ABS actuator connection vehicle harness side connector 17 (HCAN) - battery positive terminal
 - (2) Between ABS actuator connection vehicle harness side connector 19 (LCAN) - battery positive terminal
 - (3) Between ABS actuator connection vehicle harness side connector 17 (HCAN) - body earth
 - (4) Between ABS actuator connection vehicle harness side connector 19 (LCAN) - body earth

SPECIFIED VALUE: No continuity exists.

▼ If it is OK, proceed to ▷8.

▼ If it is NG, repair or replace the defective sections.

▷8. EFI ECU internal resistance check

1. Remove all connectors of the EFI ECU.
2. Measure the resistance between the following terminals.
 - (1) Between EFI ECU side connector 6 (CANL) - EFI ECU side connector 7 (CANH)
 - (2) Between EFI ECU side connector 8 (LCAN) - EFI ECU side connector 9 (HCAN)

SPECIFIED VALUE: 110 - 130 Ω

▼ If it is OK, proceed to ▷9.

▼ If it is NG, replace the EFI ECU.

Refer to Page B8-1.

▷9. Combination meter internal resistance check

1. Remove the connectors of the combination meter.
2. Measure the resistance between the following terminals.
 - (1) Between combination meter side connector 1 (CANH) - combination meter side connector 2 (CANL)
 - (2) Between combination meter side connector 3 (HCAN) - combination meter side connector 4 (LCAN)

SPECIFIED VALUE: 110 - 130 Ω

▼ If it is OK, proceed to ▷10.

▼ If it is NG, replace the combination meter.

Refer to Page J3-2.

▷10. ABS actuator internal circuit check

1. Remove the connectors of the ABS actuator.
2. Perform continuity check between each of the following terminals.
 - (1) Between ABS actuator side connector 17 (HCAN) - ABS actuator side connector 19 (LCAN)SPECIFIED VALUE: Continuity exists. (Less than 1MΩ)

▼ If everything is OK, perform the circuit check of the combination meter, EFI ECU and ABS actuator.

▼ If it is NG, replace the ABS actuator.

Refer to Page E3-1.

② When not using diagnosis tester (DS-21/DS-II) or OBD II generic scan tool:

▷1. Diagnosis code confirmation (ABS related)

1. Short-circuit the terminals 4 (ECU-T) and 13 (E) of the DLC, using the SST.

SST: 09991-87404-000(1)

09991-87403-000(2)

2. Check to see if the diagnosis code of the ABS is outputted

(No.C0200/21 - No.C0215/24: short circuit or open wire of wheel speed sensor, No.C1235/25 - No.C1239/28: period abnormality of wheel speed sensor, No.C1237/29: Rotor tooth missing abnormality)

NOTE

- Refer to the diagnosis code output indication method of ABS.

Refer to Page E3-16.

▼ If it is outputted, proceed to ▷2.

▼ If it is not outputted, proceed to ▷4.

▷2. Trouble shooting according to diagnosis code (ABS related)

1. Perform trouble shooting for the diagnosis code outputted in ▷1.

Refer to Page E3-22.

2. After repairing, short-circuit the terminals 4 (ECU-T) and 13 (E) of the DLC, using the SST.

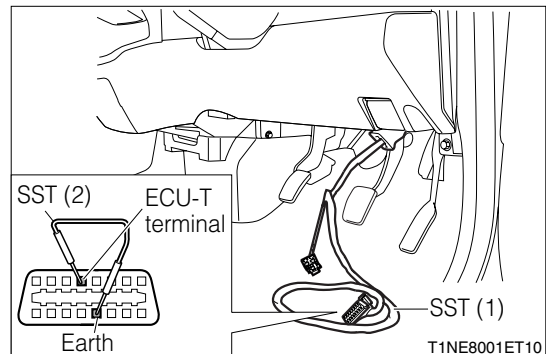
SST: 09991-87404-000(1)

09991-87403-000(2)

3. Confirm that the diagnosis code of ABS is not outputted.

▼ If it is not outputted, proceed to ▷3.

▼ If it is outputted, perform recheck for the diagnosis code outputted.



▷3. Diagnosis code reconfirmation (EFI related)

1. Cancel the diagnosis code of the EFI.
2. After canceling, short-circuit the terminals 5 (EFI-T) and 13 (E) of the DLC, using SST.
SST: 09991-87404-000(1)
09991-87403-000(2)

3. Check to see if the diagnosis code of EFI is outputted.
SPECIFIED VALUE: It is not outputted.

- ▼ If it is OK, the EFI system is normal.
- ▼ If it is NG, proceed to ▷4.

▷4. CAN communication basic check

1. Perform basic check of the CAN communication.
Refer to Page L2-9.

- ▼ If it is OK, go to ▷5 for RHD vehicles.
- ▼ If it is OK, go to ▷7 for LHD vehicles.
- ▼ If it is NG, repair or replace the defective sections.

▷5. CAN line open wire check (RHD vehicles)

1. Turn the IG switch to "LOCK".
 2. Remove all connectors of the EFI ECU, combination meter and ABS actuator.
 3. Perform continuity check between each of the following terminals.
 - (1) Between EFI ECU connection vehicle harness side connector 6 (CANL) - EFI ECU connection vehicle harness side connector 7 (CANH)
 - (2) Between ABS actuator connection vehicle harness side connector 17 (HCAN) - ABS actuator connection vehicle harness side connector 19 (LCAN)
- SPECIFIED VALUE: No continuity exists.

- ▼ If it is OK, proceed to ▷7.
- ▼ If it is NG, repair or replace the defective sections.

▷6. CAN line open wire check (LHD vehicles)

1. Turn the IG switch to "LOCK".
 2. Remove all connectors of the EFI ECU, combination meter and ABS actuator.
 3. Perform continuity check between each of the following terminals.
 - (1) Between combination meter connection vehicle harness side connector 6 (CANL) - combination meter connection vehicle harness side connector 7 (CANH)
 - (2) Between ABS actuator connection vehicle harness side connector 17 (HCAN) - ABS actuator connection vehicle harness side connector 19 (LCAN)
- SPECIFIED VALUE: No continuity exists.

- ▼ If it is OK, proceed to ▷7.
- ▼ If it is NG, repair or replace the defective sections.

▷7. CAN line short circuit check

1. Perform continuity check between each of the following terminals.

- (1) Between ABS actuator connection vehicle harness side connector 17 (HCAN) - battery positive terminal
- (2) Between ABS actuator connection vehicle harness side connector 19 (LCAN) - battery positive terminal
- (3) Between ABS actuator connection vehicle harness side connector 17 (HCAN) - body earth
- (4) Between ABS actuator connection vehicle harness side connector 19 (LCAN) - body earth

SPECIFIED VALUE: No continuity exists.

▼ If it is OK, proceed to ▷8.

▼ If it is NG, repair or replace the defective sections.

▷8. EFI ECU internal resistance check

1. Remove all connectors of the EFI ECU.

2. Measure the resistance between the following terminals.

- (1) Between EFI ECU side connector 6 (CANL) - EFI ECU side connector 7 (CANH)
- (2) Between EFI ECU side connector 8 (LCAN) - EFI ECU side connector 9 (HCAN)

SPECIFIED VALUE: 110 - 130 Ω

▼ If it is OK, proceed to ▷9.

▼ If it is NG, replace the EFI ECU.

Refer to Page B8-1.

▷9. Combination meter internal resistance check

1. Remove the connectors of the combination meter.

2. Measure the resistance between the following terminals.

- (1) Between combination meter side connector 1 (CANH) - combination meter side connector 2 (CANL)
- (2) Between combination meter side connector 3 (HCAN) - combination meter side connector 4 (LCAN)

SPECIFIED VALUE: 110 - 130 Ω

▼ If it is OK, proceed to ▷10.

▼ If it is NG, replace the combination meter.

Refer to Page J3-2.

▷10. ABS actuator internal circuit check

1. Remove the connectors of the ABS actuator.

2. Perform continuity check between each of the following terminals.

- (1) Between ABS actuator side connector 17 (HCAN) - ABS actuator side connector 19 (LCAN)

SPECIFIED VALUE: Continuity exists. (less than 1MΩ)

▼ If everything is OK, perform the circuit check of the combination meter, EFI ECU and ABS actuator.

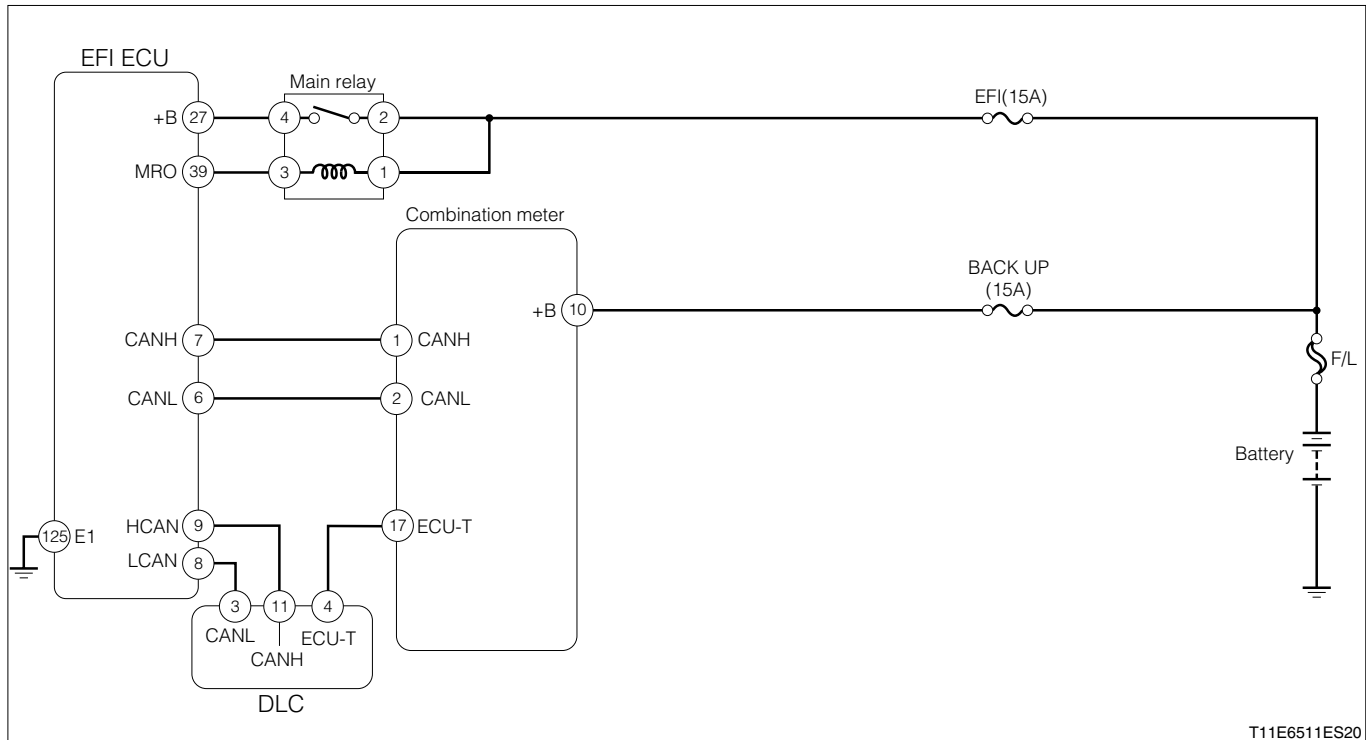
▼ If it is NG, replace the ABS actuator.

Refer to Page E3-1.

7-12-31 DTC NO.U0156/87 COMBINATION METER COMMUNICATION FAILURE

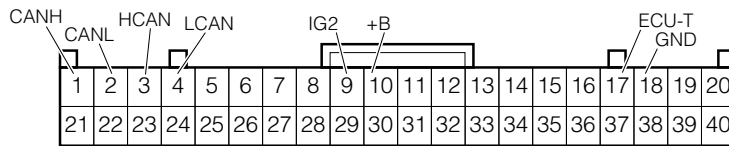
B8-175

② LHD vehicles



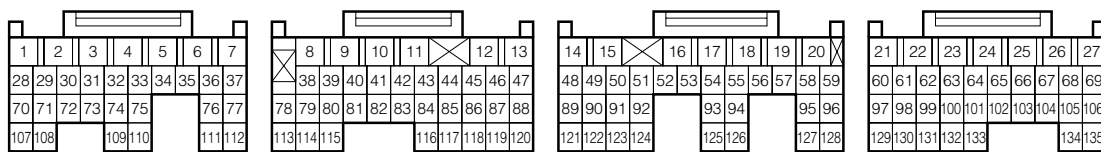
T11E6511ES20

Each unit, relays connection vehicle harness side connector



T11E6180S10

EFI ECU connection vehicle harness side connector



H11E6051S10

(2) Diagnosis code output conditions

1. When communication signal cannot be received from combination meter

(3) Checking points

1. Is the harness between EFI ECU - combination meter normal?
2. Is the combination meter normal?
3. Check whether there is no poor contact at the connector section.

(4) Checking method

① When using diagnosis tester (DS-21/DS-II) or OBD II generic scan tool:

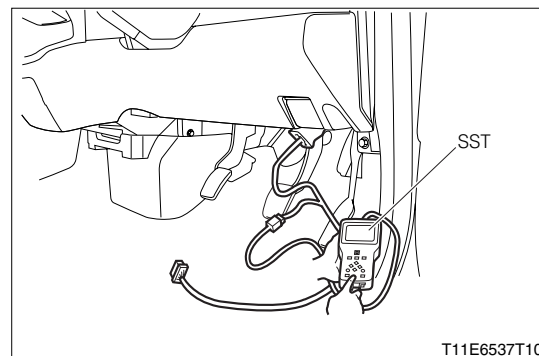
➤ 1. Confirmation of the diagnosis codes (related to meter)

1. IG switch turned "LOCK".

2. Connect the diagnosis tester to DLC.

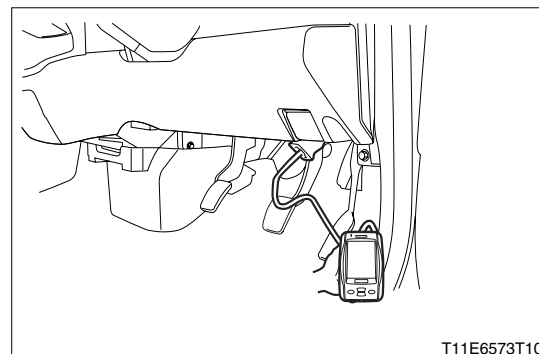
- (1) In case of DS-21, connect the DS-21 diagnosis tester to DLC through the SST.

SST: 09991-87404-000



- (2) In case of DS-II, connect the DS-II diagnosis tester directly to DLC.

- (3) In case of the OBD II generic scan tool, connect the OBD II generic scan tool directly to DLC.



3. Confirm whether any meter-related diagnosis code is outputted.

(No.0043: Failure to read out CAN system connection ECU information, No.0061: Abnormal low voltage)

Refer to Page J3-10.

▼ If it is outputted, go to >2.

▼ If it is not outputted, go to >4.

>2. Troubleshooting according to diagnosis code (Related to meters)

1. Perform the troubleshooting related to the diagnosis codes that have been outputted in >1.

- (1) No.43: Failure to read out CAN system connection ECU information

Refer to Page J3-14.

- (2) No.61: Abnormal low voltage

Refer to Page J3-14.

2. After completion of the repairs, connect the diagnosis tester (DS-21/DS-II) to the DLC, using the SST.

SST: 09991-87404-000

3. Confirm whether any diagnosis code related to the meter is outputted.

▼ If it is not outputted, go to >3.

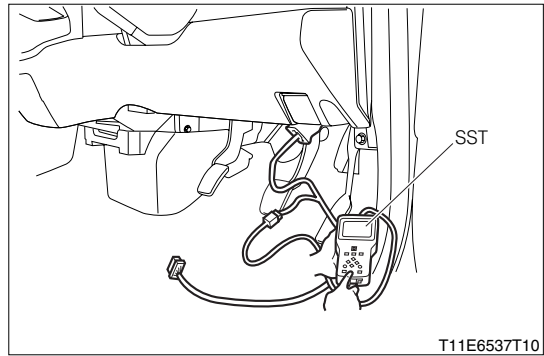
▼ If it is output, perform the recheck of the diagnosis code that has been outputted.

▷3. Reconfirmation of diagnosis code (Related to EFI)

1. Connect the diagnosis tester to DLC.

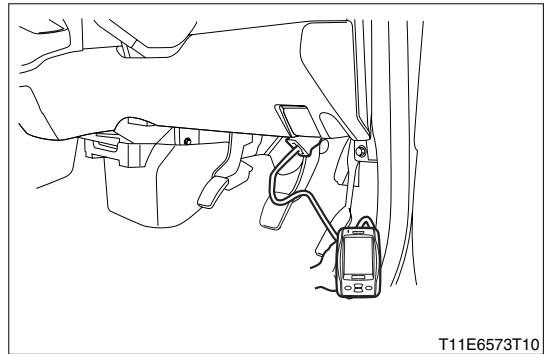
- (1) In case of DS-21, connect the DS-21 diagnosis tester to DLC through the SST.

SST: 09991-87404-000



- (2) In case of DS-II, connect the DS-II diagnosis tester directly to DLC.

- (3) In case of the OBD II generic scan tool, connect the OBD II generic scan tool directly to DLC.



2. Erase the diagnosis code of the EFI.

3. Confirm whether the diagnosis code of the EFI is outputted.

SPECIFIED VALUE: It is not outputted.

▼ If it is OK, the EFI system is normal.

▼ If it is NG, go to ▷4.

▷4. Check of CAN line for open wire

1. Set the IG switch to the "LOCK" position.

2. Disconnect all of the EFI ECU connectors.

3. Perform continuity check between the following terminals.

- (1) Between EFI ECU connection vehicle harness side connector 6(CANL) - EFI ECU connection vehicle harness side connector 7(CANH)

SPECIFIED VALUE: No continuity exists

▼ If it is OK, go to ▷5.

▼ If it is NG, repair or replace malfunctioning sections.

▷5. Check of EFI ECU internal resistance

1. Disconnect all of the EFI ECU connectors.

2. Measure the resistance between the following terminals.

- (1) Between EFI ECU side connector 6(CANL) - EFI ECU side connector 7(CANH)

- (2) Between EFI ECU side connector 8(LCAN) - EFI ECU side connector 9(HCAN)

SPECIFIED VALUE: 110 - 130 Ω

▼ If it is OK, go to ▷6.

▼ If it is NG, replace the EFI ECU.

Refer to Page B8-1.

▷6. Check of combination meter internal resistance

1. Disconnect the connector of the combination meter.
2. Measure the resistance between the following terminals.
 - (1) Between combination meter side connector 1(CANH) - combination meter side connector 2(CANL)
 - (2) Between combination meter side connector 3(HCAN) - combination meter side connector 4(LCAN)

SPECIFIED VALUE: 110 - 130 Ω

▼ If it is OK, check the circuits of the combination meter and ECU.

▼ If it is NG, replace the combination meter.

Refer to Page J3-2.

② When not using diagnosis tester (DS-21/DS-II) or OBD II generic scan tool:**▷1. Diagnosis code confirmation (Meter-related)**

1. Short-circuit the terminals 4 (ECU-T) and 13 (E) of the DLC, using the SST.

SST: 09991-87404-000(1)
09991-87403-000(2)
2. Check to see if the meter-related diagnosis code is outputted
(No.0043: CAN system connection ECU information readout not possible, No.0061: low voltage abnormality)

NOTE

- Refer to the diagnosis code output indication method of combination meter.

Refer to Page J3-10.

▼ If it is outputted, proceed to ▷2.

▼ If it is not outputted, proceed to ▷4.

▷2. Trouble shooting according to diagnosis code (Meter-related)

1. Perform trouble shooting for the diagnosis code outputted in ▷1.
 - (1) No.0043: CAN system connection ECU information readout not possible
Refer to Page J3-13.
 - (2) No.0061: Low voltage abnormality
Refer to Page J3-14.
2. After repairing, short-circuit the terminals 4 (ECU-T) and 13 (E) of the DLC, using the SST.

SST: 09991-87404-000(1)
09991-87403-000(2)
3. Confirm that the diagnosis code related to the meter is not outputted.
 - ▼ If it is not outputted, proceed to ▷3.
 - ▼ If it is outputted, perform recheck for the diagnosis code outputted.

▷3. Diagnosis code reconfirmation (EFI related)

1. Cancel the diagnosis code of the EFI.
2. After canceling, short-circuit the terminals 5 (EFI-T) and 13 (E) of the DLC, using SST.
SST: 09991-87404-000(1)
09991-87403-000(2)

3. Check to see if the diagnosis code of EFI is outputted.
SPECIFIED VALUE: It is not outputted.

- ▼ If it is OK, the EFI system is normal.
- ▼ If it is NG, proceed to ▷4.

▷4. CAN communication basic check

1. Perform basic check of the CAN communication.
Refer to Page L2-9.

- ▼ If it is OK, proceed to ▷5.
- ▼ If it is NG, repair or replace the defective sections.

▷5. CAN line open wire check

1. Turn the IG switch to "LOCK".
2. Remove all connectors of the EFI ECU and A/T ECU.
3. Perform continuity check between each of the following terminals.
 - (1) Between EFI ECU connection vehicle harness side connector 6 (CANL) - EFI ECU connection vehicle harness side connector 7 (CANH)
 - (2) Between A/T ECU connection vehicle harness side connector B9 (HCN1) - A/T ECU connection vehicle harness side connector B19 (LCN1)
SPECIFIED VALUE: No continuity exists.

- ▼ If it is OK, proceed to ▷6.
- ▼ If it is NG, repair or replace the defective sections.

▷6. EFI ECU internal resistance check

1. Remove all of the EFI ECU connectors.
2. Measure the resistance between the following terminals.
 - (1) Between EFI ECU side connector 6 (CANL) - EFI ECU side connector 7 (CANH)
 - (2) Between EFI ECU side connector 8 (LCAN) - EFI ECU side connector 9 (HCAN)
SPECIFIED VALUE: 110 - 130 Ω

- ▼ If it is OK, proceed to ▷7.
- ▼ If it is NG, replace the EFI ECU.

Refer to Page B8-1.

➤7. Combination meter internal resistance check

1. Remove all connectors of the combination meter.
2. Measure the resistance between the following terminals.
 - (1) Between combination meter side connector 1 (CANH) - combination meter side connector 2 (CANL)
 - (2) Between combination meter side connector 3 (HCAN) - combination meter side connector 4 (LCAN)

SPECIFIED VALUE: 110 - 130 Ω

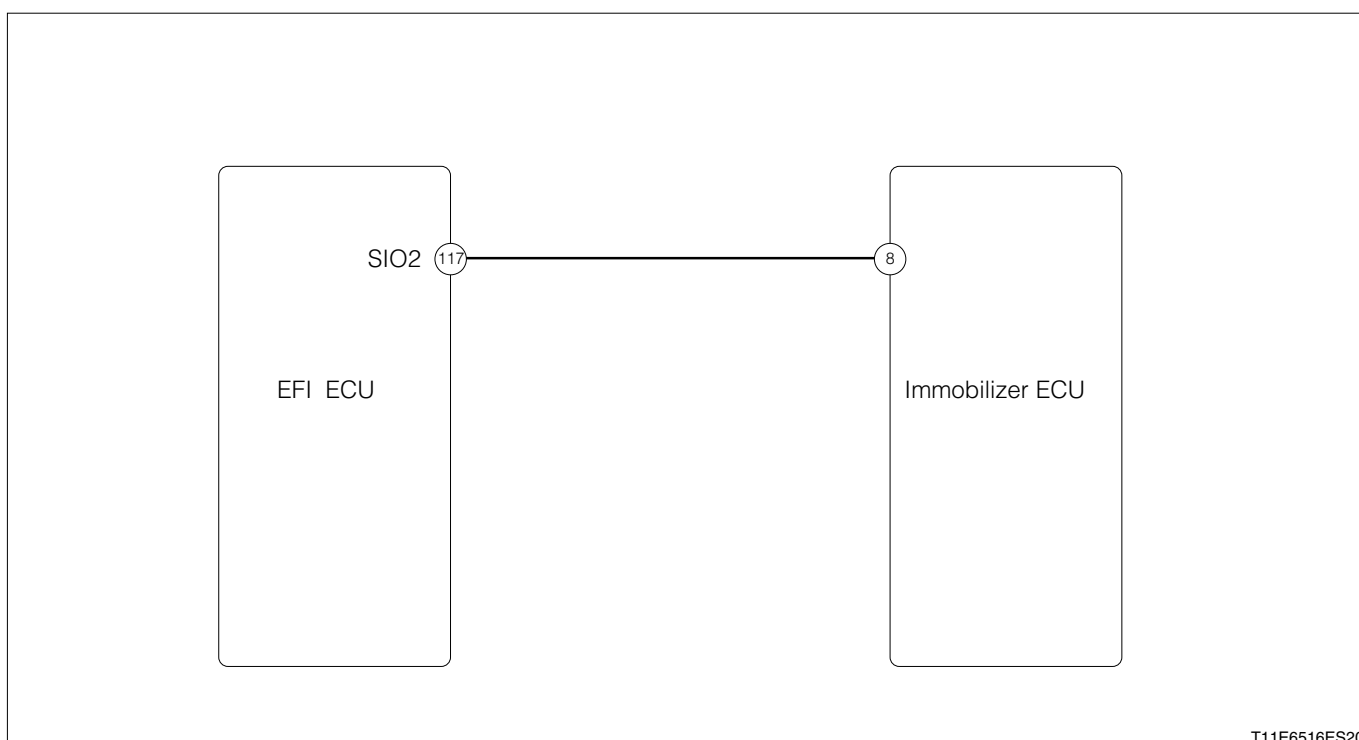
▼ If it is OK, perform circuit check of the combination meter and EFI ECU.

▼ If it is NG, replace the combination meter.

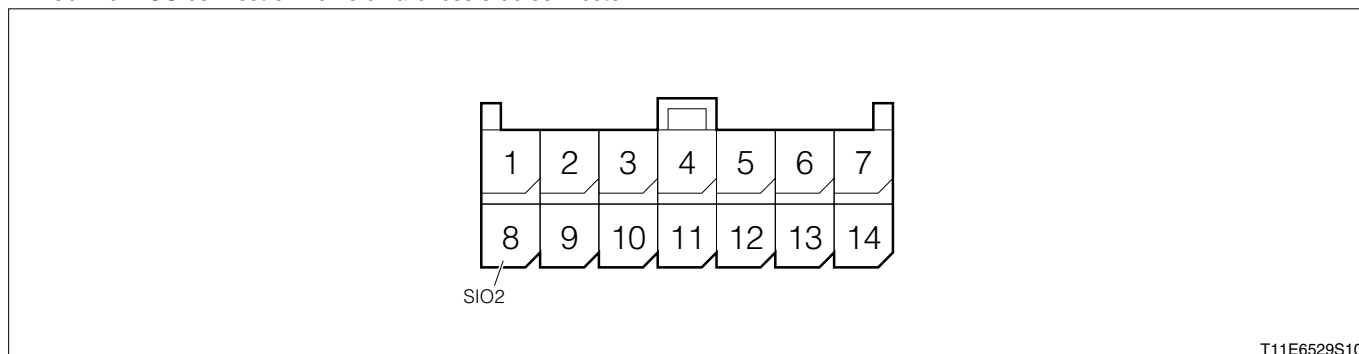
Refer to Page J3-2.

7-12-32 DTC NO.U0167/81 COMMUNICATION WITH IMMOBILIZER SYSTEM

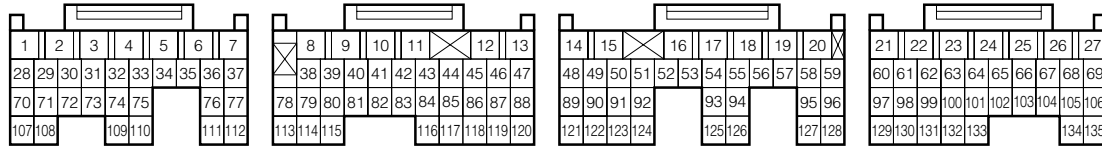
(1) System diagram



Immobilizer ECU connection vehicle harness side connector



EFI ECU connection vehicle harness side connector



H11E6051S10

(2) Condition for output

1. When engine starts rolling code is not matched.

(3) Check point

1. Is harness between immobilizer ECU – EFI ECU correct?

(4) Checking procedure

▷1. Wire harness check

1. Disconnect EFI ECU side SST connector first. Then, connect SST.

SST: 09842-97201-000

2. Disconnect immobilizer ECU connector.

3. Perform the continuity check between the following terminals with the IG switch set to the "LOCK" position.

(1) Between immobilizer ECU connection vehicle harness side connector 8(SIO2) – SST117(SIO2).

SPECIFIED VALUE: Continuity exists

▼ If it is "OK", go to ▷2.

▼ If it is NG, repair or replace harness and connector at the faulty section.

▷2. Immobilizer system check (1)

1. Connect immobilizer ECU connector.
2. Replace EFI ECU with a new EFI ECU. Connect SST connector to the EFI ECU.
3. Start the engine with a master key.

SPECIFIED VALUE: Start the engine.

▼ If it is OK, check or replace EFI ECU.

▼ If it is NG, go to ▷3.

▷3. Immobilizer system check (2)

1. Replace the immobilizer ECU with a new one, with the IG switch turned "LOCK".
2. Register the ID code of the master key in the immobilizer ECU.
3. Start the engine with a master key.

SPECIFIED VALUE: Start the engine.

▼ If it is OK, replace the immobilizer ECU.

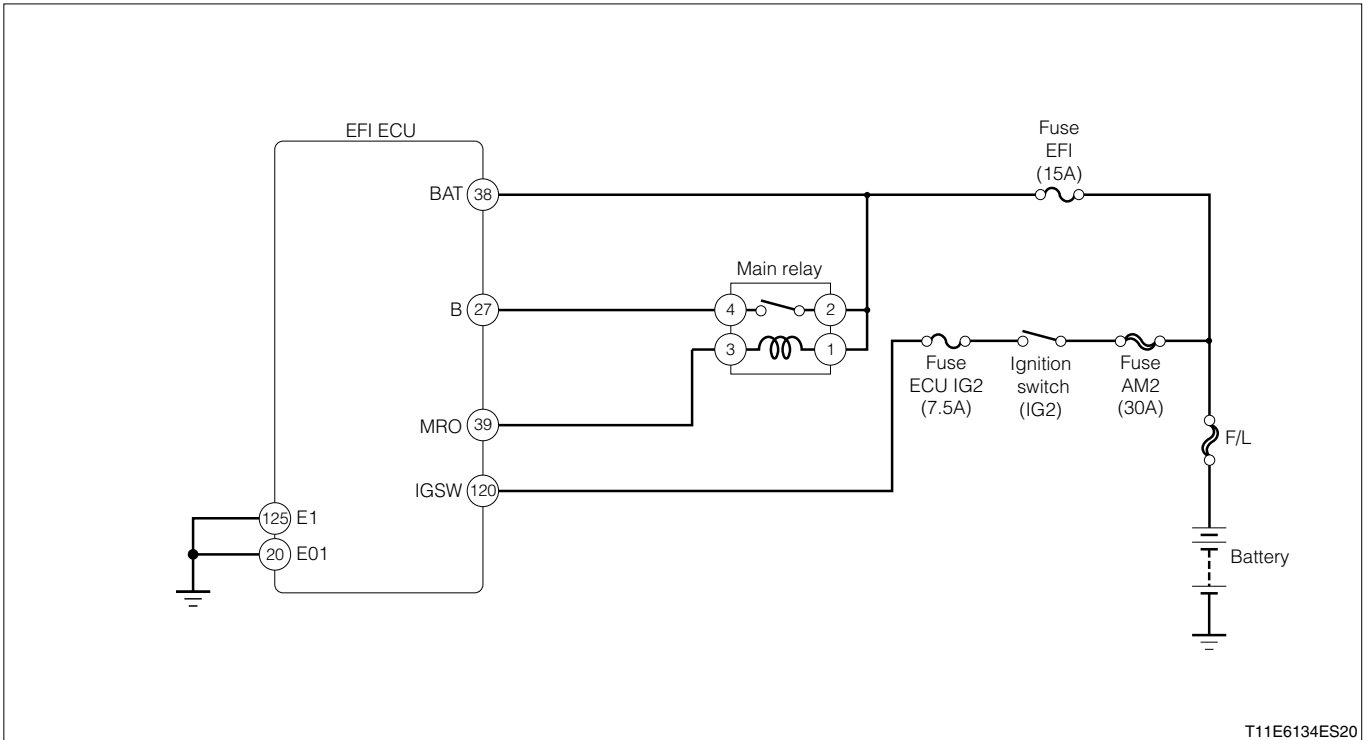
▼ If it is NG, check or replace the IG key, antenna coil, etc.

Refer to Page I4-25.

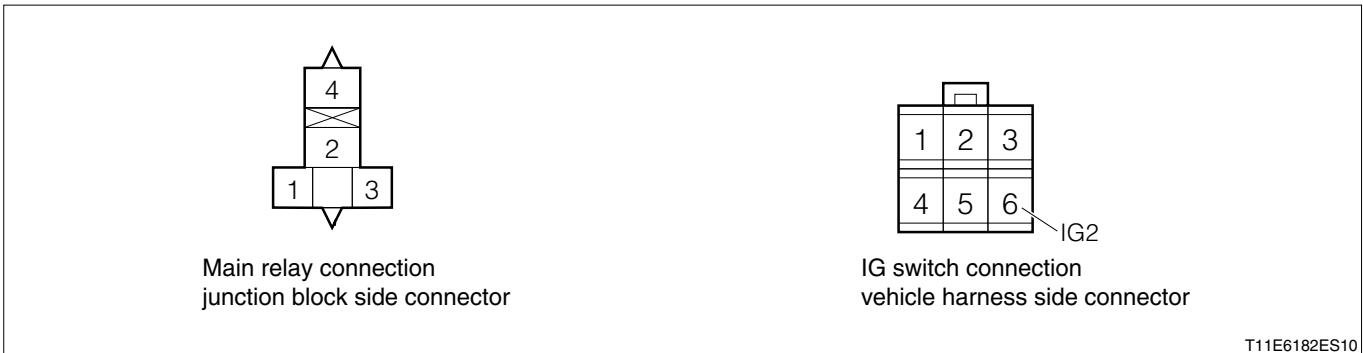
7-13 TROUBLE SHOOTING ACCORDING TO SYSTEM

7-13-1 EFI ECU POWER SUPPLY SYSTEM CHECK

(1) System diagram

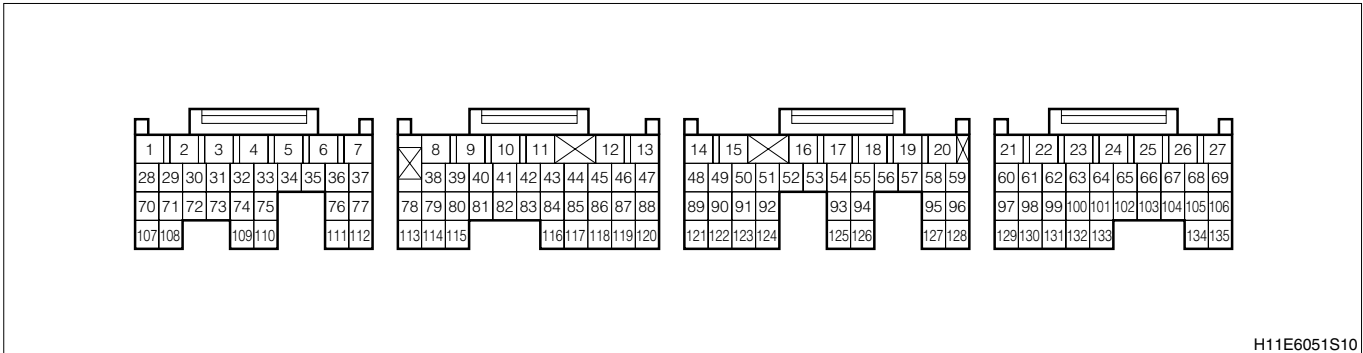


T11E6134ES20



T11E6182ES10

EFI ECU connection vehicle harness side connector



H11E6051S10

(2) Checking points

1. If the engine check lamp does not light up when the IG switch is "ON" or during diagnosis indication, it is possible that there is no power supplied to the EFI ECU.

(3) Checking method

▷1. EFI ECU voltage check

1. Remove the connector on the EFI ECU side and perform voltage measurements for each of the terminals when the IG switch is "ON".

- (1) ECU connection vehicle harness side connector 27 (+B) - ECU connection vehicle harness side connector 125 (E1)
- (2) ECU connection vehicle harness side connector 38 (BAT) - ECU connection vehicle harness side connector 125 (E1)

SPECIFIED VALUE: Battery voltage

▼ If it is OK, there is no abnormality in the EFI ECU power supply system.

▼ If it is NG, proceed to ▷2.

▷2. Check of wire harness continuity (1)

1. Perform continuity check between each of the following terminals.

- (1) Between ECU connection vehicle harness side connector 27 (+B) - relay side connector 4
- (2) Between ECU connection vehicle harness side connector 38 (BAT) - relay side connector 4

SPECIFIED VALUE: Continuity exists.

▼ If it is OK, proceed to ▷3.

▼ If it is NG, repair the harness and the connectors.

▷3. Main relay unit check

1. Perform unit check of the main relay.

Refer to Page B8-206.

▼ If it is OK, proceed to ▷4.

▼ If it is NG, replace the main relay.

▷4. Main relay voltage check

1. Remove the main relay.
2. Perform voltage measurement between each terminal when the IG switch is "ON".

- (1) Between relay side connector 1 (coil side) - body earth
- (2) Between relay side connector 2 (switch side) - body earth

SPECIFIED VALUE: Battery voltage

▼ If it is OK, perform checking or repairing of the harness and connector for each of the following terminals.

- (3) Between main relay - body earth

▼ if the switch side is NG, perform checking or repairing of the harness and connector for each of the following terminals.

- (4) Between main relay - battery

▼ If the coil side is NG, proceed to ▷5.

➤5. Check of wire harness continuity (2)

1. Perform continuity check between each of the following terminals.

(1) Between relay side connector 1 - IG switch side connector 6 (IG2)

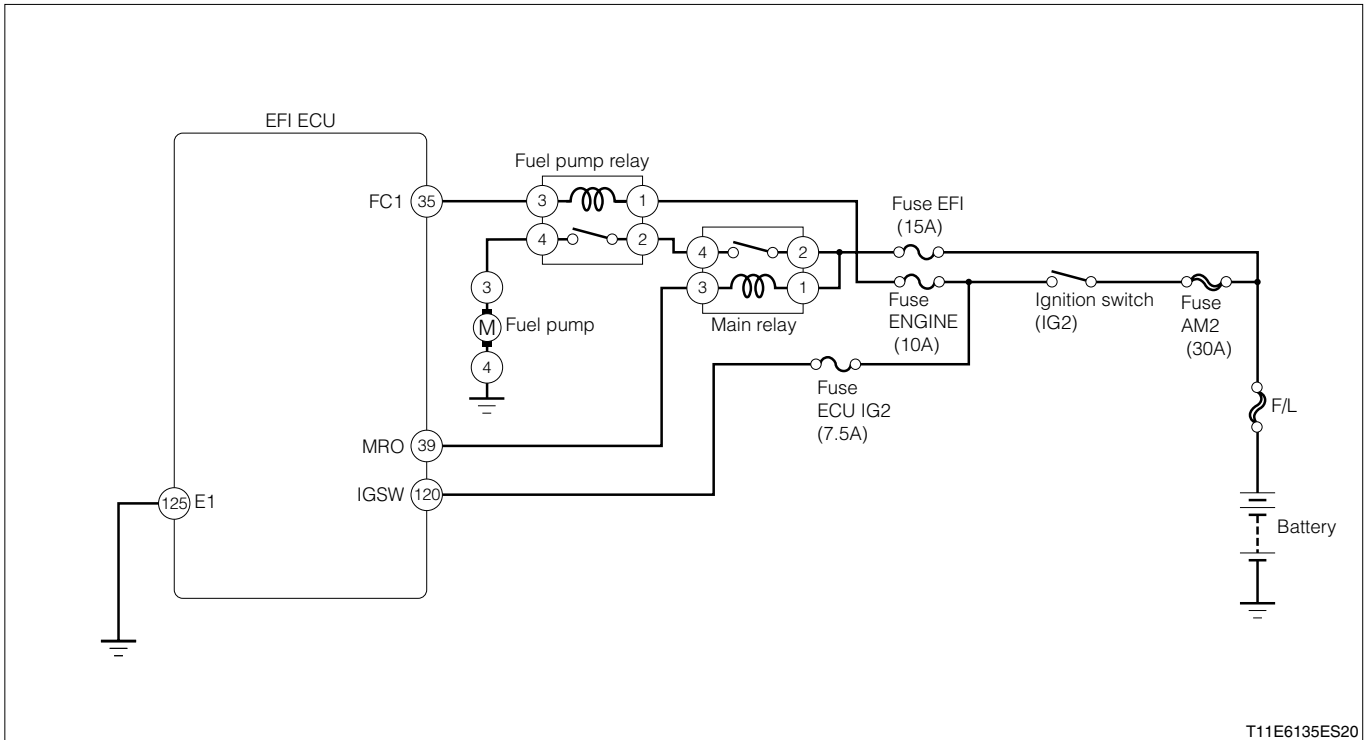
SPECIFIED VALUE: Continuity exists.

▼ If it is OK, perform checking or repairing of the IG switch.

▼ If it is NG, repair the harness and the connectors.

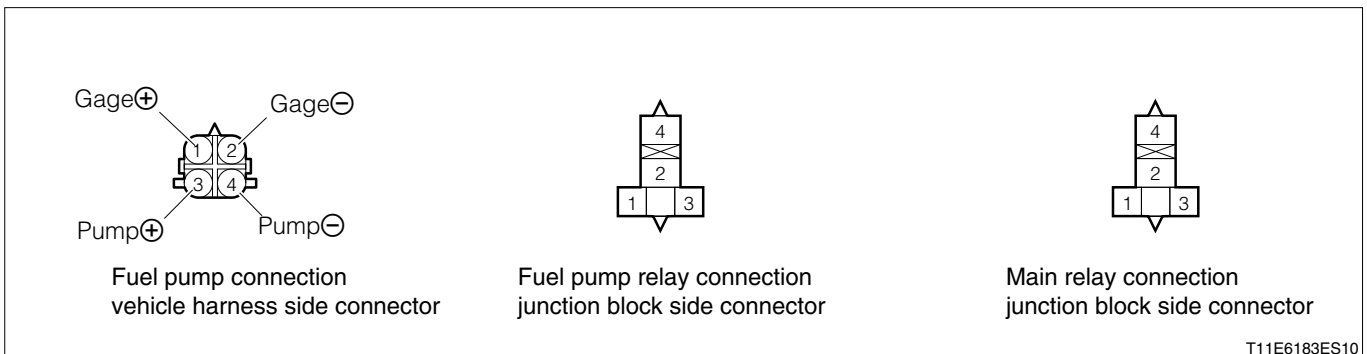
7-13-2 FUEL PUMP SYSTEM CHECK

(1) System diagram



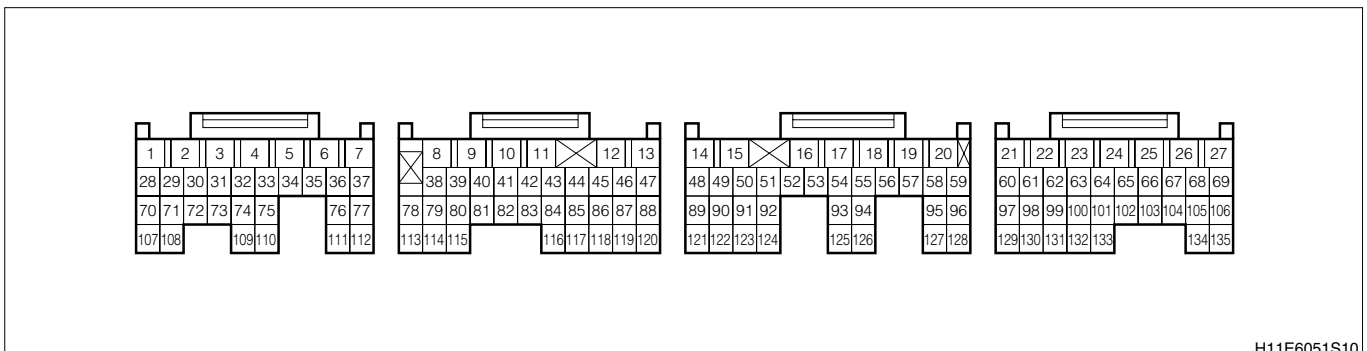
T11E6135ES20

Each unit connection vehicle harness side connector



T11E6183ES10

EFI ECU connection vehicle harness side connector



H11E6051S10

(2) Checking points

1. Is the fuel pump relay power supply voltage normal?
2. Is the fuel pump relay operating correctly?
3. Is the fuel pump power supply voltage normal?
4. Is the fuel pump operating correctly?

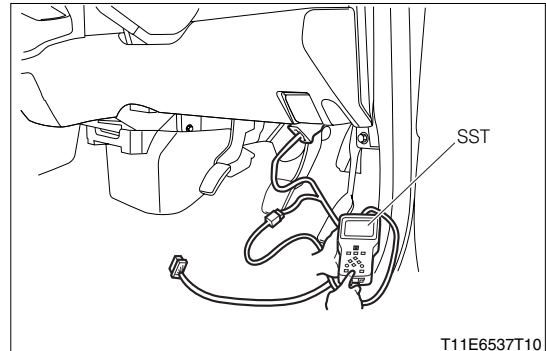
(3) Checking method

① When using diagnosis tester (DS-21/DS-II) or OBD Ⅱ generic scan tool:

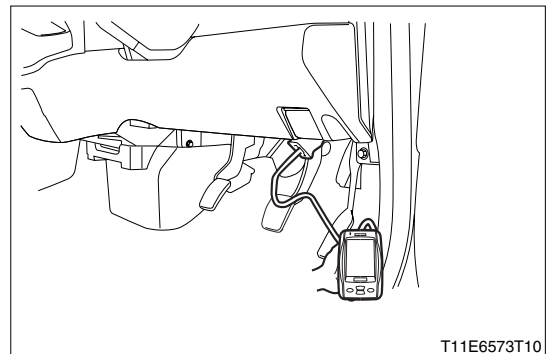
▷1. Fuel pump operation check

1. IG switch turned "LOCK".
2. Connect the diagnosis tester to DLC.
- (1) In case of DS-21, connect the DS-21 diagnosis tester to DLC through the SST.

SST: 09991-87404-000



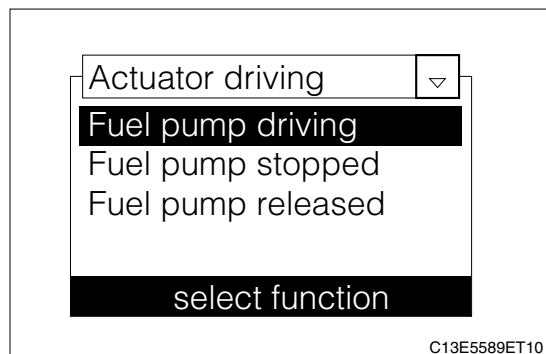
- (2) In case of DS-II, connect the DS-II diagnosis tester directly to DLC.
- (3) In case of the OBD Ⅱ generic scan tool, connect the OBD Ⅱ generic scan tool directly to DLC.



3. Turn "ON" the IG switch, and turn "ON" the main switch of the tester.

4. Confirmation of operation of the purge VSV for EVAP.

- (1) DS-21: Select the "Fuel pump" of the "Actuator driving" so as to drive the fuel pump.



(2) DS-II: Select the "Fuel pump" of the "Active test" so as to drive the fuel pump.

5. At the time, check the operation sound of the fuel pump.

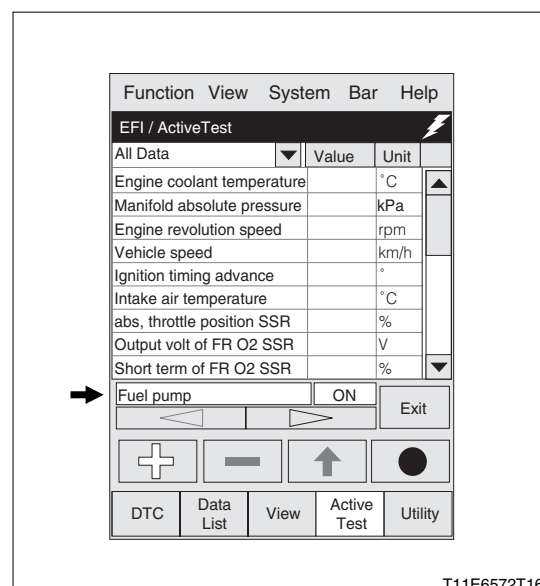
NOTE

- Confirm the operation sound from the fuel inlet side.

SPECIFIED VALUE: Operation sound is generated.

▼ If it is OK, proceed to ⤵2.

▼ If it is NG, proceed to ⤵3.



T11E6572T16

⤵2. Fuel pressure check

1. Perform fuel pressure check.

Refer to Page B8-200.

▼ If it is OK, the fuel pump system is normal.

▼ If it is NG, perform the following operations.

(1) Replacement of the fuel pump

Refer to Page B7-7.

(2) Repairing of the fuel line

⤵3. Fuel pump relay voltage check

1. Remove the fuel pump relay.

2. Perform voltage measurements between each of the following terminals when the IG switch is "ON".

(1) Between relay side connector 1 (coil side) - body earth

(2) Between relay side connector 2 (switch side) - body earth

SPECIFIED VALUE: Battery voltage

▼ If it is OK, proceed to ⤵4.

▼ If the switch side is NG, proceed to ⤵8.

▼ If the coil side is NG, perform checking and repairing for the following portions.

(3) Harness and connectors between the fuel pump relay and battery

(4) Fuse

(5) Ignition switch

⤵4. Fuel pump relay unit check

1. Perform unit check of the fuel pump relay.

Refer to Page B8-200.

▼ If it is OK, proceed to ⤵5.

▼ If it is NG, replace the fuel pump relay.

▷5. Check of wire harness continuity (1)

1. Perform continuity check between each of the following terminals.
 - (1) Between relay side connector 4 - pump side connector 3 (pump+)
 - (2) Between pump side connector 4 (pump-) - body earth

SPECIFIED VALUE: Continuity exists.

▼ If it is OK, proceed to ▷6.

▼ If it is NG, repair the harness and the connectors of the defective sections.

▷6. Fuel pump unit check

1. Perform unit check of the fuel pump.
Refer to Page B8-200.

▼ If it is OK, proceed to ▷7.

▼ If it is NG, replace the fuel pump.

▷7. Check of wire harness continuity (2)

1. Perform continuity check between each of the following terminals.
 - (1) Between relay side connector 3 - ECU connection vehicle harness side connector 35 (FC1)

SPECIFIED VALUE: Continuity exists.

▼ If it is OK, check the EFI ECU circuit.

▼ If it is NG, repair the harness and the connectors.

▷8. Check of wire harness continuity (3)

1. Perform continuity check between each of the following terminals.
 - (1) Between fuel pump relay side connector 2 - main relay side connector 4

SPECIFIED VALUE: Continuity exists.

▼ If it is OK, proceed to ▷9.

▼ If it is NG, repair the harness and the connectors.

▷9. Main relay unit check

1. Perform unit check of the main relay.
Refer to Page B8-206.

▼ If it is OK, proceed to ▷10.

▼ If it is NG, replace the main relay.

▷10. Main relay voltage check

1. Remove the main relay.
2. Perform voltage measurement between each terminal when the IG switch is "ON".
 - (1) Between relay side connector 1 (coil side) - body earth
 - (2) Between relay side connector 2 (switch side) - body earth

SPECIFIED VALUE: Battery voltage

▼ If it is OK, perform checking or repairing of the harness and connector for each of the following terminals.

- (3) Between main relay - body earth

▼ If the switch side is NG, perform checking or repairing of the following portions.

- (4) Harness and connectors between the main relay side connector 2 and battery
- (5) Fuse

▼ If the coil side is NG, perform checking and repairing for the following portions.

- (6) Harness and connectors between main relay side connector 1 and battery
- (7) Ignition switch
- (8) Fuse

② When not using diagnosis tester (DS-21/DS-II) or OBD II generic scan tool:

▷1. Fuel pump operation check

1. Check if there is the operation sound of the fuel pump by shorting the EFI-T terminal when the IG switch is "ON".

SST: 09991-87404-000(1)

09991-87403-000(2)

NOTE

- Confirm the operation sound from the fuel inlet side.

SPECIFIED VALUE: Operation sound is generated.

▼ If it is OK, proceed to ▷2.

▼ If it is NG, proceed to ▷3.

▷2. Fuel pressure check

1. Perform fuel pressure check.

Refer to Page B8-200.

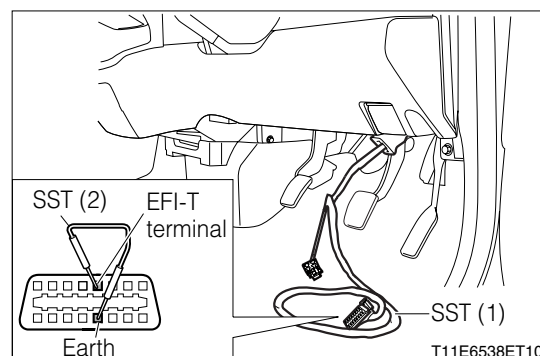
▼ If it is OK, the fuel pump system is normal.

▼ If it is NG, perform the following operations.

- (1) Replacement of the fuel pump

Refer to Page B7-7.

- (2) Repairing of the fuel line



▷3. Fuel pump relay voltage check

1. Remove the fuel pump relay.
2. Perform voltage measurements between each of the following terminals when the IG switch is "ON".
 - (1) Between relay side connector 1 (coil side) - body earth
 - (2) Between relay side connector 2 (switch side) - body earth

SPECIFIED VALUE: Battery voltage

- ▼ If it is OK, proceed to ▷4.
- ▼ If the switch side is NG, proceed to ▷8.
- ▼ If the coil side is NG, perform checking and repairing for the following portions.
 - (3) Harness and connectors between the fuel pump relay and battery
 - (4) Fuse
 - (5) Ignition switch

▷4. Fuel pump relay unit check

1. Perform unit check of the fuel pump relay.
Refer to Page B8-200.

- ▼ If it is OK, proceed to ▷5.
- ▼ If it is NG, replace the fuel pump relay.

▷5. Check of wire harness continuity (1)

1. Perform continuity check between each of the following terminals.
 - (1) Between relay side connector 4 - pump side connector 3 (pump+)
 - (2) Between pump side connector 4 (pump-) - body earth

SPECIFIED VALUE: Continuity exists.

- ▼ If it is OK, proceed to ▷6.
- ▼ If it is NG, repair the harness and the connectors of the defective sections.

▷6. Fuel pump unit check

1. Perform unit check of the fuel pump.
Refer to Page B8-200.

- ▼ If it is OK, proceed to ▷7.
- ▼ If it is NG, replace the fuel pump.

▷7. Check of wire harness continuity (2)

1. Perform continuity check between each of the following terminals.
 - (1) Between relay side connector 3 - ECU connection vehicle harness side connector 35 (FC1)

SPECIFIED VALUE: Continuity exists.

- ▼ If it is OK, check the EFI ECU circuit.
- ▼ If it is NG, repair the harness and the connectors.

▷8. Check of wire harness continuity (3)

1. Perform continuity check between each of the following terminals.

(1) Between fuel pump relay side connector 2 - main relay side connector 4

SPECIFIED VALUE: Continuity exists.

▼ If it is OK, proceed to ▷9.

▼ If it is NG, repair the harness and the connectors.

▷9. Main relay unit check

1. Perform unit check of the main relay.

Refer to Page B8-206.

▼ If it is OK, proceed to ▷10.

▼ If it is NG, replace the main relay.

▷10. Main relay voltage check

1. Remove the main relay.

2. Perform voltage measurement between each terminal when the IG switch is "ON".

(1) Between relay side connector 1 (Coil side) - body earth

(2) Between relay side connector 2 (Switch side) - body earth

SPECIFIED VALUE: Battery voltage

▼ If it is OK, perform checking or repairing of the harness and connector for each of the following terminals.

(3) Between main relay - body earth

▼ If the switch side is NG, perform checking or repairing of the following portions.

(4) Harness and connectors between the main relay side connector 2 and battery

(5) Fuse

▼ If the coil side is NG, perform checking and repairing for the following portions.

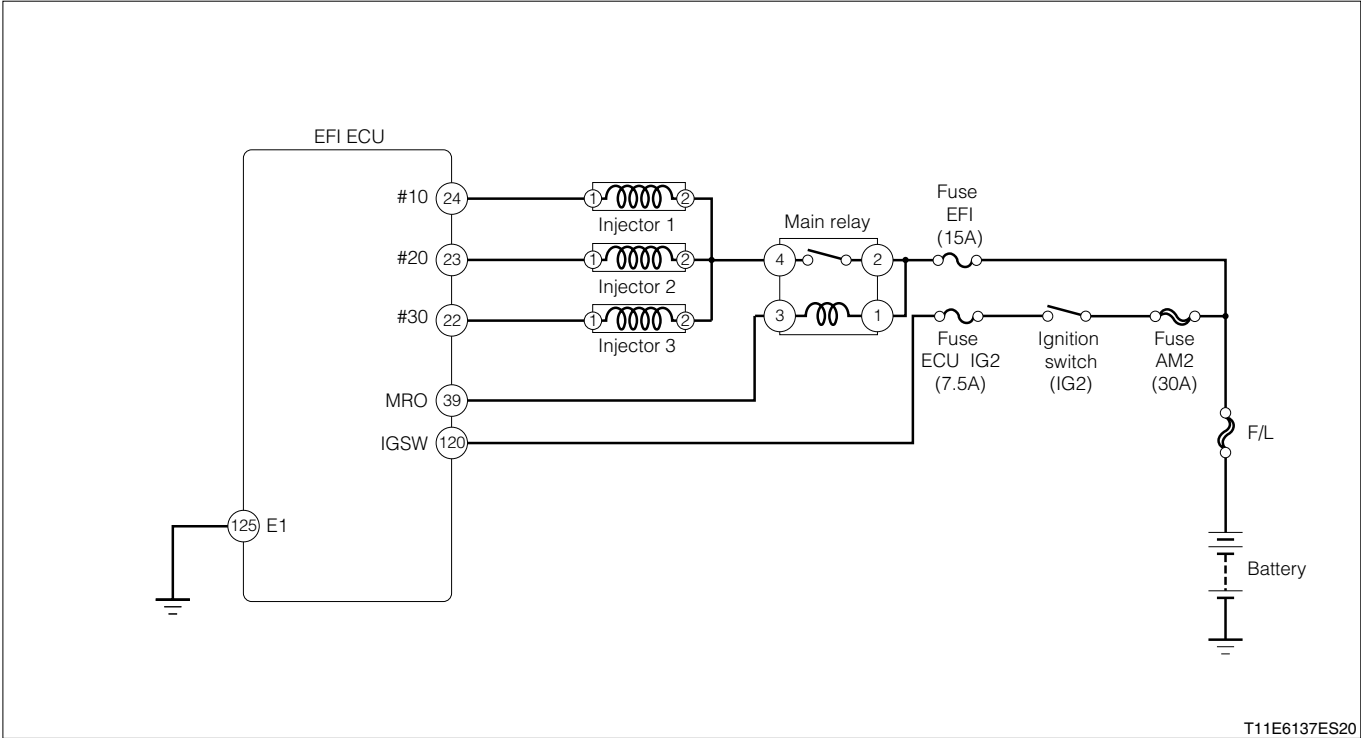
(6) Harness and connectors between main relay side connector 1 and battery

(7) Ignition switch

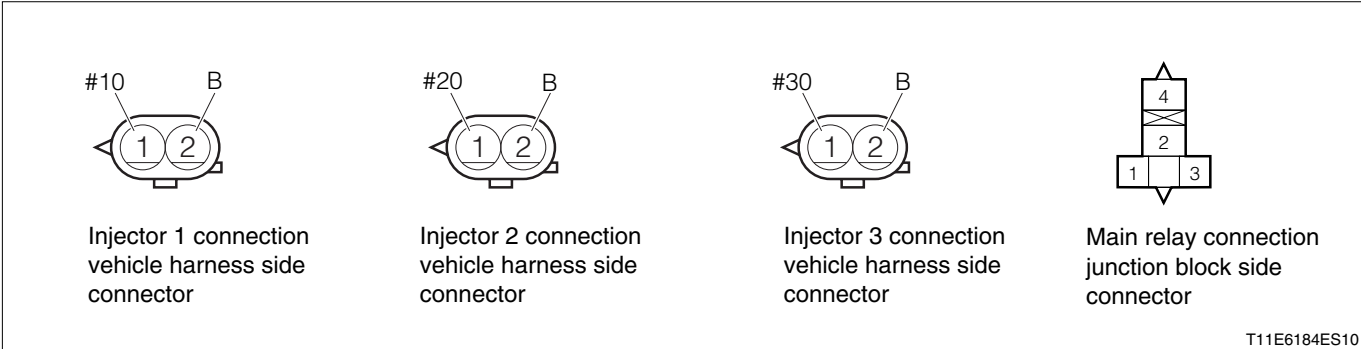
(8) Fuse

7-13-3 INJECTOR SYSTEM CHECK

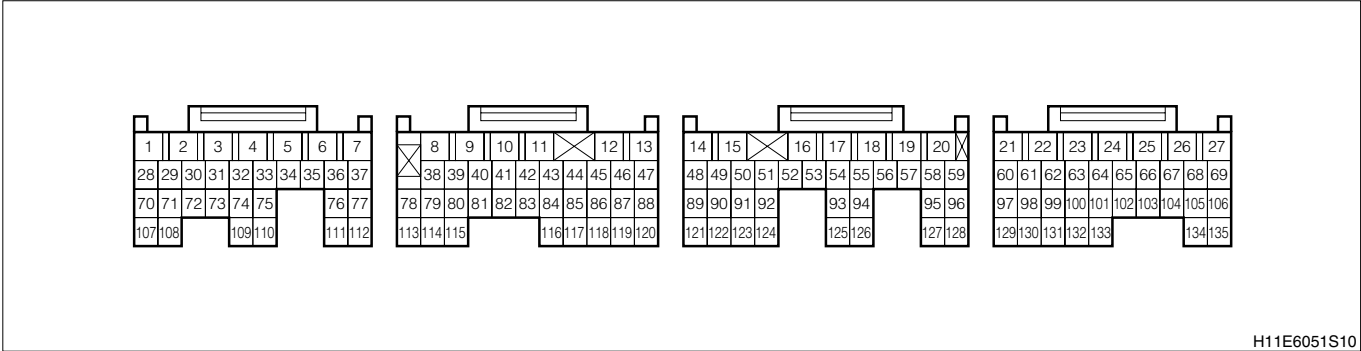
(1) System diagram



Each units connection vehicle harness side connector



EFI ECU connection vehicle harness side connector



(2) Checking points

1. Is the injector control signal outputted correctly from the EFI ECU?
2. Is the injector power supply voltage normal?
3. Is the harness between the injector and EFI ECU normal?
4. Is the injection of the injector proper?

(3) Checking method

▷1. Injector operation check

1. Check if there is the operation sound of the injector using a sound scope or a long screwdriver.

SPECIFIED VALUE: Operation sound is generated.

▼ If it is OK, proceed to ▷2.

▼ If it is NG, proceed to ▷3.

▷2. Injector unit check (1)

1. Perform unit check of the injector.

Refer to Page B8-205.

▼ If it is OK, the injector system is normal.

▼ If it is NG, replace the injector.

Refer to Page B7-9.

▷3. Injector voltage check

1. Remove all of the connectors on the injector side.
2. Perform voltage measurements between each of the following terminals when the IG switch is "ON".

(1) Each injector connection vehicle harness side connector 2 (+B) - body earth

SPECIFIED VALUE: Battery voltage

▼ If it is OK, proceed to ▷4.

▼ If it is NG, perform checking or repairing of the harness and relay between the following terminals.

(2) Between battery - injector

▷4. Check of wire harness continuity

1. Perform continuity check between each of the following terminals.

(1) Between ECU connection vehicle harness side connector 24 (#10) - injector 1 connection vehicle harness side connector 1 (#10)

(2) Between ECU connection vehicle harness side connector 23 (#20) - injector 2 connection vehicle harness side connector 1 (#20)

(3) Between ECU connection vehicle harness side connector 22 (#30) - injector 3 connection vehicle harness side connector 1 (#30)

SPECIFIED VALUE: Continuity exists.

▼ If it is OK, proceed to ▷5.

▼ If it NG, repair the harness and connectors of the defective sections.

▷5. Injector unit check (2)

1. Perform unit check of the injector.

Refer to Page B8-205.

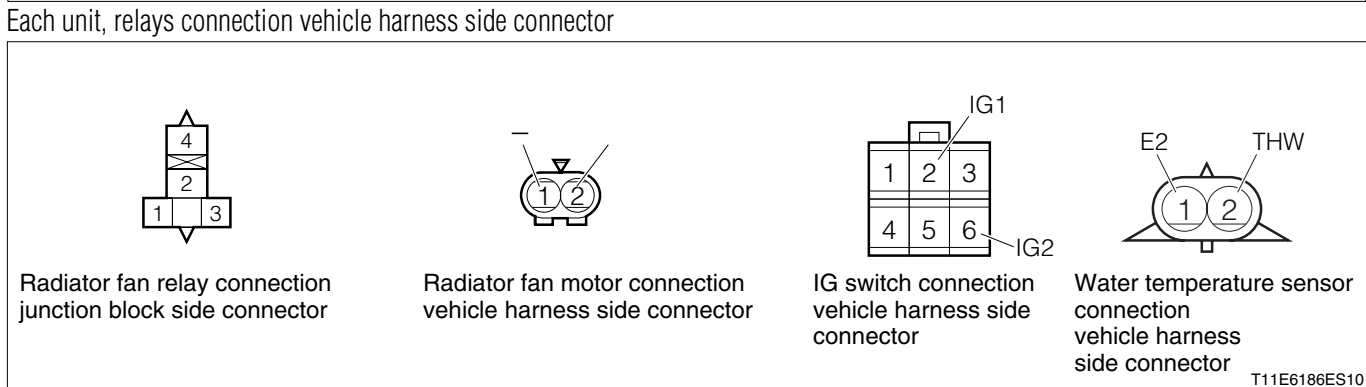
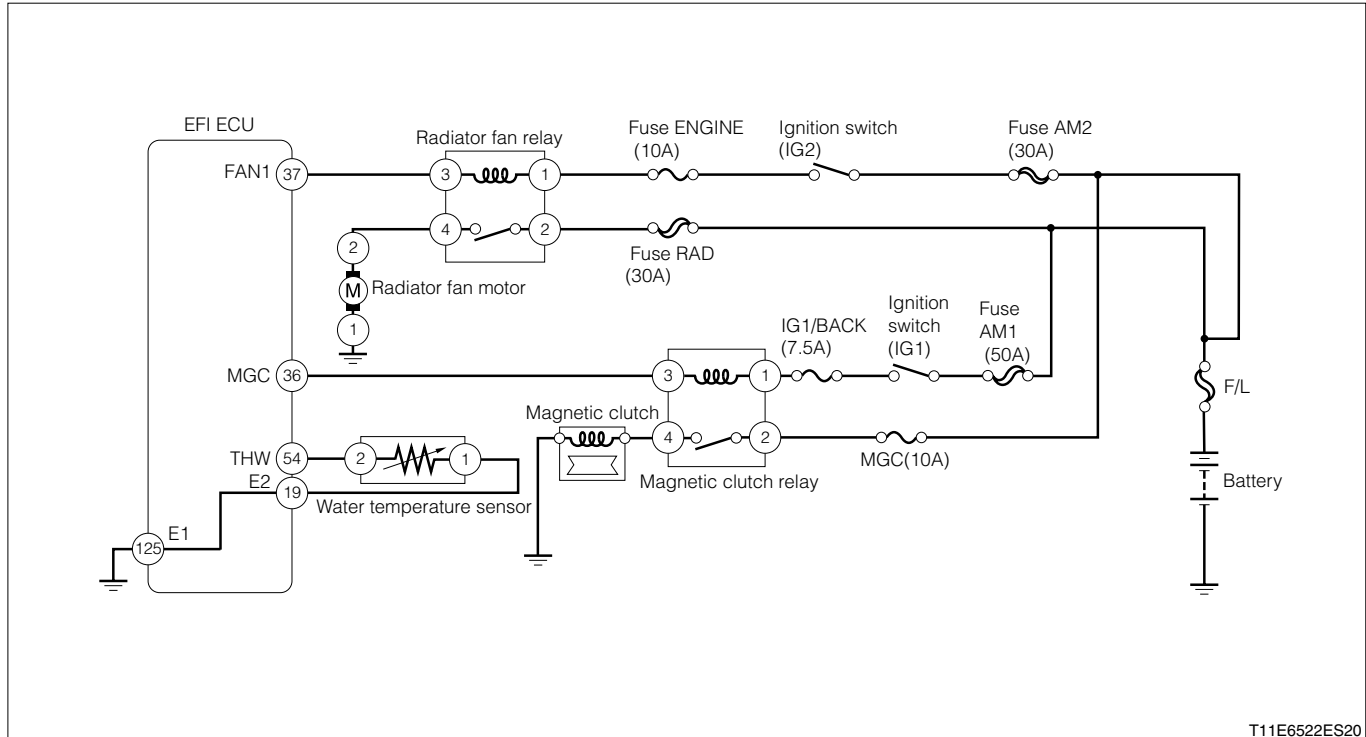
▼ If it is OK, check the connecting condition of each connector.

▼ If it is NG, replace the injector.

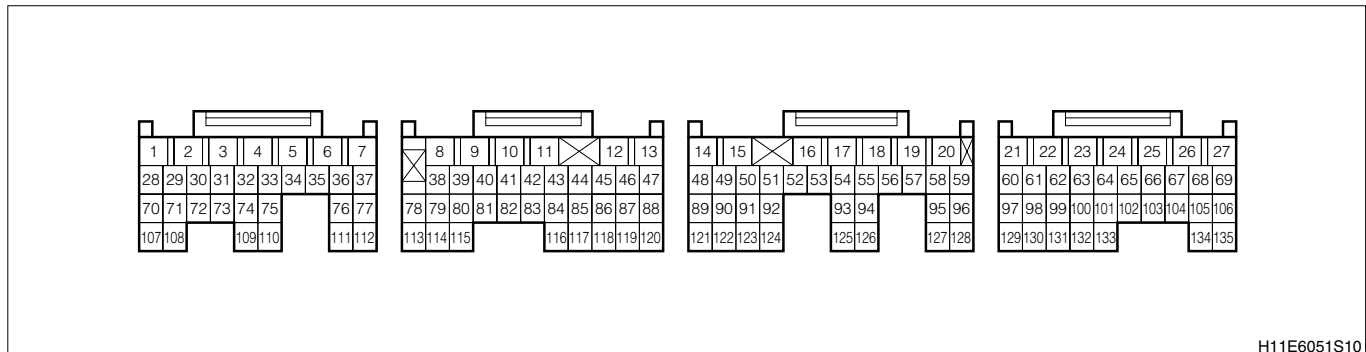
Refer to Page B7-9.

7-13-4 RADIATOR FAN SYSTEM CHECK

(1) System diagram



EFI ECU connection vehicle harness side connector



(2) Checking points

1. Is the signal from the water temperature sensor inputted to the EFI ECU?
2. Is the harness between the water temperature sensor and EFI ECU normal?
3. Is the output of the water temperature sensor correct?
4. Is the signal from the magnet clutch relay inputted to the EFI ECU?
5. Is the harness between the magnet clutch relay and EFI ECU normal?
6. Is the harness between the radiator fan relay and EFI ECU normal?
7. Is the radiator fan motor normal?

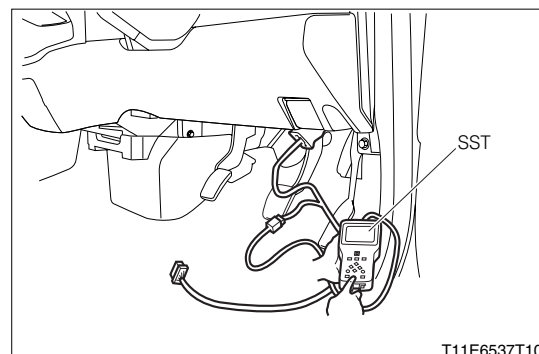
(3) Checking method

① When using diagnosis tester (DS-21/DS-II) or OBD Ⅱ generic scan tool:

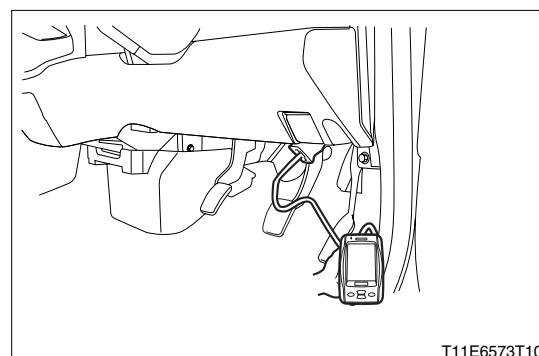
➤1. Radiator fan operation check (1)

1. The IG switch turned "LOCK".
2. Connect the diagnosis tester to DLC.
- (1) In case of DS-21, connect the DS-21 diagnosis tester to DLC through the SST.

SST: 09991-87404-000



- (2) In case of DS-II, connect the DS-II diagnosis tester directly to DLC.
- (3) In case of the OBD Ⅱ generic scan tool, connect the OBD Ⅱ generic scan tool directly to DLC.



3. Turn "ON" the IG switch, and turn "ON" the main switch of the tester.
4. Confirmation of operation of the radiator fan.
 - (1) DS-21: Select the "Radiator fan 1st stage" of the "Actuator driving".
 - (2) DS-II: Select the "Radiator fan 1st stage" of the "Active test".
5. Choose the "Radiator fan 1st stage ON" and "Radiator fan 1st stage OFF", respectively.

SPECIFIED VALUE: The fan rotates when "ON" is chosen. The fan stops when "OFF" is chosen.

▼ If it is OK, proceed to ➤2.

▼ If it is NG, proceed to ➤9.

➤2. Radiator fan operation check (2)

1. Check if the fan does not operate during cold period, but operates after warm-up when warming up the engine.
2. Check if the fan operates when the air conditioner is turned "ON".

NOTE

- Air conditioner "ON" means that the air conditioner switch (ACSW), blower switch (BLW) and magnet clutch (MGC) are all "ON".

SPECIFIED VALUE: The fan operates when the air conditioner is turned "ON".

▼ If it is OK, the system is normal.

▼ If it does not rotate after warm-up, perform checking the water temperature sensor system.

Refer to Page B8-61.

▼ If it does not rotate when the air conditioner is "ON", proceed to ➤3.

▼ When it is rotating constantly, proceed to ➤6.

▼ If it does not rotate at all, proceed to ➤9.

▷3. Check of wire harness continuity (1)

1. Perform continuity check between each of the following terminals.

(1) Between relay side connector 3 - ECU connection vehicle harness side connector 36 (MGC)

SPECIFIED VALUE: Continuity exists.

▼ If it is OK, proceed to ▷4.

▼ If it is NG, repair or replace the defective sections.

▷4. Magnet clutch relay voltage check

1. Perform voltage measurements between each of the following terminals when the IG switch is "ON".

(1) Between relay side connector 1 - body earth

SPECIFIED VALUE: Battery voltage

▼ If it is OK, proceed to ▷5.

▼ If it is NG, perform checking or repairing the harness and the connectors for the following terminals.

(2) Between magnet clutch relay - battery

▷5. Magnet clutch relay unit check

1. Perform unit check of the magnet clutch relay.

Refer to Page B8-206.

▼ If it is OK, check the EFI ECU circuit.

▼ If it is NG, replace the magnet clutch relay

▷6. Diagnosis code check

1. Short-circuit the EFI-T terminals, using SST.

SST: 09991-87404-000(1)

09991-87403-000(2)

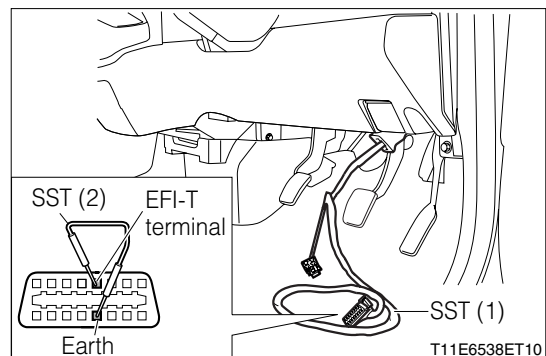
2. Is the normal code outputted when the IG switch is "ON"?

SPECIFIED VALUE: The normal code is outputted.

▼ If it is OK, proceed to ▷7.

▼ If code No.42 is outputted, perform checking of the water temperature sensor system.

Refer to Page B8-61.



▷7. Wire harness check (2)

1. Perform continuity check between each of the following terminals.

(1) Between relay side connector 3 - ECU connection vehicle harness side connector 37 (FAN1)

SPECIFIED VALUE: Continuity exists.

▼ If it is OK, proceed to ▷8.

▼ If it is NG, repair or replace the defective sections.

▷8. Radiator fan relay unit check (1)

1. Perform unit check of the radiator fan relay.

Refer to Page B8-206.

▼ If it is OK, check the EFI ECU circuit.

▼ If it is NG, replace the radiator fan relay.

▷9. EFI ECU voltage check

1. Connect the SST.

SST: 09842-97209-000

2. Perform voltage measurements between the following terminals when the air conditioner is turned "ON".

NOTE

- Air conditioner "ON" means that the air conditioner switch (ACSW), blower switch (BLW) and magnet clutch (MGC) are all "ON".

- (1) Between SST 37 (FAN1) - SST 125 (E1)

SPECIFIED VALUE:

Measuring condition	Specified value
When magnet clutch is "ON".	1V or less
When magnet clutch is "OFF".	Battery voltage

▼ If it is OK, proceed to ▷13.

▼ If it is NG, proceed to ▷10.

▷10. Check of wire harness continuity (3)

1. Perform continuity check between each of the following terminals.

- (1) Between relay side connector 3 - ECU connection vehicle harness side connector 37 (FAN1)

SPECIFIED VALUE: Continuity exists.

▼ If it is OK, proceed to ▷11.

▼ If it is NG, repair the harness and the connectors.

▷11. Radiator fan relay coil side voltage check

1. Perform voltage measurements between each of the following terminals when the IG switch is "ON".

- (1) Between relay side connector 1 - body earth

SPECIFIED VALUE: Battery voltage

▼ If it is OK, proceed to ▷12.

▼ If it is NG, perform checking or repairing of the harness and connectors between the following terminals.

- (2) Between radiator fan relay - battery

▷12. Radiator fan relay unit check (2)

1. Perform unit check of radiator fan relay.

Refer to Page B8-206.

▼ If it is OK, check the EFI ECU circuit.

▼ If it is NG, replace the radiator fan relay.

▷13. Radiator fan relay switch side voltage check

1. Perform voltage measurements between the following terminals when the IG switch is "ON".

(1) Between relay side connector 2 - body earth

SPECIFIED VALUE: Battery voltage

▼ If it is OK, proceed to ▷13.

▼ If it is NG, perform checking or repairing of the harness and connectors between the following terminals.

(2) Between radiator fan relay - battery

▷14. Radiator fan relay unit check (3)

1. Perform unit check of radiator fan relay.

Refer to Page B8-206.

▼ If it is OK, proceed to ▷14.

▼ If it is NG, replace the radiator fan relay.

▷15. Check of wire harness continuity (4)

1. Perform continuity check between each of the following terminals.

(1) Between relay side connector 4 - motor side connector 2 (+)

(2) Between motor side connector 1 (−) - body earth

SPECIFIED VALUE: Continuity exists.

▼ If it is OK, replace the radiator fan motor.

Refer to Page B6-4.

▼ If it is NG, perform repairing and replacing of the defective sections.

② When not using diagnosis tester (DS-21/DS-II) or OBD II generic scan tool:

▷1. Radiator fan operation check

1. Check if the fan does not operate during cold period, but operates after warm-up when warming up the engine.

2. Check if the fan operates when the air conditioner is turned "ON".

NOTE

- Air conditioner "ON" means that the air conditioner switch (ACSW), blower switch (BLW) and magnet clutch (MGC) are all "ON".

SPECIFIED VALUE: The fan operates when the air conditioner is turned "ON".

▼ If it is OK, the system is normal.

▼ If it does not rotate after warm-up, perform checking the water temperature sensor system.

Refer to Page B8-61.

▼ If it does not rotate when the air conditioner is "ON"

▼ When it is rotating constantly, proceed to ▷5.

▼ If it does not rotate at all, proceed to ▷8.

➤2. Check of wire harness continuity (1)

1. Perform continuity check between each of the following terminals.

(1) Between relay side connector 3 - ECU connection vehicle harness side connector 36 (MGC)
SPECIFIED VALUE: Continuity exists.

▼ If it is OK, proceed to ➤3.

▼ If it is NG, repair or replace the defective sections.

➤3. Magnet clutch relay voltage check

1. Perform voltage measurements between each of the following terminals when the IG switch is "ON".

(1) Between relay side connector 1 - body earth

SPECIFIED VALUE: Battery voltage

▼ If it is OK, proceed to ➤4.

▼ If it is NG, perform checking or repairing the harness and the connectors for the following terminals.

(2) Between magnet clutch relay - battery

➤4. Magnet clutch relay unit check

1. Perform unit check of the magnet clutch relay.

Refer to Page B8-206.

▼ If it is OK, check the EFI ECU circuit.

▼ If it is NG, replace the magnet clutch relay

➤5. Diagnosis code check

1. Short-circuit the EFI-T terminals, using SST.

SST: 09991-87404-000(1)

09991-87403-000(2)

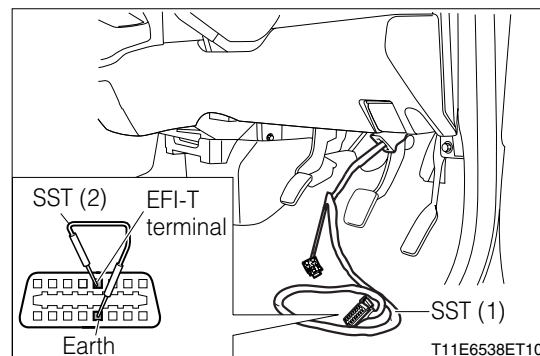
2. Is the normal code outputted when the IG switch is "ON"?

SPECIFIED VALUE: The normal code is outputted.

▼ If it is OK, proceed to ➤6.

▼ If code No.42 is outputted, perform checking of the "water temperature sensor system".

Refer to Page B8-61.



➤6. Wire harness check (2)

1. Perform continuity check between each of the following terminals.

(1) Between relay side connector 3 - ECU connection vehicle harness side connector 37 (FAN1)

SPECIFIED VALUE: Continuity exists.

▼ If it is OK, proceed to ➤7.

▼ If it is NG, repair or replace the defective sections.

➤7. Radiator fan relay unit check (1)

1. Perform unit check of the radiator fan relay.

Refer to Page B8-206.

▼ If it is OK, check the EFI ECU circuit.

▼ If it is NG, replace the radiator fan relay.

B8-199

▷8. EFI ECU voltage check

1. Connect the SST.

SST: 09842-97209-000

2. Perform voltage measurements between the following terminals when the air conditioner is turned "ON".

NOTE

- Air conditioner "ON" means that the air conditioner switch (ACSW), blower switch (BLW) and magnet clutch (MGC) are all "ON".

- (1) Between SST 37 (FAN1) - SST 125 (E1)

SPECIFIED VALUE:

Measuring condition	Specified value
When magnet clutch is "ON".	1V or less
When magnet clutch is "OFF".	Battery voltage

▼ If it is OK, proceed to ▷2.

▼ If it is NG, proceed to ▷9.

▷9. Check of wire harness continuity (3)

1. Perform continuity check between each of the following terminals.

- (1) Between relay side connector 3 - ECU connection vehicle harness side connector 37 (FAN1)

SPECIFIED VALUE: Continuity exists.

▼ If it is OK, proceed to ▷10.

▼ If it is NG, repair the harness and the connectors.

▷10. Radiator fan relay coil side voltage check

1. Perform voltage measurements between each of the following terminals when the IG switch is "ON".

- (1) Between relay side connector 1 - body earth

SPECIFIED VALUE: Battery voltage

▼ If it is OK, proceed to ▷11.

▼ If it is NG, perform checking or repairing of the harness and connectors between the following terminals.

- (2) Between radiator fan relay - battery

▷11. Radiator fan relay unit check (2)

1. Perform unit check of radiator fan relay.

Refer to Page B8-206.

▼ If it is OK, check the EFI ECU circuit.

▼ If it is NG, replace the radiator fan relay.

▷12. Radiator fan relay switch side voltage check

1. Perform voltage measurements between the following terminals when the IG switch is "ON".

(1) Between relay side connector 2 - body earth

SPECIFIED VALUE: Battery voltage

▼ If it is OK, proceed to ▷13.

▼ If it is NG, perform checking or repairing of the harness and connectors between the following terminals.

(2) Between radiator fan relay - battery

▷13. Radiator fan relay unit check (3)

1. Perform unit check of radiator fan relay.

Refer to Page B8-206.

▼ If it is OK, proceed to ▷14.

▼ If it is NG, replace the radiator fan relay.

▷14. Check of wire harness continuity (4)

1. Perform continuity check between each of the following terminals.

(1) Between relay side connector 4 - motor side connector 2 (+)

(2) Between motor side connector 1 (−) - body earth

SPECIFIED VALUE: Continuity exists.

▼ If it is OK, replace the radiator fan motor.

▼ If it is NG, perform repairing and replacing of the defective sections.

7-14 UNIT CHECK**WARNING**

- If the vehicle is driven with the SST (EFI computer check sub harness, etc.) connected there is a possibility of causing malfunction and may be very dangerous. Therefore, remove it without fail before running.

7-14-1 FUEL PRESSURE CHECK**WARNING**

- Fire is strictly forbidden while operation.
Place cloth, etc. to prevent fuel from splashing.

1. Connect the SST.

SST: 09842-97209-000

09268-87701-000

09268-87702-000

2. Turn the IG switch to the "ON" position.

3. Drive the fuel pump by shorting between SST 35 (FC1) - SST 125 (E1) and measure the fuel pressure at this point.

SPECIFIED VALUE: $324 \pm 5 \text{ kPa}$ $\{3.3 \pm 0.05 \text{ kgf/cm}^2\}$

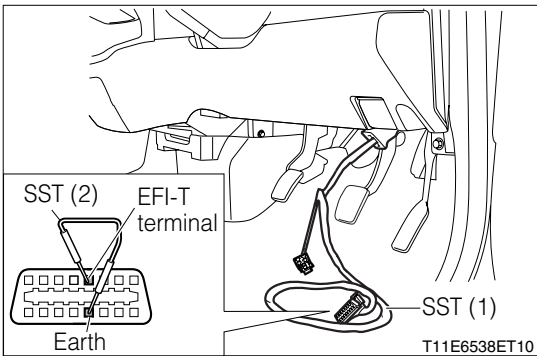
There should be no large fluctuation.

7-14-2 FUEL PUMP**WARNING**

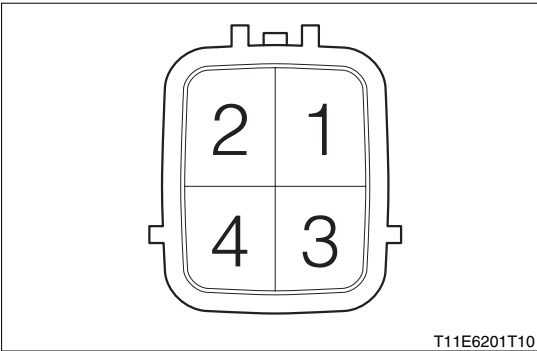
- Fire is strictly forbidden while operation.

1. Turn the IG switch to the "ON" position.

- 2. Short-circuit the terminals 5 (EFI-T) and 13 (E) of the DLC, using the SST and confirm the operation sound of the fuel pump at this point.
SST: 09991-87404-000(1)
09991-87403-000(2)
- 3. Turn the IG switch to "LOCK".

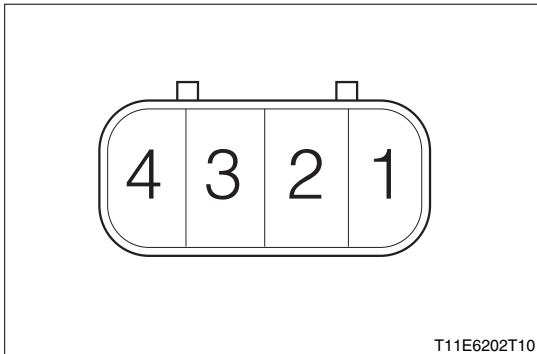


- 4. Pull out the pump connector on top of the fuel tank and measure the resistance between 3 (pump+) - 4 (pump-) of the fuel pump.
SPECIFIED VALUE: 0.2 - 3.0Ω



7-14-3 INTAKE MANIFOLD PRESSURE/INTAKE TEMPERATURE INTEGRATED SENSOR

- 1. Connect the SST.
SST: 09842-97209-000
- 2. Perform voltage measurements between the following terminals when the IG switch is "ON".
(1) Between SST 57 (VCPM) - SST 122 (E2PM)
SPECIFIED VALUE: 4.5 - 5.5V
- 3. Perform voltage measurements between the following terminals when the IG switch is "ON".
(1) Between SST 52 (PIM) - SST 122 (E2PM)
SPECIFIED VALUE: 3.1 - 4.1V
- 4. Perform voltage measurements between the following terminals by cranking with the fuel pump relay removed.
(1) Between SST 52 (PIM) - SST 122 (E2PM)
SPECIFIED VALUE: The voltage value changes.
- 5. Measure the resistance between the following terminals.
(1) Between 4 (THA) - 2 (E2PM)

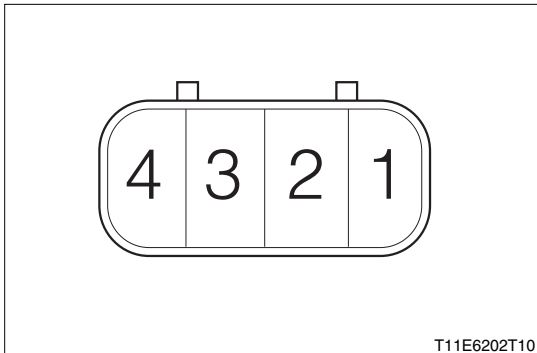


Intake air temperature sensor characteristics

Temperature (°C)	-30	-20	20	80	120
Resistance (kΩ)	28.6	16.2	2.45	0.322	0.117

NOTE

- The reference value is indicated in the parentheses.

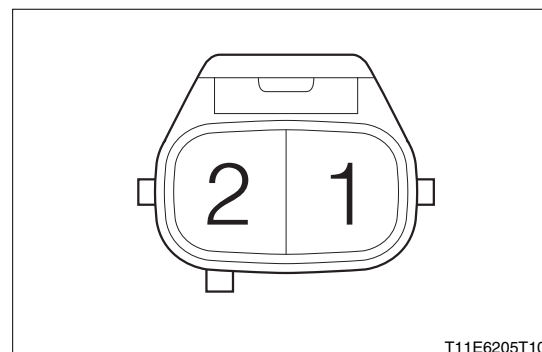


7-14-4 ENGINE REVOLUTION SENSOR

1. Measure the resistance between the following terminals.

(1) Between 1 (N1+) - 2 (N1-)

SPECIFIED VALUE: $2150 \pm 300 \Omega$ (At 20°C)

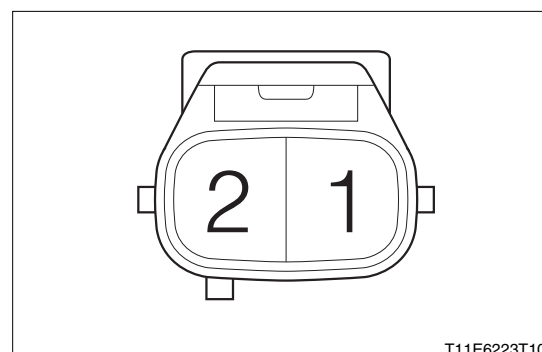


7-14-5 CAMSHAFT POSITION SENSOR

1. Measure the resistance between the following terminals.

(1) Between 1 (N2+) - 2 (N2-)

SPECIFIED VALUE: $2150 \pm 300 \Omega$ (At 20°C)

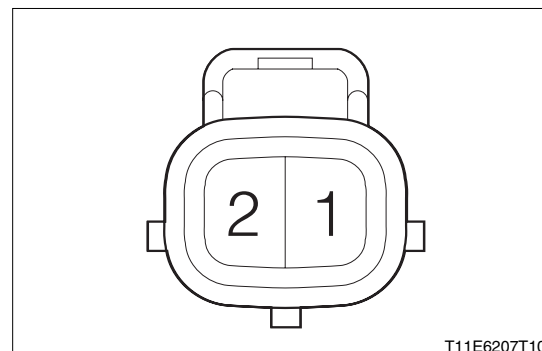


7-14-6 WATER TEMPERATURE SENSOR

1. Measure the resistance between the following terminals.

(1) Between 1 (E2) - 2 (THW)

Temperature (°C)	-20	20	80	110
Resistance (kΩ)	15.04	2.45	0.318	0.142



7-14-7 OXYGEN SENSOR

1. Measure the resistance between the following terminals.

(1) Between 1 (OXH1) - 2 (+)

SPECIFIED VALUE: $7.0^{+1.4}_{-0.7} \Omega$ (20±1°C)

2. Confirm that there is no continuity between each of the following terminals.

- (1) Between oxygen sensor body - 3 (OX1)
- (2) Between oxygen sensor body - 4 (E2)
- (3) Between oxygen sensor body - 1 (OXH1)
- (4) Between oxygen sensor body - 2 (+B)
- (5) Between 3 (OX1) - 1 (OXH1)
- (6) Between 3 (OX1) - 2 (+B)
- (7) Between 4 (E2) - 1 (OXH1)
- (8) Between 4 (E2) - 2 (+B)

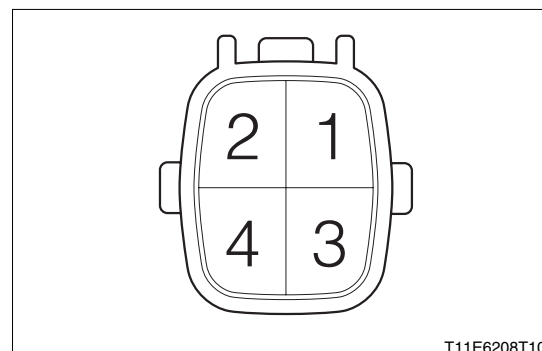
SPECIFIED VALUE: No continuity exists

NOTE

- Other than the above unit check, perform checking for the oxygen sensor output voltage under the condition in which it is installed to the vehicle.

(Refer to the page of the oxygen sensor system of the trouble shooting according to the systems.)

Refer to Page B8-80.



7-14-8 REAR OXYGEN SENSOR

1. Measure the resistance between the following terminals.

(1) Between 1 (OXH2) - 2 (+)

SPECIFIED VALUE: $13.0^{+25}_{-13} \Omega$ ($20 \pm 1^\circ\text{C}$)

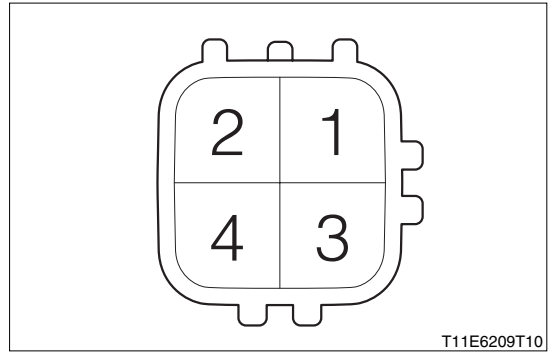
2. Confirm that there is no continuity between each of the following terminals.

- (1) Between rear oxygen sensor body - 3 (OX2)
- (2) Between rear oxygen sensor body - 4 (E2)
- (3) Between rear oxygen sensor body - 1 (OXH2)
- (4) Between rear oxygen sensor body - 2 (+B)
- (5) Between 3 (OX2) - 1 (OXH2)
- (6) Between 3 (OX2) - 2 (+B)
- (7) Between 4 (E2) - 1 (OXH2)
- (8) Between 4 (E2) - 2 (+B)

SPECIFIED VALUE: No continuity exists.

NOTE

- Other than the above unit check, perform checking for the rear oxygen sensor output voltage under the condition in which it is installed to the vehicle.
(Refer to the page of the rear oxygen sensor system of the trouble shooting according to the systems.)

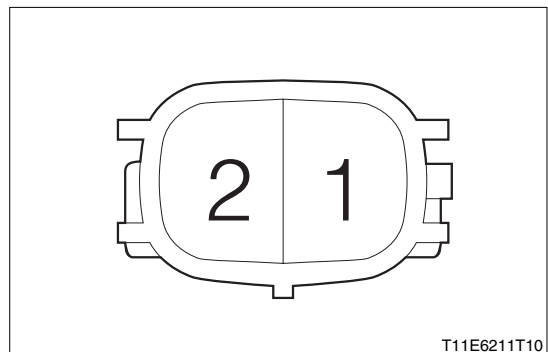


7-14-9 KNOCK SENSOR

1. Measure the resistance between the following terminals.

(1) Between 1 (E2) - 2 (KNK)

SPECIFIED VALUE: $200 \pm 80 \text{ k}\Omega$



7-14-10 THROTTLE POSITION SENSOR

1. Measure the resistance between the following terminals.

(1) Between 1 (VC) - 2 (E2)

SPECIFIED VALUE: $2.5 - 6.0 \text{ k}\Omega$

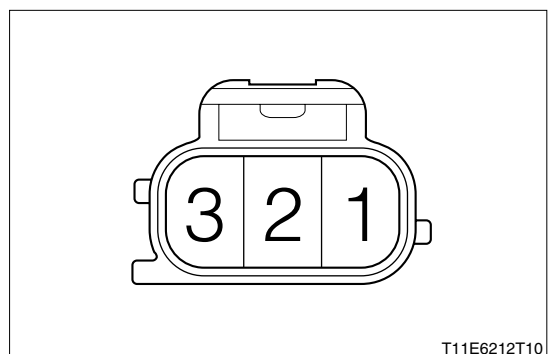
2. Measure the resistance between the following terminals.

(1) Between 3 (VTH) - 2 (E2)

SPECIFIED VALUE: The resistance value will increase proportionally to the throttle lever opening.

NOTE

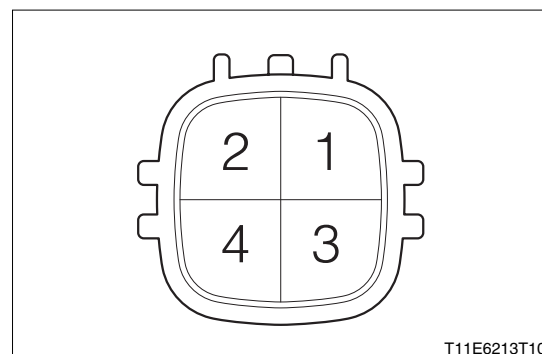
- The resistance value when the throttle lever is fully closed is about $0.4 \text{ k}\Omega$.
- The resistance value when the throttle lever is fully opened is about $3.4 \text{ k}\Omega$.



7-14-11 STEPPER MOTOR FOR ISC

1. Warm up the engine completely.
2. Confirm the engine revolution speed under the idling condition with no air conditioner and electric load applied.

SPECIFIED VALUE: It is at the regular idling speed.
Idling speed 750^{+100}_{-50} rpm



7-14-12 AIR CONDITIONER EVAPORATOR TEMPERATURE SENSOR

1. Measure the resistance between the sensor side connector terminals.
2. Connect the connectors and leave it for five minutes with the air conditioner "ON".

NOTE

- Air conditioner "ON" means that the air conditioner switch (ACSW), blower switch (BLW) and magnet clutch (MGC) are all "ON".

3. Turn the air conditioner "OFF" and measure the resistance value between the following terminals.

NOTE

- Air conditioner "OFF": Conditions in which all of the air conditioner switch (ACSW), blower switch (BLW) and magnet clutch (MGC) are "OFF".

(1) Between 1 (ACEV) - 2 (E21)

SPECIFIED VALUE: The resistance value changes before and after the air conditioner operation.

NOTE

- The lower the temperature is the higher the resistance value will become.

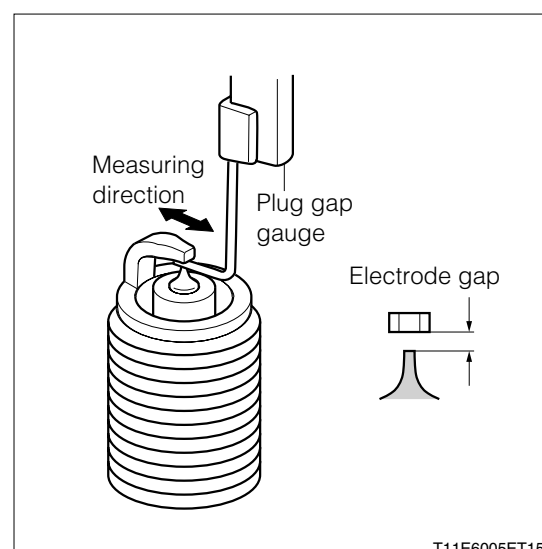
7-14-13 SPARK PLUG

WARNING

- Be very careful not to burn yourself since the spark plugs are hot.

1. Check that the spark plugs exhibits no smoldering and the plugs are not burnt excessively.
2. Check the plug gaps using the plug gap gauge.

SPECIFIED VALUE: $1.1^{+0}_{-0.1}$ mm



7-14-14 INJECTOR

WARNING

- Never use fire during the work.
- Put cloth, etc. to prevent fuel from splashing.

1. Remove the injector to be checked.

CAUTION

- After removing, install a substitute injector.

2. Remove the fuel hose between the fuel inlet pipe and fuel pipe.

3. Set the injector to be checked to the fuel hose, using SST (Sub harness, measuring tool, EFI inspection wire). (Refer to the right figure.)

SST: 09842-97209-000
09268-41047-000(A)
09842-30070-000(B)

4. With the IG switch "ON"

5. Confirm that the fuel is injected when the battery voltage is applied to the injector.

SPECIFIED VALUE: It is injected.

CAUTION

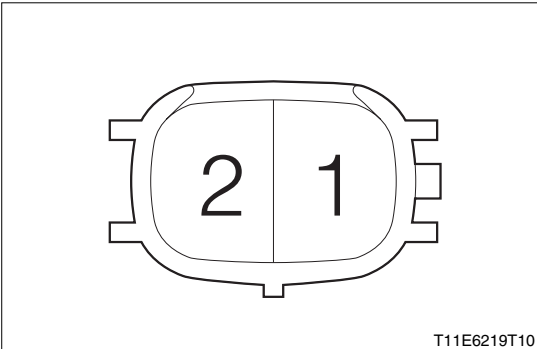
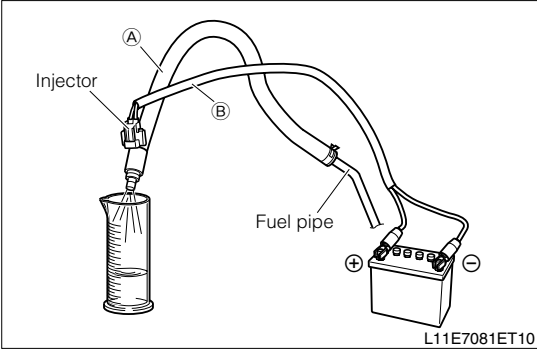
- Perform "ON" or "OFF" at the battery side.

6. Measure the amount leaking from the injector in one minute by removing the battery in the injection check condition.

SPECIFIED VALUE: One drop or less

7. Measure the resistance value between the injector terminals.

SPECIFIED VALUE: 12 Ω (At 20℃)



7-14-15 OIL CONTROL VALVE

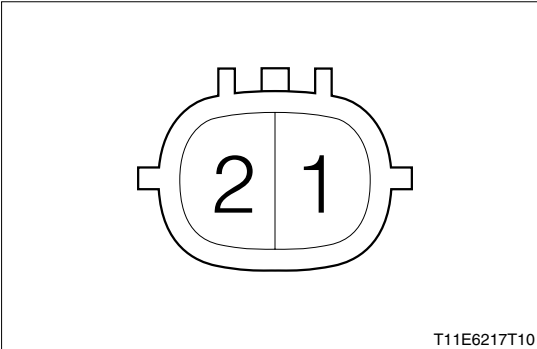
1. Visually confirm the operation of the valve when battery voltage is applied to between the connector terminals of the oil control valve.

	Connected to:
Battery positive terminal	1 (OCV+)
Battery negative (-) terminal	2 (OCV-)

CAUTION

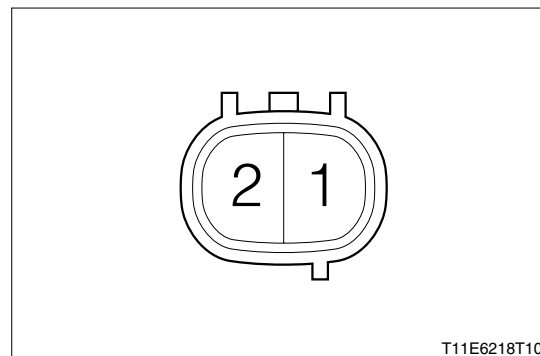
- The time while the battery voltage is applied should be kept within one minute.

SPECIFIED VALUE: The valve operates when the battery voltage is applied.



7-14-16 VSV FOR EVAPORATIVE EMISSION CONTROL SYSTEM PURGE CONTROL

1. Perform air continuity check between the ports.
SPECIFIED VALUE: No air continuity
2. Perform air continuity check between the ports when battery voltage is applied between the VSV for evaporative emission control system purge control connector terminals.
SPECIFIED VALUE: Air continuity exists.
3. Measure the resistance value between the following terminals.
(1) Between 1 (PRG) - 2 (+B)
SPECIFIED VALUE: 30 - 34 Ω (20°C)



7-14-17 MAIN RELAY (EFI), FUEL PUMP RELAY (FUEL PUMP), RADIATOR FAN RELAY (RAD), MAGNET CLUTCH RELAY (MGC)

1. Ensure that the relay is operating when the IG switch is "ON" by sound and vibration.

WARNING

- Do not touch the relay during operation since the relay may become hot while operating.

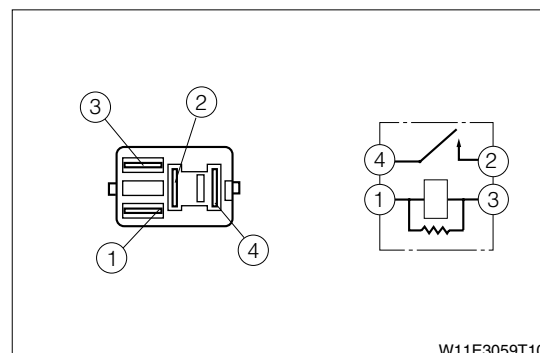
2. Measure the resistance between relay side terminals 1 and 3.

SPECIFIED VALUE: 131 - 230 Ω (At 20°C)

NOTE

- Measure after the temperature in the relay becomes the same with the ambient temperature (20°C).
(Measure after leaving it for one hour or more in the ambient temperature 20°C with the relay "OFF".)

3. Ensure that there is no continuity between each terminal other than the relay side terminals 1 and 3.
4. Ensure that there is continuity between relay side terminals 2 and 4 when battery voltage is applied between the relay side terminal 1 and 3.



7-14-18 STEPPER MOTOR TYPE EGR VALVE

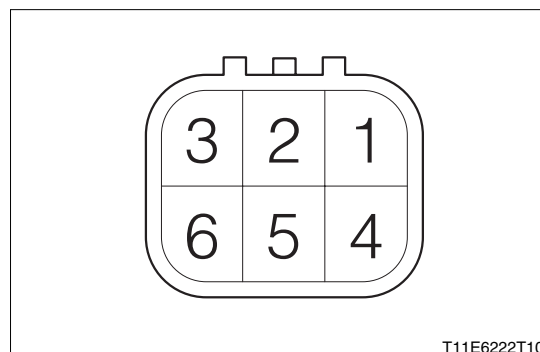
(1) Resistance value check

1. Measure the resistance value between the following terminals.
(1) 1 (EGR4) - 2 (B2)
(2) 3 (EGR2) - 2 (B2)
(3) 4 (EGR1) - 5 (B1)
(4) 6 (EGR3) - 5 (B1)

SPECIFIED VALUE: 18 - 22 Ω (At 20°C)

NOTE

- Measure after the temperature in the stepper motor type EGR valve becomes the same with the ambient temperature (20°C).
(Measure after leaving it for one hour or more in the ambient temperature 20°C with the engine stopped.)



(2) Visual check

1. Check that there are no clogging, damage or foreign matters in the passage of the EGR gas of the EGR valve.

CAUTION

- Be careful not to touch the valve section by tools when removing any foreign matters.

7-15 ECU INPUT/OUTPUT SIGNAL CHECK

7-15-1 SPECIFIED VALUE FOR INPUT/ OUTPUT SIGNAL

Check system	Terminal	Measuring condition	Specified value
Power supply system	27 (+B) - 125 (E1)	When IG switch is "ON"	Battery voltage
	38 (BAT) - 125 (E1)	At all times	
Manifold absolute pressure sensor system	57 (VCPM) - 122 (E2PM)	When IG switch is "ON"	4.5 - 5.5V
	52 (PIM) - 122 (E2PM)	When the sensor is opened to the atmosphere	3.1 - 4.1V
		After starting the engine	Changes according to the opening of the accelerator
Throttle positionsensor system	56 (VC) - 19 (E2)	When IG switch is "ON"	4.5 - 5.5V
	53 (VTH) - 19 (E2)	When throttle valve is fully closed	0.4 - 0.8V
		When throttle valve is fully opened	3.2 - 5.0V
Water temperature sensor system	54 (THW) - 19 (E2)	When warmed up (water temperature 60 - 120°C)	0.3 - 1.3V
Intake air temperature sensor system	51 (THA) - 19 (E2)	When warmed up	0.5 - 4.3V
Knock sensor system	121 (KNK) - 19 (E2)	When idling, when racing	Pulse generation
Engine revolution sensor system	59 (N1+) - 128 (N1-)	When idling	Pulse generation
Camshaft position sensor system	58 (N2+) - 127 (N2-)	When idling	Pulse generation
Oxygen sensor system	123 (OX1) - 19 (E2)	After maintaining at 3000rpm for four minutes	Changes between 0.2 - 1.0V
Injector system	24 (#10) - 125 (E1)	When IG switch is "ON" When idling	Battery voltage Pulse generation
	23 (#20) - 125 (E1)		
	22 (#30) - 125 (E1)		
Ignition system	63 (IG1) - 125 (E1)	When IG switch is "ON" When idling	0 - 0.11V Pulse generation
	62 (IG2) - 125 (E1)		
	61 (IG3) - 125 (E1)		
Ion current combustion control system*	51 (ICMB1) - 125 (E1)	While idling	Pulse generation
	50 (ICMB2) - 125 (E1)		
	49 (ICMB3) - 125 (E1)		

※: Only vehicles with EU specifications

Check system	Terminal	Measuring condition	Specified value
ISC driving signal system	66 (IACALO) - 125 (E1)	When idling	Pulse generation
	67 (IACAHI) - 125 (E1)		
	68 (IACBLO) - 125 (E1)		
	69 (IACBHI) - 125 (E1)		
	12 (EPS) - 125 (E1)	When the steering wheel is turned with the vehicle stopped	0 - 1V
Fuel pump system	35 (FC1) - 125 (E1)	When the steering wheel is not turned with the vehicle stopped	Battery voltage
		Fuel pump stopped	Battery voltage
		When idling (or when cranking)	1.2V or less
Evaporative emission temperature sensor system	45 (ACEV) - 116 (E21)	When air conditioner is "ON"	0.15 - 4.8V
Air conditioner input signal system	3 (ACSW) - 125 (E1)	When air conditioner switch is "ON"	Battery voltage
		When air conditioner switch is "OFF"	0 - 0.5V
Air conditioner relay system	36 (MGC) - 125(E1)	When magnet clutch relay is "ON"	Around 0V
		When magnet clutch relay is "OFF"	Battery voltage
Stop lamp system	43 (STP) - 125 (E1)	When stop lamp is lighted	Battery voltage
		When stop lamp is not lighted	0 - 0.5V
Defogger system	11 (DEF) - 125 (E1)	When defogger switch is "ON"	Battery voltage
		When defogger switch is "OFF"	0 - 0.5V
Blower system	42 (BLW) - 125 (E1)	When heater blower switch is "ON"	0 - 0.5V
		When heater blower switch is "OFF"	Battery voltage
Radiator fan control system	37 (FAN1) - 125 (E1)	When magnet clutch is "ON"	1V or less
		When magnet clutch is "OFF"	Battery voltage
Variable valve timing control system	26 (OCV+) - 25 (OCV-)	When idling	Pulse generation
Engine revolution output system	118 (REV) - 125 (E1)	When idling	Pulse generation
Stepper motor type EGR valve control system	130 (EGR4) - 27 (+B)	When cranking	Pulse generation
	131 (EGR3) - 27 (+B)		
	132 (EGR2) - 27 (+B)		
	133 (EGR1) - 27 (+B)		
Earth system	Between 19 (E2) - body	At all times	Continuity exists.
	Between 20 (E01) - body		
	Between 116 (E21) - body		
	Between 125 (E1) - body		

7-15-2 OSCILLOSCOPE WAVEFORMS

(1) Injector

1. Connect the SST.

SST: 09842-97209-000

2. Perform output check between the following terminals using an oscilloscope.

- (1) Between SST 24 (#10) - SST 125 (E1)
- (2) Between SST 23 (#20) - SST 125 (E1)
- (3) Between SST 22 (#30) - SST 125 (E1)

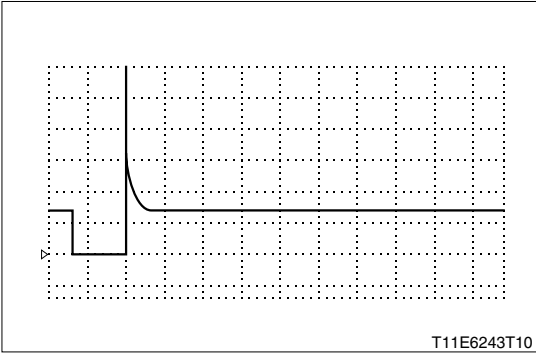
3. As an example, in case of the following measuring range and measuring conditions, it will be as in the right figure.

Time axis	2ms / DIV
Voltage axis	10V / DIV
Measuring condition	When air conditioner is "OFF" with no electric load and while idling

Air conditioner "OFF": Conditions in which all of the air conditioner switch (ACSW), blower switch (BLW) and magnet clutch (MGC) are "OFF".

NOTE

- The waveform cannot be specified, but confirm that a waveform as in the right figure (one such example) shows up.



4. Confirm the following points.

- (1) The voltage changes from the battery voltage to 0V while fuel injection.

(2) Oil control valve

1. Connect the SST.

SST: 09842-97209-000

2. Completely warm up the engine.

3. Perform output check between the following terminals using an oscilloscope.

- (1) SST 26 (OCV+) - SST 25 (OCV-)

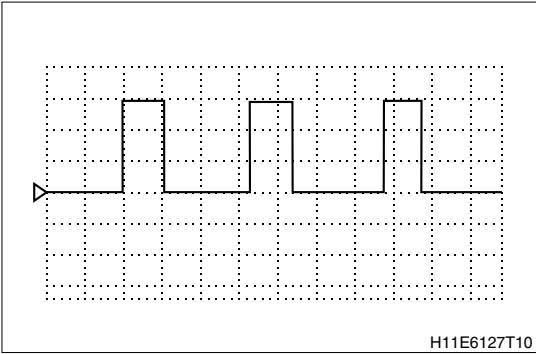
4. As an example, in case of the following measuring range and measuring conditions, it will be as in the right figure.

Time axis	1ms / DIV
Voltage axis	5V / DIV
Measuring condition	When air conditioner is "OFF" with no electric load and while idling

Air conditioner "OFF": Conditions in which all of the air conditioner switch (ACSW), blower switch (BLW) and magnet clutch (MGC) are "OFF".

NOTE

- The waveform cannot be specified, but confirm that a waveform as in the right figure (One such example) shows up.



5. Confirm the following points.

- (1) The pulse of 0V ↔ battery voltage is generated.

(3) Engine revolution output signal

1. Connect the SST.

SST: 09842-97209-000

2. Perform output check between the following terminals using an oscilloscope.

3. Completely warm up the engine.

- (1) SST 118 (REV) - SST 125 (E1)

4. As an example, in case of the following measuring range and measuring conditions, it will be as in the right figure.

Time axis	50ms / DIV
Voltage axis	5V / DIV
Measuring condition	When air conditioner is "OFF" with no electric load and while idling

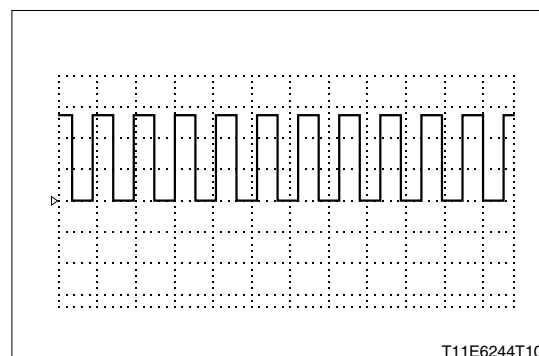
Air conditioner "OFF": Conditions in which all of the air conditioner switch (ACSW), blower switch (BLW) and magnet clutch (MGC) are "OFF".

NOTE

- The waveform cannot be specified, but confirm that a waveform as in the right figure (One such example) shows up.

5. Confirm the following points.

- (1) The pulse of 0V $\leftrightarrow$ battery voltage is generated.
- (2) The wave period becomes shorter as the engine revolution speed rises.



B9 EMISSION CONTROL SYSTEM

1KR-----	B9-1
CHARCOAL CANISTER-----	B9-1
REMOVAL AND INSTALLATION(RHD VEHICLES)-----	B9-1
REMOVAL AND INSTALLATION(LHD VEHICLES)-----	B9-1
STEPPER MOTOR TYPE EGR VALVE -----	B9-2
REMOVAL AND INSTALLATION-----	B9-2
EXHAUST EMISSION PURIFICATION SYSTEM-----	B9-3
LIST OF EMISSION CONTROL DE- VICES-----	B9-3
DIAGRAM OF EMISSION CONTROL SYSTEM -----	B9-5
DIAGRAM SHOWING POSITION OF EMISSION CONTROL DEVICE-----	B9-6
AIR-FUEL RATIO CONTROL DEVICE --	B9-7
IGNITION TIMING CONTROL DEVICE -----	B9-7
DECELERATION CONTROL DEVICE -----	B9-7
EXHAUST GAS RECIRCULATION DE- VICE -----	B9-7
EVAPORATIVE EMISSION CONTROL DEVICE -----	B9-7
BLOW-BY RECIRCULATION DEVICE ---	B9-8

B9-1

■ 1KR

1 CHARCOAL CANISTER

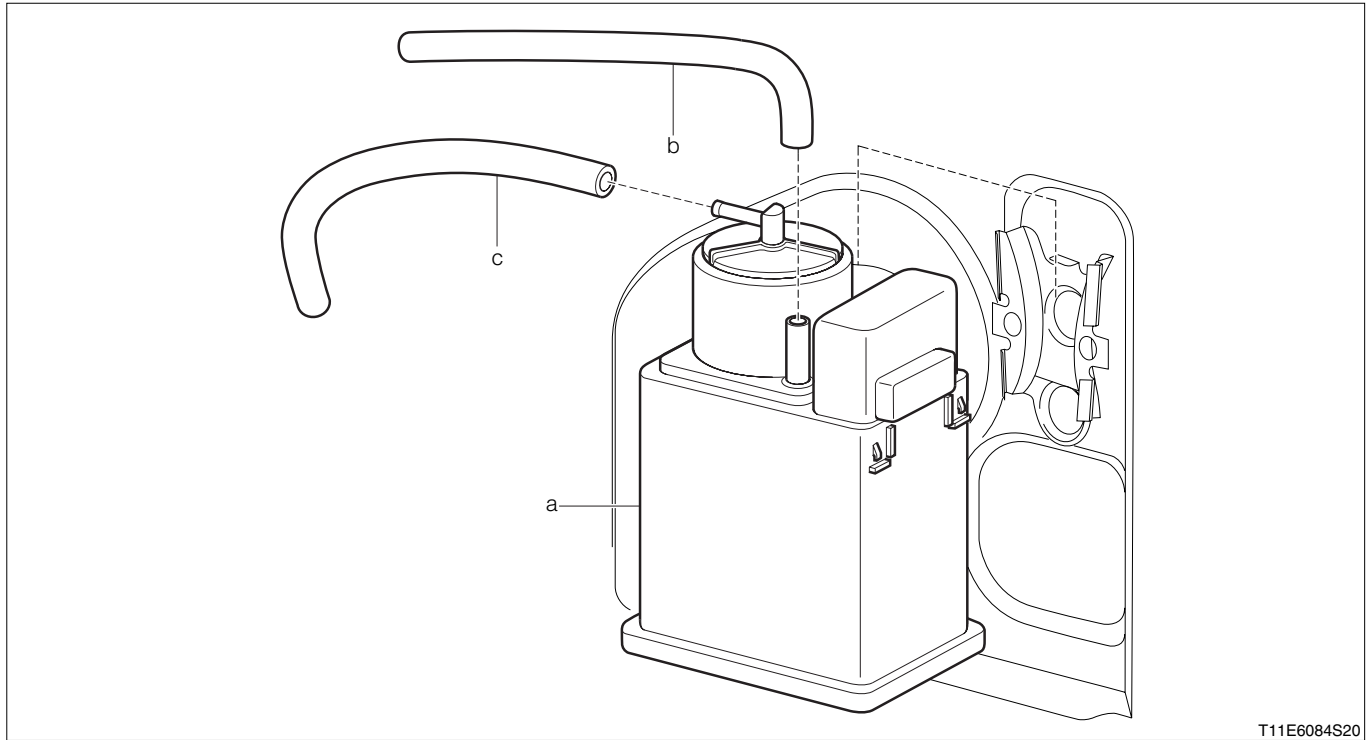
1-1 REMOVAL AND INSTALLATION(RHD VEHICLES)

1-1-1 OPERATION BEFORE REMOVAL

1. Remove the charcoal canister outlet hose No.1 (vacuum switching valve Ay side).
2. Remove the evaporative emission hose (body side).

1-1-2 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



T11E6084S20

(2) Removal and installation procedures

- 1 a Charcoal canister Ay
- 2 b Hose, evaporative emission
- 3 c Charcoal canister outlet hose No.1

1-1-3 OPERATION AFTER INSTALLATION

1. Install the charcoal canister outlet hose No.1 (vacuum switching valve Ay side).
2. Install the evaporative emission hose (body side).

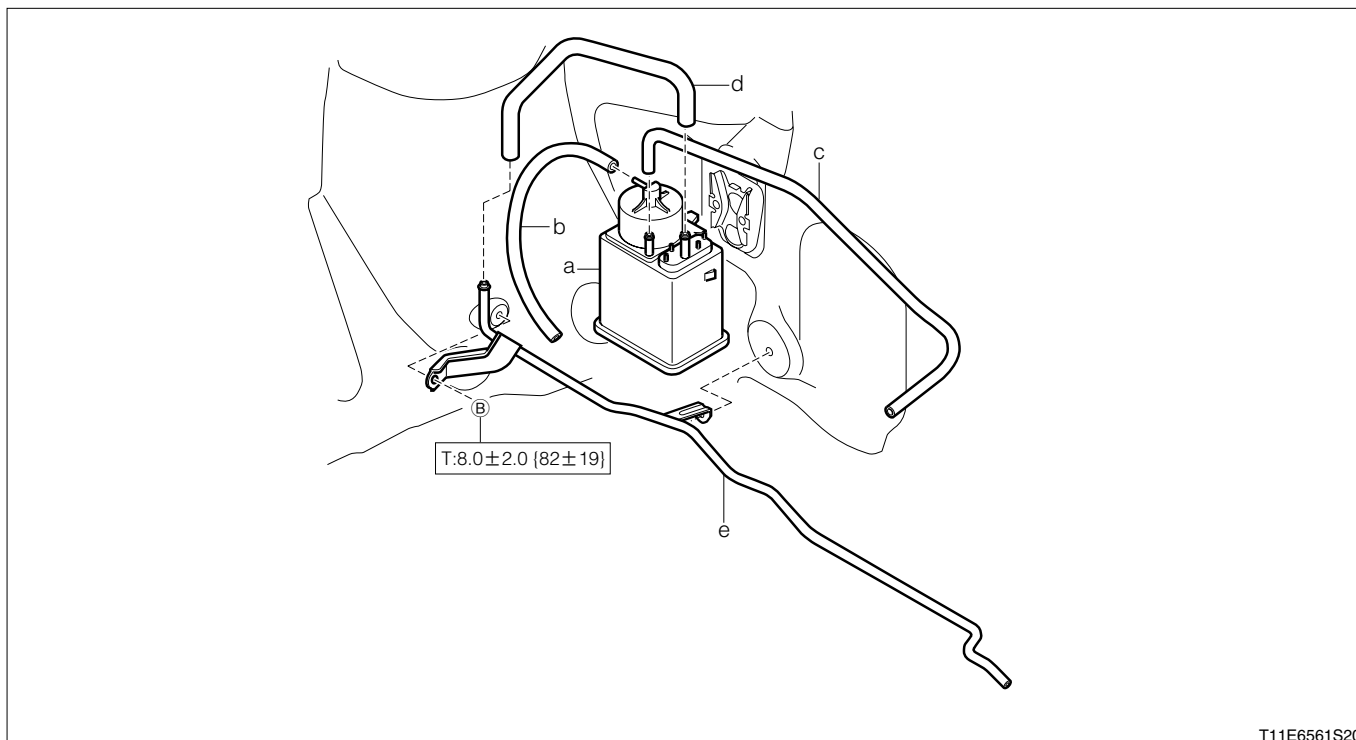
1-2 REMOVAL AND INSTALLATION(LHD VEHICLES)

1-2-1 OPERATION BEFORE REMOVAL

1. Remove the charcoal canister outlet hose No.1 (vacuum switching valve Ay side).
2. Remove the evaporative emission hose (body side).

1-2-2 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



T11E6561S20

(2) Removal and installation procedures

- 1 a Charcoal canister Ay
- 2 b Evaporative emission hose
- 3 c Charcoal canister outlet hose No.1
- 4 d Charcoal canister hose
- 5 e Tube,charcoal canister outlet

1-2-3 OPERATION AFTER INSTALLATION

1. Install the charcoal canister outlet hose No.1 (vacuum switching valve Ay side).
2. Install the evaporative emission hose (body side).

2 STEPPER MOTOR TYPE EGR VALVE

2-1 REMOVAL AND INSTALLATION

3 EXHAUST EMISSION PURIFICATION SYSTEM

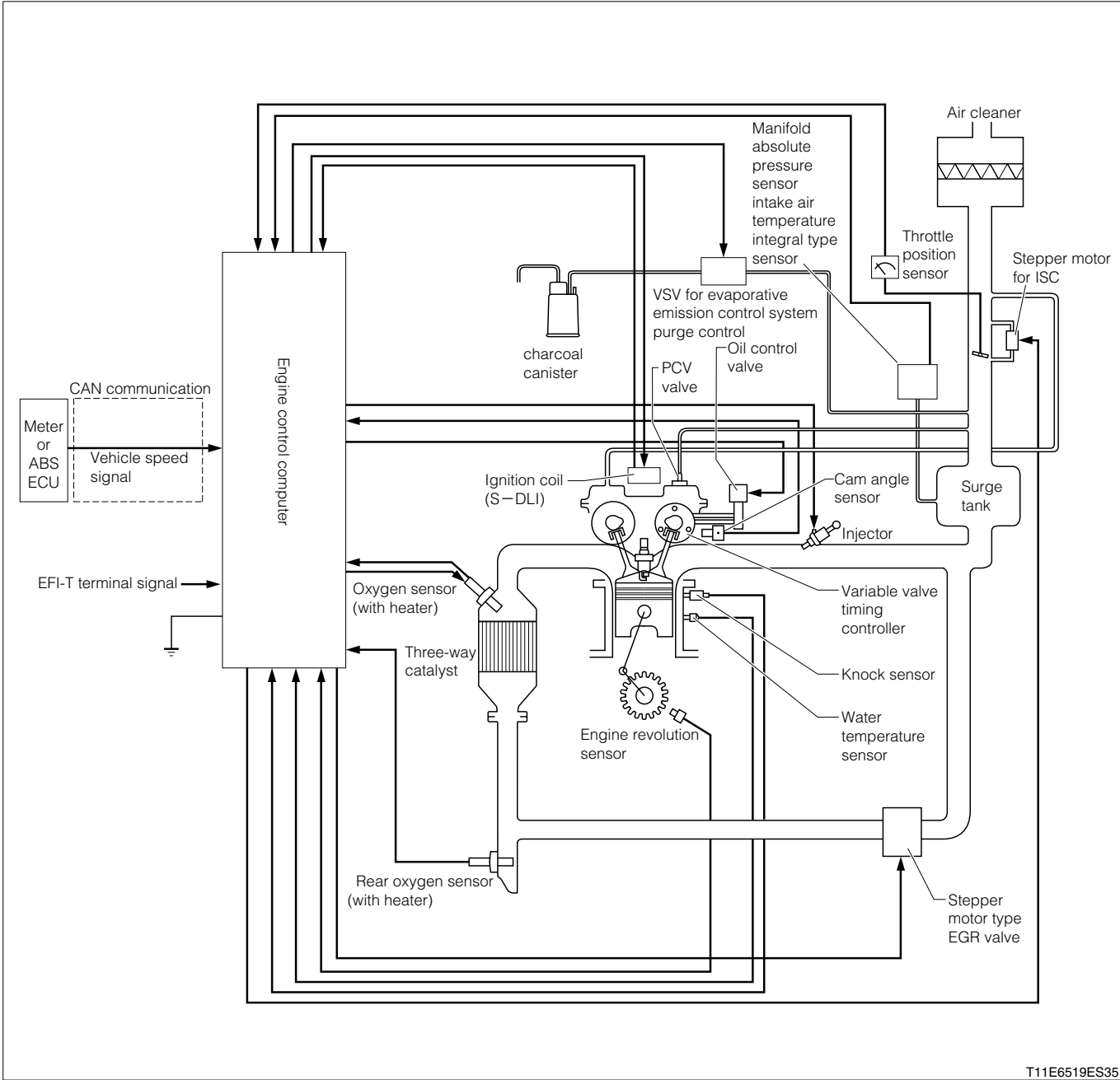
3-1 LIST OF EMISSION CONTROL DEVICES

Name of device	System of device	COMPONENTS	Purpose/function
Catalyst device	Three-way catalyst system	(1)Monolithic catalyst 0.849ℓ	· Reduction of CO, HC and NO _x
Air-fuel ratio control device	Electronic controlled fuel injection system	(1)Injector (2) Oxygen sensor (with heater) (3)Rear oxygen sensor (with heater) (4)Computer for control (5)Operation control device Throttle position sensor, intake pipe pressure/intake air temperature integrated sensor, water temperature sensor, engine revolution sensor, atmospheric pressure sensor, stepper motor for ISC	· Reduction of CO, HC and NO _x (The air-fuel ratio of the mixture taken in the combustion chamber will be controlled approximately to the stoichiometric air-fuel ratio, thus enabling the three-way catalyst to fully exercise the purification performance.)
Ignition timing control device	Electronic controlled system	(1)Ignition coil (Ion current detection device built-in) (2)Computer for control (3)Operation control device Intake pipe pressure/intake air temperature integrated sensor, water temperature sensor, throttle position sensor, engine revolution sensor, cam angle sensor, knock sensor, injector	· Reduction of HC · Reduction of NO _x (An appropriate ignition timing control is performed according to the operating conditions.)
Deceleration control device		(1)Injector (2)Computer for control (3)Operation control device Throttle position sensor	· Reduction of CO and HC during deceleration · Improvement of fuel consumption · Prevention of catalyst heating (Fuel cut is carried out during deceleration by the control device.)
Evaporative emission control device	Canister type	(1)Charcoal canister 0.36 ℓ (2)VSV for evaporative emission control system purge control (3)Computer for control	· Emission control of fuel evaporative emission
Blow-by gas recirculation device	Closed type	(1)Ventilation hose (2)PCV valve	· Reduction of CO and HC (The blow-by gas will be burned again to prevent emission of CO and HC.)

Name of device	System of device	COMPONENTS	Purpose/function
Variable valve timing device		(1)Oil control valve Variable valve timing controller (3)Computer for control (4)Operation control device Engine revolution sensor, cam angle sensor, intake pipe pressure/intake air temperature integrated sensor, water temperature sensor, injector	· Reduction of NO _x (The NO _x is reduced by controlling the opening and closing of the intake valve to the appropriate timing according to the operating conditions.)
Exhaust gas recirculation device	Electronic controlled system	(1)Stepper motor type EGR valve (2)Computer for control (3)Operation control device Engine revolution sensor, water temperature sensor, intake pipe pressure/intake air temperature integrated sensor, throttle position sensor	· Reduction of NO _x (The NO _x in the exhaust gas is reduced by the external EGR effect.) · Improvement of fuel consumption

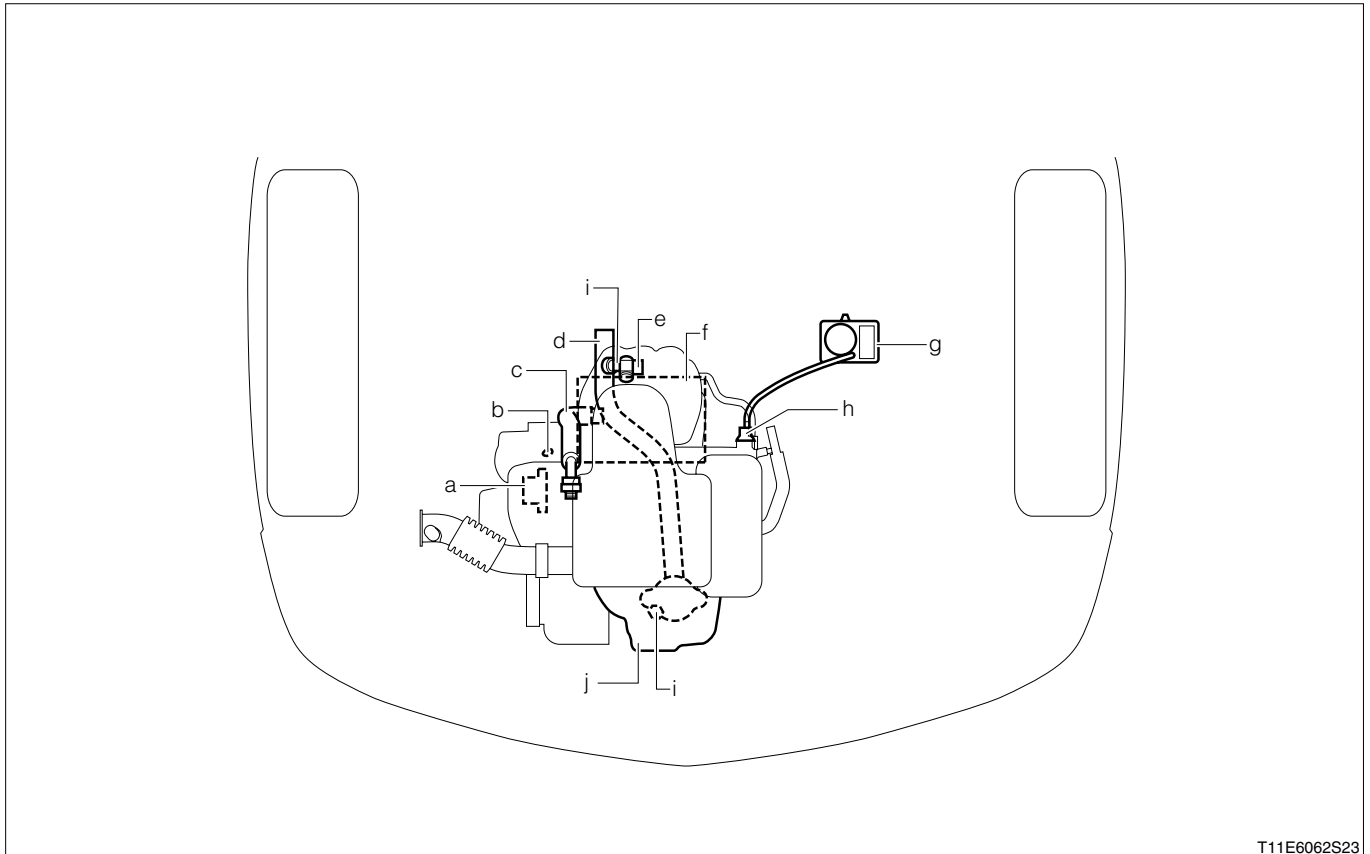
On-board diagnosis device		Engine control computer, throttle position sensor, intake pipe pressure/intake air temperature integrated sensor, water temperature sensor, engine revolution sensor, cam angle sensor, oxygen sensor, oxygen sensor heater circuit, rear oxygen sensor, rear oxygen sensor heater circuit, oil control valve, atmospheric pressure sensor, ignition coil (ion current detection device built-in), fuel supply system, exhaust gas recirculation system, warning lamp	· Detection of failure of the emission control device

3-2 DIAGRAM OF EMISSION CONTROL SYSTEM



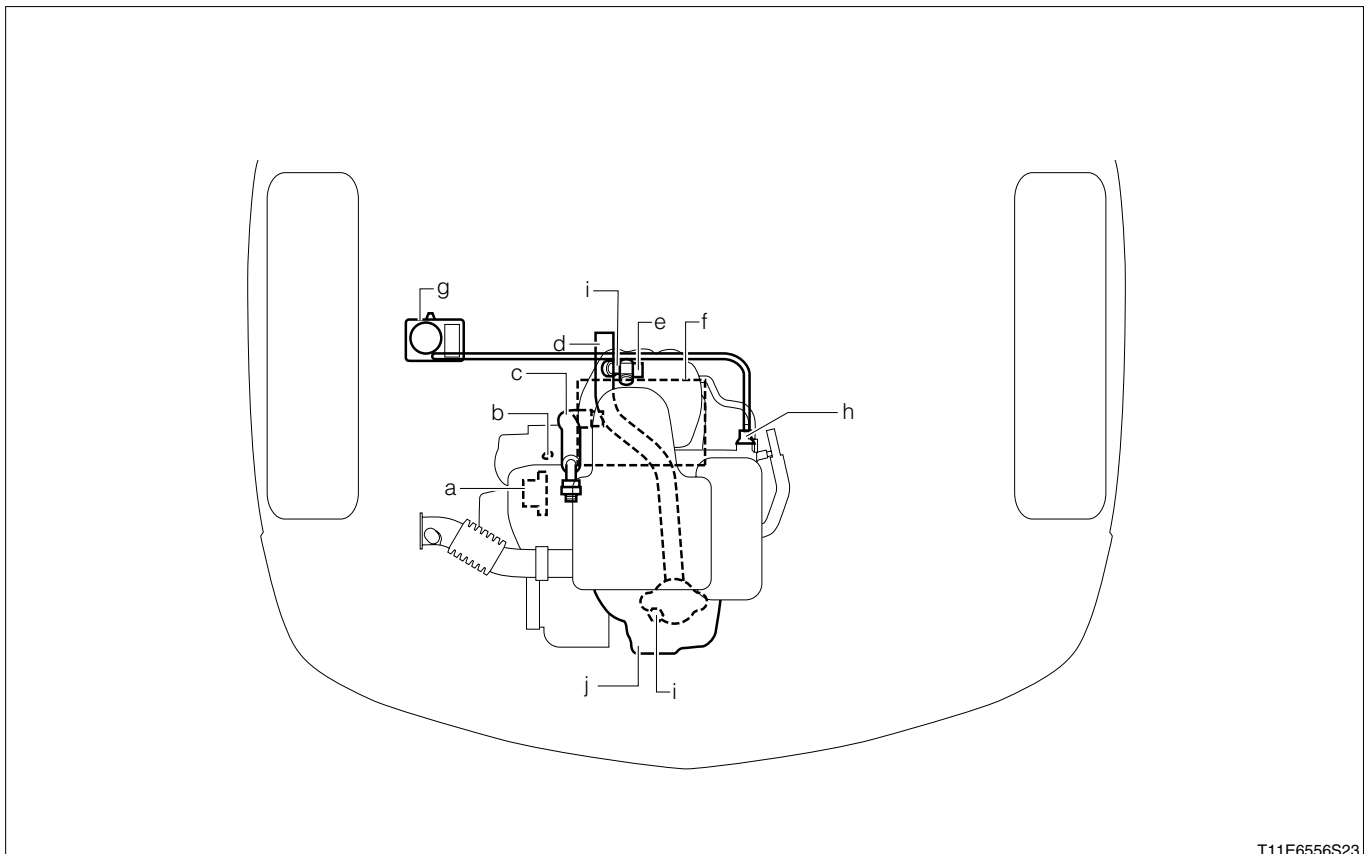
3-3 DIAGRAM SHOWING POSITION OF EMISSION CONTROL DEVICE

RHD vehicles



T11E6062S23

LHD vehicles



T11E6556S23

B9-7

	Part name
a	Variable valve timing device
b	Engine revolution sensor (Ignition timing control device)
c	Blow-by gas hose (countermeasure for blow-by gas)
d	Exhaust pipe
e	Intake pipe pressure/intake air temperature integrated sensor
f	Electronic controlled fuel injection device (air-fuel ratio control device) (deceleration control device)
g	Charcoal canister (countermeasure for fuel evaporative gas)
h	VSV for evaporative emission control system purge control
i	Oxygen sensor (with front oxygen sensor heater, rear oxygen sensor heater)
j	Exhaust manifold (three-way catalyst)

3-4 AIR-FUEL RATIO CONTROL DEVICE

3-4-1 FUNCTION CHECK

1. Refer to "CO/HC concentration check" of the engine tune-up.
Refer to Page B1-10.
2. Refer to "Unit check" of the engine control system.
Refer to Page B8-8.

3-5 IGNITION TIMING CONTROL DEVICE

3-5-1 FUNCTION CHECK

1. Refer to "Ignition timing check" of the engine tune-up.
Refer to Page B1-7.
2. Perform the "unit check" of the engine control system.
Refer to Page B8-8.

3-6 DECELERATION CONTOROL DEVICE

3-6-1 FUNCTION CHECK

1. Refer to "Function check of deceleration control device" of the engine tune-up.
Refer to Page B1-13.

3-7 EXHAUST GAS RECICULATION DEVICE

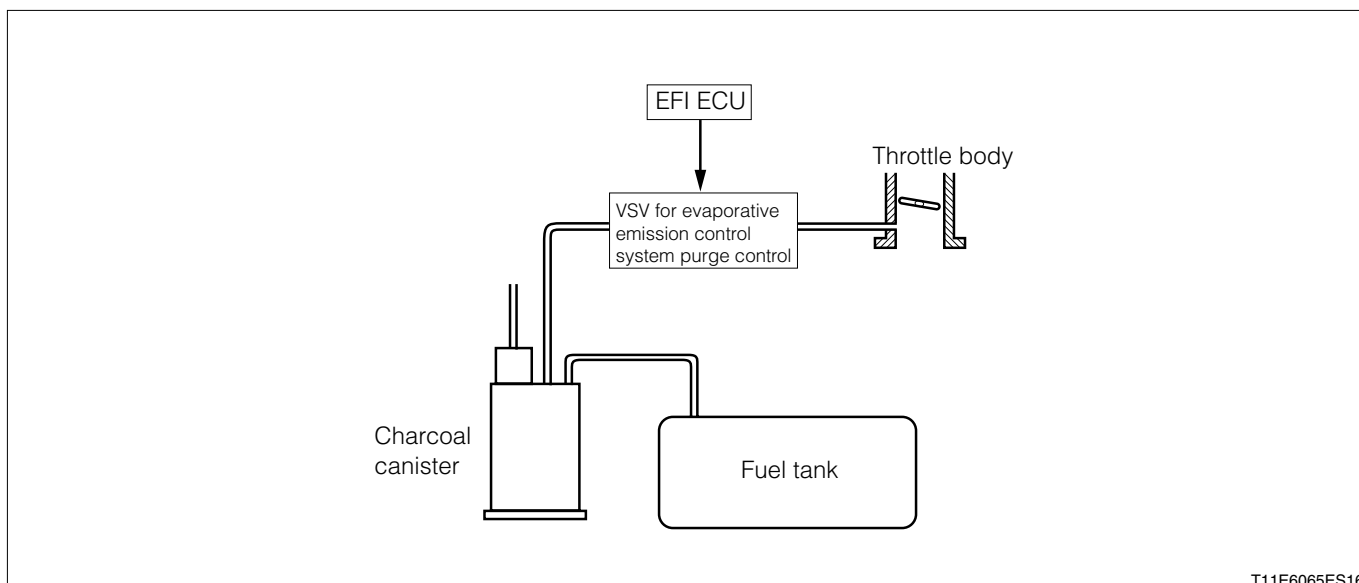
3-7-1 FUNCTION CHECK

Refer to "Exhaust gas recirculation device check" of the engine tune-up.
Refer to Page B1-14.

3-8 EVAPORATIVE EMISSION CONTROL DEVICE

<canister type>

3-8-1 SYSTEM DIAGRAM



3-8-2 UNIT CHECK

(1) **VSV for evaporative emission control system purge control**

1. Refer to "Unit check" of the engine control system.
Refer to Page B8-124.

(2) **Charcoal canister**

1. Refer to "Charcoal canister check" of the engine tune-up.
Refer to Page B1-12.

3-9 BLOW-BY RECIRCULATION DEVICE

3-9-1 UNIT CHECK

(1) **PCV valve (metering valve)**

1. Refer to "Check of piping of blow-by recirculation device for damage" of the engine tune-up.
Refer to Page B1-13.

B10 IGNITION SYSTEM

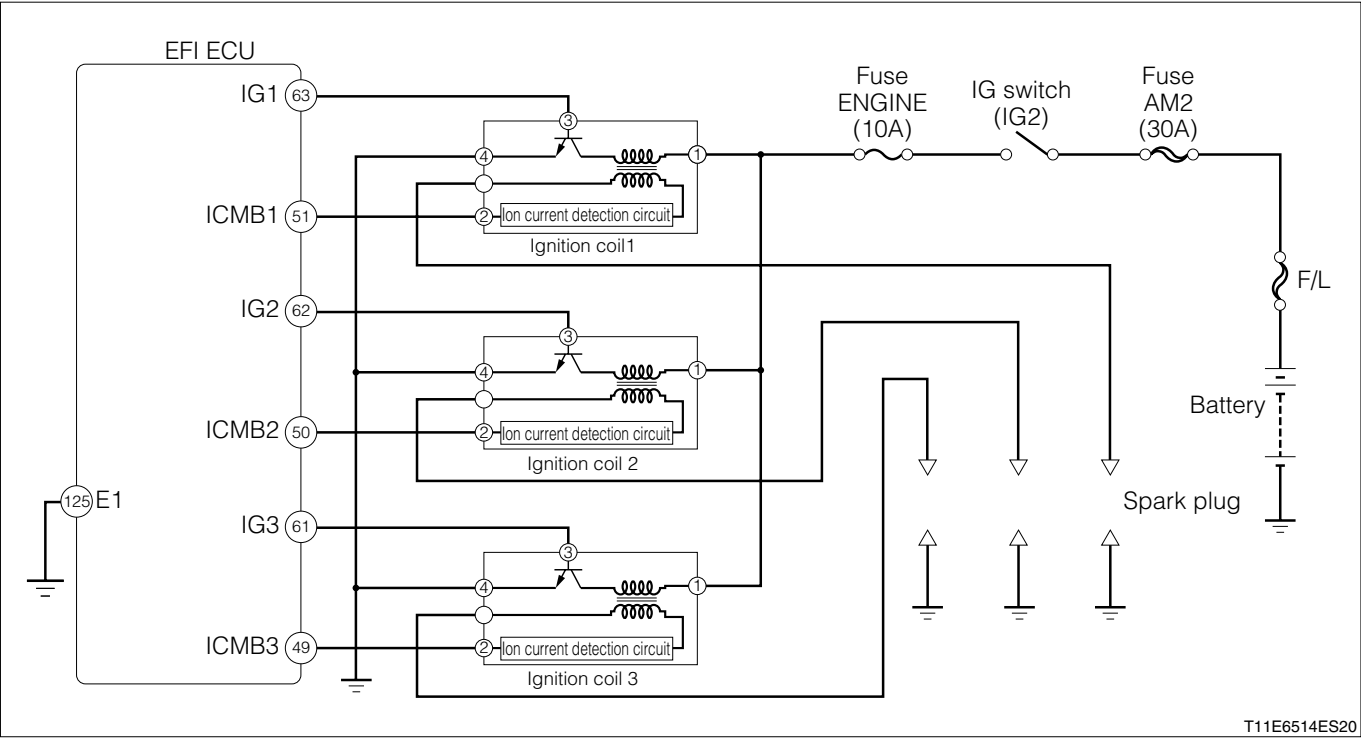
1KR-----	B10—1
IGNITION SYSTEM-----	B10—1
SYSTEM DIAGRAM-----	B10—1
SPARK PLUG-----	B10—1
REMOVAL AND INSTALLATION-----	B10—1

B10-1

■ 1KR

1 IGNITION SYSTEM

1-1 SYSTEM DIAGRAM

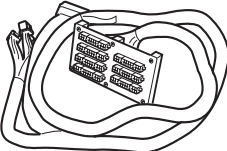


2 SPARK PLUG

2-1 REMOVAL AND INSTALLATION

2-1-1 ARTICLES TO BE PREPARED

SST

Shape	Part No.	Part name
	09842-97209-000	Sub-harness,EFI computer check

Instrument

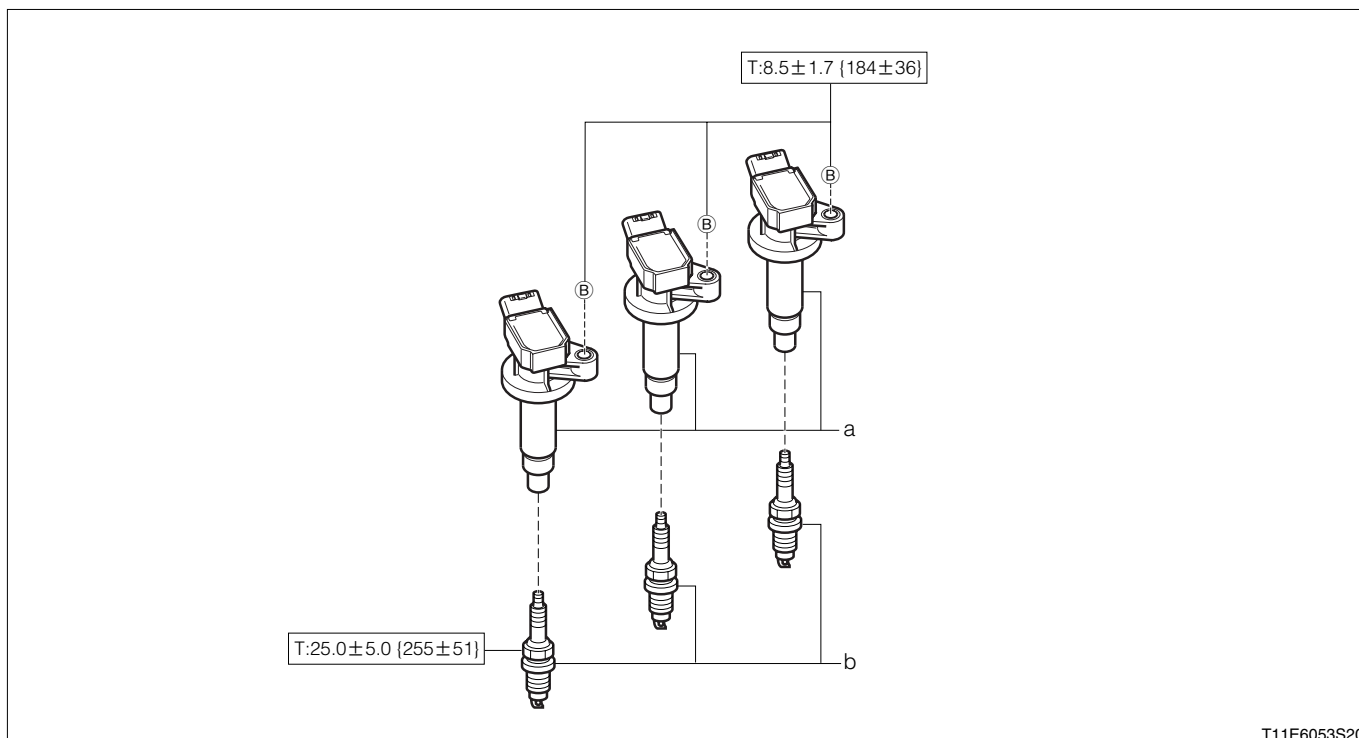
Torque wrench

2-1-2 OPERATION BEFORE REMOVAL

1. Remove the hose S/A, air cleaner.
- Refer to Page B3-1.

2-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



T11E6053S20

Unit: N·m {kgf·cm}

(2) Removal and installation procedures

- 1 a Coil Ay, w/igniter
- 2 b Plug, spark

B10-3

2-1-4 INSPECTION

(1) Coil Ay, w/igniter

1. Spark check

WARNING

- Sparks will take place. Care must be exercised to the surrounding combustible objects.

- (1) Warm up the engine.
- (2) Turn the IG switch to LOCK.
- (3) Remove the fuel pump relay.
- (4) Let the engine idle and wait until it stops by itself.
- (5) Turn the IG switch to LOCK.
- (6) Remove the connector of the injector.

CAUTION

- Stop the fuel injection through the above operation and prevent damaging the catalyst by the unburned gas.

- (7) Remove the spark plug and install it to the ignition coil to earth the plug.
- (8) Check the state of the spark plug during cranking..

SPECIFIED VALUE: An ignition spark is generated.

2. Diagnosis check

- (1) Check the diagnosis.

Refer to Page B8-18.

3. Ion current combustion detection circuit check (Vehicle equipped with the ion current combustion control system)

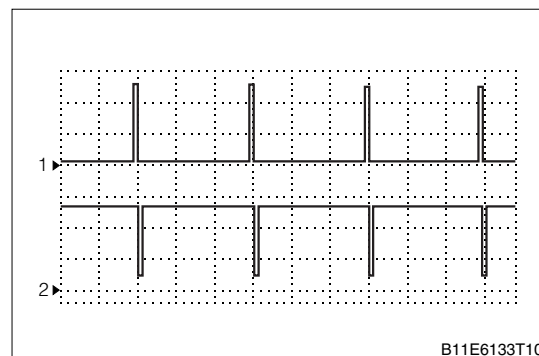
- (1) Connect the SST.

SST: 09842-97209-000

- (2) Completely warm up the engine.

- (3) While idling (With the air conditioner turned ON with electric load), check each cylinder for output waveforms of the ignition signal (1▶) and ion current combustion control signal (2▶), using an oscilloscope.

	Channel	+ side measuring terminal	— side measuring terminal
Cylinder No.1	1▶	63(IG1)	125(E1)
	2▶	51(ICMB1)	125(E1)
Cylinder No.2	1▶	62(IG2)	125(E1)
	2▶	50(ICMB2)	125(E1)
Cylinder No.3	1▶	61(IG3)	125(E1)
	2▶	49(ICMB3)	125(E1)



Time axis	50ms / DIV
Voltage axis	2V / DIV
Measuring condition	Air conditioner is ON; Electric load exists; during idling

Air conditioner is ON: Condition where all of the air conditioner switch (ACSW), blower switch (BLW) and magnet clutch (MGC) are ON.

Electric load exists: Conditions where the headlight (H/L) and defogger (DEF) are both ON.

SPECIFIED VALUE: Check that waveforms like those in the figure (Example) are produced (Ion current combustion control signal must output 0↔5V waveforms).

4. If 0↔5V waveform output is not detected in the ion current detection circuit check in Step 3 above, inspect the following points.

- (1) Check for an open or short circuit in the harness between the ignition coil - EFI ECU of the ion current combustion control signal system. (Repair fault if any.)
- (2) Check that no engine misfire has occurred and that idle state is stable, and then repeat the ion current detection circuit check in Step 3 above.

5. Using an oscilloscope, check the output waveform of the ion current combustion control signal for each cylinder, when the engine speed is increased slowly from an idle state to 4000rpm, and then the throttle is suddenly closed (At the fuel cut).

SPECIFIED VALUE: The output level must be constant at approx. 5V (0↔5V waveform must not be outputted).

(2) Plug, spark

1. Perform the plug check.
Refer to Page B8-204.

2-1-5 OPERATION AFTER INSTALLATION

1. Install air cleaner cap S/A.
Refer to Page B3-1.

B11 STARTING SYSTEM/CHARGING SYSTEM

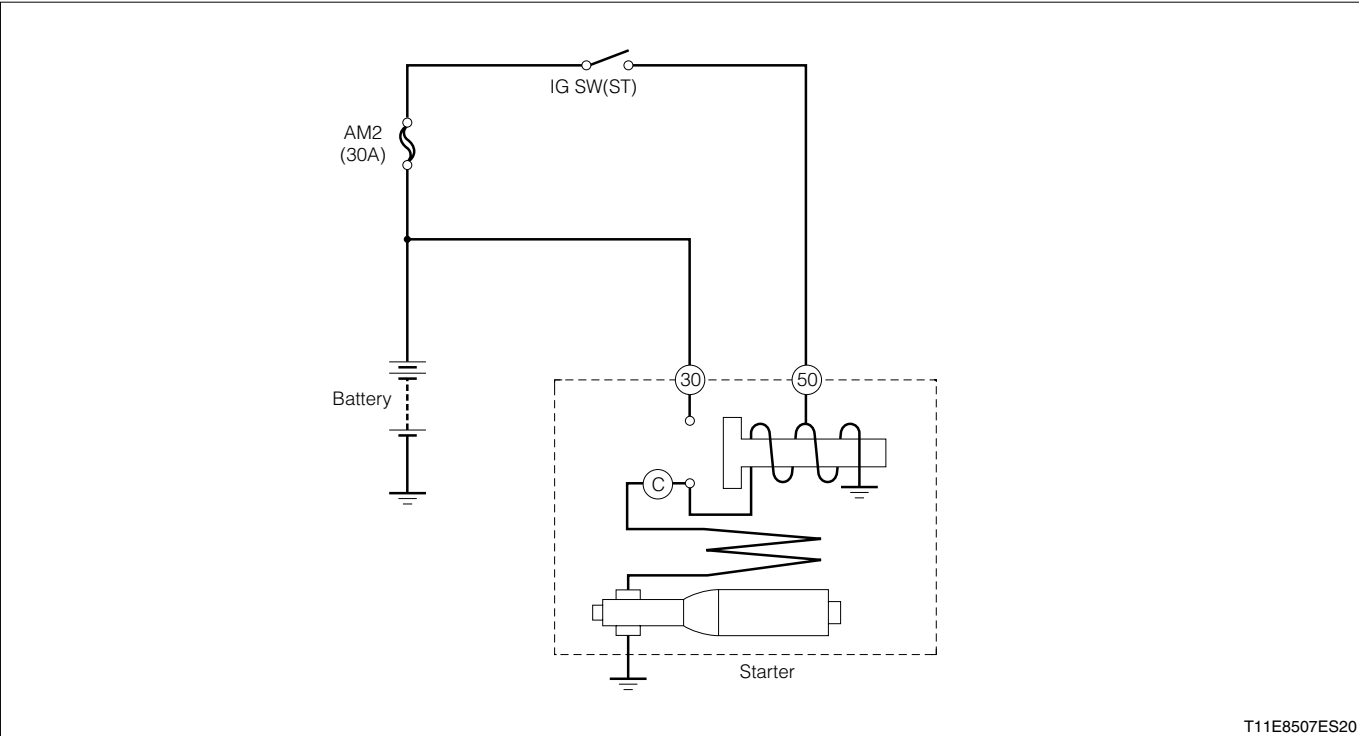
1KR-----	B11-1
STARTING SYSTEM-----	B11-1
SYSTEM DIAGRAM-----	B11-1
STARTER-----	B11-1
REMOVAL AND INSTALLATION-----	B11-1
CHARGING SYSTEM-----	B11-2
ARTICLES TO BE PREPARED-----	B11-2
SYSTEM DIAGRAM-----	B11-3
IN-VEHICLE CHECK-----	B11-3
ALTERNATOR-----	B11-4
REMOVAL AND INSTALLATION-----	B11-4

B11-1

■ 1KR

1 STARTING SYSTEM

1-1 SYSTEM DIAGRAM



T11E8507ES20

2 STARTER

2-1 REMOVAL AND INSTALLATION

2-1-1 ARTICLES TO BE PREPARED

Instrument

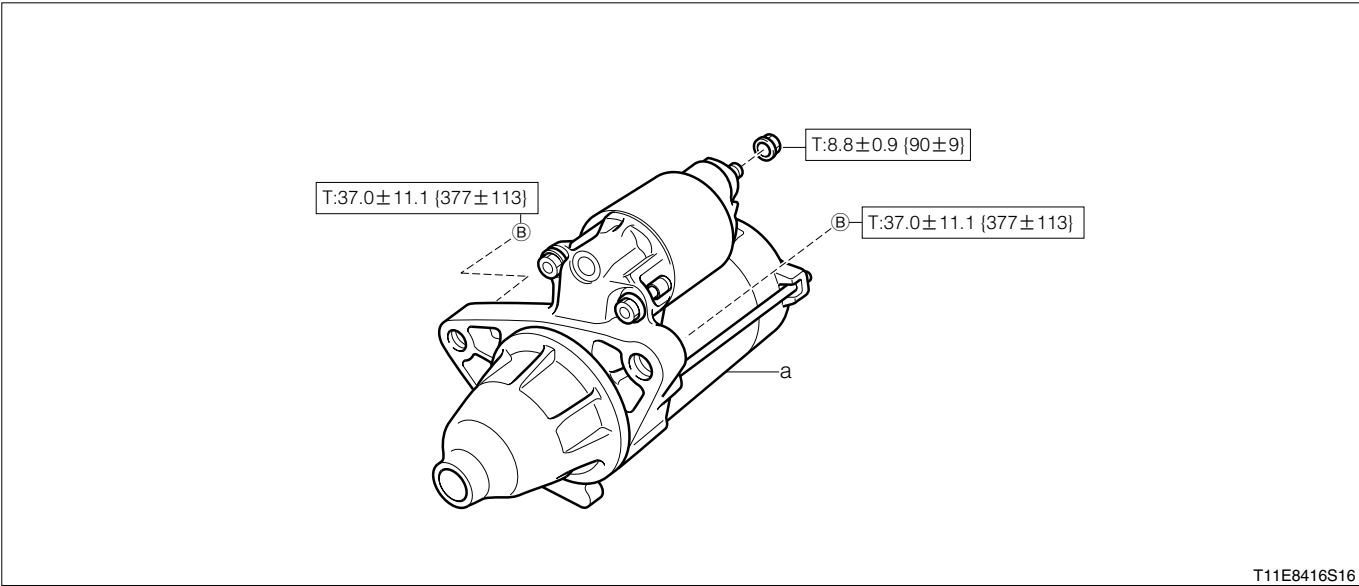
Torque wrench,Electrical tester

2-1-2 OPERATION BEFORE REMOVAL

1. Disconnect the negative (-) terminal of the battery.

2-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



T11E8416S16

Unit:N·m{kgf·cm}

(2) Removal and installation procedures

▼ 1 a Starter Ay

2-1-4 POINTS OF REMOVAL

(1) Starter Ay

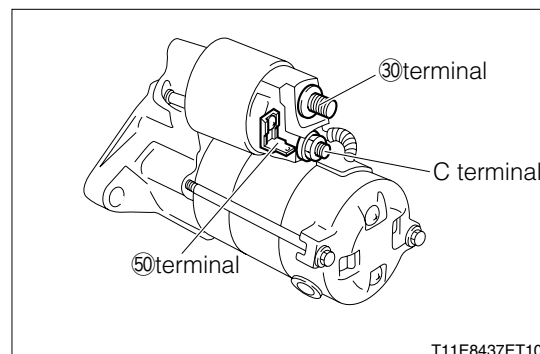
1. After removing the attaching bolts, take out the starter assembly from the engine compartment to the upper section of the vehicle.

2-1-5 INSPECTION

(1) Points to be observed and terminal positions

CAUTION

- Make sure to perform each check in a short length of time (Three to five seconds).

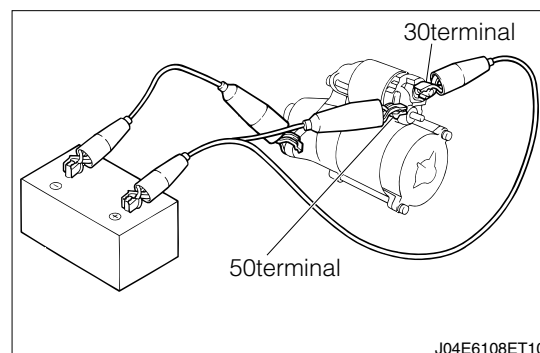


(2) Operation check

CAUTION

- A large current will flow during the test. Hence, be certain to employ a heavy lead wire.

1. Secure the starter with a vice etc.
2. Connect the cables as shown in the figure. (At this time, do not connect the wire for terminal 50.)
3. Connect the terminal 50. Ensure that the pinion gear jumps out and turns.
4. Disconnect the terminal 50. Ensure that the pinion gear stops its turning and returns to the original position.



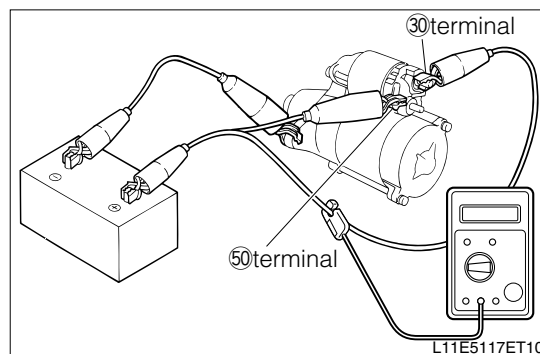
(3) No-load test

CAUTION

- A large current will flow during the test. Hence, be certain to employ a heavy lead wire.

1. Secure the starter with a vice etc.
2. Perform wiring to the cable and tester, as indicated in the figure. (At this time, do not connect the wire for the terminal 50.)
3. Connect the terminal 50. When the ammeter reading has stabilized, take the reading of the ammeter.

SPECIFIED VALUE: 50A or less(0.7kW type)
90A or less(1.0kW type)



2-1-6 OPERATION AFTER INSTALLATION

1. Connect the negative (-) terminal of the battery.

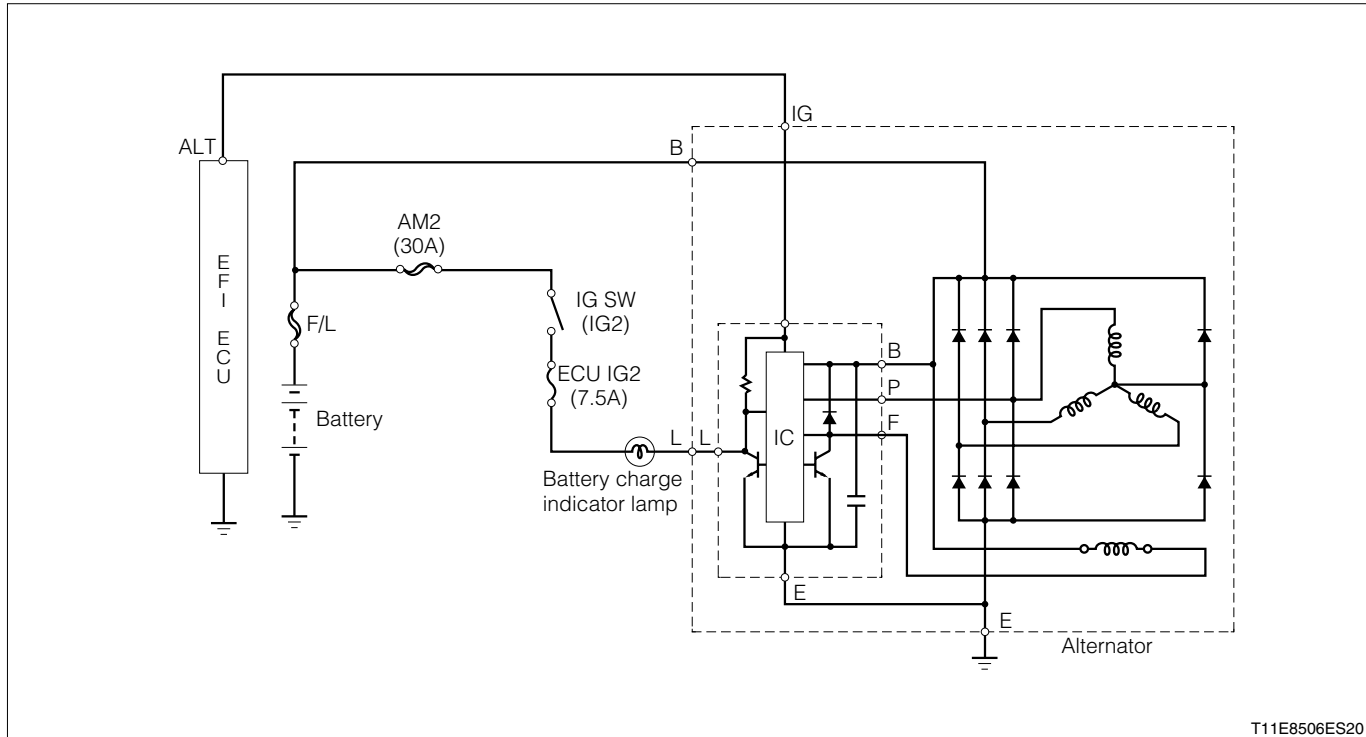
3 CHARGING SYSTEM

3-1 ARTICLES TO BE PREPARED

Instrument

Electrical tester

3-2 SYSTEM DIAGRAM



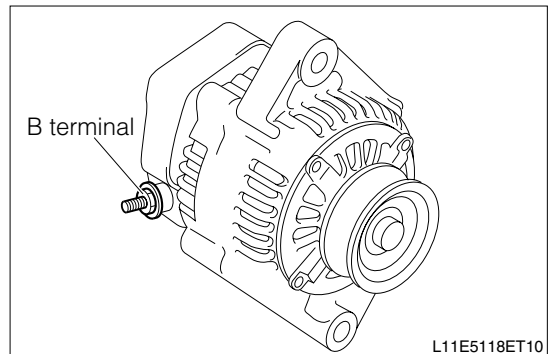
3-3 IN-VEHICLE CHECK

3-3-1 PRE-CHECK

1. After conducting the checks given below, carry out the in-vehicle check.
 - (1) Check the battery terminals for connecting state.
 - (2) Check the deflection amount of the V-belt.
 Refer to Page B1-1.
- (3) Check the fuse.
- (4) Check the wiring.
- (5) Check that the alternator emits abnormal noise while the engine is running.

3-3-2 NO-LOAD TEST

1. Connect a tester to the harness connected to the terminal B in the right figure.
2. Gradually raise the engine speed up to 2100 to 2300 rpm. Measure the current.
SPECIFIED VALUE: 10A or less (25°C)
3. Measure the battery voltage at this time.
SPECIFIED VALUE: 14.2 - 14.8V(25°C)



3-3-3 LOAD TEST

1. Under the conditions of the no-load test, turn ON the high beams of the headlamps and set the heater blower switch to the high position.
2. Gradually raise the engine speed up to 2000 rpm. Measure the current.
SPECIFIED VALUE: 30A or more

NOTE

- It should be noted that the charging current may become smaller when the battery is in a fully charged state. Therefore, replace the present battery with a battery that has been discharged to some extent or increase the electrical load (Hazard lamps or defogger etc.) Carry out the measurement again.

4 ALTERNATOR

4-1 REMOVAL AND INSTALLATION

4-1-1 ARTICLES TO BE PREPARED

Instrument

Torque wrench

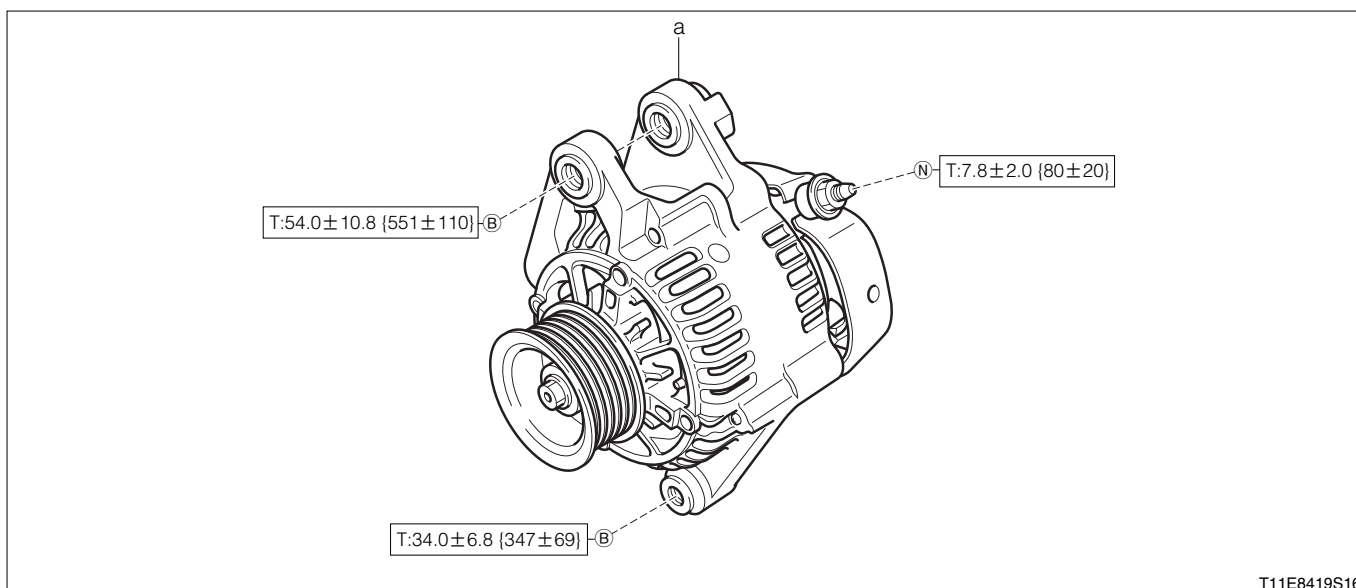
4-1-2 OPERATION BEFORE REMOVAL

1. Disconnect the negative (-) terminal of the battery.
2. Remove the front bumper cover.
Refer to Page I2-1.

3. Remove the V-ribbed belt.

4-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



(2) Removal and installation procedures

- 1 a Alternator Ay

4-1-4 OPERATION AFTER INSTALLATION

1. Install the V-ribbed belt and adjust the tension.
Refer to Page B1-1.
2. Install the front bumper cover.
Refer to Page I2-1.
3. Install the negative terminal of the battery.

B12 ENGINE MOUNTING

ENGINE MOUNTING RIGHT INSULATOR -----	B12—1
REMOVAL AND INSTALLATION-----	B12—1
ENGINE MOUNTING LEFT INSULATOR -----	B12—2
REMOVAL AND INSTALLATION-----	B12—2
ENGINE MOUNTING REAR INSULATOR-----	B12—4
REMOVAL AND INSTALLATION-----	B12—4

B12-1

1 ENGINE MOUNTING RIGHT INSULATOR

1-1 REMOVAL AND INSTALLATION

1-1-1 ARTICLES TO BE PREPARED

Instrument

Torque wrench

Lubricant,adhesive,others

Wooden block

1-1-2 OPERATION BEFORE REMOVAL

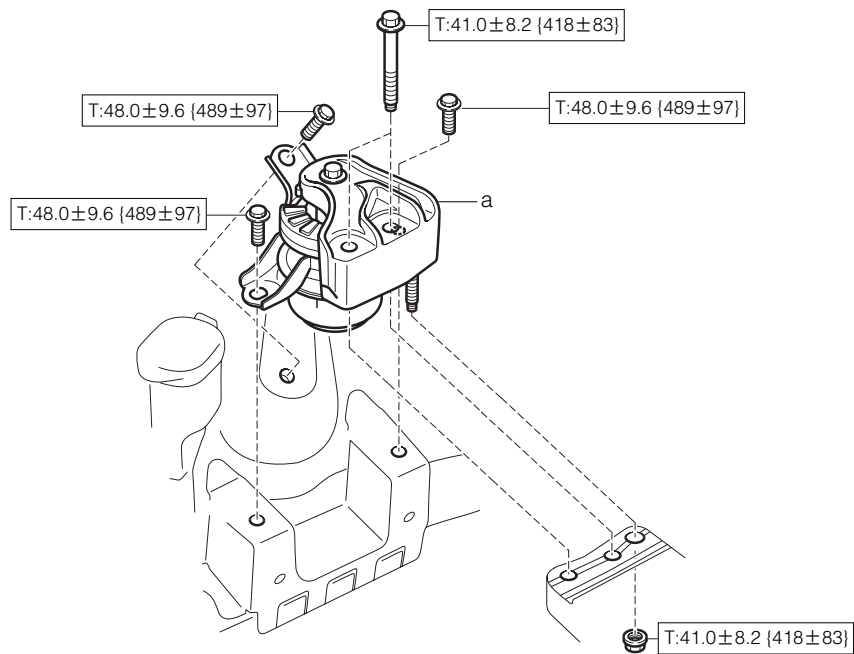
1. Disconnect the air cleaner hose No.1.
Refer to Page B3-1.

2. Lift up the vehicle.
3. Remove the engine under cover RH.

1-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components

① Vehicle mounted with type 1KR engine



T11C5052_1S24

Unit:N·m{kgf·cm}

(2) Removal and installation procedures

- ▼ ▲ 1 a Insulator S/A, engine mounting, RH

1-1-4 POINTS OF REMOVAL

(1) Insulator S/A, engine mounting, RH

1. Apply a garage jack to the joint section between the engine Ay and the manual transaxle Ay to support.

CAUTION

- When applying a garage jack, be sure to interpose a wooden block or cloth so as not to scratch the parts.

2. Apply a garage jack to the joint section of the engine Ay and the compressor Ay with magnet clutch.

CAUTION

- When applying a garage jack, be sure to interpose a wooden block or cloth so as not to scratch the parts.
- Be very careful not to bring the garage jack in contact with the tank section of the oil pan S/A. (Engine)

3. Remove the insulator S/A.

NOTE

- Do not disassemble the insulator section and bracket section during the removal of the insulator S/A.

1-1-5 INSPECTION

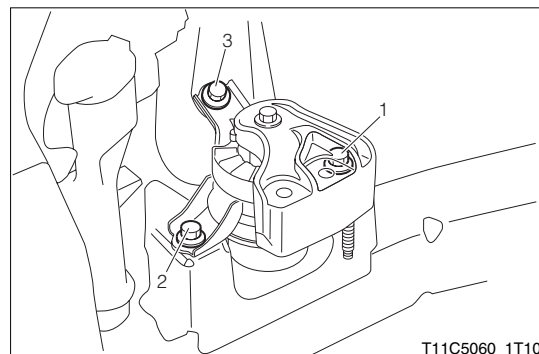
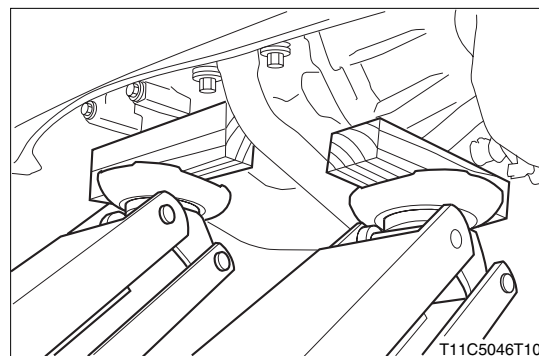
(1) Insulator S/A, engine mounting, RH

1. Replace any insulator S/A that exhibits cracks, fluid leakage or a flattened condition.

1-1-6 POINTS OF INSTALLATION

(1) Insulator S/A, engine mounting, RH

1. Install the insulator S/A while adjusting the position of the engine with a garage jack.
2. Thoroughly tighten the three attaching bolts at the body side in the order of (1), (2) and (3) indicated in the right figure.
3. Lower the garage jack. With the load applied to the insulator S/A, thoroughly tighten the bolts and nuts connected to the engine Ay.



1-1-7 OPERATION AFTER INSTALLATION

1. Install the engine under cover RH.
2. Lift down the vehicle.
3. Connect the air cleaner hose No.1.
 - (1) Vehicle mounted with Type 1KR engine
 Refer to Page B3-1.

2 ENGINE MOUNTING LEFT INSULATOR

2-1 REMOVAL AND INSTALLATION

2-1-1 ARTICLES TO BE PREPARED

Instrument

Torque wrench

Lubricant, adhesive, others

Wooden block

B12-3

2-1-2 OPERATION BEFORE REMOVAL

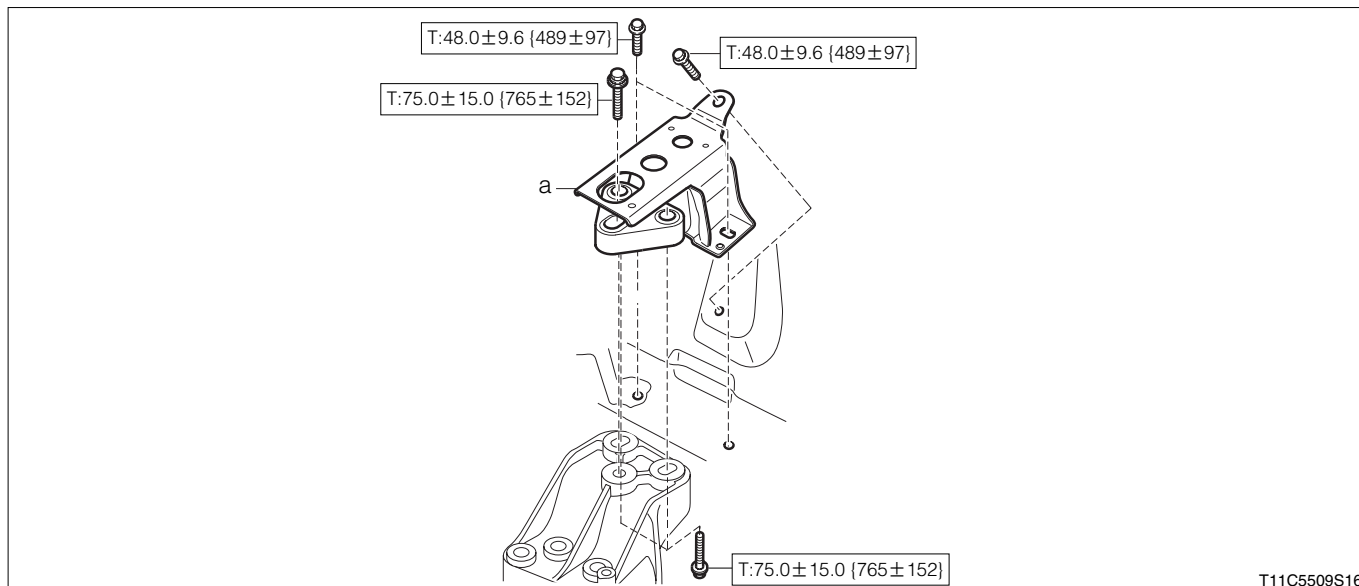
1. Remove the battery carrier.

Refer to Page J5-2.

2. Lift up the vehicle.
3. Remove the engine under cover LH.

2-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



(2) Removal and installation procedures

- ▼ ▲ 1 a Insulator S/A, engine mounting, LH

2-1-4 POINTS OF REMOVAL

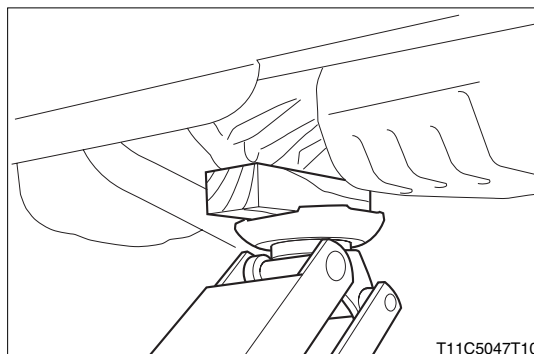
(1) Insulator S/A, engine mounting, LH

1. Apply a garage jack to the joint section between the engine Ay and the manual transaxle Ay to support.

CAUTION

- When applying a garage jack, be sure to interpose a wooden block or cloth so as not to scratch the parts.

2. Remove the insulator S/A.



2-1-5 INSPECTION

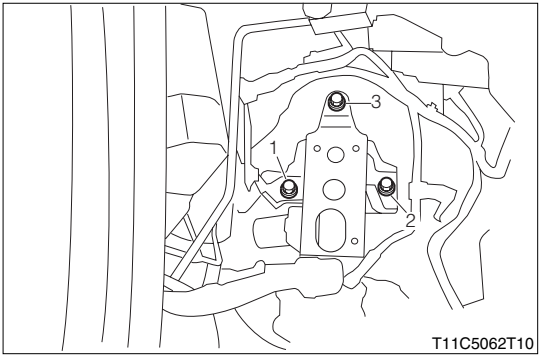
(1) Insulator S/A, engine mounting, LH

1. Replace any insulator S/A that exhibits cracks, or a flattened condition.

2-1-6 POINTS OF INSTALLATION

(1) Insulator S/A, engine mounting, LH

- 1. Install the insulator S/A to the body. Then, fully tighten the bolts in the sequence of (1), (2), and (3) in the right figure.
- 2. Install the insulator S/A to the LH engine mounting bracket while adjusting the position of the manual trans-axle Ay with a garage jack.
- 3. Completely lower the garage jack. Under the condition in which the load is applied to the insulator S/A, fully tighten the bolts attaching the LH engine mounting bracket.



2-1-7 OPERATION AFTER INSTALLATION

- 1. Install the engine under cover LH.
- 2. Lift down the vehicle.
- 3. Install the battery carrier.

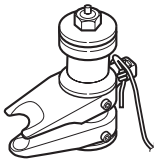
Refer to Page J5-2.

3 ENGINE MOUNTING REAR INSULATOR

3-1 REMOVAL AND INSTALLATION

3-1-1 ARTICLES TO BE PREPARED

SST

Shape	Part No.	Part name
	09628-00011-000 (09611-87701-000)	Puller,tie-rod end

Instrument

Torque wrench

Lubricant,adhesive,others

Wooden block

B12-5

3-1-2 OPERATION BEFORE REMOVAL

1. Separate the joint at the steering gear assembly side of the steering shaft universal joint assembly No.2.

Refer to Page G1-4.

2. Push out the steering column hole shield to the vehicle outside under a condition where it is attached to the steering gear assembly.
3. Lift up the vehicle.
4. Remove the disc wheels. (Front)
5. Remove the front speed sensor RH/LH from the steering knuckle RH/LH. (ABS-equipped vehicle)

Refer to Page E3-3.

6. Remove the front disc brake caliper Ay RH/LH and suspend it with wire, etc.
7. Remove the Front disc.
8. Separate the stabilizer link from the suspension lower arm S/A RH/LH with bush.

Refer to Page C1-12.

9. Remove the nuts of the front drive shaft Ay RH/LH.

Refer to Page D2-8.

10. Separate the steering knuckle RH/LH from the ball joint section of the tie-rod end S/A RH/LH, using the SST.

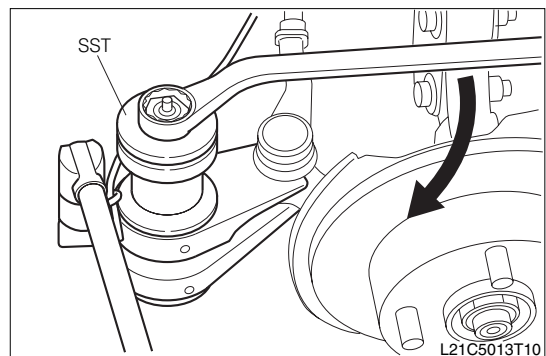
CAUTION

- When setting the SST, attach a dummy nut to the threaded portion of the tie-rod end S/A RH/LH so that the threaded portion may not be damaged.
- Hang the SST using a cord.

SST: 09628-00011-000

11. Separate the front shock absorber Ay from the steering knuckle RH/LH.

Refer to Page C1-5.



12. Pull out the front drive shaft Ay RH/LH from the steering knuckle RH/LH and suspend it with wire, etc.

Refer to Page D2-8.

13. Separate the steering knuckle RH/LH from the ball joint section of the suspension lower arm S/A with bush RH/LH, using the SST.

CAUTION

- When setting the SST, attach a dummy nut to the threaded portion of the suspension lower arm S/A with bush RH/LH so that the threaded portion may not be damaged.
- Hang the SST using a cord.

SST: 09628-00011-000

14. Remove the exhaust front pipe Ay.

Refer to Page B4-2.

15. Remove the transmission floor shift Ay.

Refer to Page F2-10.

16. Apply a garage jack to the joint section between the engine Ay and the manual transaxle Ay to support.

CAUTION

- When applying a garage jack, be sure to interpose a wooden block or cloth so as not to scratch the parts.
- Care must be exercised so that the engine will not come down, while supporting with the garage jack.

17. Remove the bolts connecting the rear engine mounting bracket and the engine mounting control rod S/A.

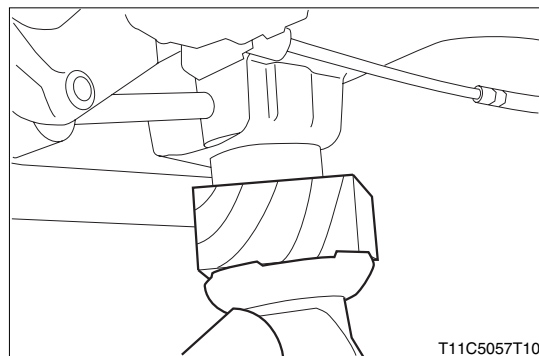
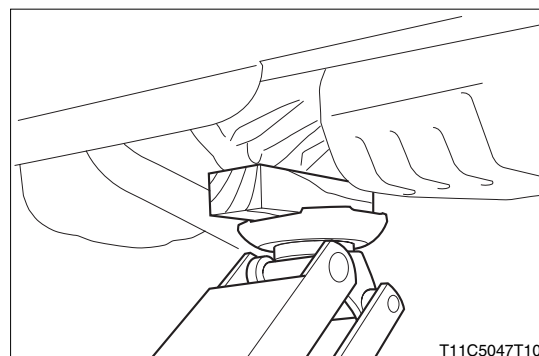
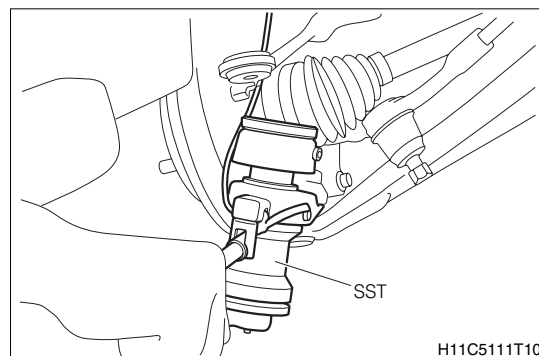
18. Apply a garage jack to the jack point of the front suspension crossmember S/A.

CAUTION

- When applying a garage jack, be sure to interpose a wooden block or cloth so as not to scratch the parts.

19. With the following parts installed, remove the front suspension crossmember S/A from the vehicle.

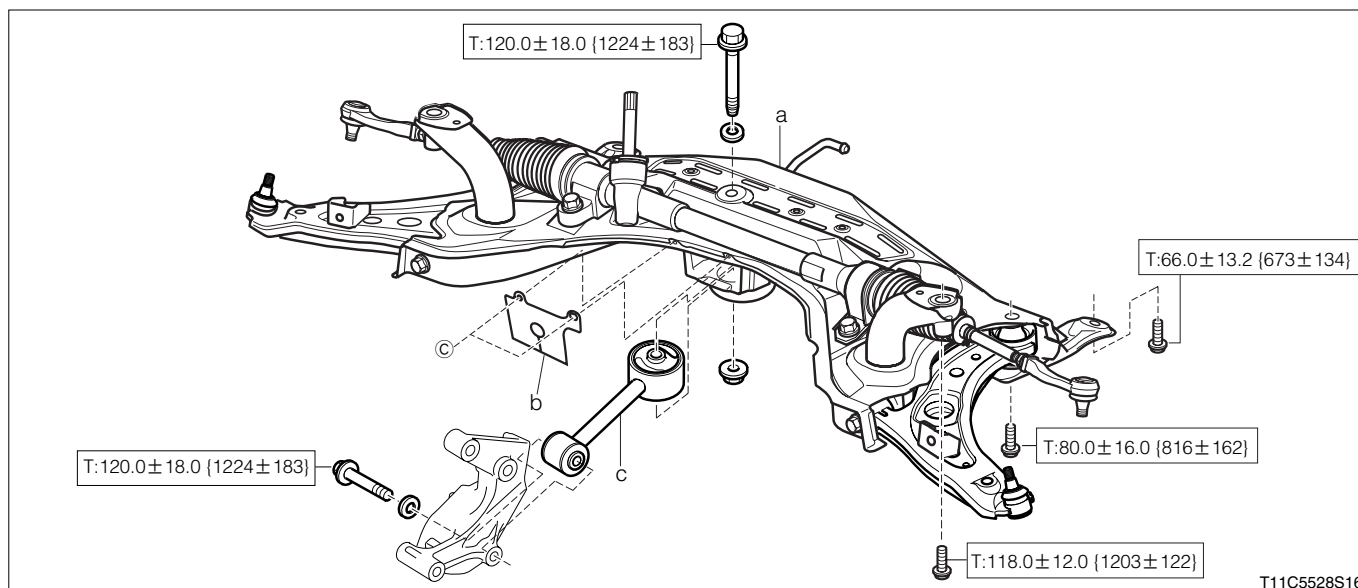
- (1) Arm S/A, suspension lower w/bush, RH/LH
- (2) Gear Ay, steering
- (3) Cover, engine mounting hole (Cold region specification vehicle)
- (4) Rod S/A, engine mounting control



B12-7

3-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



Unit: N·m {kgf·cm}

(2) Removal procedures

- 1 a Crossmember S/A, front suspension
- 2 b Cover, engine mounting hole (Cold region specification vehicle)
- 3 c Rod S/A, engine mounting control

(3) Installation procedures

- 1 a Crossmember S/A, front suspension
- ▲ 2 c Rod S/A, engine mounting control
- 3 b Cover, engine mounting hole (Cold region specification vehicle)

3-1-4 INSPECTION

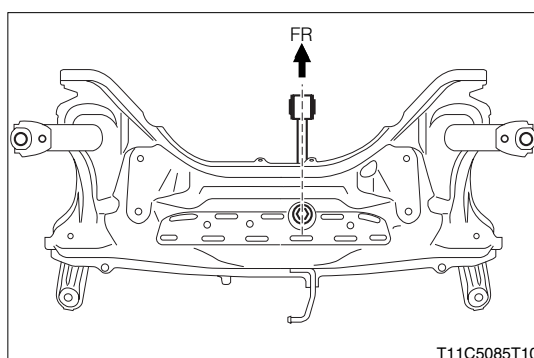
(1) Rod S/A, engine mounting control

1. Replace any rod S/A that exhibits cracks, or a flattened condition.

3-1-5 POINTS OF INSTALLATION

(1) Rod S/A, engine mounting control

1. Install the rod S/A to the front suspension crossmember S/A, making sure that it faces the front direction of the vehicle as shown in the figure. Then, tighten from the bolt side.



T11C5085T10

3-1-6 OPERATION AFTER INSTALLATION

1. With the following parts installed to the front suspension crossmember S/A, support it with a garage jack. Then, install it to the vehicle, while adjusting the position.

- (1) Arm S/A, suspension lower w/bush, RH/LH
- (2) Gear Ay, steering
- (3) Cover, engine mounting hole (Cold region specification vehicle)
- (4) Rod S/A, engine mounting control

CAUTION

- When applying a garage jack, be sure to interpose a wooden block or cloth so as not to scratch the parts.

2. Apply a garage jack to the joint section between the engine Ay and the manual transaxle Ay to support.

CAUTION

- When applying a garage jack, be sure to interpose a wooden block or cloth so as not to scratch the parts.
- Care must be exercised so that the engine will not come down, while supporting with the garage jack.

3. Tighten the bolts connecting the engine mounting rear bracket and engine mounting control rod S/A.

4. Install the transmission floor shift Ay.

Refer to Page F2-10.

5. Install the exhaust front pipe Ay.

Refer to Page B4-2.

6. Adjust the mounting dimensions of the suspension lower arm S/A with bush RH/LH.

Refer to Page C1-5.

7. Install the ball joint section of the suspension lower arm S/A with bush RH/LH to the steering knuckle RH/LH.

Refer to Page C1-5.

8. Insert the front drive shaft Ay RH/LH into the steering knuckle RH/LH.

Refer to Page C1-5.

9. Install the steering knuckle RH/LH to the front shock absorber.

Refer to Page C1-5.

10. Install the joint section of the steering tie-rod end S/A RH/LH to the steering knuckle RH/LH.

Refer to Page C1-8.

11. Tighten the nuts of the front drive shaft Ay RH/LH.

Refer to Page C1-5.

12. Install the stabilizer link to the suspension lower arm S/A with bush RH/LH.

Refer to Page C1-12.

13. Install the front disc.

14. Install the front disc brake caliper Ay RH/LH.

15. Install the front speed sensor RH/LH to the steering knuckle RH/LH.

Refer to Page E3-3.

B12-9

- 16. Install the disc wheels. (Front)
- 17. Lift down the vehicle.
- 18. Install the steering shaft universal joint Ay No.2 to the steering gear Ay.

Refer to Page G1-4.

- 19. Check and adjust the front wheel alignment.

Refer to Page C1-1.

C1 FRONT SUSPENSION

FRONT SUSPENSION -----	C1—1
BASIC CHECK AND ADJUSTMENT ---	C1—1
FRONT SHOCK ABSORBER AND FRONT COIL SPRING	
-----	C1—5
REMOVAL AND INSTALLATION-----	C1—5
FRONT SUSPENSION LOWER ARM-----	C1—8
REMOVAL AND INSTALLATION-----	C1—8
FRONT STABILIZER BAR-----	C1—12
REMOVAL AND INSTALLATION-----	C1—12
FRONT SUSPENSION MEMBER -----	C1—15
REMOVAL AND INSTALLATION-----	C1—15

C1-1

1 FRONT SUSPENSION

1-1 BASIC CHECK AND ADJUSTMENT

1-1-1 CHECK OF EACH PART OF SUSPENSION

(1) Operations prior to check

- 1. Jack up the vehicle.
- 2. Remove the front disc wheels.

(2) Check of bolts for tightening condition

- 1. Check bolts and nuts of each part of the axle and suspensions for loosen.

(3) Check of excessive play

- 1. Check each part of the axle and suspensions specified in the item given below to see if any looseness, etc. is present.
 - (1) Ball joint
 - (2) Steering linkage
 - (3) Each part of the suspension
 - (4) Front disc wheel bearing
- Refer to Page D2-2.

(4) Check of damage

- 1. Visually check each part of the axle and suspensions to see if any damage is present.

(5) Check of cracks and damage

- 1. Visually check the dust boots of the ball joints to see if any cracks and damage are present.

(6) Check of shock absorber for oil leakage

- 1. Visually check the front shock absorber sleeve section, etc. to see if any oil leakage is present.

1-1-2 FRONT WHEEL ALIGNMENT

(1) Articles to be prepared

Tool

CCK gauge compensator, Brake pedal pusher

Instrument

Turning radius gauge, Tire pressure gauge, Camber caster gauge, Dial gauge

(2) Checks prior to measurement

① Check of vehicle conditions

- 1. Check that the vehicle is in the unloaded state. (Fuel fully filled, spare tire and tools mounted)

② Check of tires for size and wear conditions

- 1. Check that the tires has no wrong size, no significant difference in wear between the right and left and uneven wear.

③ Check of tire air inflation pressure

Refer to Page C3-1.

④ Check of tires for runout

Refer to Page C3-1.

⑤ Check bolts of each part of the suspension for tightening conditions

Refer to Page C1-1.

⑥ Check of each part of the suspensions for excessive play

Refer to Page C1-1.

(3) Toe-in

① Check

1. Rock the vehicle so that it may be stabilized.
2. Move the vehicle about 5 m straight forward by pushing it by hands.

CAUTION

- When the vehicle has been moved backward, be sure to move it forward by the distance that the vehicle traveled backward.

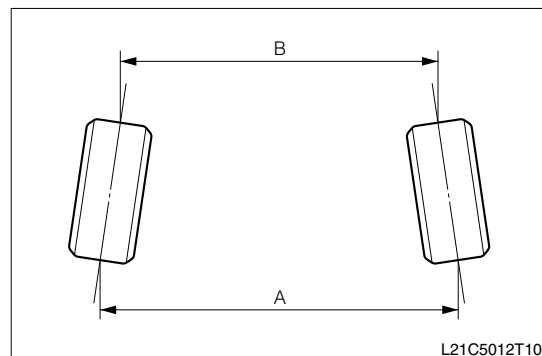
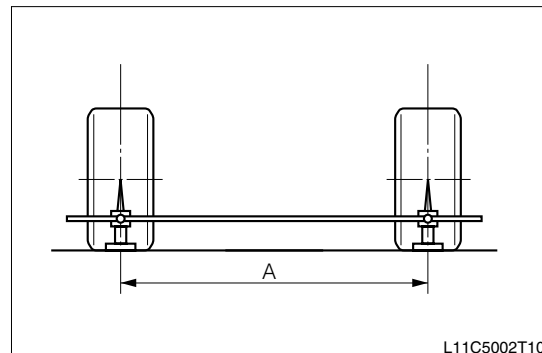
3. Align the height of the pointer of the toe-in gauge with the center height of the front disc wheel axle, and place the gauge behind the tires.
4. Put a mark on the tread center of each front wheel tire at the rear side. Measure the distance between the two marks. (Dimension A)
5. Slowly move the vehicle forward by pushing it, until the front wheels tire make 180 degrees turn.

CAUTION

- Be very careful not to turn the wheel more than 180 degrees. If the wheel is turned more than 180 degrees, repeat the operations from Step 3.

6. Measure the distance (B) between the marks at the front section of the front tires.
7. Calculate the toe-in (A-B).

SPECIFIED VALUE: $0.0 \pm 2.0 \text{ mm}$



② Adjustment

1. Detach the steering rack boot band No.2.
2. Loosen the lock nut of the tie-rod end.
3. Turn the rack ends at the right and left sides the same amount in the opposite direction and adjust them so that the toe-in may enter within the specified range.

SPECIFIED VALUE: $0.0 \pm 1.0 \text{ mm}$

4. Tighten the lock nut of the tie-rod end.

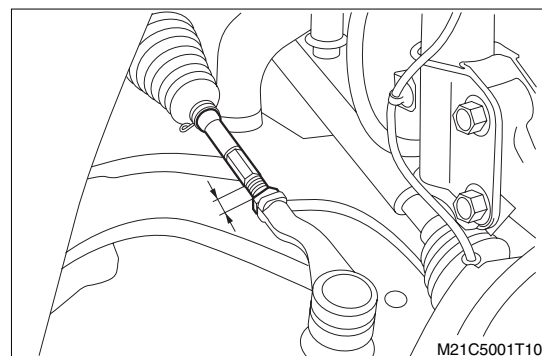
TIGHTENING TORQUE: $36.8 \pm 7.3 \text{ N} \cdot \text{m} \{375 \pm 74 \text{ kgf} \cdot \text{cm}\}$

CAUTION

- Make sure that the length indicated in the right figure is the same. (Failure to observe this caution may cause differences in the wheel turning angle.)

5. Check the toe-in again.

SPECIFIED VALUE: $0.0 \pm 1.0 \text{ mm}$



C1-3

(4) Camber, caster and kingpin inclination angle

① Check

1. Setting of turning radius gauge
2. Align the turning radius gauge with the 0 degrees position and lock it.
3. Drive the vehicle so that the center of the ground-contacting surface of the tire may be aligned with the center of the turning radius gauge.

CAUTION

- The checks should be conducted under the unloaded state and with the service brake applied, using a brake pedal pressure, so that the front wheels may not turn.
- When using a portable type turning radius gauge, make sure to put a base having the same height as the gauge so as to assure the horizontal state.
- Remove the stop lamp fuse so that the stop lamp may not be turned on.

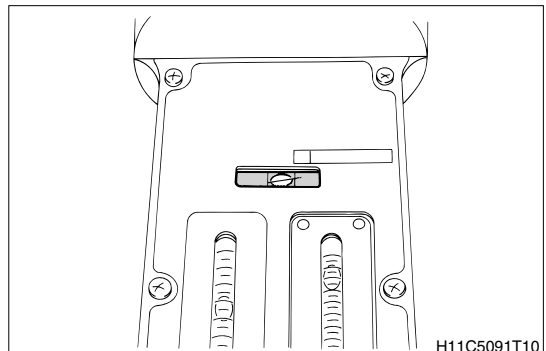
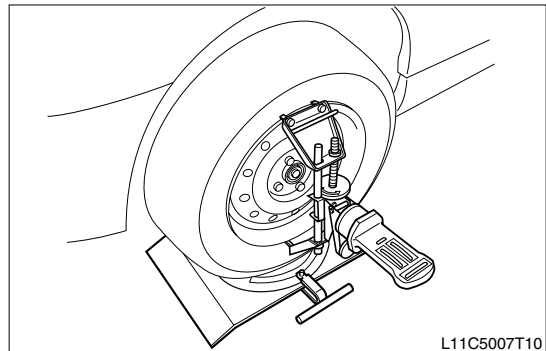
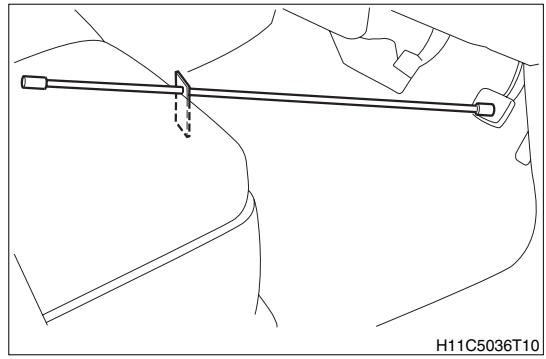
TOOL: Brake pedal pusher

4. Install a compensator to the disc wheel. Then, install a camber/caster/kingpin gauge.
5. Align the graduation of the turning radius gauge with the 0 degrees position. Unlock the turning radius gauge.
6. Install the gauge, while aligning the tip end of the center rod of the camber-caster-kingpin gauge with the designated position of the compensator.

TOOL: CCK gauge compensator

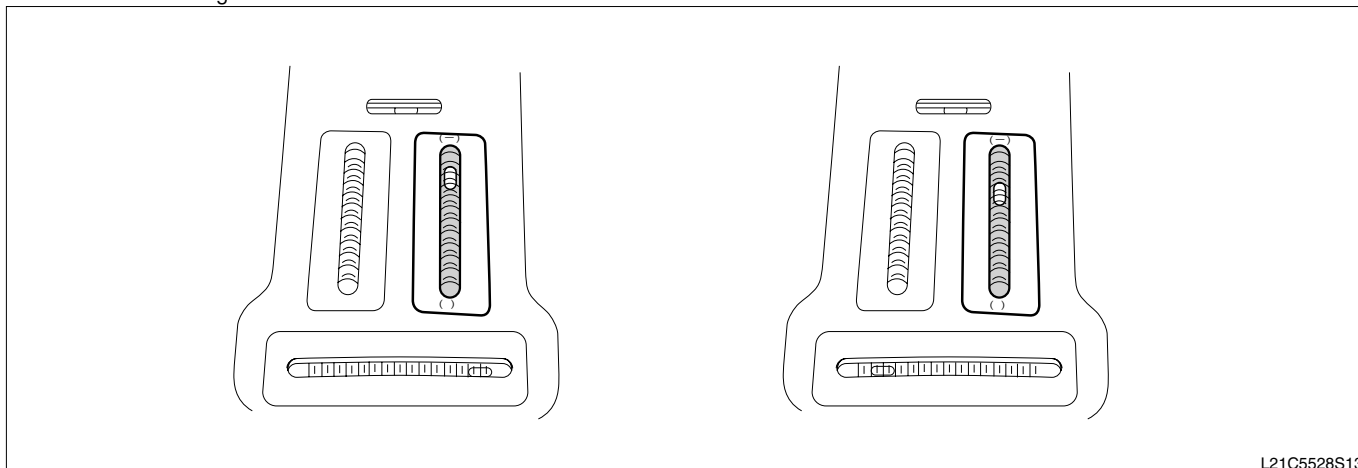
7. Check the camber.
8. Confirm the straight-ahead position.
9. Set the gauge horizontally so that a level bubble of the gauge comes at the center.
10. Read out the graduation at the center position of the bubble of the gauge for the camber measurement.

SPECIFIED VALUE: $0^{\circ} \pm 45'$

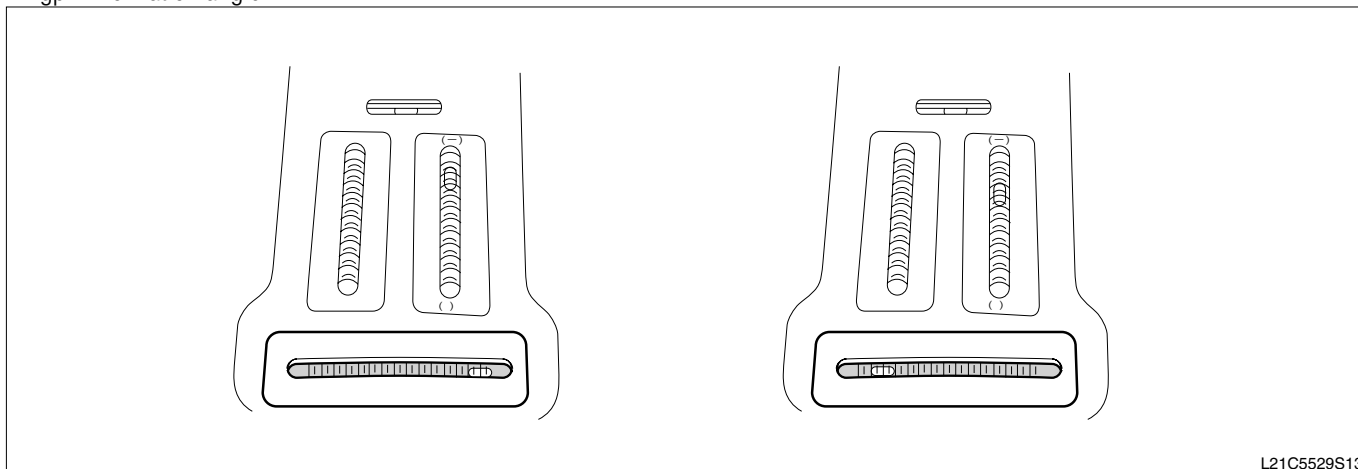


11. Check the caster angle and kingpin angle (Right wheel).

Caster inclination angle



Kingpin inclination angle



12. Turn the steering wheel clockwise until the turning radius gauge points to 20 degrees.

13. Adjust the adjusting screws of the caster angle and kingpin inclination angle until each air bubble is aligned with the "0" position.

14. Turn the steering wheel counterclockwise until the turning radius gauge points 20 degrees.

15. Read the graduation of the bubble center position at the caster angle measuring gauge and kingpin angle measuring gauge.

SPECIFIED VALUE: caster angle $3^{\circ} 28' \pm 1^{\circ}$
 kingpin inclination angle $10^{\circ} 36' \pm 1^{\circ}$

16. Check the caster angle and kingpin inclination angle (Left wheel).

NOTE

- This is a non-adjustable type, in which the camber, caster and kingpin inclination angle have already been adjusted to the specified values.

17. Remove the gauge and SST.

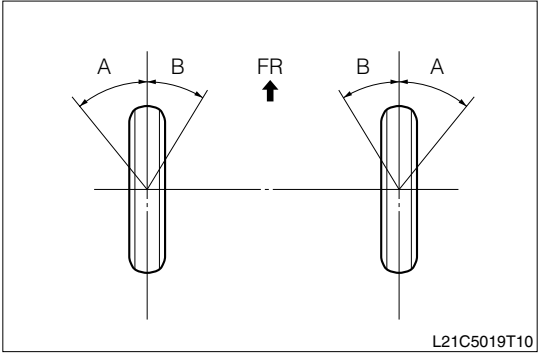
C1-5

(5) Wheel turning angle

① Check

1. Turn the steering wheel fully to the right and to the left.
At this time, check the wheel turning angle.

Tire	Inside (A)	Outside (B)
155/80R13	45 ° 42' ^{+2°} _{-3°}	37 ° 00' ^{+2°} _{-3°}
175/65R14	40 ° 00' ^{+2°} _{-3°}	33 ° 48' ^{+2°} _{-3°}



② Adjustment

1. If the turning angles differ greatly between the right and left sides or they are deviated greatly from the specified values, carry out the check and adjustment of the toe-in.

(6) Front side slip

① Check

NOTE

- Even when the side slip value is within the range of the specified value, if there is any abnormality, be sure to check and adjust the above items.

1. Check the side slip, using a side slip tester.
SPECIFIED VALUE: In 5 mm - out 5 mm

2 FRONT SHOCK ABSORBER AND FRONT COIL SPRING

2-1 REMOVAL AND INSTALLATION

WARNING

- If you try to remove the lock nut without using the SST, the front coil spring would jump out, posing a serious danger. Therefore, make sure to employ the SST.

2-1-1 ARTICLES TO BE PREPARED

SST

Shape	Part No.	Part name
	09727-30021-000 (09727-30020-000)	Compressor, front coil spring

Instrument

Torque wrench

2-1-2 OPERATION BEFORE REMOVAL

1. Jack up the vehicle.

2. Remove the disc wheel. (Front)

Refer to Page C3-2.

3. Remove the clamp section of the flexible hose.

Refer to Page E1-25.

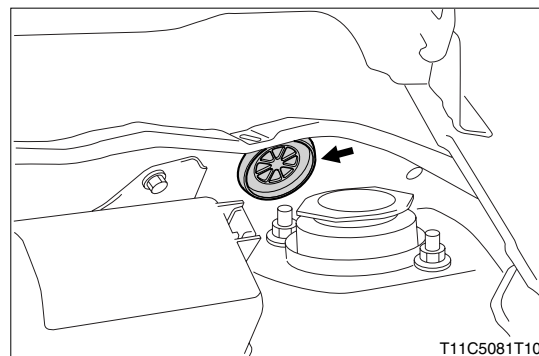
4. Remove the clamp section of the front speed sensor RH/LH. (ABS-equipped vehicle)

Refer to Page E3-3.

5. Remove the cowl top ventilator louver S/A RH/LH.

Refer to Page I2-4.

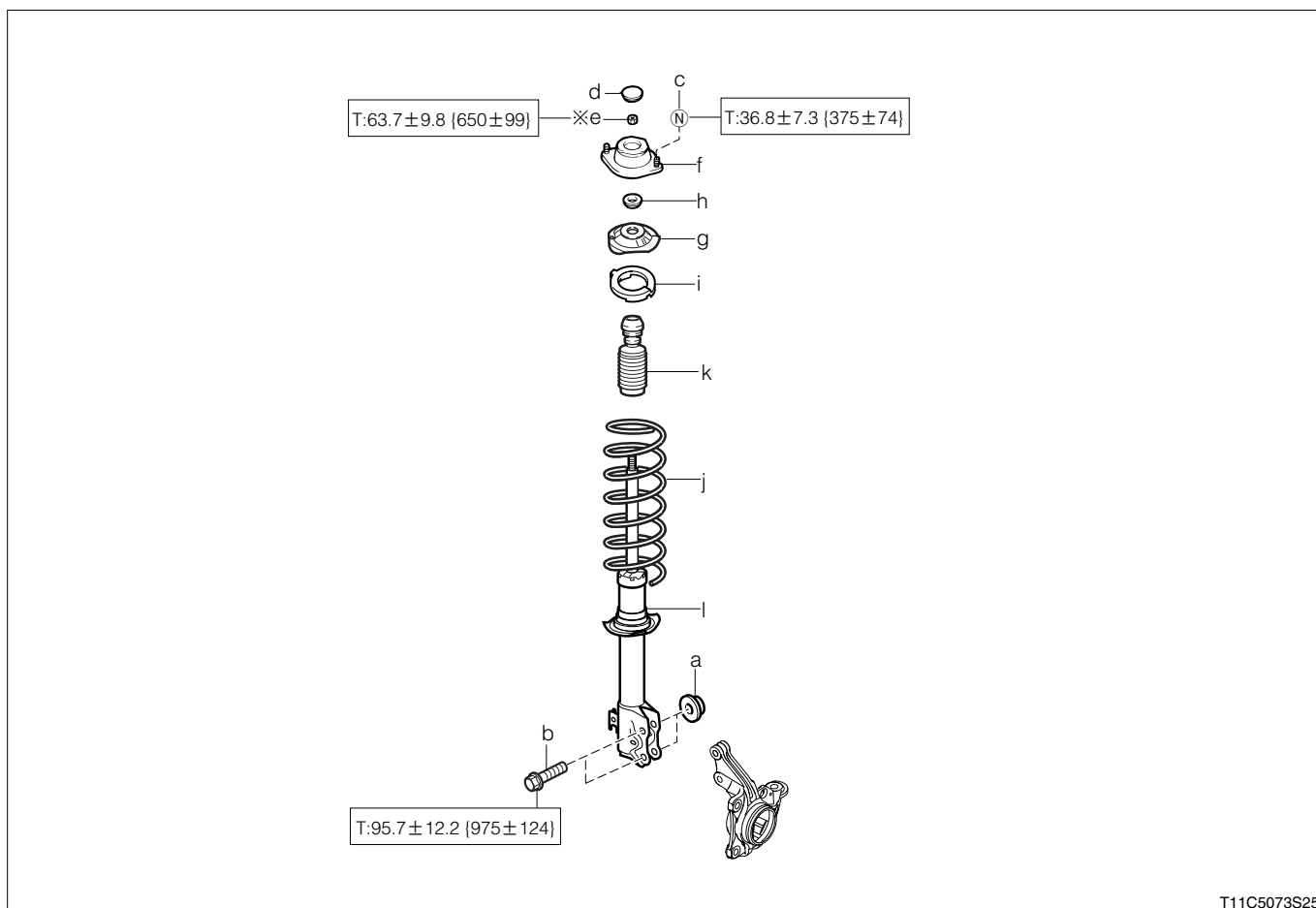
6. Disconnect the control cable from the cowl top inner panel S/A.



T11C5081T10

2-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



T11C5073S25

※:Non - reusable parts

Unit:N·m{kgf·cm}

(2) Removal and installation procedures

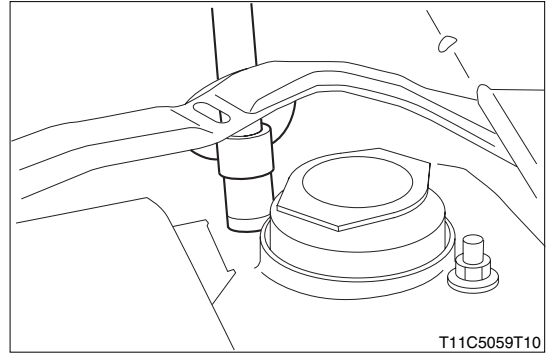
1 a Nut, hexagon	7 g Seat Ay, front spring, upper
2 b Bolt, hexagon	8 h Bearing, strut mounting
3 c Nut	9 i Insulator, front coil spring
4 d Cover, bearing dust	▼ ▲ 10 j Spring, coil, front
5 e Nut, lock	11 k Bumper, front spring
▼ 6 f Support S/A, front suspension	12 l Absorber Ay, shock, front

C1-7

2-1-4 POINTS OF REMOVAL

(1) Support S/A, front suspension

1. Put the tool through the service hole so as to remove the nut of the support S/A.



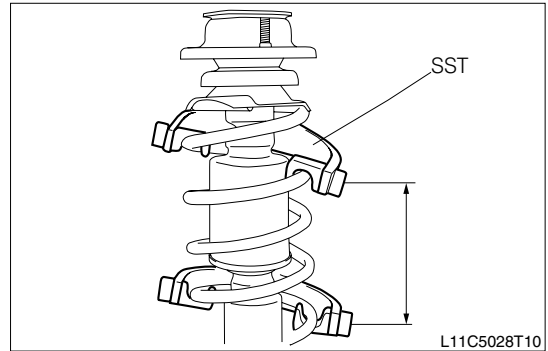
(2) Spring, front, coil

1. Install the SST to the spring.
2. Compress the spring fully.

WARNING

- At this time, make sure that the SST is installed in such a way that the distance between the hooks becomes the greatest.
- When compressing the spring, do not use an impact wrench.

SST: 09727-30021-000

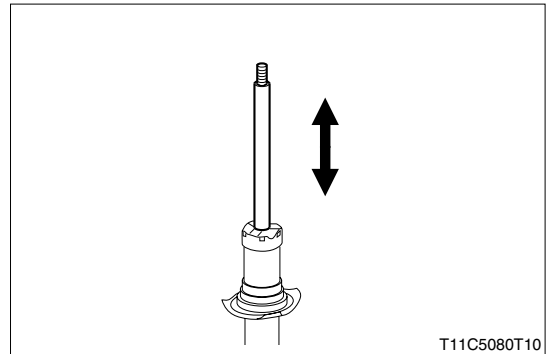


2-1-5 INSPECTION

(1) Absorber AY, shock, front RH/LH

1. Check the operation of the shock absorber Ay by compressing and expanding it.

SPECIFIED VALUE: When the shock absorber is compressed by hand, ensure that it can be compressed with a certain resistance, but without binding. When you release your hand after compressing the shock absorber, ensure that it is extended at a constant speed by itself.



(2) Spring, front, coil

1. Check the spring for cracks, wear and damage.

2-1-6 POINTS OF INSTALLATION

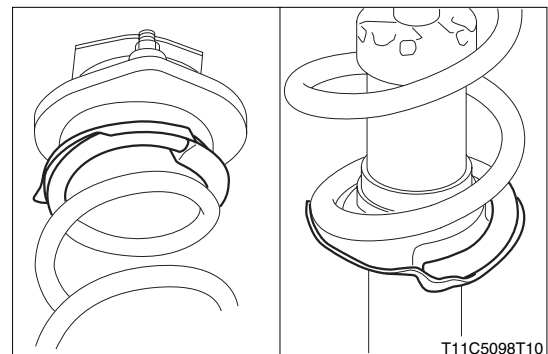
(1) Spring, front, coil

1. Install the spring to the front shock absorber assembly RH/LH, using the SST.

WARNING

- At this time, make sure that the SST is installed in such a way that the distance between the hooks becomes the greatest.
- When compressing the spring, do not use an impact wrench.
- Make sure to align the groove of the spring seats at the upper and lower sides with the edge of the spring.

SST: 09727-30021-000



2-1-7 OPERATION AFTER INSTALLATION

1. Install the hole plug to the inner top cowl panel S/A.
2. Install the cowl top ventilator louver S/A RH/LH.
Refer to Page I2-4.
3. Install the clamp section of the front speed sensor RH/LH. (ABS-equipped vehicle)
Refer to Page E3-3.
4. Install the clamp section of the flexible hose.
Refer to Page E1-25.
5. Install the disc wheel. (Front)
Refer to Page C3-2.
6. Jack down the vehicle.
7. Check and adjust the front wheel alignment.
Refer to Page C1-2.

3 FRONT SUSPENSION LOWER ARM

3-1 REMOVAL AND INSTALLATION

3-1-1 ARTICLES TO BE PREPARED

SST

Shape	Part No.	Part name
	09628-00011-000 (09611-87701-000)	Puller, tie-rod end

Instrument

Torque wrench

Lubricant, adhesive, others

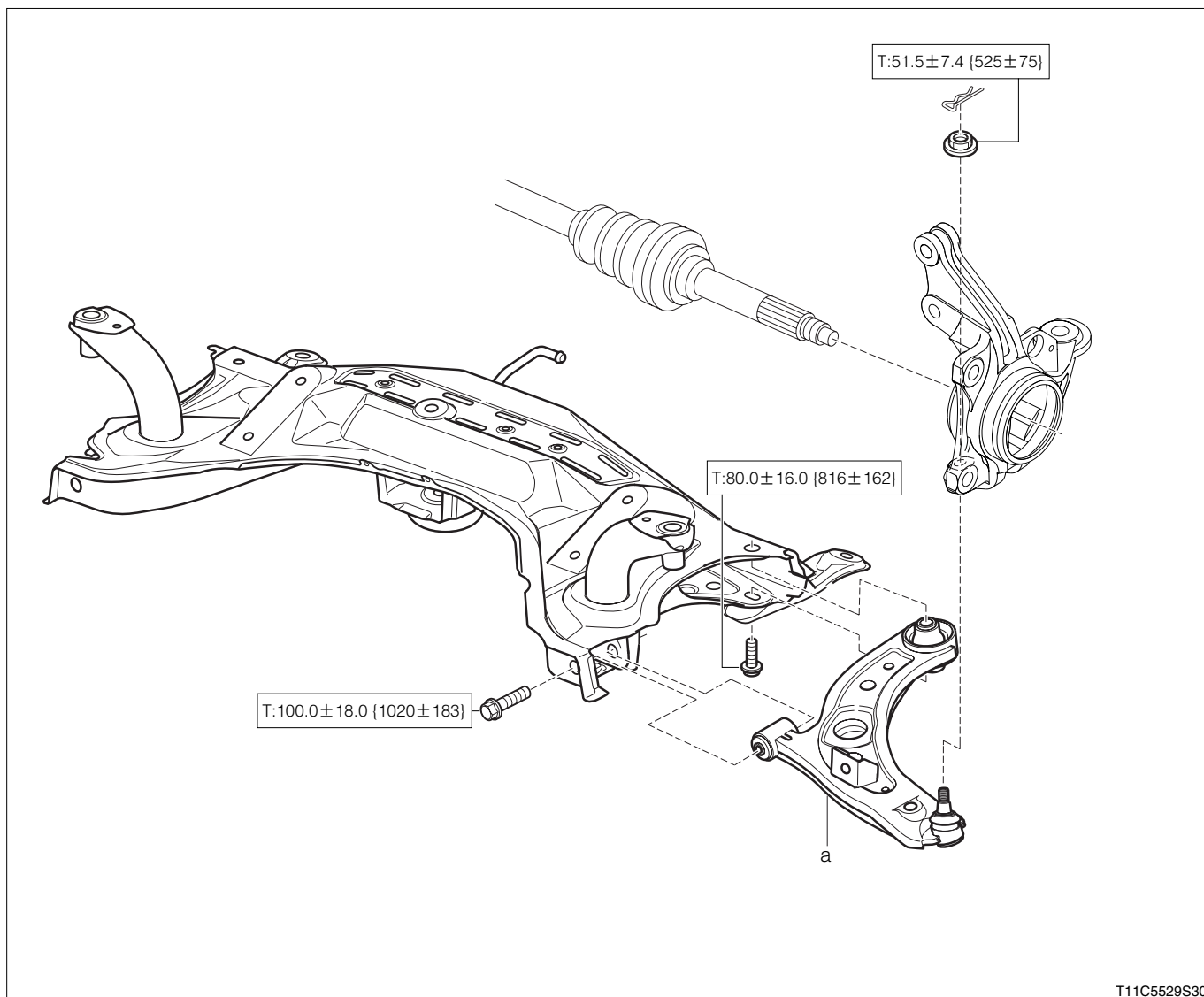
Wire

3-1-2 OPERATION BEFORE REMOVAL

1. Jack up the vehicle.
2. Remove the disc wheel. (Front)
Refer to Page C3-2.
3. Remove the front speed sensor RH/LH from the steering knuckles RH/LH. (ABS-equipped vehicles)
Refer to Page E3-3.
4. Remove the front disc brake caliper Ay RH/LH. Hang them with wire, etc.
Refer to Page E1-33.
5. Remove the front disc.
Refer to Page E1-39.
6. Separate the stabilizer link from the suspension lower arm S/A RH/LH with bush.
Refer to Page C1-12.
7. Remove the nut of the front drive shaft Ay RH/LH.
Refer to Page D2-8.
8. Separate the front shock absorber Ay from the steering knuckles RH/LH.
Refer to Page C1-5.
9. Pull out the front drive shaft Ay RH/LH from the steering knuckles RH/LH. Then, hang it with wire, etc.
Refer to Page D2-15.

3-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



Unit:N·m{kgf·cm}

(2) Removal and installation procedures

- ▼ ▲ 1 a Arm S/A, suspension lower arm w/bush, RH/LH

3-1-4 POINTS OF REMOVAL

(1) Arm S/A, Suspension lower w/bush, RH/LH

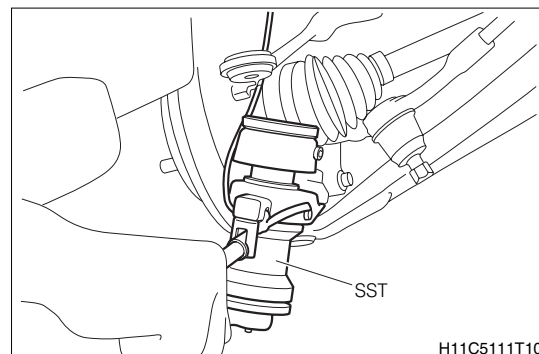
1. Separate the steering knuckles RH/LH from the ball joint section of the arm S/A, using the SST.

CAUTION

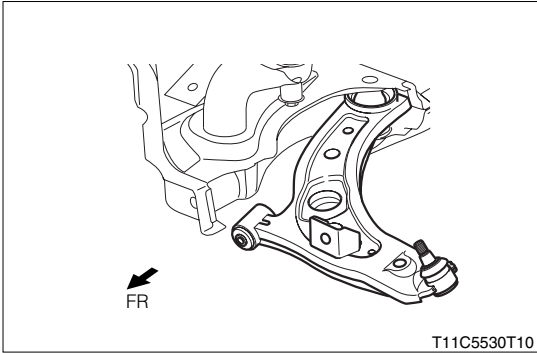
- When setting the SST, attach a dummy nut to the threaded portion of the arm subassembly so that the threaded portion may not be damaged.
- Hang the SST using a cord.

SST: 09628-00011-000

2. Remove the two bolts that connect the arm S/A with the front suspension cross member S/A.



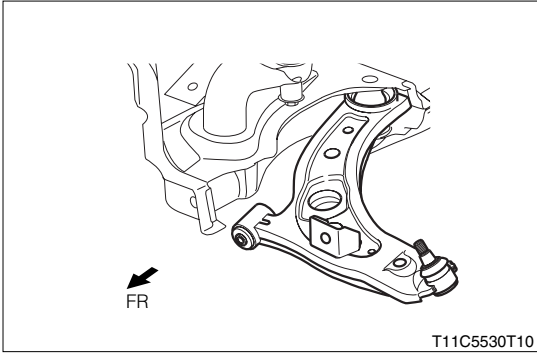
3. Remove the arm S/A from the front side of the vehicle.



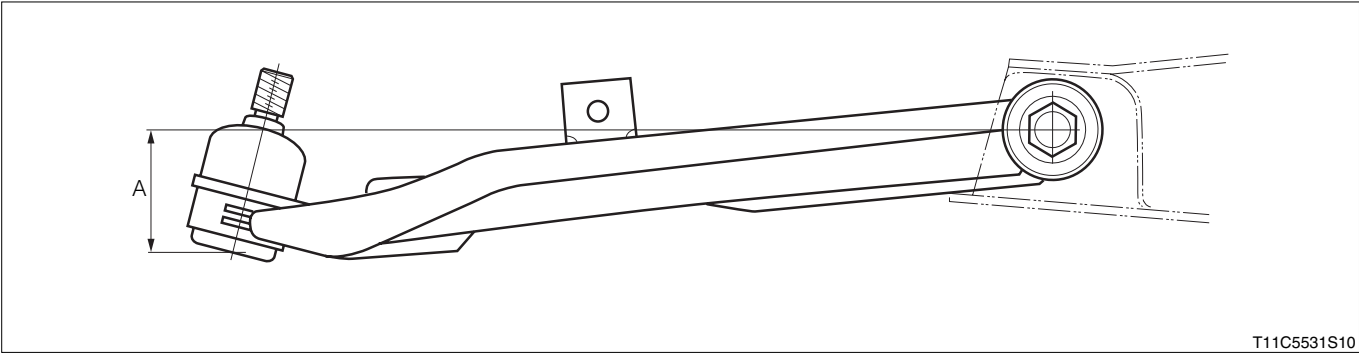
3-1-5 POINTS OF INSTALLATION

(1) Arm S/A, suspension lower w/bush, RH/LH

1. Install the arm S/A from the rear side of the vehicle.



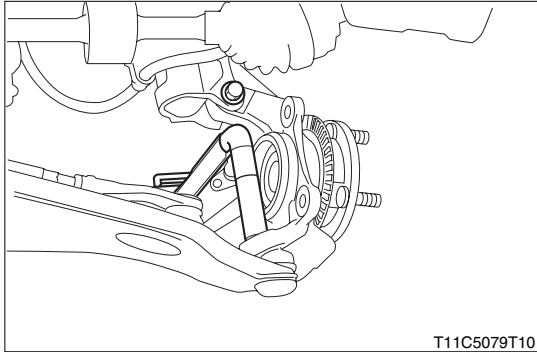
(1) Tighten the arm S/A to the dimensions indicated in the figure. Or, temporarily tighten the arm S/A at this step. Then, rock the vehicle several times under a condition where the vehicle weight is applied, thus stabilizing the suspension. Finally, securely tighten the bolts.



SPECIFIED VALUE:

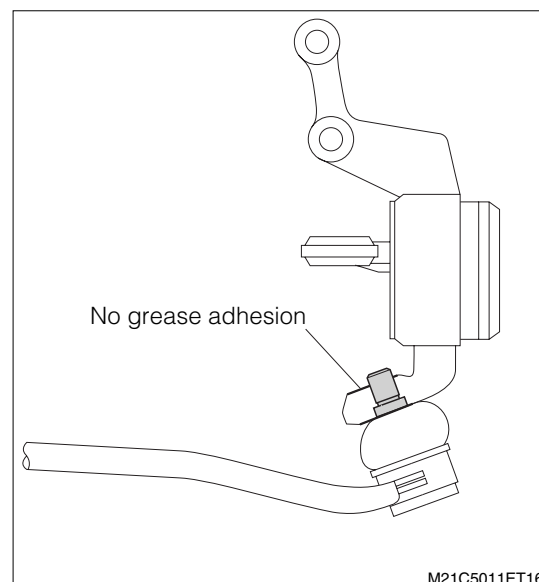
Measuring point	Dimension A [mm]
Lower arm bush - Lowest edge of arm S/A	46±5

2. Temporarily install the front suspension absorber Ay and the steering knuckle RH/LH.
3. Install the arm S/A to the steering knuckle RH/LH. Tighten them securely.



CAUTION

- During the assembly, ensure that no oil nor grease is adhered to the threaded portion of the ball stud, tapered section, and steering knuckle RH/LH installation section of the arm subassembly. If oil or grease is adhered, be certain to wipe it off.

**3-1-6 OPERATION AFTER INSTALLATION**

- Insert the front drive shaft Ay RH/LH to the steering knuckle RH/LH.
Refer to Page D2-15.
- Install the steering knuckle RH/LH to the front shock absorber Ay.
Refer to Page C1-5.
- Tighten the nuts of the front drive shaft Ay RH/LH.
Refer to Page D2-15.

Refer to Page C1-12.
- Install the Front disc.
Refer to Page E1-39.
- Install the front disc brake caliper Ay RH/LH.
Refer to Page E1-33.
- Install the front speed sensors RH/LH to the steering knuckles RH/LH. (ABS-equipped vehicles)
Refer to Page E3-3.
- Install the disc wheel. (Front)
Refer to Page C3-2.
- Jack down the vehicle.
- Check and adjust the front wheel alignment.
Refer to Page C3-2.

4 FRONT STABILIZER BAR**4-1 REMOVAL AND INSTALLATION****4-1-1 ARTICLES TO BE PREPARED**

Instrument

Torque wrench

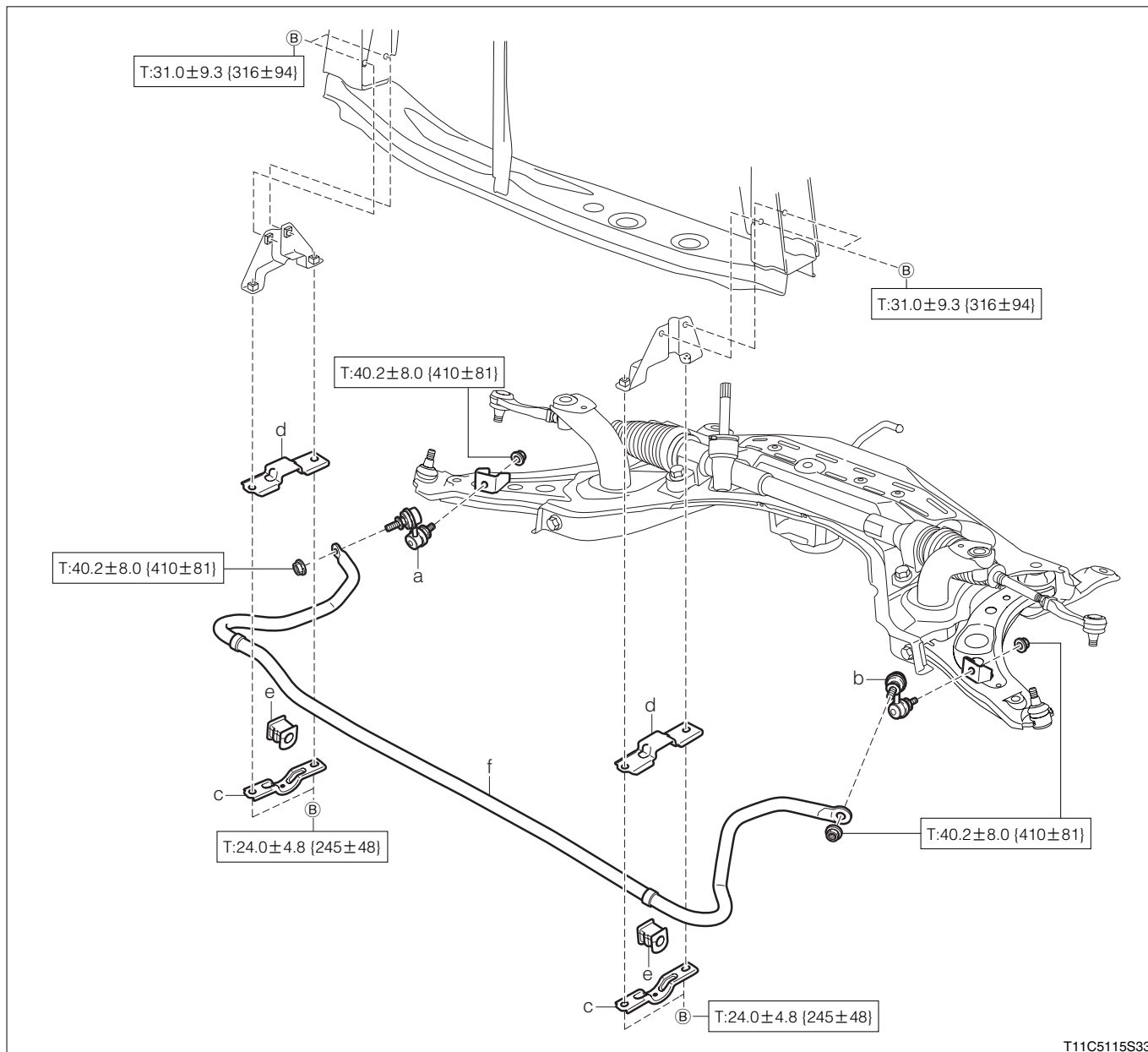
C1-13

4-1-2 OPERATION BEFORE REMOVAL

1. Lift up the vehicle.
2. Remove the disc wheels. (Front)

4-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



T11C5115S33

Unit: N·m {kgf·cm}

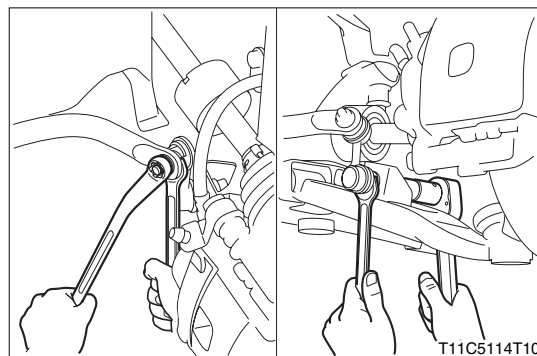
(2) Removal and installation procedures

▼ ▲ 1	a Link, stabilizer, No.1	▼ ▲ 6	f Bar, stabilizer, front
▼ ▲ 2	b Link, stabilizer, No.2		
▲ 3	c Bracket, stabilizer, No.2		
▲ 4	d Bracket, stabilizer		
5	e Bush, stabilizer		

4-1-4 POINTS OF REMOVAL

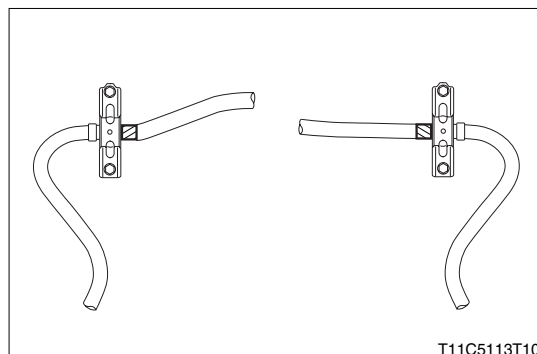
(1) Link, stabilizer

1. When removing the link, be sure to secure the nut section, using a spanner, so that no excessive force may be applied to the ball joint section.



(2) Bar, stabilizer, front

1. Put a mating mark at the position where the bar is assembled with the stabilizer bush.



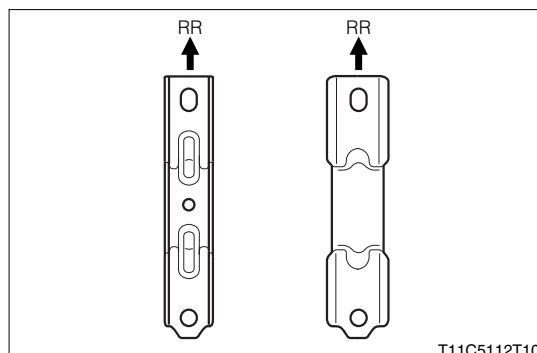
4-1-5 POINTS OF INSTALLATION

(1) Bar, stabilizer, front

1. Install the stabilizer bushing to the bar, while referring to the mating mark that has been put during the removal operation.

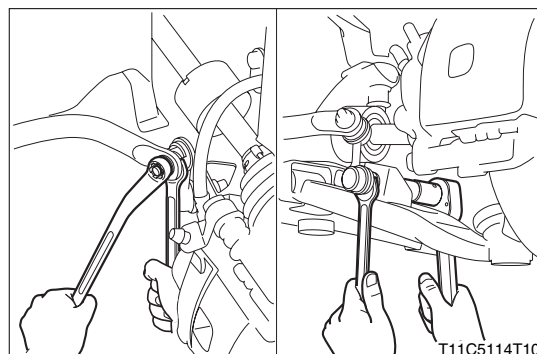
(2) Bracket, stabilizer

1. Install the bracket in such a way that the side at which an elongated hole is provided comes to the vehicle rear side. Then, gradually tighten the attaching bolts alternately at the front and rear sides, while exercising utmost care so that the bracket may not be tilted.



(3) Link, stabilizer

1. When tightening the hexagon nut, be sure to secure the nut section of the link so that no excessive force may be applied to the ball joint section of the link, using a spanner.
2. Once tighten the link temporarily. Afterward, rock the vehicle several times under the weighted condition so that the suspension may be settled. Then, carry out the tightening securely.



4-1-6 OPERATION AFTER INSTALLATION

1. Install the disc wheels. (Front)

Refer to Page C3-2.

2. Lift down the vehicle.

C1-15

5 FRONT SUSPENSION MEMBER

5-1 REMOVAL AND INSTALLATION

5-1-1 ARTICLES TO BE PREPARED

SST

Shape	Part No.	Part name
	09628-00011-000 (09611-87701-000)	Puller, tie-rod end

Instrument

Torque wrench

Lubricant, adhesive, others

Wooden block

5-1-2 OPERATION BEFORE REMOVAL

1. Separate the joint at the steering gear assembly side of the steering shaft universal joint assembly No.2.
Refer to Page G2-1.
2. Push out the steering column hole shield to the vehicle outside under a condition where it is attached to the steering gear assembly.
3. Lift up the vehicle.
4. Remove the disc wheels. (Front)
Refer to Page C3-2.
5. Remove the front speed sensors RH/LH from the steering knuckles RH/LH. (ABS-equipped vehicles)
Refer to Page E3-3.
6. Remove the front disc brake caliper Ay RH/LH. Hang it with a wire, etc.
Refer to Page E1-33.
7. Remove the Front disc.
Refer to Page E1-39.
8. Separate the stabilizer link from the suspension lower arm S/A RH/LH with bush.
Refer to Page C1-12.
9. Remove the nuts of the front drive shaft Ay RH/LH.
Refer to Page D2-8.
10. Remove the steering knuckles RH/LH and the ball joint sections of the tie-rod end S/A RH/LH, using the SST.

CAUTION

- When setting the SST, attach a dummy nut to the threaded portion of the tie-rod end S/A RH/LH so that the threaded portion may not be damaged.
- Hang the SST using a cord.

SST: 09628-00011-000

11. Separate the front shock absorber Ay from the steering knuckles RH/LH.

Refer to Page C1-5.

12. Pull out the front drive shaft Ay RH/LH from the steering knuckles RH/LH. Then, hang them with a wire, etc.

Refer to Page D2-15.

13. Separate the steering knuckles RH/LH from the ball joints of the suspension lower arm S/A with bush RH/LH, using the SST.

CAUTION

- When setting the SST, attach a dummy nut to the threaded portion of the suspension lower arm S/A with bush RH/LH so that the threaded portion may not be damaged.
- Hang the SST using a cord.

SST: 09628-00011-000

14. Remove the exhaust front pipe Ay.

(1) Vehicle mounted with Type 1KR engine

Refer to Page B4-2.

15. Remove the transmission floor shift Ay.

Refer to Page F2-10.

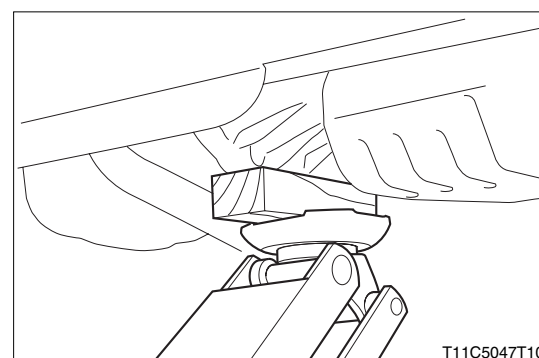
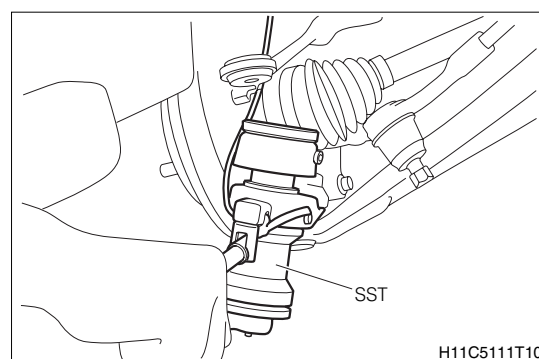
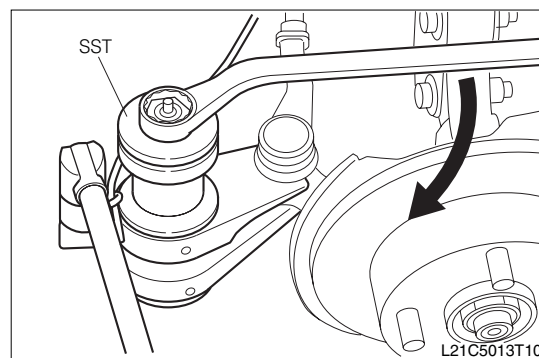
16. Apply a garage jack to the joint section between the engine Ay and the manual transaxle Ay to support.

CAUTION

- When applying a garage jack, be sure to interpose a wooden block or cloth so as not to scratch the parts.
- Care must be exercised that the engine will not get lowered while it is supported with the garage jack.

17. Remove the bolts that connect the engine mounting rear bracket with the engine mounting control rod S/A.

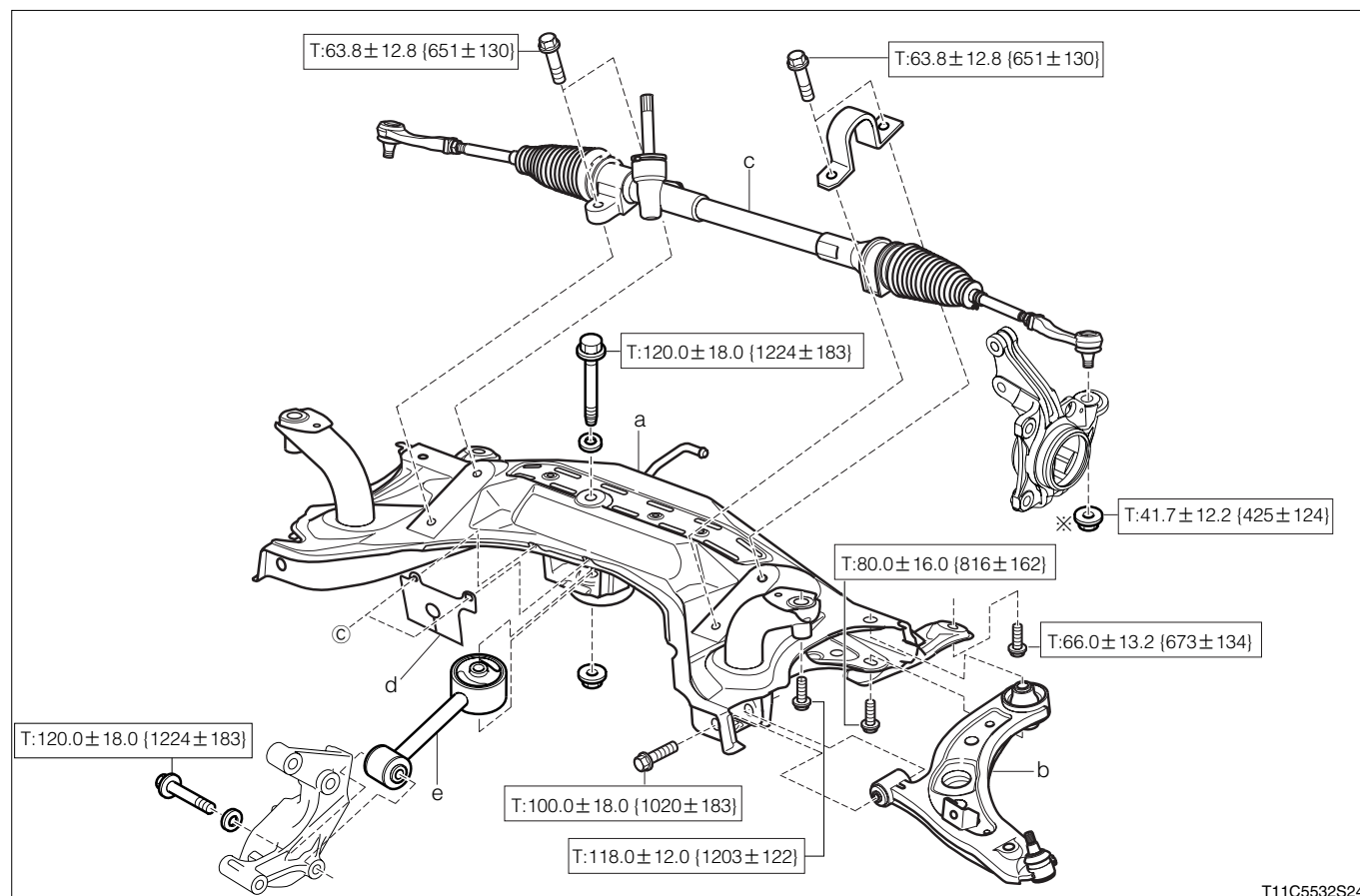
Refer to Page B12-4.



C1-17

5-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



※:Non - reusable parts

Unit:N·m{kgf·cm}

(2) Removal procedures

- ▼ 1 a Crossmember S/A, front suspension
- 2 b Arm S/A, suspension lower w/bush, RH/LH
- 3 c Gear Ay, steering
- 4 d Cover, engine mounting hole (Cold region specification vehicle)
- 5 e Rod S/A, engine mounting control

(3) Installation procedures

- ▲ 1 a Crossmember S/A, front suspension
- 2 b Arm S/A, suspension lower w/bush, RH/LH
- 3 c Gear Ay, steering
- 4 d Cover, engine mounting hole (Cold region specification vehicle)
- 5 e Rod S/A, engine mounting control

5-1-4 POINTS OF REMOVAL

(1) Crossmember S/A, front suspension

1. Apply a garage jack to the jacking point of the crossmember S/A.

CAUTION

- When applying a garage jack, be sure to interpose a wooden block or cloth so as not to scratch the parts.

2. Remove the crossmember S/A from the vehicle with the following parts given below mounted on it.

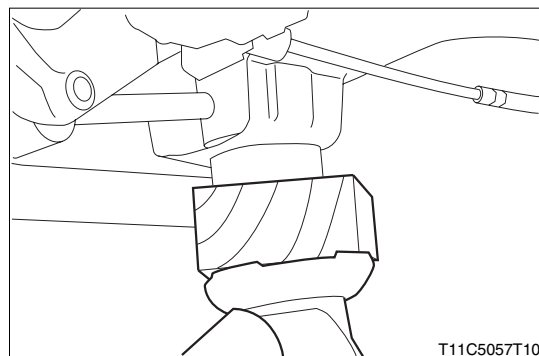
- (1) Arm S/A, suspension lower w/bush, RH/LH
- (2) Gear Ay, steering
- (3) Cover, engine mounting hole (Cold region specification vehicle)
- (4) Rod S/A, engine mounting control

3. Remove the suspension lower w/bush RH/LH.

4. Remove the steering gear Ay.

5. Remove the engine mounting hole cover. (Cold region specification vehicle)

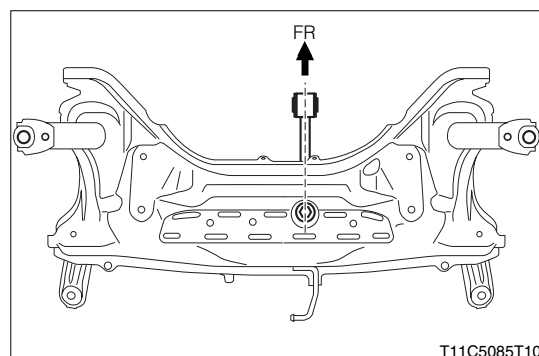
6. Remove the engine mounting control rod S/A.



5-1-5 POINTS OF INSTALLATION

(1) Crossmember S/A, front suspension

1. Install the engine mounting control rod S/A in such a direction that it faces toward the front side of the vehicle relative to the crossmember S/A. Then, tighten it from the bolt side.
2. Install the engine mounting hole cover. (Cold region specification vehicle)
3. Install the steering gear Ay.
4. Install the suspension lower w/bush RH/LH.
5. Using a garage jack, support the following parts given below while they are mounted on the crossmember S/A. Install the crossmember S/A to the vehicle, while adjusting its position.

**CAUTION**

- When applying a garage jack, be sure to interpose a wooden block or cloth so as not to scratch the parts.

- (1) Arm S/A, suspension lower w/bush, RH/LH
- (2) Gear Ay, steering
- (3) cover, engine mounting hole (Cold region specification vehicle)
- (4) Rod S/A, engine mounting control

C1-19

5-1-6 OPERATION AFTER INSTALLATION

1. Apply a garage jack to the joint section between the engine Ay and the manual transaxle Ay to support.

CAUTION

- When applying a garage jack, be sure to interpose a wooden block or cloth so as not to scratch the parts.
- Care must be exercised that the engine will not get lowered while it is supported with the garage jack.

2. Tighten the bolts connecting the engine mounting rear bracket and engine mounting control rod S/A.
Refer to Page B12-4.
3. Install the transmission floor shift Ay.
Refer to Page F2-10.
4. Install the exhaust front pipe Ay.
(1) Vehicle mounted with Type 1KR engine
Refer to Page B4-2.
5. Adjust the installation dimension of the suspension lower arm S/A with bush RH/LH.
Refer to Page C1-11.
6. Install the ball joint sections of the suspension lower arm S/A with bush RH/LH to the steering knuckles RH/LH.
Refer to Page D2-8.
7. Insert the front drive shaft Ay RH/LH to the steering knuckle RH/LH.
Refer to Page D2-8.
8. Install the steering knuckle RH/LH to the front shock absorber Ay.
Refer to Page C1-5.
9. Install the ball joint sections of the steering tie-rod end S/A RH/LH to the steering knuckles RH/LH.
Refer to Page C1-15.
10. Tighten the nuts of the front drive shaft Ay RH/LH.
Refer to Page D2-8.
11. Install the stabilizer link to the suspension lower arm S/A with bush RH/LH.
Refer to Page C1-12.
12. Install the front disc.
Refer to Page E1-39.
13. Install the front disc brake caliper Ay RH/LH.
Refer to Page E1-33.
14. Install the front speed sensors RH/LH to the steering knuckles RH/LH. (ABS-equipped vehicles)
Refer to Page E3-3.
15. Install the disc wheels. (Front)
Refer to Page C3-2.

16. Lift down the vehicle.
17. Install the No.2 steering shaft universal joint Ay to the steering gear Ay.
Refer to Page G2-1.
18. Check and adjust the front wheel alignment.
Refer to Page C3-2.

C2 REAR SUSPENSION

REAR SUSPENSION	C2—1
BASIC CHECK AND ADJUSTMENT ---	C2—1
REAR SHOCK ABSORBER AND REAR COIL SPRING--	C2—1
REMOVAL AND INSTALLATION-----	C2—1
REAR SUSPENSION ARM	C2—3
REMOVAL AND INSTALLATION-----	C2—3
REAR STABILIZER BAR(2WD VEHICLES)	C2—5
REMOVAL AND INSTALLATION-----	C2—5

C2-1

1 REAR SUSPENSION

1-1 BASIC CHECK AND ADJUSTMENT

1-1-1 CHECK OF EACH PART OF SUSPENSION

(1) Operations prior to check

1. Lift up the vehicle.
2. Remove the rear disc wheel.

(2) Check of bolts for tightening conditions

1. Visually check each attaching section of the axle and suspension for loosening.

(3) Check of excessive play

1. Check each part of the axle and suspension given in the following item to see if any looseness is present.
 - (1) Each part of suspension
 - (2) Rear axle hub & bearing

(4) Check of damage

1. Visually check each part of the axle and suspension to see if any damage is present.

(5) Check of shock absorber for oil leakage

1. Visually check the rear shock absorber sleeve section, etc. to see if any oil leakage is present.

1-1-2 REAR WHEEL ALIGNMENT

1. The rear wheel alignment has no adjusting mechanism. (The following values are referential values.)

(1) Toe-in

SPECIFIED VALUE: $3.0 \pm 3.3\text{mm}$

(2) Camber angle

SPECIFIED VALUE: $-0^{\circ}45' \pm 45'$

(3) Rear wheel alignment

SPECIFIED VALUE: In 10 mm - out 3 mm

2 REAR SHOCK ABSORBER AND REAR COIL SPRING

2-1 REMOVAL AND INSTALLATION

2-1-1 ARTICLES TO BE PREPARED

Instrument

Torque wrench

Lubricant, adhesive, others

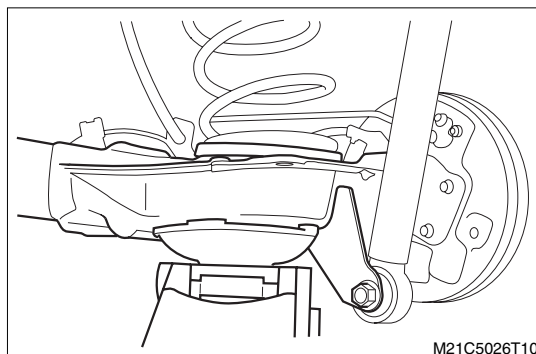
Cloth

2-1-2 OPERATION BEFORE REMOVAL

1. Lift up the vehicle.
2. Remove the disc wheels. (Rear)
3. Support the rear suspension arm Ay with a garage jack.

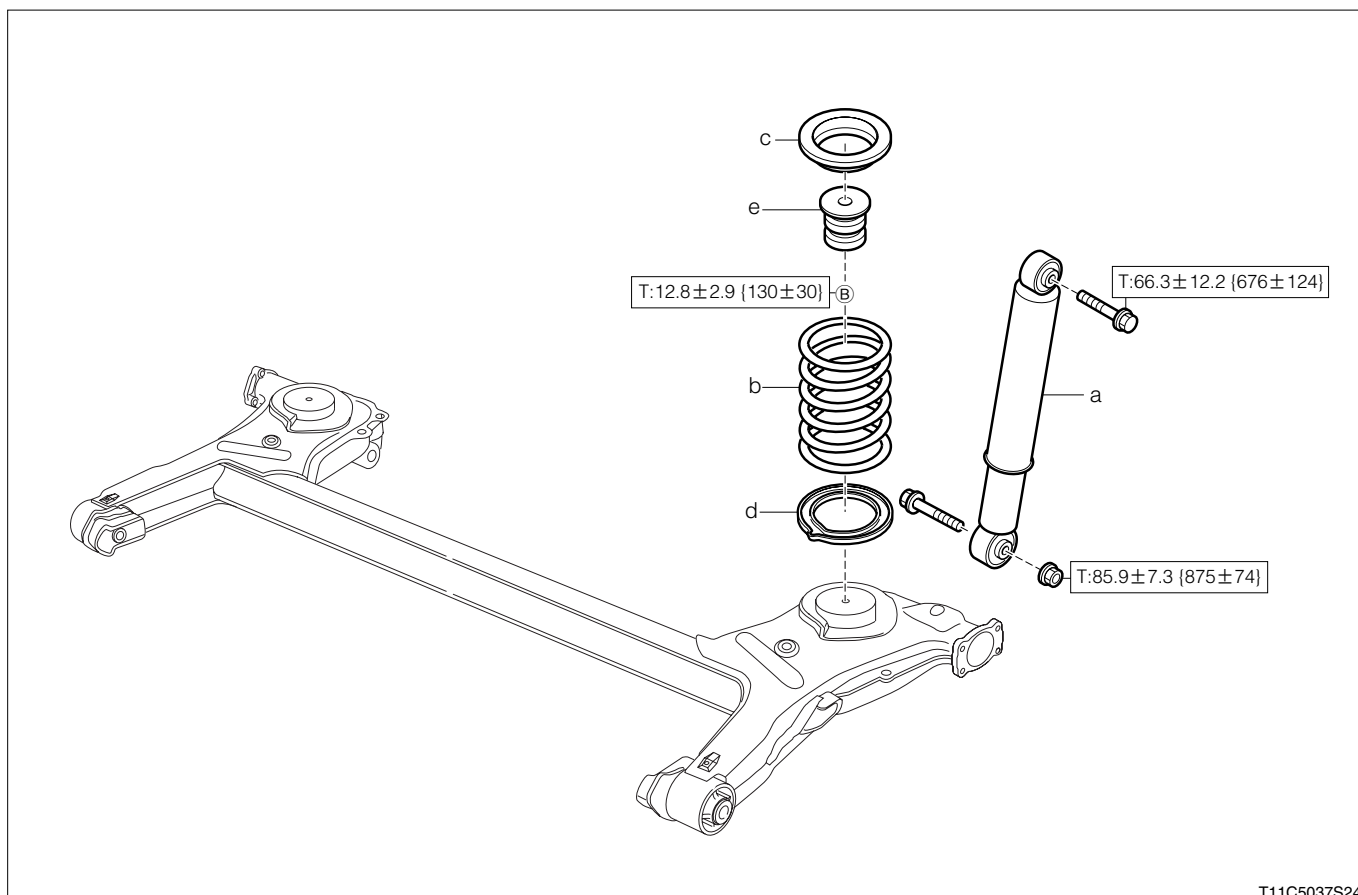
CAUTION

- Make sure to support the trailing arm with a garage jack. Never apply the jack to the bracket section below the rear shock absorber or the torsion beam section.
- When using a garage jack, interpose a cloth or the like so as not to scratch the affected surface.



2-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



(2) Removal and installation procedures

- ▲ 1 a Absorber, shock, rear
- ▼ ▲ 2 b Spring, coil, rear
- 3 c Seat, rear spring, upper
- 4 d Seat, rear coil spring, lower
- 5 e Bumper, rear spring

2-1-4 POINTS OF REMOVAL

(1) Spring, coil, rear

1. When the spring is removed, slowly lower the jack that is supporting the rear suspension arm Ay.

2-1-5 INSPECTION

(1) Absorber, shock, rear

1. Extend and compress the absorber. If any abnormality is present, replace the shock absorber.
 SPECIFIED VALUE: When the shock absorber is compressed by hand, ensure that it can be compressed with a certain resistance, but without binding.
 When you release your hand after compressing the shock absorber, ensure that it is extended at a constant speed by itself.

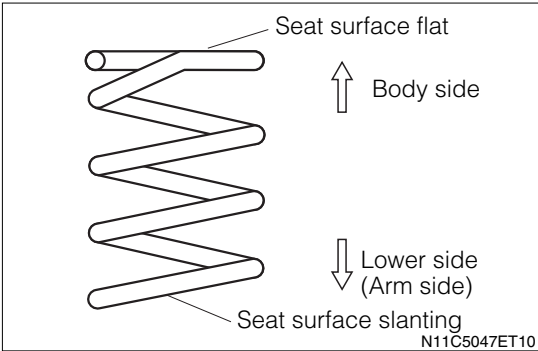
(2) Spring, coil, rear

1. Check the spring for cracks, wear and damage. If any damage is present, replace the spring.

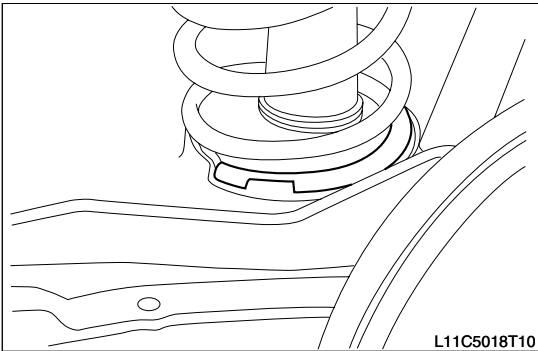
2-1-6 POINTS OF INSTALLATION

(1) Spring, coil, rear

- 1. Set the vertical direction of the spring in to such a direction as shown in the right figure.



- 2. Align the lower edge section of the spring with the groove of the rear suspension arm Ay during the installation.



(2) Absorber, shock, rear

- 1. With the rear coil spring set to the specified position, slowly raise the jack supporting the rear suspension arm Ay.
- 2. Compress the rear coil spring and raise the rear suspension arm Ay up to a point where the shock absorber can be installed. Then, install the shock absorber.

2-1-7 OPERATION AFTER INSTALLATION

- 1. Remove the garage jack.
- 2. Install the disc wheels. (Rear)
- 3. Jack down the vehicle. Rock the vehicle up and down several times so as to settle down the suspensions.
- 4. Under a condition where the vehicle weight is applied, tighten the attaching bolts and nuts of the rear shock absorber to the specified torque.

3 REAR SUSPENSION ARM

3-1 REMOVAL AND INSTALLATION

3-1-1 ARTICLES TO BE PREPARED

Instrument

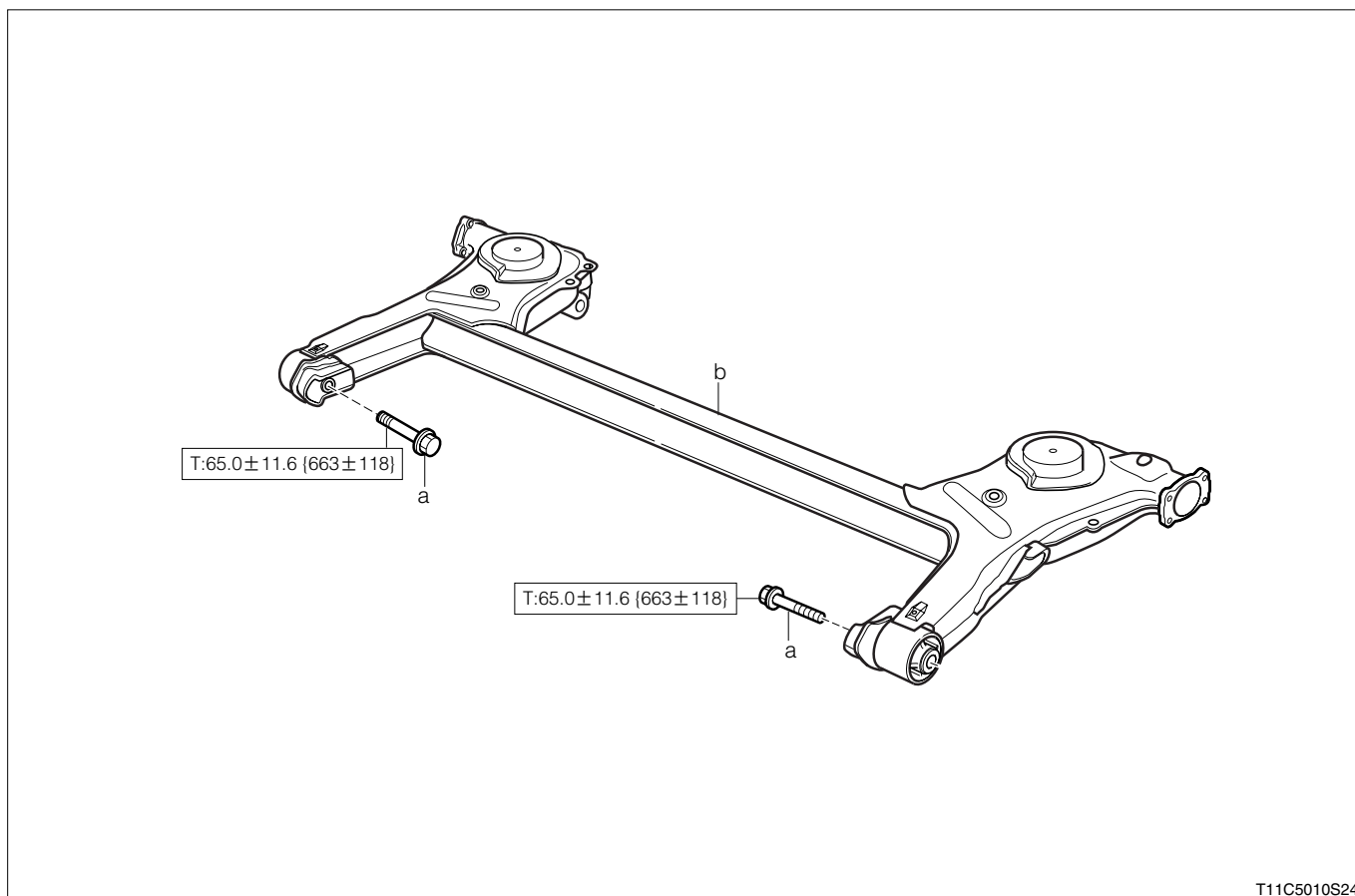
Torque wrench

3-1-2 OPERATION BEFORE REMOVAL

1. Lift up the vehicle.
2. Remove the disc wheels. (Rear)
3. Remove the rear stabilizer bar. (Rear stabilizer bar equipped vehicles)
Refer to Page C2-5.
4. Remove the rear shock absorber and rear coil spring.
Refer to Page C2-1.
5. Remove the flexible hose from the rear suspension arm Ay.
Refer to Page E1-28.
6. Remove the rear brake Ay.
Refer to Page E1-43.
7. Remove the RH/LH speed sensor wires from the rear suspension arm Ay. (ABS-equipped vehicles)
Refer to Page E3-5.
8. Remove No.2/No.3 parking brake cable Ay from the rear suspension arm Ay.
Refer to Page E2-1.

3-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



Unit: N·m {kgf·cm}

(2) Removal and installation procedures

- 1 a Shaft, rear suspension lower arm, No.1
- ▲ 2 b Arm Ay, rear suspension

3-1-4 POINTS OF INSTALLATION

(1) Arm Ay, rear suspension

- 1. Temporarily tighten the arm Ay with a bolt and a nut.

3-1-5 OPERATION AFTER INSTALLATION

- 1. Install the No.2/No.3 parking brake cable Ay to the rear suspension arm Ay.
Refer to Page E2-1.
- 2. Install the RH/LH speed sensor wires to the rear suspension arm Ay. (ABS-equipped vehicles)
Refer to Page E3-5.
- 3. Install the rear brake Ay.
Refer to Page E1-43.
- 4. Install the flexible hose to the rear suspension arm Ay.
Refer to Page E1-28.
- 5. Install the rear shock absorber and rear coil spring.
Refer to Page C2-1.
- 6. Install the rear stabilizer bar. (Rear stabilizer bar equipped vehicles)
Refer to Page C2-5.
- 7. Install the disc wheels. (Rear)
- 8. Lift down the vehicle. Rock the vehicle up and down several times so that the suspensions may be settled.
- 9. Under a condition where the vehicle weight is applied, tighten the attaching bolts and nuts of the rear suspension arm Ay and rear shock absorber to the specified torque.

4 REAR STABILIZER BAR(2WD VEHICLES)

4-1 REMOVAL AND INSTALLATION

4-1-1 ARTICLES TO BE PREPARED

Instrument

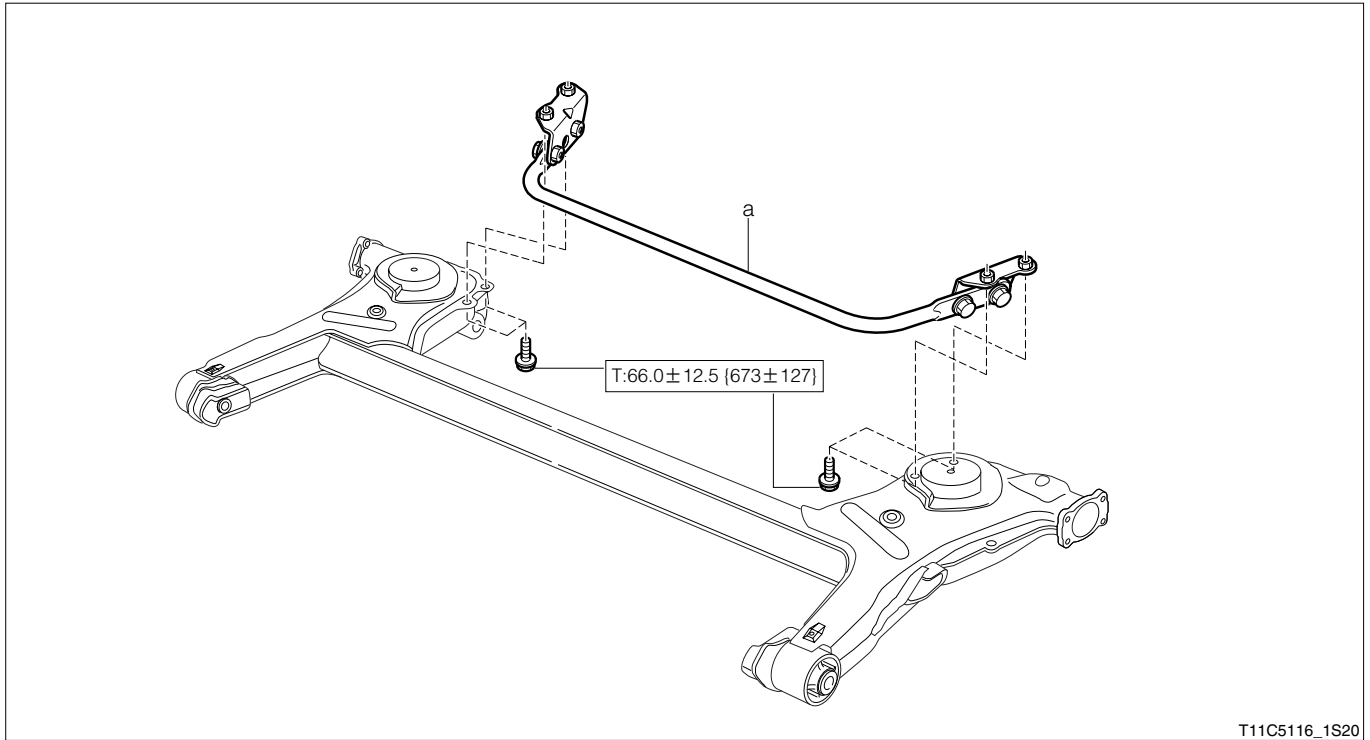
Torque wrench

4-1-2 OPERATION BEFORE REMOVAL

- 1. Lift up the vehicle.

4-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



Unit:N·m{kgf·cm}

(2) Removal and installation procedures

- 1 a Bar, stabilizer, rear

4-1-4 OPERATION AFTER INSTALLATION

1. Lift down the vehicle.

C3 WHEEL & TIRE

WHEEL & TIRE SYSTEM-----	C3—1
BASIC CHECK AND ADJUSTMENT ---	C3—1
WHEEL & TIRE-----	C3—2
REMOVAL AND INSTALLATION-----	C3—2

1 WHEEL & TIRE SYSTEM

1-1 BASIC CHECK AND ADJUSTMENT

1-1-1 TIRE CONDITIONS

(1) Articles to be prepared

Instrument

Tire pressure gauge,Depth gauge

(2) Check of air inflation pressure

- 1. Remove the valve cap.
- 2. Check to see if the tire air inflation pressure is the specified value, using a tire pressure gauge. Also, check the spare tire, too.

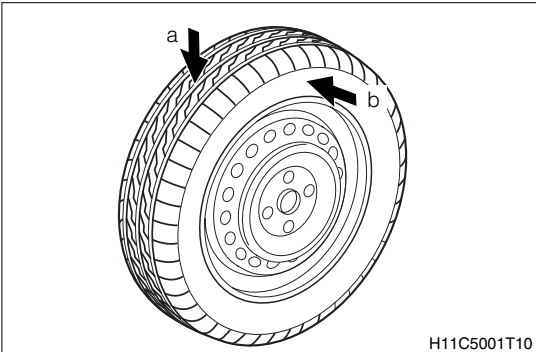
SPECIFIED VALUE:

TIRE SIZE	Air inflation pressure [kPa{kgf/cm ² }]	
	Front wheel	Rear wheel
155/80R13 79S	220{2.2}	
175/65R14 82S	220{2.2}	
175/65R14 82T	220{2.2}	
T115/70D14	420{4.2}	

- 3. After the air pressure check, ensure that there is no air leakage from the tire valve.

(3) Check of cracks and damage

- 1. Jack up the vehicle.
- 2. Visually check the tread section (a) and side wall section (b) over all the peripheries to see if any cracks or damage is present.



(4) Check of metal piece or foreign matter

- 1. Visually check the tread section (a) and side wall section (b) over all the peripheries to see if any metal piece, gravel or other foreign matter is stuck or caught in.

(5) Check of abnormal wear

- 1. Visually check to see if any uneven wear or stepped wear or other abnormal wear is present.

CAUTION

- If there is abnormal wear, check the wheel balance and front wheel alignment.

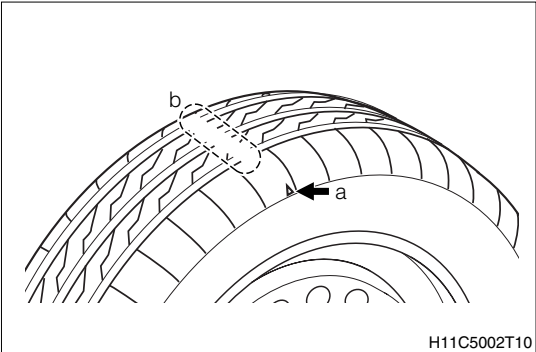
(6) Check the groove depth

- 1. Check the groove depth, using a depth gauge or the like.

SPECIFIED VALUE: 1.6 mm or more

NOTE

- When the depth of the remaining groove becomes less than 1.6 mm, a slip sign (b) will appear on the extended line of the triangle mark (a) on the side wall section.

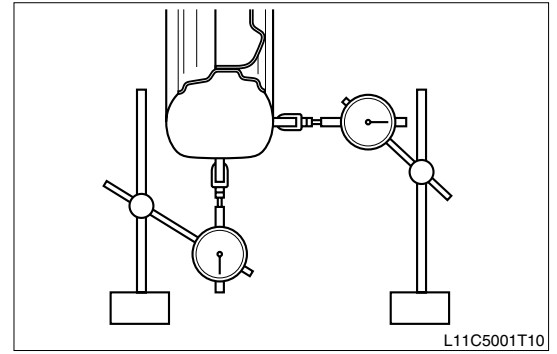


(7) Check of tires for runout

- 1. Jack up the vehicle.

2. Check the tire for runout, using a dial gauge.

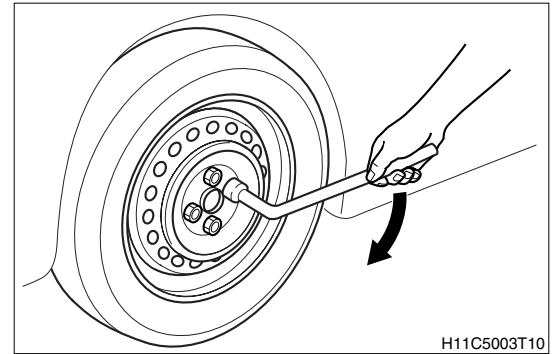
ALLOWABLE LIMIT: 1.4mm (Vertical runout)
 2.0mm (Lateral runout)



1-1-2 DISC WHEEL

(1) Check the hub nuts for looseness

1. Check the hub nuts for looseness, using a wheel nut wrench, etc.



(2) Check of disc wheel for damage

1. Jack up the vehicle.
2. Visually check the disc wheel to see if any corrosion, deformation, cracks or runout is present.

2 WHEEL & TIRE

2-1 REMOVAL AND INSTALLATION

2-1-1 ARTICLES TO BE PREPARED

Instrument

Torque wrench

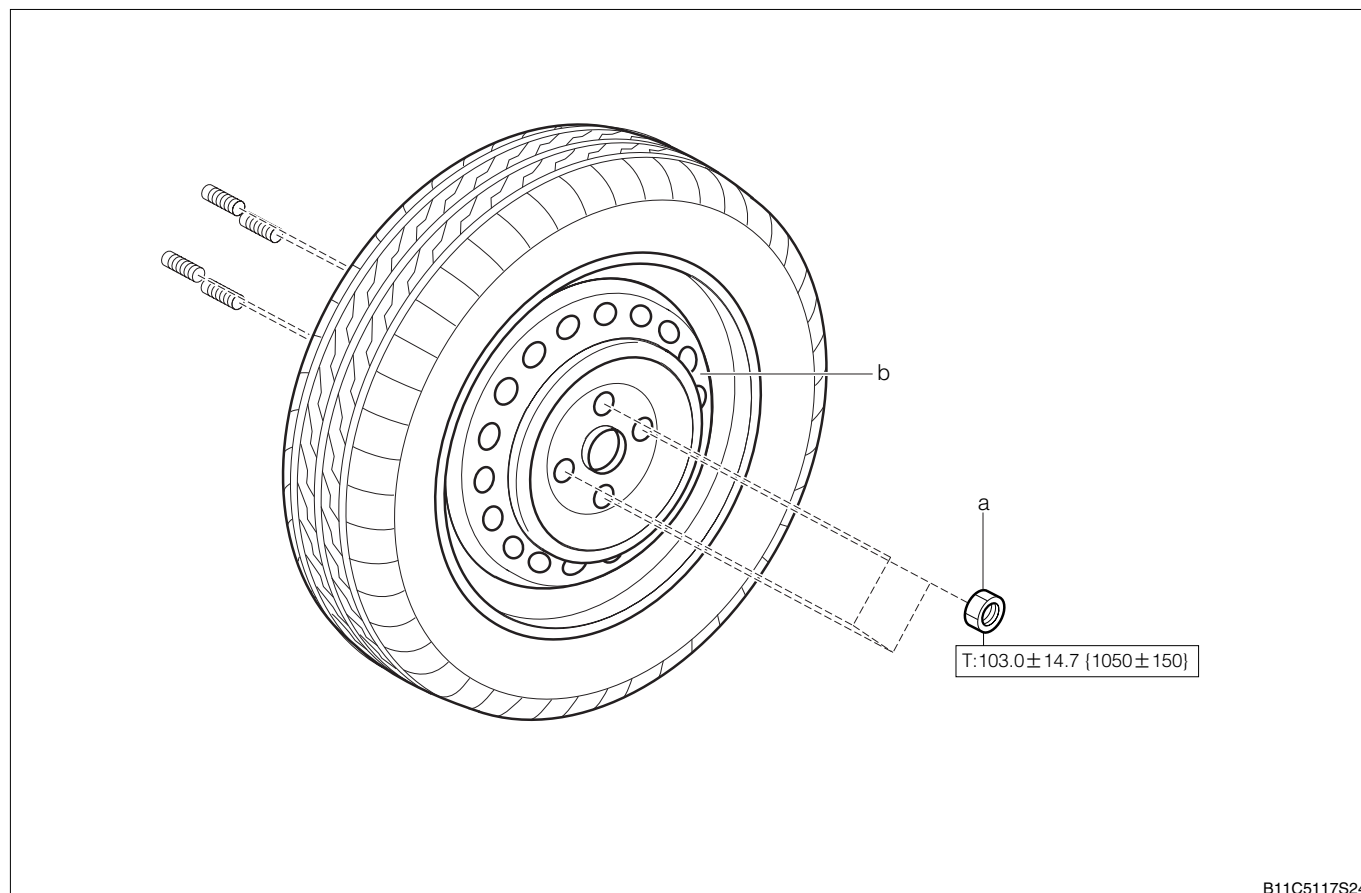
2-1-2 OPERATION BEFORE REMOVAL

1. Remove the wheel cap S/A. (Wheel cap S/A mounted vehicles)
2. Jack up the vehicle.

C3-3

2-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



Unit: N · m {kgf · cm}

(2) Removal and installation procedures

- 1 a Nut, hub
- 2 b Wheel, disc

2-1-4 OPERATION AFTER INSTALLATION

1. Jack down the vehicle.
2. Install the wheel cap S/A. (Wheel cap S/A mounted vehicles)

D2 DRIVE SHAFT/PROPELLER SHAFT/AXLE

AXLE SYSTEM -----	D2—1
BASIC CHECK AND ADJUSTMENT ----	D2—1
FRONT AXLE BEARING -----	D2—2
REMOVAL AND INSTALLATION-----	D2—2
FRONT DRIVE SHAFT -----	D2—8
REMOVAL AND INSTALLATION-----	D2—8
DISASSEMBLING AND ASSEMBLING	
-----	D2—11
REAR AXLE BEARING (2WD VEHICLES) -----	D2—16
REMOVAL AND INSTALLATION-----	D2—16

D2-1

1 AXLE SYSTEM

1-1 BASIC CHECK AND ADJUSTMENT

1-1-1 CHECK OF WHEEL BEARING FOR EXCESSIVE PLAY

(1) Check of wheel bearing for excessive play

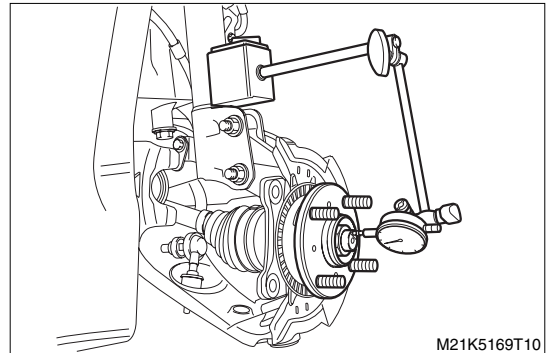
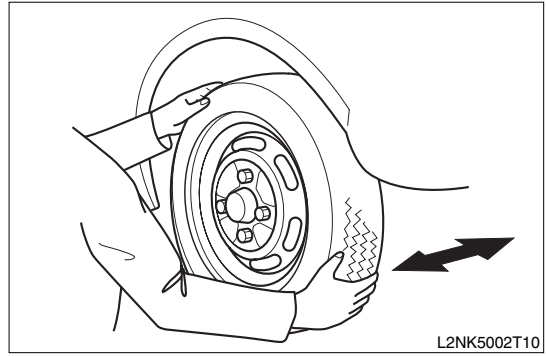
1. Move the tire by holding the tire at the upper and lower parts by hands. Check to see if the wheel bearing has excessive play.

If there is excessive play, perform the check again while depressing the brake pedal and confirm whether it is excessive play of the wheel bearing or not.

2. Turn the wheel and check to see if abnormal noise is emitted.
3. If necessary, set a dial gauge at the circumference of the forward end of the drive shaft and check for excessive play in the bearing axial direction.

If the allowable limit is exceeded, replace the axle hub and radial ball bearing.

ALLOWABLE LIMIT: 0.05mm



(2) Check of boot for cracks and damage

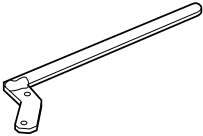
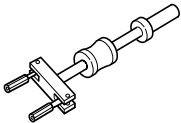
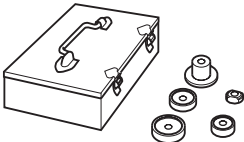
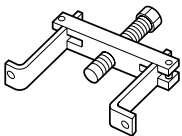
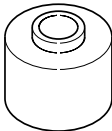
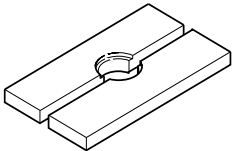
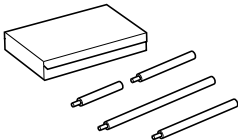
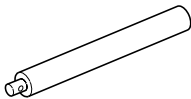
1. Visually check the boot of the universal joint section of the drive shaft for any cracks or damage.
2. Visually check to see if any boot rupture or boot band looseness is present.

2 FRONT AXLE BEARING

2-1 REMOVAL AND INSTALLATION

2-1-1 ARTICLES TO BE PREPARED

SST

Shape	Part No.	Part name
	09628-00011-000 (09611-87701-000)	Puller,tie-rod end
	09511-87202-000	Stopper,brake drum
	09520-00031-000 (09520-00030-000)	Puller,rear axle shaft
	09550-10013-000 (09550-10012-000)	Set,replacer B
	09950-97201-000 (09950-20017-000)	Puller,universal
	09510-87301-000	Puller,axle shaft
	09506-87301-000	Replacer,differential drive pinion bearing corn,rear
	09527-87301-000	Remover,rear axle shaft bearing
	09950-70010-000	Set,handle
	09951-07200-000 (09631-00020-000)	Handle

D2-3

Tool

Snap ring pliers

Instrument

Dial gauge, Torque wrench

2-1-2 OPERATION BEFORE REMOVAL

1. Lift up the vehicle.
2. Remove the front wheel.
3. Remove the front wheel speed sensor.(ABS equipped vehicles)
Refer to Page E3-3.

4. Remove the front disc brake caliper assembly and hang it, using a wire or the like.

CAUTION

- Be very careful not to damage the flexible hose.

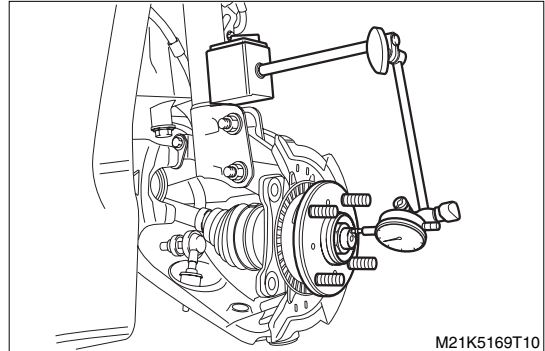
5. Remove the brake disc.

2-1-3 INSPECTION

(1) Check of bearing for axial play

1. Set a dial gauge to a point on the periphery at the tip-end of the drive shaft. Check the bearing for axial play.
If the play exceeds the limit, replace the axle hub and radial ball bearing.

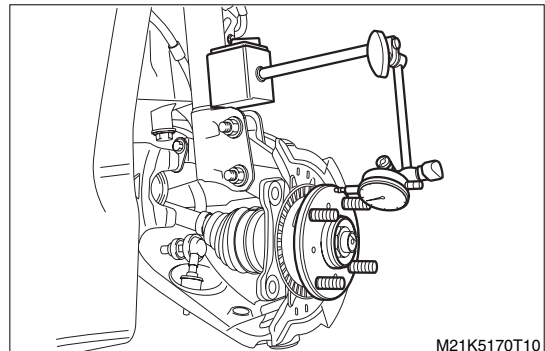
ALLOWABLE LIMIT: 0.05mm



(2) Check of front axle runout

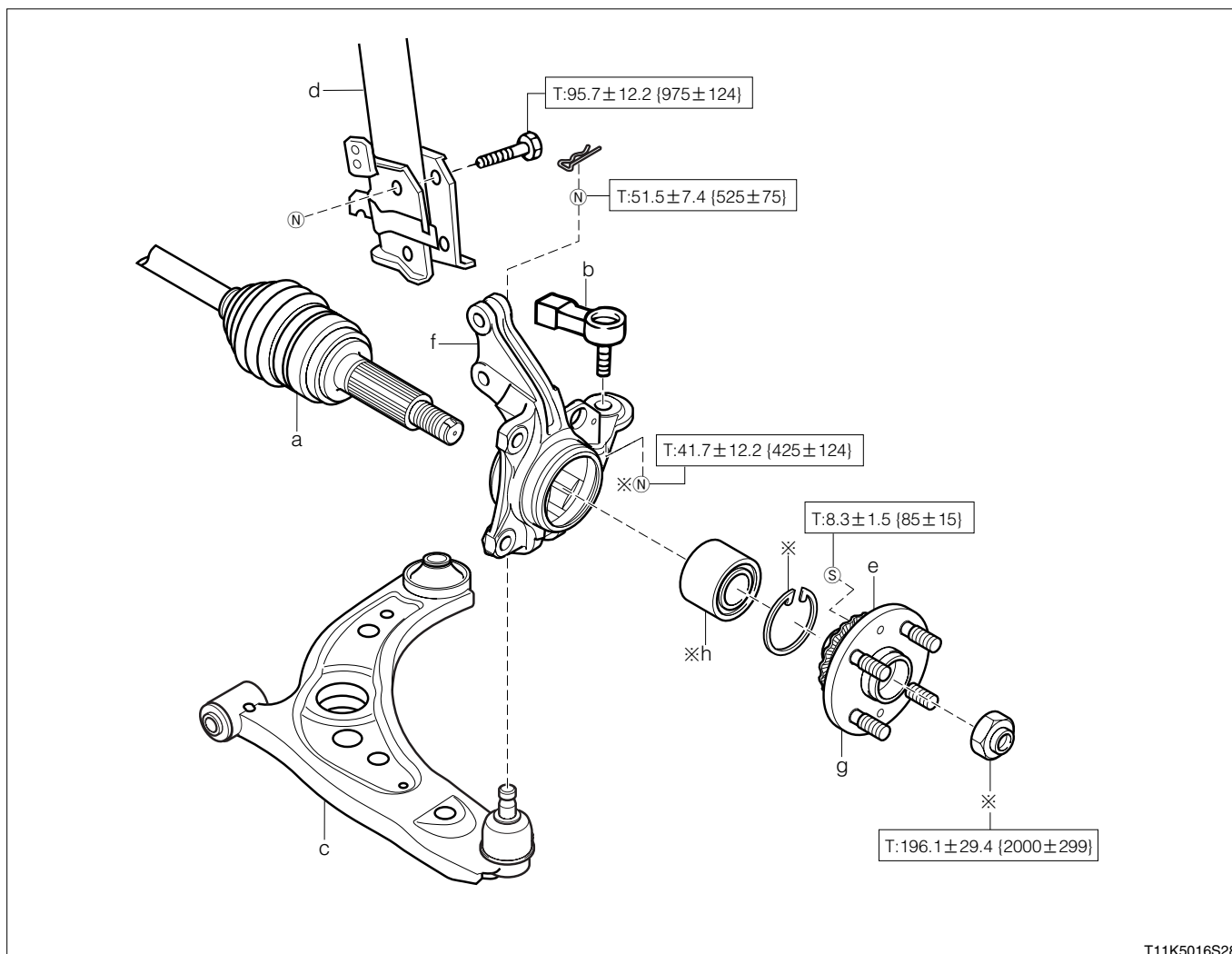
1. Set a dial gauge to the outer periphery of the axle hub. Turn the axle hub to check the runout.
If the runout exceeds the limit, replace the axle hub and radial ball bearing.

ALLOWABLE LIMIT: 0.05mm



2-1-4 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



T11K5016S28

※:Non - reusable parts

Unit:N·m{kgf·cm}

(2) Removal and installation procedures

▼ ▲ 1	a Shaft Ay, front drive,RH/LH	▼ 6	e Hub S/A, front axle
▼ 2	b End S/A, tie rod,RH/LH	7	f Knuckle, steering,RH/LH
▼ ▲ 3	c Arm S/A, suspension lower W/bush,RH/LH	8	g Rotor, skid control, sensor front
▼ 4	a Shaft Ay, front drive,RH/LH	▼ ▲ 9	h Bearing, Radial ball
5	d Absorber Ay, shock front,RH/LH		

2-1-5 POINTS OF REMOVAL

(1) Shaft Ay, front drive,RH/LH

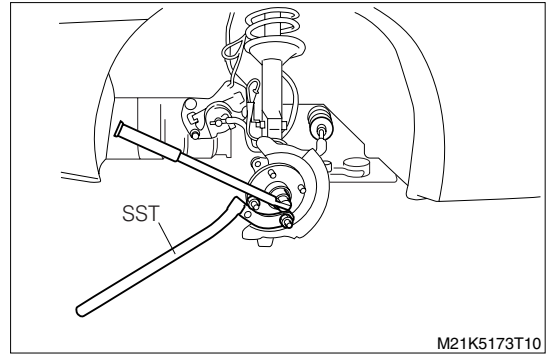
1. Remove the nut.

(1) Release the staked portion, using a chisel or the like.

D2-5

(2) Remove the nut, using the SST.

SST: 09511-87202-000



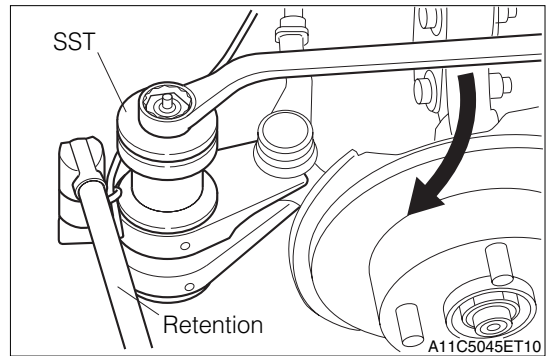
(2) End S/A, tie rod,RH/LH

1. Separate the RH/LH steering knuckles from the end S/A, using the SST.

(1) Suspend the SST with a rope.

(2) Install a dummy nut to the threaded section of the end S/A. Set the SST and remove the end S/A.

SST: 09628-00011-000



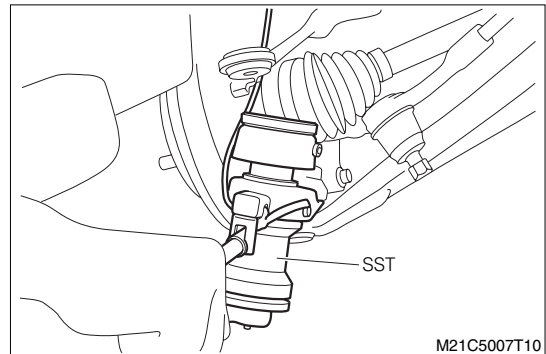
(3) Arm S/A, suspension lower W/bush,RH/LH

1. Remove the ball joint section of the arm S/A, using the SST.

(1) Suspend the SST with a rope.

(2) Install a dummy nut to the threaded section of the arm S/A. Set the SST and remove the arm S/A.

SST: 09628-00011-000



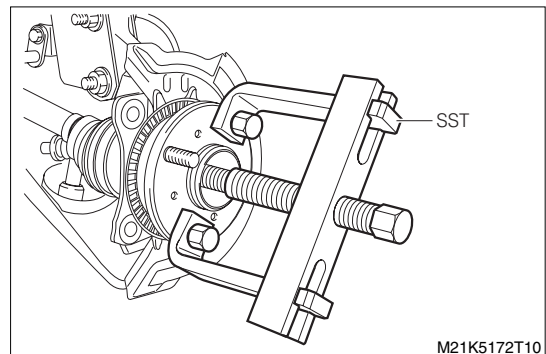
(4) Shaft Ay, front drive,RH/LH

1. Separate the shaft Ay from the front axle hub S/A and RH/LH steering knuckle, using the SST.

SST: 09510-87301-000

CAUTION

- Hang the drive shaft by means of wire or the like.



(5) Hub S/A, front axle

1. Remove the hub S/A and RH/LH steering knuckle from the RH/LH front shock absorber Ay.

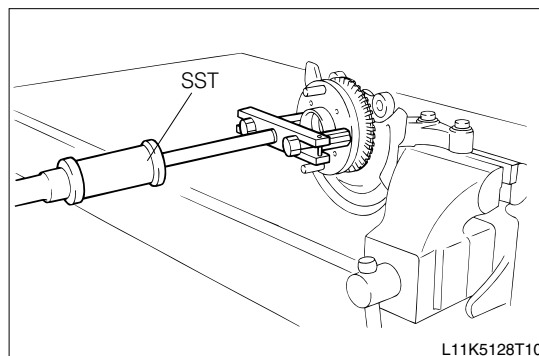
2. Remove the front axle hub S/A.

(1) Secure the hub S/A and RH/LH steering knuckle in a vice, using the bolts that retain the RH/LH steering knuckles in the RH/LH front shock absorber Ay.

- (2) Remove the hub S/A from the RH/LH steering knuckle, using the SST.

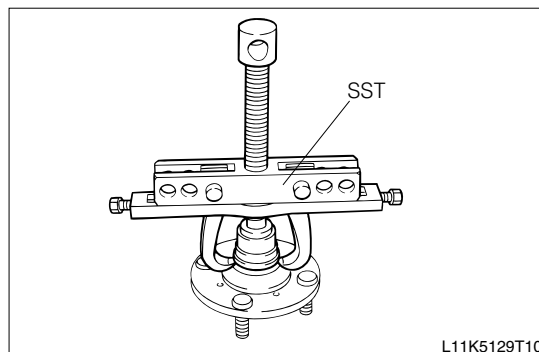
SST: 09520-00031-000

- (3) Remove the skid control sensor rotor.



- (4) Remove the radial ball bearing inner race, using the SST.

SST: 09950-97201-000



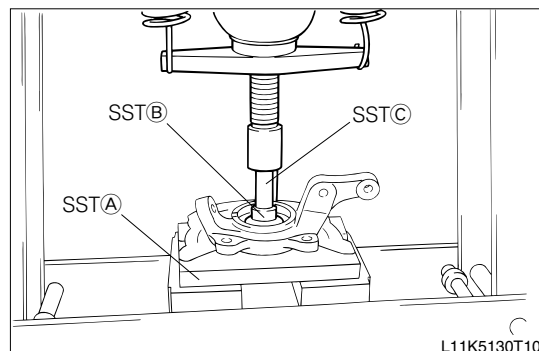
(6) Bearing, radial ball

1. Detach the hole snap ring, using a snap ring expander.
2. Remove the bearing, using the SST in combination with a press.

SST: 09527-87301-000(Ⓐ)

09550-10013-000 [09554-10011-000](Ⓑ)

09950-70010-000 [09951-07200-000](Ⓒ)



2-1-6 POINTS OF INSTALLATION

(1) Bearing, radial ball

1. Press the radial ball bearing to the steering knuckle S/A, using the SST in combination with a press. Install the hole snap ring.

SST: 09506-87301-000(Ⓐ)

09550-10013-000 [09554-10011-000](Ⓑ)

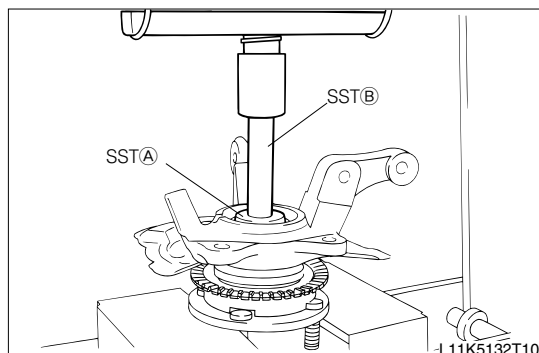
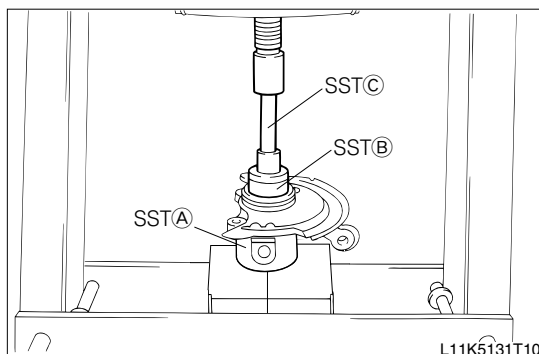
09950-70010-000 [09951-07200-000](Ⓒ)

2. Install the skid control sensor rotor.(ABS-equipped vehicles)

3. Press the front axle hub S/A into the steering knuckle, using the SST in combination with a press.

SST: 09550-10013-000 [09556-10011-000](Ⓐ)

09950-70010-000 [09951-07200-000](Ⓑ)



D2-7

(2) Arm S/A, suspension lower W/bush,RH/LH

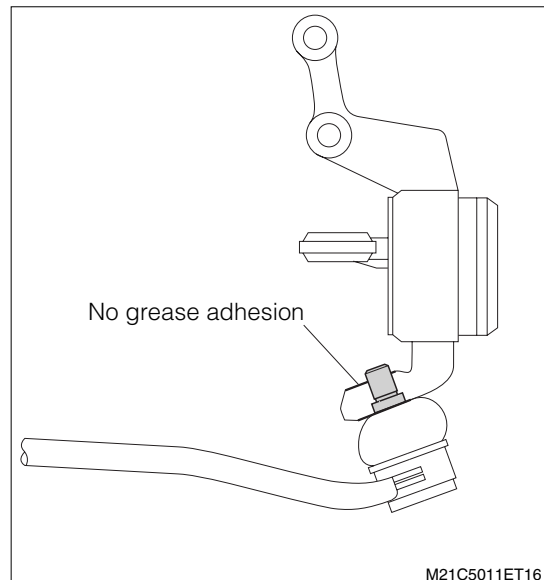
1. Install the RH/LH steering knuckle to the arm S/A.

CAUTION

- During the assembly, ensure that no lubricant, such as grease, is adhered to the threaded portion, tapered section, and RH/LH steering knuckle installation sections of the ball stud of the arm S/A. If any lubricant is adhered, be certain to wipe it off.
2. Install the front axle hub S/A and RH/LH steering knuckle to the shock absorber, while inserting the RH/LH front drive shaft Ay.

CAUTION

- Do not pull out the drive shaft beyond the required extent.

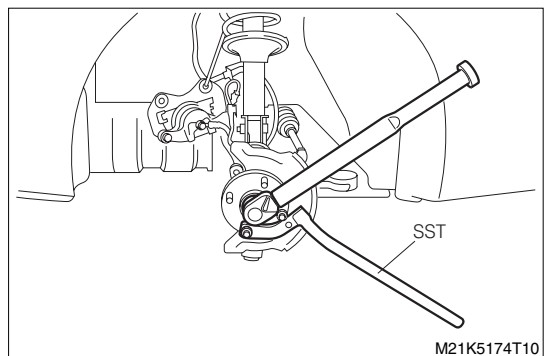


(3) ShaftAy, front drive,RH/LH

1. Install the nut.

- (1) Tighten the nut to the specified torque, using the SST.

SST: 09511-87202-000



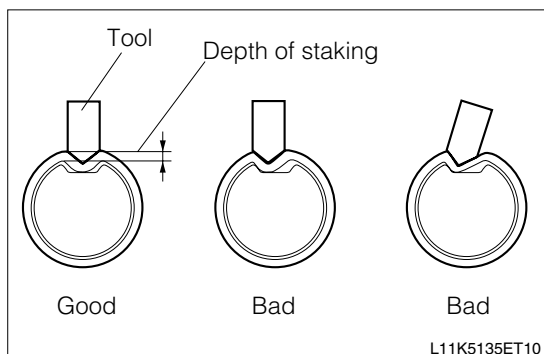
- (2) Using a chisel, firmly stake the tip-end of the front drive shaft and nut, as indicated in the right figure.

CAUTION

- Ensure that the staked section of the nut and the threaded portion of the shaft Ay exhibit no crack. (Peeling off of the plating of the nut is permissible.)

NOTE

- The staking should be carried out in the center direction of the shaft Ay. The staking depth must be $3.5^{+1.5}_{-0.5}$ mm.



2-1-7 OPERATION AFTER INSTALLATION

1. Install the brake disc.
2. Install the front disc brake caliper assembly.
3. Install the front wheel speed sensor.

Refer to Page E3-3.

4. Install the front wheel.

TIGHTENING TORQUE: $103.0 \pm 14.7 \text{ N} \cdot \text{m}$ { $1050 \pm 150 \text{ kgf} \cdot \text{cm}$ }

5. Check the front alignment.

Refer to Page C1-1.

6. Lift down the vehicle.

3 FRONT DRIVE SHAFT

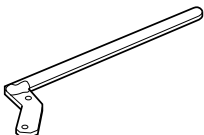
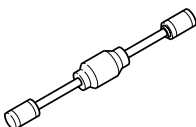
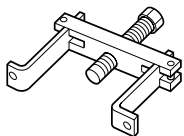
3-1 REMOVAL AND INSTALLATION

WARNING

- Do not carry out the operation while the exhaust pipe is still hot, for there is a possibility of getting scalded.

3-1-1 ARTICLES TO BE PREPARED

SST

Shape	Part No.	Part name
	09511-87202-000	Stopper, brake drum
	09628-00011-000 (09611-87701-000)	Puller, tie-rod end
	09912-87301-000	Puller, slide hammer
	09510-87301-000	Puller, axle shaft

Instrument

Torque wrench

Lubricant, adhesive, others

MP grease, ATF Dexron®III, Transmission gear oil SAE75W-90 or SAE75W-85 or SAE75W-80 (API Classification GL3 or GL4)

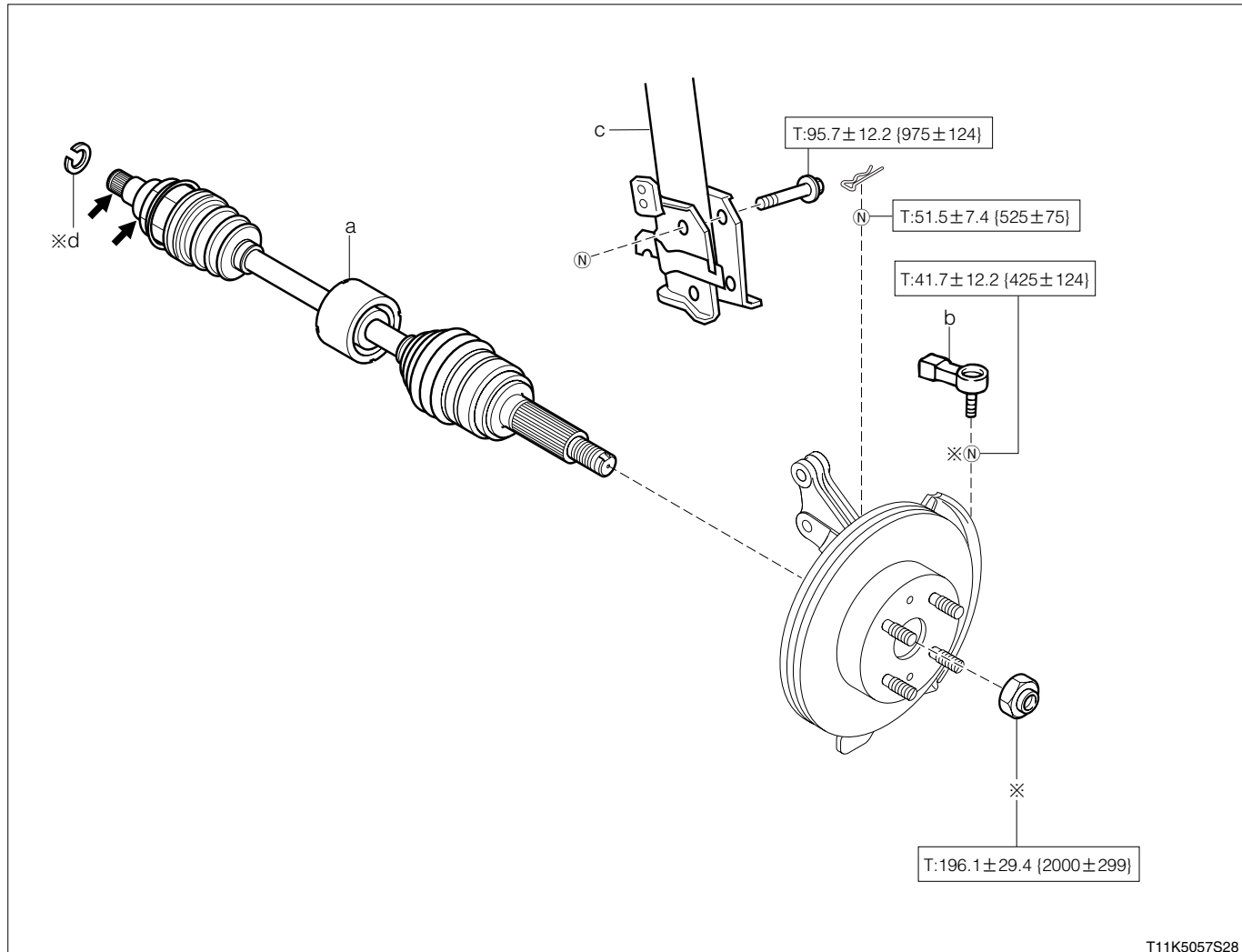
3-1-2 OPERATION BEFORE REMOVAL

- Lift up the vehicle.
- Remove the front wheel.
- Drain the transaxle oil.

D2-9

3-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



T11K5057S28

➡: MP grease

※: Non-reusable parts

Unit: N·m{kgf·cm}

(2) Removal and installation procedures

- ▼ ▲ 1 a Shaft Ay, front drive,RH/LH
- ▼ 2 b End S/A, tie rod,RH/LH
- 3 c Absorber Ay, shock front,RH/LH
- ▼ ▲ 4 a Shaft Ay, front drive,RH/LH
- 5 d Ring, shaft snap

3-1-4 POINTS OF REMOVAL

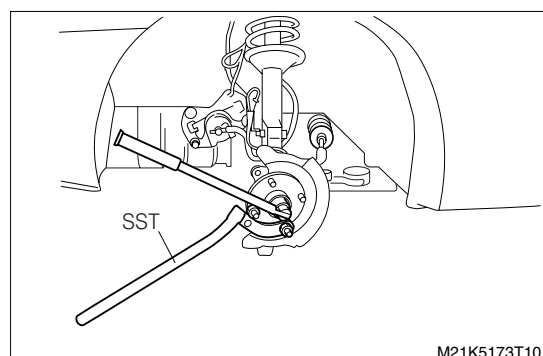
(1) Shaft Ay, front drive,RH/LH

1. Remove the lock nut.

(1) Release the staked portion, using a chisel or the like.

(2) Remove the nut by using the SST to prevent turning.

SST: 09511-87202-000



M21K5173T10

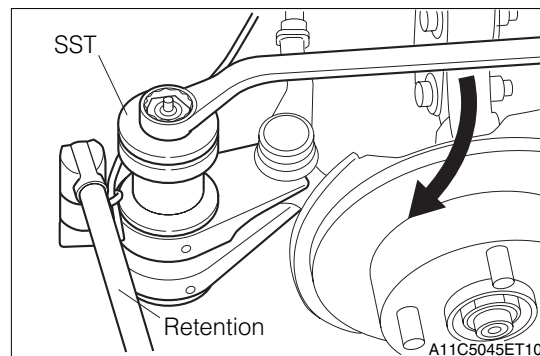
(2) End S/A, tie rod,RH/LH

1. Remove the end S/A from the RH/LH steering knuckles, using the SST.

- (1) Suspend the SST with a rope.

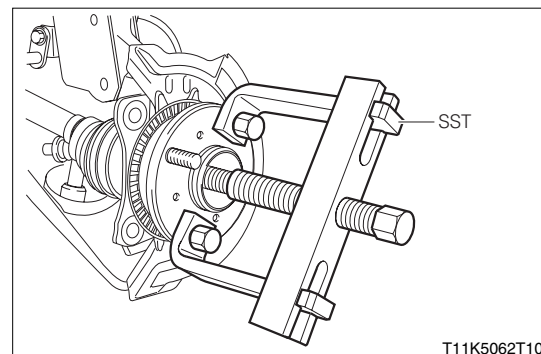
- (2) Install a dummy nut to the threaded section of the end S/A. Set the SST and remove the end S/A.

SST: 09628-00011-000

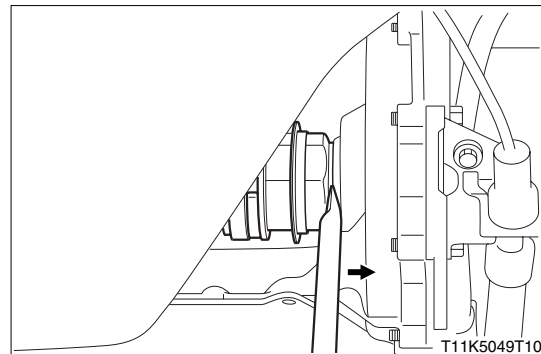
**(3) Shaft Ay, front drive,RH/LH**

1. Separate the shaft Ay from the RH/LH steering knuckles, using the SST.

SST: 09510-87301-000



2. Turn over the dust cover, while paying attention not to scratch the dust cover. Remove the shaft Ay by applying the arrow edge of the hub nut wrench to the edge surface of the shaft Ay.

**3-1-5 INSPECTION**

Check the boot for brekage or damage. Replace any faulty part.

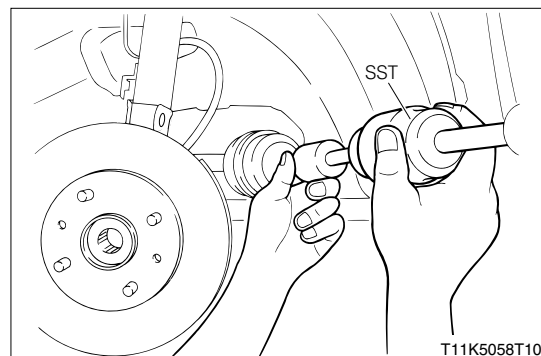
3-1-6 POINTS OF INSTALLATION**(1) Shaft Ay, front drive,RH/LH**

1. Insert the front drive shaft assembly to the differential carrier assembly, using the SST.

SST: 09912-87301-000

CAUTION

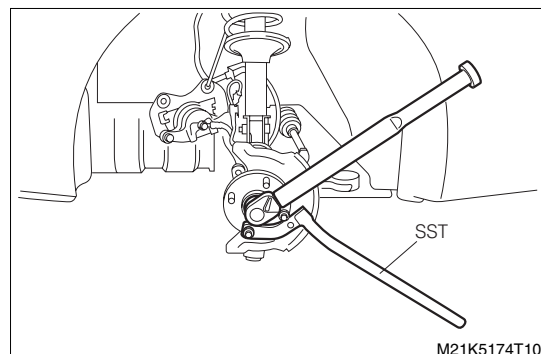
- The insertion should be carried out in such a way that the lip section of the oil seal may not be damaged.
- Apply MP grease to the oil seal contact surface of the shaft Ay and its serration section.

**(2) Shaft Ay, front drive,RH/LH**

1. Install the nut.

- (1) Tighten the nut to the specified torque, using the SST.

SST: 09511-87202-000



D2-11

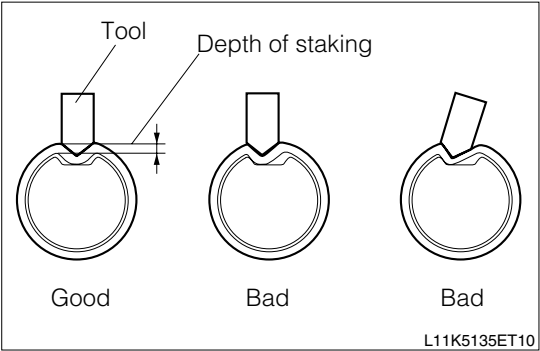
(2) Using a chisel, firmly stake the tip-end of the front drive shaft and nut, as indicated in the right figure.

CAUTION

- Ensure that the staked section of the nut and the threaded portion of the shaft Ay exhibit no crack. (Peeling off of the plating of the nut is permissible.)

NOTE

- The staking should be carried out in the center direction of the shaft Ay. The staking depth must be $3.5^{+1.5}_{-0.5}$ mm.



3-1-7 OPERATION AFTER INSTALLATION

1. Fill transaxle fluid.
2. Install the front wheel.
TIGHTENING TORQUE: $103.0 \pm 14.7 \text{ N} \cdot \text{m}$ { $1050 \pm 150 \text{ kgf} \cdot \text{cm}$ }
3. Lift down the vehicle.
4. Check and adjust the front wheel alignment.
Refer to Page C1-1.

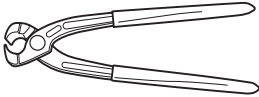
3-2 DISASSEMBLING AND ASSEMBLING

3-2-1 ARTICLES TO BE PREPARED

Tool

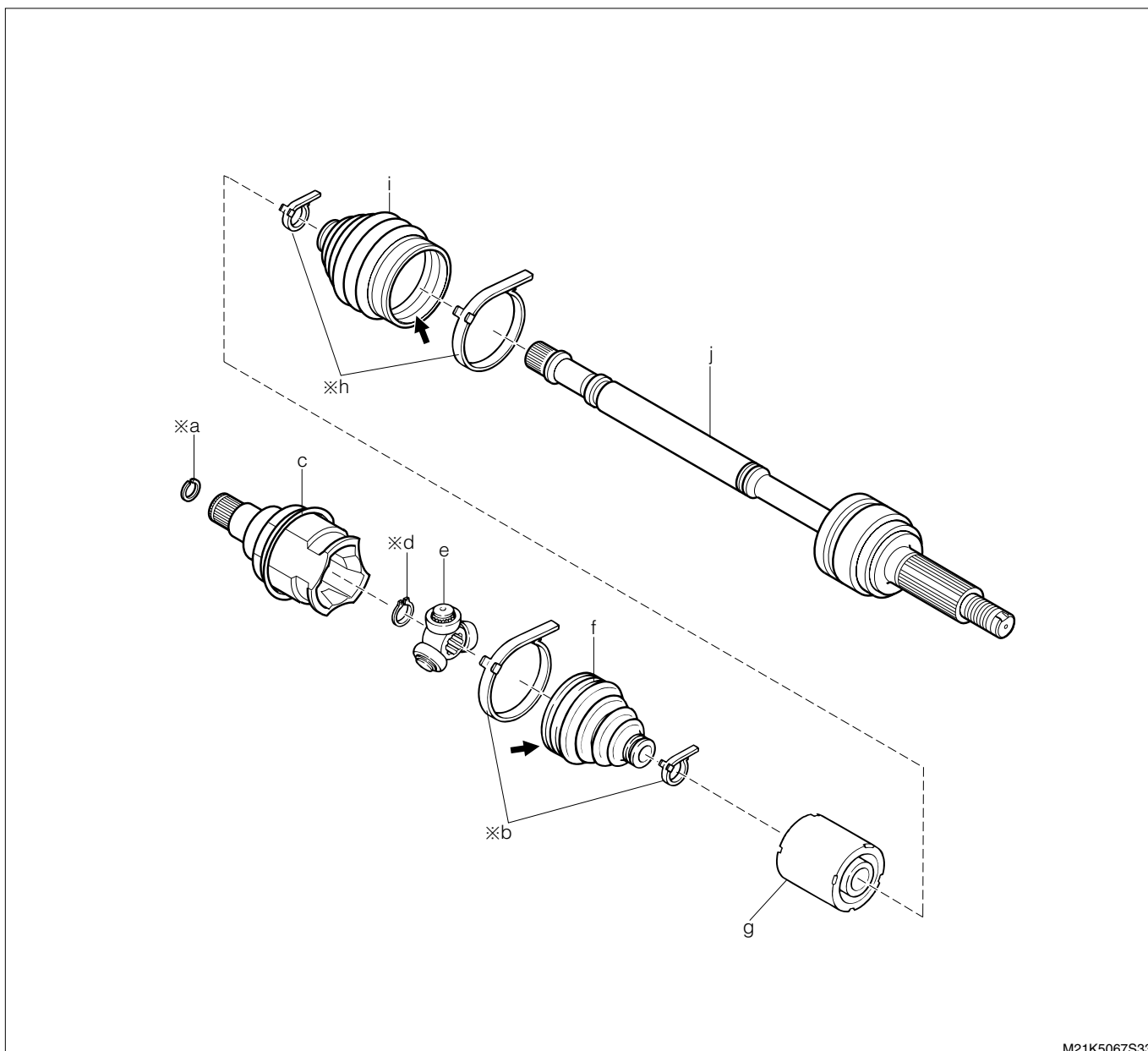
Snap ring expander

SST

Shape	Part No.	Part name
	09648-97202-000	Pliers B,drive shaft boots band

3-2-2 DISASSEMBLY AND ASSEMBLY PROCEDURES

(1) Components



M21K5067S33

※:Non - reusable parts

(2) Disassembling and assembling procedure

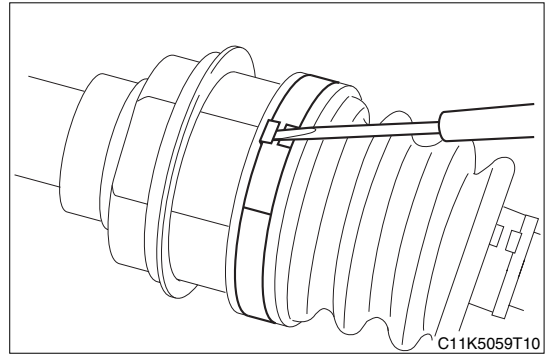
1	a	Ring, shaft snap	▼	6	f	Boot, front axle inboard joint
2	b	Clamp, rear drive shaft boot	▼ ▲	7	g	Damper, drive shaft
▼ ▲	3	c	Joint S/A, front axle inboard	8	h	Clamp, Rear drive shaft boot
4	d	Ring, drive shaft snap	▼ ▲	9	i	Boot, front axle outboard joint
▼ ▲	5	e	Tripod Ay, Inboard joint	10	j	Shaft, front axle, RH/LH

D2-13

3-2-3 POINTS OF DISASSEMBLY

(1) Joint S/A, front axle inboard

1. Remove the rear drive shaft boot clamp (At the inboard side).
 - (1) Using a flat screwdriver, release the locking at the bent section of the boot band (At the inboard side).

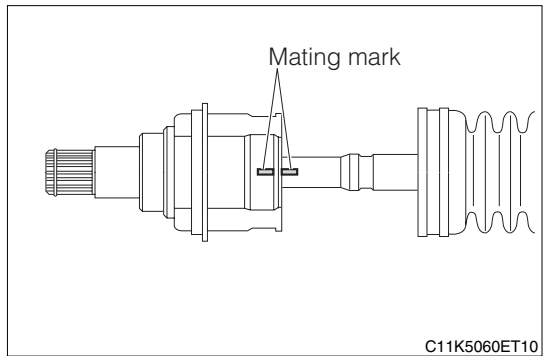


2. Displace the front axle inboard joint boot. Wipe off grease. Put mate marks on the joint S/A and RH/LH front axle shaft.

CAUTION

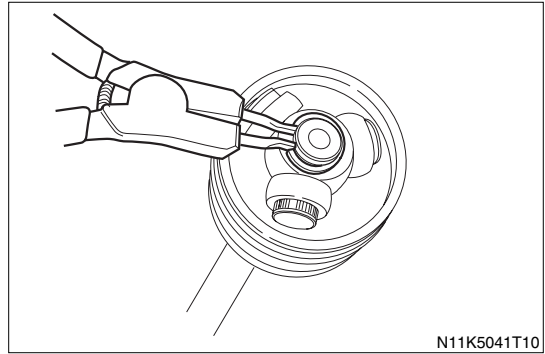
- As for the mate marks, use paint. (Do not use punching.)

3. Remove the front axle inboard joint S/A

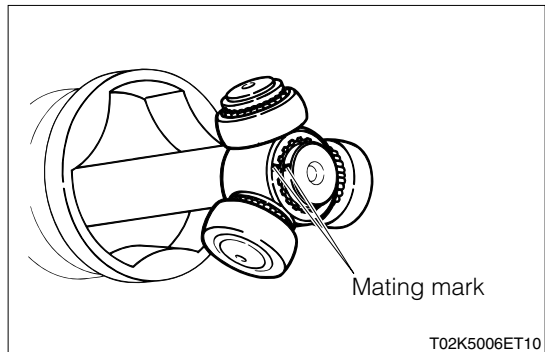


(2) Tripod Ay, Inboard joint

1. Remove the drive shaft snap ring, using a snap ring expander.
TOOL: Snap ring expander



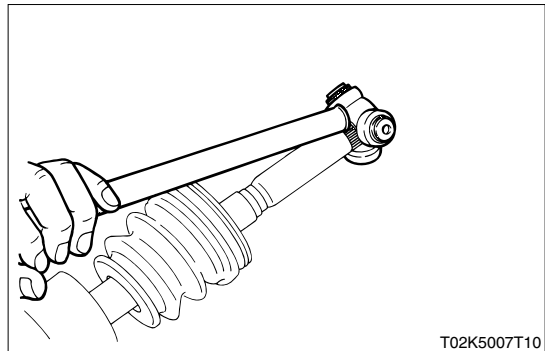
2. Put mating marks on the tripod Ay and RH/LH front axle shaft.



3. Remove the inboard joint tripod Ay, using a brass bar.

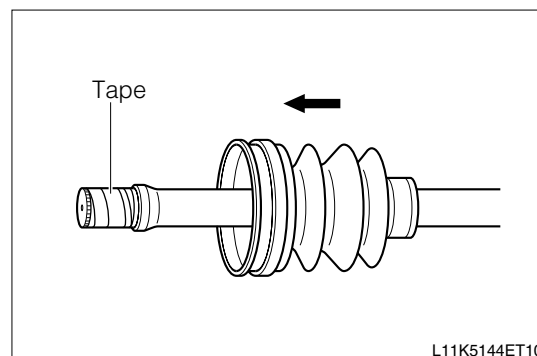
CAUTION

- Be sure to apply a brass bar to the boss section of the tripod, not at the roller section.



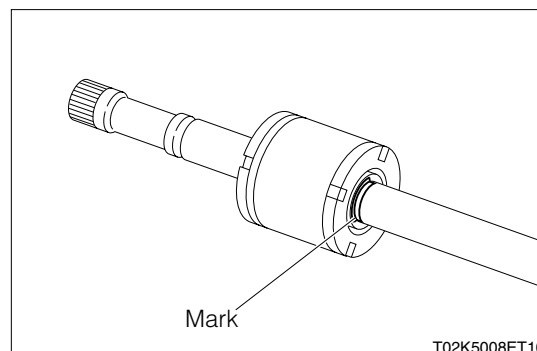
(3) Boot, front axle inboard joint

1. Wind a tape on the spline section at the inboard side.
Remove the boot (At the inboard side).



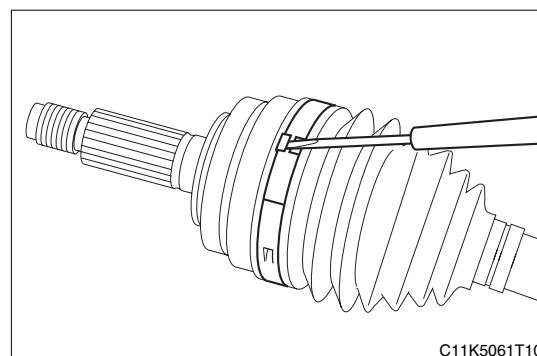
(4) Damper, drive shaft

1. Put mate marks on the damper and drive shaft.
(These mate marks are used as a guide during the press-fitting.)
2. Remove the damper, using a press.



(5) Boot, front axle outboard joint

1. Remove the boot band (At the outboard side).
 - (1) Using a flat screwdriver, release the locking at the bent section of the boot band (at the outboard side).

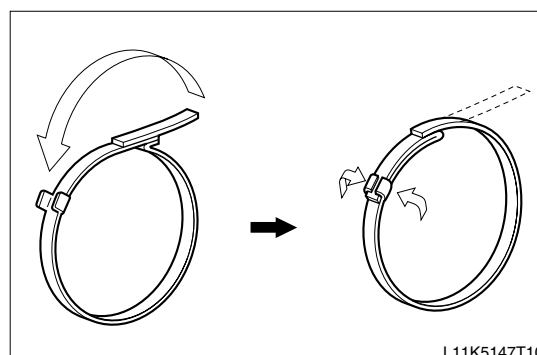


2. Remove the boot (At the outboard side).

3-2-4 POINTS OF ASSEMBLY

(1) Boot, front axle outboard joint

1. Assemble the boot (At the outboard side).
 - (1) Wind a tape on the spline section at the inboard side.
 - (2) Fill the outboard joint section and the inside of the boot with the grease furnished in the boot set.
Assemble the boot (At the outboard side).
2. Assemble the rear drive shaft boot clamp by bending it in the sequence specified in the right figure.



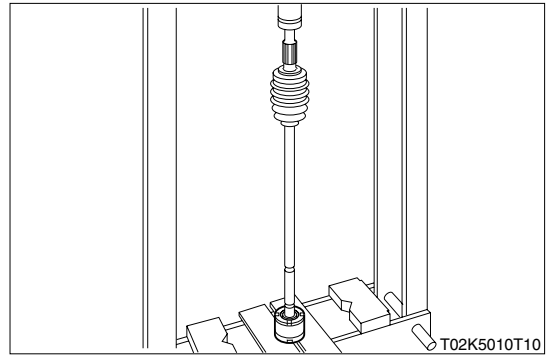
D2-15

(2) Damper, drive shaft

1. The press-fitting should be made up to the mark position that was put during the disassembly.

CAUTION

- The press-fitting should be with the joint section in a straight condition.

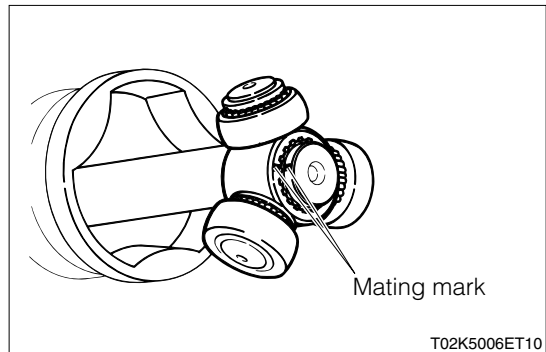


(3) Tripod Ay, inboard joint

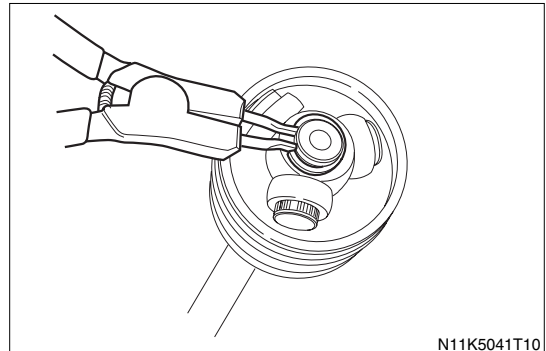
1. Assemble the front axle inboard joint boot and rear drive shaft boot clamp to the RH/LH front axle shafts.
2. Assemble the tripod Ay, aligning with the mating marks on the RH/LH front axle shaft.

CAUTION

- Assemble the tripod Ay to the RH/LH front axle shaft from the chamfered side of the spline.
- When the brass bar is used for driving, be sure to apply the brass bar to the boss section of the tripod, not to the roller section.

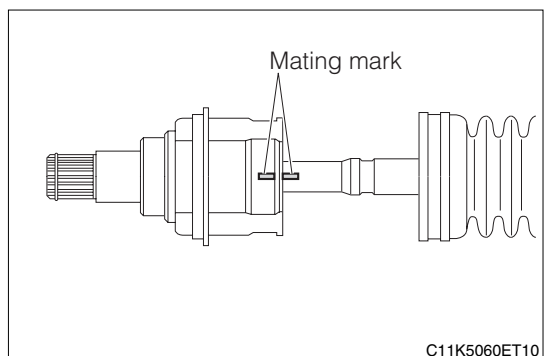


3. Install the drive shaft snap ring, using a snap ring expander.

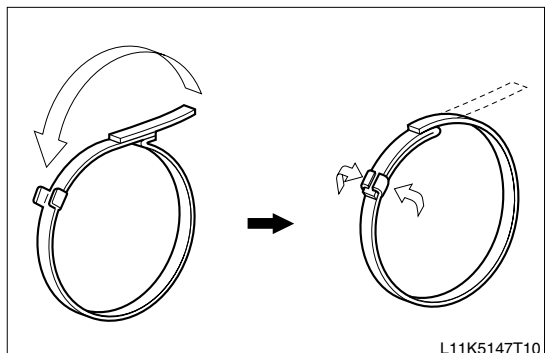


(4) Joint S/A, front axle inboard

1. Fill the joint S/A with the grease furnished in the boot set. Assemble the joint S/A, aligning with the mate marks on the RH/LH front axle shafts. .



2. Bend and assemble the boot band, as indicated in the right figure.



4 REAR AXLE BEARING (2WD VEHICLES)

4-1 REMOVAL AND INSTALLATION

Refer to Page E1-43.

E1 BRAKE

BRAKE-----	E1-1
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REPLACEMENT -----	E1-8
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REMOVAL AND INSTALLATION (LHD VEHICLES)-----	E1-10
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DISASSEMBLING AND ASSEMBLING -----	E1-46

E1-1

1 BRAKE

1-1 ARTICLES TO BE PREPARED

Instrument

Foot pressure gauge, Torque wrench

Lubricant, adhesive, others

Brake fluid(DOT3), Brake grease

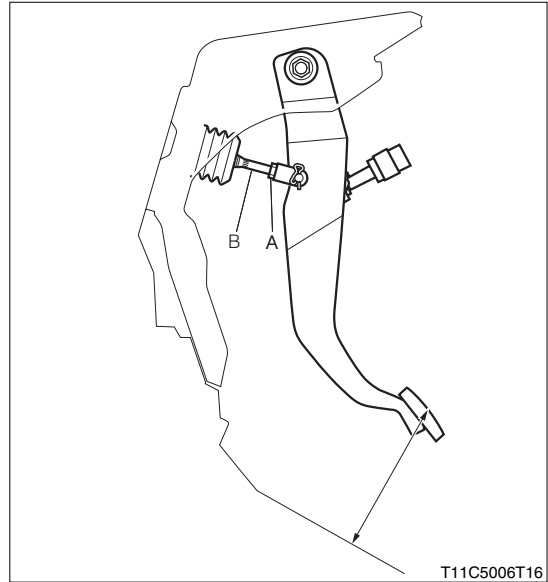
1-2 BASIC CHECK AND ADJUSTMENT

1-2-1 BRAKE PEDAL

(1) Height check

1. Turn over the carpet near the brake pedal.
2. Measure the height from the central section of the brake pedal depressing surface to the upper surface of the dash panel.

SPECIFIED VALUE: $135.7 \pm 5\text{mm}$ (RHD vehicles)
 $134.9 \pm 5\text{mm}$ (LHD vehicles)



(2) Height adjustment

1. Remove the instrument panel finish lower panel S/A.
2. Disconnect the connector of the stop lamp switch Ay.
3. Remove the stop lamp switch assembly by turning it counterclockwise so that the brake pedal may have a free play.
4. Loosen the nut (A) indicated in the figure. Adjust the brake pedal height by turning the push rod (B).

TIGHTENING TORQUE: $13.0 \pm 3.0\text{N} \cdot \text{m}$ { $133 \pm 30\text{kgf} \cdot \text{cm}$ }

5. Lock the stop lamp switch assembly by turning the main body of the assembly clockwise. Confirm the protruding amount of the shaft of the stop lamp switch assembly.

SPECIFIED VALUE: 2 mm or less (A clearance shall be provided so that the screw end surface of the stop lamp switch assembly may not be brought into contact with the bracket cushion at the brake pedal side.)

6. Connect the connector of the stop lamp switch Ay.
7. Check the brake pedal play. Ensure that the stop lamp is illuminated.
8. Install the instrument panel finish lower panel S/A.

(3) Free play check

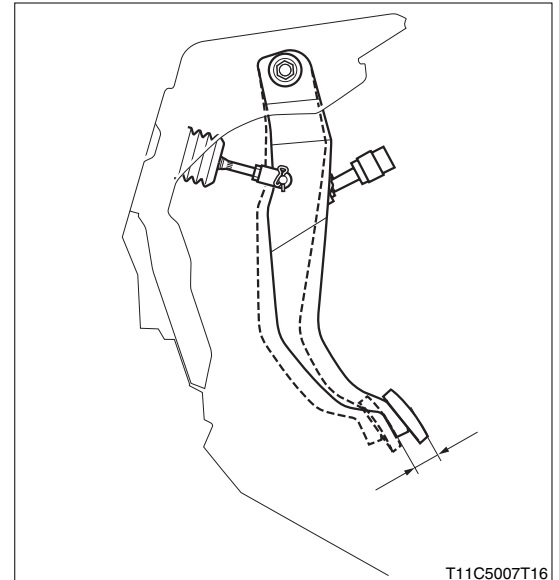
1. After stopping the engine, depress strongly the brake pedal several times so that the negative pressure inside the brake booster no longer exists.
2. Measure the play of the pedal (Excessive play between the clevis and the clevis pin) by pulling the brake pedal toward your side. (The stop lamp switch side)

SPECIFIED VALUE: 0.5 - 3.0 mm

NOTE

- If the measured value is out of the specification, check and adjust the protruding amount of the stop lamp SW.

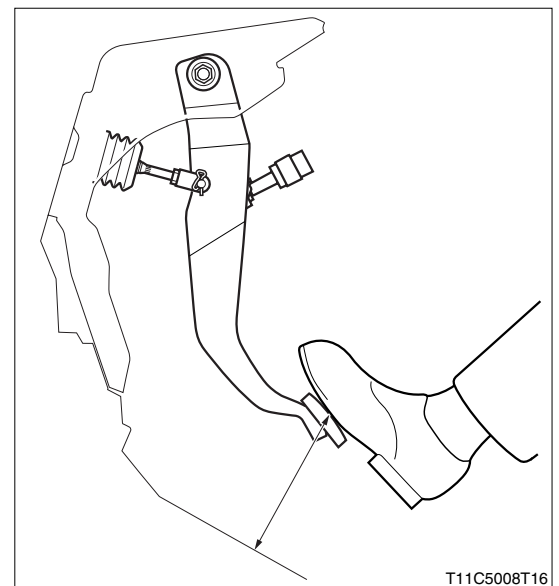
Refer to Page E1-12.



(4) Reserve travel check

1. Turn over the carpet near the brake pedal.
2. Release the parking brake while the engine is idling.
3. While the brake pedal is being depressed by the specified depressing force, measure the height from the central section of the brake pedal depressing surface to the upper surface of the dash panel.

SPECIFIED VALUE: 70 mm or more (Depressing force 294N {30kgf}) (RHD vehicles)
60 mm or more (Depressing force 294N {30kgf}) (LHD vehicles)



(5) Check of depressing state

1. Depress the brake pedal. Carry out the following checks.
 - (1) Ensure that there exists no ingress of air by checking the depression state.
 - (2) Ensure that there exists no abnormal noise due to looseness at the installing section's.
 - (3) Ensure that there exists no excessive play due to wear or looseness at the installing section.

(6) Brake working condition check

① Check through actual running

1. Run on dry road surface and depress the brake pedal. Ensure that you can get the braking force equivalent to the depressing force and the vehicle can stop straight in the advancing direction.

(7) Check of brake operation state

1. Ensure that the brake master cylinder, front brake calipers and rear wheel cylinder are operating correctly, based on the check results of the brake pedal free play, reserve travel and braking performance.

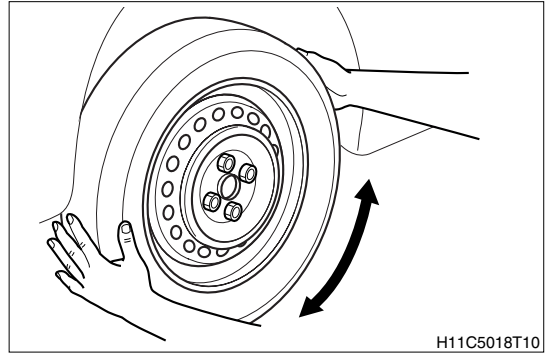
1-2-2 CHECK OF BRAKE DRAGGING

(1) Dragging check

1. Jack up the vehicle.

E1-3

2. Operate the brake pedal and parking brake several times so as to stabilize the front brake pads and rear brake shoe linings. Then, turn the wheels by hand to see if the brake exhibits no dragging.



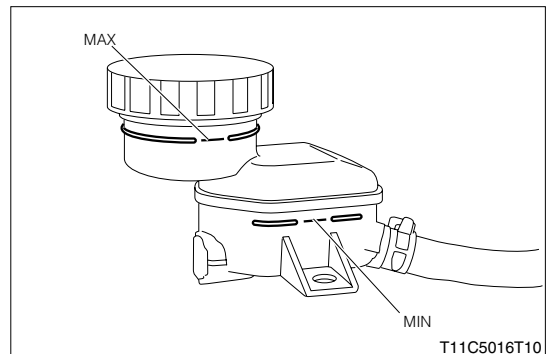
1-2-3 CHECK AND REPLENISHING OF BRAKE FLUID

CAUTION

- Never reuse the wiped-out brake fluid.
- Care must be exercised so that no brake fluid may adhere to the paint surface. If brake fluid is adhered to the paint surface, immediately wipe it out and wash it with water.

(1) Fluid level check

1. Check that the fluid level of the reservoir tank is within the specified range. (Between MIN and MAX)



(2) Replenishment

1. If the fluid level is below the MIN level, after the following check has been conducted, replenish brake fluid up to a level between MIN and MAX levels of the reservoir tank.

LUBRICANT: Brake fluid(DOT3)

(1) Brake pad thickness check

Refer to Page E1-5.

(2) Brake master cylinder fluid leakage check

Refer to Page E1-4.

(3) Check of brake hoses and pipes for fluid leakage

Refer to Page E1-4.

(4) Front brake caliper fluid leakage check

Refer to Page E1-6.

(5) Rear wheel cylinder fluid leakage check

Refer to Page E1-7.

(3) Air bleeding

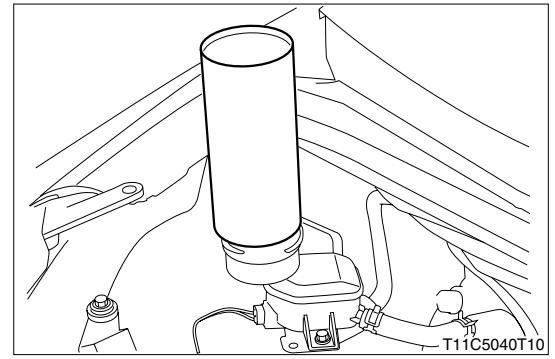
1. Jack up the vehicle.
2. Remove the disc wheels.

3. Replenish the brake fluid by placing the container of brake fluid upside down on the reservoir tank.

LUBRICANT: Brake fluid(DOT3)

CAUTION

- Ensure that the container contains an adequate amount of brake fluid.
- When replenishing, ensure that the master cylinder reservoir at the upper section of the master cylinder Ay is filled with brake fluid fully. Then, proceed to the operation.
- To avoid any ingress of air, keep refilling the brake fluid at all times so that the reservoir tank may not become empty.



4. Install a transparent tube to the bleeder plug and receive the brake fluid in a container.
5. Depress the brake pedal several times.
6. Carry out air bleeding by loosening the bleeder plug with the brake pedal in the depressed state.
7. When the brake fluid stops coming out strongly, temporarily tighten the bleeder plug and return the brake pedal.
8. Repeat the operations posted in Items 5 through 7 until the air is no longer emitted.
9. Tighten the bleeder plug.

TIGHTENING TORQUE: $8.4 \pm 1.4 \text{ N} \cdot \text{m} \{85 \pm 14 \text{ kgf} \cdot \text{cm}\}$

10. Carry out the operations posted in Items 4 through 9 for each wheel.

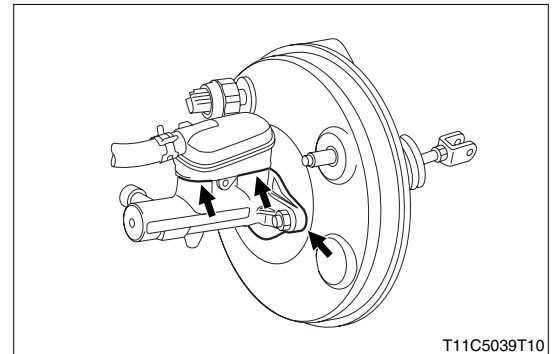
11. Check the fluid level of the reservoir tank.

Refer to Page E1-3.

1-2-4 CHECK OF EACH PART OF BRAKE MASTER CYLINDER

(1) Check of fluid leakage

1. Visually check around the reservoir tank to ensure that no fluid leakage is present.
2. Visually check around the brake master cylinder to ensure that no fluid leakage is present.



(2) Check of wear and damage

1. Visually check the external view of the brake master cylinder to ensure that no damage or fluid leakage is present.
2. When disassembling the brake master cylinder, check the following items given below.
 - (1) Scores on bore surfaces of the brake master cylinder
 - (2) Deformation and damage of cylinder

1-2-5 CHECK OF BRAKE HOSES AND PIPES

(1) Operations prior to check

1. Jack up the vehicle.

(2) Check of fluid leakage

1. Visually check the connections of the brake hoses and pipes to ensure that no fluid leakage is present.

E1-5

- (3) **Check of damage**
 - 1. Visually check the brake hoses for bulge or cracks due to deterioration; the pipes for cracks or damage.
- (4) **Check of installing conditions**
 - 1. Check that the clamps are installed to the brake hoses or pipes securely.
 - 2. Visually check that the brake hoses and pipes do not interfere with the body or other sections due to vibration during running. Furthermore, fully turn the steering wheel to the right and left sides to ensure that the brake hoses will not interfere with other parts.
- (5) **Check of tightening conditions**
 - 1. Check the connections and clamps for loosening, using spanners or the like.

1-2-6 CHECK OF EACH PART OF FRONT BRAKE SYSTEM

(1) Operations prior to check

- 1. Jack up the vehicle.
- 2. Remove the front disc wheels.

(2) Check of front brake pads

① Thickness check

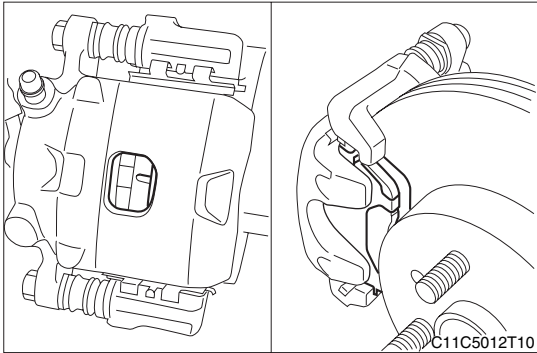
- 1. Check the pad thickness.

	Front disc 234 mm dai	Front disc 246 mm dai
Limit value [mm]	1	1.5

NOTE

- New part

	Front disc 234 mm dai	Front disc 246 mm dai
Standard value [mm]	10	9.5



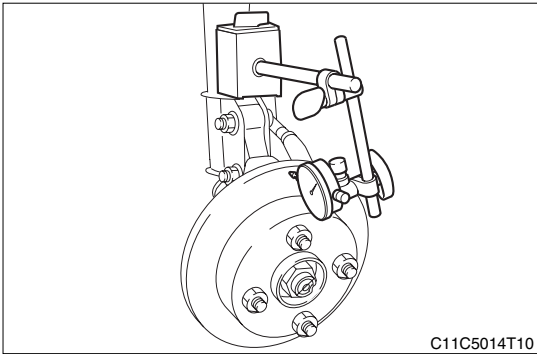
- 2. If the pad thickness is below the limit, replace the pad.
Refer to Page E1-39.

(3) Check of front brake disc

① Runout check

- 1. Secure the front brake disc by attaching proper four wheel nuts (Penetration type) and tightening them to a uniform torque.
- 2. Ensure that the front hub bearing exhibit no excessive looseness.
Refer to Page D2-2.

- 3. Measure the runout of the disc edge at a point 10 mm from the outer periphery of the disc, using a dial gauge.
ALLOWABLE LIMIT: 0.10mm
- 4. If the runout of the front brake disc exceeds the limit, check the axle hub for runout. If no abnormality is found, replace the front brake disc.
Refer to Page E1-39.



② Check of wear, damage and thickness

1. Visually check the front brake disc to ensure that no excessive wear or damage is present.
2. Measure the thickness of the front brake disc.

ALLOWABLE LIMIT:

	Front disc 234 mm dai	Front disc 246 mm dai
Limit value [mm]	15	16

NOTE

- New part

	Front disc 234 mm dai	Front disc 246 mm dai
Standard value [mm]	16	17

3. If the front brake disc thickness becomes below the limit or the brake disc exhibits excessive uneven wear or damage, replace the front brake disc.

(4) Check of front brake caliper

① Check of fluid leakage

1. Visually check around the front brake caliper to ensure that no fluid leakage is present.

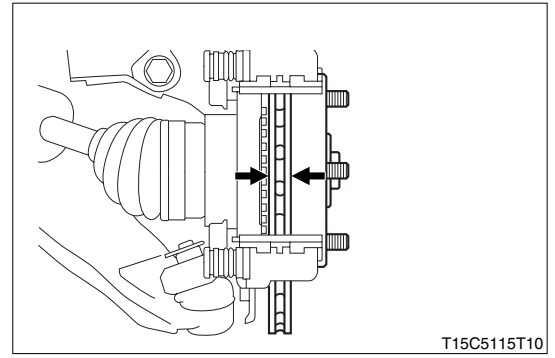
② Check of wear and damage

1. Visually check the external view of the front brake caliper to ensure that no fluid leakage is present.
2. When the front brake caliper is disassembled, check the following items.
 - (1) Disc brake cylinder bore surface
 - (2) Wear and damage of disc brake piston

1-2-7 CHECK OF EACH SECTION OF REAR BRAKE SYSTEM

(1) Operations prior to check

1. Remove the rear brake drum.
Refer to Page E1-43.



E1-7

(2) Check of rear brake shoe linings

① Check of wear, damage and thickness

1. Visually check the shoe linings to ensure that no excessive uneven wear, damage or peeling off is present.
2. Measure the thickness of the shoe lining.

ALLOWABLE LIMIT: 1mm

NOTE

- New part: 4 mm
3. If the shoe lining thickness becomes below the limit or the shoe linings exhibit excessive uneven wear, damage or peeling off, replace the brake shoes.

CAUTION

- When replacing the rear brake shoe Ay, replace both shoes in right and left wheels as a set in order to prevent the pulling of brake.
4. When the rear brake shoe is disassembled, check the following items.
 - (1) Excessive wear at the contact surface between the rear brake backing plate and the rear brake shoe.

CAUTION

- Lack of grease at the contact surface between the rear brake backing plate and the rear brake shoe causes premature wear or abnormal noise. Therefore, apply grease here at the time of checking.

LUBRICANT: Brake grease

- (2) Flattened return spring
- (3) Smooth operation of adjusting device

(3) Check of rear brake drum

① Check of wear, damage and bore diameter

1. Visually check the inner surface of the rear brake drum to ensure that no excessive uneven wear, cracks or damage, etc. is present.
2. Measure the rear brake drum inner diameter.

ALLOWABLE LIMIT: 181mm

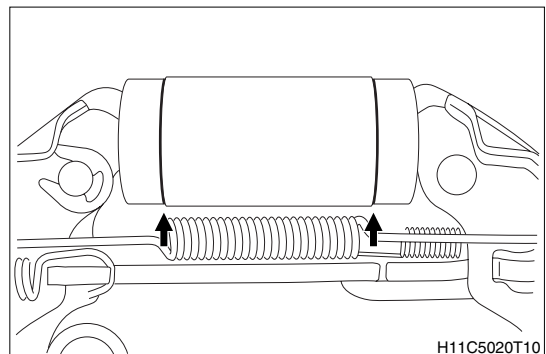
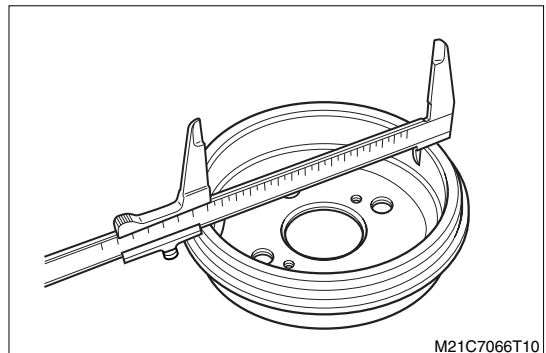
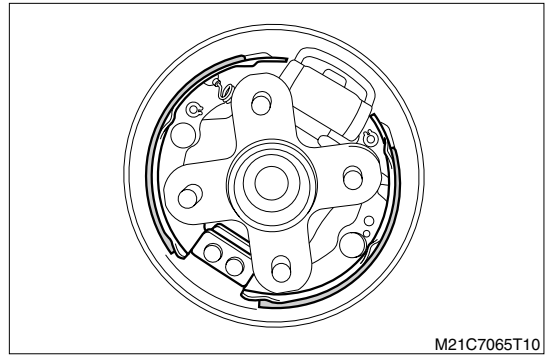
NOTE

- New part: 180 mm
3. If the rear brake drum exhibits excessive uneven wear, cracks, or damage, grind or replace the rear brake drum.

(4) Check of rear wheel cylinder

① Check of fluid leakage

1. Visually check around the rear wheel cylinder boot to ensure that no fluid leakage is present.



② Check of wear and damage

1. Visually check the external view of the rear wheel cylinder to ensure that no damage or fluid leakage is present.
2. When the rear wheel cylinder is disassembled, check the following items
 - (1) Wear and damage of wheel brake cylinder piston
 - (2) Wear and damage of rear body bore of wheel brake cylinder

2 BRAKE FLUID

2-1 REPLACEMENT

CAUTION

- Never reuse the wiped-out brake fluid.
- Care must be exercised so that no brake fluid may adhere to the paint surface. If brake fluid is adhered to the paint surface, immediately wipe it out and wash it with water.

2-1-1 ARTICLES TO BE PREPARED

Instrument

Torque wrench

Lubricant, adhesive, others

Brake fluid(DOT3)

2-1-2 OPERATION BEFORE REPLACEMENT

1. Jack up the vehicle.
2. Remove the disc wheels.

2-1-3 REPLACING PROCEDURE

1. Replenish the brake fluid by placing the container of brake fluid upside down on the reservoir tank.

LUBRICANT: Brake fluid(DOT3)

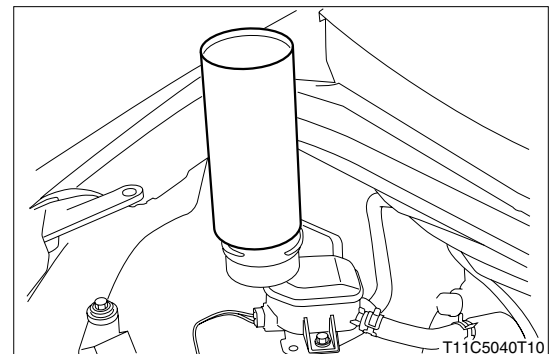
CAUTION

- Ensure that the container contains an adequate amount of brake fluid.
- When replenishing, ensure that the master cylinder reservoir at the upper section of the master cylinder Ay is filled with brake fluid fully. Then, proceed to the operation.
- To avoid any ingress of air, keep refilling the brake fluid at all times so that the reservoir tank may not become empty.

2. Install a transparent tube to the bleeder plug and receive the brake fluid in a container.
3. Loosen the bleeder plug. Slowly depress the brake pedal and return the pedal.
4. Repeat the operations posted in Item 3 at intervals of two or three seconds. At the time when the fresh brake fluid starts emitting, depress the brake pedal and tighten the bleeder plug.

TIGHTENING TORQUE: $8.4 \pm 1.4 \text{ N} \cdot \text{m} \{85 \pm 14 \text{ kgf} \cdot \text{cm}\}$

5. Conduct the operations posted in Items 2 through 4 above for each wheel.
6. Check the fluid level of the reservoir tank.
Refer to Page E1-3.



E1-9

2-1-4 OPERATION AFTER REPLACEMENT

1. Install the disc wheels.
2. Jack down the vehicle.

3 BRAKE PEDAL

3-1 REMOVAL AND INSTALLATION (RHD VEHICLES)

3-1-1 ARTICLES TO BE PREPARED

Instrument

Torque wrench

Lubricant, adhesive, others

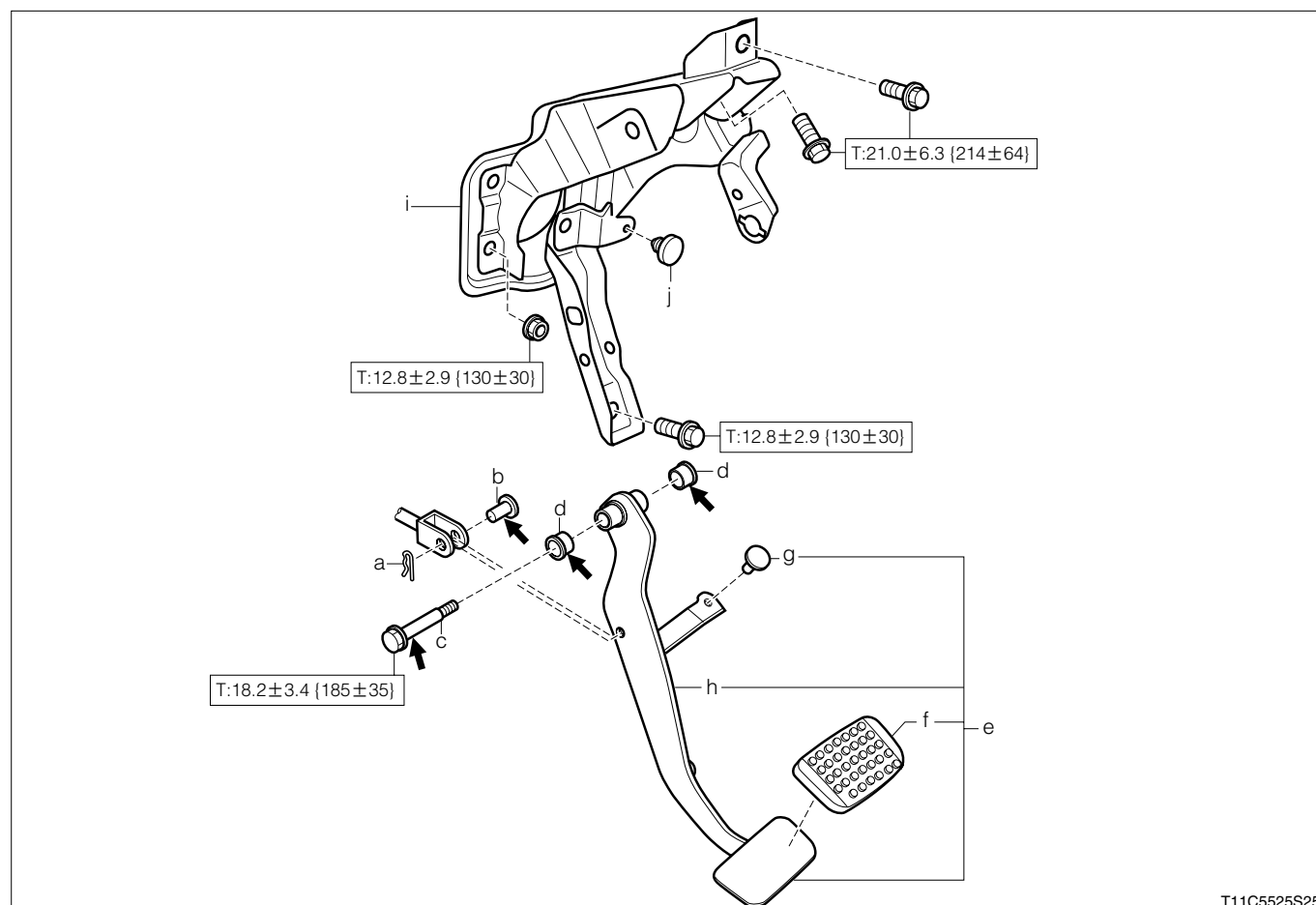
MP grease

3-1-2 OPERATION BEFORE REMOVAL

1. Remove the instrument panel finish panel subassembly lower.
Refer to Page I2-15.
2. Remove the steering column cover lower.
Refer to Page G1-4.
3. Remove the stop lamp switch assembly.
Refer to Page E1-12.
4. Remove the accelerator pedal assembly.

3-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



T11C5525S25

Unit: N·m(kgf·cm)

➡: MP grease

(2) Removal and installation procedures

- 1

a

Clip
- 2

b

Pin, w/hall
- 3

c

Shaft, pedal
- 4

d

Bush
- 5

e

Pedal Ay, brake
- 6

f

Pad, pedal
- 7

g

Cushion
- 8

h

Pedal S/A, brake
- 9

i

Support S/A, brake pedal
- 10

j

Cushion

3-1-4 OPERATION AFTER INSTALLATION

1. Install the accelerator pedal assembly.
2. Install the stop lamp switch assembly.
Refer to Page E1-12.

3. Install the steering column cover lower.
Refer to Page G1-4.

4. Install the instrument panel finish panel subassembly lower.
Refer to Page I2-15.

5. Check and adjust the brake pedal Ay.
Refer to Page E1-1.

3-2 REMOVAL AND INSTALLATION (LHD VEHICLES)

3-2-1 ARTICLES TO BE PREPARED

Instrument

Torque wrench

Lubricant,adhesive,others

MP grease

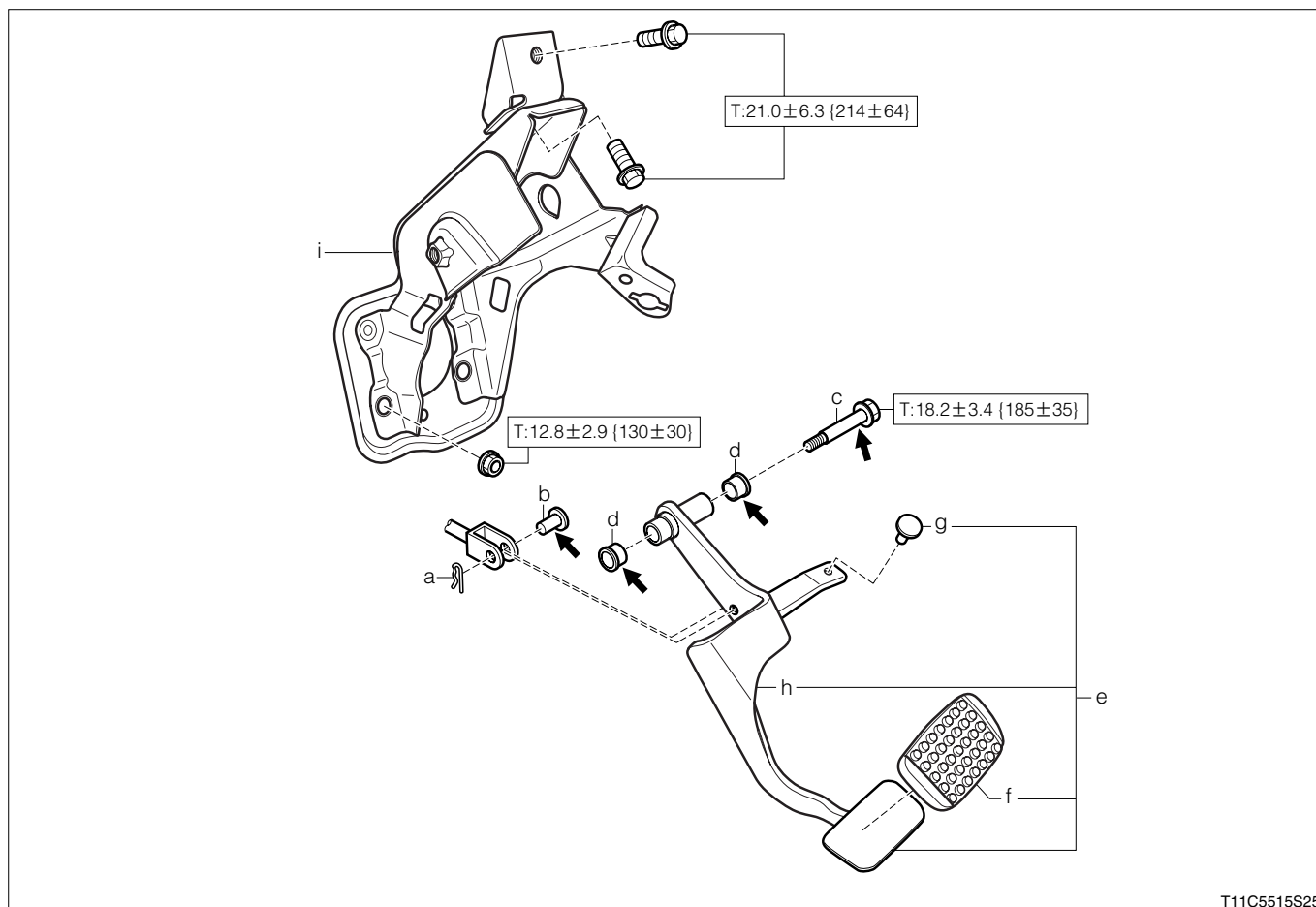
3-2-2 OPERATION BEFORE REMOVAL

1. Remove the instrument panel finish panel subassembly lower.
Refer to Page I2-15.
2. Remove the steering column cover lower.
Refer to Page G1-4.
3. Remove the stop lamp switch assembly.
Refer to Page E1-12.

E1-11

3-2-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



T11C5515S25

Unit: N·m{kgf·cm}

➡: MP grease

(2) Removal and installation procedures

1 a Clip	6 f Pad, pedal
2 b Pin, w/hall	7 g Cushion
3 c Shaft, pedal	8 h Pedal S/A, brake
4 d Bush	9 i Cushion
5 e Pedal Ay, brake	

3-2-4 POINTS OF REMOVAL

(1) Support S/A, brake pedal

1. With the brake pedal Ay installed, remove the support S/A from the vehicle.

3-2-5 OPERATION AFTER INSTALLATION

1. Install the stop lamp switch assembly.
Refer to Page E1-12.
2. Install the steering column cover lower.
Refer to Page G1-4.
3. Install the instrument panel finish panel subassembly lower.
Refer to Page I2-15.
4. Check and adjust the brake pedal Ay.
Refer to Page E1-1.

4 STOP LAMP SWITCH

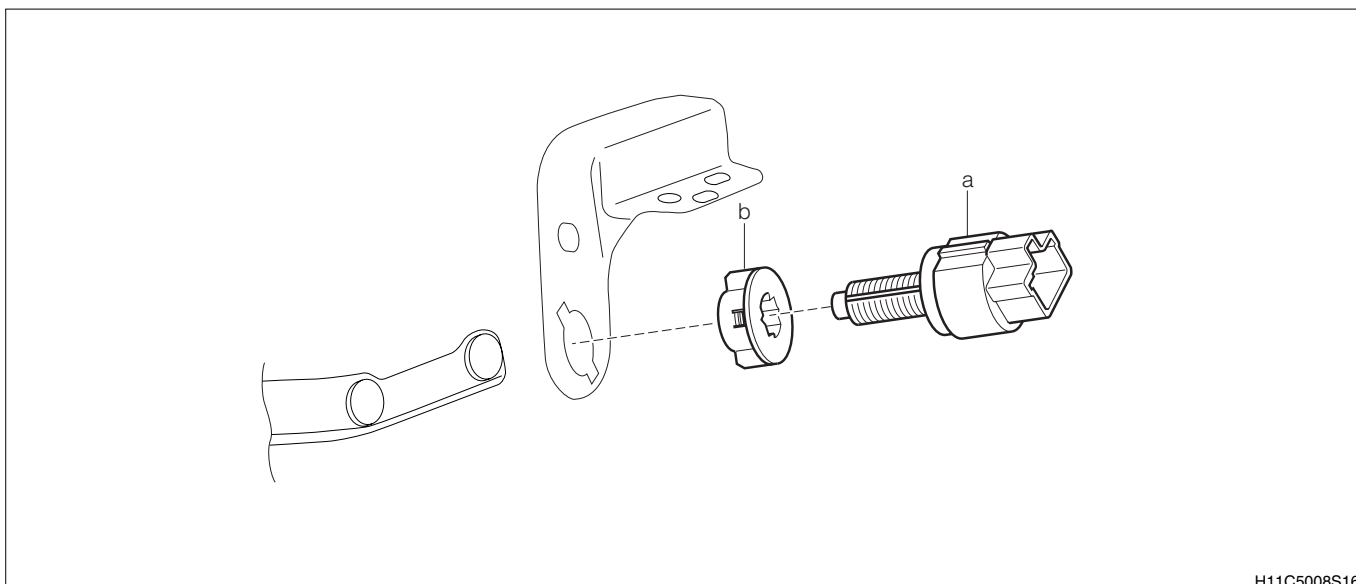
4-1 REMOVAL AND INSTALLATION

4-1-1 OPERATION BEFORE REMOVAL

1. Disconnect the connector of the stop lamp switch Ay.

4-1-2 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



H11C5008S16

(2) Removal and installation procedures

- ▼ ▲ 1 a Switch Ay, stop lamp
2 b Adjuster, stop lamp switch mounting

4-1-3 POINTS OF REMOVAL

(1) SW AY, stop lamp

1. Remove the switch assembly by turning it counterclockwise.

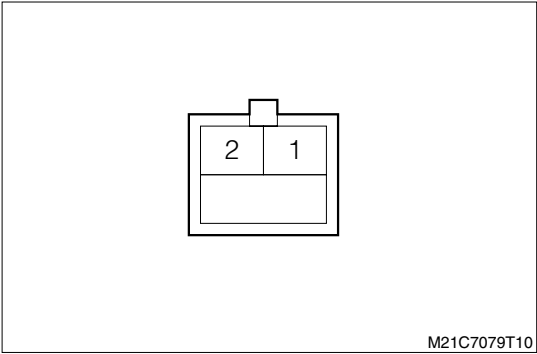
E1-13

4-1-4 INSPECTION

1. Check continuity between the connector terminals of the stop lamp switch Ay.

SPECIFIED VALUE:

Switch conditions	Continuity
When released	Exists
When pushed	Not exists



4-1-5 POINTS OF INSTALLATION

(1) SW AY, stop lamp

1. Lightly push the edge surface of the threaded section of the switch Ay to the bracket of the brake pedal Ay.

CAUTION

- Make sure that the edge surface of the threaded portion of the switch assembly will not push the brake pedal assembly.
2. Turn the main body of the switch assembly clockwise in order to lock it. At this time, ensure that the shaft protruding amount of the switch assembly is 2 mm or less.

4-1-6 OPERATION AFTER INSTALLATION

1. Connect the connector of the stop lamp switch Ay.
2. Depress the brake pedal Ay. At this time, ensure that the stop lamp functions properly.
3. Check the free travel of the brake pedal Ay.

Refer to Page E1-1.

5 BRAKE MASTER CYLINDER

5-1 REMOVAL AND INSTALLATION

CAUTION

- Care must be exercised so that no brake fluid may adhere to the paint surface. If brake fluid is adhered to the paint surface, immediately wipe it out and wash it with water.
- Never reuse the wiped-out brake fluid.

5-1-1 ARTICLES TO BE PREPARED

SST

Shape	Part No.	Part name
	09258-00030-000	Plug set,hose
	09023-00100-000	Wrench,union nut
	09730-87401-000	Gauge set,brake booster gauge

Lubricant,adhesive,others

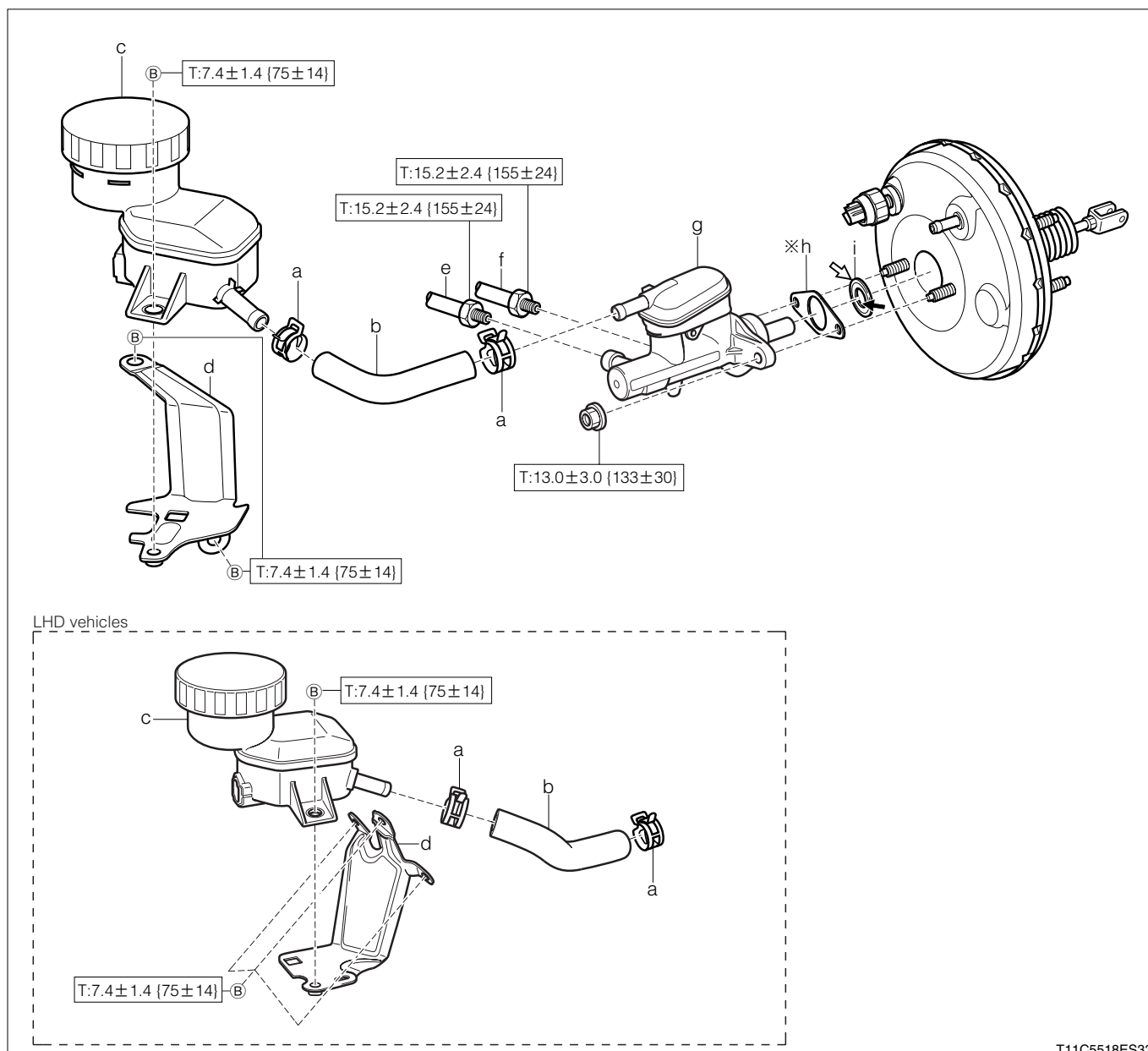
Brake fluid(DOT3),Brake grease,Silicon grease

5-1-2 OPERATION BEFORE REMOVAL

1. Remove the disc wheels.
2. On ABS-equipped vehicles, perform the following operations.
 - (1) After setting the IG SW "LOCK"
 - (2) Disconnect the connector of the brake actuator Ay.
3. Disconnect the air cleaner hose No.1. (RHD vehicles)
Refer to Page B3-1.
4. Remove the battery. (LHD vehicles)
5. Disconnect the connector of the level warning switch to the brake master reservoir S/A.

5-1-3 REMOVAL AND INSTALLATION PROCEDURES (ABS-EQUIPPED VEHICLES)

(1) Components



T11C5518ES33

Unit: N·m{kgf·cm}

※: Non-reusable parts

➡: Brake grease

⇨: Silicone grease

(2) Removal and installation procedures

▼ ▲ 1	a Clip	▼ ▲ 6	f Tube, front brake, No.3
▼ ▲ 2	b Hose, reservoir, No.1	▲ 7	g Cylinder S/A, brake master
3	c Reservoir Ay, master cylinder	8	h Gasket, master cylinder
4	d Bracket, reservoir	9	i Seal, master cylinder
▼ ▲ 5	e Tube, front brake, No.1		

5-1-4 POINTS OF REMOVAL

(1) Hose, reservoir, No.1

1. Disconnect the hose at the brake master cylinder S/A. side. Plug the hose tip end with the SST.

SST: 09258-00030-000

(2) Tube, front brake

1. Disconnect the tube from the brake master cylinder S/A.
2. Plug the disconnected tube with the bleeder plug cap or the like.

5-1-5 POINTS OF INSTALLATION

(1) Cylinder S/A, brake master

1. Check the push rod gap of the brake booster Ay, following the next procedure given below.

- (1) Fit an O-ring (SST) into the groove at the rod section of the gauge (SST). Then, install an attachment (SST) to the same place. Moreover, apply brake grease to the surface of the attachment (SST) in advance.

SST: 09730-87401-000

LUBRICANT: Brake grease

- (2) Install the vacuum hose Ay to the brake booster Ay.
- (3) Apply brake grease to the bore lip section of the master cylinder seal attached between the cylinder S/A and the brake booster Ay. Also, apply silicone grease to its outer circumference.

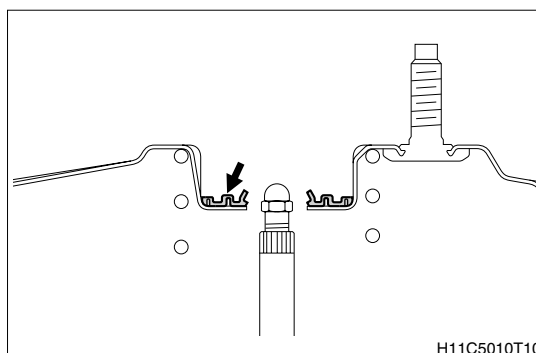
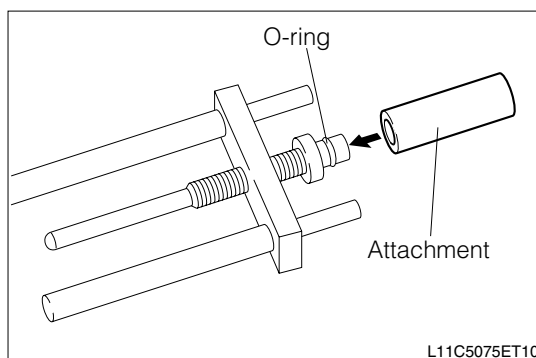
LUBRICANT: Brake grease

Silicon grease

- (4) Install the master cylinder seal to the brake booster Ay side.

CAUTION

- Make sure that the master cylinder seal is attached in the correct direction.
- (5) Install the master cylinder gasket to the brake master cylinder Ay.



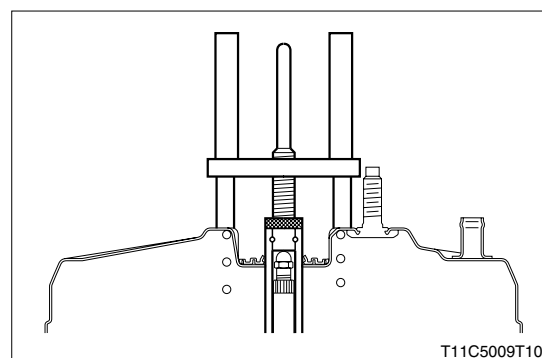
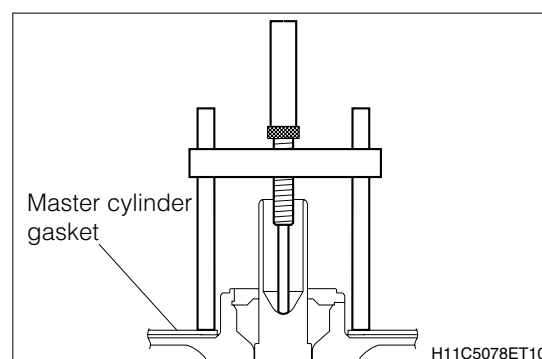
- (6) Set the gauge (SST) to a position where the rod of the gauge (SST) may come in contact lightly with the master cylinder piston S/A No.1 of the cylinder S/A.

- (7) Install the negative terminal of the battery. Start the engine. Apply a negative pressure of about 66.7kPa{500mmHg} to the booster.

CAUTION

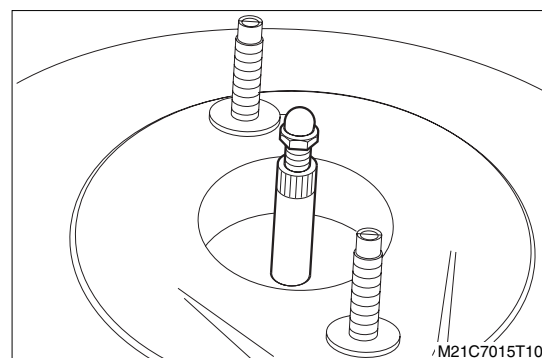
- Connect the negative terminal of the battery with the connector of the brake actuator Ay disconnected.
- (8) Install the SST at the brake booster Ay side in an inverted state. Then, check the clearance between the rod of the SST and the push rod of the brake booster Ay.

SPECIFIED VALUE: Clearance: 0 mm



2. If the clearance of the brake booster push rod fails to conform to the specified value, perform the adjustment, following the procedure given below.

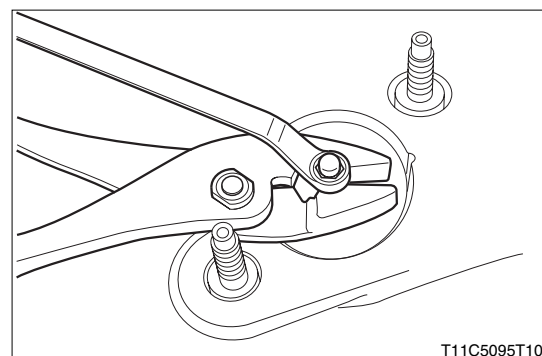
- (1) Retain the push rod in a pushed-out state.



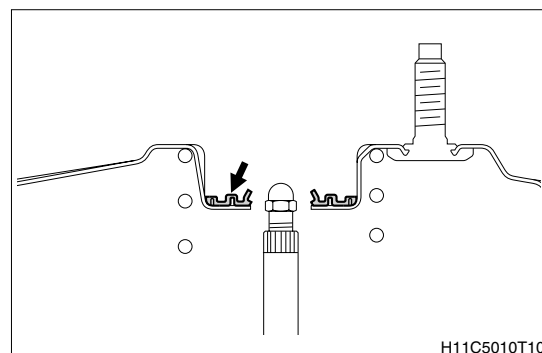
- (2) Secure the push rod, using pliers or the like. Then, adjust the length by turning the bolt provided at the tip end of the push rod.

3. Apply silicone grease to the tip-end of the push rod of the brake booster Ay.

LUBRICANT: Silicon grease



4. Ensure that the master cylinder seal is correctly installed. Then, install the cylinder subassembly to the brake booster assembly.



E1-17

(2) **Tube, front brake**

- 1. When the brake master cylinder S/A has been removed and installed, before the tube is connected, carry out air bleeding of the brake master cylinder S/A.

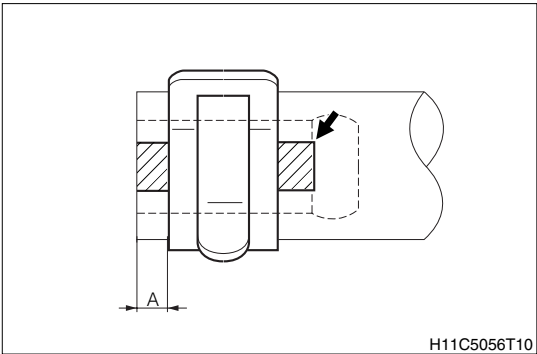
Refer to Page E1-3.

- 2. Temporarily tighten the union nut until the tube flare section contacts closely with the seat.
- 3. Using the SST, connect the tube to the brake master cylinder S/A and tighten it to the specified torque.

SST: 09023-00100-000

(3) **Hose, reservoir, No.1**

- 1. Install the hose, using the following procedure.
 - (1) The installation must be in such a way that the paint line at both ends of the hose come at the upper side of the vehicle.
 - (2) Be sure to insert the hose up to the stopper surface of the union.
 - (3) The installation positions of the clips at the both ends of the hose are such that the point (A) in the figure comes in a range of 4 ± 2 mm.



5-1-6 **OPERATION AFTER INSTALLATION**

- 1. Connect the connector of the level warning switch to the brake master reservoir S/A.
- 2. Connect the air cleaner hose No.1. (RHD vehicles)

Refer to Page B3-1.

- 3. Install the battery. (LHD vehicles)
- 4. Carry out the air bleeding of the brake.

Refer to Page E1-3.

- 5. On ABS-equipped vehicles, perform the following operations.
 - (1) Connect the connector of the brake actuator Ay.
 - (2) Connect the negative (-) terminal of the battery.

- 6. Install the disc wheels.

- 7. Confirm that there is no brake dragging.

Refer to Page E1-2.

- 8. Jack down the vehicle.

5-2 **DISASSEMBLING AND ASSEMBLING (ABS-EQUIPPED VEHICLES)**

5-2-1 **ARTICLES TO BE PREPARED**

Tool

Snap ring pliers

Lubricant, adhesive, others

Brake fluid(DOT3),Brake grease,Silicon grease

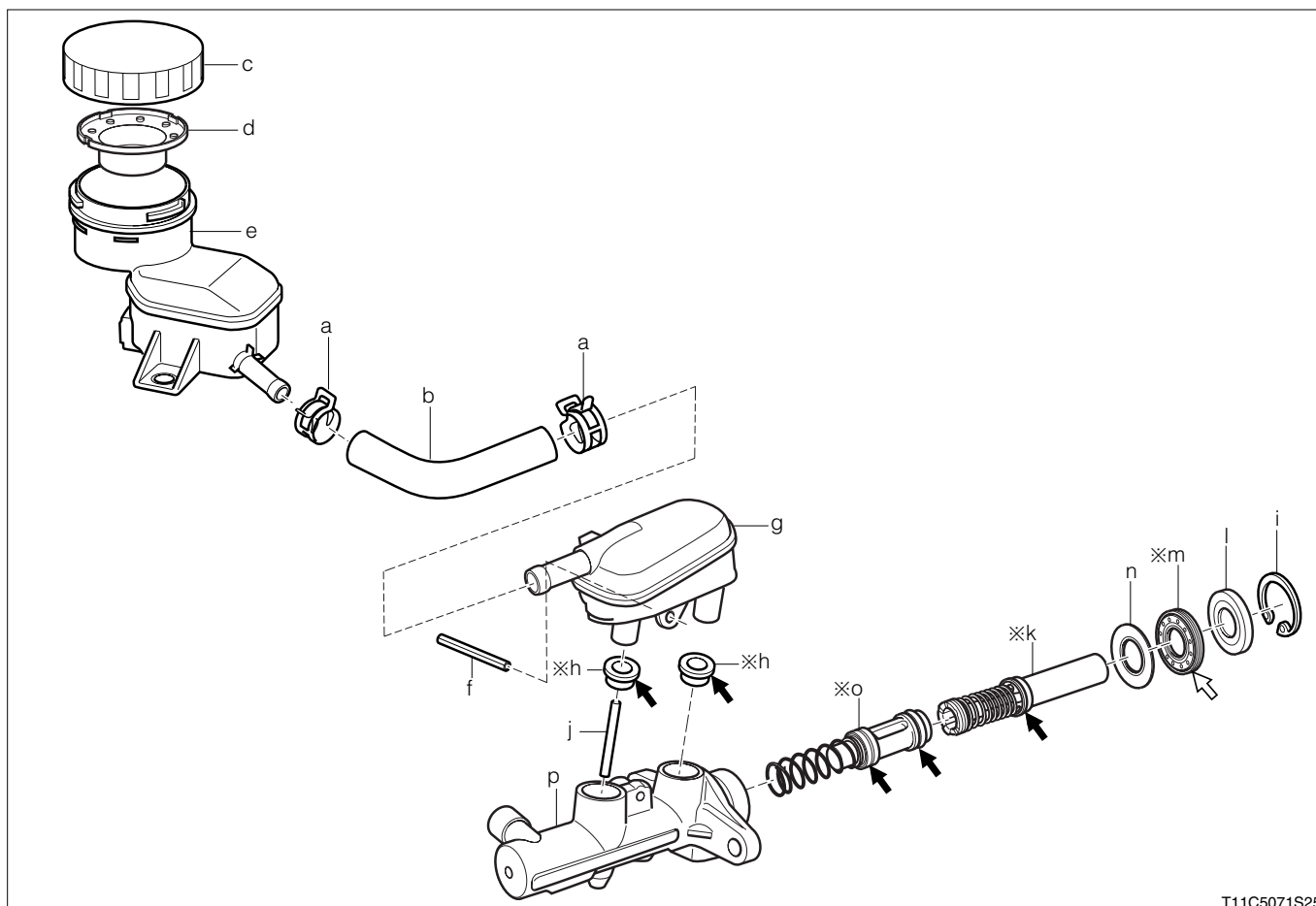
5-2-2 **OPERATION BEFORE DISASSEMBLY**

- 1. Remove the brake master cylinder S/A.

Refer to Page E1-13.

5-2-3 DISASSEMBLY AND ASSEMBLY PROCEDURES

(1) Components



T11C5071S25

※: Non-reusable parts

➡: Brake fluid (Equivalent to DOT3)

⇨: Brake grease

(2) Disassembling and assembling procedure

1 a Clip	▼ ▲ 9 i Ring, hole snap
▲ 2 b Hose, reservoir, No.1	▼ ▲ 10 j Pin
3 c Cap Ay, reservoir filler	▼ ▲ 11 k Piston S/A, master cylinder No.1
4 d Strainer, master cylinder reservoir	12 l Guide, master cylinder piston
5 e Reservoir S/A, master cylinder	▲ 13 m Cup, cylinder
6 f Pin	14 n Plate, master cylinder piston stop
7 g Reservoir, master cylinder	▼ ▲ 15 o Piston S/A, master cylinder, No.2
▲ 8 h Grommet, reservoir	16 p Body, master cylinder

5-2-4 POINTS OF DISASSEMBLY

(1) Ring, hole snap

1. Remove the residual brake fluid inside the brake master cylinder S/A by pushing the master cylinder piston S/A No.1 several times.

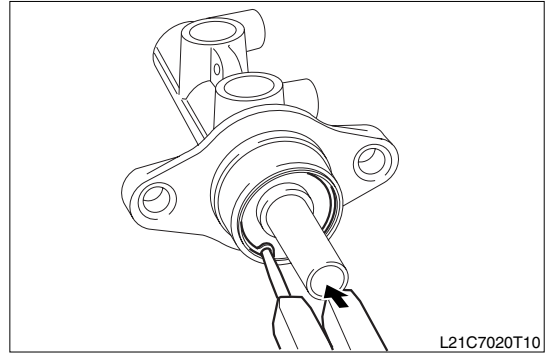
CAUTION

- Be careful so that the fluid may not scatter when pushing the master cylinder piston S/A No.1.

E1-19

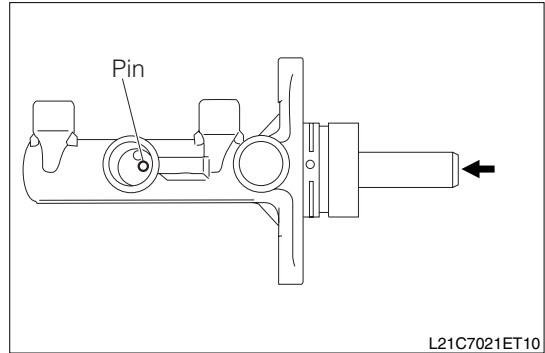
2. With the master cylinder piston S/A No.1 pushed in, remove the ring, using snap ring pliers.

TOOL: Snap ring pliers



(2) Pin

1. With the master cylinder piston S/A No.1 pushed in, remove the pin.



(3) Piston S/A, master cylinder, No.1

1. Take out the piston S/A straight.

CAUTION

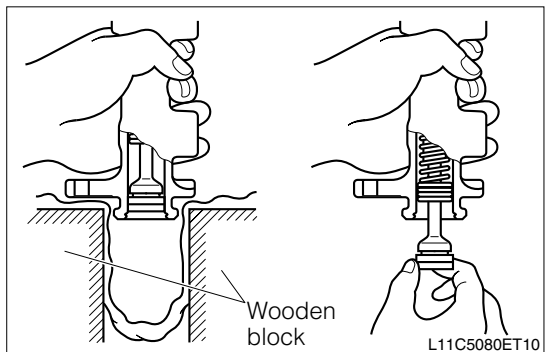
- The removal must be made in such a way that no score be made to the bore surface of the master cylinder body.

(4) Piston S/A, master cylinder, No.2

1. Tap flange portion lightly against a chip of wood until the end of the piston S/A comes out.
2. When the end of the piston S/A comes out, then pull out the piston S/A straight.

CAUTION

- The removal must be made in such a way that no score be made to the bore surface of the master cylinder body.



5-2-5 INSPECTION

(1) body, master cylinder

1. Check to see if the cylinder bore exhibits scratches.
2. Check to see if the cylinder exhibits deformation and scratches.

5-2-6 POINTS OF ASSEMBLY

(1) Piston S/A, master cylinder, No.2

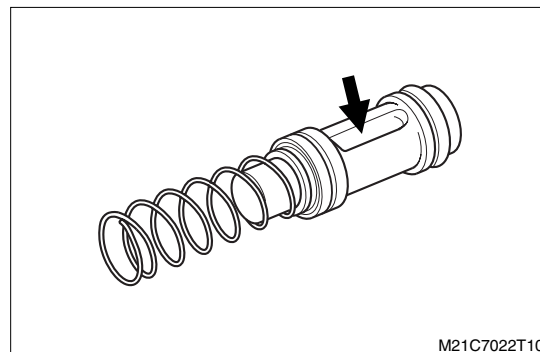
1. Apply brake fluid to the entire periphery of the cylinder inner surface of the master cylinder body.

LUBRICANT: Brake fluid(DOT3)

2. Apply brake fluid to the entire periphery of the cup of the piston subassembly.

LUBRICANT: Brake fluid(DOT3)

3. Insert the piston S/A in such a way that the elongated hole of it is aligned with the pin attaching hole of the master cylinder body.



(2) Cup, cylinder

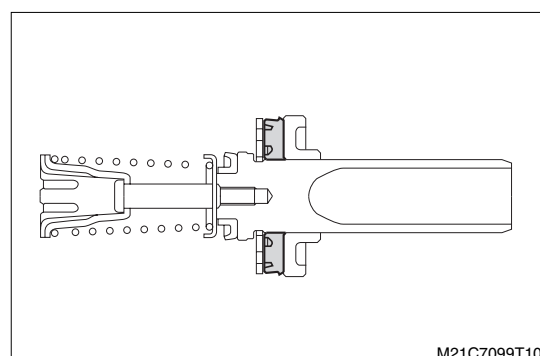
1. Apply brake grease to the entire periphery of the inner and outer surfaces of the cup.

LUBRICANT: Brake grease

2. Install the cup to the master cylinder piston S/A No.1.

CAUTION

- Install the cup in such a way that the side having the groove comes at the master cylinder piston stop plate side.



(3) Piston S/A, master cylinder, No.1

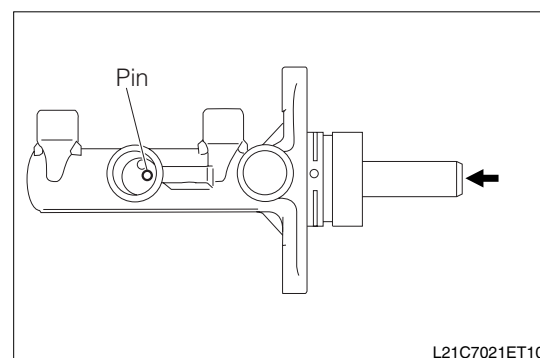
1. Apply brake fluid to the entire periphery of the cup of the piston subassembly.

LUBRICANT: Brake fluid(DOT3)

2. Insert the piston S/A into the master cylinder body.

(4) Pin

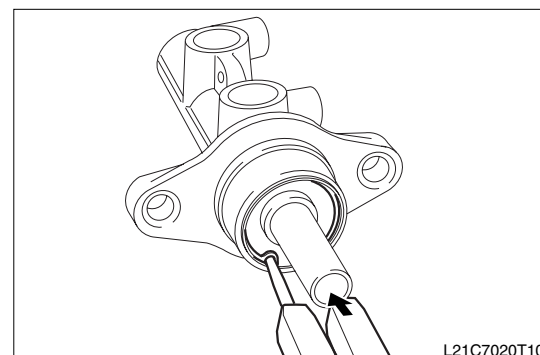
1. With the master cylinder piston S/A No.1 pushed in, remove the pin.



(5) Ring, hole snap

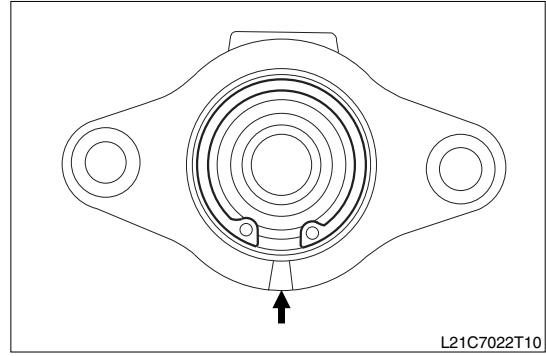
1. With the master cylinder piston S/A No. 1 pushed in, assemble the ring, using snap ring pliers.

TOOL: Snap ring pliers



E1-21

2. Install the ring in such a way that the opening may face downward.

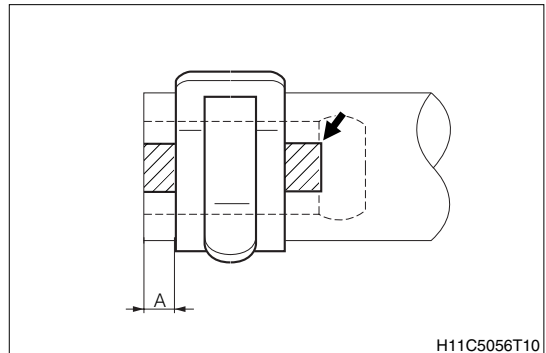


(6) Grommet, reservoir

1. Apply brake fluid to the entire periphery of the inner and outer surfaces of the grommet.
LUBRICANT: Brake fluid(DOT3)

(7) Hose, reservoir, No.1

1. Install the hose, using the following procedure.
 - (1) The installation must be performed in such a way that the paint line at both ends of the hose come at the upper side of the vehicle.
 - (2) Be sure to insert the hose up to the stopper surface of the union.
 - (3) The installation positions of the clips at the both ends of the hose are such that the point (A) in the figure comes in a range of $4 \pm 2\text{mm}$.



5-2-7 OPERATION AFTER ASSEMBLY

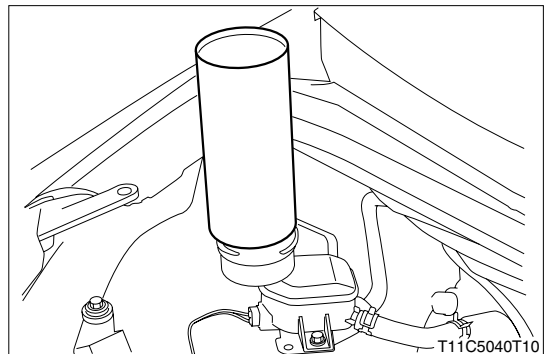
1. With the brake tube only disconnected, install the brake master cylinder S/A.
Refer to Page E1-13.

2. Carry out the air bleeding of the brake master cylinder S/A, using the following procedure given below.
 - (1) Replenish the brake fluid by placing the container of brake fluid upside down on the master cylinder reservoir S/A.

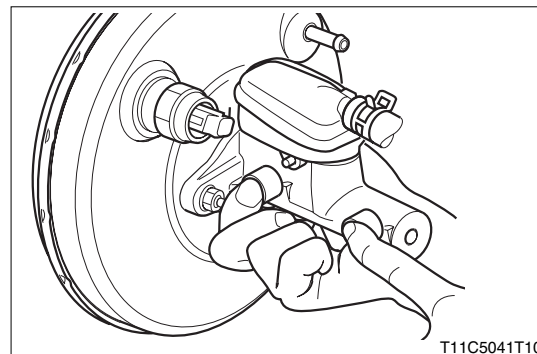
LUBRICANT: Brake fluid(DOT3)

CAUTION

- Ensure that the container contains an adequate amount of brake fluid.
 - When replenishing, ensure that the master cylinder reservoir at the upper section of the brake master cylinder S/A is filled with brake fluid fully. Then, proceed to the operation.
 - To avoid any ingress of air, keep refilling the brake fluid at all times so that the master cylinder reservoir S/A may not become empty.
- (2) Slowly depress the brake pedal and maintain this state.



- (3) Plug the installing hole of the brake tube with your finger. Return the brake pedal.
- (4) Release your finger from the installing hole of the brake tube.
- (5) Repeat the operations posted in Items (2) through (4) above three or four times. Thus, fill the brake master cylinder S/A with brake fluid.
- (6) Install the brake tube to the brake master cylinder S/A.



6 BRAKE BOOSTER

6-1 REMOVAL AND INSTALLATION

NOTE

- Never turn "ON" the IG SW until the air bleeding is completed. Failure to observe this caution causes air to be trapped into the brake actuator Ay, making it difficult to carry out air bleeding.

6-1-1 ARTICLES TO BE PREPARED

Instrument

MityVac, Torque wrench

Lubricant, adhesive, others

Brake fluid(DOT3), MP grease

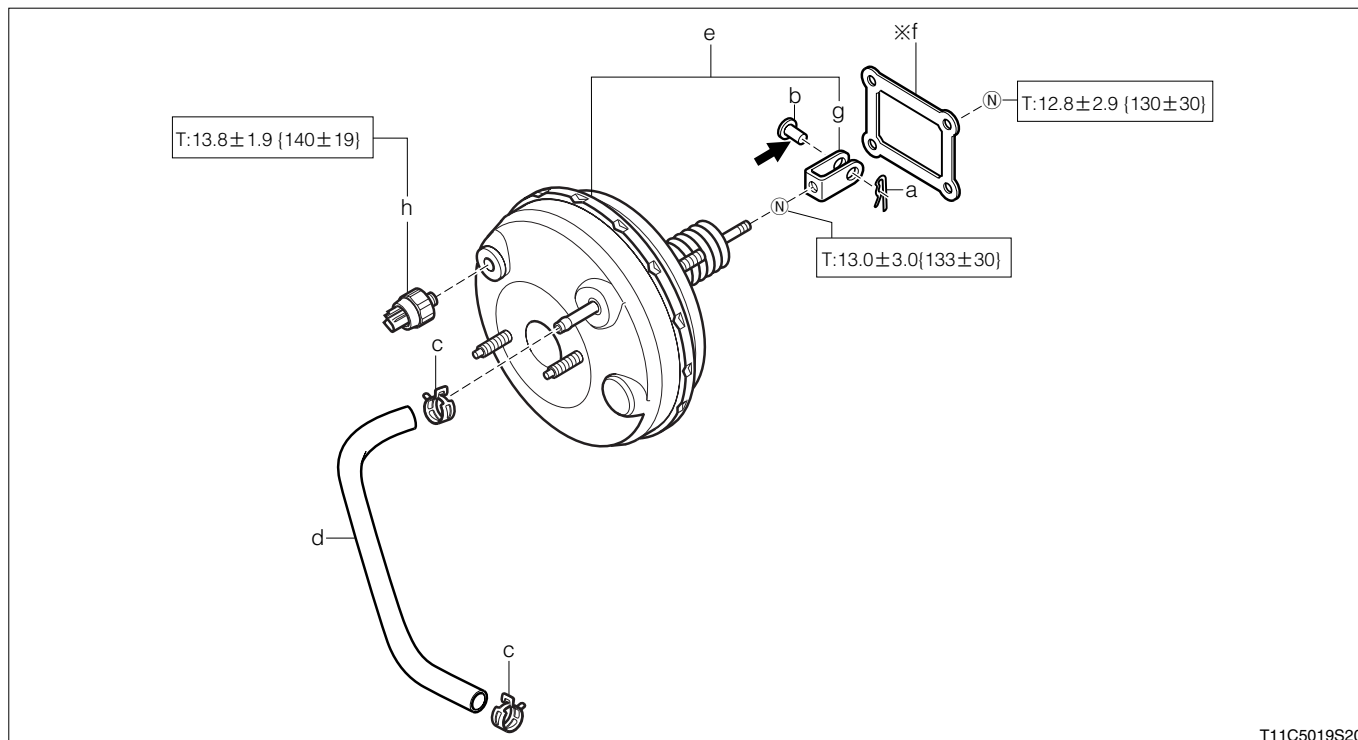
6-1-2 OPERATION BEFORE REMOVAL

1. Remove the brake master cylinder S/A.
Refer to Page E1-13.
2. Remove the instrument panel finish panel subassembly lower.
Refer to Page I2-15.

E1-23

6-1-3 REMOVAL AND INSTALLATION PROCEDURES (RHD VEHICLES)

(1) Components



T11C5019S20

Unit: N·m{kgf·cm}

※: Non-reusable parts

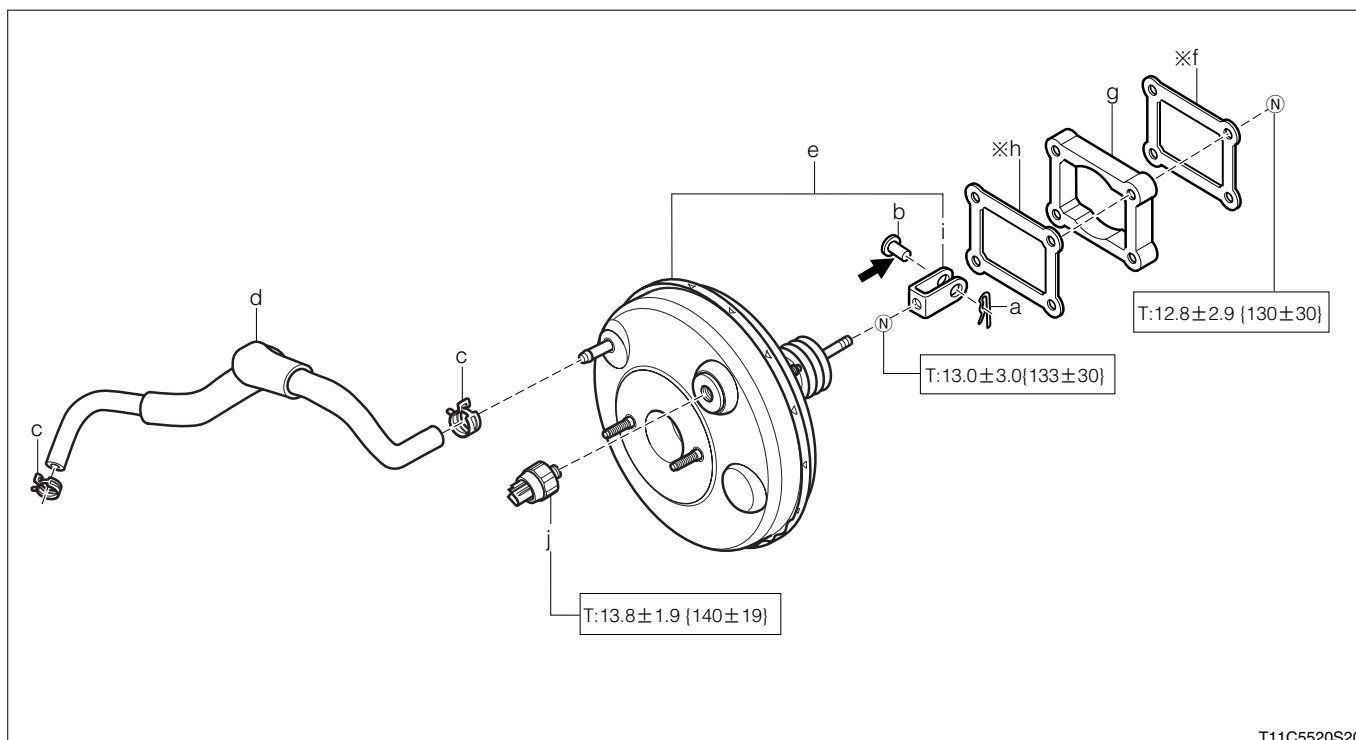
➡: MP grease

(2) Removal and installation procedures

1	a	Clip	6	f	Gasket, master cylinder bracket
2	b	Pin, w/hole	7	g	Clevis, master cylinder push rod
3	c	Clip	8	h	SW Ay, vacuum
▲ 4	d	Hose Ay, vacuum			
5	e	Booster Ay, brake			

6-1-4 REMOVAL AND INSTALLATION PROCEDURES (LHD VEHICLES)

(1) Components



Unit: N·m{kgf·cm}

※: Non-reusable parts

➡: MP grease

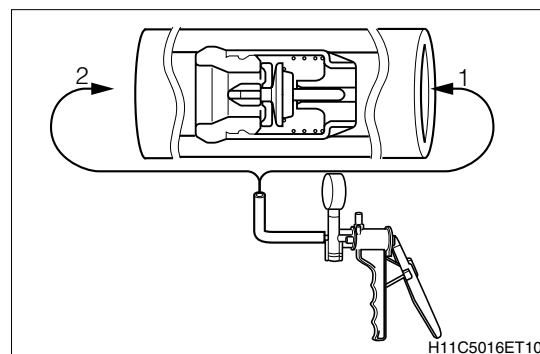
(2) Removal and installation procedures

1 a Clip	6 f Gasket, master cylinder bracket (9-inch brake booster-equipped vehicles)
2 b Pin, w/hole	7 g Spacer, master cylinder (9-inch brake booster-equipped vehicles)
3 c Clip	8 h Gasket, master cylinder bracket
▲ 4 d Hose Ay, vacuum	9 i Clevis, master cylinder push rod
5 e Booster Ay, brake	10 j SW Ay, vacuum

6-1-5 INSPECTION

(1) Hose Ay, vacuum

1. Connect a MityVac to the engine side (1). Then, check that air continuity exists from the booster side (2) to the engine side (1) (No negative pressure is applied).
2. Connect a MityVac to the booster side (2). Then, check that no air continuity exists from the engine side (1) to the booster side (2) (Negative pressure is applied).
3. Replace the hose Ay in case that the above condition is not satisfied.



(2) Booster Ay, brake

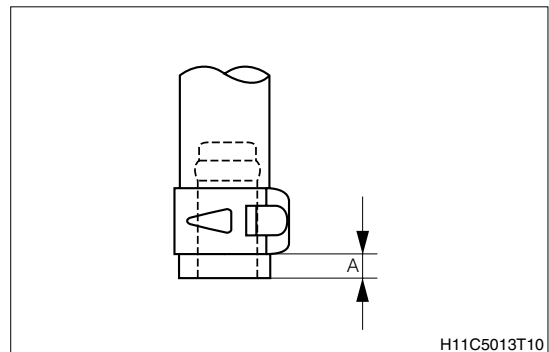
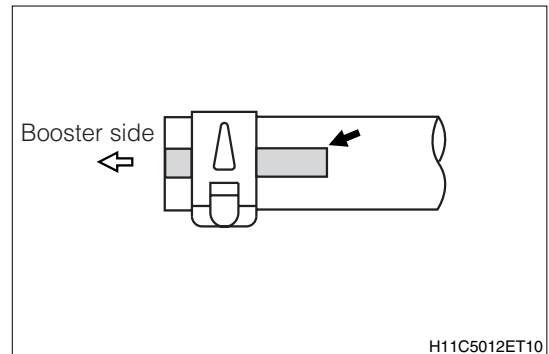
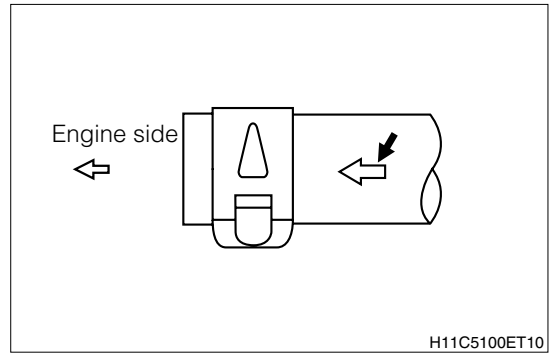
1. Check and adjust the push rod clearance of the brake booster Ay.
Refer to Page E1-1.

E1-25

6-1-6 POINTS OF INSTALLATION

(1) Hose Ay, vacuum

1. Install the hose Ay, using the following procedure.
 - (1) The installation must be made in such a way that the side having the arrow-marked paint comes at the intake manifold Ay side of the engine Ay.
 - (2) If the mark is no longer visible, check continuity. The installation must be made in such a way that continuity exists from the brake booster Ay to the intake manifold Ay.
 - (3) The installation must be made in such a way that the arrow-marked paint comes at the upper side of the vehicle.
 - (4) Connection at the brake booster Ay side should be performed in such a way that the paint line faces the vehicle upward.
- (5) Be sure to insert the hose Ay up to the stopper surface of the union.
- (6) The installing position of the clip is such that point (A) in the figure comes within a range of 2 to 4.5 mm.



6-1-7 OPERATION AFTER INSTALLATION

1. Connect the connector of the vacuum SW Ay. (A/T vehicle)
2. Install the brake master cylinder S/A.
Refer to Page E1-13.
3. Install the instrument panel finish panel subassembly lower.
Refer to Page I2-15.
4. Check and adjust the brake pedal Ay.
Refer to Page E1-1.

7 BRAKE HOSE

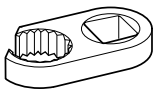
7-1 REMOVAL AND INSTALLATION (FRONT)

CAUTION

- Care must be exercised so that no brake fluid may adhere to the paint surface. If brake fluid is adhered to the paint surface, immediately wipe it out and wash it with water.
- Never reuse the wiped-out brake fluid.
- Care must be exercised so that no brake fluid or oil, etc. may adhere to the flexible hose.

7-1-1 ARTICLES TO BE PREPARED

SST

Shape	Part No.	Part name
	09023-00100-000	Wrench,union nut

Tool

Brake pedal pusher

Instrument

Torque wrench

Lubricant,adhesive,others

Brake fluid(DOT3)

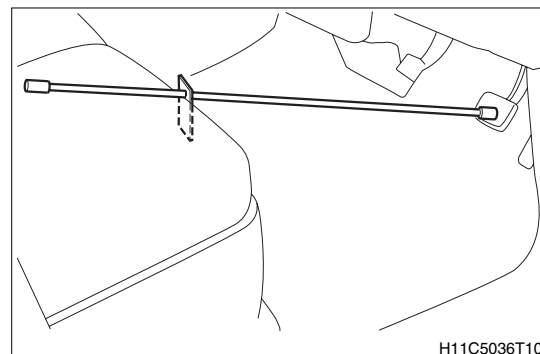
7-1-2 OPERATION BEFORE REMOVAL

1. Remove the disc wheels. (Front)
2. Prevent brake fluid from flowing out, using the following procedure.
 - (1) Connect a bottle for air bleeding to the bleeder plug of the RH/LH front disc brake caliper Ay. Open the bleeder plug.
 - (2) Fully depress the brake pedal. At this point, secure the brake pedal Ay.

TOOL: Brake pedal pusher

NOTE

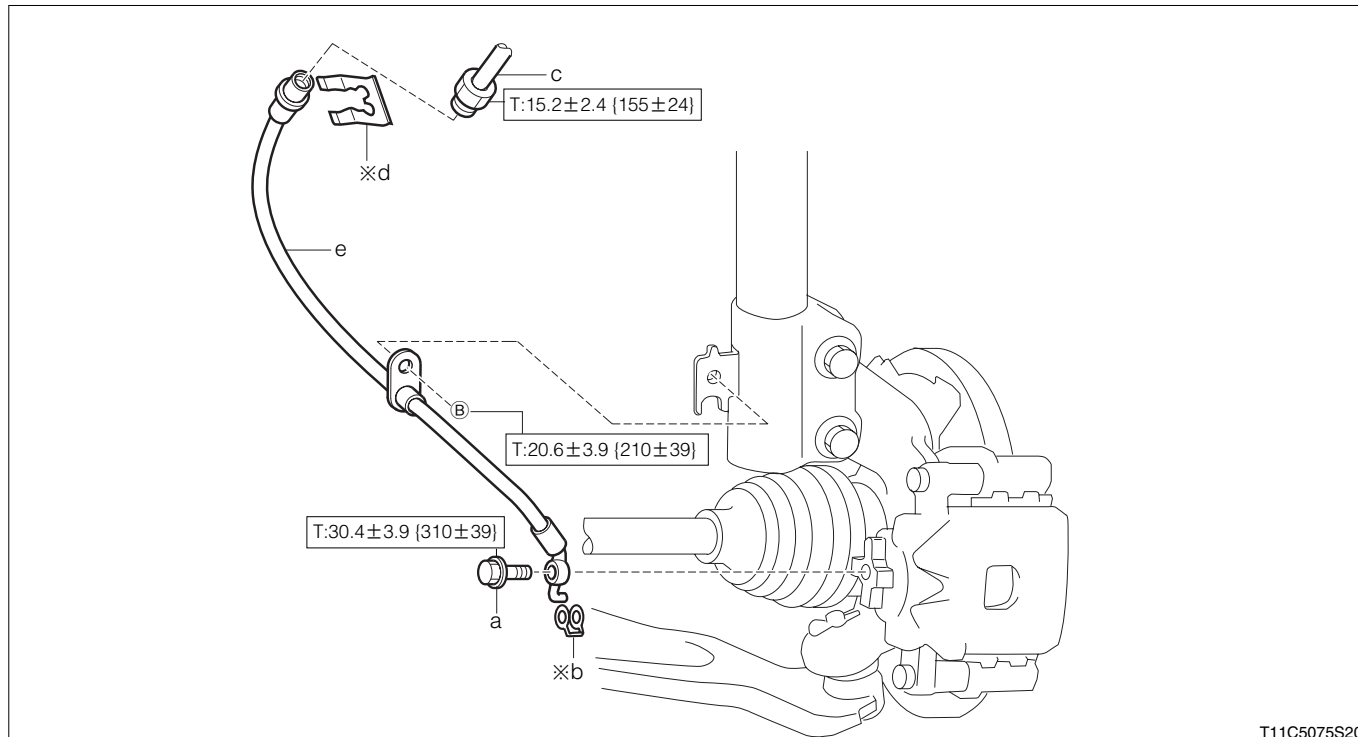
- This causes the port of the brake master cylinder S/A to close. Therefore, any escape of brake fluid from the brake hydraulic circuit can be prevented.
- (3) Close the bleeder plug of the RH/LH front disc brake caliper Ay.



E1-27

7-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



(2) Removal procedures

- 1 a Bolt, union
- 2 b Gasket, flexible hose
- ▼ 3 c Tube, front brake, No.2(RH)/No.4(LH)
- 4 d Clamp
- 5 e Hose, flexible

(3) Installation procedures

- ▲ 1 c Tube, front brake No.2(RH)/No.4(LH)
- ▲ 2 e Hose, flexible
- ▲ 3 d Clamp
- 4 b Gasket, flexible hose
- 5 a Bolt, union

7-1-4 POINTS OF REMOVAL

(1) Tube, front brake

1. Disconnect the tube from the flexible hose.
2. Plug the disconnected tube with the bleeder plug cap or the like.

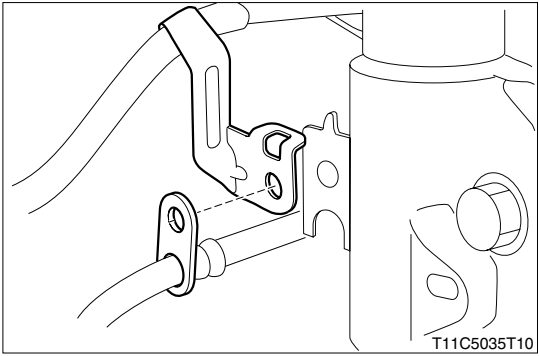
7-1-5 POINTS OF INSTALLATION

(1) Tube, front brake

1. Temporarily tighten the union nut until the tube flare section contacts closely with the seat.

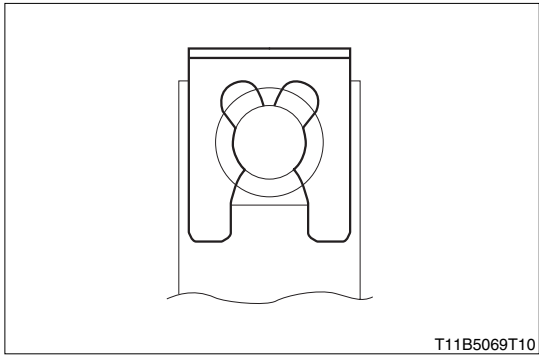
(2) **Hose, flexible**

1. Install the hose bracket as indicated in the right figure so that it may be interposed by the RH/LH front speed sensor brackets.



(3) **Clamp**

1. Positively insert the clamp until it touches the hose metal fitting. Be very careful not to mistake the installing direction.



(4) **Tube, front brake**

1. Using the SST, connect the tube to the RH/LH flexible hose and tighten it to the specified torque.
SST: 09023-00100-000

7-1-6 **OPERATION AFTER INSTALLATION**

1. Release the securing of the brake pedal Ay.
2. Perform air bleeding of the brake.
Refer to Page E1-3.

3. Install the disc wheels. (Front)
4. Confirm that there is no brake dragging.
Refer to Page E1-2.

5. Jack down the vehicle.

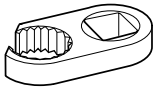
7-2 **REMOVAL AND INSTALLATION (REAR)**

CAUTION

- Care must be exercised so that no brake fluid may adhere to the paint surface. If brake fluid is adhered to the paint surface, immediately wipe it out and wash it with water.
- Never reuse the wiped-out brake fluid.
- Care must be exercised so that no brake fluid or oil, etc. may adhere to the flexible hose.

7-2-1 **ARTICLES TO BE PREPARED**

SST

Shape	Part No.	Part name
	09023-00100-000	Wrench,union nut

Tool

Brake pedal pusher

E1-29

Instrument

Torque wrench

Lubricant, adhesive, others

Brake fluid(DOT3)

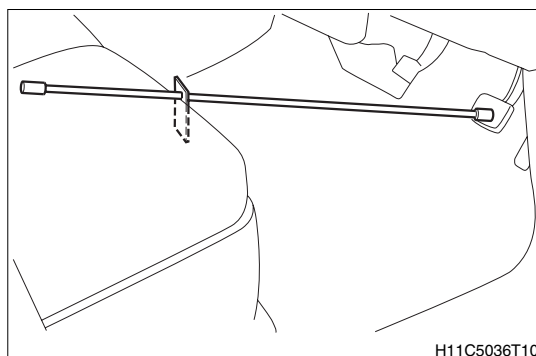
7-2-2 OPERATION BEFORE REMOVAL

1. Remove the disc wheels. (Rear)
2. Prevent brake fluid from flowing out, using the following procedure.
 - (1) Connect a bottle for air bleeding to the bleeder plug of the rear wheel brake cylinder Ay. Open the bleeder plug,
 - (2) Fully depress the brake pedal Ay. At this point, secure the brake pedal Ay.

TOOL: Brake pedal pusher

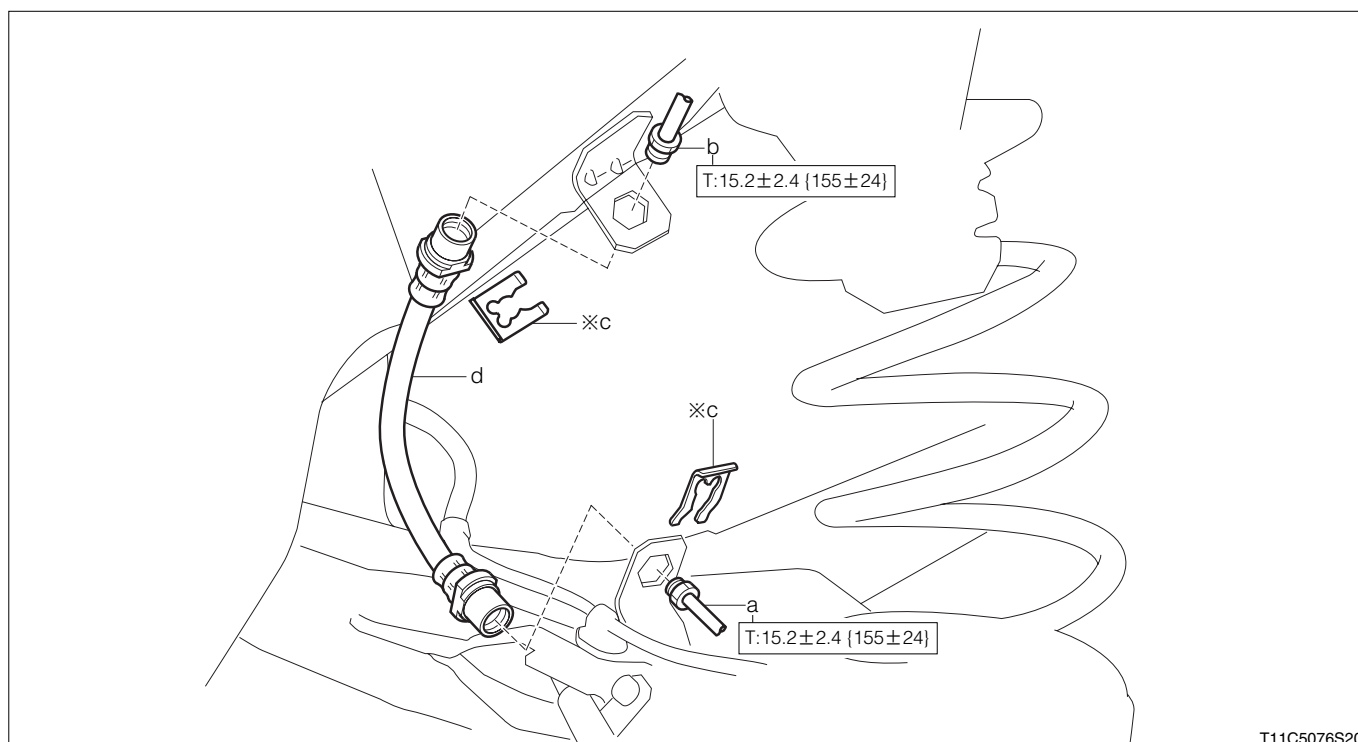
NOTE

- This causes the port of the brake master cylinder S/A to close. Therefore, any escape of brake fluid from the brake hydraulic circuit can be prevented.
- (3) Close the bleeder plug of the rear wheel brake cylinder Ay.



7-2-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



Unit: N·m(kgf·cm)

※: Non-reusable parts

(2) Removal procedures

- ▼ 1 a Tube, rear brake No.5(RH)/No.6(LH)
- ▼ 2 b Tube, rear brake, No.2(RH)/No.4(LH)
- 3 c Clamp
- 4 d Hose, flexible

(3) Installation procedures

- 1 d Hose, flexible
- ▲ 2 b Tube, rear brake, No.2(RH)/No.4(LH)
- ▲ 3 a Tube, rear brake No.5(RH)/No.6(LH)
- ▲ 4 c Clamp

7-2-4 POINTS OF REMOVAL

(1) Tube, rear brake

- 1. Disconnect the tube from the flexible hose.
- 2. Plug the disconnected tube with the bleeder plug cap or the like.

7-2-5 POINTS OF INSTALLATION

(1) Tube, rear brake

- 1. Temporarily tighten the union nut by hand until the tube flare section contacts closely with the seat.

(2) Clamp

- 1. Positively insert the clamp until it touches the hose metal fitting. Be very careful not to mistake the installing direction.

(3) Tube, rear brake

- 1. Using the SST, connect the tube to the flexible hose and tighten it to the specified torque.
SST: 09023-00100-000

7-2-6 OPERATION AFTER INSTALLATION

- 1. Release the securing of the brake pedal Ay.
- 2. Perform air bleeding of the brake.
Refer to Page E1-3.

- 3. Install the disc wheels. (Rear)
- 4. Confirm that there is no brake dragging.
Refer to Page E1-2.

- 5. Jack down the vehicle.

8 FRONT DISC BRAKE PAD

8-1 REMOVAL AND INSTALLATION

CAUTION

- Care must be exercised so that no oil, grease, etc. may adhere to the sliding surface between the disc brake pad and the front disc.
- Care must be exercised so that no brake fluid may adhere to the paint surface. If brake fluid is adhered to the paint surface, immediately wipe it out and wash it with water.

8-1-1 ARTICLES TO BE PREPARED

Instrument

Torque wrench

Lubricant,adhesive,others

Wire

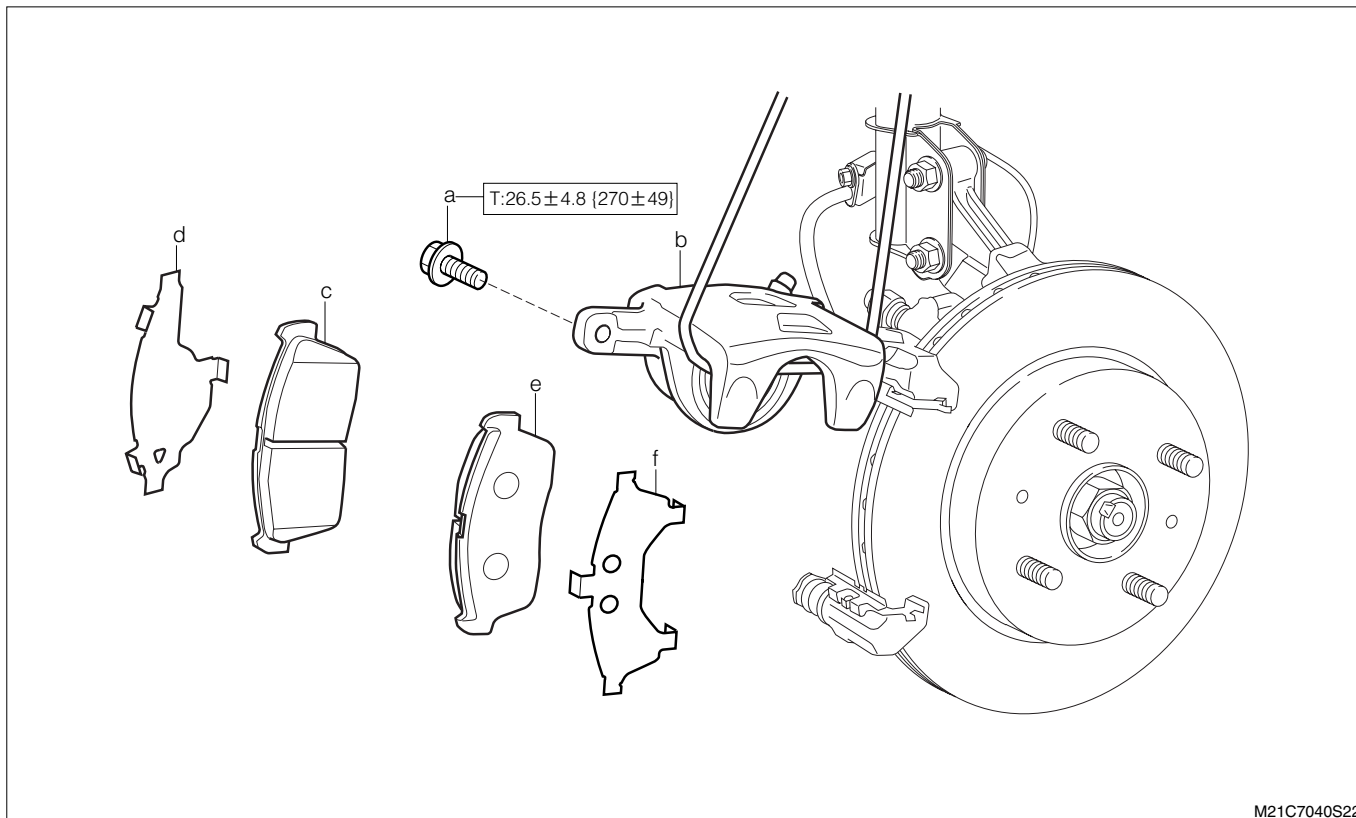
8-1-2 OPERATION BEFORE REMOVAL

- 1. Remove the disc wheels. (Front)

E1-31

8-1-3 REMOVAL AND INSTALLATION PROCEDURES(FRONT DISC 234MM DAI)

(1) Components

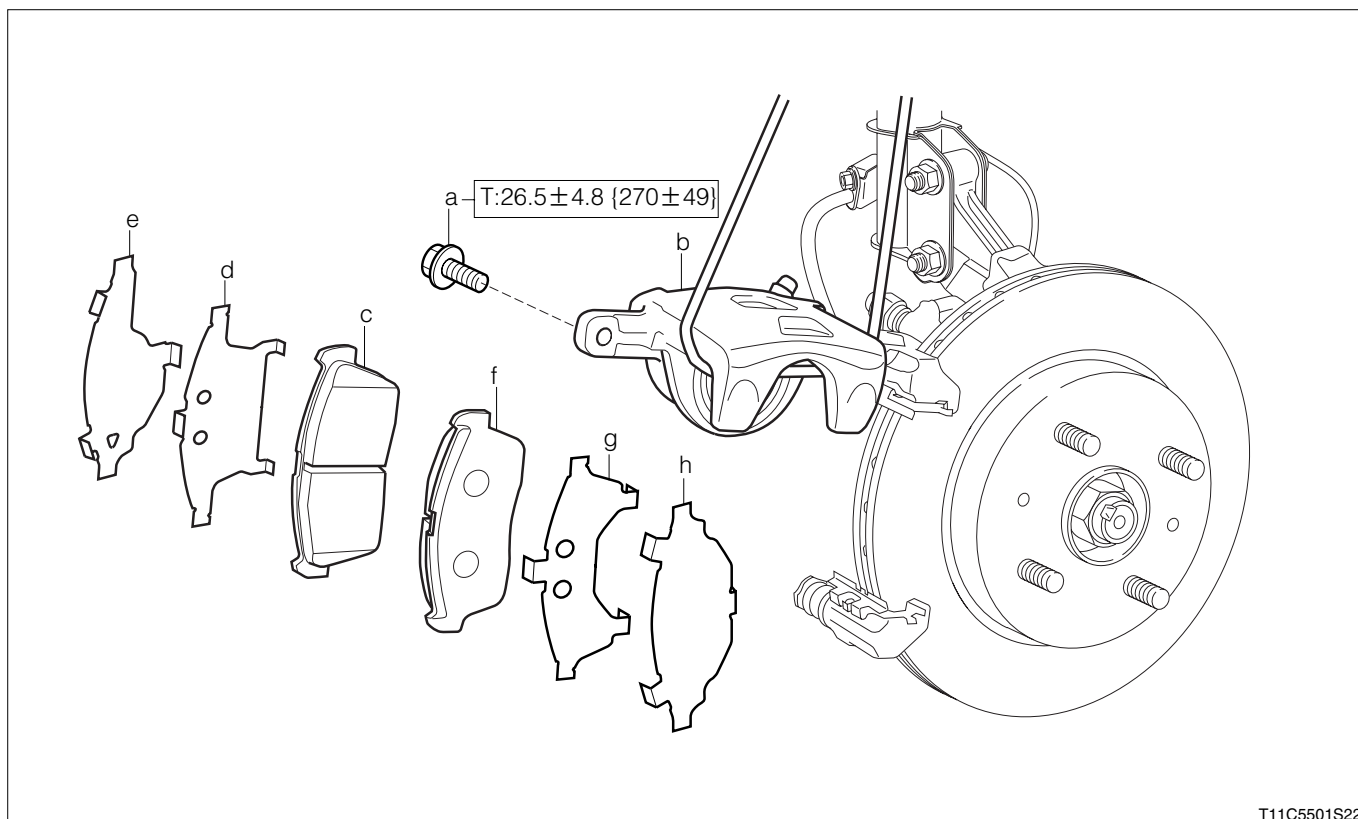


(2) Removal and installation procedures

1	a Bolt, disc brake cylinder	6	f Shim, anti squeal, No.2
▼ ▲ 2	b Cylinder Ay, disc brake, RH/LH		
▲ 3	c Pad, disc brake, No.1		
4	d Shim, anti squeal, No.3		
5	e Pad, disc brake, No.2		

8-1-4 REMOVAL AND INSTALLATION PROCEDURES(FRONT DISC 246MM DAI)

(1) Components



T11C5501S22

Unit:N·m{kgf·cm}

(2) Removal and installation procedures

1	a Bolt, disc brake cylinder	6	f Pad, disc brake, No.2
▼ ▲ 2	b Cylinder Ay, disc brake, RH/LH	7	g Shim, anti squeal, No.2
▲ 3	c Pad, disc brake W/wear indicator, No.1	8	h Shim, anti squeal, No.4
4	d Shim, anti squeal, No.1		
5	e Shim, anti squeal, No.3		

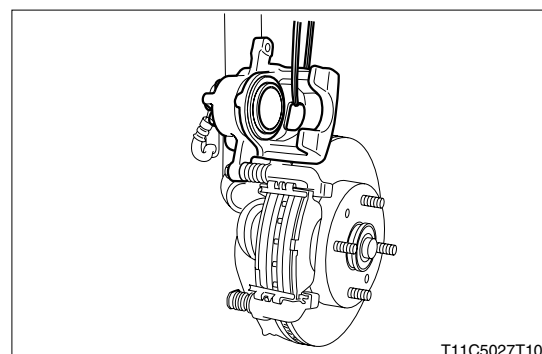
8-1-5 POINTS OF REMOVAL

(1) Cylinder Ay, disc brake, RH/LH

1. After removing the disc brake cylinder bolt, raise the cylinder Ay.
2. Suspend the cylinder assembly, using a wire or the like.

CAUTION

- Do not pull the flexible hose. Also, be very careful not to damage the flexible hose.

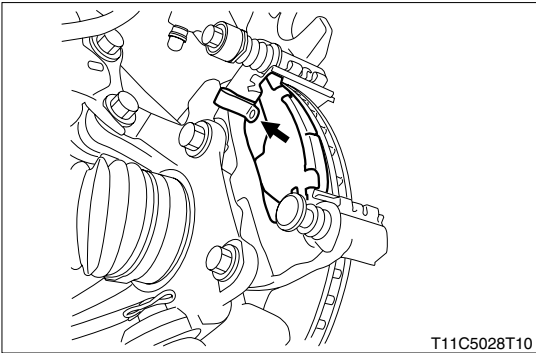


T11C5027T10

8-1-6 POINTS OF INSTALLATION

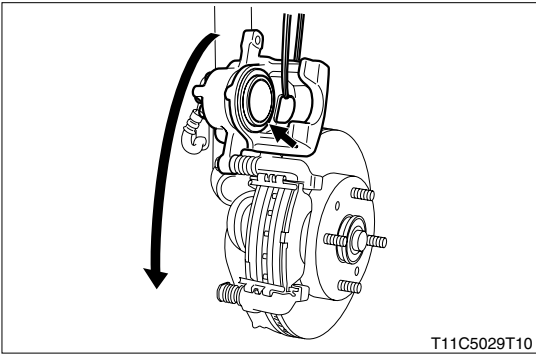
(1) Pad, disc brake, No.1 / Pad, disk brake W/wear indicator, No.1

- 1. Install the pad with a wear indicator at the inner side of the vehicle. At this time, make sure that the wear indicator comes at the vehicle upper side during the installation.



(2) Cylinder Ay, disc brake, RH/LH

- 1. Check the brake fluid level of the brake master reservoir S/A.
- 2. Slowly push the disc brake piston.
- 3. Ensure that no brake fluid is leaking from the brake master reservoir S/A.
- 4. Remove the wire that has been supporting the cylinder assembly and return the cylinder assembly to the original position.



8-1-7 OPERATION AFTER INSTALLATION

- 1. Depress the brake pedal Ay several times so that the brake disc piston of the disc brake cylinder Ay RH/LH may be pushed out.
- 2. Check the brake fluid level of the brake master reservoir S/A.
Refer to Page E1-3.
- 3. Install the disc wheels. (Front)
- 4. Confirm that there is no brake dragging.
Refer to Page E1-2.

- 5. Jack down the vehicle.

9 FRONT DISC CALIPER

9-1 REMOVAL AND INSTALLATION

CAUTION

- Care must be exercised so that no brake fluid may adhere to the paint surface. If brake fluid is adhered to the paint surface, immediately wipe it out and wash it with water.
- Never reuse the wiped-out brake fluid.
- Care must be exercised so that no oil, grease, etc. may adhere to the sliding surface between the disc brake pad and the front disc.

9-1-1 ARTICLES TO BE PREPARED

Tool

Brake pedal pusher

Instrument

Torque wrench

Lubricant,adhesive,others

Brake fluid(DOT3)

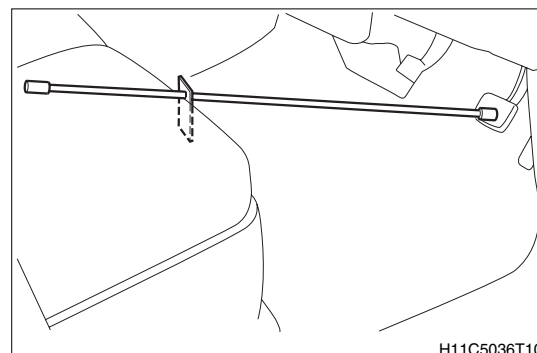
9-1-2 OPERATION BEFORE REMOVAL

1. Remove the disc wheels. (Front)
2. Prevent brake fluid from flowing out, using the following procedure.
 - (1) Connect a bottle for air bleeding to the bleeder plug of the RH/LH front disc brake caliper Ay. Open the bleeder plug.
 - (2) Fully depress the brake pedal. At this point, secure the brake pedal Ay.

TOOL: Brake pedal pusher

NOTE

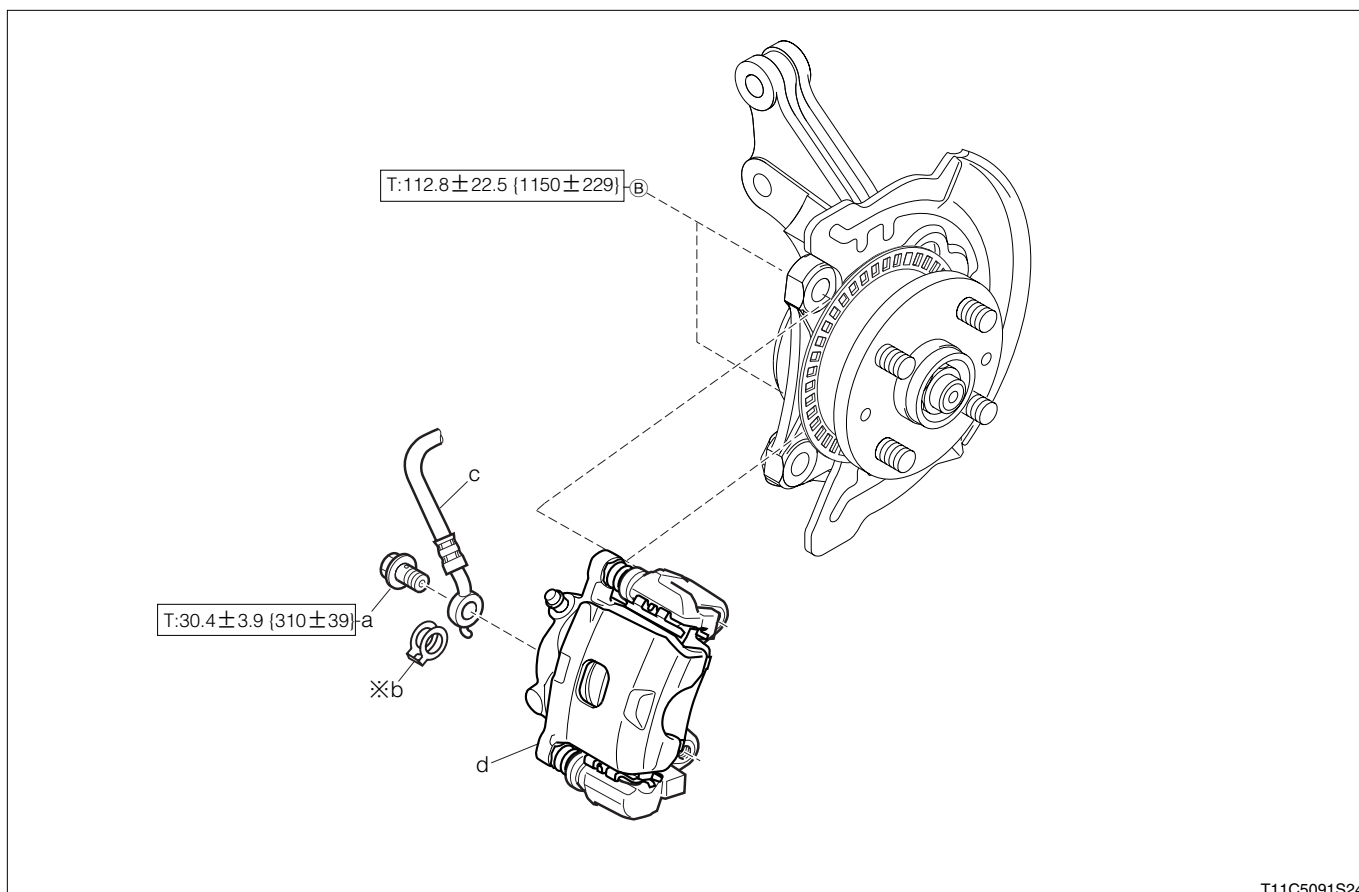
- This causes the port of the brake master cylinder S/A to close. Therefore, any escape of brake fluid from the brake hydraulic circuit can be prevented.
- (3) Close the bleeder plugs of the front RH/LH disc brake caliper Ay.



H11C5036T10

9-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



T11C5091S24

Unit: N·m{kgf·cm}

※: Non-reusable parts

(2) Removal and installation procedures

- 1 a Bolt, union
- 2 b Gasket, flexible, hose
- 3 c Hose, flexible
- 4 d Caliper Ay, disc brake, front RH/LH

9-1-4 OPERATION AFTER INSTALLATION

- 1. Release the securing of the brake pedal Ay.
- 2. Perform air bleeding of the brake.
Refer to Page E1-3.

- 3. Install the disc wheels. (Front)
- 4. Confirm that there is no brake dragging.
Refer to Page E1-2.

- 5. Jack down the vehicle.

9-2 DISASSEMBLING AND ASSEMBLING

WARNING

- Be sure to wear protective goggles when using compressed air.

CAUTION

- Never reuse the wiped-out brake fluid.
- Care must be exercised so that no oil, grease, etc. may adhere to the sliding surface between the disc brake pad and the front disc.

9-2-1 ARTICLES TO BE PREPARED

Instrument

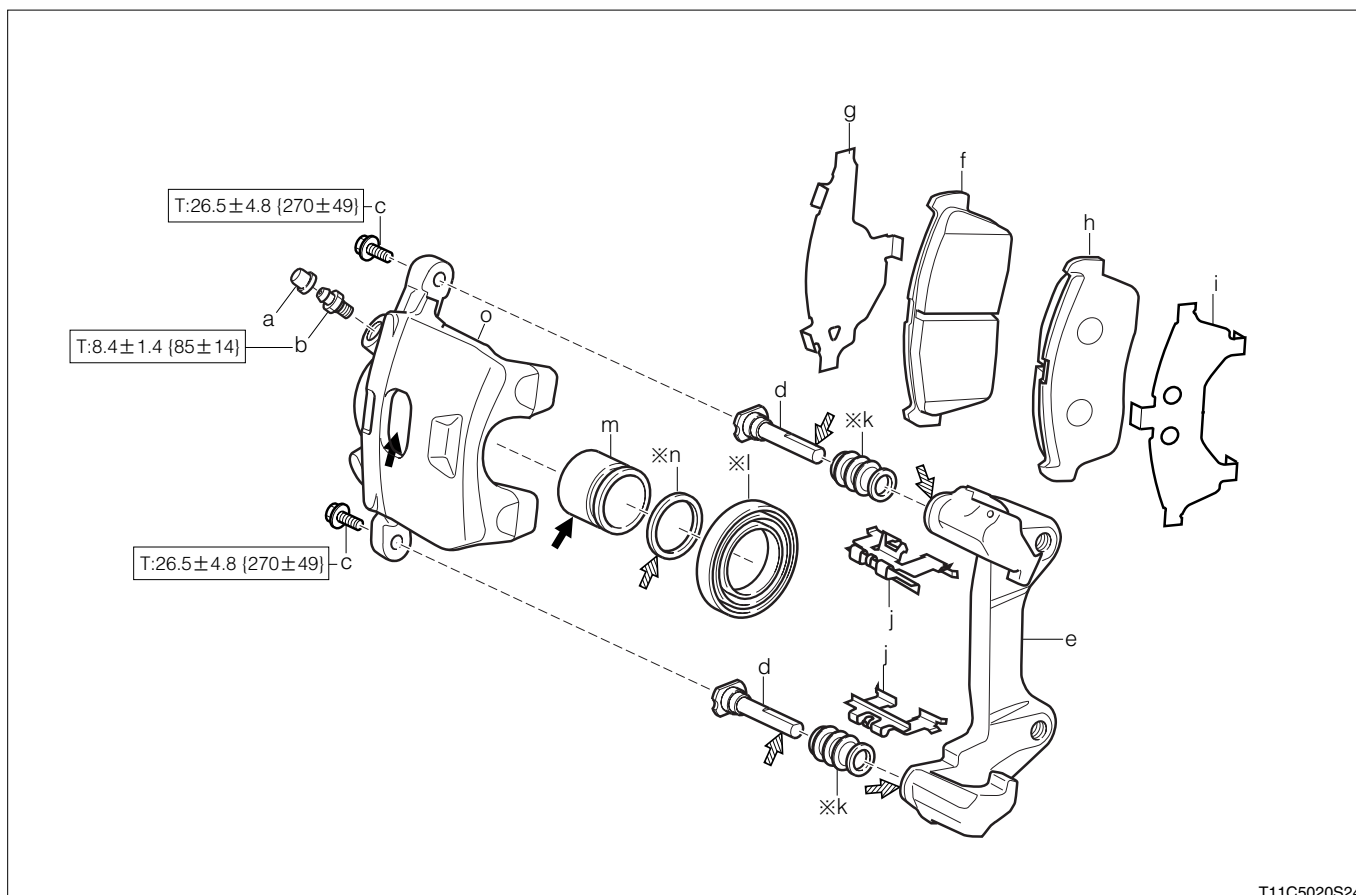
Torque wrench

Lubricant, adhesive, others

Brake fluid(DOT3),Brake grease,Cloth

9-2-2 DISASSEMBLY AND ASSEMBLY PROCEDURES(FRONT DISC 234MM DAI)

(1) Components



T11C5020S24

Unit: N·m{kgf·cm}

※: Non-reusable parts

➡: Brake fluid (Equivalent to DOT3)

⇒: Brake grease

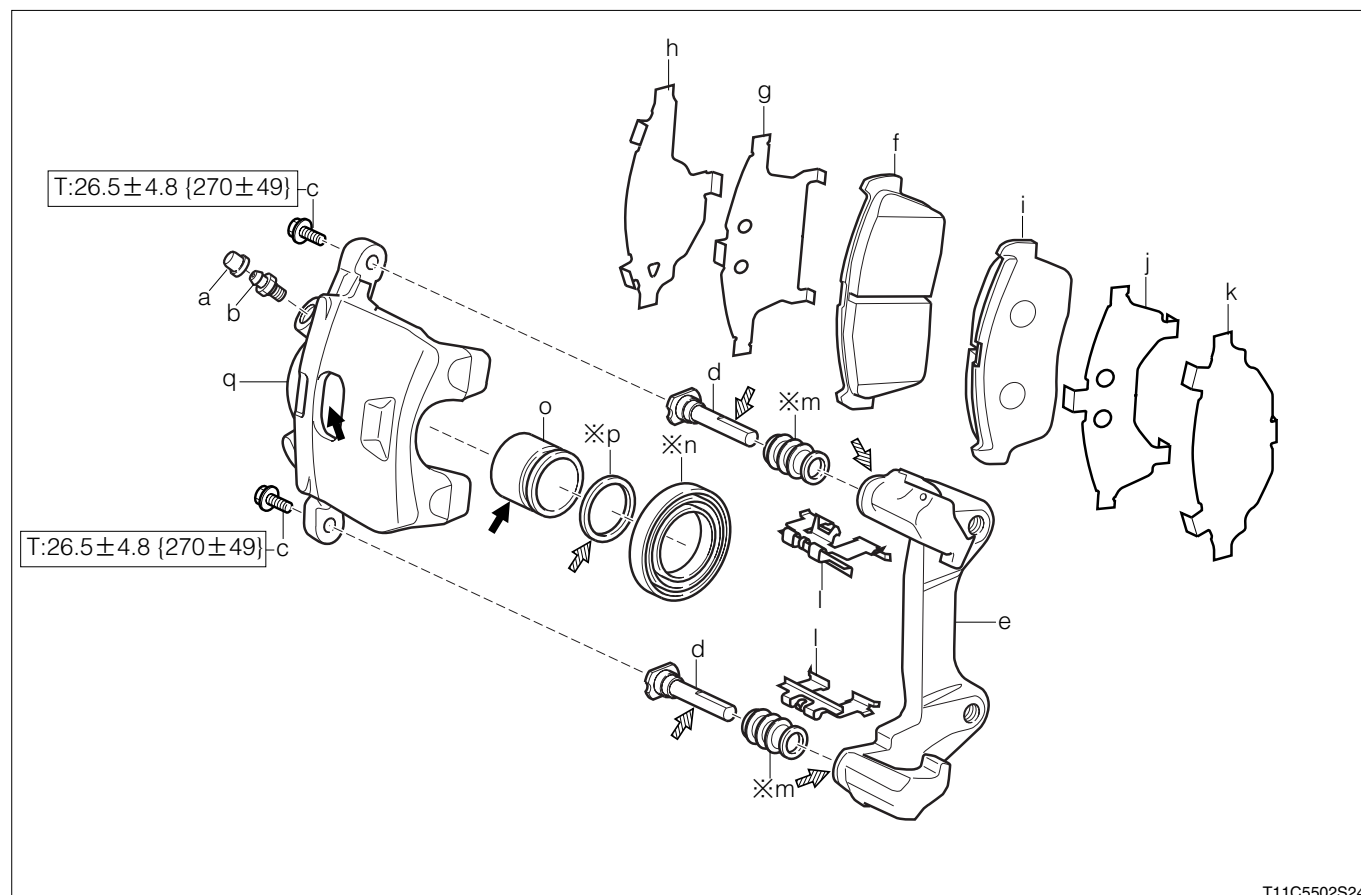
(2) Disassembling and assembling procedure

1 a Cap, bleeder plug	9 i Shim, anti squeal, No.2
2 b Plug, bleeder	10 j Plate, disc brake pad guide
3 c Bolt, disc brake cylinder	11 k Boot, pin
▲ 4 d Pin, cylinder slide	▲ 12 l Boot, cylinder
▲ 5 e Mounting, disc brake cylinder	▼ ▲ 13 m Piston, disc brake
▲ 6 f Pad, disc brake, No.1	▼ ▲ 14 n Seal, piston
7 g Shim, anti squeal, No.3	15 o Cylinder, disc brake, RH/LH
8 h Pad, disc brake, No.2	

E1-37

9-2-3 DISASSEMBLY AND ASSEMBLY PROCEDURES(FRONT DISC 246MM DAI)

(1) Components



Unit: N·m{kgf·cm}

※: Non-reusable parts

➡: Brake fluid (Equivalent to DOT3)

➡: Brake grease

(2) Disassembly and assembly procedures

1 a Cap, bleeder plug	10 j Shim, anti squeal, No.2
2 b plug, bleeder	11 k Shim, anti squeal, No.4
3 c Bolt,disc brake cylinder	12 l Plate, disc brake pad guide
▲ 4 d Pin, cylinder slide	13 m Boot, pin
▲ 5 e Mounting, disc brake cyinder	▲ 14 n Boot, cylinder
▲ 6 f Pad, disc brake W/wear indicator, No.1	▼ ▲ 15 o Piston, disc brake
7 g Shim, anti squeal, No.1	▼ ▲ 16 p Seal, piston
8 h Shim, anti squeal, No.3	17 q Cylinder, disc brake, RH/LH
9 i Pad, disc brake, No.2	

9-2-4 POINTS OF DISASSEMBLY

(1) Piston, disc brake

1. Drain the residual brake fluid in the disc brake cylinder RH/LH from the flexible hose installation section.

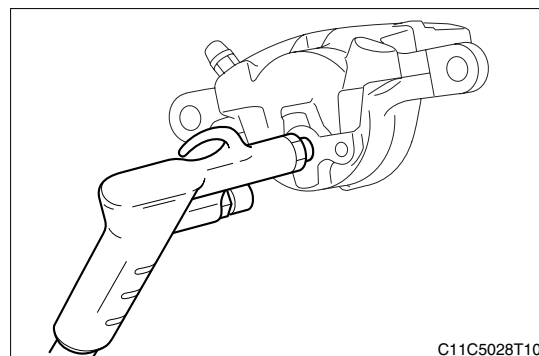
2. To prevent damages, be sure to interpose a cloth or the like in the disc brake cylinder RH/LH. While holding the bleeder plug installation section, apply compressed air from the flexible hose installation section in order to pull out the piston.

WARNING

- Care must be exercised to prevent your finger from being pinched by the piston that may jump up strongly.

CAUTION

- Care must be exercised to ensure that the bore of the RH/LH disc brake cylinder may not be scored.



C11C5028T10

(2) Seal, piston

1. Remove the seal from the disc brake piston, using a toothpick or the like.

9-2-5 POINTS OF ASSEMBLY

Prior to the assembling, wash each part with brake fluid that is the same as the one to be used.

LUBRICANT: Brake fluid(DOT3)

(1) Seal, piston

1. Apply brake grease to the entire periphery of the inner and outer surfaces of the seal.

LUBRICANT: Brake grease

2. Securely assemble the piston seal into the groove of the disc brake cylinder RH/LH in such a way that the seal may not be twisted.

(2) Piston, disc brake

1. Apply brake fluid to the cylinder inner surface of the disc brake cylinder RH/LH.
2. Apply brake fluid to the outer periphery of the piston.

LUBRICANT: Brake fluid(DOT3)

3. Assemble the piston to the disc brake cylinder RH/LH by your hand.

CAUTION

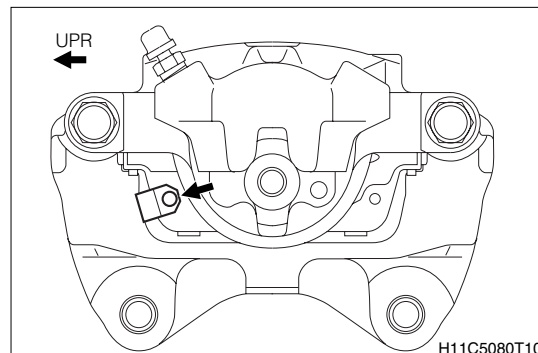
- Be sure to insert the piston straight. Be very careful not to insert it diagonally nor push it with an excessive force.

(3) Boot, cylinder

1. Attach the boot to the groove at the edge of the disc brake piston.
2. Securely install the boot to the boot groove at the bore surface of the RH/LH disc brake cylinders.
3. Ensure that the boot is securely installed in the boot groove.

(4) Pad, disc brake, No.1/Pad, disk brake w/wear indicator, No.1

1. Install the pad with a wear indicator at the inner side of the vehicle. At this time, make sure that the wear indicator comes at the vehicle upper side during the installation.



H11C5080T10

(5) Mounting, disc brake cylinder

1. Apply brake grease to the pin boot installation groove of the mounting and the inner periphery of the cylinder slide pin sliding hole.

LUBRICANT: Brake grease

(6) Pin, cylinder slide

- 1. Apply brake grease to the pin boot installation groove of the pin and the entire periphery of the sliding section.

LUBRICANT: Brake grease

10 FRONT BRAKE DISC

10-1 REMOVAL AND INSTALLATION

CAUTION

- Care must be exercised so that no oil, grease, etc. may adhere to the sliding surface between the disc brake pad and the front disc.

10-1-1 ARTICLES TO BE PREPARED

Instrument

Torque wrench

Lubricant, adhesive, others

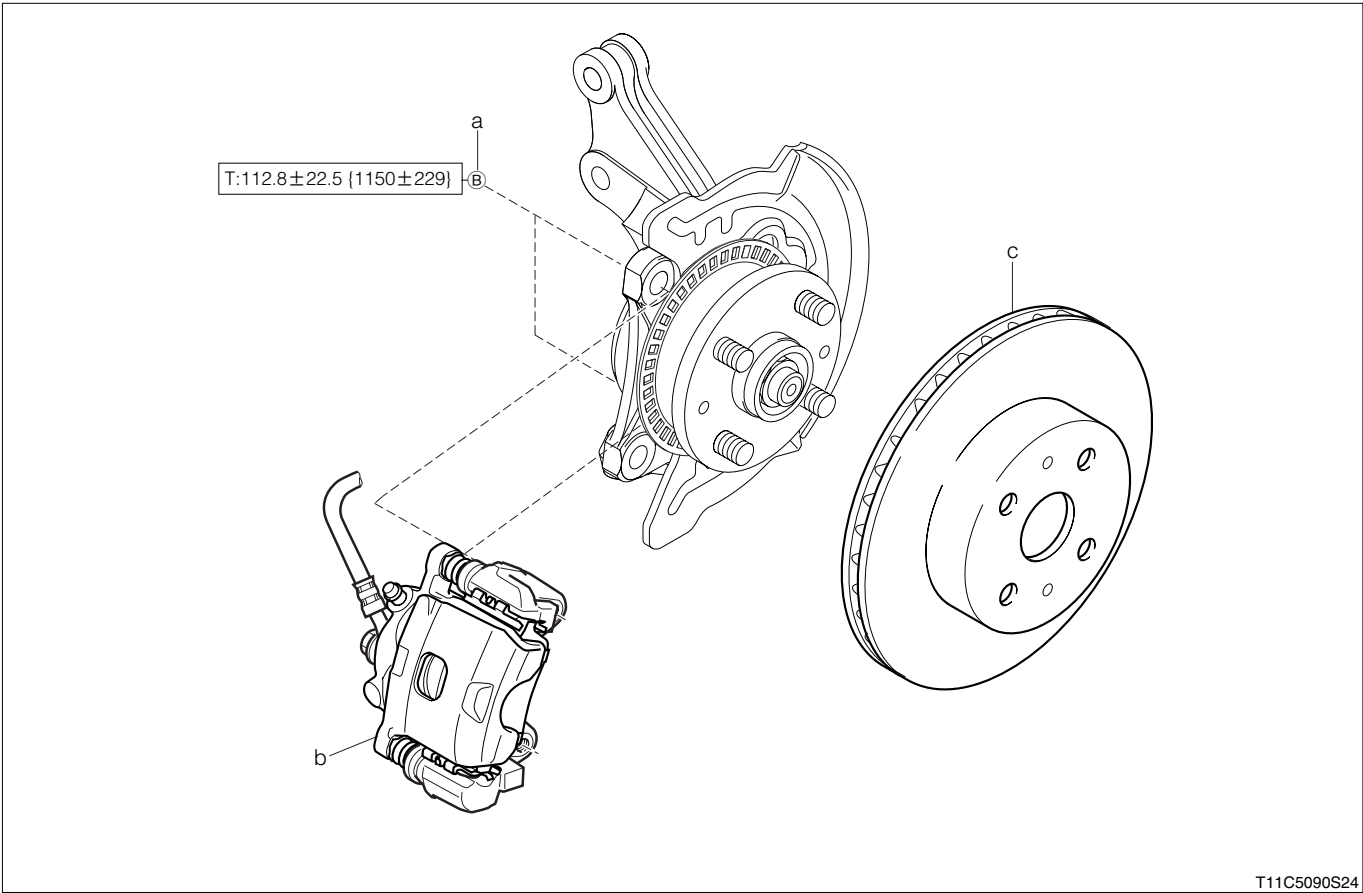
Wire

10-1-2 OPERATION BEFORE REMOVAL

- 1. Remove the disc wheels. (Front)

10-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) COMPONENTS



T11C5090S24

Unit: N · m { kgf · cm }

(2) Removal and installation procedures

- 1 a Bolt, washer based head hexagon
- ▼ ▲ 2 b Caliper Ay, disc brake, front RH/LH
- ▼ 3 c Disc, front

10-1-4 POINTS OF REMOVAL**(1) Caliper Ay, disc brake, front RH/LH**

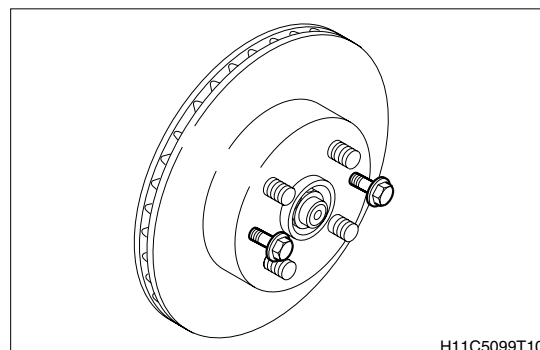
1. Remove the caliper Ay from the RH/LH steering knuckles. Suspend it with a wire or the like.

CAUTION

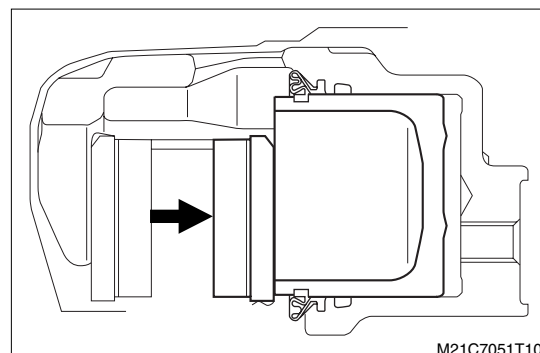
- Do not pull the flexible hose. Also, be very careful not to damage the flexible hose.

(2) Disc, front

1. If the disc cannot be removed because it has seized to the front axle hub S/A, screw two appropriate bolts (M8 × 1.25) in the screw holes of the disc, thus removing the disc.

**10-1-5 POINTS OF INSTALLATION****(1) Caliper Ay, Disc brake, front RH/LH**

1. Check the brake fluid level of the brake master reservoir S/A.
2. Slowly push the disc brake piston.
3. Ensure that no brake fluid is leaking from the brake master reservoir S/A.
4. Remove the wire suspending the caliper Ay. Install the caliper Ay to the RH/LH steering knuckles.

**10-1-6 OPERATION AFTER INSTALLATION**

1. Depress the brake pedal Ay several times so that the brake disc piston of the disc brake cylinder Ay RH/LH may be pushed out.
2. Check the brake fluid level of the brake master reservoir S/A.
Refer to Page E1-3.
3. Install the disc wheels. (Front)
4. Confirm that there is no brake dragging.
Refer to Page E1-2.
5. Jack down the vehicle.

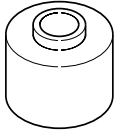
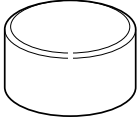
E1-41

11 FRONT BRAKE DUST COVER

11-1 REMOVAL AND INSTALLATION

11-1-1 ARTICLES TO BE PREPARED

SST

Shape	Part No.	Part name
	09506-87302-000	Replacer,differential drive pinion bearing corn,rear
	09718-87701-000	Replacer,dust cover

11-1-2 OPERATION BEFORE REMOVAL

1. Remove the disc wheels. (Front)
2. Remove the front speed sensor RH/LH.
Refer to Page E3-3.

3. Remove the front disc brake caliper assembly RH/LH from the steering knuckle RH/LH without cutting the brake pipe. Then, suspend the front brake caliper assembly, RH/LH using a wire or the like.

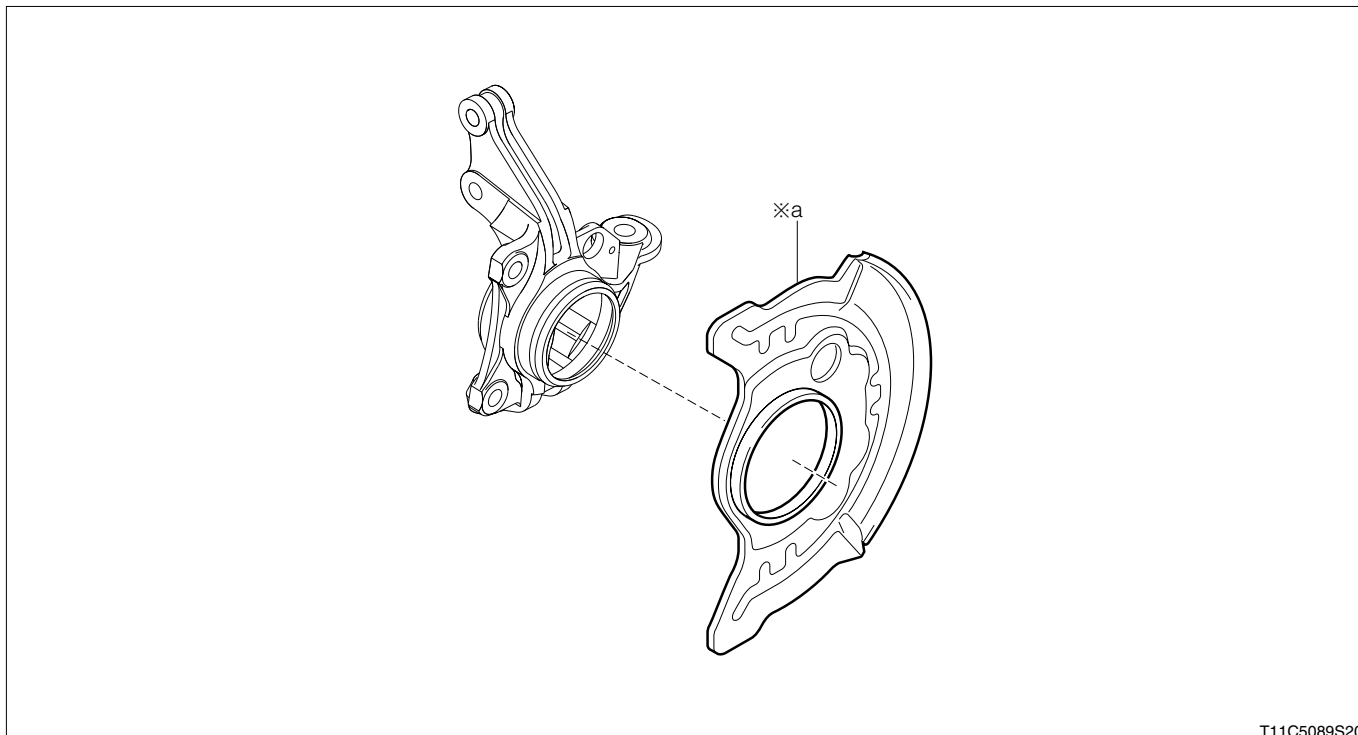
CAUTION

- Do not pull the flexible hose. Also, be very careful not to damage the flexible hose.

4. Remove the front disc.
5. Remove the front axle hub subassembly. Then, remove the steering knuckle RH/LH together with the radial ball bearing and disc brake dust front cover.
Refer to Page D2-2.

11-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



※: Non-reusable parts

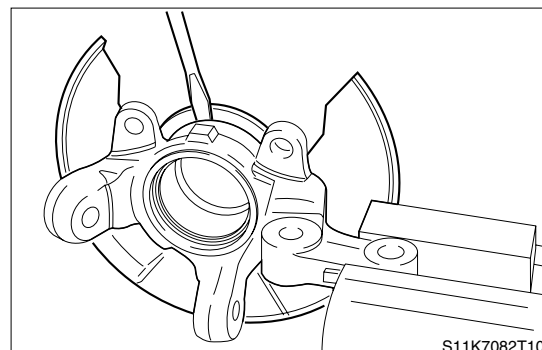
(2) Removal and installation procedures

▼ ▲ 1 a Cover, disc brake dust, front RH/LH

11-1-4 POINTS OF REMOVAL

(1) Cover, disc brake dust, front RH/LH

1. Lightly tap the outer periphery to make a clearance. Then, remove the cover, using a flat screwdriver or the like.



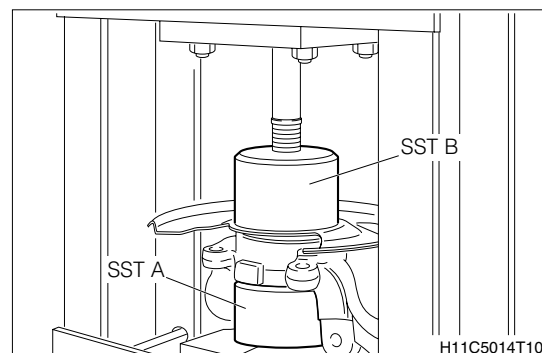
11-1-5 POINTS OF INSTALLATION

(1) Cover, disc brake dust, front RH/LH

1. Install the disc cover to the steering knuckle, using a press in combination with the SST.

SST: 09506-87302-000:A

09718-87701-000:B



E1-43

11-1-6 OPERATION AFTER INSTALLATION

1. Install the steering knuckle RH/LH together with the radial ball bearing and disc brake dust front cover RH/LH.
2. Install the front axle hub subassembly.
Refer to Page D2-2.
3. Remove the front disc.
4. Install the front disc brake caliper assembly RH/LH.
Refer to Page E1-33.
5. Install the front speed sensor RH/LH.
Refer to Page E3-3.
6. Install the disc wheels. (Front)
7. Check and adjust the front wheel alignment.
Refer to Page C1-1.

12 REAR BRAKE DRUM

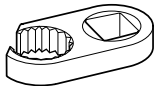
12-1 REMOVAL AND INSTALLATION

CAUTION

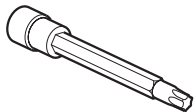
- Care must be exercised so that no brake fluid may adhere to the paint surface. If brake fluid is adhered to the paint surface, immediately wipe it out and wash it with water.
- Care must be exercised so that no lubricant, etc. may adhere to the sliding surfaces of the brake shoe linings and brake drums.

12-1-1 ARTICLES TO BE PREPARED

SST

Shape	Part No.	Part name
	09023-00100-000	Wrench,union nut

Tool

Shape	Part No.	Part name	Use
	KTC BT4-T55L or equivalent	Long TORX® wrench T55	

Brake pedal pusher

Instrument

Torque wrench

Lubricant,adhesive,others

Brake fluid(DOT3),Brake grease

12-1-2 OPERATION BEFORE REMOVAL

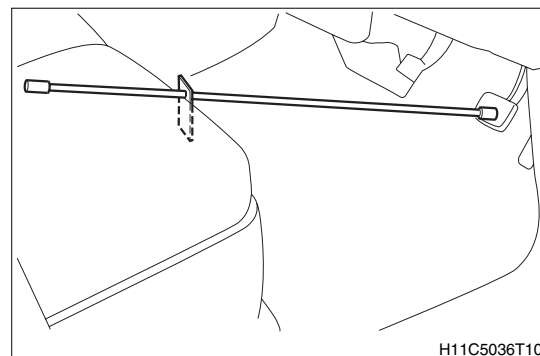
1. Remove the disc wheels. (Rear)
2. Prevent brake fluid from flowing out, using the following procedure.
 - (1) Connect a bottle for air bleeding to the bleeder plug of the rear wheel brake cylinder Ay.
Open the bleeder plug.

- (2) Fully depress the brake pedal Ay. At this point, secure the brake pedal Ay.

TOOL: Brake pedal pusher

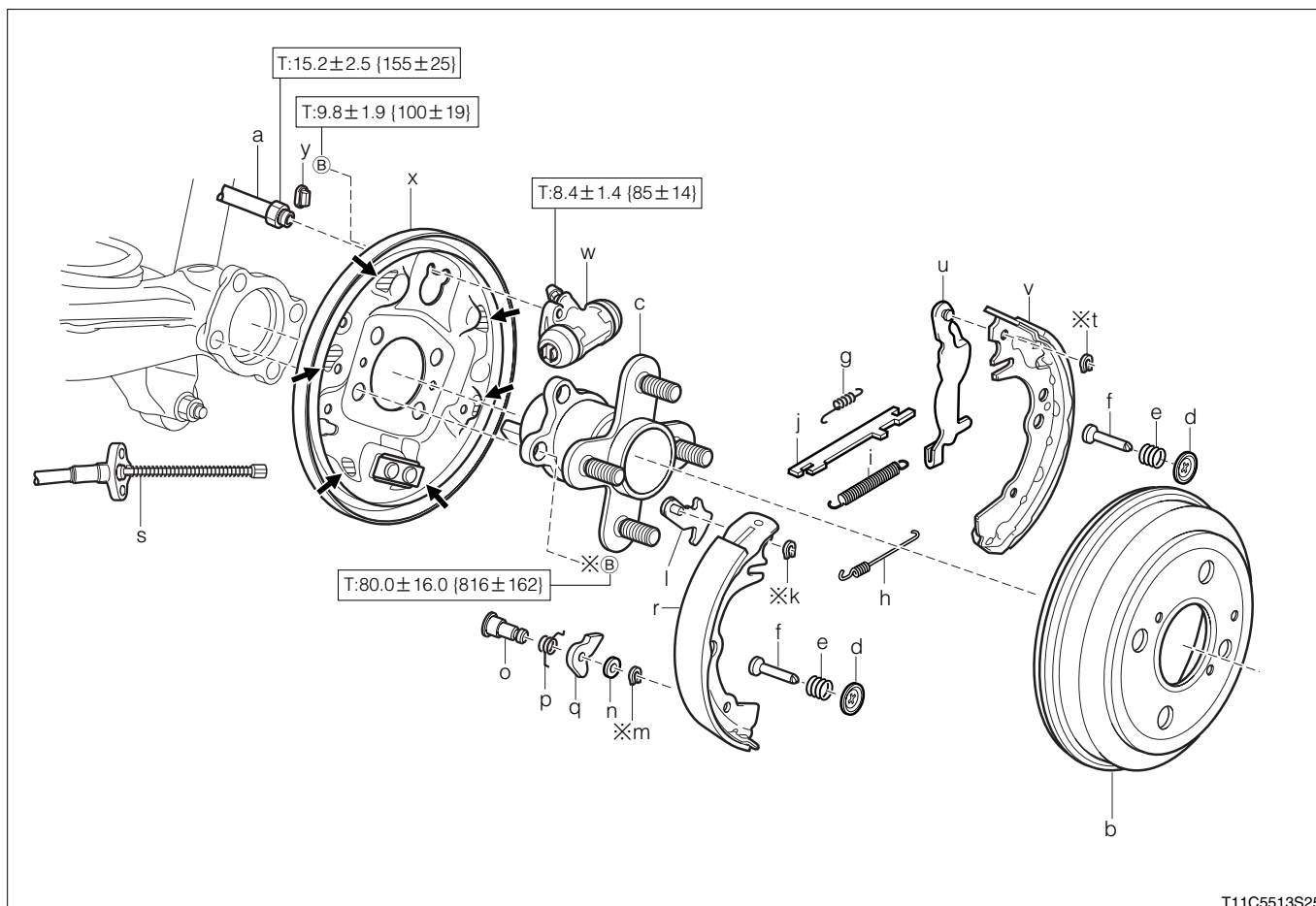
NOTE

- This causes the port of the brake master cylinder S/A to close. Therefore, any escape of brake fluid from the brake hydraulic circuit can be prevented.
- (3) Close the bleeder plug of the rear wheel brake cylinder Ay.



12-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



Unit: N·m{kgf·cm}

※: Non-reusable parts

➡: Brake grease

(2) Removal and installation procedures

- ▼ ▲ 1 a Tube, rear brake, No.5(RH)/No.6(LH)
- ▼ ▲ 2 b Drum, brake
- ▼ ▲ 3 c Hub & bearing Ay, rear axle
 - 4 d Cup, shoe hold down spring
 - 5 e Spring, compression
 - 6 f Pin, shoe hold down spring
 - 7 g Spring, tension
 - 8 h Spring, tension
 - 9 i Spring, tension
 - 10 j Strut, parking brake shoe
 - 11 k Washer, type C
 - 12 l Lever S/A, automatic adjust, RH/LH
 - 13 m Washer, type C
 - 14 n Washer, wave
 - 15 o Pin, automatic adjust lever
 - 16 p Spring, torsion
 - 17 q Latch, automatic adjust RH/LH
 - 18 r Shoe Ay, brake, No.3
 - 19 s Cable Ay, parking brake, No.2(RH)/No.3(LH)
 - 20 t Washer, type C
 - 21 u Lever S/A, parking brake shoe RH/LH
 - 22 v Shoe Ay, brake, No.3
 - 23 w Cylinder Ay, disc brake, rear RH/LH
 - 24 x Plate S/A, brake backing, rear RH/LH
 - 25 y Plug, shoe adjusting hole

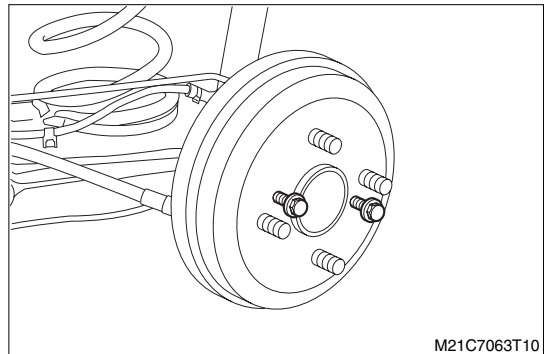
12-1-4 POINTS OF REMOVAL

(1) Tube, rear brake, No.5 (RH)/No.6 (LH)

1. Disconnect the tube from the rear wheel brake cylinder Ay.
2. Plug the disconnected tube with the bleeder plug cap or the like.

(2) Drum, brake

1. If the drum cannot be removed because it has seized to the rear axle hub & bearing Ay, screw two appropriate bolts (M6×1.00) into the screw holes of the drum and remove it.



(3) Hub & bearing Ay, rear axle

1. Remove the bolt retaining the hub & bearing assembly, using a long Torx wrench T55.

TOOL: KTC
BT4-T55L
or equivalent
Long TORX® wrench T55

2. Slowly pull out the hub & bearing assembly from the rear suspension arm assembly. Disconnect the connector from the speed sensor wire.

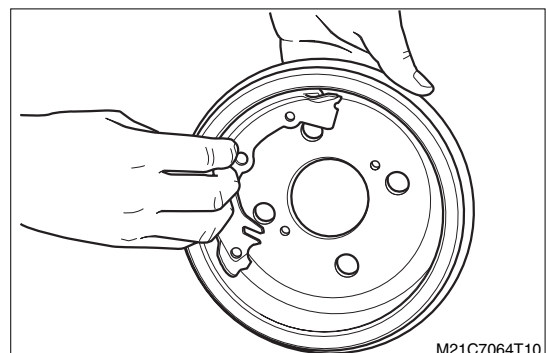
12-1-5 INSPECTION

(1) Contact between brake shoe lining and brake drum

1. Apply chalk to the inner surface of the drum. Slide the lining, while it is being pressed against the inner surface of the drum. If poor contact is present, be sure to grind the lining.

SPECIFIED VALUE: No significant poor contact is present.

2. Be sure to wipe off the chalk.



(2) Cylinder Ay, disc brake, rear

1. Check the cylinder assembly for corrosion and damage.

(3) Plate S/A, brake backing, rear RH/LH

1. Check the plate subassembly for wear and damage.

12-1-6 POINTS OF INSTALLATION

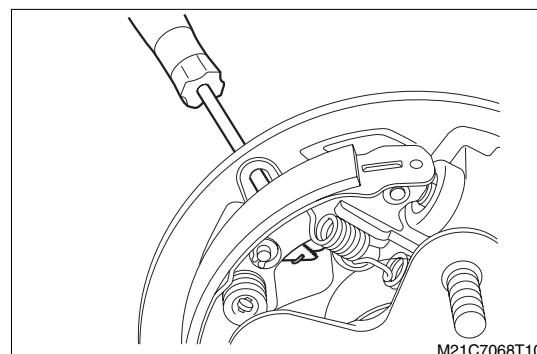
(1) Hub & bearing Ay, rear axle

1. Connect the connector of the speed sensor wire to the hub & bearing assembly. Then, install the hub & bearing assembly to the rear suspension arm assembly.
2. Secure the hub & bearing assembly and brake backing rear plate subassembly RH/LH, using a long Torx wrench T55.

TOOL: KTC
BT4-T55L
or equivalent
Long TORX® wrench T55

(2) Drum, brake

1. Insert a flat screwdriver through the shoe adjusting hole of the RH/LH rear brake backing plate S/A and turn the RH/LH automatic adjusting ratchets by . In this way, release the engagement with the RH/LH automatic adjusting lever S/A. Then, fully contract the brake shoe Ay No. 3 at the leading side and the trailing side. Under this condition, install the drum into position.



(3) Tube, rear brake, No.5 (RH)/No.6 (LH)

1. Temporarily tighten the union nut until the tube flare section contacts closely with the seat.
2. Using the SST, connect tube to the rear wheel brake cylinder Ay and tighten it to the specified torque.

SST: 09023-00100-000

12-1-7 OPERATION AFTER INSTALLATION

1. Release the securing of the brake pedal Ay.
2. Perform air bleeding of the brake.

Refer to Page E1-3.

3. Depress the brake pedal several times to actuate the adjusting mechanism of the brake shoe adjuster mechanism. In this way, adjust the clearance between the brake shoe linings.
4. Install the disc wheels. (Rear)
5. Confirm that there is no brake dragging.

Refer to Page E1-2.

6. Jack down the vehicle.

13 REAR WHEEL CYLINDER

13-1 DISASSEMBLING AND ASSEMBLING

CAUTION

- Never reuse the wiped-out brake fluid.

13-1-1 ARTICLES TO BE PREPARED

Instrument

Torque wrench

E1-47

Lubricant,adhesive,others

Brake fluid(DOT3),Brake grease

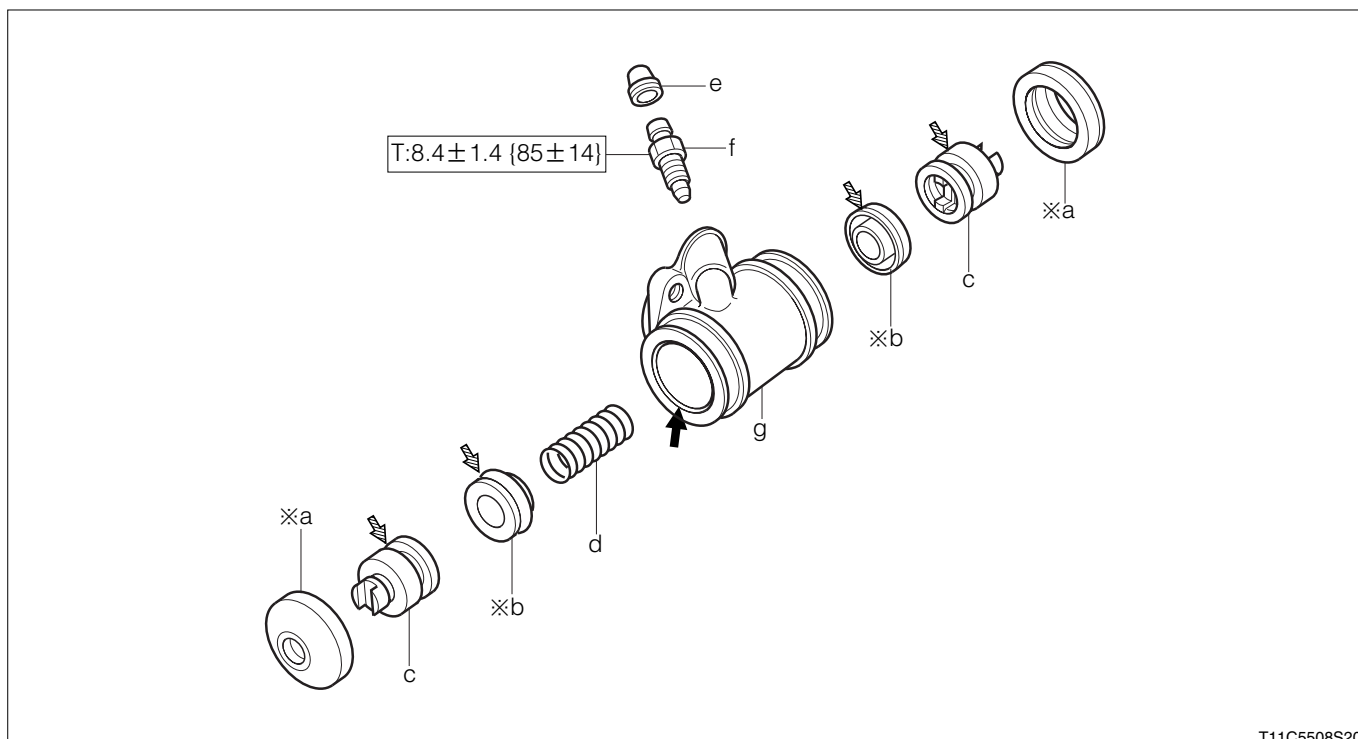
13-1-2 OPERATION BEFORE DISASSEMBLY

1. Remove the rear wheel brake cylinder assembly.
Refer to Page E1-43.

2. Drain the remaining brake fluid in the rear wheel brake cylinder Ay from the installing sections of the rear brake tube No. 5 and No. 6.

13-1-3 DISASSEMBLY AND ASSEMBLY PROCEDURES

(1) Components



Unit: N·m{kgf·cm}

※: Non-reusable parts

➡: Brake fluid (Equivalent to DOT3)

➡: Brake grease

(2) Disassembling and assembling procedure

1	a	Boot, wheel cylinder	6	f	Plug, bleeder
▲ 2	b	Cup, cylinder	▲ 7	g	Body, wheel brake cylinder, rear RH/LH
▲ 3	c	Piston S/A, wheel brake cylinder			
4	d	Spring, compression			
5	e	Cap, bleeder plug			

13-1-4 INSPECTION

(1) Piston S/A, wheel brake cylinder

1. Check for wear and damage.

(2) Body, wheel brake cylinder, rear

1. Check the cylinder inner surface for wear and damage.

13-1-5 POINTS OF ASSEMBLY

(1) Body, wheel brake cylinder, rear

1. Apply brake fluid to the entire periphery of the cylinder inner surface of the body.

LUBRICANT: Brake fluid(DOT3)

E1-49

(2) Piston S/A, wheel brake cylinder

1. Apply brake grease to the entire periphery of the piston S/A.

LUBRICANT: Brake grease

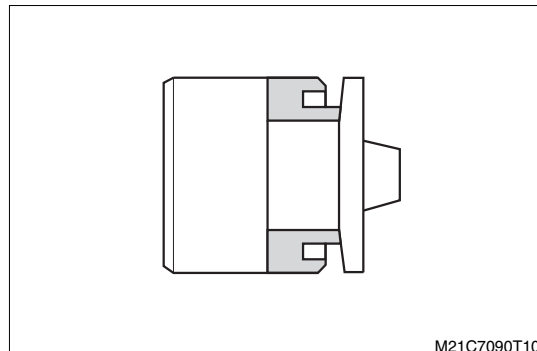
(3) Cup, cylinder

1. Apply brake grease to the entire periphery of the inner and outer surfaces of the cup.

LUBRICANT: Brake grease

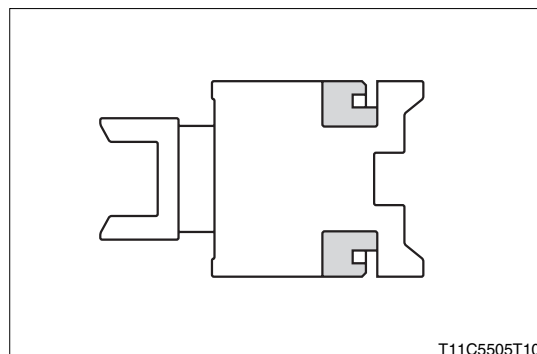
CAUTION

- Make sure that the cup is installed in the correct direction.
2. Install the cup to the wheel brake cylinder piston S/A.



CAUTION

- Make sure that the cup is installed in the correct direction.



13-1-6 OPERATION AFTER ASSEMBLY

1. Install the rear wheel brake cylinder assembly.
Refer to Page E1-43.

E2 PARKING BRAKE

PARKING BRAKE -----	E2—1
BASIC CHECK AND ADJUSTMENT ---	E2—1
PARKING BRAKE LEVER -----	E2—1
REMOVAL AND INSTALLATION-----	E2—1

E2-1

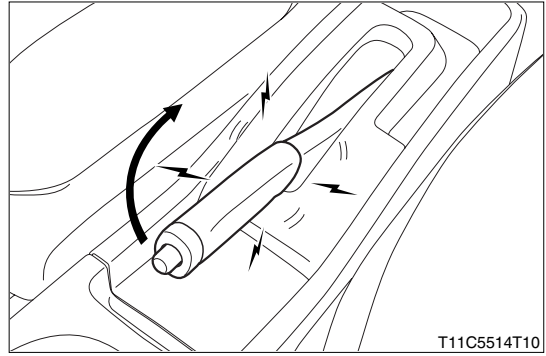
1 PARKING BRAKE

1-1 BASIC CHECK AND ADJUSTMENT

1-1-1 PARKING BRAKE LEVER

(1) Check of pulling amount

1. Depress the brake pedal several times.



① Operate the parking brake lever. At this time, ensure that the brake warning lamp goes on.

SPECIFIED VALUE: Ensure that the brake warning lamp goes on before the parking brake lever is engaged one notch after the lever starts to be pulled out.

1. Slowly pull the parking brake lever with the specified force. At this time, count the number of clicking sounds.

SPECIFIED VALUE: 4 to 7 notches (Operating force: 196N {20kgf})

2. Check to see if the running position is held when released.

(2) Adjustment of pulling amount

1. Depress the brake pedal several times.

2. Remove the rear console box.

Refer to Page I2-23.

3. Move the front seat backward as far as it will go.

4. Perform the adjustment to the specified value by turning the adjusting nut from the vehicle rear side, using a deep socket (10 mm).

SPECIFIED VALUE: 4 to 7 notches (Operating force: 196N {20kgf})

5. Check that there is no rear brake dragging.

Refer to Page E1-2.

(3) Brake working condition check

1. Check that the stopped state can be held at a dry hill.

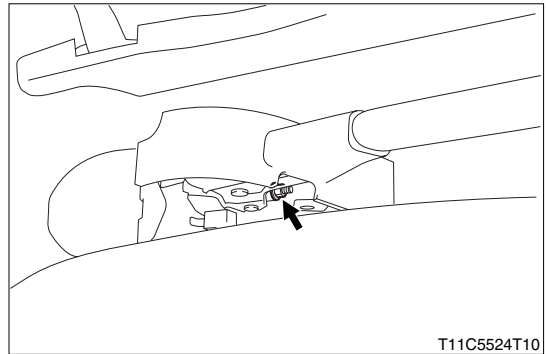
2 PARKING BRAKE LEVER

2-1 REMOVAL AND INSTALLATION

2-1-1 ARTICLES TO BE PREPARED

Instrument

Torque wrench



2-1-2 OPERATION BEFORE REMOVAL

1. Remove the front console box S/A and rear console box S/A.

Refer to Page I2-23.

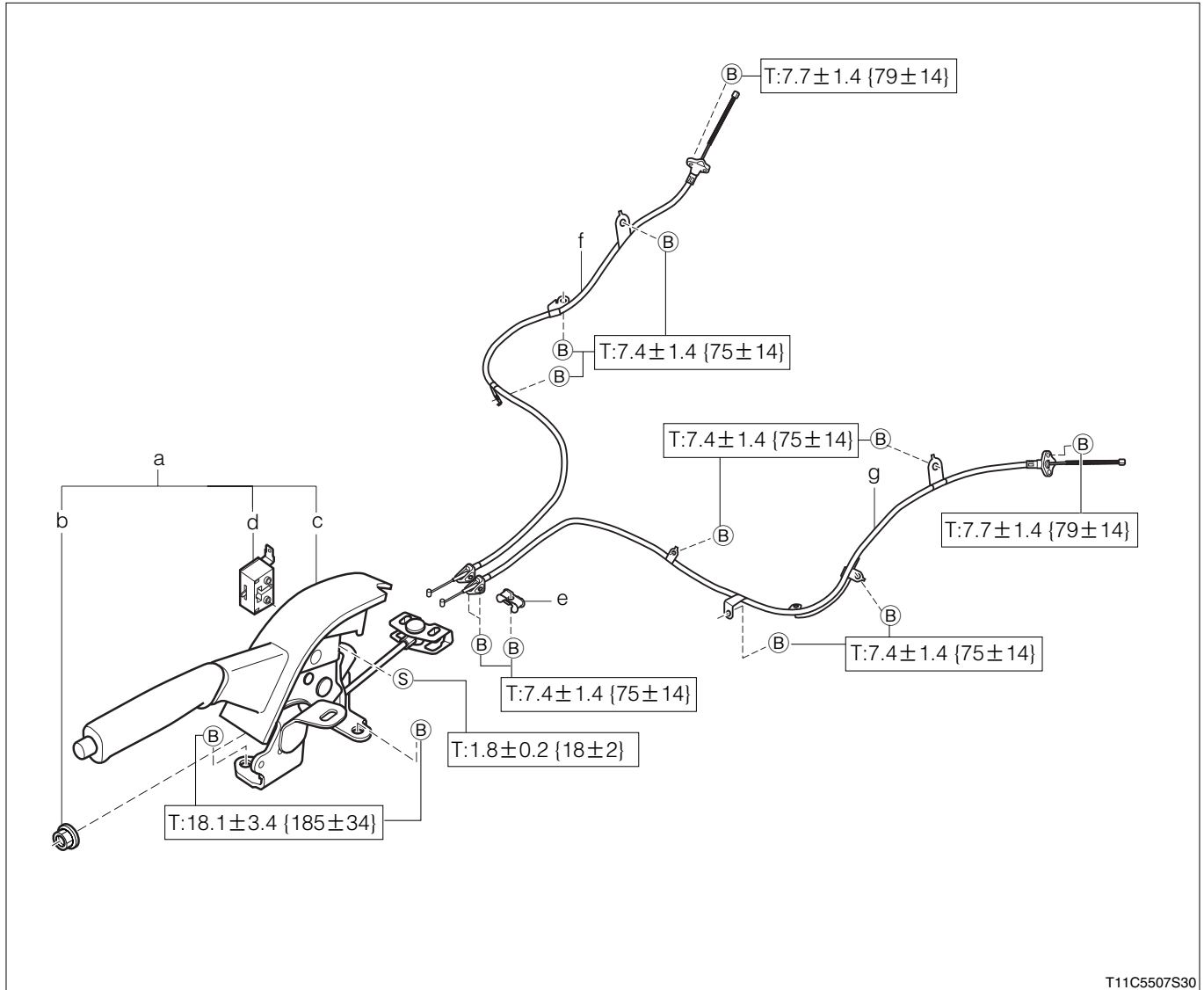
2. Jack up the vehicle.

3. Remove the brake shoe assembly.

Refer to Page E1-43.

2-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



(2) Removal and installation procedure

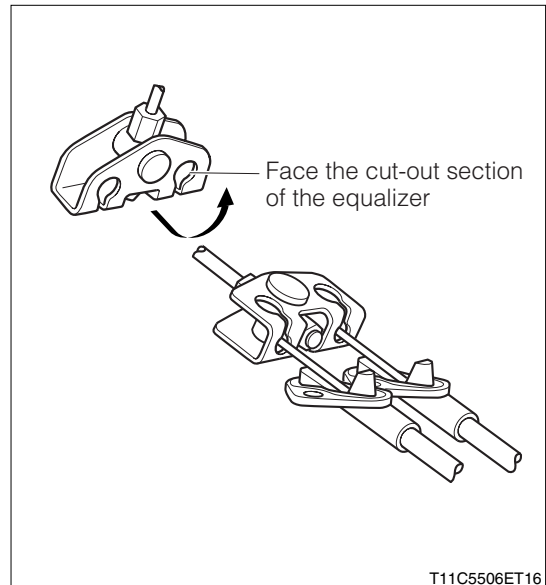
▲ 1	a Lever Ay, parking brake	6	f Cable Ay, parking brake No.2
2	b Nut, wire adjusting	7	g Cable Ay, parking brake No.3
3	c		
4	d Switch Ay, brake warning test		
5	e Clamp		

E2-3

2-1-4 POINTS OF INSTALLATION

(1) Lever Ay, parking brake

1. When assembling the parking brake cable Ay No.2/N0.3 to the equalizer section of the parking brake lever Ay, face the cut-out section of the equalizer toward the cable. Then, turn it 90 degrees.



2-1-5 OPERATION AFTER INSTALLATION

1. Install the rear brake shoe assembly.
Refer to Page E1-43.
2. Check and adjust the pulling amount of the parking brake lever.
3. Make sure that the parking brake cable Ay No.2/No.3 cannot be separated from the equalizer section of the parking brake lever Ay.
4. Confirm that there is no rear brake dragging.
Refer to Page E1-2.
5. Jack down the vehicle.
6. Install the front console box S/A and rear console box S/A.
Refer to Page I2-23.

E3 BRAKE CONTROL

ABS-----	E3-1
ACTUATOR UNIT -----	E3-1
REMOVAL AND INSTALLATION-----	E3-1
FRONT WHEEL SPEED SENSOR -----	E3-3
REMOVAL AND INSTALLATION-----	E3-3
REAR WHEEL SPEED SENSOR -----	E3-5
REMOVAL AND INSTALLATION-----	E3-5
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TO MALFUNCTION PHENOMENA---	E3-27
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-----	E3-32

E3-1

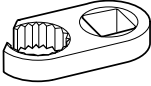
■ ABS

1 ACTUATOR UNIT

1-1 REMOVAL AND INSTALLATION

1-1-1 ARTICLES TO BE PREPARED

SST

Shape	Part No.	Part name
	09023-00100-000	Wrench,union nut

Tool

Shape	Part No.	Part name	Use
	KTC BT3-T25L or equivalent	Long TORX® wrench T25	
Brake pedal pusher			

Instrument

Torque wrench

Lubricant, adhesive, others

Brake fluid(DOT3)

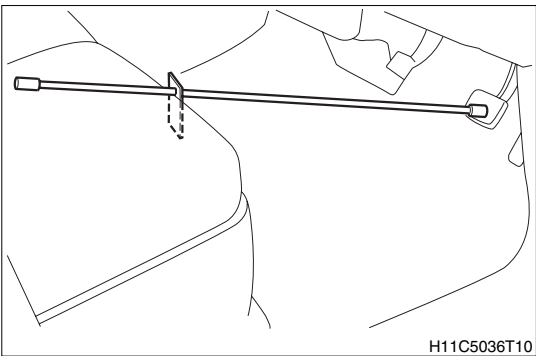
1-1-2 OPERATION BEFORE REMOVAL

1. After setting IG SW "LOCK" position, disconnect the negative (-) terminal of the battery.
2. Disconnect the connector of the brake actuator Ay.
3. Prevent brake fluid from flowing out, using the following procedure.
 - (1) Remove the disc wheels.
Refer to Page C3-2.
 - (2) Connect a bottle for air bleeding to the bleeder plug of the front disc brake caliper Ay RH/LH.
Then, open the bleeder plug.
 - (3) Fully depress the brake pedal Ay. At this point, secure the brake pedal Ay.

TOOL: Brake pedal pusher

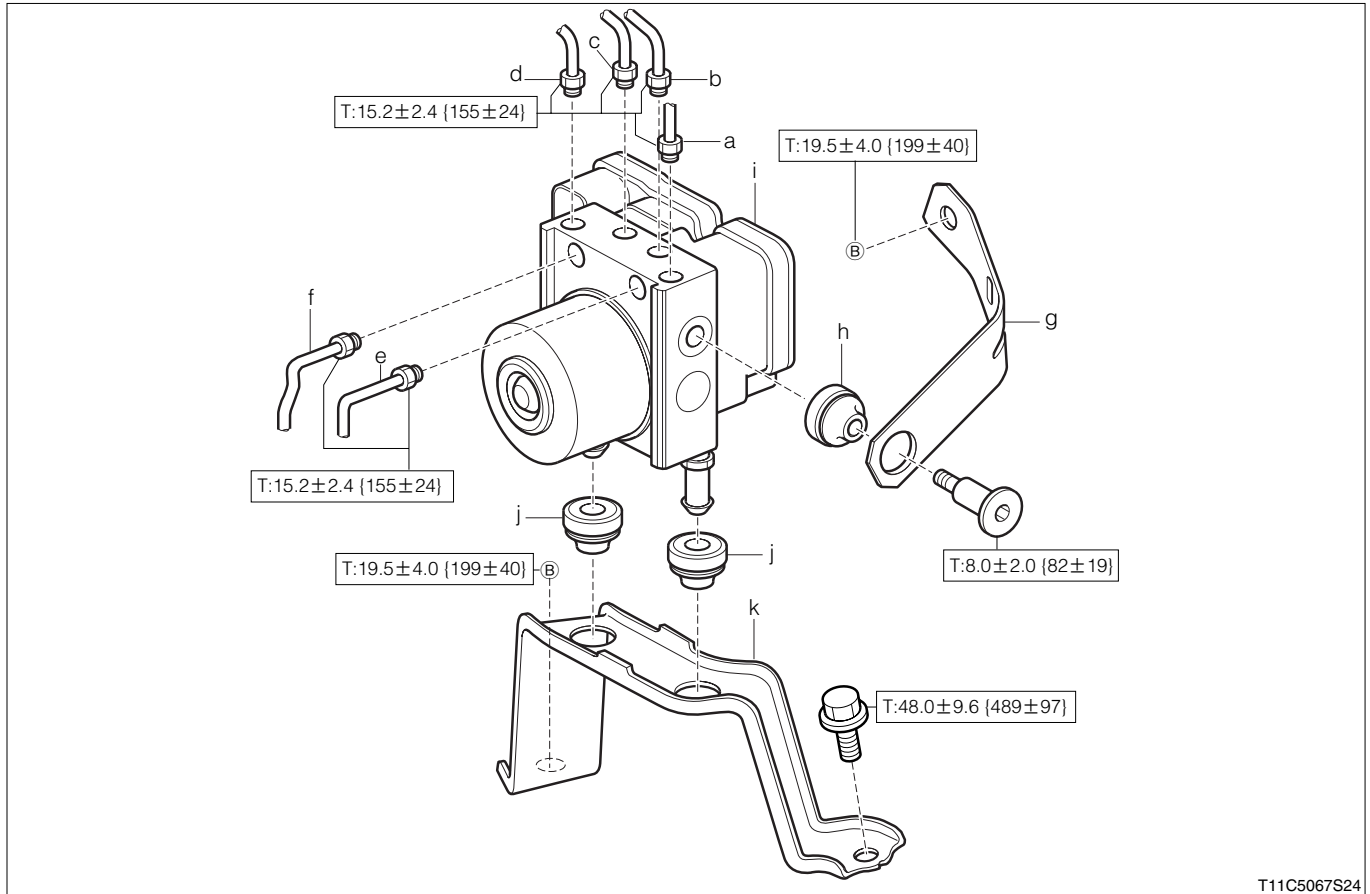
NOTE

- This closes the brake master cylinder S/A port, thus preventing the brake fluid from flowing out from the brake hydraulic circuit.
- (4) Close the bleeder plug of the RH/LH front disc brake caliper Ay.
4. Remove the battery carrier.
Refer to Page J5-2.



1-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



Unit:N·m{kgf·cm}

T11C5067S24

(2) Removal and installation procedures

▼ ▲ 1	a Tube, front brake, No.1	▲ 7	g Bracket, brake actuator (Upper side)
▼ ▲ 2	b Tube, front brake, No.4	▲ 8	h Cushion, brake actuator bracket
▼ ▲ 3	c Tube, front brake, No.2	▼ 9	i Actuator Ay, Brake
▼ ▲ 4	d Tube, front brake, No.3	▲ 10	j Cushion, brake actuator bracket
▼ ▲ 5	e Tube, rear brake, No.2	▲ 11	k Bracket, brake actuator (Low side)
▼ ▲ 6	f Tube, rear brake, No.4		

1-1-4 POINTS OF REMOVAL

(1) Tube, brake

1. Disconnect the tube from the brake actuator Ay.
2. Plug the disconnected tube with the bleeder plug cap or the like.

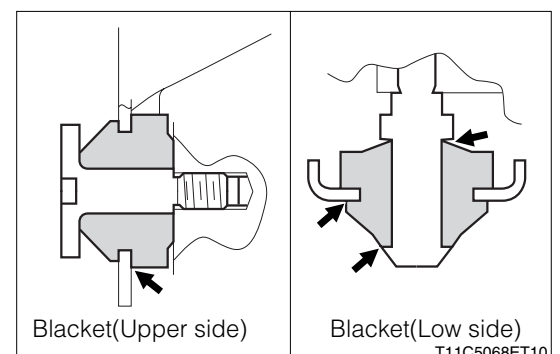
(2) Actuator Ay, brake

1. In order to prevent the brake fluid from flowing out, attach the bleeder plug or the like to the brake tube attaching section of the actuator assembly.

1-1-5 POINTS OF INSTALLATION

(1) Cushion, brake actuator bracket

1. Install the cushion correctly to the brake actuator Ay and brake actuator bracket, as indicated in the right figure.



T11C5068ET10

E3-3

(2) Bracket, brake actuator

1. Using the Torx wrench T25, install the bracket (Upper side) assembled with the brake actuator bracket cushion to the brake actuator Ay.

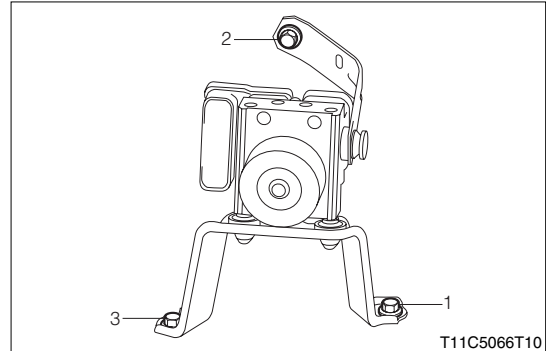
TOOL: KTC

BT3-T25L

or equivalent

Long TORX® wrench T25

2. After installing the bolt (1) temporarily, securely tighten the bolts in an order of (2), (3) and (1).



(3) Tube, brake

1. Temporarily tighten the union nut until the tube flare section contacts closely with the seat.
2. Using the SST, tighten tube to the brake actuator Ay to the specified torque.

SST: 09023-00100-000

1-1-6 OPERATION AFTER INSTALLATION

1. Install the battery carrier.

Refer to Page J5-2.

2. Release the securing of the brake pedal Ay.
3. Connect the connector of the brake actuator Ay.
4. Connect the negative (－) terminal of the battery.
5. Perform air bleeding of the brake.

Refer to Page E1-8.

6. Install the disc wheels.

Refer to Page C3-2.

2 FRONT WHEEL SPEED SENSOR

2-1 REMOVAL AND INSTALLATION

2-1-1 ARTICLES TO BE PREPARED

Instrument

Torque wrench

2-1-2 OPERATION BEFORE REMOVAL

1. After setting the IG SW "LOCK" position, disconnect the negative (－) terminal of the battery.
2. Remove the disc wheels. (Front)

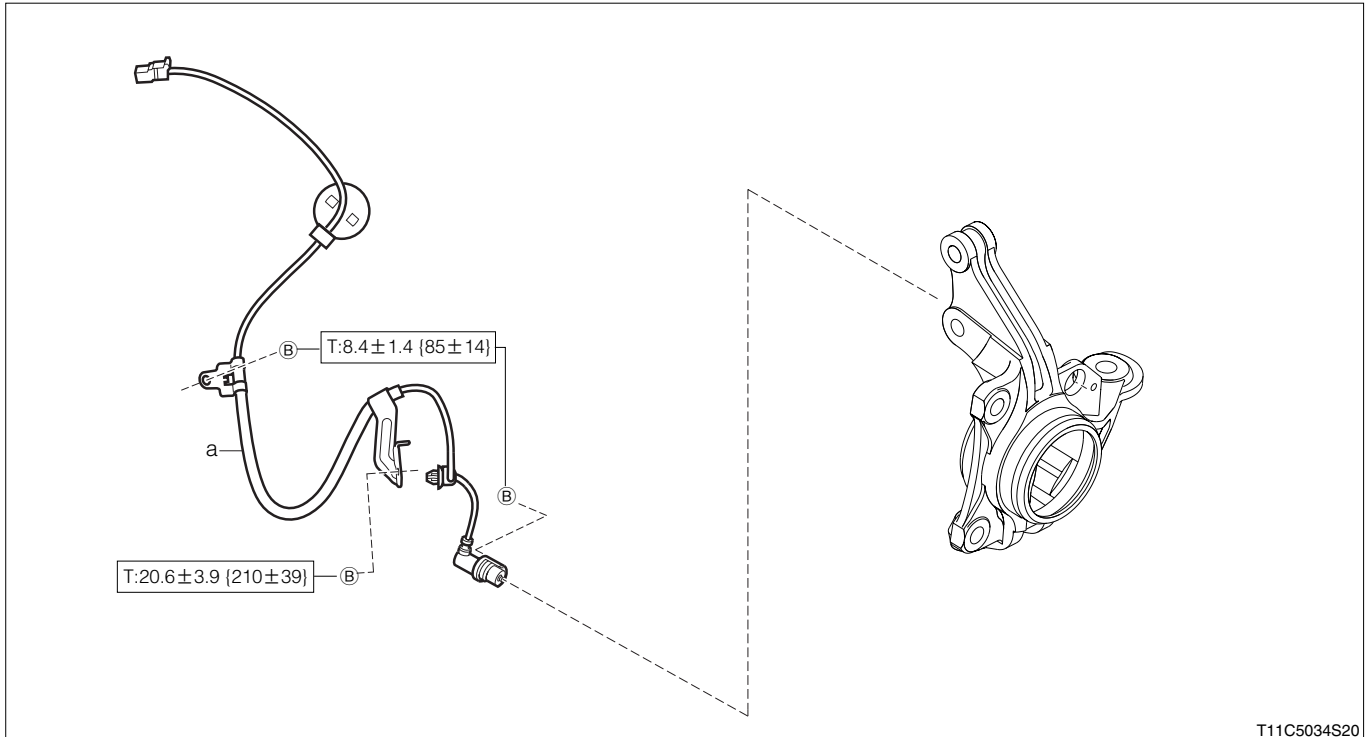
Refer to Page C3-2.

3. Disconnect the connectors of the RH/LH front speed sensors.

Refer to Page E3-3.

2-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



Unit: N·m {kgf·cm}

T11C5034S20

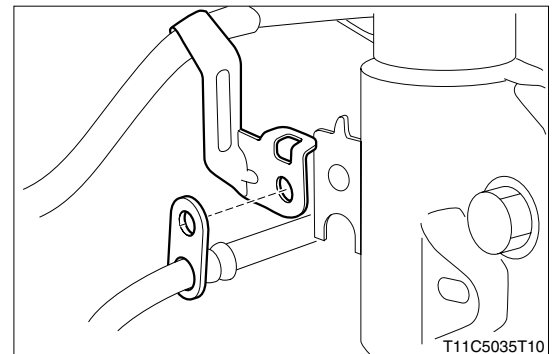
(2) Removal and installation procedures

- ▲ 1 a Sensor, speed, front RH/LH

2-1-4 POINTS OF INSTALLATION

(1) Sensor, speed, front RH/LH

1. Install the sensor bracket in such a way that it is interposed by the brackets of the RH/LH front shock absorber Ay and the flexible hose, as indicated in the right figure. Tighten it by the bolt.



2-1-5 OPERATION AFTER INSTALLATION

1. Connect the connector of the RH/LH front speed sensors.
Refer to Page E3-3.
2. Install the disc wheels. (Front)
Refer to Page C3-2.
3. Connect the negative (—) terminal of the battery.

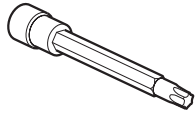
E3-5

3 REAR WHEEL SPEED SENSOR

3-1 REMOVAL AND INSTALLATION

3-1-1 ARTICLES TO BE PREPARED

Tool

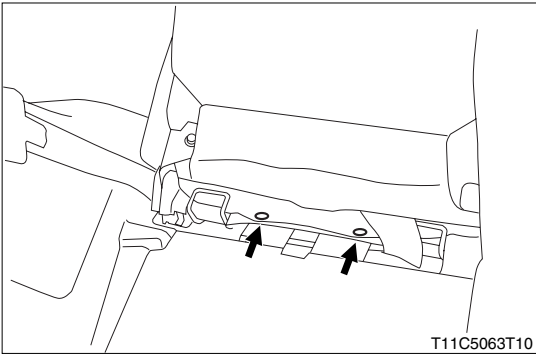
Shape	Part No.	Part name	Use
	KTC BT4-T55L or equivalent	Long TORX® wrench T55	

Instrument

Torque wrench

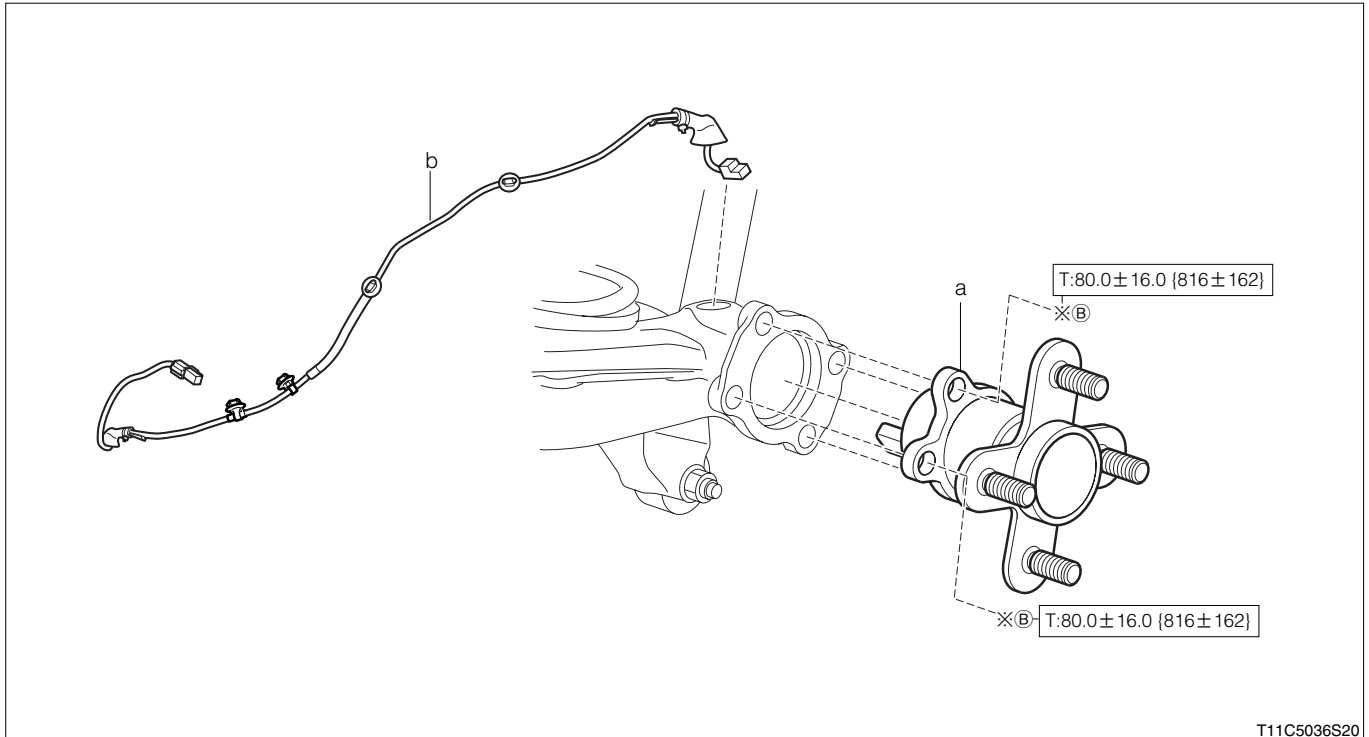
3-1-2 OPERATION BEFORE REMOVAL

1. After setting the IG SW "LOCK" position, disconnect the negative (－) terminal of the battery.
2. Remove the rear door scuff plate RH/LH.
Refer to Page I2-41.
3. Tilt forward the seatback of the rear RH/LH seat Ay. Remove the clips of the carpet.
4. Erect the cushions of the rear RH/LH seat Ay. Turn over the carpet around the rear RH/LH seat Ay.
5. Remove the rear floor board front RH/LH.
Refer to Page I2-47.
6. Detach the clip at one point of the rear RH/LH quarter trim panel Ay. Float the rear RH/LH quarter trim panel Ay.
7. Disconnect the connectors of the RH/LH speed sensor wires.
8. Remove the drum brake.
Refer to Page E1-43.



3-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



※:Non - reusable parts

Unit:N·m{kgf·cm}

(2) Removal and installation procedures

- ▼ ▲ 1 a Hub & bearing Ay, rear axle
- 2 b Wire, speed sensor, RH/LH

3-1-4 POINTS OF REMOVAL

(1) Hub & bearing Ay, rear axle

1. Remove the bolt retaining the hub & bearing assembly, using a long Torx wrench T55.

TOOL: KTC

BT4-T55L

or equivalent

Long TORX® wrench T55

2. Slowly pull out the hub & bearing assembly from the rear suspension arm assembly. Disconnect the connector from the speed sensor wire RH/LH.

3-1-5 POINTS OF INSTALLATION

(1) Hub & bearing Ay, rear axle

1. Connect the connectors of the RH/LH speed sensor wires to the hub & bearing Ay. Install the hub & bearing Ay to the rear suspension arm Ay.
2. Secure the hub & bearing assembly and rear brake backing plate subassembly RH/LH, using a long Torx wrench T55.

TOOL: KTC

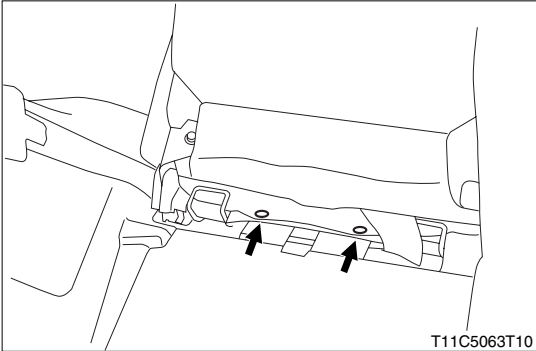
BT4-T55L

or equivalent

Long TORX® wrench T55

3-1-6 OPERATION AFTER INSTALLATION

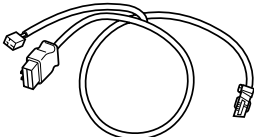
1. Install the drum brake.
Refer to Page E1-43.
2. Connect the connectors of the RH/LH speed sensor wires.
3. Install the rear quarter trim panel Ay RH/LH.
4. Install the rear floor board front RH/LH.
Refer to Page I2-47.
5. Place the carpet around the RH/LH rear seat Ay. Return the cushion to the original place.
6. Tilt the seatback of the RH/LH rear seat Ay and install the carpet clips.
7. Install the rear door scuff plate RH/LH.
Refer to Page I2-41.
8. Connect the negative (－) terminal of the battery.



4 CONTROL SYSTEM

4-1 ARTICLES TO BE PREPARED

SST

Shape	Part No.	Part name
	09991-87404-000 (09991-87401-000)	Wire,engine control system inspection
	09991-87403-000	Wire,diagnosis check

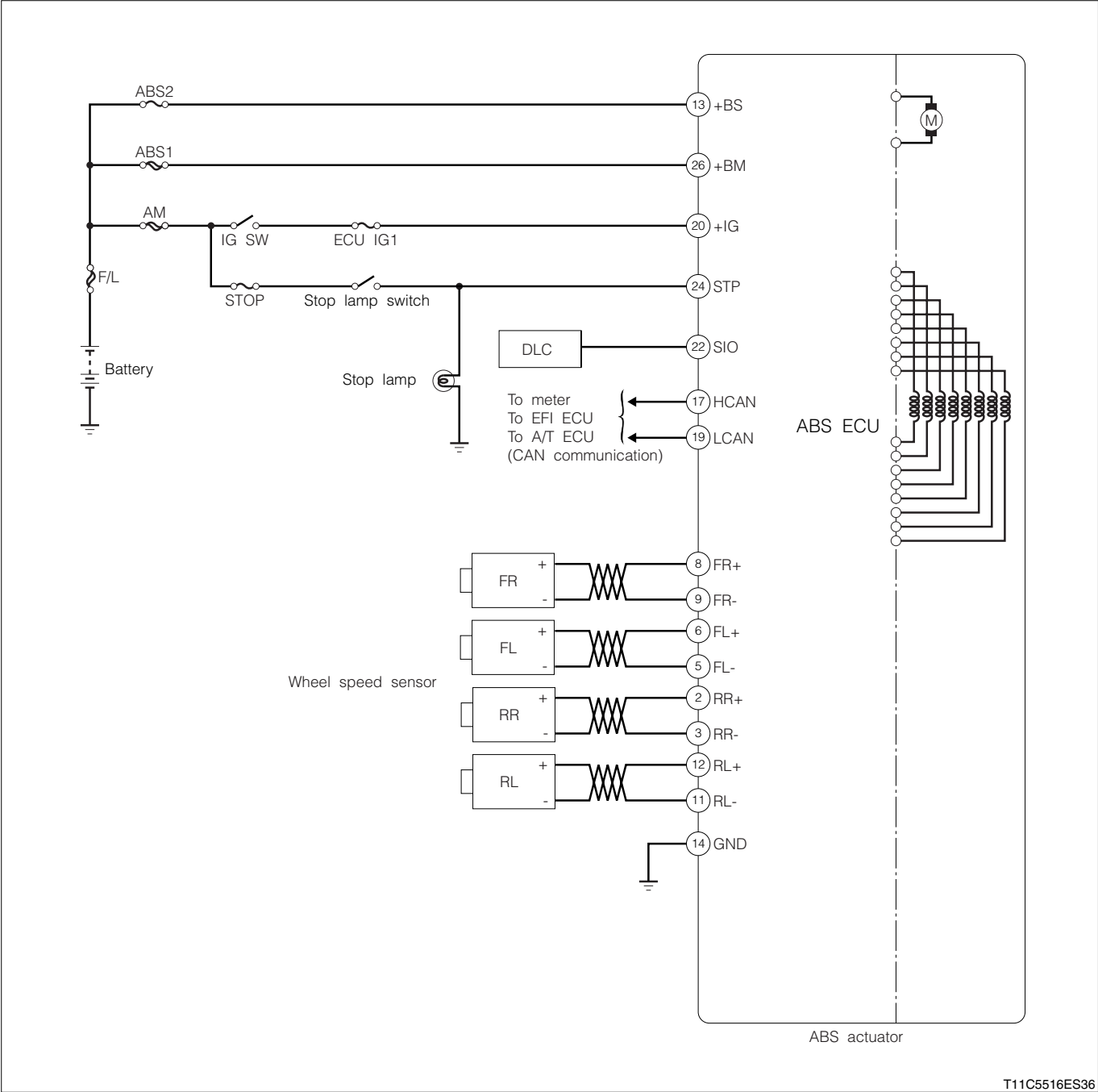
Instrument

Electrical tester

4-2 HANDLING INSTRUCTIONS OF CONTROL SYSTEM

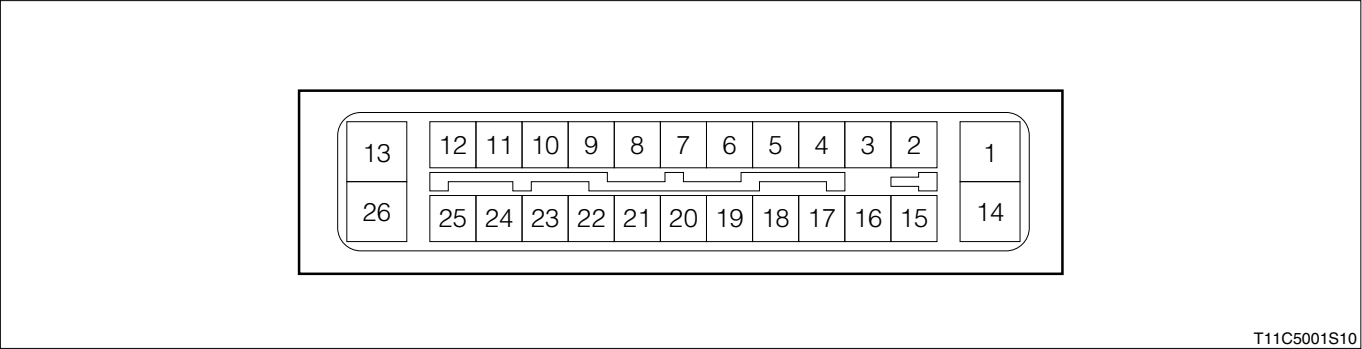
1. Never apply big shocks to the ABS actuator and sensors, etc. during the removal/installation, etc. for they are precision components. Do not use any such parts that have undergone big shocks (E.g. dropped to the floor).
2. Make sure water does not get in the system when conducting an inspection during rainy weather or when the vehicle is washed. Do not allow water to get to the ABS actuators or sensors.
3. If the vehicle becomes normal by judging that the ABS ECU was abnormal and by replacing the ABS ECU, be sure to install the old ABS actuator (That has been judged to be malfunctioning) in order to confirm that the initially-observed malfunction may be reproduced. Then, finally judge that the ABS ECU was malfunctioning.
4. Do not disassemble the ABS actuator.
5. Make sure that the brake related parts of each wheel are installed properly.
6. When a wireless device is to be mounted, care must be exercised as for the following points given below.
 - (1) Place the antenna as far away as possible from the ABS ECU.
 - (2) The feeder of the antenna should be routed as far away as possible (Minimum distance: 30 cm) from the ABS ECU and wire harness. Also, make certain to avoid routing the feeder for a long distance in parallel with these parts.
 - (3) The antenna should be matched well.
 - (4) Do not install wireless devices with a high output.

4-3 SYSTEM WIRING DIAGRAM



T11C5516ES36

4-4 ARRANGEMENT OF ECU TERMINAL



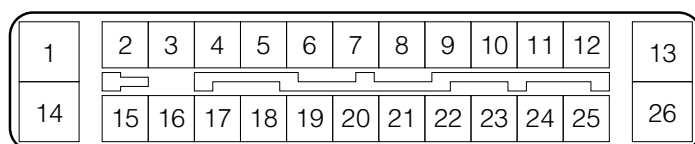
T11C5001S10

Terminal name

Terminal No.	Terminal code	Terminal name
1	—	—
2	RR+	Input of the rear right wheel speed sensor (+)
3	RR—	Input of the rear right wheel speed sensor (—)
4	—	—
5	FL—	Input of the front left wheel speed sensor (—)
6	FL+	Input of the front left wheel speed sensor (+)
7	—	—
8	FR+	Input of the front right wheel speed sensor (+)
9	FR—	Input of the front right wheel speed sensor (—)
10	—	—
11	RL—	Input of the rear left wheel speed sensor (—)
12	RL+	Input of the rear left wheel speed sensor (+)
13	+BS	Solenoid valve power supply
14	GND	Earth
15	—	—
16	—	—
17	HCAN	CAN communication HI
18	—	—
19	LCAN	CAN communication LO
20	+IG	Power supply through IG SW
21	—	—
22	SIO	External communication
23	—	—
24	STP	Input of the stop lamp SW
25	—	—
26	+BM	Motor power supply

4-5 ARRANGEMENT OF VEHICLE HARNESS SIDE CONNECTOR TERMINALS

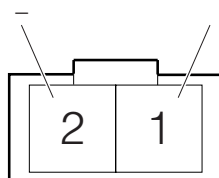
ABS ECU



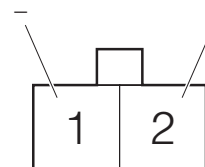
T11C5002S10

As for the terminal names of computer at the ABS ECU vehicle harness side, refer to the computer connector terminal arrangement diagram.

Wheel speed sensor

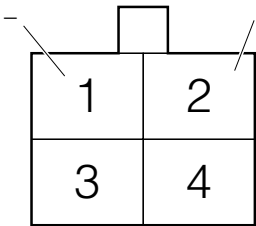


FR



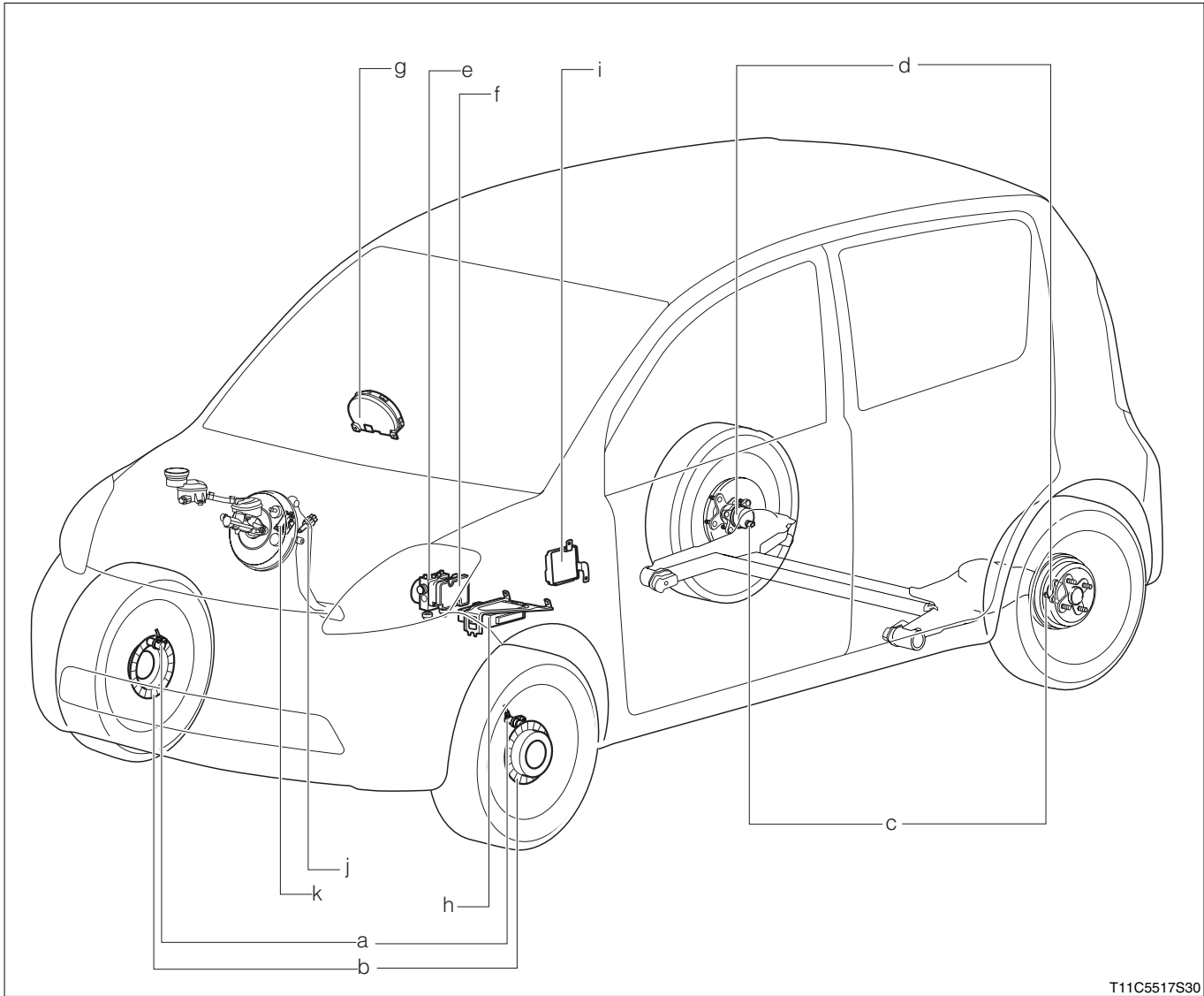
RR

T11C5032S10



M21C7411S10

4-6 LOCATION OF COMPONENTS



T11C5517S30

a	Front wheel speed sensor
b	Front wheel speed sensor rotor
c	Rear wheel speed sensor
d	Rear wheel speed sensor rotor
e	ABS actuator
f	ABS ECU
g	Combination meter (Incorporating the warning lamp)
h	EFI ECU
i	Transmission control ECU
j	Stop lamp SW
k	DLC

4-7 HOW TO PROCEED WITH TROUBLE SHOOTING

1. This system is equipped with a diagnosis function capable of performing the self-diagnosis for malfunctioning sections. This will be an important help at the time of trouble-shooting. The diagnosis of this system has a backup that uses an EEPROM (Non-volatile ROM). Hence, the diagnosis code is stored in the memory even if the power is cut off.

▷1. Bringing of malfunctioning vehicles to workshop

▼ Go to ▷2.

▷2. Inquiry with customer

Fully obtain information about the conditions and environmental phenomena in which the malfunctions took place.

▼ Go to ▷3.

▷3. Confirmation of normal indication of diagnosis code of LCD inside meter

1. Using the SST, short-circuit the DLC terminals 4 (ECU-T) and 13 (E).

SST: 09991-87403-000

09991-87404-000

2. Ensure that the LCD inside the meter indicates the diagnosis code (Including the normal codes).

SPECIFIED VALUE: Indicated

NOTE

- It is permissible that codes other than the CAN-related codes are outputted.

▼ If it is OK, go to ▷4.

▼ In the case of NG, check the meter in particular about the points given below. If no problems are found, replace the meter.

- (1) Check the harness between the meter and the DLC and the harness between the DLC and the body earth.
- (2) Check the power supply system and the earth system of the meter.

▷4. Confirmation of diagnosis code (Related to CAN)

1. Confirm that the CAN related-diagnosis codes (Codes 0051 through 0053) are not indicated on the LCD in the meter.

SPECIFIED VALUE: Codes 0051 through 0053 are not indicated.

▼ If it is OK, go to ▷5.

▼ In the case of NG, refer to the item of the CAN communication system.

Refer to Page L2-1.

E3-13

▷5. Confirmation and recording of diagnosis code

Refer to Page E3-16.

▼ Go to ▷6.

▷6. Erasing of diagnosis code

Refer to Page E3-16.

▼ In the case of erasable one, proceed to ▷7.

▼ In the case of inerasable one, proceed to ▷9.

▷7. Running test using the sensor check function (Test mode)

Refer to Page E3-19.

▼ Go to ▷8.

▷8. Basic check

Refer to Page E3-21.

▼ Go to ▷9.

▷9. Reconfirmation of malfunctioning phenomena

Confirm the phenomenon to grasp the malfunctioning situation.

▼ Go to ▷10.

▷10. Reconfirmation of diagnosis code

Narrow down the malfunctioning system.

Refer to Page E3-16.

▼ If the malfunction is reproduced and the normal code is outputted, proceed to ▷11.

▼ If the malfunction is not reproduced and the normal code is outputted, proceed to ▷11.

▼ If an abnormal code is outputted, proceed to ▷12.

▷11. Trouble-shooting according to malfunction phenomenon.

Refer to Page E3-31.

▼ Go to ▷13.

▷12. Trouble-shooting according to diagnosis code

As for the system for which the abnormal code was outputted at the first check, check its harness with a top priority.

Refer to Page E3-22.

▼ Go to ▷13.

▷13. Erasing of diagnosis code

Refer to Page E3-17.

▼ In the case of erasable one, proceed to ▷14.

▼ In the case of inerasable one, proceed to ▷9.

▷14. Running test by sensor check function (Test mode)

Refer to Page E3-19.

▼ In the case of the normal one, proceed to ▷15.

▼ If an abnormal code is outputted, proceed to ▷9.

▷15. Confirmation test

Confirm that the malfunctioning phenomenon the customer had been appealing has been solved completely and the vehicle has been restored to the normal condition.

▼ If OK, complete the check.

▼ If it is NG, go to ▷3.

4-7-1 SERVICE NOTICE

- Although the system is normal, the warning lamps may light according to the vehicle running conditions or the work contents.

Warning lamp illuminating	Cases where there is a possibility of lighting	Lamp extinguishing conditions	Control conditions
· ABS warning lamp · Brake warning lamp	When the front wheels only are turned at a speed of 10 km/h or more by stacking, jacking up or chassis roller, etc.	After setting IG SW "LOCK" position once: Run the vehicle at a speed of 10 km/h or more, When the normal state is confirmed,	ABS control: Suspend. EBD control: Suspend
	The brakes are dragging,		
	During quick accelerating period		

4-8 INQUIRY

- When the vehicle is encountered with a malfunction, even if an attempt is made to remove its cause, it is impossible to find out the cause, unless the malfunction phenomenon can be actually confirmed. Hence, the vehicle may not be remedied to the normal condition regardless of the repairing operations if the cause is not known. The diagnosis through inquiries to the customer is to be performed in order to collect information from the customer before confirming the malfunction phenomenon. This step will be a very important help in reproducing the malfunction phenomenon.
- Since the information obtained by the diagnosis through interviews is referred to during the trouble shooting, it is imperative to make an inquiry of the customer, centering on the items related to the malfunction, instead of simply asking general questions.
- In addition, during the diagnosis through interviews, utmost attention must be paid to complaints of the customer, for it may include phenomena peculiar to the ABS-equipped vehicles.

4-8-1 DIAGNOSIS INTERVIEW SHEET FOR ABS SYSTEM

Checked by		Check date	Day Month (Day of week)

Customer information

Name of customer	Mr./Ms.	Gender of customer (Male, Female)	Age [Approx.]	Occupation []	
		Area where vehicle is mainly used	Urban, suburb, seashore, mountain, others	Parking place	Outdoor, indoor

Details of vehicle

Date when vehicle was brought to workshop	Day Month (Day of week)	Date when malfunction took place	Day Month (Day of week)	Repair history	No, Yes (How many times?)	
Frame No.		Registration date	Day Month Year	Vehicle model		
Engine type		Transmission	5M/T · 3A/T · 4A/T · CVT electronically-controlled 4A/T		Driving	2WD · 4WD
Running distance		Equipment	Tire [] · Wheel [Steel · Aluminum]			

Weather

☐ Fine	☐ Cloudy	☐ Rainy	☐ Snow	☐ Other()
Temperature(Approx. °C)				

Frequency of malfunction

☐ Always	☐ Under certain condition()	☐ Sometimes()

Road conditions

☐ Urban	☐ Suburb	☐ Express way	☐ Mountain road (uphill, downhill)
☐ Snowy road	☐ Icy road	☐ Dry concrete	☐ Wet asphalt

Driving conditions

☐ When the brake pedal is depressed lightly.
☐ When the brake pedal is depressed at a vehicle speed of () km/h during driving.
☐ During hard braking at vehicle speed of () km/h.
☐ When the brake pedal is depressed at a vehicle speed of () km/h during curve driving (right curve, left curve).
☐ Others

State of parts

☐ Wear of tire
☐ Wear breakage of brake
☐ Others

Phenomena

ABS warning lamp	☐ Always illuminated when IG SW is turned ON.
	☐ Does not illuminate for three seconds after IG SW is turned ON.
Brake warning lamp	☐ Always illuminated when IG SW is turned ON.
	☐ Does not illuminate for three seconds after IG SW is turned ON.
Brake malfunction	☐ Uneven brake application.
	☐ Lack of brake efficiency.
	☐ ABS is actuated during normal braking.
	☐ Pedal vibrates during ABS operation.
☐ ABS warning lamp is illuminated during running.	
☐ Others	

Diagnosis indication (Short circuit of T terminal)	During check	☐ Normal ☐ Abnormal code []
	Second time	☐ Normal ☐ Abnormal code []
	nd(rd) time	☐ Normal ☐ Abnormal code []

4-9 CONFIRMATION, RECORD AND ERASURE OF DIAGNOSIS CODE

NOTE

- When any abnormality code of the diagnosis is indicated, it is necessary to confirm the relationship with the reproduced malfunction phenomenon by ascertaining whether the system malfunction has occurred in the past or it still persists up to the present. To this end, the diagnosis code should be indicated twice, i.e. before and after the confirmation of the phenomenon.

4-9-1 CHECKING METHOD OF DIAGNOSIS

(1) Indication by ABS warning lamp

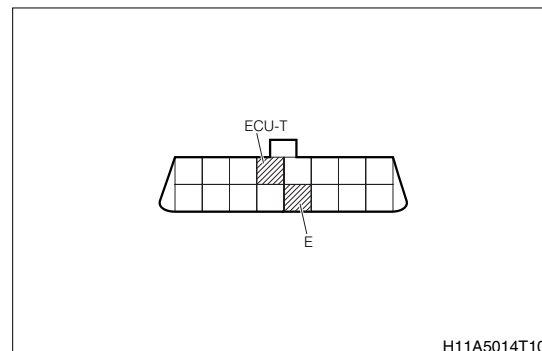
- Stop the vehicle.
- With the IG SW set to "LOCK", short-circuit the ECU-T terminal and E terminal of the DLC located below the instrument panel.

CAUTION

- Be sure to employ the specified SST for short-circuit of the DLC.
- If the short-circuit of the DLC is made for wrong positions, it may cause a malfunction. Be very careful not to select wrong terminals.

SST: 09991-87404-000

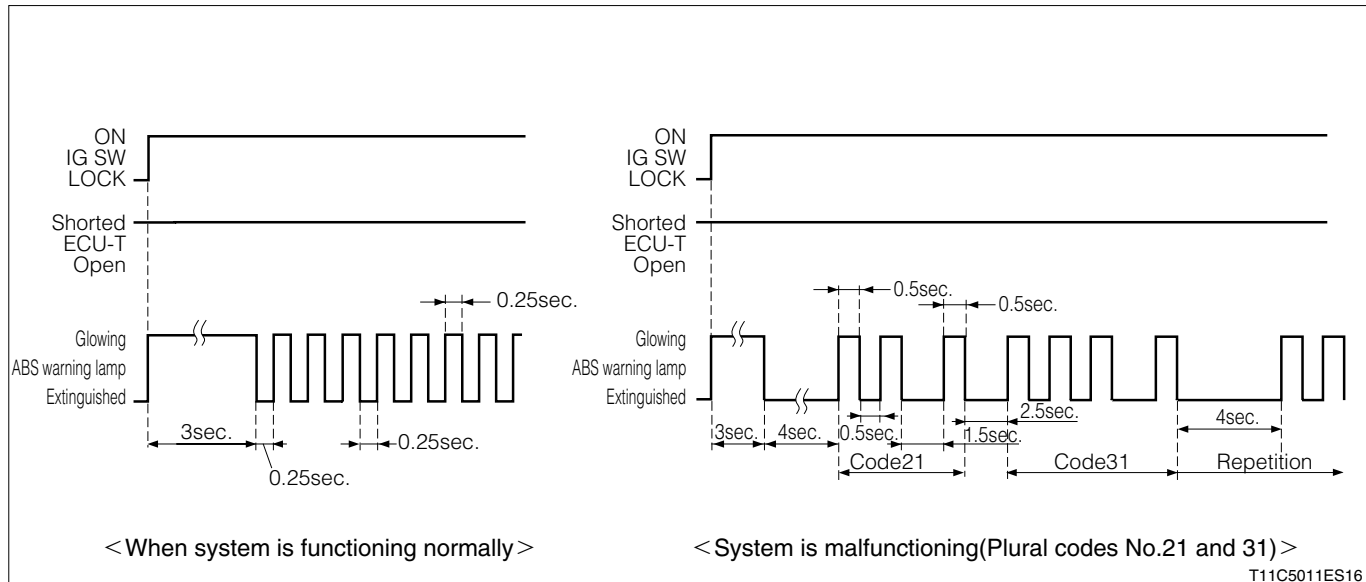
09991-87403-000



3. After setting the IG SW "ON" position, read out the flashing number of the ABS warning lamp.
 - (1) When the system is functioning normally, the flashing interval is 0.25 second.
 - (2) If there is one malfunction code, after a pause of four seconds, the same code will be outputted.
 - (3) If plural codes are outputted, the respective codes will be outputted at an interval of 2.5 seconds. After all the codes have been outputted, there will be another 4 second pause before the output of the codes starts over again.

NOTE

- When the DLC is short-circuited, the warning lamps other than that for ABS will flash. However, this does not represent a malfunction of the system.
- When plural codes are outputted, they will appear in the order of the code number, starting from the smaller one.



4-9-2 CANCELING METHOD OF DIAGNOSIS

NOTE

- When the section for which codes are outputted has been repaired, erase the abnormality code memorized in the ECU by the following method given below.
- When the memory is erased, the test mode function (See the next item) will automatically start, and the ABS warning lamp will flash. In this case, perform the test mode function and check that each sensor has no abnormality.
- If the abnormal code can not be erased, again carry out the check and repair for the abnormal code generating point.

(1) Erasure by stop lamp SW

1. Stop the vehicle.
2. With the IG SW set to "LOCK", short-circuit the ECU-T terminal and E terminal of the DLC located below the instrument panel.
Refer to Page A1-23.

CAUTION

- Be sure to employ the specified SST for short-circuiting the DLC.
- If the short-circuit of the DLC is made for wrong positions, it may cause a malfunction. Be very careful not to select wrong terminals.

SST: 09991-87404-000
09991-87403-000

3. After setting the IG SW to "ON", within 0.5 second to three seconds, start depressing the brake pedal. Within five seconds from this point, repeat "ON" and "OFF" of the stop lamp switch more than eight times.

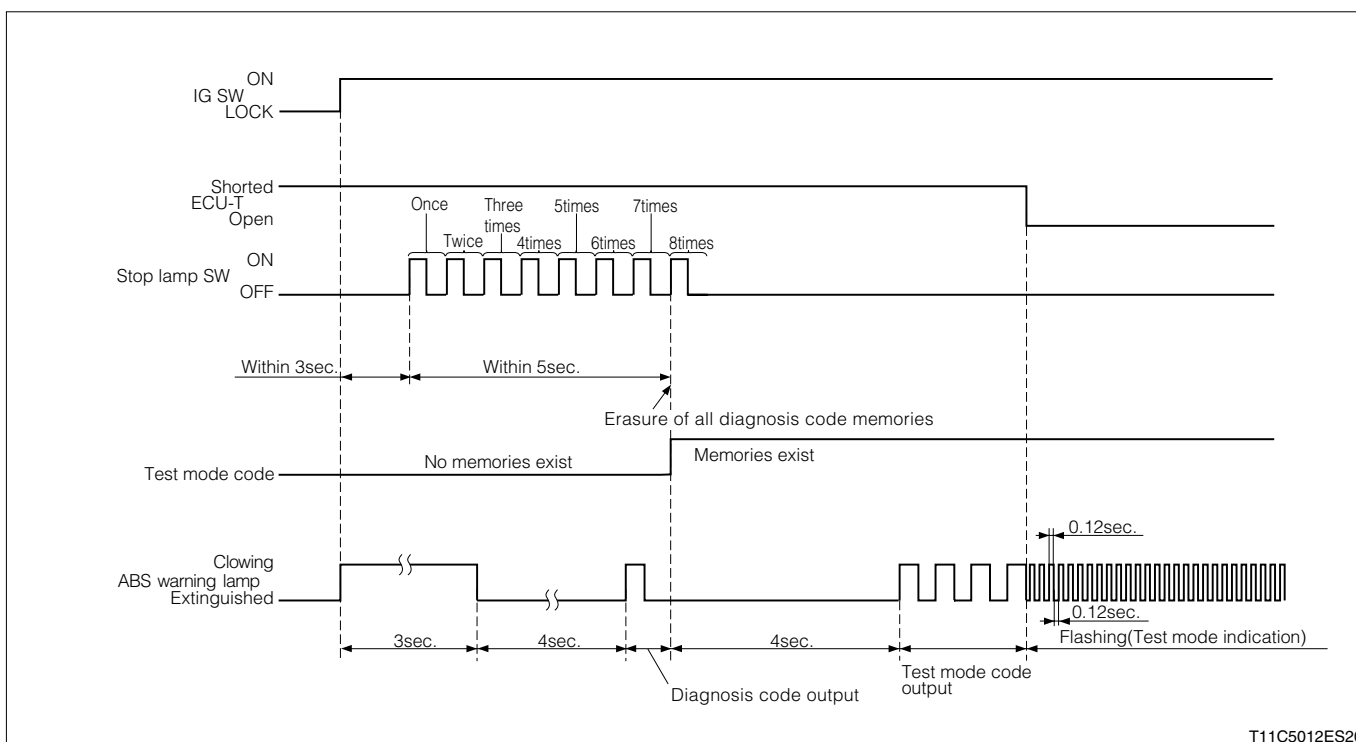
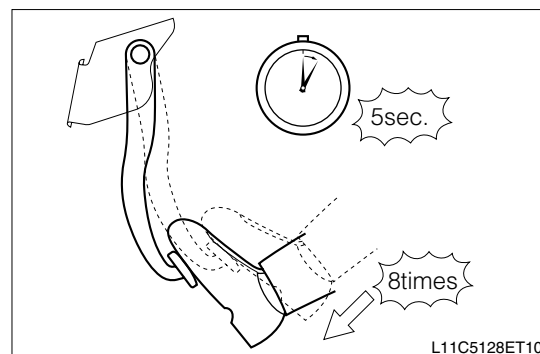
NOTE

- If the malfunction still persists after the abnormal code has been erased, again record the abnormal code. After being extinguished four seconds, the ABS warning lamp outputs the diagnosis code and test mode code.
- If there is no malfunction, the test mode code only is outputted.
- If the diagnosis code cannot be erased, set the IG SW "LOCK" position. Then, perform the operation above again.

4. Open the ECU-T terminal and E terminal.

NOTE

- If there is no malfunction when the ECU-T terminal and the E terminal are opened, the ABS warning lamp flashes (Test mode indication). At this point, release the short-circuiting. With the IG SW "LOCK" position again, run the vehicle to check the function of each sensor.



T11C5012ES20

E3-19

4-9-3 CONTENTS OF DIAGNOSIS

Contents of diagnosis

Code No.		Warning indication (Provided: ○,Not-provided:×)		Code memory (Provided: ○,Not-provided:×)	Contents of diagnosis	
Two digit	Four digit	ABS	Brake		System diagnosed	Diagnosis items
11	C0278	○	○	○	Solenoid relay	Open/short
15	C1241	○	×/○※ ¹	○	Power supply	Voltage dropping/rise
21	C0200	○	×※ ²	○	Wheel speed sensor front right	Open/short
22	C0205	○	×※ ²	○	Wheel speed sensor front left	Open/short
23	C0210	○	×※ ²	○	Wheel speed sensor rear right	Open/short
24	C0215	○	×※ ²	○	Wheel speed sensor rear left	Open/short
25	C1235	○	×※ ²	○	Wheel speed sensor front right	Abnormal intervals
26	C1236	○	×※ ²	○	Wheel speed sensor front left	Abnormal intervals
27	C1238	○	×※ ²	○	Wheel speed sensor rear right	Abnormal intervals
28	C1239	○	×※ ²	○	Wheel speed sensor rear left	Abnormal intervals
29	C1237	○	×※ ²	○	Rotor	Missing teeth
51	C1251	○	×	○	Motor pump	Abnormality of non-rotation
52	C0226	○	○	○	Holding or front/right pressure-reducing solenoid	Abnormal
54	C0236	○	○	○	Holding or front/left pressure-reducing solenoid	Abnormal
56	C0246	○	○	○	Holding or rear/right pressure-reducing solenoid	Abnormal
58	C0256	○	○	○	Holding or rear/left pressure-reducing solenoid	Abnormal
77	C1300	○	○	○	ABS ECU	ECU internal abnormality

※¹:When the voltage rises: "○", When the voltage drops:"×

※²:When failure occurred on two or more wheels: "○"

4-10 SENSOR CHECK FUNCTION (TEST MODE)

1. The test mode is executed, immediately after any abnormal code has been erased through the brake pedal operation or at the time when the IG SW is turned "ON" for the first time after a new ABS actuator has been installed. Then, the test mode checks the following items to detect any abnormal output of each sensor, the rotor deformation or missing tooth, etc.

(1) Output voltage of wheel speed sensor

(2) Output interval of wheel speed sensor

During the test mode, the ABS warning lamp flashes. When the check of each sensor completes normally, the lamp is extinguished.

4-10-1 OUTPUT OF TEST MODE CODE

1. The indicating method of the test mode code output is the same as that of the diagnosis code output.

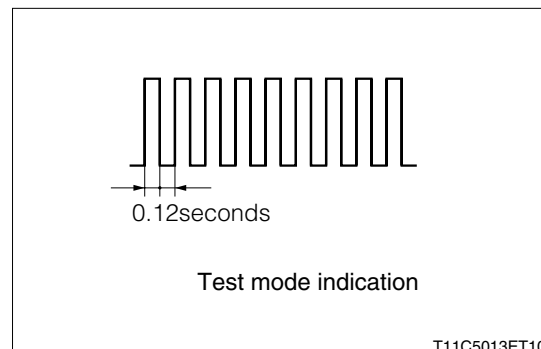
Refer to Page E3-16.

4-10-2 HOW TO ERASE TEST MODE CODE

1. When the test mode starts, all the test mode codes are automatically memorized.
2. Turn "ON" the IG SW with the DLC ECU-T terminal and E terminal released. Ensure that the ABS warning lamp flashes in the test mode indication.

CAUTION

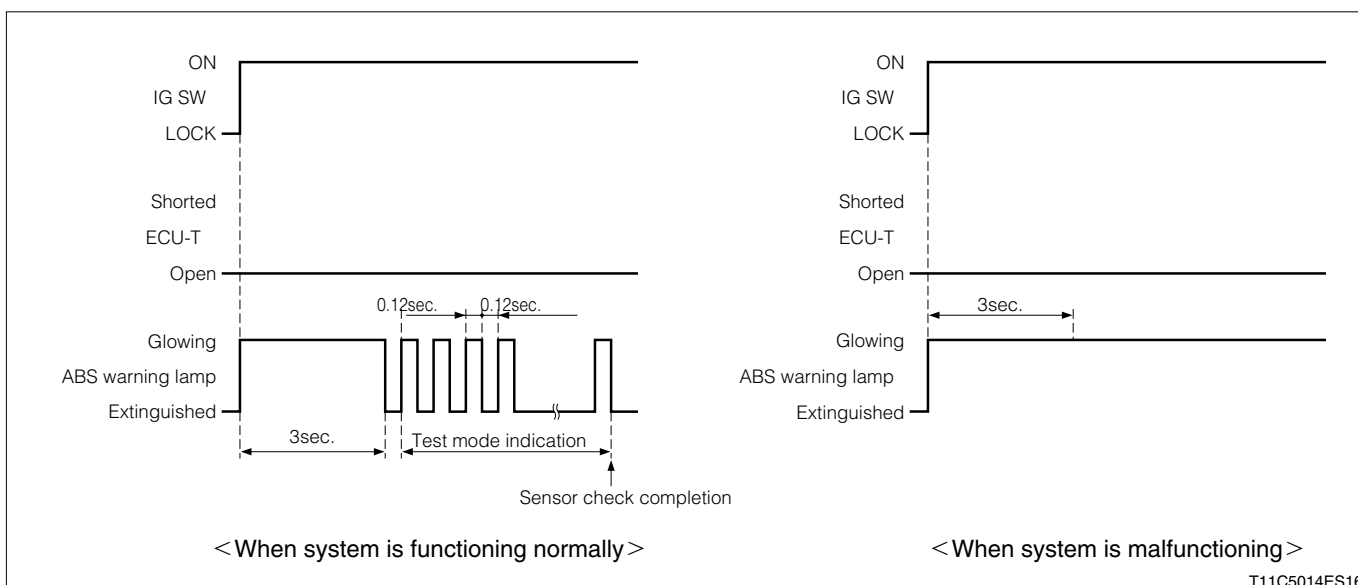
- If the ABS warning lamp remains illuminated, the system may be malfunctioning. Therefore, confirm the diagnosis code.



3. Run the vehicle straight at a speed of 40 km/h or more.
4. Stop the vehicle.

NOTE

- If the test finishes successfully for all the check items, the test mode code will be automatically erased and the ABS warning lamp will go out.
- If the vehicle has not been run or the test mode check conditions have not been satisfied, the memorized test mode code will not be erased. The ABS warning lamp will keep flashing (Test mode indication).



E3-21

4-10-3 CONTENTS OF DIAGNOSIS

Test mode code table

Check system	Code No.		Check items	Releasing conditions
	Two digit	Four digit		
Wheel speed sensor Output voltage	81	C1271	The right front wheel speed sensor is malfunctioning electrically.	Run the vehicle straight at a speed of 4 km/h to 7 km/h.
	82	C1272	The left front wheel speed sensor is malfunctioning electrically.	
	83	C1273	The right rear wheel speed sensor is malfunctioning electrically.	
	84	C1274	The left rear wheel speed sensor is malfunctioning electrically.	
Wheel speed sensor Output interval	85	C1275	Right front wheel speed sensor interval faulty	Run the vehicle straight at least five seconds at a vehicle speed of 10 km/h to 40 km/h. Or run the vehicle straight up to 40 km/h or more.
	86	C1276	Left front wheel speed sensor interval faulty	
	87	C1277	Right rear wheel speed sensor interval faulty	
	88	C1278	Left rear wheel speed sensor interval faulty	

4-11 BASIC CHECK

4-11-1 ABS ECU

(1) Circuit check

- During the system check, carry out the ABS ECU circuit check, following the procedure given below.
If faulty, repair the circuit or connector concerned. If the check results are normal, replace the ABS actuator.

CAUTION

- When you apply a tester to the ABS ECU connector or short-circuit to the body earth, use the SST to reduce the possibility of damage to the terminals.

SST: 09991-87403-000

(2) Visual check of connector section and check of contact pressure

- After setting the IG SW "LOCK" position, remove the negative (—) terminal of the battery.
- Check the connector of the ABS actuator.

(3) Earth circuit check

- After setting the IG SW "LOCK" position, remove the negative (—) terminal of the battery.
- Disconnect the connector of the ABS actuator. Check that there is continuity between the following harness side connector terminal and the body earth.

(1) Harness side connector 14 (GND)—Body earth

SPECIFIED VALUE: Continuity exists.

(4) Power supply circuit check

- Disconnect the connector of the ABS actuator. Measure the voltage between the following harness side connector terminal and the body earth.

(1) Harness side connector 13 (+BS)—Body earth

(2) Harness side connector 26 (+BM)—Body earth

(3) Harness side connector 20 (+IG) terminal —Body earth (To be measured with IG SW "ON")

SPECIFIED VALUE: Battery voltage

4-11-2 MEASUREMENT OF BATTERY VOLTAGE

1. Measure the battery voltage with the engine stopped.

SPECIFIED VALUE: 10 — 14V (When engine is stopped)

4-11-3 CHECK OF BRAKE FLUID

Refer to Page E1-3.

4-11-4 BRAKE WORKING CONDITION CHECK

Refer to Page E1-1.

4-11-5 CHECK OF WARNING LAMP

1. Set the IG SW "ON" position. Ensure that the ABS warning lamp and brake warning lamp illuminate for about three seconds and, then, they go out.

NOTE

- Conduct the brake warning lamp check with the parking brake released.

4-12 TROUBLE SHOOTING ACCORDING TO DIAGNOSIS CODE**4-12-1 NO.11 (SOLENOID RELAY SYSTEM)****(1) Diagnostic code output conditions**

1. When the solenoid relay remains in the "OFF" state, although the ECU turns "ON" the solenoid relay.
2. When the solenoid relay remains in the "ON" state, although the ECU turns "OFF" the solenoid relay.

NOTE

- The ABS ECU monitors the solenoid relay circuit at all times.

(2) Checking points

1. Is the ABS 2 fusible link normal?
2. Is the harness between the ABS 2 fusible link and ABS actuator normal?
3. Are all connected connectors normal?

(3) Checking method**▷1. Check of ABS2 fusible link**

SPECIFIED VALUE: Not fused.

▼ If it is OK, go to ▷2.

▼ If it is NG, go to ▷3.

▷2. Check of continuity between the ABS2 fusible link and ABS actuator

1. After setting the IG SW "LOCK" position, remove the negative (—) terminal of the battery.
2. Separate the connectors of the ABS2 fusible link and ABS actuator. Check the harness.
 - (1) Terminal between the ABS2 fusible link connector downstream side and the ABS actuator harness side connector 13 (+BS)
 - (2) Between the ABS actuator harness side connector 14 (GND) and the body earth

SPECIFIED VALUE: Continuity exists.

▼ If OK, replace the ABS actuator.

Refer to Page E3-1.

▼ If NG, repair the harness and connectors between the ABS actuator and the ABS2 fusible link.

▷3. Check continuity between the ABS2 fusible link and the ABS actuator.

1. After setting the IG SW "LOCK" position, remove the negative (—) terminal of the battery.
2. Separate the connectors of the ABS2 fusible link and ABS actuator. Check the harness.

(1) Between the ABS2 fusible link connector downstream side and the body earth

SPECIFIED VALUE: No continuity exists.

▼ If it is OK, go to ▷4.

▼ If NG, repair the harness and connectors between the ABS actuator and the ABS2 fusible link.

▷4. Check the ABS2 fusible link for operating conditions.

1. After the ABS2 fusible link has been replaced, install the connector and negative (—) terminal of the battery. Turn "ON" the IG SW.

SPECIFIED VALUE: The fusible link should not burn out.

▼ If OK, observe for a while.

▼ If NG, replace the ABS actuator.

Refer to Page E3-1.

4-12-2 NO.15 (ABS ECU POWER SUPPLY SYSTEM)

(1) Diagnostic code output conditions

1. When the power supply voltage of the ABS ECU is below 9.7V,
2. When the power supply voltage of the ABS ECU exceeds 18.0 V,

NOTE

- The ABS ECU monitors the power supply voltage.

(2) Checking points

1. Is the alternator normal?
2. Is the battery normal?
3. Is the ABS 2 fusible link normal?
4. Are the harness and connector between the battery and ABS actuator normal?

(3) Checking method

▷1. Check of the voltage between the ABS2 fuse and the ABS actuator

1. After the IG SW has been set to "LOCK" position, disconnect the connector from the ABS actuator.
2. After turning "ON" the IG SW, measure the voltage between the terminals given below.

(1) Between the ABS actuator harness side connector 13 (+BS) terminal and the 14 (GND) terminal

SPECIFIED VALUE: 10.0V — 16.0V

▼ If OK, observe for a while.

▼ If it is NG, go to ▷2.

▷2. Continuity check between the ABS2 fuse and the ABS actuator

1. After setting the IG SW "LOCK" position, measure the resistance between the following terminals given below.

- (1) Between the ABS actuator harness side connector 13 (+BS) terminal and the ABS2 fuse downstream side terminal

SPECIFIED VALUE: Continuity exists.

▼ If it is OK, go to ▷3.

▼ If NG, carry out the following operations.

- (1) Check the harness between the ABS2 fuse and the ABS actuator.
- (2) Repair or replace the harness and connector

▷3. Check continuity between the ABS actuator and the earth.

1. After the IG SW has been set to "LOCK" position, disconnect the connector from the ABS actuator.
2. Measure the resistance between the following terminals.

- (1) Between the ABS actuator harness side connector 14 (GND) and the body earth

SPECIFIED VALUE: Continuity exists.

▼ If OK, check and repair the battery or the alternator.

▼ If NG, carry out the following operations.

- (1) Repair of harness and connector
- (2) Check of body earth section

4-12-3 NO.21 THROUGH NO.29 (WHEEL SPEED SENSOR, ROTOR SYSTEM)

(1) Diagnostic code output conditions

① No.21, No.22, No.23, No.24: Wheel speed sensor system open wire / short

1. When open wire or short is detected in the wheel speed sensor system or improper connection of the connector is detected:

② No.25, No.26, No.27, No.28: Wheel speed sensor interval abnormal

1. When no wheel speed sensor signal is inputted during running:
2. When signal is missing during running:
3. When noises are mixed in the signal during running:
4. When ABS control and EBD control are judged as abnormal:

NOTE

- When this code is outputted, check not only the circuits, but also the installing conditions, etc. of the wheel speed sensor and rotor.

③ No.29: Rotor teeth missing

1. When the signals are missing periodically according to the tire rotation.

(2) Checking points

① No.21, No.22, No.23, No.24: Wheel speed sensor system open wire / short

1. Are the harness and connector between the wheel speed sensor and ABS actuator normal?
2. Is the sensor resistance in the range of $0.9\text{k}\Omega - 2\text{k}\Omega$?

② No.25, No.26, No.27, No.28, No.29: Wheel speed sensor interval abnormal

1. Are the wheel speed sensor and the rotor installing conditions normal? (Are there any factors causing an unstable output of the wheel speed sensor?)

③ No.29: Rotor teeth missing

1. Does the rotor exhibit any teeth missing, deformation or excessive play?

(3) Checking method

E3-25

▷1. Unit check of wheel speed sensor

1. Carry out the unit check of the wheel speed sensor.

DIAGNOSIS CODES	Applicable item of check
No.21, No25	Right front wheel speed sensor
No.22, No26	Left front wheel speed sensor
No.23, No27	Right rear wheel speed sensor
No.24, No28	Left rear wheel speed sensor

▼ If it is OK, go to ▷2.

▼ If NG, carry out the following checks.

- (1) Check of the wheel speed sensor installing conditions
- (2) Adjustment, repair or replacement of the wheel speed sensor and wheel speed sensor rotor
- (3) Check the axle bearing for excessive play

▷2. Continuity check between the wheel speed sensor and the ABS actuator

1. Separate the connectors of the affected wheel speed sensor and ABS actuator. Check the harness.

Check contents according to diagnosis codes

No.21, No25	Between the front wheel speed sensor harness side connector 1 (+) terminal and the ABS actuator harness side connector 8 (FR+) terminal
	Between the front wheel speed sensor harness side connector 2 (−) terminal and the ABS actuator harness side connector 9 (FR−) terminal
No.22, No26	Between the front wheel speed sensor harness side connector 1(+) terminal and the ABS actuator harness side connector 6(FL+) terminal
	Between the front wheel speed sensor harness side connector 2 (−) terminal and the ABS actuator harness side connector 5 (FL−) terminal
No.23, No27	Between the rear wheel speed sensor harness side connector 1 (−) terminal and the ABS actuator harness side connector 3 (RR−) terminal
	Between the rear wheel speed sensor harness side connector 2 (+) terminal and the ABS actuator harness side connector 2 (RR+) terminal
No.24, No28	Between the rear wheel speed sensor harness side connector 1 (−) terminal and the ABS actuator harness side connector 11 (RL−) terminal
	Between the rear wheel speed sensor harness side connector 2 (+) terminal and the ABS actuator harness side connector 12 (RL+) terminal

SPECIFIED VALUE: Continuity exists.

▼ If it is OK, go to ▷3.

▼ If NG, repair the harness and connectors between the wheel speed sensor and the ABS actuator.

▷3. Check the harness between the wheel speed sensor and the ABS actuator.

1. Visually check the wheel speed sensor concerned and the harness between the wheel speed sensor and the ABS actuator. Check to see if each harness is damaged or the connector has poor contact.

▼ If it is OK, go to ▷4.

▼ If NG, repair the harness and connectors between the wheel speed sensor and the ABS actuator.

▷4. Check of the wheel speed sensor

1. Check that the installing conditions of the wheel speed sensor or the wheel speed sensor rotor exhibits no abnormality.

▼ If OK, replace the ABS actuator.

Refer to Page E3-1.

▼ If NG, repair the installing condition of the wheel speed sensor and replace the wheel speed sensor rotor.

4-12-4 OUTPUTS NO.31 AND NO.32 (G SENSOR SYSTEM)

(1) Diagnosis code output condition

① No.31: Abnormal G sensor signal

1. When the output from the G sensor remains unchanged.
2. When the output from the G sensor remains inconsistent with the vehicle acceleration.

② No.32: Open wire/short circuit in G sensor system

1. When open wire or short circuit is found in the G sensor system.

(2) Checking points

1. Is the installing condition of the ABS actuator proper? (Is there any factor which makes the G sensor output unstable?)

(3) Checking method

▷1. Checking ABS actuator for installing condition

1. Visually check the following items.
 - (1) Excessive play and deformation of installing section
 - (2) Deformation and damage of bracket

SPECIFIED VALUE: No abnormality

▼ If OK, replace the ABS actuator.

Refer to Page E3-1.

▼ In case of NG, repair the installing section.

4-12-5 NO.51 (MOTOR PUMP SYSTEM)

(1) Diagnostic code output conditions

1. When the motor pump is not operating

(2) Checking points

1. Is the ABS 1 fusible link normal?
2. Is the harness between the ABS 1 fusible link and ABS actuator normal?

(3) Checking method

▷1. Check of ABS1fusible link

SPECIFIED VALUE: Not burnt out

▼ If it is OK, go to ▷2.

▼ If it is NG, go to ▷3.

▷2. Continuity check between the ABS1 fusible link and the ABS actuator

1. After setting the IG SW "LOCK" position, remove the negative (—) terminal of the battery.
 2. Separate the connectors of the ABS1 fusible link and ABS actuator. Check the harness.
 - (1) Between the ABS1 fusible link connector downstream side and the ABS actuator harness side connector 26 (+BM) terminal.
- SPECIFIED VALUE: Continuity exists.

▼ If OK, replace the ABS actuator.

Refer to Page E3-1.

▼ If NG, repair the harness and connectors between the ABS1 fusible link and the ABS actuator.

▷3. Continuity check between the ABS1 fusible link and the ABS actuator

1. After setting the IG SW "LOCK" position, remove the negative (—) terminal of the battery.
 2. Separate the connectors of the ABS1 fusible link and ABS actuator. Check the harness.
 - (1) Between the ABS1 fusible link connector downstream side and the body earth
- SPECIFIED VALUE: No continuity exists.

▼ If it is OK, go to ▷4.

▼ If NG, repair the harness and connectors between the ABS1 fusible link and the ABS actuator.

▷4. Check of the ABS1 fusible link for operating conditions

SPECIFIED VALUE: The fusible link should not burn out.

▼ If OK, observe for a while.

▼ If NG, replace the ABS actuator.

Refer to Page E3-1.

4-12-6 NO.52, NO.54, NO.56, NO.58 (SOLENOID SYSTEM)

(1) Repairing method

1. Replace the ABS actuator.
- Refer to Page E3-1.

4-12-7 NO.77 (ABS ECU SYSTEM)

(1) Repairing method

1. Replace the ABS actuator.
- Refer to Page E3-1.

4-13 TROUBLE SHOOTING ACCORDING TO MALFUNCTION PHENOMENA

4-13-1 THE ABS WARNING LAMP REMAINS ILLUMINATED BY TURNING "ON" IG SW.

(1) Checking points

1. Has the diagnosis function detected any abnormal sections?
2. Is the connector of the ABS actuator normally connected?
3. Is the CAN communication operating normally?

(2) Checking method

▷1. Confirmation of diagnosis codes

1. Perform the diagnosis code output indication by the ABS warning lamp.

Refer to Page L2-9.

2. After turning "ON" the IG SW, check the lightening state of the ABS warning lamp.

SPECIFIED VALUE: Output the abnormal codes.

▼ If OK, perform the trouble-shooting according to the diagnosis code table.

Refer to Page L2-9.

▼ If it is NG, go to ▷2.

▷2. Check of connector fitting state

1. After setting the IG SW "LOCK"

2. After turning "ON" the IG SW, check the lightening state of the ABS warning lamp.

SPECIFIED VALUE: abnormal codes are outputted.

▼ If OK, perform the trouble-shooting according to the diagnosis code table.

Refer to Page L2-9.

▼ If it is NG, go to ▷3.

▷3. Confirmation of diagnosis codes

SPECIFIED VALUE: The normal code is indicated.

▼ If OK, observe for a while. (Normal code indication)

▼ If it is NG, go to ▷4.

▷4. Check of ECU IG1 fuse

SPECIFIED VALUE: Not burnt out

▼ If it is OK, go to ▷5.

▼ If NG, replace the ECU IG1 fuse and check the ECU IG1 fuse system.

➤5. Check the CAN communication continuity between the ABS actuation and the combination meter.

1. After setting the IG SW "LOCK", remove the negative (—) terminal of the battery. Stop the short-circuiting the DLC.
2. Disconnect the connector of the ABS actuator. Check continuity between the ABS actuator harness side connector CAN communication (HCAN and LCAN) and the combination meter harness side connector CAN communication (HCAN and LCAN)

Refer to Page L2-9.

SPECIFIED VALUE: Continuity exists.

▼ If OK, perform the trouble-shooting of the CAN communication.

Refer to Page L2-13.

▼ If NG, repair the harness between the ABS actuator and the combination meter.

4-13-2 THE BRAKE WARNING LAMP REMAINS ILLUMINATED BY TURNING "ON" IG SW.

(1) Checking points

1. When the brake warning lamp is illuminated at the same time with the ABS warning lamp, perform the troubleshooting for the case ""The ABS warning lamp is illuminated at all times with the IG SW "ON" position.""

Refer to Page E3-27.

2. If the brake warning lamp only is illuminated at all times, refer to the following.

- (1) Is the parking brake SW "ON" position?
- (2) Is the brake fluid level normal?
- (3) Is the parking brake SW normal?
- (4) Is the brake fluid level SW normal?
- (5) Are the brake fluid level SW and parking brake SW system circuit normal?
- (6) Is there open wire in the brake warning lamp system circuit?
- (7) Is the combination meter normal?

NOTE

- Perform the check with the parking brake released.

(2) Checking method

1. Perform the trouble-shooting of the combination meter.

Refer to Page J3-15.

4-13-3 THE ABS WARNING LAMP DOES NOT GO ON FOR THREE SECONDS AFTER IG SW IS SET TO "ON" POSITION.

(1) Checking points

NOTE

- The ABS warning lamp illuminates about three seconds.

1. Is the combination meter normal?

(2) Checking method

1. Perform the trouble-shooting of the combination meter.

Refer to Page J3-15.

4-13-4 THE BRAKE WARNING LAMP DOES NOT GO TO ON FOR THREE SECONDS AFTER IG SW IS SET TO "ON" POSITION.

(1) Checking points

NOTE

- The brake warning lamp illuminates about three seconds.

1. Is the combination meter normal?

(2) Checking method

1. Perform the trouble-shooting of the combination meter.

Refer to Page J3-15.

4-13-5 BRAKE MALFUNCTIONS (THE BRAKES ON ONE SIDE ONLY WORK; THE BRAKING EFFECT IS INSUFFICIENT; THE ABS OPERATES DURING NORMAL BRAKING; THE PEDAL VIBRATES DURING ABS OPERATION), AND THE ABS WARNING LAMP ILLUMINATES WHILE DRIVING.

(1) Checking points

1. Although it is not easy to evaluate malfunctions as they are observed differently depending upon the running conditions and road conditions, perform the following checking methods when the diagnosis code is the normal code.

(2) Checking method

▷1. Check of ABS warning lamp

1. Perform the diagnosis code output indication.

Refer to Page L2-9.

2. After turning "ON" the IG SW, check the lightening state of the ABS warning lamp.

SPECIFIED VALUE: The normal code is flashing.

▼ If it is OK, go to ▷2.

▼ If NG, perform the trouble-shooting according to the diagnosis code table.

Refer to Page L2-9.

▷2. Check of the installing conditions of each wheel speed sensor

1. Check the installing conditions of each wheel speed sensor.

SPECIFIED VALUE: Ensure that the retaining bolts exhibit no looseness and are installed correctly.

▼ If it is OK, go to ▷3.

▼ If NG, the installation of the wheel speed sensor is improper.

▷3. Continuity check between the terminals of each wheel speed sensor

1. Disconnect the connector of the ABS actuator. Check continuity between the terminals of each harness side sensor.

▼ If it is OK, go to ▷4.

▼ If NG, the wire harness is faulty.

▷4. Check of harness fitting state

1. Check the continuity state while the harness and connector are being moved.

SPECIFIED VALUE: Malfunction exists.

▼ If OK, the wire harness fitting is poor.

▼ If it is NG, go to ▷5.

➤5. Check of the wheel speed sensor system

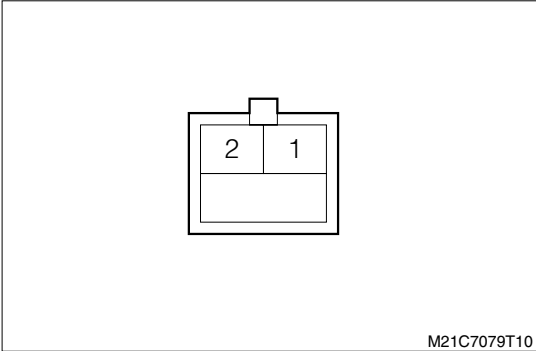
- 1. Check the wheel speed sensor.
 - ▼ If OK, observe for a while.
 - ▼ If NG, the following is true.
 - (1) The wheel speed sensor malfunctioning
 - (2) The wheel speed sensor rotor malfunctioning
 - (3) The wheel speed sensor malfunctioning

4-14 UNIT CHECK

4-14-1 STOP LAMP SWITCH

- 1. Check continuity between the connector terminals of the stop lamp switch.
SPECIFIED VALUE:

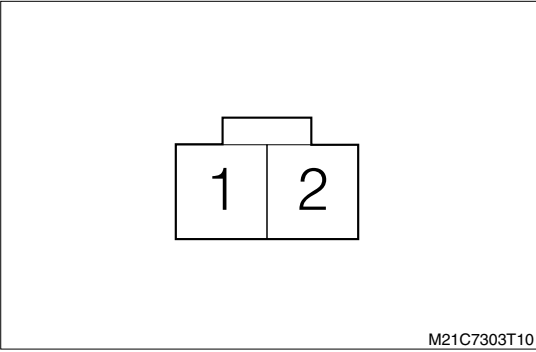
SW conditions	Continuity
When released	Exists
When pushed	Not exists



4-14-2 FRONT WHEEL SPEED SENSOR

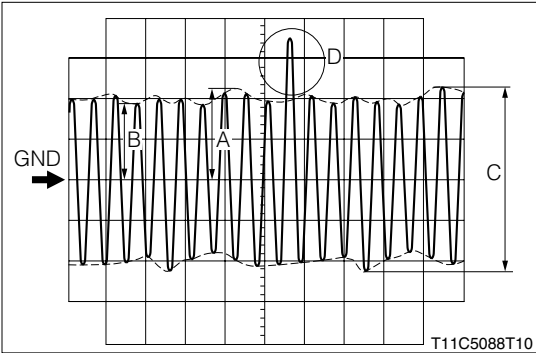
(1) Measurement and visual inspection

- 1. Measure the resistance between the connector terminals.
SPECIFIED VALUE: $1.60 \pm 0.20 \text{ k}\Omega$ (at time of 20°C)
- 2. Check the wheel speed sensor installation condition.
SPECIFIED VALUE: The sensor should not float up from the sensor installation surface.
- 3. Check the tightened condition of the wheel speed sensor installation bolts.
TIGHTENING TORQUE: $8.4 \pm 1.4 \text{ N}\cdot\text{m}$ $\{85 \pm 14 \text{ kgf}\cdot\text{cm}\}$
- 4. Check if debris is stuck to the end of the front wheel sensor.
SPECIFIED VALUE: There should be no foreign matters attached, scratches, chips or deformation.



(2) Inspection using an oscilloscope

- 1. Using an oscilloscope, check the output waveform between the wheel speed sensor connector terminals when running at a speed of 20 km/h or more.
 - (1) Connecting terminals:
1 (FR+)—2 (FR—), 1 (FL+)—2 (FL—)
- SPECIFIED VALUE: When C is 0.5V or more
B is 70% or more of A
D will not occur.



NOTE

- If C is deviated from the requirement, check the wheel speed sensor.
- If B is deviated from the requirement, check the wheel speed sensor rotor.
- If D is generated, check the tip-end of the sensor.

4-14-3 FRONT WHEEL SPEED SENSOR ROTOR

1. Check the wheel speed sensor rotor of the axle hub.
SPECIFIED VALUE: There should be no problems with the rotor, such as scratches, chips, or deformation.

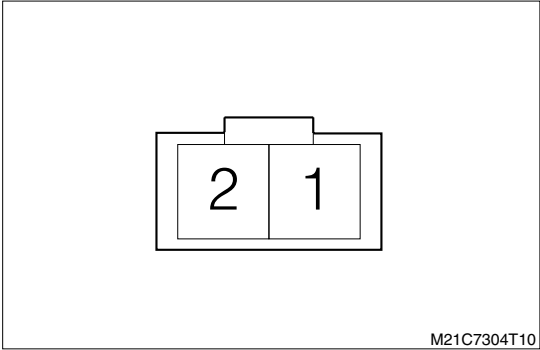
NOTE

- Air gap between wheel speed sensor and sensor rotor: 1.2 ± 0.5 mm (Reference)

4-14-4 REAR WHEEL SPEED SENSOR

(1) Measurement and visual Inspection

1. Measure the resistance between the connector terminals.
SPECIFIED VALUE: $1.11 \pm 0.20k\Omega$ (At time of 20°C)



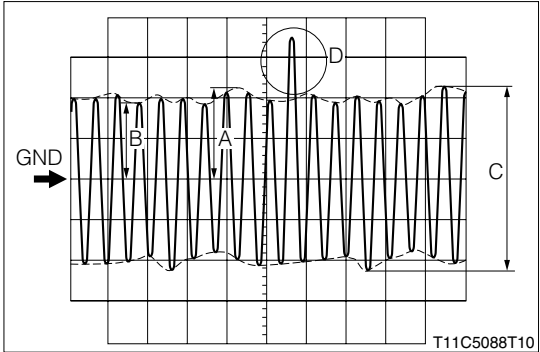
(2) Inspection using an oscilloscope

1. Using an oscilloscope, check the output waveform between the wheel speed sensor connector terminals when running at a speed of 20 km/h or more.

(1) Connecting terminals:

2 (RR+) – 1 (RR–), 2 (RL+) – 1 (RL–)

- SPECIFIED VALUE: When C is 0.5V or more
B is 70% or more of A
D will not occur.



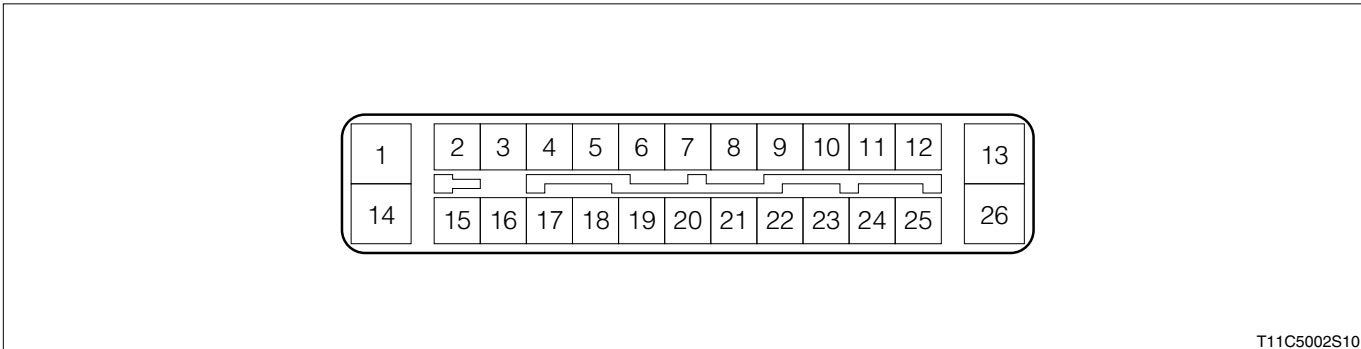
NOTE

- If C, B and D are deviated from the requirements, check the rear axle hub & bearing Ay.

4-15 ECU INPUT/OUTPUT SIGNAL CHECK

1. After setting the IG SW "LOCK", disconnect the connector of the ABS actuator. At the harness side connector, check the voltage, resistance and continuity between each terminal and the body earth.

Harness side connector



ABS ECU input/output characteristic

Check system	Connection				Measuring condition	Specification value
Power supply	20	+IG	—	Body earth	IG SW "ON"	10.0—16.0V
Wheel speed sensor	6	FL+	5	FL—	IG SW "LOCK"	1.1±0.2kΩ
	8	FR+	9	FR—	IG SW "LOCK"	1.1±0.2kΩ
	12	RL+	11	RL—	IG SW "LOCK"	1.2±0.15kΩ
	2	RR+	3	RR—	IG SW "LOCK"	1.2±0.15kΩ
Stop lamp SW	24	STP	—	Body earth	When the brake pedal is depressed	10.0—16.0V
					When the brake pedal is released	0V or less

F1 CLUTCH

CLUTCH SYSTEM -----	F1-1
BASIC CHECK AND ADJUSTMENT ---	F1-1
CLUTCH PEDAL-----	F1-2
REMOVAL AND INSTALLATION(RHD VEHICLES)-----	F1-2
REMOVAL AND INSTALLATION(LHD VEHICLES)-----	F1-5
CLUTCH CABLE-----	F1-8
REMOVAL AND INSTALLATION-----	F1-8
CLUTCH -----	F1-13
REMOVAL AND INSTALLATION-----	F1-13

F1-1

1 CLUTCH SYSTEM

1-1 BASIC CHECK AND ADJUSTMENT

1-1-1 CHECK OF CLUTCH PEDAL HEIGHT

1. Check the height from the dash panel to the center of the pedal at the right side.

SPECIFIED VALUE: Height of clutch pedal
149.9-154.9mm(RHD)
149.1-154.1mm(LHD)

CAUTION

- There is no need of adjusting the pedal height.
- The height cannot be adjusted by means of the bolt at the section ㉠.

1-1-2 ADJUSTMENT OF CLUTCH PEDAL FREE TRAVEL

1. Move the clutch release lever by your left hand and stop it at a position where it comes in contact lightly with the diaphragm spring of the clutch cover.
(The arrow mark in the figure shows the direction in which the release lever is moved.)

2. Pull up the clutch outer cable by your right hand and hold it at a position where there is no slack of the inner cable. Then, release your left hand.

3. Screw in the adjusting screw by your left hand, until it comes in contact with the rotation stopper protrusion of the vibration preventive rubber.

At this time, if the rotation stopper protrusion is not aligned with the groove position of the adjusting screw, perform the alignment by backing off the adjusting screw.

4. Release your hand under a condition where the groove position of the adjusting screw is aligned with the rotation stopper protrusion.

5. Ensure that the free travel of the clutch pedal conforms to the specified value.

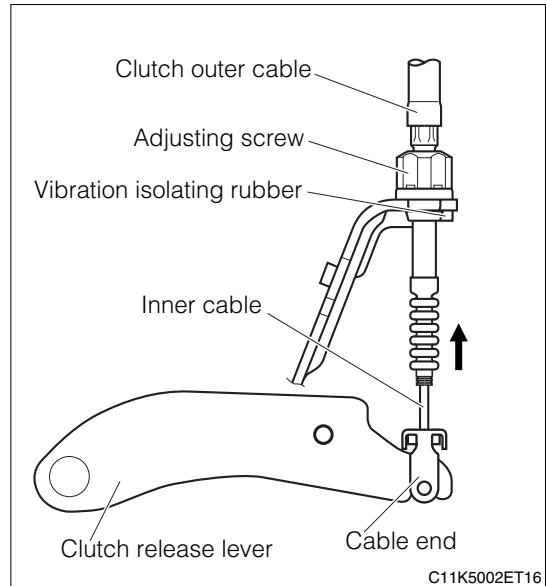
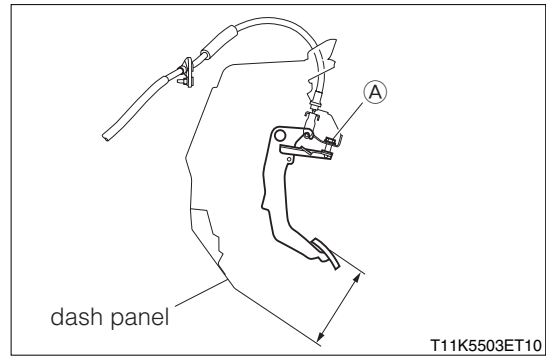
(When carrying out the operations above, the operations to be performed by your right hand can be performed by your left hand and vice versa.)

SPECIFIED VALUE: Free travel of clutch pedal
10 to 25 mm
(Upper surface of pedal pad)

1-1-3 CHECK OF DISTANCE TO THE FLOOR WHEN THE CLUTCH IS DISENGAGED

1. Check and adjust the clutch pedal height.
2. Check and adjust the free travel of the clutch pedal.
3. With the engine idling, pull the parking brake lever fully. Then, move the shift lever to the 1st gear position and slowly release the pedal. Check the distance between the pedal at a moment immediately before the clutch is engaged and the position when the clutch pedal is depressed fully to the floor.

SPECIFIED VALUE: 20 mm or more (Reserve travel)



2 CLUTCH PEDAL

2-1 REMOVAL AND INSTALLATION(RHD VEHICLES)

2-1-1 ARTICLES TO BE PREPARED

Instrument

Torque wrench

Lubricant,adhesive,others

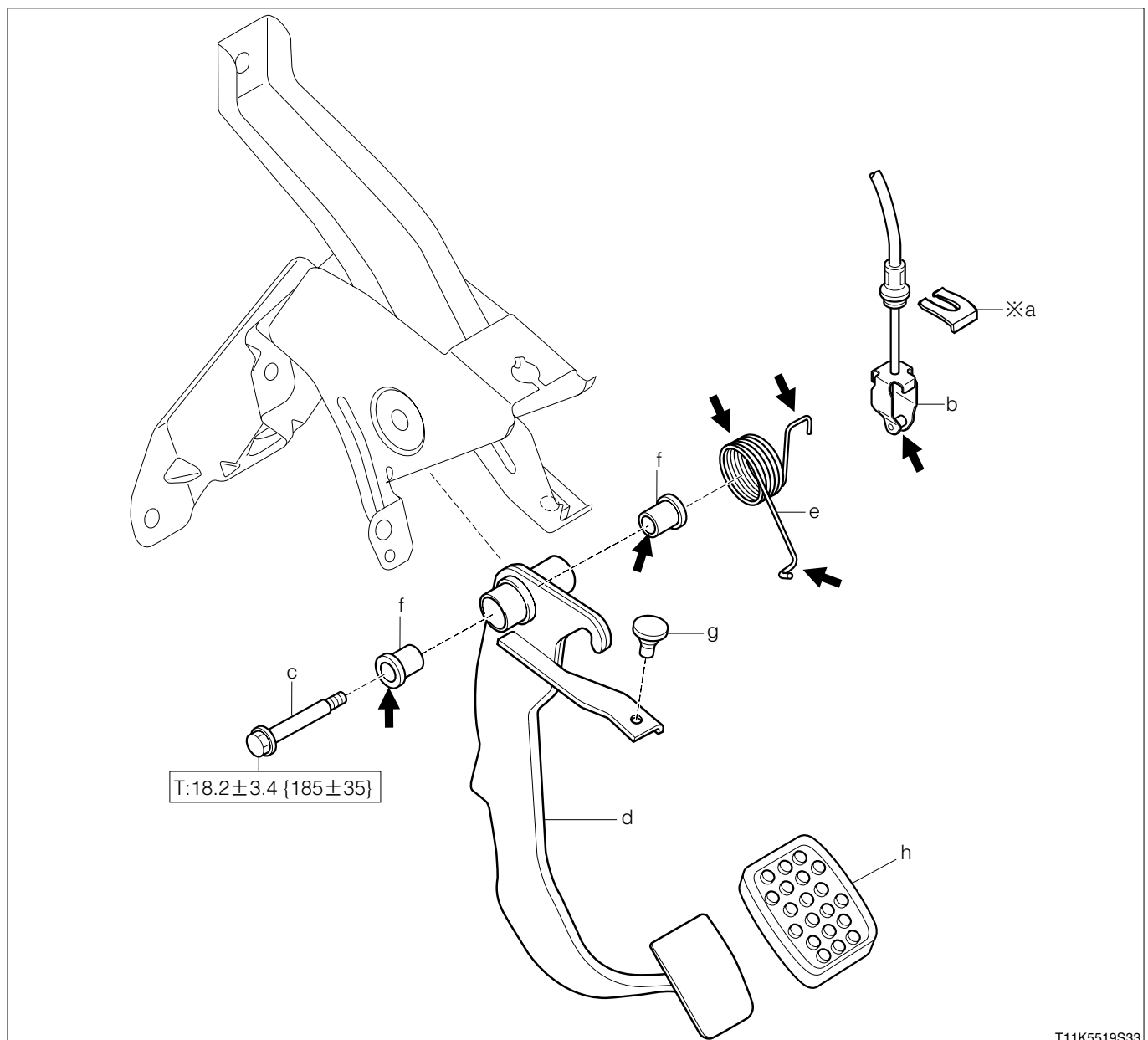
MP grease

2-1-2 OPERATION BEFORE REMOVAL

1. Remove the instrument panel finish lower panel.
Refer to Page I2-13.

2-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



T11K5519S33

➔: MP grease

※:Non - reusable parts

Unit: N·m{kgf·cm}

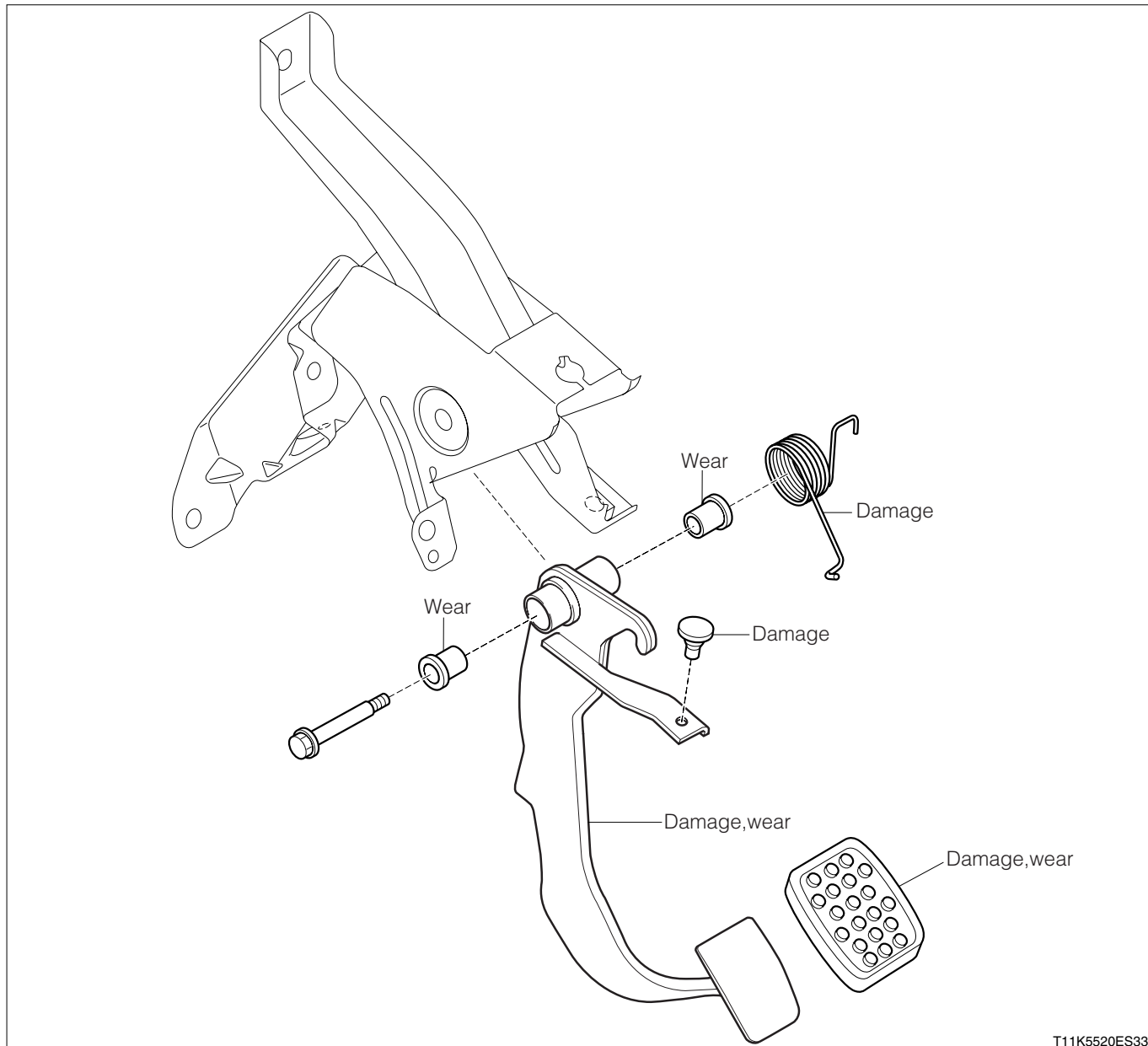
F1-3

(2) Removal and installation procedures

1	a	Clip	6	f	Bush
2	b	Cable Ay, clutch release	▲ 7	g	Cushion
3	c	Shaft, pedal	8	h	Pad, clutch pedal
4	d	Pedal S/A, clutch			
5	e	Spring, torsion			

2-1-4 INSPECTION

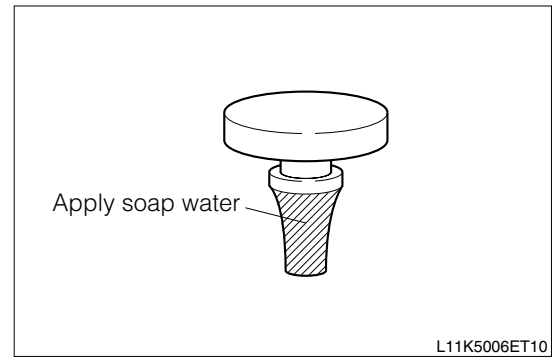
Check each of the following parts. Replace any faulty part.



T11K5520ES33

2-1-5 POINTS OF INSTALLATION**(1) Cushion**

1. Apply soap water to the tip end of the cushion. Then, install it to the clutch pedal subassembly.

**2-1-6 OPERATION AFTER INSTALLATION**

1. Check the clutch pedal height and adjust the free play.
Refer to Page F1-1.
2. Install the instrument panel finish lower panel.
Refer to Page I2-13.

F1-5

2-2 REMOVAL AND INSTALLATION(LHD VEHICLES)

2-2-1 ARTICLES TO BE PREPARED

Instrument

Torque wrench

Lubricant,adhesive,others

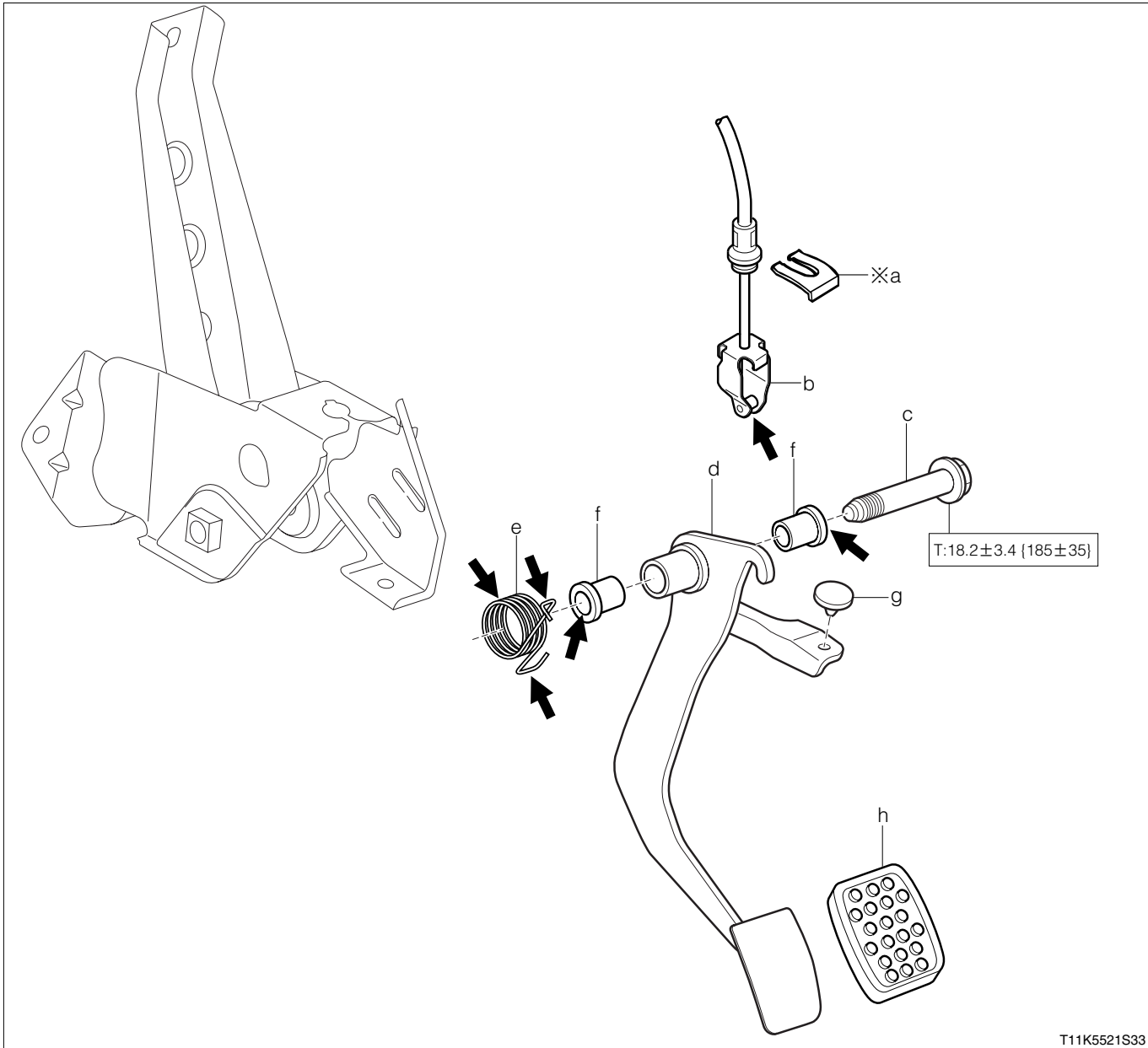
MP grease

2-2-2 OPERATION BEFORE REMOVAL

- 1. Remove the instrument panel finish lower panel.
Refer to Page I2-13.

2-2-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



T11K5521S33

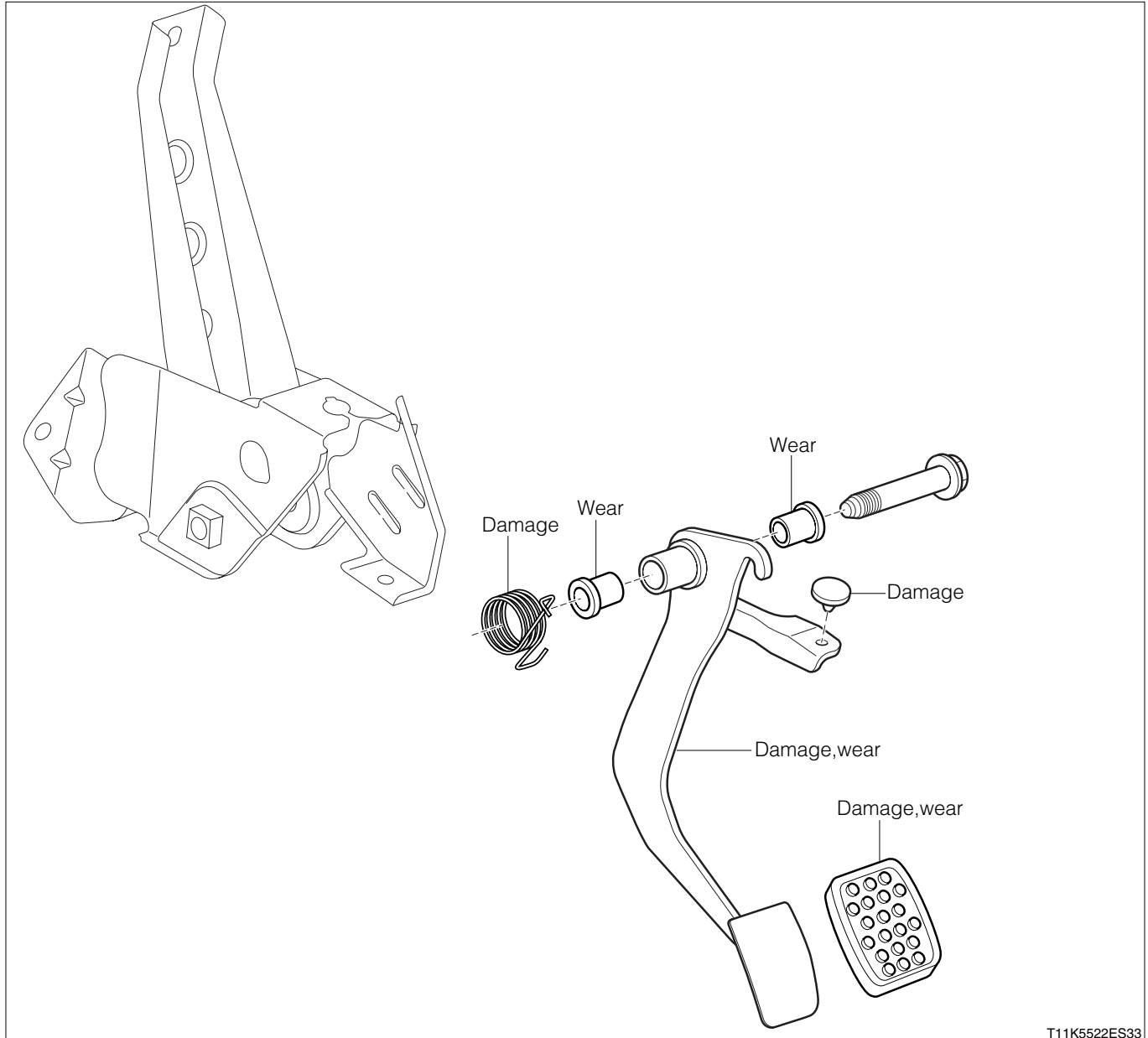
➡: MP grease
X:Non - reusable parts
Unit: N·m{kgf·cm}

(2) Removal and installation procedures

1	a	Clip	6	f	Bush
2	b	Cable Ay, clutch release	▲ 7	g	Cushion
3	c	Shaft, pedal	8	h	Pad, clutch pedal
4	d	Pedal S/A, clutch			
5	e	Spring, torsion			

2-2-4 INSPECTION

Check each of the following parts. Replace any faulty part.

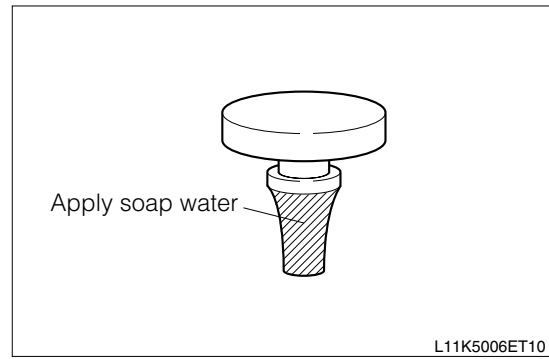


F1-7

2-2-5 POINTS OF INSTALLATION

(1) Cushion

1. Apply soap water to the tip end of the cushion. Then, install it to the clutch pedal subassembly.



2-2-6 OPERATION AFTER INSTALLATION

1. Check the clutch pedal height and adjust the free play.
Refer to Page F1-1.
2. Install the instrument panel finish lower panel.
Refer to Page I2-13.

3 CLUTCH CABLE

3-1 REMOVAL AND INSTALLATION

3-1-1 ARTICLES TO BE PREPARED

Instrument

Torque wrench

Lubricant, adhesive, others

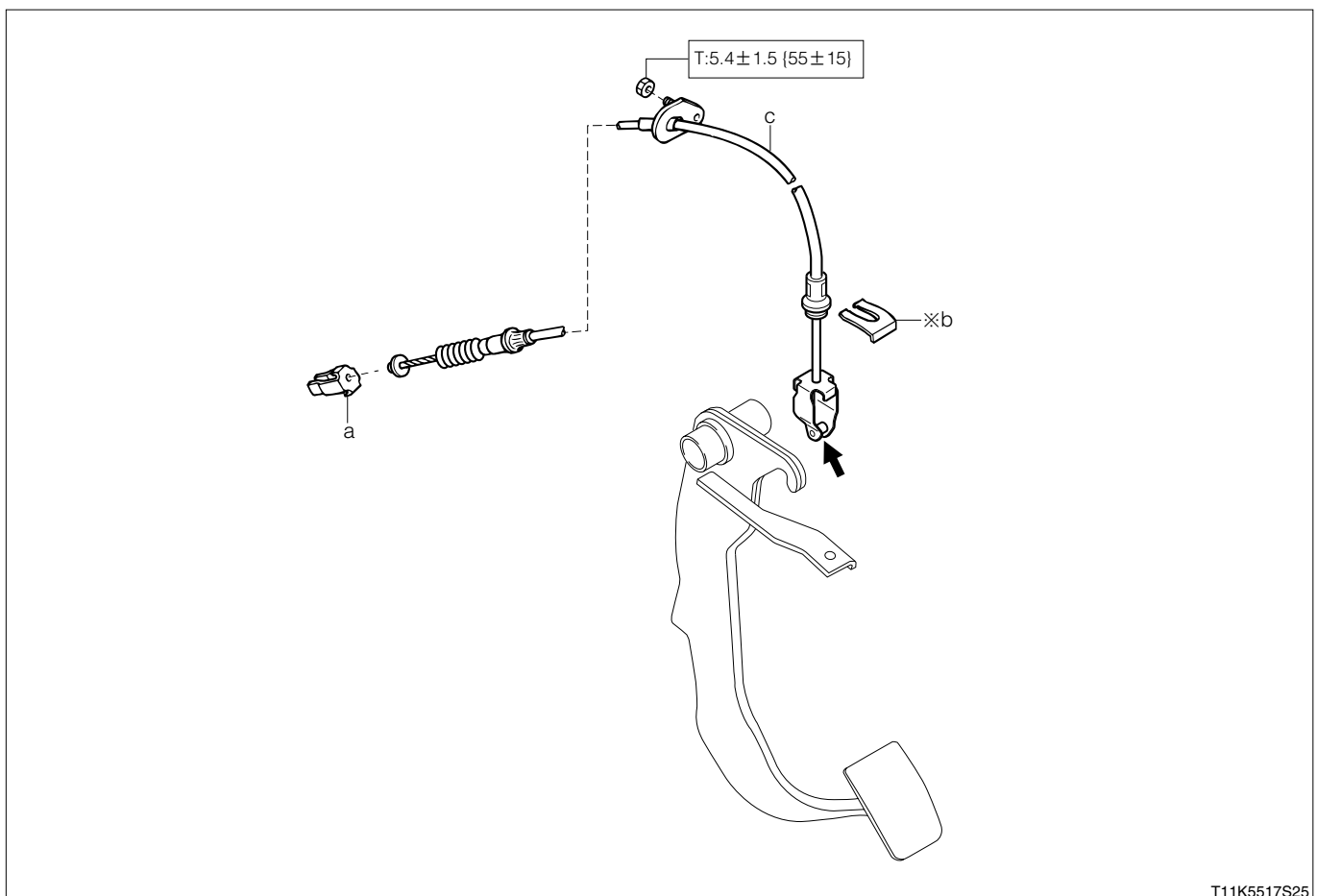
MP grease, Rope

3-1-2 OPERATION BEFORE REMOVAL

1. Remove the instrument panel finish lower panel S/A.
Refer to Page I2-13.

3-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



➡: MP grease

※: Non - reusable parts

Unit: N·m{kgf·cm}

(2) Removal and installation procedures

- ▼ ▲ 1 a Bracket, clutch release cable No.1
- 2 b Clip
- ▼ ▲ 3 c Cable Ay, clutch release

T11K5517S25

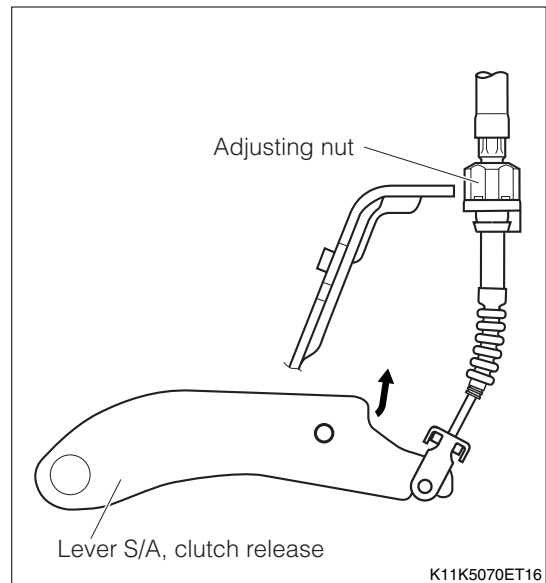
F1-9

3-1-4 POINTS OF REMOVAL

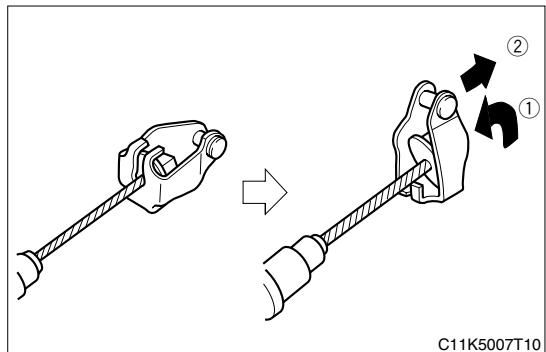
(1) Bracket, clutch cable, No.1

1. Remove the bracket.

- (1) Loosen the adjusting nut of the clutch release cable assembly.
- (2) While pulling up the clutch release lever subassembly by your hand, take out the clutch release cable bracket No.1 from the clutch release lever subassembly.



- (3) Route the cable at the cutout section of the clutch release cable bracket No.1. Then, remove the clutch release cable bracket No.1 by raising it 90 degrees.

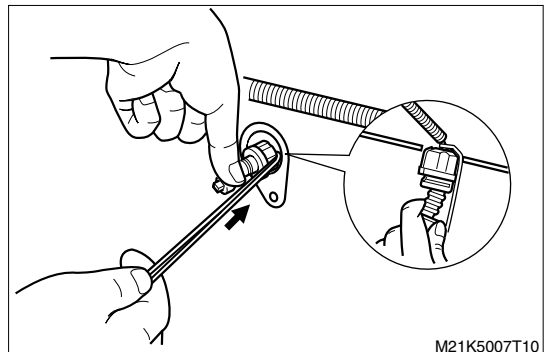


(2) Cable Ay, clutch release

1. Loosen the play adjusting nut of the clutch release cable assembly fully to the position indicated in the figure on the right. Then, while pulling the clutch release cable assembly by the cord, push it into the vehicle interior.

CAUTION

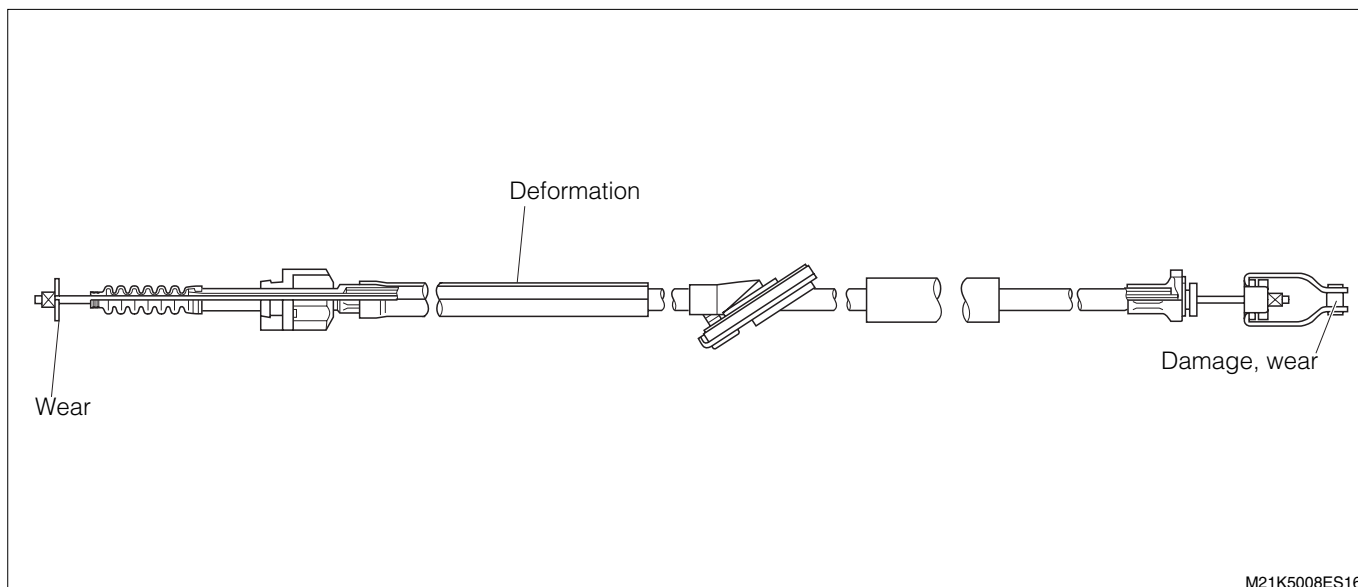
- This cord will be used when the clutch release cable assembly is installed. Hence, leave this cord routed from the engine compartment side to the vehicle interior side.
- Be sure to use a cord of about 2 m in length.
- In the case of LHD vehicles, be careful not to allow the accelerator control cable assembly to be caught by the clutch release cable assembly.



3-1-5 INSPECTION

1. Check the following items. Replace any faulty part.

- (1) Push and pull the inner cable of the clutch release cable assembly. At this time, ensure that there is no abnormal resistance and binding.
- (2) Check each part of the clutch release cable assembly for scores, deformation, wear and cracks.



- (3) Clutch release cable bracket No.1 for damage and wear



F1-11

3-1-6 POINTS OF INSTALLATION

(1) Cable Ay, clutch release

1. Install the cable Ay.

CAUTION

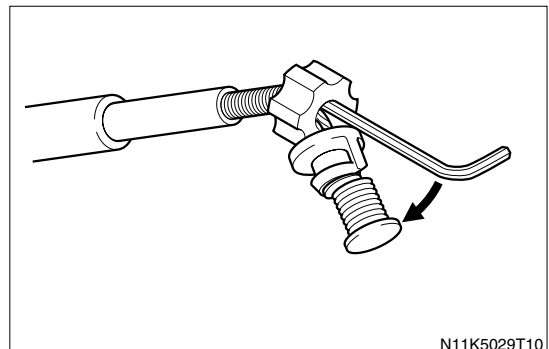
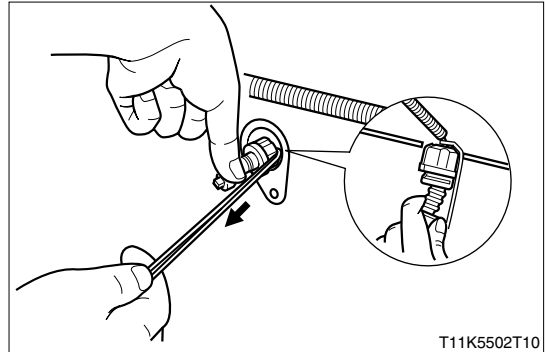
- Utmost care must be exercised so that the inner cable may not be bent.
- (1) Fully loosen the play adjusting nut of the clutch release cable assembly.
 - (2) Apply the cord, that was used at the time of the removal, to the play adjusting nut.
 - (3) Pull the cord from the engine compartment side. Also, push the clutch release cable from the vehicle interior side at the same time, thus pulling out the tip end to the engine compartment side.

CAUTION

- There is the possibility that the inner cable is bent if the cord is pulled strongly. Be very careful not to pull the cord strongly.
 - In the case of LHD vehicles, be careful not to allow the accelerator control cable assembly to be caught by the clutch release cable assembly.
- (4) Set the play adjusting nut of the clutch release cable assembly to the position indicated in the figure on the right. While pulling by means of the cord, pull the play adjusting nut to the engine compartment side.

NOTE

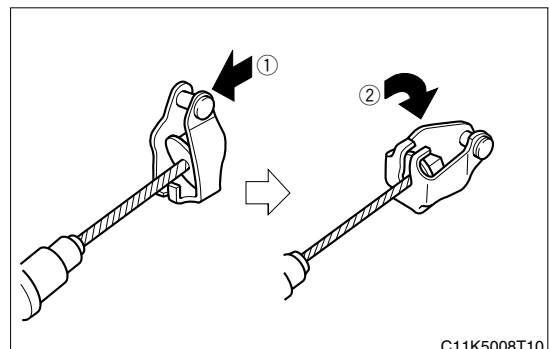
- If any difficulty is encountered in passing the adjusting nut through the dash panel, adjust the angle of the nut by inserting a fine rod into the nut, as indicated in the figure on the right.



(2) Bracket, clutch cable, No.1

1. Install the bracket.

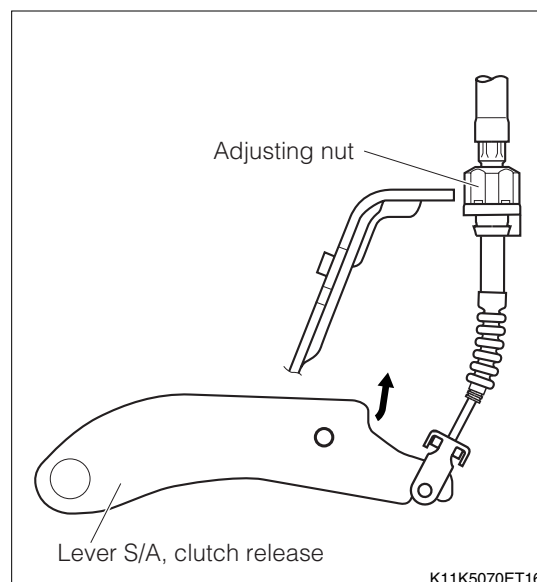
- (1) Connect the cable by routing it at the cutout section of the clutch release cable bracket No.1. Then, tilt the cable 90 degrees.



- (2) Lightly pull the clutch release lever S/A by hand, until it is brought into contact with the clutch cover. Then, apply the bracket to the clutch release lever S/A.
- (3) Tighten the adjusting nut to adjust the play.
Refer to Page F1-1.

CAUTION

- Be very careful not to damage the grommet section.

**3-1-7 OPERATION AFTER INSTALLATION**

1. Install the instrument panel finish lower panel S/A.
Refer to Page I2-13.

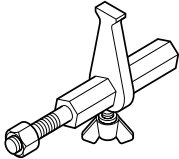
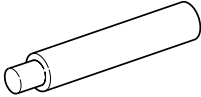
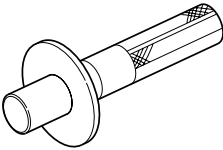
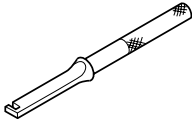
F1-13

4 CLUTCH

4-1 REMOVAL AND INSTALLATION

4-1-1 ARTICLES TO BE PREPARED

SST

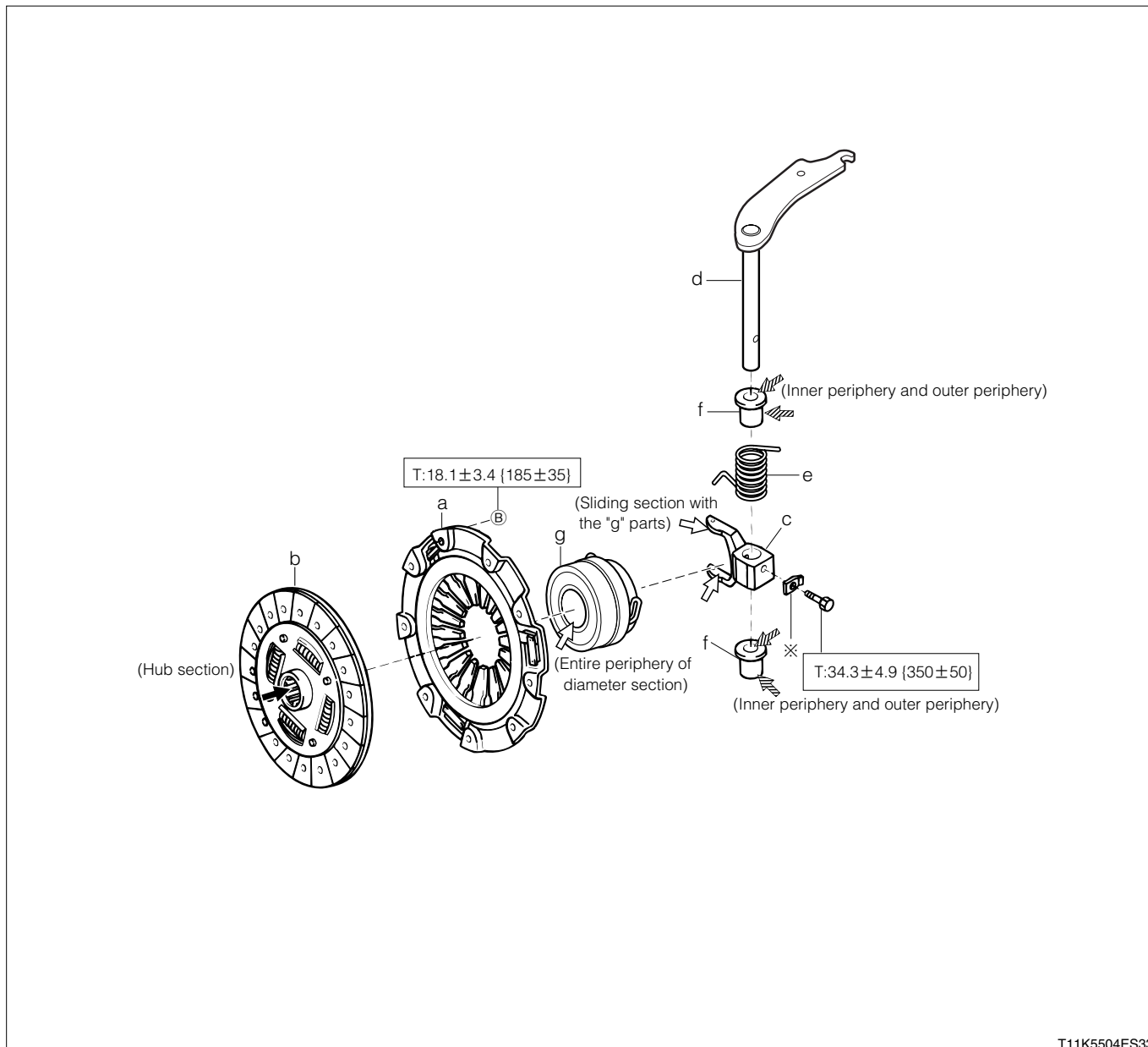
Shape	Part No.	Part name
	09210-87701-000	Holder,fly wheel
	09301-87703-000	Tool,clutch guide
	09302-87701-000	Gauge,clutch diaphragm spring height No.4
	09333-00013-000 (09301-00012-000)	Aligner,clutch diaphragm spring

Instrument
Dial gauge,Vernier calipers,Thickness gauge,Torque wrench
Lubricant,adhesive,others
MP grease,EP(Extreme Pressure) grease,Clutch grease

- #### 4-1-2 OPERATION BEFORE REMOVAL
1. Remove the manual transaxle assembly from the vehicle.

4-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



T11K5504ES33

⇒:MP grease

⇨:EP grease

➡:Clutch grease

※:Non - reusable parts

Unit:N·m{kgf·cm}

(2) Removal and installation procedures

- ▼ ▲ 1 a Cover Ay, clutch
- ▲ 2 b Disc Ay, clutch
- 3 c Yoke, clutch release lever
- 4 d Lever S/A, clutch release
- 5 e Spring, torsion

6 f Bush

7 g Hub Ay, clutch release bearing

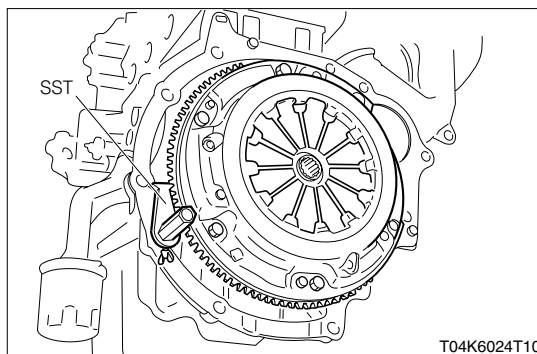
F1-15

4-1-4 POINTS OF REMOVAL

(1) Cover Ay, clutch, and disk Ay, clutch

1. Prevent the ring gear from turning, using the SST. Under this condition, remove the clutch cover assembly and clutch disc assembly.

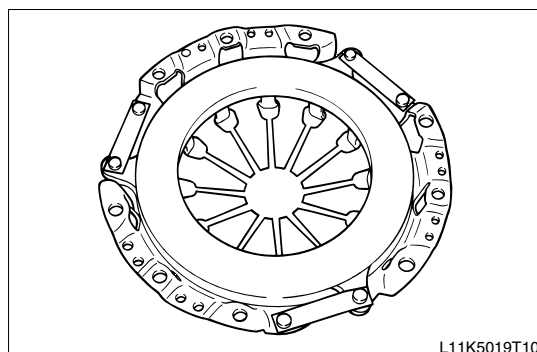
SST: 09210-87701-000



4-1-5 INSPECTION

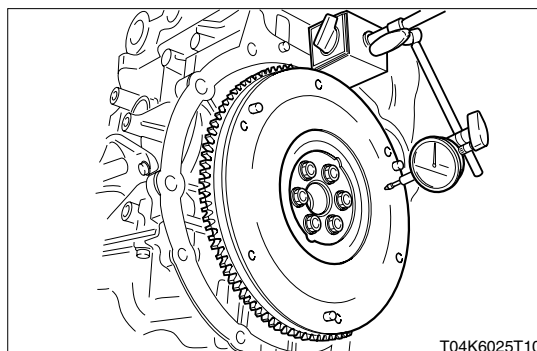
1. Check the following items. Replace any faulty part.

- (1) Flywheel and pressure plate surface of clutch cover assembly for streak, cracks and discoloration.

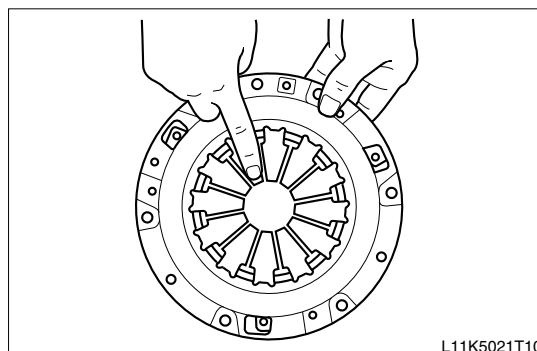


- (2) Clean the flywheel surface. Then, check the runout.

ALLOWABLE LIMIT: 0.10mm

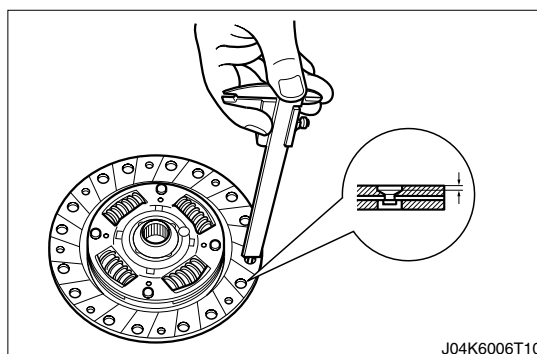


- (3) Pressure plate (diaphragm spring finger section) of clutch cover assembly for wear, rust formation and breakage



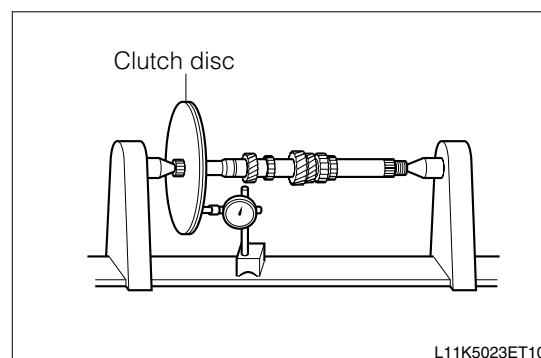
- (4) Clutch disc assembly for wear and runout

ALLOWABLE LIMIT: Wear limit
0.3mm(Sagging of rivet)
Lateral runout limit
1.0mm

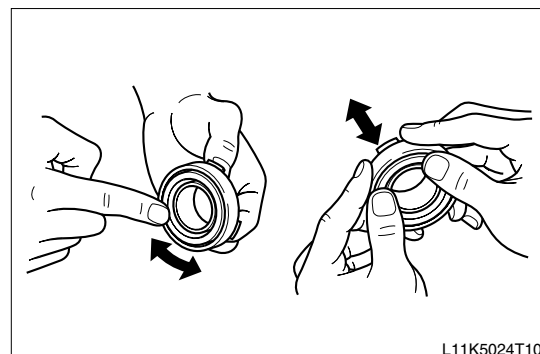


CAUTION

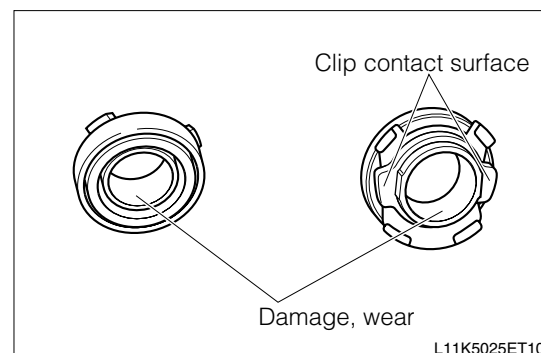
- The measurement of the lateral runout should be carried out under a condition where the clutch disc assembly is assembled with a new input shaft.



- (5) When the sliding section (the contact surface with the clutch cover) of the clutch release bearing hub subassembly is turned, and when pressure is applied to push the sliding section in the turning direction, ensure that there is no abnormal resistance nor binding.



- (6) Check the clutch release bearing hub subassembly for damage and wear. Also, check the clip contact surface and sliding section of the housing for damage and wear.

**4-1-6 POINTS OF INSTALLATION****(1) Disc Ay, clutch**

1. Install the clutch disc Ay.

- (1) Thinly apply clutch grease to the hub inside (the spline section) of the clutch disc assembly.

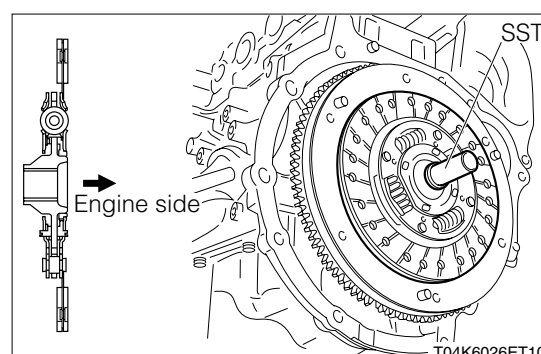
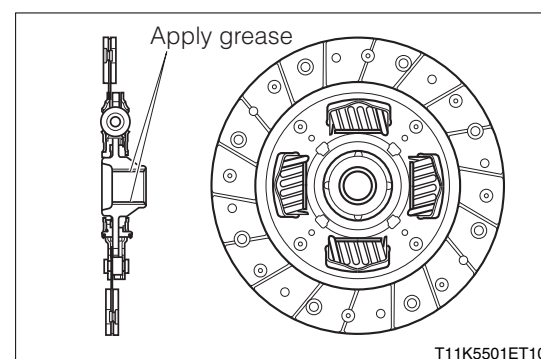
CAUTION

- As regards the grease applying direction, grease should be applied from the clutch cover side. Be sure to apply grease as thinly as possible so that the excessive grease may not ooze out to the flywheel side.

LUBRICANT: Clutch grease

- (2) Install the clutch disc assembly to the flywheel by centering it, using the SST.

SST: 09301-87703-000



F1-17

(2) Cover Ay, clutch

1. Install the cover Ay while aligning it with the knock pin of the flywheel S/A.

2. Using the SST, prevent the flywheel S/A from turning.

SST: 09210-87701-000

3. Temporarily tighten the bolts in the sequence of ① and ⑤.

4. Temporarily tighten the bolts in the sequence of ③, ①, ⑤, ②, ⑥ and ④.

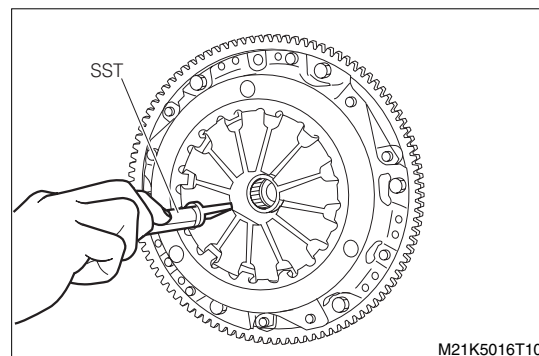
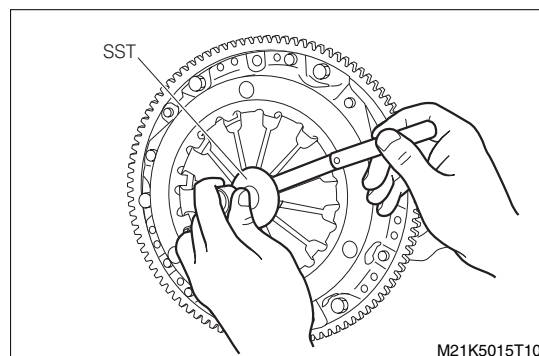
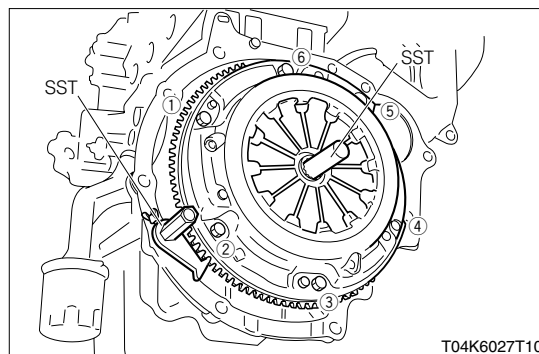
5. Check the diaphragm spring section for unevenness in height, using the SST.

SST: 09302-87701-000

ALLOWABLE LIMIT: 0.6mm

6. If the above check has revealed that the unevenness exceeds the limit, correct the unevenness in height, using the SST.

SST: 09333-00013-000



4-1-7 OPERATION AFTER INSTALLATION

1. Install the manual transaxle Ay.

F2 MANUAL TRANSMISSION/MANUAL TRANSAXLE

MANUAL TRANSAXLE -----	F2—1
BASIC CHECK AND ADJUSTMENT ---	F2—1
TRANSMISSION GEAR OIL -----	F2—1
REPLACEMENT -----	F2—1
MANUAL TRANSAXLE AY-----	F2—1
REMOVAL AND INSTALLATION-----	F2—1
DIFFERENTIAL SIDE OIL SEAL-----	F2—7
REMOVAL AND INSTALLATION-----	F2—7
BACK UP LAMP SWITCH -----	F2—9
REMOVAL AND INSTALLATION-----	F2—9
SHIFT LEVER -----	F2—10
REMOVAL AND INSTALLATION-----	F2—10
DISASSEMBLING AND ASSEMBLING -----	F2—12

F2-1

1 MANUAL TRANSAXLE

1-1 BASIC CHECK AND ADJUSTMENT

1-1-1 CHECK OF TRANSMISSION OIL LEVEL

1. Remove the filler plug. With the vehicle placed in a horizontal state, ensure that the oil level is at the specified level.

SPECIFIED VALUE: 5 mm or less below lower edge of filler plug hole

TIGHTENING TORQUE: $39.2 \pm 9.8 \text{ N} \cdot \text{m}$ { $400 \pm 100 \text{ kgf} \cdot \text{cm}$ }

CAUTION

- If the oil level is low, check for oil leakage.
Never reuse the gasket.

(2)

2 TRANSMISSION GEAR OIL

2-1 REPLACEMENT

LUBRICANT: Transmission gear oil SAE75W—90 or SAE75W—85
or SAE75W—80 (API Classification GL3 or GL4)

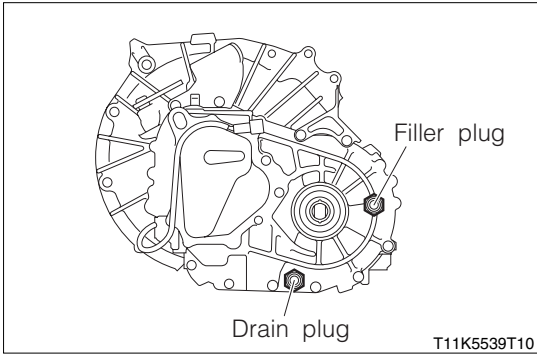
Total capacity approx. 2.1—2.25ℓ

SPECIFIED VALUE: 5 mm or less below lower edge of filler plug
hole

TIGHTENING TORQUE: $39.2 \pm 9.8 \text{ N} \cdot \text{m}$ { $400 \pm 100 \text{ kgf} \cdot \text{cm}$ }

CAUTION

- Never reuse the removed gasket.

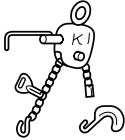


3 MANUAL TRANSAXLE AY

3-1 REMOVAL AND INSTALLATION

3-1-1 ARTICLES TO BE PREPARED

SST

Shape	Part No.	Part name
	09090-04020-000 (09090-04010-000)	Device,engine sling

Tool

Low transmission jack

Instrument

Torque wrench

Lubricant,adhesive,others

Transmission gear oil SAE75W—90 or SAE75W—85 or SAE75W—80 (API Classification GL3 or GL4),Engine hanger No.1 (Replacement parts),Engine hanger No.2 (Replacement parts)

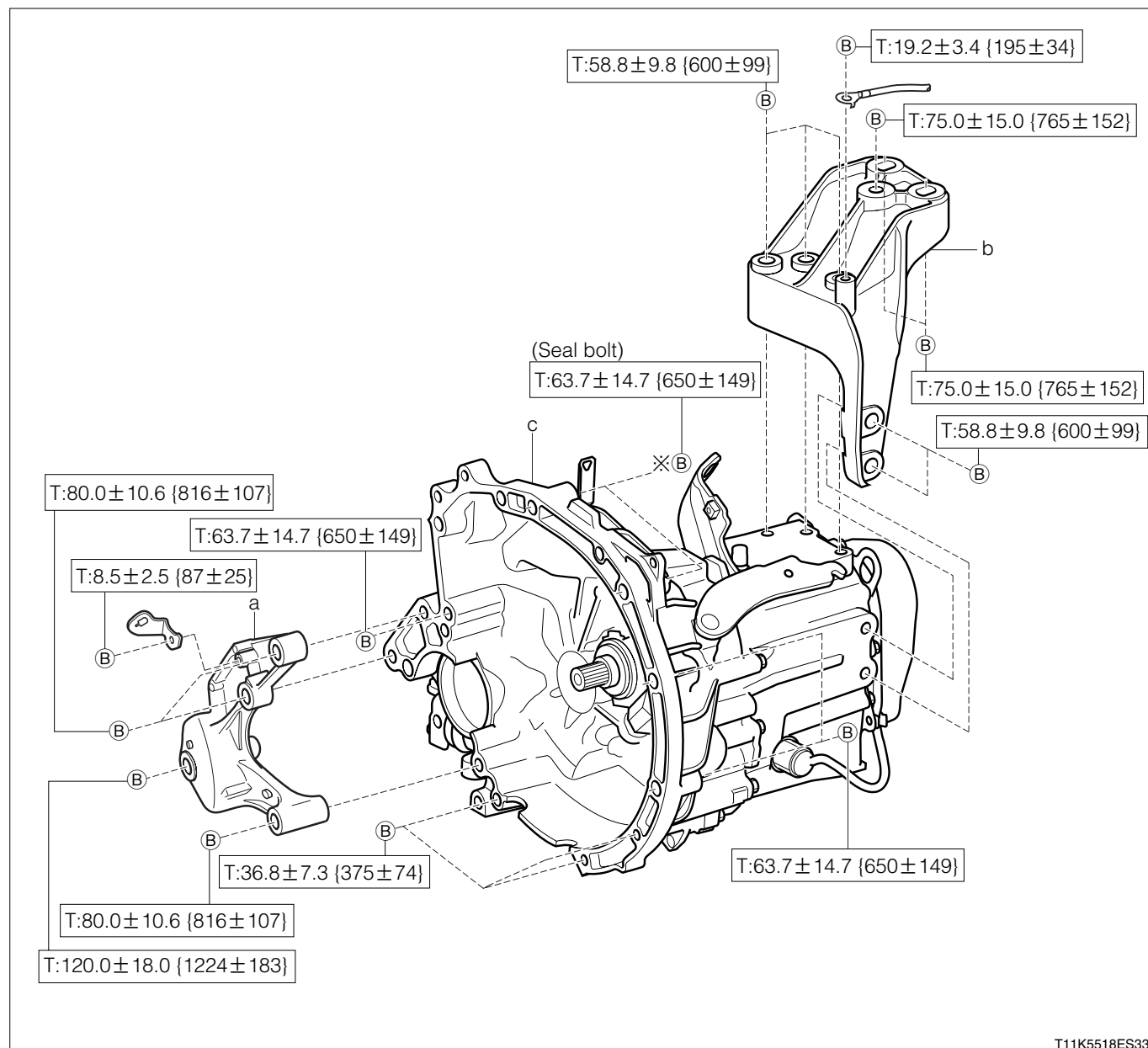
3-1-2 OPERATION BEFORE REMOVAL

1. Remove the battery and battery carrier.
Refer to Page J5-2.
2. Drain the transaxle oil.
Refer to Page F2-1.
3. Remove the exhaust pipe Ay.
Refer to Page B4-2.
4. Remove the front drive shaft Ay RH/LH.
Refer to Page D2-8.
5. Remove the starter Ay.
Refer to Page B11-1.
6. Remove the transmission floor shift Ay.
Refer to Page F2-10.

F2-3

3-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



※: Non-reusable parts

Unit: N·m {kgf·cm}

(2) Removal and installation procedures

- ▼ ▲ 1 a Bracket, engine mounting, rear
- ▼ ▲ 2 b Bracket, engine mounting, LH
- ▼ ▲ 3 c Transaxle Ay, manual

3-1-4 POINTS OF REMOVAL

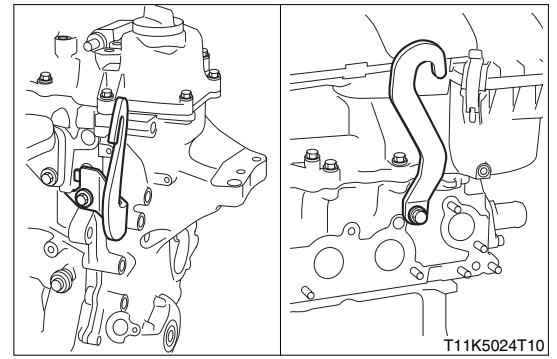
(1) Bracket, engine mounting, rear

1. Install the engine hanger at a position shown in the figure.

NOTE

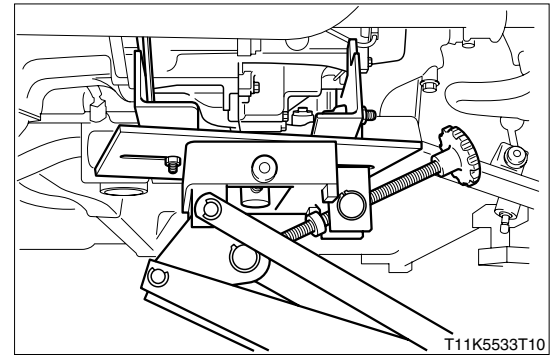
- Part number of engine hanger No.1:12282-40030-000
- Part number of engine hanger No.2:12282-40010-000

SST: 09090-04020-000

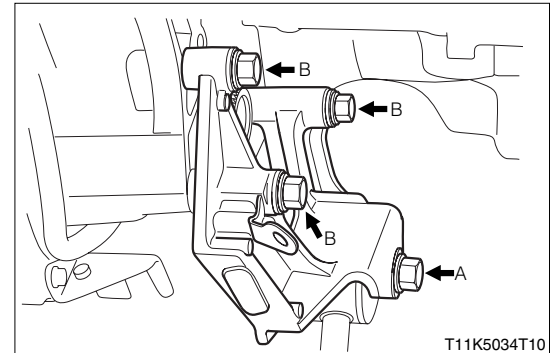


2. Support the manual transaxle Ay, using a low transmission jack.

TOOL: Low transmission jack

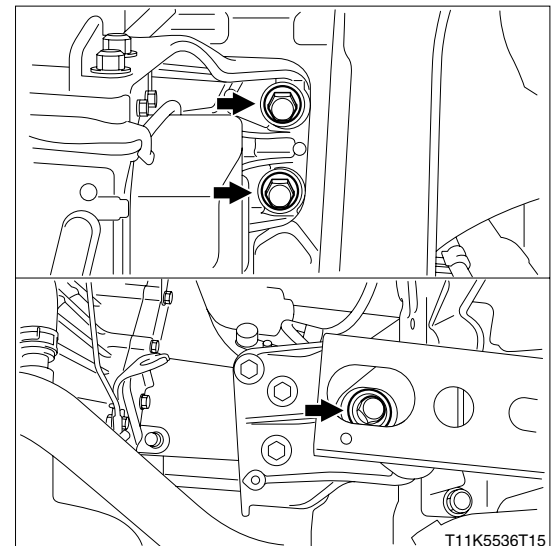


3. Remove the connecting bolt (A) between the bracket and engine mounting control rod S/A.
4. Remove the installing bolt (B) of the bracket.

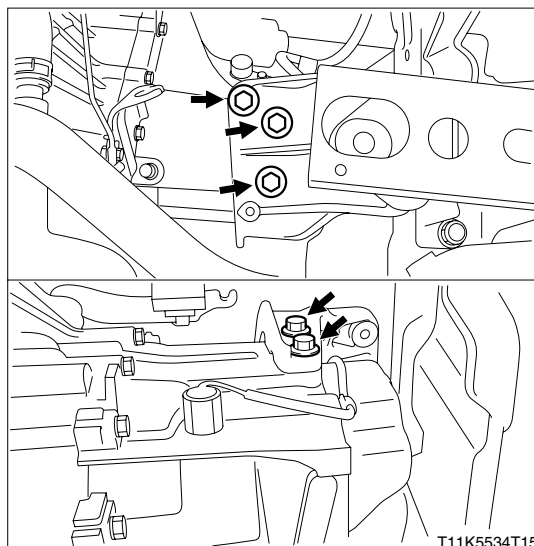


(2) Bracket, engine mounting, LH

1. Remove the connecting bolts of the bracket and engine mounting insulator LH.

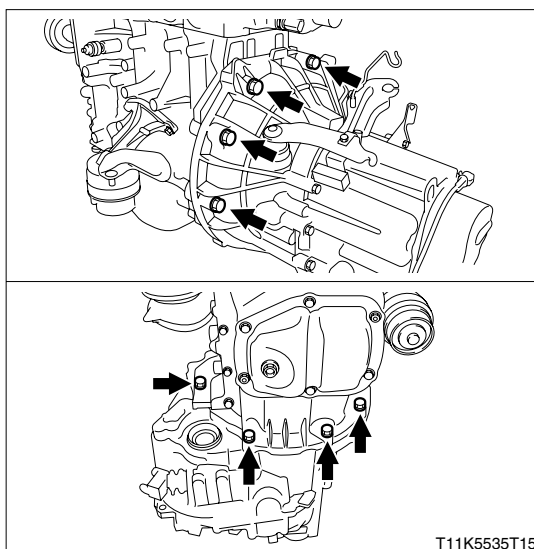


2. Remove the installing bolt of the bracket.



(3) Transaxle Ay, manual

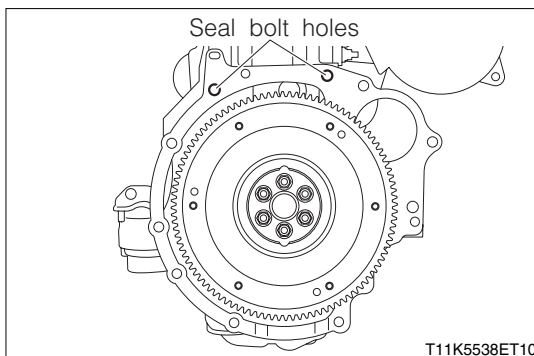
1. Remove the connecting bolt between the transaxle Ay and engine Ay. Separate the transaxle Ay from the engine Ay.



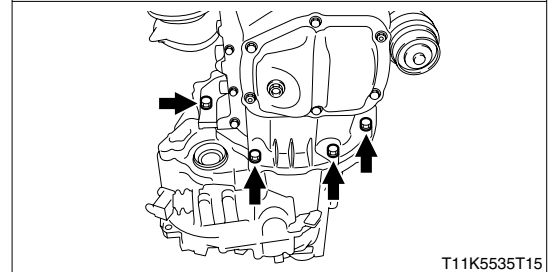
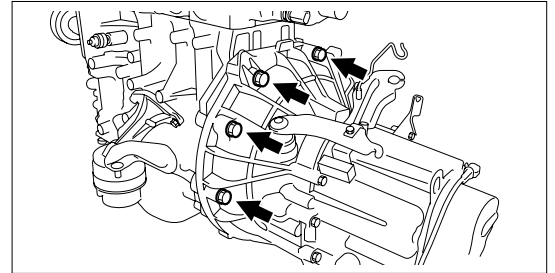
3-1-5 POINTS OF INSTALLATION

(1) Transaxle Ay, manual

1. Clean the seal bolt holes of the engine block.



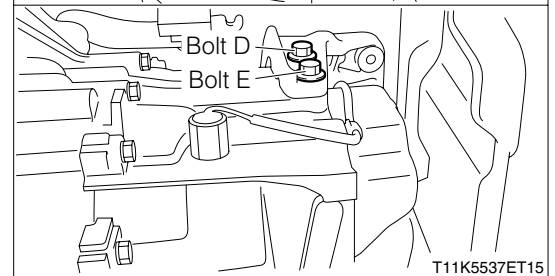
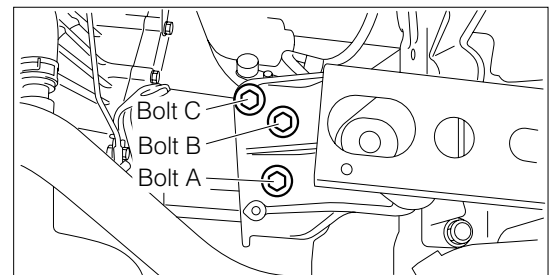
2. Install the transaxle Ay to the engine Ay.
3. Tighten the connecting bolt between the transaxle Ay and engine Ay.



T11K5535T15

(2) Bracket, engine mounting, LH

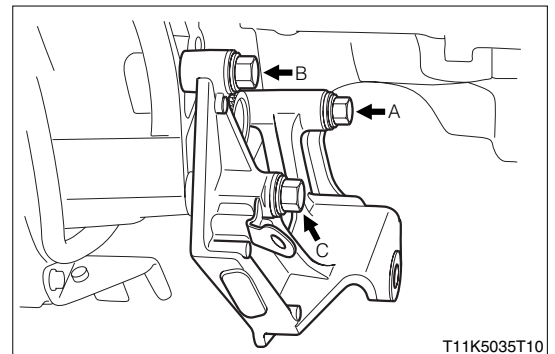
1. Temporarily tighten the bracket by using the bolt (A) in the right figure.
2. Fully tighten the bolts (D), (E), (B), (C) and (A) shown in the right figure in this order.



T11K5537ET15

(3) Bracket, engine mounting, rear

1. Temporarily tighten the bolt (A) in the right figure.
2. Fully tighten the bolts (B), (C) and (A) shown in the right figure in this order.
3. Install the connecting bolt between the bracket and engine mounting control rod S/A.



T11K5035T10

F2-7

3-1-6 OPERATION AFTER INSTALLATION

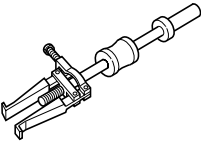
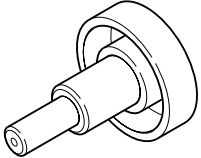
- 1. Install the transmission floor shift Ay.
Refer to Page F2-10.
- 2. Install the starter Ay.
Refer to Page B11-1.
- 3. Install the front drive shaft Ay RH/LH.
Refer to Page D2-8.
- 4. Install the exhaust pipe Ay.
Refer to Page B4-2.
- 5. Install the battery and battery carrier.
Refer to Page J5-2.
- 6. Fill transaxle fluid.
Refer to Page F2-1.

4 DIFFERENTIAL SIDE OIL SEAL

4-1 REMOVAL AND INSTALLATION

4-1-1 ARTICLES TO BE PREPARED

SST

Shape	Part No.	Part name
	09308-00010-000	Puller,oil seal
	09518-87709-000	Replacer,oil seal No.8

Lubricant,adhesive,others

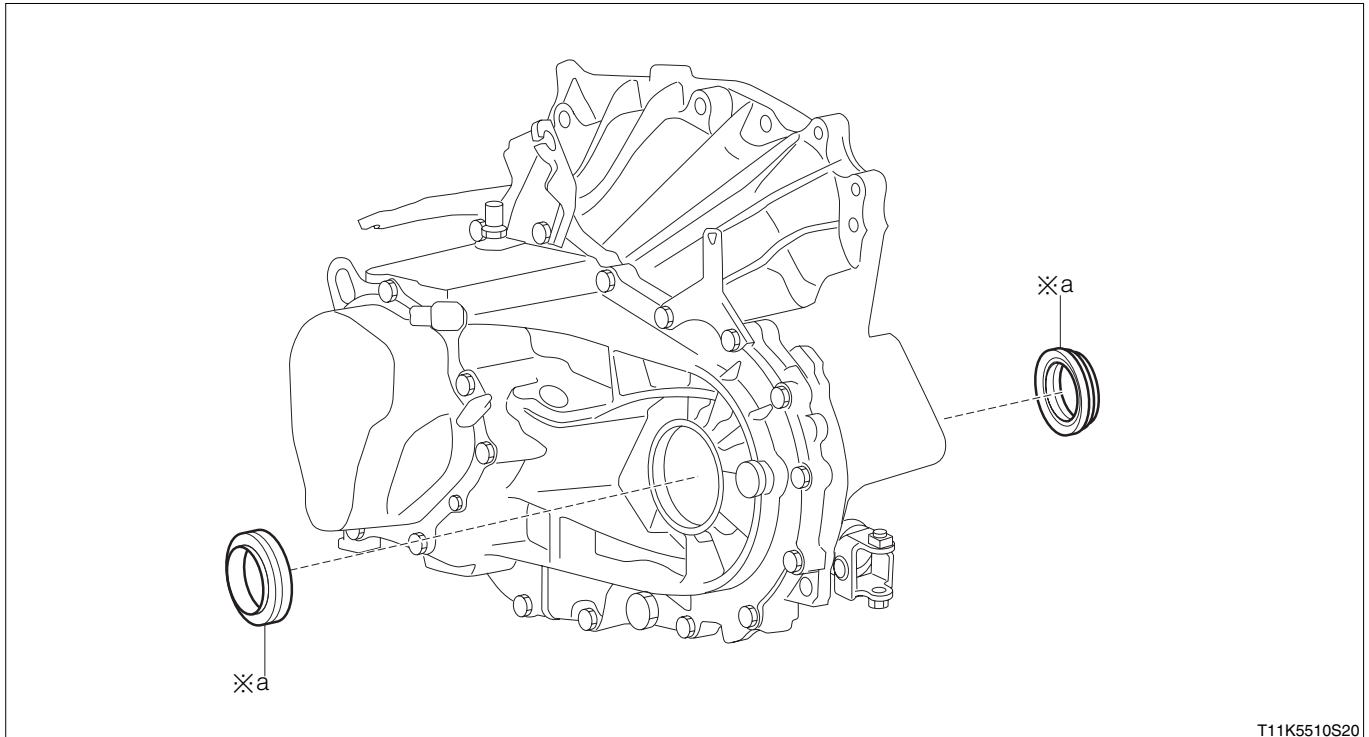
Transmission gear oil SAE75W－90 or SAE75W－85 or SAE75W－80 (API Classification GL3 or GL4)

4-1-2 OPERATION BEFORE REMOVAL

- 1. Remove the drive.
Refer to Page D2-8.

4-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



T11K5510S20

※:Non - reusable parts

(2) Removal and installation procedures

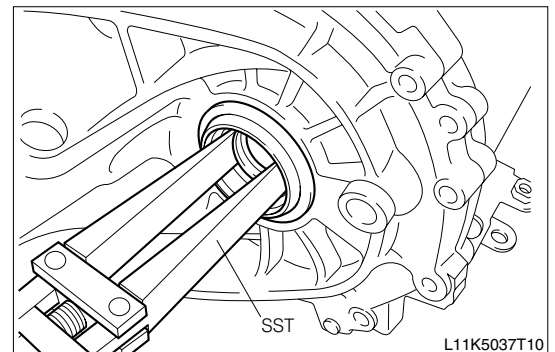
▼ ▲ 1 a Seal, type T oil

4-1-4 POINTS OF REMOVAL

(1) Seal, type T oil

1. Remove the type T oil seal, using the SST.

SST: 09308-00010-000



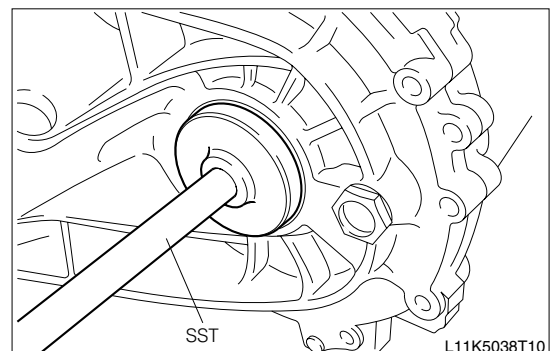
L11K5037T10

4-1-5 POINTS OF INSTALLATION

(1) Seal, type T oil

1. Drive the type T oil seal in place, using the SST.

SST: 09518-87709-000



L11K5038T10

4-1-6 OPERATION AFTER INSTALLATION

1. Install the drive shaft.
Refer to Page D2-8.

F2-9

5 BACK UP LAMP SWITCH

5-1 REMOVAL AND INSTALLATION

5-1-1 ARTICLES TO BE PREPARED

Instrument

Torque wrench,Electrical tester

Lubricant,adhesive,others

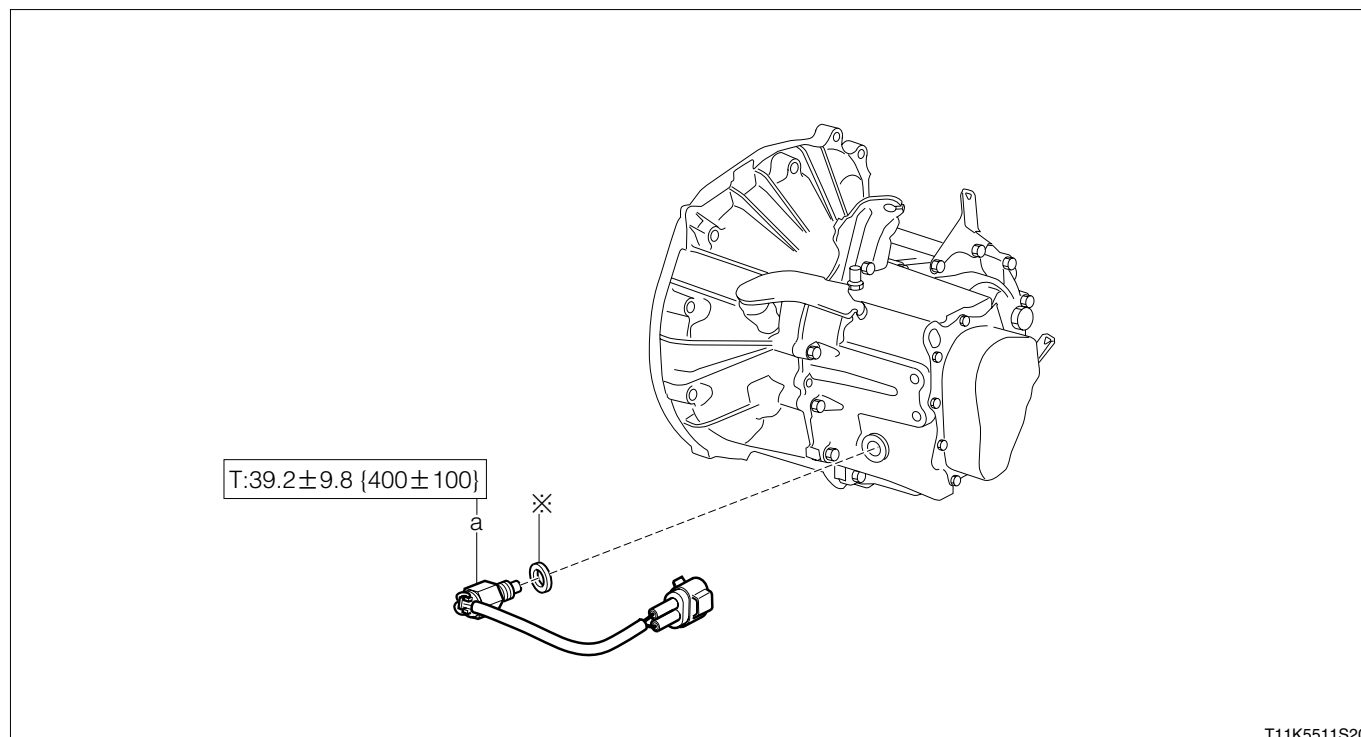
Transmission gear oil SAE75W-90 or SAE75W-85 or SAE75W-80 (API Classification GL3 or GL4)

5-1-2 OPERATION BEFORE REMOVAL

1. Drain the transaxle oil.

5-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



T11K5511S20

※:Non - reusable parts

Unit:N·m{kgf·cm}

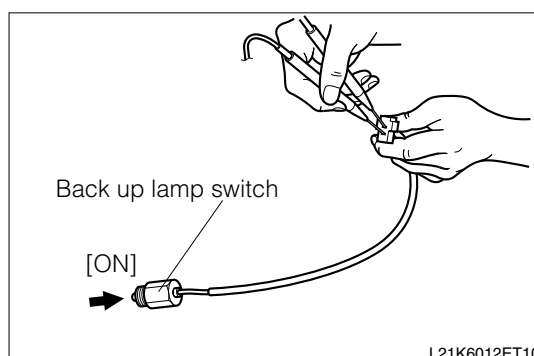
(2) Removal and installation procedures

- 1 a Switch Ay, back up lamp

5-1-4 INSPECTION

Check the following items. Replace any faulty part.

1. Ensure that continuity exists when the switch of the backup lamp switch assembly is pushed (ON). Conversely, ensure that no continuity exists when the switch is not pushed (OFF).



L21K6012ET10

5-1-5 OPERATION AFTER INSTALLATION

1. Fill transaxle oil.

Refer to Page F2-1.

6 SHIFT LEVER

6-1 REMOVAL AND INSTALLATION

WARNING

- Never perform the operation when the exhaust pipe is still hot, for there is a hazard potential of getting burned.

6-1-1 ARTICLES TO BE PREPARED

Tool

Snap ring pliers

Instrument

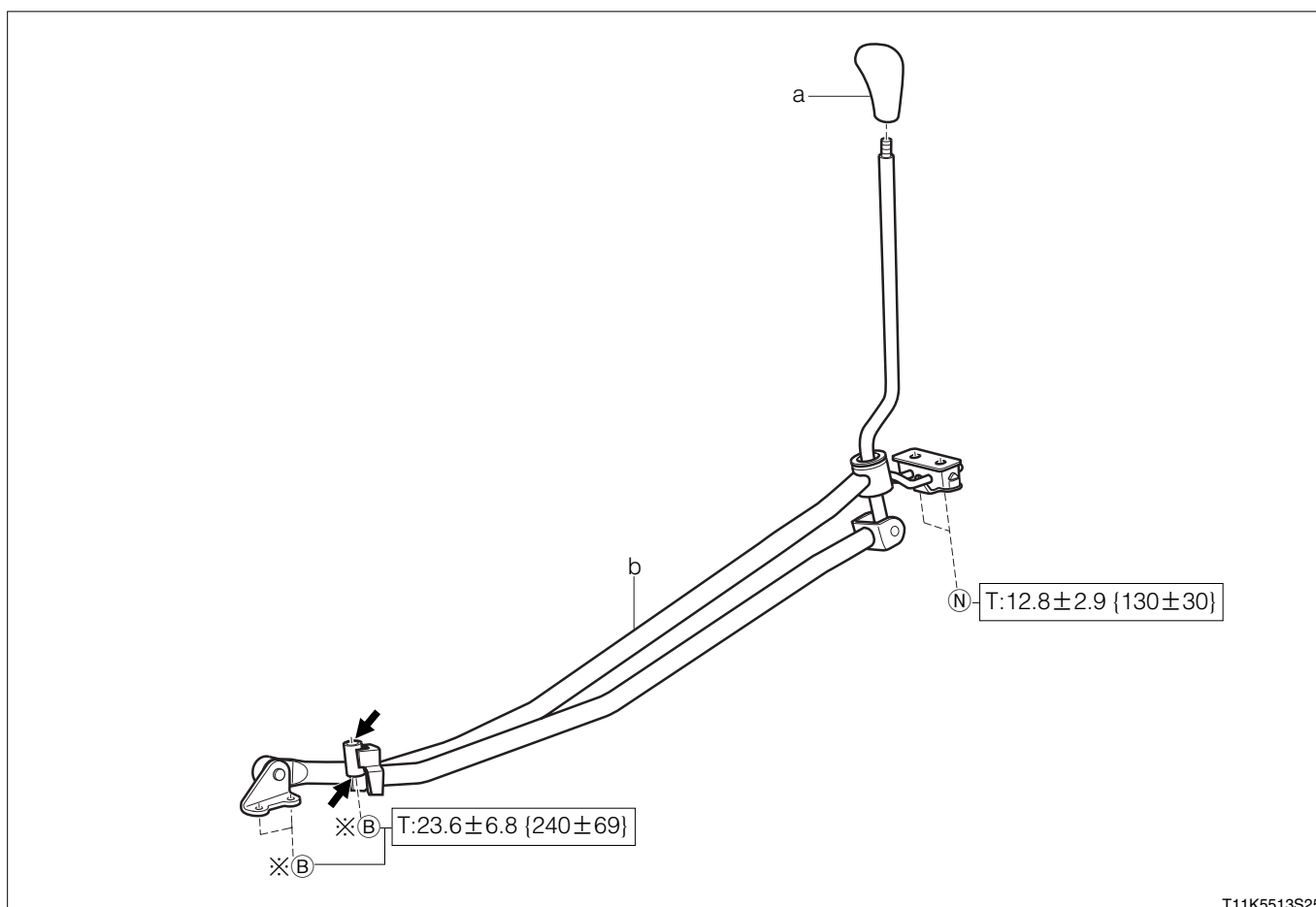
Torque wrench

Lubricant, adhesive, others

MP grease

6-1-2 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



T11K5513S25

➡: MP grease

※: Non - reusable parts

Unit: $\text{N} \cdot \text{m} \{ \text{kgf} \cdot \text{cm} \}$

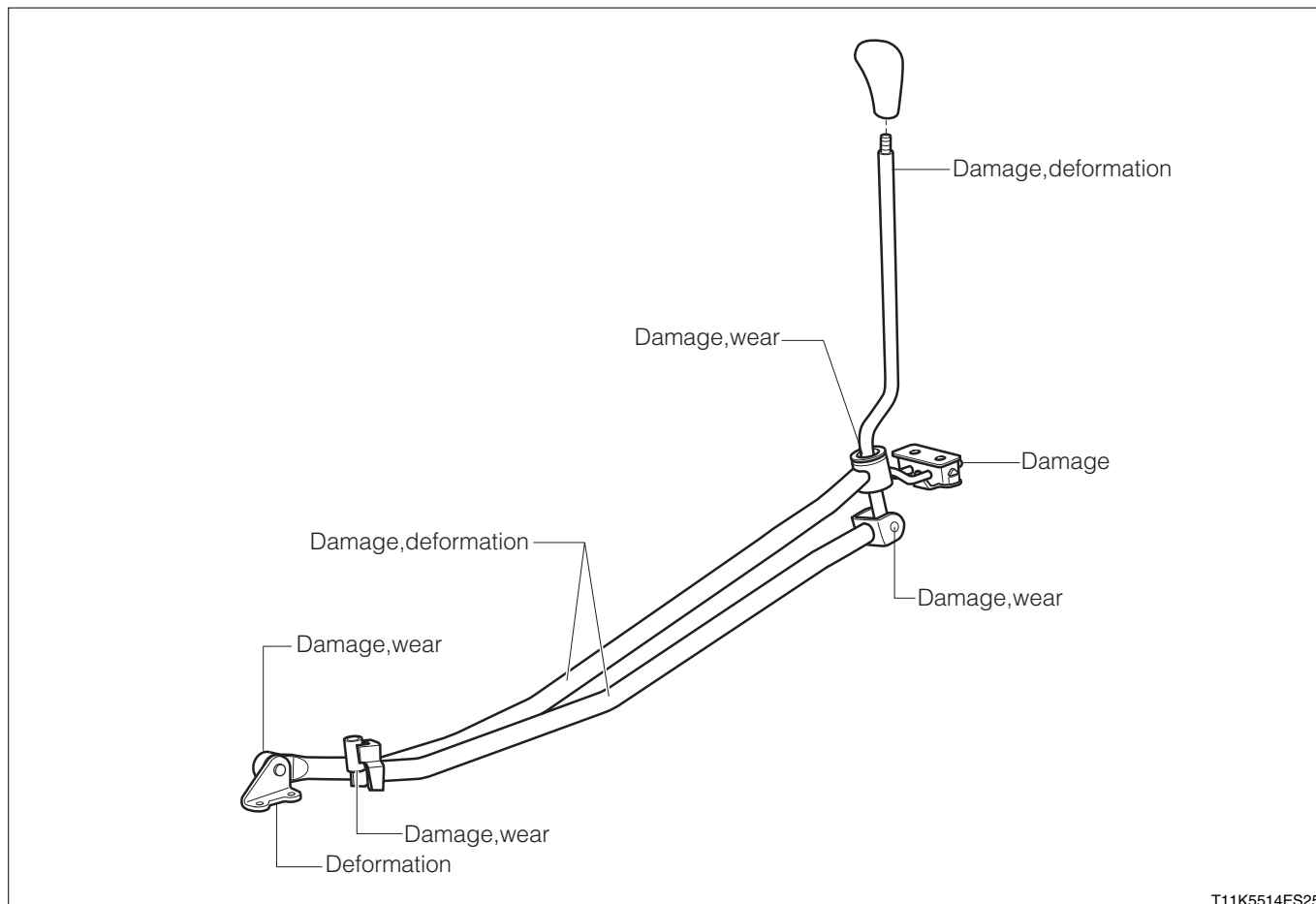
(2) Removal and installation procedures

- ▲ 1 a Knob, shift lever
- ▲ 2 b Floor shift Ay, transmission

6-1-3 INSPECTION

1. Check the following items. Replace any faulty part.

- (1) Check that each joint section of the assembly turns smoothly without any binding. If any malfunction is found, perform the replacement, following the procedure under



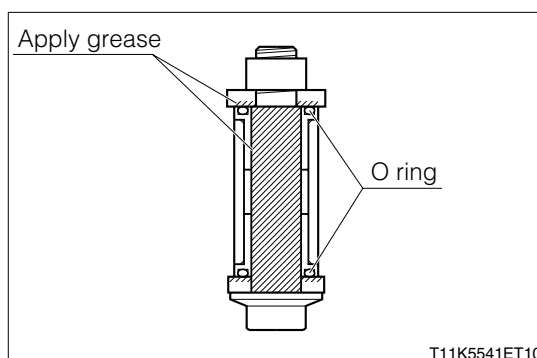
6-1-4 POINTS OF INSTALLATION

(1) Floor shift Ay, transmission

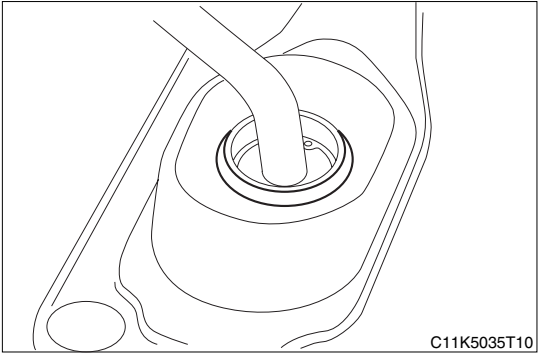
1. Install the control shaft subassembly (the lower shaft of the transmission floor shift assembly) to the transaxle.
 - (1) Ensure that the O-ring has been installed securely to the bush.
 - (2) Apply MP grease to the control shaft S/A at the transmission side (the entire periphery indicated by the hatched section in the right figure).

LUBRICANT: MP grease

2. Secure the shift lever housing rod S/A (upper rod of the floor shift Ay) to the manual transaxle Ay.



3. Securely fit the shift lever retainer dust boot into the groove of the shift lever housing rod subassembly.



(2) Knob, shift lever

1. Install the shift lever hole cover.
2. Install the shift lever knob.
 - (1) Screw in the shift lever knob, until it comes in contact lightly with the shift lever . Then, retighten the shift lever knob further 1.5 turns. Finally, adjust the direction of the shift pattern by turning the shift lever knob in the retightening direction.

6-2 DISASSEMBLING AND ASSEMBLING

6-2-1 ARTICLES TO BE PREPARED

Tool

Hand grinder, Snap ring pliers

Instrument

Torque wrench

Lubricant, adhesive, others

MP grease, Silicon grease

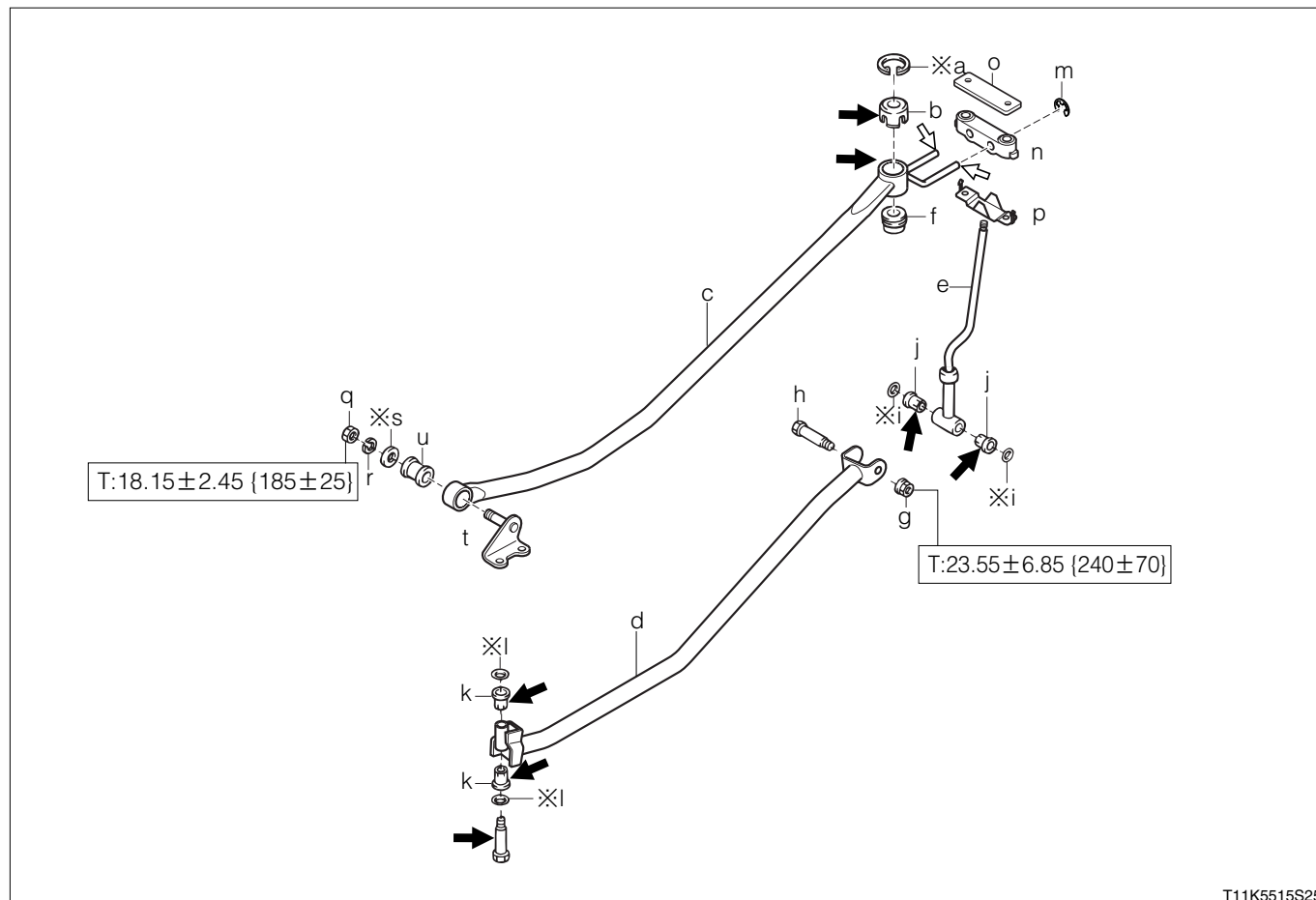
6-2-2 OPERATION BEFORE DISASSEMBLY

1. Remove the floor shift assembly from the vehicle.
Refer to Page F2-10.

F2-13

6-2-3 DISASSEMBLY AND ASSEMBLY PROCEDURES

(1) Components



T11K5515S25

➡: MP grease

⇨: Silicone grease

※: Non - reusable parts

Unit: N·m{kgf·cm}

(2) Disassembling and assembling procedure

1	a Ring, snap	12	l Ring, O
2	b Seat, shift lever	13	m Ring, E (No replacement part)
▼ ▲ 3	c Rod S/A, shift lever housing	14	n Support Ay, control rod No.2
▼ ▲ 4	d Shaft S/A, control	15	o Washer, plate
5	e Lever, shift	16	p Retainer S/A, control shift lever
6	f Boot, shift lever retainer dust	17	q Nut (Replacement parts)
7	g Nut (Replacement parts)	18	r Washer (Replacement parts)
8	h Bolt (Replacement parts)	19	s Collar (Replacement parts)
9	i Ring, O	20	t Support Ay, control rod (Replacement parts)
10	j Bush	21	u Bush
11	k Bush		

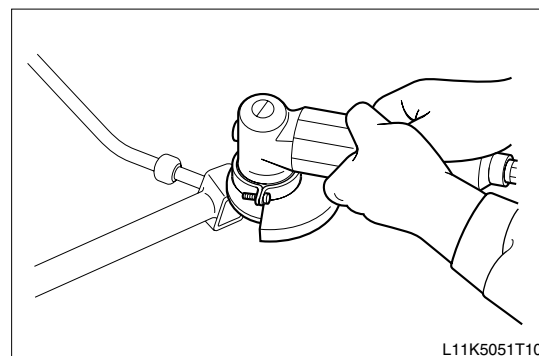
6-2-4 POINTS OF DISASSEMBLY

(1) Shaft S/A, control

1. Remove the staked state, using a grinder. Then, disassemble the control shaft subassembly and shift lever.

CAUTION

- Never reuse the pin whose staked section has been cut off.



(2) Rod S/A, shift lever housing

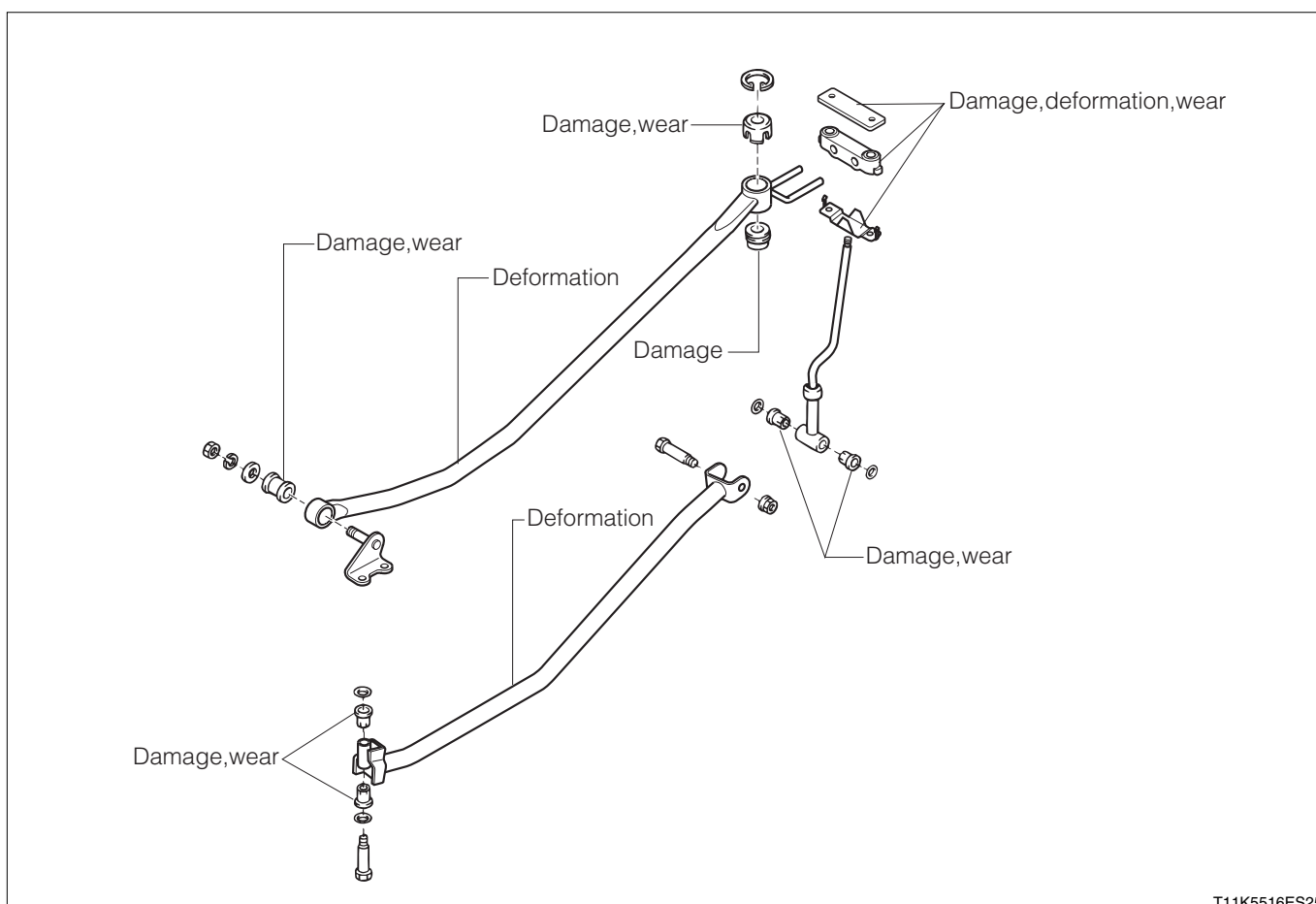
1. Remove the staked state, using a grinder. Then, disassemble the rod S/A and control rod support Ay.

CAUTION

- Never reuse the control rod support whose staked section has been cut off.

6-2-5 INSPECTION

1. Check the following items. Replace any faulty part.



F2-15

6-2-6 POINTS OF ASSEMBLY

(1) Rod S/A, shift lever housing

1. Assemble the rod S/A and control rod support Ay.

CAUTION

- In the case of replacement parts, the connecting method is of a nut securing type. Utmost care must be exercised so that no wrong installation method is employed.

2. Apply silicone grease to the rod S/A and assemble it to the No.2 control rod support Ay.

NOTE

- There is no need of assembling the E-ring. (No replacement part)

LUBRICANT: Silicon grease

(2) Shaft S/A, control

1. Assemble the shift lever and control shaft subassembly.

CAUTION

- In the case of replacement parts, the connecting method is of a bolt securing type. Utmost care must be exercised so that no wrong installation method is employed.

6-2-7 OPERATION AFTER ASSEMBLY

1. Install the floor shift assembly to the vehicle.

Refer to Page F2-10.

G1 STEERING

STEERING SYSTEM -----	G1-1
INSTRUCTIONS FOR SERVICE OP- ERATION-----	G1-1
BASIC CHECK AND ADJUSTMENT --	G1-1
STEERING WHEEL -----	G1-2
REMOVAL AND INSTALLATION-----	G1-2
STEERING COLUMN-----	G1-4
REMOVAL AND INSTALLATION-----	G1-4

1 STEERING SYSTEM

1-1 INSTRUCTIONS FOR SERVICE OPERATION

CAUTION

- See the servicing instructions.

Refer to Page A1-10.

1-2 BASIC CHECK AND ADJUSTMENT

1-2-1 CHECK OF STEERING WHEEL

(1) Free play check

1. Set the tires to a straight-ahead state.
2. Start the engine and keep the engine idling.
3. Lightly turn the steering wheel by hand to the right and left. At this time, measure the free play (Amount of movement before the tires start moving) on the outer periphery of the steering wheel.

SPECIFIED VALUE: 0 - 10 mm

(2) Check of excessive play

1. Move the steering wheel in up-and-down, right-and-left and fore-and-aft directions by holding it by hand. At this time, check that no excessive play is present.

(3) Check of operating conditions

1. As for the operating conditions during running, check the following items to see if there is any abnormality.
 - (1) The steering wheel does not shake continuously during running at a constant speed.
 - (2) The vehicle does not pull to the right or left during running straight on a flat road.
 - (3) The steering effort is normal and does not vary considerably over the entire operating range.
 - (4) When returning to straightforward running after turning, there is no abnormally heavy steering effort or binding in steering operation.

1-2-2 CHECK OF STEERING GEAR

(1) Operations prior to check

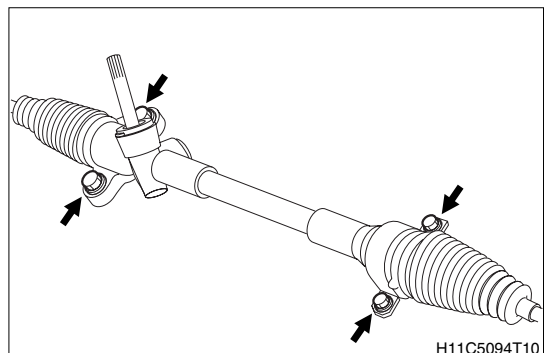
1. Jack up the vehicle.

(2) Check of tightening conditions

1. Check to see if any looseness exists at the installation of the steering gear and the front suspension member, using a spanner or the like.
2. With the tire touching the ground, let the assistant turn the steering wheel approx. 90 degrees to the right and left. Visually check to see if any looseness exists at the installation section between the steering gear and front suspension member.

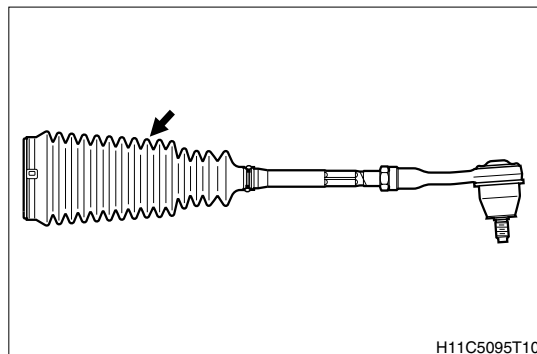
CAUTION

- Since the steering rack housing bracket LH is installed through the steering rack housing grommet LH, care must be exercised not to tighten excessively.
- If the steering wheel is turned with the vehicle stopped, movement is made only in the amount of deformation of the steering rack housing grommet. This should not be taken as looseness.



(3) Check of cracks and damage

1. Wipe off dirt on the boot. Check to see if there is crack, damage, disengagement or deterioration. If the boot has crack or damage, there might be rust formation at the gear, admission of foreign matters and lack of grease. Check these points, too.

**1-2-3 CHECK OF STEERING TIE ROD S/A AND STEERING RACK END S/A****(1) Operations prior to check**

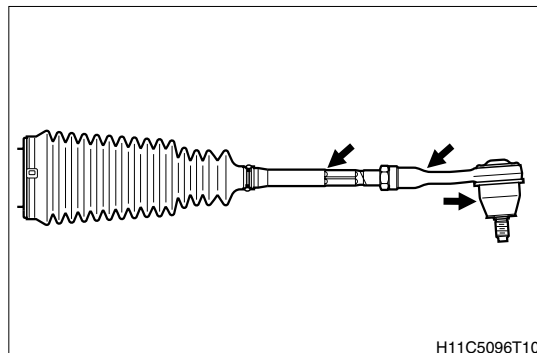
Jack up the vehicle.

(2) Check of tightening condition and excessive play

1. Shake the moving sections by hand in the direction that the steering force is transmitted. Visually check the installing section for looseness and moving sections for excessive play.
2. With the tire touching the ground, let the assistant turn the steering wheel approx. 90 degrees to the right and left. Visually check to see if any looseness exists at the installation section and excessive play exists at the moving sections.

(3) Check of cracks and damage

1. Visually check the following items.
 - (1) The steering tie rod end S/A and steering rack end S/A should have no damage nor bend.
 - (2) The dust boot of the ball joint of the steering tie rod end S/A should have no crack nor damage.

**1-2-4 CHECK OF STEERING KNUCKLE****(1) Operations prior to check**

1. Jack up the vehicle.

(2) Check of tightening conditions and excessive plays

1. Check the attaching bolts for the steering knuckle and front shock absorber for looseness. Also check the fitting section for excessive play.

(3) Check of ball joint for excessively play

1. With the brake pedal depressed, move the tire by holding the upper and lower parts of the tire. Check to see if the ball joint has excessive play.

2 STEERING WHEEL**2-1 REMOVAL AND INSTALLATION****CAUTION**

- See the servicing instructions.

Refer to Page A1-10.

2-1-1 ARTICLES TO BE PREPARED

Instrument

Torque wrench

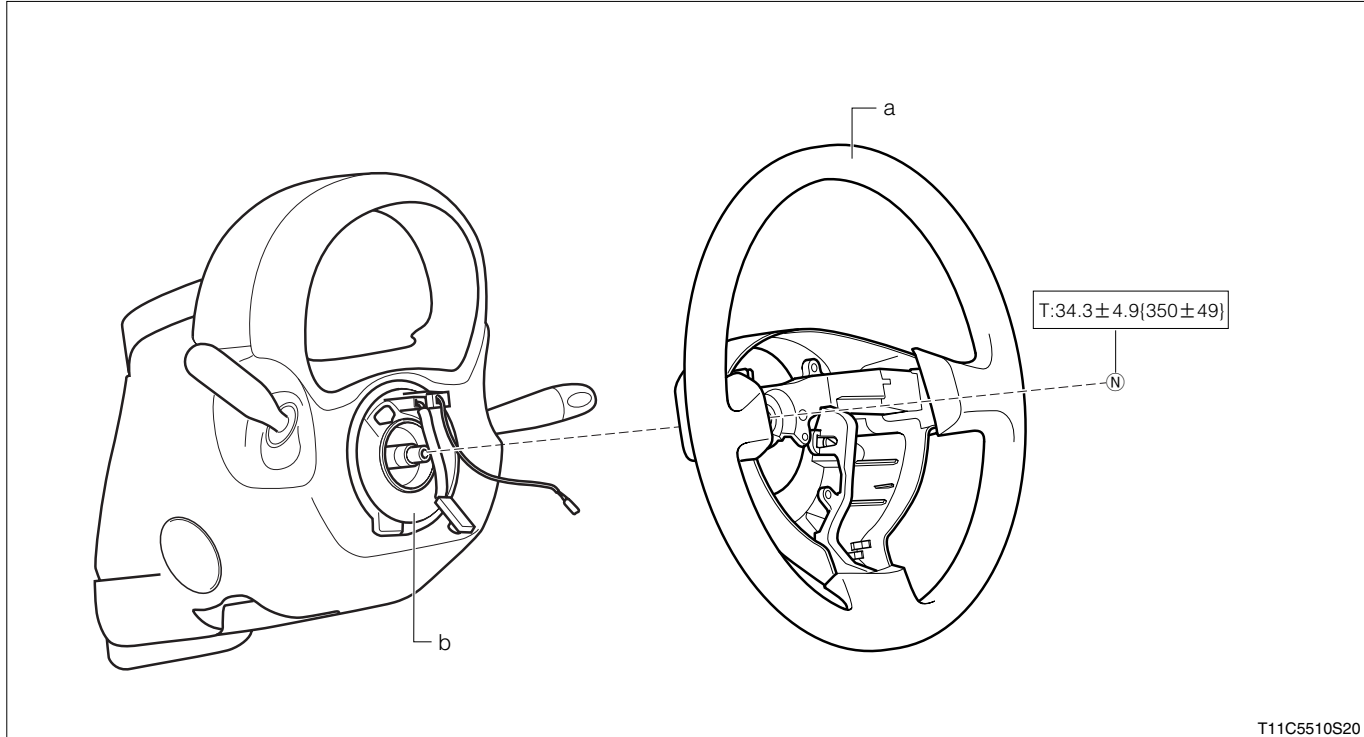
G1-3

2-1-2 OPERATION BEFORE REMOVAL

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery.
Leave the engine under this state for 60 seconds or more.
2. Ensure that the steering wheel Ay is in the straight ahead condition.
3. Remove the steering pad Ay.
Refer to Page H1-1.

2-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



Unit: N·m {kgf·cm}

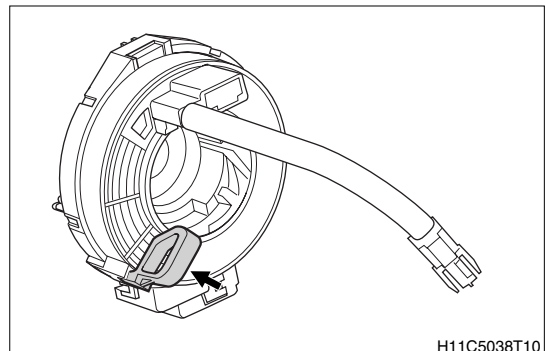
(2) Removal and installation procedures

- ▲ 1 a Wheel S/A, steering
- 2 b Cable S/A, spiral

2-1-4 POINTS OF INSTALLATION

(1) Wheel S/A, steering

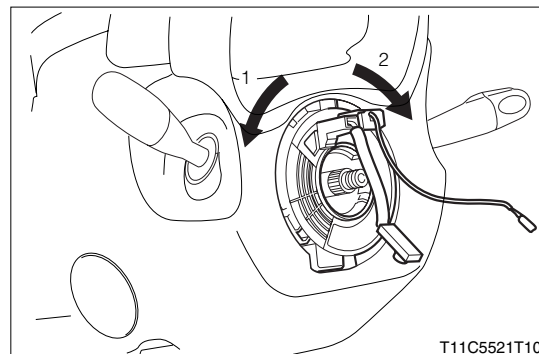
1. Ensure that the tires are in a straight-ahead state.
2. Align the center position of the spiral cable S/A.
3. When installing the new spiral cable S/A, ensure that the neutral securing pin is not disengaged. Only if it is disengaged, perform the following operations.



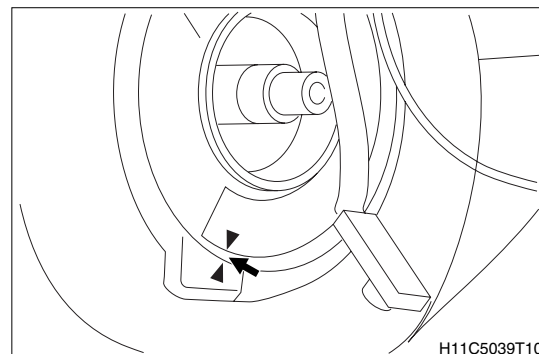
- (1) Turn the spiral cable S/A counterclockwise (Direction 1 in the right figure) until it is locked. Back off about three turns clockwise (Direction 2 in the right figure) from the lock position.

NOTE

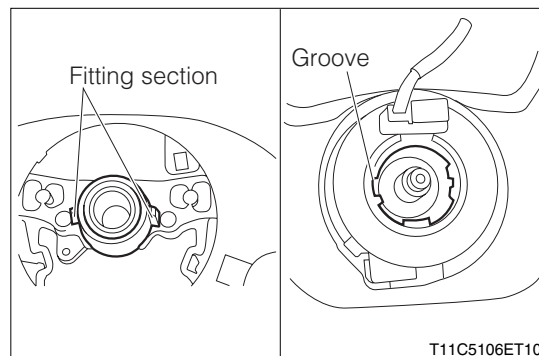
- It should be noted that the number of lock-to-lock turns of the spiral cable subassembly is about six.



- (2) Adjust the center position by turning the spiral cable subassembly in the direction close to the center mark.



4. Insert the wheel S/A completely as far as it will go. Turn it two or three times to the right and left so as to install it to the steering column tube Ay in such a way that the assembling groove at the spiral cable S/A side can align with the fitting section of the wheel S/A.
5. When a new spiral cable subassembly is installed, remove the neutral securing pin by breaking it.

**2-1-5 OPERATION AFTER INSTALLATION**

1. Ensure that the steering wheel Ay is in the straight ahead condition.
2. Install the steering wheel pad Ay.
Refer to Page H1-1.

3. Connect the negative terminal of the battery.
4. After the IG SW has been set to "ON" position, ensure that the airbag warning lamp is illuminated for about 6 seconds and then remains extinguished afterward.

3 STEERING COLUMN**3-1 REMOVAL AND INSTALLATION****CAUTION**

- Refer to the precaution on checking procedure.

Refer to Page A1-10.

3-1-1 ARTICLES TO BE PREPARED**Tool**

Center punch, Drill, Tap

Instrument

Torque wrench

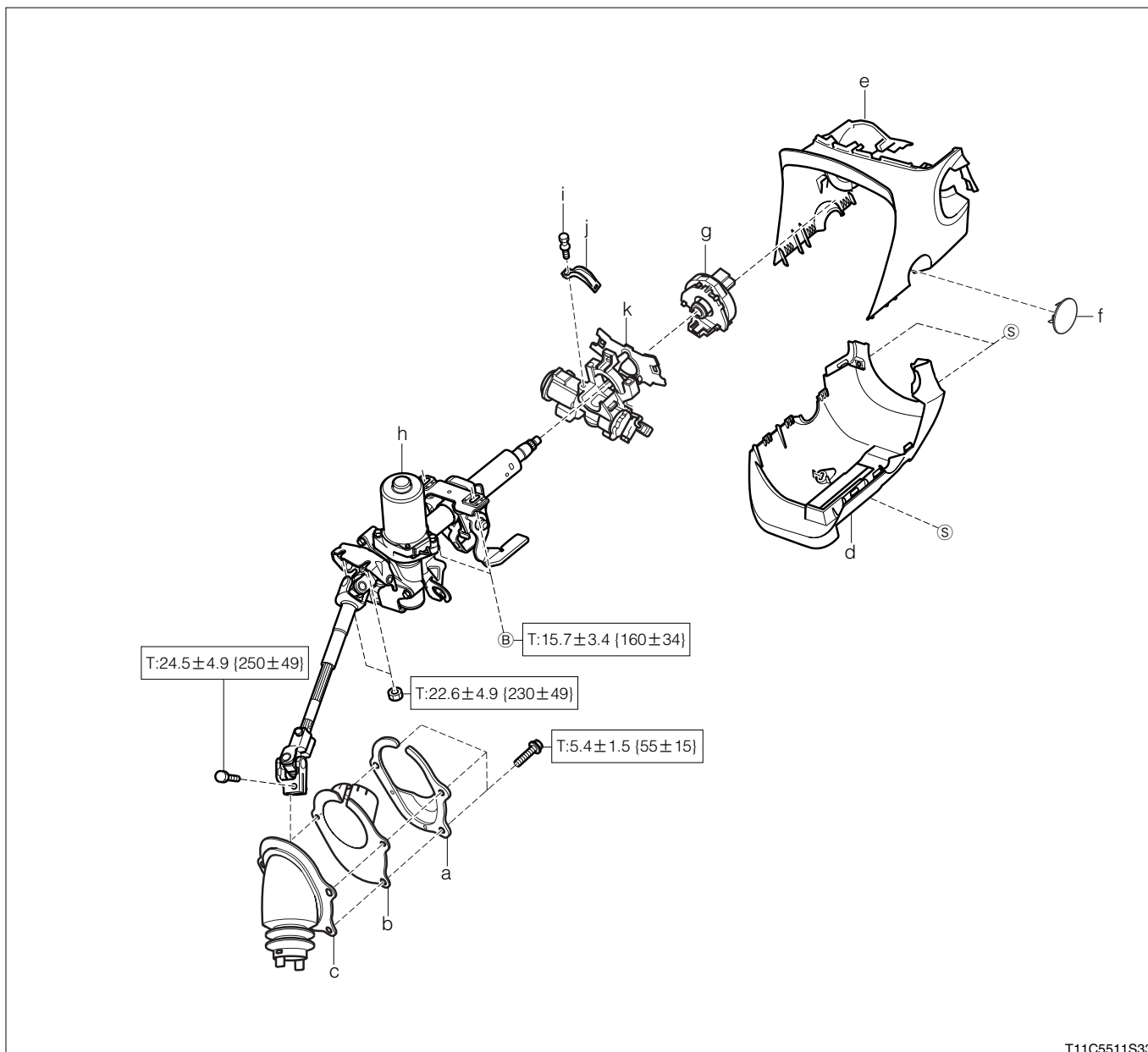
G1-5

3-1-2 OPERATION BEFORE REMOVAL

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery.
Leave the engine under this state for 60 seconds or more.
2. Remove the steering wheel pad Ay.
Refer to Page H1-1.
3. Remove the steering wheel S/A.
Refer to Page G1-2.
4. Remove the combination meter assembly.
Refer to Page J3-2.
5. Remove the instrument cluster finish panel.
Refer to Page I2-15.
6. Remove the instrument panel finish panel S/A lower.
Refer to Page I2-15.
7. Turn over the carpet near the dust cover retainer.
Refer to Page I2-47.

3-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



T11C5511S33

Unit: N·m {kgf·cm}

(2) Removal and installation procedures

▲ 1	a Retainer, dust cover	7	g Cable S/A, spiral
2	b Cover, dust	▼ ▲ 8	h Tube Ay, steering column
3	c Shield, steering column hole	9	i bolt, steering lock set
4	d Cover, steering column, lower	10	j Housing, steering column, upper
▼ 5	e Cover, steering column, upper	▼ ▲ 11	k Bracket Ay, steering column upper, w/switch
6	f Spacer, column cover		

3-1-4 POINTS OF REMOVAL

(1) Cover, steering column, upper

1. Unlock the operation lever of the tilt mechanism. Lower the steering column tube Ay fully and remove the cover.

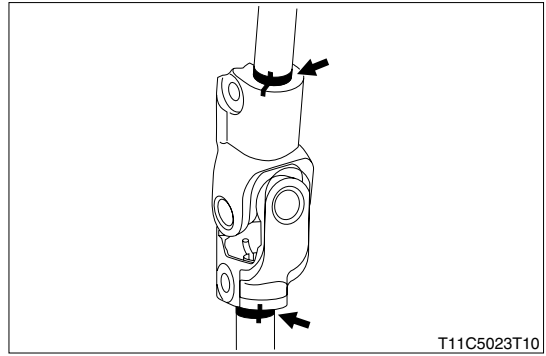
G1-7

(2) Tube Ay, steering column

1. Put mating marks on the joint section of the universal joint section.
2. Disconnect the connector of each harness.
3. Be sure to lock the operating lever of the tilt mechanism.
Then, remove the tube Ay.

CAUTION

- Do not operate the operating lever of the tilt mechanism when the tube Ay is in the unit state.



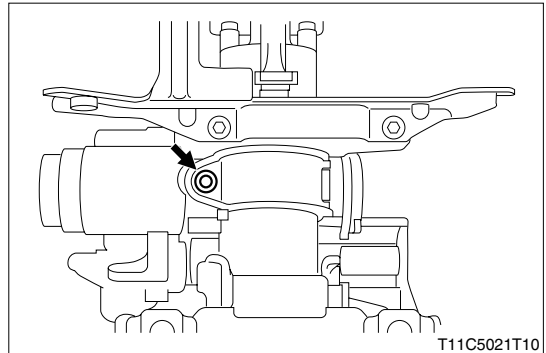
(3) Bracket Ay, steering column upper w/ switch

1. Remove the lever Ay in the following procedure.
 - (1) Make a hole, using a drill, to such an extent that the reverse tapping of the steering lock set bolt is possible.

TOOL: Center punch
Drill

- (2) Remove the steering lock set bolt, using the reverse tapping. Then, remove the lever assembly.

TOOL: Tap

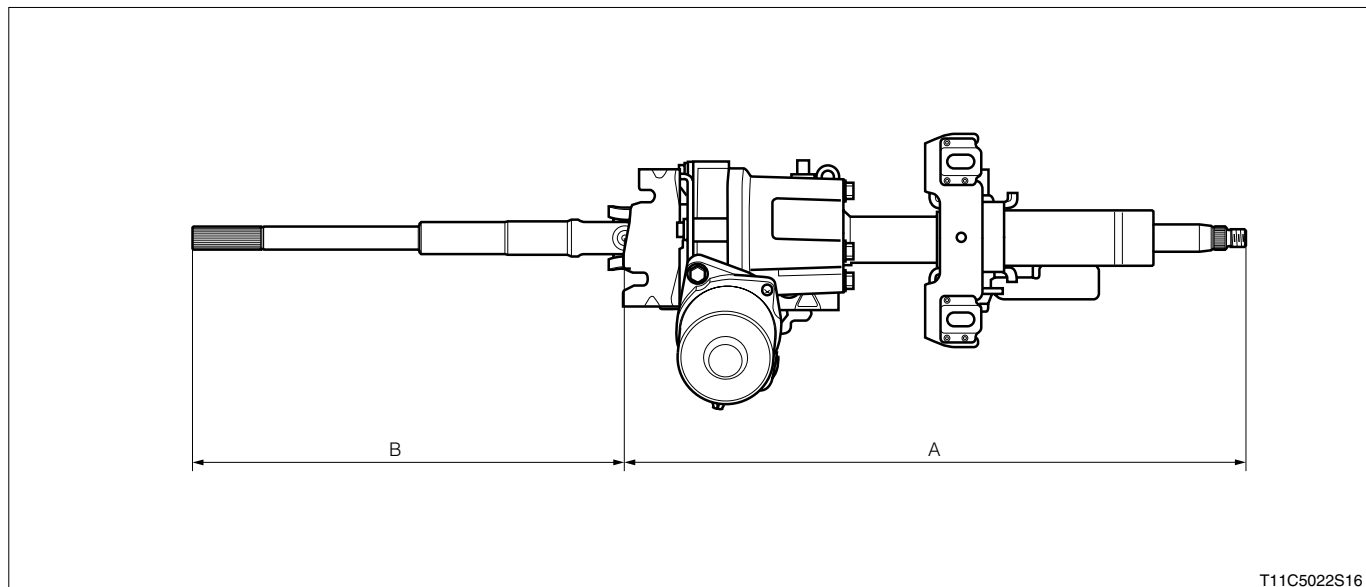


3-1-5 INSPECTION

(1) Tube Ay, steering column

Since the tube Ay has impact absorbing construction, measure the dimensions A and B shown in the figure below after the removal. If they are considerably short, replace the assembly.

SPECIFIED VALUE: A:430.7mm
B:301.0mm



3-1-6 POINTS OF INSTALLATION

(1) Bracket Ay, steering column upper w/switch

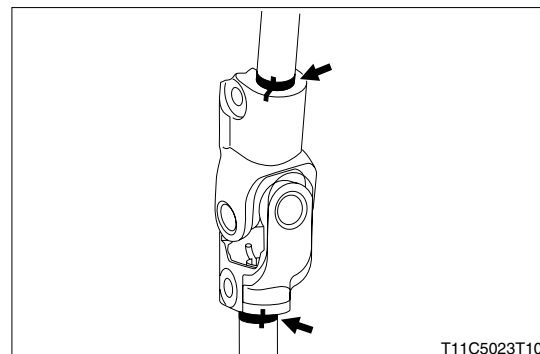
1. Install a new steering lock set bolt. Tighten it, until the head of the bolt is cut off.

(2) Tube Ay, steering column

1. Perform the installation while aligning the mating mark of the steering gear assembly with that of the tube assembly.

CAUTION

- Ensure that there are no foreign matters.



2. Ensure that the operating lever of the tilt mechanism is locked.

CAUTION

- Do not operate the operating lever of the tilt mechanism when the tube Ay is in the unit state.

NOTE

- If the tilt mechanism is operated, the impact absorption construction of the tube Ay is actuated during the installation and the tube Ay contracts.

3. Temporarily tighten the nut (a) of the lower side bracket of the tube Ay.
4. Temporarily tighten the bolt (b) of the upper side bracket of the tube Ay.
5. Completely tighten the nut (a) of the lower side bracket of the tube Ay. Then, completely tighten the bolt (b) of the upper side bracket.
6. Loosen the bolt (2) indicated in the right figure.
7. Temporarily install the bolts (1) and (2) shown in the right figure in this order. Then, tighten the bolts (1) and (2) again to the specified torque in this order.

TIGHTENING TORQUE: $24.5 \pm 4.9 \text{ N} \cdot \text{m}$
 $\{250 \pm 49 \text{ kgf} \cdot \text{cm}\}$

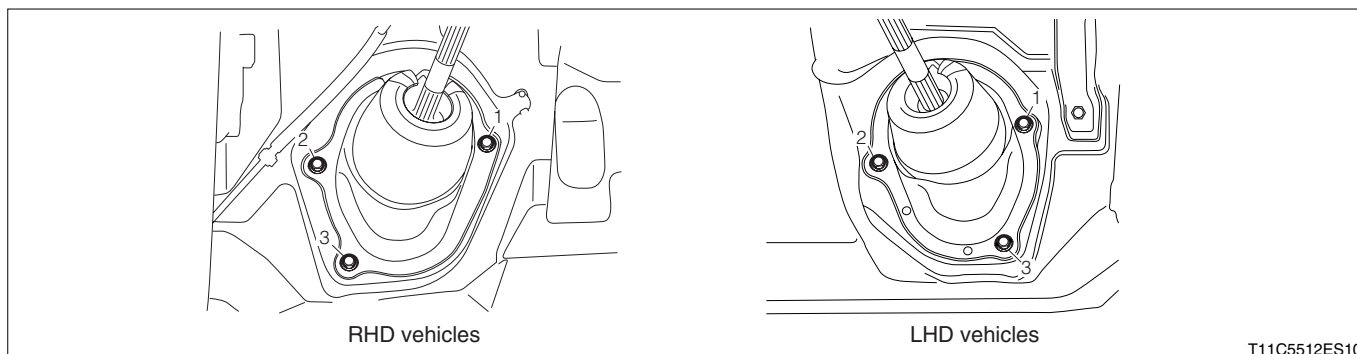
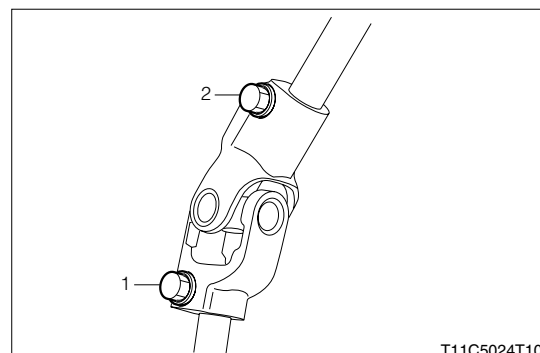
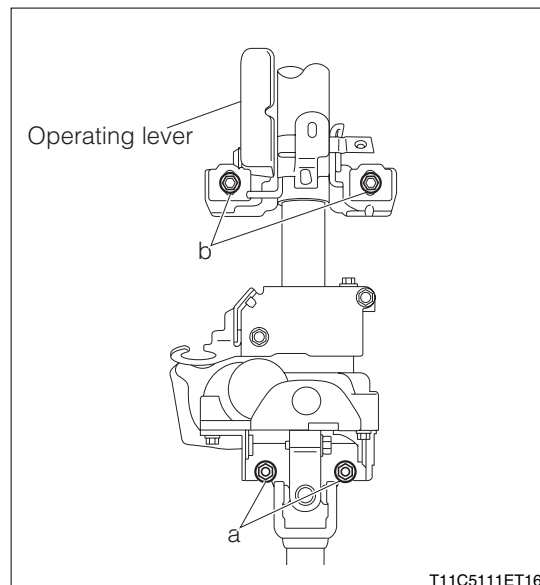
CAUTION

- Be sure to start the installation of bolts from the direction where the spot facing of the joint Ay is present.

8. Connect the connector to each harness, etc.

(3) Retainer, dust cover

1. Tighten the retainer attaching bolts to the specified torque in the sequence of (1), (2) and (3) as shown in the figure below.



G1-9

3-1-7 OPERATION AFTER INSTALLATION

1. Place the carpet near the dust cover retainer.
Refer to Page I2-47.
2. Install the instrument panel finish panel S/A lower.
Refer to Page I2-15.
3. Install the instrument cluster finish panel.
Refer to Page I2-15.
4. Install the combination meter assembly.
Refer to Page J3-2.
5. Install the steering wheel S/A.
Refer to Page G1-2.
6. Ensure that the steering wheel Ay is in the straight ahead condition.
7. Install the steering wheel pad Ay.
Refer to Page H1-1.
8. Connect the negative terminal of the battery.
9. After the IG SW has been set to "ON" position, ensure that the airbag warning lamp is illuminated for about 6 seconds and then remains extinguished afterward.

G2 POWER STEERING

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ELECTRONIC CONTROLLED POWER STEERING ---	G2—1
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STEERING GEAR-----	G2—1
REMOVAL AND INSTALLATION-----	G2—1
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G2-1

■

ELECTRIC POWER STEERING

1 ELECTRONIC CONTROLLED POWER STEERING

1-1 INSTRUCTIONS FOR SERVICE OPERATION

- CAUTION
- See the servicing instructions.

Refer to Page A1-10.

2 STEERING COLUMN

Refer to Page G1-4.

3 STEERING GEAR

3-1 REMOVAL AND INSTALLATION

3-1-1 ARTICLES TO BE PREPARED

SST

Shape	Part No.	Part name
	09628-00011-000 (09611-87701-000)	Puller, tie-rod end

Instrument

Torque wrench

Lubricant, adhesive, others

Wooden block

3-1-2 OPERATION BEFORE REMOVAL

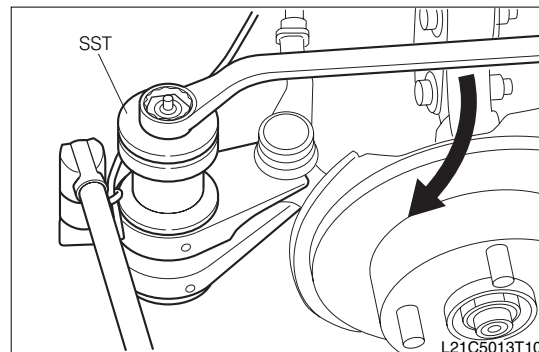
1. Separate the joint at the steering gear assembly side of the steering shaft universal joint assembly No.2.
2. Push out the steering column hole shield to the vehicle outside under a condition where it is attached to the steering gear assembly.
3. Lift up the vehicle.
4. Remove the disc wheels. (Front)
Refer to Page C3-2.
5. Remove the front RH/LH speed sensor from the RH/LH steering knuckle.
Refer to Page E3-3.
6. Remove the front RH/LH disc brake caliper Ay and hang it with a wire or the like.
Refer to Page E1-33.
7. Remove the Front disc.
Refer to Page E1-39.
8. Separate the stabilizer link from the suspension lower arm S/A RH/LH with bush.
Refer to Page C1-12.
9. Remove the nuts of the front drive shaft Ay RH/LH.
Refer to Page D2-8.
10. Using the SST, disconnect the RH/LH steering knuckle and ball joint section of the RH/LH tie rod end S/A.

CAUTION

- When setting the SST, attach a dummy nut to the threaded portion of the tie-rod end S/A RH/LH so that the threaded portion may not be damaged.
- Hang the SST using a cord.

SST: 09628-00011-000

11. Disconnect the front shock absorber Ay and RH/LH steering knuckle.
Refer to Page C1-5.
12. Pull out the RH/LH front drive shaft Ay from the RH/LH steering knuckle and hang it with a wire.
Refer to Page D2-15.
13. Using the SST, disconnect the RH/LH steering knuckle and ball joint section of the RH/LH suspension lower arm S/A with bush.



CAUTION

- When setting the SST, attach a dummy nut to the threaded portion of the RH/LH suspension lower arm S/A with bush so as to protect the threaded portion from damage.
- Hang the SST using a cord.

SST: 09628-00011-000

14. Remove the exhaust front pipe Ay.

Refer to Page B4-2.

15. Remove the transmission floor shift Ay. (M/T vehicle)

Refer to Page F2-10.

16. Apply a garage jack to the joint section between the engine Ay and the manual transaxle Ay/automatic transaxle Ay to support.

CAUTION

- When applying a garage jack, be sure to interpose a wooden block or cloth so as not to scratch the parts.
- Care should be exercised so that the engine will not get lowered while being supported by the garage jack.

17. Remove the bolts that secure the rear engine mounting bracket with the engine mounting control rod S/A.

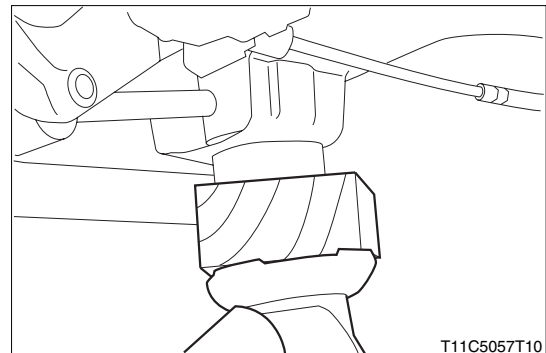
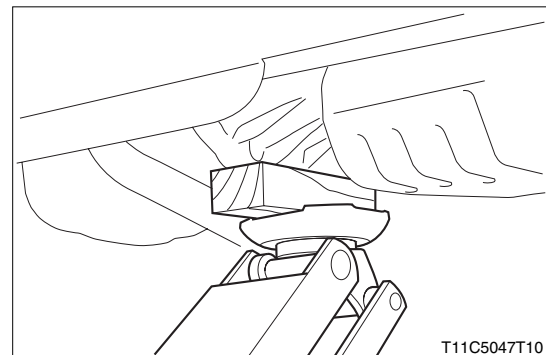
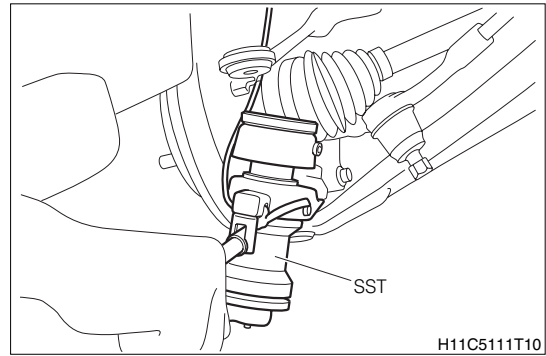
18. Apply a garage jack to the jack point of the front suspension cross member S/A.

CAUTION

- When applying a garage jack, be sure to interpose a wooden block or cloth so as not to scratch the parts.

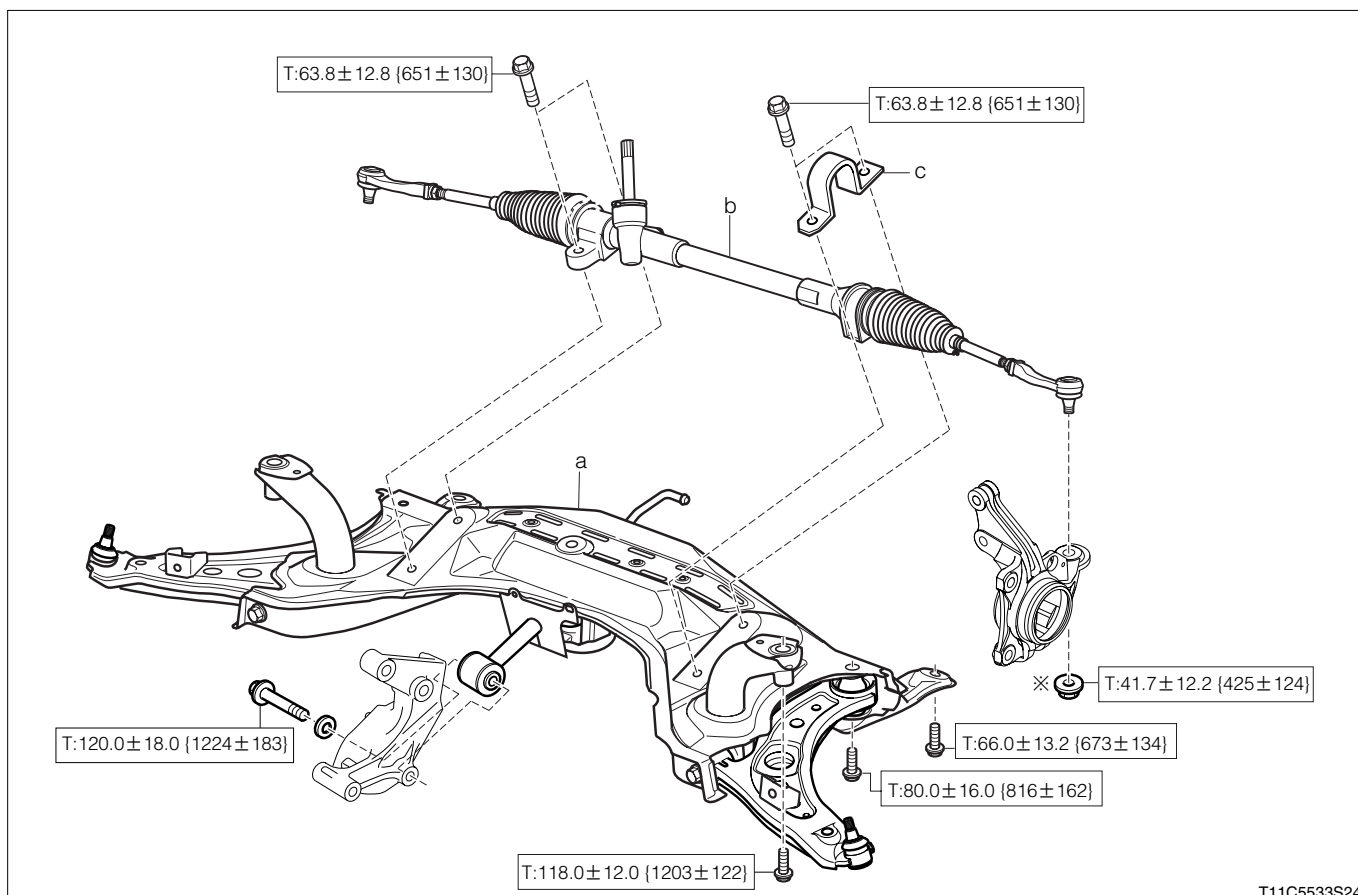
19. Remove the front suspension cross member S/A with the following parts installed.

- (1) Arm S/A, suspension lower w/bush, RH/LH
- (2) Gear Ay, steering
- (3) cover, engine mounting hole (Cold region specification vehicle)
- (4) Rod S/A, engine mounting control



3-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



※: Non-reusable parts

Unit: N·m{kgf·cm}

(2) Removal procedures

- 1 a Crossmember S/A, front suspension
- 2 b Gear assembly, steering
- 3 c Bracket, steering rack housing

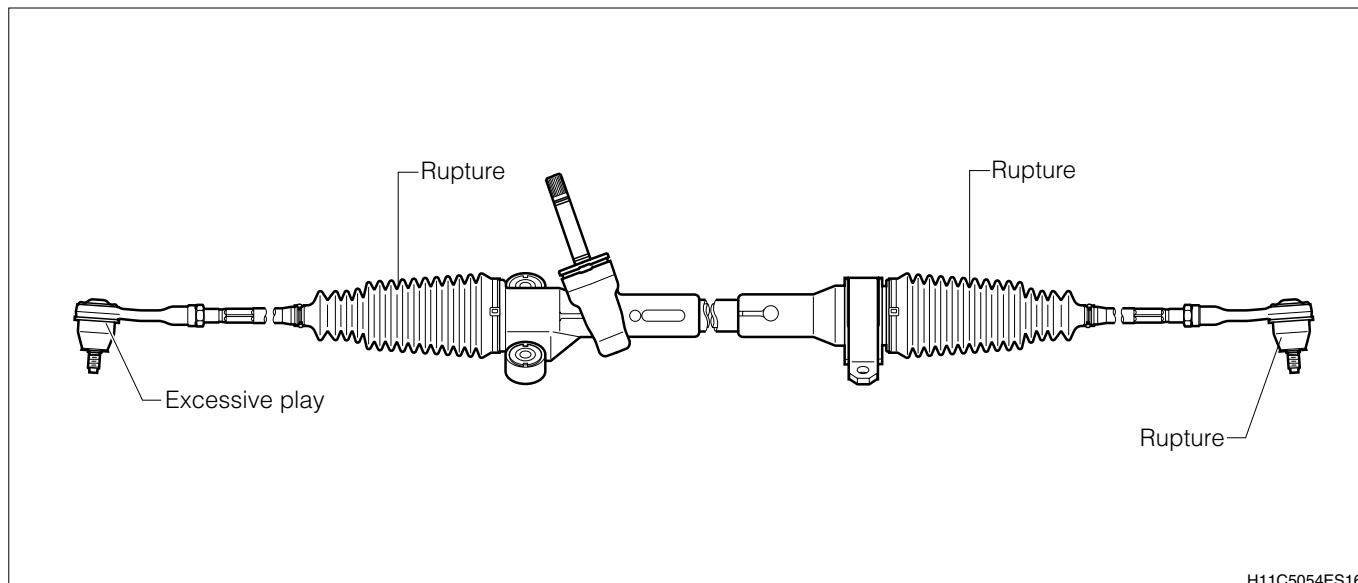
(3) Installation procedures

- 1 a Crossmember S/A, front suspension
- ▲ 2 c Bracket, steering rack housing
- ▲ 3 b Gear assembly, steering

G2-5

3-1-4 INSPECTION

1. Check the following items. Replace any faulty part.

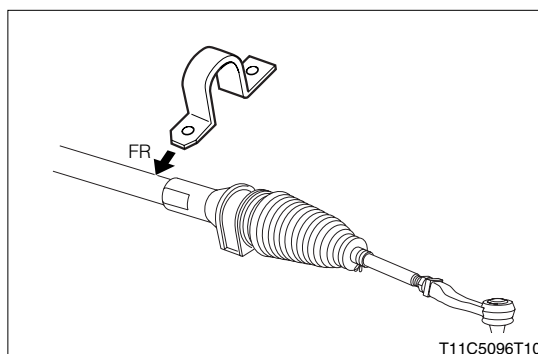


H11C5054ES16

3-1-5 POINTS OF INSTALLATION

(1) Bracket, steering rack housing

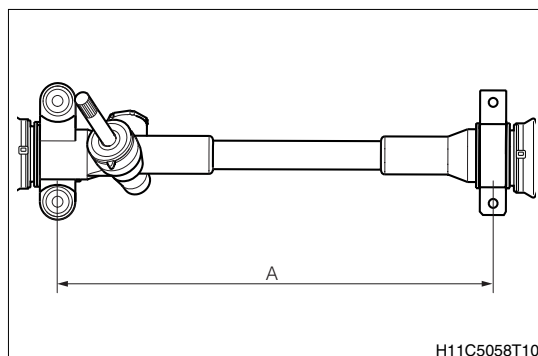
1. Install the bracket to the steering gear Ay in such a way that the side with a cut out section comes at the vehicle front.



T11C5096T10

NOTE

- If you are uncertain about the installation position of the bracket at the left side, the installation should be performed in such a way that the dimensions A indicated in the figure on the right becomes 502 ± 1 mm from the reference point of the installation hole on the power steering rack housing assembly.



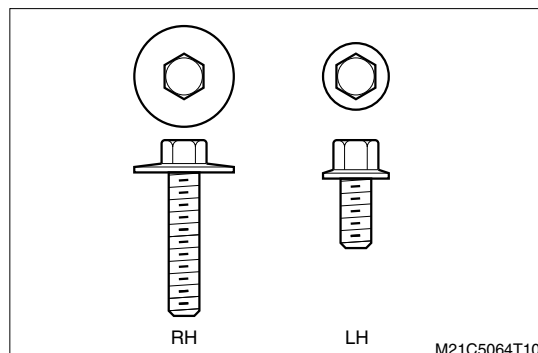
H11C5058T10

(2) Gear Ay, steering

1. Install the gear Ay to the front suspension cross member S/A.

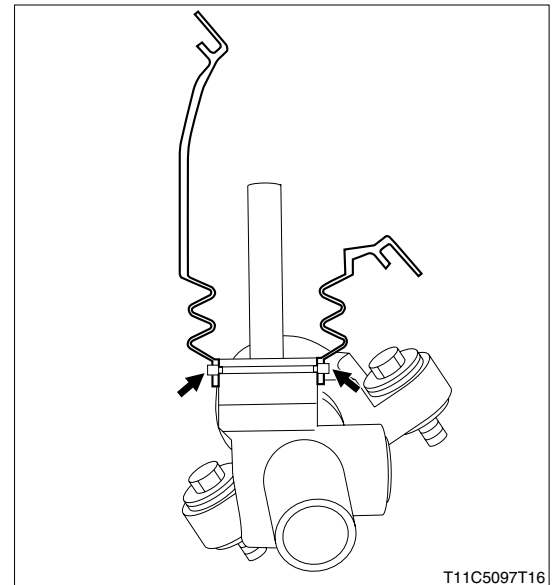
CAUTION

- Make sure that the right and left attaching bolts are installed at the correct positions, for the right and left bolts are different from each other.



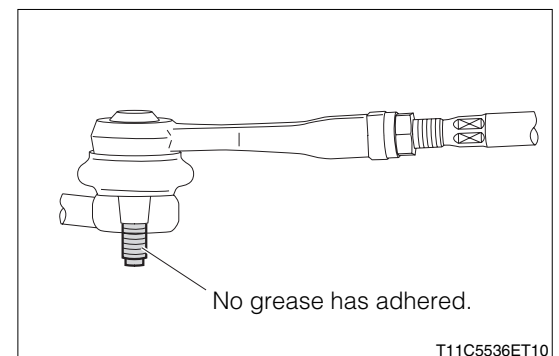
M21C5064T10

2. Install the steering column hole shield to the protrusion of the gear Ay.
3. Install the ball joint section of the RH/LH steering tie rod end S/A to the RH/LH steering knuckle.



CAUTION

- Ensure that no oil nor grease gets to the ball joint section of the RH/LH steering tie-rod end S/A. If any oil or grease gets to that section, degrease there completely.



3-1-6 OPERATION AFTER INSTALLATION

1. With the following parts installed to the front suspension cross member S/A, support them with a garage jack. While positioning them correctly, installed them to the vehicle.
 - (1) Arm S/A, suspension lower w/bush, RH/LH
 - (2) Gear Ay, steering
 - (3) cover, engine mounting hole (Cold region specification vehicle)
 - (4) Rod S/A, engine mounting control

G2-7

2. Apply a garage jack to the joint section between the engine Ay and the manual transaxle Ay/ to support.

CAUTION

- When applying a garage jack, be sure to interpose a wooden block or cloth so as not to scratch the parts.
- Care should be exercised so that the engine will not get lowered while being supported by the garage jack.

3. Tighten the bolts connecting the engine mounting rear bracket and engine mounting control rod S/A.
Refer to Page B12-4.
4. Install the transmission floor shift Ay. (M/T vehicle)
Refer to Page F2-10.
5. Install the exhaust front pipe Ay.
Refer to Page B4-2.
6. Adjust the installation dimensions of the RH/LH suspension lower arm S/A with bush.
Refer to Page C1-5.
7. Install the ball joint section of the RH/LH suspension lower arm S/A with bush to the RH/LH steering knuckle.
Refer to Page C1-5.
8. Insert the RH/LH front drive shaft Ay to the RH/LH steering knuckle.
Refer to Page D2-15.
9. Install the RH/LH steering knuckle to the front shock absorber Ay.
Refer to Page C1-5.
10. Install the ball joint section of the RH/LH steering tie rod end S/A to the RH/LH steering knuckle.
11. Tighten the nut of the RH/LH front drive shaft Ay.
Refer to Page D2-8.
12. Install the stabilizer link to the suspension lower arm S/A with bush RH/LH.
Refer to Page C1-12.
13. Install the front disk.
Refer to Page E1-39.
14. Install the disk brake caliper Ay front RH/LH.
Refer to Page E1-33.
15. Install the front RH/LH speed sensor to the RH/LH steering knuckle. (ABS-equipped vehicles)
Refer to Page E3-3.
16. Install the disc wheels. (Front)
Refer to Page C3-2.
17. Lift down the vehicle.
18. Install the No.2 steering shaft universal joint Ay to the steering gear Ay.
Refer to Page G2-1.

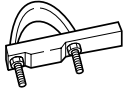
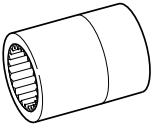
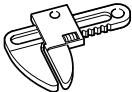
19. Check and adjust the front wheel alignment.

Refer to Page C1-2.

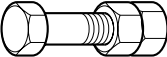
3-2 DISASSEMBLING AND ASSEMBLING

3-2-1 ARTICLES TO BE PREPARED

SST

Shape	Part No.	Part name
	09612-00012-000 (09612-00011-000)	Stand, rack & pinion steering rack housing
	09616-87701-000	Socket, steering pinion bearing adjusting
	09922-10010-000	Wrench, steering rack end

Tool

Shape	Part No.	Part name	Use
	—	Simplified spinner	Screw two nuts which across flats is 17mm into a bolt and fix them as double nut.

Instrument

Torque wrench

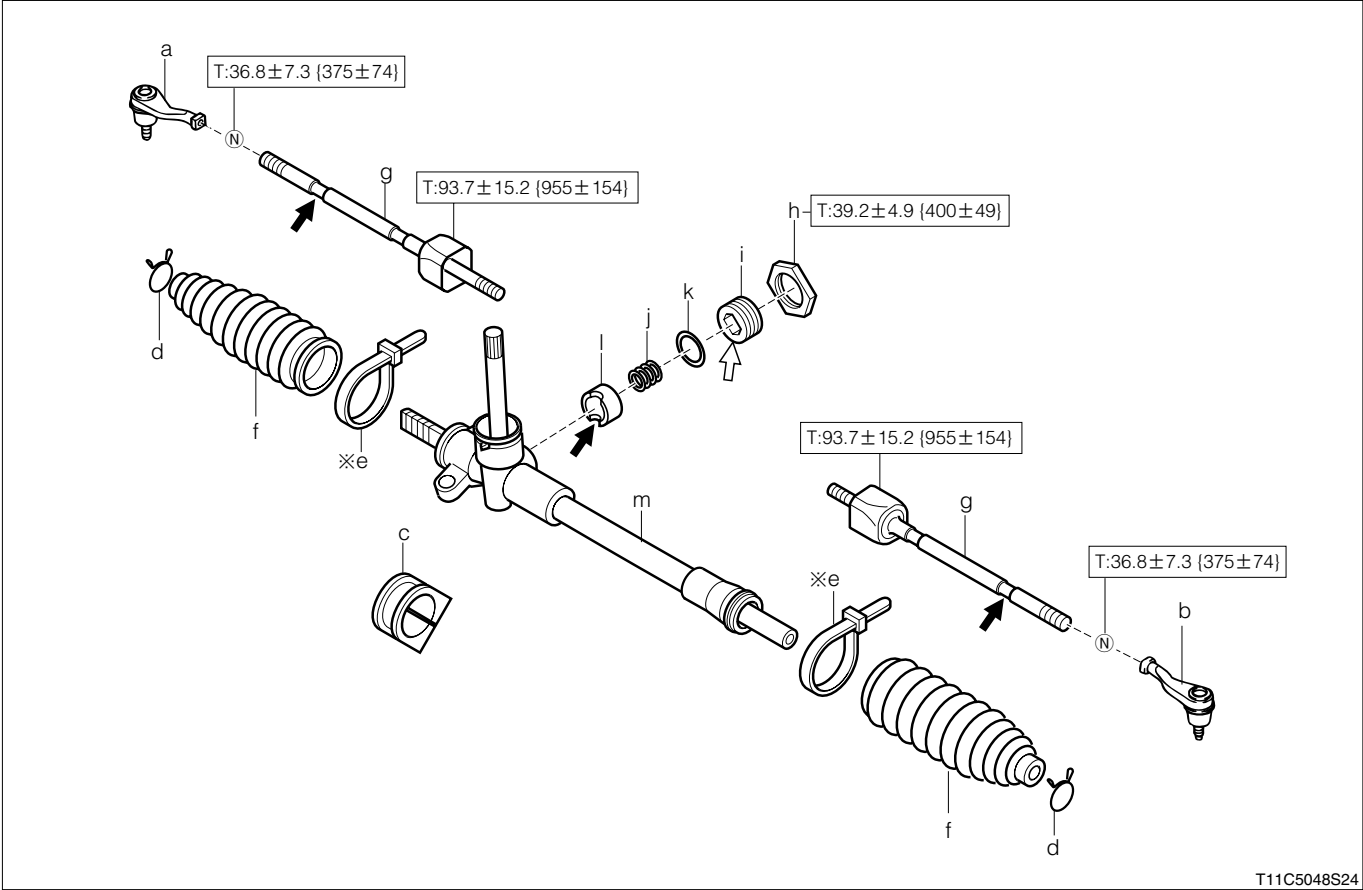
Lubricant, adhesive, others

Molybdenum disulphide lithium base grease, EP (Extreme Pressure) grease, Wire

G2-9

3-2-2 DISASSEMBLY AND ASSEMBLY PROCEDURES

(1) Components



T11C5048S24

※: Non-reusable parts

Unit: N·m{kgf·cm}

➡: Molybdenum disulphide lithium base grease

⇨: EP grease

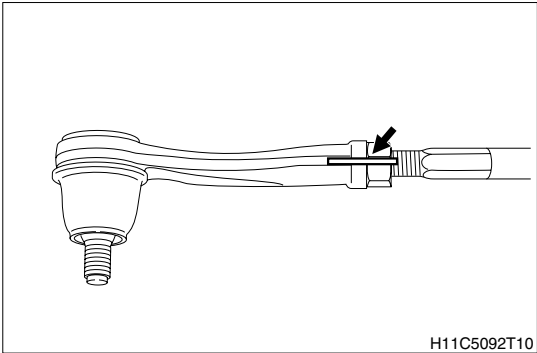
(2) Disassembling and assembling procedure

▼ ▲ 1	a End S/A, tie rod, RH	▼	8	h Nut, lock
▼ ▲ 2	b End S/A, tie rod, LH	▼ ▲ 9	i	Cap, rack guide spring
▼ ▲ 3	c Grommet, steering rack housing, No.1	10	j	Spring, compression
4	d Band, steering rack boot, No.2	▲ 11	k	Washer, conical spring
5	e Band, steering rack boot	▲ 12	l	Guide, rack
▼ ▲ 6	f Boots, steering rack, No.1	▲ 13	m	Housing S/A, steering rack
▼ ▲ 7	g End S/A, steering rack			

3-2-3 POINTS OF DISASSEMBLY

(1) End S/A, steering tie rod, RH/LH

1. In order to distinguish the right and left of the end S/A and steering rack end S/A, put mating marks.



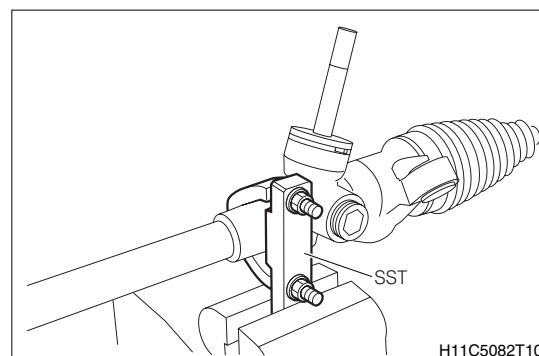
H11C5092T10

2. By applying the SST to the steering rack housing section of the steering gear Ay, secure the steering gear Ay to a vice and remove the end S/A.

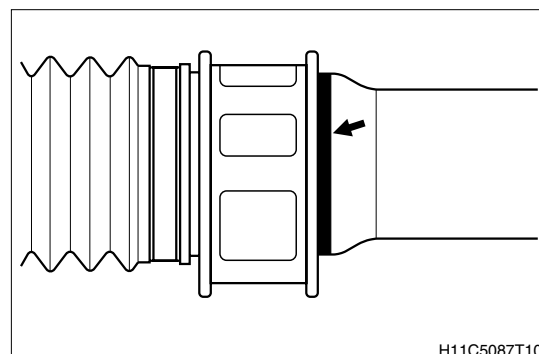
CAUTION

- Do not secure the rack housing section of the steering gear assembly directly in a vice.

SST: 09612-00012-000

**(2) Grommet, steering rack housing, No.1**

1. Before removing the grommet, put mating marks on the steering rack housing S/A so that the installation position of the grommet can be known easily.

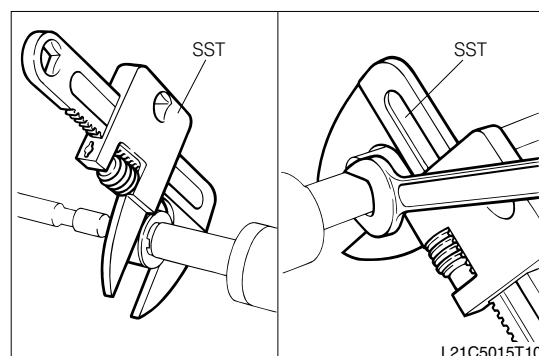
**(3) Boots, steering rack, No.1**

1. Remove the boot by removing the No.2 steering rack boot band and steering rack boot band. (Both right and left)

(4) End S/A, steering rack

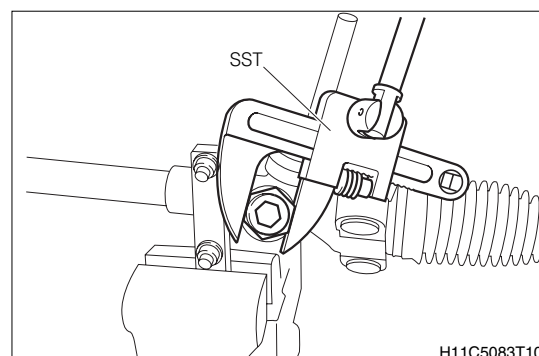
1. Remove the end subassembly, using the SST in combination with a spanner. (Both right and left sides)

SST: 09922-10010-000

**(5) Nut, hexagon**

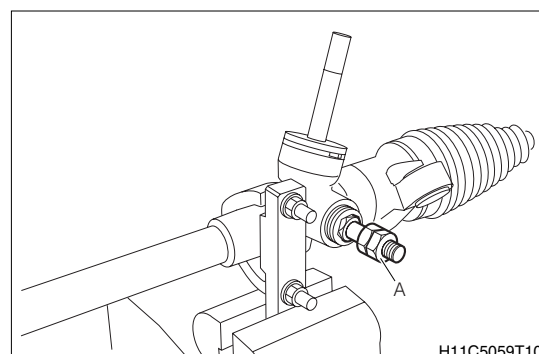
1. Remove the nut, using the SST.

SST: 09922-10010-000

**(6) Cap, rack guide spring**

1. Remove the cap, using a simplified spinner.

TOOL: Simplified spinner:A



G2-11

3-2-4 INSPECTION

(1) Grommet, steering rack housing, No.1

1. Check the following parts. Replace any faulty part.

- (1) grommet for cracks and damage

(2) End S/A, tie rod, RH/LH

1. Check the following parts. Replace any faulty part.

- (1) Check the dust boot of end S/A for rupture and ball joint for unsmooth operation

(3) Boot, steering rack, No.1

1. Check the following parts. Replace any faulty part.

- (1) Boot for cracks, damage and aging

(4) End S/A, steering rack

1. Check the following items. Replace any faulty part.

- (1) End subassembly ball for excessive play and non-smooth operation

- (2) End subassembly for foreign matter and grease for discoloration

- (3) Tie-rod section of End subassembly for bending and cracks

(5) Guide, rack

1. Check the following parts. Replace any faulty part.

- (1) Check the guide sliding surface seat for abnormal wear.

(6) Housing S/A, steering rack

1. Check the following items. Replace any faulty part.

- (1) Housing subassembly for cracks and damage

- (2) Harmful scores in groove where large-diameter boot is assembled

3-2-5 POINTS OF ASSEMBLY

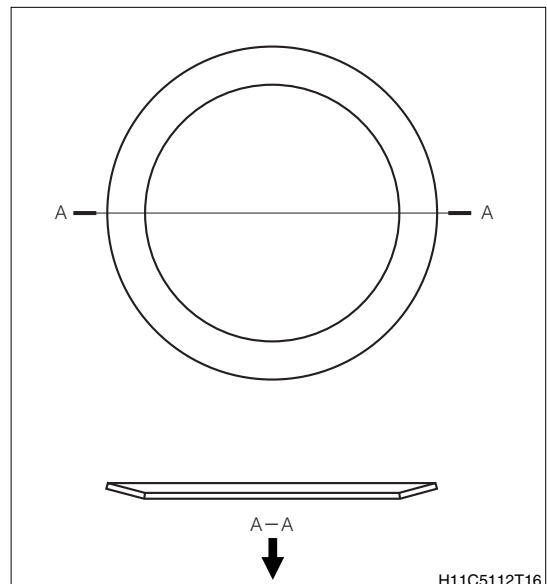
(1) Guide, rack

1. Apply long-life grease to the inside of the guide (Contact surface with the rack shaft). Then, install the steering rack housing subassembly.

LUBRICANT: Molybdenum disulphide lithium base grease

(2) Washer, conical spring

1. Install the washer in such a way that the arrow in the right figure faces the rack guide spring cap side.



(3) Cap, rack guide spring

1. Apply EP grease to between the cap and conical spring washer.

LUBRICANT: EP(Extreme Pressure) grease

2. Insert the compression spring to the rack guide. Install the cap and temporarily tighten.

3. Adjust the preload.

- (1) Using a simplified spinner, tighten the cap to the specified torque.

TOOL: Simplified spinner:A

TIGHTENING TORQUE: $12.3 \pm 2.0 \text{ N} \cdot \text{m}$
 $\{125 \pm 20 \text{ kgf} \cdot \text{cm}\}$

- (2) From the state in the step (1) above, back off the cap about 45° .

- (3) Operate the steering rack once or twice in the full stroke by turning the steering pinion, using the SST. In this way, the steering rack is bedded in.

CAUTION

- Be careful not to allow the end surface of the steering rack housing S/A to enter into the inside beyond the end surface of the steering rack bush.

SST: 09616-87701-000

- (4) Loosen the cap with a simple spinner until the compression spring of the rack guide no longer works.

CAUTION

- Loosen the end surface of the steering rack housing S/A by pushing it by hand until it can move smoothly.

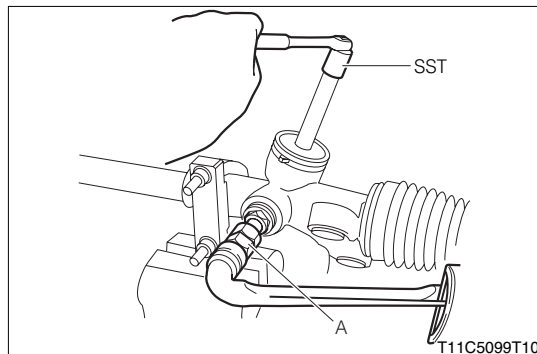
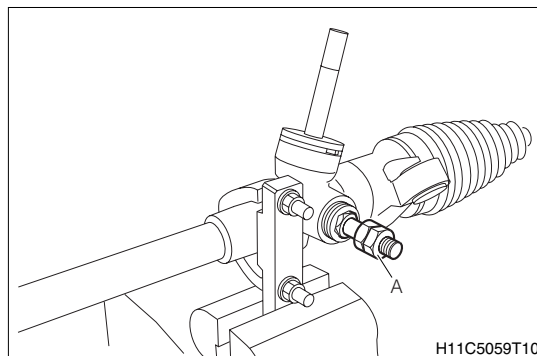
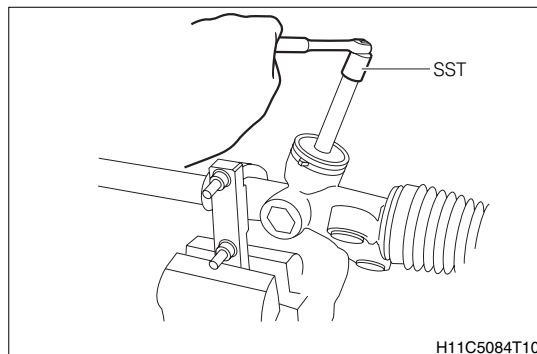
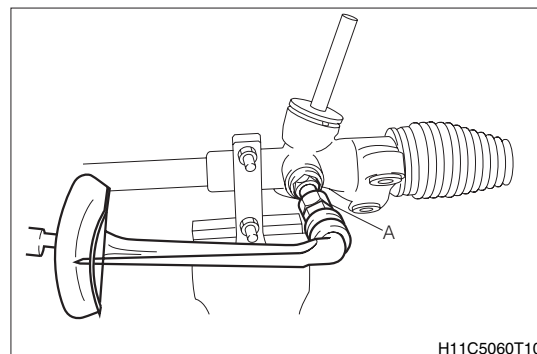
TOOL: Simplified spinner:A

- (5) Turn the steering pinion, using the SST. At this time, tighten the cap so that the preload during turning may conform to the specified value.

SST: 09616-87701-000

TOOL: Simplified spinner:A

SPECIFIED VALUE: $1.03 \pm 0.25 \text{ N} \cdot \text{m}$ $\{10.5 \pm 2.5 \text{ kgf} \cdot \text{cm}\}$ (During turning)



G2-13

- (6) With the SST, tighten the hexagon nut (For the cap) to the specified torque.

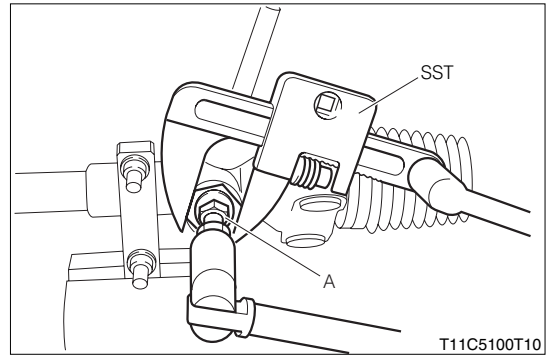
SST: 09922-10010-000

TOOL: Simplified spinner:A

NOTE

- When tightening is made by extending the overall length by combining the torque wrench with the SST, tools, etc., obtain the reading of the torque wrench by the calculation formula.

Refer to Page A1-9.



- (7) Turn the steering pinion again, using the SST. At this time, ensure that the preload during turning conforms to the specified value.

SST: 09616-87701-000

SPECIFIED VALUE: $1.03 \pm 0.25 \text{ N} \cdot \text{m}$ { $10.5 \pm 2.5 \text{ kgf} \cdot \text{cm}$ } (During turning)

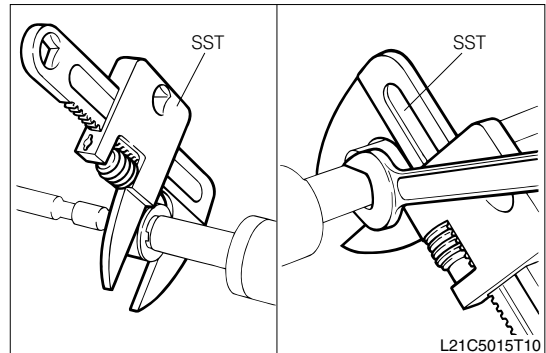
(4) End S/A, steering rack

1. Install the end subassembly and tighten it to the specified torque, using the SST in combination with a spanner.

CAUTION

- While tightening, be very careful not to twist the end subassembly.

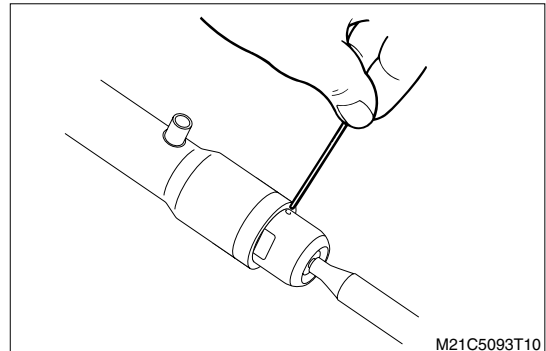
SST: 09922-10010-000



2. Insert a wire (Outer diameter of approx. 2 mm, length of approx. 50 mm) into the vent hole of the end S/A to see if the vent hole is clogged with grease.

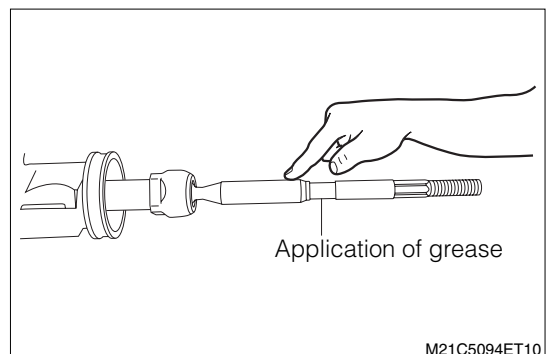
NOTE

- The vent hole of the end subassembly equalizes pressure difference in both sides of the steering rack boot No.1 right and left. For this reason, if the vent hole is blocked, the pressure in the steering rack boot No.1 when the steering is turned may vary so that the steering rack boot No.1 may be deflected or broken.



3. Apply long-life grease to the steering rack boot No.1 installation groove of the end subassembly.

LUBRICANT: Molybdenum disulphide lithium base grease



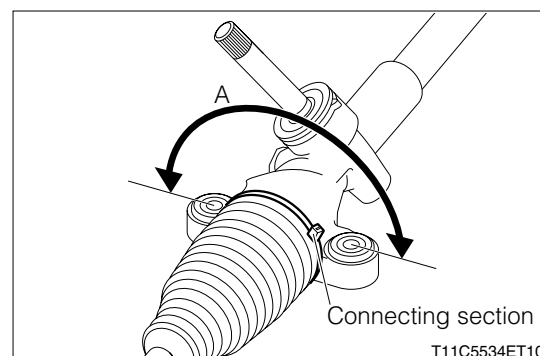
(5) Boot, steering rack, No.1

1. Attach the steering rack boot band to the steering rack housing subassembly. Then, install the boot.

- Secure fully by means of the steering rack boot band that has already been installed.

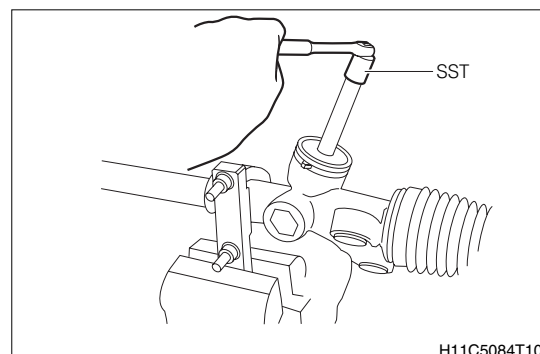
CAUTION

- When installing the steering gear Ay, make sure that the connecting section of the steering rack boots band comes within the range (A) so that the connecting section of the steering rack boots band may not contact the front suspension crossmember S/A.

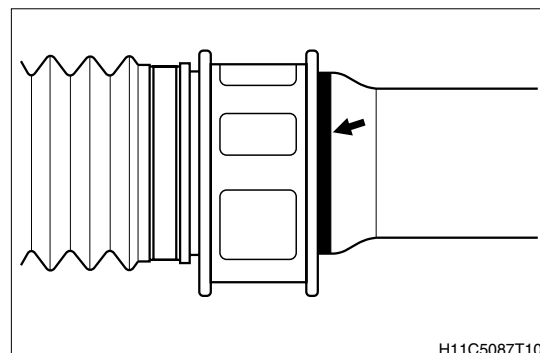


- With the SST, turn the steering pinion to see if the boot can be smoothly extended or contracted.

SST: 09616-87701-000

**(6) Grommet, steering rack housing, No.1**

- Install the grommet LH, while referring to the mating mark that has been put during the disassembling.

**(7) End S/A, steering tie rod RH/LH**

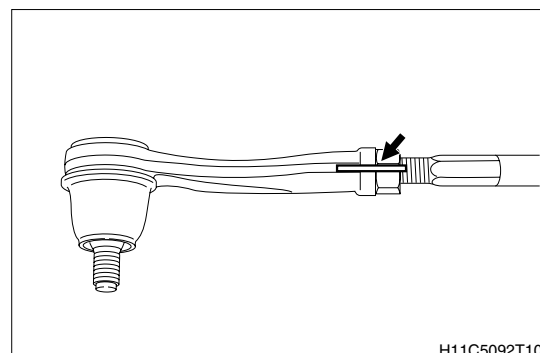
- By referring to the mating marks put during the removal of the end S/A, temporarily install the end S/A correctly, being careful not to mistake the right side for the left side.

CAUTION

- While tightening, be very careful not to twist the steering rack end subassembly.
- After the steering gear assembly has been mounted on the vehicle, fully tighten the nut of the end S/A at the time of adjusting the front wheel alignment.

- Remove the SST for securing the steering rack housing subassembly.

SST: 09612-00012-000



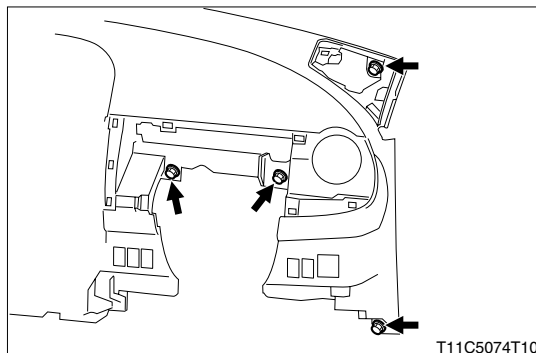
G2-15

4 EPS COMPUTER

4-1 REMOVAL AND INSTALLATION (RHD VEHICLES)

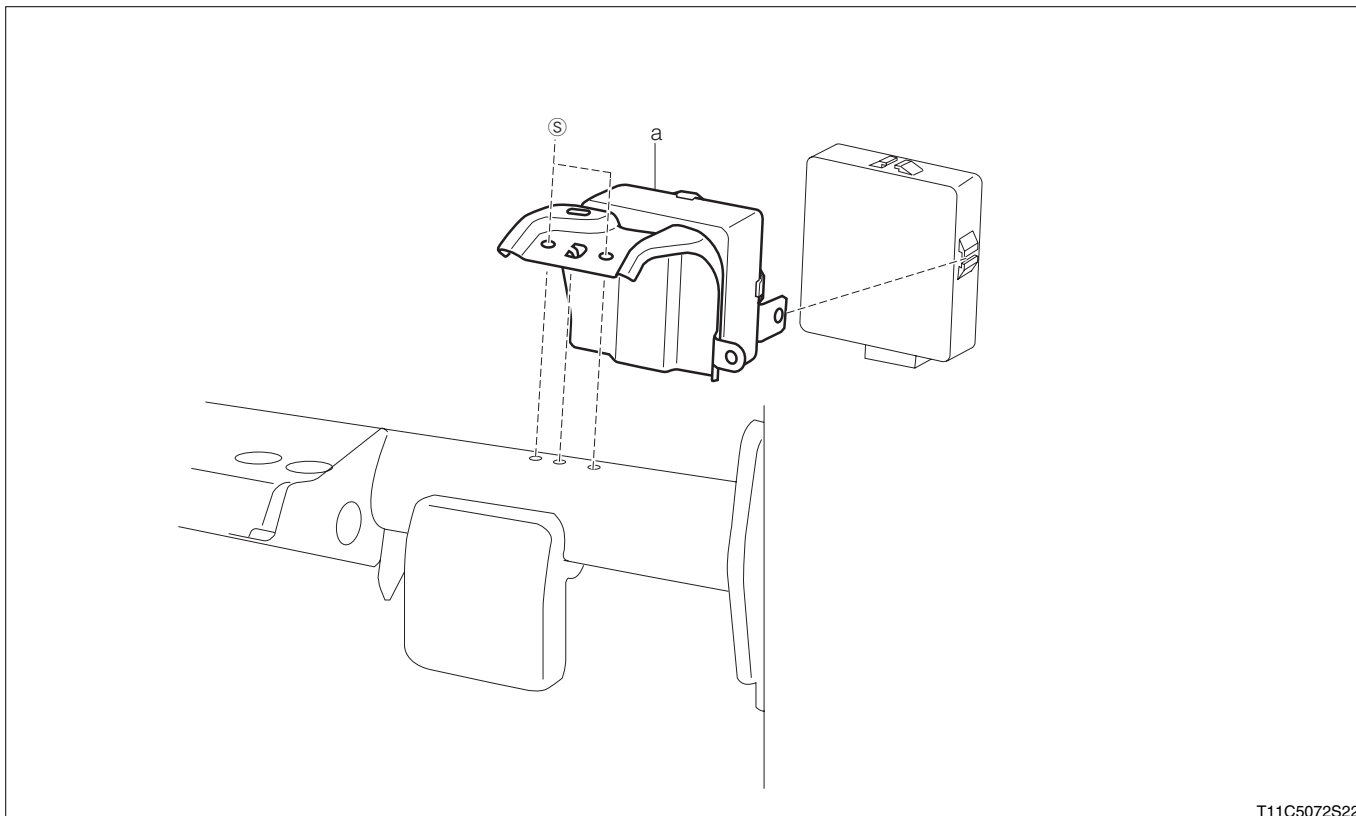
4-1-1 OPERATION BEFORE REMOVAL

1. After setting IG SW "LOCK" position, disconnect the negative (-) terminal of the battery.
2. Remove the instrument panel finish panel S/A lower.
Refer to Page I2-15.
3. Remove the steering column lower cover.
Refer to Page G1-4.
4. Remove the combination meter assembly.
Refer to Page J3-2.
5. Remove the instrument cluster finish panel.
Refer to Page I2-15.
6. Remove the steering column upper cover.
Refer to Page G1-4.
7. Remove the front pillar garnish RH/LH.
Refer to Page I2-39.
8. Remove the grille speaker RH.
Refer to Page I2-15.
9. Remove each connector.
10. Remove the bolts and screws shown in the right figure.
Raise the instrument panel.
Refer to Page I2-15.



4-1-2 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



T11C5072S22

(2) Removal and installation procedures

- 1 a Computer Ay, power steering

4-1-3 OPERATION AFTER INSTALLATION

1. Install the instrument panel.
Refer to Page I2-15.
2. Install each connector.
3. Install the speaker grille RH.
Refer to Page I2-15.
4. Install the front pillar garnish RH/LH.
Refer to Page I2-39.
5. Install the steering column upper cover.
Refer to Page G1-4.
6. Install the instrument cluster finish panel.
Refer to Page I2-15.
7. Install the combination meter assembly.
Refer to Page J3-2.
8. Install the steering column lower cover.
Refer to Page G1-4.
9. Install the instrument panel finish panel S/A lower.
Refer to Page I2-15.
10. After setting IG SW "LOCK" position, connect the negative (—) terminal of the battery.

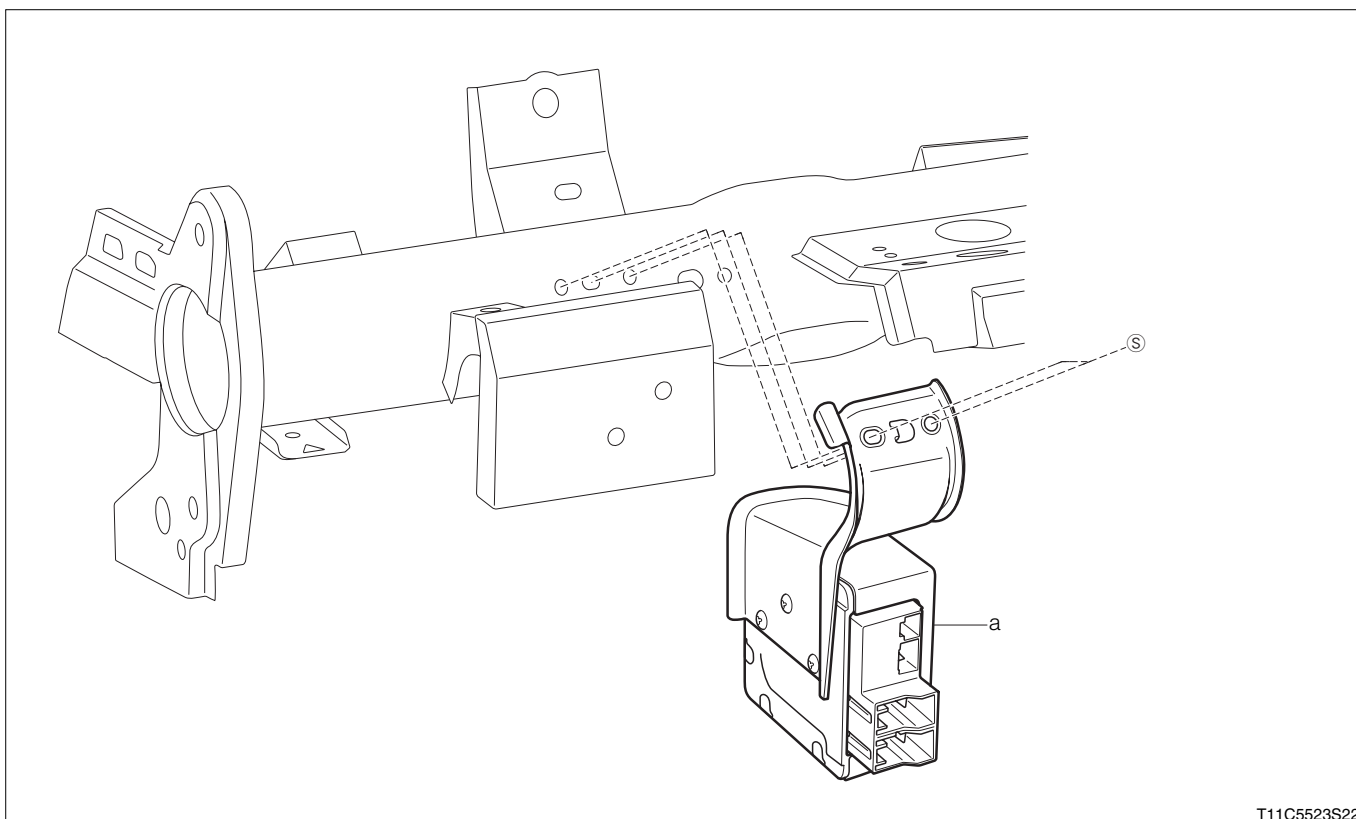
4-2 REMOVAL AND INSTALLATION (LHD VEHICLES)

4-2-1 OPERATION BEFORE REMOVAL

1. After setting IG SW "LOCK" position, disconnect the negative (—) terminal of the battery.
2. Remove the instrument panel finish panel S/A lower.
Refer to Page I2-15.
3. Remove the steering column lower cover.
Refer to Page G1-4.
4. Remove the combination meter assembly.
Refer to Page J3-2.
5. Remove the instrument cluster finish panel.
Refer to Page I2-15.
6. Remove the steering column upper cover.
Refer to Page G1-4.
7. Remove the fuse box opening cover.
Refer to Page I2-15.
8. Remove each connector.

4-2-2 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



T11C5523S22

(2) Removal and installation procedures

- 1 a Computer Ay, power steering

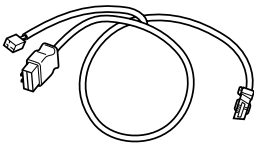
4-2-3 OPERATION AFTER INSTALLATION

1. Install each connector.
2. Install the fuse box opening cover
Refer to Page I2-15.
3. Install the steering column upper cover.
Refer to Page G1-4.
4. Install the instrument cluster finish panel.
Refer to Page I2-15.
5. Install the combination meter assembly.
Refer to Page J3-2.
6. Install the steering column lower cover.
Refer to Page G1-4.
7. Install the instrument panel finish panel S/A lower.
Refer to Page I2-15.
8. After setting IG SW "LOCK" position, connect the negative (—) terminal of the battery.

5 CONTROL SYSTEM

5-1 ARTICLES TO BE PREPARED

SST

Shape	Part No.	Part name
	09991-87404-000 (09991-87401-000)	Wire,engine control system inspection
	09991-87403-000	Wire,diagnosis check

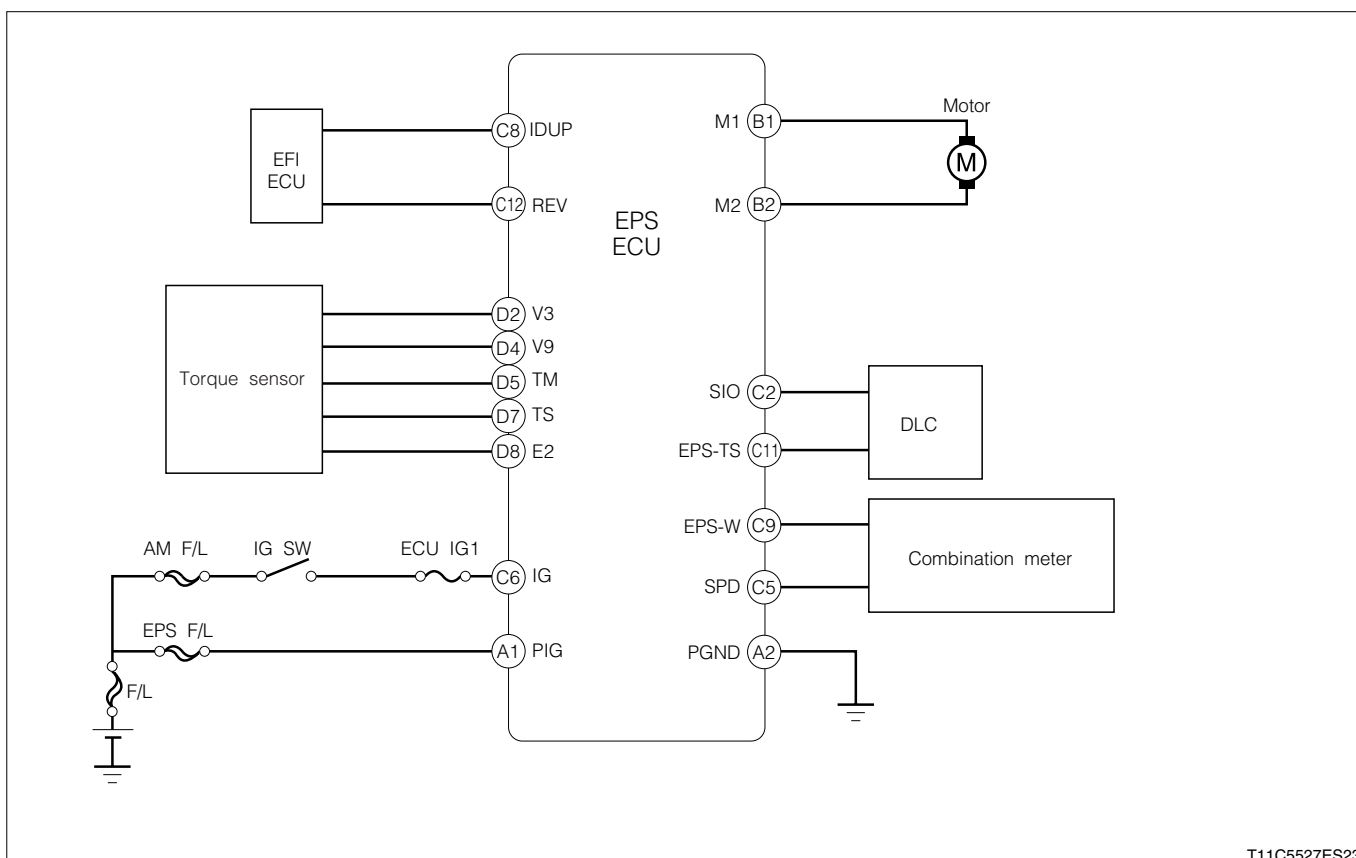
Instrument

Spring separates ,Electrical tester

5-2 HANDLING INSTRUCTIONS OF CONTROL SYSTEM

1. Since the sensors are precision parts, be careful not to allow great shocks to apply to the parts during the removal and installation. Never use the parts which have been subjected to great shocks (E.g. parts dropped on to the floor).
2. Do not disassemble the EPS ECU steering column.
3. When carrying the steering column, be very careful not to pull the harness. Rather, be certain to hold the motor section or housing section.
4. Never apply an excessive force or an impact to the steering column in the axial direction and turning direction.
5. Never use the steering column if a strong impact has been applied to it, especially to the motor section, torque sensor section and EPS ECU (Cases where the part has been dropped onto the floor or the motor section has a dent).
6. Utmost care must be exercised so that no water may be admitted during the checks in rainy weather or when washing the vehicle (Especially when washing the vehicle interior). Also, care should be paid so that no water may be splashed on the steering column, each sensor, EPS ECU, etc.
7. Except during the abnormality check of the system, connecting / disconnecting the connector should be carried out only after the battery negative (-) terminal is removed.
8. If the EPS ECU is judged abnormal and the vehicle resumes the normal operation after replacing the EPS ECU, install the EPS ECU that was removed (Judged abnormal) and confirm that the initial abnormality is reproduced. If it is reproduced, make a final judgment that the EPS ECU is faulty.
9. After installing the steering column and EPS ECU, confirm that each bolt is securely installed and the connector is securely connected.
10. When a wireless device is installed, take the following precautions.
 - (1) The antenna should be installed at the farthest position from the EPS ECU.
 - (2) The feeder of the antenna should be routed as far away as possible (Minimum distance: 30 cm) from the steering column and wire harness. Also, make certain to avoid routing the feeder for a long distance in parallel with these parts.
 - (3) The antenna should be matched well.
 - (4) Do not install wireless devices with a high output.

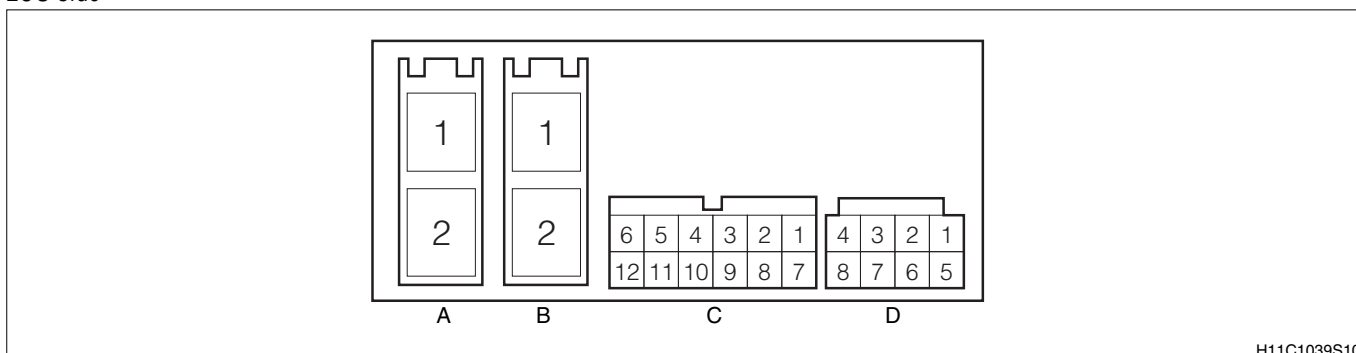
5-3 SYSTEM WIRING DIAGRAM



T11C5527ES23

5-4 ARRANGEMENT OF ECU TERMINAL

ECU side



H11C1039S10

Connector A

Terminal No.	Terminal code	Terminal name
1	PIG	Battery power supply
2	PGND	Battery earth

Connector B

Terminal No.	Terminal code	Terminal name
1	M1	Motor output 1
2	M2	Motor output 2

G2-21

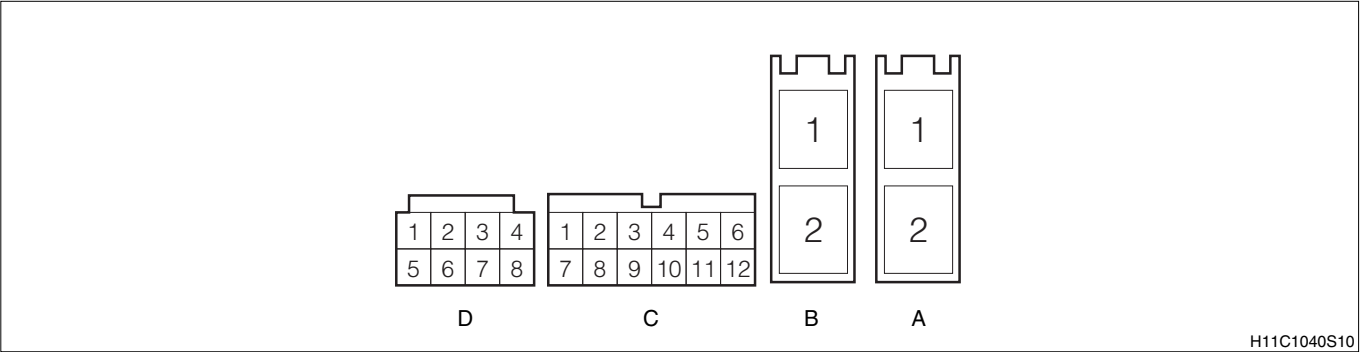
Connector C

Terminal No.	Terminal code	Terminal name
1	—	—
2	SIO	Communication of diagnosis device
3	—	—
4	—	—
5	SPD	Input of vehicle speed signal
6	IG	IG power supply
7	—	—
8	IDUP	Idle up signal
9	EPS-W	Warning lamp / diagnosis output
10	—	—
11	EPS-TS	Start of diagnosis
12	REV	Input of engine revolution speed signal

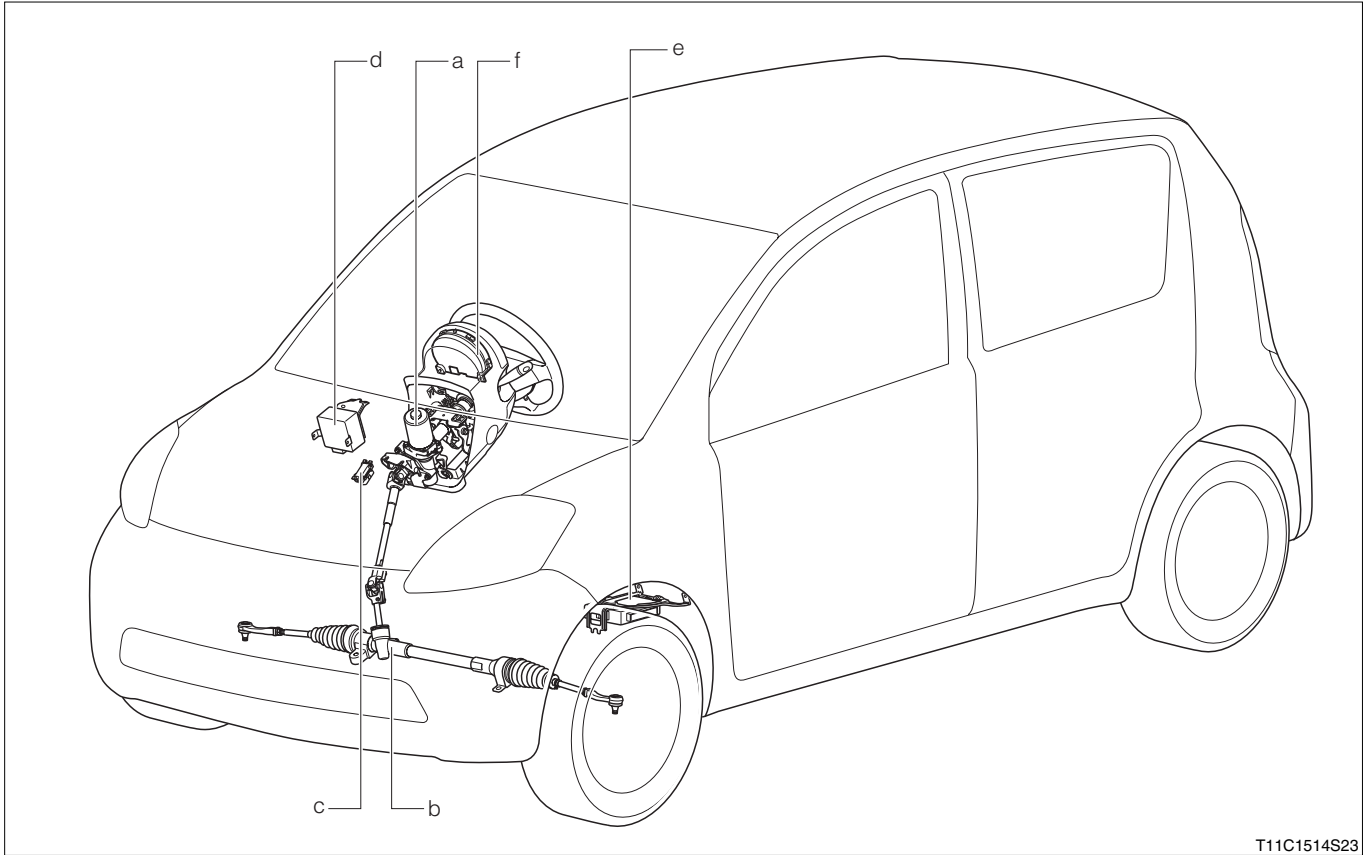
Connector D

Terminal No.	Terminal code	Terminal name
1	—	—
2	V3	Torque sensor power supply of 3.3V
3	—	—
4	V9	Torque sensor power supply of 9V
5	TM	Main torque sensor input
6	—	—
7	TS	Sub torque sensor input
8	E2	Torque sensor earth

5-5 ARRANGEMENT OF VEHICLE HARNESS SIDE CONNECTOR TERMINALS

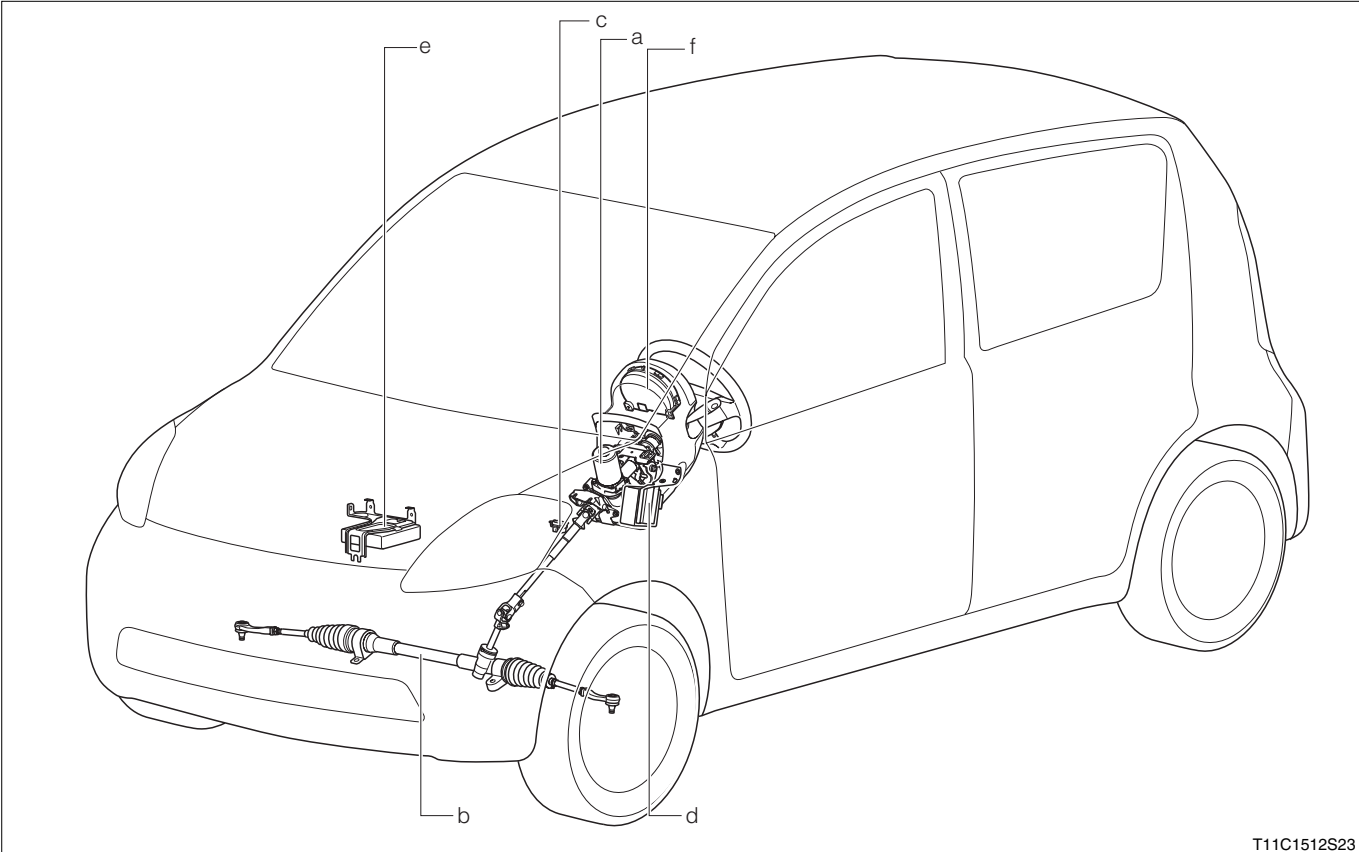


5-6 LOCATION OF COMPONENTS
RHD VEHICLES



T11C1514S23

a	STEERING COLUMN
b	Steering gear
c	DLC
d	EPS ECU
e	EFI ECU
f	Combination meter (EPS warning lamp incorporated)

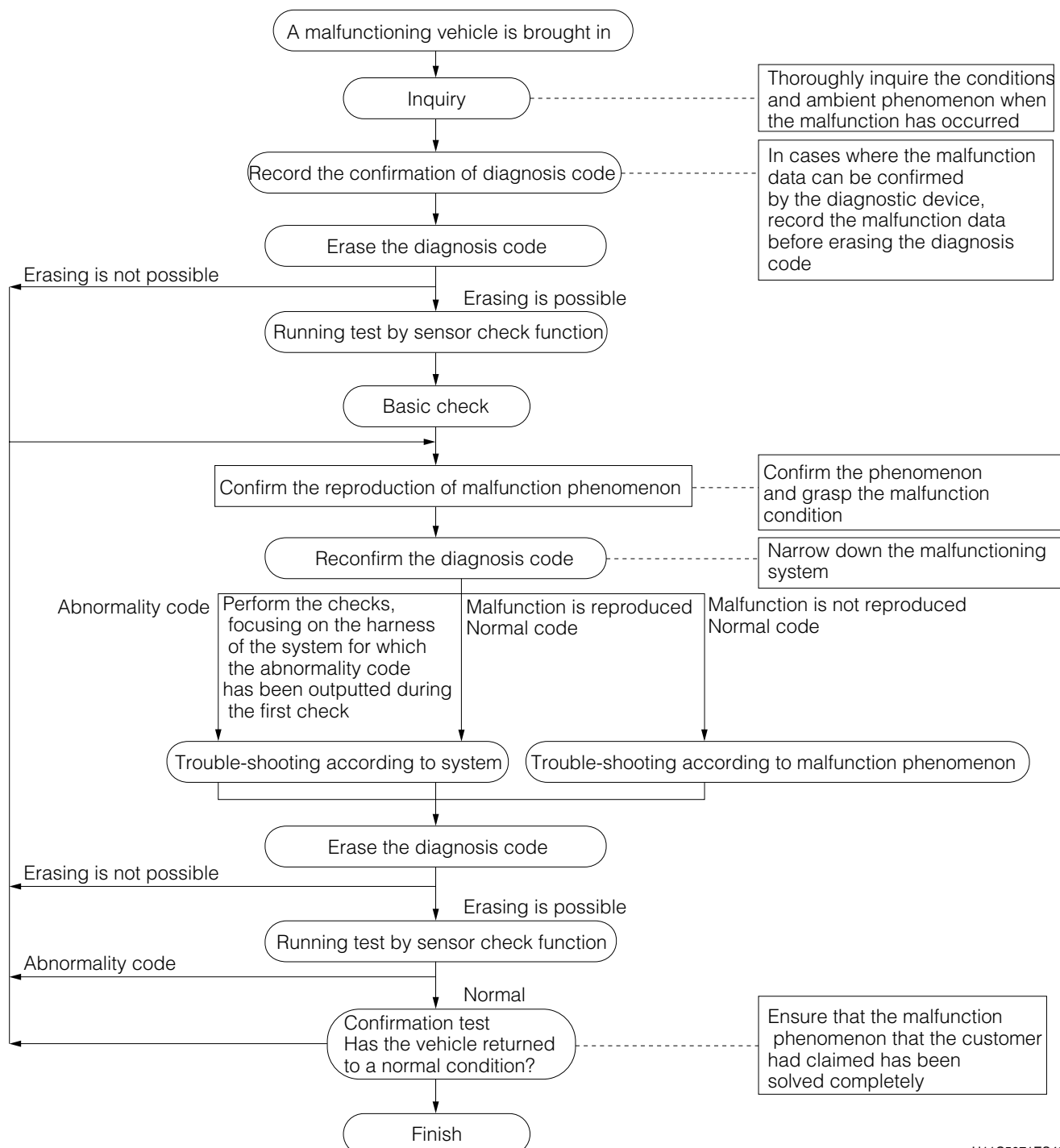


T11C1512S23

a	STEERING COLUMN
b	Steering gear
c	DLC
d	EPS ECU
e	EFI ECU
f	Combination meter (EPS warning lamp incorporated)

5-7 HOW TO PROCEED WITH TROUBLE SHOOTING

1. This system is equipped with a diagnosis function capable of performing the self-diagnosis for malfunctioning sections. This will be an important help at the time of trouble-shooting. The diagnosis of this system has a backup that uses an EEPROM (Non-volatile ROM). Hence, the diagnosis code is stored in the memory even if the power is cut off.



5-8 INQUIRY

- 1. In an effort to remove causes for malfunction from the vehicle concerned, it is impossible to determine the cause without confirming the malfunction phenomenon. If the phenomenon is not confirmed, the vehicle may not be able to return to the normal conditions even if you continue your work. The diagnosis through interview is to collect information from the customer before confirming the malfunction phenomena. The diagnosis through interview provides very important clues in reproducing malfunction phenomena.
- 2. Since the information obtained by the diagnosis through interview is referred to during the trouble shooting, it is imperative to make an inquiry of the customer, centering on the items related to the malfunction, instead of simply asking general questions.
- 3. During the diagnosis through interviews, utmost attention must be paid to complaints of the customer, for it may include phenomena peculiar to the EPS-equipped vehicles.

5-8-1 DIAGNOSIS INTERVIEW SHEET FOR ELECTRIC POWER STEERING SYSTEM

Checked by		Check date	Day Month (Day of week)

Customer information

Name of customer		Gender of customer (Male, female)	Age [approx.]	Occupation []
	Mr./Ms.	Area where vehicle is mainly used	Urban, suburb, seashore, mountain, others	Parking place Outdoor, indoor

Details of vehicle

Date when vehicle was brought to workshop	Day Month (day of week)	Date when malfunction took place	Day Month (day of week)	Repair history	No, Yes (How many times?)
Frame No.		Registration date	Day Month Year	Vehicle model	
Engine type		Transmission	5M/T · 3A/T · 4A/T · CVT electronically-controlled 4A/T	Driving	2WD · 4WD
Running distance	km	Equipment	Tire [] · Wheel [Steel · Aluminum]		

Phenomena

☐ Steering effort is excessive, or the steering wheel does not return properly.
☐ The steering wheel has no play, or excessive play.
☐ Clonking abnormal noise is emitted when the power steering is operating or steering wheel is turned.
☐ When the steering wheel is turned at a low vehicle speed, a rubbing noise is emitted.
☐ When the steering wheel is turned slowly with the vehicle stopped, a high pitched noise is emitted (squeaking sound).
☐ When the steering wheel is turned with the vehicle stationary, the steering wheel vibrates. (Emits abnormal noise.).
☐
☐
☐ Others

State of EPS warning lamp	☐ Always illuminated ☐ Sometimes illuminated ☐ Not illuminated		
Diagnosis indication (Short circuit of T terminal)	During check	☐ Normal ☐ Abnormal code []	
	Second time	☐ Normal ☐ Abnormal code []	
	nd(rd) time	☐ Normal ☐ Abnormal code []	

5-9 CONFIRMATION, RECORD AND ERASURE OF DIAGNOSIS CODE

5-9-1 OUTLINE

- When any abnormality code of the diagnosis is indicated, it is necessary to confirm the relationship with the reproduced malfunction phenomenon by ascertaining whether the system malfunction has occurred in the past or it still persists up to the present. To this end, the diagnosis code should be indicated twice, i.e. before and after the confirmation of the phenomenon

5-9-2 CHECKING METHOD OF DIAGNOSIS

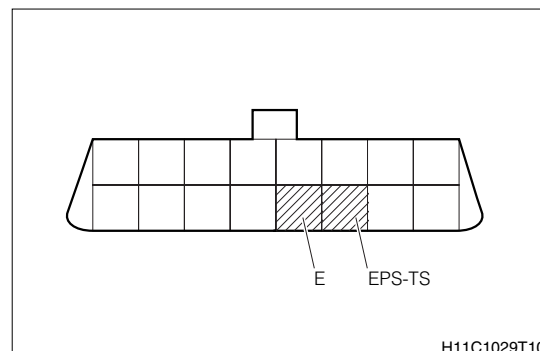
- Stop the vehicle.
- With the IG SW "LOCK" position, short circuit the terminals EPS-TS and E of the DLC located under the instrument panel.

CAUTION

- In order to short-circuit the DLC, be sure to use the specified SST.
- If the short-circuit of the DLC is made for wrong terminals, it may cause malfunction. Be very careful not to select wrong terminals

SST: 09991-87404-000

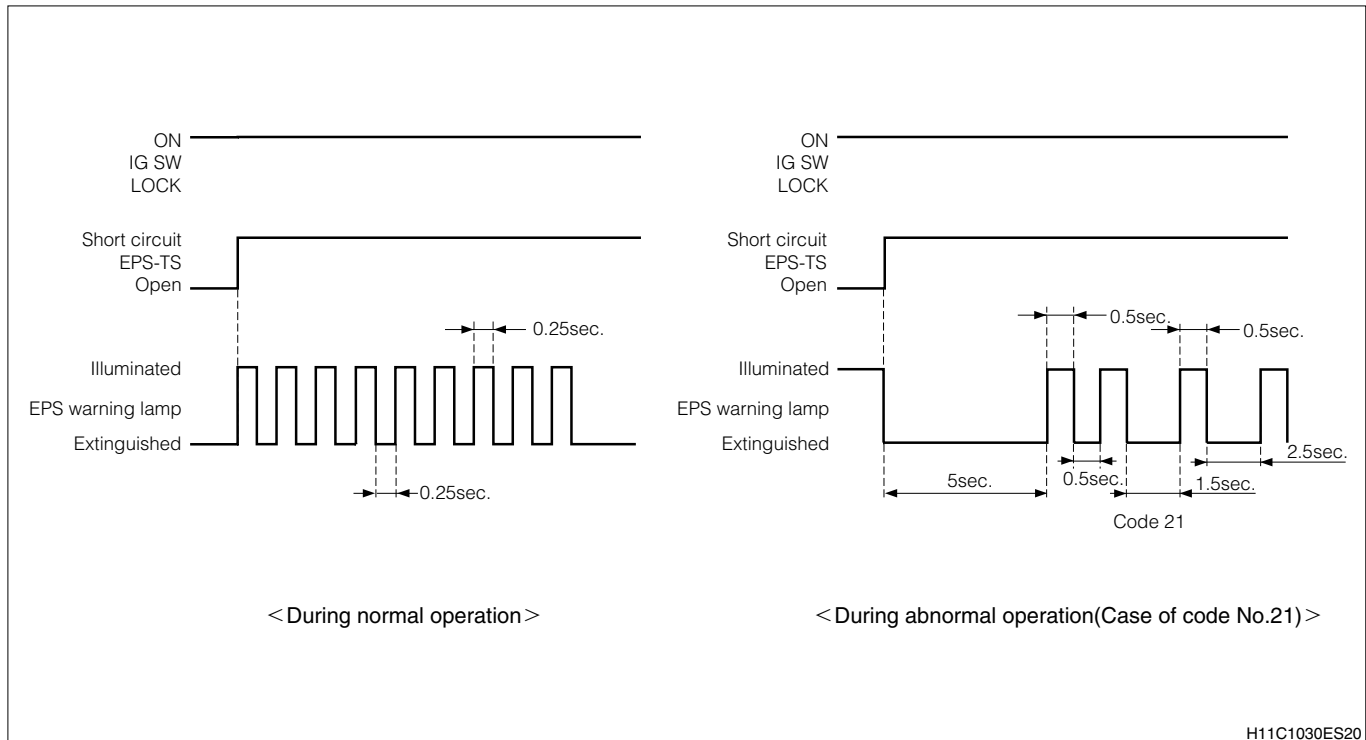
09991-87403-000



3. After turning "ON" the IG SW, read the flashing number of the EPS warning lamp.

CAUTION

- Connecting the connector in the wrong location could cause a malfunction. Therefore, make sure the connection is correct.



H11C1030ES20

NOTE

- When the system is functioning normally, the flashing interval is 0.5 second.
- If there is one malfunction code, after a pause of five seconds, the same code will be outputted. If plural codes are outputted, the respective codes will be outputted at an interval of 2.5 seconds. After all the codes have been outputted, there will be another 4 second pause before the output of the codes starts over again.
- When plural codes are outputted, they will appear in the order of the code number, starting from the smaller one.

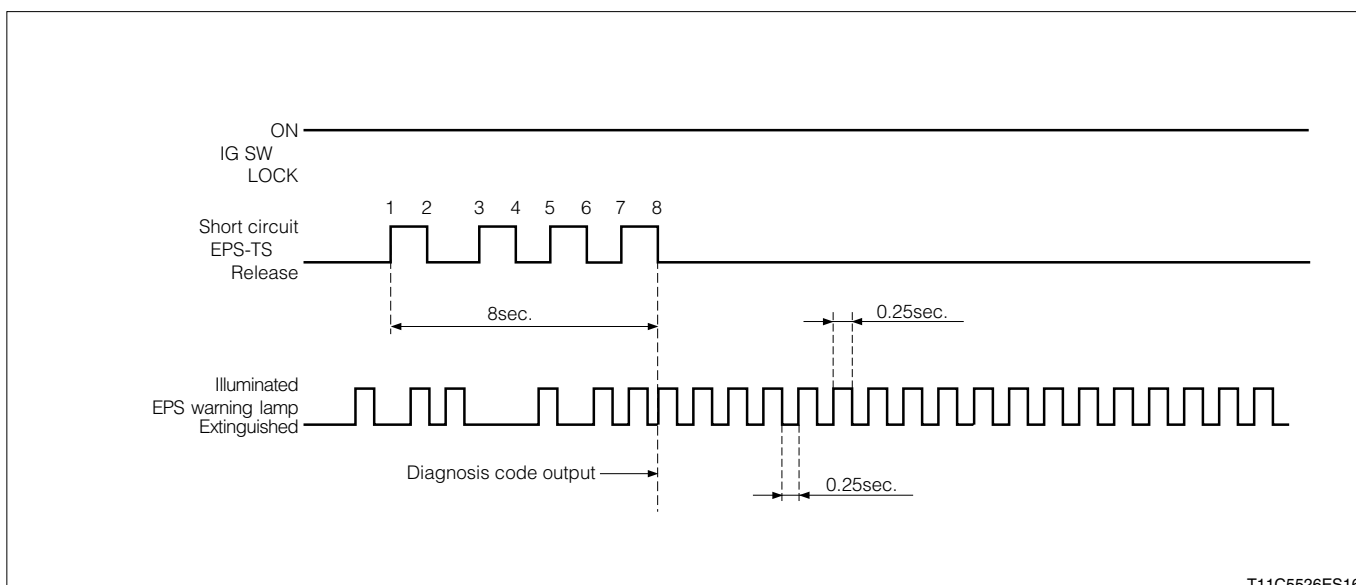
5-9-3 CANCELING METHOD OF DIAGNOSIS

1. The diagnosis of this system has a backup that uses an EEPROM (Non-volatile ROM). Hence, the diagnosis code is stored in the memory even if the power is cut off. When having checked and repaired a section concerning which an abnormal code is generated, erase that abnormality code by following the procedure given below.
2. Stop the vehicle and keep the IG SW in the "LOCK" position five seconds or more.
3. With the IG SW turned "ON", short-circuit and release the terminal EPS-TS and E of the DLC at least eight times in eight seconds. This will erase the code.

CAUTION

- In order to short-circuit the DLC, be sure to use the specified SST.
- If the short-circuit of the DLC is made for wrong terminals, it may cause malfunction. Be very careful not to select wrong terminals

SST: 09991-87404-000
09991-87403-000



T11C5526ES16

NOTE

- If the malfunction persists, the abnormality code can not be erased.

5-9-4 CONTENTS OF DIAGNOSIS

Contents of diagnosis

Code No.		Warning indication (Provided: ○, Not-provided: ×)	Code memory (Provided: ○, Not-provided: ×)	Contents of diagnosis	
2 digits	4 digits			System diagnosed	Diagnosis items
11	C1511	○	○	Torque sensor	Open wire, short-circuit, main torque sensor characteristics faulty
12	C1512	○	○	Torque sensor	Open wire, short-circuit, sub torque sensor characteristics faulty
13	C1513	○	○	Torque sensor	Excessive permissible difference between main sensor output and sub sensor output
14	C1514	○	○	Torque sensor	Abnormality of 9V power supply voltage of sensor
21	C1521	○	○	Motor	Excessive current
23	C1523	○	○	Motor	Open wire
24	C1524	○	○	Motor	Excessive voltage between both terminals of motor Low voltage, short circuit
31	C1531	○	○	EPS ECU	Faulty internal circuit
32	C1532	○	○	EPS ECU	Faulty internal circuit
33	C1533	×	○	EPS ECU	Faulty internal temperature sensor
34	C1534	×	○	EPS ECU	Faulty internal non-volatile EEPROM
41※ ¹	C1541	○	○	Vehicle speed signal	Faulty vehicle speed sensor main body open wire, short circuit
44※ ²	C1544	○	○	Engine revolution speed signal	Missing of engine revolution speed (REV) signal, or open wire, short circuit
51	C1551	○	○	Power supply	Abnormal rise of battery voltage
52	C1552	○	○	Power supply	Abnormal drop of battery voltage Voltage monitor circuit faulty
54	C1554	○	○	Power supply	Abnormality of power supply relay in EPS ECU
55※ ³	C1555	○	○	EPS ECU	Abnormality of motor relay in EPS ECU
57※ ⁴	C1557	×	○	EPS ECU	Protection of over-heating of motor or EPS ECU is performed. (This is not a malfunction.)

※1: This code may be memorized if the engine speed is varied for five minutes or more in an unloaded state (Racing).

※2: This code may be memorized when running the vehicle in the neutral gear without starting the engine.

※3: This code may be memorized when IG SW is set to "LOCK", and the motor terminal is connected to the ground.

※4: If the motor or ECU gets overheated because the steering wheel has been turned for a long time with the vehicle stopped, the motor current is controlled to a smaller amount to protect the motor and ECU. This code shows that the protection of the motor from overheating has been performed, and therefore, it does not mean that there is a malfunction.

5-10 SENSOR CHECK FUNCTION (TEST MODE)

1. In the test mode, the vehicle speed sensor signal system and engine revolution speed signal system are checked by running the vehicle. In cases where both items have been judged to be normal, the warning lamp changes from a flashing state to an extinguished state. Then, the test mode code will be erased automatically. Therefore, if the flashing indication will not go out (The test mode code is memorized) even after the running has been conducted, repair the vehicle speed sensor signal system and engine revolution speed signal system. Then, check and repair the relevant malfunctioning system.

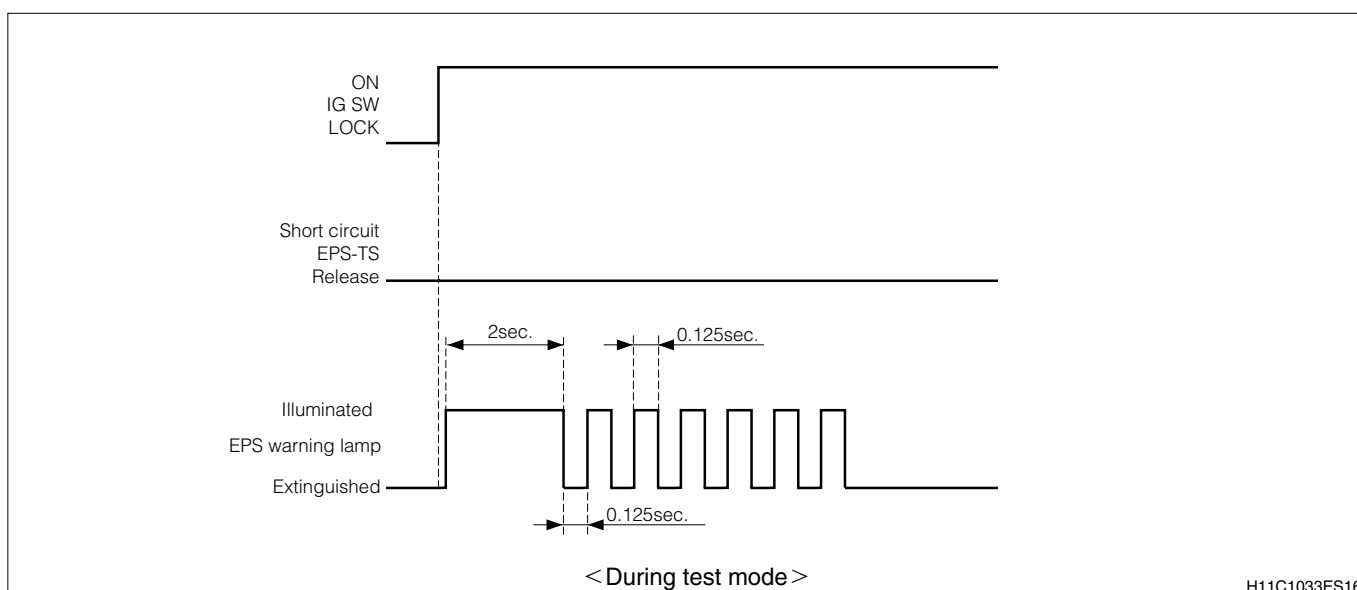
5-10-1 OUTPUT OF TEST MODE CODE

1. With the IG SW turned "ON", short-circuit and release the terminal EPS-TS and E of the DLC at least eight times in eight seconds. Check to see if the warning lamp flashes at an interval of about 0.25 second.

CAUTION

- If the EPS warning lamp illuminates at all the times, the system may be malfunctioning. Check the diagnosis code.

2. Start the engine.
3. Run the vehicle for at least 2 seconds at a speed of about 20 km/h or more.
4. In cases where all check items are normal, the EPS warning lamp goes out. Under this condition, stop the vehicle.
5. In cases where the EPS warning lamp will not go out even when the running continues, most likely the vehicle speed sensor signal system and engine revolution speed signal system are malfunctioning. Check these systems.



5-10-2 CONTENTS OF DIAGNOSIS

Test mode code table

Code No.		Warning indication (Provided: ○, Not-provided: X)	Code memory (Provided: ○, Not-provided: X)	Contents of diagnosis	Releasing conditions
Two digit	Four digit				
71	C1571	○	○	Vehicle speed signal system	Meter vehicle speed signal State of 20km/h or more continues at least 2 seconds.
73	C1573	○	○	Engine revolution speed signal system	Engine revolution speed signal State of 360rpm or more continues at least 2 seconds.

5-11 BASIC CHECK

5-11-1 ENGINE STARTING CHECK

1. Check to see if the engine can start.
2. Check to see if the engine revolution speed drops significantly or fluctuates under the idling condition.

5-11-2 MEASUREMENT OF BATTERY VOLTAGE

1. With the engine running and the vehicle in a stationary state, measure the battery voltage.

SPECIFIED VALUE: 10.5—14V (At idle speed)

5-11-3 CHECK OF SPEEDOMETER INDICATION

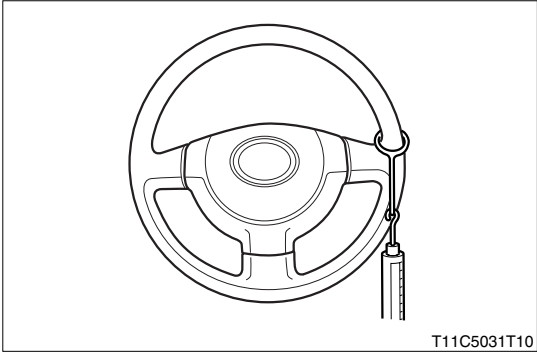
- 1. Ensure that the indication of the speedometer is appropriate under the running condition.

5-11-4 CHECK OF TIRE AIR INFLATION PRESSURE

- 1. Place the vehicle on a flat asphalt or concrete road. Perform the measurement with the steering wheel set straight-ahead state.
Refer to Page C3-1.

5-11-5 CHECK OF STEERING EFFORT

- 1. Start the engine.
 - 2. With one person riding on the vehicle and the engine idling, make one turn of the steering wheel from the straight-ahead condition to the right. At this point, attach a spring balance to the steering wheel. Then, pull the spring balance in a right-turn tangential direction and measure the steering effort. In the same way, make one turn of the steering wheel from the straight-ahead condition to the left. At this point, measure the steering effort.
- SPECIFIED VALUE:



	While power steering is operating
Steering effort	30N{3.1kgf} or less

5-11-6 CHECK OF EPS WARNING LAMP

- 1. After turning "ON" the IG SW, ensure that the EPS warning lamp illuminates and is extinguished 2 seconds later.

5-11-7 CHECK OF POWER SUPPLY CIRCUIT

- 1. With the EPS ECU connector connected, turn "ON" the IG SW. Measure the voltage between the following connector and body earth.

(1) Vehicle side connector A1 (PIG)—Vehicle side connector A2 (PGND)

SPECIFIED VALUE: 9V—16V

(2) Vehicle side connector C6 (IG)—Vehicle side connector A2 (PGND)

SPECIFIED VALUE: 10V—16V

5-11-8 CHECK OF EARTH CIRCUIT

- 1. With the EPS ECU connector connected, set the IG SW "LOCK". Measure the resistance between the following connector and body earth.

(1) Vehicle side connector A2 (PGND) and body earth

SPECIFIED VALUE: 0.1 Ω or less

(2) Column side connector D8 (E2)—Body earth

SPECIFIED VALUE: 0.1 Ω or less

5-12 TROUBLE SHOOTING ACCORDING TO MALFUNCTION PHENOMENA

Phenomenon	Check points
The steering wheel is heavy or it does not return smoothly.	· Front tires (Improper air inflation pressure, uneven wear) · Front wheel alignment (Improper) · Front suspension (Lower ball joint) · Steering shaft universal joint assembly. · Steering column tube assembly · Steering gear assembly · EPS ECU
The steering wheel exhibits no play or exhibits excessive play.	· Steering shaft universal joint assembly. · Steering column tube assembly · Steering gear assembly
When the steering wheel is returned while the power steering is operating, an abnormal noise, such as clonking noise, is emitted.	· Front suspension (Lower ball joint) · Steering shaft universal joint Ay · Steering column tube Ay · Front axle hub (Hub bearing) · Steering gear assembly
When the steering wheel is operated while the vehicle is running at a low speed, a scraping noise is emitted.	· Spiral cable S/A · Steering column hole shield · Steering column tube assembly
When the steering wheel is turned slowly with the vehicle in a stationary state, a squeaking noise is emitted.	· Spiral cable S/A · Steering column hole shield · Steering column tube assembly
When the steering wheel is turned with the vehicle in a stationary state, the steering wheel vibrates (With abnormal noise).	· Front tires (Improper air inflation pressure) · Steering column tube assembly

5-13 TROUBLE SHOOTING ACCORDING TO DIAGNOSIS CODE

5-13-1 DIAGNOSIS CODE NO.11 (TORQUE SENSOR SYSTEM)

(1) Checking method

▷1. Voltage check between EPS ECU side connectors

1. After setting IG SW "LOCK", disconnect the connector D of the EPS ECU.
2. Turn "ON" the IG SW. Measure the ECU side connector voltage.

NOTE

- There may be cases that diagnosis codes not related to the malfunction are memorized when the engine starts.
- The voltage may be varying when the steering wheel is operated.

(1) ECU side connector D4 (V9) — D8 (E2)

SPECIFIED VALUE: 8.0 — 11.0V

▼ If it is OK, go to ▷2.

▼ In the case of NG, replace the EPS ECU.

Refer to Page G2-15.

▷2. Voltage check of torque sensor power supply

1. After setting IG SW "LOCK", connect the connector D of the EPS ECU.
2. Turn "ON" the IG SW. Measure the connector voltage.

(1) Column side connector D4 (V9) — D8 (E2)

SPECIFIED VALUE: 8.0 — 11.0V

▼ If it is OK, go to ▷3.

▼ In the case of NG, replace the steering column.

Refer to Page G1-4.

▷3. Voltage check of main torque sensor input

1. Measure the voltage of the connector.

(1) Column side connector D5 (TM) — D8 (E2)

SPECIFIED VALUE: When no steering operation is made: $2.5 \pm 0.3V$

▼ If OK, replace the EPS ECU.

Refer to Page G2-15.

▼ In the case of NG, replace the steering column.

Refer to Page G1-4.

5-13-2 DIAGNOSIS CODE NO.12 (TORQUE SENSOR SYSTEM)

(1) Checking method

▷1. Voltage check between EPS ECU side connectors

1. After setting IG SW "LOCK", disconnect the connector D of the EPS ECU.
2. Turn "ON" the IG SW. Measure the ECU side connector voltage.

NOTE

- There may be cases that diagnosis codes not related to the malfunction are memorized when the engine starts.
- The voltage may be varying when the steering wheel is operated.

(1) EPS ECU side connectors D4 (V9) — D8 (E2)

SPECIFIED VALUE: 8.0 — 11.0V

▼ If it is OK, go to ▷2.

▼ If NG, replace the EPS ECU.

Refer to Page G2-15.

▷2. Voltage check of torque sensor power supply

1. After setting IG SW "LOCK", connect the connector D of the EPS ECU.
2. Turn "ON" the IG SW, and measure the voltage of the connector.

(1) Column side connectors D4 (V9) — D8 (E2)

SPECIFIED VALUE: 8.0 — 11.0V

▼ If it is OK, go to ▷3.

▼ If NG, replace the steering column.

Refer to Page G1-4.

▷3. Voltage check of sub torque sensor input

1. Measure the voltage of the connector.

(1) Column side connectors D7 (TS) — D8 (E2)

SPECIFIED VALUE: When no steering operation is made: $2.5 \pm 0.3V$

▼ If OK, replace the EPS ECU.

Refer to Page G2-15.

▼ In the case of NG, replace the steering column.

Refer to Page G1-4.

5-13-3 DIAGNOSIS CODE NO.13 (TORQUE SENSOR SYSTEM)

(1) Checking method

▷1. Voltage check of main torque sensor input and sub torque sensor input

1. After turning "ON" the IG SW, measure the column side connector voltage.

NOTE

- There may be cases that diagnosis codes not related to the malfunction are memorized when the engine starts.
- The voltage may be varying when the steering wheel is operated.

(1) Column side connectors D5 (TM)—D8 (E2), D7 (TS)—D8 (E2)

SPECIFIED VALUE: When no steering operation is made: $2.5 \pm 0.3V$

▼ If OK, replace the EPS ECU.

Refer to Page G2-15.

▼ In the case of NG, replace the steering column.

Refer to Page G1-4.

5-13-4 DIAGNOSIS CODE NO.14 (TORQUE SENSOR SYSTEM)

(1) Checking method

▷1. Check of voltage between EPS ECU side connectors

1. After setting the IG SW "LOCK", disconnect the connector D of the EPS ECU.
2. Turn "ON" the IG SW and measure the ECU side connector voltage.

NOTE

- There may be cases that diagnosis codes not related to the malfunction are memorized when the engine starts.
- The voltage may be varying when the steering wheel is operated.

(1) EPS ECU side connectors D4 (V9)—D8 (E2)

SPECIFIED VALUE: 8.0—11.0V

▼ If it is OK, go to ▷2.

▼ In the case of NG, replace the EPS ECU.

Refer to Page G2-15.

▷2. Voltage check of torque sensor power supply

1. After setting IG SW "LOCK", connect the connector D of the EPS ECU.
2. Turn "ON" the IG SW, and measure the voltage of the connector.

(1) Column side connectors D4 (V9)—D8 (E2)

SPECIFIED VALUE: 8.0—11.0V

▼ If OK, replace the EPS ECU.

Refer to Page G2-15.

▼ In the case of NG, replace the steering column.

Refer to Page G1-4.

5-13-5 DIAGNOSIS CODE NO.24, NO.24, NO.55 (MOTOR SYSTEM)

(1) Checking method

▷1. Check of voltage between motor side connectors

1. After setting the IG SW "LOCK", disconnect the connector B of the EPS ECU.
2. Measure the voltage of the column side connector. (When steering wheel is operated)

NOTE

- There may be cases that diagnosis codes not related to the malfunction are memorized when the measurement is done with the IG SW turned "ON".

(1) Column side connectors B1 (M1) — B2 (M2)

SPECIFIED VALUE: The voltage varies according to the steering wheel operating speed.

▼ If it is OK, go to ▷2.

▼ In the case of NG, replace the steering column.

Refer to Page G1-4.

▷2. Check of continuity between motor side connector and body earth

1. Check continuity of the column side connector. (When no steering operation is made)

(1) Column side connectors B1 (M1) — body earth

(2) Column side connectors B2 (M2) — body earth

SPECIFIED VALUE: Continuity exists.

▼ If OK, replace the steering column.

Refer to Page G1-4.

▼ In the case of NG, replace the EPS ECU.

Refer to Page G2-15.

5-13-6 DIAGNOSIS CODE NO.23 (OPEN WIRE IN MOTOR SYSTEM)

(1) Checking method

▷1. Check of continuity between motor side connectors

1. After setting the IG SW "LOCK", disconnect the connector B of the EPS ECU.
2. Check continuity of the column side connector. (When no steering operation is made)

NOTE

- There may be cases that diagnosis codes not related to the malfunction are memorized when the check is done with the IG SW turned "ON".

(1) Column side connectors B1 (M1) — B2 (M2)

SPECIFIED VALUE: Continuity exists.

▼ If it is OK, go to ▷2.

▼ In the case of NG, replace the steering column.

➤2. Check of continuity between motor side connector and body earth

1. Check continuity of the column side connector. (When no steering operation is made)

- (1) Column side connector B1 (M1)—body earth
- (2) Column side connector B2 (M2)—body earth

SPECIFIED VALUE: Continuity exists.

▼ If OK, replace the steering column.

Refer to Page G1-4.

▼ In the case of NG, replace the EPS ECU.

Refer to Page G2-15.

5-13-7 DIAGNOSIS CODE NO.31, NO.33, NO.34 (POWER STEERING COMPUTER SYSTEM)

(1) Repairing method

Replace the EPS ECU.

Refer to Page G2-15.

5-13-8 DIAGNOSIS CODE NO.32 (POWER STEERING COMPUTER SYSTEM)

(1) Checking method

➤1. Check of voltage between motor side connectors

1. After setting the IG SW "LOCK", disconnect the connector B of the EPS ECU.
2. Measure the voltage of the column side connector. (When steering wheel is operated)

NOTE

- There may be cases that diagnosis codes not related to the malfunction are memorized when the measurement is done with the IG SW turned "ON".

- (1) Column side connectors B1 (M1)—B2 (M2)

SPECIFIED VALUE: The voltage varies according to the steering wheel operating speed.

▼ If it is OK, go to ➤2.

▼ In the case of NG, replace the steering column.

➤2. Check of continuity between motor side connector and body earth

1. Check continuity of the column side connector. (When no steering operation is made)

- (1) Column side connector B1 (M1)—body earth
- (2) Column side connector B2 (M2)—body earth

SPECIFIED VALUE: Continuity exists

▼ If OK, replace the steering column.

Refer to Page G1-4.

▼ In the case of NG, replace the EPS ECU.

Refer to Page G2-15.

5-13-9 DIAGNOSIS CODE NO.41 (VEHICLE SPEED SIGNAL SYSTEM)

(1) Checking method

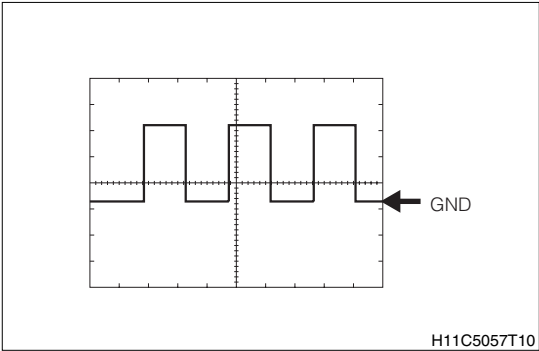
➤1. Measurement of waveform between column side connector and body earth

1. After setting IG SW "LOCK", disconnect the connector C of the EPS ECU.

2. Measure the waveform between the column side connector and body earth during vehicle running.

SPECIFIED VALUE: The pulse waveform shown in the right figure is outputted.

Detected item	Contents
Measuring terminals	Column side connector C5 (SPD)—body earth
Instrument setting	2V/DIV, 20ms/DIV
Measuring condition	Vehicle speed of about 20 km/h or more, and 2 seconds or more



- ▼ If it is OK, go to >2.
- ▼ If NG, perform the following check.
 - (1) ABS ECU check
 - (2) Combination meter check
 - (3) Wire harness check
 - (4) EFI ECU check

>2. Confirmation of erasure of test mode code

- After setting IG SW "LOCK", connect the connector C of the EPS ECU.
- Perform the test mode check. Check to see if the test mode code No.71 can be erased.
SPECIFIED VALUE: The test mode code No.71 can be erased by running the vehicle for 2 seconds or more at a speed of 20 km/h or more.

- ▼ If OK, the following can be said.
 - (1) Hard braking accompanied by brake locking has taken place.
 - (2) It is possible that abnormality detection was made due to engine racing. No repair is needed.
- ▼ In the case of NG, replace the EPS ECU.
Refer to Page G2-15.

5-13-10 DIAGNOSIS CODE NO.44 (ENGINE REVOLUTION SPEED SIGNAL SYSTEM)

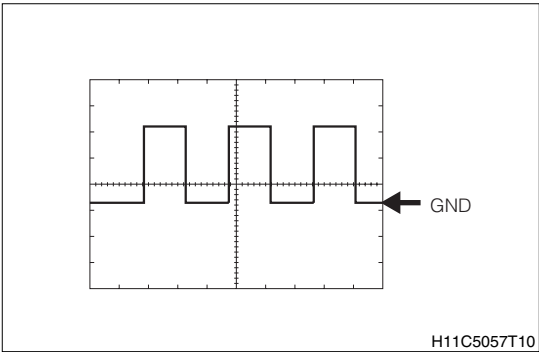
(1) Checking method

>1. Measurement of waveform between column side connector and body earth

- After setting IG SW "LOCK", disconnect the connector C of the EPS ECU.
- Start the engine. Measure the waveform between the column side connector and body earth during idling.

SPECIFIED VALUE: The pulse waveform shown in the right figure is outputted.

Detected item	Contents
Measuring terminals	Column side connector C12 (REV)—body earth
Instrument setting	5V/DIV, 10ms/DIV
Condition	When the engine is idling



- ▼ If it is OK, go to >2.
- ▼ If NG, perform the following check.
 - (1) Combination meter check
 - (2) Wire harness check
 - (3) EFI ECU check

➤2. Confirmation of erasure of test mode code

1. After setting IG SW "LOCK", connect the connector C of the EPS ECU.
2. Perform the test mode check. Check to see if the test mode code No.73 can be erased.
SPECIFIED VALUE: The test mode code No.73 can be erased during idling.

▼ If it is OK, it is possible that the abnormality was detected due to engine stall. It is not necessary to repair.

▼ If NG, replace the EPS ECU.

Refer to Page G2-15.

5-13-11 DIAGNOSIS CODE NO.51 (POWER SUPPLY SYSTEM)

(1) Checking method

➤1. Measurement of voltage between column side connector and body earth

1. Start the engine. Measure the voltage between the column side connector and body earth during idling.
(1) Column side connector C6 (IG)—body earth
SPECIFIED VALUE: 16V or less

▼ If OK, replace the EPS ECU.

Refer to Page G2-15.

▼ If NG, replace the alternator.

5-13-12 DIAGNOSIS CODE NO.52, NO.54 (POWER SUPPLY SYSTEM)

(1) Checking method

➤1. Measurement of voltage between column side connector and body earth

1. With the vehicle side connector (Connector A) disconnected, measure the voltage between the column side connector and the body earth.
(1) Column side connector A1 (PIG)—body earth
SPECIFIED VALUE: At least 9V

▼ If it is OK, go to ➤2.

▼ If NG, perform the following check.

- (1) EPS F/L check
- (2) Wire harness check

➤2. Measurement of voltage between column side connectors

1. Measure the voltage between the column side connectors during engine starting and steering operation.
(1) Between column side connectors A1 (PIG)—A2 (PGND)
SPECIFIED VALUE: At least 9V

▼ If OK, replace the EPS ECU.

Refer to Page G2-15.

▼ If NG, perform the following check.

- (1) Wire harness check
- (2) Connector check
- (3) Battery check

5-13-13 VEHICLE SPEED SIGNAL AND ENGINE REVOLUTION SPEED SIGNAL SYSTEM

(1) Checking method

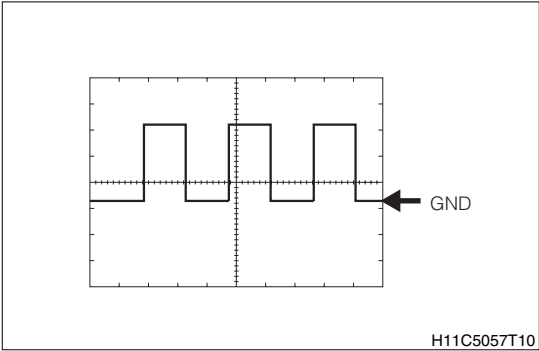
▷1. Measurement of waveform between column side connector and body earth

- 1. After setting IG SW "LOCK", disconnect the connector C of the EPS ECU.
- 2. Start the engine. Measure the waveform specified below.

(1) Column side connector C12 (REV)—body earth
(During idling)

SPECIFIED VALUE: The pulse waveform shown in the right figure is outputted.

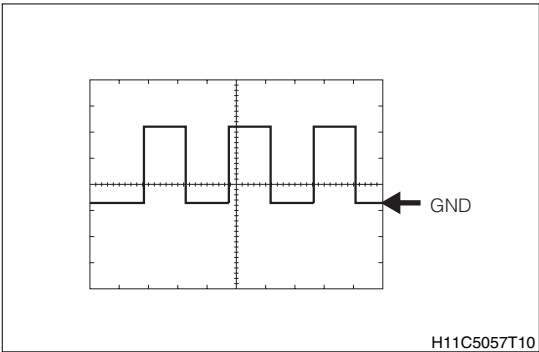
Detected item	Contents
Measuring terminals	Column side connector C12 (REV)—body earth
Instrument setting	5V/DIV, 10ms/DIV
Measuring condition	When the engine is idling



(2) Column side connector C5 (SPD)—body earth (During running at a speed of about 20 km/h)

SPECIFIED VALUE: The pulse waveform shown in the right figure is outputted.

Detected item	Contents
Measuring terminals	Column side connector C5 (SPD)—body earth
Instrument setting	2V/DIV, 20ms/DIV
Measuring condition	Vehicle speed of about 20 km/h or more, and 2 seconds or more



- ▼ If it is OK, go to ▷2.
- ▼ If NG, perform the following check.
- (1) Meter check
- (2) Harness check
- (3) ABS ECU check
- (4) EFI ECU check

▷2. Test mode check

- 1. After setting the IG SW "LOCK", connect the connector C of the EPS ECU.
- 2. Perform the test mode check.

SPECIFIED VALUE: The test mode code No.73 can be erased at a speed of 360 rpm or more.
The test mode code No.71 can be erased by running the vehicle for 2 seconds or more at a speed of 20 km/h or more.

- ▼ If OK, the normal state has been reached. (Check other sections.)
 - ▼ In the case of NG, replace the EPS ECU.
- Refer to Page G2-15.

5-13-14 EPS WARNING LAMP SYSTEM

(1) Checking method

▷1. Confirmation of lighting of EPS warning lamp

- 1. After turning "ON" the IG SW, check how many seconds the EPS warning lamp illuminates.

SPECIFIED VALUE: The lamp illuminates for 2 seconds.

- ▼ If it is OK, go to ▷2.
- ▼ If it is NG, go to ▷5.

▷2. Confirmation of going out of EPS warning lamp

SPECIFIED VALUE: The lamp goes out.

▼ If OK, the normal state has been reached.

▼ If it is NG, go to ▷3.

▷3. Confirmation of lighting of EPS warning lamp

1. After setting the IG SW "LOCK", disconnect the connector C of the EPS ECU.

2. After turning "ON" the IG SW, check to see if the warning lamp illuminates.

SPECIFIED VALUE: Illuminates.

▼ If OK, perform the following checks.

(1) Harness check

(2) Meter check

(3) Connector check

▼ If it is NG, go to ▷4.

▷4. Diagnosis code output check

1. Connect the connector of the EPS ECU.

SPECIFIED VALUE: Are diagnosis codes outputted.

▼ If OK, perform the trouble shooting according to the diagnosis codes.

▼ In the case of NG, replace the EPS ECU.

Refer to Page G2-15.

▷5. Check of ECU IG1 fuse

SPECIFIED VALUE: The ECU IG1 fuse is blown out.

▼ If OK, replace the fuse.

▼ If it is NG, go to ▷6.

▷6. Check of warning lamp bulb

SPECIFIED VALUE: The warning lamp bulb is blown out.

▼ If OK, replace the warning lamp bulb.

▼ If it is NG, go to ▷7.

▷7. Continuity check of warning lamp harness between combination meter and EPS ECU

1. After setting the IG SW "LOCK", disconnect the EPS ECU connector and combination meter connector.

2. Perform continuity check of the warning lamp harness between the combination meter and the EPS ECU.

SPECIFIED VALUE: No continuity exists.

▼ If OK, perform the following checks.

(1) Harness check

(2) Connector check

▼ If NG, replace the EPS ECU.

Refer to Page G2-15.

G2-41

5-13-15 POWER SUPPLY SYSTEM

(1) Checking method

▷1. Continuity check between column side connector and body earth

1. After setting the IG SW "LOCK", disconnect the connector A of the EPS ECU.
2. Perform continuity check between the column side connector and body earth.
 - (1) Vehicle side connector A2 (PGND)—body earthSPECIFIED VALUE: Continuity exists.

▼ If it is OK, go to ▷2.

▼ If NG, perform the following check.

- (1) Harness check
- (2) Connector check

▷2. Measurement of voltage between column side connector and body earth

1. Connect the connector A of the EPS ECU.
2. Turn "ON" the IG SW. Measure the voltage between the column side connector and the body earth.
 - (1) Between column side connectors C6 (IG)—body earthSPECIFIED VALUE: At least 9V

▼ If it is OK, go to ▷3.

▼ If NG, perform the following check.

- (1) Battery check
- (2) Harness check
- (3) ECU IG fuse check

▷3. Measurement of voltage between column side connector and body earth

1. Measure the voltage between the column side connector and the body earth during engine starting.
 - (1) Column side connector C6 (IG)—body earthSPECIFIED VALUE: 16V or less

▼ If it is OK, go to ▷4.

▼ If NG, check the alternator.

▷4. Measurement of voltage between column side connectors

1. Measure the voltage between the column side connectors during engine starting with the steering wheel operated.
 - (1) Between column side connector A1 (PIG)—A2 (PGND)SPECIFIED VALUE: At least 9V

▼ If OK, the normal state has been reached. (Check other sections.)

▼ If NG, perform the following check.

- (1) Battery check
- (2) Harness check
- (3) EPS F/L check

5-14 UNIT CHECK

5-14-1 VEHICLE SPEED SENSOR

1. Check the vehicle speed signal.
Refer to Page J3-1.

5-14-2 WARNING LAMP

1. Set the IG SW "LOCK" and disconnect the connector of the steering gear Ay. Under this condition, connect the vehicle side connector C9 (EPS-W) terminal of the disconnected steering column Ay to the earth. Turn "ON" the IG SW. Check to see if the EPS warning lamp illuminates.

5-14-3 POWER STEERING COLUMN ASSEMBLY

(1) TORQUE SENSOR

1. With the column side connector (Connector D) connected, measure the voltage between the following terminals.

SPECIFIED VALUE:

Steering position	D5 (TM)–D8 (E2)	D7 (TS)–D8 (E2)
Neutral	$2.5 \pm 0.3V$	←
Right turn	2.20–4.50V	0.50–2.80V
Left turn	0.50–2.80V	2.20–4.50V

(2) Motor

1. With the column side connector (Connector B) disconnected, check continuity between the column side connectors B1 (M1)–B2 (M2).

SPECIFIED VALUE: Continuity exists. (Resistance 0.1 Ω or less)

2. With the column side connector (Connector B) disconnected, measure the voltage between the column side connectors B1 (M1)–B2 (M2) when the steering wheel is operated.

SPECIFIED VALUE: Ensure that the voltage changes according to the steering wheel operating speed.

3. With the column side connector (Connector B) disconnected, check continuity between the column side connector B1 (M1)–body earth, and between the column side connector B2 (M2)–body earth.

SPECIFIED VALUE: No continuity

4. With the column side connector (Connector B) connected, measure the voltage between the following terminals.

SPECIFIED VALUE:

Steering position	B1 (M1)–A2 (PGND)	B2 (M2)–A2 (PGND)
Neutral position → right turn and steering wheel held	The voltage rises.	The voltage drops.
Neutral position → left turn and steering wheel held	The voltage drops.	The voltage rises.

5-14-4 POWER STEERING COMPUTER ASSEMBLY

1. Check the connector terminal for deformation or bend.
2. Check the connector for crack and deformation.
3. The following checks should be carried out with all electric loads applied while idling.

- (1) Check the battery voltage.

SPECIFIED VALUE: 10.5–14.0V

4. The following checks should be carried out with the IG SW set to "LOCK".

- (1) Check continuity between the terminal A2 (PGND) and the body earth.

SPECIFIED VALUE: Continuity exists. (Resistance 0.1 Ω or less)

5-15 ECU INPUT/OUTPUT SIGNAL CHECK

5-15-1 CHECKING METHOD

The checks should be carried out with the connector connected to the EPS ECU.

5-15-2 SPECIFIED VALUE FOR INPUT/ OUTPUT SIGNAL

Check system	Connecting terminal	Name of input/output	Check items	Measuring condition	Standard
Torque sensor	D4 (V9) —D8 (E2)	Torque sensor power supply input	Voltage	IG SW "ON"	8.0—11.0V
	D8 (E2) —Body earth	Torque sensor earth	Continuity	At all times	Continuity exists.
	D5 (TM) —D8 (E2)	Main torque sensor signal input	Voltage	Steering neutral position	2.5±0.3V
			Voltage	Steering right turn	2.20—4.50V
			Voltage	Steering left turn	0.50—2.80V
	D7 (TS) —D8 (E2)	Sub torque sensor signal input	Voltage	Steering neutral position	2.5±0.3V
			Voltage	Steering right turn	0.50—2.80V
			Voltage	Steering left turn	2.20—4.50V
Motor	B1 (M1) —A2 (PGND)	Motor output	Voltage	Steering right turn	The voltage rises.
			Voltage	Steering left turn	The voltage drops.
	B2 (M2) —A2 (PGND)	Motor output	Voltage	Steering right turn	The voltage drops.
			Voltage	Steering left turn	The voltage rises.
Vehicle power supply	A1 (PIG) —A2 (PGND)	Power supply input of power system	Voltage	IG SW "ON"	9—16V
	A2 (PGND) —Body earth	Earth	Continuity	At all times	Continuity exists
Vehicle communication	C6 (IG) —A2 (PGND)	IG key input	Voltage	IG SW "ON"	10—16V
	C5 (SPD) —A2 (PGND)	Vehicle speed sensor signal input	Voltage waveform	Running at a vehicle speed of about 20 km/h	Pulse generation
	C11 (EPS-TS) —A2 (PGND)	DLC Terminal input	Voltage	Inside DLC Short circuit between terminals EPS-TS—E.	2V or less
			Voltage	Within DLC Release between terminals EPS-TS—E.	9—14V
	C12 (REV) —A2 (PGND)	Engine revolution signal input	Voltage waveform	When the engine is idling	Pulse generation
	C9 (EPS-W) —A2 (PGND)	EPS warning lamp output	Voltage	IG SW "LOCK"→"ON"	When the lamp is illuminated 1V or less When the lamp is extinguished 9—14V
	C8 (IDUP) —A2 (PGND)	Idle up request signal output	Voltage	The steering wheel is not turned while the EPS is operating. → The steering wheel is turned with the vehicle in a stationary state.	9—14V →2V or less

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1 SRS AIRBAG (DRIVER'S SEAT SIDE)

1-1 REMOVAL AND INSTALLATION

CAUTION

- Refer to the Caution Tips on Servicing.

Refer to Page A1-2.

1-1-1 ARTICLES TO BE PREPARED

Tool

Shape	Part No.	Part name	Use
	KTC BT3-T30L or equivalent	Long TORX® wrench T30	

Instrument

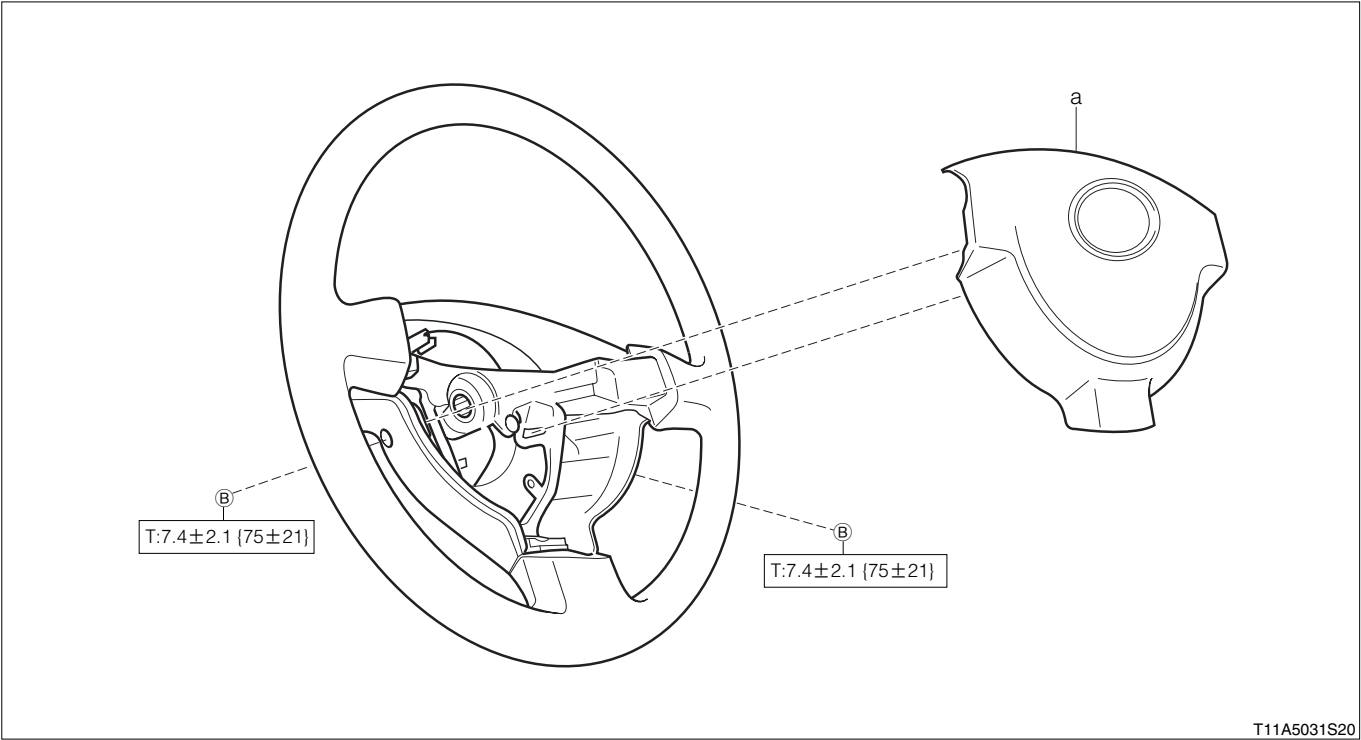
Torque wrench

1-1-2 OPERATION BEFORE REMOVAL

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.

1-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



T11A5031S20

Unit:N·m{kgf·cm}

(2) Removal and installation procedures

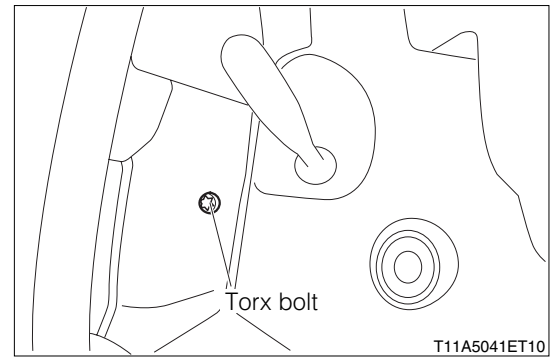
- ▼ ▲ 1 a Pad Ay, steering wheel

1-1-4 POINTS OF REMOVAL

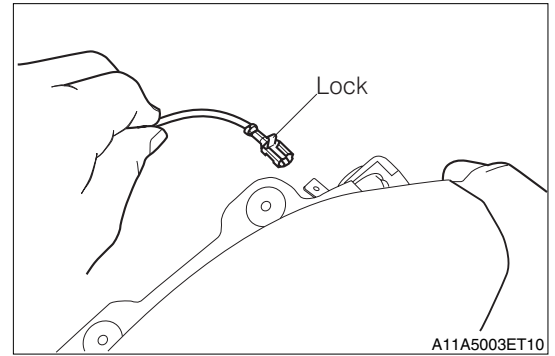
(1) Pad Ay, steering wheel

1. Loosen the Torx bolts located at the right and left sides of the pad Ay.

TOOL: KTC
BT3-T30L
or equivalent
Long TORX® wrench T30



2. Disconnect the horn connector.
3. Disconnect the connector for the airbag.
4. Remove the pad Ay.



1-1-5 INSPECTION

(1) Check of steering wheel pad Ay

1. When the following cases have occurred, perform visual checks or system checks. If there are any faulty parts, replace them.
 - (1) Case where the vehicle is damaged, including minor collisions where the airbag has not been deployed.
 - (2) Case where problems have been found out by the diagnosis check

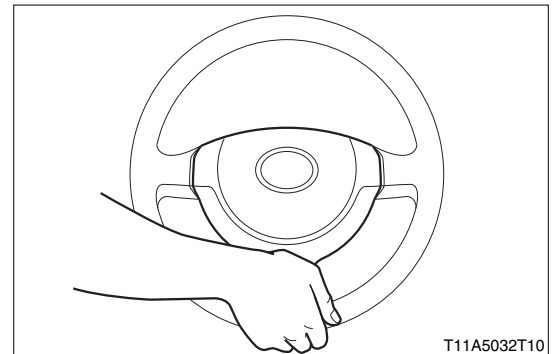
(2) External Check of steering wheel pad Ay

1. When the following cases have occurred, replace the pad assembly.
 - (1) Case where the airbag has been deployed.
 - (2) Case where the airbag deploying surface has scratches or cracks.
 - (3) Case where the connector or harness has dents or chips.
 - (4) Case where grease, water, detergent or oil has got to the pad assembly in a large quantity.
 - (5) Case where the pad assembly dropped and got damaged.

1-1-6 POINTS OF INSTALLATION

(1) Pad Ay, steering wheel

1. Insert firmly the connector for the airbag as far as it will go.
2. When installing the pad Ay, hold the lower side of the pad Ay.



1-1-7 OPERATION AFTER INSTALLATION

1. Connect the negative (—) terminal of the battery.
2. Set the IG SW to "ON" position. At this time, ensure that the airbag warning lamp goes on about six seconds and then goes out.

H1-3

1-2 DISPOSAL

CAUTION

- Refer to the Caution Tips on Servicing.

Refer to Page A1-2.

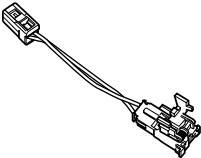
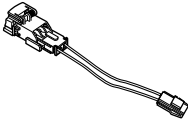
1-2-1 OUTLINE

1. When scrapping a vehicle equipped with an airbag system or scrapping the airbag at the driver's seat, be sure to deploy the airbag. Then, follow the "Scrapping procedure" to scrap the airbag itself. When scrapping the airbag at the driver's seat, that has been deployed by a customer during its use, too, follow the "Scrapping procedure."

1-2-2 DEPLOYMENT OF STEERING WHEEL PAD AY

(1) Articles to be prepared

SST

Shape	Part No.	Part name
	09082-87710-000 (09082-87701-000)	Wire,air bag deployment
	09082-00760-000	Sub-harness 4,air bag deployment wire
	09082-10801-000	Sub-harness 8A,air bag deployment wire
	09082-20801-000	Sub-harness 8B,air bag deployment wire

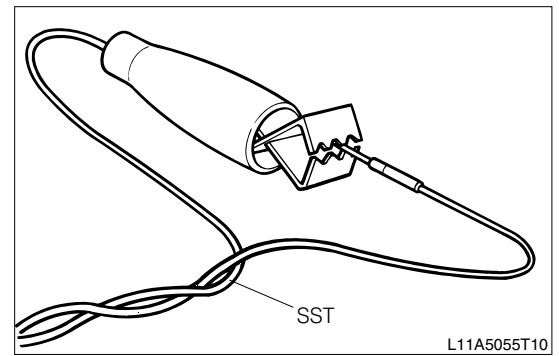
Lubricants, bonds and others

Wire harness (1.25mm ²),Two bolts (Nominal length of 35 mm or more, pitch of 1.0 mm, nominal diameter of 6.0 mm),12V battery for car use,2 tires with disc wheel,3 tires,Plastic bag

(2) In-vehicle deployment

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.
2. Connect the following two SSTs.
SST: 09082-87710-000
09082-00760-000

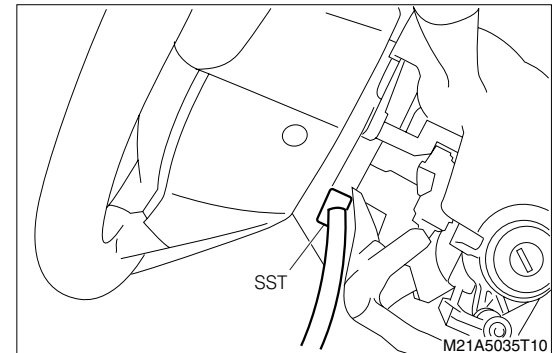
3. Short the terminal with the alligator clip of the SST.
SST: 09082-87710-000
4. Remove the steering column lower cover.
Refer to Page G1-4.
5. Disconnect the harness side connector for the airbag from the spiral cable S/A.



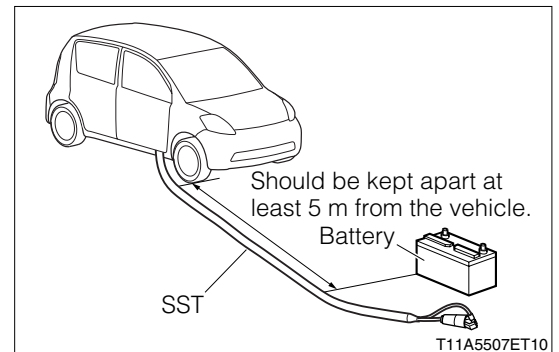
6. Connect the SST connector to the connector for the airbag (Yellow 2P).

WARNING

- Ensure that there is no excessive play around the steering wheel S/A.
- At this time, close all the doors and windows.



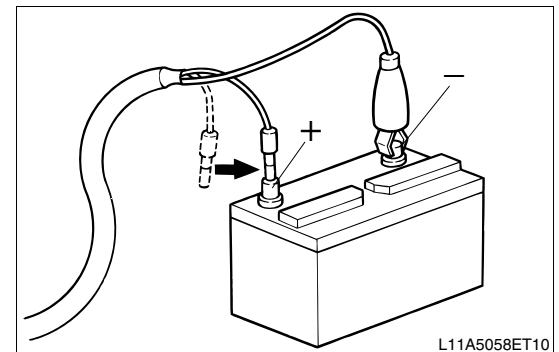
7. Extend the SST fully. Place the battery at least 5 m away from the vehicle.



8. Confirm safety inside and around the vehicle. Then, connect the SST to the battery (The alligator clip to the negative (−) terminal of the battery; the terminal to the positive (+) terminal) so as to actuate the airbag.

WARNING

- Make sure that there is no one inside and around the vehicle.
- Give warning loudly to those nearby before deploying the airbag.

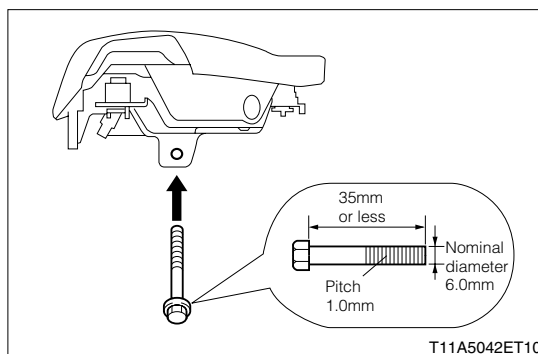


(3) Unit deployment

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.
2. Remove the pad Ay.

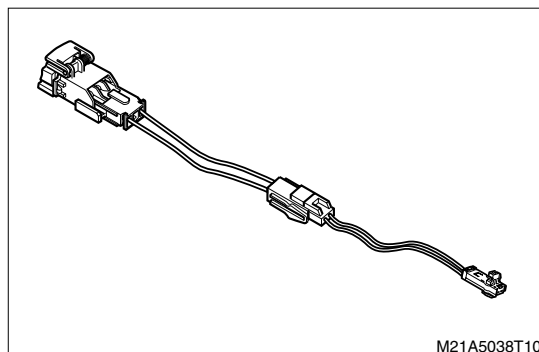
H1-5

3. Attach plate washers to two bolts. By your hands, fully tighten the bolts to the two attaching holes of the pad assembly.



4. Connect the following two SSTs.

SST: 09082-10801-000
09082-20801-000



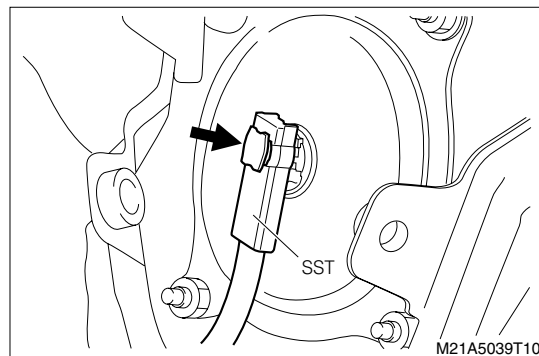
5. Connect the SST to the pad Ay.

CAUTION

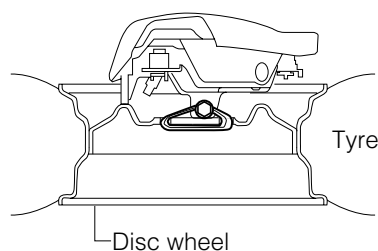
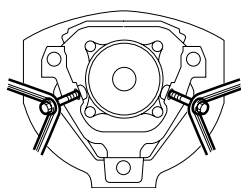
- Firmly lock the SST.

NOTE

- The connector section of the SST, which is connected to the pad Ay directly, will melt away once it operates, due to high temperature of the pad Ay.



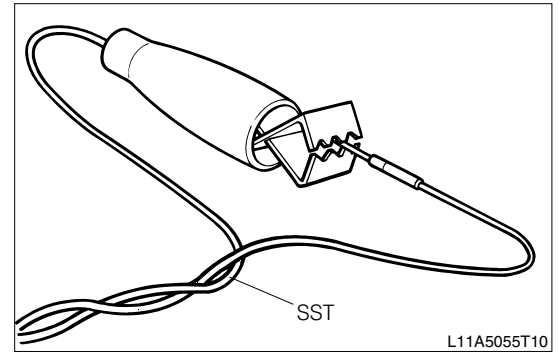
6. Secure the pad Ay to a disc wheel, using a wire harness for automotive use (Cross-sectional area of core wire: 1.25mm^2 or more).



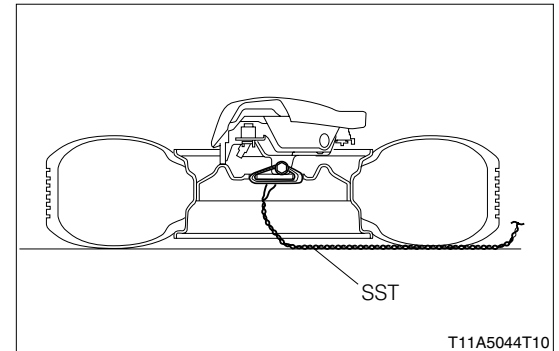
WARNING

- Perform the installation in such a direction that the airbag deploying surface faces upward.
- A great force will be applied to the wire harness at the time of airbag deployment. Therefore, secure the wire harness firmly by winding it triple.

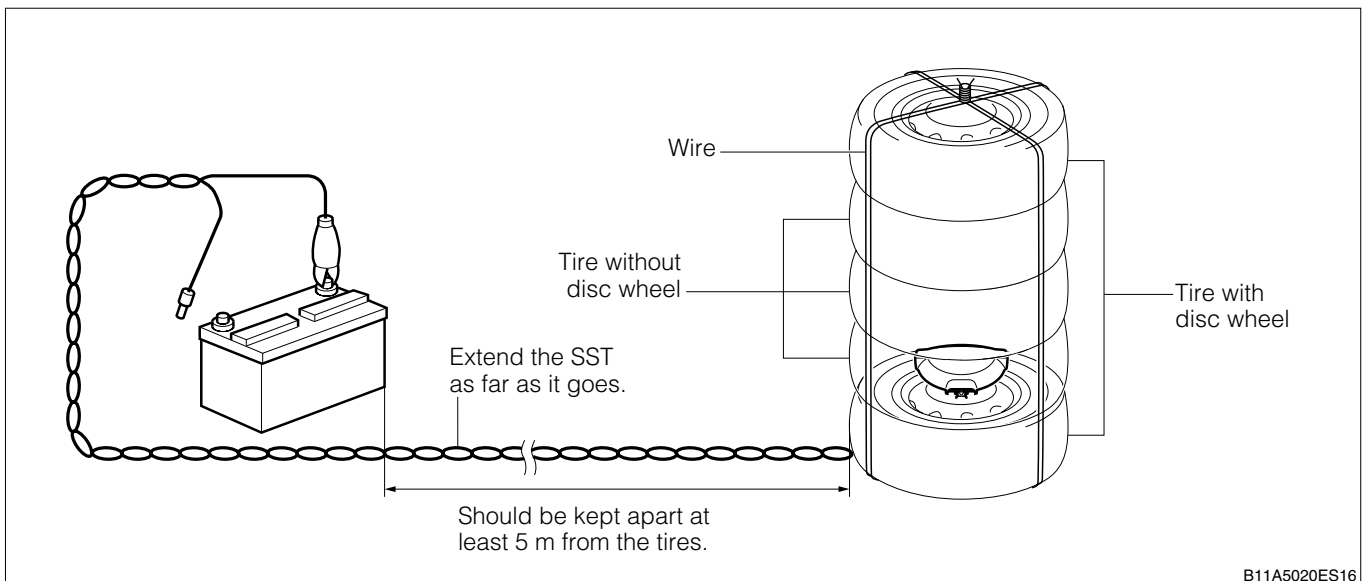
7. Short the terminal with the alligator clip of the SST.
SST: 09082-87710-000



8. Connect the SST at a point under the disc wheel.



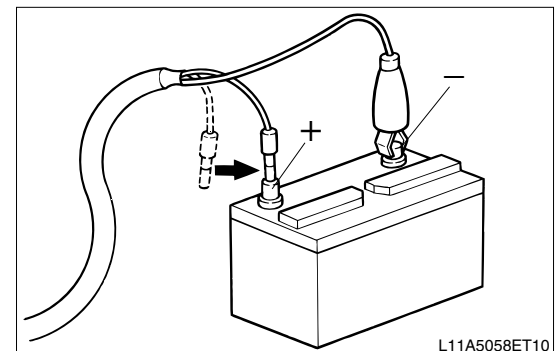
9. Pile up at least three tires on the disc wheel to which the pad Ay has been secured. Then, place a tire with a disc wheel on the top.
10. Connect the tires with wire so that the tires will not be scattered when the airbag is deployed.



11. Confirm safety inside and around the vehicle. Then, connect the SST to the battery (The alligator clip to the negative (−) terminal of the battery; the terminal to the positive (+) terminal) so as to deploy the airbag.

WARNING

- Make sure that there is no one inside and around the vehicle.
- Give warning loudly to those nearby before deploying the airbag.
- Never mount and reuse the tires and disc wheels used for the deployment on vehicles.



H1-7

(4) Scrapping procedure

1. Seal the deployed pad assembly in a plastic bag before it is scrapped.

WARNING

- The temperature reaches a few hundred °C at some sections. Therefore, leave it at least 30 minutes after it is deployed.
- Do not apply water, etc.
- When handling, wear dust protective goggles and gloves.
- After completion of the operation, be sure to wash your hands with water.
- Never scrap the pad Ay that has not been deployed.



2 SPIRAL CABLE

2-1 REMOVAL AND INSTALLATION

CAUTION

- Refer to the Caution Tips on Servicing.

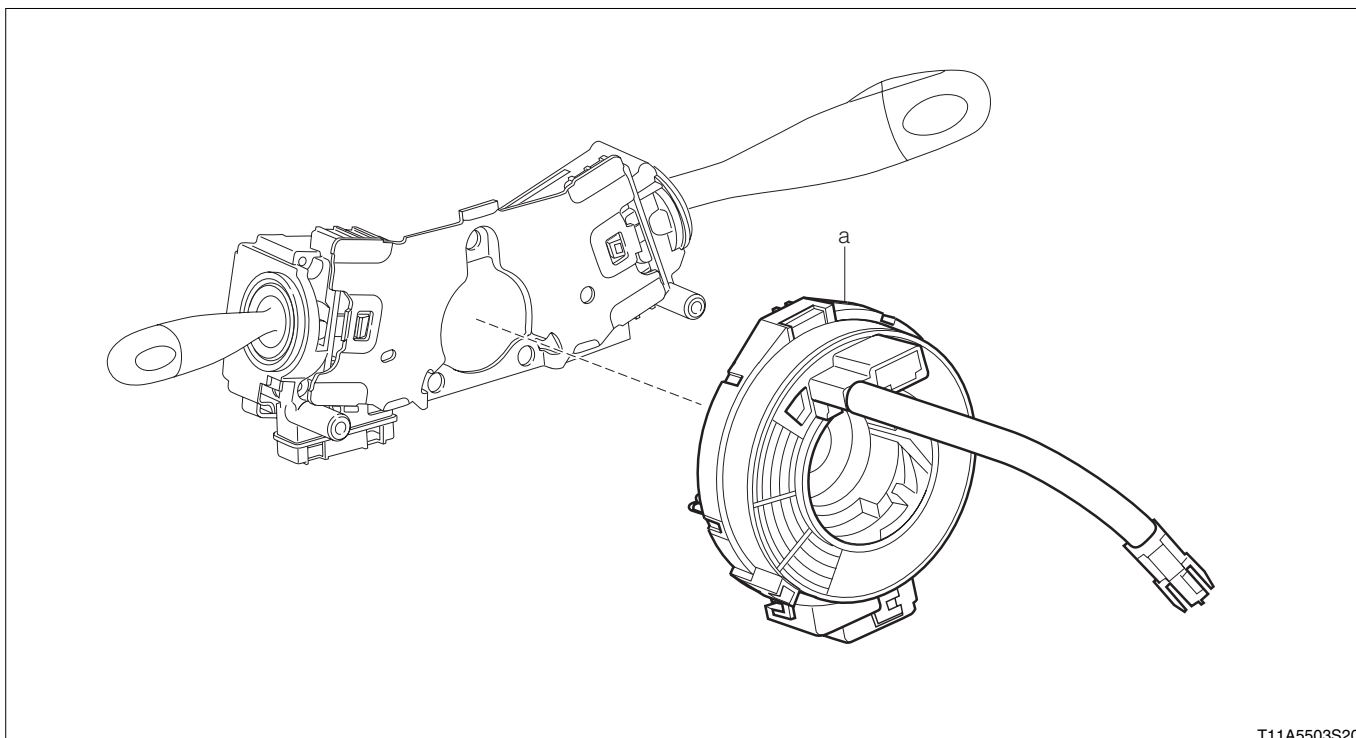
Refer to Page A1-2.

2-1-1 OPERATION BEFORE REMOVAL

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.
2. Ensure that the steering wheel subassembly is in the straight ahead condition.
3. Remove the steering wheel pad assembly.
Refer to Page H1-1.
4. Remove the steering wheel subassembly.
Refer to Page G1-2.
5. Lower the steering column assembly as far as it goes.
6. Remove the steering column upper cover and steering column lower cover.
Refer to Page G1-4.

2-1-2 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



T11A5503S20

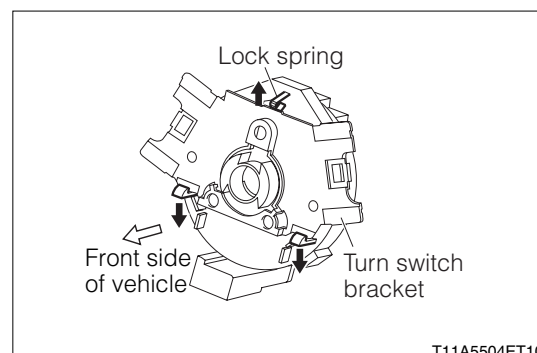
(2) Removal and installation procedures

▼ ▲ 1 a Cable S/A, spiral

2-1-3 POINTS OF REMOVAL

(1) Cable S/A, spiral

1. Disconnect the connector.
2. Perform the removal operation by releasing the lock spring and two pawls of the cable S/A.



T11A5504ET10

2-1-4 INSPECTION

(1) Check standard for spiral cable S/A

1. Check the cable S/A in the following cases. Replace it if problems are found.
 - (1) Case where the vehicle is involved in a collision.

(2) Check of spiral cable S/A

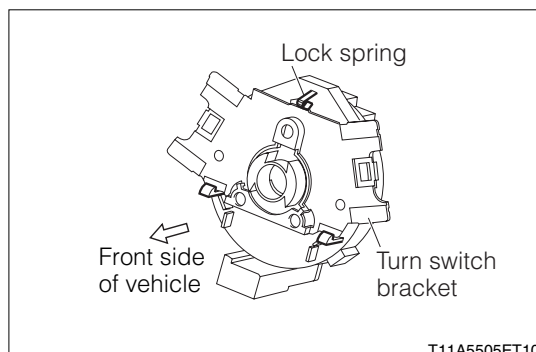
1. When the following cases have occurred, replace the cable subassembly.
 - (1) When the driver's seat airbag has been deployed:
 - (2) When the cable S/A is dropped:
 - (3) Case where the connector section has scratches, cracks and breakage:
 - (4) Case where the cable S/A has deformation, cracks and breakage:
 - (5) Case where the harness section is damaged:

H1-9

2-1-5 POINTS OF INSTALLATION

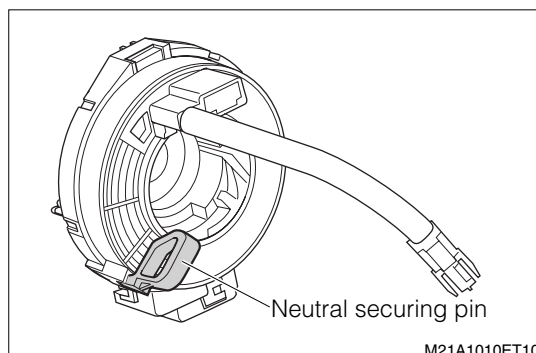
(1) Cable S/A, spiral

1. Ensure that the steering wheel is in the straight ahead state.
2. Perform the installation in such a way that the lock spring and two pawls are engaged.



NOTE

- In the case of a new cable S/A, do not bend the neutral fixing pin at this moment.
3. Connect the connector.



2-1-6 OPERATION AFTER INSTALLATION

1. Install the steering column upper cover and steering column lower cover.
Refer to Page G1-4.
2. Install the steering wheel S/A to the steering column Ay.
Refer to Page G1-2.
3. Install the steering wheel pad assembly.
Refer to Page H1-1.
4. Ensure that the steering wheel subassembly is in the straight ahead condition.
5. Connect the negative (—) terminal of the battery.
6. Set the IG SW to "ON" position. At this time, ensure that the airbag warning lamp goes on about six seconds and then goes out.

3 SRS AIRBAG (FRONT PASSENGER SEAT SIDE)

3-1 REMOVAL AND INSTALLATION

CAUTION

- Refer to the Caution Tips on Servicing.

Refer to Page A1-2.

3-1-1 ARTICLES TO BE PREPARED

Instrument

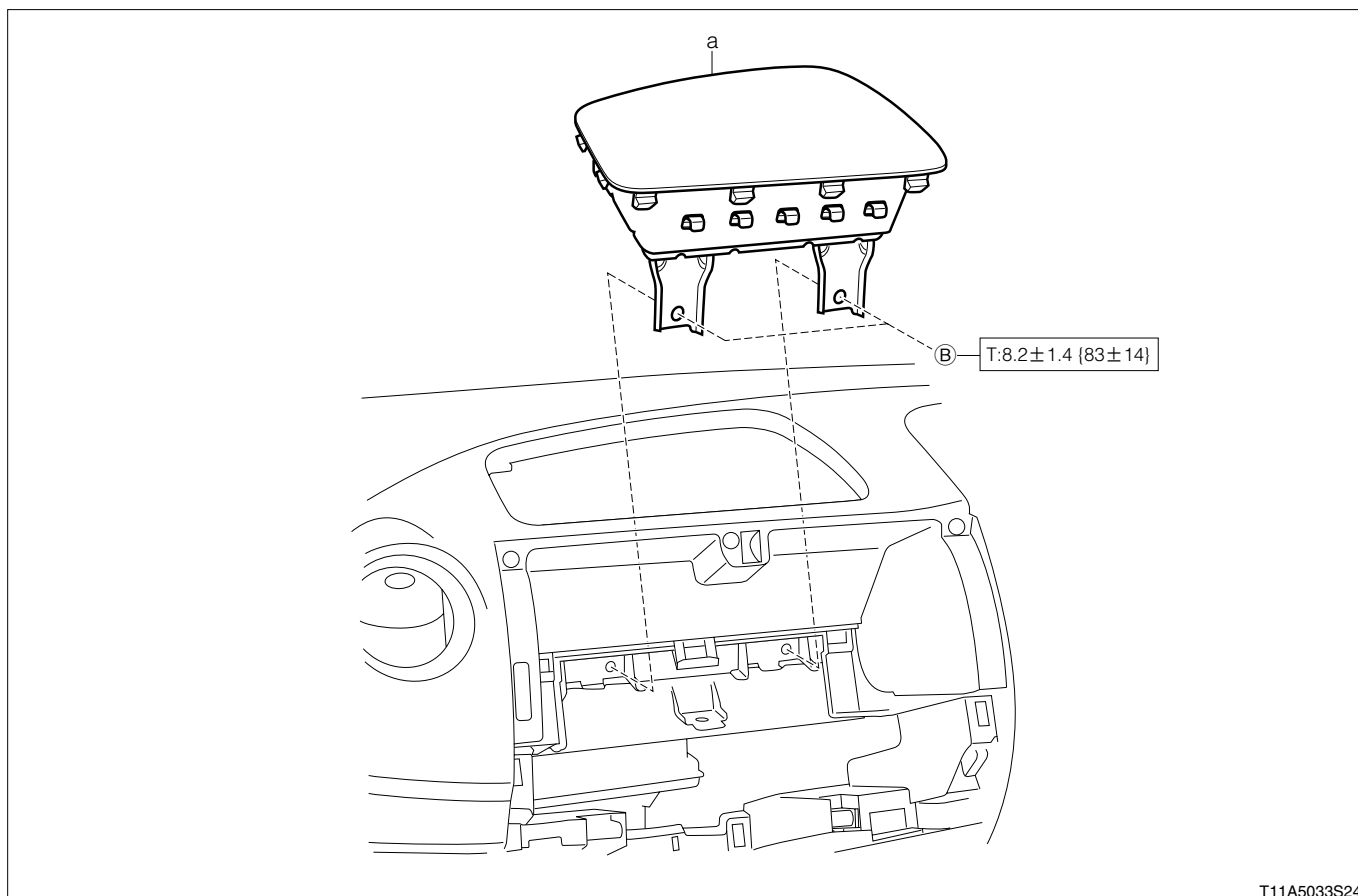
Torque wrench

3-1-2 OPERATION BEFORE REMOVAL

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.
2. Remove the instrument panel box No. 1.
Refer to Page I2-15.

3-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



Unit: N · m {kgf · cm}

T11A5033S24

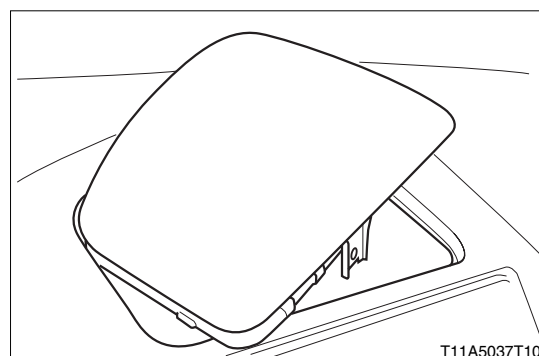
(2) Removal and installation procedures

- ▼ ▲ 1 a Airbag Ay, instrument panel passenger

3-1-4 POINTS OF REMOVAL

(1) AIRBAG AY, INSTRUMENT PANEL PASSENGER

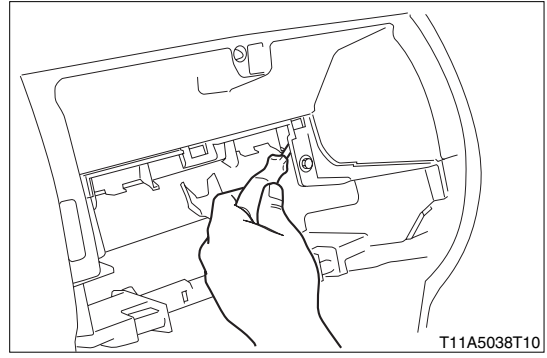
1. Remove the bolt retaining the instrument panel reinforcement S/A and airbag Ay.
2. Disconnect the connector under a condition that the airbag Ay is floated from the instrument panel.



T11A5037T10

H1-11

3. With a flat screwdriver or the like, remove the clamp of the airbag Ay harness from the instrument panel reinforcement S/A through the installation section of the instrument panel box No. 1.



3-1-5 INSPECTION

(1) Check of instrument panel passenger airbag Ay

1. When the following cases have occurred, perform checks. If there are any faulty parts, replace them.
 - (1) Case where the vehicle is damaged, including minor collisions where the airbag has not been deployed.
 - (2) Case where problems have been found out by the diagnosis check

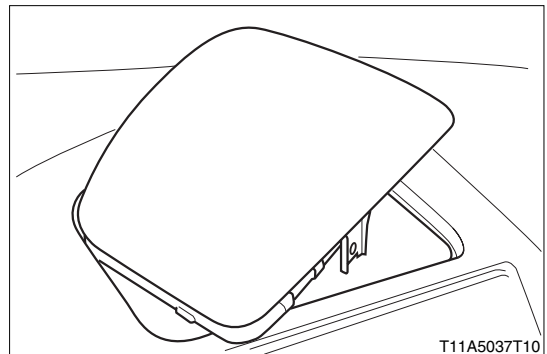
(2) External check of Instrument panel passenger airbag Ay

1. When the following cases have occurred, replace the airbag assembly.
 - (1) Case where the airbag has been deployed.
 - (2) Case where the airbag deploying surface has scratches or cracks.
 - (3) Case where the connector or harness has dents or chips.
 - (4) Case where grease, water, detergent or oil has got to the airbag assembly in a large quantity.
 - (5) Case where the airbag assembly dropped and got damaged.

3-1-6 POINTS OF INSTALLATION

(1) Airbag Ay, instrument panel passenger

1. Connect the connector and harness under a condition that the airbag Ay is floated.
2. Fit the airbag Ay into the instrument panel. Then, tighten the attaching bolts.



3-1-7 OPERATION AFTER INSTALLATION

1. Install the instrument panel box No. 1.
Refer to Page I2-15.
2. Connect the negative (—) terminal of the battery.
3. Set the IG SW to "ON" position. At this time, ensure that the airbag warning lamp goes on about six seconds and then goes out.

3-2 DISPOSAL

CAUTION

- Refer to the Caution Tips on Servicing.

Refer to Page A1-2.

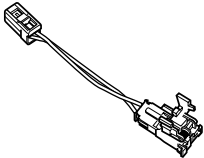
3-2-1 OUTLINE

1. When scrapping a vehicle equipped with an airbag system or scrapping the airbag at the passenger seat, be sure to deploy the airbag. Then, follow the "Scrapping procedure" to scrap the airbag itself. When scrapping the airbag at the passenger seat, that has been deployed by a customer during its use, too, follow the "Scrapping procedure."

3-2-2 DEPLOYMENT OF INSTRUMENT PANEL PASSENGER AIRBAG AY

(1) Articles to be prepared

SST

Shape	Part No.	Part name
	09082-87710-000 (09082-87701-000)	Wire,air bag deployment
	09082-00760-000	Sub-harness 4,air bag deployment wire

Lubricants, bonds and others

Wire harness (1.25mm²), 12V battery for car use, 1 tire with disc wheel, 4 tires, Plastic bag

(2) In-vehicle deployment

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.

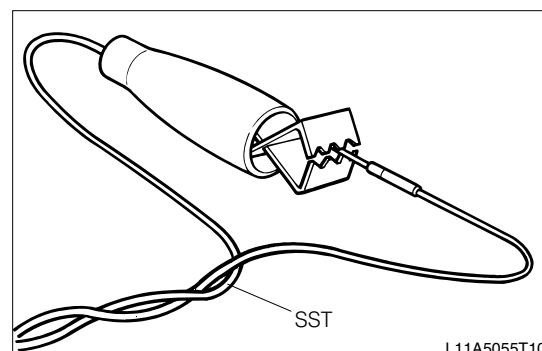
2. Connect the following two SSTs.

SST: 09082-87710-000

09082-00760-000

3. Short the terminal with the alligator clip of the SST.

SST: 09082-87710-000



4. Remove the instrument panel box No. 1.

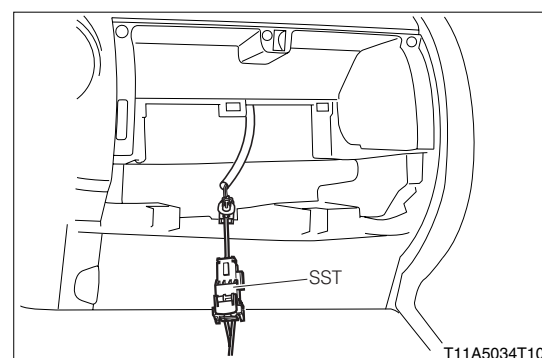
Refer to Page I2-15.

5. Disconnect the connector at the airbag harness side.

Refer to Page H1-9.

6. Install the airbag Ay to the instrument panel reinforcement S/A.

Refer to Page H1-9.



7. Connect the SST connector to the connector for the air-bag (Yellow 2P).

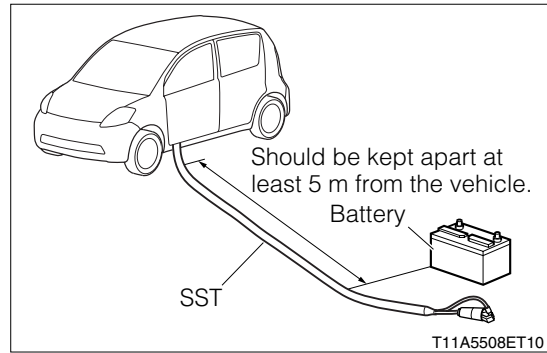
SST: 09082-00760-000

WARNING

- Ensure that there is no excessive play at the airbag assembly.
- At this time, close all the doors and windows.

H1-13

8. Extend the SST fully. Place the battery at least 5 m away from the vehicle.

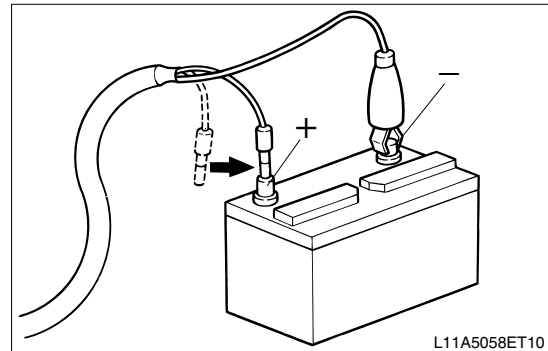


9. Confirm safety inside and around the vehicle. Then, connect the SST to the battery (The alligator clip to the negative (−) terminal of the battery; the terminal to the positive (+) terminal) so as to actuate the airbag.

SST: 09082-87710-000

WARNING

- Make sure that there is no one inside and around the vehicle.
- Give warning loudly to those nearby before deploying the airbag.



(3) Unit deployment

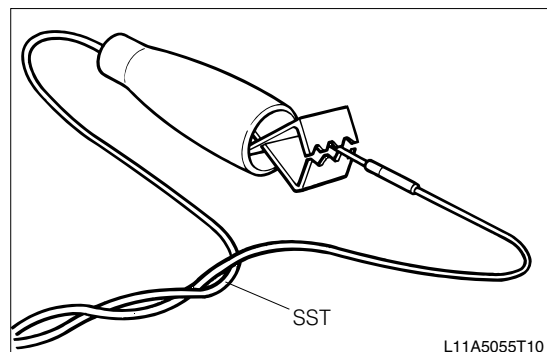
1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.
2. Connect the following two SSTs.

SST: 09082-87710-000

09082-00760-000

3. Short the terminal with the alligator clip of the SST.
4. Remove the airbag Ay from the instrument main panel.

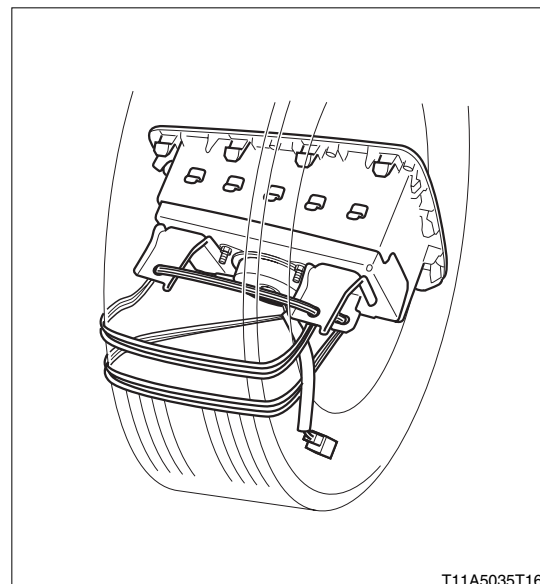
SST: 09082-87710-000



5. Secure the airbag Ay to a tire, using a wire harness for automotive use (Cross-sectional area of core wire: 1.25mm^2 or more).

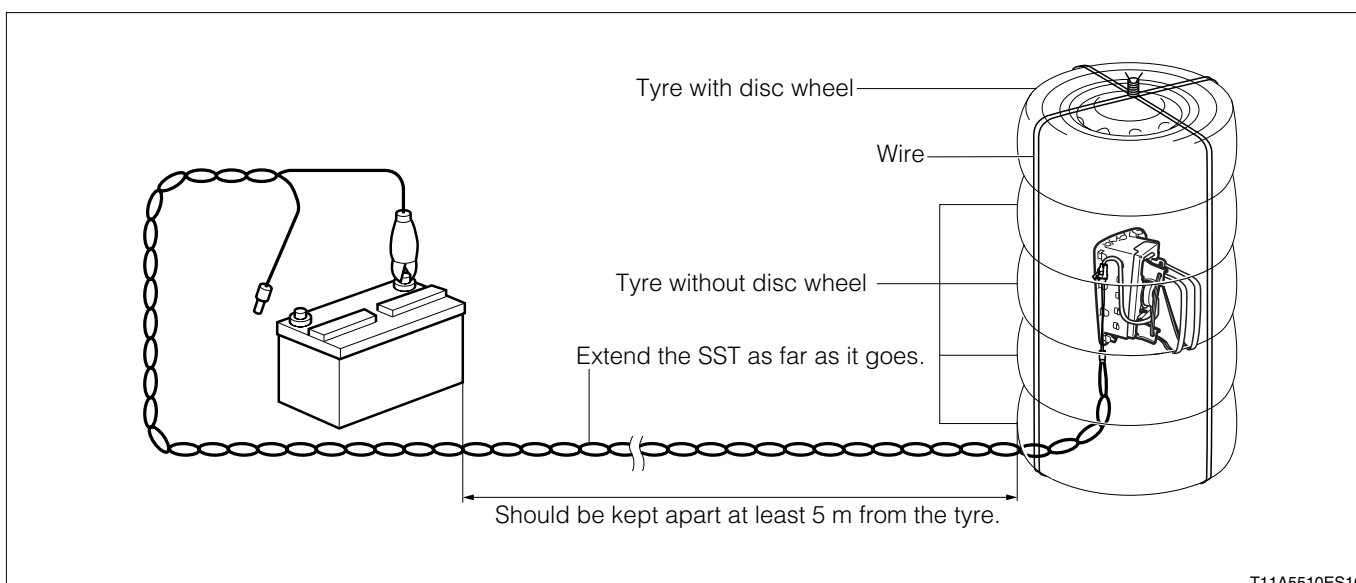
WARNING

- Install the airbag assembly in such a way that the airbag deploying surface faces toward the center of the tire.
- A great force will be applied to the wire harness at the time of airbag deployment. Therefore, secure the wire harness firmly by winding it triple.



T11A5035T16

6. Connect the SST connector to the connector for the airbag (Yellow 2P).
7. Place a tire tied with the airbag Ay to two tires stacked vertically. Then, place one or more tires on these tires. Finally place a tire with a disc wheel on the top.
8. Connect the tires with wire so that the tires will not be scattered when the airbag is deployed.
9. Extend the SST fully. Place the battery at least 5 m away from the tire.

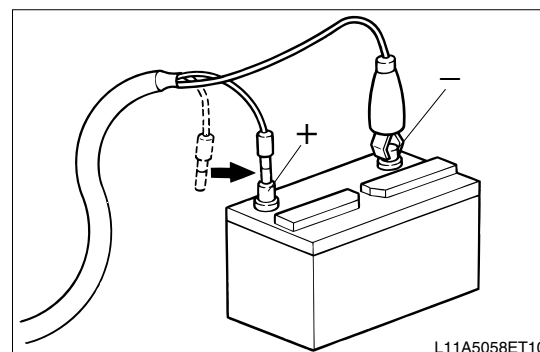


T11A5510ES16

10. Confirm safety inside and around the vehicle. Then, connect the SST to the battery (The alligator clip to the negative (−) terminal of the battery; the terminal to the positive (+) terminal) so as to deploy the airbag.

WARNING

- Make sure that there is no one inside and around the vehicle.
- Give warning loudly to those nearby before deploying the airbag.
- Never mount and reuse the tires and disc wheels used for the deployment on vehicles.



L11A5058ET10

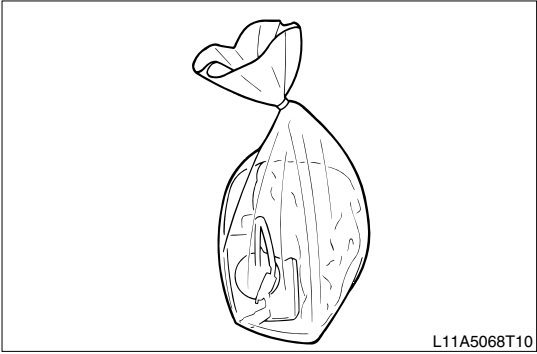
H1-15

(4) Scrapping procedure

1. Seal the deployed airbag assembly in a plastic bag before it is scrapped.

WARNING

- The temperature reaches a few hundred °C at some sections. Therefore, leave it at least 30 minutes after it is deployed.
- Do not apply water, etc.
- When handling, wear dust protective goggles and gloves.
- After completion of the operation, be sure to wash your hands with water.
- Never scrap the pad Ay that has not been deployed.



4 FRONT SEAT OUTER BELT (EQUIPPED WITH PRETENSIONER AND FORCE LIMITER MECHANISM)

4-1 REMOVAL AND INSTALLATION

CAUTION

- Refer to the Caution Tips on Servicing.

Refer to Page A1-2.

4-2 DISPOSAL

CAUTION

- Refer to the Caution Tips on Servicing.

Refer to Page A1-2.

4-2-1 OUTLINE

1. When scrapping a vehicle equipped with a pretensioner or scrapping the front seat outer belt itself, be sure to actuate the pretensioner. Then, follow the "Scrapping procedure" to scrap the front seat outer belt itself. When scrapping the front seat outer belt that has been actuated by a customer during its use, too, follow the "Scrapping procedure."

NOTE

- The pretensioner is actuated even if the seat belt is not fastened.

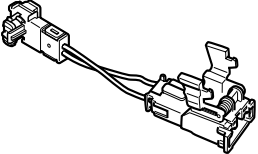
4-2-2 CONFIRMATION OF ACTUATED PRETENSIONER

1. The pretensioner is actuated together with the airbag. Therefore if the airbag has been deployed in an accident, the pretensioner also has been actuated.

4-2-3 ACTUATION OF PRETENSIONER

(1) Articles to be prepared

SST

Shape	Part No.	Part name
	09082-87710-000 (09082-87701-000)	Wire,air bag deployment
	09082-97201-000	Sub-harness D1,air bag deployment wire

Lubricants, bonds and others

12V battery for car use, 2 tires with disc wheel, A steel sheet (a thickness $t = 1$ to 2mm), Plastic bag

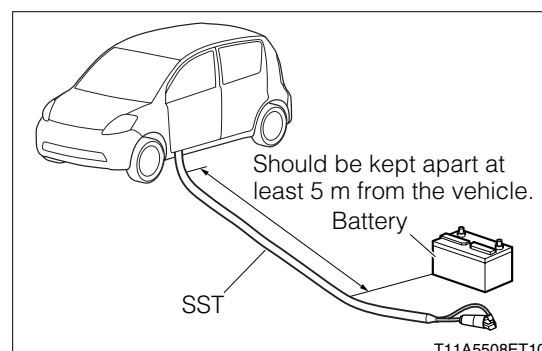
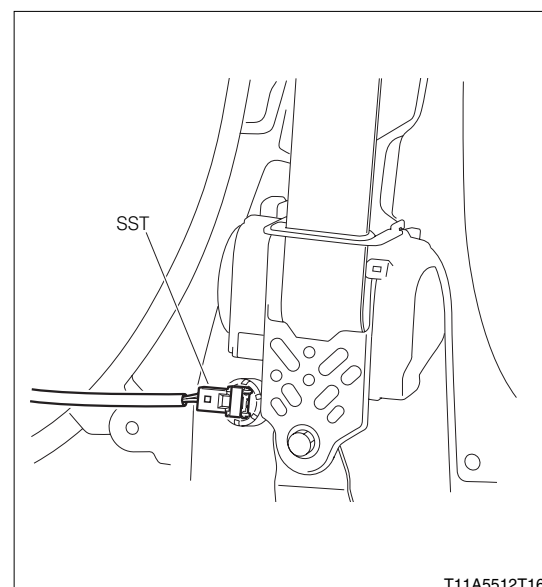
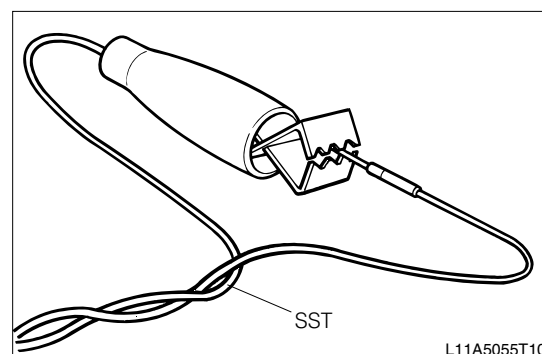
(2) In-vehicle actuation

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.
2. Connect the following two SSTs.
SST: 09082-87710-000
09082-97201-000
3. Short the terminal with the alligator clip of the SST.
SST: 09082-87710-000
4. Remove the front door scuff plate RH/LH.
Refer to Page I2-43.
5. Remove the rear door scuff plate RH/LH.
Refer to Page I2-43.
6. Remove the center pillar lower garnish RH/LH.
Refer to Page I2-43.
7. Disconnect the connector for the pretensioner.
8. Connect the connector of the SST to the pretensioner.
SST: 09082-97201-000

WARNING

- Ensure that there is no excessive play at the pretensioner installing section.
- Check that the belt section of the outside (Front) belt Ay has no looseness.
- Do not cut the belt of the outside (Front) belt Ay before the actuation is completed.
- At this time, close all the doors and windows.

9. Extend the SST fully. Place the battery at least 5 m away from the vehicle.

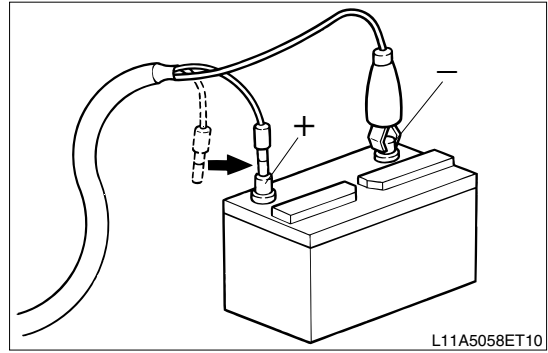


H1-17

10. Confirm safety inside and around the vehicle. Then, connect the SST to the battery (The alligator clip to the negative (–) terminal of the battery; the terminal to the positive (+) terminal) so as to actuate the pretensioner.

WARNING

- Make sure that there is no one inside and around the vehicle.
- Give warning loudly to those nearby before actuating the pretensioner.



(3) Unit actuation

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.

2. Connect the following two SSTs.

SST: 09082-87710-000

09082-97201-000

3. Short the terminal with the alligator clip of the SST.

SST: 09082-87710-000

4. Remove the front door scuff plate RH/LH.

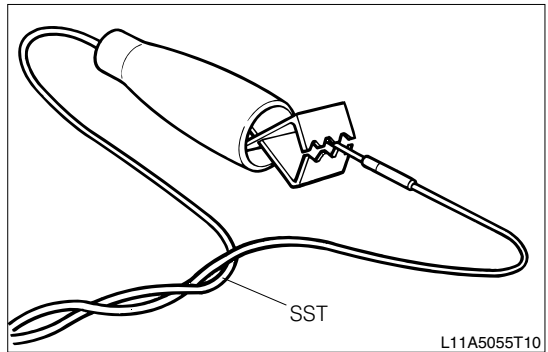
Refer to Page I2-43.

5. Remove the rear door scuff plate RH/LH.

Refer to Page I2-43.

6. Remove the center pillar lower garnish RH/LH.

Refer to Page I2-43.



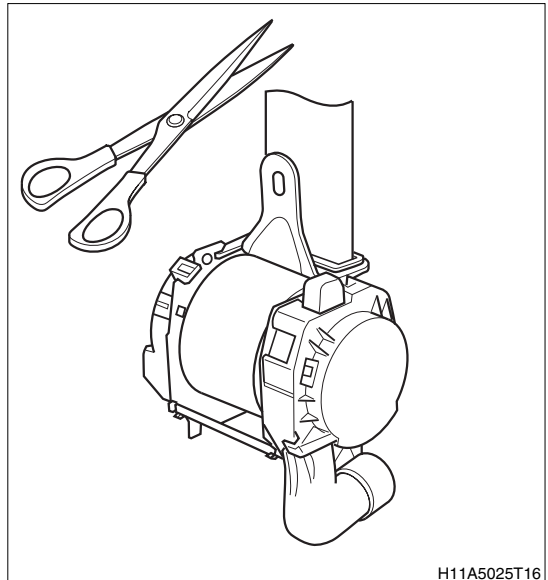
7. Disconnect the connector for the pretensioner.

8. Cut the belt of the outside (Front) belt Ay at the retractor section.

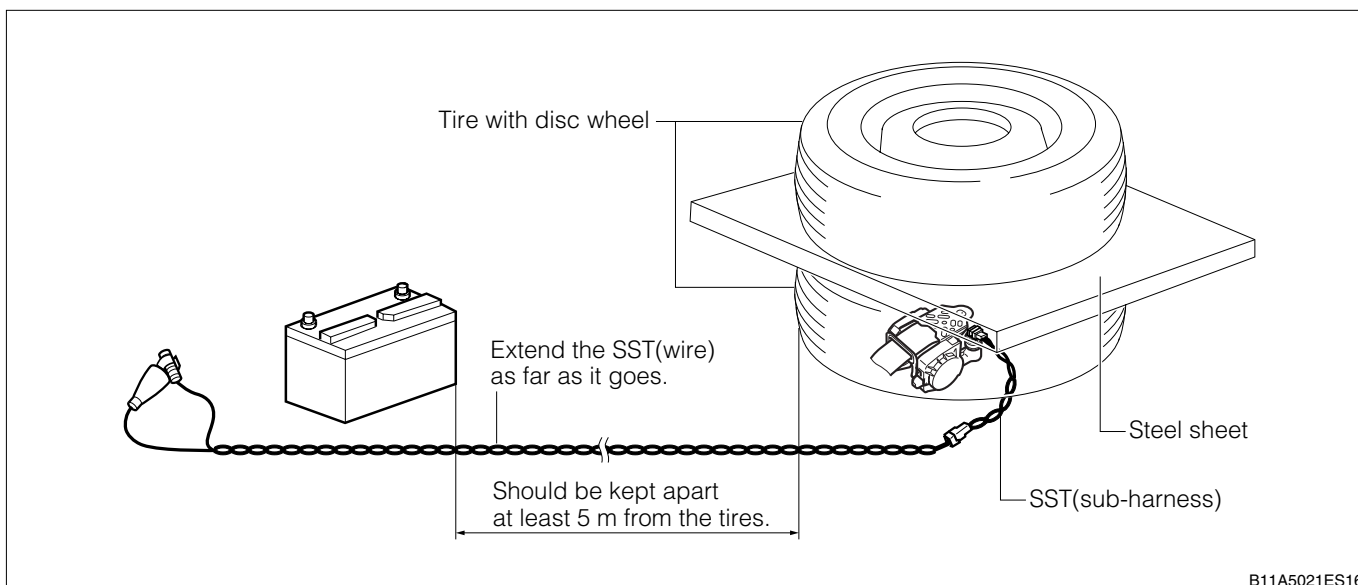
9. Remove the pretensioner from the vehicle.

10. Connect the connector of the SST to the pretensioner.

SST: 09082-97201-000



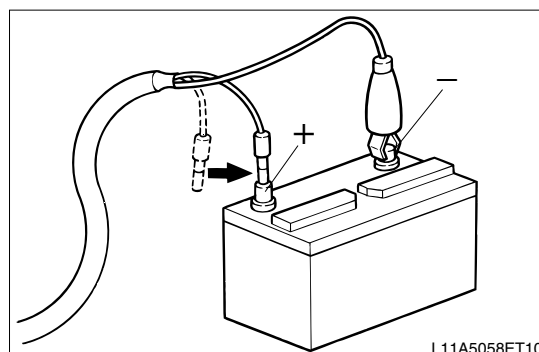
11. Place the pretensioner on the ground with its connector side facing upward. Place a tire with a disc wheel on it.
12. Place a steel sheet (Thickness $t = \text{approx. } 1 - 2 \text{ mm}$) on the tire with disc wheel. Place another tire with a disc wheel on it.
13. Extend the SST fully. Place the battery at least 5 m away from the tire.



14. Confirm safety inside and around the vehicle. Then, connect the SST to the battery (The alligator clip to the negative (−) terminal of the battery; the terminal to the positive (+) terminal) so as to deploy the airbag.

WARNING

- Make sure that there is no one inside and around the vehicle.
- Give warning loudly to those nearby before actuating the pretensioner.
- Never mount and reuse the tires and wheels used for the deployment on vehicles.

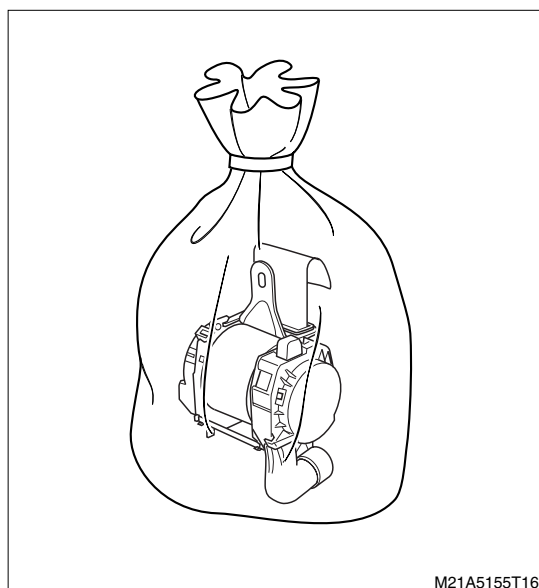


4-2-4 SCRAPPING PROCEDURE

1. Put the actuated pretensioner in a plastic bag and seal it to be scrapped.

WARNING

- The temperature reaches a few hundred °C at some sections. Therefore, leave it at least 30 minutes after it is actuated.
- Do not apply water, etc.
- When handling, wear dust protective goggles and gloves.
- After completion of the operation, be sure to wash your hands with water.
- Never scrap the pad Ay that has not been deployed.



H1-19

5 SRS SIDE AIRBAG

5-1 REMOVAL AND INSTALLATION

CAUTION

- Refer to the Caution Tips on Servicing.

Refer to Page A1-2.

5-1-1 ARTICLES TO BE PREPARED

Instrument

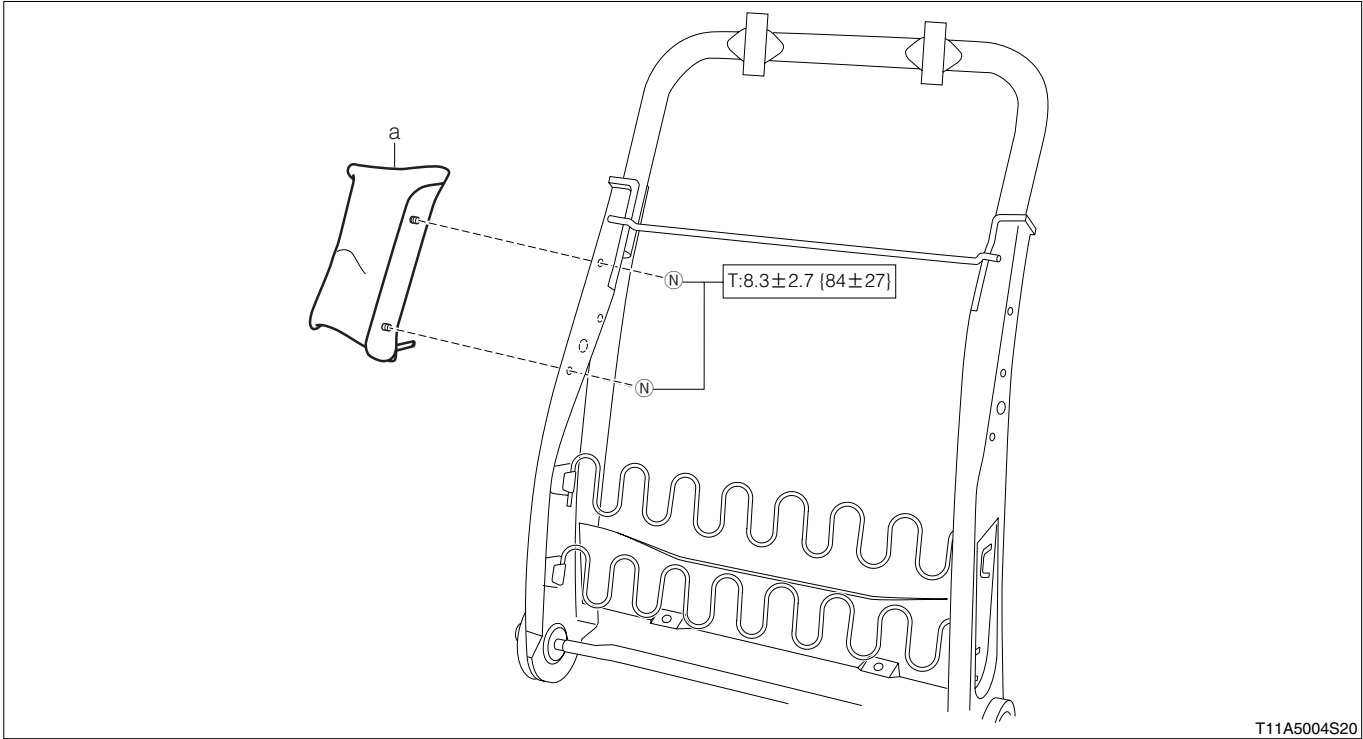
Torque wrench

5-1-2 OPERATION BEFORE REMOVAL

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.
2. Disconnect the connectors of the front seat airbag Ay, RH/LH.
3. Remove the front seat Ay RH/LH.
Refer to Page I2-24.
4. Remove the front seat back w/cover pad S/A RH/LH.
Refer to Page I2-26.
5. Detach the hook and clip at the skirt of the front seat cushion pad with cover RH/LH.
Refer to Page I2-26.
6. Disconnect the harness of the front seat airbag Ay RH/LH from the front seat Ay RH/LH.

5-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



T11A5004S20

Unit: N · m {kgf · cm}

(2) Removal and installation procedures

- 1 a Airbag Ay, front seat, RH/LH

5-1-4 INSPECTION

(1) Check of front seat airbag Ay RH/LH

1. When the following cases have occurred, perform checks. If there are any faulty parts, replace them.
 - (1) Case where the vehicle is damaged, including minor collisions where the airbag has not been deployed.
 - (2) Case where problems have been found out by the diagnosis check

(2) External check of front seat airbag Ay RH/LH

1. When the following cases have occurred, replace the airbag assembly.
 - (1) Case where the airbag has been deployed.
 - (2) Case where the airbag deploying surface has scratches or cracks.
 - (3) Case where the connector or harness has dents or chips.
 - (4) Case where grease, water, detergent or oil has got to the airbag assembly in a large quantity.
 - (5) Case where the airbag assembly dropped and got damaged.

5-1-5 OPERATION AFTER INSTALLATION

1. Connect the harness of the front seat airbag Ay RH/LH to the front seat Ay RH/LH.
2. Attach the hook and clip at the skirt of the front seat cushion pad with cover RH/LH.
Refer to Page I2-26.
3. Install the front seat back w/cover pad S/A RH/LH.
Refer to Page I2-26.
4. Install the front seat Ay RH/LH.
Refer to Page I2-24.
5. Connect the connector of the front seat airbag Ay RH/LH.
6. Install the negative (－) terminal of the battery.
7. Set the IG SW "ON" position. At this time, ensure that the airbag warning lamp goes on about six seconds and then goes out.

5-2 DISPOSAL

CAUTION

- Refer to the Caution Tips on Servicing.

Refer to Page A1-2.

5-2-1 OUTLINE

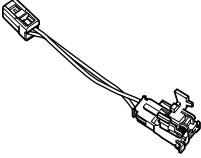
1. When scrapping a vehicle equipped with an airbag system or scrapping the front seat airbag Ay, be sure to deploy the airbag. Then, follow the "Scrapping procedure" to scrap the airbag itself. When scrapping the front seat airbag Ay, that has been deployed by a customer during its use, too, follow the "Scrapping procedure."

H1-21

5-2-2 DEPLOYMENT OF SRS SIDE AIRBAG

(1) Articles to be prepare

SST

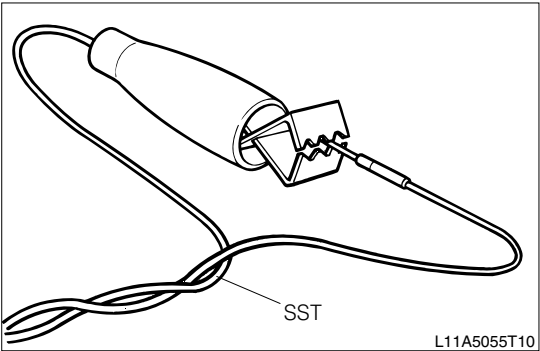
Shape	Part No.	Part name
	09082-87710-000 (09082-87701-000)	Wire,air bag deployment
	09082-00760-000	Sub-harness 4,air bag deployment wire

Lubricant,adhesive,others

12V battery for car use,Wire harness (1.25mm ²),1 tire with disc wheel,4 tires,Plastic bag

(2) In-vehicle deployment of front seat airbag Ay

1. Set the IG SW "LOCK" position. Remove the negative (－) terminal of the battery.
2. Connect the following two SSTs.
SST: 09082-87710-000
09082-00760-000
3. Short the terminal with the alligator clip of the SST.
SST: 09082-87710-000



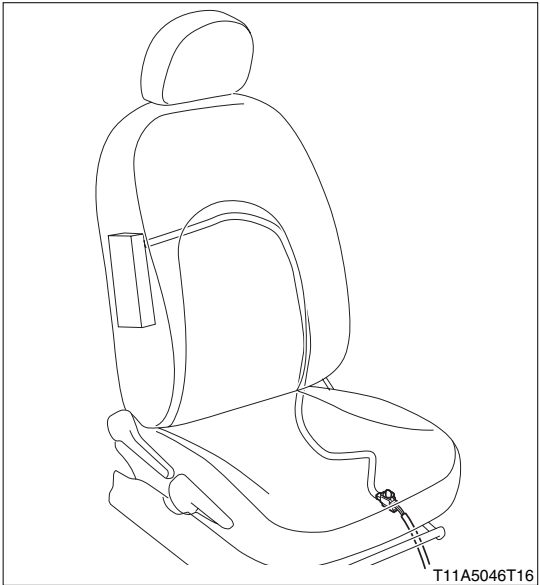
4. Disconnect the harness side connector for the airbag of the front seat Ay RH/LH at the side to be deployed.
5. Connect the SST connector to the front seat airbag assembly connector (Yellow 2P).
SST: 09082-00760-000

WARNING

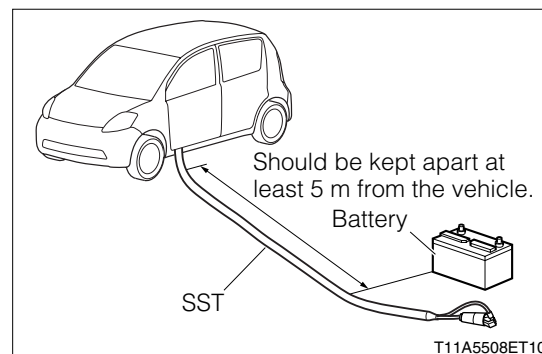
- At this time, close all the doors and windows.

CAUTION

- Ensure that the front seat Ay RH/LH is secured to the vehicle.



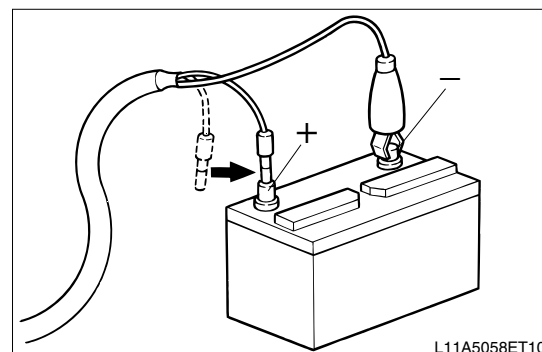
6. Extend the SST fully. Place the battery at least 5 m away from the vehicle.



7. Confirm safety inside and around the vehicle. Then, connect the SST to the battery (The alligator clip to the negative (−) terminal of the battery; the terminal to the positive (+) terminal) so as to deploy the airbag.

WARNING

- Make sure that there is no one inside and around the vehicle.
- Give warning loudly to those nearby before deploying the airbag.



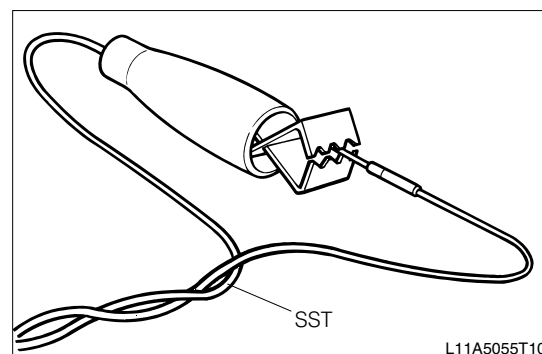
(3) Deployment of front seat airbag Ay

1. Set the IG SW "LOCK" position. Remove the negative (−) terminal of the battery. If you begin the operation before 60 seconds pass, there is a danger that the airbag is mistakenly deployed.
2. Connect the following two SSTs.

SST: 09082-87710-000
09082-00760-000

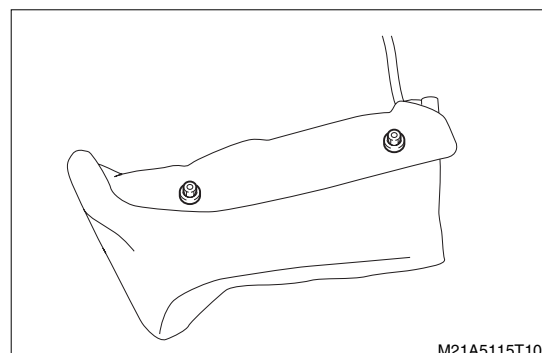
3. Short the terminal with the alligator clip of the SST.

SST: 09082-87710-000



4. Remove the airbag Ay from the front seat Ay RH/LH. Refer to Page H1-19.

5. Install the two wire harness installing nuts to the airbag assembly.



H1-23

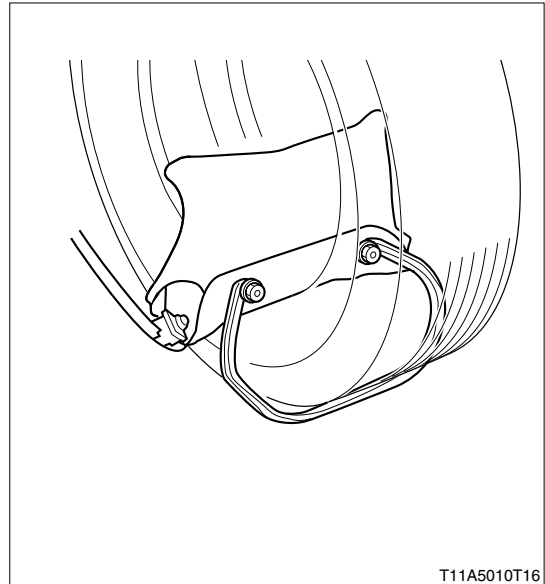
6. Secure the front seat airbag assembly to a tyre, using a wire harness for car use (Cross-sectional area of core wire: 1.25 mm² or more).

WARNING

- Install the airbag assembly in such a way that the airbag deploying surface faces toward the center of the tyre.
- A great force will be applied to the wire harness at the time of airbag deployment. Therefore, secure the wire harness securely by winding it triple.

7. Install the SST to the front seat airbag assembly connector (2P).

SST: 09082-00760-000

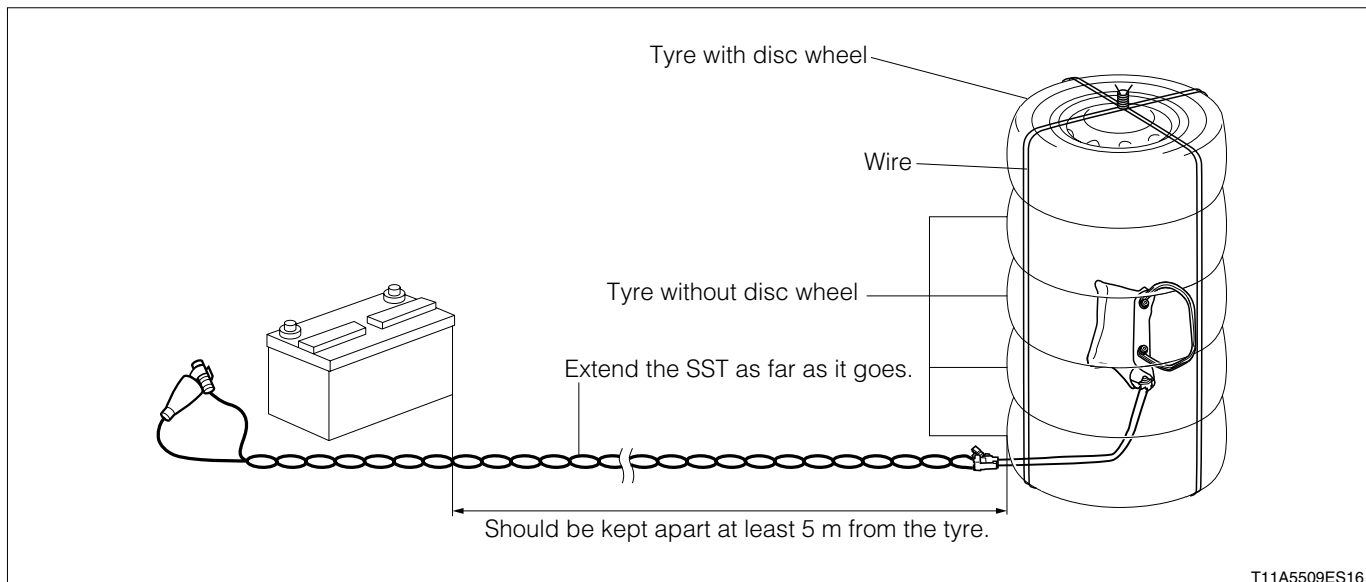


T11A5010T16

8. Place a tyre tied with the airbag Ay to two tyres stacked vertically. Then, place one or more tyres on these tyres. Finally place a tyre with a disc wheel on the top.

9. Connect the tyres with wire so that the tyres will not be scattered when the airbag is deployed.

10. Extend the SST fully. Place the battery at least 5 m away from the tyre.

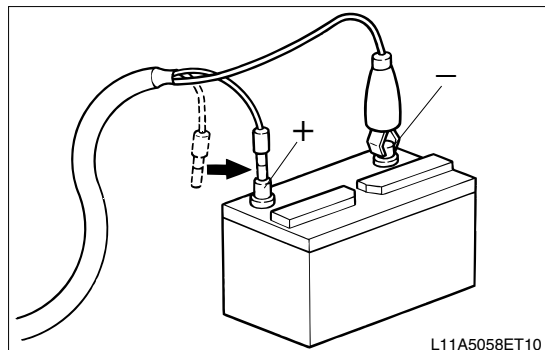


T11A5509ES16

11. Confirm safety inside and around the vehicle. Then, connect the SST to the battery (The alligator clip to the negative (−) terminal of the battery; the terminal to the positive (+) terminal) so as to deploy the airbag.

WARNING

- Make sure that there is no one inside and around the vehicle.
- Give warning loudly to those nearby before deploying the airbag.
- Never mount and reuse the tyres and wheels used for the deployment on vehicles.



L11A5058ET10

(4) Scrapping procedure

1. Seal the deployed airbag assembly in a plastic bag before it is scrapped.

WARNING

- The temperature of the front seat airbag assembly that has been deployed is a few hundred °C at some sections. Therefore, leave it at least 30 minutes after it is deployed.
- Do not apply water, etc. to the deployed front seat airbag assembly.
- When handling the deployed front seat airbag assembly, wear protective goggles and gloves.
- After completion of the operation, be sure to wash your hands with water.
- Never scrap the front seat airbag assembly that has not been deployed.



W11A5006T10

6 CURTAIN SHIELD AIRBAG**6-1 REMOVAL AND INSTALLATION****CAUTION**

- Refer to the Caution Tips on Servicing.

Refer to Page A1-2.

6-1-1 ARTICLES TO BE PREPARED

Instrument

Torque wrench

6-1-2 OPERATION BEFORE REMOVAL

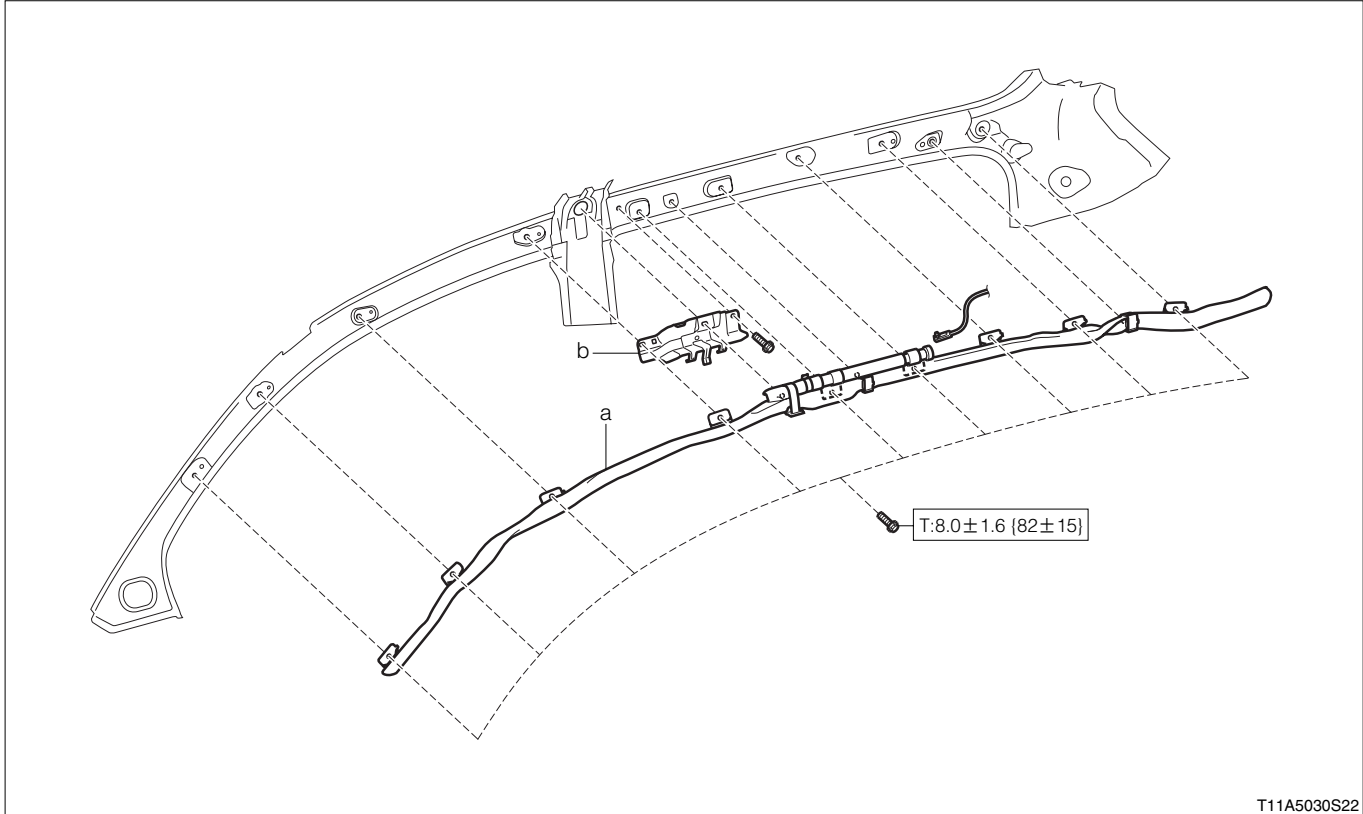
1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.
2. Remove the roof headlining Ay.

Refer to Page I2-43.

H1-25

6-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



Unit: N · m {kgf · cm}

(2) Removal and installation procedures

- ▲ 1 a Airbag Ay, curtain shield, RH/LH
- 2 b Bracket S/A, roof side rail, RH/LH

6-1-4 INSPECTION

(1) Check of curtain shield airbag ay RH/LH

1. When the following cases have occurred, perform checks. If there are any faulty parts, replace them.
 - (1) Case where the vehicle is damaged, including minor collisions where the airbag has not been deployed.
 - (2) Case where problems have been found out by the diagnosis check

(2) External check of curtain shield airbag Ay RH/LH

1. When the following cases have occurred, replace the airbag assembly.
 - (1) Case where the airbag has been deployed.
 - (2) Case where the airbag deploying surface has scratches or cracks.
 - (3) Case where the connector or harness has dents or chips.
 - (4) Case where grease, water, detergent or oil has got to the airbag assembly in a large quantity.
 - (5) Case where the airbag assembly dropped and got damaged.

6-1-5 POINTS OF INSTALLATION

(1) Airbag Ay, curtain shield, RH/LH

1. Install the airbag assembly.

CAUTION

- Be very careful not to installed the airbag Ay in a twisted state.

6-1-6 OPERATION AFTER INSTALLATION

1. Install the roof headlining Ay.

Refer to Page I2-43.

2. Connect the negative (—) terminal of the battery.

3. Set the IG SW "ON" position. At this time, ensure that the airbag warning lamp goes on about six seconds and then goes out.

6-2 DISPOSAL

CAUTION

- Refer to the Caution Tips on Servicing.

Refer to Page A1-2.

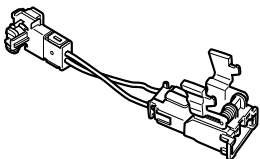
6-2-1 DESCRIPTION

1. When scrapping a vehicle equipped with an airbag system or scrapping the curtain shield airbag Ay, be sure to deploy the airbag. Then, follow the "Scrapping procedure" to scrap the airbag itself. When scrapping the curtain shield airbag Ay, that has been deployed by a customer during its use, too, follow the "Scrapping procedure."

6-2-2 DEPLOYMENT OF CURTAIN SHIELD AIRBAG AY

(1) Articles to be prepared

SST

Shape	Part No.	Part name
	09082-87710-000 (09082-87701-000)	Wire,air bag deployment
	09082-97201-000	Sub-harness D1,air bag deployment wire

Lubricant,adhesive,others

12V battery for car use,1 tire with disc wheel,4 tires,Plastic bag

(2) In-vehicle deployment

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.

2. Connect the following two SSTs.

SST: 09082-87710-000

09082-97201-000

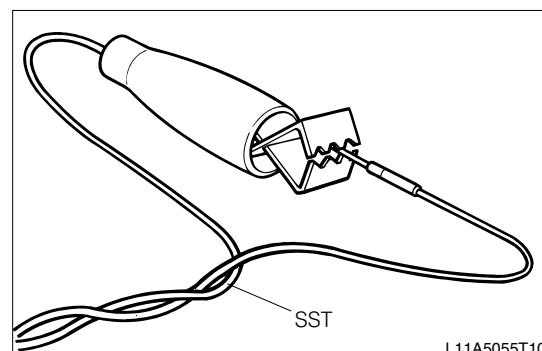
3. Short the terminal with the alligator clip of the SST.

SST: 09082-87710-000

4. Remove the roof headlining Ay.

Refer to Page I2-43.

5. Disconnect the harness side connector for the airbag.



L11A5055T10

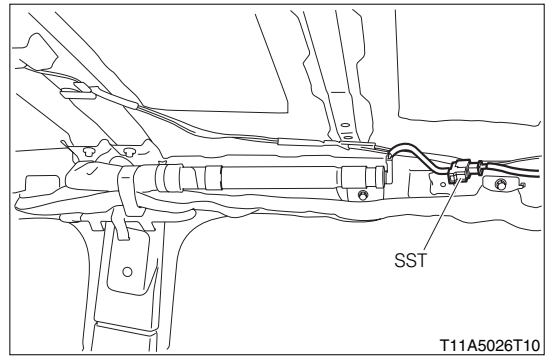
H1-27

6. Connect the SST connector to the connector for the air-bag (Yellow 2P).

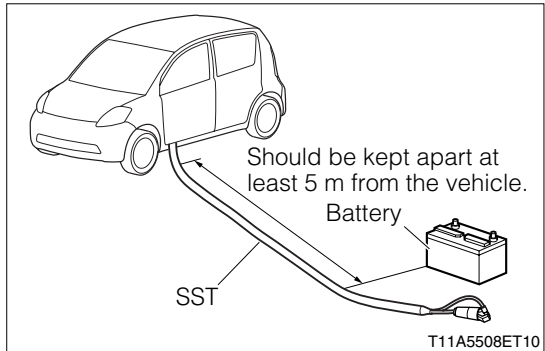
SST: 09082-97201-000

WARNING

- Ensure that there is no excessive play at the airbag assembly.
- At this time, close all the doors and windows.



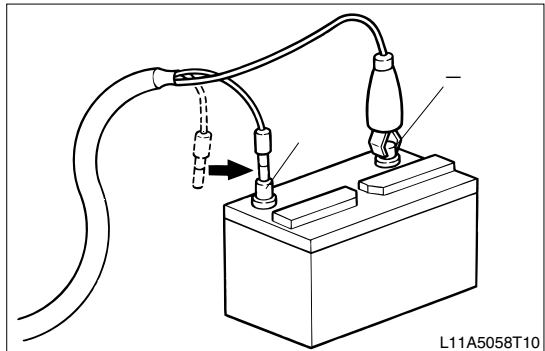
7. Extend the SST fully. Place the battery at least 5 m away from the vehicle.



8. Confirm safety inside and around the vehicle. Then, connect the SST to the battery (The alligator clip to the negative (−) terminal of the battery; the terminal to the positive (+) terminal) so as to actuate the airbag.

WARNING

- Make sure that there is no one inside and around the vehicle.
- Give warning loudly to those nearby before deploying the airbag.



(3) Unit deployment

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.

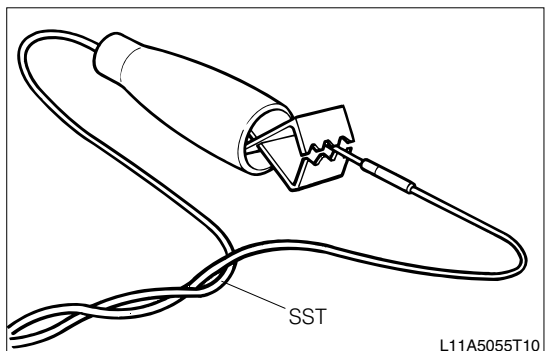
2. Connect the following two SSTs.

SST: 09082-87710-000

09082-97201-000

3. Short the terminal with the alligator clip of the SST.

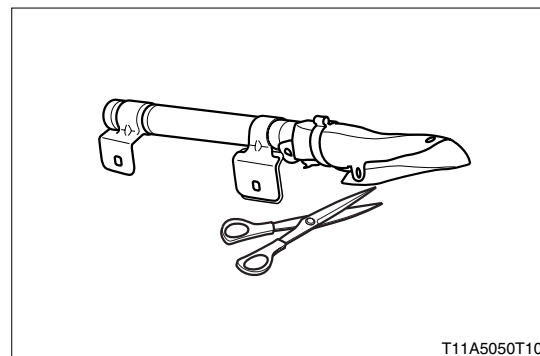
SST: 09082-87710-000



4. Remove the airbag assembly.

Refer to Page H1-24.

5. Cut the bag of the airbag Ay at the root of the inflator.



6. Secure the airbag Ay to a tire, using a wire harness for automotive use (Cross-sectional area of core wire: 1.25mm^2 or more).

WARNING

- Make sure that the airbag deploying surface faces toward the inside of the tire during the installation.
- A great force will be applied to the wire harness at the time of airbag deployment. Therefore, secure the wire harness firmly by winding it triple.

7. Connect the SST connector to the connector for the airbag (Yellow 2P).

SST: 09082-00760-000

SST: 09082-97201-000

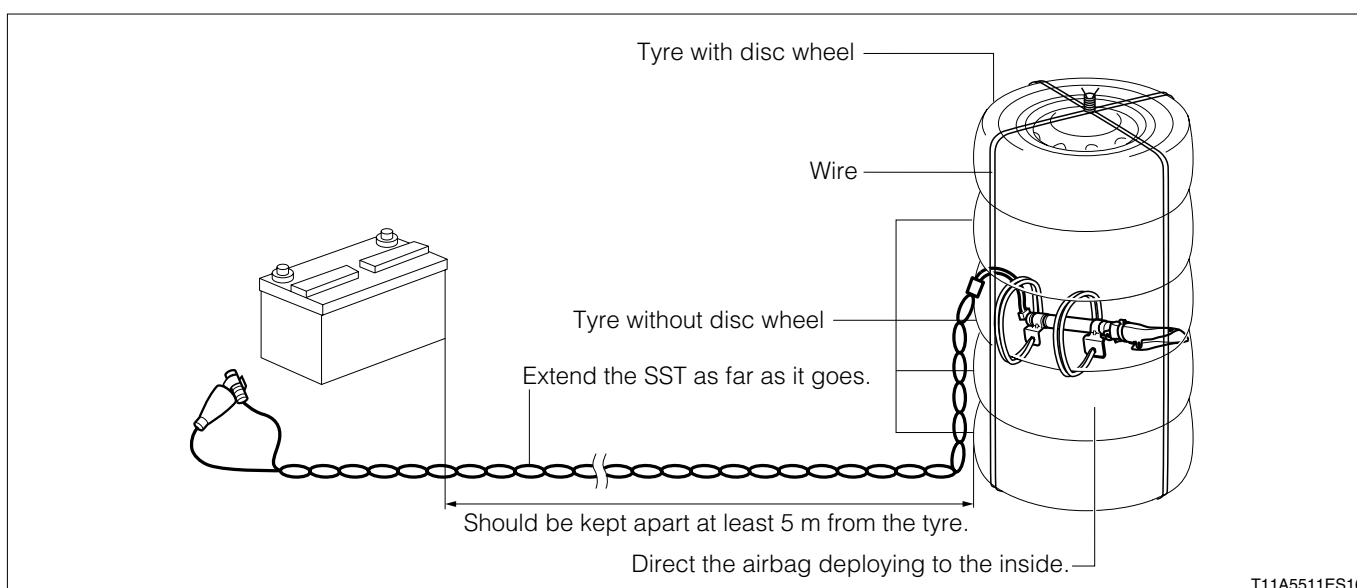
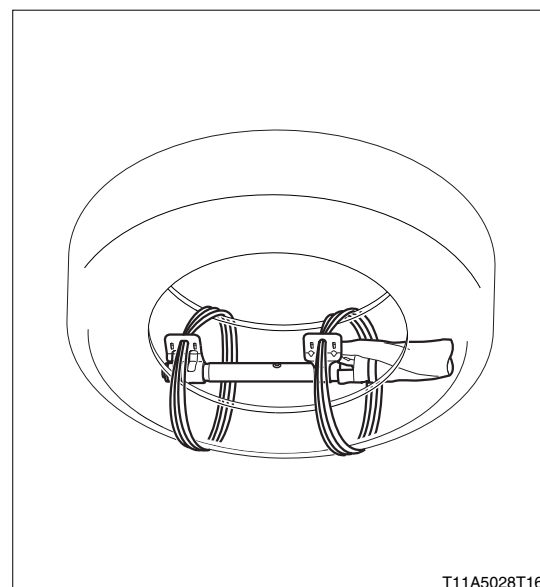
8. Place a tire tied with the airbag Ay to two tires stacked vertically. Then, place one or more tires on these tires. Finally place a tire with a disc wheel on the top.

9. Connect the tires with wire so that the tires will not be scattered when the airbag is deployed.

WARNING

- Since a big sound will be emitted at the time of deployment, keep at least 5 m away.

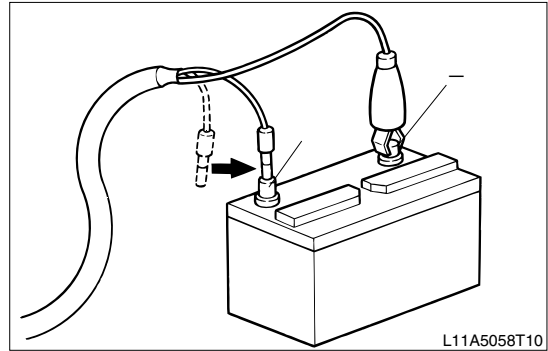
10. Extend the SST fully. Place the battery at least 5 m away from the tire.



11. Confirm safety inside and around the vehicle. Then, connect the SST to the battery (The alligator clip to the negative (−) terminal of the battery; the terminal to the positive (+) terminal) so as to deploy the airbag.

WARNING

- Make sure that there is no one inside and around the vehicle.
- Give warning loudly to those nearby before deploying the airbag.
- Never mount and reuse the tires and wheels used for the deployment on vehicles.

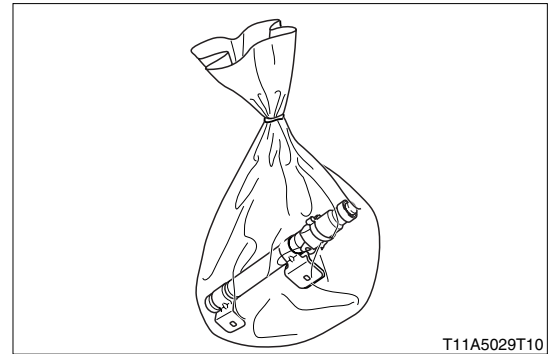


(4) Scrapping procedure

1. Seal the deployed airbag assembly in a plastic bag before it is scrapped.

WARNING

- The temperature reaches a few hundred °C at some sections. Therefore, leave it at least 30 minutes after it is deployed.
- Do not apply water, etc.
- When handling, wear dust protective goggles and gloves.
- After completion of the operation, be sure to wash your hands with water.
- Never scrap the pad Ay that has not been deployed.



7 AIRBAG COMPUTER

7-1 REMOVAL AND INSTALLATION

CAUTION

- Refer to the Caution Tips on Servicing.

Refer to Page A1-2.

7-1-1 ARTICLES TO BE PREPARED

Instrument

Torque wrench

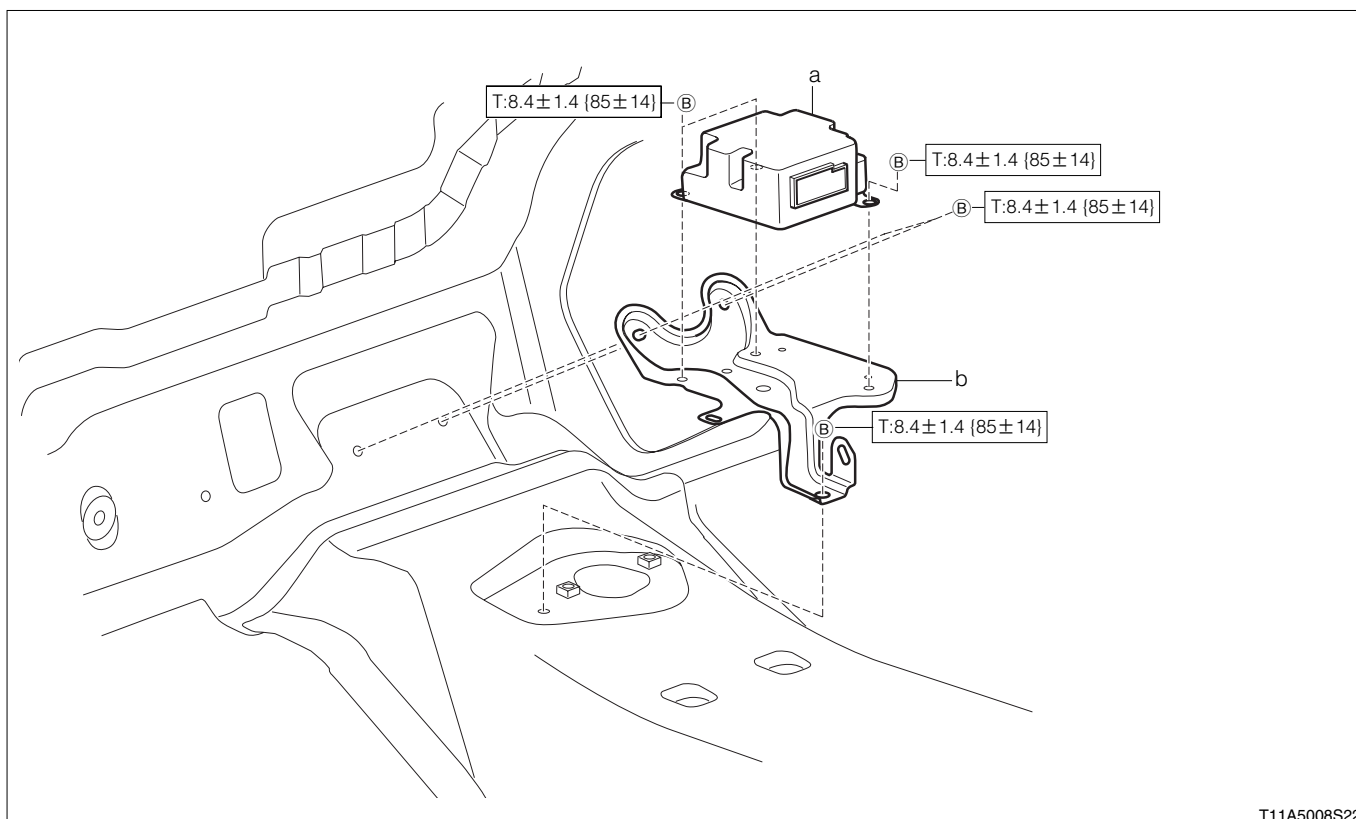
7-1-2 OPERATION BEFORE REMOVAL

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.
2. Remove the console panel and turn over the carpet.

Refer to Page I2-47.

7-1-3 REMOVAL AND INSTALLATION PROCEDURES (VEHICLES NOT EQUIPPED WITH CURTAIN SHIELD AIRBAG & SIDE AIRBAG)

(1) Components



Unit:N·m{kgf·cm}

T11A5008S22

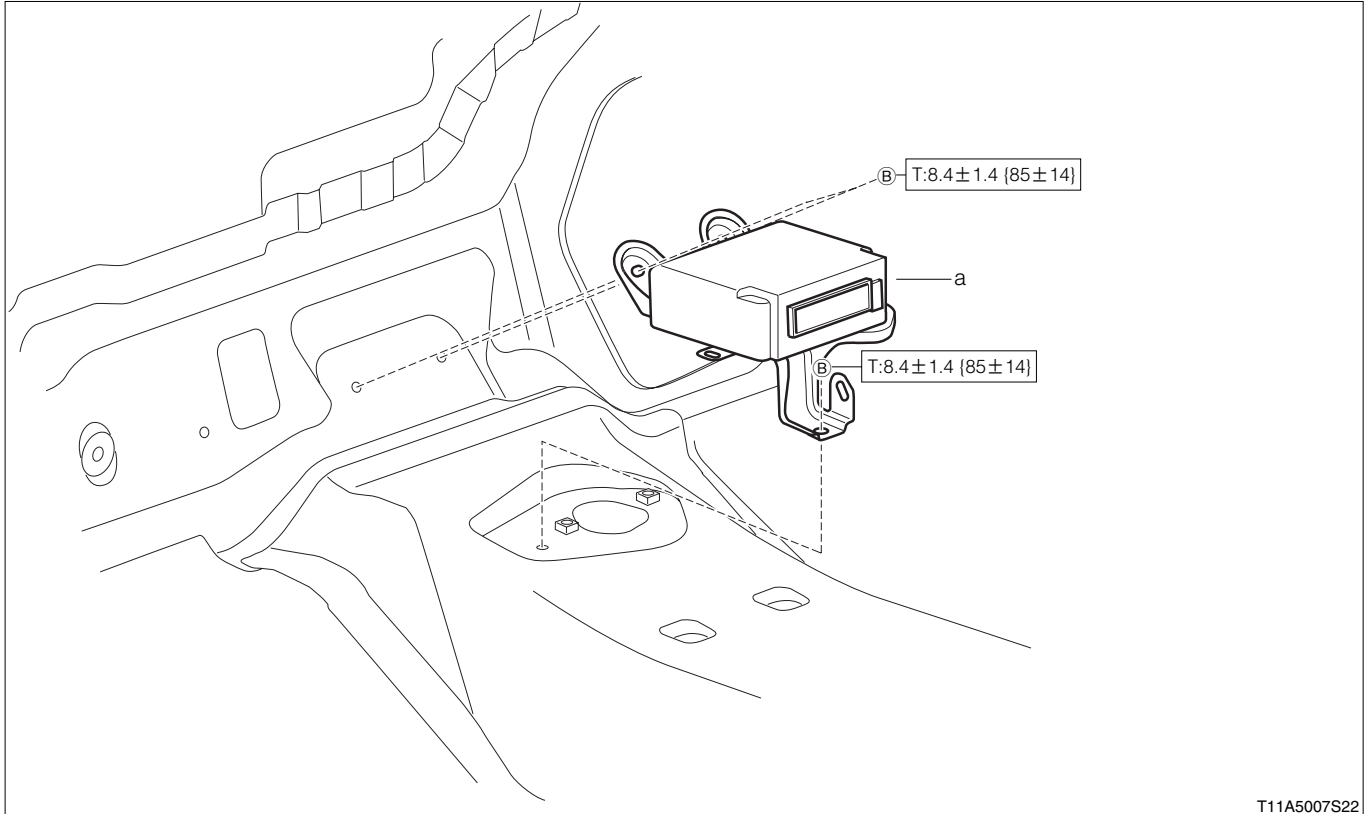
(2) Removal and installation procedures

- 1 a Computer Ay, airbag
- 2 b Bracket, ECU unit

H1-31

7-1-4 REMOVAL AND INSTALLATION PROCEDURES (VEHICLES EQUIPPED WITH CURTAIN SHIELD AIRBAG & SIDE AIRBAG)

(1) Components



(2) Removal and installation procedures

- 1 a Computer Ay, airbag

7-1-5 INSPECTION

(1) Check standard for airbag computer Ay

1. In cases where the vehicle is involved in a collision, check the computer Ay. Replace it if it is faulty.

(2) External Check of airbag computer Ay

1. When the following cases have occurred, replace the computer assembly.
 - (1) Case where the computer Ay is dropped:
 - (2) Case where the connector section of the computer Ay has damage and cracks:
 - (3) Case where the computer Ay has deformation and cracks:

7-1-6 OPERATION AFTER INSTALLATION

1. Place the carpet and install the console panel.
2. Connect the negative (－) terminal of the battery.
3. Set the IG SW "ON" position. At this time, ensure that the airbag warning lamp goes on about six seconds and then goes out.

8 FRONT AIRBAG SENSOR

8-1 REMOVAL AND INSTALLATION

CAUTION

- Refer to the Caution Tips on Servicing.

Refer to Page A1-2.

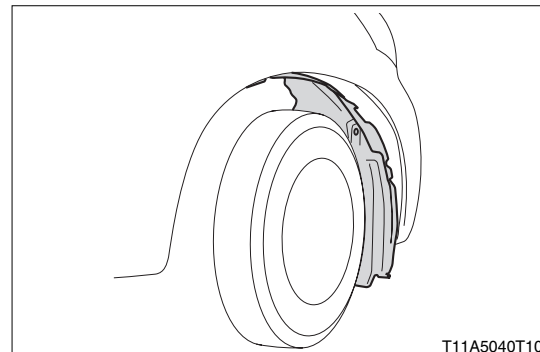
8-1-1 ARTICLES TO BE PREPARED

Instrument

Torque wrench

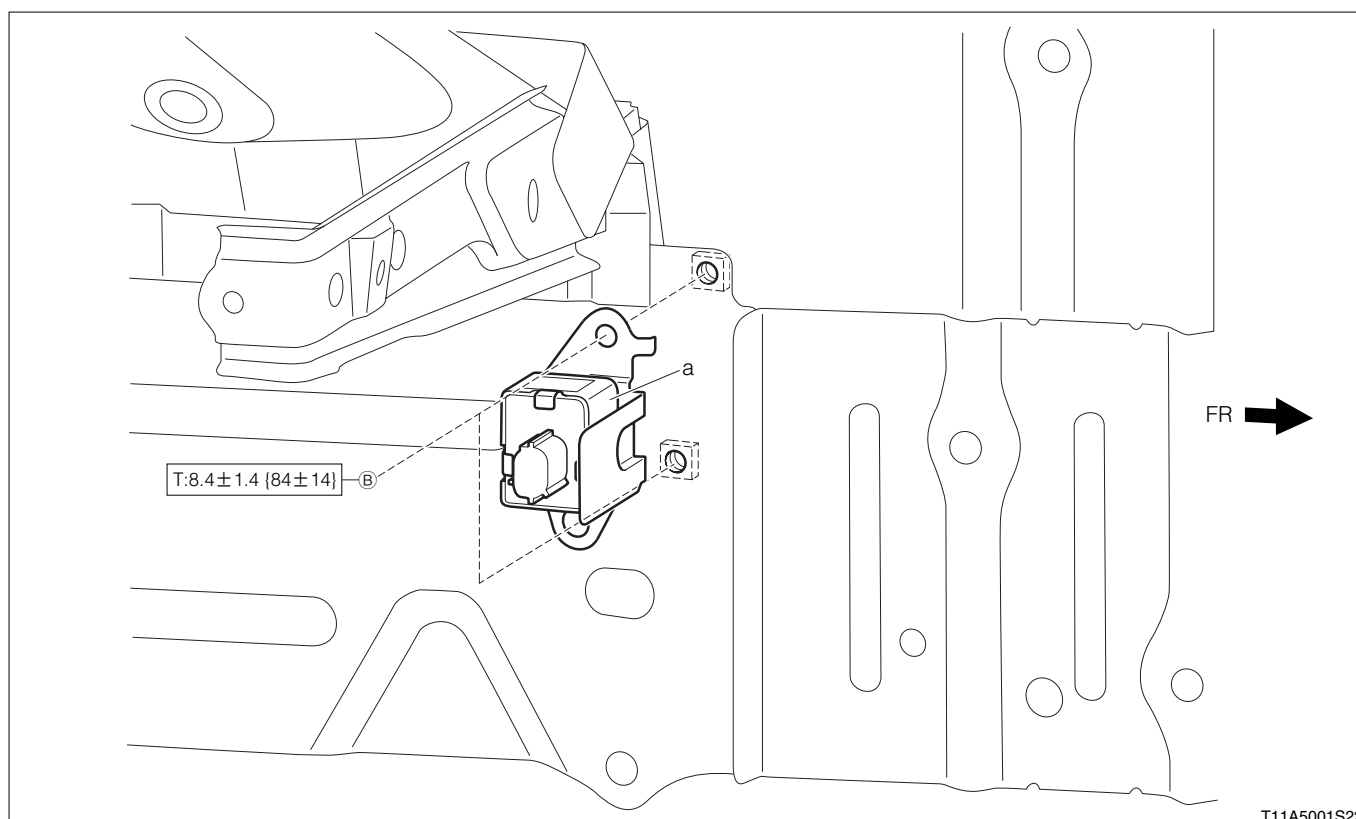
8-1-2 OPERATION BEFORE REMOVAL

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.
2. Remove the clip and grommet of the front fender liner RH (RHD vehicles) or the front fender liner LH (LHD vehicles). Then, turn over the front side.
Refer to Page I1-21.



8-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



Unit: N·m {kgf·cm}

The component diagram shows the RHD vehicle.

(2) Removal and installation procedures

- ▲ 1 a Sensor, airbag, front RH/LH

8-1-4 INSPECTION

(1) Check standard for sensor, airbag front

1. In cases where the vehicle is involved in a collision, check the sensor. Replace it if it is faulty.

(2) External check of sensor, airbag front

- 1. When the following cases have occurred, replace the sensor.
 - (1) Case where the sensor is dropped:
 - (2) Case where the connector section of the sensor has damage and cracks:
 - (3) Case where the sensor has deformation and cracks:

8-1-5 POINTS OF INSTALLATION

(1) Sensor, airbag front

- 1. Install the side member Ay RH, being very careful not to install the sensor in a wrong direction.

8-1-6 OPERATION AFTER INSTALLATION

- 1. Install the front fender liner RH (RHD vehicles) or the front fender liner LH (LHD vehicles).
Refer to Page I1-21.
- 2. Connect the negative (－) terminal of the battery.
- 3. Set the IG SW "ON" position. At this time, ensure that the airbag warning lamp goes on about six seconds and then goes out.

9 SIDE AIRBAG SENSOR

9-1 REMOVAL AND INSTALLATION

CAUTION

- Refer to the Caution Tips on Servicing.

Refer to Page A1-2.

9-1-1 ARTICLES TO BE PREPARED

Instrument

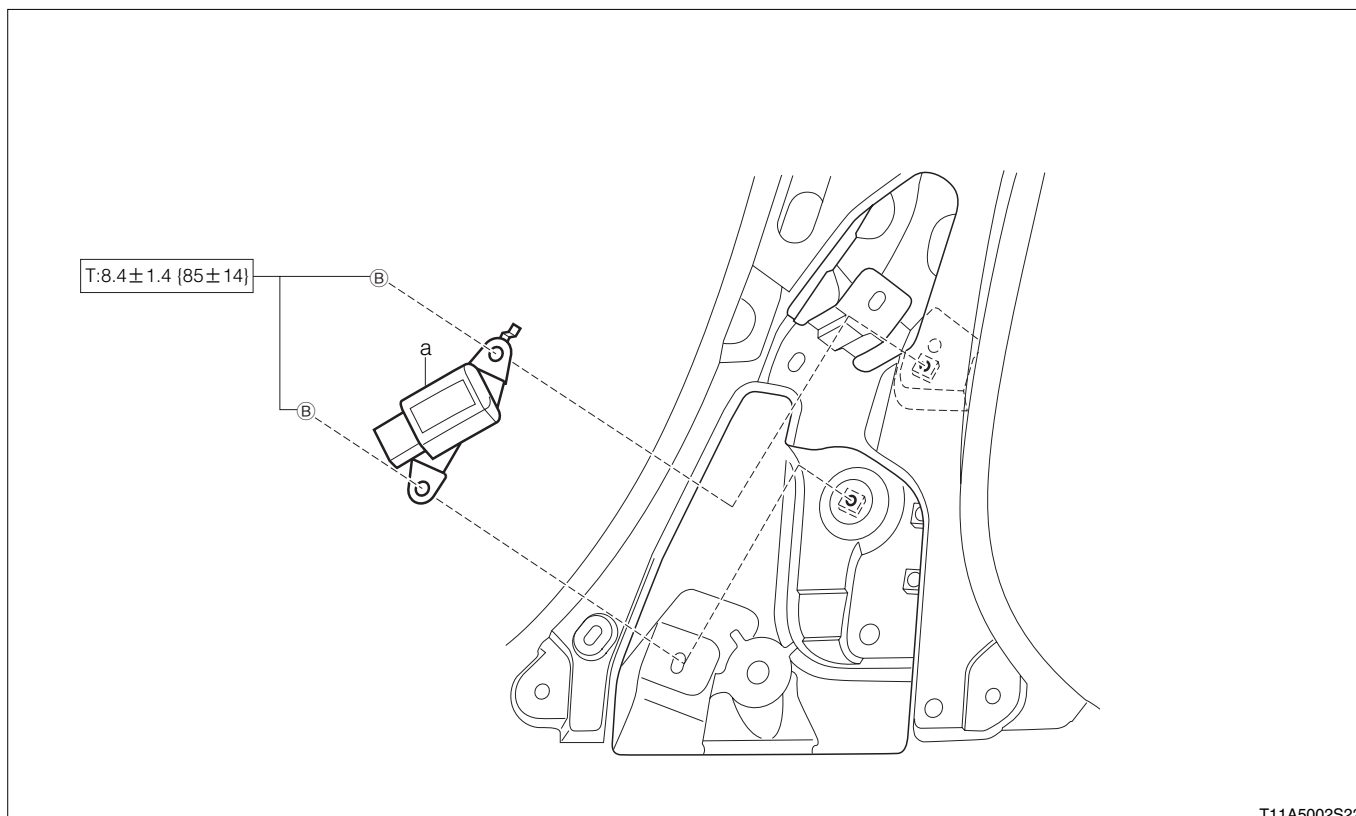
Torque wrench

9-1-2 OPERATION BEFORE REMOVAL

- 1. Set the IG SW "LOCK" position. Remove the negative (－) terminal of the battery.If you begin the operation before 60 seconds pass, there is a danger that the airbag and pretensioner are mistakenly actuated and deployed.
- 2. Remove the center pillar lower garnish RH/LH.
Refer to Page I2-43.
- 3. Remove the front seat belt outer belt Ay RH/LH.
Refer to Page I2-24.

9-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



Unit: N · m {kgf · cm}

T11A5002S22

(2) Removal and installation procedures

- 1 a Sensor, side airbag, RH/LH

9-1-4 INSPECTION

(1) Check standard for sensor Ay, side airbag RH/LH

1. In cases where the vehicle is involved in a collision, check the sensor Ay. Replace it if it is faulty.

(2) External check of sensor Ay, side airbag RH/LH

1. When the following cases have occurred, replace the sensor assembly.
 - (1) Case where the sensor Ay is dropped:
 - (2) Case where the connector section of the sensor Ay has damage and cracks:
 - (3) Case where the computer Ay has deformation and cracks:

9-1-5 OPERATION AFTER INSTALLATION

1. Install the front seat belt outer belt Ay RH/LH.
Refer to Page I2-24.
2. Install the center pillar lower garnish RH/LH.
Refer to Page I2-43.
3. Install the negative (—) terminal of the battery.
4. Set the IG SW "ON" position. At this time, ensure that the airbag warning lamp goes on about six seconds and then goes out.

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10SIDE AIRBAG REAR SENSOR

10-1 REMOVAL AND INSTALLATION

CAUTION

- Refer to the Caution Tips on Servicing.

Refer to Page A1-2.

10-1-1 ARTICLES TO BE PREPARED

Instrument

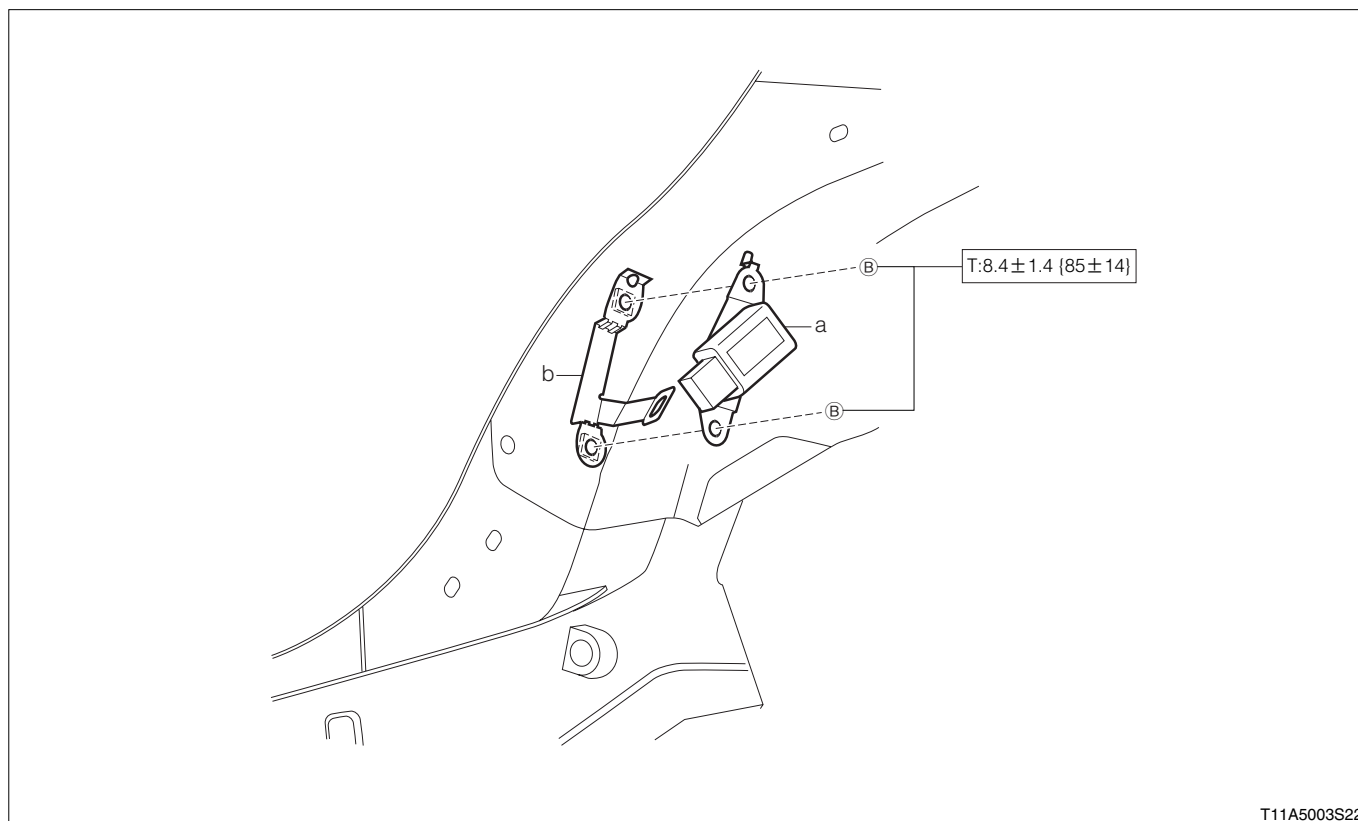
Torque wrench

10-1-2 OPERATION BEFORE REMOVAL

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.
2. Remove the rear quarter trim panel Ay RH/LH.
Refer to Page I2-43.

10-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



T11A5003S22

Unit: N · m {kgf · cm}

(2) Removal and installation procedures

- 1 a Sensor, side airbag, RH/LH

10-1-4 INSPECTION

(1) Check standard for sensor Ay, side airbag RH/LH

1. In cases where the vehicle is involved in a collision, check the sensor Ay. Replace it if it is faulty.

(2) External check of sensor Ay, side airbag RH/LH

1. When the following cases have occurred, replace the sensor assembly.
 - (1) Case where the sensor Ay is dropped:
 - (2) Case where the connector section of the sensor Ay has damage and cracks:
 - (3) Case where the computer Ay has deformation and cracks:

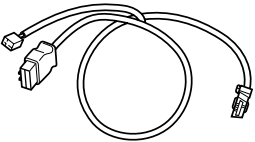
10-1-5 OPERATION AFTER INSTALLATION

1. Install the rear quarter trim panel Ay RH/LH.
Refer to Page I2-43.
2. Install the negative (—) terminal of the battery.
3. Set the IG SW "ON" position. At this time, ensure that the airbag warning lamp goes on about six seconds and then goes out.

11 CONTROL SYSTEM

11-1 ARTICLES TO BE PREPARED

SST

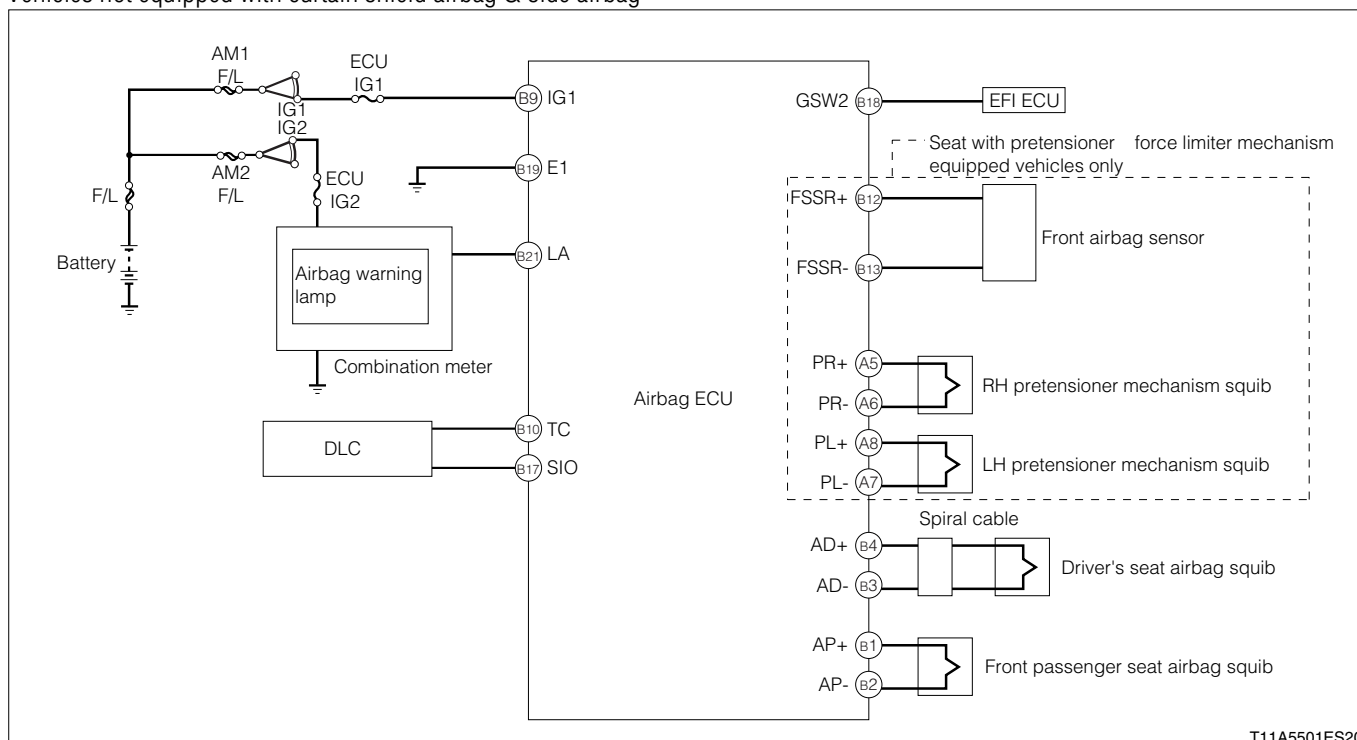
Shape	Part No.	Part name
	09991-87404-000 (09991-87401-000)	Wire,engine control system inspection
	09991-87403-000	Wire,diagnosis check
	09082-87710-000 (09082-87701-000)	Wire,air bag deployment

Instrument

Electrical tester

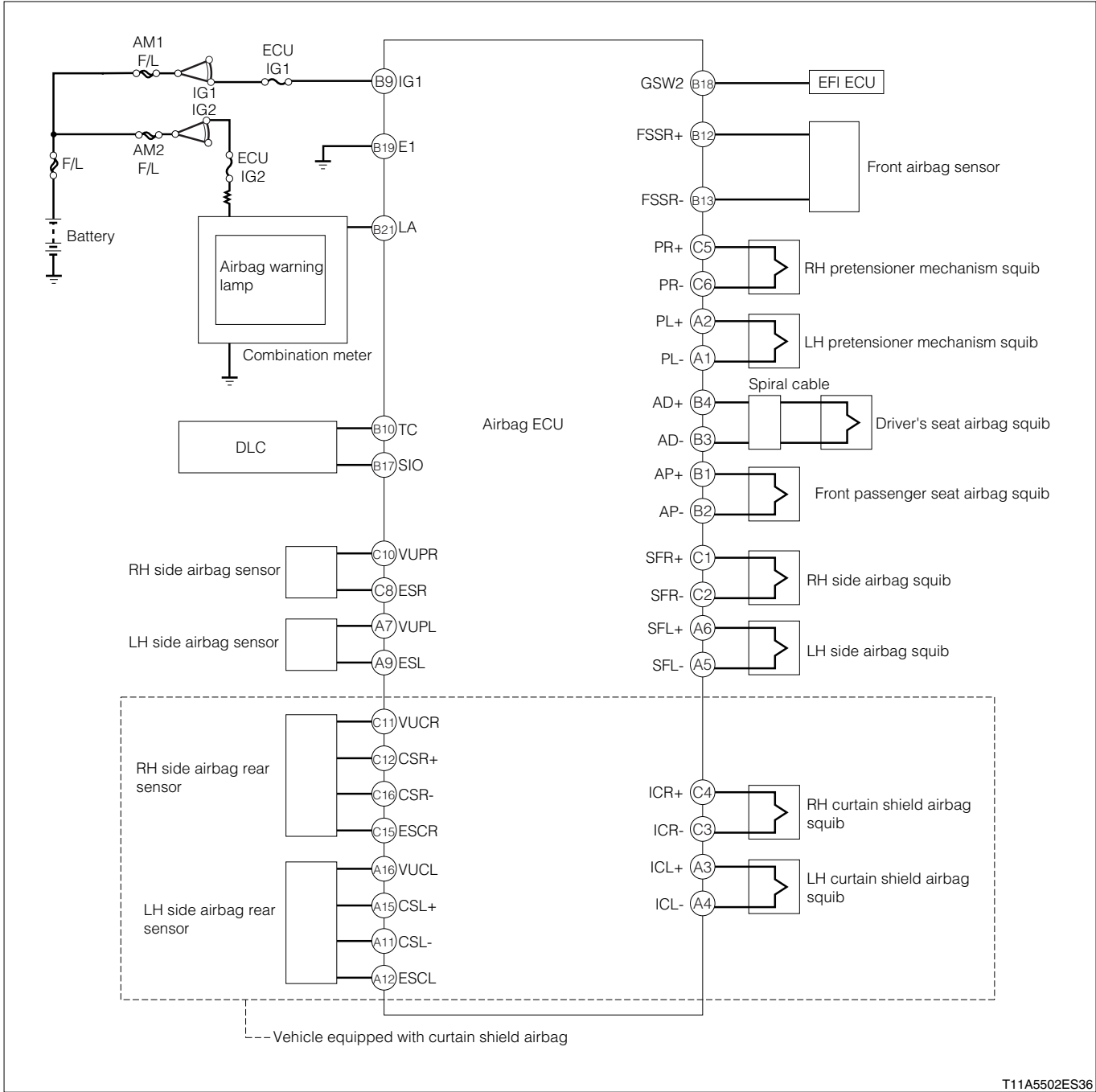
11-2 SYSTEM WIRING DIAGRAM

Vehicles not equipped with curtain shield airbag & side airbag



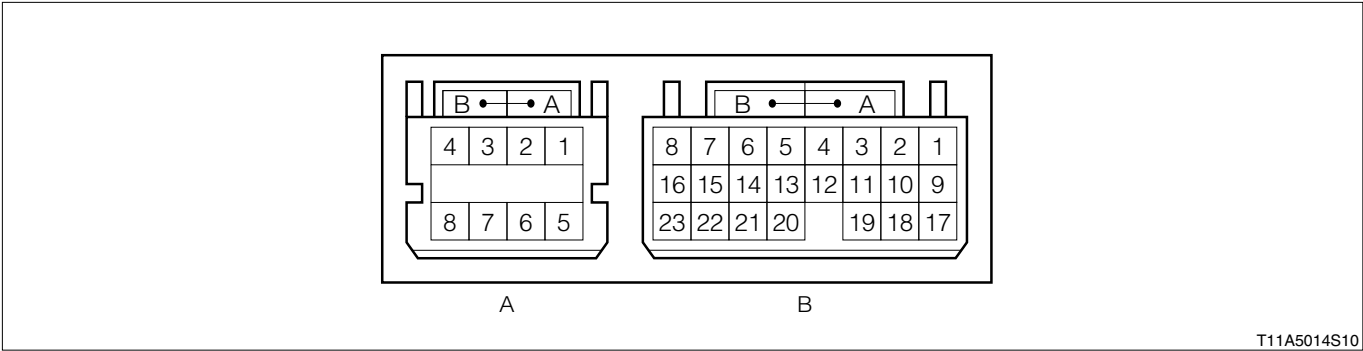
T11A5501ES20

Vehicles equipped with side airbag / Vehicles equipped with curtain shield airbag & side airbag



11-3 ARRANGEMENT OF ECU TERMINAL

Vehicles not equipped with curtain shield airbag & side airbag



Connector A

Terminal No.	Terminal code	Terminal name
A	—	Half fit detecting mechanism
B	—	Half fit detecting mechanism
1	—	—
2	—	—
3	—	—
4	—	—
5*	PR+	RH pretensioner mechanism squib (+)
6*	PR—	RH pretensioner mechanism squib (—)
7*	PL—	LH pretensioner mechanism squib (—)
8*	PL+	LH pretensioner mechanism squib (+)

※: Vehicles equipped with only seat belt with pretensioner + force limiter mechanism

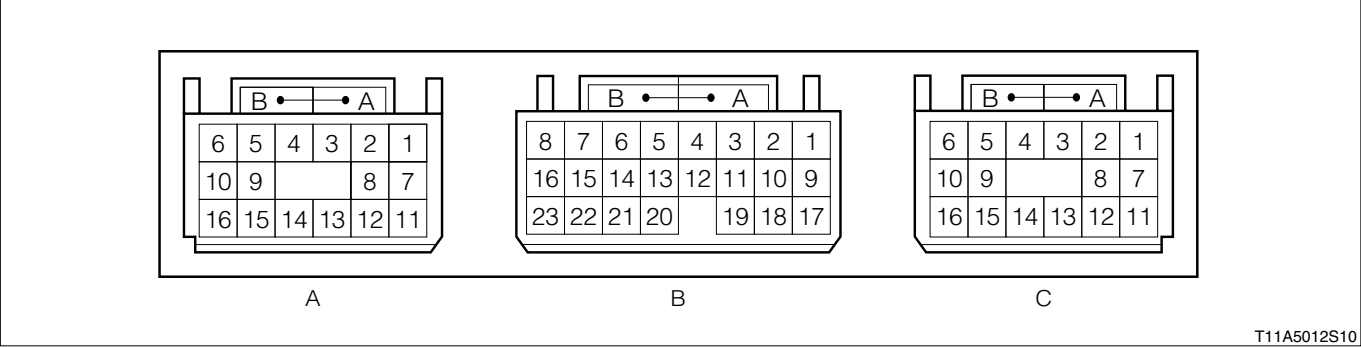
Connector B

Terminal No.	Terminal code	Terminal name
A	—	Half fit detecting mechanism
B	—	Half fit detecting mechanism
1	AP+	Front passenger seat airbag squib (+)
2	AP—	Front passenger seat airbag squib (—)
3	AD—	Driver's seat airbag squib (—)
4	AD+	Driver's seat airbag squib (+)
5	—	—
6	—	—
7	—	—
8	—	—
9	IG1	IG power supply
10	TC	Start of diagnosis
11	—	—
12*	FSSR +	Front airbag sensor (+)
13*	FSSR —	Front airbag sensor (—)
14	—	—
15	—	—
16	—	—
17	SIO	DLC
18	GSW2	EFI ECU
19	E1	Earth
20	—	—
21	LA	Airbag warning lamp
22	—	—
23	—	—

※: Vehicles equipped with only seat belt with pretensioner + force limiter mechanism

H1-39

Vehicles equipped with side airbag / Vehicles equipped with curtain shield airbag & side airbag



Connector A

Terminal No.	Terminal code	Terminal name
A	—	Half fit detecting mechanism
B	—	Half fit detecting mechanism
1	PL—	LH pretensioner mechanism squib (—)
2	PL+	LH pretensioner mechanism squib (+)
3※	ICL+	LH curtain shield airbag squib (+)
4※	ICL—	LH curtain shield airbag squib (—)
5	SFL—	LH side airbag squib (—)
6	SFL+	LH side airbag squib (+)
7	VUPL	LH side airbag sensor power supply, communication
8	—	—
9	ESL	LH side airbag sensor earth
10	—	—
11※	CSL—	LH side airbag safing rear sensor (—)
12※	ESCL	LH side airbag rear sensor earth
13	—	—
14	—	—
15※	CSL+	LH side airbag safing rear sensor (+)
16※	VUCL	LH side airbag rear sensor power supply, communication

※:Vehicle equipped with curtain shield airbag

Connector B

Terminal No.	Terminal code	Terminal name
A	—	Half fit detecting mechanism
B	—	Half fit detecting mechanism
1	AP+	Front passenger seat airbag squib (+)
2	AP—	Front passenger seat airbag squib (—)
3	AD—	Driver's seat airbag squib (—)
4	AD+	Driver's seat airbag squib (+)
5	—	—
6	—	—
7	—	—
8	—	—
9	IG1	IG power supply
10	TC	Start of diagnosis
11	—	—
12	FSSR +	Front airbag sensor (+)
13	FSSR —	Front airbag sensor (—)
14	—	—
15	—	—
16	—	—
17	SIO	DLC
18	GSW2	EFI ECU
19	E1	Earth
20	—	—
21	LA	Airbag warning lamp
22	—	—
23	—	—

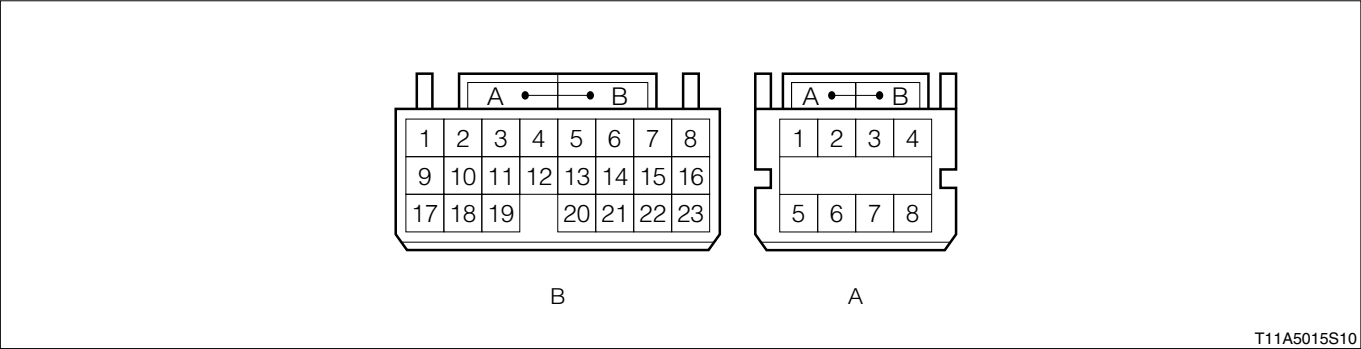
Connector C

Terminal No.	Terminal code	Terminal name
A	—	Half fit detecting mechanism
B	—	Half fit detecting mechanism
1	SFR+	RH side airbag squib (+)
2	SFR—	RH side airbag squib (—)
3*	ICR—	RH curtain shield airbag squib (—)
4*	ICR+	RH curtain shield airbag squib (+)
5	PR+	RH pretensioner mechanism squib (+)
6	PR—	RH pretensioner mechanism squib (—)
7	—	—
8	ESR	RH side airbag sensor earth
9	—	—
10	VUPR	RH side airbag sensor power supply, communication
11*	VUCR	RH side airbag rear sensor power supply, communication
12*	CSR+	RH side airbag safing rear sensor (+)
13	—	—
14	—	—
15*	ESCR	RH side airbag rear sensor earth
16*	CSR—	RH side airbag safing rear sensor (—)

※:Vehicle equipped with curtain shield airbag

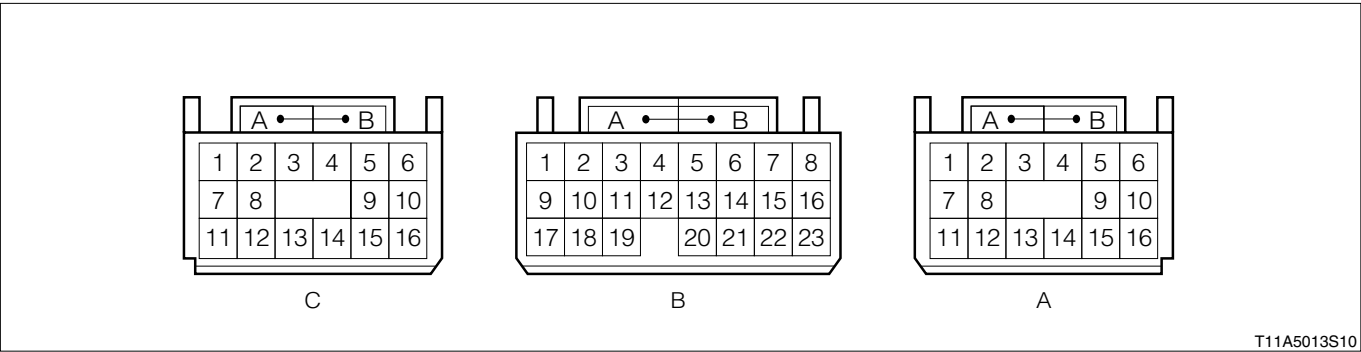
11-4 ARRANGEMENT OF VEHICLE HARNESS SIDE CONNECTOR TERMINALS

Harness side connector of airbag ECU (Vehicles not equipped with curtain shield airbag & side airbag)



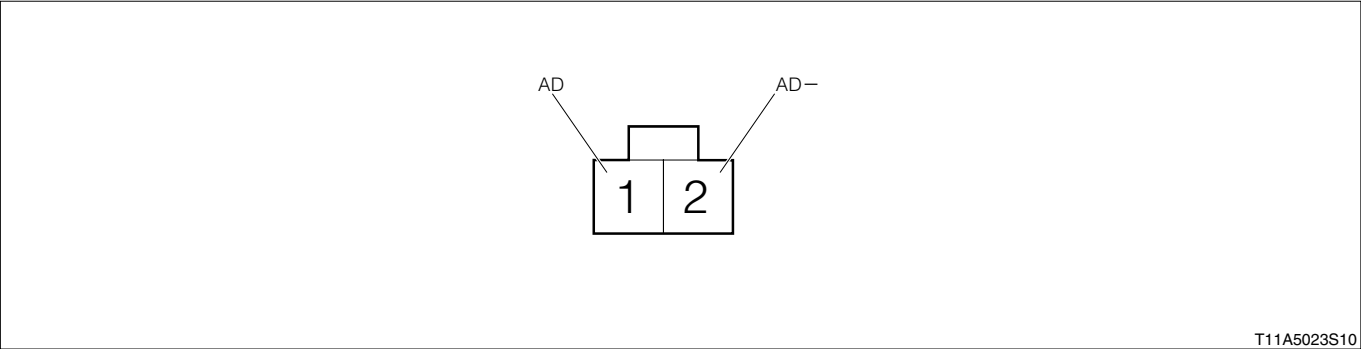
With regard to the terminal names of the connector leading to the airbag ECU, refer to the "Arrangement Diagram of Computer Connector Terminals."

Harness side connector of airbag ECU (Vehicles equipped with side airbag / Vehicles equipped with curtain shield airbag & side airbag)

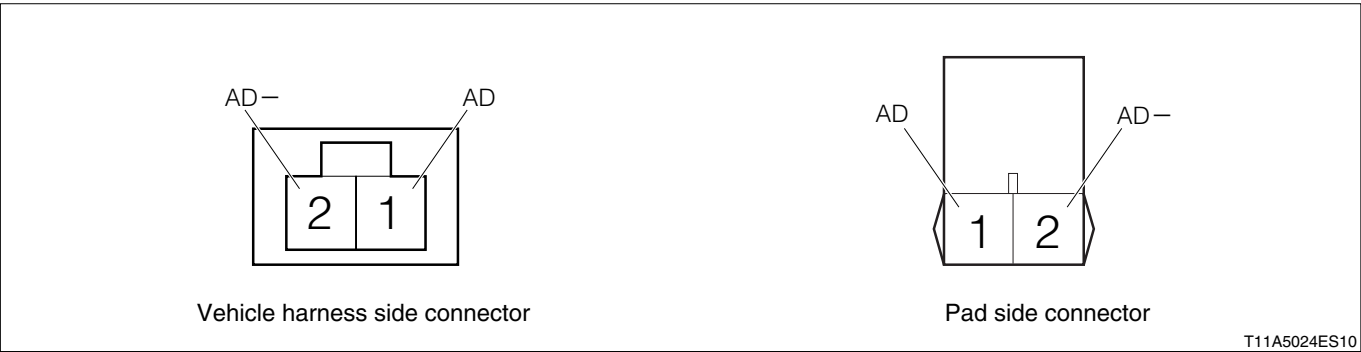


With regard to the terminal names of the connector leading to the airbag ECU, refer to the "Arrangement Diagram of Computer Connector Terminals."

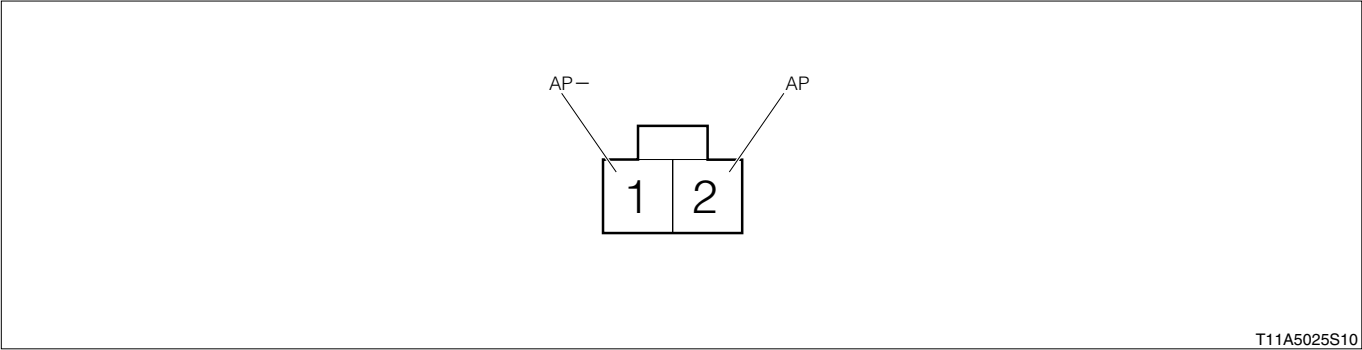
Connector leading to spiral cable



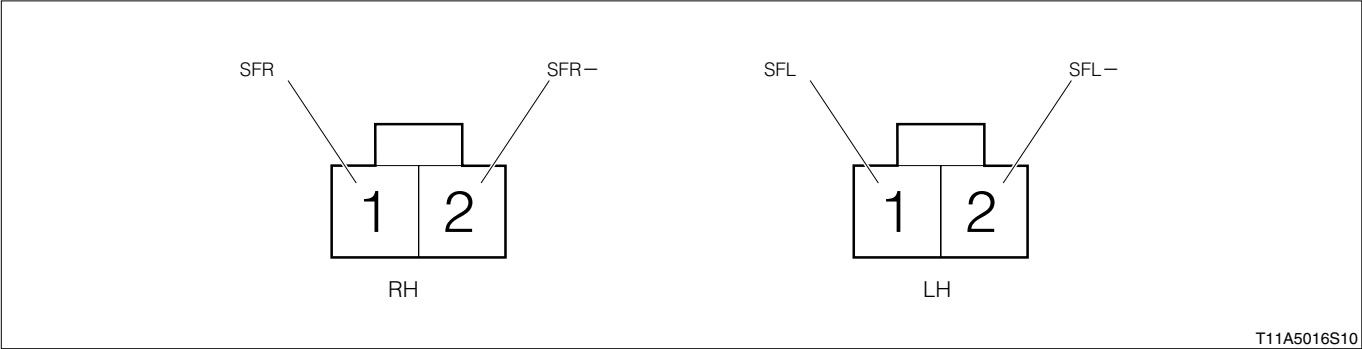
Spiral cable



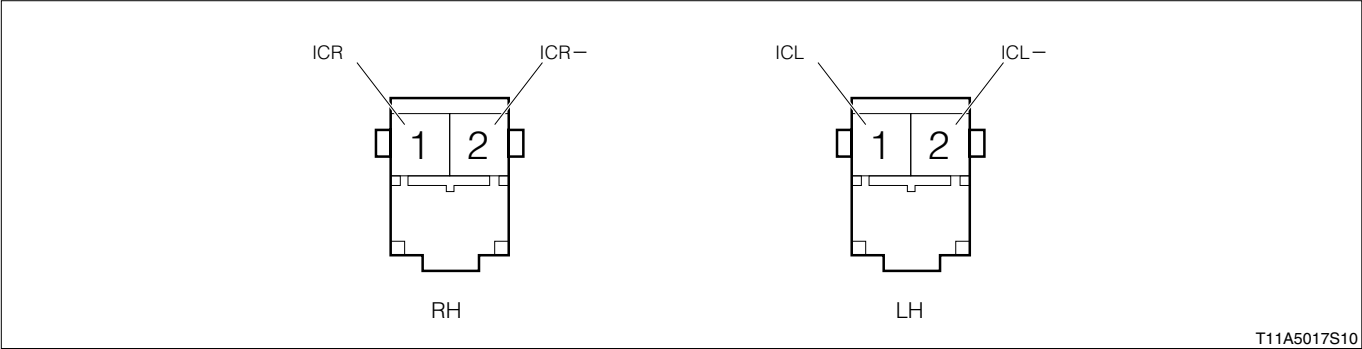
Front passenger seat airbag



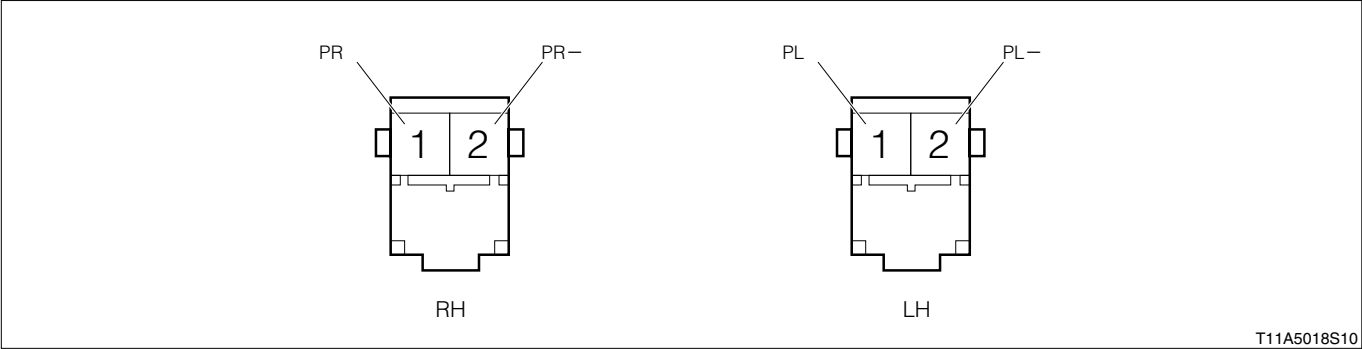
Side airbag



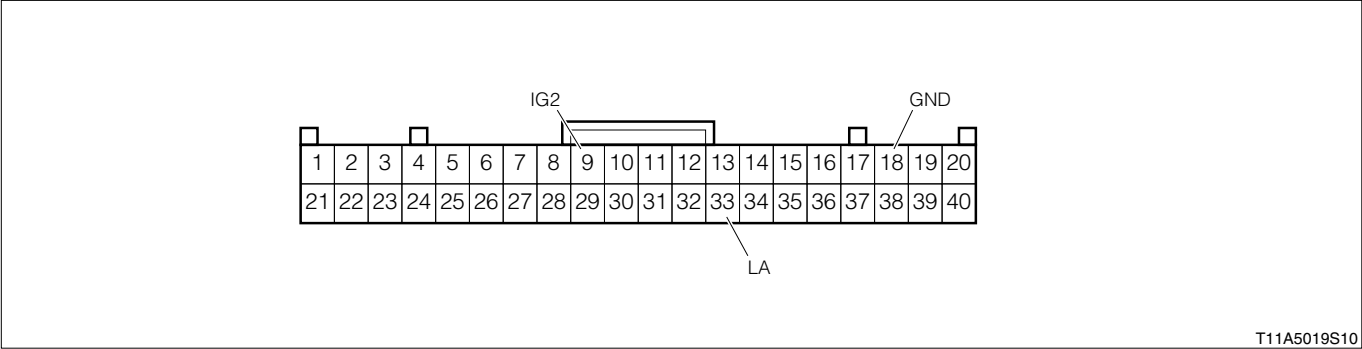
Curtain shield airbag



Seat belt with pretensioner + force limiter mechanism

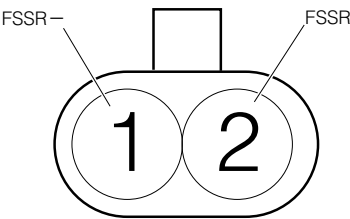


Combination meter



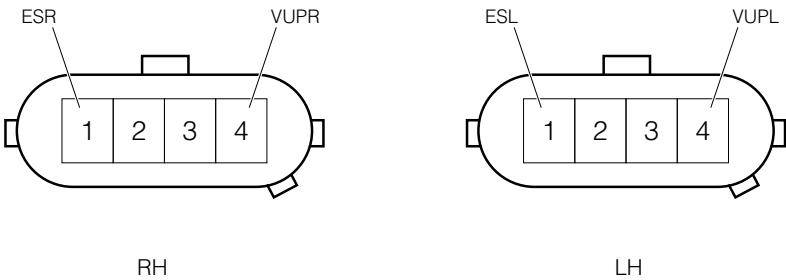
H1-43

Front airbag sensor



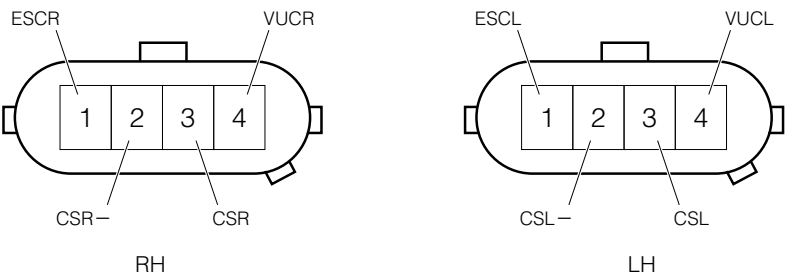
H11A5026S10

Side airbag sensor



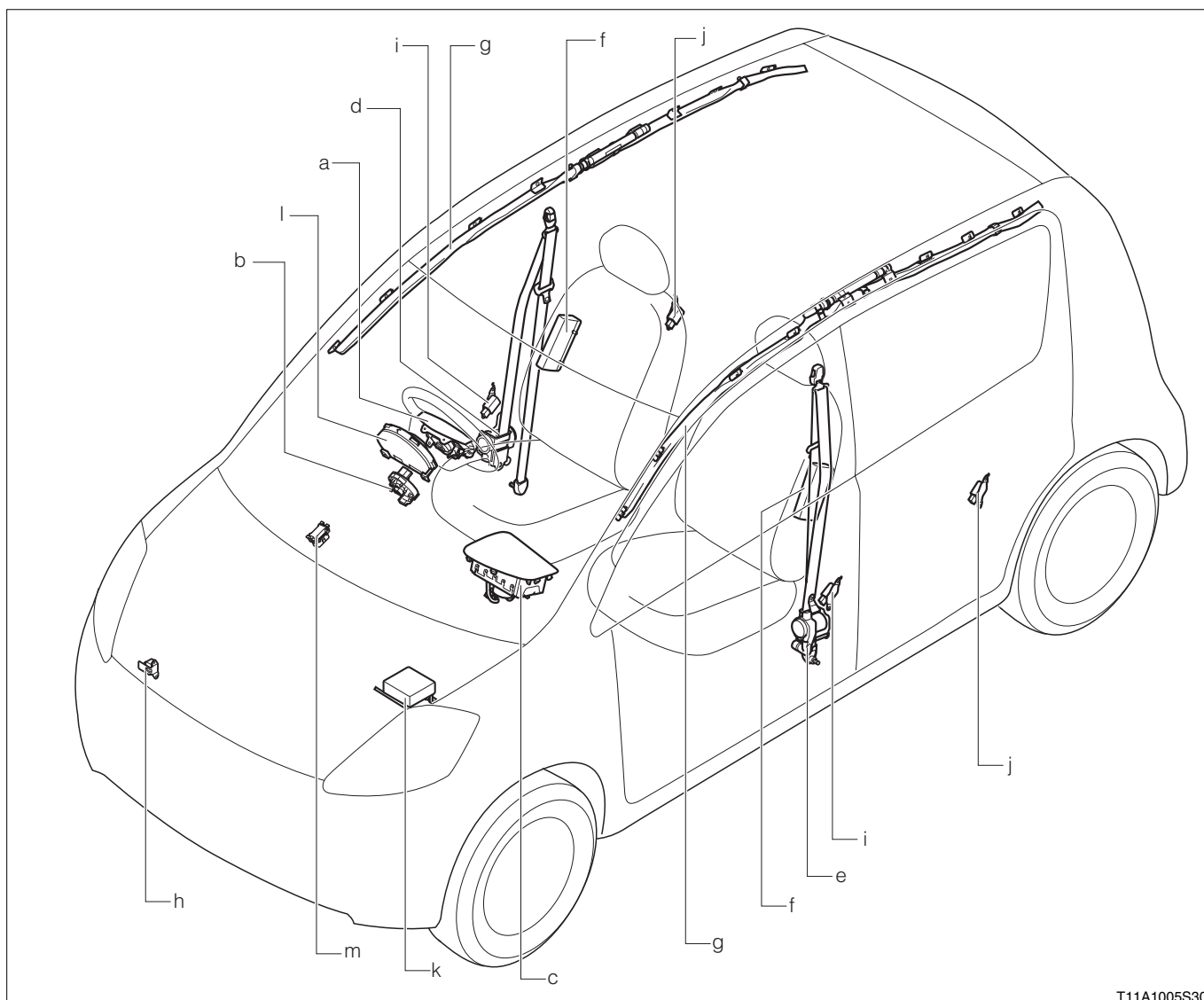
T11A5020S10

Side airbag rear sensor



T11A5021S10

11-5 LOCATION OF COMPONENTS



T11A1005S30

The figure shows the RHD vehicle.

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		Vehicles with the airbags at the driver's seat and front passenger seat		Vehicles with the side airbag	Vehicles with the curtain shield airbag & side airbag
		Vehicles with RH, LH pretensioner + force limiter mechanism equipped seat belt	Vehicles without RH, LH pretensioner + force limiter mechanism equipped seat belt		
a	Driver's seat airbag	○	○	○	○
b	Spiral cable	○	○	○	○
c	Front passenger-side airbag	○	○	○	○
d	Seatbelts with the RH pretensioner and the force limiter mechanism	○	—	○	○
e	Seatbelts with the LH pretensioner and the force limiter mechanism	○	—	○	○
f	Side airbag RH/LH	—	—	○	○
g	Curtain Shield Airbag RH/LH	—	—	—	○
h	Front Airbag Sensor	○	—	○	○
i	Side Airbag Sensor RH/LH	—	—	○	○
j	Side airbag rear sensor RH/LH	—	—	—	○
k	Airbag ECU	○	○	○	○
l	Combination Meter (air bag warning lamp)	○	○	○	○
m	DLC	○	○	○	○

○: Provided —: Not provided

11-6 HOW TO PROCEED WITH TROUBLE SHOOTING

1. The airbag is provided with a diagnosis function which diagnoses malfunctioning sections. This function gives important clues in carrying out the trouble shooting. This system is provided with a backup function (EEPROM) which memorizes the diagnosis code. Therefore, even if the power supply is cut off, the diagnosis contents are retained.
2. The diagnosis code is indicated by illumination of the airbag warning lamp inside the combination meter.
3. In the airbag system, by using the diagnosis mode function that uses the diagnosis tester (DS-21/DS-II), you can choose between the normal mode and test mode. When the test mode is selected, the detection sensitivity of diagnosis will be increased.
 - (1) Refer to the diagnosis code list in the service manual for the diagnosis codes which correspond to each test mode.
 - (2) As for the the diagnosis tester (DS- 21/DS-II) operating method, refer to the DS-21 INSTRUCTION MANUAL Rev.1.

CAUTION

- In the airbag trouble-shooting procedure, there are cases where confirmation as to the "※"-marked items given below is difficult due to the characteristics of the system (safety device).
- If wrong operations are performed during checks or repairs, the system may have malfunction or wrong operation. Therefore, care must be exercised to observe the notes given and perform the operations according to the instructions of this manual.

▷1. Bringing-in of malfunctioning vehicle

▼ Go to ▷2.

▷2. Inquiry with customer※

1. Thoroughly inquire about conditions and environmental phenomenon when the malfunction took place.

▼ Go to ▷3.

▷3. Check of airbag warning lamp

1. Check the airbag warning lamp.

- ▼ Proceed to ▷4 in cases where the warning lamp is illuminated at all times (The airbag ECU is detecting a malfunction).
- ▼ Proceed to ▷11 in the case of an abnormality of the warning lamp not illuminated (A malfunction is taking place in the warning lamp system).

▷4. Record the confirmation of diagnosis codes

Refer to Page H1-49.

- ▼ Go to ▷5.

▷5. Erasing of diagnosis code

Refer to Page H1-49.

- ▼ Go to ▷6.

▷6. Basic check

Refer to Page H1-53.

- ▼ Go to ▷7.

▷7. Reproduction and confirmation of malfunction phenomenon *

1. Confirm the phenomenon and grasp the malfunctioning condition.

- ▼ Go to ▷8.

▷8. Reconfirmation of diagnosis code

Refer to Page H1-49.

- ▼ Proceed to ▷10 in cases where a diagnosis code is outputted.
- ▼ Proceed to ▷11 in cases where the lamp is illuminated at all times.
- ▼ Proceed to ▷9 in cases where no diagnosis code is outputted.

▷9. Check using test mode function (Using DS-21)

1. Confirm and record diagnosis codes, using the test mode function.

- ▼ Proceed to ▷10 in cases where a diagnosis code is outputted.
- ▼ Proceed to ▷11 in cases where no diagnosis code is outputted.

▷10. Trouble-shooting check according to diagnosis code

Refer to Page H1-54.

- ▼ In cases where no malfunction can be found, the reproduction method must be employed. Proceed to ▷12.

Refer to Page A1-21.

- ▼ Narrow down the malfunctioning system and perform repairs if a malfunction is found. Then, proceed to ▷12.

▷11. Trouble-shooting check according to malfunction phenomenon

▼ In cases where no malfunction can be found, the reproduction method must be employed. Proceed to ▷12.

Refer to Page A1-21.

▼ Narrow down the malfunctioning system and perform repairs if a malfunction is found. Then, proceed to ▷12.

▷12. Erasing of diagnosis code

Refer to Page H1-47.

▼ Go to ▷13.

▷13. Confirmation and recording of diagnosis code

Refer to Page H1-49.

▼ Proceed to ▷14 in cases where the normal code is outputted.

▼ Proceed to ▷10 in cases where a diagnosis code is outputted.

▷14. Confirmation test

1. Confirm that the malfunction phenomenon of the vehicle claimed by the customer has been remedied and the vehicle has been restored to the normal condition.

▼ If the result is OK, the test is finished.

11-6-1 DIAGNOSIS THROUGH INQUIRIES

1. In an effort to remove causes for malfunction from the vehicle concerned, it is impossible to determine the cause without confirming the malfunction phenomenon. If the phenomenon is not confirmed, the vehicle may not be able to return to the normal conditions even if you continue your work. The diagnosis by interviews is to collect information from the customer before confirming the malfunction phenomena. The diagnosis by interviews provides very important clues in reproducing malfunction phenomena.

2. Since the information obtained through the diagnosis by interviews is referred to during the trouble shooting, it is imperative to make an inquiry of the customer, centering on the items related to the malfunction, instead of simply asking general questions.

(1) Diagnosis interview sheet for SRS airbag system

Checked by		Check date	Day Month (Day of week)

Customer information

Name of customer		Gender of customer (Male, female)		Age [approx.]	Occupation []	
		Area where vehicle is mainly used	Urban, suburb, seashore, mountain, others		Parking place	Outdoor, indoor

Details of vehicle

Date when vehicle was brought to workshop	Day Month (day of week)	Date when malfunction took place	Day Month (day of week)	Repair history	No, Yes (how many times?)	
Frame No.		Registration date	Day Month Year	Vehicle model		
Engine type		Transmission	5M/T · 3A/T · 4A/T · CVT electronically-controlled 4A/T		Driving	2WD · 4WD
Running distance		Equipment	Tire [] · Wheel [Steel · Aluminum]			

Weather

☐ Fine	☐ Cloudy	☐ Rainy	☐ Snow	☐ Other()
Temperature(Approx. °C)				

Vehicle conditions

☐ Starting	☐ Idling	☐ Running (Constant speed	Acceleration	Deceleration
Others)				

Road conditions

Contents of problem

State of airbag warning lamp	☐ Always illuminated ☐ Sometimes illuminated ☐ Not illuminated		
Diagnosis indication (Short circuit of T terminal)	During check	☐ Normal ☐ Abnormal code []	
	Second time	☐ Normal ☐ Abnormal code []	
	nd(rd) time	☐ Normal ☐ Abnormal code []	

11-6-2 CONFIRMATION, RECORD AND ERASURE OF DIAGNOSIS CODE

1. When an abnormality code is indicated, confirm whether the malfunction took place sometimes in the system or is still persisting. Also it is necessary to check any relation between the code and the reproduced malfunction (Malfunction code). For this purpose, the diagnosis code should be indicated twice, namely before and after the confirmation of the phenomena.

11-6-3 BASIC CHECK

1. The basic check enables you to narrow down the malfunctioning system.

11-6-4 RE-CONFIRMATION OF DIAGNOSIS CODE

1. After confirming the malfunction phenomenon, check the illuminating condition of the warning lamp (Malfunction mode). Note whether any change has occurred before and after the confirmation. In this way, judge whether the system is currently normal or not.

11-7 CONFIRMATION, RECORD AND ERASURE OF DIAGNOSIS CODE

11-7-1 CHECKING METHOD OF DIAGNOSIS

(1) Indication by airbag warning lamp

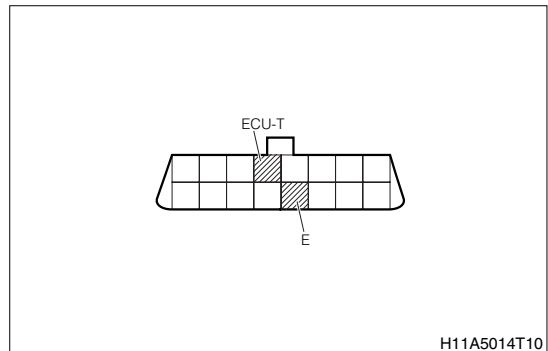
1. Stop the vehicle.
2. With the IG SW set to "ON" position, short the ECU-T terminal and E terminal of the DLC located under the instrument panel.

CAUTION

- In order to short the DLC, be sure to use the specified SST.
- If the short is made for wrong positions of the DLC, it will cause malfunction. Be very careful not to select wrong terminals.

SST: 09991-87404-000

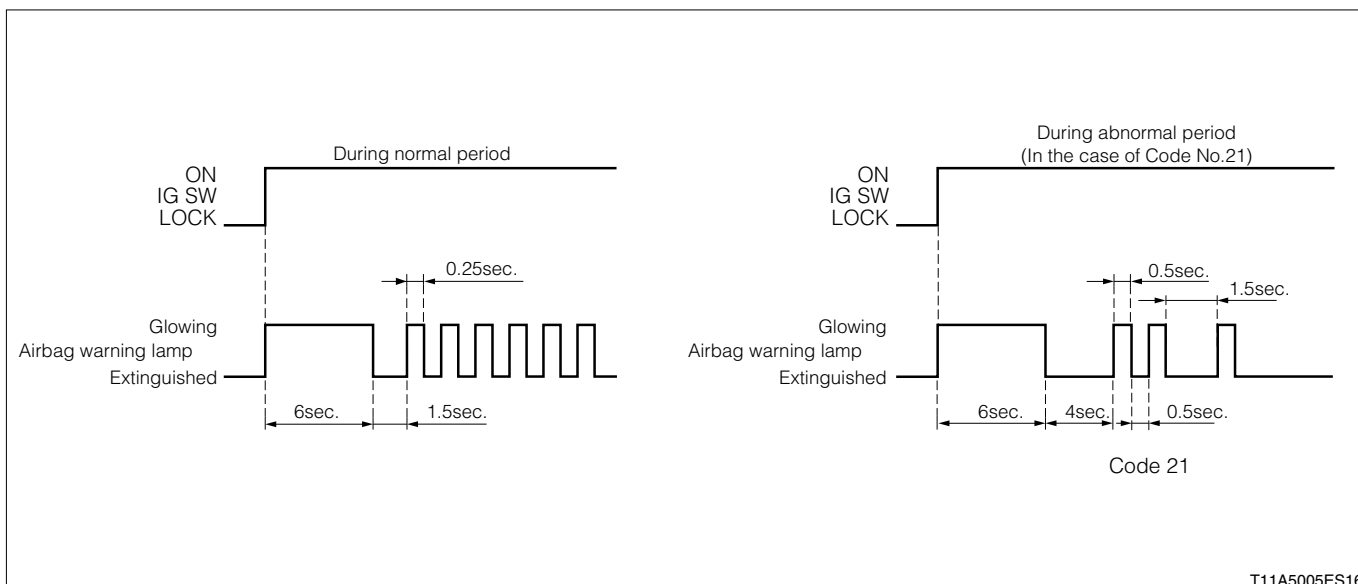
09991-87403-000



3. The airbag warning lamp inside the combination meter flashes, thus indicating the code.

NOTE

- When the DLC is shorted, warning lamps other than the airbag warning lamp will flash. But this does not indicate system malfunction.
- All the memorized codes are shown repeatedly in the sequence of malfunction number, starting from the smallest number.
- When there is one code, the malfunction code is indicated again after a pause of four second.
- When there are more than one code, the codes are shown starting from the smaller number with a pause of 2.5 seconds made between each code indication. When all codes have been shown, after a pause of 4 seconds, the codes are again indicated one by one from the smaller one.



11-7-2 CANCELING METHOD OF DIAGNOSIS

(1) Canceling method using DLC

1. When the section which is responsible for the malfunction code has been checked and repaired, erase the memory, following the procedure given below.
 - (1) Make the abnormality code be outputted to the airbag warning lamp by using the diagnosis code output indicating method.
 - (2) While looking at a clock (Having a second hand), short the ECU-T terminal and E terminal of the DLC for 1 ± 0.4 second, and release these terminals for 1 ± 0.4 second. Repeat connecting/releasing four times. Then, when the ECUT terminal and E terminal are shorted fifth time, these terminals should be kept connected.

Refer to Page A1-23.

- (3) If the code has been erased by now, the airbag warning lamp will flash quickly.

CAUTION

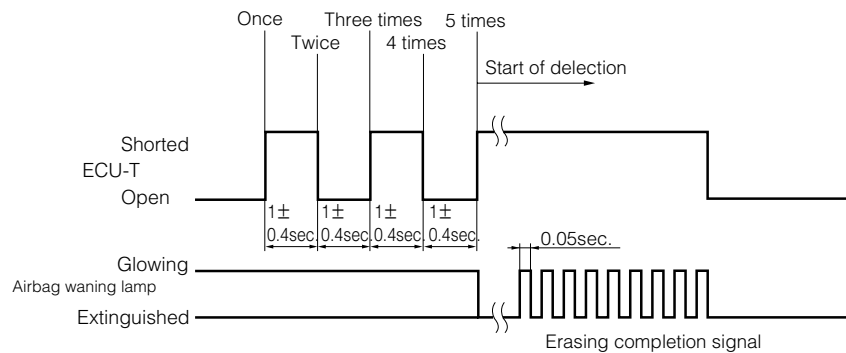
- In order to short the DLC, be sure to use the specified SST.
- If the short is made for wrong positions of the DLC, it will cause malfunction. Be very careful not to select wrong terminals.

SST: 09991-87404-000
09991-87403-000

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NOTE

- If the airbag warning lamp does not flash quickly, repeat this operation from the beginning.



T11A5006ES16

- (4) After the memory has been erased, ensure that the airbag warning lamp is extinguished. Let the code be outputted again. Ensure that the normal code is outputted.

11-7-3 CONTENTS OF DIAGNOSIS

Contents of diagnosis

Code No.		Test mode Output ※3 (Provided: ○) (Not pro- vided: ✕)	Warning Indication (Provided: ○) (Not pro- vided: ✕)	Cord Memory (Provided: ○) (Not pro- vided: ✕)	Contents of diagnosis	
Two- digit code	Four-digit code				System diagnosed	Diagnosis items
11	B1802	✕	○	○	Airbag ECU	Abnormality of the main body
12	B1803	✕	○	○	Front airbag sensor	Abnormality of the main body
13	B1800	○	○	○	RH SIDE AIRBAG SENSOR	Abnormality of the main body
14	B1801	○	○	○	LH side airbag sensor	Abnormality of the main body
15※1	B1600	○	○	○	RH side airbag sensor	Abnormality of the main body
23※1	B1630	○	○	○	LH side airbag rear sensor	Abnormality of the main body
24※1	B1635	○	○	○	Driver's seat airbag squib circuit	Short between wires
31※2	B1000	○	○	○	Driver's seat airbag squib circuit	Open wire
32※1	B1620	○	○	○	Driver's seat airbag squib circuit	Earth short
33※1	B1625	○	○	○	Driver's seat airbag squib circuit	Power supply short
41	B1822	○	○	○	Front passenger's seat airbag squib circuit	Short between wires
42	B1823	○	○	○	Front passenger's seat airbag squib circuit	Open wire
43	B1820	○	○	○	Front passenger's seat airbag squib circuit	Earth short
44	B1821	○	○	○	Front passenger's seat airbag squib circuit	Power supply short
45	B1827	○	○	○	RH side airbag squib circuit	Short between wires
46	B1828	○	○	○	RH side airbag squib circuit	Open wire
47	B1825	○	○	○	RH side airbag squib circuit	Earth short
48	B1826	○	○	○	RH side airbag squib circuit	Power supply short
51	B1807	○	○	○	LH side airbag squib circuit	Short between wires
52	B1808	○	○	○	LH side airbag squib circuit	Open wire
53	B1805	○	○	○	LH side airbag squib circuit	Earth short
54	B1806	○	○	○	LH side airbag squib circuit	Power supply short
61	B1902	○	○	○	RH curtain shield airbag squib circuit	Short between wires
62	B1903	○	○	○	RH curtain shield airbag squib circuit	Open wire
63	B1900	○	○	○	RH curtain shield airbag squib circuit	Earth short
64	B1901	○	○	○	RH curtain shield airbag squib circuit	Power supply short
71	B1907	○	○	○	LH curtain shield airbag squib circuit	Short between wires
72	B1908	○	○	○	LH curtain shield airbag squib circuit	Open wire
73	B1905	○	○	○	LH curtain shield airbag squib circuit	Earth short
74	B1906	○	○	○	LH curtain shield airbag squib circuit	Power supply short
81	B1832	○	○	○	RH pretensioner mechanism squib circuit	Short between wires
82	B1833	○	○	○	RH pretensioner mechanism squib circuit	Open wire
83	B1830	○	○	○	RH pretensioner mechanism squib circuit	Earth short

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84	B1831	○	○	○	RH pretensioner mechanism squib circuit	Power supply short
85	B1837	○	○	○	LH pretensioner mechanism squib circuit	Short between wires
86	B1838	○	○	○	LH pretensioner mechanism squib circuit	Open wire
87	B1835	○	○	○	LH pretensioner mechanism squib circuit	Earth short
88	B1836	○	○	○	LH pretensioner mechanism squib circuit	Power supply short

※1: This may be emitted, not only when the airbag sensor inside is malfunctioning, but also when the circuit has an abnormality.

※2: This may be emitted, not only when the airbag ECU inside is malfunctioning, but also when the squib system circuit has an abnormality.

※3: This is outputted when the diagnosis tester (DS- 21/DS-II) is used.

NOTE

- After the airbag and pretensioner have operated and deployed, the airbag warning lamp flashes at an interval of 0.5 second.

11-8 BASIC CHECK

11-8-1 MEASUREMENT OF BATTERY VOLTAGE

1. With the engine in a stopped state, measure the battery voltage.
SPECIFIED VALUE: 10—14V

11-8-2 CHECK OF SRS AIRBAG SYSTEM POWER SUPPLY AND EARTH CIRCUIT

(1) Check of power supply circuit

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.
2. Disconnect the connector from the airbag ECU.
3. Connect the negative (－) terminal of the battery.
4. After the IG SW has been turned "ON", check the voltage of the connectors at the airbag ECU harness side, respectively.
(1) Connector B9 (IG1)—B19 (E1) at airbag ECU harness side
SPECIFIED VALUE: 10—14V (Battery voltage)

(2) Check of earth circuit

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.
2. Disconnect the connector from the airbag ECU.
3. Check continuity between the connectors between the airbag ECU and the vehicle harness, respectively.

(1) Connectors B19 (E1)—body earth at the airbag ECU side

SPECIFIED VALUE: Continuity exists

(2) Connectors B19 (E1)—body earth at airbag ECU harness side

SPECIFIED VALUE: Continuity exists

11-9 TROUBLE SHOOTING ACCORDING TO DIAGNOSIS CODE**11-9-1 WARNING LAMP CIRCUIT SYSTEM****(1) Checking points**

1. Is the gauge fuse normal?
2. Is the combination meter normal?
3. Is there any abnormality in the harness of the warning lamp system?

(2) Checking method**▷1. Confirmation of warning lamp illuminating state**

1. After the IG SW has been set to "ON" position, check the illuminating state of the airbag warning lamp.

▼ Proceed to ▷2 when the lamp remains illuminated even after an elapse of 6 seconds.

▼ If the lamp is extinguished, proceed to ▷4.

▷2. Confirmation of warning lamp illuminating state

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.
2. Disconnect the connector from the airbag ECU. Short the connector B21 (LA) with earth, using the SST.

SST: 09991-87403-000

3. Install the negative terminal of the battery. With the IG SW set to "ON" position, check the lighting state of the airbag warning lamp.

SPECIFIED VALUE: The lamp goes out.

▼ Replace the airbag ECU if the lamp goes out.

Refer to Page H1-29.

▼ If it remains illuminated, proceed to ▷3.

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▷3. Continuity check between combination meter and airbag ECU

1. After the IG SW has been set to "LOCK" position, disconnect the combination meter connector.
2. Check the harness between the combination meter and the airbag ECU.
 - (1) Connector 33 (LA) of combination meter at harness side—Connector B21 (LA) of airbag ECU at harness side

SPECIFIED VALUE: Continuity exists

▼ If the result is OK, repair or replace the combination meter.

Refer to Page J3-2.

▼ If the result is NG, replace the harness and connector.

▷4. Confirmation of warning lamp illuminating state

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.
2. Disconnect the connector from the airbag ECU. Then, install the negative (—) terminal of the battery.
3. After the IG SW has been set to "ON" position, check the illuminating state of the warning lamp.

SPECIFIED VALUE: Illuminates.

▼ If the lamp is illuminated, replace the airbag ECU.

Refer to Page H1-29.

▼ If the lamp is extinguished, proceed to ▷5.

▷5. Check of fuse

1. After the IG SW has been set to "LOCK" position, remove the negative (—) terminal of the battery. Check the fuse.

SPECIFIED VALUE: No fuse has blown out.

▼ If it is OK, go to ▷6.

▼ If it is NG, go to ▷8.

▷6. Check continuity between the combination meter and the fuse and continuity between the combination meter and the earth.

1. Check the harnesses between the combination meter and the gauge fuse as well as between the combination meter and the earth for open wire.
 - (1) Connector 9 (IG2) of combination meter at harness side—gauge fuse (Downstream side)
 - (2) Connector 18 (GND) of combination meter at harness side—body earth

SPECIFIED VALUE: Continuity exists

▼ If it is OK, go to ▷7.

▼ If the result is NG, replace the harness and connector.

▷7. Check of short between combination meter and airbag ECU

1. Check the harness between the combination meter and the airbag ECU for short circuit.

(1) Connector B21 (LA) of airbag ECU at harness side—body earth

SPECIFIED VALUE: 1MΩ or more (No continuity)

▼ If the result is OK, repair or replace the combination meter.

Refer to Page J3-2.

▼ If the result is NG, replace the harness and connector.

▷8. Check continuity between the combination meter and the fuse

1. Check the harness between the combination meter and the fuse.

(1) Connector 9 (IG2) of combination meter at harness side—IG SW (+ B side)

SPECIFIED VALUE: Continuity exists

▼ If the result is OK, replace the gauge fuse. Then, observe for a while.

▼ If the result is NG, replace the gauge fuse and replace the harness and connector.

11-9-2 DIAGNOSIS CODE NO.11(DRIVER'S SEAT AIRBAG SQUIB CIRCUIT SYSTEM)

(1) Diagnostic code output conditions

1. Cases where the harness between the driver's seat airbag and the airbag ECU is shorted with the earth

(2) Checking points

1. Is there any abnormality in the harness and connector between the driver's seat airbag and the airbag ECU.

CAUTION

- Since a connector with terminal short mechanism is used for the spiral cable, there is the possibility to make a wrong judgment that there is a short between harnesses. Therefore, before starting the check, ensure that there is no damage, such as open wire or short, in the SST for deploying the airbag (Part number: 09082-87710-000). Then, install it to the spiral cable. Check the harness with the SST installed.

(3) Checking method

▷1. Check of harness between steering wheel pad Ay and airbag ECU for short circuit

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.

2. Remove the airbag ECU and steering wheel pad Ay. Then, check the harness between the pad Ay and the airbag ECU for short circuit.

(1) Connector 1 (AD+) of spiral cable at pad side—Body earth

(2) Connector 2 (AD-) of spiral cable at pad side—Body earth

SPECIFIED VALUE: 1MΩ or more (No continuity)

▼ If it is OK, go to ▷2.

▼ If it is NG, go to ▷4.

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▷2. Confirmation of diagnosis code

1. After the IG SW has been set to "LOCK" position, install the airbag ECU to the vehicle and connector the connector.
2. Install the negative (—) terminal of the battery. After the IG SW has been turned "ON", erase the codes. Then, check the code again.

SPECIFIED VALUE: Diagnosis code No.11 is not outputted. (Other codes may be outputted.)

▼ If not outputted, proceed to ▷3.

▼ If outputted, replace the airbag ECU.

Refer to Page H1-29.

▷3. Confirmation of diagnosis code

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.
2. Install the steering wheel pad assembly.
3. Install the negative (—) terminal of the battery. After the IG SW has been turned "ON", erase the diagnosis codes. Then, check the diagnosis code again.

SPECIFIED VALUE: Diagnosis code No.11 is not outputted. (Other codes may be outputted.)

▼ If not outputted, it means that the system has returned to the normal state. Erase the diagnosis code and observe for a while.

▼ If outputted, replace the steering wheel pad Ay.

Refer to Page H1-1.

▷4. Check of harness between spiral cable and airbag ECU for short circuit

1. Disconnect the connector at the spiral cable harness side.
2. Check the harness between the spiral cable and the airbag ECU for short circuit.
(1) Connector 2 (AD—) leading to spiral cable—Body earth

SPECIFIED VALUE: 1MΩ or more (No continuity)

▼ If it is OK, go to ▷5.

▼ If the result is NG, replace the harness and connector at the vehicle side.

▷5. Check of spiral cable inside for short circuit.

1. Check the inside of the spiral cable for short circuit.
(1) Connector 1 (AD+) of spiral cable at pad side—Body earth

SPECIFIED VALUE: 1MΩ or more (No continuity)

▼ If the result is OK, it means that the system has returned to the normal state. Erase the diagnosis code and observe for a while.

▼ If the result is NG, replace the spiral cable.

Refer to Page H1-7.

11-9-3 DIAGNOSIS CODE NO.12(DRIVER'S SEAT AIRBAG SQUIB CIRCUIT SYSTEM)

(1) Diagnostic code output conditions

1. Cases where the harness between the driver's seat airbag and the airbag ECU is shorted with the earth

(2) Checking points

1. Check the harness and connector between the driver's seat airbag and the airbag ECU for abnormality.

CAUTION

- Since a connector with terminal short mechanism is used for the spiral cable, there is the possibility to make a wrong judgment that there is a short between harnesses. Therefore, before starting the check, ensure that there is no damage, such as open wire or short, in the SST for deploying the airbag (Part number: 09082-87710-000). Then, install it to the spiral cable. Check the harness with the SST installed.

(3) Checking method**▷1. Check of harness between steering wheel pad Ay and airbag ECU for short circuit**

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.
2. Remove the airbag ECU and steering wheel pad Ay.
3. Install the negative (–) terminal of the battery. After the IG SW has been turned "ON", check the harness between the pad Ay and the airbag ECU for short circuit.
 - (1) Connector 1 (AD+) of spiral cable at pad side—Body earth
 - (2) Connector 2 (AD–) of spiral cable at pad side—Body earth

SPECIFIED VALUE: 0 V (No continuity with +B)

▼ If it is OK, go to ▷2.

▼ If it is NG, go to ▷4.

▷2. Confirmation of diagnosis code

1. After the IG SW has been set to "LOCK" position, install the airbag ECU to the vehicle and connector the connector.
2. Install the negative (–) terminal of the battery. After the IG SW has been turned "ON", erase the diagnosis codes. Then, check the diagnosis code again.

SPECIFIED VALUE: Diagnosis code No.12 is not outputted. (Other codes may be outputted.)

▼ If not outputted, proceed to ▷3.

▼ If outputted, replace the airbag ECU.

Refer to Page H1-29.

▷3. Confirmation of diagnosis code

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.
2. Install the steering wheel pad assembly.
3. Install the negative terminal of the battery. With the IG SW set to "ON" position, erase the diagnosis codes. Then, check the diagnosis code.

SPECIFIED VALUE: Diagnosis code No.12 is not outputted. (Other codes may be outputted.)

▼ If not outputted, it means that the system has returned to the normal state. Erase the diagnosis code and observe for a while.

▼ If outputted, replace the steering wheel pad Ay.

Refer to Page H1-1.

▷4. Check of harness between spiral cable and airbag ECU for short circuit

1. After the IG SW has been set to "LOCK" position, disconnect the connector at the vehicle harness side of the spiral cable.
2. After the IG SW has been turned "ON", check the harness between the spiral cable and the airbag ECU for short circuit.
 - (1) Connector 2 (AD—) leading to spiral cable—Body earthSPECIFIED VALUE: 0 V (No continuity with +B)

▼ If it is OK, go to ▷5.

▼ If the result is NG, replace the harness and connector at the vehicle side.

▷5. Check of spiral cable inside for short circuit.

1. Set the IG SW "LOCK" position.
2. With the IG SW set to "ON" position, check the spiral cable inside for short circuit.
 - (1) Connector 1 (AD+) of spiral cable at pad side—Body earthSPECIFIED VALUE: 0 V (No continuity with +B)

▼ If the result is OK, the system has returned to the normal state. Erase the diagnosis code and observe for a while.

▼ If the result is NG, replace the spiral cable.

Refer to Page H1-7.

11-9-4 DIAGNOSIS CODE NO.13(DRIVER'S SEAT AIRBAG SQUIB CIRCUIT SYSTEM)

(1) Diagnostic code output conditions

1. Case of short between wires of the harness between the driver's seat airbag and the airbag ECU

(2) Checking points

1. Check the harness and connector between the driver's seat airbag and the airbag ECU for abnormality.

CAUTION

- Since a connector with terminal short mechanism is used for the spiral cable, there is the possibility to make a wrong judgment that there is a short between harnesses. Therefore, before starting the check, ensure that there is no damage, such as open wire or short, in the SST for deploying the airbag (Part number: 09082-87710-000). Then, install it to the spiral cable. Check the harness with the SST installed.

(3) Checking method

▷1. Confirmation of diagnosis code

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.
2. Remove the steering wheel pad Ay. Then, short both terminals of the connector of the spiral cable at pad side.
3. Install the negative (—) terminal of the battery. Erase the diagnosis codes. Then, check the diagnosis code again.

SPECIFIED VALUE: Diagnosis code No.13 is outputted.

▼ If outputted, proceed to ▷2.

▼ If not outputted, replace the airbag ECU.

Refer to Page H1-29.

▷2. Confirmation of diagnosis code

1. After the IG SW has been set to "LOCK" position, release the short between the terminals of the connector of the spiral cable at pad side.
2. After the IG SW has been turned "ON", erase the diagnosis code. Then, check the diagnosis code again.

SPECIFIED VALUE: Diagnosis code No.13 is outputted. (Other codes may be outputted.)

▼ If not outputted, proceed to ▷3.

▼ If outputted, proceed to ▷4.

▷3. Confirmation of diagnosis code

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Install the steering wheel pas Ay.
2. After the IG SW has been turned "ON", check the diagnosis code.

SPECIFIED VALUE: Diagnosis code No.13 is not outputted. (Other codes may be outputted.)

▼ If not outputted, the system has returned to the normal state. Erase the diagnosis codes and observe for a while.

▼ If outputted, replace the steering wheel pad Ay.

Refer to Page H1-1.

▷4. Confirmation of diagnosis codes

1. After the IG SW has been set to "LOCK" position, disconnect the connector at the vehicle harness side of the spiral cable.
2. After the IG SW has been turned "ON", erase the diagnosis code. Then, check the diagnosis code again.

SPECIFIED VALUE: Diagnosis code No.13 is not outputted. (Other codes may be outputted.)

▼ If not outputted, proceed to ▷5.

▼ If outputted, proceed to ▷6.

▷5. Check of spiral cable inside for short circuit.

1. After the IG SW has been set to "LOCK" position, disconnect the spiral cable from the vehicle.
2. Connect the SST to the connector at the spiral cable vehicle harness side.

SST: 09082-87710-000

3. Ensure that the terminals of the SST for connecting the battery are not in contact with each other. Then, check the spiral cable inside for short circuit.

(1) Connector 1 (AD+) of spiral cable at vehicle harness side

— Connector 2 (AD-) of spiral cable at vehicle harness side

SPECIFIED VALUE: 1MΩ or more (No continuity)

▼ If the result is OK, the system has returned to the normal state. Erase the diagnosis code and observe for a while.

▼ If the result is NG, replace the spiral cable.

Refer to Page H1-7.

▷6. Check of harness between spiral cable and airbag ECU for short circuit

1. After the IG SW has been set to "LOCK" position, disconnect the connector of the airbag ECU. Then, disconnect the shorted terminal of the connector at the airbag ECU vehicle side.
2. Check the harness between the spiral cable and the airbag ECU for short circuit.
 - (1) Connector 1 (AD+) leading to spiral cable
—Connector 2 (AD-) leading to spiral cable

SPECIFIED VALUE: 1MΩ or more (No continuity)

▼ If the result is OK, the system has returned to the normal state. Erase the diagnosis code and observe for a while.

▼ If it is NG, replace the vehicle side harness.

11-9-5 DIAGNOSIS CODE NO.14(DRIVER'S SEAT AIRBAG SQUIB CIRCUIT SYSTEM)

(1) Diagnostic code output conditions

1. When open wire took place in the harness between the driver's seat airbag and the airbag ECU

(2) Checking points

1. Check the harness and connector between the driver's seat airbag and the airbag ECU for abnormality.

CAUTION

- Since a connector with terminal short mechanism is used for the spiral cable, there is the possibility to make a wrong judgment that there is a short between harnesses. Therefore, before starting the check, ensure that there is no damage, such as open wire or short, in the SST for deploying the airbag (Part number: 09082-87710-000). Then, install it to the spiral cable. Check the harness with the SST installed.

(3) Checking method

▷1. Continuity check between steering wheel pad Ay and airbag ECU

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.
2. Remove the airbag ECU and steering wheel pad Ay.
3. Check the harness between the pad Ay and the airbag ECU for open wire.
 - (1) Connector 1 (AD+) of spiral cable at pad side
—Connector B4 (AD+) of airbag ECU at harness side
 - (2) Connector 2 (AD-) of spiral cable at pad side
—Connector B3 (AD-) of airbag ECU at harness side

SPECIFIED VALUE: Continuity exists

▼ If it is OK, go to ▷2.

▼ If it is NG, go to ▷4.

▷2. Confirmation of diagnosis code

1. Short the connectors 1 (AD+) and 2 (AD-) of the spiral cable at pad side.
2. Install the airbag ECU to the vehicle and connect the connector.
3. Install the negative (—) terminal of the battery. After the IG SW has been turned "ON", erase the diagnosis codes. Then, check the diagnosis code again.

SPECIFIED VALUE: Diagnosis code No.14 is not outputted. (Other codes may be outputted.)

▼ If not outputted, proceed to ▷3.

▼ If outputted, replace the airbag ECU.

Refer to Page H1-29.

▷3. Confirmation of diagnosis code

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.
2. Release the short between the terminals of the spiral cable. Then, install the steering wheel pad Ay.
3. After the IG SW has been turned "ON", check the diagnosis code.

SPECIFIED VALUE: Diagnosis code No.14 is not outputted. (Other codes may be outputted.)

▼ If not outputted, the system has returned to the normal state. Erase the diagnosis codes and observe for a while.

▼ If outputted, replace the steering wheel pad Ay.

Refer to Page H1-1.

▷4. Continuity check between spiral cable and airbag ECU

1. Disconnect the connector at the vehicle harness side of the spiral cable.
2. Check the harness between the spiral cable and the airbag ECU for open wire.
 - (1) Connector 1 (AD+) leading to spiral cable
 - Connector 2 (AD-) leading to spiral cable

SPECIFIED VALUE: Continuity exists

▼ If it is OK, go to ▷5.

▼ If the result is NG, replace the vehicle harness and connector.

▷5. Continuity check of spiral cable inside

1. Check the spiral cable inside for open wire.
 - (1) Connector 1 (AD+) of spiral cable at pad side
 - Connector 2 (AD-) of spiral cable at pad side

SPECIFIED VALUE: Continuity exists

▼ If the result is OK, the system has returned to the normal state. Erase the diagnosis code and observe for a while.

▼ If the result is NG, replace the spiral cable.

Refer to Page H1-7.

11-9-6 DIAGNOSIS CODE NO.15(FRONT SATELLITE SENSOR SYSTEM)

(1) Diagnostic code output conditions

1. Cases where the harness between the front airbag sensor and the airbag ECU exhibits open wire or short circuit
2. Inner abnormality in the front airbag sensor

(2) Checking points

1. Check the harness and connector between the front airbag sensor and the airbag ECU for abnormality.

(3) Checking method

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▷1. Unit check of front airbag sensor

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.
2. Disconnect the connector from the front airbag sensor.
3. Remove the front airbag sensor. Then, perform the unit check.

Refer to Page H1-31.

▼ If it is OK, go to ▷2 .

▼ If the result is NG, replace the front airbag sensor.

Refer to Page H1-31.

▷2. Continuity check between front airbag sensor and airbag ECU

1. Disconnect the connector at the harness side from the airbag ECU.
2. Check the harness between the front airbag sensor and the airbag ECU for open wire.
 - (1) Connector 1 (FSSR—) of front airbag sensor at vehicle side—Connector B13 (FSSR—) of airbag ECU at harness side
 - (2) Connector 2 (FSSR+) of front airbag sensor at vehicle side—Connector B12 (FSSR+) of airbag ECU at harness side

SPECIFIED VALUE: Continuity exists

▼ If it is OK, go to ▷3 .

▼ If it is NG, replace the vehicle side harness.

▷3. Check of harness between front airbag sensor and airbag ECU for short circuit

1. Check that the harness between the front airbag sensor and the airbag ECU is not shorted with the earth.

(1) Connector 1 (FSSR—) of front airbag at sensor vehicle side—Body earth

SPECIFIED VALUE: 1M Ω or more (No continuity)

2. Check that the harness between the front airbag sensor and the airbag ECU is not shorted with the power supply.

(1) Connector 2 (FSSR+) of front airbag sensor at vehicle side—Body earth

SPECIFIED VALUE: 0 V (No continuity with +B)

3. Check that the harnesses of the front airbag sensor are not shorted with each other.

(1) Connector 1 (FSSR—) of front airbag sensor at vehicle side—Connector 2 (FSSR+) of front airbag sensor at vehicle side

SPECIFIED VALUE: 1M Ω or more (No continuity)

▼ If it is OK, go to ▷4 .

▼ If it is NG, replace the vehicle side harness.

▷4. Confirmation of diagnosis codes

1. Connect the connector to the airbag ECU.
2. Install the negative (—) terminal of the battery. After the IG SW has been turned "ON", erase the diagnosis codes. Then, check the diagnosis code again.

SPECIFIED VALUE: Diagnosis code No.15 is not outputted. (Other codes may be outputted.)

▼ If not outputted, the system has returned to the normal state. Erase the diagnosis codes and observe for a while.

▼ If outputted, replace the airbag ECU.

Refer to Page H1-29.

11-9-7 NO.23 (RH SIDE AIRBAG REAR SENSOR SYSTEM)

(1) Output conditions of diagnosis code

1. Cases where the harness between the RH side airbag rear sensor and the airbag ECU exhibits open wire or short circuit
2. Inner abnormality in the RH side airbag rear sensor
3. Cases where the safing sensor inside the sensor is shorted

(2) Checking points

1. Check the harness and connector between the RH side airbag rear sensor and the airbag ECU for abnormality.

(3) Checking method

▷1. Continuity check between connector of RH side airbag rear sensor at vehicle side and connector of airbag ECU at vehicle side

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.
2. Disconnect the connectors from the airbag ECU and RH side airbag rear sensor.
3. Check the harness between the RH side airbag rear sensor and the airbag ECU for open wire.
 - (1) Connector 1 (ESCR) of RH side airbag rear sensor at vehicle side—Connector C15 (ESCR) of airbag ECU at vehicle side
 - (2) Connector 2 (CSR—) of RH side airbag rear sensor at vehicle side—Connector C16 (CSR—) of airbag ECU at vehicle side
 - (3) Connector 3 (CSR+) of RH side airbag rear sensor at vehicle side—Connector C12 (CSR+) of airbag ECU at vehicle side
 - (4) Connector 4 (VUCR) of RH side airbag rear sensor at vehicle side—Connector C11 (VUCR) of airbag ECU at vehicle side

SPECIFIED VALUE: Continuity exists

▼ If it is OK, go to ▷2.

▼ If the result is NG, replace the vehicle harness and connector.

▷2. Check of harness between RH side airbag rear sensor and airbag ECU for short circuit

1. Check the harness between the RH side airbag rear sensor and the airbag ECU for short circuit.

(1) Connector of RH side airbag rear sensor at vehicle side—Body earth

SPECIFIED VALUE: 1M Ω or more (No continuity)

2. Check that the harness between the RH side airbag rear sensor and the airbag ECU is not shorted with the power supply.

(1) Connector of RH side airbag rear sensor at vehicle side—Body earth

SPECIFIED VALUE: 0 V (No continuity with +B)

3. Check that the harnesses of the RH side airbag rear sensor are not shorted with each other.

(1) Each terminal of connector of RH side airbag rear sensor at vehicle side—Other terminals of connector of RH side airbag rear sensor at vehicle side

SPECIFIED VALUE: 1M Ω or more (No continuity)

▼ If it is OK, go to ▷3.

▼ If the result is NG, replace the vehicle harness and connector.

▷3. Confirmation of diagnosis code

1. Connect the connectors to the airbag ECU and RH side airbag rear sensor.

2. Install the negative (—) terminal of the battery. After the IG SW has been turned "ON", erase the diagnosis codes. Then, check the diagnosis code again.

SPECIFIED VALUE: Diagnosis code No.23 is not outputted.

▼ If the result is OK, the system has returned to the normal state. Erase the diagnosis code and observe for a while.

▼ If the result is NG, replace the RH side airbag rear sensor.

Refer to Page H1-35.

11-9-8 NO.24 (LH SIDE AIRBAG REAR SENSOR SYSTEM)

(1) Output conditions of diagnosis code

1. Cases where the harness between the LH side airbag rear sensor and the airbag ECU exhibits open wire or short circuit
2. Inner abnormality in the LH side airbag rear sensor
3. Cases where the safing sensor inside the sensor is shorted

(2) Checking points

1. Check the harness and connector between the LH side airbag rear sensor and the airbag ECU for abnormality.

(3) Checking method

▷1. Continuity check between connector of LH airbag rear sensor at vehicle side and connector of airbag at vehicle side

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.
2. Disconnect the connectors from the airbag ECU and LH side airbag rear sensor.
3. Check the harness between the LH side airbag rear sensor and the airbag ECU for open wire.
 - (1) Connector 1 (ESCL) of LH side airbag rear sensor at vehicle side—Connector A12 (ESCL) of airbag ECU at vehicle side
 - (2) Connector 2 (CSL—) of LH side airbag rear sensor at vehicle side—Connector A11 (CSL—) of airbag ECU at vehicle side
 - (3) Connector 3 (CSL+) of LH side airbag rear sensor at vehicle side—Connector A15 (CSL+) of airbag ECU at vehicle side
 - (4) Connector 4 (VUCL) of LH side airbag rear sensor at vehicle side—Connector A16 (VUCL) of airbag ECU at vehicle side

SPECIFIED VALUE: Continuity exists

▼ If it is OK, go to ▷2.

▼ If the result is NG, replace the vehicle harness and connector.

▷2. Check of harness between LH side airbag rear sensor and airbag ECU for short circuit

1. Check the harness between the LH side airbag rear sensor and the airbag ECU for short circuit.
 - (1) Connector of LH side airbag rear sensor at vehicle side—Body earth

SPECIFIED VALUE: 1MΩ or more (No continuity)
2. Check that the harness between the LH side airbag rear sensor and the airbag ECU is not shorted with the power supply.
 - (1) Connector of LH side airbag rear sensor at vehicle side—Body earth

SPECIFIED VALUE: 0 V (No continuity with +B)
3. Check that the harnesses of the LH side airbag rear sensor are not shorted with each other.
 - (1) Each terminal of connector of LH side airbag rear sensor at vehicle side—Other terminals of connector of LH side airbag rear sensor at vehicle side

SPECIFIED VALUE: 1MΩ or more (No continuity)

▼ If it is OK, go to ▷3.

▼ If the result is NG, replace the vehicle harness and connector.

▷3. Confirmation of diagnosis code

1. Connect the connectors to the airbag ECU and LH side airbag rear sensor.
 2. Install the negative (—) terminal of the battery. After the IG SW has been turned "ON", erase the diagnosis codes. Then, check the diagnosis code again.
- SPECIFIED VALUE: Diagnosis code No.24 is not outputted.

▼ If the result is OK, the system has returned to the normal state. Erase the diagnosis code and observe for a while.

▼ If the result is NG, replace the LH side airbag rear sensor.

Refer to Page H1-35.

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11-9-9 NO.32 (RH SIDE AIRBAG SENSOR SYSTEM)

(1) Output conditions of diagnosis code

1. Cases where the harness between the RH side airbag sensor and the airbag ECU exhibits open wire or short circuit
2. Inner abnormality in the RH side airbag sensor

(2) Checking points

1. Check the harness and connector between the RH side airbag sensor and the airbag ECU for abnormality.

(3) Checking method

▷1. Continuity check between connector of RH side airbag sensor at vehicle side and connector of airbag ECU at vehicle side

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.
2. Disconnect the connectors from the airbag ECU and RH side airbag sensor.
3. Check the harness between the RH side airbag sensor and the airbag ECU for open wire.
 - (1) Connector 1 (ESR) of RH side airbag sensor at vehicle side—Connector C8 (ESR) of airbag ECU at vehicle side
 - (2) Connector 4 (VUPR) of RH side airbag sensor at vehicle side—Connector C10 (VUPR) of airbag ECU at vehicle side

SPECIFIED VALUE: Continuity exists

▼ If it is OK, go to ▷2.

▼ If the result is NG, replace the vehicle harness and connector.

▷2. Check of harness between RH side airbag sensor and airbag ECU for short circuit

1. Check that the harness between the RH side airbag sensor and the airbag ECU is not shorted with the earth.

(1) Connector of RH side airbag sensor at vehicle side—Body earth

SPECIFIED VALUE: 1M Ω or more (No continuity)

2. Check that the harness between the RH side airbag sensor and the airbag ECU is not shorted with the power supply.

(1) Connector of RH side airbag sensor at vehicle side—Body earth

SPECIFIED VALUE: 0 V (No continuity with +B)

3. Check that the harnesses of the RH side airbag sensor are not shorted with each other.

(1) Each terminal of connector of RH side airbag sensor at vehicle side—Other terminals of connector of RH side airbag sensor at vehicle side

SPECIFIED VALUE: 1M Ω or more (No continuity)

▼ If it is OK, go to ▷3.

▼ If the result is NG, replace the vehicle harness and connector.

▷3. Confirmation of diagnosis code

1. Connect the connectors to the airbag ECU and RH side airbag sensor.
2. Install the negative (—) terminal of the battery. After the IG SW has been turned "ON", erase the diagnosis codes. Then, check the diagnosis code again.

SPECIFIED VALUE: Diagnosis code No.32 is not outputted.

▼ If the result is OK, the system has returned to the normal state. Erase the diagnosis code and observe for a while.

▼ If the result is NG, replace the RH side airbag rear sensor.

Refer to Page H1-33.

11-9-10 NO.33 (LH SIDE AIRBAG SENSOR SYSTEM)

(1) Output conditions of diagnosis code

1. Cases where the harness between the LH side airbag sensor and the airbag ECU exhibits open wire or short circuit
2. Inner abnormality in the LH side airbag sensor

(2) Checking points

1. Check the harness and connector between the LH side airbag sensor and the airbag ECU for abnormality.

(3) Checking method

▷1. Continuity check between connector of LH side airbag sensor at vehicle side and connector of airbag ECU at vehicle side

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.
2. Disconnect the connectors from the airbag ECU and LH side airbag sensor.
3. Check the harness between the LH side airbag sensor and the airbag ECU for open wire.
 - (1) Connector 1 (ESL) of LH side airbag sensor at vehicle side—Connector A9 (ESL) of airbag ECU at vehicle side
 - (2) Connector 4 (VUPL) of LH side airbag sensor at vehicle side—Connector A7 (VUPL) of airbag ECU at vehicle side

SPECIFIED VALUE: Continuity exists

▼ If it is OK, go to ▷2.

▼ If the result is NG, replace the vehicle harness and connector.

▷2. Check of harness between LH side airbag sensor and airbag ECU for short circuit

1. Check that the harness between the LH side airbag sensor and the airbag ECU is not shorted with the earth.

(1) Connector of LH side airbag sensor at vehicle side—Body earth

SPECIFIED VALUE: 1M Ω or more (No continuity)

2. Check that the harness between the LH side airbag sensor and the airbag ECU is not shorted with the power supply.

(1) Connector of LH side airbag sensor at vehicle side—Body earth

SPECIFIED VALUE: 0 V (No continuity with +B)

3. Check that the harnesses of the LH side airbag sensor are not shorted with each other.

(1) Each terminal of connector of LH side airbag sensor at vehicle side—Other terminals of connector of LH side airbag sensor at vehicle side

SPECIFIED VALUE: 1M Ω or more (No continuity)

▼ If it is OK, go to ▷3.

▼ If the result is NG, replace the vehicle harness and connector.

▷3. Confirmation of diagnosis code

1. Connect the connectors to the airbag ECU and passenger seat airbag sensor.

2. Install the negative (—) terminal of the battery. After the IG SW has been turned "ON", erase the diagnosis codes. Then, check the diagnosis code again.

SPECIFIED VALUE: Diagnosis code No.33 is not outputted.

▼ If the result is OK, the system has returned to the normal state. Erase the diagnosis code and observe for a while.

▼ If the result is NG, replace the LH side airbag sensor.

Refer to Page H1-33.

11-9-11 NO.41 (RH SIDE AIRBAG SQUIB CIRCUIT SYSTEM)

(1) Output conditions of diagnosis codes

1. Cases where the harness between the RH side airbag and the airbag ECU is shorted with the earth

(2) Checking points

1. Check the harness and connector between the RH side airbag and the airbag ECU for abnormality.

(3) Checking method

▷1. Continuity check between RH side airbag and airbag ECU

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.

2. Disconnect the connectors from the airbag ECU and RH side airbag.

3. Check the harness between the RH side airbag and the airbag ECU for short circuit.

(1) Connector 1 (SFR+) of RH side airbag at vehicle side—Body earth

(2) Connector 2 (SFR—) of RH side airbag at vehicle side—Body earth

SPECIFIED VALUE: 1M Ω (No continuity)

▼ If it is OK, go to ▷2.

▼ If it is NG, replace the vehicle side harness.

▷2. Confirmation of diagnosis code

1. Connect the connector to the airbag ECU.
2. After the IG SW has been turned "ON", erase the diagnosis code. Then, check the diagnosis code again.

SPECIFIED VALUE: Diagnosis code No.41 is not outputted. (Other codes may be outputted.)

▼ If not outputted, proceed to ▷3.

▼ If outputted, replace the airbag ECU.

Refer to Page H1-29.

▷3. Confirmation of diagnosis code

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.
2. Connect the connector to the RH side airbag.
3. Install the negative (—) terminal of the battery. After the IG SW has been turned "ON", erase the diagnosis codes. Then, check the diagnosis code again.

SPECIFIED VALUE: Diagnosis code No.41 is not outputted. (Other codes may be outputted.)

▼ If not outputted, the system has returned to the normal state. Erase the diagnosis codes and observe for a while.

▼ If outputted, replace the RH side airbag.

Refer to Page H1-19.

11-9-12 NO.42 (RH SIDE AIRBAG SQUIB CIRCUIT SYSTEM)

(1) Output conditions of diagnosis codes

1. Cases where the harness between the RH side airbag and the airbag ECU is shorted with the power supply

(2) Checking points

1. Check the harness and connector between the RH side airbag and the airbag ECU for abnormality.

(3) Checking method

▷1. Continuity check between RH side airbag and airbag ECU

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.
2. Disconnect the connectors from the airbag ECU and RH side airbag.
3. Connect the negative (—) terminal of the battery.
4. After the IG SW has been turned "ON", check the harness between the RH side airbag and the airbag ECU for short circuit.
 - (1) Connector 1 (SFR+) of RH side airbag at vehicle side—Body earth
 - (2) Connector 2 (SFR—) of RH side airbag at vehicle side—Body earth

SPECIFIED VALUE: 0 V (No continuity with +B)

▼ If it is OK, go to ▷2.

▼ If it is NG, replace the vehicle side harness.

▷2. Confirmation of diagnosis code

1. After the IG SW has been set to "LOCK" position, connect the connector to the airbag ECU.
2. After the IG SW has been turned "ON", erase the diagnosis code. Then, check the diagnosis code again.

SPECIFIED VALUE: Diagnosis code No.42 is not outputted. (Other codes may be outputted.)

▼ If not outputted, proceed to ▷3.

▼ If outputted, replace the airbag ECU.

Refer to Page H1-29.

▷3. Confirmation of diagnosis code

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.
2. Connect the connector to the RH side airbag.
3. Install the negative (—) terminal of the battery. After the IG SW has been turned "ON", erase the diagnosis codes. Then, check the diagnosis code again.

SPECIFIED VALUE: Diagnosis code No.42 is not outputted. (Other codes may be outputted.)

▼ If not outputted, the system has returned to the normal state. Erase the diagnosis codes and observe for a while.

▼ If outputted, replace the RH side airbag.

Refer to Page H1-19.

11-9-13 NO.43 (RH SIDE AIRBAG SQUIB CIRCUIT SYSTEM)

(1) Output conditions of diagnosis codes

1. Case of short between wires of the harness between the RH side airbag and the airbag ECU

(2) Checking points

1. Check the harness and connector between the RH side airbag and the airbag ECU for abnormality.

(3) Checking method

▷1. Confirmation of diagnosis code

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.
2. Disconnect the connector from the RH side airbag.
3. Short both terminals of the connector of the RH side airbag at vehicle side.
4. Install the negative (—) terminal of the battery. Erase the diagnosis codes. Then, check the diagnosis code again.

SPECIFIED VALUE: Diagnosis code No.43 is outputted.

▼ If outputted, proceed to ▷2.

▼ If not outputted, replace the airbag ECU.

Refer to Page H1-29.

▷2. Confirmation of diagnosis code

1. After the IG SW has been set to "LOCK" position, release the short between the terminals of the connector of the RH side airbag at vehicle side.
2. After the IG SW has been turned "ON", erase the diagnosis code. Then, check the diagnosis code again.

SPECIFIED VALUE: Diagnosis code No.43 is not outputted. (Other codes may be outputted.)

▼ If not outputted, proceed to ▷3.

▼ If outputted, proceed to ▷4.

▷3. Confirmation of diagnosis code

1. After the IG SW has been set to "LOCK" position, remove the negative (—) terminal of the battery. Then, install the RH side airbag.
2. After the IG SW has been turned "ON", check the diagnosis code.

SPECIFIED VALUE: Diagnosis code No.43 is not outputted. (Other codes may be outputted.)

▼ If not outputted, the system has returned to the normal state. Erase the diagnosis codes and observe for a while.

▼ If outputted, replace the RH side airbag.

Refer to Page H1-19.

▷4. Check of harness between RH side airbag and airbag ECU for short circuit

1. After the IG SW has been set to "LOCK" position, disconnect the connector from the airbag ECU.
2. Check the harness between the RH side airbag and the airbag ECU for short circuit.
 - (1) Connector 1 (SFR+) of RH side airbag at vehicle side—Connector 2 (SFR—) of RH side airbag at vehicle side

SPECIFIED VALUE: 1MΩ or more (No continuity)

▼ If the result is OK, the system has returned to the normal state. Erase the diagnosis code and observe for a while.

▼ If it is NG, replace the vehicle side harness.

11-9-14 NO.44 (RH SIDE AIRBAG SQUIB CIRCUIT SYSTEM)**(1) Output conditions of diagnosis codes**

1. When open wire took place in the harness between the RH side airbag and the airbag ECU

(2) Checking points

1. Check the harness and connector between the RH side airbag and the airbag ECU for abnormality.

(3) Checking method**▷1. Continuity check between RH side airbag and airbag ECU**

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.
2. Disconnect the connectors from the airbag ECU and RH side airbag.
3. Check the harness between the RH side airbag and the airbag ECU for open wire.
 - (1) Connector 1 (SFR+) of RH side airbag at vehicle side—Connector C1 (SFR+) of airbag ECU at vehicle side
 - (2) Connector 2 (SFR—) of RH side airbag at vehicle side—Connector C2 (SFR—) of airbag ECU at vehicle side

SPECIFIED VALUE: Continuity exists

▼ If it is OK, go to ▷2.

▼ If the result is NG, replace the vehicle harness and connector.

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▷2. Confirmation of diagnosis code

1. Short the connectors 1 (SFR+) and 2 (SFR-) of the RH side airbag at vehicle side.
2. Connect the connector to the airbag ECU.
3. Install the negative (—) terminal of the battery. After the IG SW has been turned "ON", erase the diagnosis codes. Then, check the diagnosis code again.

SPECIFIED VALUE: Diagnosis code No.44 is not outputted. (Other codes may be outputted.)

▼ If not outputted, proceed to ▷3.

▼ If outputted, replace the airbag ECU.

Refer to Page H1-29.

▷3. Confirmation of diagnosis code

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.
2. Release the short between the terminals of the RH side airbag at vehicle side.
3. Connect the connector to the RH side airbag.
4. Install the negative (—) terminal of the battery. After the IG SW has been turned "ON", erase the diagnosis codes. Then, check the diagnosis code again.

SPECIFIED VALUE: Diagnosis code No.44 is not outputted. (Other codes may be outputted.)

▼ If not outputted, the system has returned to the normal state. Erase the diagnosis codes and observe for a while.

▼ If outputted, replace the RH side airbag.

Refer to Page H1-19.

11-9-15 NO.45 (LH SIDE AIRBAG SQUIB CIRCUIT SYSTEM)

(1) Output conditions of diagnosis codes

1. Cases where the harness between the LH side airbag and the airbag ECU is shorted with the earth

(2) Checking points

1. Check the harness and connector between the LH side airbag and the airbag ECU for abnormality.

(3) Checking method

▷1. Continuity check between LH side airbag and airbag ECU

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.
2. Disconnect the connectors from the airbag ECU and LH side airbag.
3. Check the harness between the LH side airbag and the airbag ECU for short circuit.
 - (1) Connector 1 (SFL+) of LH side airbag at vehicle side—Body earth
 - (2) Connector 2 (SFL-) of LH side airbag at vehicle side—Body earth

SPECIFIED VALUE: 1MΩ (No continuity)

▼ If it is OK, go to ▷2.

▼ If it is NG, replace the vehicle side harness.

▷2. Confirmation of diagnosis code

1. Connect the connector to the airbag ECU.
2. After the IG SW has been turned "ON", erase the diagnosis code. Then, check the diagnosis code again.

SPECIFIED VALUE: Diagnosis code No.45 is not outputted. (Other codes may be outputted.)

▼ If not outputted, proceed to ▷3.

▼ If outputted, replace the airbag ECU.

Refer to Page H1-29.

▷3. Confirmation of diagnosis code

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.
2. Connect the connector to the LH side airbag.
3. Install the negative (—) terminal of the battery. After the IG SW has been turned "ON", erase the diagnosis codes. Then, check the diagnosis code again.

SPECIFIED VALUE: Diagnosis code No.45 is not outputted. (Other codes may be outputted.)

▼ If not outputted, the system has returned to the normal state. Erase the diagnosis codes and observe for a while.

▼ If outputted, replace the LH side airbag.

Refer to Page H1-19.

11-9-16 NO.46 (LH SIDE AIRBAG SQUIB CIRCUIT SYSTEM)

(1) Output conditions of diagnosis codes

1. Cases where the harness between the LH side airbag and the airbag ECU is shorted with the power supply

(2) Checking points

1. Check the harness and connector between the LH side airbag and the airbag ECU for abnormality.

(3) Checking method

▷1. Continuity check between LH side airbag and airbag ECU

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.
2. Disconnect the connectors from the airbag ECU and LH side airbag.
3. Connect the negative (—) terminal of the battery.
4. After the IG SW has been turned "ON", check the harness between the LH side airbag and the airbag ECU for short circuit.
5. After the IG SW has been turned "ON", check the harness between the LH side airbag and the airbag ECU for short circuit.

(1) Connector 1 (SFL +) of LH side airbag at vehicle side — Body earth

(2) Connector 2 (SFL —) of LH side airbag at vehicle side — Body earth

SPECIFIED VALUE: 0 V (No continuity with +B)

▼ If it is OK, go to ▷2.

▼ If it is NG, replace the vehicle side harness.

▷2. Confirmation of diagnosis code

1. After the IG SW has been set to "LOCK" position, connect the connector to the airbag ECU.
2. After the IG SW has been turned "ON", erase the diagnosis code. Then, check the diagnosis code again.

SPECIFIED VALUE: Diagnosis code No.46 is not outputted. (Other codes may be outputted.)

▼ If not outputted, proceed to ▷3.

▼ If outputted, replace the airbag ECU.

Refer to Page H1-29.

▷3. Confirmation of diagnosis code

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.
2. Connect the connector to the LH side airbag.
3. Install the negative (—) terminal of the battery. After the IG SW has been turned "ON", erase the diagnosis codes. Then, check the diagnosis code again.

SPECIFIED VALUE: Diagnosis code No.46 is not outputted. (Other codes may be outputted.)

▼ If not outputted, the system has returned to the normal state. Erase the diagnosis codes and observe for a while.

▼ If outputted, replace the LH side airbag.

Refer to Page H1-19.

11-9-17 NO.47 (LH SIDE AIRBAG SQUIB CIRCUIT SYSTEM)

(1) Output conditions of diagnosis codes

1. Case of short between wires of the harness between the LH side airbag and the airbag ECU

(2) Checking points

1. Check the harness and connector between the LH side airbag and the airbag ECU for abnormality.

(3) Checking method

▷1. Confirmation of diagnosis code

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.
2. Disconnect the connector from the LH side airbag.
3. Short both terminals of the connector of the LH side airbag at vehicle side.
4. Install the negative (—) terminal of the battery. Erase the diagnosis codes. Then, check the diagnosis code again.

SPECIFIED VALUE: Diagnosis code No.47 is outputted.

▼ If outputted, proceed to ▷2.

▼ If not outputted, replace the airbag ECU.

Refer to Page H1-29.

▷2. Confirmation of diagnosis code

1. After the IG SW has been set to "LOCK" position, release the short between the terminals of the connector of the LH side airbag at vehicle side.
2. After the IG SW has been turned "ON", erase the diagnosis code. Then, check the diagnosis code again.

SPECIFIED VALUE: Diagnosis code No.47 is not outputted. (Other codes may be outputted.)

▼ If not outputted, proceed to ▷3.

▼ If outputted, proceed to ▷4.

▷3. Confirmation of diagnosis code

1. After the IG SW has been set to "LOCK" position, remove the negative (—) terminal of the battery. Then, install the LH side airbag.
2. After the IG SW has been turned "ON", check the diagnosis code.

SPECIFIED VALUE: Diagnosis code No.47 is not outputted. (Other codes may be outputted.)

▼ If not outputted, the system has returned to the normal state. Erase the diagnosis codes and observe for a while.

▼ If outputted, replace the LH side airbag.

Refer to Page H1-19.

▷4. Check of harness between LH side airbag and airbag ECU for short circuit

1. After the IG SW has been set to "LOCK" position, disconnect the connector from the airbag ECU.
2. Check the harness between the LH side airbag and the airbag ECU for short circuit.
 - (1) Connector 1 (SFL+) of LH side airbag at vehicle side—Connector 2 (SFL—) of LH side airbag at vehicle side

SPECIFIED VALUE: 1MΩ or more (No continuity)

▼ If the result is OK, the system has returned to the normal state. Erase the diagnosis code and observe for a while.

▼ If it is NG, replace the vehicle side harness.

11-9-18 NO.48 (LH SIDE AIRBAG SQUIB CIRCUIT SYSTEM)

(1) Output conditions of diagnosis codes

1. When open wire took place in the harness between the LH side airbag and the airbag ECU

(2) Checking points

1. Check the harness and connector between the LH side airbag and the airbag ECU for abnormality.

(3) Checking method

▷1. Continuity check between LH side airbag and airbag ECU

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.
2. Disconnect the connectors from the airbag ECU and LH side airbag.
3. Check the harness between the LH side airbag and the airbag ECU for open wire.
 - (1) Connector 1 (SFL+) of LH side airbag at vehicle side—Connector A6 (SFL+) of airbag ECU at vehicle side
 - (2) Connector 2 (SFL—) of LH side airbag at vehicle side—Connector A5 (SFL—) of airbag ECU at vehicle side

SPECIFIED VALUE: Continuity exists

▼ If it is OK, go to ▷2.

▼ If the result is NG, replace the vehicle harness and connector.

▷2. Confirmation of diagnosis code

1. Short the connectors 1 (SFL +) and 2 (SFL –) of the LH side airbag at vehicle side.
2. Connect the connector to the airbag ECU.
3. Install the negative (–) terminal of the battery. After the IG SW has been turned "ON", erase the diagnosis codes. Then, check the diagnosis code again.

SPECIFIED VALUE: Diagnosis code No.48 is not outputted. (Other codes may be outputted.)

▼ If not outputted, proceed to ▷3.

▼ If outputted, replace the airbag ECU.

Refer to Page H1-29.

▷3. Confirmation of diagnosis code

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.
2. Release the short between the terminals of the LH side airbag at vehicle side.
3. Connect the connector to the LH side airbag.
4. Install the negative (–) terminal of the battery. After the IG SW has been turned "ON", erase the diagnosis codes. Then, check the diagnosis code again.

SPECIFIED VALUE: Diagnosis code No.48 is not outputted. (Other codes may be outputted.)

▼ If not outputted, the system has returned to the normal state. Erase the diagnosis codes and observe for a while.

▼ If outputted, replace the LH side airbag.

Refer to Page H1-19.

11-9-19 DIAGNOSIS CODE NO.51(FRONT PASSENGER SEAT AIRBAG SQUIB CIRCUIT SYSTEM)

(1) Diagnostic code output conditions

1. Cases where the harness between the passenger seat airbag and the airbag ECU is shorted with the earth

(2) Checking points

1. Check the harness and connector between the passenger seat airbag and the airbag ECU for abnormality.

(3) Checking method

▷1. Check of harness between passenger seat airbag and airbag ECU for short circuit

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.
2. Disconnect the connectors from the airbag ECU and passenger seat airbag.
3. Check the harness between the passenger seat airbag and the airbag ECU for short circuit.
 - (1) Connector 1 (AP–) of passenger seat airbag at vehicle side – Body earth
 - (2) Connector 2 (AP+) of passenger seat airbag at vehicle side – Body earth

SPECIFIED VALUE: 1MΩ (No continuity)

▼ If it is OK, go to ▷2.

▼ If it is NG, replace the vehicle side harness.

➤2. Confirmation of diagnosis code

1. Connect the connector to the airbag ECU.
2. After the IG SW has been turned "ON", erase the diagnosis code. Then, check the diagnosis code again.

SPECIFIED VALUE: Diagnosis code No.51 is not outputted. (Other codes may be outputted.)

▼ If not outputted, proceed to ➤3.

▼ If outputted, replace the airbag ECU.

Refer to Page H1-29.

➤3. Confirmation of diagnosis code

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.
2. Connect the connector to the passenger seat airbag.
3. Install the negative (—) terminal of the battery. After the IG SW has been turned "ON", erase the diagnosis codes. Then, check the diagnosis code again.

SPECIFIED VALUE: Diagnosis code No.51 is not outputted. (Other codes may be outputted.)

▼ If not outputted, the system has returned to the normal state. Erase the diagnosis codes and observe for a while.

▼ If outputted, replace the passenger seat airbag.

Refer to Page H1-9.

11-9-20 DIAGNOSIS CODE NO.52(FRONT PASSENGER SEAT AIRBAG SQUIB CIRCUIT SYSTEM)

(1) Diagnostic code output conditions

1. Cases where the harness between the passenger seat airbag and the airbag ECU is shorted with the power supply

(2) Checking points

1. Check the harness and connector between the passenger seat airbag and the airbag ECU for abnormality.

(3) Checking method

➤1. Check of harness between passenger seat airbag and airbag ECU for short circuit

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.
2. Disconnect the connectors from the airbag ECU and passenger seat airbag. Then, install the negative (—) terminal of the battery.
3. After the IG SW has been turned "ON", check the harness between the passenger seat airbag and the airbag ECU for short circuit.

(1) Connector 1 (AP—) of passenger seat airbag at vehicle side—Body earth

(2) Connector 2 (AP+) of passenger seat airbag at vehicle side—Body earth

SPECIFIED VALUE: 0 V (No continuity with +B)

▼ If it is OK, go to ➤2.

▼ If it is NG, replace the vehicle side harness.

▷2. Confirmation of diagnosis code

1. After the IG SW has been set to "LOCK" position, connect the connector to the airbag ECU.
2. After the IG SW has been turned "ON", erase the diagnosis code. Then, check the diagnosis code again.

SPECIFIED VALUE: Diagnosis code No.52 is not outputted. (Other codes may be outputted.)

▼ If not outputted, proceed to ▷3.

▼ If outputted, replace the airbag ECU.

Refer to Page H1-29.

▷3. Confirmation of diagnosis code

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.
2. Connect the connector to the passenger seat airbag.
3. Install the negative (—) terminal of the battery. After the IG SW has been turned "ON", erase the diagnosis codes. Then, check the diagnosis code again.

SPECIFIED VALUE: Diagnosis code No.52 is not outputted. (Other codes may be outputted.)

▼ If not outputted, the system has returned to the normal state. Erase the diagnosis codes and observe for a while.

▼ If outputted, replace the passenger seat airbag.

Refer to Page H1-9.

11-9-21 DIAGNOSIS CODE NO.53(FRONT PASSENGER SEAT AIRBAG SQUIB CIRCUIT SYSTEM)

(1) Diagnostic code output conditions

1. Case of short between wires of the harness between the passenger seat airbag and the airbag ECU

(2) Checking points

1. Check the harness and connector between the passenger seat airbag and the airbag ECU for abnormality.

(3) Checking method

▷1. Confirmation of diagnosis code

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.
2. Disconnect the connector from the passenger seat airbag. Then, short both terminals of the connector of the passenger seat airbag at vehicle side.
3. Install the negative (—) terminal of the battery. Erase the diagnosis codes. Then, check the diagnosis code again.

SPECIFIED VALUE: Diagnosis code No.53 is outputted.

▼ If outputted, proceed to ▷2.

▼ If not outputted, replace the airbag ECU.

Refer to Page H1-29.

▷2. Confirmation of diagnosis code

1. After the IG SW has been set to "LOCK" position, release the short between the terminals of the connector of the passenger seat airbag at vehicle side.
2. After the IG SW has been turned "ON", erase the diagnosis code. Then, check the diagnosis code again.

SPECIFIED VALUE: Diagnosis code No.53 is not outputted. (Other codes may be outputted.)

▼ If not outputted, proceed to ▷3.

▼ If outputted, proceed to ▷4.

▷3. Confirmation of diagnosis code

1. After the IG SW has been set to "LOCK" position, remove the negative (—) terminal of the battery. Then, connect the connector to the passenger seat airbag.
2. After the IG SW has been turned "ON", check the diagnosis code.

SPECIFIED VALUE: Diagnosis code No.53 is not outputted. (Other codes may be outputted.)

▼ If not outputted, the system has returned to the normal state. Erase the diagnosis codes and observe for a while.

▼ If outputted, replace the passenger seat airbag.

Refer to Page H1-9.

▷4. Check of harness between passenger seat airbag and airbag ECU for short circuit

1. After the IG SW has been set to "LOCK" position, disconnect the connector from the airbag ECU. Then, disconnect the shorted terminal of the connector of the airbag ECU at vehicle side.
2. Check the harness between the passenger seat airbag and the airbag ECU for short circuit.
 - (1) Connector 1 (AP—) of passenger seat airbag at vehicle side—Connector 2 (AP+) of passenger seat airbag at vehicle side

SPECIFIED VALUE: 1MΩ or more (No continuity)

▼ If the result is OK, the system has returned to the normal state. Erase the diagnosis code and observe for a while.

▼ If it is NG, replace the vehicle harness.

11-9-22 DIAGNOSIS CODE NO.54(FRONT PASSENGER SEAT AIRBAG SQUIB CIRCUIT SYSTEM)

(1) Diagnostic code output conditions

1. When open wire took place in the harness between the passenger seat airbag and the airbag ECU

(2) Checking points

1. Check the harness and connector between the passenger seat airbag and the airbag ECU for abnormality.

(3) Checking method

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▷1. Continuity check between passenger seat airbag and airbag ECU

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.
2. Disconnect the connectors from the airbag ECU and passenger seat airbag. Then, check the harness between the passenger seat airbag and the airbag ECU for open wire.
 - (1) Connector 1 (AP—) of passenger seat airbag at vehicle side—Connector B2 (AP—) of airbag ECU at harness side
 - (2) Connector 2 (AP+) of passenger seat airbag at vehicle side—Connector B1 (AP+) of airbag ECU at harness side

SPECIFIED VALUE: Continuity exists

▼ If it is OK, go to ▷2.

▼ If the result is NG, replace the vehicle harness and connector.

▷2. Confirmation of diagnosis code

1. Short the connectors 1 (AP—) and 2 (AP+) of the passenger seat airbag at vehicle side. Then, connect the connector to the airbag ECU.
2. Install the negative (—) terminal of the battery. After the IG SW has been turned "ON", erase the diagnosis codes. Then, check the diagnosis code again.

SPECIFIED VALUE: Diagnosis code No.54 is not outputted. (Other codes may be outputted.)

▼ If not outputted, proceed to ▷3.

▼ If outputted, replace the airbag ECU.

Refer to Page H1-29.

▷3. Confirmation of diagnosis code

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.
2. Release the short between the terminals of the passenger seat airbag at vehicle side. Then, connect the connector to the passenger seat airbag.
3. Install the negative (—) terminal of the battery. After the IG SW has been turned "ON", erase the diagnosis codes. Then, check the diagnosis code again.

SPECIFIED VALUE: Diagnosis code No.54 is not outputted. (Other codes may be outputted.)

▼ If not outputted, the system has returned to the normal state. Erase the diagnosis codes and observe for a while.

▼ If outputted, replace the passenger seat airbag.

Refer to Page H1-9.

11-9-23 DIAGNOSIS CODE NO.61(FRONT DRIVER'S PRETENSIONER SQUIB CIRCUIT SYSTEM)

(1) Diagnostic code output conditions

1. Cases where the harness between the RH pretensioner mechanism and the airbag ECU is shorted with the earth

(2) Checking points

1. Check the harness and connector between the RH pretensioner mechanism and the airbag ECU for abnormality.

(3) Checking method

▷1. Check of harness between RH pretensioner mechanism and airbag ECU for short circuit

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.
2. Disconnect the connectors from the airbag ECU and RH pretensioner mechanism.
3. Check the harness between the RH pretensioner mechanism and the airbag ECU for short circuit.
 - (1) Connector 1 (PR+) of RH pretensioner mechanism at vehicle side—Body earth
 - (2) Connector 2 (PR-) of RH pretensioner mechanism at vehicle side—Body earthSPECIFIED VALUE: 1MΩ or more (No continuity)

▼ If it is OK, go to ▷2.

▼ If it is NG, replace the vehicle side harness.

▷2. Confirmation of diagnosis code

1. Connect the connector to the airbag ECU.
2. After the IG SW has been turned "ON", erase the diagnosis code. Then, check the diagnosis code again.
SPECIFIED VALUE: Diagnosis code No.61 is not outputted. (Other codes may be outputted.)

▼ If not outputted, proceed to ▷3.

▼ If outputted, replace the airbag ECU.

Refer to Page H1-29.

▷3. Confirmation of diagnosis code

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.
2. Connect the connector to the RH pretensioner mechanism.
3. Install the negative (—) terminal of the battery. After the IG SW has been turned "ON", erase the diagnosis codes. Then, check the diagnosis code again.
SPECIFIED VALUE: Diagnosis code No.61 is not outputted. (Other codes may be outputted.)

▼ If not outputted, the system has returned to the normal state. Erase the diagnosis codes and observe for a while.

▼ If outputted, replace the RH pretensioner mechanism.

Refer to Page I2-33.

11-9-24 DIAGNOSIS CODE NO.62(FRONT DRIVER'S PRETENSIONER SQUIB CIRCUIT SYSTEM)

(1) Diagnostic code output conditions

1. Cases where the harness between the RH or LH pretensioner mechanism and the airbag ECU is shorted with the power supply

(2) Checking points

1. Check the harness and connector between the RH pretensioner mechanism and the airbag ECU for abnormality.

(3) Checking method

H1-83

▷1. Check of harness between RH pretensioner mechanism and airbag ECU for short circuit

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.
2. Disconnect the connectors from the airbag ECU and RH pretensioner mechanism.
3. Install the negative (—) terminal of the battery. With the IG SW turned "ON", check the harness between the RH pretensioner mechanism and the airbag ECU for short circuit.

(1) Connector 1 (PR+) of RH pretensioner mechanism at vehicle side—Body earth

(2) Connector 2 (PR—) of RH pretensioner mechanism at vehicle side—Body earth

SPECIFIED VALUE: 0 V (No continuity with +B)

▼ If it is OK, go to ▷2.

▼ If it is NG, replace the vehicle side harness.

▷2. Confirmation of diagnosis code

1. After the IG SW has been set to "LOCK" position, connect the connector to the airbag ECU.
2. After the IG SW has been turned "ON", erase the diagnosis code. Then, check the diagnosis code again.

SPECIFIED VALUE: Diagnosis code No.62 is not outputted. (Other codes may be outputted.)

▼ If not outputted, proceed to ▷3.

▼ If outputted, replace the airbag ECU.

Refer to Page H1-29.

▷3. Confirmation of diagnosis code

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.
2. Connect the connector to the RH pretensioner mechanism.
3. Install the negative (—) terminal of the battery. After the IG SW has been turned "ON", erase the diagnosis codes. Then, check the diagnosis code again.

SPECIFIED VALUE: Diagnosis code No.62 is not outputted. (Other codes may be outputted.)

▼ If not outputted, the system has returned to the normal state. Erase the diagnosis codes and observe for a while.

▼ If outputted, replace the RH pretensioner mechanism.

Refer to Page I2-33.

11-9-25 DIAGNOSIS CODE NO.63(FRONT DRIVER'S PRETENSIONER SQUIB CIRCUIT SYSTEM)

(1) Diagnostic code output conditions

1. Case of short between wires of the harness between the RH pretensioner mechanism squib and the airbag ECU

(2) Checking points

1. Check the harness and connector between the RH pretensioner mechanism and the airbag ECU for abnormality.

(3) Checking method

▷1. Confirmation of diagnosis code

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.
2. Disconnect the connector from the RH pretensioner mechanism.
3. Short both terminals of the connector of the RH pretensioner mechanism at vehicle side.
4. Install the negative (—) terminal of the battery. After the IG SW has been turned "ON", erase the diagnosis codes. Then, check the diagnosis code again.

SPECIFIED VALUE: Diagnosis code No.63 is outputted.

▼ If outputted, proceed to ▷2.

▼ If not outputted, replace the airbag ECU.

Refer to Page H1-29.

▷2. Confirmation of diagnosis code

1. After the IG SW has been set to "LOCK" position, release the short between the terminals of the connector of the RH pretensioner mechanism at vehicle side.
2. After the IG SW has been turned "ON", erase the diagnosis code. Then, check the diagnosis code again.

SPECIFIED VALUE: Diagnosis code No.63 is not outputted. (Other codes may be outputted.)

▼ If not outputted, proceed to ▷3.

▼ If outputted, proceed to ▷4.

▷3. Confirmation of diagnosis code

1. After the IG SW has been set to "LOCK" position, install the negative (—) terminal of the battery. Then, connect the connector to the RH pretensioner mechanism.
2. After the IG SW has been turned "ON", check the diagnosis code.

SPECIFIED VALUE: Diagnosis code No.63 is not outputted. (Other codes may be outputted.)

▼ If not outputted, the system has returned to the normal state. Erase the diagnosis codes and observe for a while.

▼ If outputted, replace the RH pretensioner mechanism.

Refer to Page I2-33.

▷4. Check of harness between RH pretensioner mechanism and airbag ECU for short circuit

1. After the IG SW has been set to "LOCK" position, disconnect the connector from the airbag ECU.
2. Check the harness between the RH pretensioner mechanism and the airbag ECU for short circuit.
 - (1) Connector 1 (PR+) of RH pretensioner mechanism at vehicle side—Connector 2 (PR—) of RH pretensioner mechanism at vehicle side

SPECIFIED VALUE: 1MΩ or more (No continuity)

▼ If the result is OK, the system has returned to the normal state. Erase the diagnosis code and observe for a while.

▼ If it is NG, replace the vehicle side harness.

11-9-26 DIAGNOSIS CODE NO.64(FRONT DRIVER'S PRETENSIONER SQUIB CIRCUIT SYSTEM)

(1) Diagnostic code output conditions

1. When open wire took place in the harness between the RH pretensioner mechanism and the airbag ECU

H1-85

(2) Checking points

1. Check the harness and connector between the RH pretensioner mechanism and the airbag ECU for abnormality.

(3) Checking method

▷1. Continuity check of harness between RH pretensioner mechanism and airbag ECU

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.
2. Disconnect the connectors from the airbag ECU and RH pretensioner mechanism.
3. Check the harness between the RH pretensioner mechanism and the airbag ECU for open wire.

Vehicles not equipped with curtain shield airbag & side airbag	Connector 1 (PR+) of RH pretensioner mechanism at vehicle side — Connector A5 (PR+) of airbag ECU at harness side
	Connector 2 (PR-) of RH pretensioner mechanism at vehicle side — Connector A6 (PR-) of airbag ECU at harness side
Vehicles equipped with curtain shield airbag & side airbag	Connector 1 (PR+) of RH pretensioner mechanism at vehicle side — Connector C5 (PR+) of airbag ECU at harness side
	Connector 2 (PR-) of RH pretensioner mechanism at vehicle side — Connector C6 (PR-) of airbag ECU at harness side

SPECIFIED VALUE: Continuity exists

▼ If it is OK, go to ▷2.

▼ If the result is NG, replace the vehicle harness and connector.

▷2. Confirmation of diagnosis code

1. Short the connectors 1 (PR+) and 2 (PR-) of the RH pretensioner mechanism at vehicle side.
2. Connect the connector to the airbag ECU.
3. Install the negative (—) terminal of the battery. After the IG SW has been turned "ON", erase the diagnosis codes. Then, check the diagnosis code again.

SPECIFIED VALUE: Diagnosis code No.64 is not outputted. (Other codes may be outputted.)

▼ If not outputted, proceed to ▷3.

▼ If outputted, replace the airbag ECU.

Refer to Page H1-26.

▷3. Confirmation of diagnosis code

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.
2. Release the short between the terminals of the RH pretensioner mechanism at vehicle side.
3. Connect the connector to the RH pretensioner mechanism.
4. Install the negative (—) terminal of the battery. After the IG SW has been turned "ON", erase the diagnosis codes. Then, check the diagnosis code again.

SPECIFIED VALUE: Diagnosis code No.64 is not outputted. (Other codes may be outputted.)

▼ If not outputted, the system has returned to the normal state. Erase the diagnosis codes and observe for a while.

▼ If outputted, replace the RH pretensioner mechanism.

Refer to Page I2-33.

11-9-27 DIAGNOSIS CODE NO.71(FRONT PASSENGER'S PRETENSIONER SQUIB CIRCUIT SYSTEM)

(1) Diagnostic code output conditions

1. Cases where the harness between the LH pretensioner mechanism and the airbag ECU is shorted with the earth

(2) Checking points

1. Check the harness and connector between the LH pretensioner mechanism and the airbag ECU for abnormality.

(3) Checking method**▷1. Check of harness between LH pretensioner mechanism and airbag ECU for short circuit**

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.
2. Disconnect the connectors from the airbag ECU and LH pretensioner mechanism.
3. Check the harness between the LH pretensioner mechanism and the airbag ECU for short circuit.
 - (1) Connector 1 (PL +) of LH pretensioner mechanism at vehicle side — Body earth
 - (2) Connector 2 (PL —) of LH pretensioner mechanism at vehicle side — Body earth

SPECIFIED VALUE: 1MΩ or more (No continuity)

▼ If it is OK, go to ▷2.

▼ If it is NG, replace the vehicle side harness.

▷2. Confirmation of diagnosis code

1. Connect the connector to the airbag ECU.
 2. After the IG SW has been turned "ON", erase the diagnosis code. Then, check the diagnosis code again.
- SPECIFIED VALUE: Diagnosis code No.71 is not outputted. (Other codes may be outputted.)

▼ If not outputted, proceed to ▷3.

▼ If outputted, replace the airbag ECU.

Refer to Page H1-29.

▷3. Confirmation of diagnosis code

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.
 2. Connect the connector to the LH pretensioner mechanism.
 3. Install the negative (—) terminal of the battery. After the IG SW has been turned "ON", erase the diagnosis codes. Then, check the diagnosis code again.
- SPECIFIED VALUE: Diagnosis code No.71 is not outputted. (Other codes may be outputted.)

▼ If not outputted, the system has returned to the normal state. Erase the diagnosis codes and observe for a while.

▼ If outputted, replace the LH pretensioner mechanism.

Refer to Page I2-33.

11-9-28 DIAGNOSIS CODE NO.72(FRONT PASSENGER'S PRETENSIONER SQUIB CIRCUIT SYSTEM)**(1) Diagnostic code output conditions**

1. Cases where the harness between the LH pretensioner mechanism and the airbag ECU is shorted with the power supply

(2) Checking points

1. Check the harness and connector between the LH pretensioner mechanism and the airbag ECU for abnormality.

(3) Checking method

H1-87

▷1. Check of harness between LH pretensioner mechanism and airbag ECU for short circuit

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.
2. Disconnect the connectors from the airbag ECU and LH pretensioner mechanism.
3. Install the negative (—) terminal of the battery. With the IG SW turned "ON", check the harness between the LH pretensioner mechanism and the airbag ECU for short circuit.
 - (1) Connector 1 (PL+) of LH pretensioner mechanism at vehicle side—Body earth
 - (2) Connector 2 (PL—) of LH pretensioner mechanism at vehicle side—Body earthSPECIFIED VALUE: 0 V (No continuity with +B)

▼ If it is OK, go to ▷2.

▼ If it is NG, replace the vehicle side harness.

▷2. Confirmation of diagnosis code

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.
2. Connect the connector to the airbag ECU.
3. After the IG SW has been turned "ON", erase the diagnosis code. Then, check the diagnosis code again.
SPECIFIED VALUE: Diagnosis code No.72 is not outputted. (Other codes may be outputted.)

▼ If not outputted, proceed to ▷3.

▼ If outputted, replace the airbag ECU.

Refer to Page H1-29.

▷3. Confirmation of diagnosis code

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.
2. Connect the connector to the LH pretensioner mechanism.
3. Install the negative (—) terminal of the battery. After the IG SW has been turned "ON", erase the diagnosis codes. Then, check the diagnosis code again.
SPECIFIED VALUE: Diagnosis code No.72 is not outputted. (Other codes may be outputted.)

▼ If not outputted, the system has returned to the normal state. Erase the diagnosis codes and observe for a while.

▼ If outputted, replace the LH pretensioner mechanism.

Refer to Page I2-33.

11-9-29 DIAGNOSIS CODE NO.73(FRONT PASSENGER'S PRETENSIONER SQUIB CIRCUIT SYSTEM)

(1) Diagnostic code output conditions

1. Case of short between wires of the harness between the LH pretensioner mechanism squib and the airbag ECU

(2) Checking points

1. Check the harness and connector between the RH pretensioner mechanism and the airbag ECU for abnormality.

(3) Checking method

▷1. Confirmation of diagnosis code

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.
2. Disconnect the connector from the LH pretensioner mechanism.
3. Short both terminals of the connector of the LH pretensioner mechanism at vehicle side.
4. Install the negative (—) terminal of the battery. After the IG SW has been turned "ON", erase the diagnosis codes. Then, check the diagnosis code again.

SPECIFIED VALUE: Diagnosis code No.73 is outputted.

▼ If outputted, proceed to ▷2.

▼ If not outputted, replace the airbag ECU.

Refer to Page H1-29.

▷2. Confirmation of diagnosis code

1. After the IG SW has been set to "LOCK" position, release the short between the terminals of the connector of the LH pretensioner mechanism at vehicle side.
2. After the IG SW has been turned "ON", erase the diagnosis code. Then, check the diagnosis code again.

SPECIFIED VALUE: Diagnosis code No.73 is not outputted. (Other codes may be outputted.)

▼ If not outputted, proceed to ▷3.

▼ If outputted, proceed to ▷4.

▷3. Confirmation of diagnosis code

1. After the IG SW has been set to "LOCK" position, install the negative (—) terminal of the battery. Then, connect the connector to the LH pretensioner mechanism.
2. After the IG SW has been turned "ON", check the diagnosis code.

SPECIFIED VALUE: Diagnosis code No.73 is not outputted. (Other codes may be outputted.)

▼ If not outputted, the system has returned to the normal state. Erase the diagnosis codes and observe for a while.

▼ If outputted, replace the LH pretensioner mechanism.

Refer to Page I2-33.

▷4. Check of harness between LH pretensioner mechanism and airbag ECU for short circuit

1. After the IG SW has been set to "LOCK" position, disconnect the connector from the airbag ECU.
2. Check the harness between the LH pretensioner mechanism and the airbag ECU for short circuit.
 - (1) Connector 1 (PL+) of LH pretensioner mechanism at vehicle side—Connector 2 (PL—) of LH pretensioner mechanism at vehicle side

SPECIFIED VALUE: 1MΩ or more (No continuity)

▼ If the result is OK, the system has returned to the normal state. Erase the diagnosis code and observe for a while.

▼ If it is NG, replace the vehicle side harness.

11-9-30 DIAGNOSIS CODE NO.74(FRONT PASSENGER'S PRETENSIONER SQUIB CIRCUIT SYSTEM)**(1) Diagnostic code output conditions**

1. When open wire took place in the harness between the LH pretensioner mechanism and the airbag ECU

(2) Checking points

1. Check the harness and connector between the LH pretensioner mechanism and the airbag ECU for abnormality.

(3) Checking method

▷1. Continuity check between LH pretensioner mechanism and airbag ECU

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.
2. Disconnect the connectors from the airbag ECU and LH pretensioner mechanism.
3. Check the harness between the LH pretensioner mechanism and the airbag ECU for open wire.

Vehicles not equipped with curtain shield airbag & side airbag	Connector 1 (PL +) of LH pretensioner mechanism at vehicle side — Connector A8 (PL +) of airbag ECU at harness side
	Connector 2 (PL –) of LH pretensioner mechanism at vehicle side — Connector A7 (PL –) of airbag ECU at harness side
Vehicles equipped with curtain shield airbag & side airbag	Connector 1 (PL +) of LH pretensioner mechanism at vehicle side — Connector A2 (PL +) of airbag ECU at harness side
	Connector 2 (PL –) of LH pretensioner mechanism at vehicle side — Connector A1 (PL –) of airbag ECU at harness side

SPECIFIED VALUE: Continuity exists

▼ If it is OK, go to ▷2.

▼ If the result is NG, replace the vehicle harness and connector.

▷2. Confirmation of diagnosis code

1. Short the connectors 1 (PL +) and 2 (PL –) of the LH pretensioner mechanism at vehicle side.
2. Connect the connector to the airbag ECU.
3. Install the negative (–) terminal of the battery. After the IG SW has been turned "ON", erase the diagnosis codes. Then, check the diagnosis code again.

SPECIFIED VALUE: Diagnosis code No.74 is not outputted. (Other codes may be outputted.)

▼ If not outputted, proceed to ▷3.

▼ If outputted, replace the airbag ECU.

Refer to Page H1-29.

▷3. Confirmation of diagnosis code

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.
2. Release the short between the terminals of the LH pretensioner mechanism at vehicle side.
3. Connect the connector to the LH pretensioner mechanism.
4. Install the negative (–) terminal of the battery. After the IG SW has been turned "ON", erase the diagnosis codes. Then, check the diagnosis code again.

SPECIFIED VALUE: Diagnosis code No.74 is not outputted. (Other codes may be outputted.)

▼ If not outputted, the system has returned to the normal state. Erase the diagnosis codes and observe for a while.

▼ If outputted, replace the LH pretensioner mechanism.

Refer to Page I2-33.

11-9-31 NO.81 (RH CURTAIN SHIELD AIRBAG SQUIB CIRCUIT SYSTEM)

(1) Diagnostic code output conditions

1. Cases where the harness between the RH curtain shield airbag and the airbag ECU is shorted with the earth

(2) Checking points

1. Check the harness and connector between the RH curtain shield airbag and the airbag ECU for abnormality.

(3) Checking method**▷1. Check of harness between RH curtain shield airbag and airbag ECU for short circuit**

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.
 2. Disconnect the connectors from the airbag ECU and RH curtain shield airbag.
 3. Check the harness between the RH curtain shield airbag and the airbag ECU for short circuit.
 - (1) Connector 1 (ICR+) of RH curtain shield airbag at vehicle side – Body earth
 - (2) Connector 2 (ICR–) of RH curtain shield airbag at vehicle side – Body earth
- SPECIFIED VALUE: 1MΩ (No continuity)

▼ If it is OK, go to ▷2.

▼ If it is NG, repair or replace the vehicle side harness.

▷2. Confirmation of diagnosis code

1. Connect the connector to the airbag ECU.
 2. After the IG SW has been turned "ON", erase the diagnosis code. Then, check the diagnosis code again.
- SPECIFIED VALUE: Diagnosis code No.81 is not outputted. (Other codes may be outputted.)

▼ If not outputted, proceed to ▷3.

▼ If outputted, replace the airbag ECU.

Refer to Page H1-29.

▷3. Confirmation of diagnosis code

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.
 2. Connect the connector to the RH curtain shield airbag.
 3. Install the negative (–) terminal of the battery. After the IG SW has been turned "ON", erase the diagnosis codes. Then, check the diagnosis code again.
- SPECIFIED VALUE: Diagnosis code No.81 is not outputted. (Other codes may be outputted.)

▼ If not outputted, the system has returned to the normal state. Erase the diagnosis codes and observe for a while.

▼ If outputted, replace the RH curtain shield airbag.

Refer to Page H1-24.

11-9-32 NO.82 (RH CURTAIN SHIELD AIRBAG SQUIB CIRCUIT SYSTEM)**(1) Diagnostic code output conditions**

1. Cases where the harness between the RH curtain shield airbag and the airbag ECU is shorted with the power supply

(2) Checking points

1. Check the harness and connector between the RH curtain shield airbag and the airbag ECU for abnormality.

(3) Checking method

H1-91

▷1. Check of harness between RH curtain shield airbag and airbag ECU for short circuit

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.
 2. Disconnect the connectors from the airbag ECU and RH curtain shield airbag.
 3. Connect the negative (—) terminal of the battery.
 4. After the IG SW has been turned "ON", check the harness between the RH curtain shield airbag and the airbag ECU for short circuit.
 - (1) Connector 1 (ICR+) of RH curtain shield airbag at vehicle side—Body earth
 - (2) Connector 2 (ICR—) of RH curtain shield airbag at vehicle side—Body earth
- SPECIFIED VALUE: 0 V (No continuity with +B)

▼ If it is OK, go to ▷2.

▼ If it is NG, replace the vehicle side harness.

▷2. Confirmation of diagnosis code

1. After the IG SW has been set to "LOCK" position, connect the connector to the airbag ECU.
 2. After the IG SW has been turned "ON", erase the diagnosis code. Then, check the diagnosis code again.
- SPECIFIED VALUE: Diagnosis code No.82 is not outputted. (Other codes may be outputted.)

▼ If not outputted, proceed to ▷3.

▼ If outputted, replace the airbag ECU.

Refer to Page H1-29.

▷3. Confirmation of diagnosis code

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.
 2. Connect the connector to the RH curtain shield airbag.
 3. Install the negative (—) terminal of the battery. After the IG SW has been turned "ON", erase the diagnosis codes. Then, check the diagnosis code again.
- SPECIFIED VALUE: Diagnosis code No.82 is not outputted. (Other codes may be outputted.)

▼ If not outputted, the system has returned to the normal state. Erase the diagnosis codes and observe for a while.

▼ If outputted, replace the RH curtain shield airbag.

Refer to Page H1-24.

11-9-33 NO.83 (RH CURTAIN SHIELD AIRBAG SQUIB CIRCUIT SYSTEM)

(1) Diagnostic code output conditions

1. Case of short between wires of the harness between the RH curtain shield airbag and the airbag ECU

(2) Checking points

1. Check the harness and connector between the RH curtain shield airbag and the airbag ECU for abnormality.

(3) Checking method

▷1. Confirmation of diagnosis code

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.
2. Disconnect the connector from the RH curtain shield airbag.
3. Short both terminals of the connector of the RH curtain shield airbag at vehicle side.
4. Install the negative (—) terminal of the battery. Erase the diagnosis codes. Then, check the diagnosis code again.

SPECIFIED VALUE: Diagnosis code No.83 is outputted.

▼ If outputted, proceed to ▷2.

▼ If not outputted, replace the airbag ECU.

Refer to Page H1-29.

▷2. Confirmation of diagnosis code

1. After the IG SW has been set to "LOCK" position, release the short between the terminals of the connector of the RH curtain shield airbag at vehicle side.
2. After the IG SW has been turned "ON", erase the diagnosis code. Then, check the diagnosis code again.

SPECIFIED VALUE: Diagnosis code No.83 is not outputted. (Other codes may be outputted.)

▼ If not outputted, proceed to ▷3.

▼ If outputted, proceed to ▷4.

▷3. Confirmation of diagnosis code

1. After the IG SW has been set to "LOCK" position, remove the negative (—) terminal of the battery. Then, install the RH curtain shield airbag.
2. After the IG SW has been turned "ON", check the diagnosis code.

SPECIFIED VALUE: Diagnosis code No.83 is not outputted. (Other codes may be outputted.)

▼ If not outputted, the system has returned to the normal state. Erase the diagnosis codes and observe for a while.

▼ If outputted, replace the RH curtain shield airbag.

Refer to Page H1-24.

▷4. Check of harness between RH curtain shield airbag and airbag ECU for short circuit

1. After the IG SW has been set to "LOCK" position, disconnect the connector from the airbag ECU.
2. Check the harness between the RH curtain shield airbag and the airbag ECU for short circuit.
 - (1) Connector 1 (ICR+) of RH curtain shield airbag at vehicle side—Connector 2 (ICR—) of RH curtain shield airbag at vehicle side

SPECIFIED VALUE: 1MΩ or more (No continuity)

▼ If the result is OK, the system has returned to the normal state. Erase the diagnosis code and observe for a while.

▼ If the result is NG, repair or replace the vehicle side harness.

11-9-34 NO.84 (RH CURTAIN SHIELD AIRBAG SQUIB CIRCUIT SYSTEM)

(1) Diagnostic code output conditions

1. When open wire took place in the harness between the RH curtain shield airbag and the airbag ECU

(2) Checking points

1. Check the harness and connector between the RH curtain shield airbag and the airbag ECU for abnormality.

H1-93

(3) Checking method

▷1. Continuity check of harness between RH curtain shield airbag and airbag ECU

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.
2. Disconnect the connectors from the airbag ECU and RH curtain shield airbag.
3. Check the harness between the RH curtain shield airbag and the airbag ECU for open wire.
 - (1) Connector 1 (ICR+) of RH curtain shield airbag at vehicle side—Connector C4 (ICR+) of airbag ECU at vehicle side
 - (2) Connector 2 (ICR-) of RH curtain shield airbag at vehicle side—Connector C3 (ICR-) of airbag ECU at vehicle side

SPECIFIED VALUE: 4.6 Ω or less (Continuity exists.)

▼ If it is OK, go to ▷2.

▼ If the result is NG, repair or replace the vehicle harness and connector.

▷2. Confirmation of diagnosis code

1. Short the connectors 1 (ICR+) and 2 (ICR-) of the RH curtain shield airbag at vehicle side.
2. Connect the connector to the airbag ECU.
3. Install the negative (—) terminal of the battery. After the IG SW has been turned "ON", erase the diagnosis codes. Then, check the diagnosis code again.

SPECIFIED VALUE: Diagnosis code No.84 is not outputted. (Other codes may be outputted.)

▼ If not outputted, proceed to ▷3.

▼ If outputted, replace the airbag ECU.

Refer to Page H1-26.

▷3. Confirmation of diagnosis code

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.
2. Release the short between the terminals of the RH curtain shield airbag at vehicle side.
3. Connect the connector to the RH curtain shield airbag.
4. Install the negative (—) terminal of the battery. After the IG SW has been turned "ON", erase the diagnosis codes. Then, check the diagnosis code again.

SPECIFIED VALUE: Diagnosis code No.84 is not outputted. (Other codes may be outputted.)

▼ If not outputted, the system has returned to the normal state. Erase the diagnosis codes and observe for a while.

▼ If outputted, replace the RH curtain shield airbag.

Refer to Page H1-24.

11-9-35 NO.85 (LH CURTAIN SHIELD AIRBAG SQUIB CIRCUIT SYSTEM)

(1) Diagnostic code output conditions

1. Cases where the harness between the LH curtain shield airbag and the airbag ECU is shorted with the earth

(2) Checking points

1. Check the harness and connector between the LH curtain shield airbag and the airbag ECU for abnormality.

(3) Checking method

▷1. Check of harness between LH curtain shield airbag and airbag ECU for short circuit

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.
 2. Disconnect the connectors from the airbag ECU and LH curtain shield airbag.
 3. Check the harness between the LH curtain shield airbag and the airbag ECU for short circuit.
 - (1) Connector 1 (ICL+) of LH curtain shield airbag at vehicle side—Body earth
 - (2) Connector 2 (ICL-) of LH curtain shield airbag at vehicle side—Body earth
- SPECIFIED VALUE: 1MΩ (No continuity)

▼ If it is OK, go to ▷2.

▼ If it is NG, repair or replace the vehicle side harness.

▷2. Confirmation of diagnosis codes

1. Connect the connector to the airbag ECU.
 2. After the IG SW has been turned "ON", erase the diagnosis code. Then, check the diagnosis code again.
- SPECIFIED VALUE: Diagnosis code No.85 is not outputted. (Other codes may be outputted.)

▼ If not outputted, proceed to ▷3.

▼ If outputted, replace the airbag ECU.

Refer to Page H1-29.

▷3. Confirmation of diagnosis codes

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.
 2. Connect the connector to the LH curtain shield airbag.
 3. Install the negative (—) terminal of the battery. After the IG SW has been turned "ON", erase the diagnosis codes. Then, check the diagnosis code again.
- SPECIFIED VALUE: Diagnosis code No.85 is not outputted. (Other codes may be outputted.)

▼ If not outputted, the system has returned to the normal state. Erase the diagnosis codes and observe for a while.

▼ If outputted, replace the LH curtain shield airbag.

Refer to Page H1-24.

11-9-36 NO.86 (LH CURTAIN SHIELD AIRBAG SQUIB CIRCUIT SYSTEM)**(1) Diagnostic code output conditions**

1. Cases where the harness between the LH curtain shield airbag and the airbag ECU is shorted with the power supply

(2) Checking points

1. Check the harness and connector between the LH curtain shield airbag and the airbag ECU for abnormality.

(3) Checking method

▷1. Check of harness between LH curtain shield airbag and airbag ECU for short circuit

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.
 2. Disconnect the connectors from the airbag ECU and LH curtain shield airbag.
 3. Connect the negative (—) terminal of the battery.
 4. After the IG SW has been turned "ON", check the harness between the LH curtain shield airbag and the airbag ECU for short circuit.
 - (1) Connector 1 (ICL+) of LH curtain shield airbag at vehicle side—Body earth
 - (2) Connector 2 (ICL—) of LH curtain shield airbag at vehicle side—Body earth
- SPECIFIED VALUE: 0 V (No continuity with +B)

▼ If it is OK, go to ▷2.

▼ If it is NG, repair or replace the vehicle side harness.

▷2. Confirmation of diagnosis code

1. After the IG SW has been set to "LOCK" position, connect the connector to the airbag ECU.
 2. After the IG SW has been turned "ON", erase the diagnosis code. Then, check the diagnosis code again.
- SPECIFIED VALUE: Diagnosis code No.86 is not outputted. (Other codes may be outputted.)

▼ If not outputted, proceed to ▷3.

▼ If outputted, replace the airbag ECU.

Refer to Page H1-29.

▷3. Confirmation of diagnosis code

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.
 2. Connect the connector to the LH curtain shield airbag.
 3. Install the negative (—) terminal of the battery. After the IG SW has been turned "ON", erase the diagnosis codes. Then, check the diagnosis code again.
- SPECIFIED VALUE: Diagnosis code No.86 is not outputted. (Other codes may be outputted.)

▼ If not outputted, the system has returned to the normal state. Erase the diagnosis codes and observe for a while.

▼ If outputted, replace the LH curtain shield airbag.

Refer to Page H1-24.

11-9-37 NO.87 (LH CURTAIN SHIELD AIRBAG SQUIB CIRCUIT SYSTEM)

(1) Diagnostic code output conditions

1. Case of short between wires of the harness between the LH curtain shield airbag and the airbag ECU

(2) Checking points

1. Check the harness and connector between the LH curtain shield airbag and the airbag ECU for abnormality.

(3) Checking method

▷1. Confirmation of diagnosis code

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.
2. Disconnect the connector from the LH curtain shield airbag.
3. Short both terminals of the connector of the LH curtain shield airbag at vehicle side.
4. Install the negative (—) terminal of the battery. Erase the diagnosis codes. Then, check the diagnosis code again.

SPECIFIED VALUE: Diagnosis code No.87 is outputted.

▼ If outputted, proceed to ▷2.

▼ If not outputted, replace the airbag ECU.

Refer to Page H1-29.

▷2. Confirmation of diagnosis code

1. After the IG SW has been set to "LOCK" position, release the short between the terminals of the connector of the LH curtain shield airbag at vehicle side.
2. After the IG SW has been turned "ON", erase the diagnosis code. Then, check the diagnosis code again.

SPECIFIED VALUE: Diagnosis code No.87 is not outputted. (Other codes may be outputted.)

▼ If not outputted, proceed to ▷3.

▼ If outputted, proceed to ▷4.

▷3. Confirmation of diagnosis code

1. After the IG SW has been set to "LOCK" position, remove the negative (—) terminal of the battery. Then, install the LH curtain shield airbag.
2. After the IG SW has been turned "ON", check the diagnosis code.

SPECIFIED VALUE: Diagnosis code No.87 is not outputted. (Other codes may be outputted.)

▼ If not outputted, the system has returned to the normal state. Erase the diagnosis codes and observe for a while.

▼ If outputted, replace the LH curtain shield airbag.

Refer to Page H1-24.

▷4. Check of harness between LH curtain shield airbag and airbag ECU for short circuit

1. After the IG SW has been set to "LOCK" position, disconnect the connector from the airbag ECU.
2. Check the harness between the LH curtain shield airbag and the airbag ECU for short circuit.
 - (1) Connector 1 (ICL+) of LH curtain shield airbag at vehicle side—Connector 2 (ICL—) of LH curtain shield airbag at vehicle side

SPECIFIED VALUE: 1MΩ or more (No continuity)

▼ If the result is OK, the system has returned to the normal state. Erase the diagnosis code and observe for a while.

▼ If the result is NG, repair or replace the vehicle side harness.

11-9-38 NO.88 (LH CURTAIN SHIELD AIRBAG SQUIB CIRCUIT SYSTEM)

(1) Diagnostic code output conditions

1. When open wire took place in the harness between the LH curtain shield airbag and the airbag ECU

(2) Checking points

1. Check the harness and connector between the LH curtain shield airbag and the airbag ECU for abnormality.

(3) Checking method

H1-97

▷1. Continuity check of harness between LH curtain shield airbag and airbag ECU

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.
2. Disconnect the connectors from the airbag ECU and LH curtain shield airbag.
3. Check the harness between the LH curtain shield airbag and the airbag ECU for open wire.
 - (1) Connector 1 (ICL+) of LH curtain shield airbag at vehicle side—Connector A3 (ICL+) of airbag ECU at vehicle side
 - (2) Connector 2 (ICL-) of LH curtain shield airbag at vehicle side—Connector A4 (ICL-) of airbag ECU at vehicle side

SPECIFIED VALUE: Continuity exists

▼ If it is OK, go to ▷2.

▼ If the result is NG, repair or replace the vehicle harness and connector.

▷2. Confirmation of diagnosis code

1. Short the connectors 1 (ICL+) and 2 (ICL-) of the LH curtain shield airbag at vehicle side.
2. Connect the connector to the airbag ECU.
3. Install the negative (—) terminal of the battery. After the IG SW has been turned "ON", erase the diagnosis codes. Then, check the diagnosis code again.

SPECIFIED VALUE: Diagnosis code No.88 is not outputted. (Other codes may be outputted.)

▼ If not outputted, proceed to ▷3.

▼ If outputted, replace the airbag ECU.

Refer to Page H1-29.

▷3. Confirmation of diagnosis code

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.
2. Release the short between the terminals of the LH curtain shield airbag at vehicle side.
3. Connect the connector to the LH curtain shield airbag.
4. Install the negative (—) terminal of the battery. After the IG SW has been turned "ON", erase the diagnosis codes. Then, check the diagnosis code again.

SPECIFIED VALUE: Diagnosis code No.88 is not outputted. (Other codes may be outputted.)

▼ If not outputted, the system has returned to the normal state. Erase the diagnosis codes and observe for a while.

▼ If outputted, replace the LH curtain shield airbag.

Refer to Page H1-24.

11-10TROUBLE SHOOTING ACCORDING TO MALFUNCTION PHENOMENA

11-10-1 NO DIAGNOSIS CODE IS INDICATED

(1) Checking points

1. Open wire of harness and connector between airbag ECU and DLC
2. Abnormality of airbag ECU main body

(2) Checking method

➤1. Continuity check between airbag ECU and DLC

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.
 2. Disconnect the connector from the airbag ECU.
 3. Check the harness between the airbag ECU and the DLC for open wire.
 - (1) Connector B10 (TC) of airbag ECU at harness side—DLC4 (ECU-T)
 - (2) Connector B17 (SIO) of airbag ECU at harness side—DLC10 (SIO)
- SPECIFIED VALUE: Continuity exists

▼ If it is OK, go to ➤2 .

▼ If the result is NG, replace the harness and connector.

➤2. Continuity check between DLC and earth

1. Check the harness between the DLC and the earth for open wire.
 - (1) DLC13 (E)—Body earth
- SPECIFIED VALUE: Continuity exists

▼ If the result is OK, connect the connector to the airbag ECU and observe for a while.

▼ If the result is NG, replace the harness and connector.

11-10-2 THE DIAGNOSIS CODE IS ALWAYS INDICATED

(1) Checking points

1. Short circuit of harness between airbag ECU and DLC

(2) Checking method

➤1. Check of harness between airbag ECU and DLC for short circuit

1. After the IG SW has been set to "LOCK" position, remove the negative terminal of the battery. Leave the engine under this state for 60 seconds or more.
 2. Disconnect the connector from the airbag ECU.
 3. Check the harness between the airbag ECU and the DLC for short circuit.
 - (1) Connector B10 (TC) of airbag ECU at harness side—DLC4 (ECU-T)
- ▼ If the result is OK, replace the airbag ECU.
Refer to Page H1-29.

▼ If the result is NG, replace the harness and connector.

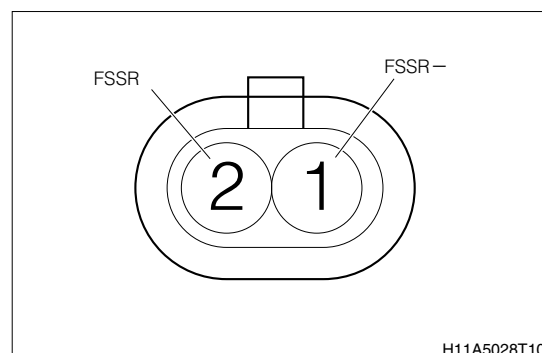
11-11 UNIT CHECK

11-11-1 FRONT AIRBAG SENSOR

1. Measure the resistance between the terminals 1 (FSSR—) and 2 (FSSR+) of the front airbag sensor.
- SPECIFIED VALUE: $820 \pm 82 \Omega$ (at 20°C)

CAUTION

- Be sure to perform the check if there is the possibility that the front section of the vehicle has received an impact.

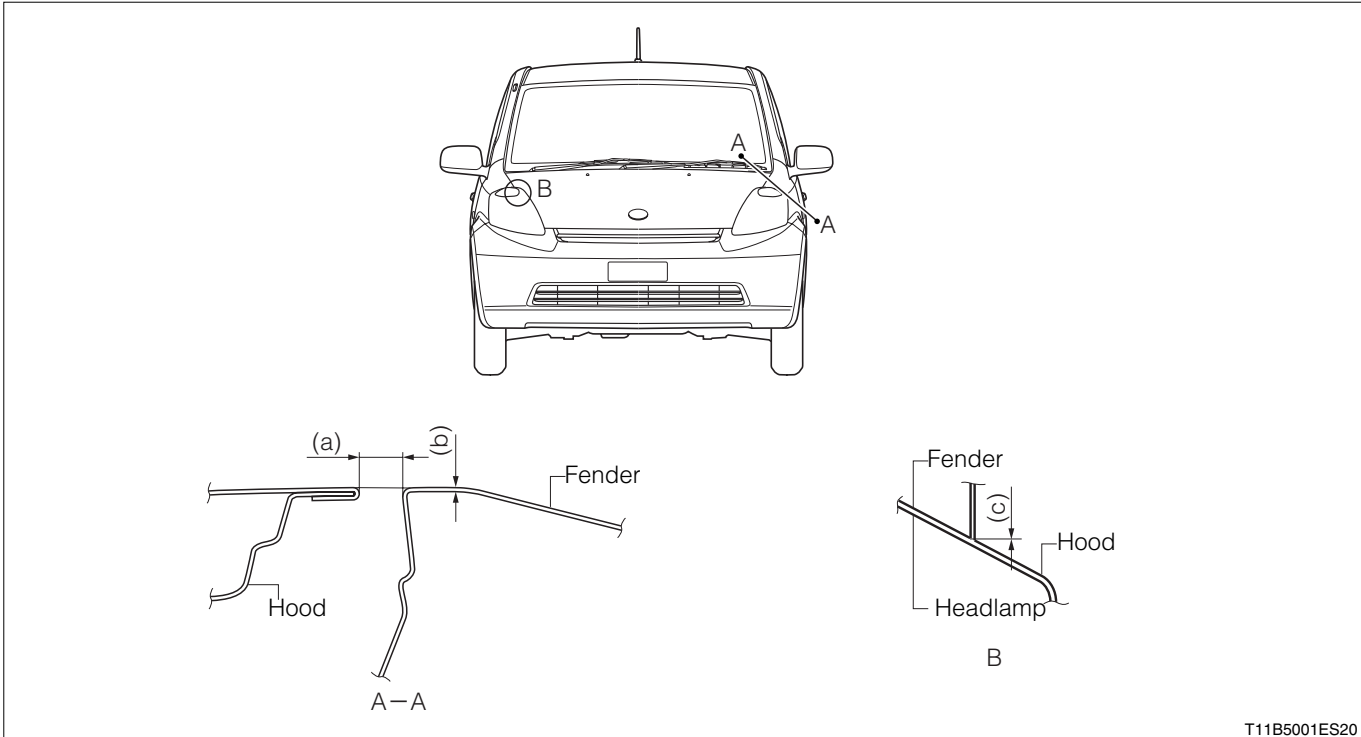


I1 BODY

BODY-----	I1-1
BASIC CHECK AND ADJUSTMENT ----	I1-1
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DISASSEMBLING AND ASSEMBLING --	I1-7
FRONT DOOR(GLASS-RELATED) -----	I1-11
DISASSEMBLING AND ASSEMBLING	
-----	I1-11
FRONT DOOR(LOCK-RELATED) -----	I1-12
DISASSEMBLING AND ASSEMBLING	
-----	I1-12
REAR DOOR(TRIM-RELATED) -----	I1-14
DISASSEMBLING AND ASSEMBLING	
-----	I1-14
REAR DOOR(GLASS-RELATED)-----	I1-16
DISASSEMBLING AND ASSEMBLING	
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REMOVAL AND INSTALLATION(RHD	
VEHICLES)-----	I1-23
REMOVAL AND INSTALLATION(LHD	
VEHICLES)-----	I1-26
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REMOVAL AND INSTALLATION(RHD	
VEHICLES)-----	I1-28
REMOVAL AND INSTALLATION(LHD	
VEHICLES)-----	I1-31
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REMOVAL AND INSTALLATION-----	I1-34

1 BODY
1-1 BASIC CHECK AND ADJUSTMENT
1-1-1 FITTING ADJUSTMENT

- (1) hood
① Fitting dimensions



T11B5001ES20

FITTING DIMENSIONS OF HOOD PANEL

Measuring point		Specified gap (a)	Difference in height (b)	Flatness (c)	Difference between right and left	Deviation value
A – A	Hood X Front fender	3.5 ± 1.5	0 ± 1.5	–	Not to exceed 1.5	Not to exceed 1.5
B	Hood end	–	–	0 ± 1.5	Not to exceed 1.5	–

Unit : mm

② Fitting adjustment

a. Adjustment of the hood in longitudinal direction, and in lateral direction at the rear end

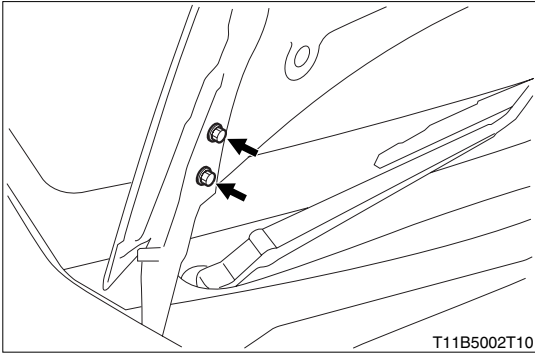
1. Loosen the hood hinge bolts to adjust.

CAUTION

- Since the centering bolt is used, adjustment must be done only after the centering bolt is replaced with the supplied bolt.

NOTE

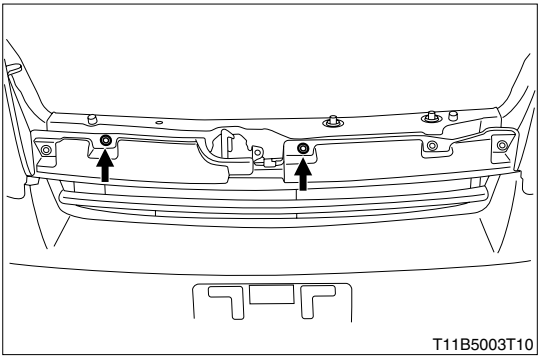
- Part number of bolt:91631-60614-000



T11B5002T10

b. Adjustment of the hood in vertical and lateral direction at the front end

1. Remove two clips on the front bumper cover and pull the hood lock area of the front bumper cover to provide a gap for the tool.



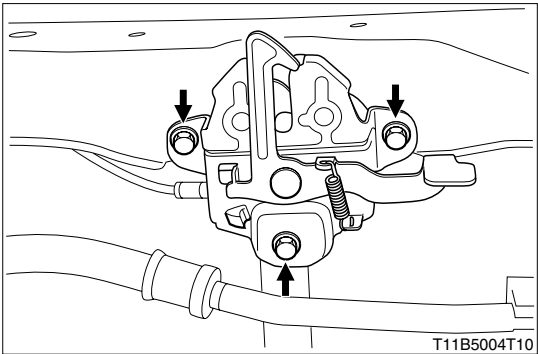
2. Loosen the hood lock bolt prior to adjustment.

CAUTION

- In cases where the centering bolt has been used, replace it with a bolt supplied for adjustment use in advance.

NOTE

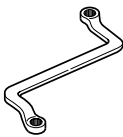
- Part number of bolt:91511-G0612-000



(2) Front & rear door

① Articles to be prepared

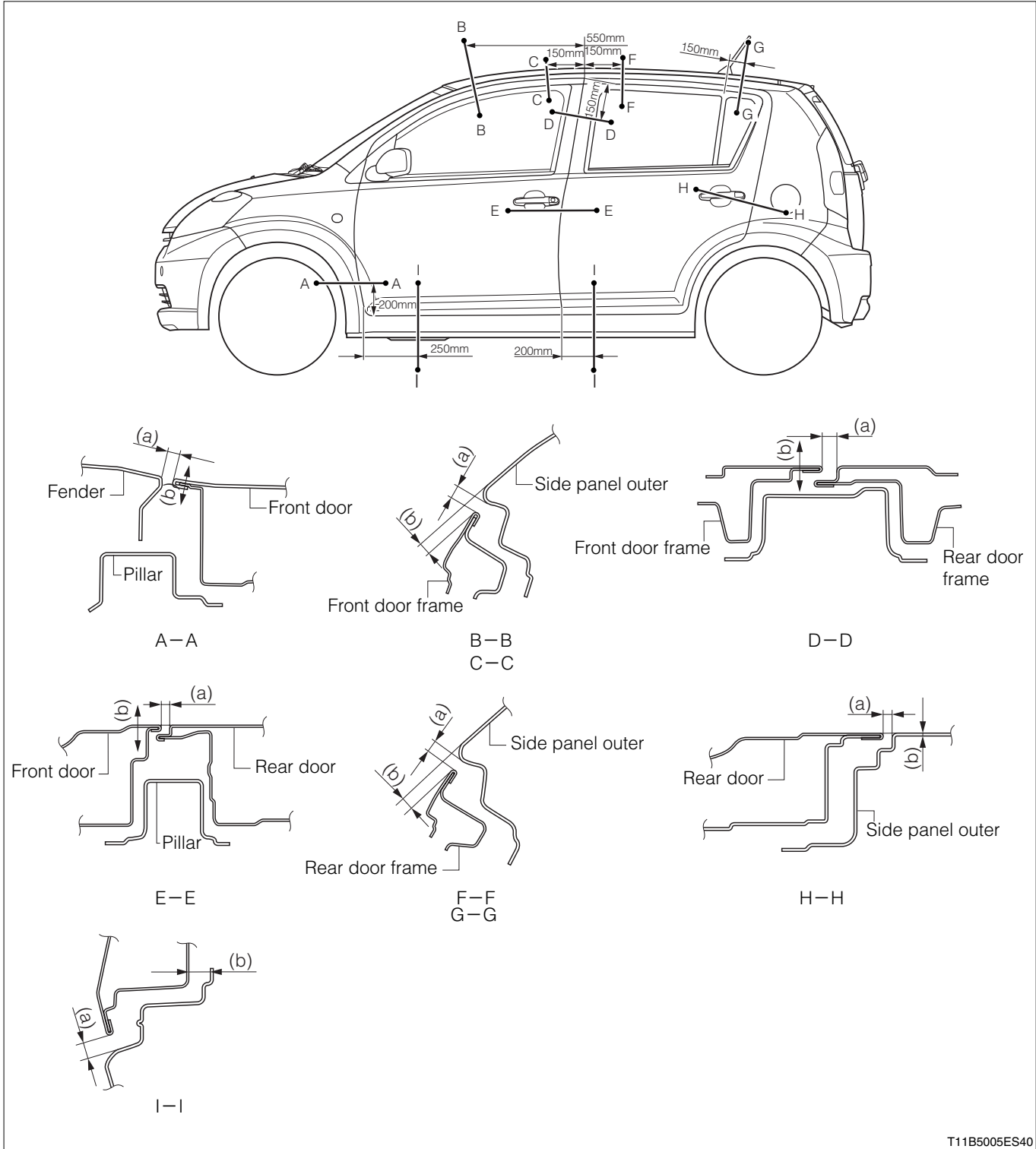
SST

Shape	Part No.	Part name
	09812-00010-000 (09812-22010-000)	Wrench,door hinge set bolt

Tool

Shape	Part No.	Part name	Use
	KTC BT3-T40L or equivalent	Long TORX® wrench T40	

② Fitting dimensions



Fitting dimensions of door

Measuring point		Specified gap (a)	Difference in height (b)	Difference between right and left	Deviation value
A – A	Front door X Front fender	4.2 ± 1.2	0 ± 1.5	—	Not to exceed 1.5
B – B	Front door X Side panel	4.8 ± 1.5	-3.7 ± 1.5	—	Not to exceed 1.5
C – C	Front door X Side panel	4.8 ± 1.5	-3.8 ± 1.5	—	Not to exceed 1.5
D – D	Front door X Rear door	4.2 ± 1.2	0 ± 1.5	Not to exceed 1.5	Not to exceed 1.5
E – E	Front door X Rear door	4.2 ± 1.2	0 ± 1.5	—	Not to exceed 1.5
F – F	Rear door X Side panel	4.8 ± 1.5	-3.5 ± 1.5 (Side panel reference)	—	Not to exceed 1.5
G – G	Rear door X Side panel	4.8 ± 1.5	-3.1 ± 1.5 (Side panel reference)	—	Not to exceed 1.5
H – H	Rear door X Quarter panel	4.2 ± 1.2	0 ± 1.5 (Rear door reference)	—	Not to exceed 1.5
I – I	Front/Rear door X Rocker panel	6.0 ± 1.5	—	—	Not to exceed 2.0

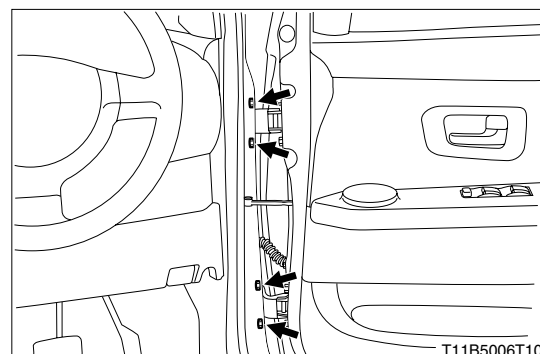
Unit : mm

③ Fitting adjustment (Front door)

a. Adjustment of the door at the rear end, and in vertical and lateral directions

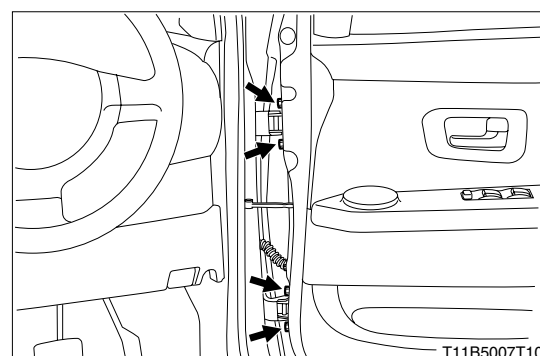
- Loosen the bolt on the pillar side with the SST and perform adjustment.

SST: 09812-00010-000



b. Adjustment of the door in vertical direction, and in lateral direction at the front end

- Loosen the bolt on the door side to adjust.



c. Adjustment of the door in longitudinal and lateral directions and the front door lock striker

- Loosen the striker mounting screw until the striker gets loose.

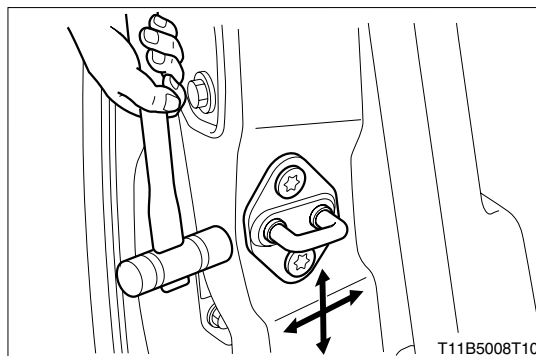
TOOL: KTC

BT3-T40L

or equivalent

Long TORX® wrench T40

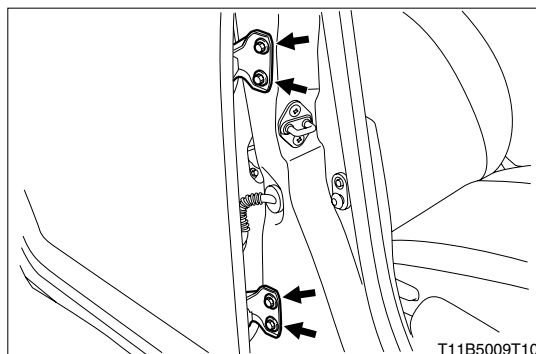
2. Adjust the striker by tapping lightly.



④ Fitting adjustment (Rear door)

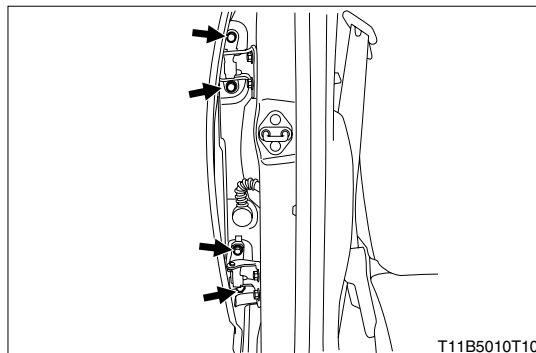
a. Adjustment of the door at the rear end, and in vertical and lateral directions

1. Loosen the bolt on the pillar side to adjust.



b. Adjustment of the door in vertical direction, and lateral direction at the door front end

1. Loosen the bolt on the door side to adjust.



c. Adjustment of the door in longitudinal and lateral directions and the rear door lock striker

1. Loosen the striker mounting screw until the striker gets loose.

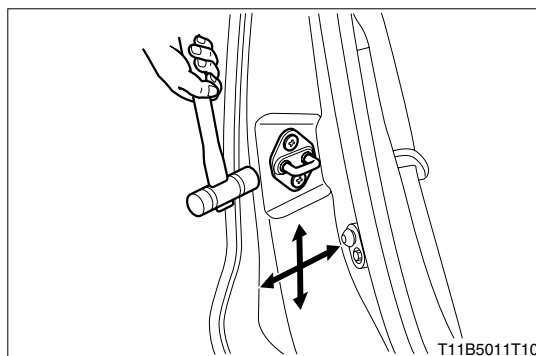
TOOL: KTC

BT3-T40L

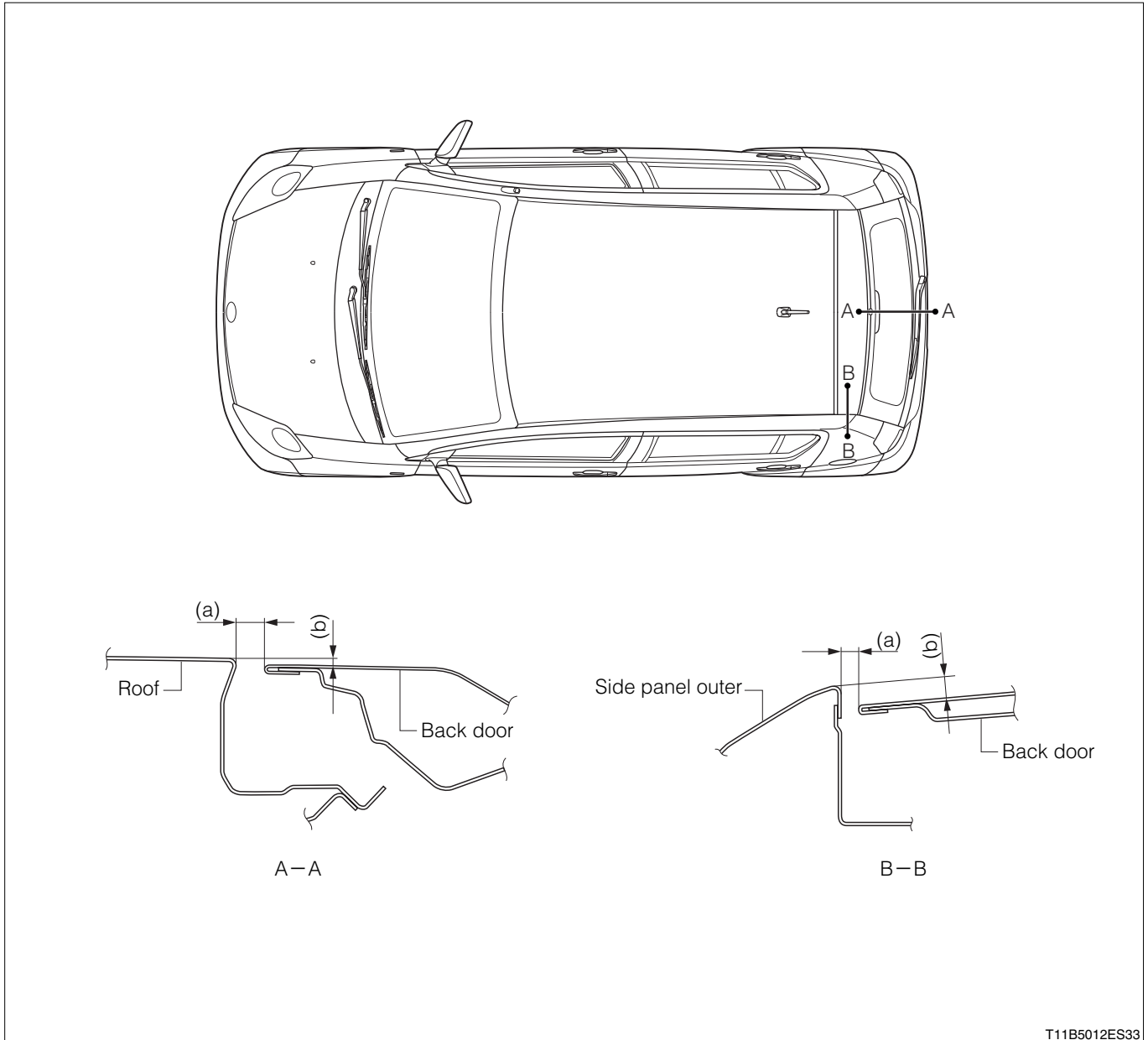
or equivalent

Long TORX® wrench T40

2. Adjust the striker by tapping lightly.



(3) Back door
① Fitting dimensions



T11B5012ES33

Fitting dimensions of back door

Measuring point		Specified gap (a)	Difference in height (b)	Difference between right and left	Deviation value
A - A	Back door X Roof	7.5 ± 1.5	-1.0 ± 1.6	—	Not to exceed 1.5
B - B	Back door X Quarter panel	5.0 ± 1.5	9.8 ± 1.5	Not to exceed 1.5	—

Unit : mm

② Fitting adjustment

a. Adjustment of the back door in vertical and lateral directions at the upper end

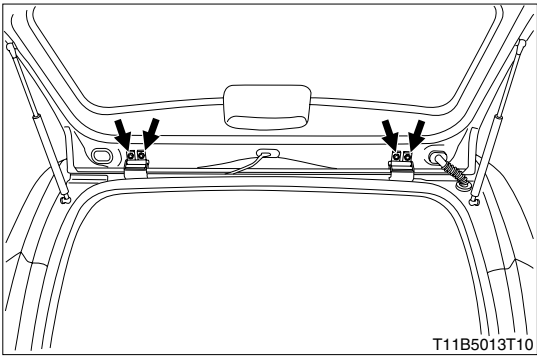
1. Loosen the hinge mounting bolt on the door side before the adjustment.

CAUTION

- Since the centering bolt is used, adjustment must be done only after the centering bolt is replaced with the supplied bolt.

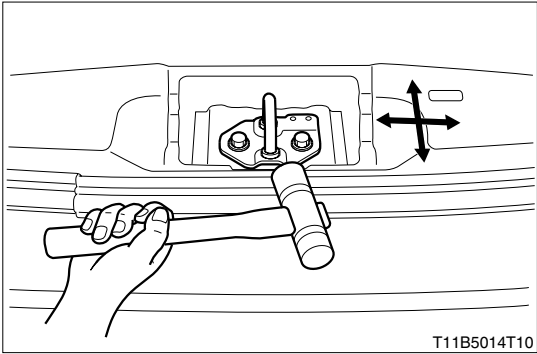
NOTE

- Part number of bolt:91651-40816-000



b. Adjustment of the back door in longitudinal direction and the back door lock striker

1. Loosen the striker mounting screw until the striker gets loose.
2. Adjust the striker by tapping lightly.



1-1-2 CHECK THE FRAME AND THE BODY FOR ANY LOOSENING AND DAMAGE

1. Check the conditions of the tightening bolts, nuts and rivets for the frames and cross members with a spanner.

SPECIFIED VALUE: There shall be no loosening.

2. Check the body, frame and cross member for damage such as rust, crack, deformation, and peel-off of welding.

SPECIFIED VALUE: There shall be no damage, such as rust, crack, deformation, and peel-off of welding.

3. Move the door by hand to ensure there are no loose hinges due to excessive play.

SPECIFIED VALUE: There shall be no loosening.

2 FRONT DOOR(TRIM-RELATED)

2-1 DISASSEMBLING AND ASSEMBLING

2-1-1 ARTICLES TO BE PREPARED

Tool

Clip remover

Lubricant,adhesive,others

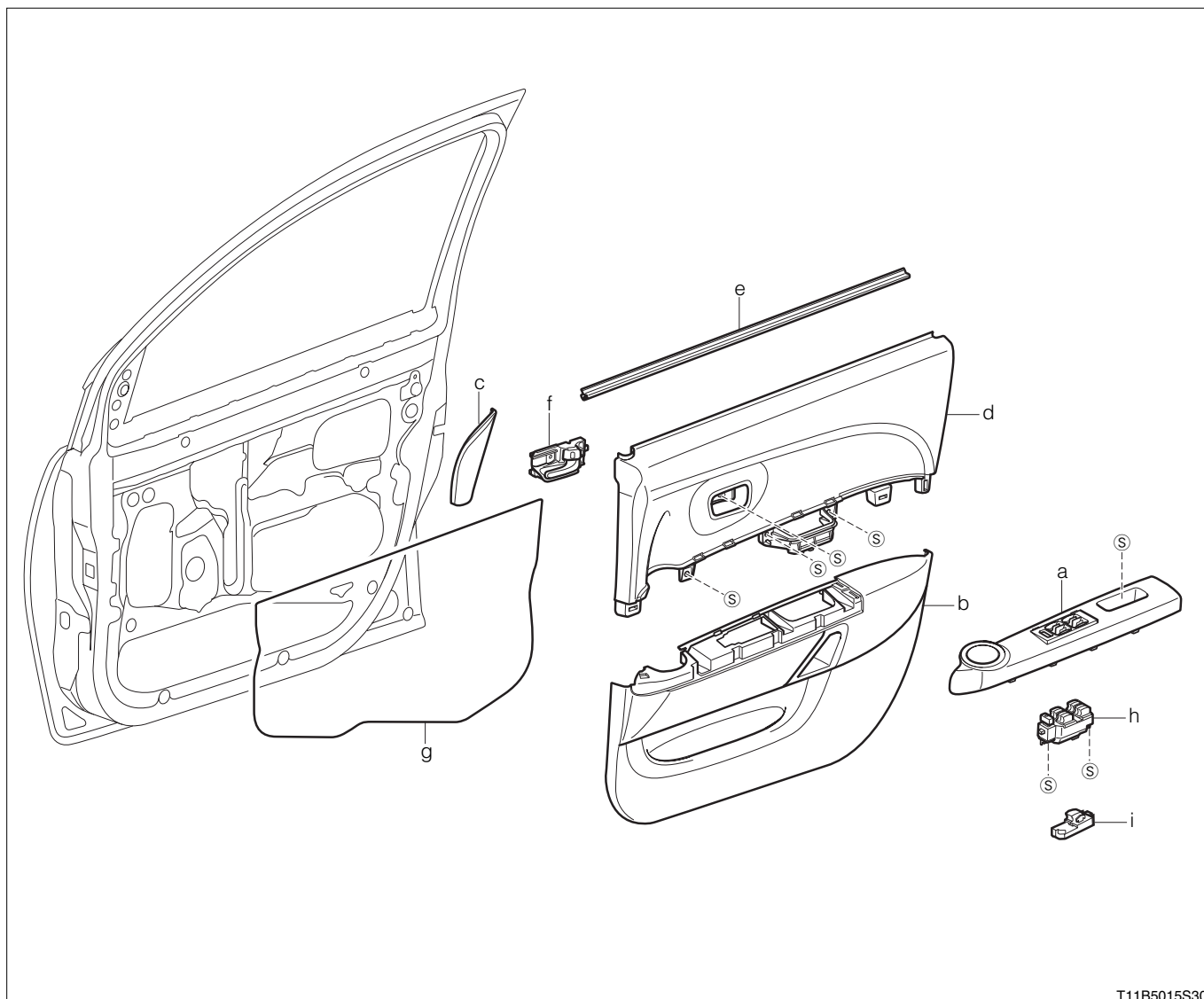
Butyl tape

2-1-2 OPERATION BEFORE DISASSEMBLY

1. Disconnect the battery negative (－) terminal.

2-1-3 DISASSEMBLY AND ASSEMBLY PROCEDURES

(1) Components



T11B5015S30

(2) Disassembling and assembling procedures

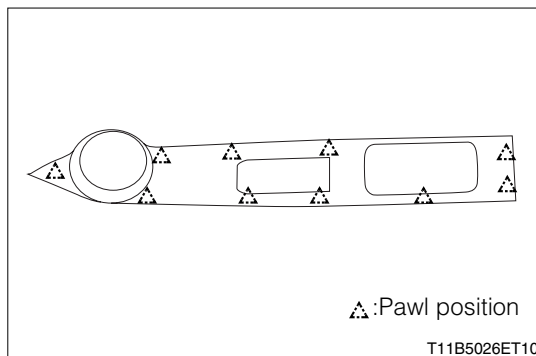
▼ 1	a Panel, front door armrest base, upper RH/LH	▲ 6	f Handle S/A, front door inside RH/LH
▼ 2	b Board Ay, front door trim, lower RH/LH	▲ 7	g Cover, front door service hole, RH
▼ 3	c Garnish, front door lower frame bracket, RH/LH	8	h Master switch Ay, power window regulator (Driver's seat side)
▼ 4	d Board Ay, front door trim, upper RH/LH	9	i Switch Ay, power window regulator (Passenger seat side)
▼ 5	e Weather-strip, front door glass, inner RH/LH		

2-1-4 POINTS OF DISASSEMBLY

(1) Panel, front door armrest base, upper RH/LH

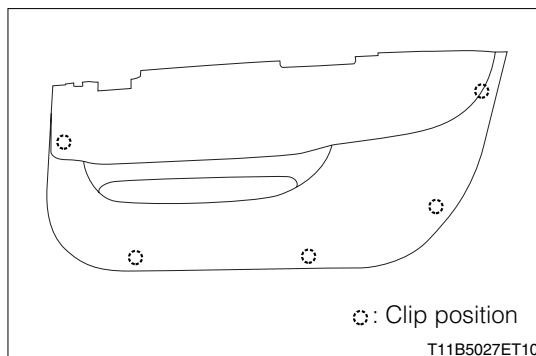
1. Remove 1 screw.

2. Disengage and remove the tabs.



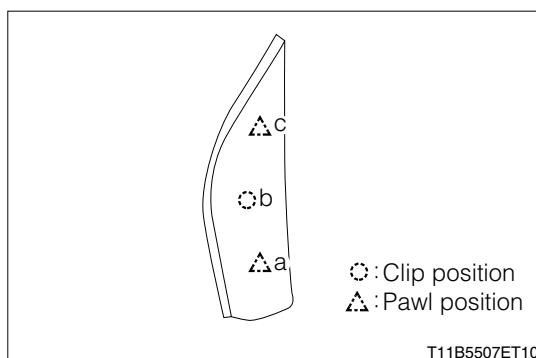
(2) **Board Ay, front door trim, lower RH/LH**

1. Remove the screws (3 locations).
2. Disengage and remove the pawls and clips.



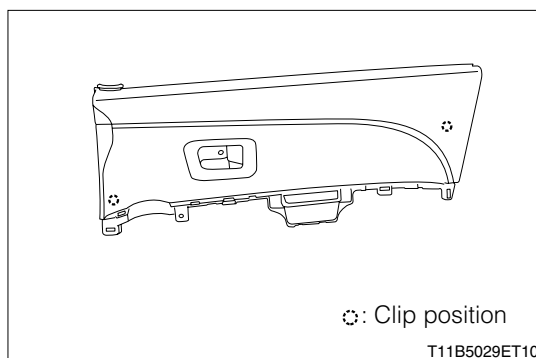
(3) **Garnish, front door lower frame bracket, RH/LH**

1. Disengage the pawl (a) and clip (b).
2. Slightly lift the garnish to the upward of the vehicle, and remove it by disengaging the pawl (c).



(4) **Board Ay, front door trim, upper RH/LH**

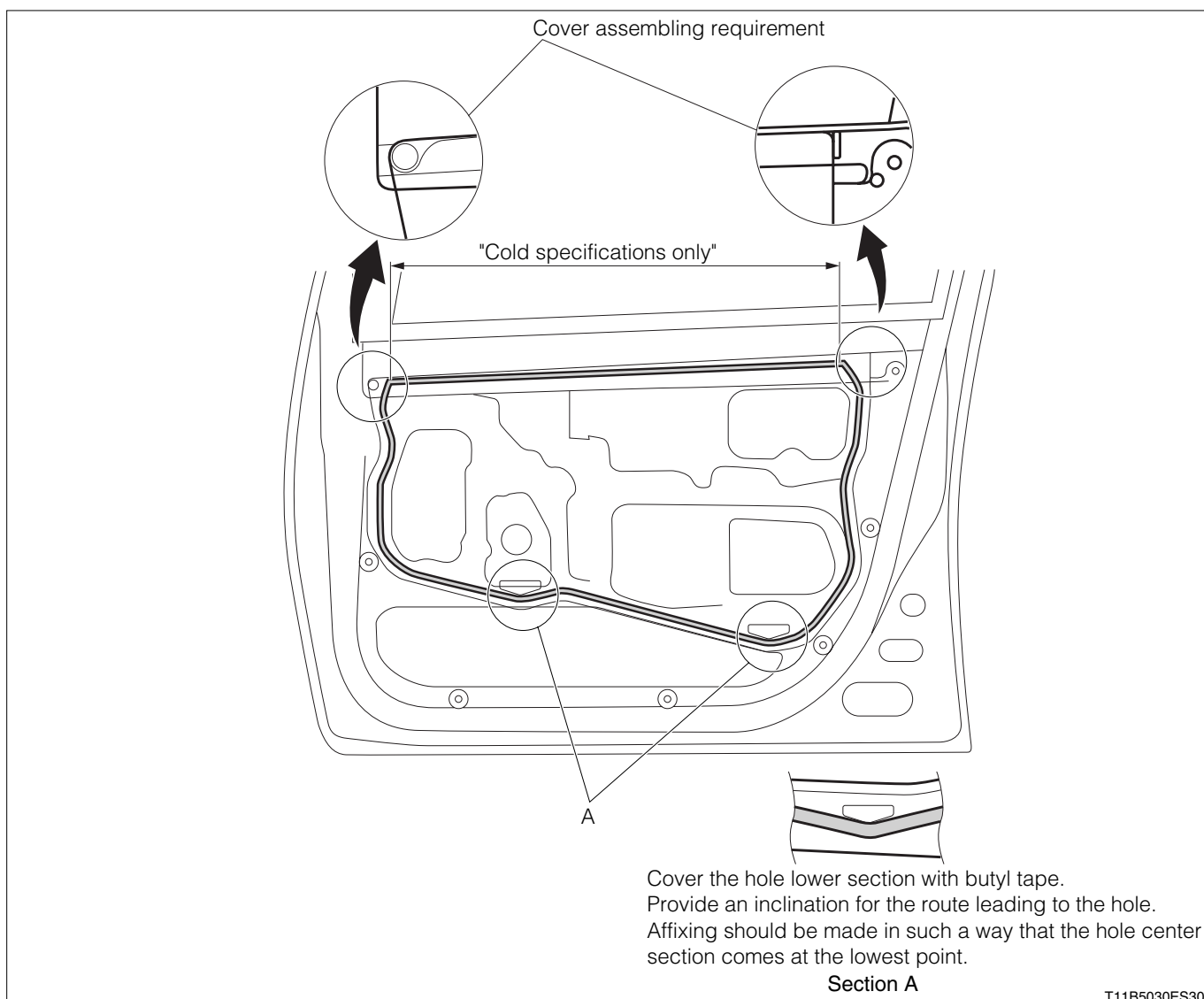
1. Disengage the clips.
2. Lift the board Ay toward the upper side of the vehicle and remove.



2-1-5 POINTS OF ASSEMBLY

(1) Cover, front door service hole, RH

1. Perform the assembling by referring to the main points given in the figure below.



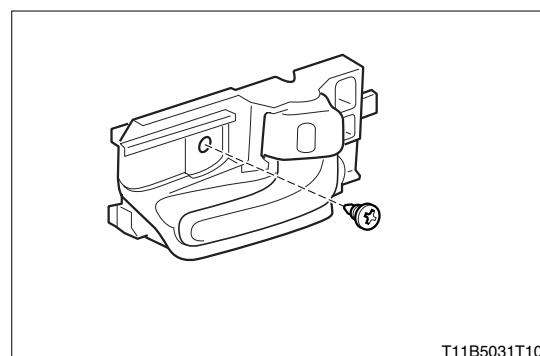
(2) Handle S/A, front door, inside RH/LH

CAUTION

- Be very careful not to break the threaded hole by tightening the screw with an excessive torque, for an ET screw has been employed.
- Do not use an impact driver when tightening the screw.
- If the threaded section should be broken, be sure to use an oversized ET screw (90041-67041-000).

NOTE

- ET screw: This is a screw by which a female screw is threaded as it is tightened, utilizing the shape at the tip end which has a self-drilling effect.



2-1-6 OPERATION AFTER ASSEMBLY

1. Connect the battery negative (—) terminal.

3 FRONT DOOR(GLASS-RELATED)

3-1 DISASSEMBLING AND ASSEMBLING

3-1-1 ARTICLES TO BE PREPARED

Lubricant, adhesive, others

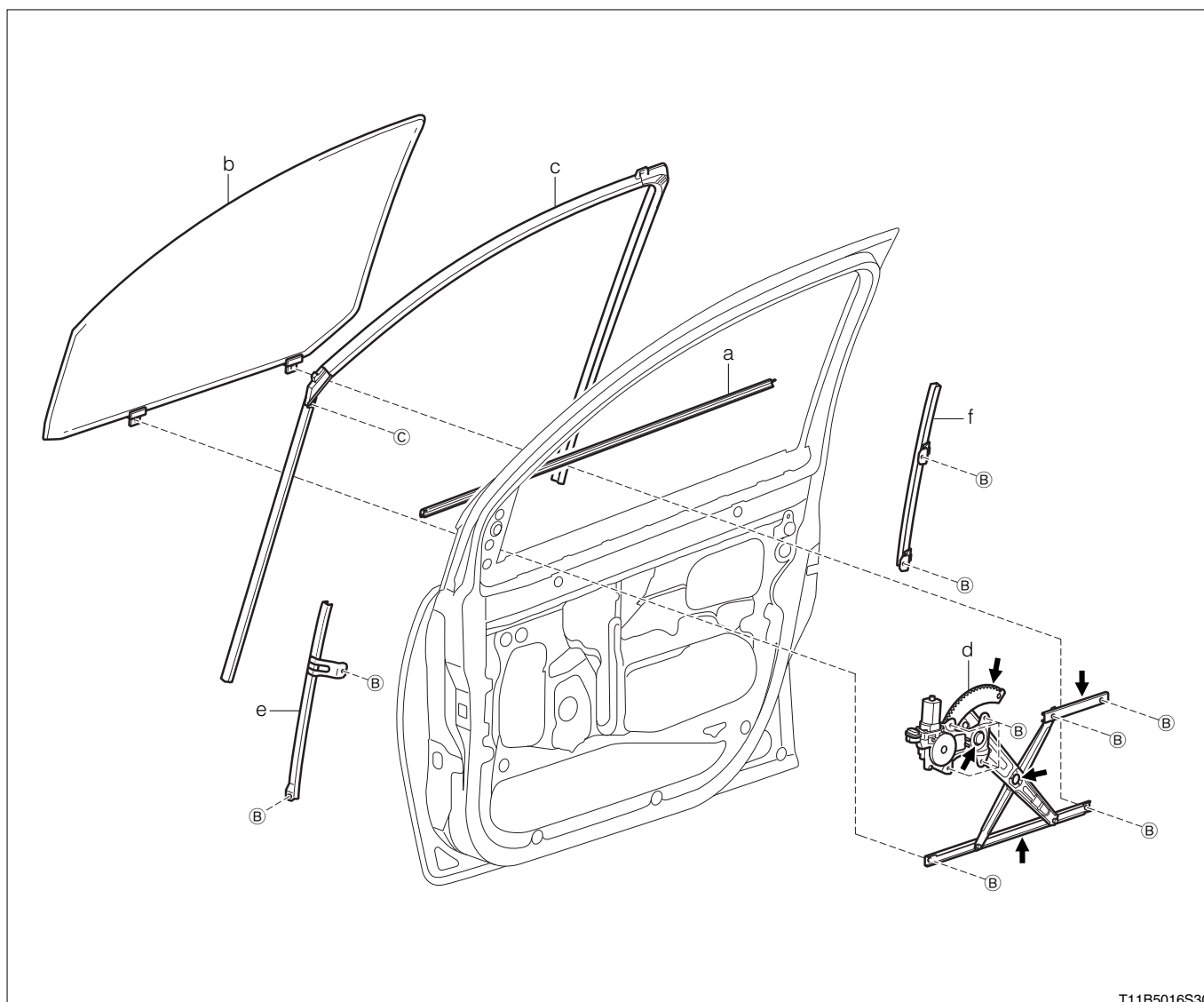
MP grease, Protective tape

3-1-2 OPERATION BEFORE DISASSEMBLY

1. Disconnect the battery negative (－) terminal.
2. Remove the front door service hole cover RH.
Refer to Page I1-7.
3. Remove the outer rear view mirror Ay RH/LH.
Refer to Page I3-25.

3-1-3 DISASSEMBLY AND ASSEMBLY PROCEDURES

(1) Components



T11B5016S30

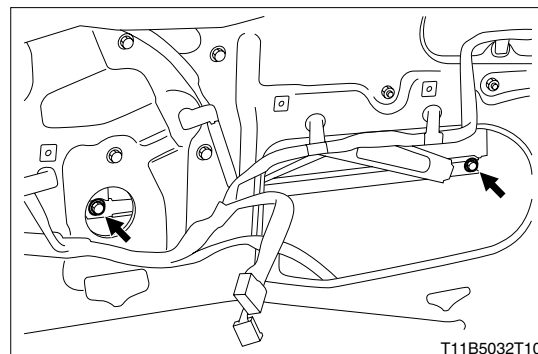
➡: MP grease

(2) Disassembling and assembling procedures

- 1 a Weather-strip, front door window, outer RH/LH
- ▼ 2 b Glass S/A, front door, RH/LH
- 3 c Run, front door glass front, RH/LH
- 4 d Regulator Ay, front door power window, RH/LH
- 5 e Frame S/A, front door, front lower, RH/LH
- 6 f Frame S/A, front door, rear lower, RH/LH

3-1-4 POINTS OF DISASSEMBLY**(1) Glass S/A, front door, RH/LH**

1. Apply a protective tape to the door panel flange.
2. Operate the glass S/A until the bolts are visible.
3. Remove the bolts (2 locations).

**3-1-5 OPERATION AFTER ASSEMBLY**

1. Install the outer rear view mirror Ay RH/LH.
Refer to Page I3-25.
2. Install the front door service hole cover RH.
Refer to Page I1-7.
3. Connect the battery negative (—) terminal.

4 FRONT DOOR(LOCK-RELATED)**4-1 DISASSEMBLING AND ASSEMBLING****4-1-1 ARTICLES TO BE PREPARED**

Tool

TORX® wrench T30

Lubricant, adhesive, others

MP grease

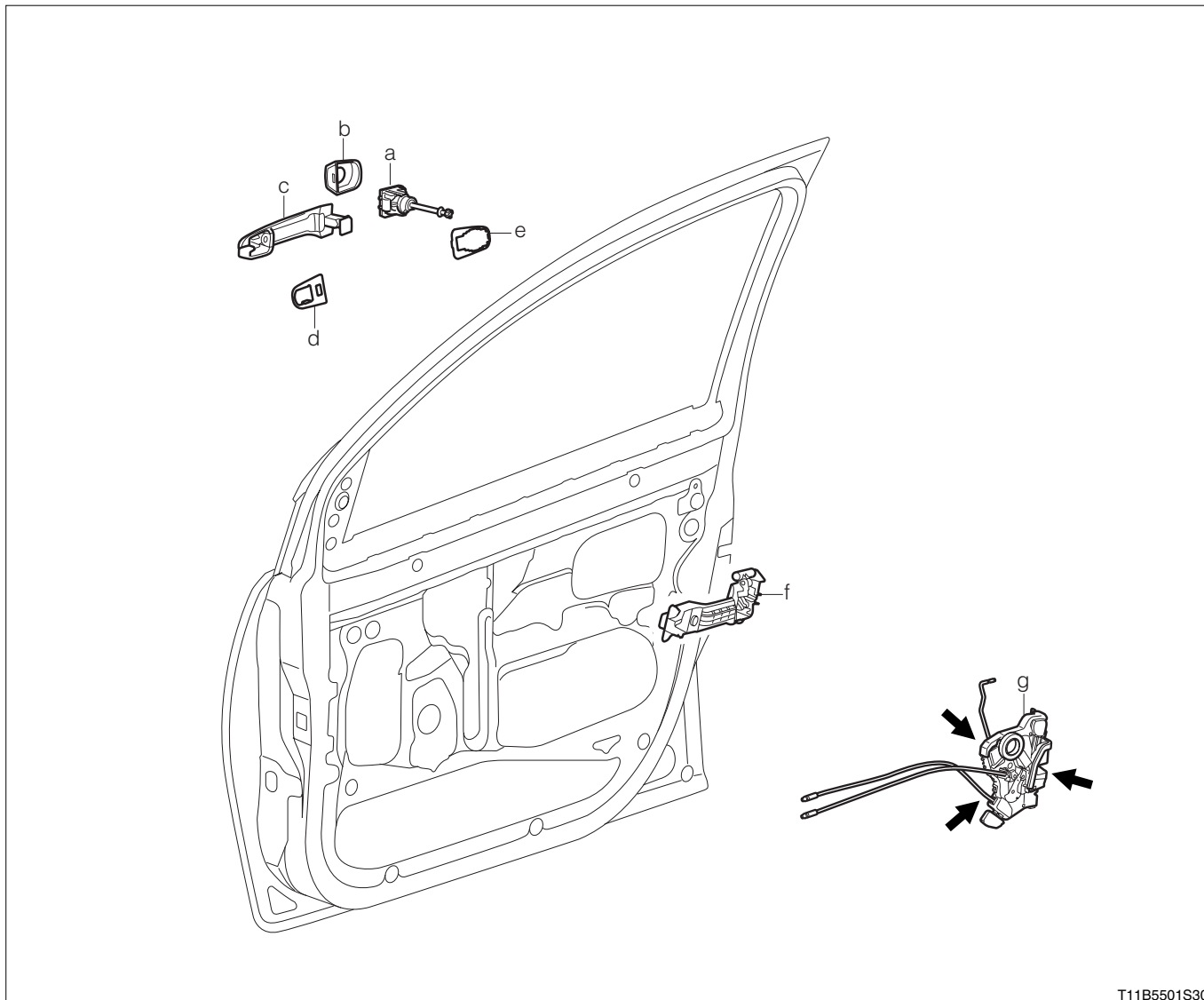
4-1-2 OPERATION BEFORE DISASSEMBLY

1. Disconnect the battery negative (—) terminal.
2. Remove the front door service hole cover RH.
Refer to Page I1-7.
3. Remove the front door rear lower frame S/A RH/LH.
Refer to Page I1-11.

I1-13

4-1-3 DISASSEMBLY AND ASSEMBLY PROCEDURES

(1) Components



T11B5501S30

➡: MP grease

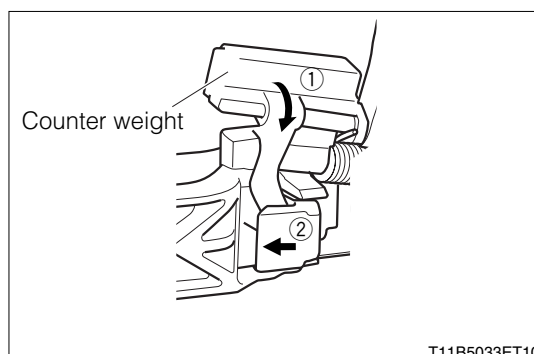
(2) Disassembling and assembling procedures

1	a	Cylinder Ay, front door lock, RH/LH	6	f	Frame S/A, front door outside handle, RH/LH
2	b	Cover, front door outside handle, RH/LH	7	g	Lock Ay, front door w/motor, RH/LH
▲ 3	c	Handle, front door outside RH			
4	d	Pad, front door outside handle, RH			
5	e	Pad, front door outside handle, LH			

4-1-4 POINTS OF ASSEMBLY

(1) Handle, front door outside RH/LH

1. While pushing the counterweight of the RH/LH front door outside handle frame S/A, push the handle toward the front of the vehicle to assemble.



T11B5033ET10

4-1-5 OPERATION AFTER ASSEMBLY

1. Install the front door rear lower frame S/A RH/LH.
Refer to Page I1-11.
2. Install the front door service hole cover RH.
Refer to Page I1-7.
3. Connect the battery negative (–) terminal.

5 REAR DOOR(TRIM-RELATED)

5-1 DISASSEMBLING AND ASSEMBLING

5-1-1 ARTICLES TO BE PREPARED

Tool

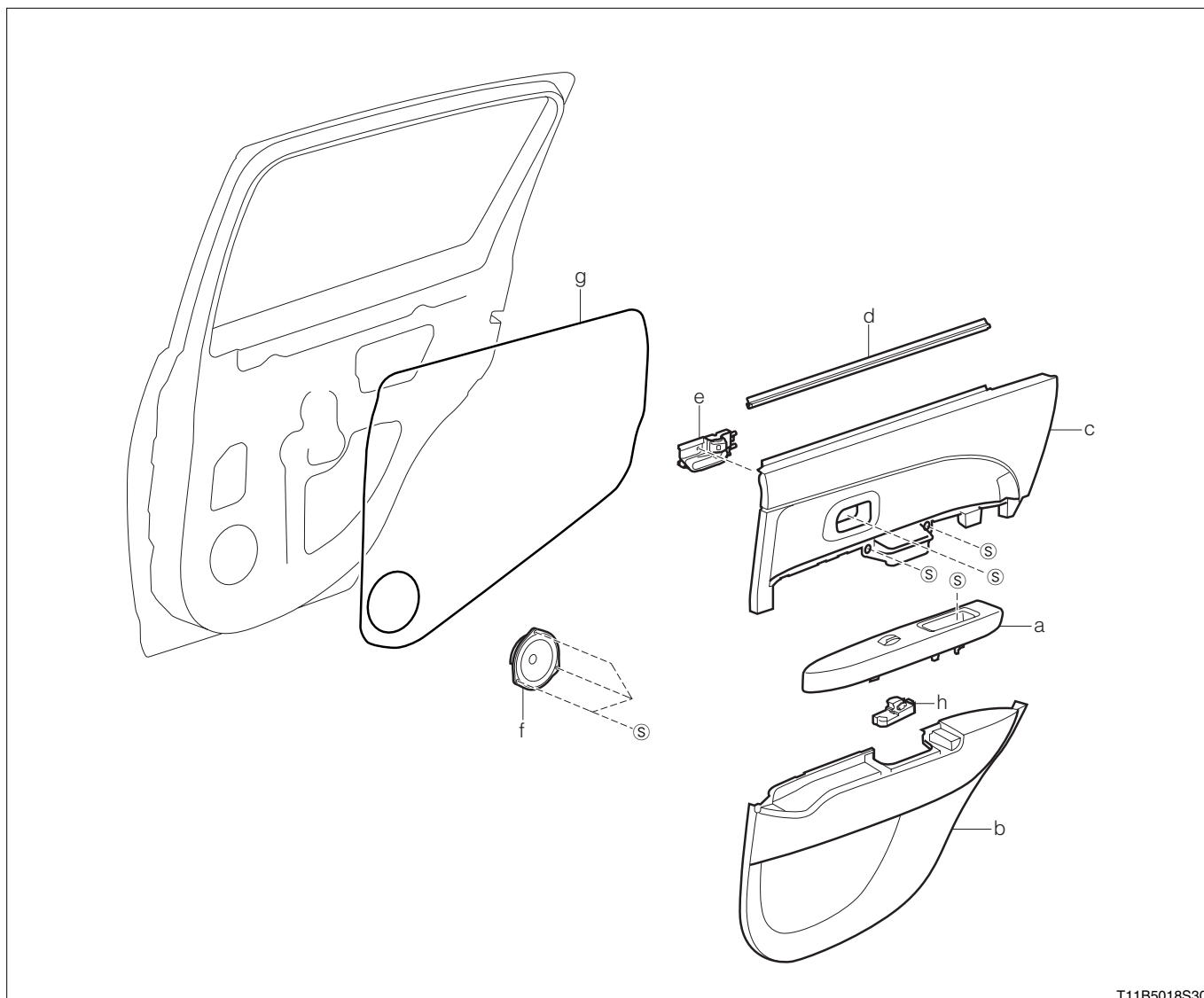
Clip remover

Lubricant, adhesive, others

Butyl tape

5-1-2 DISASSEMBLY AND ASSEMBLY PROCEDURES

(1) Components



I1-15

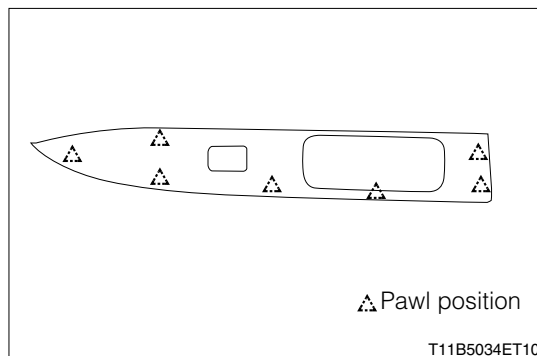
(2) Disassembling and assembling procedures

- ▼ 1 a Panel, rear door armrest base, upper RH/LH
- ▼ 2 b Board Ay, rear door trim, lower RH/LH
- ▼ 3 c Panel, rear door trim, upper RH/LH
- 4 d Weather-strip, rear door trim, inner RH/LH
- ▲ 5 e Handle S/A, front door inside, RH/LH
- 6 f Speaker Ay, radio
- ▲ 7 g Cover, rear door service hole, RH
- 8 h Switch Ay, power window regulator

5-1-3 POINTS OF DISASSEMBLY

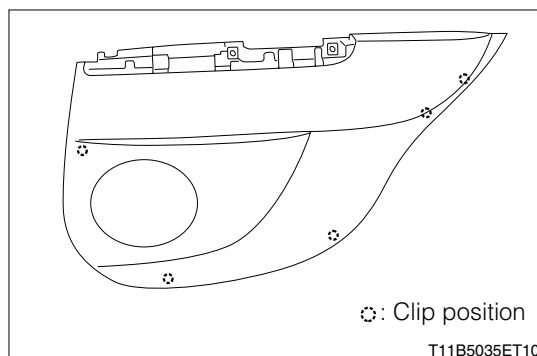
(1) Panel, rear door armrest base, upper RH/LH

1. Remove the screw (1 location).
2. Disengage the pawls to remove.



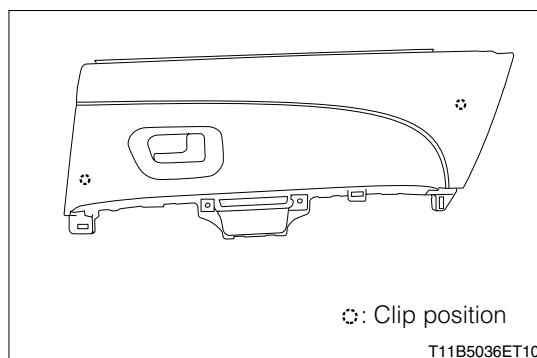
(2) Board Ay, rear door trim, lower RH/LH

1. Remove the screws (2 locations).
2. Disengage the pawls and clips to remove.



(3) Panel, rear door trim, upper RH/LH

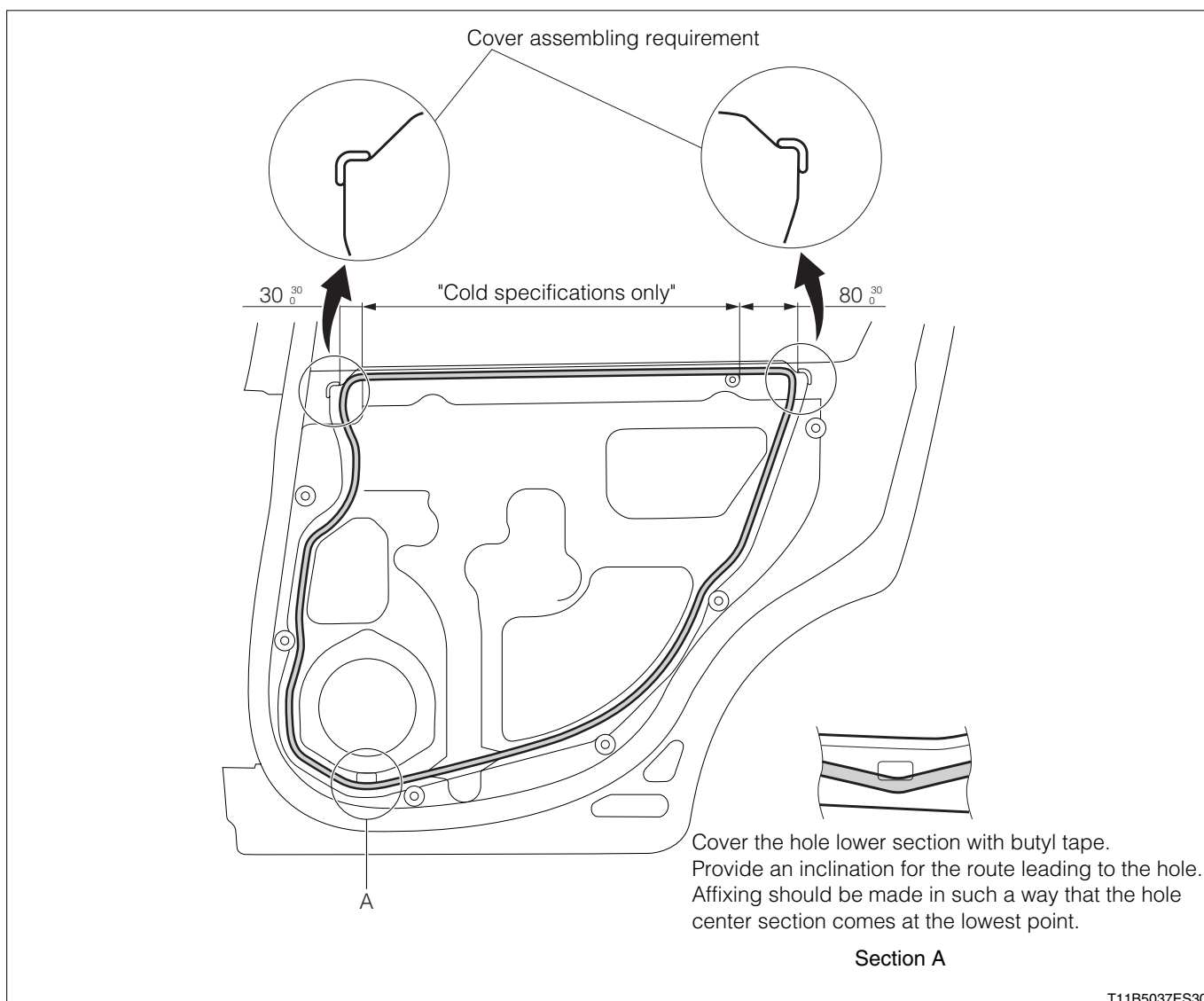
1. Disengage the clips.
2. Lift the panel Ay toward the upper side of the vehicle and remove.



5-1-4 POINTS OF ASSEMBLY

(1) Cover, rear door service hole, RH

1. Perform the assembling by referring to the main points given in the figure below.



T11B5037ES30

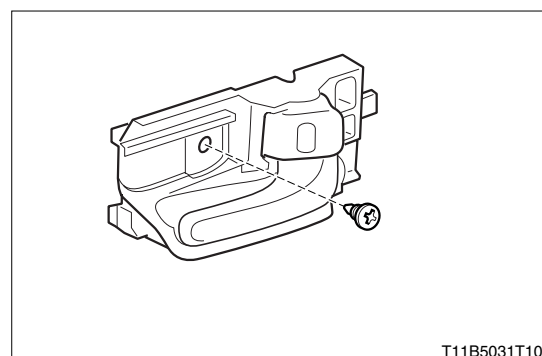
(2) Handle S/A, front door inside, RH/LH

CAUTION

- Be very careful not to break the threaded hole by tightening the screw with an excessive torque, for an ET screw has been employed.
- Do not use an impact driver when tightening the screw.
- If the threaded section should be broken, be sure to use an oversized ET screw(90041-67041-000).

NOTE

- ET screw: This is a screw by which a female screw is threaded as it is tightened, utilizing the shape at the tip end which has a self-drilling effect.



T11B5031T10

6 REAR DOOR(GLASS-RELATED)

6-1 DISASSEMBLING AND ASSEMBLING

6-1-1 ARTICLES TO BE PREPARED

Lubricant, adhesive, others

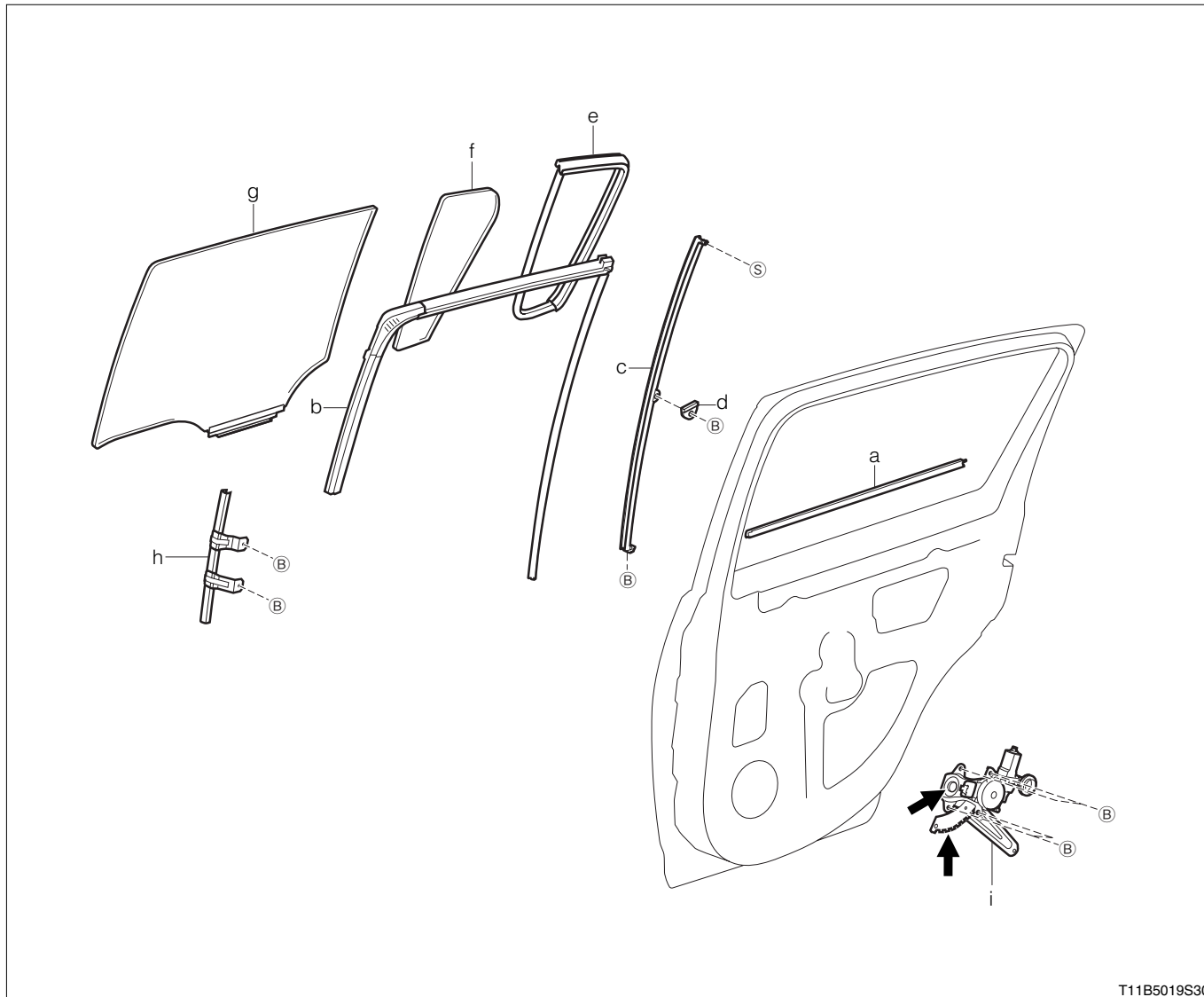
MP grease, Protective tape

6-1-2 OPERATION BEFORE DISASSEMBLY

1. Disconnect the battery negative (—) terminal.
 2. Remove the rear door service hole cover RH.
- Refer to Page I1-14.

6-1-3 DISASSEMBLY AND ASSEMBLY PROCEDURES

(1) Components



T11B5019S30

➡: MP grease

(2) Disassembling procedure

1	a	Weather-strip, rear door glass, outer RH/LH	6	f	Glass, rear door quarter window, RH/LH
2	b	Run, rear door glass, RH/LH	7	g	Glass S/A, rear door, RH/LH
3	c	Bar S/A, rear door window division, RH/LH	8	h	Guide S/A, rear door window, front RH/LH
4	d	Spacer, side window frame	9	i	Regulator Ay, rear door window, RH/LH
5	e	Weather-strip, rear door quarter window, RH/LH			

(3) Assembling procedure

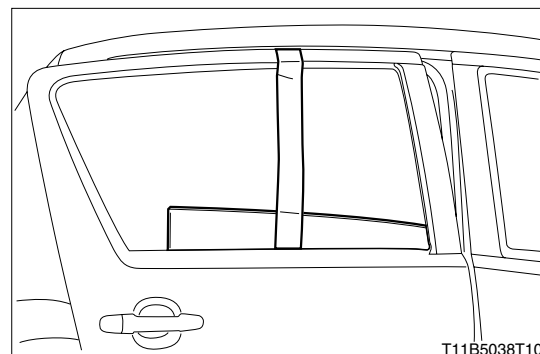
1	h	Guide S/A, rear door window, front RH/LH	▲ 6	c	Bar S/A, rear door window division, RH/LH
▲ 2	g	Glass S/A, rear door, RH/LH	▲ 7	i	Regulator Ay, rear door window, RH/LH
3	f	Glass, rear door quarter window, RH/LH	8	b	Run, rear door glass, RH/LH
4	e	Weather-strip, rear door quarter window, RH/LH	9	a	Weather-strip, rear door glass, outer RH/LH
5	d	Spacer, side window frame			

6-1-4 POINTS OF DISASSEMBLY**(1) Glass S/A, rear door, RH/LH**

1. Apply a protective tape to the door panel flange.
2. Move the glass S/A toward the back of the vehicle and remove it from the RH/LH rear door window regulator Ay.

6-1-5 POINTS OF ASSEMBLY**(1) Glass S/A, rear door, RH/LH**

1. Insert the glass S/A inside the door panel. Hang and hold it with a tape.

**(2) Bar S/A, rear door window division, RH/LH**

1. Place the bar S/A between the RH/LH rear door glass S/A and the RH/LH rear door quarter window weather-strip so that the RH/LH rear door glass S/A will fit in the groove of the bar S/A.

(3) Regulator Ay, rear door window, RH/LH

1. Insert the roller of the regulator Ay into the rail of the RH/LH rear door glass S/A.
2. Install the regulator Ay, while adjusting the height of the RH/LH rear door glass S/A.

6-1-6 OPERATION AFTER ASSEMBLY

1. Install the rear door service hole cover RH.
Refer to Page I1-14.

2. Connect the battery negative (—) terminal.

7 REAR DOOR(LOCK-RELATED)**7-1 DISASSEMBLING AND ASSEMBLING****7-1-1 ARTICLES TO BE PREPARED**

Tool

TORX® wrench T30

Lubricant, adhesive, others

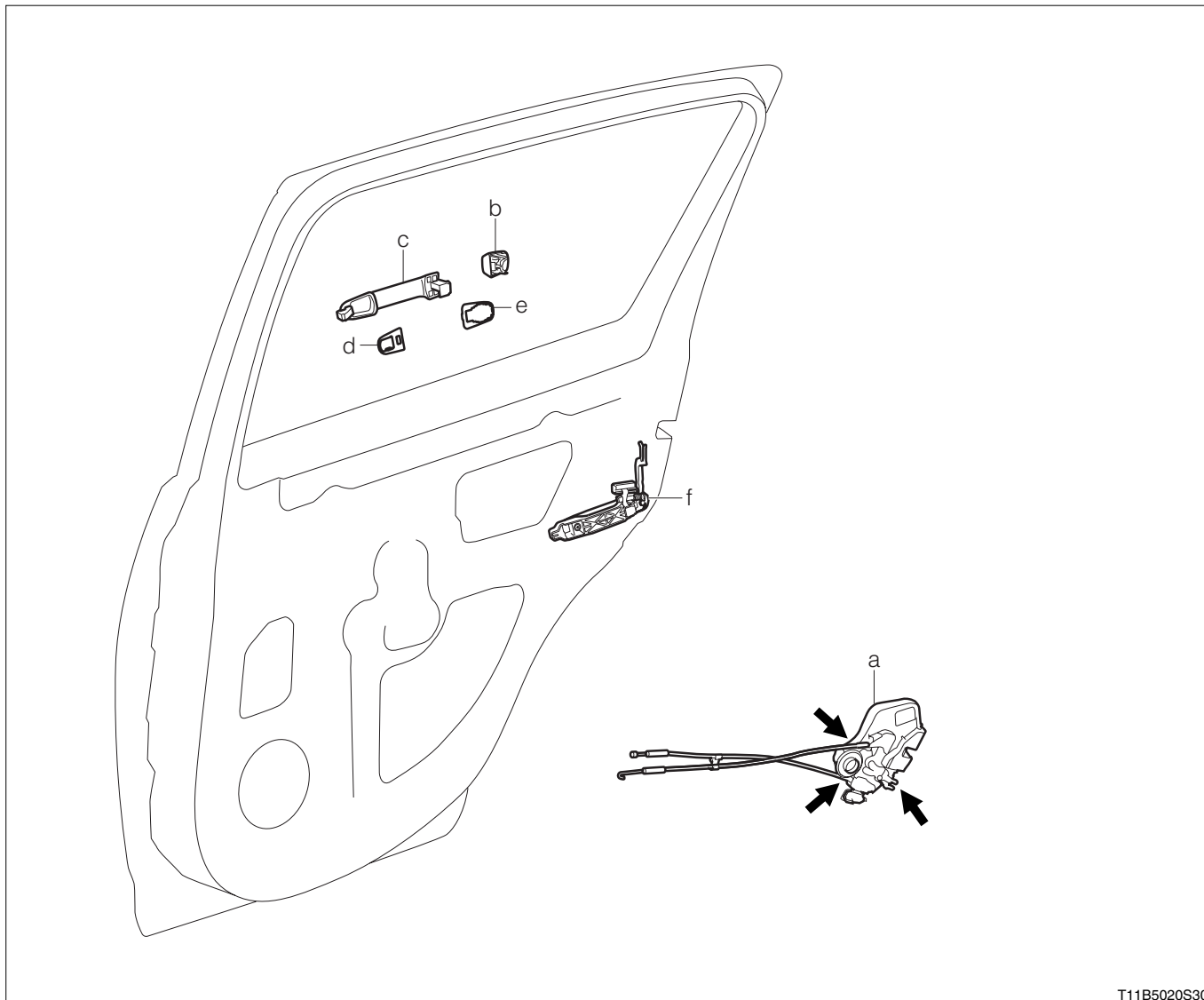
MP grease

7-1-2 OPERATION BEFORE DISASSEMBLY

1. Disconnect the battery negative (—) terminal.
2. Remove the rear door service hole cover RH.
Refer to Page I1-14.

7-1-3 DISASSEMBLY AND ASSEMBLY PROCEDURES

(1) Components



T11B5020S30

➡: MP grease

(2) Disassembling and assembling procedures

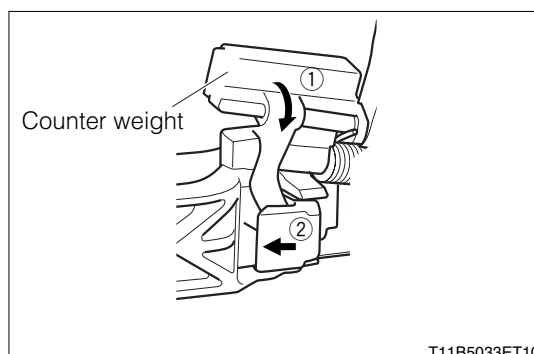
- 1 a Lock Ay, rear door w/motor, RH/LH
- 2 b Cover, rear door outside handle, RH
- ▲ 3 c Handle, front door, outside RH
- 4 d Pad, front door outside handle
- 5 e Pad, front door outside handle, LH

- 6 f Frame S/A, rear door outside handle, S/A

7-1-4 POINTS OF ASSEMBLY

(1) Handle, front door, outside RH

1. While pushing the counterweight of the RH/LH front door outside handle frame S/A, push the handle toward the front of the vehicle to assemble.



T11B5033ET10

7-1-5 OPERATION AFTER ASSEMBLY

1. Install the rear door service hole cover RH.
Refer to Page I1-14.

2. Connect the battery negative (–) terminal.

8 BACK DOOR

8-1 DISASSEMBLING AND ASSEMBLING

8-1-1 ARTICLES TO BE PREPARED

Tool

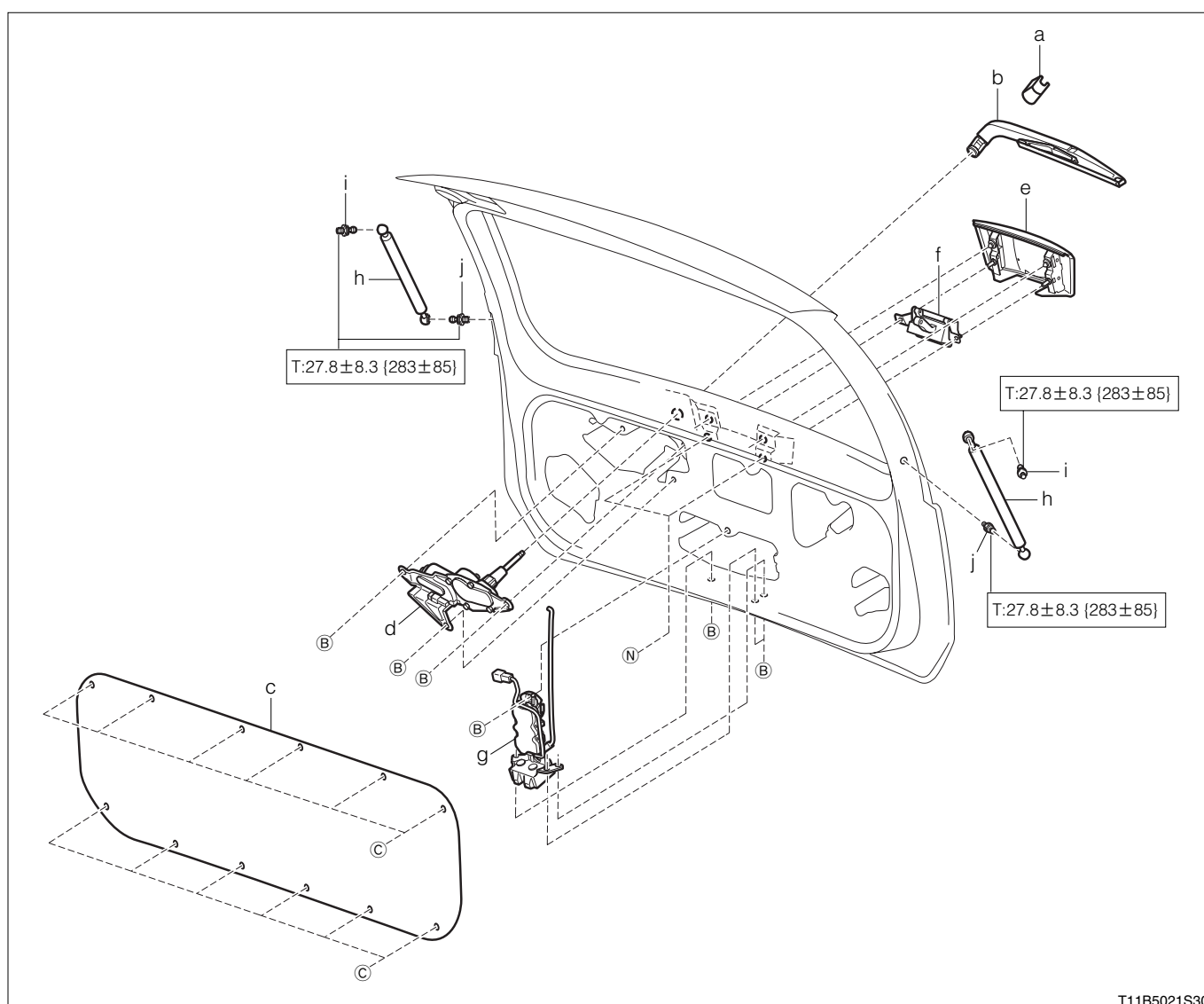
Clip remover

Instrument

Torque wrench

8-1-2 DISASSEMBLY AND ASSEMBLY PROCEDURES

(1) Components



T11B5021S30

Unit: N·m {kgf·cm}

(2) Disassembling and assembling procedures

- 1

a

Cap, wiper arm head
- ▲ 2

b

Arm & blade Ay, rear wiper
- 3

c

Panel Ay, back door trim
- ▲ 4

d

Motor Ay, rear wiper
- 5

e

Cover Ay, door outside handle
- 6

f

Handle S/A, back door outside
- 7

g

Lock Ay, back door
- 8

h

Stay Ay, back door
- 9

i

Stud, back door stay
- 10

j

Bolt, back door stay

8-1-3 POINTS OF ASSEMBLY

(1) Motor Ay, rear wiper
Refer to Page J2-12.

(2) Arm & blade Ay, rear wiper
Refer to Page J2-12.

9 FENDER
9-1 REMOVAL AND INSTALLATION
9-1-1 ARTICLES TO BE PREPARED

Tool
Cutter knife
Lubricant,adhesive,others
Protective tape

9-1-2 OPERATION BEFORE REMOVAL

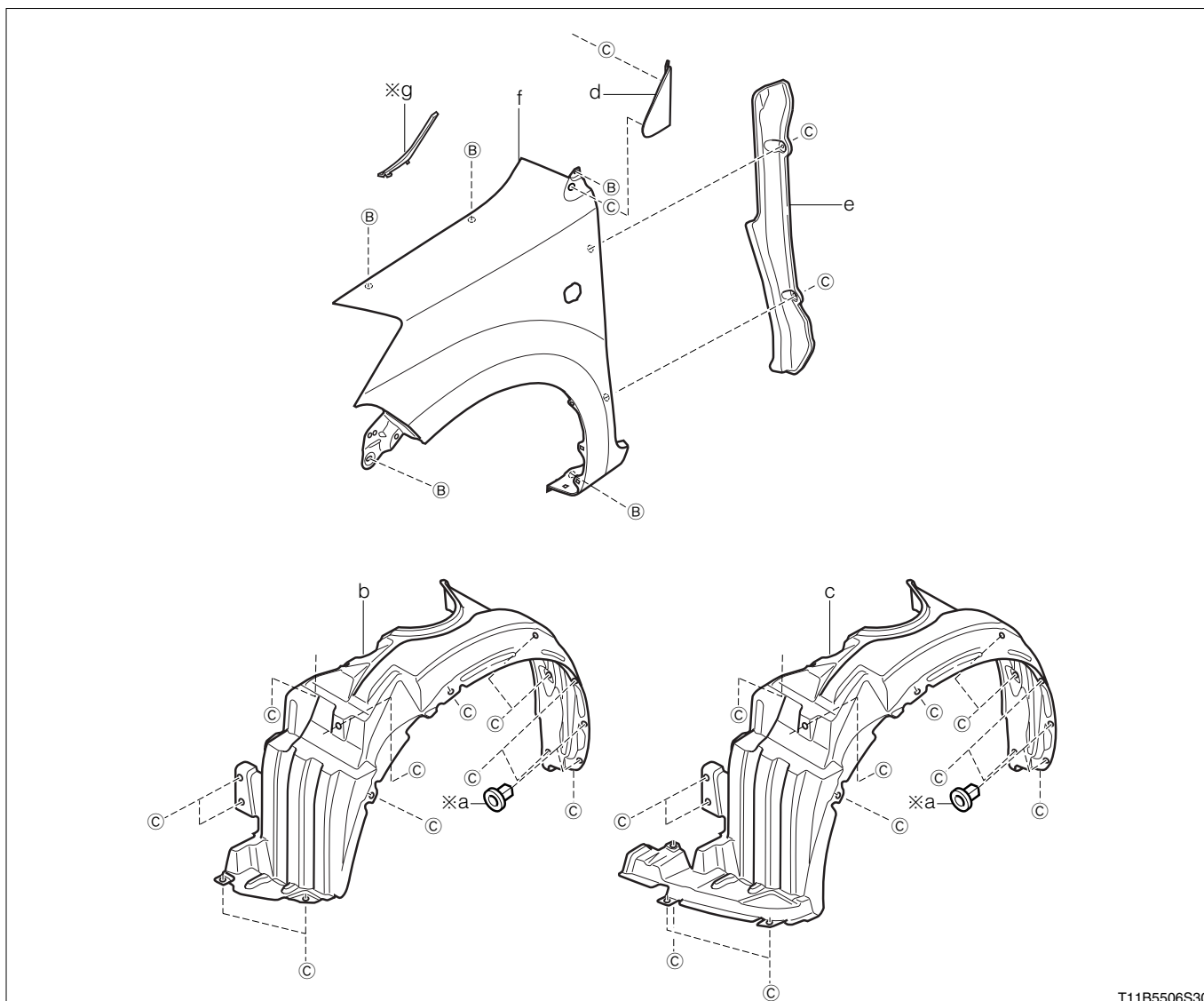
1. Remove the front bumper cover.

Refer to Page I2-1.
2. Remove the cowl top ventilator louver RH/LH.

Refer to Page I2-4.
3. Remove the side turn signal lamp Ay.

9-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



T11B5506S30

※:Non - reusable parts

(2) Removal and installation procedures

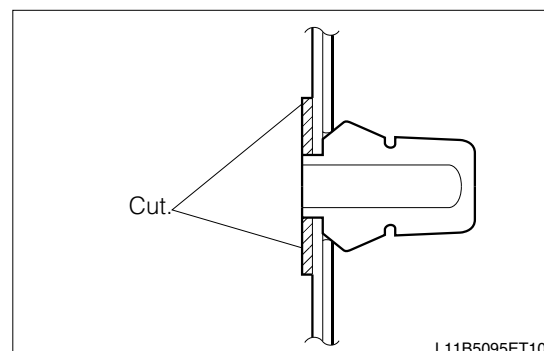
- ▼ 1 a Grommet, screw
- 2 b Liner, front fender, RH/LH (Standard-bumper equipped vehicle)
- 3 c Shield S/A, fender splash, front RH/LH (Aero-bumper equipped vehicle)
- ▼ 4 d Garnish, front pillar, lower RH/LH
- 5 e Protector, front fender side panel, RH/LH
- 6 f Panel, front fender, RH/LH
- 7 g Seal, front fender to cowl side, No.2 RH/LH

9-1-4 POINTS OF REMOVAL

(1) Grommet, screw

1. To remove the grommet, cut off the edge

TOOL: Cutter knife

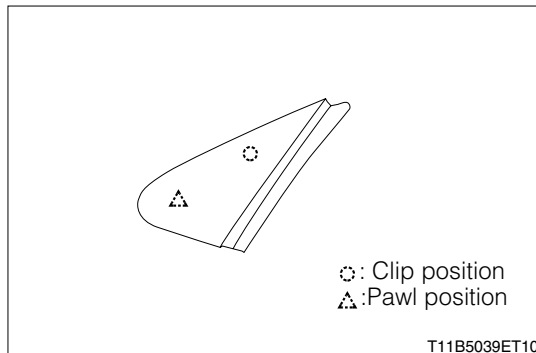


L11B5095ET10

I1-23

(2) Garnish, front pillar, Lower RH/LH

1. Apply a protective tape to the front fender panel RH/LH.
2. Disengage the pawls and clips to remove.



9-1-5 OPERATION AFTER INSTALLATION

1. Install the side turn signal lamp Ay.
2. Install the cowl top ventilator louver RH/LH.
Refer to Page I2-4.
3. Install the front bumper cover.
Refer to Page I2-1.

10 HOOD LOCK CONTROL CABLE

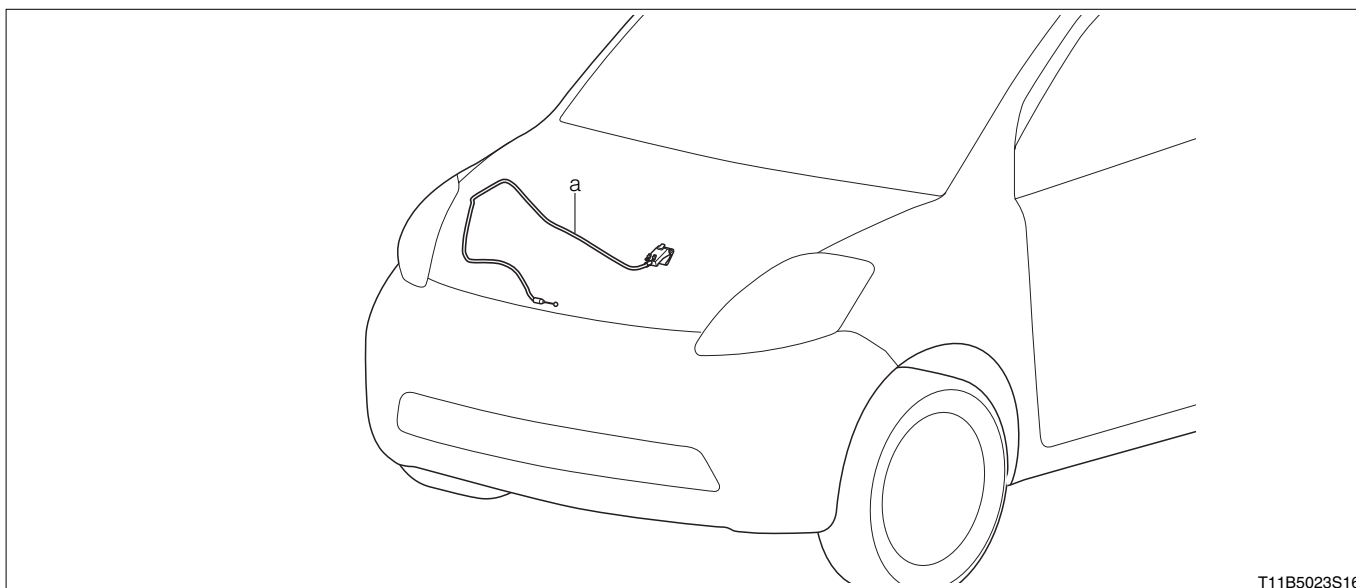
10-1 REMOVAL AND INSTALLATION(RHD VEHICLES)

10-1-1 OPERATION BEFORE REMOVAL

1. Remove the front bumper cover.
Refer to Page I2-1.
2. Remove the front fender liner RH.
Refer to Page I1-21.

10-1-2 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



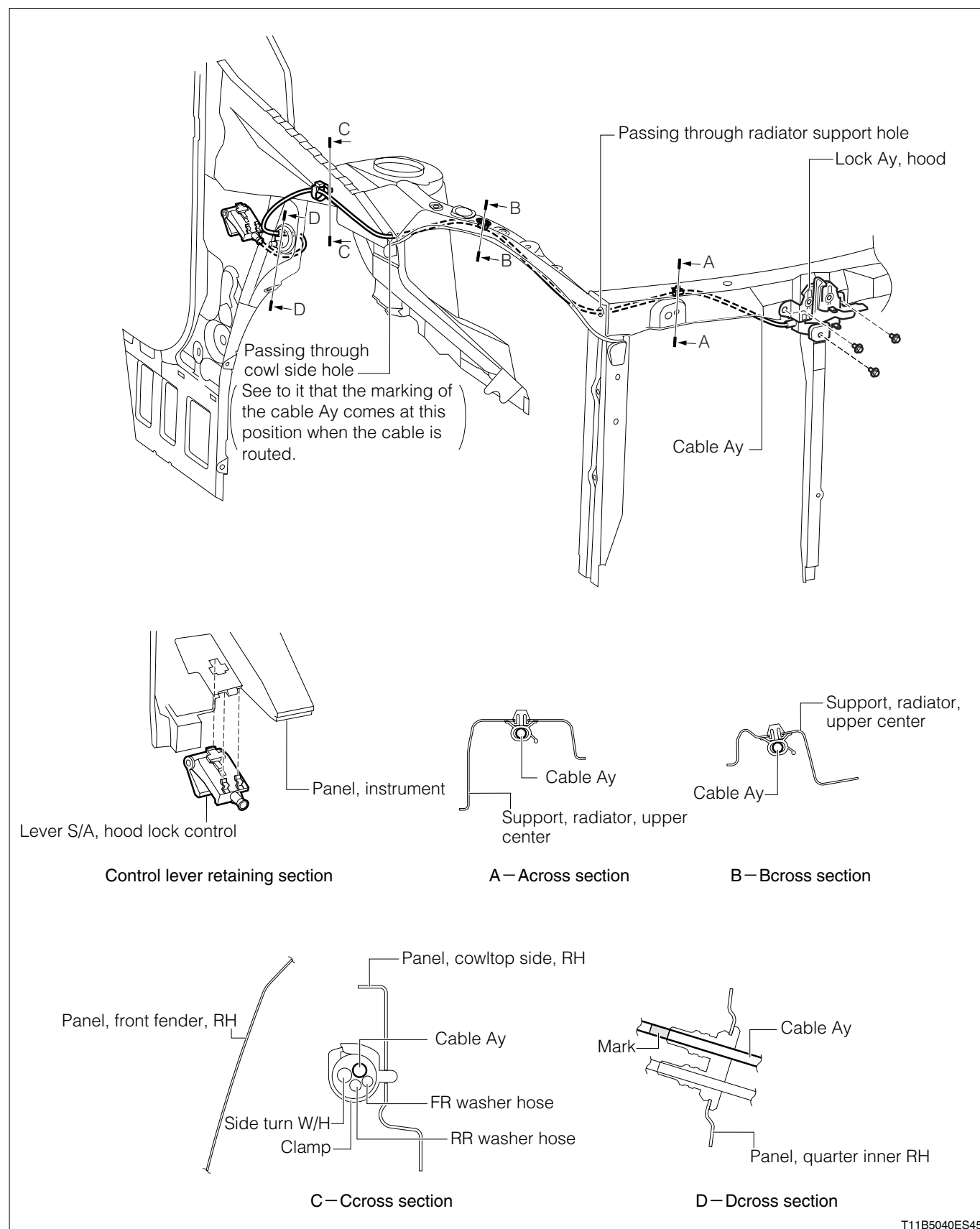
(2) Removal and installation procedures

- ▲ 1 a Cable Ay, hood lock control

10-1-3 POINTS OF INSTALLATION

(1) Cable Ay, hood lock control

1. Perform the installation by referring to the main points given in the figure below.



10-1-4 OPERATION AFTER INSTALLATION

1. Install the front fender liner RH.

Refer to Page I1-21.

2. Install the front bumper cover.

Refer to Page I2-1.

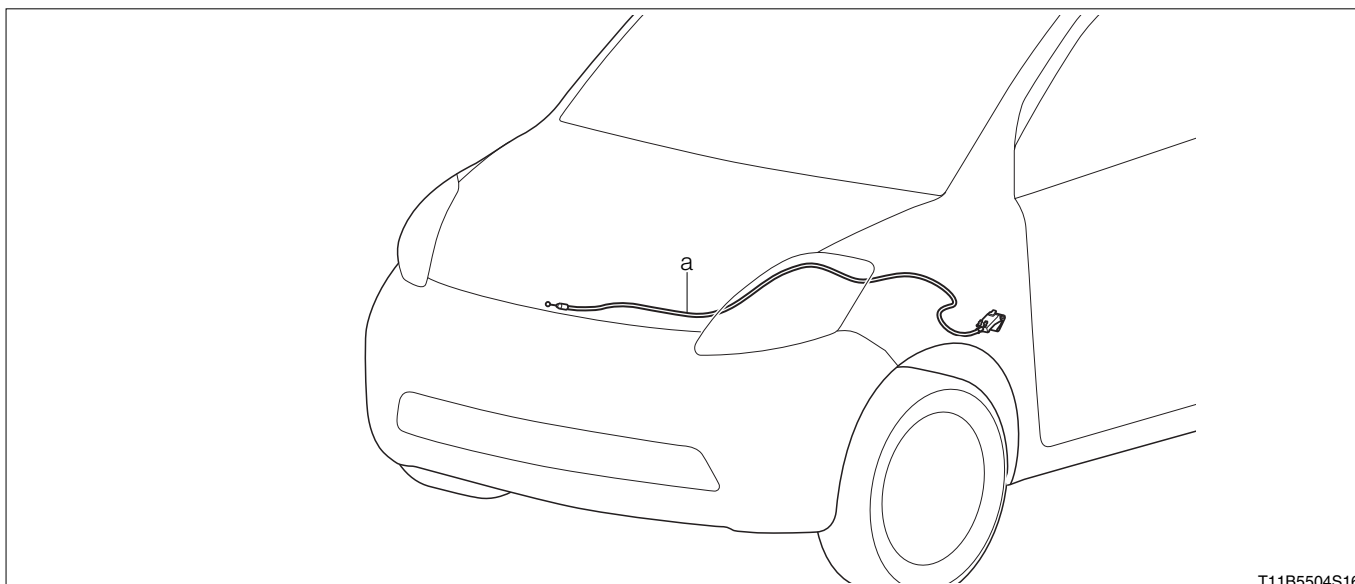
10-2 REMOVAL AND INSTALLATION(LHD VEHICLES)**10-2-1 OPERATION BEFORE REMOVAL**

1. Remove the cover front bumper cover.

Refer to Page I2-1.

2. Remove the front fender liner LH.

Refer to Page I1-21.

10-2-2 REMOVAL AND INSTALLATION PROCEDURES**(1) Components**

T11B5504S16

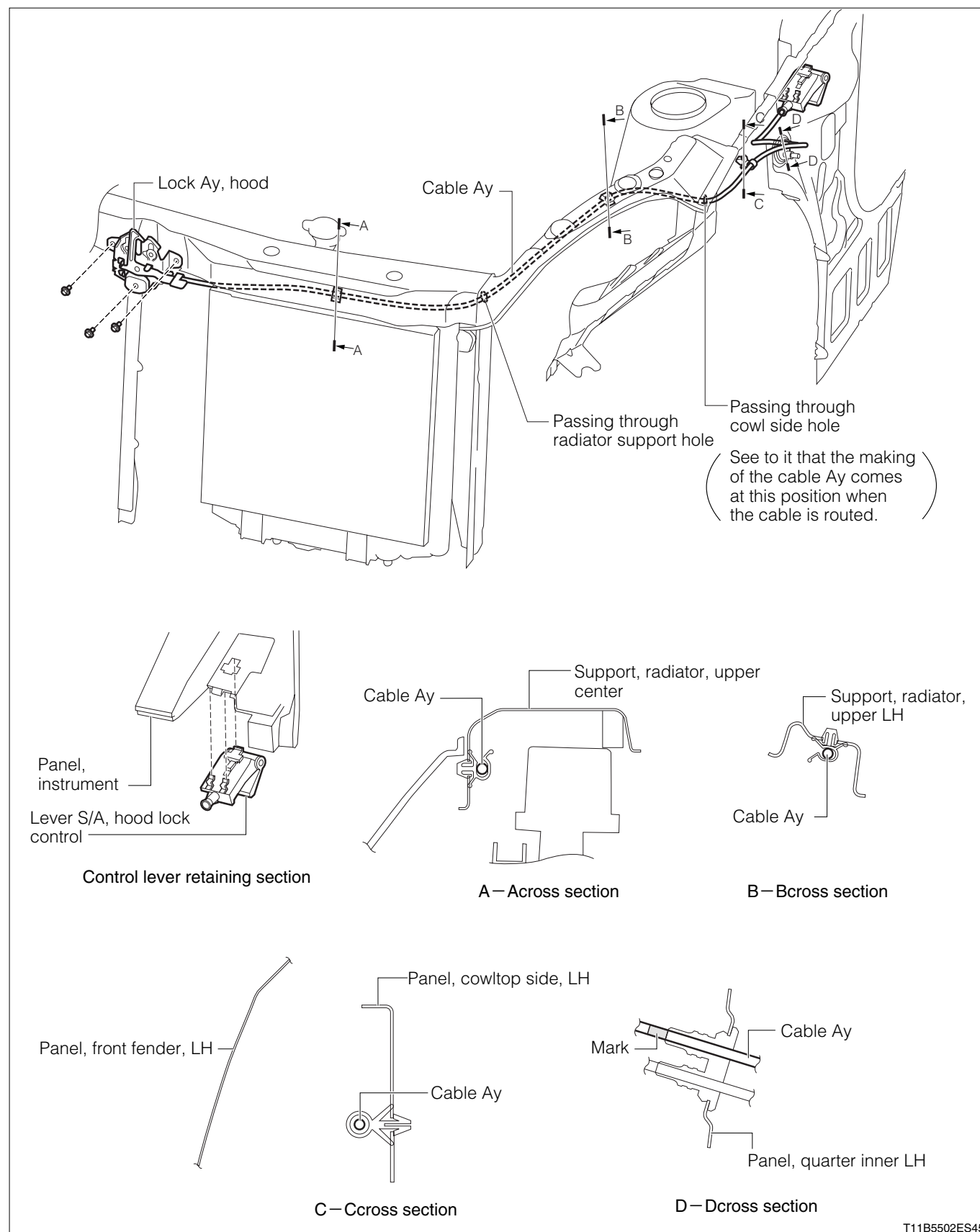
(2) Removal and installation procedures

- ▲ 1 a Cable Ay, hood lock control

10-2-3 POINTS OF INSTALLATION

(1) Cable Ay, hood lock control

1. Perform the installation by referring to the main points given in the figure below.



10-2-4 OPERATION AFTER INSTALLATION

1. Install the front fender liner LH.

Refer to Page I1-21.

2. Install the front bumper cover.

Refer to Page I2-1.

11 FUEL LID CONTROL CABLE**11-1 REMOVAL AND INSTALLATION(RHD VEHICLES)****11-1-1 OPERATION BEFORE REMOVAL**

1. Remove the front seat Ay RH/LH.

Refer to Page I2-24.

2. Remove the rear quarter trim panel Ay LH.

Refer to Page I2-39.

3. Remove the rear console box S/A.

Refer to Page I2-23.

4. Remove the front console box S/A.

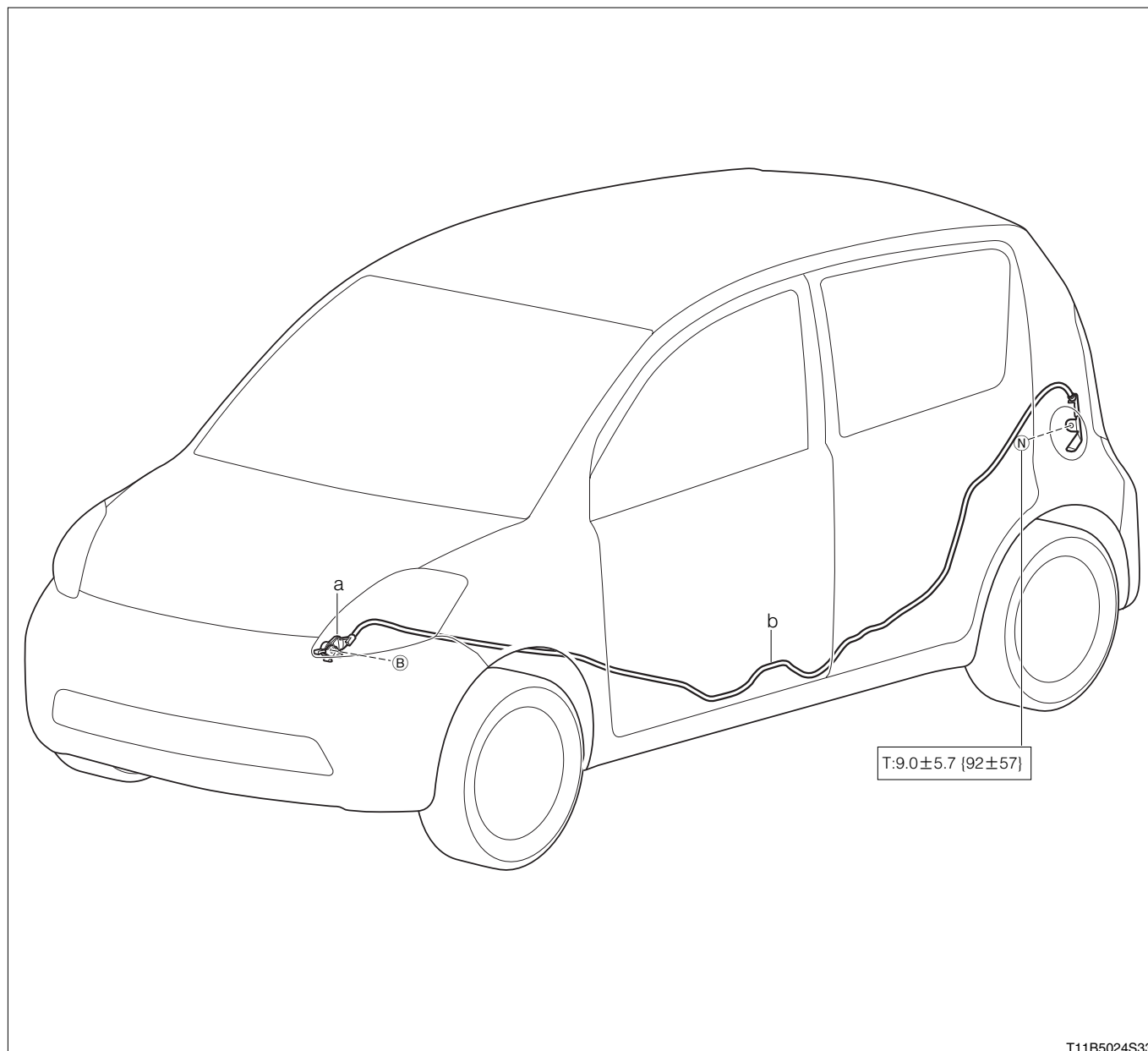
Refer to Page I2-23.

5. Remove the front floor carpet Ay (Driver's seat, front passenger's seat, left-rear seat).

Refer to Page I2-47.

11-1-2 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



T11B5024S33

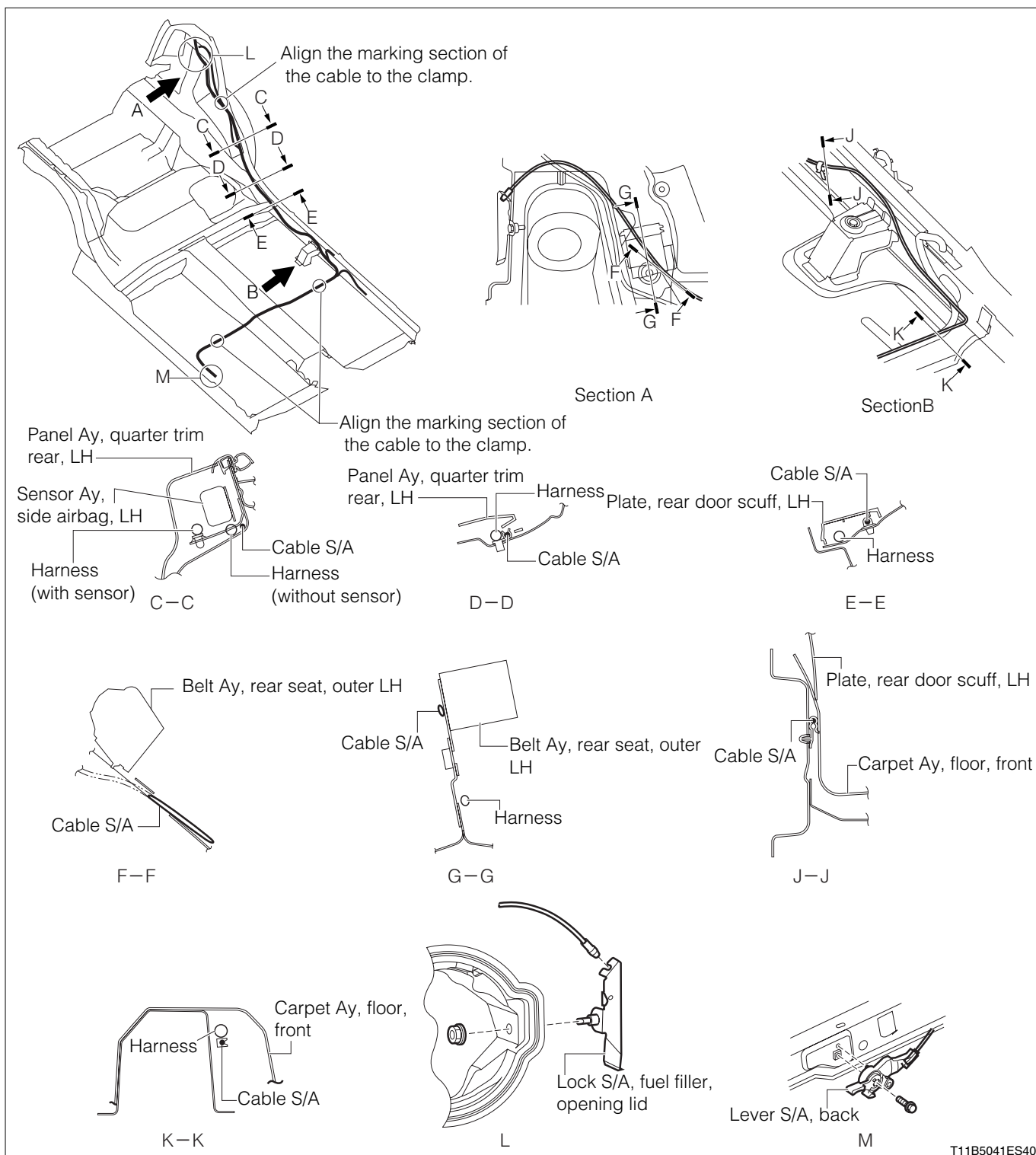
(2) Removal and installation procedures

- 1 a Lever S/A, back door lock open
- ▲ 2 b Cable S/A, fuel lid lock control

11-1-3 POINTS OF INSTALLATION

(1) Cable S/A, fuel lid lock control

1. Perform the installation by referring to the main points given in the figure below.



11-1-4 OPERATION AFTER INSTALLATION

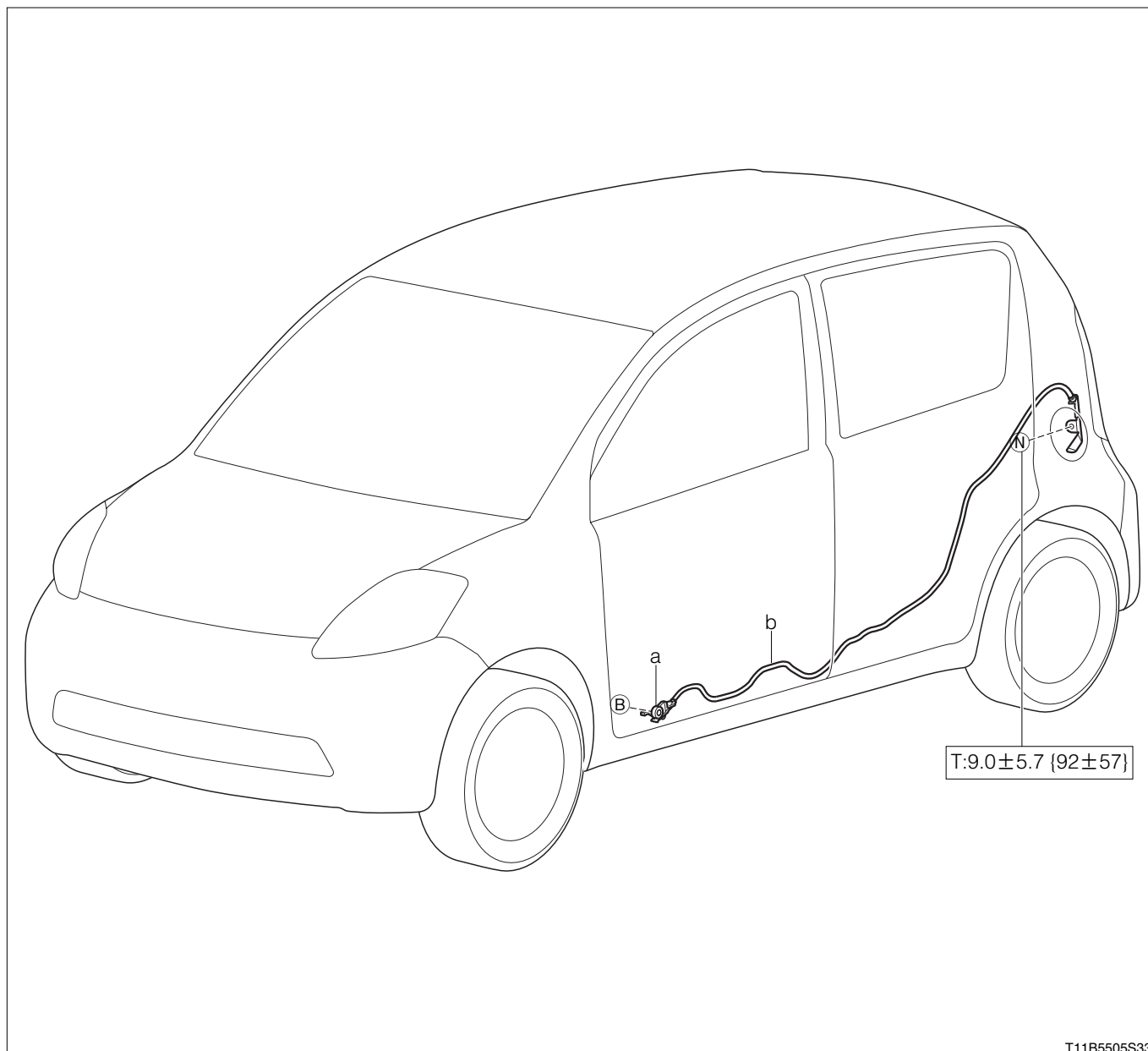
1. Install the front floor carpet Ay.
Refer to Page I2-47.
2. Install the front console box S/A.
Refer to Page I2-23.
3. Install the rear console box S/A.
Refer to Page I2-23.
4. Install the rear quarter trim panel Ay LH.
Refer to Page I2-39.
5. Install the front seat Ay RH/LH.
Refer to Page I2-24.

11-2 REMOVAL AND INSTALLATION(LHD VEHICLES)

1. Remove the front seat Ay LH.
Refer to Page I2-24.
2. Remove the rear quarter trim panel Ay LH.
Refer to Page I2-39.
3. Remove the front floor carpet Ay (Driver's seat, left-rear seat).
Refer to Page I2-47.

11-2-1 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



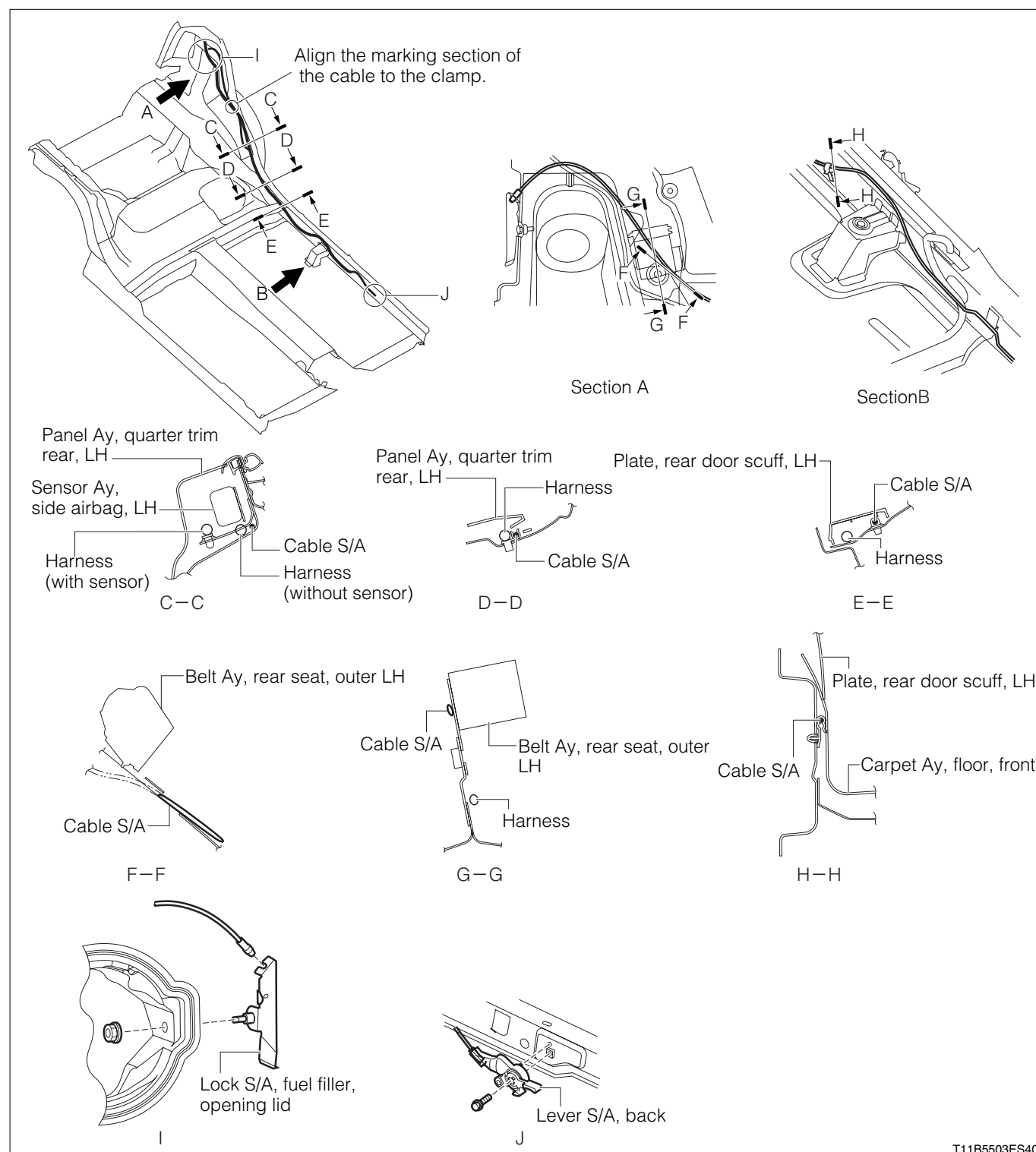
(2) Removal and installation procedures

- 1 a Lever S/A, back door lock open
- ▲ 2 b Cable S/A, fuel lid lock control

11-2-2 POINTS OF INSTALLATION

(1) Cable S/A, fuel lid lock control

1. Perform the installation by referring to the main points given in the figure below.



11-2-3 OPERATION AFTER INSTALLATION

1. Install the front floor carpet Ay.
Refer to Page I2-47.
2. Install the rear quarter trim panel Ay LH.
Refer to Page I2-39.
3. Install the front seat Ay LH.
Refer to Page I2-24.

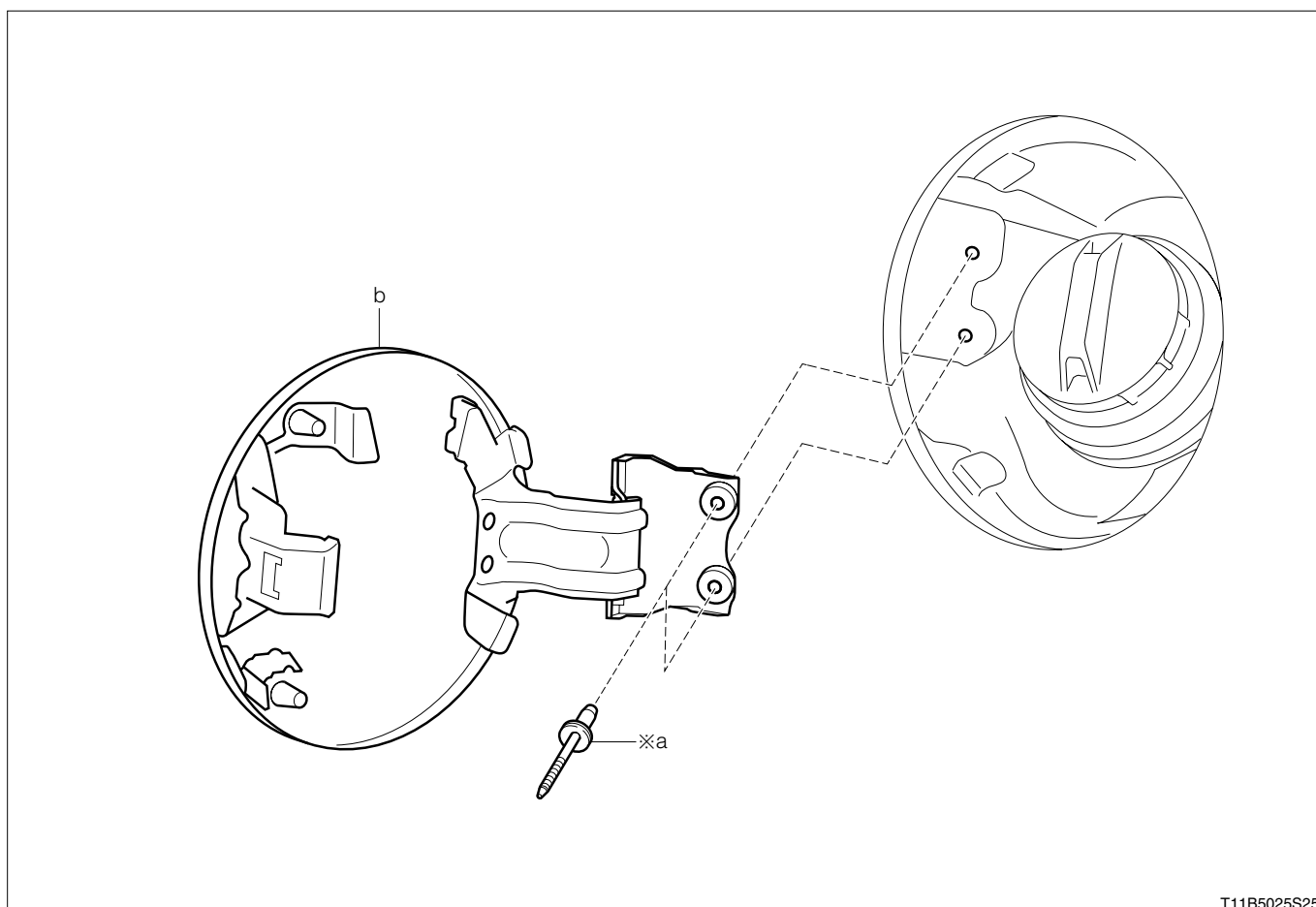
12 FUEL FILLER OPENING LID**12-1 REMOVAL AND INSTALLATION****12-1-1 ARTICLES TO BE PREPARED**

Tool

Hand riveter, Drill

12-1-2 OPERATION BEFORE REMOVAL

1. Remove the rear quarter trim panel Ay LH.
Refer to Page I2-39.

12-1-3 REMOVAL AND INSTALLATION PROCEDURES**(1) Components**

T11B5025S25

※:Non - reusable parts

(2) Removal and installation procedures

- 1 a Rivet
▼ ▲ 2 b Lid Ay, fuel filler opening.

12-1-4 POINTS OF REMOVAL

(1) Lid Ay, fuel filler opening

- Secure the rivet with a tape, butyl tape, etc. from the inside of the vehicle so that the removed rivet may not fall down to the locker section.

CAUTION

- When the head section of the rivet is removed, be sure to secure it so that the rivet may not fall down to the locker section.

- Apply a protective tape or cloth to prevent the lid Ay from being damaged.

- Lightly apply a drill to the rivet vertically. Then, grind the flange section of the rivet, using the drill.

WARNING

- Wear safety glasses to protect your eyes from iron powder or the like during the operation.

CAUTION

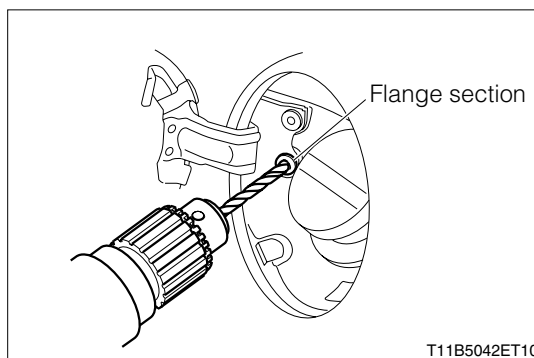
- Be careful not to damage the lid Ay area.

TOOL: Drill

- After the flange section of the rivet has been removed, stop the drilling operation. Then, remove the remaining fragments of the rivet, using pliers or the like.

WARNING

- The rivet is very hot, when removed.



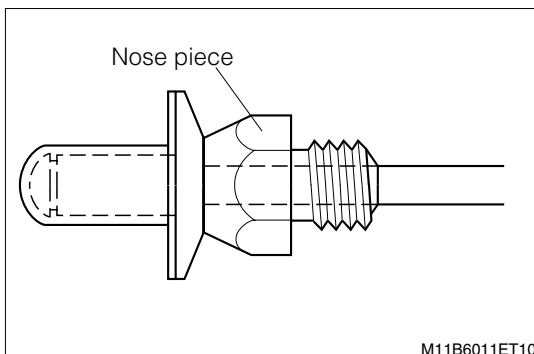
12-1-5 POINTS OF INSTALLATION

(1) Lid Ay, fuel filler opening

- Select a nose piece with the minimum diameter for which the mandrel of the rivet can be inserted.

CAUTION

- Any wrong selection of the nose piece will cause improper rivet tightening and malfunctions of riveter.



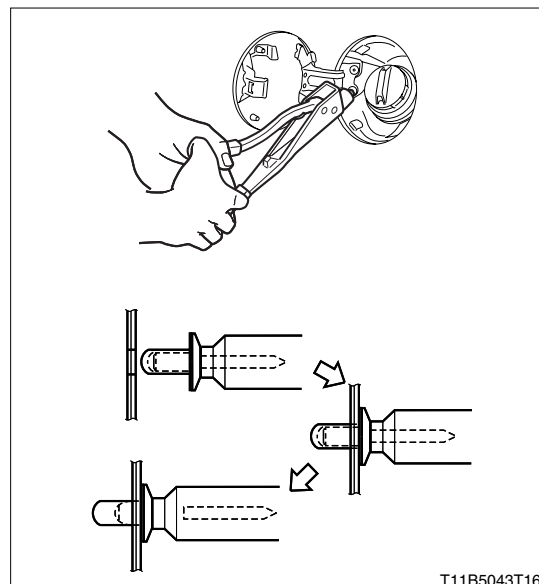
2. Mount the nose piece to the hand riveter and insert the mandrel section of the rivet into the nose piece.

NOTE

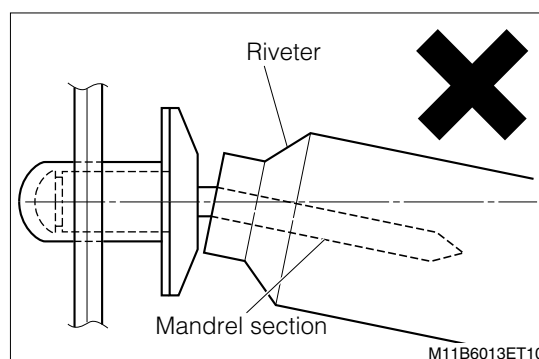
- Part number of rivet:90042-69027-000

3. With the rivet applied strongly and vertically to the installation hole, operate the hand riveter to install the rivet.

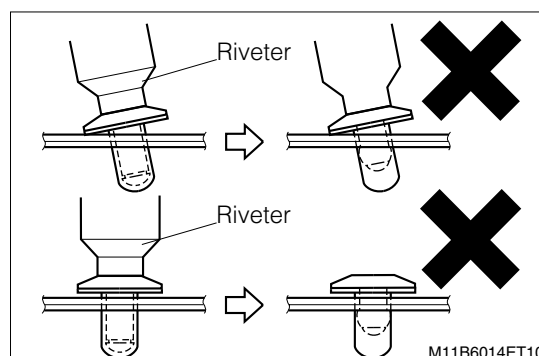
TOOL: Hand riveter

**CAUTION**

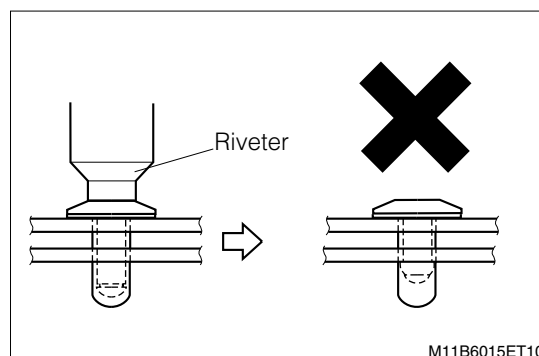
- Be careful not to damage the lid Ay area.
- In cases where the rivet has not been tightened by one riveter operation (the mandrel has not been cut), repeat the operation again.
- If the operation is performed by prying during the hand riveter operation, the mandrel section of the rivet will be bent, leading to improper rivet tightening and malfunctions of the hand riveter.

**CAUTION**

- If the hand riveter is operated with the rivet tilted or floating, it will lead to improper rivet tightening.

**CAUTION**

- If the rivet is installed without press-fitting the installation parts, it will lead to improper rivet tightening.

**12-1-6 OPERATION AFTER INSTALLATION**

1. Install the rear quarter trim panel Ay LH.

Refer to Page I2-39.

I2 EXTERIOR/INTERIOR

EXTERIOR/INTERIOR-----	I2-1
BASIC CHECK AND ADJUSTMENT ----	I2-1
BUMPER -----	I2-1
REMOVAL AND INSTALLA- TION(STANDARD-BUMPER EQUIPPED VEHICLE) -----	I2-1
REAR BUMPER-----	I2-2
REMOVAL AND INSTALLATION-----	I2-2
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I2-1

1 EXTERIOR/INTERIOR

1-1 BASIC CHECK AND ADJUSTMENT

1-1-1 SEATBELT DAMAGE CHECK

1. Visually check the seatbelt for damage.

SPECIFIED VALUE: There should be no defect.

2. Operate the buckle to see if there is any problem in engagement

SPECIFIED VALUE: There should be no defect.

2 BUMPER

2-1 REMOVAL AND INSTALLATION(STANDARD-BUMPER EQUIPPED VEHICLE)

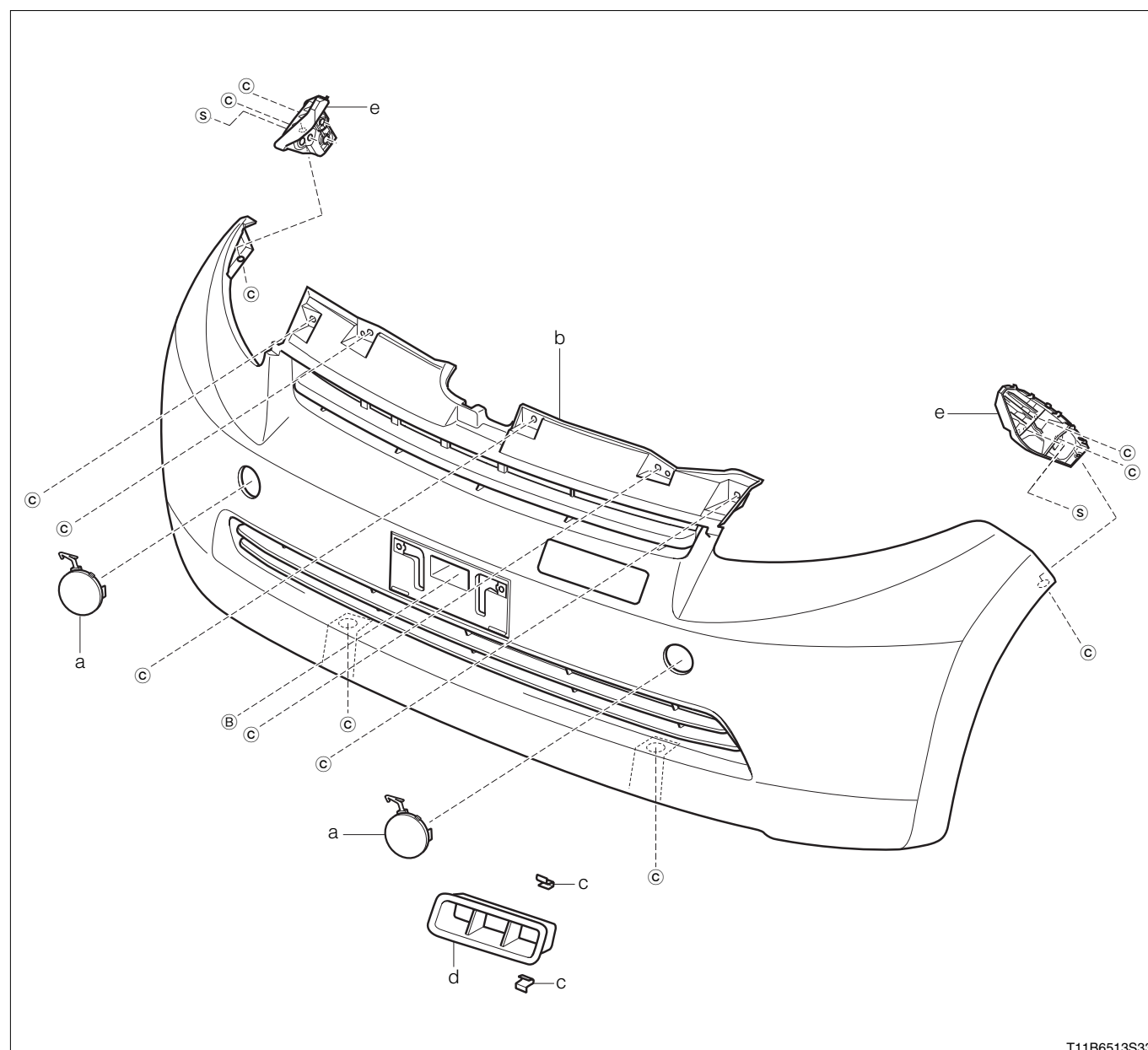
2-1-1 ARTICLES TO BE PREPARED

Tool

Clip remover

2-1-2 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



T11B6513S33

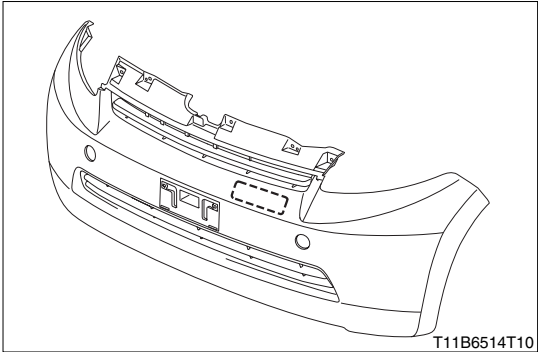
(2) Removal and installation procedures

- 1 a Cover, front bumper hole, RH/LH
- 2 b Cover, front bumper
- 3 c Clip (not equipped for some specifications)
- ▲ 4 d Garnish, front bumper (not equipped for some specifications)
- 5 e Support, front bumper side, RH/LH

2-1-3 POINTS OF INSTALLATION

(1) Cover, front bumper

1. When replacing the cover with a new one, cut the cover at the scribing line shown at the back of the cover.



3 REAR BUMPER

3-1 REMOVAL AND INSTALLATION

3-1-1 ARTICLES TO BE PREPARED

Tool

Shape	Part No.	Part name	Use
	KTC BT3-T40L or equivalent	Long TORX® wrench T40	
Clip remover			

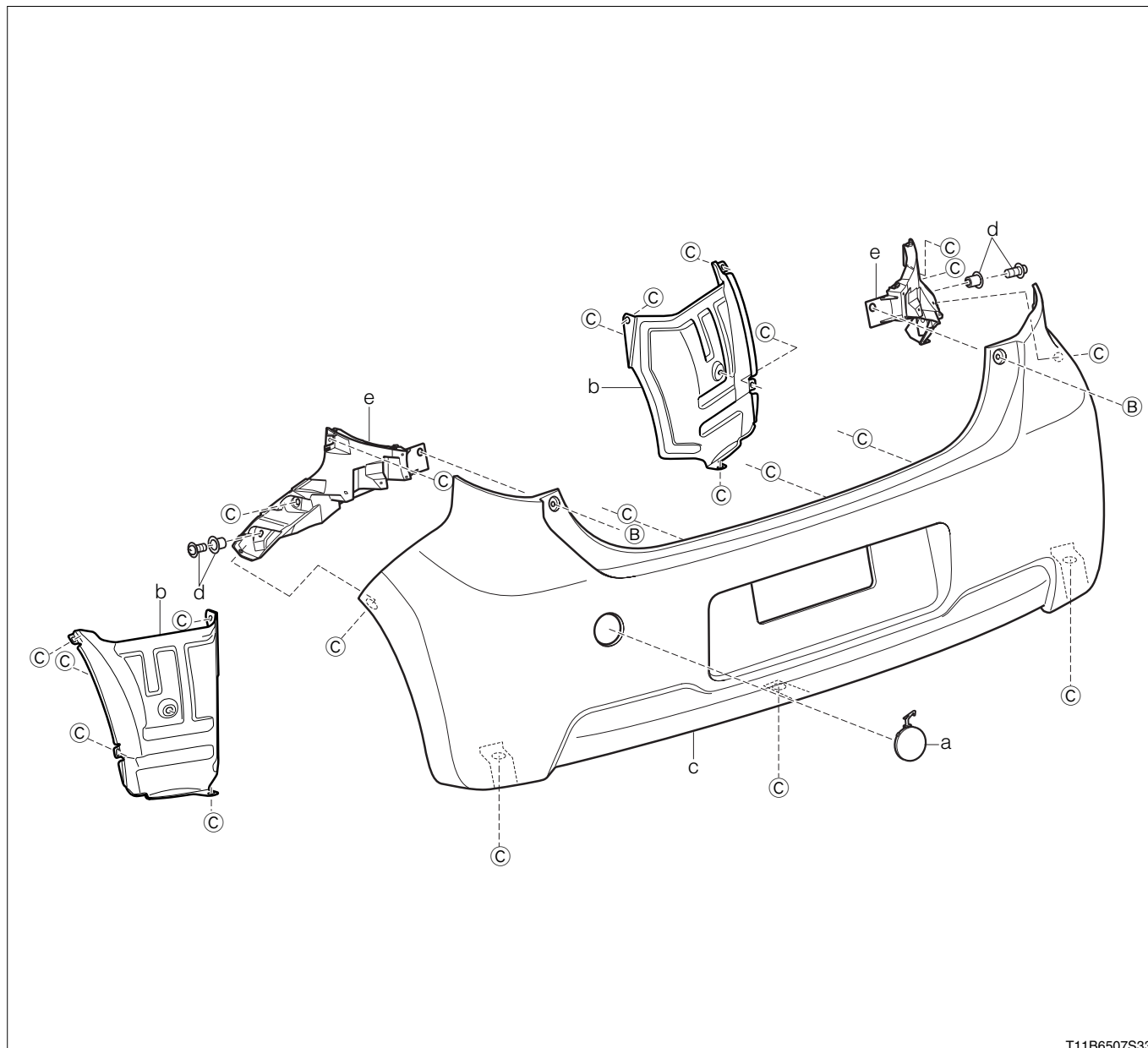
3-1-2 OPERATION BEFORE REMOVAL

1. Remove the license plate lamp Ay.
Refer to Page J1-9.

I2-3

3-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



T11B6507S33

(2) Removal and installation procedures

- 1 a Cover, rear bumper, upper LH
- 2 b Liner, rear wheel house, RH/LH
- ▼ 3 c Cover, rear bumper
- 4 d Retainer, front bumper, upper
- 5 e Support, rear bumper side, RH/LH

3-1-4 POINTS OF REMOVAL

(1) Cover, rear bumper

1. Remove the clips (8 pcs) and the bolts (2 pcs).

TOOL: KTC

BT3-T40L

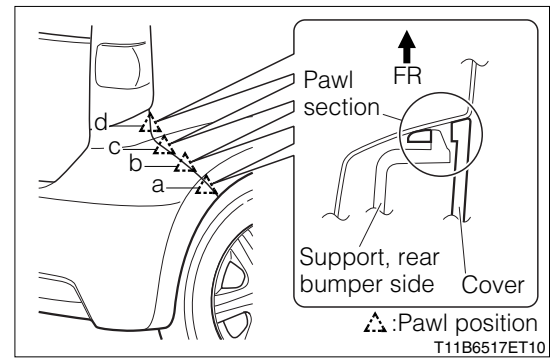
or equivalent

Long TORX® wrench T40

2. Remove the pawls of the bumper side support in the order of a→b→c→d.

NOTE

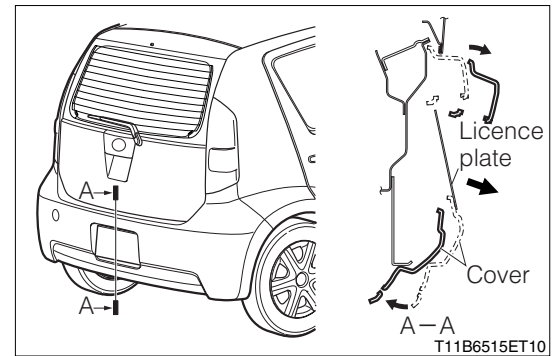
- Draw the cover to the outer side of the vehicle and disengage the pawls.



3. Turn the lower end of the cover to the front of the vehicle; the upper end to the rear of the vehicle. Pass the license plate through the service hole for the cover removal/installation use. Move the cover downward to remove.

CAUTION

- Be careful not to allow the cover to interfere with the rear end of the exhaust pipe.



3-1-5 OPERATION AFTER INSTALLATION

1. Install the license plate lamp Ay.
Refer to Page J1-9.

4 COWL TOP VENTILATOR LOUVER

4-1 REMOVAL AND INSTALLATION

4-1-1 ARTICLES TO BE PREPARED

Tool

Clip remover

Lubricant, adhesive, others

Primer for molding (equivalent to 3M K-500)

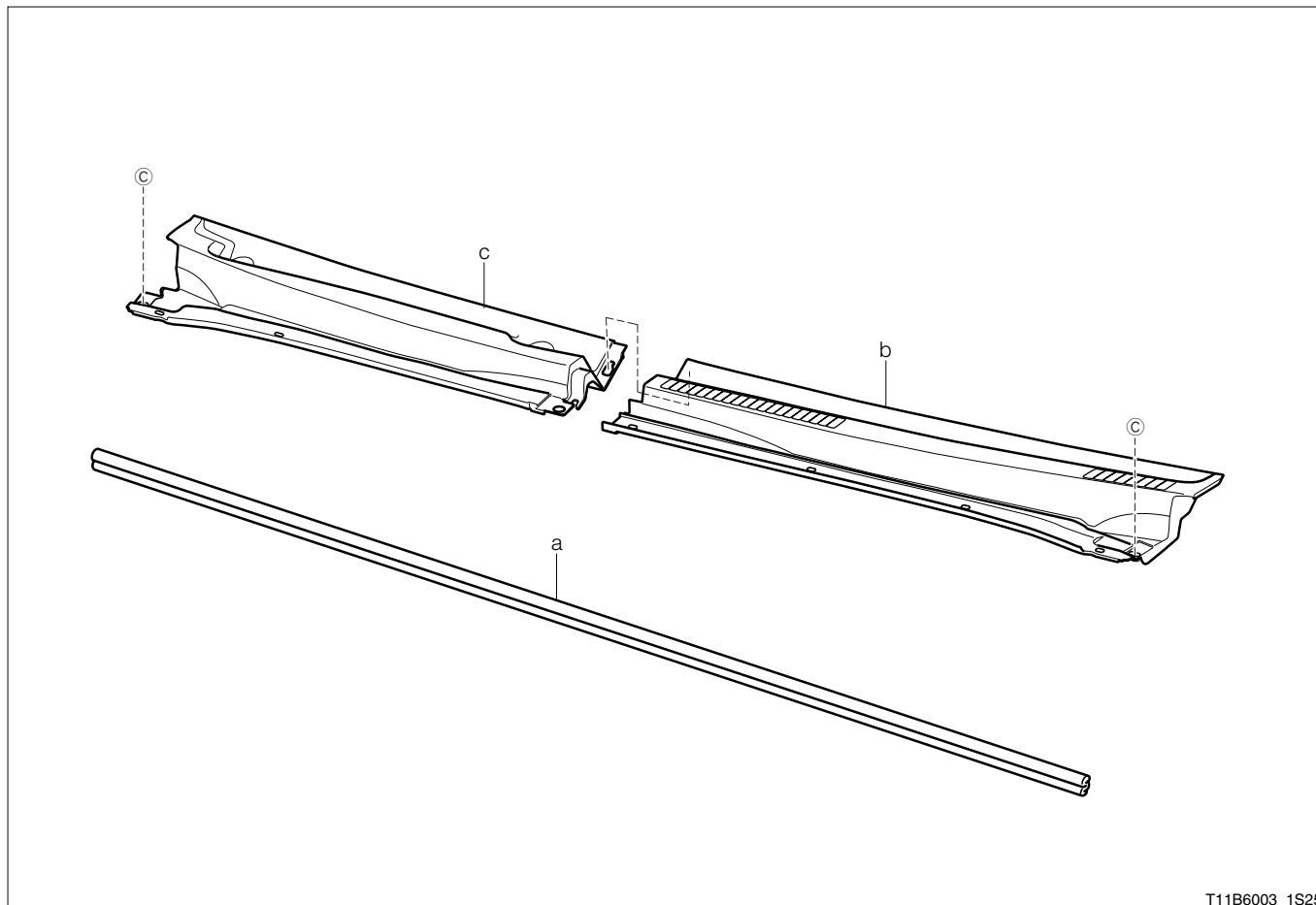
4-1-2 OPERATION BEFORE REMOVAL

1. Remove the front wiper arm RH/LH.
Refer to Page J2-9.

I2-5

4-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



T11B6003_1S25

(2) Removal and installation procedures

- ▼ ▲ 1 a Seal, hood to cowl top
- 2 b Louver, cowl top ventilator, LH
- ▼ ▲ 3 c Louver, cowl top ventilator, RH

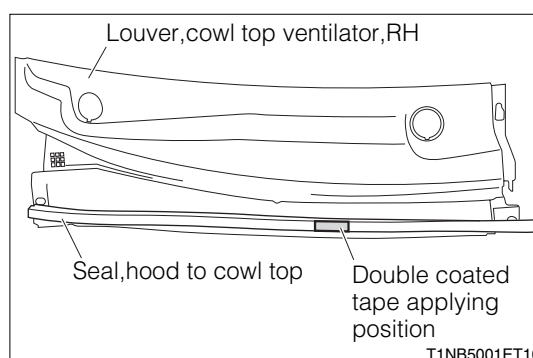
4-1-4 POINTS OF REMOVAL

(1) Hood to cowl top seal, RH cowl top ventilator louver

1. When removing the seal and the louver from the vehicle, remove them while the seal is mounted to the louver.

CAUTION

- When the seal is removed from the louver, the seal surface will be broken where the double-coated tape is attached.



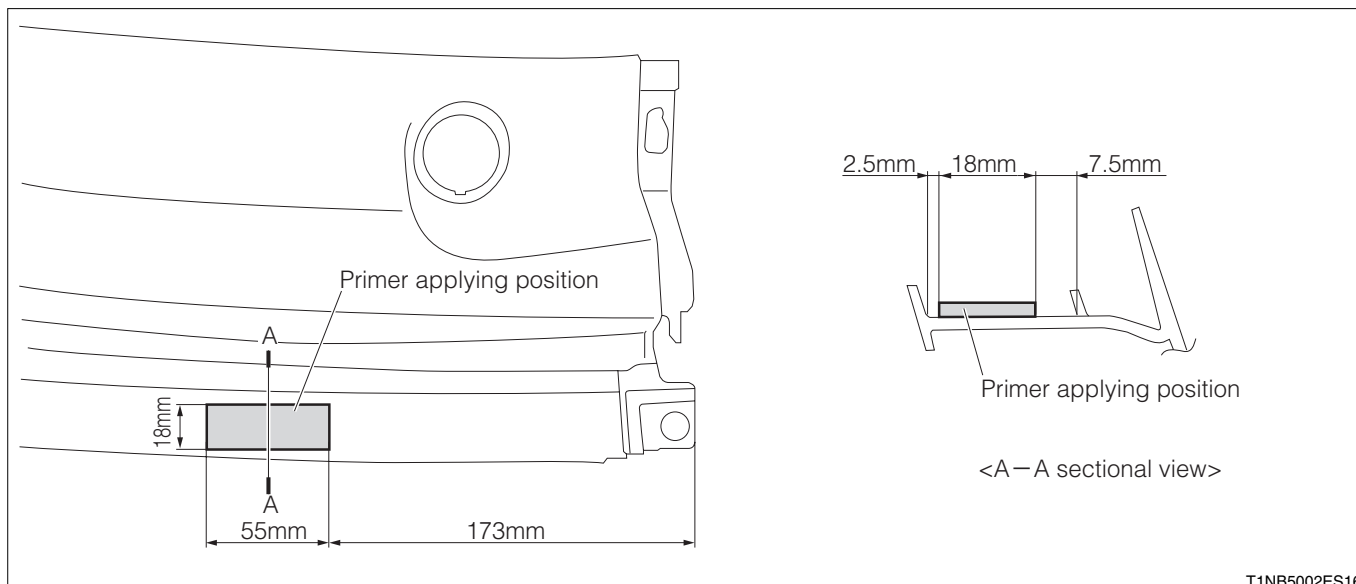
T1NB5001ET10

4-1-5 POINTS OF INSTALLATION

(1) Hood to cowl top seal, RH cowl top ventilator louver

① When the RH louver is reused

1. After removing the seal from the louver, remove any remaining double-coated tape and primer on the louver.
2. Apply primer to the louver.



T1NB5002ES16

NOTE

- When applying the primer, follow the instruction of the primer instruction manual, etc.

LUBRICANT: Primer for molding (equivalent to 3M K-500)

3. After installing the louver to the vehicle, attach the seal clips onto the louver, except for the double-coated tape, to temporarily attach the seal.
4. Peel-off the affixed paper of the double-coated tape and apply the double-coated tape to the louver.

② When the new RH louver is used

1. Install the louver to the vehicle.

NOTE

- There is no need to apply the primer, as the primer has been coated to the replacement parts.

2. Attach the seal clips onto the louver, except for the double-coated tape, to temporarily attach the seal.
3. Peel-off the affixed paper of the double-coated tape and apply the double-coated tape to the louver.

4-1-6 OPERATION AFTER INSTALLATION

1. Install the front wiper arm RH/LH.

Refer to Page J2-9.

5 ROOF MOLDING

5-1 REMOVAL AND INSTALLATION

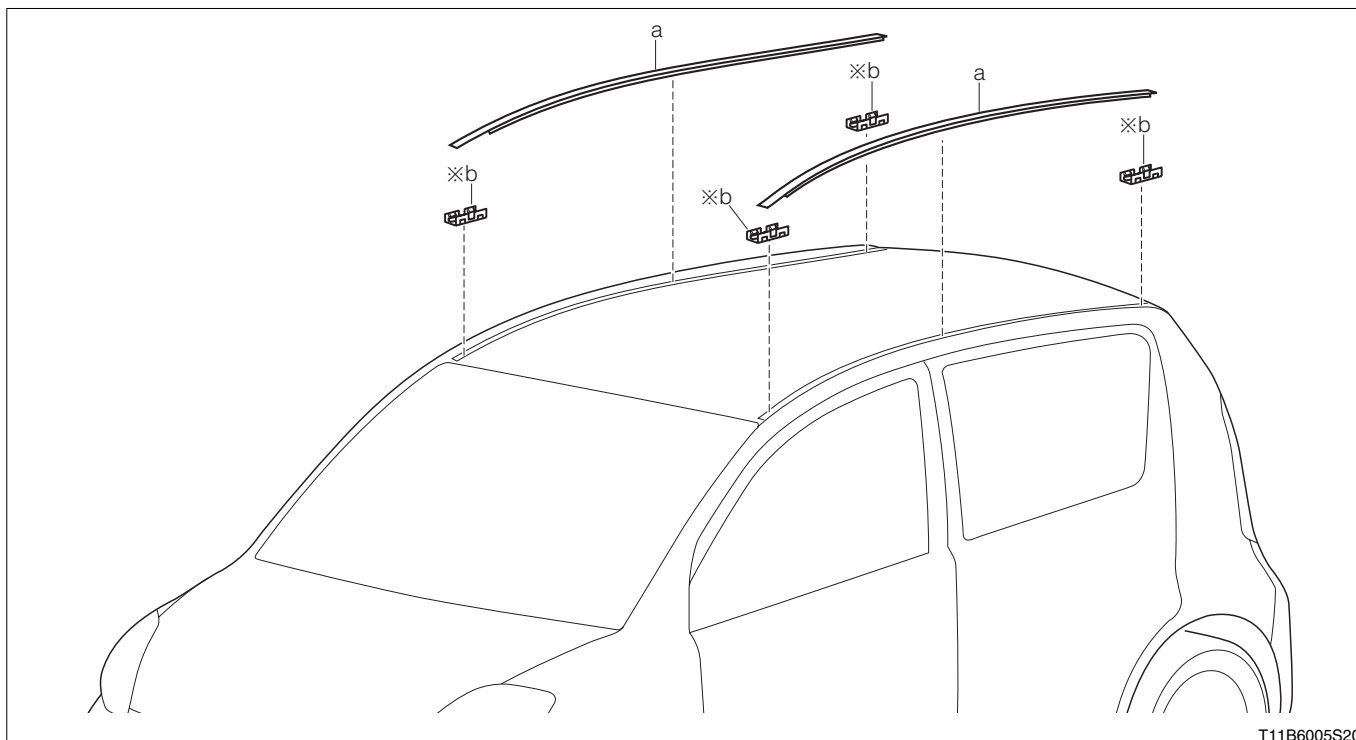
5-1-1 ARTICLES TO BE PREPARED

Lubricant, adhesive, others

Alcohol or white gasoline, Cemedine EP001 or equivalent

5-1-2 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



T11B6005S20

※:Non - reusable parts

(2) Removal and installation procedures

- ▼ 1 a Moulding, roof drip side, RH
- ▼ ▲ 2 b Clip, roof drip side finish moulding

5-1-3 POINTS OF REMOVAL

(1) Moulding, roof drip side, RH

1. Disengage the fitting of the roof drip side finish moulding clip, and remove the moulding.

(2) Clip, roof drip side finish moulding

1. Remove using tools such as a flat screw driver.

CAUTION

- Do not damage the body.

NOTE

- If the tape is hard and difficult to remove, heat up the tape (needs to be lower than 80℃) to soften it for easy removal.

2. Remove the remaining tape without damaging the body.

5-1-4 POINTS OF INSTALLATION

(1) Clip, roof drip side finish moulding

1. Clean up the sealed side.

LUBRICANT: Alcohol or white gasoline

2. Put adhesive material and hardener at the ratio of 1 to 1 in a plastic bag and mix them until the clear adhesive material becomes milky white.

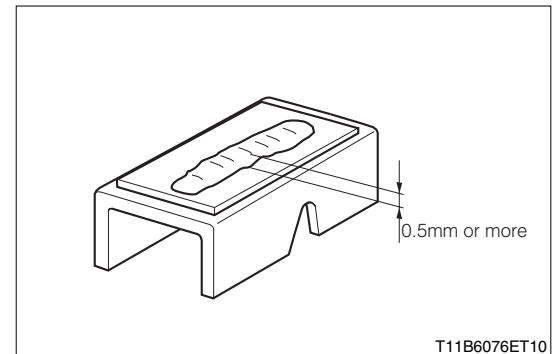
CAUTION

- Note that incorrect ratio of the adhesive material and hardener impairs adhesiveness.
- Note that unevenly mixed material could cause a hardening problem.
- Spread the material within 20 minutes after mixing.

ADHESIVE: Cemedine EP001 or equivalent

3. Spread the adhesive material on the clip whose thickness shall be thicker than 0.5mm.

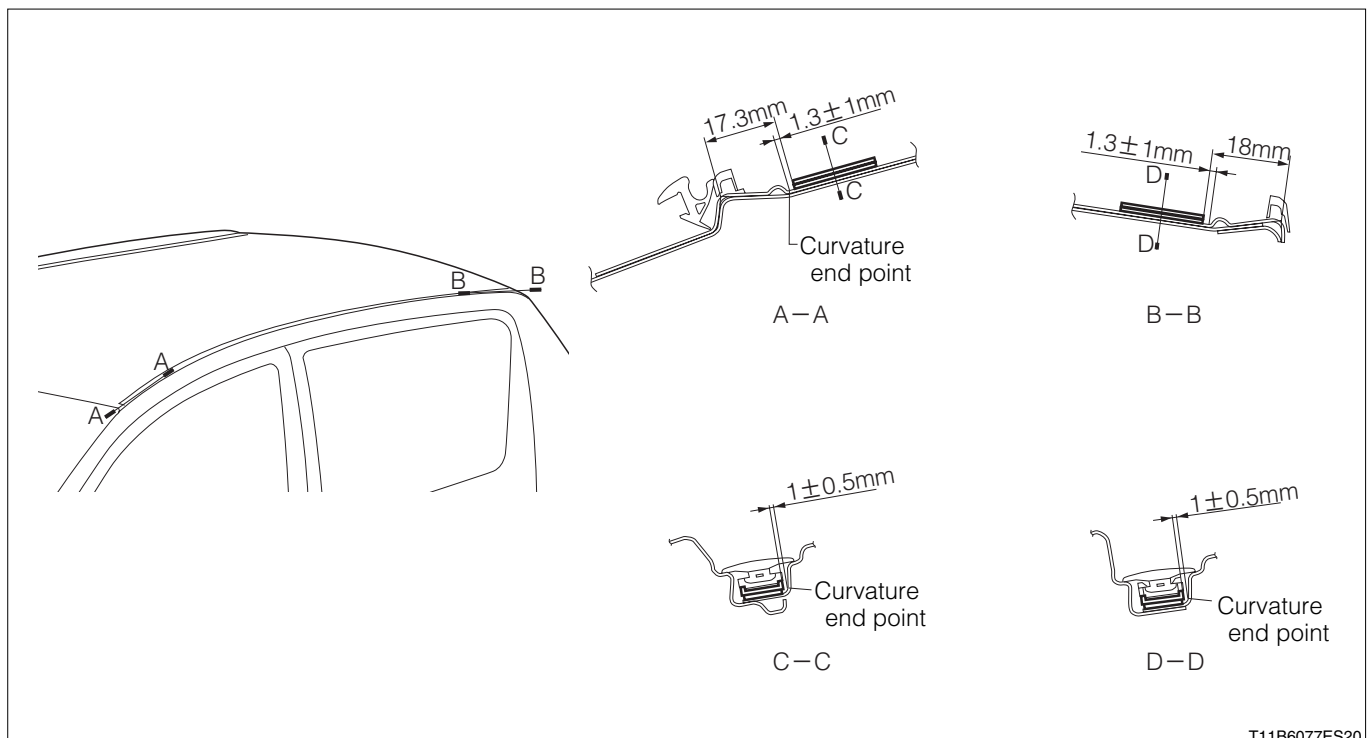
SPECIFIED VALUE: The adhesive material comes out at the sides of the clips when pressed down hard.



4. Press the clips on the exact places indicated in the figure below.

CAUTION

- Do not touch the sealed side with fingers.
- Note that no oil, water or dust shall be in the material.
- Press the tape onto the body evenly.
- Pressed at right angles to the body.



5. Let the adhesive material harden.

CAUTION

- Do not touch until the material harden.

NOTE

- Warming up (lower than 80°C) accelerates the hardening procedure.

Let it sit.	Longer than 3 hours at a room temperature.
Heat up.	Longer than 30 minutes at 80°C.

6. Remove/install the RH roof drip side moulding to ensure the clips stay firmly.

6 BLACKOUT TAPES(FRONT DOOR)

6-1 REMOVAL AND INSTALLATION

6-1-1 ARTICLES TO BE PREPARED

Tool

Rubber spatula

Lubricant,adhesive,others

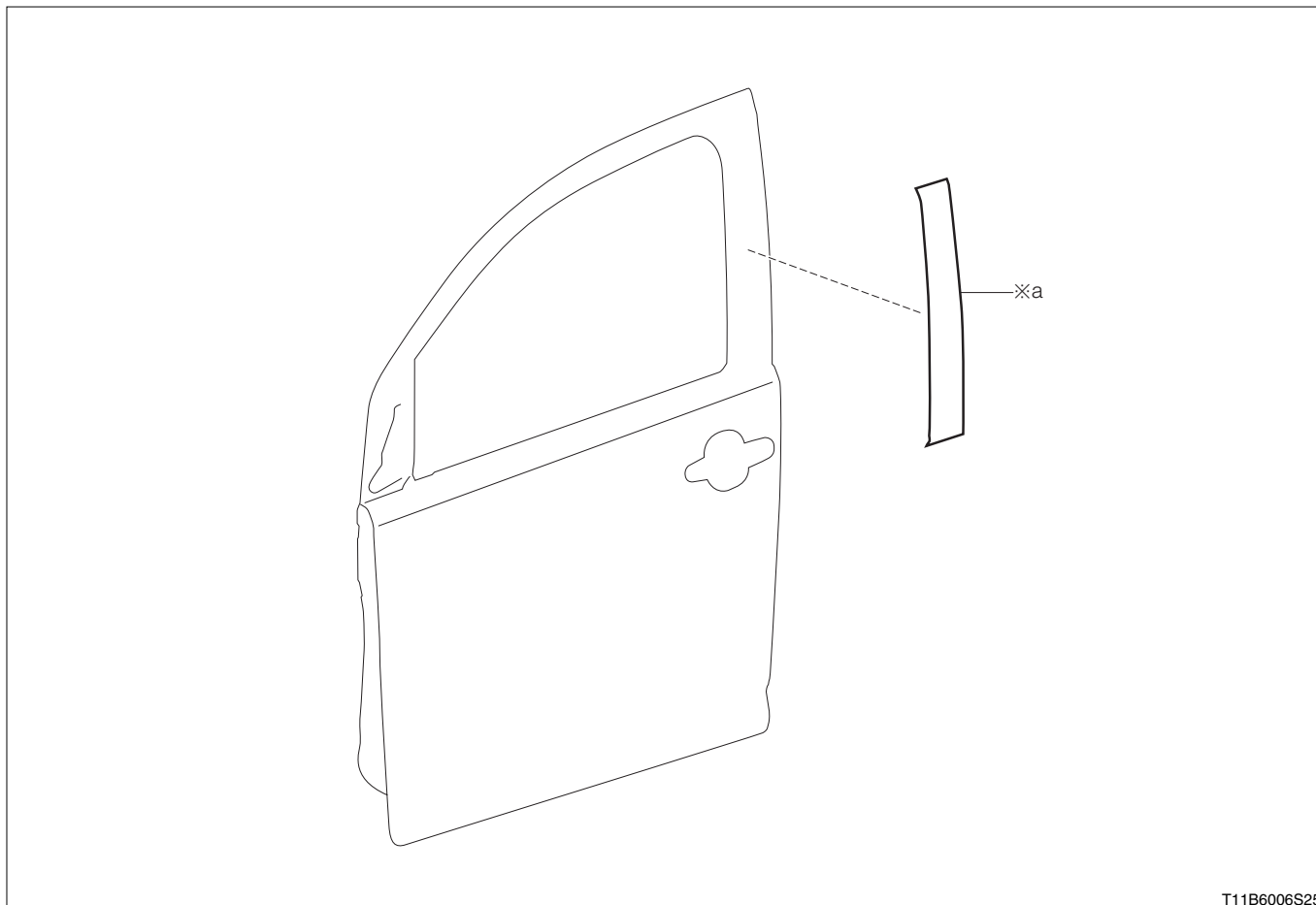
Spray,Dryer,Soap water,Cloth

6-1-2 OPERATION BEFORE REMOVAL

1. Remove the front door window outer weather-strip.
Refer to Page I1-11.
2. Remove the front door glass run RH/LH.
Refer to Page I1-11.

6-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



T11B6006S25

※:Non - reusable parts

(2) Removal and installation procedures

▼ ▲ 1 a Tape, black out, No.2 RH/LH

6-1-4 POINTS OF REMOVAL

(1) Tape, black out, No.2 RH/LH

1. Take off the tape from the end slowly.

NOTE

- If the tape doesn't come off easily due to seizure, heat the tape by a drier for easy removal.

6-1-5 POINTS OF INSTALLATION

CAUTION

- Work inside of the building where there is little wind and dust.
- Application operation shall be done at the temperature between 15 to 27°C.
- Warm up the tape and the door sash sealing side with a drier when the temperature is below 15°C.

I2-11

(1) Tape, black out, No.2 RH/LH

1. With alcohol, clean off the application surface of the RH/LH front door panel S/A sash to remove dirt and foreign matters from there.

CAUTION

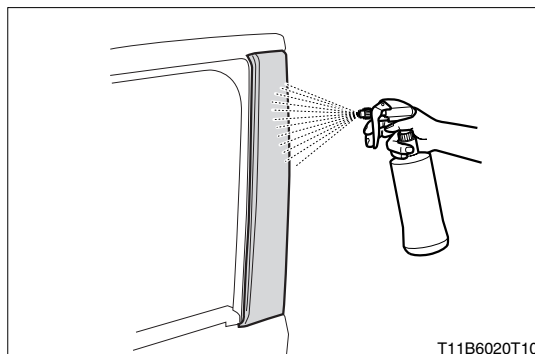
- Anything left on the sealing side when taping will cause weak adhesiveness and external defects such as spots. Therefore, be sure to wipe off dirt.

2. Wrap a spatula with cloth.

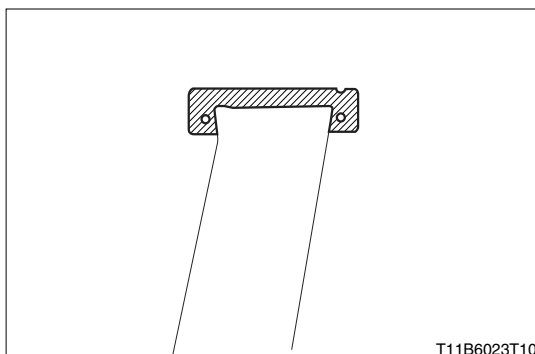
NOTE

- A spatula wrapped with cloth gives smooth strokes, thus improving workability.

3. Mix tap water and mild liquid detergent at the ratio of 100 to 1, and spray it evenly onto the applying surface of the RH/LH front door panel S/A sash.



4. Cut out the marked area in the figure on the right.
5. Remove the backing sheet on the top end of the tape.

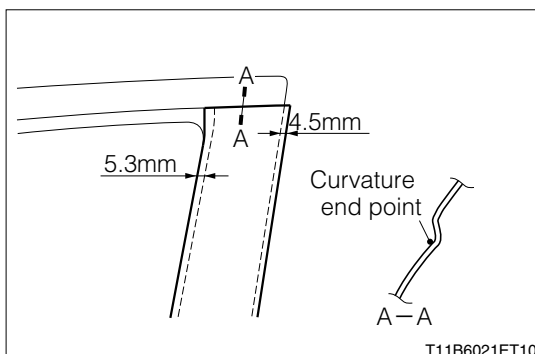


6. Place the cut-out of the tape onto the end of curvature of the RH/LH front door panel S/A sash, and paste it temporarily.

CAUTION

- The tape is temporarily pasted parallel to the RH/LH front door panel S/A sash.
- Ensure that there is about 4.5mm of roll-in length behind the vehicle.

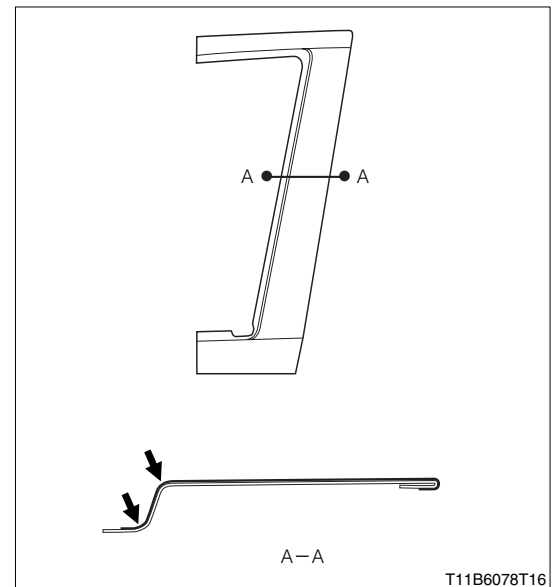
7. Check the taping position.



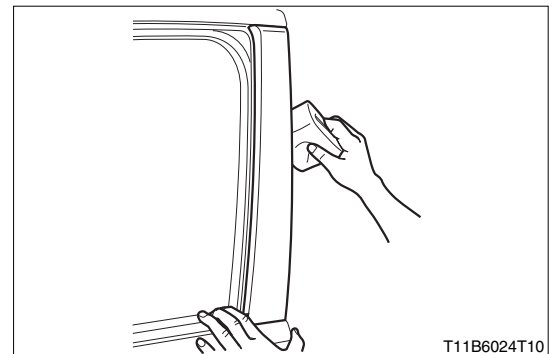
8. Press and paste with the spatula on curvature section (2 locations).
9. After application, push out the water with the spatula and press it down hard.

CAUTION

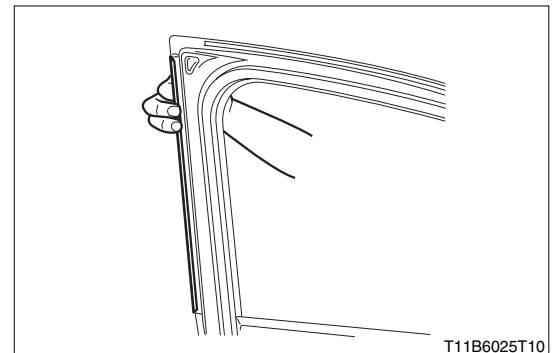
- Ensure to push out all water from between the tape and the RH/LH front door panel S/A sash, for any remaining water will cause spots later.



10. With a spatula, make a fold on the tape roll-in portions at both sides of the RH/LH front door panel S/A sash.



11. Lightly warm up the tape roll-in portion with a drier, and fold it with fingers.
12. Press the entire tape hard and let it dry after wiping off water.

**6-1-6 OPERATION AFTER INSTALLATION**

1. Install the front door glass run RH/LH.
Refer to Page I1-11.
2. Install the front door window outer weather-strip.
Refer to Page I1-11.

7 BLACKOUT TAPES(REAR DOOR)**7-1 REMOVAL AND INSTALLATION****7-1-1 ARTICLES TO BE PREPARED**

Tool

Rubber spatula

Lubricant, adhesive, others

Spray, Dryer, Soap water, Cloth

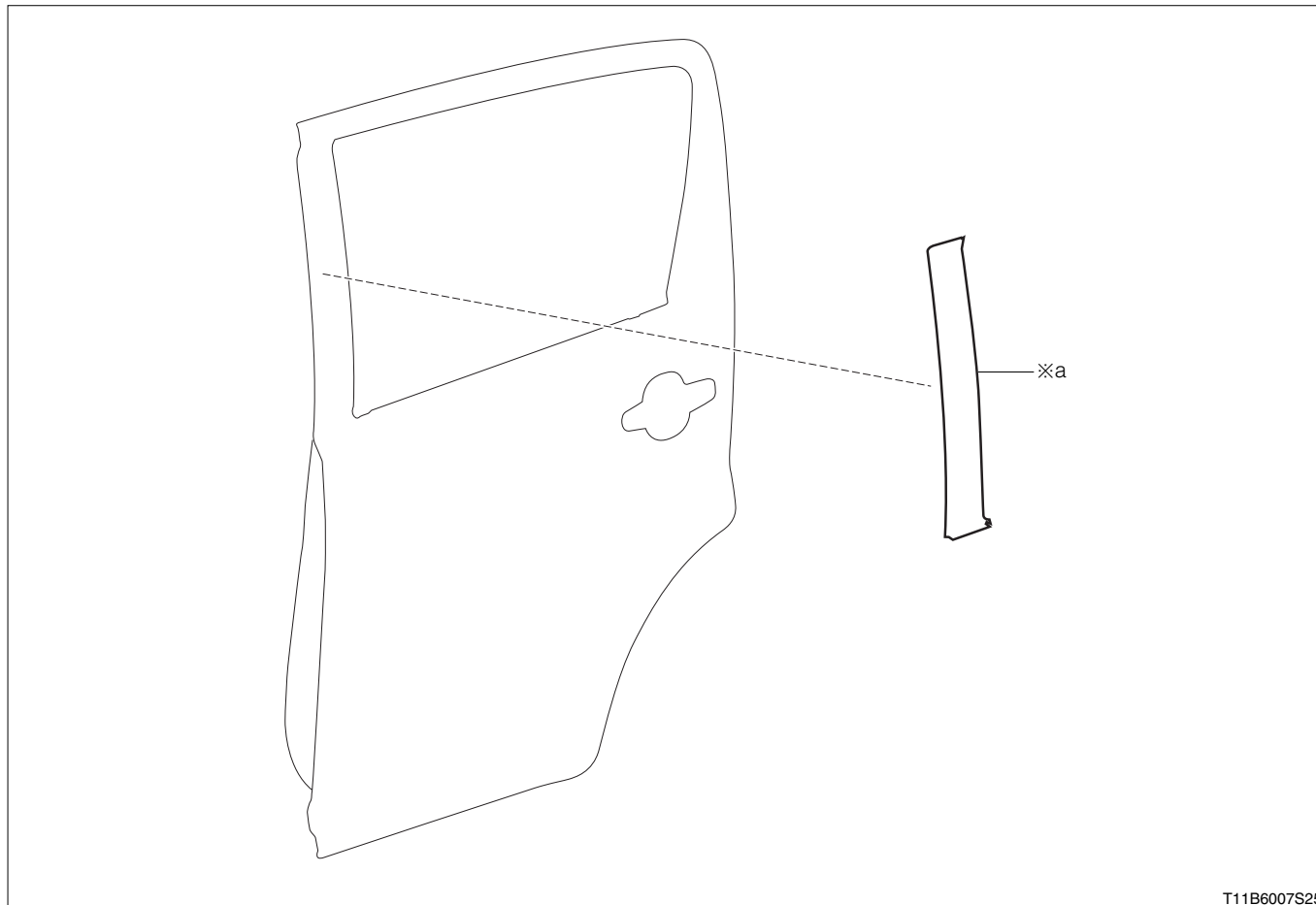
I2-13

7-1-2 OPERATION BEFORE REMOVAL

1. Remove the rear door window outer weather-strip.
Refer to Page I1-16.
2. Remove the rear door glass run RH/LH.
Refer to Page I1-16.

7-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



T11B6007S25

※:Non - reusable parts

(2) Removal and installation procedures

▼ ▲ 1 a Tape, black out, No.3 RH/LH

7-1-4 POINTS OF REMOVAL

(1) Tape, black out, No.3 RH/LH

1. Take off the tape from the end slowly.

NOTE

- If the tape doesn't come off easily due to seizure, heat the tape by a drier for easy removal.

7-1-5 POINTS OF INSTALLATION

CAUTION

- Work inside of the building where there is little wind and dust.
- Tape application shall be done at the temperature between 15 to 27°C.
- Warm up the tape and the door sash sealing surface with a drier when the temperature is below 15°C.

(1) **Tape, black out, No.3 RH/LH**

1. With alcohol, clean off the application surface of the RH/LH rear door panel S/A sash to remove dirt and foreign matters from there.

CAUTION

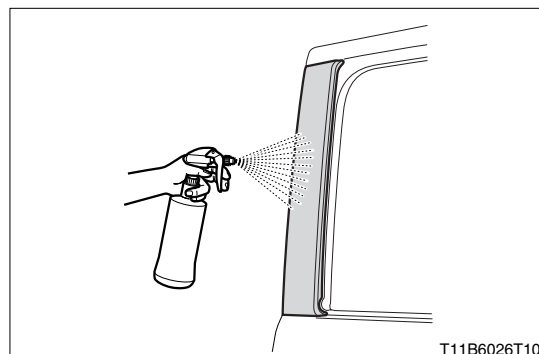
- Anything left on the sealing side when taping will cause weak adhesiveness and external defects such as spots. Therefore, be sure to wipe off dirt.

2. Wrap a spatula with cloth.

NOTE

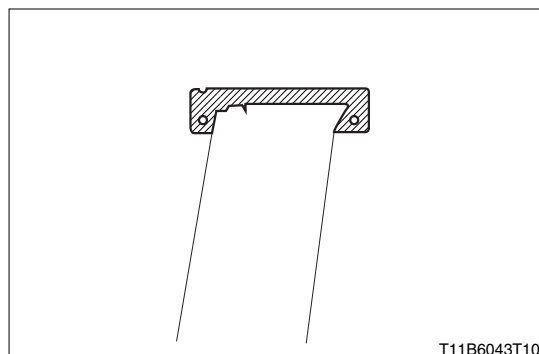
- A spatula wrapped with cloth gives smooth strokes, thus improving workability.

3. Mix tap water and mild liquid detergent at the ratio of 100 to 1, and spray it evenly onto the applying surface of the RH/LH rear door panel S/A sash.



4. Cut out the marked area in the figure on the right.

5. Remove the backing sheet on the top end of the tape.

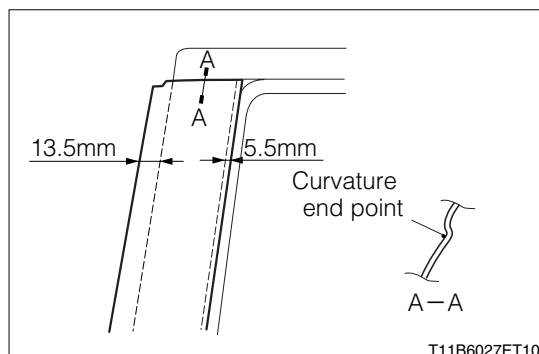


6. Place the cut-out of the tape onto the end of curvature of the RH/LH rear door panel S/A sash, and paste it temporarily.

CAUTION

- The tape is temporarily pasted parallel to the RH/LH rear door panel S/A sash.
- Check that there is approx. 13.5mm of roll-in length for the left side.

7. Check the taping position.



8. Press and paste with the spatula on the curvature section (4 locations).
9. After taping, push out the water with the spatula.

CAUTION

- Paste parallel to the RH/LH rear door panel S/A sash.

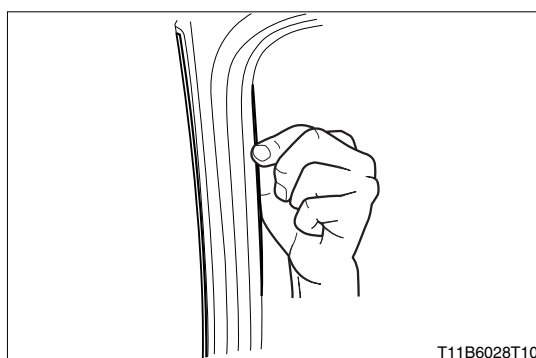
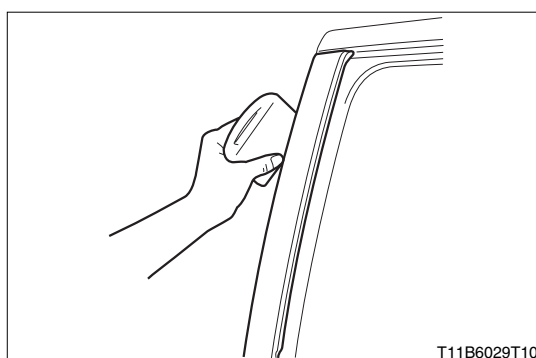
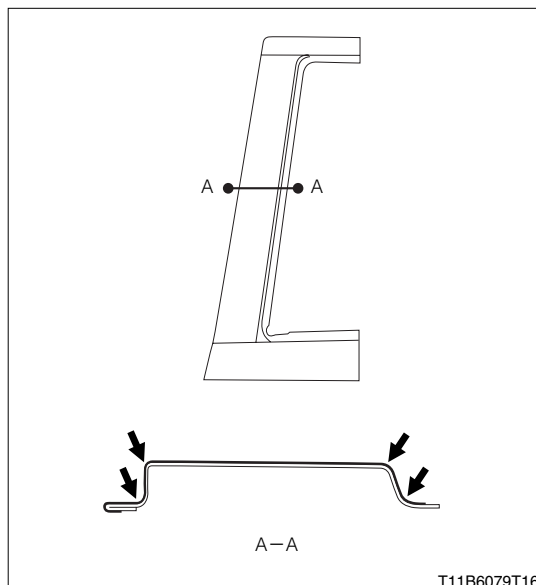
10. Check the taping position.
11. After taping, push out the water with the spatula.

CAUTION

- Ensure to push out all water from between the tape and the RH/LH rear door panel S/A sash, for any remaining water will cause spots later.

12. With a spatula, make a fold on the tape roll-in portions.

13. Lightly warm up the tape roll-in portion with a drier, and fold it with fingers.
14. Press the entire tape hard and let it dry after wiping off water.



7-1-6 OPERATION AFTER INSTALLATION

1. Install the rear door glass run RH/LH.
Refer to Page I1-16.
2. Install the rear door window outer weather-strip.
Refer to Page I1-16.

8 INSTRUMENT PANEL

8-1 REMOVAL AND INSTALLATION

CAUTION

- Refer to the precaution on maintenance for SRS airbag system.

Refer to Page A1-2.

8-1-1 ARTICLES TO BE PREPARED

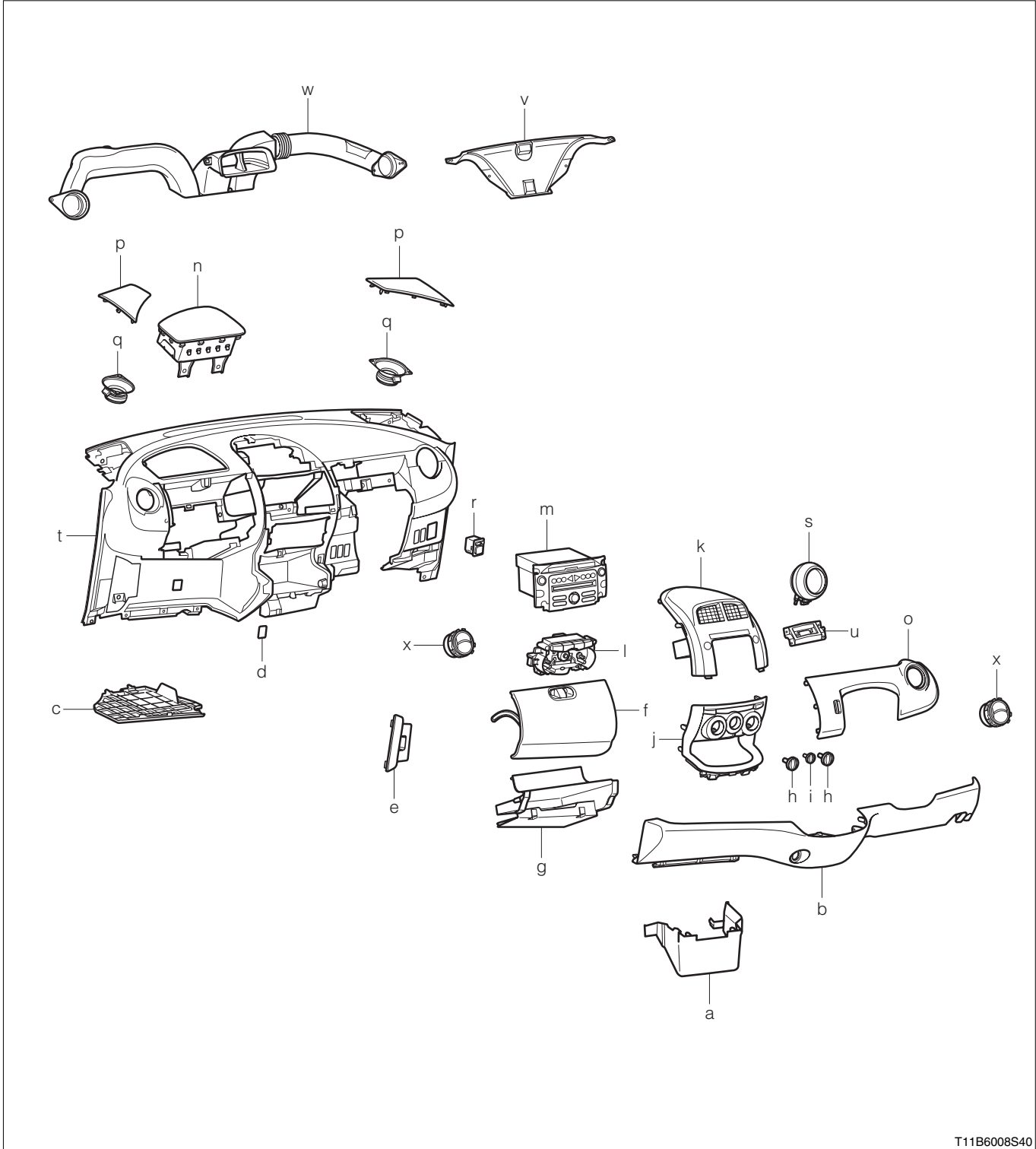
Tool

Clip remover

8-1-2 OPERATION BEFORE REMOVAL

1. Remove the negative battery (－) terminal.
2. Remove the front pillar garnish RH/LH.
Refer to Page I2-43.
3. Remove the cowl side trim board RH/LH.
Refer to Page I2-43.

8-1-3 REMOVAL AND INSTALLATION PROCEDURES
(1) Components



T11B6008S40

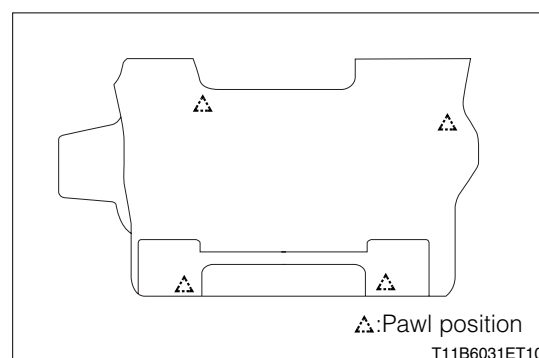
The illustration shows a typical example.

(2) Removal and installation procedures

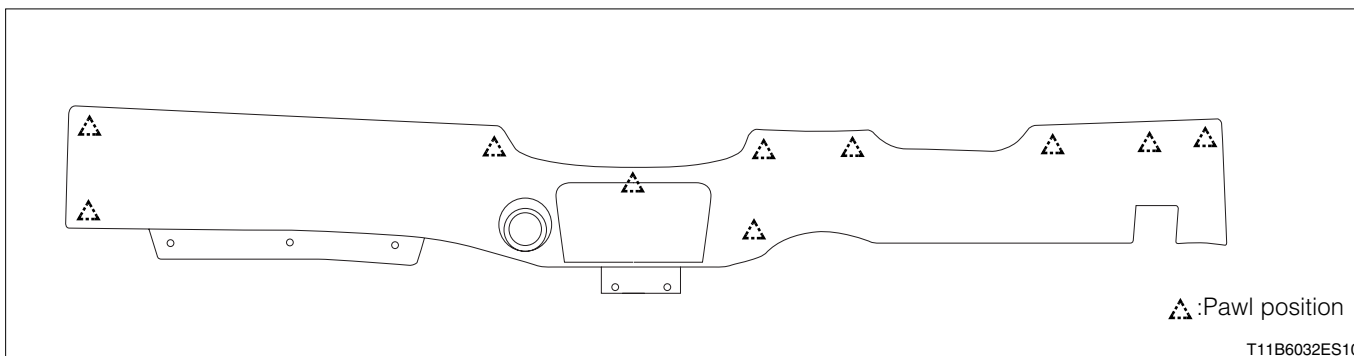
▼ 1 a Panel, console	▼ ▲ 13 m Receiver Ay, radio
▼ 2 b Panel S/A, instrument panel finish, lower	▼ ▲ 14 n Airbag Ay, instrument panel passenger
▼ 3 c Cover, instrument panel under, No.1	▼ ▲ 15 o Panel, instrument cluster finish
▼ 4 d Cover, instrument, lower	▼ 16 p Grille, speaker, RH/LH
▼ 5 e Cover, fuse box opening	▲ 17 q Speaker Ay, radio
▼ 6 f Door, instrument panel	18 r Switch Ay, outer mirror
▼ 7 g Box Ay, instrument panel, No.1	▼ 19 s Tachometer Ay, engine
8 h Knob S/A, control	▼ 20 t Panel, instrument
9 i Knob S/A, control	▼ 21 u Bracket, accessory meter
▼ 10 j Panel S/A, instrument cluster finish, lower center	▼ 22 v Nozzle Ay, defroster
▼ 11 k Panel S/A, instrument cluster finish, center	▼ 23 w Duct S/A, heater to register, center
▼ ▲ 12 l Control Ay, heater	▼ 24 x Register Ay, instrument panel, No.1

8-1-4 POINTS OF REMOVAL**(1) Panel, console**

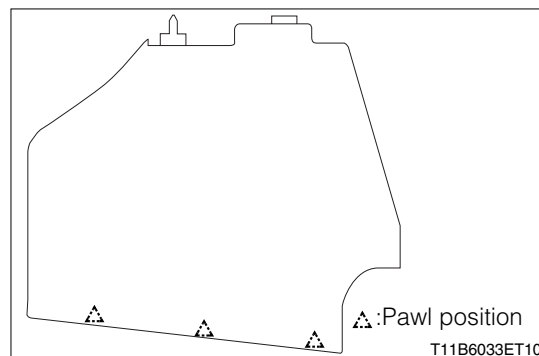
- Disengage the pawls indicated in the right figure and remove the panel.

**(2) Panel, instrument panel finish, lower**

- Remove the screws. (RHD vehicle: 6 points, LHD vehicle: 5 points)
- Remove the clips (3 locations).
- Disengage the pawls indicated in the figure below and remove.

**(3) Cover, instrument panel under, No.1**

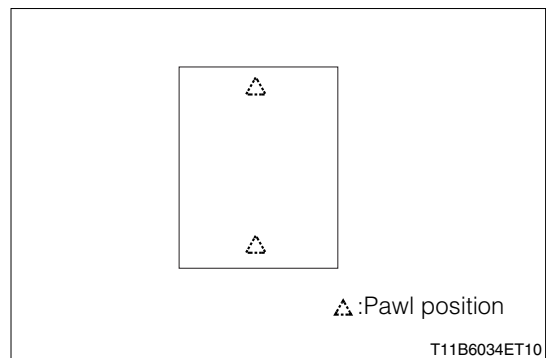
- Disengage the pawls indicated in the right figure and remove the cover.



I2-19

(4) Cover, instrument, lower

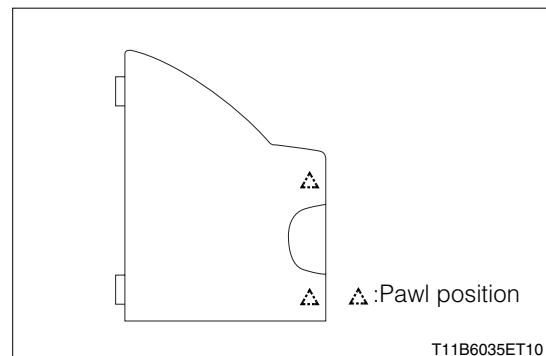
1. Disengage the pawls indicated in the right figure and remove the cover.



(5) Cover, fuse box opening

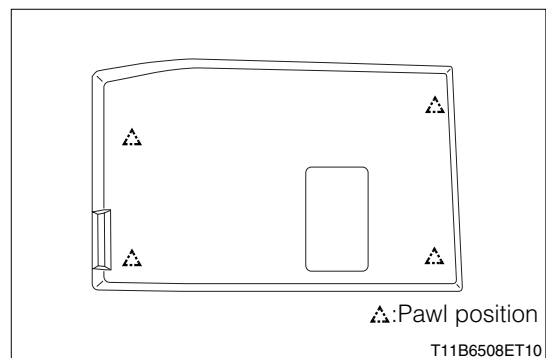
① RHD vehicles

1. Disengage the pawls indicated in the right figure and remove the cover.



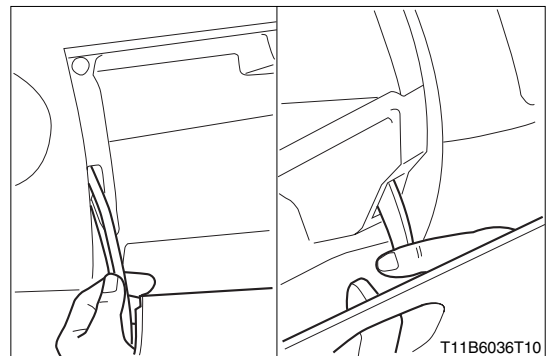
② LHD vehicles

1. Disengage the pawls indicated in the right figure and remove the cover.



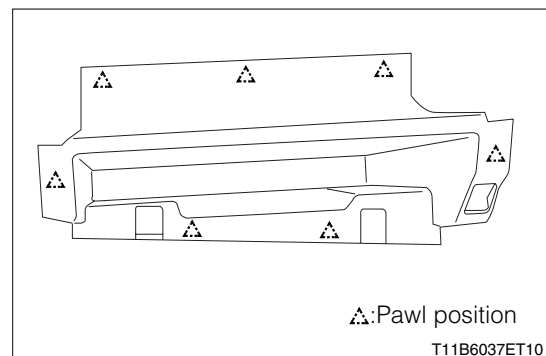
(6) Door, instrument panel

1. Open the door fully and then close approx. 10mm from the full open position. While pushing up the right and left door arm sections together, remove them through the instrument panel holes.



(7) Box, instrument panel, No.1

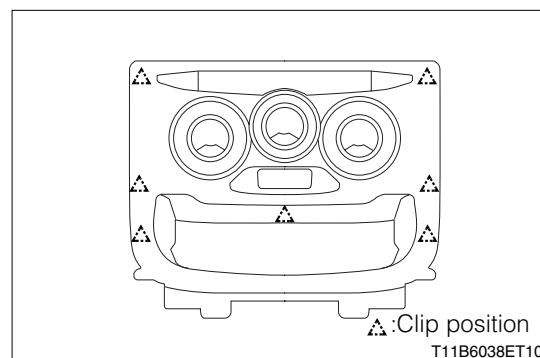
1. Disengage the pawls indicated in the right figure and remove the box.



(8) Panel S/A, instrument cluster finish, lower center

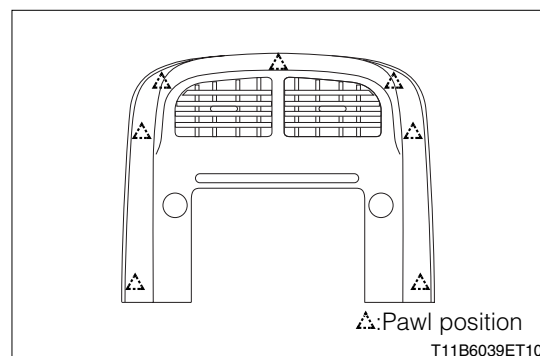
1. Remove the screws (4 locations).

2. Disengage the pawls indicated in the right figure and remove the panel S/A.



(9) Panel S/A, instrument cluster finish, center

1. Disengage the pawls indicated in the right figure and remove the panel S/A.



(10) Control Ay, heater

Refer to Page K1-6.

(11) Receiver Ay, radio

Refer to Page J4-1.

(12) Airbag Ay, instrument panel passenger

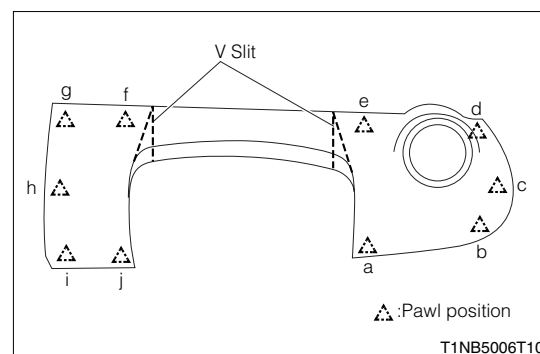
Refer to Page H1-9.

(13) Panel, instrument cluster finish

1. Disengage the pawls in the sequence of d→e→f→c→b→a→g→h→i→j, and remove the panel.

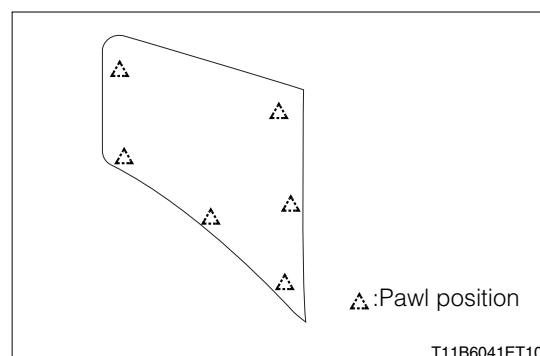
CAUTION

- Failure to follow the sequence will break the panel.



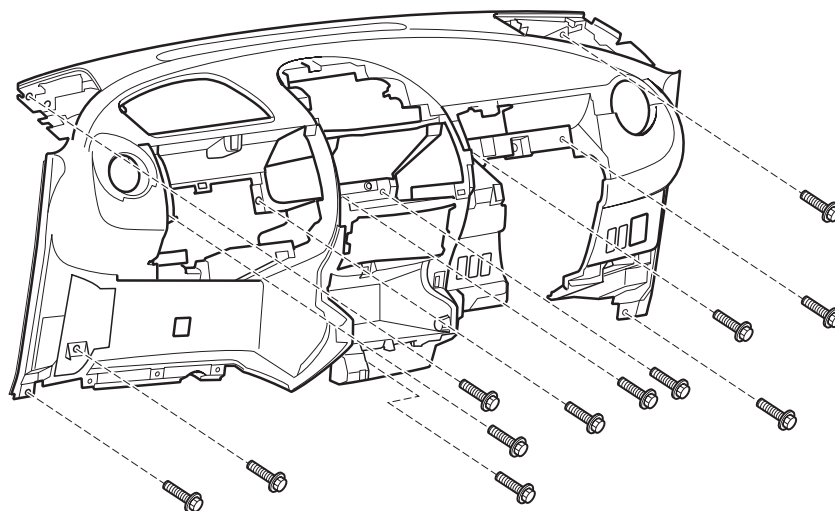
(14) Grille, speaker, RH/LH

1. Disengage the pawls indicated in the right figure and remove it.



(15) Panel, instrument

1. Remove the electric power steering column Ay from the instrument panel reinforcement S/A.
2. Remove the front door front lower frame subassembly by removing the bolts at the positions indicated in the figure below.

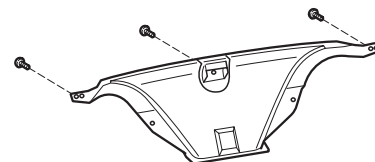


T11B6042S20

(16) Nozzle Ay, defroster

① RHD vehicles

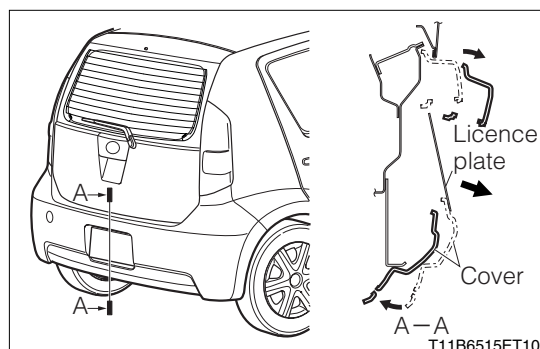
1. Remove the screws (3 locations).



T11B6044T10

② LHD vehicles

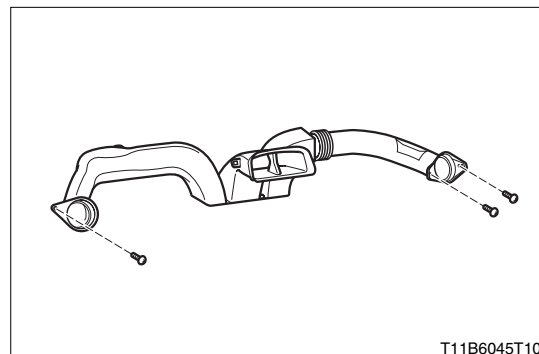
1. Remove the screws (5 locations).



T11B6515ET10

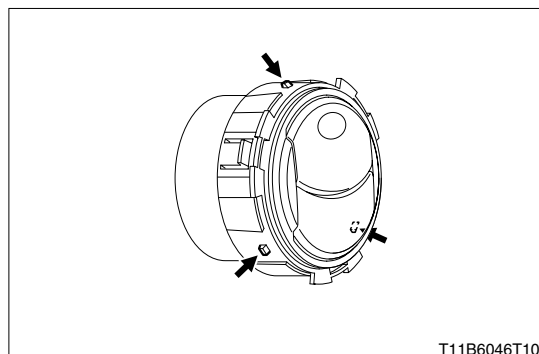
(17) Duct S/A, heater to register, center

1. Remove the screws (3 locations).



(18) Register Ay, instrument panel, No.1

1. Disengage the pawls indicated in the right figure and remove the register Ay.



8-1-5 POINTS OF INSTALLATION

(1) Speaker Ay, radio

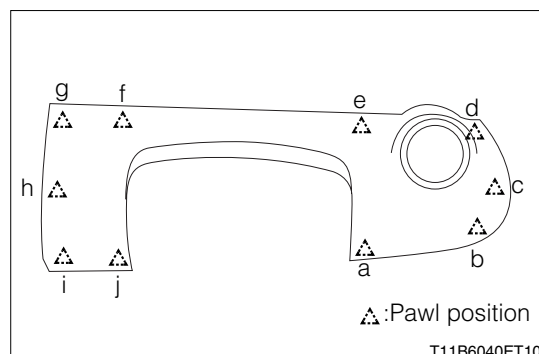
Refer to Page J4-2.

(2) Panel, instrument cluster finish

1. Engage the pawls indicated in the right figure in the sequence of j to a.

CAUTION

- Press the top part of the pawl to install.



(3) Airbag Ay, instrument panel passenger

Refer to Page H1-9.

(4) Receiver Ay, radio

Refer to Page J4-1.

(5) Control Ay, heater

Refer to Page K1-6.

8-1-6 OPERATION AFTER INSTALLATION

1. Install the front pillar garnish RH/LH.
Refer to Page I2-43.
2. Install the cowl side trim board RH/LH.
Refer to Page I2-43.
3. Connect the battery negative (–) terminal.

9 REAR CONSOLE BOX

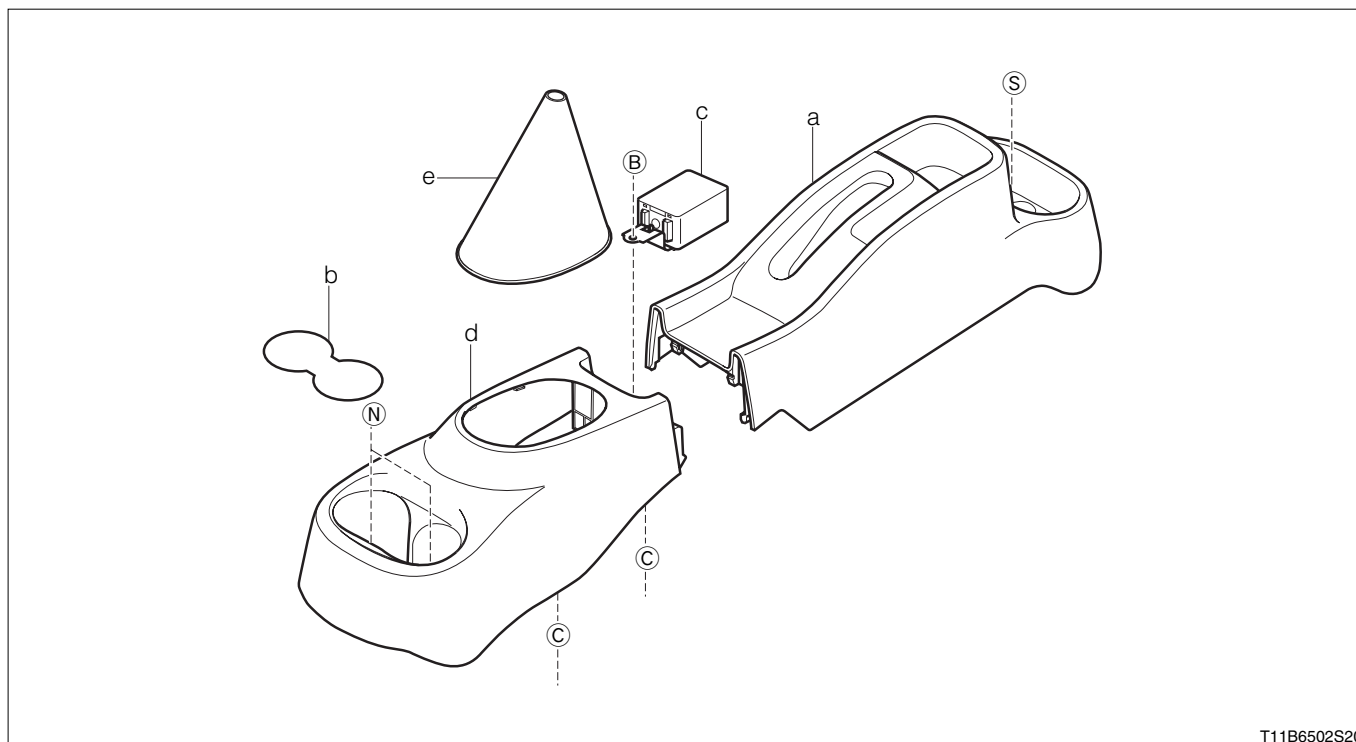
9-1 REMOVAL AND INSTALLATION

9-1-1 OPERATION BEFORE REMOVAL

1. Remove the shift lever knob S/A
Refer to Page F2-10.

9-1-2 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



T11B6502S20

(2) Removal and installation procedures

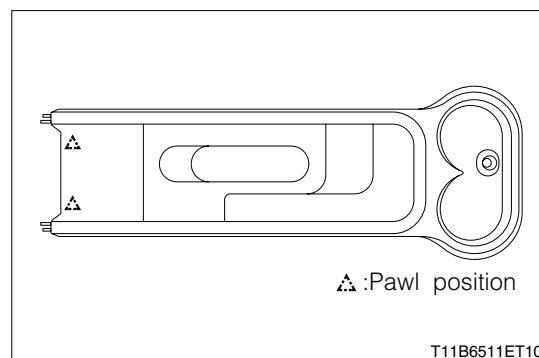
- ▼ 1 a Box S/A, console, rear
- 2 b Carpet, console box
- 3 c Relay Ay, windshield wiper (not equipped for some specifications)
- 4 d Box S/A, console, front
- 5 e Cover Ay, shifting hole (M/T vehicle only)

9-1-3 POINTS OF REMOVAL

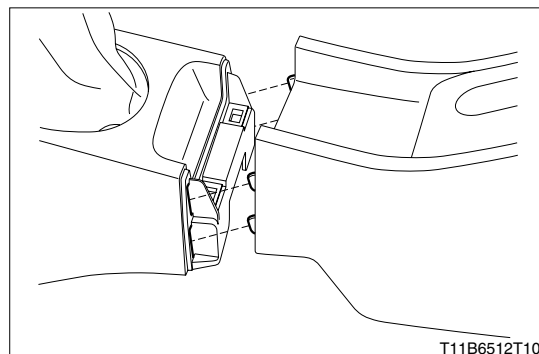
(1) Box S/A, console, rear

1. Pull the parking brake lever to provide a gap for moving the box S/A.

2. Disengage the pawls indicated in the right figure and lift the box S/A upward.



3. Move the box S/A toward the rear of the vehicle. Disengage it from the front console box S/A to remove.



9-1-4 OPERATION AFTER INSTALLATION

1. Install the shift lever knob S/A.
Refer to Page F2-10.

10 FRONT SEAT

10-1 REMOVAL AND INSTALLATION

CAUTION

- Refer to the precaution on checking procedure for SRS airbag system.

Refer to Page A1-2.

10-1-1 ARTICLES TO BE PREPARED

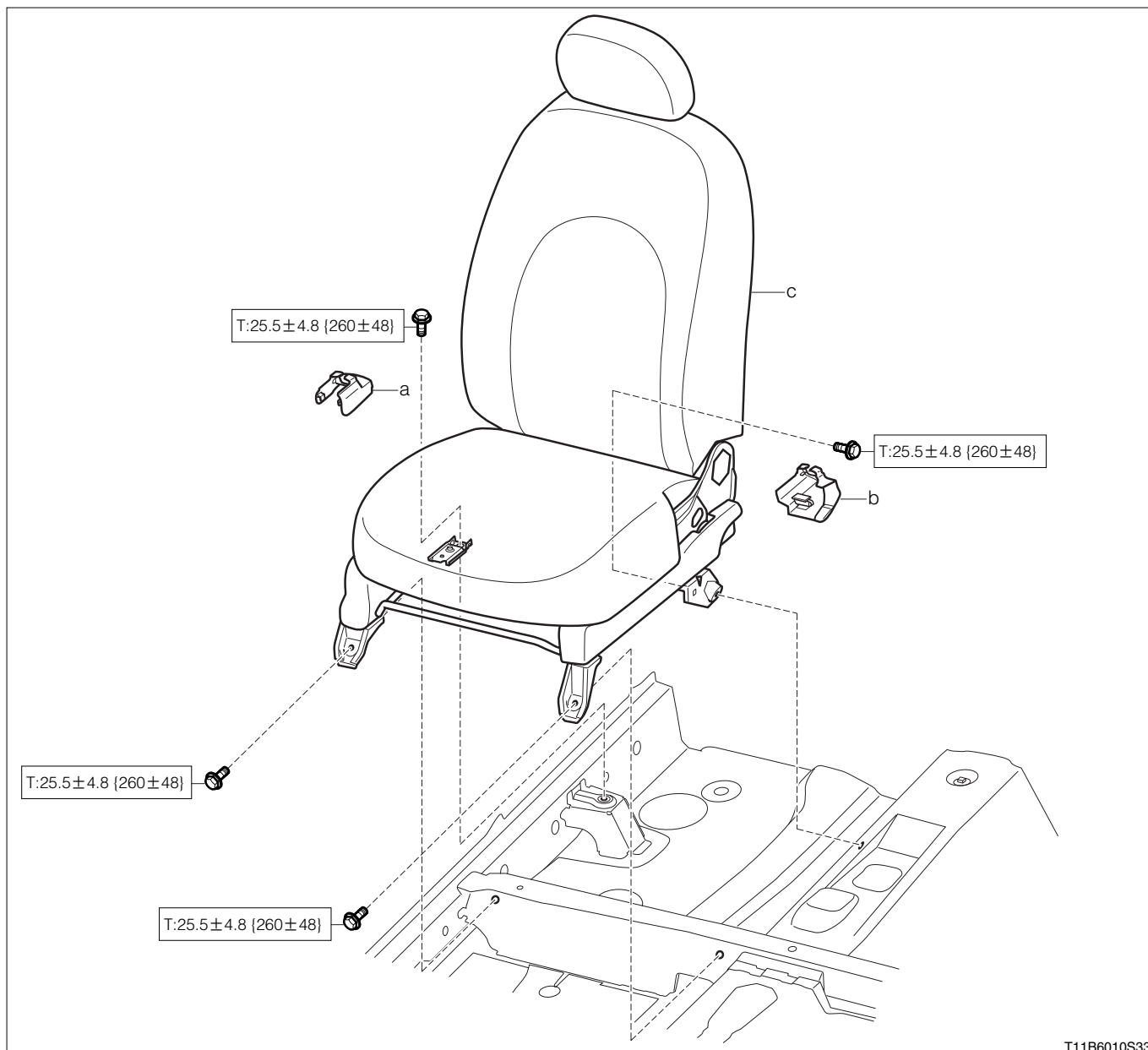
Instrument

Torque wrench

I2-25

10-1-2 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



T11B6010S33

Unit: N·m {kgf·cm}

(2) Removal and installation procedures

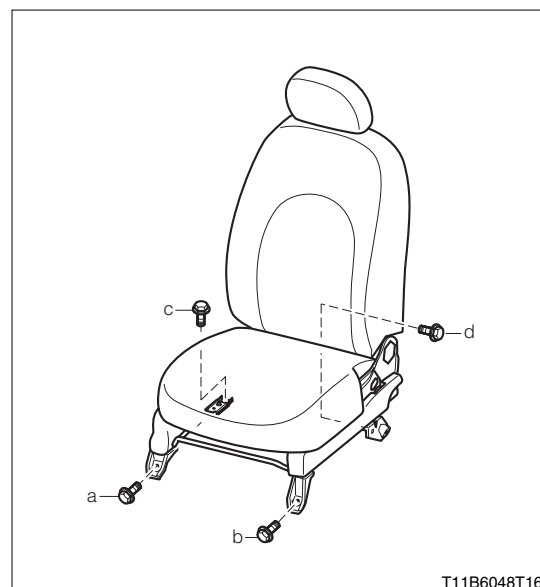
- 1 a Cover, front seat leg
- 2 b Cover, front seat leg, LH
- ▲ 3 c Seat Ay, front RH/LH

10-1-3 POINTS OF INSTALLATION

(1) Seat Ay, front RH/LH

1. Temporarily install the bolts a and b.
2. Slide the seat to the most forward position.
3. Tighten the bolts c and d.

4. Tighten the bolts a and b.



10-2 DISASSEMBLING AND ASSEMBLING

10-2-1 ARTICLES TO BE PREPARED

Instrument

Torque wrench

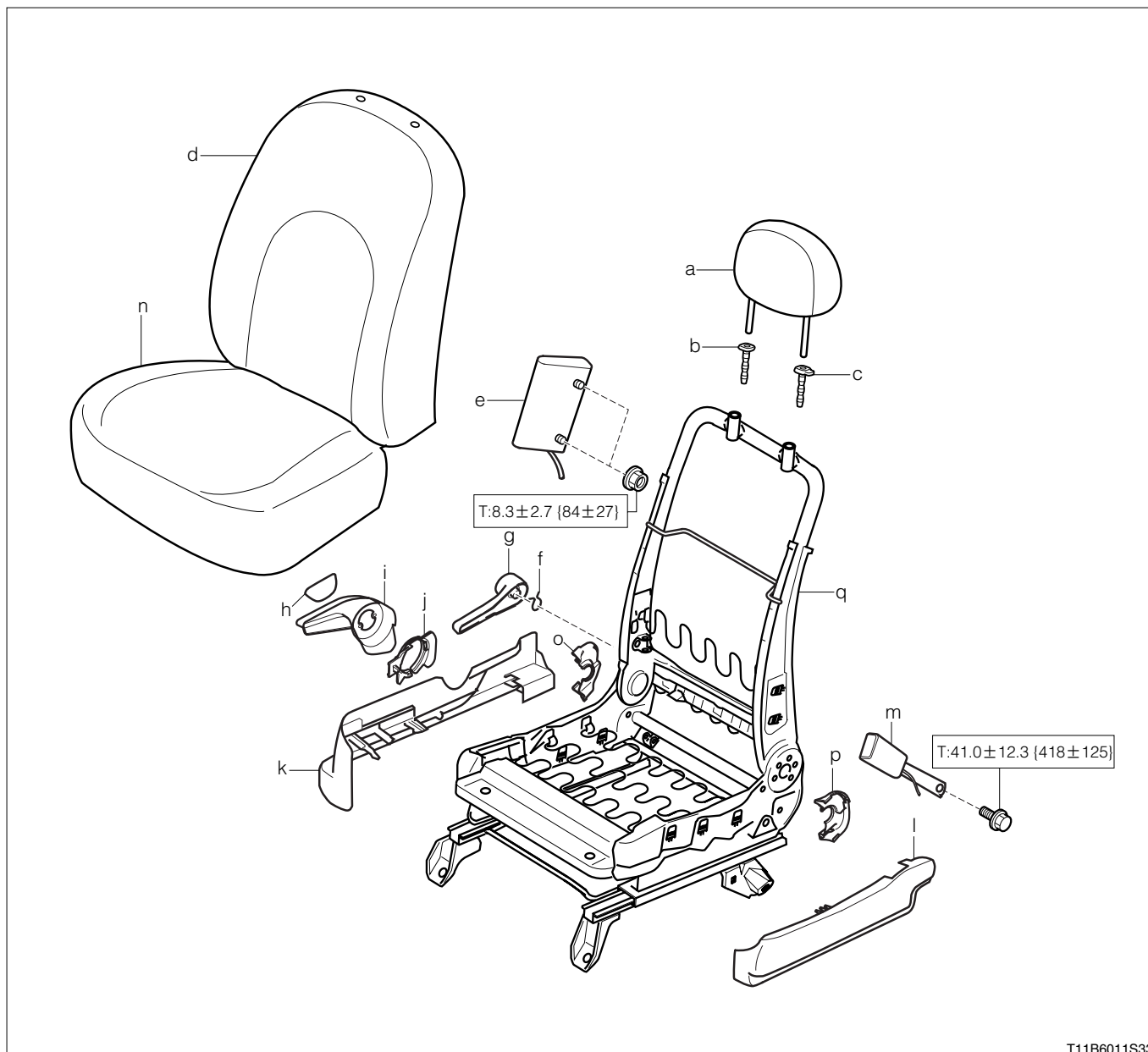
10-2-2 OPERATION BEFORE DISASSEMBLY

1. Remove the front seat Ay RH/LH.

Refer to Page I2-24.

10-2-3 DISASSEMBLY AND ASSEMBLY PROCEDURES

(1) Components



Unit:N·m{kgf·cm}

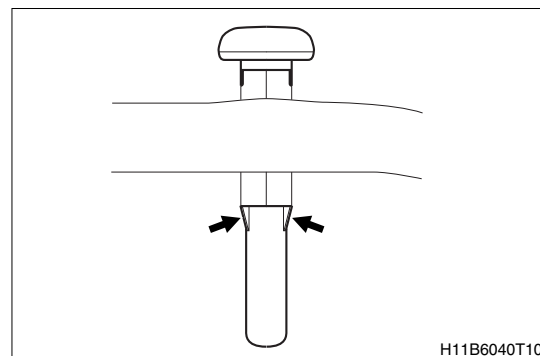
(2) Disassembling and assembling procedures

1	a	Headrest Ay, front seat	10	j	Spacer, vertical adjuster
▼ 2	b	Support, front seat headrest, RH	11	k	Shield, front seat cushion, RH
▼ 3	c	Support, front seat headrest, LH	12	l	Shield, front seat cushion, inner RH
4	d	Pad, front seat back w/cover, RH	13	m	Belt Ay, front seat, inner
5	e	Air bag Ay, front seat, RH	14	n	Pad S/A, front seat cushion, RH
6	f	Ring	15	o	Cover, seat hinge outer, RH
▼ 7	g	Handle, reclining adjuster release, RH	16	p	Cover, seat hinge inner, RH
8	h	Cover, vertical adjuster	17	q	Frame S/A, front seat w/adjuster, RH
9	i	Lever, vertical adjuster lock			

10-2-4 POINTS OF DISASSEMBLY

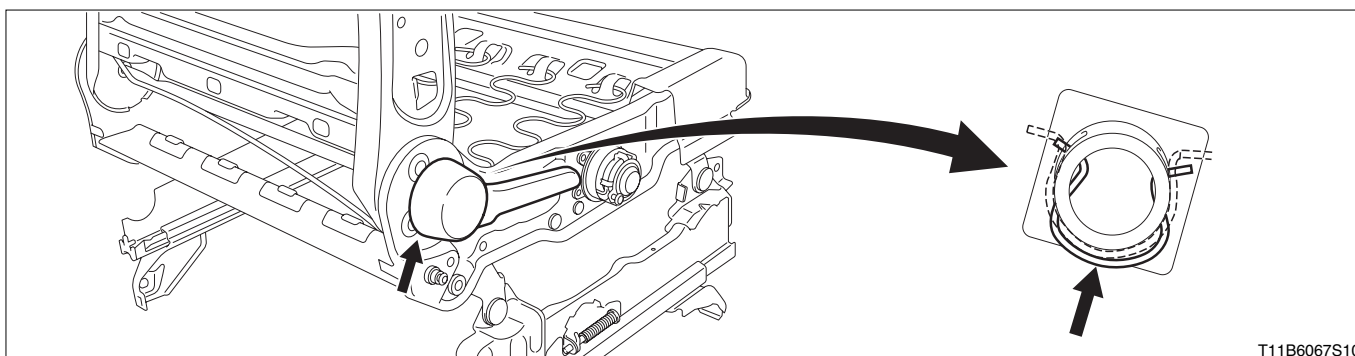
(1) Support, front seat headrest, RH / Support Ay, front seat headrest, LH

1. Put a hand from the bottom of the RH front seat back pad W/cover, and press the pawl to push off the support Ay.



(2) Handle, reclining adjuster release, RH

1. Press the ring and disengage the fitting with the RH front seat frame Ay W/adjuster.
2. Remove with a flat screwdriver while pressing the ring.



10-2-5 OPERATION AFTER ASSEMBLY

1. Install the front seat Ay RH/LH.
Refer to Page I2-24.

11 REAR SEAT

11-1 REMOVAL AND INSTALLATION

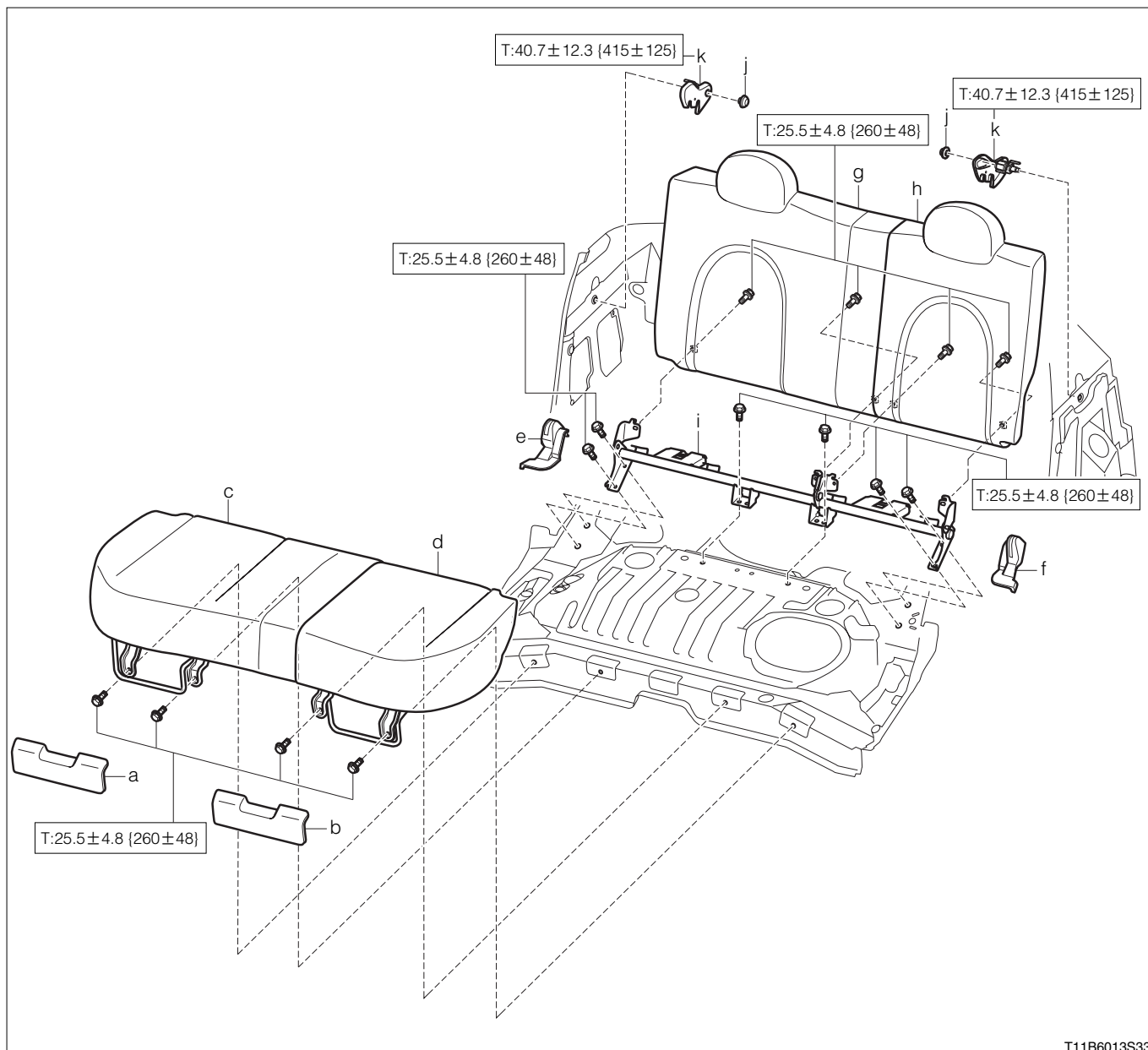
11-1-1 ARTICLES TO BE PREPARED

Instrument

Torque wrench

11-1-2 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



T11B6013S33

Unit: N·m {kgf·cm}

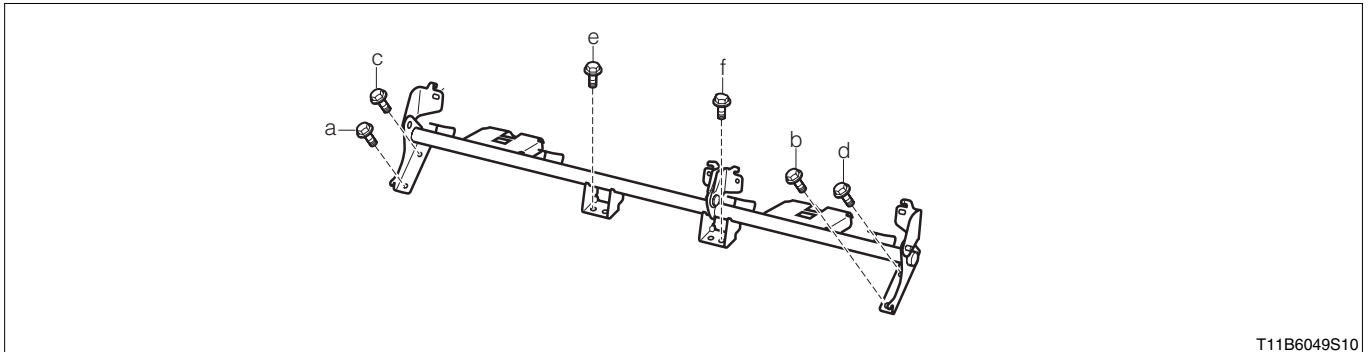
(2) Removal and installation procedures

1	a	Leg S/A, rear seat cushion	7	g	Back Ay, rear seat, RH
2	b	Leg S/A, rear seat cushion	8	h	Back Ay, rear seat, LH
3	c	Cushion Ay, rear seat, RH	▲ 9	i	Bracket S/A, CRS anchor
4	d	Cushion Ay, rear seat, LH	10	j	Cap
5	e	Cover, rear seat hinge	11	k	Lock S/A, rear seat back, RH/LH
6	f	Cover, rear seat hinge, LH			

11-1-3 POINTS OF INSTALLATION

(1) Bracket S/A, CRS anchor

1. Tighten the bolts in the sequence of a to f.



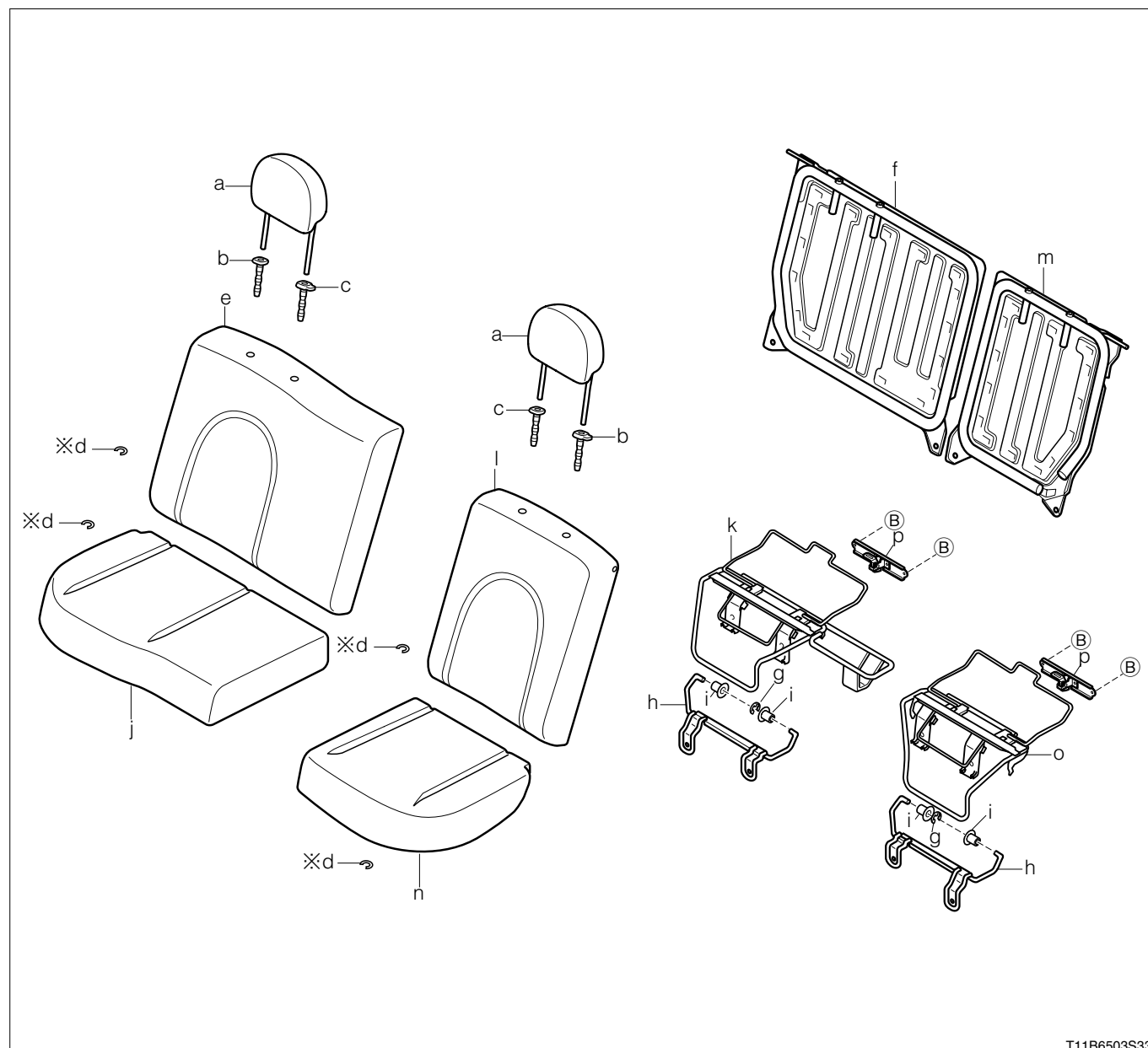
11-2 DISASSEMBLING AND ASSEMBLING

11-2-1 OPERATION BEFORE DISASSEMBLY

1. Remove the rear seat cushion Ay RH/LH.
Refer to Page I2-28.
2. Remove the rear seat back Ay RH/LH.
Refer to Page I2-28.

11-2-2 DISASSEMBLY AND ASSEMBLY PROCEDURES

(1) Components



T11B6503S33

※:Non - reusable parts

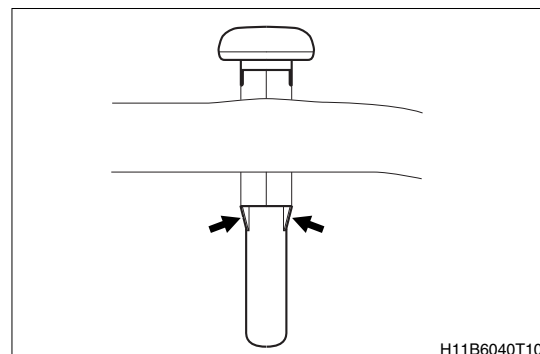
(2) Disassembling and assembling procedures

1	a	Headrest Ay, rear seat	▼	14	b	Support, front seat headrest, RH	
▼	2	b	Support, front seat headrest, RH	▼	15	c	Support Ay, front seat headrest, LH
▼	3	c	Support Ay, front seat headrest, LH	▼	16	l	Pad S/A, rear seat back, LH
▲	4	d	Ring, hog small	▼	17	m	Frame S/A, rear seat back, LH
▼	5	e	Pad S/A, rear seat back, RH	▲	18	d	Ring, hog small
	6	f	Frame S/A, rear seat back, RH		19	g	Ring, E
▲	7	d	Ring, hog small		20	h	Leg S/A, rear seat cushion
	8	g	Ring, E		21	i	Bush
	9	h	Leg S/A, rear seat cushion	▼	22	n	Pad S/A, rear seat cushion, LH
	10	i	Bush		23	o	Frame S/A, rear seat cushion, LH
▼	11	j	Pad S/A, rear seat cushion, RH	▲	24	d	Ring, hog small
	12	k	Frame S/A, rear seat cushion, RH		25	p	Lock S/A, rear seat turn
	13	a	Headrest Ay, rear seat				

11-2-3 POINTS OF DISASSEMBLY

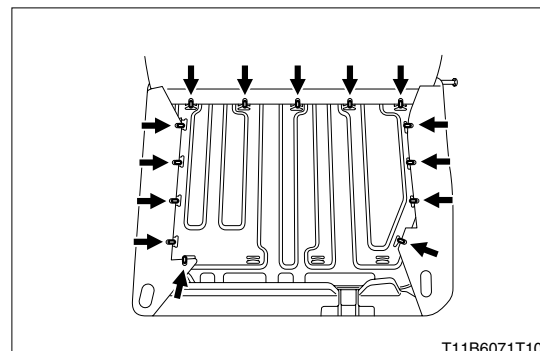
(1) Support, front seat headrest, RH / Support Ay, front seat headrest, LH

1. Put a hand from the bottom of the RH/LH rear seat back pad S/A, and press the pawls to push out the support.



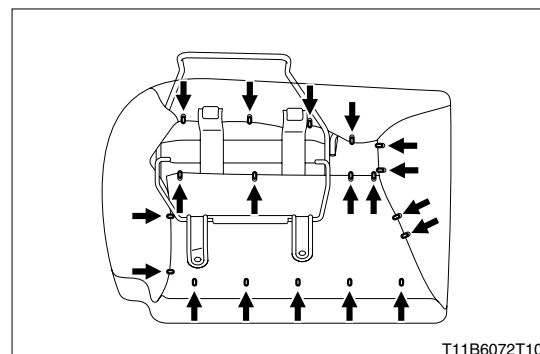
(2) Pad S/A, rear seat back, RH

1. Take off the small hog rings indicated in the figure, and remove the pad S/A from the RH rear seat back frame S/A.



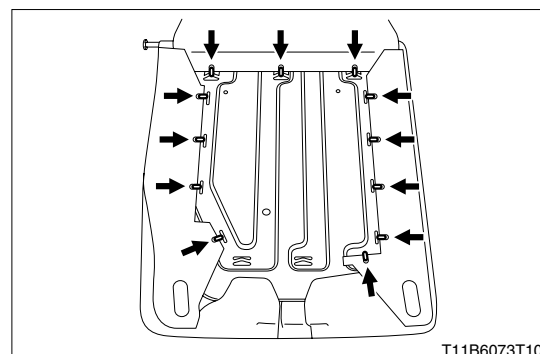
(3) Pad S/A, rear seat cushion, RH

1. Take off the small hog rings indicated in the figure, and remove the pad S/A from the RH rear seat cushion frame S/A.



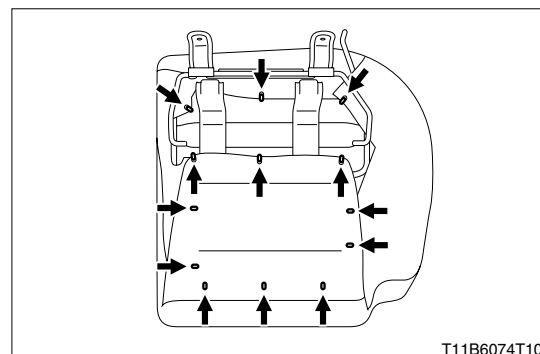
(4) Pad S/A, rear seat back, LH

1. Take off the small hog rings indicated in the figure, and remove the pad S/A from the LH rear seat back frame S/A.



(5) Pad S/A, rear seat cushion, LH

1. Take off the small hog rings indicated in the figure, and remove the pad S/A from the LH rear seat cushion frame S/A.

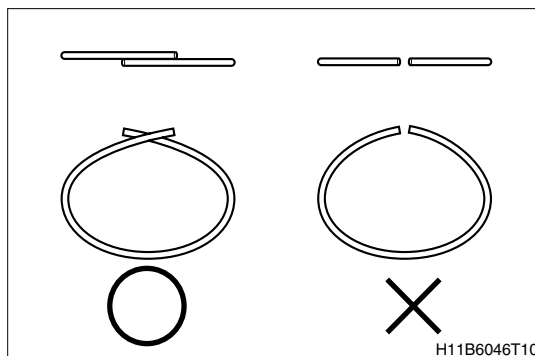


I2-33

11-2-4 POINTS OF ASSEMBLY

(1) Ring, hog small

1. Install the ring as indicated in the figure.



11-2-5 OPERATION AFTER ASSEMBLY

1. Install the rear seat back Ay RH/LH.

Refer to Page I2-28.

2. Install the rear seat cushion Ay RH/LH.

Refer to Page I2-28.

12 FRONT SEAT OUTER BELT

12-1 REMOVAL AND INSTALLATION

CAUTION

- Refer to the precaution on maintenance procedure for the SRS airbag system.

Refer to Page A1-2.

12-1-1 ARTICLES TO BE PREPARED

Instrument

Torque wrench

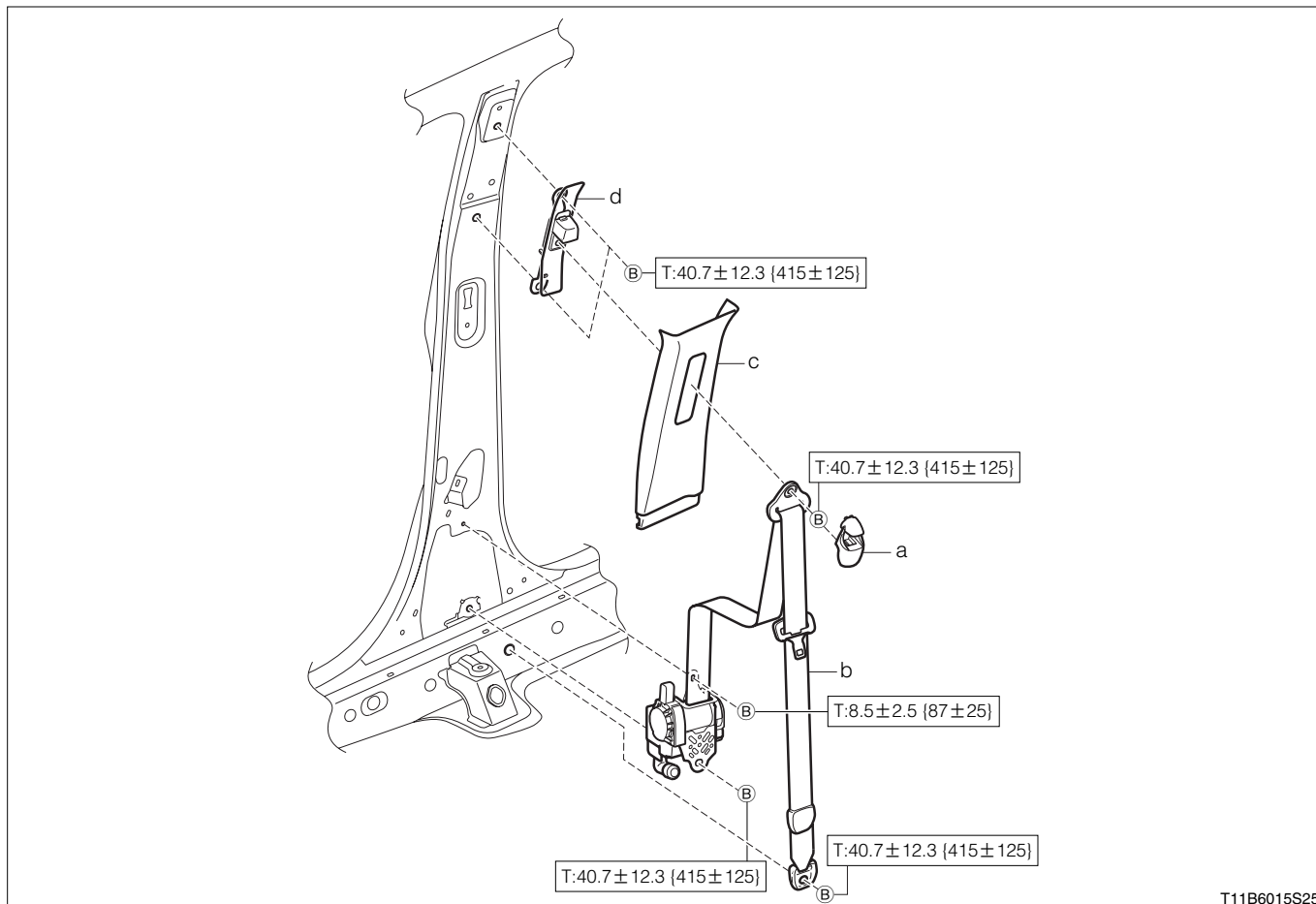
12-1-2 OPERATION BEFORE REMOVAL

1. Remove the battery negative (—) terminal.
2. Remove the center pillar lower garnish RH/LH.

Refer to Page I2-43.

12-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



Unit:N·m{kgf·cm}

(2) Removal and installation procedures

- 1 a Cover, shoulder belt anchor
- 2 b Belt Ay, front seat outer RH/LH
- ▼ 3 c Garnish, center pillar, upper RH/LH
- 4 d Adjuster Ay, front shoulder belt anchor

12-1-4 POINTS OF REMOVAL

(1) Garnish, center pillar, upper RH/LH

Refer to Page I2-43.

12-1-5 INSPECTION

(1) Belt Ay, front seat belt outer RH/LH

① Check of inclination angle at time of ELR lock

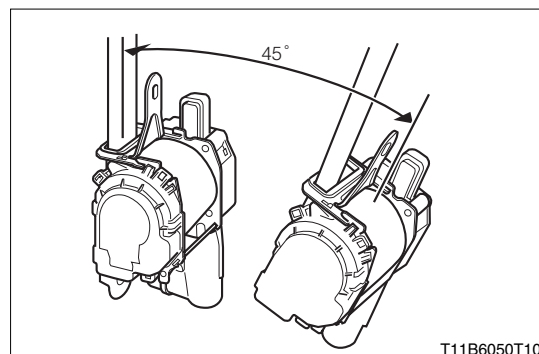
1. Gently move the belt Ay and check the locking state at various tilting angles.

SPECIFIED VALUE:

Ensure that the belt locking does not take place within 15 degrees in all directions. Also ensure that the lock is retained beyond 45 degrees.

WARNING

- Never disassemble the retractor.



T11B6050T10

12-35

② ELR lock check

1. Check the locking state when the seat belt is pulled out abruptly in the vehicle assembled state.
SPECIFIED VALUE: The belt Ay shall be locked.

(2) External appearance check

1. When the following cases have occurred, replace the belt assembly.
 - (1) Case where the pretensioner mechanism has been actuated.
 - (2) Case where the vehicle is damaged in a collision, including a minor one in which pretensioner mechanism has not been actuated.
 - (3) In cases where the pretensioner mechanism of the belt Ay exhibits damage or cracks.
 - (4) Case where the connector or harness has dents or chips.
 - (5) Case where considerable amount of grease, water, detergent and oil are left on the pretensioner mechanism of the belt Ay.
 - (6) Case where the pretensioner mechanism of the belt Ay has been dropped and damaged.

12-1-6 OPERATION AFTER INSTALLATION

1. Install the RH/LH center pillar lower garnish.
Refer to Page I2-43.
2. Connect the battery negative (－) terminal.
3. Turn ON the IG switch.
4. Ensure that the airbag warning lamp is illuminated for about 6 seconds and then remains extinguished afterward.



13 REAR SEAT OUTER BELT

13-1 REMOVAL AND INSTALLATION(TWO - POINT SEAT BELTS)

13-1-1 ARTICLES TO BE PREPARED

Instrument

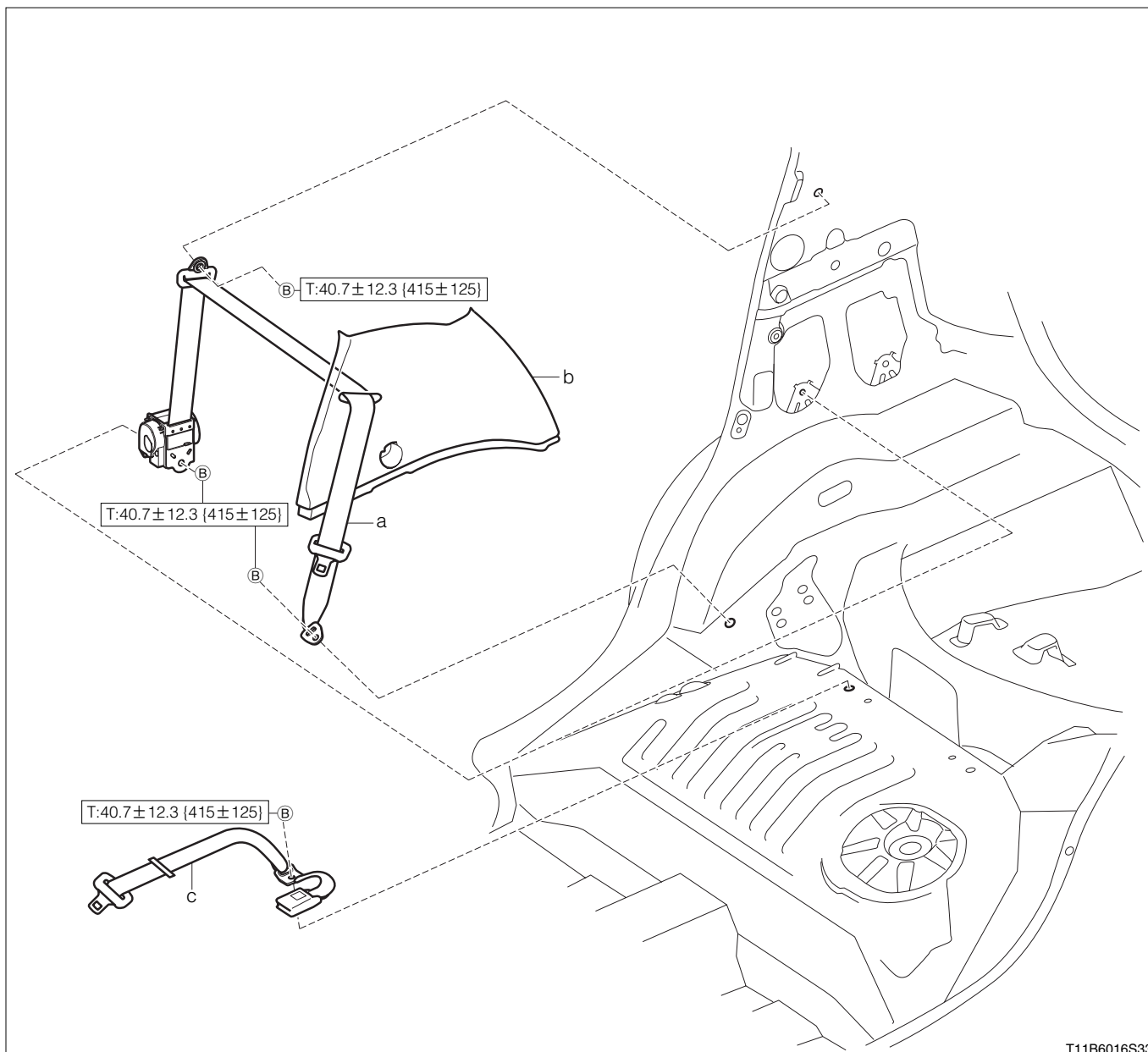
Torque wrench

13-1-2 OPERATION BEFORE REMOVAL

1. Remove the rear quarter trim panel Ay RH/LH.
Refer to Page I2-43.

13-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



Unit:N·m{kgf·cm}

(2) Removal and installation procedures

- 1 a Belt Ay, rear seat, outer RH/LH
- ▼ 2 b Garnish, roof side inner, RH/LH
- 3 c Belt Ay, rear seat lap type, center w/inner

13-1-4 POINTS OF REMOVAL

(1) Garnish, roof side, inner RH/LH

Refer to Page I2-43.

13-1-5 INSPECTION

(1) Belt Ay, rear seat, outer

① CHECK of inclination angle at time of ELR lock

1. Gently move the belt Ay and check the locking state at various tilting angles.
- SPECIFIED VALUE: Ensure that the belt locking does not take place within 15 degrees in all directions. Also ensure that the lock is retained beyond 45 degrees.

WARNING

- Never disassemble the retractor.

(2) ELR lock check

1. Check the locking state when the seat belt is pulled out abruptly in the vehicle assembled state.
- SPECIFIED VALUE: The belt shall be locked.

13-1-6 POINTS OF INSTALLATION

(1) Belt Ay, rear seat, outer RH/LH

CAUTION

- Assemble in a way that the webbing does not twist.
- In the assembled state, ensure that the belt can be pulled out and returned smoothly.

13-1-7 OPERATION AFTER INSTALLATION

1. Install the rear quarter trim panel Ay RH/LH.
- Refer to Page I2-43.

13-2 REMOVAL AND INSTALLATION(THREE - POINT SEAT BELTS)

13-2-1 ARTICLES TO BE PREPARED

Instrument

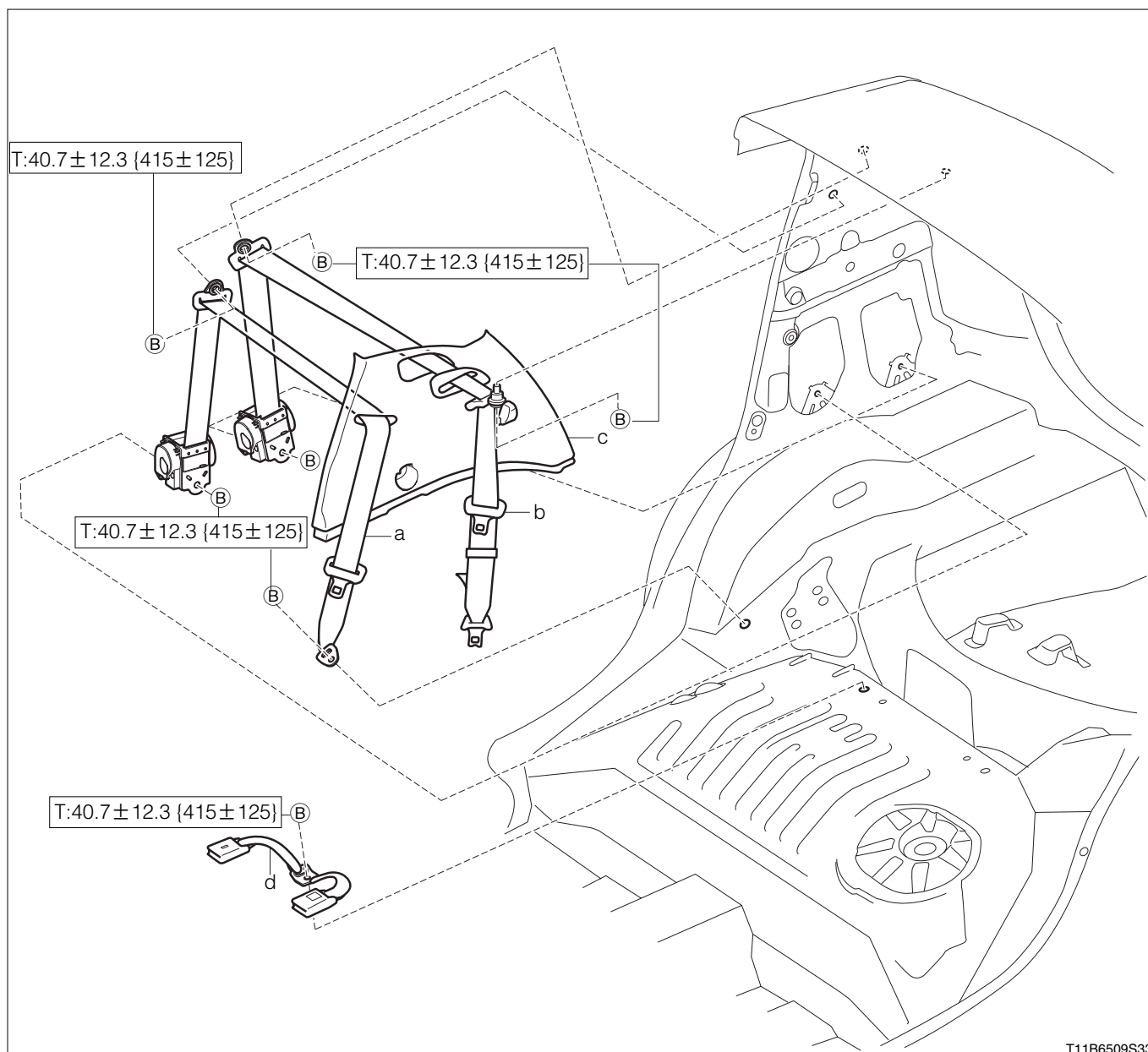
Torque wrench

13-2-2 OPERATION BEFORE REMOVAL

1. Remove the rear quarter trim panel Ay RH/LH.
- Refer to Page I2-43.

13-2-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



T11B6509S33

Unit:N·m{kgf·cm}

(2) Removal and installation procedures

- 1 a Belt Ay, rear seat, outer RH/LH
- 2 b Belt Ay, rear seat, outer center
- ▼ 3 c Garnish, roof side inner, RH/LH
- 4 d Belt Ay, rear seat lap type, center w/inner

13-2-4 POINTS OF REMOVAL

(1) Garnish, roof side, inner RH/LH

Refer to Page I2-43.

13-2-5 INSPECTION

(1) Belt Ay, rear seat, outer and belt Ay, rear seat, outer center

① Check of inclination angle at time of ELR lock

1. Gently move the belt Ay and check the locking state at various tilting angles.
- SPECIFIED VALUE: Ensure that the belt locking does not take place within 15 degrees in all directions. Also ensure that the lock is retained beyond 45 degrees.

WARNING

- Never disassemble the retractor.

(2) ELR lock check

1. Check the locking state when the seat belt is pulled out abruptly in the vehicle assembled state.
- SPECIFIED VALUE: The belt shall be locked.

13-2-6 POINTS OF INSTALLATION

(1) Belt Ay, rear seat, outer center and belt Ay, rear seat, outer RH/LH

CAUTION

- Assemble in a way that the webbing does not twist.
- In the assembled state, ensure that the belt can be pulled out and returned smoothly.

13-2-7 OPERATION AFTER INSTALLATION

1. Install the rear quarter trim panel Ay RH/LH.
- Refer to Page I2-43.

14 TRIM PANEL

14-1 REMOVAL AND INSTALLATION

14-1-1 ARTICLES TO BE PREPARED

Tool

Clip remover

Lubricant,adhesive,others

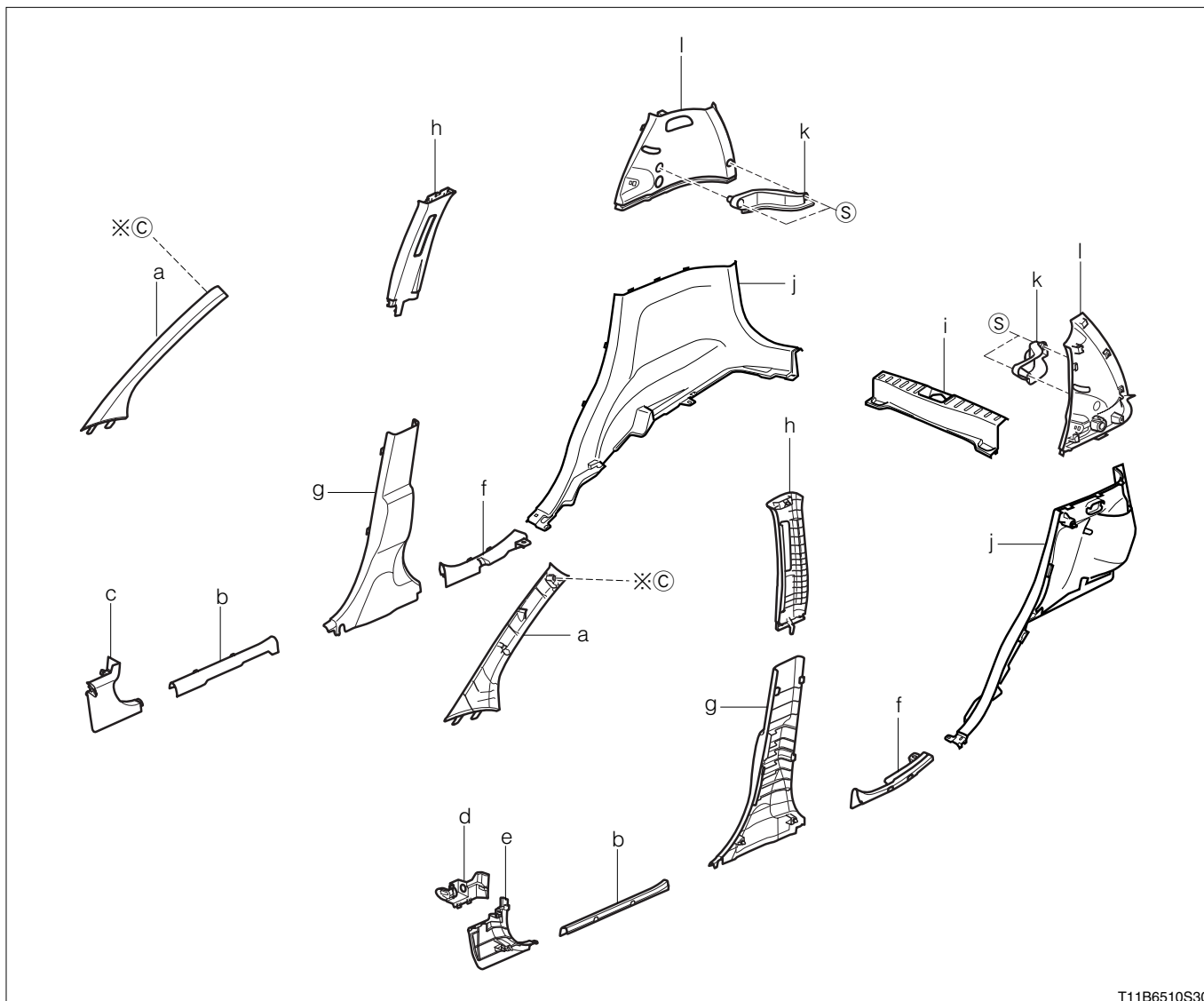
Protective tape

14-1-2 OPERATION BEFORE REMOVAL

1. Remove the shoulder anchor portion of the RH/LH outer front seat belt Ay. (Only when removing the RH/LH upper center pillar garnish.)
- Refer to Page I2-33.
2. Remove the shoulder anchor portion of the RH/LH outer rear seat belt Ay. (Only when removing the RH/LH inner roof side garnish.)
- Refer to Page I2-35.
3. Remove the shoulder anchor section of the outer center rear seat belt Ay. (Only when the inner RH /LH roof side garnish of the three-point seat belt-equipped vehicle has been removed)
- Refer to Page I2-37.
4. Remove the dome lamp Ay. (Only when removing the LH rear quarter trim panel Ay.)
- Refer to Page J1-11.

14-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



T11B6510S30

※:Non-reusable parts (vehicles with curtain shield airbag)

(2) Removal and installation procedures

▼ 1 a Garnish, front pillar, RH/LH	▼ 7 g Garnish, center pillar, lower RH/LH
▼ 2 b Plate, front door scuff, RH/LH	▼ 8 h Garnish, center pillar, upper RH/LH
▼ 3 c Board, cowl side trim, RH	▼ 9 i Cover, deck trim, rear
▼ 4 d Cover, cowl side trim service hole	▼ 10 j Panel Ay, quarter trim, rear RH/LH
▼ 5 e Board, cowl side trim, LH	▼ 11 k Panel S/A, quarter trim, upper RH/LH
▼ 6 f Plate, rear door scuff, RH/LH	▼ 12 l Garnish, roof side, inner RH/LH

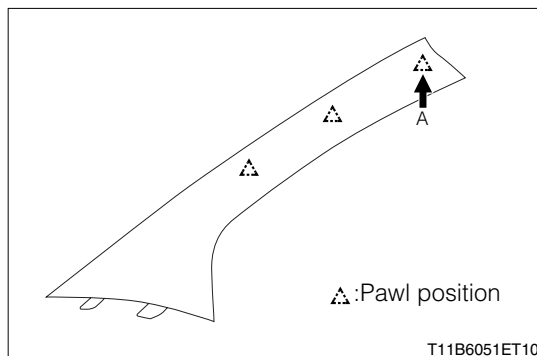
14-1-4 POINTS OF REMOVAL

(1) Garnish, front pillar, RH/LH

1. Remove the weather-strip.
2. Using a flat screwdriver wrapped with a protection tape, press the pawl (A) fitting section from the bottom of the vehicle indicated in the right figure and remove.

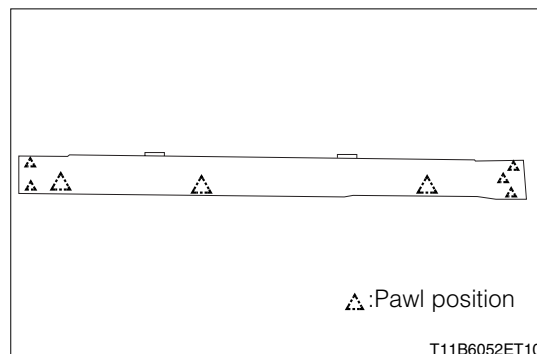
I2-41

3. Disengage the pawls indicated in the right figure except the one in section A at the right figure and, remove the garnish.



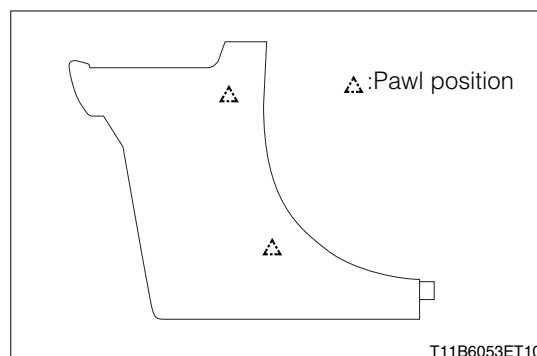
(2) Plate, front door scuff, RH/LH

1. Disengage the pawls indicated in the right figure and, remove the plate.



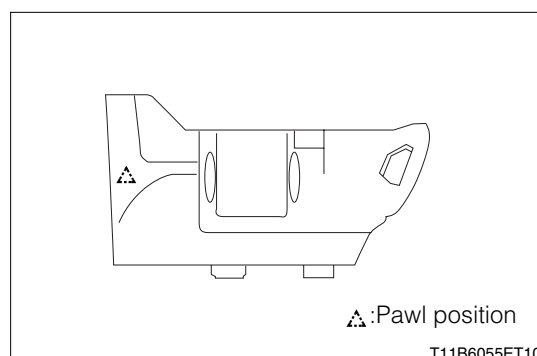
(3) Board, cowl side trim, RH

1. Disengage the pawls indicated in the right figure and, remove the board.



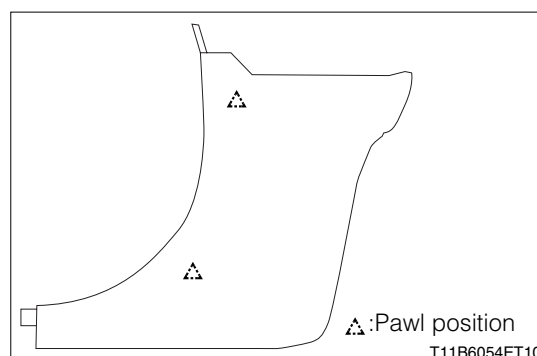
(4) Cover, cowl side trim service hole

1. Disengage the pawls indicated in the right figure and, remove the cover.



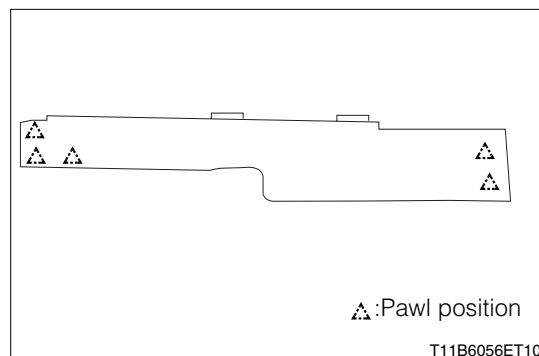
(5) Board, cowl side trim, LH

1. Disengage the pawls indicated in the right figure and, remove the board.

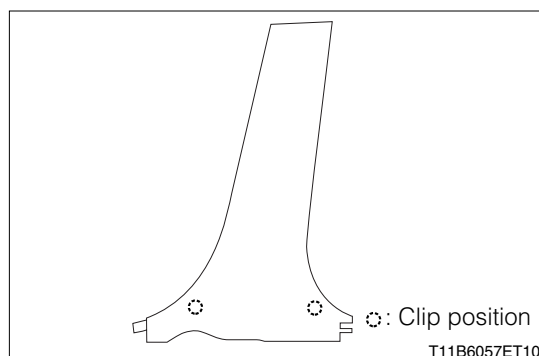


(6) **Plate, rear door scuff, RH/LH**

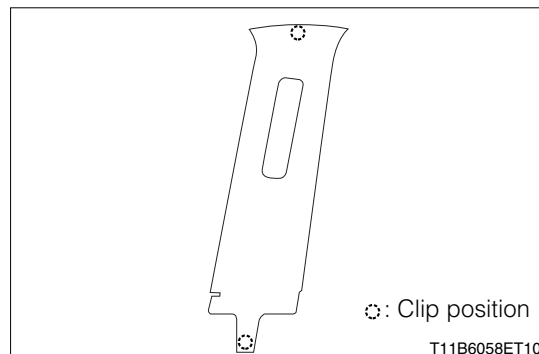
1. Disengage the pawls indicated in the right figure and, remove the plate.

(7) **Garnish, center pillar, lower RH/LH**

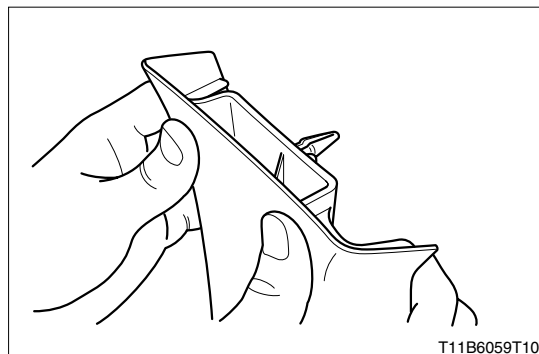
1. Disengage the clips indicated in the right figure and, remove the garnish.

(8) **Garnish, center pillar, upper RH/LH**

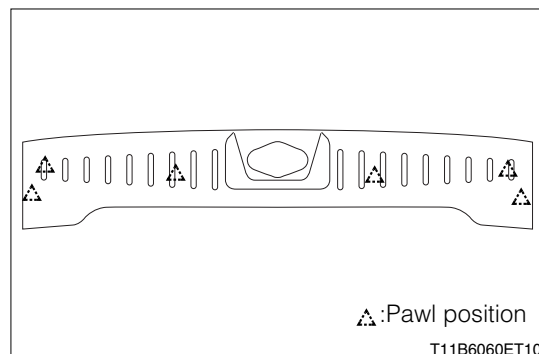
1. Disengage the clips indicated in the right figure and, remove the garnish.

**CAUTION**

- Hold the correct place indicated in the right figure to prevent the garnish from getting deformed. Remove it without bending.

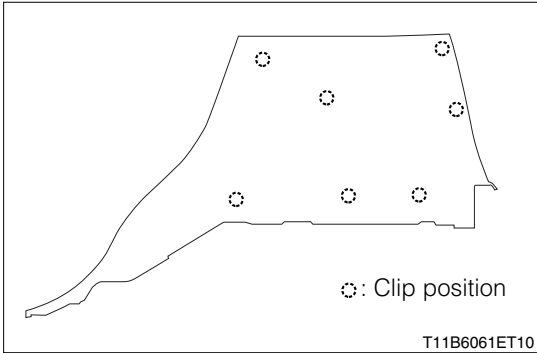
(9) **Cover, deck trim, rear**

1. Disengage the pawls indicated in the right figure and, remove the cover.



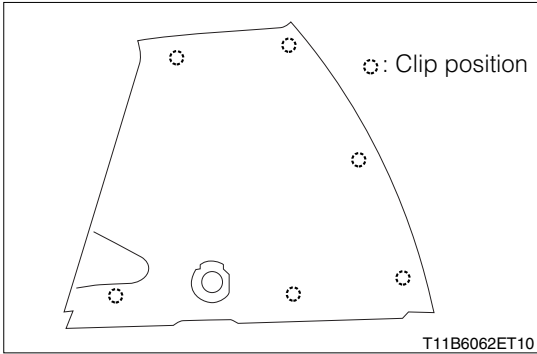
(10) Panel Ay, quarter trim, rear RH/LH

- 1. Disengage the clips indicated in the right figure and, remove the panel Ay.



(11) Garnish, roof side, inner RH/LH

- 1. Disengage the clips indicated in the right figure and, remove the garnish.



14-1-5 OPERATION AFTER INSTALLATION

- 1. Install the dome lamp Ay. (Only when removing the LH rear quarter trim panel Ay.)
Refer to Page J1-11.
- 2. Install the shoulder anchor section of the RH/LH outer front seat belt Ay. (Only when removing the RH/LH upper center pillar garnish.)
Refer to Page I2-37.
- 3. Install the shoulder anchor section of the outer center rear seat belt Ay. (Only when the inner RH /LH roof side garnish of the three-point seat belt-equipped vehicle has been removed)
Refer to Page I2-35.
- 4. Install the shoulder anchor portion of the RH/LH outer rear seat belt Ay. (Only when removing the RH/LH inner roof side garnish.)
Refer to Page I2-33.

15 ROOF HEADLINING

15-1 REMOVAL AND INSTALLATION

15-1-1 ARTICLES TO BE PREPARED

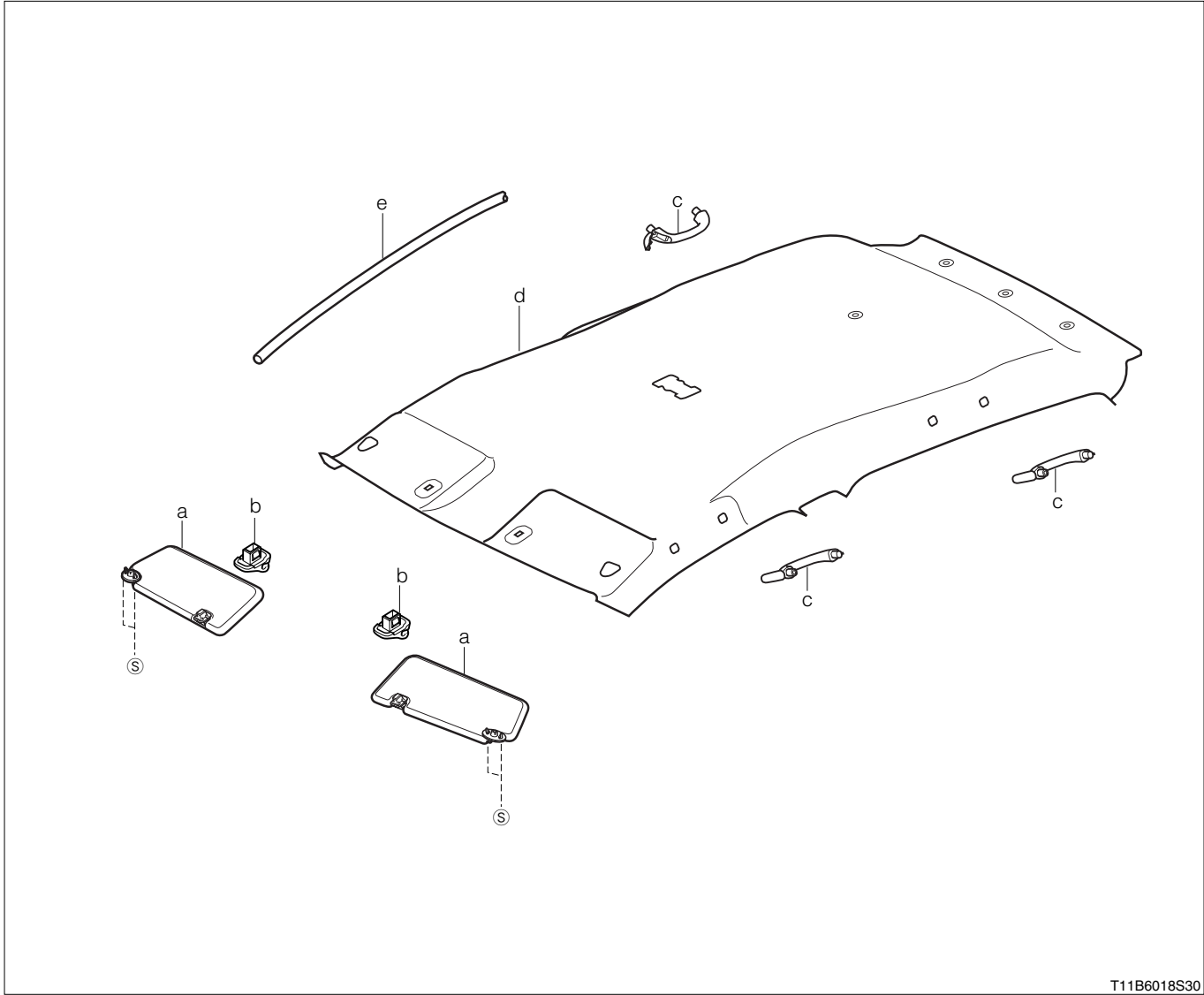
Tool
Clip remover
Lubricant,adhesive,others
Protective tape,Wire harness repair tape (Part number : 82997-B2010-000)

15-1-2 OPERATION BEFORE REMOVAL

1. Remove the front pillar garnish RH/LH.
Refer to Page I2-43.
2. Remove the center pillar upper garnish RH/LH.
Refer to Page I2-43.
3. Remove the shoulder anchor section of the outer center rear seat belt Ay. (Three-point seat belt-equipped vehicle)
Refer to Page I2-37.
4. Remove the roof side inner garnish RH/LH.
Refer to Page I2-43.
5. Remove the map lamp Ay.
Refer to Page J1-9.
6. Remove the dome lamp Ay.
Refer to Page J1-11.

15-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



T11B6018S30

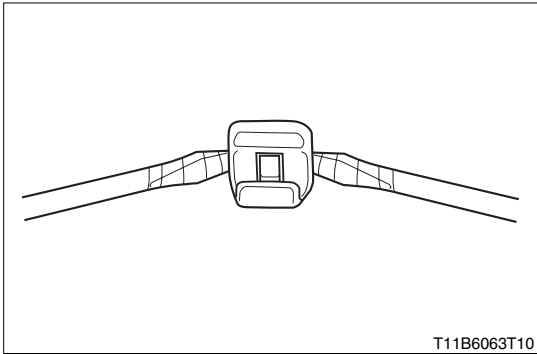
(2) Removal and installation procedures

- 1 a Visor Ay, RH/LH
- ▼ 2 b Holder, visor
- 3 c Grip, assist
- ▼ ▲ 4 d Headlining Ay, roof
- 5 e Hose Ay, washer

15-1-4 POINTS OF REMOVAL

(1) Holder, visor

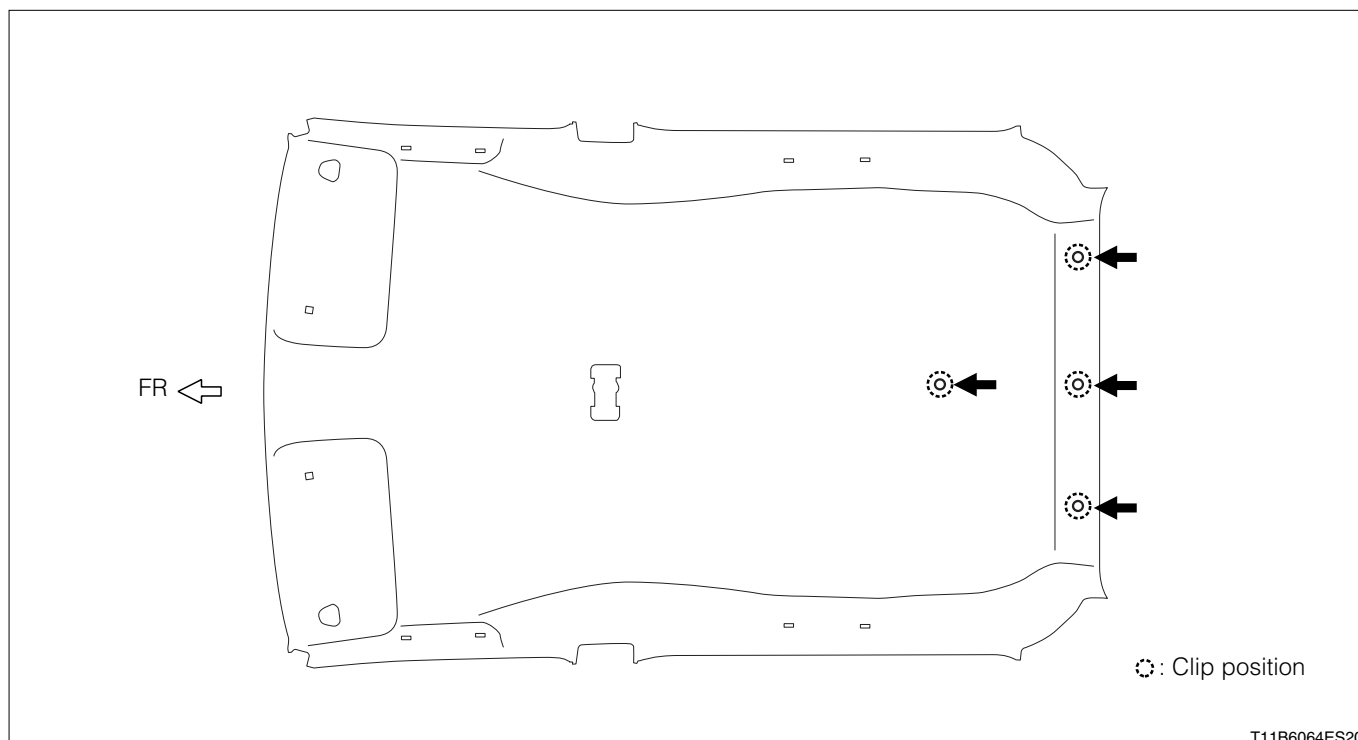
- 1. Disengage the pawls to remove it by inserting a minus driver wrapped in protection tape from both sides.



T11B6063T10

(2) Headlining Ay, roof

1. Remove the clips (4 locations).



T11B6064ES20

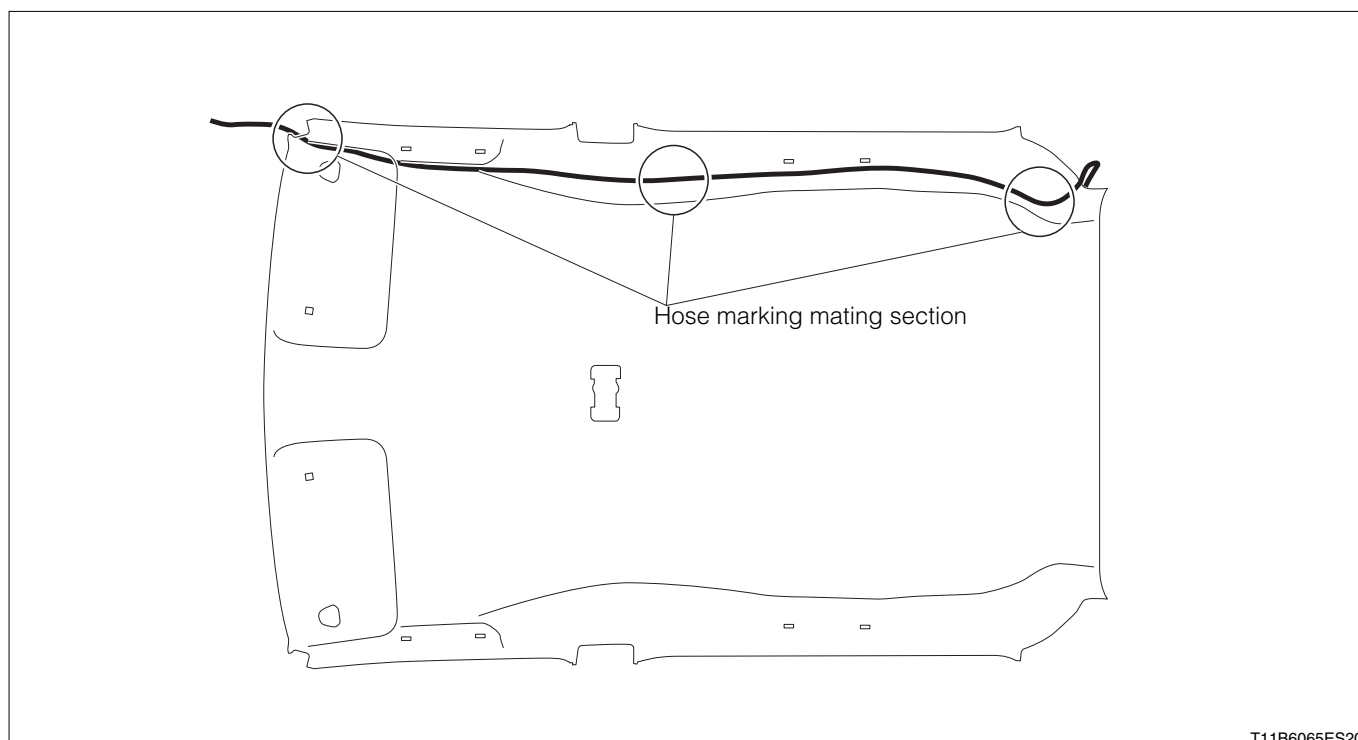
15-1-5 POINTS OF INSTALLATION

(1) Headlining Ay, roof

1. Apply the double-sided tape to the groove in the head lining Ay.
2. Fix the washer hose Ay along the head lining Ay groove to which the double-sided tape has been affixed.

NOTE

- Tape: Wire harness repair tape, Part No : 82997-B2010-000



T11B6065ES20

I2-47

15-1-6 OPERATION AFTER INSTALLATION

1. Install the dome lamp Ay.
Refer to Page J1-11.
2. Install the map lamp Ay.
Refer to Page J1-9.
3. Install the roof side inner garnish RH/LH.
Refer to Page I2-43.
4. Install the shoulder anchor section of the outer center rear seat belt Ay. (Three-point seat belt-equipped vehicle)
Refer to Page I2-37.
5. Install the center pillar upper garnish RH/LH.
Refer to Page I2-43.
6. Install the front pillar garnish RH/LH.
Refer to Page I2-43.

16 FLOOR CARPET

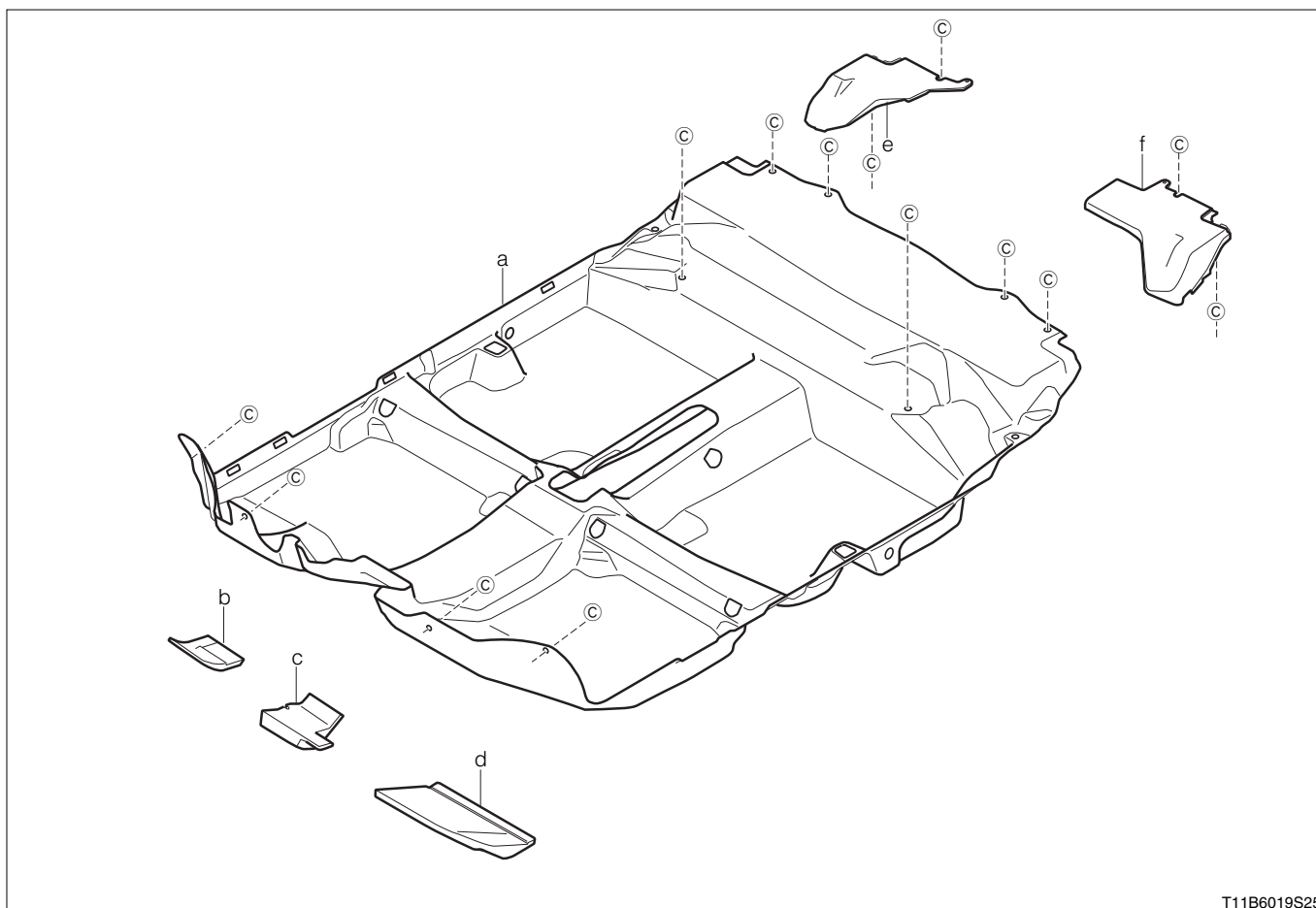
16-1 REMOVAL AND INSTALLATION

16-1-1 OPERATION BEFORE REMOVAL

1. Remove the front seat Ay RH/LH.
Refer to Page I2-24.
2. Remove the rear console box S/A.
Refer to Page I2-23.
3. Remove the front console box S/A.
Refer to Page I2-23.
4. Remove the rear seat cushion Ay RH/LH.
Refer to Page I2-28.
5. Remove the front door scuff plate RH/LH.
Refer to Page I2-43.
6. Remove the cowl side trim board RH/LH.
Refer to Page I2-43.
7. Remove the rear door scuff plate RH/LH.
Refer to Page I2-43.
8. Remove the center pillar lower garnish RH/LH.
Refer to Page I2-43.

16-1-2 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



T11B6019S25

(2) Removal and installation procedures

1	a Carpet Ay, floor, front	6	f Board, rear floor, front LH
2	b Pad, dash panel insulator, No.2		
3	c Pad, dash panel insulator, No.4		
4	d Pad, dash panel insulator, No.3		
5	e Board, rear floor, front RH		

16-1-3 OPERATION AFTER INSTALLATION

1. Install the center pillar lower garnish RH/LH.
Refer to Page I2-43.
2. Install the rear door scuff plate RH/LH.
Refer to Page I2-43.
3. Install the cowl side trim board RH/LH.
Refer to Page I2-43.
4. Install the front door scuff plate RH/LH.
Refer to Page I2-43.
5. Install the rear seat cushion Ay RH/LH.
Refer to Page I2-28.
6. Install the front console box S/A.
Refer to Page I2-23.
7. Install the rear console box S/A.
Refer to Page I2-23.
8. Install the front seat Ay RH/LH.
Refer to Page I2-24.

I3 WINDSHIELD WINDOWGLASS/MIRROR

WINDSHIELD GLASS -----	I3—1
REMOVAL AND INSTALLATION-----	I3—1
BACK DOOR WINDOW -----	I3—5
REMOVAL AND INSTALLATION-----	I3—5
POWER WINDOW MASTER SWITCH-----	I3—9
REMOVAL AND INSTALLATION-----	I3—9
FRONT DOOR POWER WINDOW SWITCH -----	I3—9
REMOVAL AND INSTALLATION-----	I3—9
REAR DOOR POWER WINDOW SWITCH -----	I3—9
REMOVAL AND INSTALLATION-----	I3—9
FRONT DOOR REGULATOR-----	I3—9
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I3-1

1 WINDSHIELD GLASS

1-1 REMOVAL AND INSTALLATION

1-1-1 ARTICLES TO BE PREPARED

Tool

Sealant gun, Drill or eyeleteer (heavy needle to make a hole), Cutter knife, Rubber suction cups

Lubricant, adhesive, others

Seal set (Part number : 999-09600-U9-001), Wooden block, Protective tape, Cloth, Alcohol or white gasoline, Piano wire

1-1-2 OPERATION BEFORE REMOVAL

1. Remove the cowl top ventilator louver RH/LH.

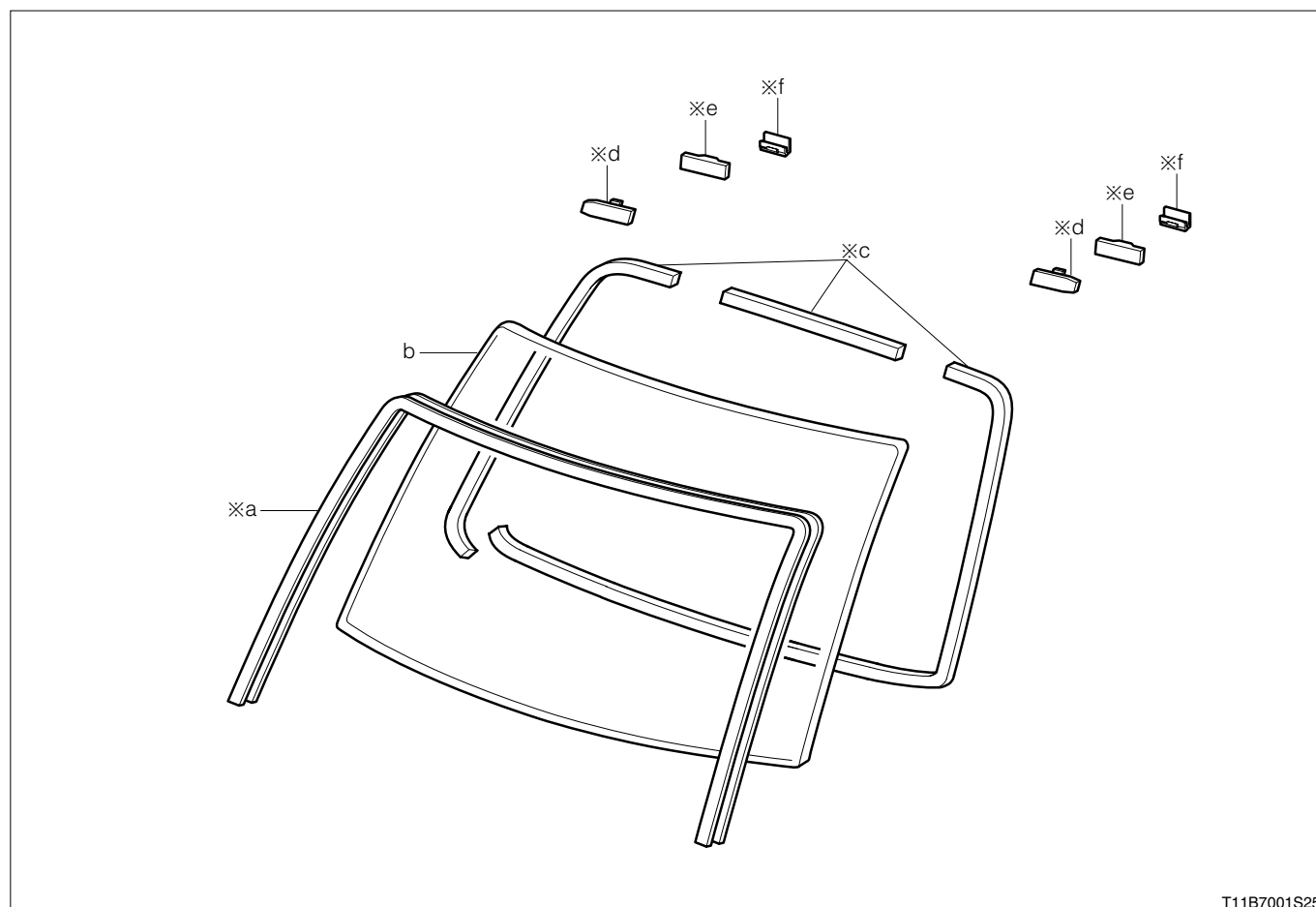
Refer to Page I2-4.

2. Remove the instrument panel.

Refer to Page I2-15.

1-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



※:Non-reusable parts.

The window glass adhesive dam is supplied as a single part in length necessary for one car.

(2) Removal procedures

- 1 a Moulding, windshield, outside
- ▼ 2 b Glass S/A, windshield
- 3 c Dam, window glass adhesive
- 4 d Stopper, windshield glass

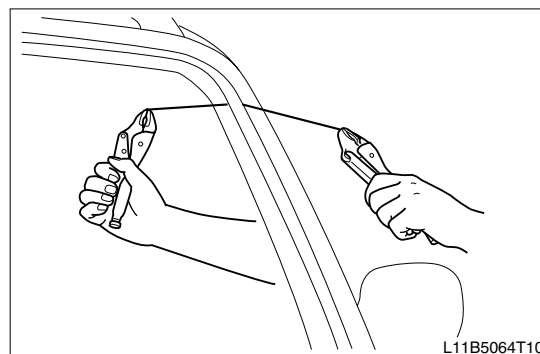
(3) installation procedures

- ▲ 1 f Stopper, windshield glass, No.1(For repair)
- ▲ 2 e Stopper, windshield glass, No.2 (For repair)
- ▲ 3 c Dam, window glass adhesive
- ▲ 4 b Glass S/A, windshield
- ▲ 5 a Moulding, windshield, outside

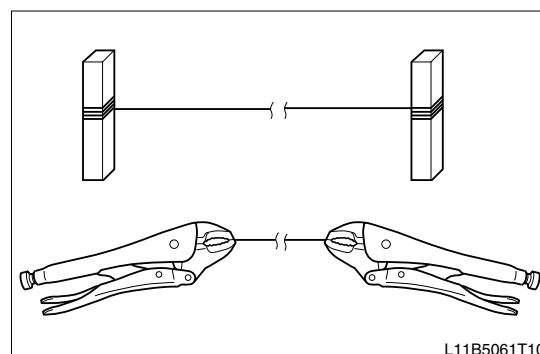
1-1-4 POINTS OF REMOVAL

(1) Glass S/A, windshield

1. Apply a protective seal to the body around the edge of the glass.
2. Make a hole in the adhesive layer and pass a piano wire through it.
3. Using the piano wire, saw the adhesive layer.

**CAUTION**

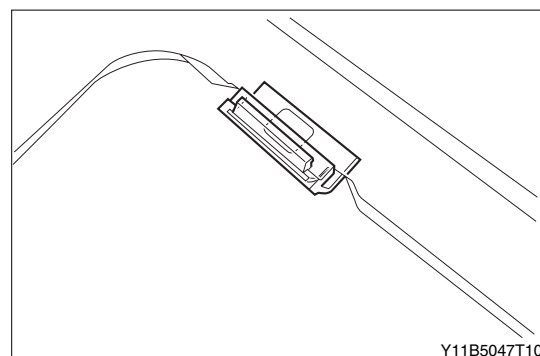
- When cutting the glass adhesive layer, attach a wooden block to each end of the piano wire or fit vice pliers to it.



1-1-5 POINTS OF INSTALLATION

(1) Stopper, windshield glass, No.1

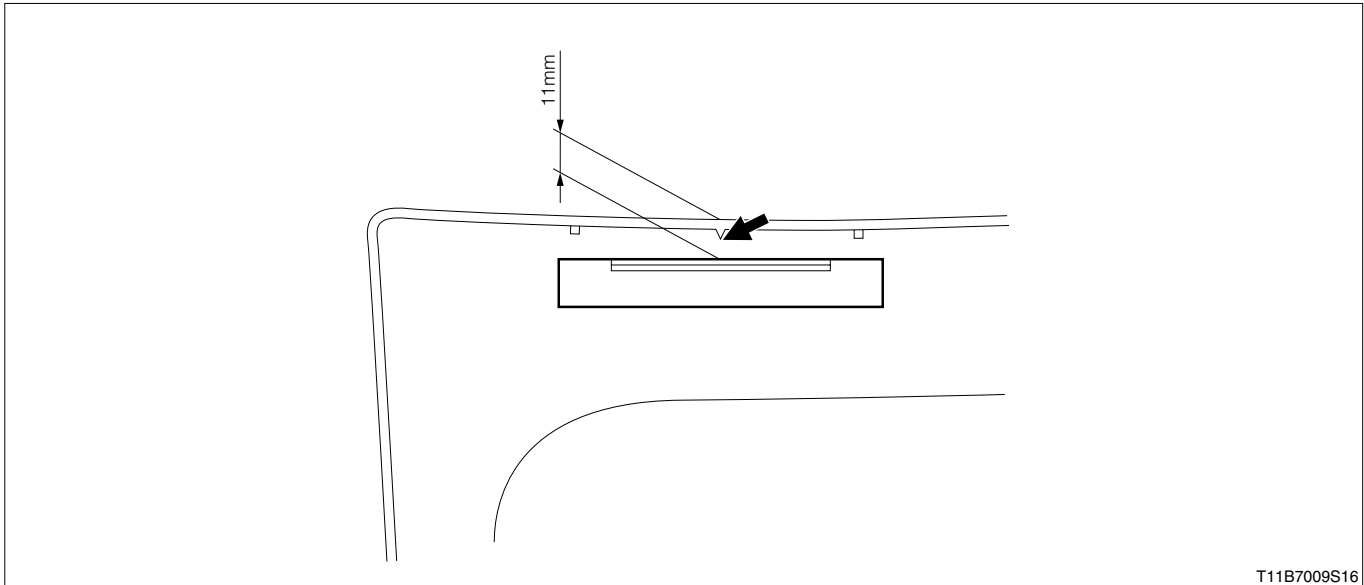
1. Attach the stopper to the body hook section. (Two sections at both right and left)



I3-3

(2) Stopper, windshield glass, No.2

1. Affix the stopper to the position shown at the figure below. (Two sections at both right and left)
2. Match the center of the stopper with the cut-out section and affix it to the glass.



T11B7009S16

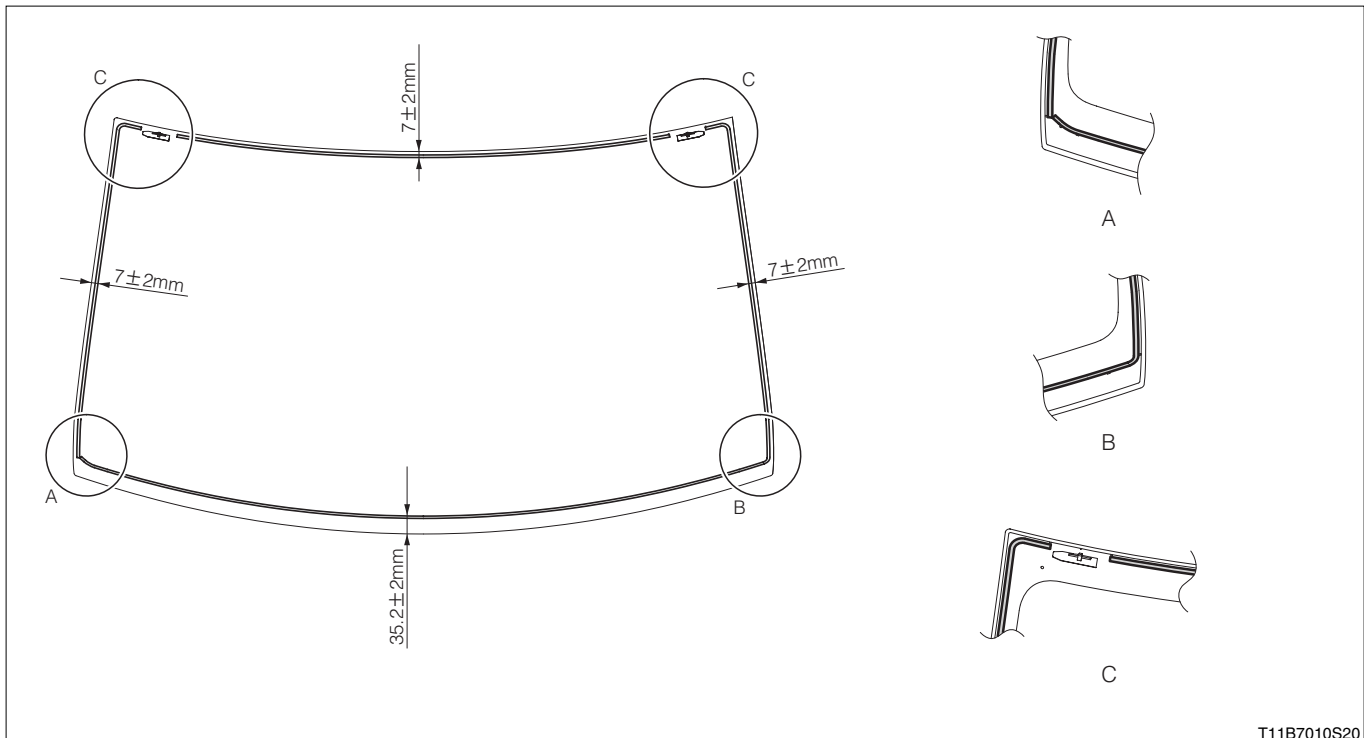
(3) Dam, window glass adhesive

1. Attach the dam to the position shown in the figure below based on the procedure below.

Match the dams at the corner. (Area A)

Do not bend. (Area B)

Cut the dam at the ceramic cut-out section and affix. (Area C)



T11B7010S20

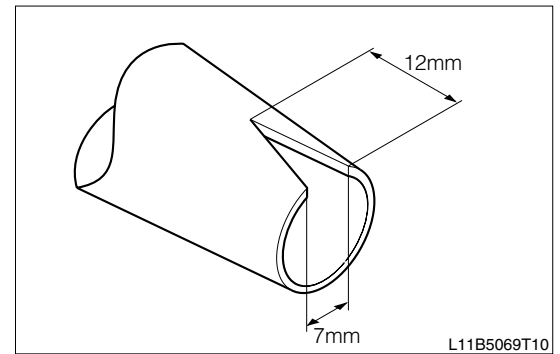
(4) Glass S/A, windshield

1. Apply glass primer to the glass side adhesive section.

CAUTION

- Do not coat thickly.
- Do not coat the adhesive.
- Proceed with work after the primer is dry.

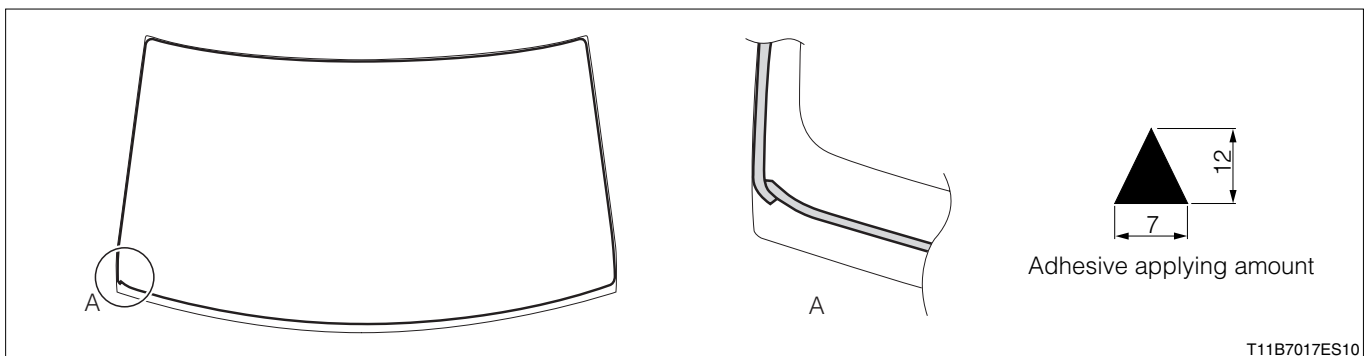
2. Cut the cartridge nozzle tip as shown in the illustration at right.



3. Load the cartridge into the gun and apply adhesive all the way around the dam.

CAUTION

- Proceed with work after the primer is dry.
- Apply the adhesive amply to the corners.
- Overlap adhesive at the corner. (Area A)



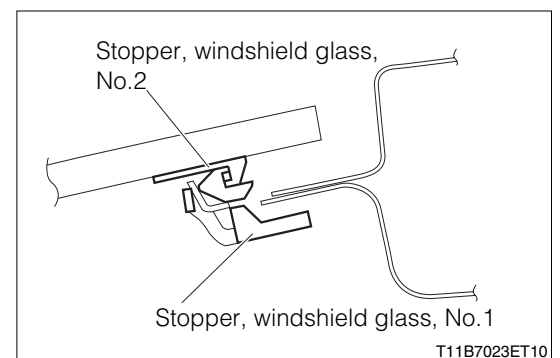
4. Using a suction rubber cup, hook the No.2 windshield glass stopper mounted to the glass S/A to the No.1 windshield glass stopper mounted on the body.

TOOL: Rubber suction cups

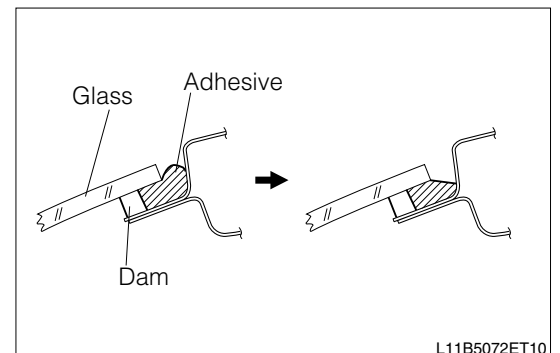
5. Lightly push the glass front surface to fit it firmly.

CAUTION

- Install the glass within 5 minutes after applying the adhesive.



6. Using a spatula or the like, correct any adhesive oozing out from the glass top section and side sections.



(5) **Moulding, windshield, outside**

- 1. Before the adhesive hardens, install the moulding.
- 2. After the adhesive hardens, check for water leakage.

CAUTION

- If water leaks, after removing water, reapply the glass from the beginning.
- If you move the vehicle after the glass installation, move the vehicle gently.

NOTE

- Refer to the seal set instruction manual for information regarding the adhesive's minimum drying time.

1-1-6 **OPERATION AFTER INSTALLATION**

- 1. Install the instrument panel.
Refer to Page I2-15.
- 2. Install the cowl top ventilator louver RH/LH.
Refer to Page I2-4.

2 **BACK DOOR WINDOW**

2-1 **REMOVAL AND INSTALLATION**

2-1-1 **ARTICLES TO BE PREPARED**

Tool

Sealant gun,Drill or eyeleteer (heavy needle to make a hole),Cutter knife,Rubber suction cups

Lubricant,adhesive,others

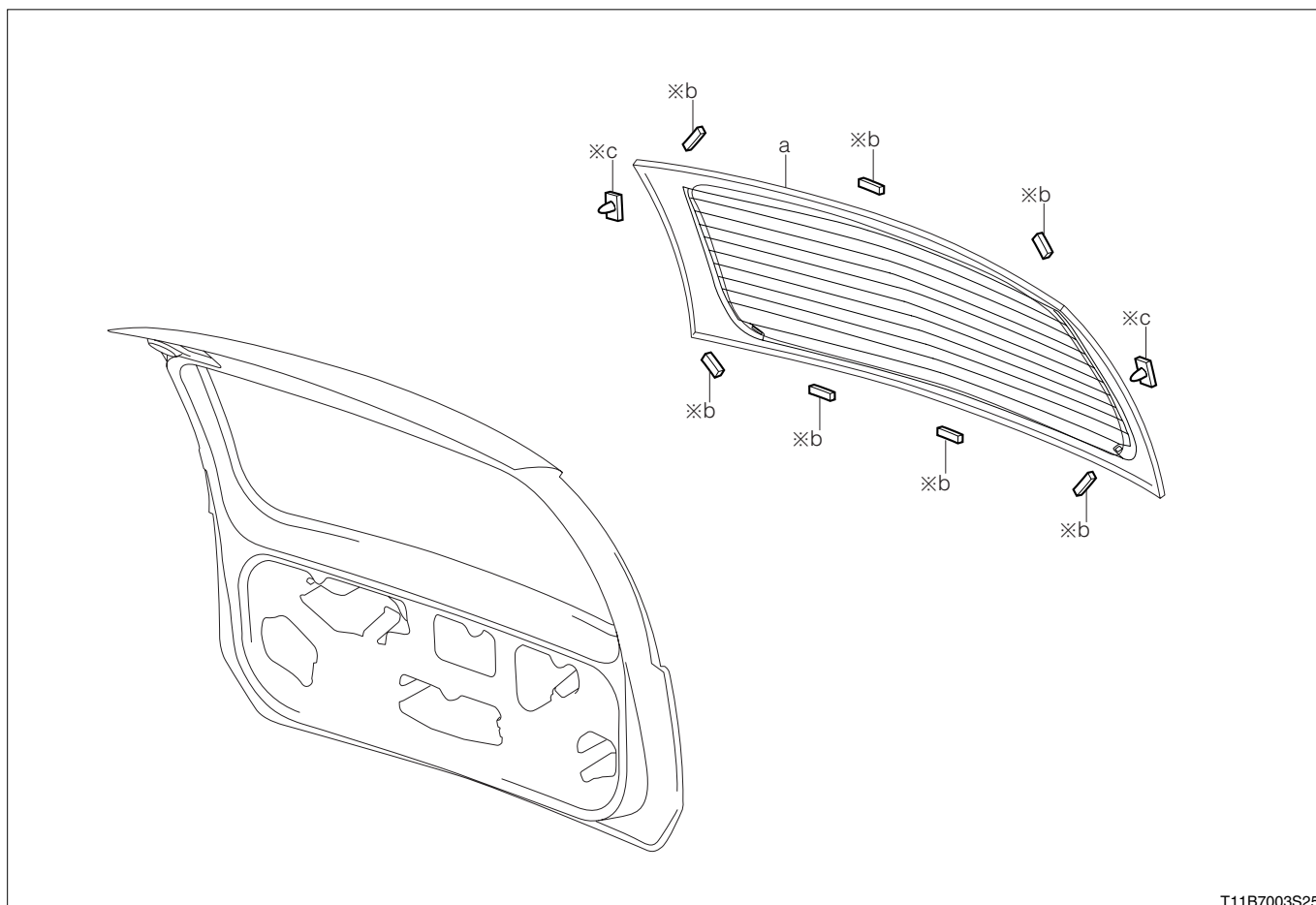
Seal set (Part number : 999-09600-U9-001),Wooden block,Protective tape,Cloth,Alcohol or white gasoline,Piano wire

2-1-2 **OPERATION BEFORE REMOVAL**

- 1. Remove the rear wiper arm Ay.
Refer to Page J2-12.

2-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



T11B7003S25

※:Non - reusable parts

(2) Removal and installation procedures

- ▼ ▲ 1 a Glass, back door
- ▲ 2 b Spacer, back window glass
- ▲ 3 c Clip, back window glass, RH

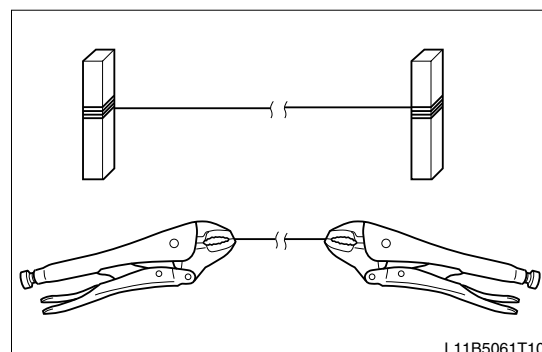
2-1-4 POINTS OF REMOVAL

(1) Glass, back door

1. Apply a protective tape to the body around the edge of the glass.
2. Make a hole in the adhesive layer and pass a piano wire through it.
3. Using the piano wire, saw the adhesive layer.

CAUTION

- When cutting the glass adhesive layer, attach a wooden block to each end of the piano wire or fit vice pliers to it.



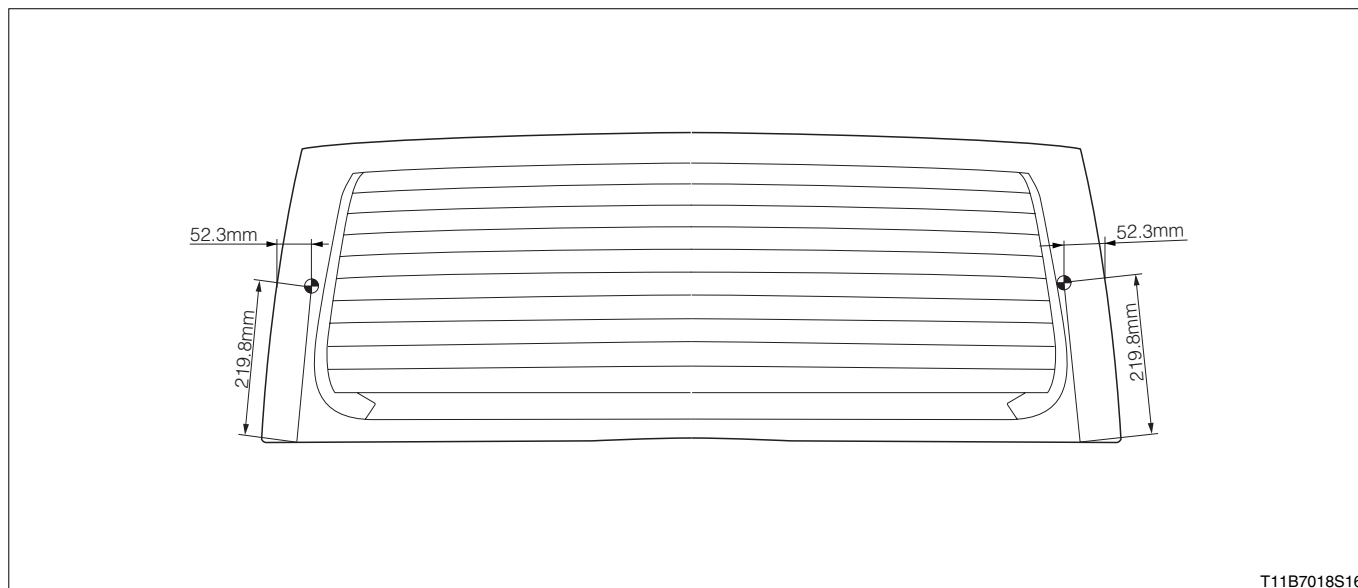
L11B5061T10

I3-7

2-1-5 POINTS OF INSTALLATION

(1) Clip, back window glass, RH

1. Attach to the positions shown below.



CAUTION

- The dimension in the illustration is the one along the glass surface.

(2) Spacer, back window glass

1. Use a cutter knife to smooth the cut adhesive layers on the body side and glass side.

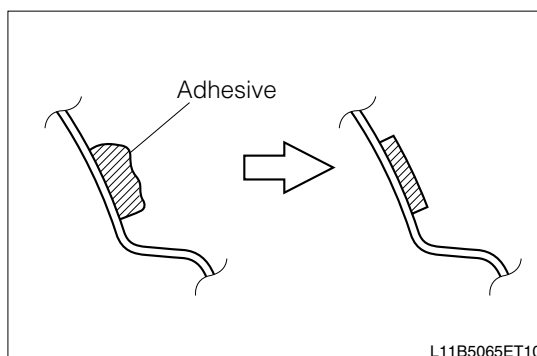
CAUTION

- Degrease the cutter knife.
- Leave a thin film of the adhesive layer.

2. Apply body primer to exposed body surfaces of the body side adhesion area.

CAUTION

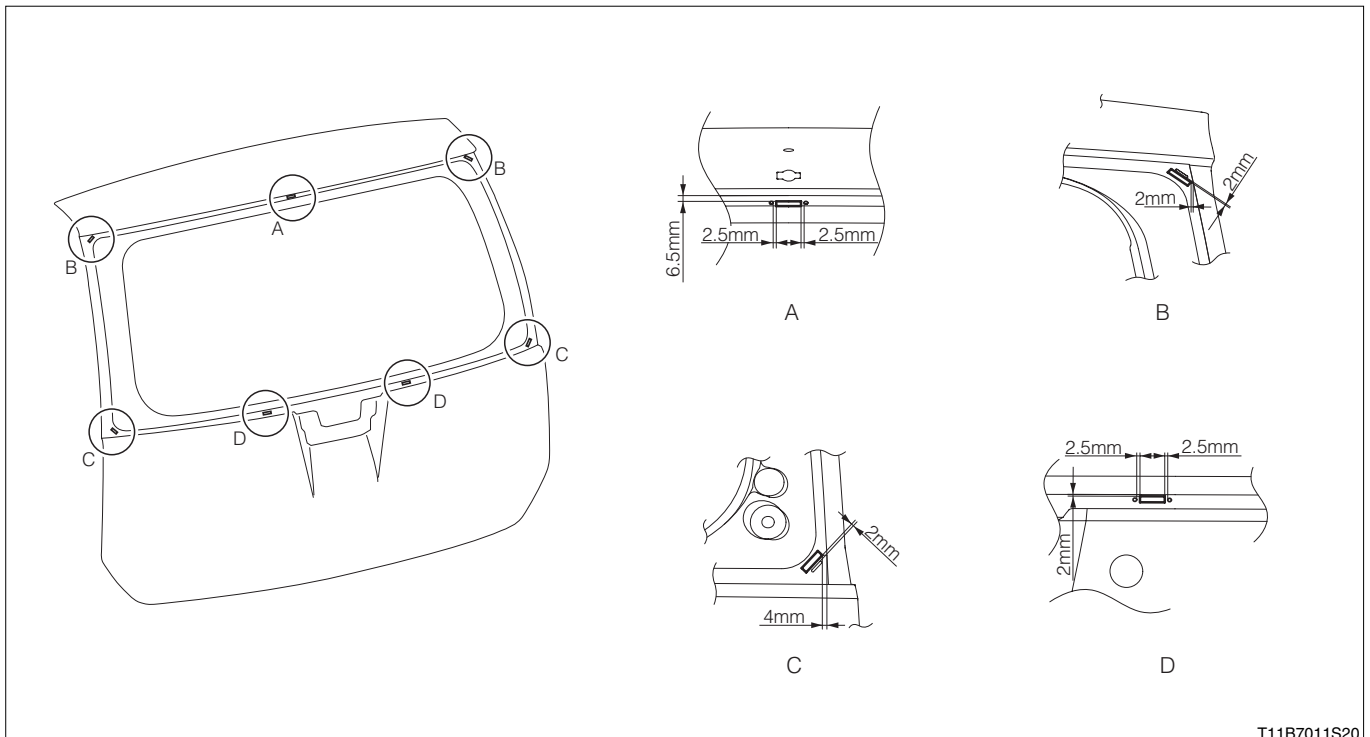
- Do not coat thickly.
- Do not coat the adhesive.
- After the primer is dry, proceed with the work.



3. Install the spacer. (7 points)

CAUTION

- Attach, aligning with the mark.



T11B7011S20

(3) Glass, back door

1. When installing new glass, apply glass primer to the glass adhesive section.

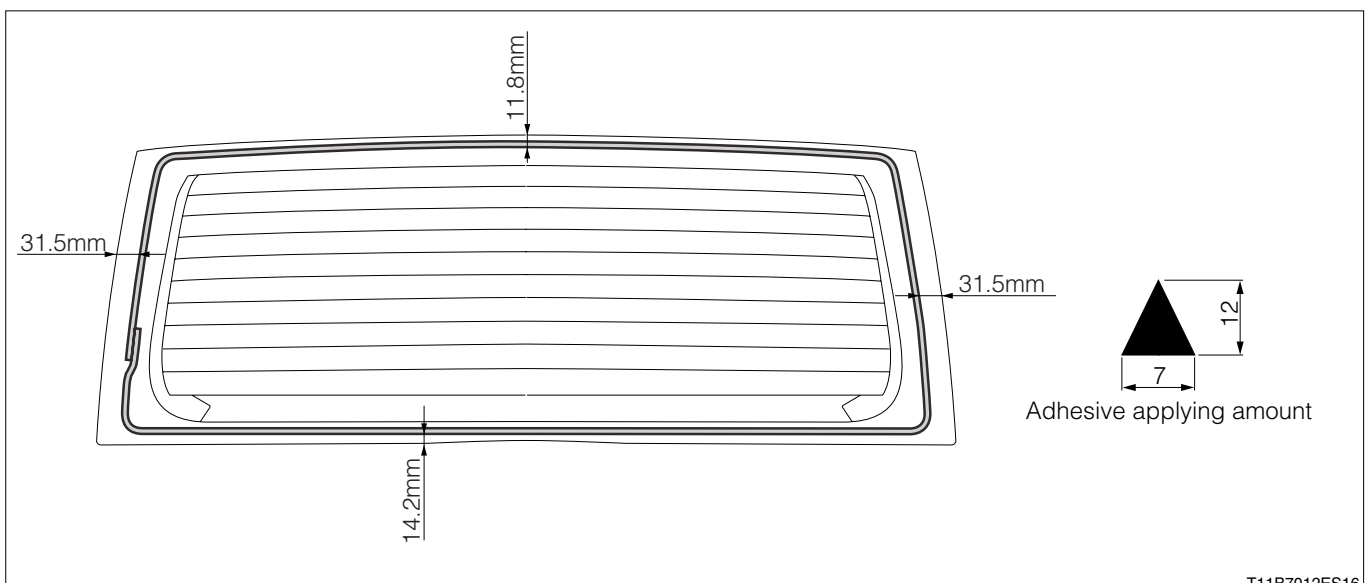
CAUTION

- Do not coat thickly.
- Do not coat the adhesive.
- After the primer is dry, proceed with the work.

2. Mount the cartridge in the gun. Apply the adhesive to the positions shown at the figure below.

CAUTION

- After the primer is dry, proceed with the work.
- Apply an ample amount of adhesive to the corners.



T11B7012ES16

3. Using a suction rubber, install the glass. Install it firmly by lightly pushing the glass front surface.

CAUTION

- After applying the adhesive, install the glass within 5 minutes.
4. After the adhesive hardens, check for water leakage.

CAUTION

- If water leaks, after removing water, reapply the glass from the beginning.
- If you move the vehicle after the glass installation, move the vehicle gently.

2-1-6 OPERATION AFTER INSTALLATION

1. Install the rear wiper arm Ay.
Refer to Page J2-12.

3 POWER WINDOW MASTER SWITCH

3-1 REMOVAL AND INSTALLATION

Refer to Page I1-7.

4 FRONT DOOR POWER WINDOW SWITCH

4-1 REMOVAL AND INSTALLATION

Refer to Page I1-7.

5 REAR DOOR POWER WINDOW SWITCH

5-1 REMOVAL AND INSTALLATION

Refer to Page I1-14.

6 FRONT DOOR REGULATOR

6-1 REMOVAL AND INSTALLATION

Refer to Page I1-12.

7 REAR DOOR REGULATOR

7-1 REMOVAL AND INSTALLATION

Refer to Page I1-18.

8 POWER WINDOW SYSTEM

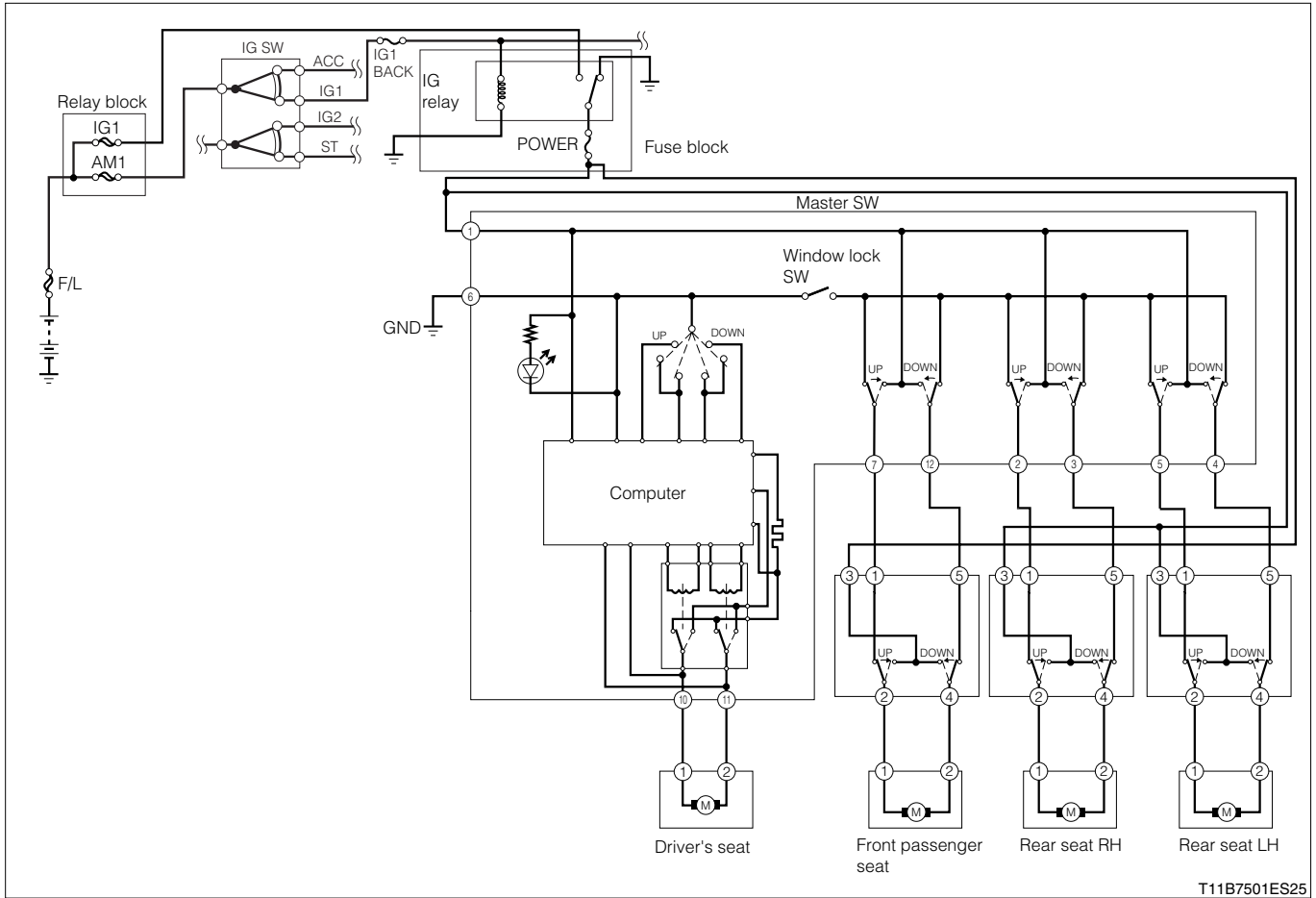
8-1 ARTICLES TO BE PREPARED

Instrument

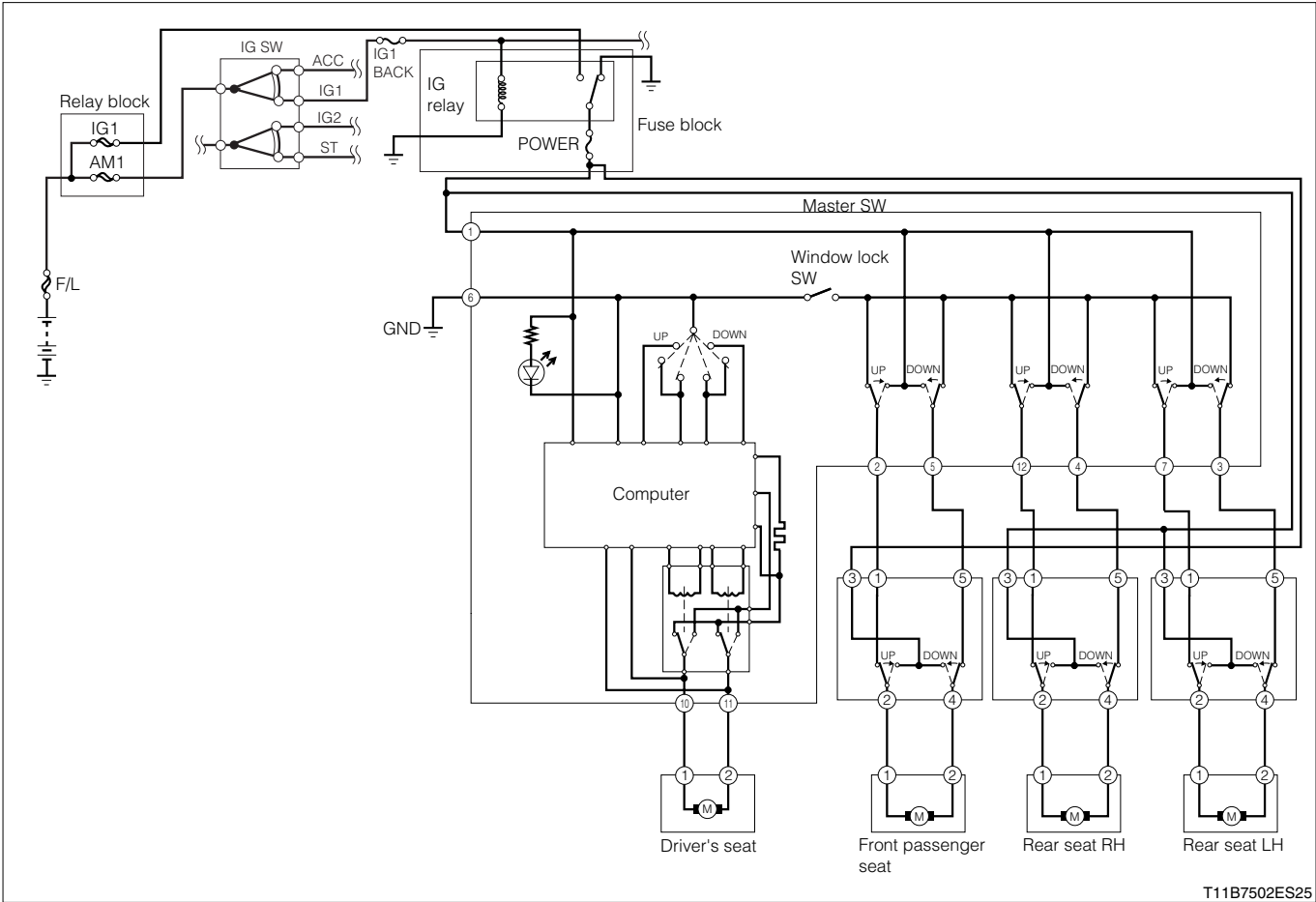
Voltage tester

8-2 SYSTEM WIRING DIAGRAM

RHD vehicles

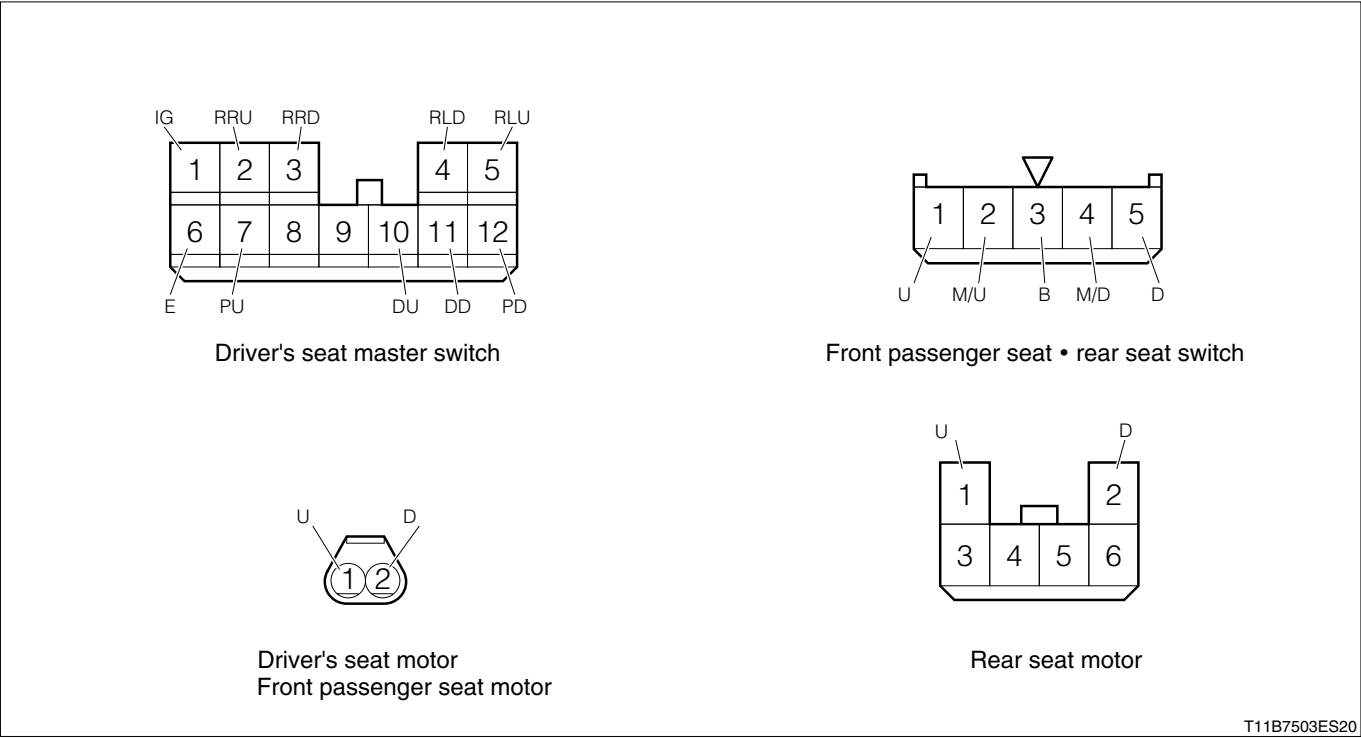


LHD vehicles

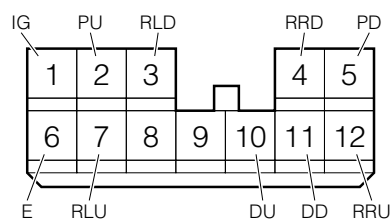


8-3 ARRANGEMENT OF VEHICLE HARNESS SIDE CONNECTOR TERMINALS

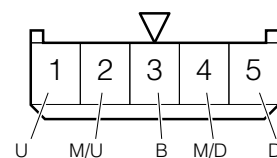
RHD vehicles



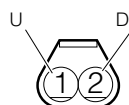
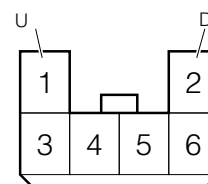
LHD vehicles



Driver's seat master switch



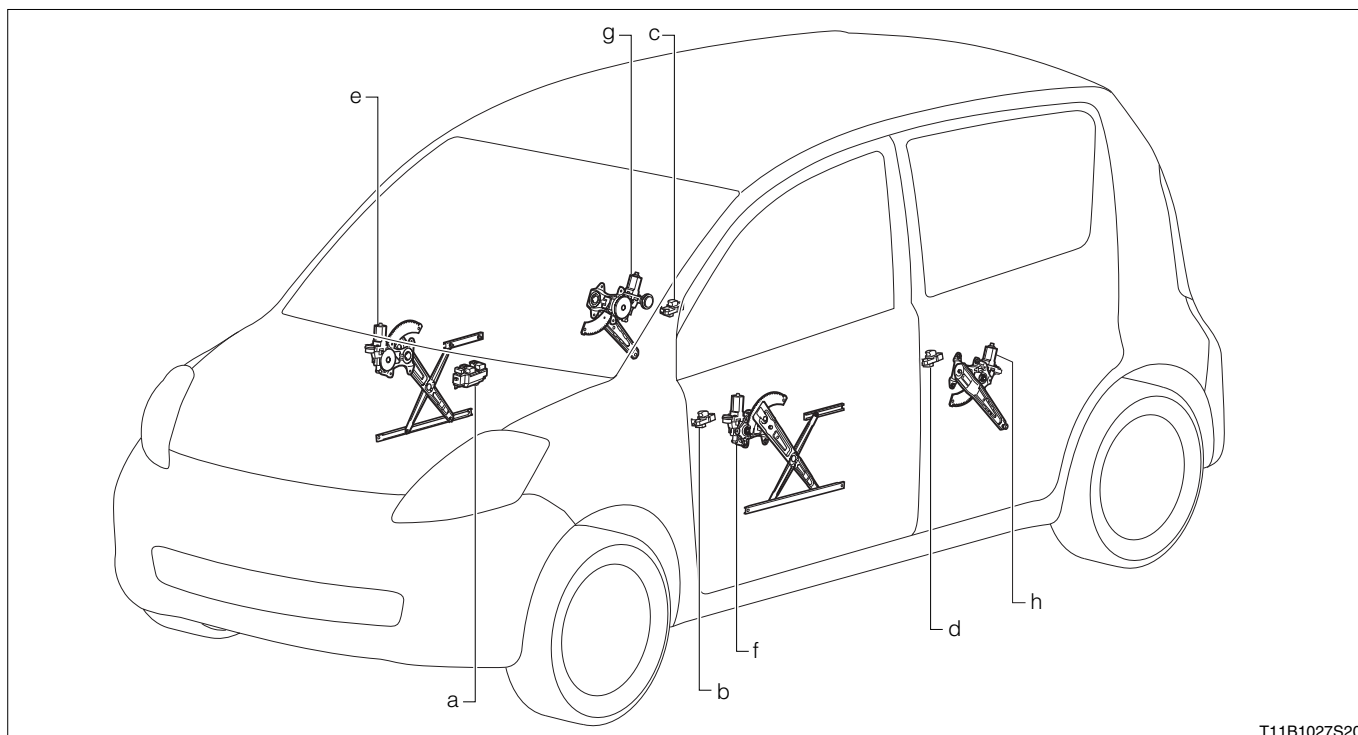
Front passenger seat • rear seat switch

Driver's seat motor
Front passenger seat motor

Rear seat motor

T11B7504ES20

8-4 LOCATION OF COMPONENTS



T11B1027S20

a	Power window master switch
b	Front door power window switch
c	Rear door power window switch RH
d	Rear door power window switch LH
e	Front door regulator motor RH
f	Front door regulator motor LH
g	Rear door regulator motor RH
h	Rear door regulator motor LH

☐	Power window at the driver's seat will not operate.
☐	Power window at the front passenger seat will not operate.
☐	Power window at the rear seat will not operate.
☐	It does not operate automatically(can be operated manually).
☐	
☐	
☐	Other

8-6 BASIC CHECK

8-6-1 MANUAL OPERATION

1. With the ignition switch set to ON position, perform the following checks.
 - (1) By means of the master switch at the driver's seat and power window switch at each door, each door glass can be opened or closed.
 - (2) When the window lock switch at the driver's seat is set to LOCK position, no operation can be made by the power window switches at the front passenger's seat and rear seats.

8-6-2 AUTOMATIC OPERATION FUNCTION

1. With the ignition switch set to ON position, perform the following checks.
 - (1) By means of the master switch at the driver's seat side, perform 2-step operation for the driver's seat side door glass in the up and down directions. Ensure that up and down automatic operations are executed, and the door stops at the full open or full closed position.
 - (2) By means of the master switch at the driver's seat side, perform 2-step operation for the driver's seat side door glass in the down direction. Ensure that down automatic operation is executed, and the door stops at the full open position.
 - (3) Operate the power window switch in the reverse direction during the automatic operation. Ensure that the automatic operation stops.

8-7 TROUBLE SHOOTING ACCORDING TO MALFUNCTION PHENOMENA

8-7-1 POWER WINDOW AT THE DRIVER'S SEAT WILL NOT OPERATE.

▷1. Check earth of master switch

1. Check continuity between terminals below.
 - (1) Between the earth wire 6 of the master switch and the body earth

SPECIFIED VALUE: Continuity exists

▼ If it is OK, go to ▷2.

▼ If it is NG, repair the earth wire.

▷2. Check of master switch voltage

1. Check the voltage of the terminals below.
 - (1) Between the master switch 1 and the master switch 6

SPECIFIED VALUE: 10 — 14V

▼ If it is OK, go to ▷4.

▼ If it is NG, go to ▷3.

▷3. Battery voltage check

1. Check the battery voltage.

SPECIFIED VALUE: 10 — 14V

▼ If it is OK, check defect of wire harness and repair.

▼ If it is NG, charge the battery.

▷4. Wiring harness check

1. Check continuity and short circuit between terminals below.

- (1) Between the vehicle harness side connector 10 of the master switch and the harness side connector 1 between motors
- (2) Between the vehicle harness side connector 11 on the master switch and the connector 2 on harness side between motors

SPECIFIED VALUE: Continuity exists and no short circuit occurs.

▼ If it is OK, go to ▷5.

▼ If it is NG, repair the wire harness.

▷5. power window motor check

1. Remove the power window motor and check operation when applying 12V to the motor connector directly.

SPECIFIED VALUE: Rotates normally.

▼ If it is OK, replace the master switch.

▼ If it is NG, replace the driver's seat side power window motor.

8-7-2 POWER WINDOW AT THE FRONT PASSENGER SEAT WILL NOT OPERETE

▷1. Check of master switch condition

1. Check that the window lock switch is at "unlock" position.

SPECIFIED VALUE: It is in the unlocked position.

▼ If it is OK, go to ▷2.

▼ If it is NG, turn the window lock switch to "unlocked" position.

▷2. Switch power voltage check

1. Turn the IG switch "ON."

2. Check the voltage between terminals below.

- (1) Between the master switch 1 and the body earth
- (2) Between the front passenger's seat side switch 3 and the body earth.

SPECIFIED VALUE: 10 – 14V

▼ If it is OK, go to ▷3.

▼ If it is NG, check the battery voltage, fuse/fusible link, and continuity of the harness.

▷3. Master switch operation check

1. Check that the operation can be performed by the master switch.

SPECIFIED VALUE: The operation can be performed.

▼ If it is OK, replace the passenger's seat side switch.

▼ If it is NG, go to ▷4.

▷4. Front passenger's seat side switch operation check

1. Check that the operation can be performed by the front passenger's seat side switch.

SPECIFIED VALUE: The operation can be performed.

▼ If it is OK, replace the master switch.

▼ If it is NG, go to ▷5.

▷5. Harness check between the master switch and the front passenger's seat side switch

1. Check continuity and short circuit between terminals below.

RHD vehicles

- (1) Between the vehicle harness side connector 7 on the master switch and the vehicle harness side connector 1 on the front passenger's seat side switch
- (2) Between the vehicle harness side connector 12 on the master switch and the vehicle harness side connector 5 on the front passenger's seat side switch

LHD vehicles

- (3) Between the vehicle harness side connector 2 on the master switch and the vehicle harness side connector 1 on the front passenger's seat side switch
- (4) Between the vehicle harness side connector 5 on the master switch and the vehicle harness side connector 5 on the front passenger's seat side switch

SPECIFIED VALUE: Continuity exists and no short circuit occurs.

▼ If it is OK, go to ▷6.

▼ If it is NG, repair the wire harness.

▷6. Master switch earth check

1. With the window lock switch at "unlocked," check continuity between terminals below.

RHD vehicles

- (1) Between the vehicle harness side connector 7 on the master switch and the body earth
- (2) Between the vehicle harness side connector 12 on the master switch and the body earth

LHD vehicles

- (3) Between the vehicle harness side connector 2 on the master switch and the body earth
- (4) Between the vehicle harness side connector 5 on the master switch and the body earth

SPECIFIED VALUE: Continuity exists

▼ If it is OK, go to ▷7.

▼ If it is NG, replace the master switch.

▷7. Power window motor earth check

1. With the switch turned "OFF," check continuity between terminals below.

- (1) Between the power window motor 1 and the body earth
- (2) Between the power window motor 2 and the body earth

SPECIFIED VALUE: Continuity exists.

▼ If it is OK, go to ▷9.

▼ If it is NG, go to ▷8.

▷8. Front passenger's seat side switch unit check

1. Check continuity between terminals below.

- (1) Between the front passenger's seat side switch 1 and the front passenger's seat side switch 2
- (2) Between the front passenger's seat side switch 4 and the front passenger's seat side switch 5

SPECIFIED VALUE: Continuity exists.

▼ If it is OK, repair the wire harness.

▼ If it is NG, replace the front passenger's seat side switch.

▷9. Power window motor power voltage check (1)

1. Check voltage between terminals below during the up and down operation of the front passenger's seat side switch.

(1) Between the power window motor 1 and the power window motor 2

SPECIFIED VALUE: 10 – 14V

▼ If it is OK, go to ▷10.

▼ If it is NG, replace the front passenger's seat side switch.

▷10. Power window motor power voltage check (2)

1. Check the voltage between terminals below during the up and down operation of the master switch.

(1) Between the power window motor terminal 1 and the body earth

(2) Between the power window motor terminal 2 and the body earth

SPECIFIED VALUE: 10 – 14V

▼ If it is OK, replace the power window motor.

▼ If it is NG, replace the master switch.

8-7-3 POWER WINDOW AT THE REAR SEAT WILL NOT OPERATE.

▷1. Master switch condition check

1. Check that the window lock switch is at "unlocked."

SPECIFIED VALUE: It is in the unlocked position.

▼ If it is OK, go to ▷2.

▼ If it is NG, turn the window lock switch to the "unlocked" position.

▷2. Master switch power voltage check

1. Turn "ON" the IG switch.

2. Check the voltage between terminals below.

(1) Between the master switch terminal 1 and the body earth

(2) Between the rear seat's switch terminal 3 and the body earth

SPECIFIED VALUE: 10 – 14V

▼ If it is OK, go to ▷3.

▼ If it is NG, check the battery voltage, fuse/fusible link, and continuity of harness.

▷3. Check of master switch operation

1. Check that the operation can be performed by the master switch.

SPECIFIED VALUE: The operation can be performed.

▼ If it is OK, replace the rear seat's switch.

▼ If it is NG, go to ▷4.

▷4. Rear seat's switch operation check

1. Check that the operation can be performed by the rear seat's switch.

SPECIFIED VALUE: The operation can be performed.

▼ If it is OK, replace the master switch.

▼ If it is NG, go to ▷5.

▷5. Wire harness check

1. Check continuity between the master switch terminal below and the rear seat's switch terminal.

RHD vehicles**2. Rear left seat**

- (1) Between the vehicle harness side connector 5 on the master switch and the vehicle harness side connector 1 on the rear seat's switch
- (2) Between the vehicle harness side connector 4 on the master switch and the vehicle harness side connector 5 on the rear seat's switch

3. Rear right seat

- (1) Between the vehicle harness side connector 3 on the master switch and the vehicle harness side connector 5 on the rear seat's switch
- (2) Between the vehicle harness side connector 2 on the master switch and the vehicle harness side connector 1 on the rear seat's switch

LHD vehicles**4. Rear left seat**

- (1) Between the vehicle harness side connector 7 on the master switch and the vehicle harness side connector 1 on the rear seat's switch
- (2) Between the vehicle harness side connector 3 on the master switch and the vehicle harness side connector 5 on the rear seat's switch

5. Rear right seat

- (1) Between the vehicle harness side connector 4 on the master switch and the vehicle harness side connector 5 on the rear seat's switch
- (2) Between the vehicle harness side connector 12 on the master switch and the vehicle harness side connector 1 on the rear seat's switch

SPECIFIED VALUE: Continuity exists.

▼ If it is OK, go to ▷6.

▼ If it is NG, repair the wire harness.

▷6. Master switch earth check

1. Check continuity between terminals below with the window lock switch "unlocked."

RHD vehicles

- (1) Between the vehicle harness side connector 2 on the master switch and the vehicle harness side connector 6 on the master switch
- (2) Between the vehicle harness side connector 3 on the master switch and the vehicle harness side connector 6 on the master switch
- (3) Between the vehicle harness side connector 4 on the master switch and the vehicle harness side connector 6 on the master switch
- (4) Between the vehicle harness side connector 5 on the master switch and the vehicle harness side connector 6 on the master switch

LHD vehicles

- (5) Between the vehicle harness side connector 3 on the master switch and the vehicle harness side connector 6 on the master switch
- (6) Between the vehicle harness side connector 4 on the master switch and the vehicle harness side connector 6 on the master switch
- (7) Between the vehicle harness side connector 7 on the master switch and the vehicle harness side connector 6 on the master switch
- (8) Between the vehicle harness side connector 12 on the master switch and the vehicle harness side connector 6 on the master switch

SPECIFIED VALUE: Continuity exists.

- ▼ If it is OK, go to >7.
- ▼ If it is NG, replace the master switch.

>7. Power window motor earth check

1. With the switch turned "OFF," check continuity between terminals below.

- (1) Between the power window motor 1 and the power window motor 2

SPECIFIED VALUE: Continuity exists.

- ▼ If it is OK, go to >9.
- ▼ If it is NG, go to >8.

>8. Rear seat's switch unit check

1. Check continuity between rear seat's switch terminals below.

- (1) Between the rear seat's switch 1 and the rear seat's switch 2
- (2) Between the rear seat's switch 4 and the rear seat's switch 5

SPECIFIED VALUE: Continuity exists.

- ▼ If it is OK, repair the wire harness.
- ▼ If it is NG, replace the rear seat's switch.

>9. Power window motor power voltage check (1)

1. Check the voltage between terminals below during the up and down operation of the rear seat's switch.

- (1) Between the power window motor 1 and the window motor 2.

SPECIFIED VALUE: 10 – 14V

- ▼ If it is OK, go to >10.
- ▼ If it is NG, replace the rear seat's switch.

>10. Power window motor power voltage check (2)

1. Check the voltage between terminals below during the up and down operation of the master switch.

- (1) Between the power window motor 1 and the window motor 2

SPECIFIED VALUE: 10 – 14V

- ▼ If it is OK, replace the power window motor.
- ▼ If it is NG, replace the master switch.

8-8 UNIT CHECK

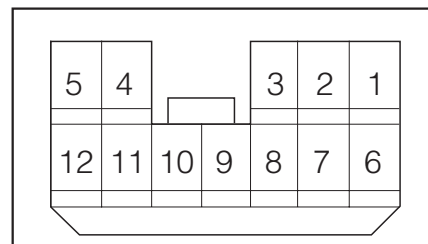
8-8-1 DRIVER'S SEAT MASTER SWITCH

(1) Continuity check

1. Check continuity between each terminal of the master switch Ay.

CAUTION

- Since continuity check by operating driver's seat side switch up and down cannot be made, check whether the state is good or bad by operation check.



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RHD vehicles

Switch operation		Front passenger seat	Rear seat at the right side	Rear seat at the left side	Standard
Unlock	UP	1 – 7	1 – 2	1 – 5	Continuity exists
		6 – 12	3 – 6	4 – 6	
	OFF	6 – 7 – 12	1 – 3 – 6	4 – 5 – 6	
	DOWN	1 – 12	1 – 3	1 – 4	
		6 – 7	2 – 6	5 – 6	
Lock	UP	1 – 7	1 – 2	1 – 5	
	OFF	7 – 12	2 – 3	4 – 5	
	DOWN	1 – 12	1 – 3	1 – 4	

LHD vehicles

Switch operation		Front passenger seat	Rear seat at the right side	Rear seat at the left side	Standard
Unlock	UP	1 – 2	1 – 12	1 – 7	Continuity exists
		5 – 6	4 – 6	3 – 6	
	OFF	1 – 5 – 6	4 – 6 – 12	3 – 6 – 7	
	DOWN	1 – 5	1 – 4	1 – 3	
		2 – 6	6 – 12	6 – 7	
	Lock	UP	1 – 2	1 – 12	
OFF		2 – 5	4 – 12	3 – 7	
DOWN		1 – 5	1 – 4	1 – 3	

(2) Operation check**CAUTION**

- When the continuity check has indicated that the system is normal, perform this check.

1. Check conductivity and voltage between each terminal and body earth following the check procedure below.

NOTE

- "Disconnected Vehicle side" in the table shows that the check is to be made at the vehicle side connector with the connector disconnected. "Connector connected" means that the check is to be made with the connector connected.

RHD vehicles

Measurement connector condition	Terminal No. Tester positive (+) ↔ tester negative	Check items	Checking condition	Standard	Defective areas in the case of non-compliance of standard
Disconnected Vehicle side	6↔Earth	Voltage	At all times	0V	Vehicle side
	1↔Earth	Voltage	IG switch "OFF"→"ON"	0V→10 – 14V	
Connector connected	11↔Earth	Voltage	IG switch "ON," the driver's seat side switch for the master switch "OFF"→DOWN (manual operation)	0V→9V or more	Master switch
			IG switch "ON," the driver's seat side door completely closed → the driver's seat side switch for the master switch "DOWN" (automatic operation)→ the door glass completely open	0V→9V or more →0V	
	10↔Earth	Voltage	IG switch "ON," the driver's seat side switch for the master switch "OFF"→ UP (manual operation)	0V→9V or more	
			IG switch "ON," the driver's seat side door completely open → the driver's seat side switch for the master switch UP (automatic operation) → Door glass completely closed.	0V→9V or more →0V	
	12↔Earth	Voltage	IG switch "ON," window lock switch "ON," front seat (left) switch "OFF"→DOWN	0V→9V or more	
	7↔Earth	Voltage	IG switch "ON," window lock switch "ON," front seat (left) switch "OFF"→UP	0V→9V or more	
	3↔Earth	Voltage	IG switch "ON," window lock switch "ON," rear seat (right) switch "OFF"→DOWN	0V→9V or more	
	2↔Earth	Voltage	IG switch "ON," window lock switch "ON," rear seat (right) switch "OFF"→UP	0V→9V or more	
	4↔Earth	Voltage	IG switch "ON," window lock switch "ON," rear seat (left) switch "OFF"→ DOWN	0V→9V or more	
	5↔Earth	Voltage	IG switch "ON," window lock switch "ON," rear seat (left) switch "OFF"→ UP	0V→9V or more	

LHD vehicles

Measurement connector condition	Terminal No. Tester positive (+) ↔ tester negative	Check items	Checking condition	Standard	Defective areas in the case of non-compliance of standard
Disconnected Vehicle side	6↔Earth	Voltage	At all times	0V	Vehicle side
	1↔Earth	Voltage	IG switch "OFF"→"ON"	0V→10 – 14V	
Connector connected	11↔Earth	Voltage	IG switch "ON," the driver's seat side switch for the master switch "OFF"→DOWN (manual operation)	0V→9V or more	Master switch
			IG switch "ON," the driver's seat side door completely closed → the driver's seat side switch for the master switch "DOWN" (automatic operation)→ the door glass completely open	0V→9V or more →0V	
	10↔Earth	Voltage	IG switch "ON," the driver's seat side switch for the master switch "OFF"→UP (manual operation)	0V→9V or more	
			IG switch "ON," the driver's seat side door completely open → the driver's seat side switch for the master switch UP (automatic operation) → Door glass completely closed.	0V→9V or more →0V	
	5↔Earth	Voltage	IG switch "ON," window lock switch "ON," front seat (left) switch "OFF"→DOWN	0V→9V or more	
	2↔Earth	Voltage	IG switch "ON," window lock switch "ON," front seat (left) switch "OFF"→UP	0V→9V or more	
	4↔Earth	Voltage	IG switch "ON," window lock switch "ON," rear seat (right) switch "OFF"→DOWN	0V→9V or more	
	12↔Earth	Voltage	IG switch "ON," window lock switch "ON," rear seat (right) switch "OFF"→UP	0V→9V or more	
	3↔Earth	Voltage	IG switch "ON," window lock switch "ON," rear seat (left) switch "OFF"→DOWN	0V→9V or more	
	7↔Earth	Voltage	IG switch "ON," window lock switch "ON," rear seat (left) switch "OFF"→UP	0V→9V or more	

(3) Illumination check

- When connecting the battery positive (+) with the terminal 1 and the battery negative with the terminal 6, check the switch illumination condition.

SPECIFIED VALUE: The switch illuminates.

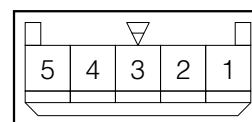
8-8-2 FRONT PASSENGER SEAT SWITCH

(1) Continuity check

- Check continuity between terminals of the switch.

Power window regulator switch section

Switching	Terminal No.	Standard
UP	2 – 3	Continuity exists
	4 – 5	
OFF	1 – 2	
	4 – 5	
DOWN	1 – 2	
	3 – 4	



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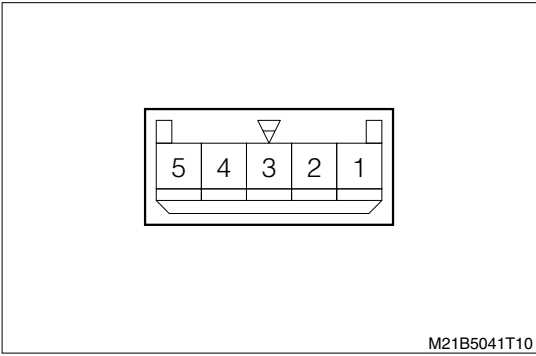
8-8-3 REAR SEAT SWITCH

(1) Continuity check

1. Check continuity between terminals of the switch.

Power window regulator switch section

Switching	Terminal No.	Standard
UP	2 - 3	Continuity exists
	4 - 5	
OFF	1 - 2	
	4 - 5	
DOWN	1 - 2	
	3 - 4	



8-8-4 DRIVER'S SEAT REGULATOR MOTOR

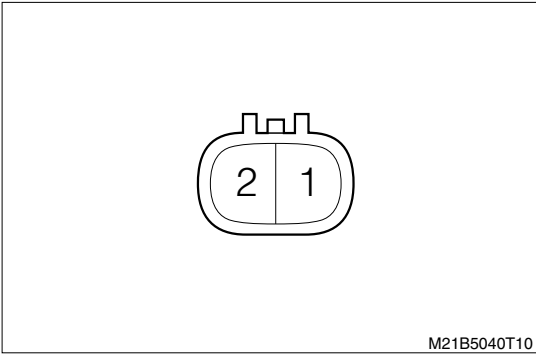
- 1. Connect each battery terminal with the terminal 1 and the terminal 2 as shown in the table below and check the rotating direction.
- 2. Check for abnormal noise, axis rattling, or distortion during the motor rotation.

CAUTION

- Do not short-circuit the battery positive (+) and negative (−) terminals.

RHD vehicles

Connection	Terminal	Motor rotating direction (as viewed from the pinion gear side)
Battery positive (+)	1	Right turn
Battery negative (−)	2	
Battery positive (+)	2	Left turn
Battery negative (−)	1	



LHD vehicles

Connection	Terminal	Motor rotating direction (as viewed from the pinion gear side)
Battery positive (+)	2	Right turn
Battery negative (−)	1	
Battery positive (+)	1	Left turn
Battery negative (−)	2	

8-8-5 FRONT PASSENGER SEAT REGULATOR MOTOR

1. Connect each battery terminal with the terminal 1 and the terminal 2 as shown in the table below and check the rotating direction.
2. Check for abnormal noise, axis rattling, or distortion during the motor rotation.

CAUTION

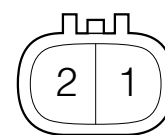
- Do not short-circuit the battery positive (+) and negative (−) terminals.

RHD vehicles

Connection	Terminal	Motor rotating direction (as viewed from the pinion gear side)
Battery positive (+)	2	Right turn
Battery negative (−)	1	
Battery positive (+)	1	Left turn
Battery negative (−)	2	

LHD vehicles

Connection	Terminal	Motor rotating direction (as viewed from the pinion gear side)
Battery positive (+)	1	Right turn
Battery negative (−)	2	
Battery positive (+)	2	Left turn
Battery negative (−)	1	



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8-8-6 REAR SEAT REGULATOR MOTOR

1. Connect each battery terminal with the terminal 1 and the terminal 2 as shown in the table below and check the rotating direction.
2. Check for abnormal noise, axis rattling, or distortion during the motor rotation.

CAUTION

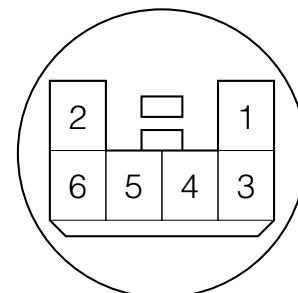
- Do not short-circuit the battery positive (+) and negative (−) terminals.

Rear seat at the right side

Connection	Terminal	Motor rotating direction (as viewed from the pinion gear side)
Battery positive (+)	1	Right turn
Battery negative (−)	2	
Battery positive (+)	2	Left turn
Battery negative (−)	1	

Rear seat at the left side

Connection	Terminal	Motor rotating direction (as viewed from the pinion gear side)
Battery positive (+)	2	Right turn
Battery negative (−)	1	
Battery positive (+)	1	Left turn
Battery negative (−)	2	



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9 OUTER REAR VIEW MIRROR

9-1 REMOVAL AND INSTALLATION

9-1-1 ARTICLES TO BE PREPARED

Lubricant,adhesive,others

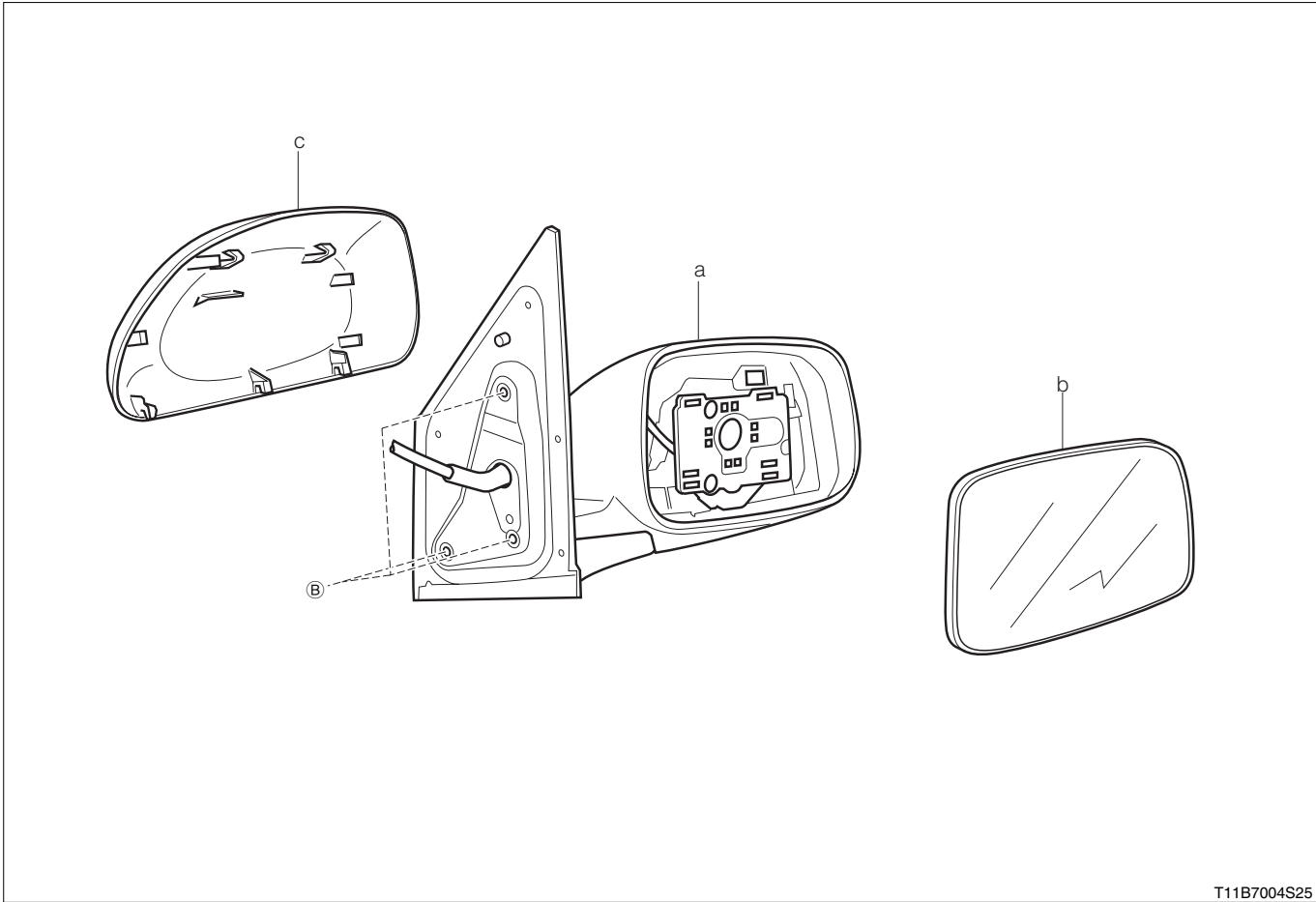
Protective tape

9-1-2 OPERATION BEFORE REMOVAL

- 1. Remove the front door lower frame bracket garnish RH/LH.
Refer to Page I1-7.

9-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



T11B7004S25

(2) Removal and installation procedures

- 1 a Mirror Ay, outer rear view, RH/LH
- ▼ ▲ 2 b Mirror, outer rear view, RH/LH
- ▼ 3 c Cover, outer mirror, RH/LH

9-1-4 POINTS OF REMOVAL

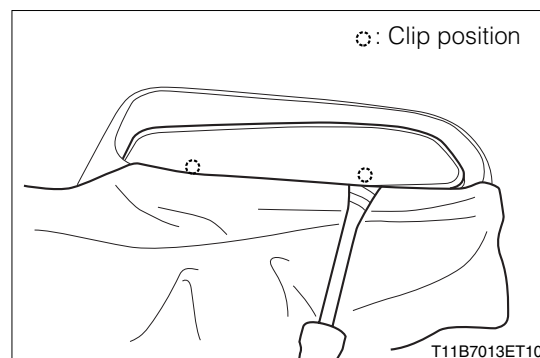
(1) Mirror, outer rear view, RH/LH

- 1. Attach the protection tape.

2. Separate the clip fitted area with a flat screwdriver and remove the mirror.

CAUTION

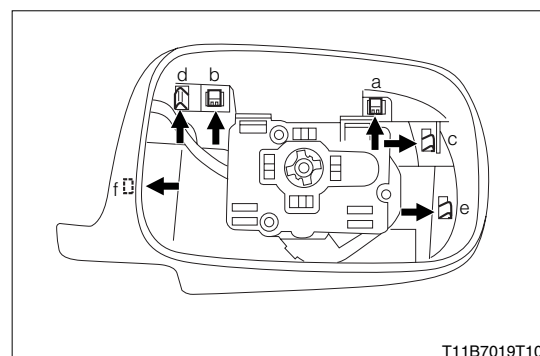
- When the temperature is low, the clip may be broken. Therefore, warm the mirror surface with a hair-dryer before removing.

**(2) Cover, outer mirror, RH/LH**

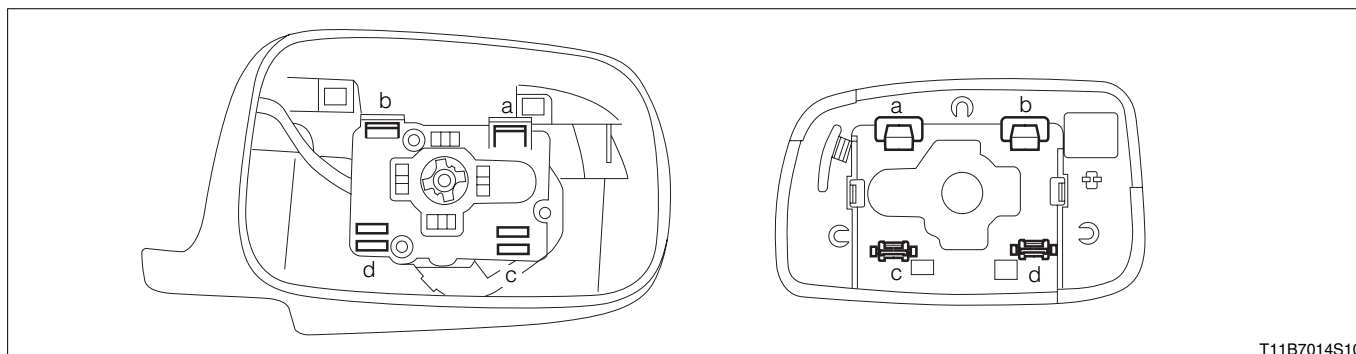
1. Disengage the fitting of the pawls (a, b).
2. With the pawls (a, b) disengaged, disengage the pawls in the order of c to f.

CAUTION

- Since the pawl f is not visible, carefully remove it to avoid damaging.

**9-1-5 POINTS OF INSTALLATION****(1) Mirror, outer rear view, RH/LH**

1. Hook the pawls (a, b) on the mirror to the outer rear view mirror Ay, RH/LH.
2. Engage the clip (c, d) and install the mirror.

**9-1-6 OPERATION AFTER INSTALLATION**

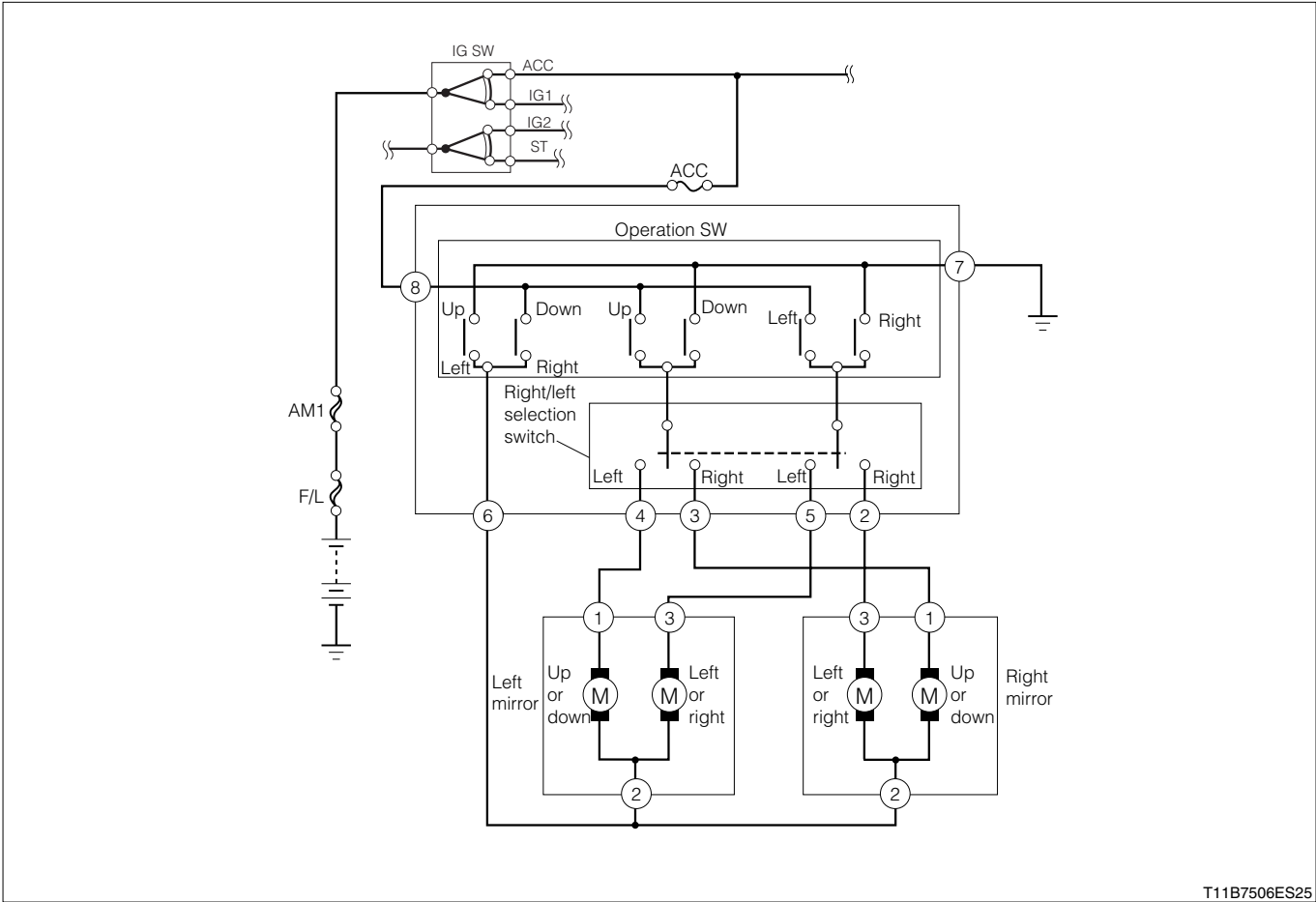
1. Install the front door lower frame bracket garnish RH/LH.
Refer to Page I1-7.

10 MIRROR SURFACE MOTOR-DRIVEN MOVABLE TYPE OUTER REAR-VIEW MIRROR**10-1 ARTICLES TO BE PREPARED**

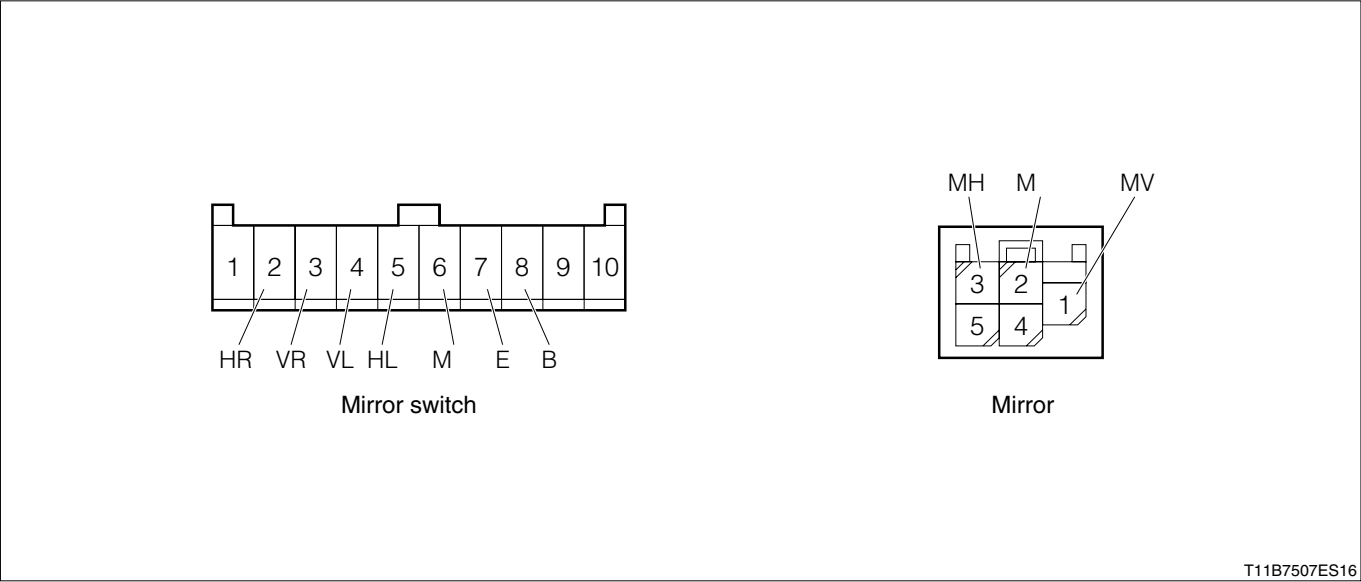
Instrument

Voltage tester

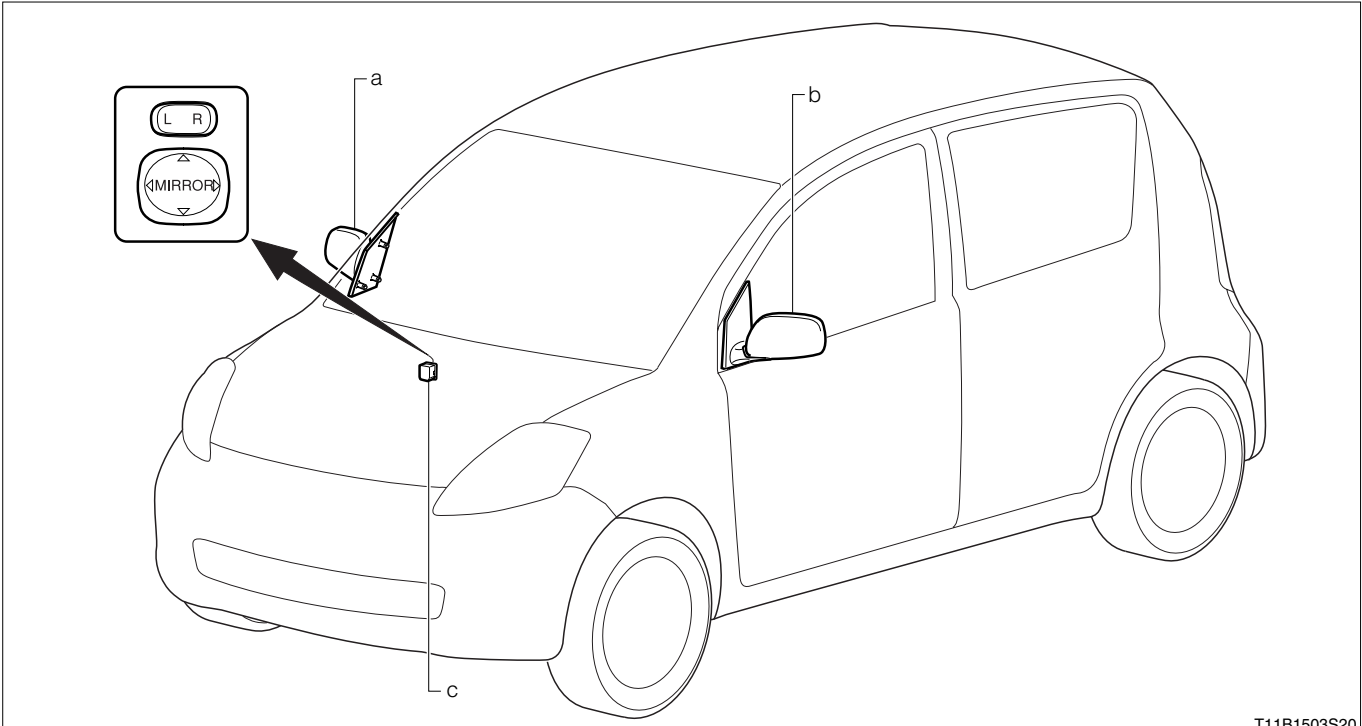
10-2 SYSTEM WIRING DIAGRAM



10-3 ARRANGEMENT OF VEHICLE HARNESS SIDE CONNECTOR TERMINALS



10-4 LOCATION OF COMPONENTS



T11B1503S20

a	Outer rear view mirror RH
b	Outer rear view mirror LH
c	Outer mirror switch

10-5 UNIT CHECK
10-5-1 OUTER MIRROR SWITCH AY

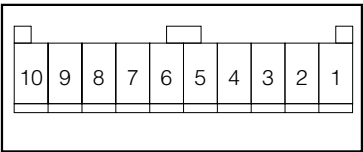
Check continuity between each terminal by operating the switch.

Right/Left Switching SW Mirror operation
 SW section

○—○: Continuity should exist

Switching	Terminal No.	⑧	⑥	⑦	③	②	④	⑤
LH	Up	○					○	
	Down	○	○	○			○	
	OFF							
	Left	○						○
	Right	○	○	○				○
OFF	Up			○				○
	Down	○						○
	OFF							
	Left			○			○	
	Right	○					○	
RH	Up	○			○			
	Down	○	○	○	○			
	OFF							
	Left	○				○		
	Right	○	○	○		○		

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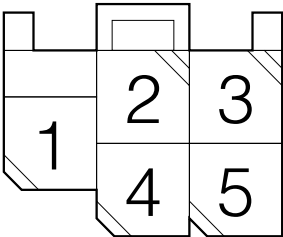


Y11B5021T10

10-5-2 OUTER REAR VIEW MIRROR AY, RH/LH

Check the operation when applying battery voltage between each terminal.

Connection	Terminal	Operating direction
Battery positive (+)	1	Up
Battery negative (−)	2	
Battery positive (+)	2	Down
Battery negative (−)	1	
Battery positive (+)	2	Left
Battery negative (−)	3	
Battery positive (+)	3	Right
Battery negative (−)	2	



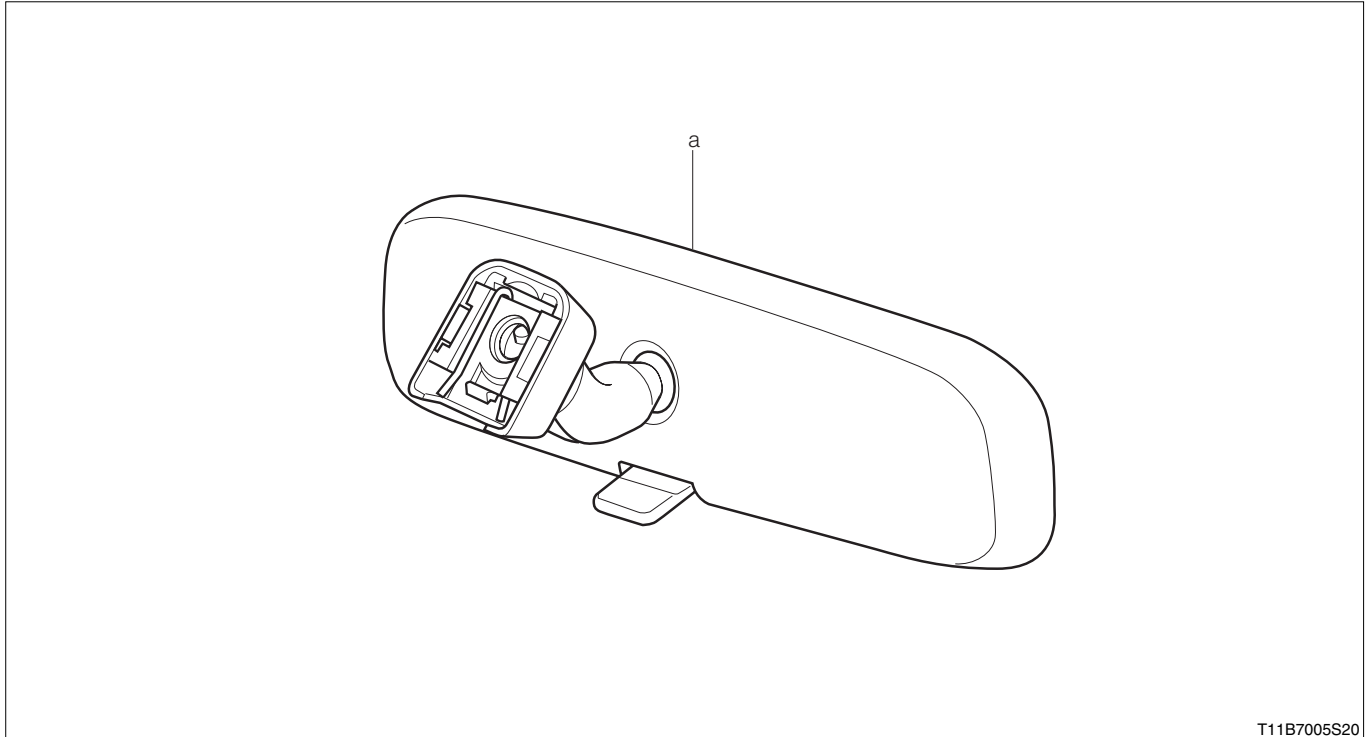
T11B7016T10

11 INNER REAR VIEW MIRROR

11-1 REMOVAL AND INSTALLATION

11-1-1 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



T11B7005S20

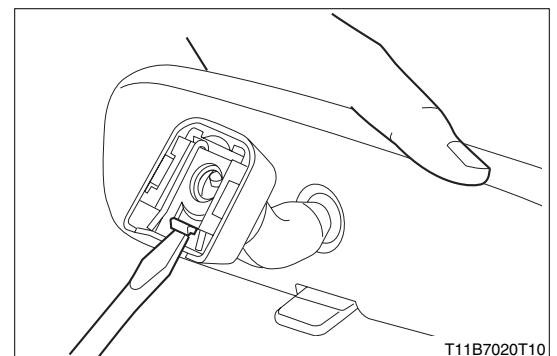
(2) Removal and installation procedures

- ▼ 1 a Mirror Ay, inner rear view

11-1-2 POINTS OF REMOVAL

(1) Mirror Ay, inner rear view

1. Press the pawl of the mirror Ay with a flat screwdriver to disengage fitting, and push upward along the glass surface to remove.



T11B7020T10

I4 DOOR LOCK & THEFT DETERRENT

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BACK DOOR LOCK MOTOR -----	I4-12		
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ARTICLES TO BE PREPARED -----	I4-12		
SYSTEM WIRING DIAGRAM -----	I4-13		
ARRANGEMENT OF ECU TERMINAL			
-----	I4-13		
ARRANGEMENT OF VEHICLE HAR-			
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SHOOTING -----	I4-18		
TROUBLE SHOOTING ACCORDING			

■ POWER DOOR LOCK SYSTEM

1 ITC COMPUTER

1-1 REMOVAL AND INSTALLATION

CAUTION

- Be careful not to drop the door control relay Ay or give great impacts to it.
- If the door control relay Ay dropped or was subjected to great impacts, replace it with a new one even if there is no abnormality in its external appearance.

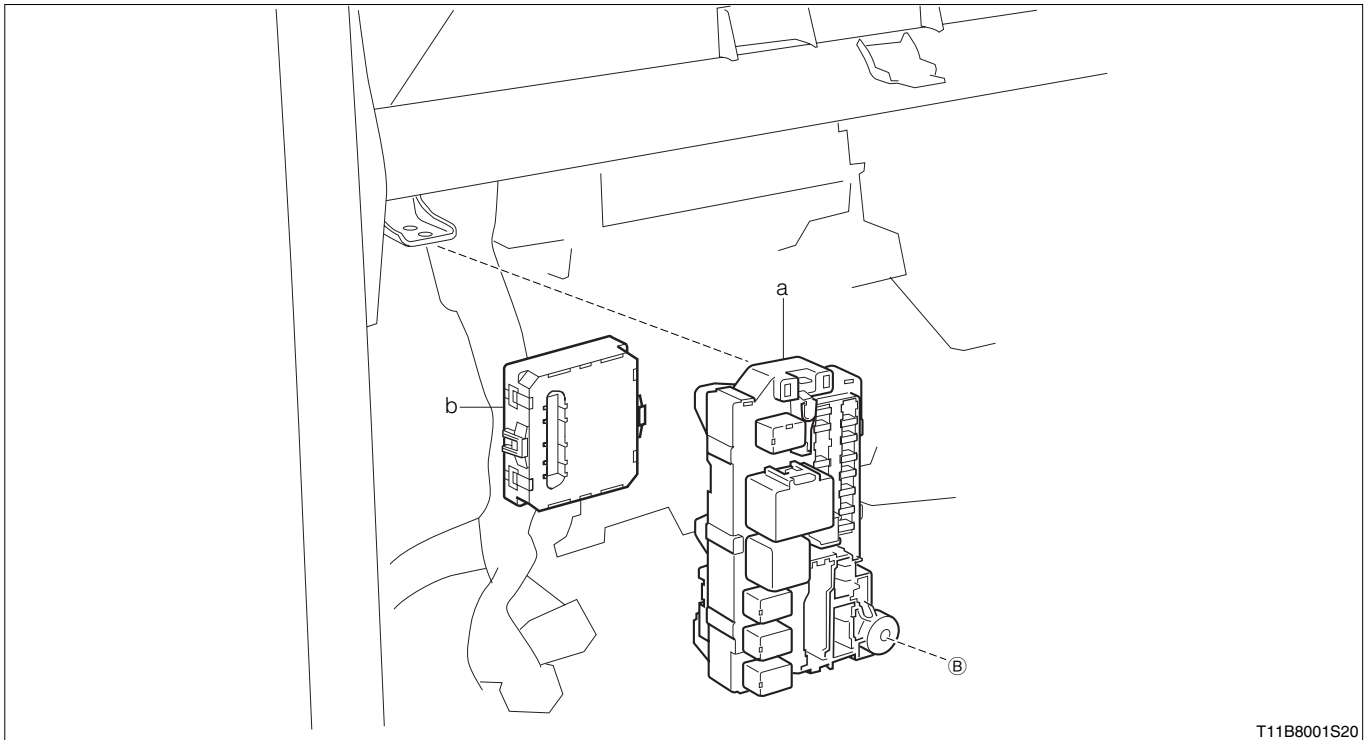
1-1-1 OPERATION BEFORE REMOVAL

1. Disconnect the battery negative (—) terminal.
2. Remove the instrument panel finish lower panel S/A.
Refer to Page I2-15.

3. Remove the fuse box opening cover.
Refer to Page I2-15.

1-1-2 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



T11B8001S20

(2) Removal and installation procedures

- 1 a Block Ay, fuse W/fuse
- 2 b Relay Ay, door control

1-1-3 INSPECTION

(1) Relay Ay, door control

1. Replace the computer with a new one in the following cases.
 - (1) Case where the door control relay Ay has deformation, abrasion, cracks or breakage.

CAUTION

- Never disassemble the computer.

1-1-4 OPERATION AFTER INSTALLATION

- 1. Install the fuse box opening cover.
Refer to Page I2-15.
- 2. Install the instrument panel finish lower panel S/A.
Refer to Page I2-15.
- 3. Connect the battery negative (－) terminal.

2 FRONT DOOR LOCK MOTOR

2-1 REMOVAL AND INSTALLATION

Refer to Page I1-12.

3 REAR DOOR LOCK MOTOR

3-1 REMOVAL AND INSTALLATION

Refer to Page I1-18.

4 BACK DOOR LOCK MOTOR

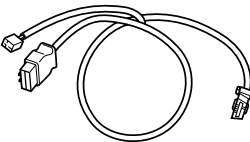
4-1 REMOVAL AND INSTALLATION

Refer to Page I1-20.

5 POWER DOOR LOCK SYSTEM

5-1 ARTICLES TO BE PREPARED

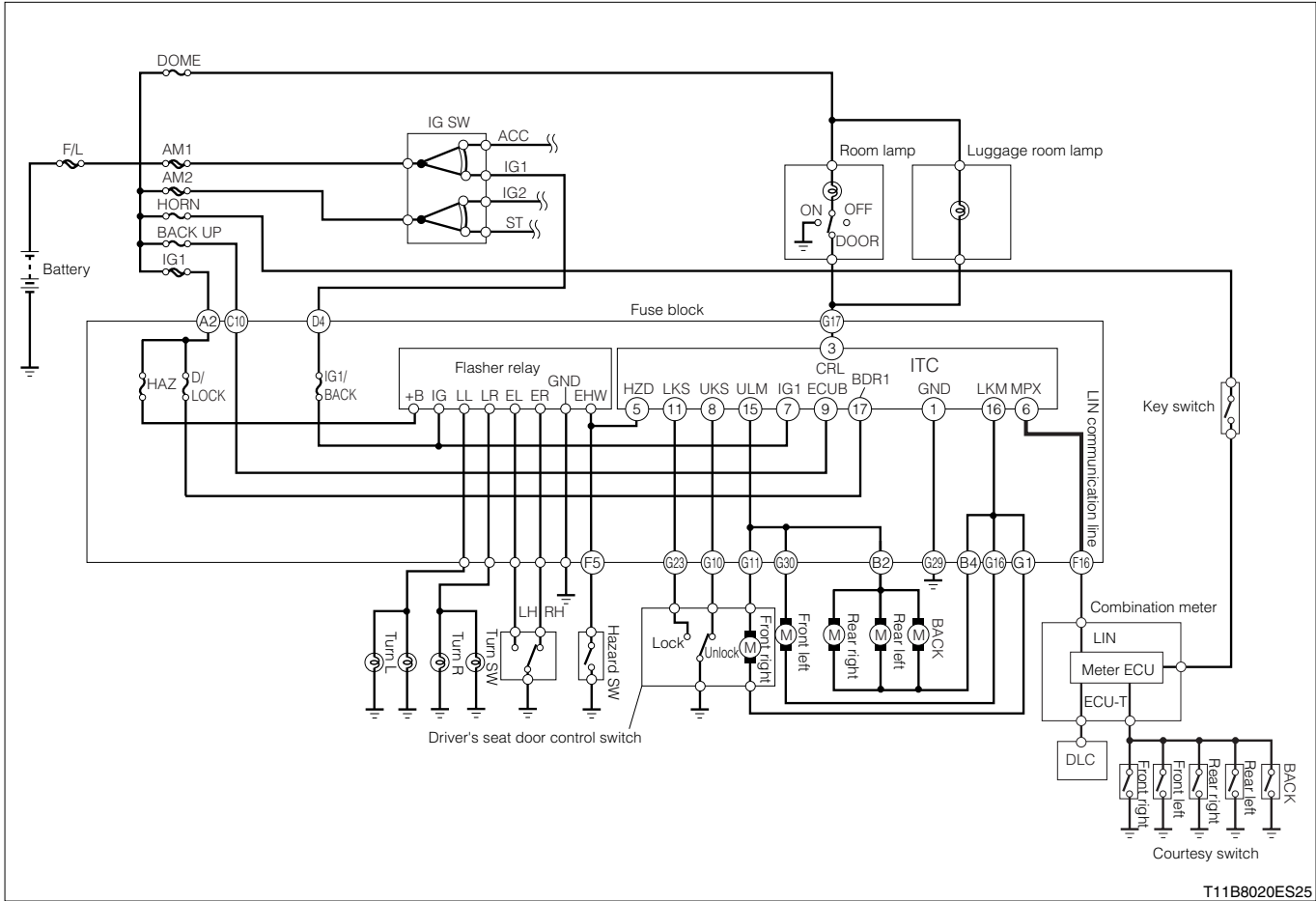
SST

Shape	Part No.	Part name
	09991-87403-000	Wire,diagnosis check
	09991-87404-000 (09991-87401-000)	Wire,engine control system inspection

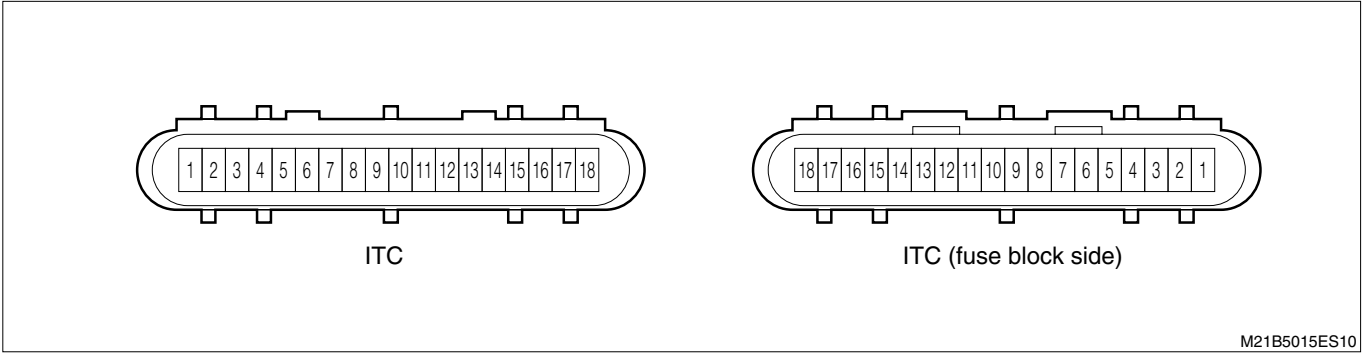
Instrument

Voltage tester,Oscillo scope

5-2 SYSTEM WIRING DIAGRAM



5-3 ARRANGEMENT OF ECU TERMINAL

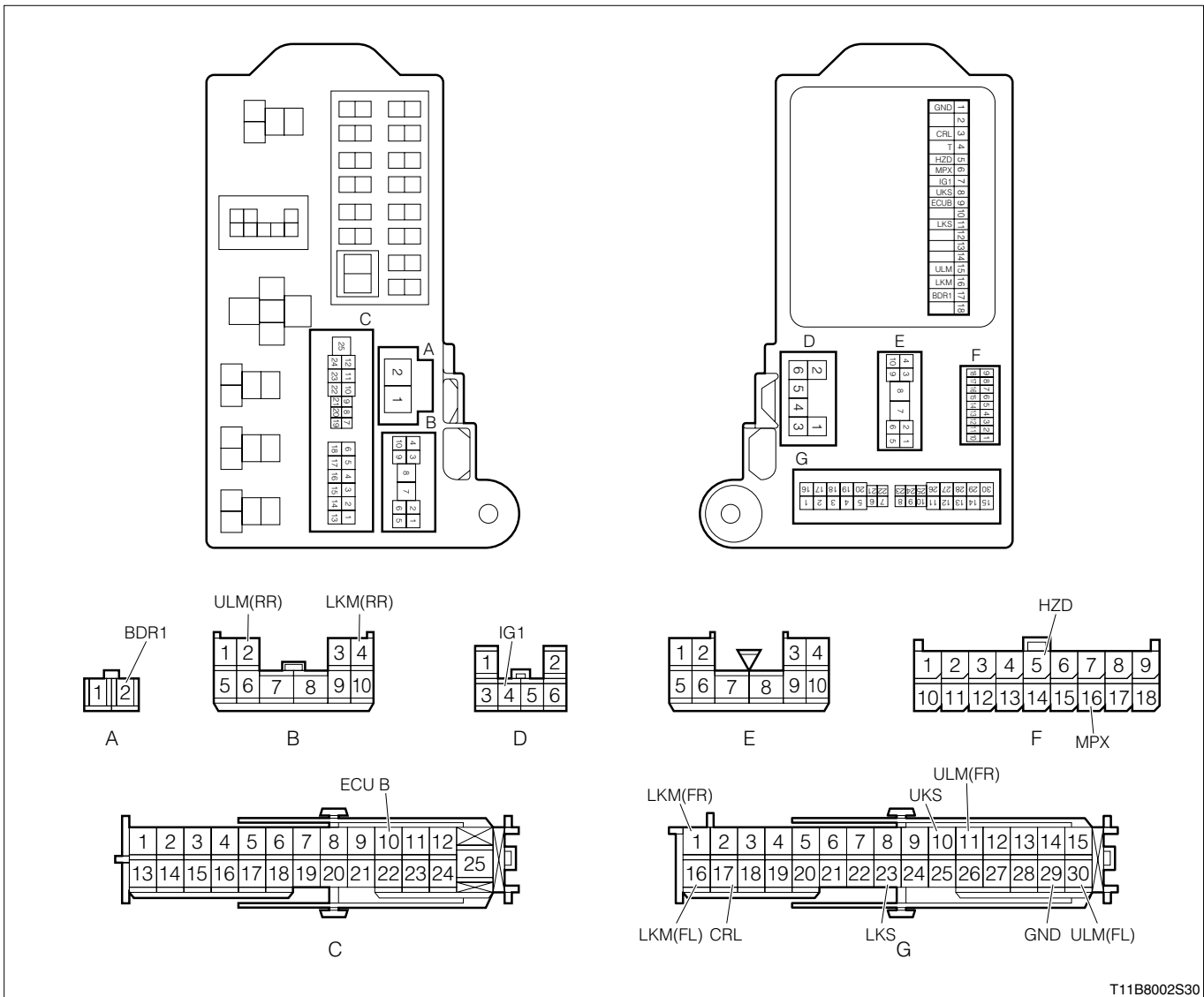


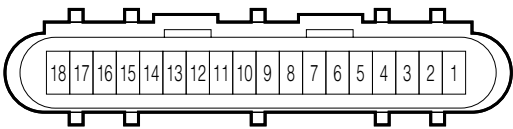
Body integrated controller (ITC) terminal name

Terminal No.	Terminal code	Terminal name
1	GND	Earth
2	—	—
3	CRL	Room lamp driving output
4	—	—
5	HZD	Hazard lamp driving output
6	MPX	LIN communication input/output
7	IG1	ECU power supply
8	UKS	Door control unlock side switch input
9	ECU B	ECU power supply
10	—	—
11	LKS	Door control lock side switch input
12	—	—
13	—	—
14	—	—
15	ULM	Door lock motor unlock side output
16	LKM	Door lock motor lock side output
17	BDR1	Power supply
18	—	—

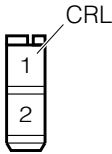
5-4 ARRANGEMENT OF VEHICLE HARNESS SIDE CONNECTOR TERMINALS

Fuse block

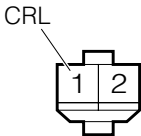




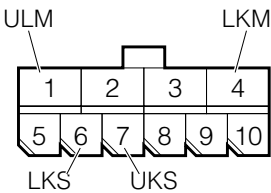
ITC (fuse block side)



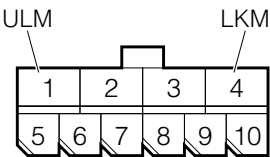
Room lamp



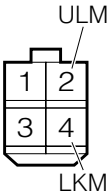
Luggage room lamp



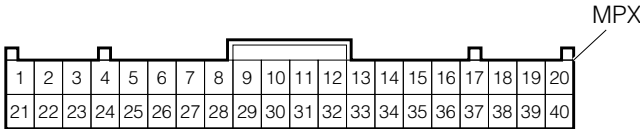
Driver's seat door control switch
Driver's seat door lock motor



Front passenger seat door lock motor
Rear seat door lock motor

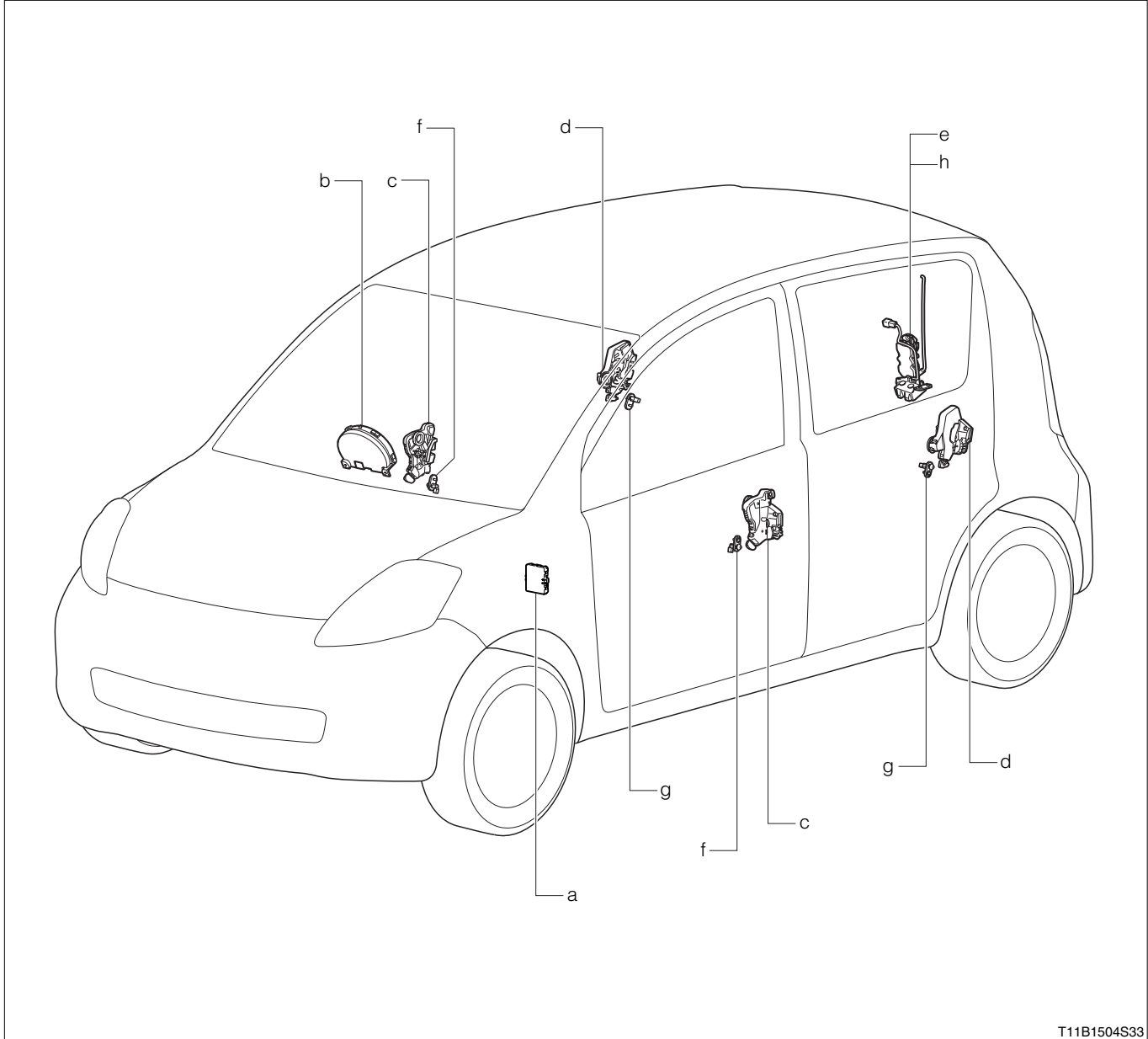


Back door lock motor



Combination meter

5-5 LOCATION OF COMPONENTS



T11B1504S33

a	Body integrated controller (ITC)
b	Meter ECU
c	Front door lock motor
d	Rear door lock motor
e	Back door lock motor
f	Front door courtesy switch
g	Rear door courtesy switch

☐	All doors are not locked interlocking with lock operation at driver's seat.
☐	Some doors are not locked interlocking with lock operation at driver's seat.
☐	
☐	
☐	
☐	
☐	Other

5-7 TROUBLE SHOOTING ACCORDING TO MALFUNCTION PHENOMENA

5-7-1 ALL DOORS ARE NOT LOCKED INTERLOCKING WITH LOCK OPERATION AT DRIVER'S SEAT.

▷1. Power supply system check

1. Check the voltage A2 and C10 on the fuse block.

SPECIFIED VALUE: 10 — 14V

▼ If it is OK, go to Step ▷2.

▼ In the case of NG, perform the following procedures.

2. Check the fuse (door lock) and the F/L for any defect .
3. Check the battery voltage.
4. Check that there are no abnormality such as open circuit in the harness of the power supply system.

▷2. Earth system check

1. Check continuity between the fuse block G29 and the body earth.

SPECIFIED VALUE: Continuity exists.

▼ If it is OK, go to ▷Step ▷3.

▼ In the case of NG, repair the earth wire.

▷3. Door control switch single unit check

1. Check the door control switch single unit on the driver's seat.

Refer to Page I4-9.

▼ If it is OK, go to Step ▷4.

▼ In the case of NG, replace the door control switch.

▷4. Wire harness check

1. Check continuity of the wire harness between the following terminals.

(1) Fuse block G10 — Door control switch terminal 7

(2) Fuse block G23 — Door control switch terminal 6

(3) Body earth — Door control switch terminal 8

SPECIFIED VALUE: Continuity exists.

▼ If it is OK, go to Step ▷5.

▼ In the case of NG, repair the harness.

▷5. Fuse block voltage check

1. Check the voltage between the following fuse block terminals when the door control switch is activated.

(1) Fuse block G16 — G30

(2) Fuse block G1 — G11

(3) Fuse block B4 — B2

SPECIFIED VALUE: 12 — 14V

▼ If it is OK, go to Step ▷7.

▼ In the case of NG, go to Step ▷6.

▷6. Fuse block check

- 1. Check the fuse block single unit.
 - ▼ If it is OK, replace the ITC.
Refer to Page I4-1.
 - ▼ In the case of NG, replace the fuse block.

▷7. Door lock motor single unit check

- 1. Check all the door lock motor single units.
Refer to Page I4-9.
 - ▼ If it is OK, repair the harness between the fuse block and all doors.
 - ▼ In the case of NG, replace the door lock motor.

5-7-2 SOME DOORS ARE NOT LOCKED INTERLOCKING WITH LOCK OPERATION AT DRIVER'S SEAT.

▷1. Fuse block voltage check

- 1. Check the voltage between the following fuse block terminals when the door control switch is activated.
 - (1) Fuse block G16 — G30
 - (2) Fuse block G1 — G11
 - (3) Fuse block B4 — B2SPECIFIED VALUE: 10 — 14V
 - ▼ If it is OK, go to Step ▷2.
 - ▼ In the case of NG, replace the fuse block.

▷2. Door lock motor single unit check

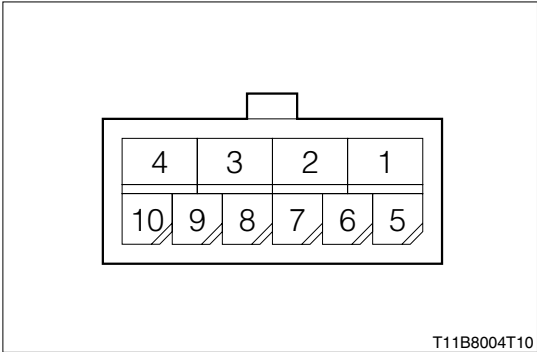
- 1. Check the door lock motor single units that are not functioning.
Refer to Page I4-9.
 - ▼ If it is OK, repair the harness.
 - ▼ In the case of NG, replace the door lock motor.

5-8 UNIT CHECK

5-8-1 FRONT DOOR CONTROL MOTOR, FR/RH

- 1. Check the door locking operation when the battery voltage is applied between the motor Ay terminals.
- 2. Check continuity between the terminals of the driver's seat door control switch.

OPERATION	Battery +	Battery -	Terminal No.	Standard
Lock	4	1	6-8	Continuity exists
Unlock	1	4	7-8	

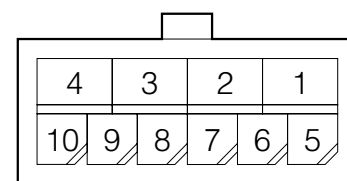


T11B8004T10

5-8-2 DOOR CONTROL MOTOR AY(FR/LH,RR/RH,RR/LH)

1. Check the door locking operation when the battery voltage is applied between the motor Ay terminals.

OPERATION	Battery +	Battery -
Lock	4	1
Unlock	1	4

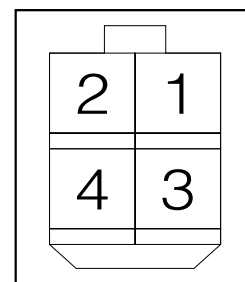


T11B8004T10

5-8-3 BACK DOOR LOCK ACTUATOR AY

1. Check the door locking operation when the battery voltage is applied between the actuator Ay terminals.

OPERATION	Battery +	Battery -
Lock	4	2
Unlock	2	4



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5-8-4 FUSE BLOCK

Remove the door control relay Ay from the fuse block and check continuity between each terminal of the fuse block and the ITC connector of the fuse block.

SPECIFIED VALUE: Continuity exists.

FUSE BLOCK INSIDE CONTINUITY CHECK

ITC fuse block side terminal	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Fuse block terminal	G29	—	G17	—	F5	F16	D4	G10	C10	—	G23	—	—	—	G11 G30 B2	G1G 16B 4	A2	—

5-9 ECU INPUT/OUTPUT SIGNAL CHECK

5-9-1 CHECKING METHOD

1. With the door control relay Ay installed to the fuse block, check that each terminal of the fuse block conforms to the following specified values given below.

5-9-2 SPECIFIED VALUE FOR INPUT/ OUTPUT SIGNAL

Check system	Terminal	Condition	Specified value	Reference (example of measurement)
Power supply	A2(BDR1) – G29(GND) C10(ECU B) – G29(GND)	At all times	Battery voltage	12.8V
IG switch	D4(IG1) – G29(GND)	IG switch "OFF"	About 0V	0V
		IG switch "ON"	Battery voltage	12.5V
Room lamp	G17(CRL) – G29(GND)	All the doors "OPEN"	About 0V	0V
		All the doors "CLOSED"	Battery voltage	12.6V
Hazard lamp	F5(HZD) – G29(GND)	Hazard Lamp "Extinguished"	Battery voltage	12.7V
		Hazard lamp "Blinking"	About 0V	0V
Front door lock motor	G16(LKM) – G30(ULM) G1(LKM) – G11(ULM) B4(LKM) – B2(ULM)	When "LOCK" is selected on the door control switch.	Battery voltage	12 – 14V
	G30(ULM) – G16(LKM) G11(ULM) – G1(LKM) B2(ULM) – B4(LKM)	When "UNLOCK" is selected on the door control switch.	Battery voltage	12 – 14V
Door control switch	G23(LKS) – Body earth	When the door control switch is in "LOCK" position.	Continuity exists	Continuity exists
	G10(UKS) – Body earth	When the door control switch is in "UNLOCK" position.	Continuity exists	Continuity exists

■ KEY-LESS ENTRY SYSTEM

1 ITC COMPUTER

1-1 REMOVAL AND INSTALLATION

Refer to Page I4-1.

2 DOOR CONTROL RECEIVER

2-1 REMOVAL AND INSTALLATION

CAUTION

- Be careful not to drop the door control receiver or give great impacts to it.
- If the door control receiver dropped or was subjected to great impacts, replace it with a new one even if there is no abnormality in its external appearance.

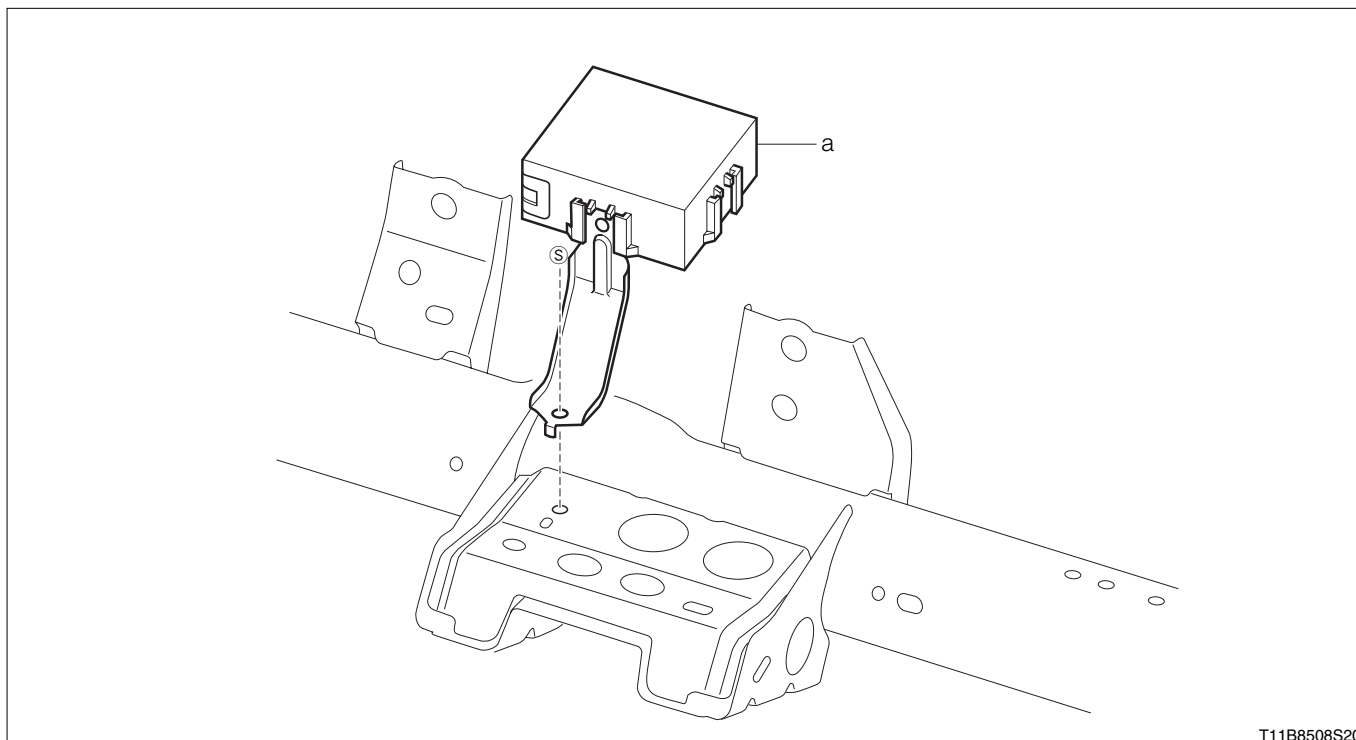
2-1-1 OPERATION BEFORE REMOVAL

1. Disconnect the battery negative (–) terminal.
2. Remove the instrument cluster finish panel.

Refer to Page I2-15.

2-1-2 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



T11B8508S20

(2) Removal and installation procedures

- 1 a Receiver, door control

2-1-3 OPERATION AFTER INSTALLATION

1. Install the instrument cluster finish panel.
Refer to Page I2-15.
2. Connect the battery negative (—) terminal.
3. Register the identification code (only when the receiver is to be replaced).
Refer to Page I4-17.

3 FRONT DOOR LOCK MOTOR

3-1 REMOVAL AND INSTALLATION

Refer to Page I1-12.

4 REAR DOOR LOCK MOTOR

4-1 REMOVAL AND INSTALLATION

Refer to Page I1-18.

5 BACK DOOR LOCK MOTOR

5-1 REMOVAL AND INSTALLATION

Refer to Page I1-20.

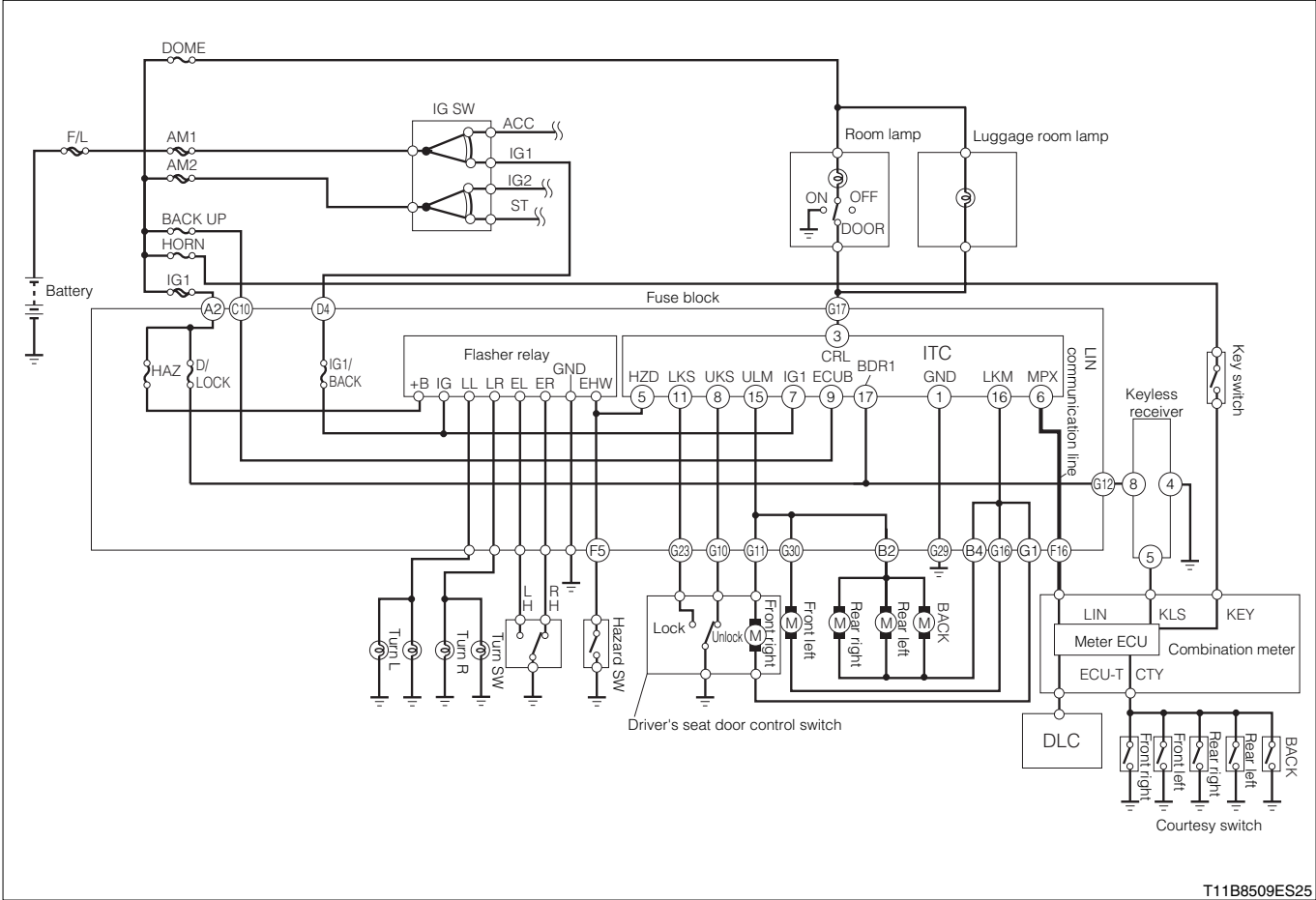
6 KEY-LESS ENTRY SYSTEM

6-1 ARTICLES TO BE PREPARED

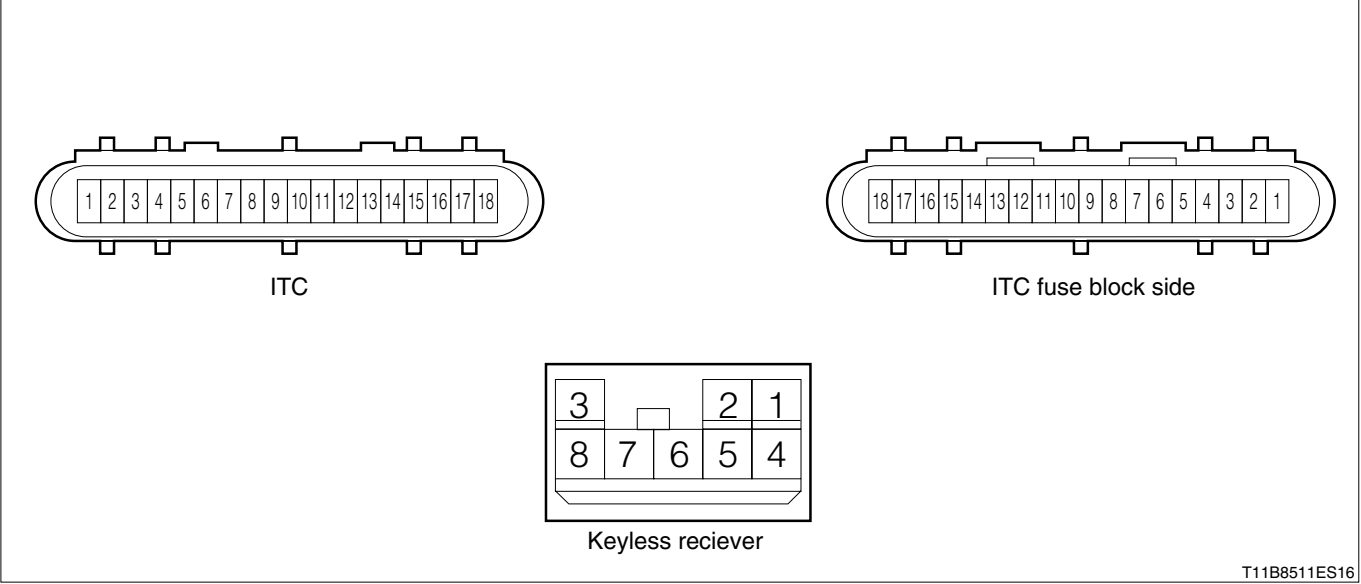
Instrument

Voltage tester, Oscillo scope

6-2 SYSTEM WIRING DIAGRAM



6-3 ARRANGEMENT OF ECU TERMINAL



Body integrated controller (ITC) terminal name

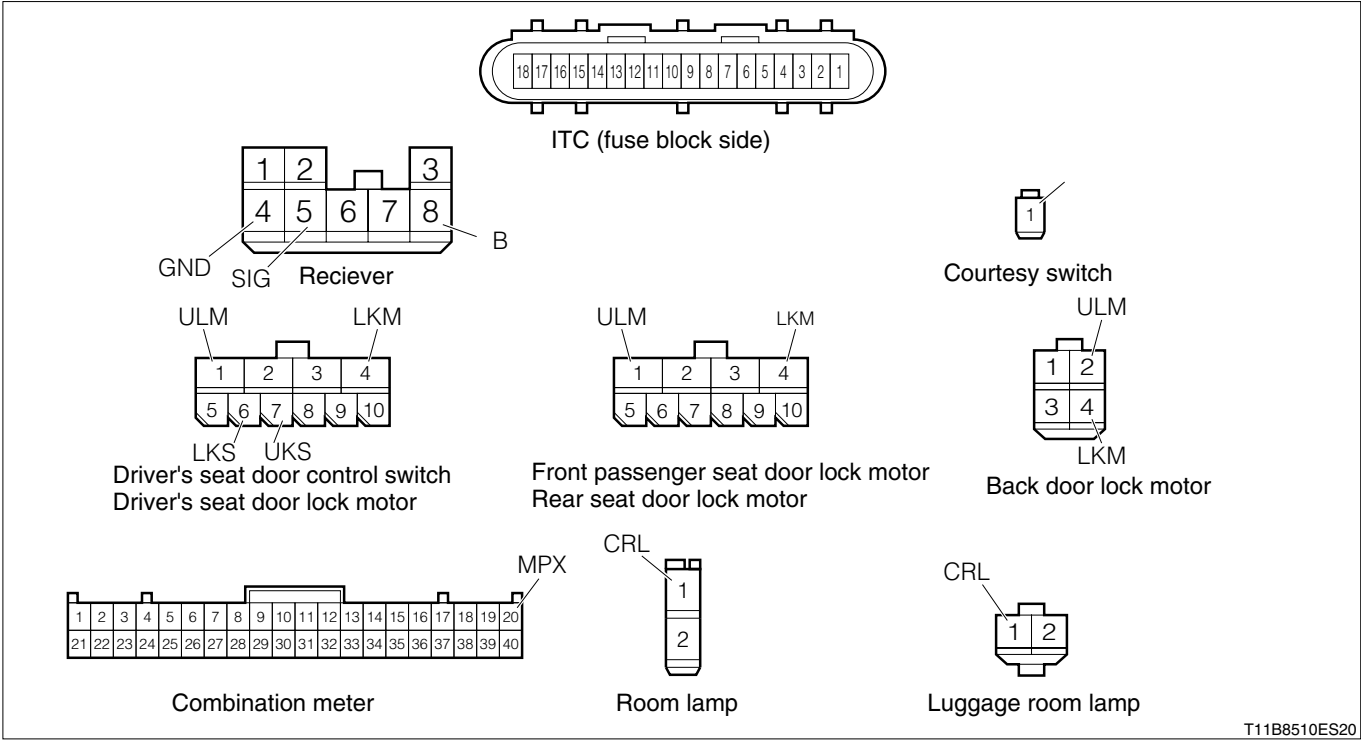
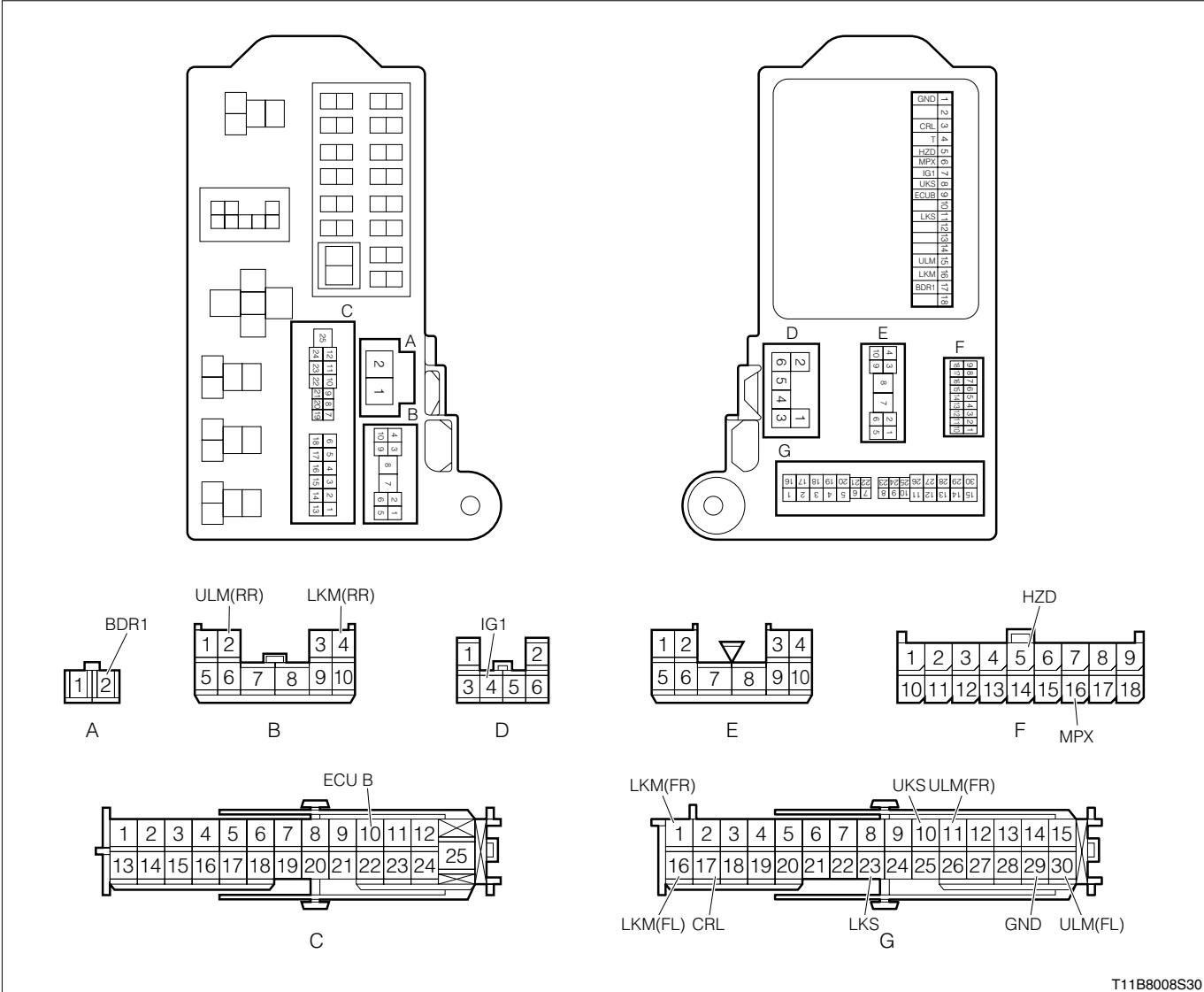
Terminal No.	Terminal code	Terminal name
1	GND	Earth
2	—	—
3	CRL	Room lamp driving output
4	—	—
5	HZD	Hazard lamp driving output
6	MPX	LIN communication input/output
7	IG1	ECU power supply
8	UKS	Door control unlock side switch input
9	ECU B	ECU power supply
10	—	—
11	LKS	Door control lock side switch input
12	—	—
13	—	—
14	—	—
15	ULM	Door lock motor unlock side output
16	LKM	Door lock motor lock side output
17	BDR1	Power supply
18	—	—

Receiver connector terminal name

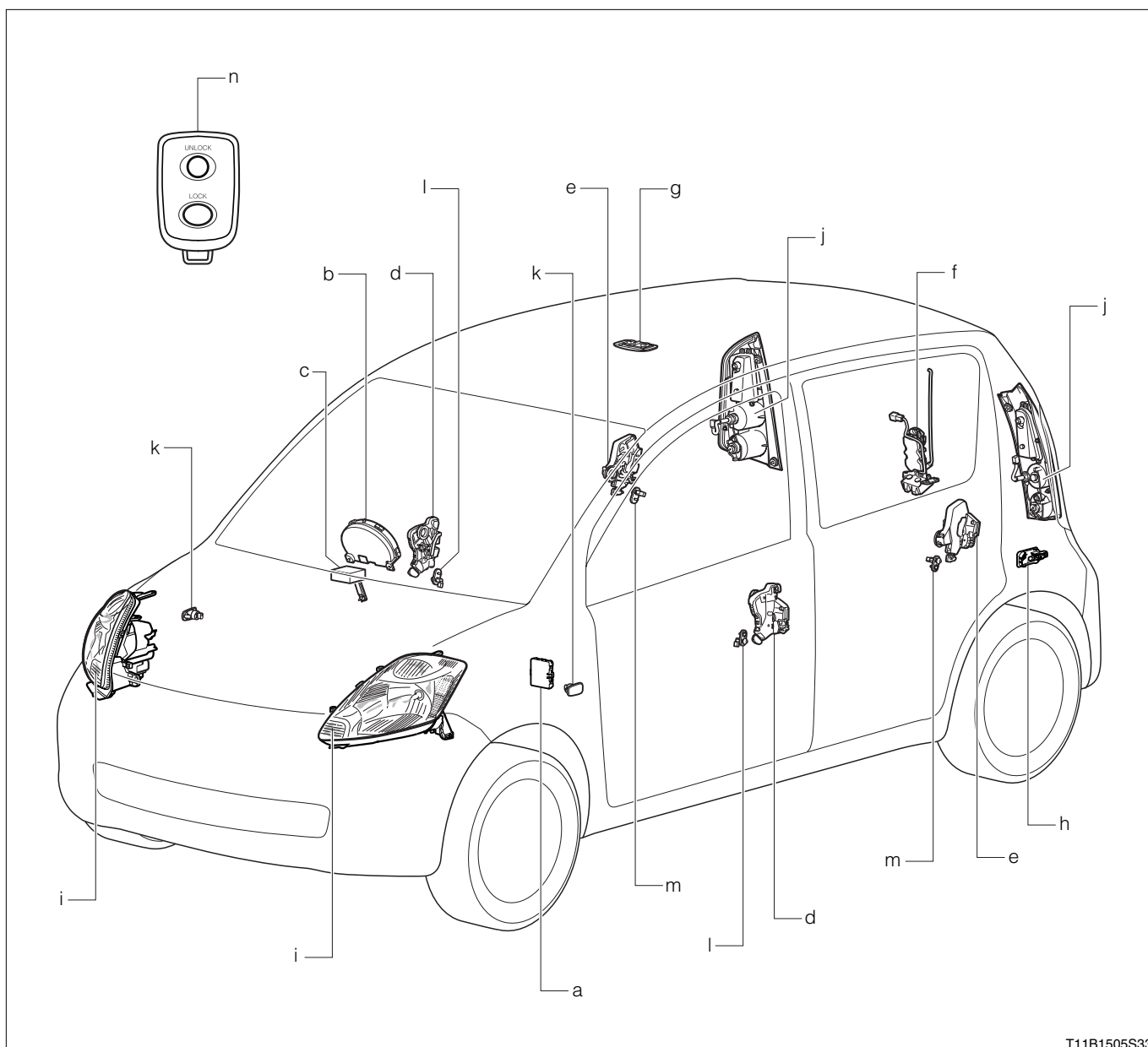
Terminal No.	Terminal code	Terminal name
1	—	—
2	—	—
3	—	—
4	GND	Earth
5	SIG	Keyless signal output
6	—	—
7	—	—
8	+B	Receiver power supply

6-4 ARRANGEMENT OF VEHICLE HARNESS SIDE CONNECTOR TERMINALS

Fuse block



6-5 LOCATION OF COMPONENTS



T11B1505S33

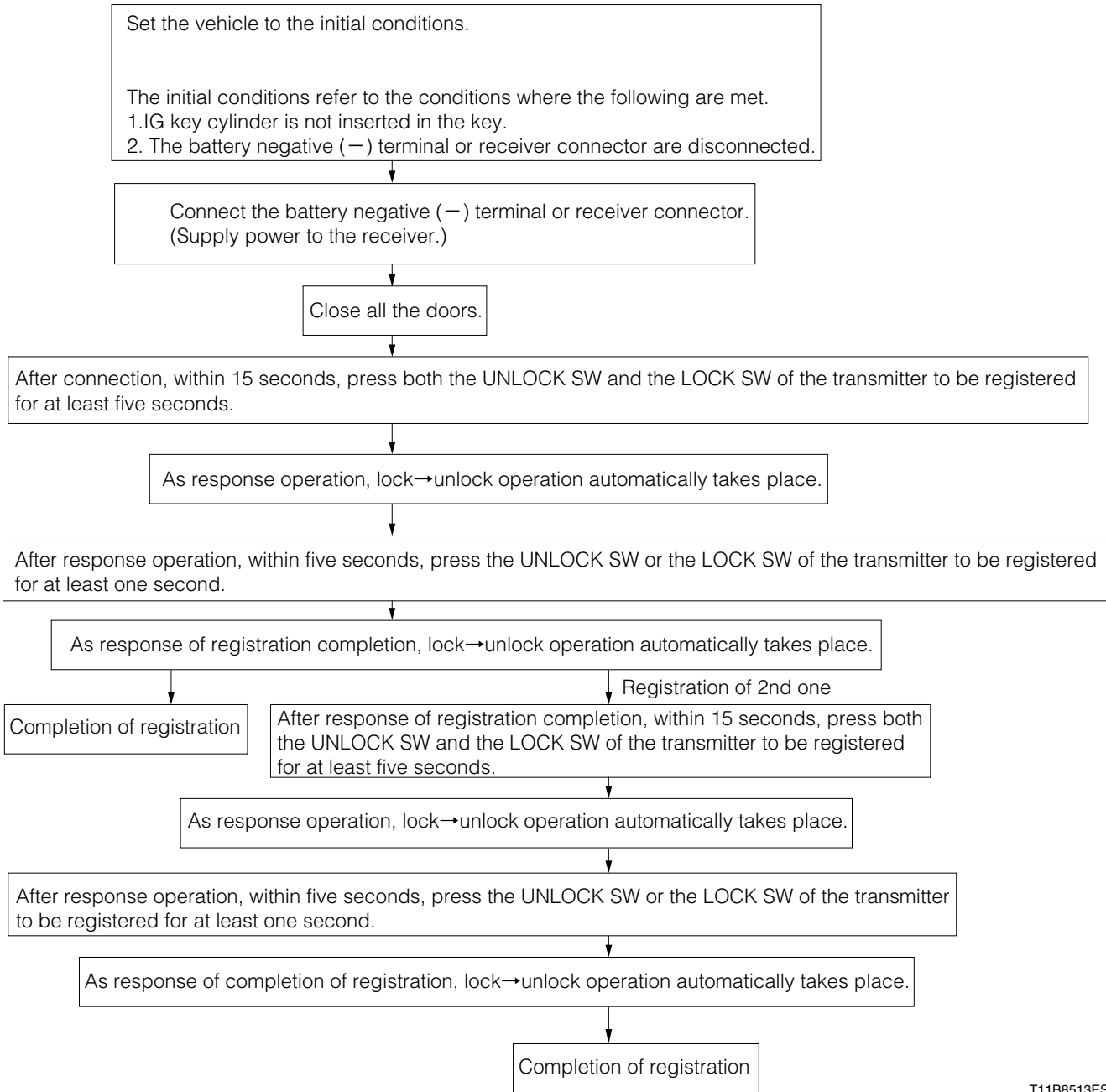
a	Body integrated controller (ITC)
b	Meter ECU
c	Keyless receiver
d	Front door lock motor
e	Rear door lock motor
f	Back door lock motor
g	Room lamp
h	Luggage room lamp
i	Front turn signal lamp
j	Rear turn signal lamp
k	Side turn signal lamp
l	Front door courtesy switch
m	Rear door courtesy switch
n	Transmitter

6-6 REGISTRATION OF IDENTIFICATION CODE

6-6-1 DESCRIPTION

- 1. If the transmitter is lost or added, the registration of the identification code is required.
- 2. Up to two identification codes can be registered for the receiver, thus making it possible to use two transmitters. When registering two transmitters, register them successively following the procedures given below.
- 3. If a new transmitter is registered, all the former identification codes registered in the receiver will be erased.
- 4. The memory of the identification code will not be lost even if the battery is disconnected.

6-6-2 HOW TO REGISTER IDENTIFICATION CODE



6-7 HOW TO PROCEED WITH TROUBLE SHOOTING

6-7-1 INQUIRY

1. In your attempt to remove the causes for a malfunction of the vehicle, you will not be able to remove the causes unless you actually confirm the malfunctioning phenomenon. No matter how long you continue operations, the vehicle may not resume the normal state unless you confirm the malfunctioning phenomenon. The inquiry with the customer is a vital information collecting activity which is to be conducted previous to the confirmation of malfunctioning phenomenon.
2. This inquiry will provide you with an important clue in an effort to reproduce the malfunctioning phenomenon. Furthermore, the information obtained by the inquiry can be referred to during the trouble-shooting. Hence, instead of making general questions, it is necessary to focus your questions on the items related to the malfunction.

(1) DIAGNOSIS BY INTERVIEW SHEET FOR KEY-LESS SYSTEM

Checked by		Check date	Day Month (day of week)

Customer information

Name of customer		Gender of customer (Male, female)	Age [approx.]	Occupation []
	Mr./Ms.	Area where vehicle is mainly used	Urban, suburb, seashore, mountain, others	Parking place Outdoor, indoor

Details of vehicle

Date when vehicle was brought to workshop	Day Month (day of week)	Date when malfunction took place	Day Month (day of week)	Repair history	No, Yes (How many times?)
Frame No.		Registration date	Day Month Year	Vehicle model	
Engine type		Transmission	5M/T · 3A/T · 4A/T · CVT electronically-controlled 4A/T	Driving	2WD · 4WD
Running distance	km	Equipment	Tire [] · Wheel [Steel · Aluminum]		

Weather

☐ Fine	☐ Cloudy	☐ Rainy	☐ Snow	☐ Other()
Temperature(Approx. °C)				

Frequency of malfunction

☐ Always	☐ Under certain condition()	☐ Sometimes()

Phenomenon

☐ In case the keyless function (remote control) is inoperative (when there is no new transmitter or no properly functioning transmitter for the same type vehicle).
☐ The keyless function (remote control) is inoperative (when there is a new or normally operating transmitter).
☐
☐
☐
☐
☐ Other

6-8 TROUBLE SHOOTING ACCORDING TO MALFUNCTION PHENOMENA

6-8-1 IN CASE THE KEYLESS FUNCTION (REMOTE CONTROL) IS INOPERATIVE (WHEN THERE IS NO NEW TRANSMITTER OR NO PROPERLY FUNCTIONING TRANSMITTER FOR THE SAME TYPE VEHICLE).

▷1. LIN communication system diagnostic code check

1. With the SST, short-circuit the ECU-T terminal and the E terminal in the DLC. Then turn the IG switch "ON"

2. Check the diagnostic code displayed for the LIN communication system.

SPECIFIED VALUE: Diagnostic codes 0011, 002 are not displayed.

▼ If it is OK, go to Step ▷2.

▼ In the case of NG, go to troubleshooting for the LIN communication system.

Refer to Page L2-21.

▷2. Basic function check of keyless system

1. Bring the vehicle into the initial state.

NOTE

- Initial state: The key is not inserted in the IG key cylinder.
All doors are closed.

2. Repeat 3 continuous LOCK and UNLOCK standard operations alternately. Check that the lock/unlock are activated properly after the 3rd trial onward.

NOTE

- Standard operation: Move away from the outside handle on the driver's seat by approx. 1m to the right.
Point the transmitter at the vehicle and press either of the transmitting switches for about 1 second.

SPECIFIED VALUE: The switch shall operate properly.

▼ If it is OK, go to Step ▷3.

▼ In the case of NG, go to Step ▷6.

▷3. Answer back functional check

1. When performing LOCK and UNLOCK operations, check to see if the answer back is performed properly by the room lamp and luggage room lamp that are interlocked with the door, and hazard lamp. (With LOCK operation, the room lamp and the luggage room lamp shall dim for 3 seconds, and the hazard lamp shall make one blink. With UNLOCK operation, the room lamp and the luggage room lamp shall dim for 15 seconds and the hazard lamp shall make two blinks.)

SPECIFIED VALUE: Answer-back function shall operate properly.

▼ If it is OK, the function is normal.

NOTE

- Operation range depends on by whom and where the operation is executed, as well as how the transmitter is being held.
- Since the system uses weak electric wave, the operation range may be reduced due to strong electric wave or noise in the operating frequency.

▼ In the case of NG, go to Step ▷4.

▷4. Room lamp, hazard lamp check

1. Check that the room lamp and the hazard lamp light up with the switch "ON".

SPECIFIED VALUE: Illuminates.

▼ If it is OK, go to Step ▷5.

▼ In the case of NG, check the bulb, fuse and harness of the room lamp, luggage room lamp and hazard lamp.

▷5. Wire harness check

1. Check continuity between the room lamp, hazard lamp and the ITC.

SPECIFIED VALUE: Continuity exists.

▼ If it is OK, check the ITC power supply and the earth system.

▼ In the case of NG, repair the harness.

▷6. Transmitter battery check

1. Check whether the indicator of the transmitter blinks, when the "LOCK" or "UNLOCK" switch of the transmitter is pressed.

SPECIFIED VALUE: The indicator shall blink.

▼ If it is OK, go to Step ▷7.

▼ In the case of NG, replace battery.

▷7. Check by the registration function

1. Bring the vehicles into the initial state.
2. Follow the procedure below to start out in the registration mode.
 - (1) Disconnect the battery negative (—) terminal or the connector of the keyless receiver.
 - (2) Connect the battery negative (—) terminal or the connector of the keyless receiver that has been removed.
 - (3) Close all the doors.
 - (4) Press the "UNLOCK" switch of the transmitter for more than 5 seconds within 15 seconds after connection has been established.
3. Check whether lock→unlock operates properly after shifted to the registration mode.

SPECIFIED VALUE: Operation shall be normal.

▼ If it is OK, go to Step ▷8.

▼ In the case of NG, go to Step ▷9.

▷8. Keyless entry operation check

1. After the identification code has been registered, check basic functions of the keyless entry system to ensure proper operation.

SPECIFIED VALUE: The system shall function properly.

▼ If it is OK, the function is normal.

▼ In the case of NG, the keyless receiver is defective.

▷9. Keyless receiver check

Refer to Page I4-23.

- ▼ If it is OK, the function is normal.
- ▼ In the case of NG, the keyless receiver is defective.

6-8-2 THE KEYLESS FUNCTION (REMOTE CONTROL) IS INOPERATIVE (WHEN THERE IS A NEW OR NORMALLY OPERATING TRANSMITTER).

▷1. Meter check

1. With the SST, short-circuit the ECU-T terminal and the E terminal in the DLC. Then turn the IG switch "ON".
2. Check the diagnostic code displayed for the LIN communication system.
SPECIFIED VALUE: Diagnostic codes 0011,0021 are not displayed.

- ▼ If it is OK, go to Step ▷2.
- ▼ In the case of NG, go to trouble shooting for the LIN communication system.
Refer to Page L2-21.

▷2. Basic function check of keyless system

1. Bring the vehicle into the initial state.

NOTE

- Initial state: The key is not inserted in the IG key cylinder.
All doors are closed

2. Repeat 3 continuous LOCK and UNLOCK standard operations alternately. Check that the lock/unlock are activated properly after the 3rd trial onward.

NOTE

- Standard operation: Move away from the outside handle on the driver's seat by approx.
1m to the right.
Point the transmitter at the vehicle and press either of the transmitting switches for about 1 second.

SPECIFIED VALUE: The switch shall operate properly.

- ▼ If it is OK, go to Step ▷3.
- ▼ In the case of NG, go to Step ▷6.

▷3. Answer back functional check

1. When performing LOCK and UNLOCK operations, check to see if the answer back is performed properly by the room lamp and luggage room lamp that are interlocked with the door, and hazard lamp. (With LOCK operation, the room lamp and the luggage room lamp shall dim for 3 seconds, and the hazard lamp shall make one blink. With UNLOCK operation, the room lamp and the luggage room lamp shall dim for 15 seconds and the hazard lamp shall make two blinks.)

SPECIFIED VALUE: Answer-back function shall operate properly.

▼ If it is OK, the function is normal.

NOTE

- Operation range depends on by whom and where the operation is executed, as well as how the transmitter is being held.
- Since the system uses weak electric wave, the operation range may be reduced due to strong electric wave or noise in the operating frequency.

▼ In the case of NG, go to Step ▷4.

▷4. Room lamp, hazard lamp check

1. Check that the room lamp and the hazard lamp light up with the switch turned "ON".

SPECIFIED VALUE: Illuminates.

▼ If it is OK, go to Step ▷5.

▼ In the case of NG, check the bulb, fuse and harness of the room lamp, and hazard lamp.

▷5. Wire harness check

1. Check continuity between the room lamp, hazard lamp and the ITC.

SPECIFIED VALUE: Continuity exists.

▼ If it is OK, check the ITC power supply and the earth system.

▼ In the case of NG, repair the harness.

▷6. Transmitter battery check

1. Check whether the indicator of the transmitter blinks, when the "LOCK" or "UNLOCK" switch of the transmitter is executed.

SPECIFIED VALUE: The indicator shall blink.

▼ If it is OK, go to Step ▷7.

▼ In the case of NG, replace the battery.

▷7. Check by the registration function

1. Bring the vehicles into the initial state.
2. Follow the procedure below to start out in the registration mode (use a normally functioning transmitter).
 - (1) Disconnect the battery negative (—) terminal or the connector of the keyless receiver.
 - (2) Connect the battery negative (—) terminal or the connector of the keyless receiver that has been removed.
 - (3) Close all the doors.
 - (4) Press the "UNLOCK" switch of the transmitter for more than 5 seconds within 15 seconds after connection has been established.

3. Check whether lock→unlock operates properly after shifted to the registration mode.

SPECIFIED VALUE: Operation shall be normal.

- ▼ If it is OK, go to Step ▷8.
- ▼ In the case of NG, go to Step ▷10.

▷8. Transmitter basic check

1. Interrupt the operation of the transmitter for more than 5 seconds to discontinue the registration mode.
2. Perform check again by the registration function. (Use the transmitter which was not able to operate.)
3. Take the same procedure as was previously done for the registration mode.
4. Check whether lock→unlock operates properly after shifted to the registration mode.
 - ▼ In the case of NG, go to Step ▷9).
 - ▼ In the case of NG, the transmitter is defective.

▷9. Keyless entry operation check

1. After the identification code has been registered, check basic functions of the keyless entry system to ensure proper operation.

SPECIFIED VALUE: The system shall function properly.

 - ▼ If it is OK, the function is normal.
 - ▼ In the case of NG, the keyless receiver is defective.

▷10. Keyless receiver check

Refer to Page I4-23.

- ▼ If it is OK, the function is normal.
- ▼ In the case of NG, the keyless receiver is defective.

6-9 ECU INPUT/OUTPUT SIGNAL CHECK(BODY INTEGRATED CONTROLLER)

6-9-1 CHECKING METHOD

1. With the door control relay Ay installed to the fuse block, check to see if each terminal of the fuse block conforms to the following specified value given below.

6-9-2 SPECIFIED VALUE FOR INPUT/ OUTPUT SIGNAL

Check system	Terminal	Condition	Specified value	Reference (example of measurement)
Power supply	A2(BDR1) – G29(GND) C10(ECU B) – G29(GND)	At all times	Battery voltage	12.8V
IG switch	D4(IG1) – G29(GND)	IG switch "OFF"	About 0V	0V
		IG switch "ON"	Battery voltage	12.5V
Room lamp	G17(CRL) – G29(GND)	All the door "OPEN"	About 0V	0V
		All the door "CLOSED"	Battery voltage	12.6V
Hazard lamp	F5(HZD) – G29(GND)	Hazard lamp is "Extinguished"	Battery voltage	12.7V
		Hazard lamp "blinks"	About 0V	0V
Door lock motor	G16(LKM) – G30(ULM) G1(LKM) – G11(ULM) B4(LKM) – B2(ULM)	When the door control switch is in "LOCK" position.	Battery voltage	12 – 14V
	G30(ULM) – G16(LKM) G11(ULM) – G1(LKM) B2(ULM) – B4(LKM)	When the door control switch is in "UNLOCK" position.	Battery voltage	12 – 14V
Door control switch	G23(LKS) – Body earth	Door control switch "LOCK"	Continuity exists	Continuity exists
	G10(UKS) – Body earth	Door control switch "UNLOCK"	Continuity exists	Continuity exists
Earth	G29(GND) – Body earth	At all times	Continuity exists	Continuity exists

6-10 ECU INPUT/OUTPUT SIGNAL CHECK(KEYLESS RECEIVER)

6-10-1 CHECKING METHOD

(1) Check

1. Check whether or not the values between the respective terminals of the receiver meet the following specified values.

Standard input/output signal of receiver

Check system	Terminal	Check items	Specified value	Reference value (Example of measured value)
Power supply	8(+B) – 4(GND)	Voltage	Battery voltage	12.8V
Keyless signal	5(SIG) – 4(GND)	Voltage	About 12V	12V
		Voltage	Pulse generation	※
		Voltage	Pulse generation	※
Earth	4(GND) – Body earth	Continuity	Continuity exists	Continuity exists

※ Refer to the oscilloscope waveform in the following section.

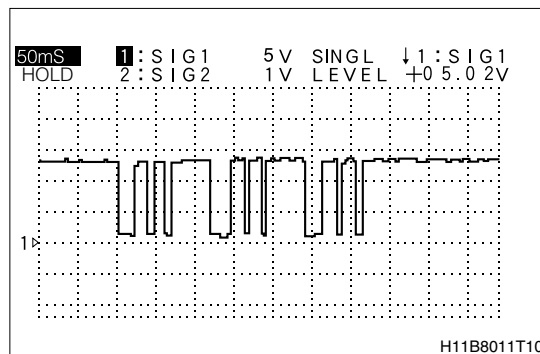
6-10-2 OSCILLOSCOPE WAVEFORMS

(1) Description

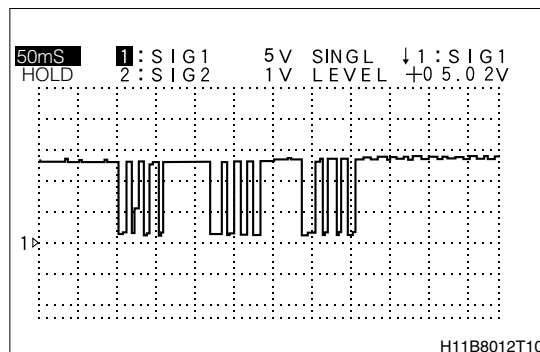
Waveforms measured by the oscilloscope function of the diagnosis tester (DS-21/DS-II) are shown below as reference.

(2) Waveform of keyless signal system

1. Measuring terminals : 5(SIG) — 4(GND)
2. Measurement conditions: When "LOCK" is executed.
3. Measuring range : 5V (voltage axis), 50ms (time axis)



4. Measuring terminals : 5(SIG) — 4(GND)



5. Measurement condition: When "UNLOCK" is executed.
Measuring range: 5V (voltage axis), 50ms (time axis)

■ IMMOBILIZER SYSTEM

1 STEERING COLUMN W/SWITCH BRACKET

1-1 REMOVAL AND INSTALLATION

2 TRANSPONDER KEY COIL(IMMOBILIZER COIL)

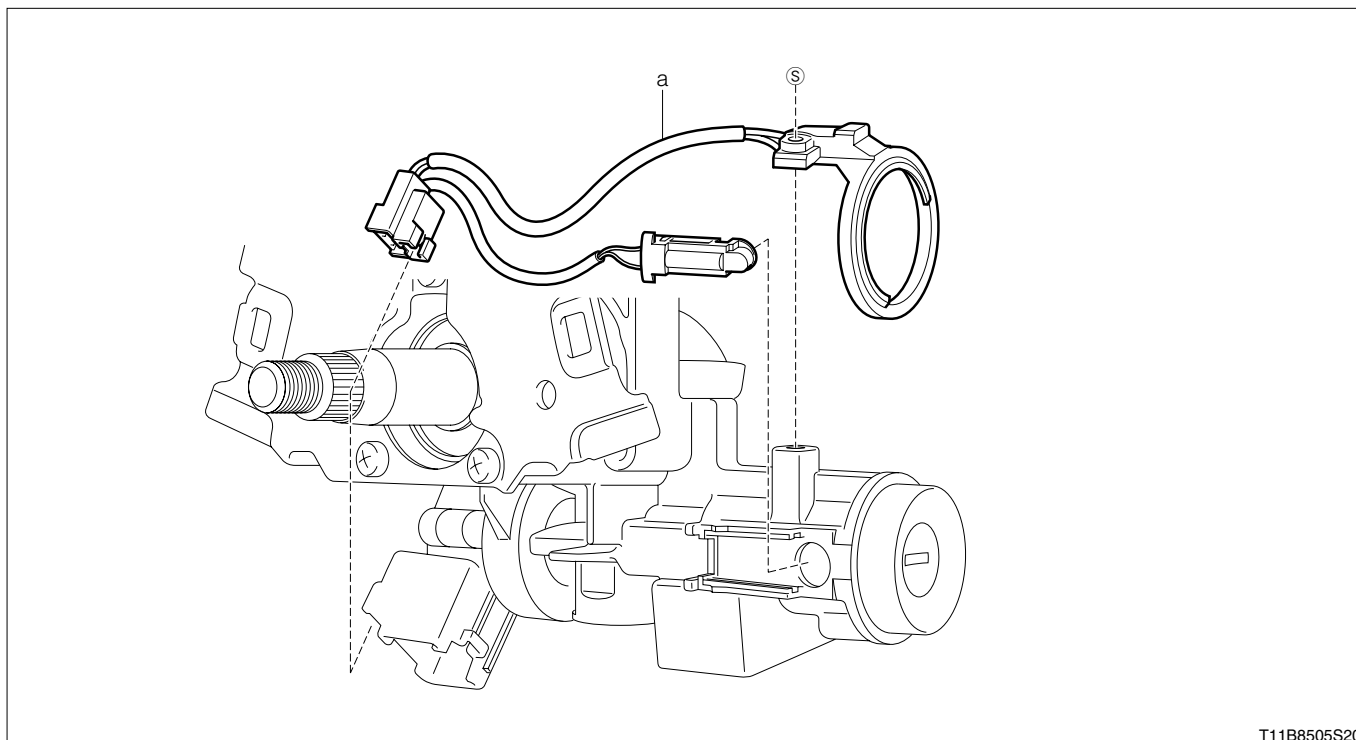
2-1 REMOVAL AND INSTALLATION

2-1-1 OPERATION BEFORE REMOVAL

1. Disconnect the battery negative (—) terminal.
2. Remove the steering column lower cover.
Refer to Page G1-4.
3. Remove the steering column upper cover.
Refer to Page G1-4.

2-1-2 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



T11B8505S20

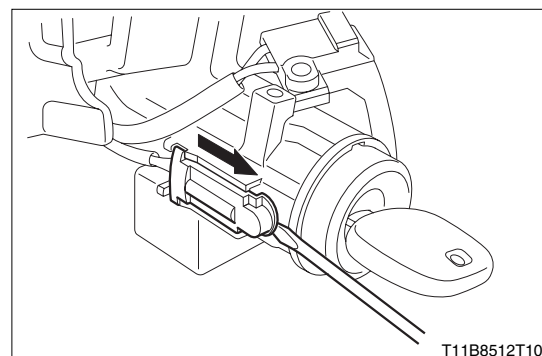
(2) Removal and installation procedures

- ▼ 1 a Coil, transponder key

2-1-3 POINTS OF REMOVAL

(1) Coil, transponder key

1. Insert the key into the key cylinder.
2. With the key inserted, insert a flat screwdriver or the like into between the coil case and the ignition switch lock cylinder Ay.
3. With the flat screwdriver or the like inserted, push the case to the right to remove.



T11B8512T10

2-1-4 OPERATION AFTER INSTALLATION

1. Install the steering column upper cover.
Refer to Page G1-4.
2. Install the steering column lower cover.
Refer to Page G1-4.
3. Connect the battery negative (—) terminal.

3 TRANSPONDER KEY COMPUTER(IMMOBILIZER ECU)

3-1 REMOVAL AND INSTALLATION

CAUTION

- Be careful not to drop the transponder key computer Ay or give great impacts to it.
- If the transponder key computer Ay dropped or was subjected to great impacts, replace it with a new one even if there is no abnormality in its external appearance.
- Refer to the precaution on maintenance for SRS airbag system.

Refer to Page A1-2.

3-1-1 OPERATION BEFORE REMOVAL

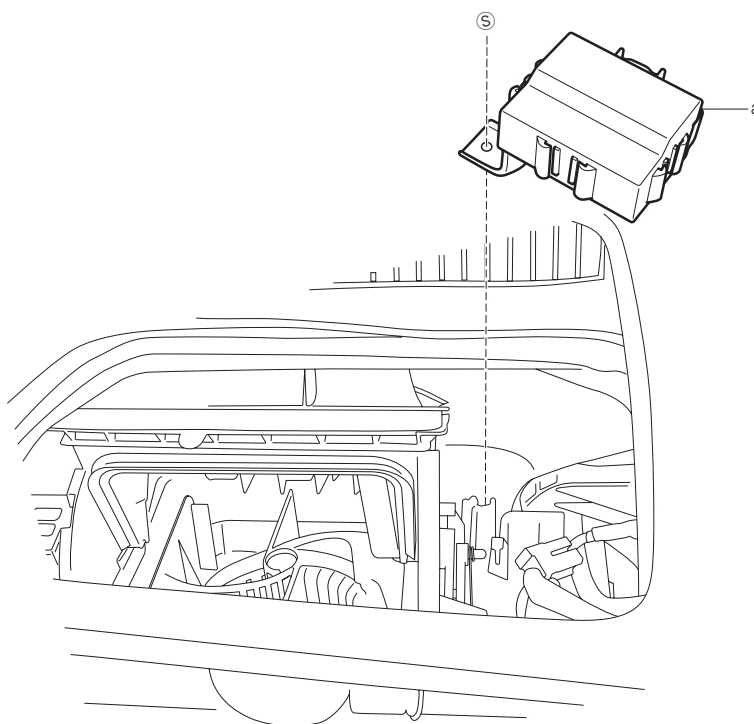
1. Disconnect the battery negative (—) terminal.
2. Remove the instrument panel passenger airbag Ay.

Refer to Page H1-9.

3-1-2 REMOVAL AND INSTALLATION PROCEDURES

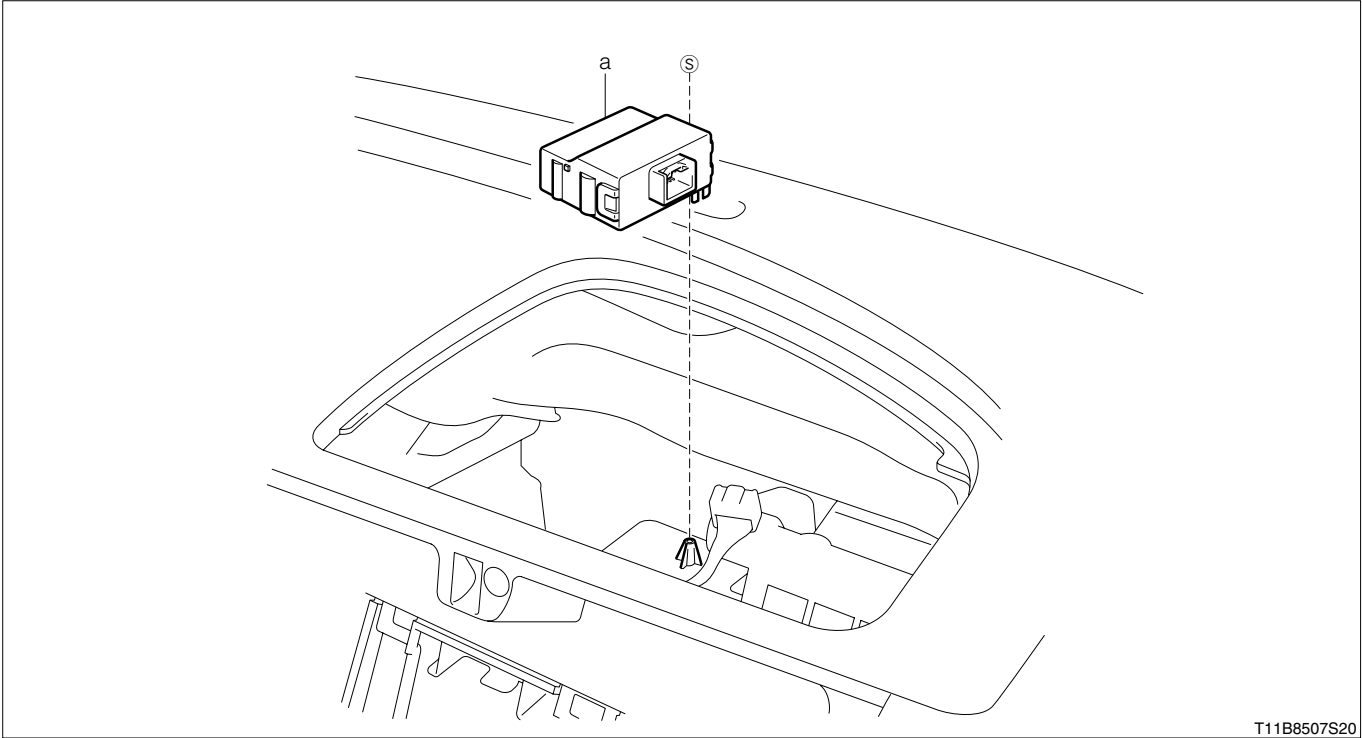
(1) Components

RHD vehicles



T11B8506S20

LHD vehicles



T11B8507S20

(2) Removal and installation procedures

- 1 a Computer Ay, transponder key

3-1-3 INSPECTION

(1) Computer Ay, transponder key

- 1. Replace the computer with a new one in the following cases.
 - (1) Case where the computer Ay has deformation, abrasion, cracks or breakage.

CAUTION

- Never disassemble the computer.

3-1-4 OPERATION AFTER INSTALLATION

- 1. Install the instrument panel passenger airbag Ay.
Refer to Page H1-9.

- 2. Connect the battery negative (－) terminal.

4 IMMOBILIZER SYSTEM

4-1 ARTICLES TO BE PREPARED

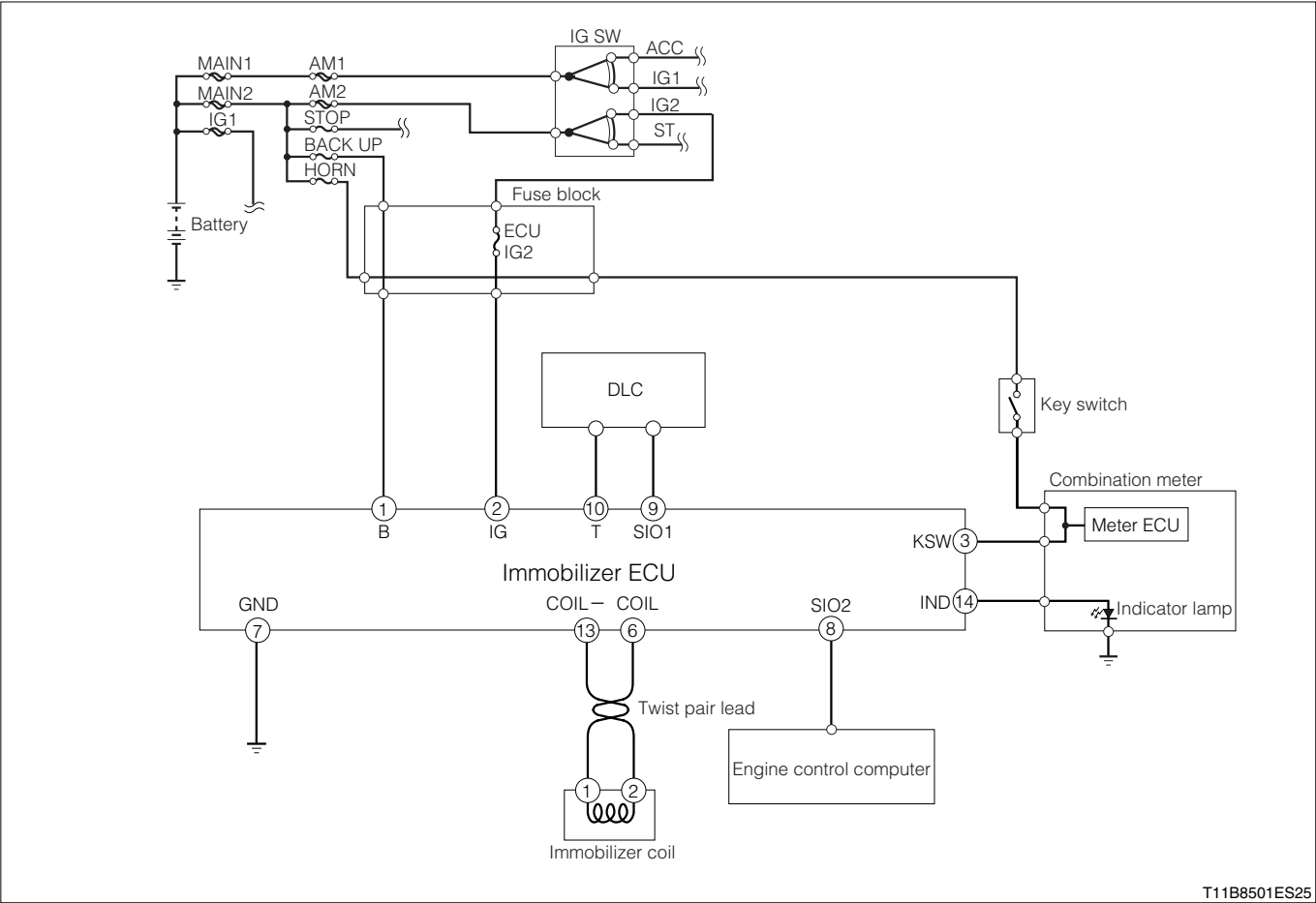
SST

Shape	Part No.	Part name
	09991-87403-000	Wire,diagnosis check

Instrument

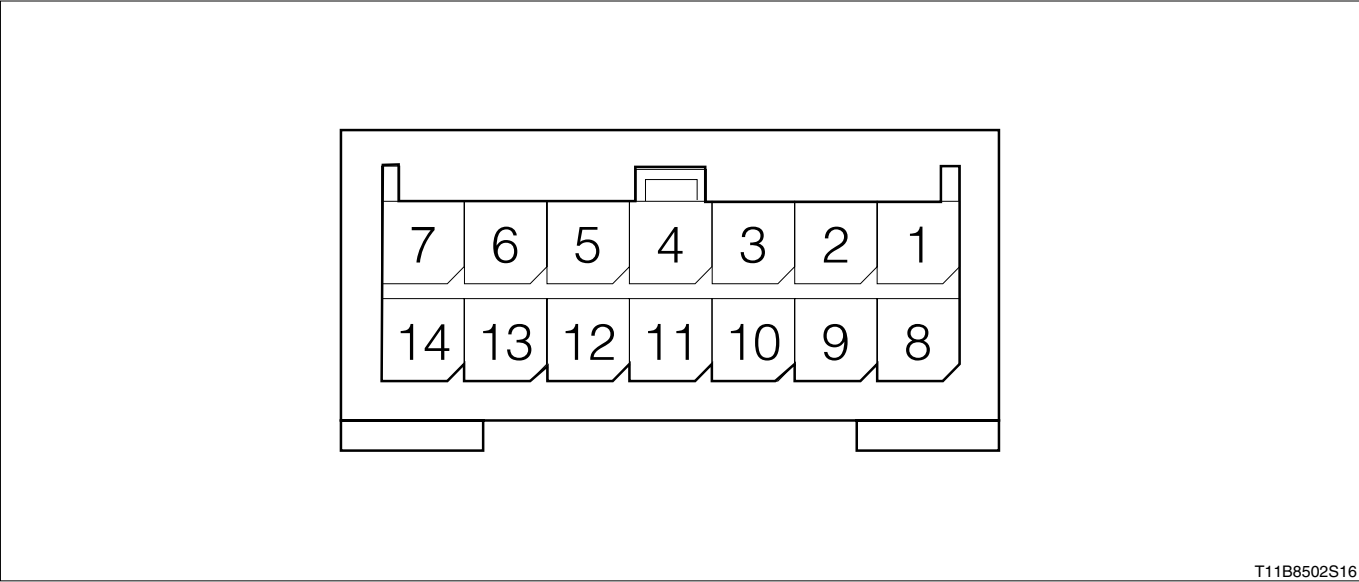
Voltage tester

4-2 SYSTEM WIRING DIAGRAM



T11B8501ES25

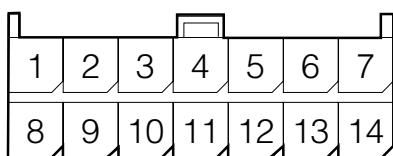
4-3 ARRANGEMENT OF ECU TERMINAL



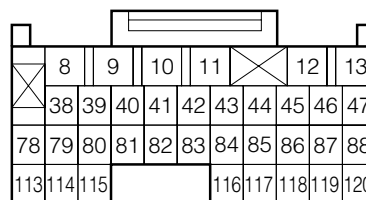
T11B8502S16

Terminal No.	Terminal code	Terminal name
1	+B	ECU power supply
2	IG	Ignition switch power supply
3	KSW	Key switch
4	—	—
5	—	—
6	COIL+	Transponder communication
7	GND	Earth
8	SIO2	Immobilizer communication
9	SIO1	Diagnostic tester communication
10	T	Diagnostic tester communication
11	—	—
12	—	—
13	COIL—	Transponder communication
14	IND	Security indicator

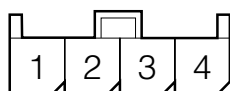
4-4 ARRANGEMENT OF VEHICLE HARNESS SIDE CONNECTOR TERMINALS



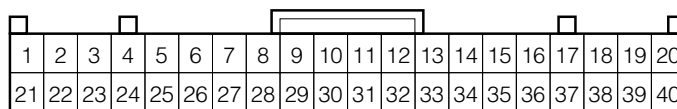
Immobilizer ECU



Engine control computer

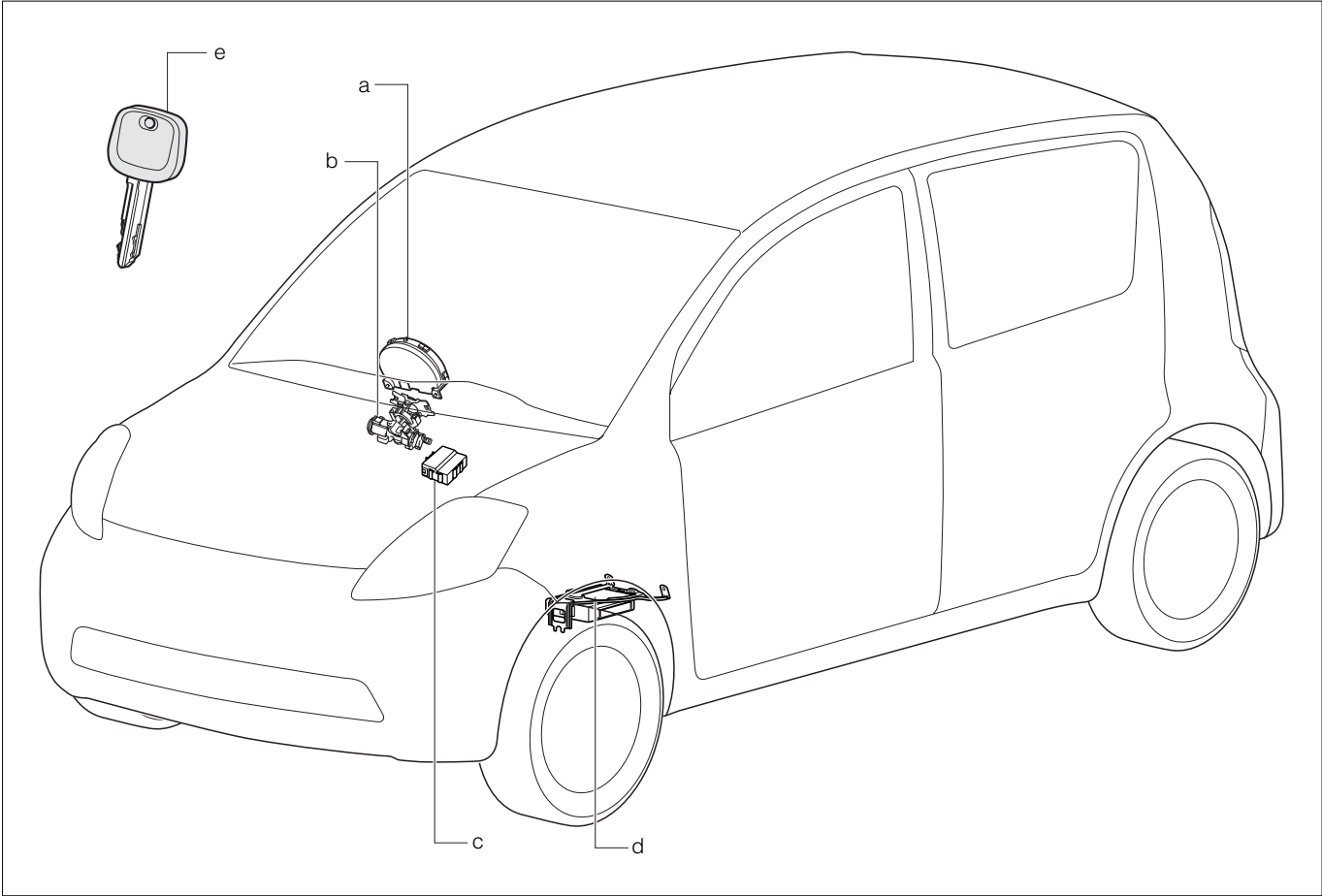


Immobilizer coil
key switch



Combination meter

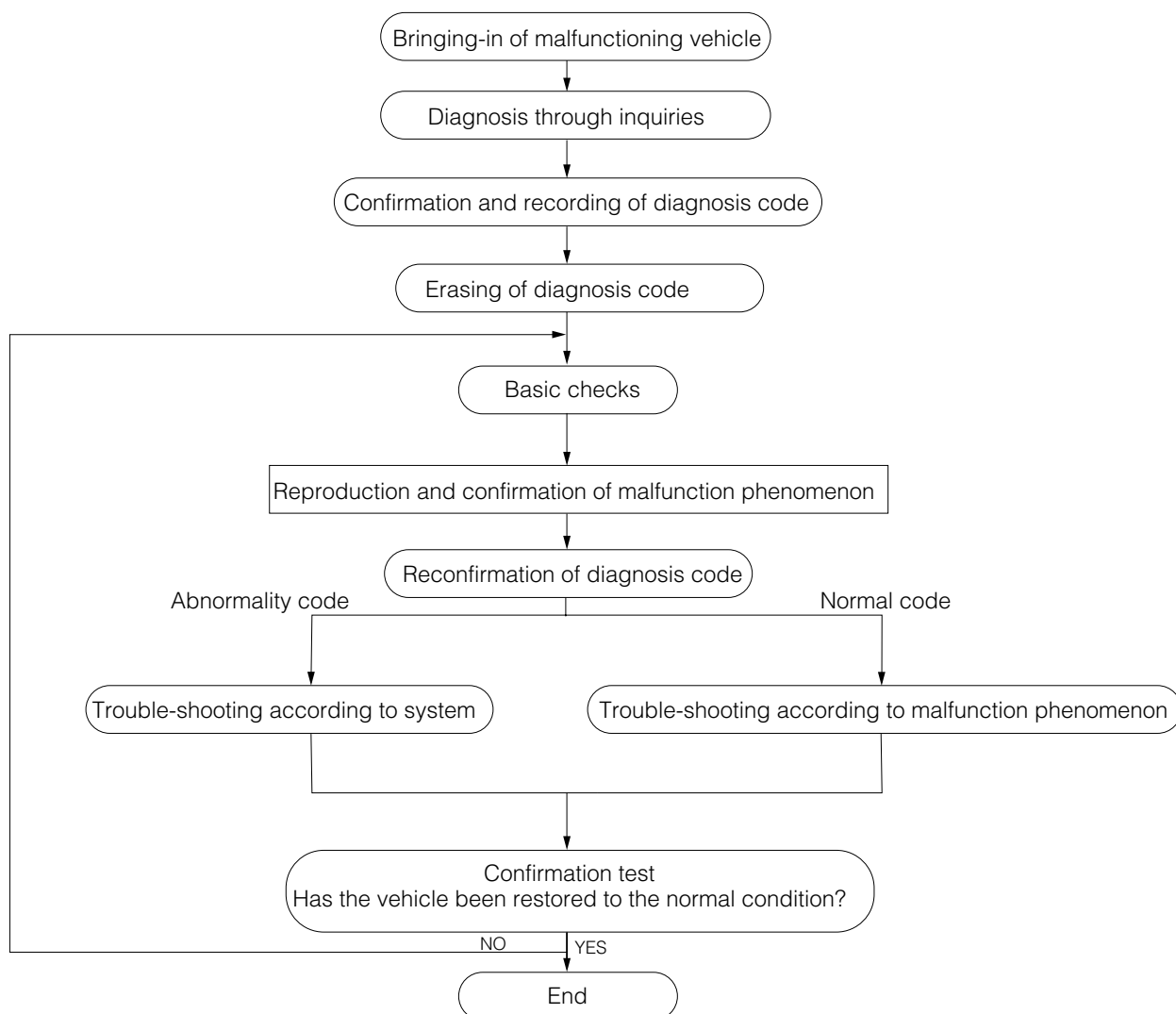
4-5 LOCATION OF COMPONENTS



code	Part name
a	Meter ECU
b	Steering column upper W/switch bracket
c	Immobilizer ECU
d	EFI ECU
e	Transponder

4-6 HOW TO PROCEED WITH TROUBLE SHOOTING

1. The immobilizer system is equipped with a diagnosis function which diagnoses malfunctioning sections and gives important clues in the trouble shooting.
2. The diagnosis function of the immobilizer system is equipped with the battery backup (which keeps supplying power for diagnosis memory even when the ignition switch is set to OFF position).



4-7 INQUIRY

1. In an effort to remove causes for malfunction from the vehicle concerned, it is impossible to determine the cause without confirming the malfunction phenomenon. If the phenomenon is not confirmed, the vehicle may not be able to return to the normal conditions even if you continue your work. The diagnosis through inquiries is to collect information from the customer before confirming the malfunction phenomena. The diagnosis through inquiries provides very important clues in reproducing malfunction phenomena.
2. Since the information obtained by the diagnosis through inquiries is referred to during the trouble shooting, it is imperative to make an inquiry of the customer, centering on the items related to the malfunction, instead of simply asking general questions.

4-8 CONFIRMATION, RECORD AND ERASURE OF DIAGNOSIS CODE

4-8-1 OUTLINE

1. When the diagnosis code is indicated, confirm whether the malfunction took place sometimes in the system or is still persisting. Also it is necessary to check any relation between the code and the reproduced malfunction. For this purpose, the diagnosis code should be indicated twice, namely before and after the confirmation of the phenomena.

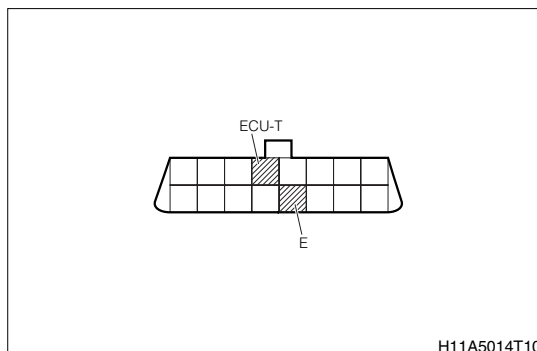
4-8-2 CHECKING METHOD OF DIAGNOSIS

1. Bring the vehicle into the stopped state.
2. Set the IG switch to LOCK. Using the SST, short circuit the terminals ECU-T and E of the DLC located under the instrument panel.

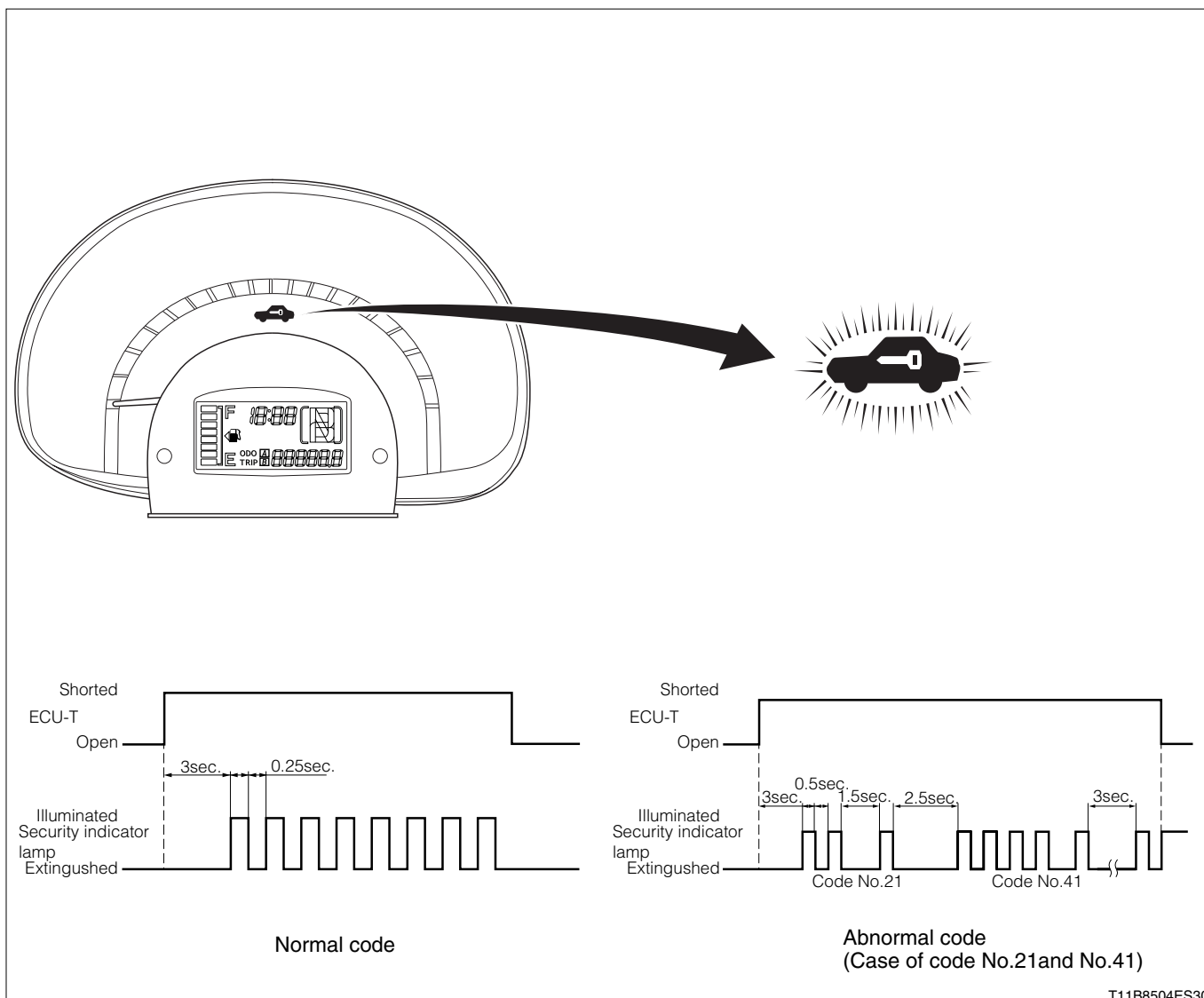
CAUTION

- If wrong connector connecting positions are selected, this may cause malfunction. Therefore, utmost care must be paid so as not to choose wrong positions.

SST: 09991-87403-000
09991-97201-000



3. Turn ON the IG switch. Let the security indicator flash and indicate the diagnosis code.
4. All the diagnosis codes memorized are shown repeatedly in the sequence of diagnosis number, starting from the smallest number.



4-8-3 CANCELING METHOD OF DIAGNOSIS

1. When the section which is responsible for the malfunction code has been checked and repaired, erase the memory, following the procedure given below. After the erasure, let the diagnosis code be outputted again and confirm that the normal code is outputted.
 - (1) Disconnect the negative (—) terminal of the battery.

4-8-4 CONTENTS OF DIAGNOSIS

Contents of diagnosis

Code No.		Warning indication (Provided: ○, Not-provided: ✕)	code memorizing (Provided: ○, Not-provided: ✕)	Contents of diagnosis	
2-digit	4-digit			Diagnosis system	Diagnosis item
12	B2796	○	✕	Immobilizer coil	Faulty key or immobilizer coil
15	B2780	○	○	Key switch	Key switch "OFF" malfunction
21	B2795	○	○	Transponder signal sending	Mismatching of key ID codes
22	B2794	○	○		Mismatching of key ID codes
23	B2793	○	○	Transponder lock	Key ID codes not registered
24	B2797	○	✕	Transponder communication	Transponder communication faulty
25	B2798	○	✕		Frame receiving faulty
41	B2788	○	○	Communication with EFI (Code mismatching)	Faulty communication with EFI ECU (1)
42	B2789	○	○	Communication with EFI (No signal receiving)	Faulty communication with EFI ECU (2)

4-9 TROUBLE SHOOTING ACCORDING TO DIAGNOSIS CODE

4-9-1 DIAGNOSIS CODE NO.12

(1) Checking points

1. Is immobilizer coil normal?
2. Are the harness and connector between the immobilizer coil and the immobilizer ECU normal?

(2) Checking method

▷1. Wire harness continuity check

1. Check continuity between the following terminals.
 - (1) Immobilizer coil vehicle harness side 1(COIL+) — immobilizer ECU vehicle harness side 6(COIL+)
 - (2) Immobilizer coil vehicle harness side 2(COIL—) — immobilizer ECU vehicle harness side 13(COIL—)

SPECIFIED VALUE: Continuity exists

▼ If it is OK, go to Step ▷2).

▼ If it is NG, replace the harness and connector.

▷2. Immobilizer coil unit check

1. Perform unit check of the transponder key coil (immobilizer coil).
Refer to Page I4-38.

SPECIFIED VALUE: No abnormality exists.

▼ If it is OK, go to Step ▷3.

▼ If it is NG, replace the transponder key coil.

▷3. Operation check by other key

1. Check the operation by the master key.

SPECIFIED VALUE: The system should operate properly.

▼ If it is OK, perform the key replacement and re-registration.

▼ If it is NG, replace the transponder key coil.

4-9-2 DIAGNOSIS CODE NO.15

(1) Checking points

1. Is the key insertion switch normal?

(2) Checking method

▷1. Wire harness continuity check

1. Check continuity between the following terminals.

- (1) Vehicle harness side 4(+) of upper steering column W/switch bracket Ay — Battery positive (+) terminal
- (2) Vehicle harness side 3(−) of upper steering column W/switch bracket Ay — Meter vehicle harness side 26(KEY2)
- (3) Immobilizer ECU vehicle harness side 3(KEY) — Meter vehicle harness side 26(KEY2)

SPECIFIED VALUE: Continuity exists.

▼ If it is OK, go to Step ▷2.

▼ If it is NG, replace the harness and connector.

▷2. Key insertion switch check

1. Perform unit check of the upper steering column W/switch bracket Ay (Key insertion switch).

SPECIFIED VALUE: No abnormality exists.

▼ If it is OK, this completes the check.

▼ If it is NG, replace the transponder key coil.

4-9-3 DIAGNOSIS CODE NO.21, NO.22

(1) Checking points

1. Is the registered key use?
2. Is the key properly used?
3. Is immobilizer ECU normal?

(2) Checking method

▷1. Operation check by the master key

1. Check to see if the engine can start by the master key.

SPECIFIED VALUE: The engine can start.

▼ If it is OK, perform the key re-registration.

NOTE

- The ID code of the key used has not been registered yet.

▼ If it is NG, go to Step ▷2.

▷2. Check of key use conditions

1. Check to see if the key is used in a wrong way.

SPECIFIED VALUE: Do not use the keys in an overlapped state. Use the key correctly.

▼ If it is OK, replace the immobilizer ECU. Then, proceed to ▷3.

▼ If it is NG, use the key correctly.

▷3.Check of immobilizer ECU operation

1. After the key ID code has been registered on the immobilizer ECU, check that the system functions normally.

SPECIFIED VALUE: The engine can start.

▼ If it is OK, this completes the check.

▼ If it is NG, replace the transponder key coil.

4-9-4 DIAGNOSIS CODE NO.23

(1) Checking points

1. Is the master key normal?

(2) Checking method

▷1.Confirmation of diagnosis code

1. After registering the ID code of the master key again, check the output of the diagnosis code.

SPECIFIED VALUE: The normal code is outputted.

▼ If it is OK, this completes the check.

▼ If it is NG, perform the key replacement and re-registration of the key ID code.

CAUTION

- Be sure to recover the master key that has been replaced.

4-9-5 DIAGNOSIS CODE NO.24, NO.25

(1) Checking points

1. Are the keys located too close?
2. Does the communication line has a noise source?

(2) Checking method

▷1. Immobilizer ECU check

1. Insert a registered master key into the key cylinder.
2. Check to see if noises exist at the immobilizer ECU computer side terminal 6(COL+).

SPECIFIED VALUE: Noises are detected.

NOTE

- The communication line has noises to a certain degree.

▼ If it is OK, remove the causes for the noises.

▼ If it is NG, go to Step ▷2.

▷2. Operation check of upper steering column W/switch bracket Ay

1. Replace the upper steering column W/switch bracket Ay with a properly functioning one (for check use).
2. Check to see if the engine starts.

SPECIFIED VALUE: Starts.

▼ If it is OK, replace the upper steering column W/switch bracket Ay.

▼ If it is NG, replace the immobilizer ECU.

4-9-6 DIAGNOSIS CODE NO.41,42

(1) Checking points

1. Are the harness and connector between the EFI ECU and the immobilizer ECU normal?

(2) Checking method

▷1. Wire harness continuity check

1. Check continuity between the following terminals.

(1) EFI ECU vehicle harness side 117(SIO2) — immobilizer ECU vehicle harness side 8(SIO2)

SPECIFIED VALUE: Continuity exists.

▼ If it is OK, replace the immobilizer ECU. Then, proceed to ▷2.

▼ If it is NG, replace the harness and connector.

▷2. Check of immobilizer ECU operation

1. After the key ID code has been registered on the immobilizer ECU, check that the system functions normally.

SPECIFIED VALUE: The engine can start.

▼ If it is OK, this completes the check.

▼ If it is NG, replace EFI ECU.

4-10 UNIT CHECK

4-10-1 STEERING COLUMN UPPER W/SWITCH BRACET AY

(1) Key insertion switch

1. At the LOCK position of the ignition switch, insert and pull out the key to check continuity between the terminals.

Key SW continuity table

Terminal No.		3 — 4
Lock cylinder	Key not inserted	No continuity exists.
	Key inserted	Continuity exists.

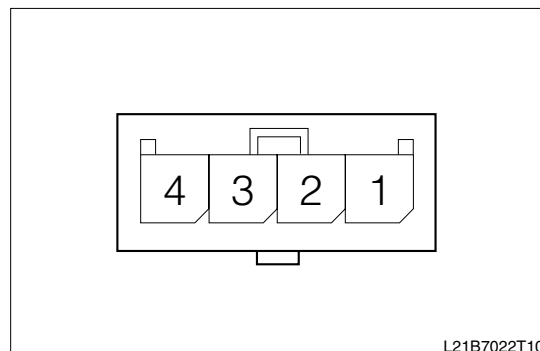
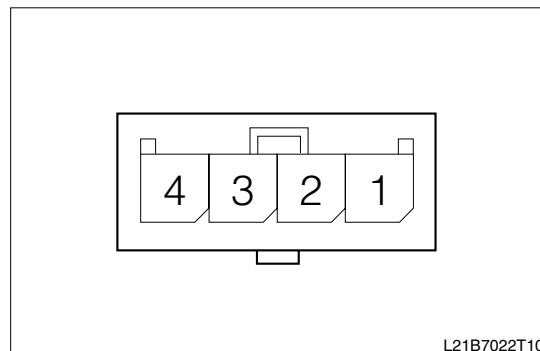
(2) Immobilizer coil

1. Check continuity between the terminals 1 and 2.

SPECIFIED VALUE: Continuity exists.

CAUTION

- Even if continuity exists, no judgment can be made about whether the coil is normal or not.



J1 LIGHTING

LIGHTING-----	J1—1	HEADLAMP DIMMER SWITCH AY -----	J1—24
INSTRUCTIONS FOR SERVICE OP-		REMOVAL AND INSTALLATION-----	J1—24
ERATION-----	J1—1		
ARTICLES TO BE PREPARED -----	J1—1		
BASIC CHECK AND ADJUSTMENT ---	J1—1		
FUNCTION CHECK-----	J1—3		
UNIT CHECK-----	J1—5		
HEADLAMP AY -----	J1—6		
REMOVAL AND INSTALLATION-----	J1—6		
REAR COMBINATION LAMP AY -----	J1—7		
REMOVAL AND INSTALLATION-----	J1—7		
HIGH MOUNTED STOP LAMP AY -----	J1—8		
REMOVAL AND INSTALLATION-----	J1—8		
LICENSE PLATE LAMP AY -----	J1—9		
REMOVAL AND INSTALLATION-----	J1—9		
ROOM LAMP AY(FRONT MAP LAMP) -----	J1—9		
REMOVAL AND INSTALLATION-----	J1—9		
ROOM LAMP AY -----	J1—11		
REMOVAL AND INSTALLATION-----	J1—11		
ROOM LAMP AY(LUGGAGE ROOM LAMP)-----	J1—11		
REMOVAL AND INSTALLATION-----	J1—11		
HEADLAMP BULB -----	J1—12		
REMOVAL AND INSTALLATION-----	J1—12		
CLEARANCE LAMP BULB-----	J1—12		
REMOVAL AND INSTALLATION-----	J1—12		
FRONT TURN SIGNAL LAMP BULB-----	J1—13		
REMOVAL AND INSTALLATION-----	J1—13		
SIDE TURN SIGNAL LAMP BULB-----	J1—15		
REMOVAL AND INSTALLATION-----	J1—15		
TAIL AND STOP LAMP BULB -----	J1—15		
REMOVAL AND INSTALLATION-----	J1—15		
REAR TURN SIGNAL LAMP BULB -----	J1—16		
REMOVAL AND INSTALLATION-----	J1—16		
BACK UP LAMP BULB -----	J1—17		
REMOVAL AND INSTALLATION-----	J1—17		
REAR FOG LAMP BULB -----	J1—18		
REMOVAL AND INSTALLATION-----	J1—18		
HIGH MOUNTED STOP LAMP BULB -----	J1—20		
REMOVAL AND INSTALLATION-----	J1—20		
LICENSE PLATE LAMP BULB -----	J1—21		
REMOVAL AND INSTALLATION-----	J1—21		
ROOM LAMP AY -----	J1—22		
REMOVAL AND INSTALLATION-----	J1—22		
ROOM LAMP AY(FRONT MAP LAMP) -----	J1—22		
REMOVAL AND INSTALLATION-----	J1—22		
ROOM LAMP BULB(LUGGAGE ROOM LAMP BULB)			
-----	J1—23		
REMOVAL AND INSTALLATION-----	J1—23		

1 LIGHTING

1-1 INSTRUCTIONS FOR SERVICE OPERATION

1-1-1 ITEMS TO BE OBSERVED DURING REPLACEMENT OF EACH LAMP

1. Halogen lamps become very high temperature while they are operated. When grease etc gets to the bulb surface, the bulb life will be shortened. Therefore, hold the flange section during the replacement. Do not allow your hand to touch the glass section.
2. If your hand should touch the bulb, degrease the affected section using alcohol etc. and proceed to assemble it to the lamp.
3. In the case of halogen lamps, the pressure inside the glass bulb is very high. Hence, if the bulb is dropped or hit or scratched, it is prone to be broken and the glass be scattered around.
4. If the bulb is left in a detached state for a prolonged period of time, there are possibilities that dirt or humidity gets to the lens. Therefore, when the bulb is to be replaced, first prepare a new bulb and then start to replace it.
5. The bulb should be replaced by a bulb with the same wattage.
6. Improper installation of the socket will cause the lens to be misted or allow water to be admitted. After completion of the bulb replacement, make sure to install the socket correctly.

1-2 ARTICLES TO BE PREPARED

Instrument

Electrical tester

1-3 BASIC CHECK AND ADJUSTMENT

1-3-1 HEADLAMP PHOTOMETRIC AXIS ADJUSTMENT

(1) Operation prior to photometric axis adjustment

1. Adjust the tire air inflation pressure to the specified value.
2. Seat one person at the Driver's seat.
3. Replenish oils to the specified levels. Fill gasoline to the full capacity.
4. Mount the tools, jack and spare tire at the specified positions.
5. Rock the vehicle in the up-and-down direction as well as in the right-and-left direction so that the suspension may bed well.
6. Set the engine speed to a level of 1500 rpm or more. (If the engine speed is too low, the lamp terminal voltage drops, thus making it difficult to recognize the cut-off line.

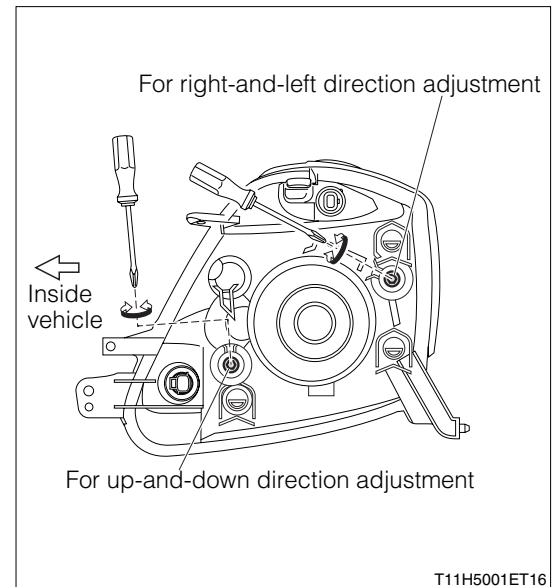
NOTE

- Cut-off line: Boundary line between the bright zone and dark zone in the low beam.

7. In the case of motor vehicles equipped with a headlamp levelling switch, set the levelling switch to the zero position.

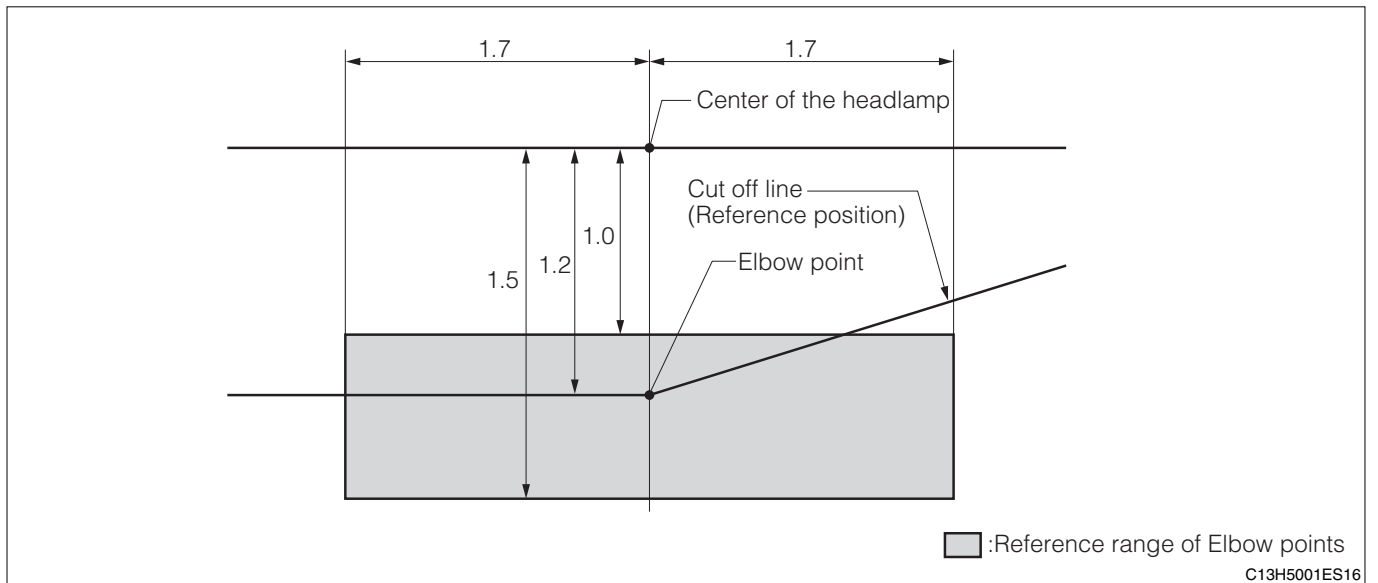
(2) Photometric axis adjustment

1. Adjust the photometric axis of the low beam according to the instruction manual of the headlamp tester to be used.



Reference range of cut-off line elbow points

Vertical position	Range from 1.0% to 1.5% below the horizontal line that passes through the lamp center (Reference position: 1.2% below)
Horizontal position	Range between 1.7 % right and left from the vertical line that passes through the lamp center: (Reference position: On the vertical line that passes through the lamp center)



Unit : %

NOTE

- Elbow point: Point where the cut-off line is articulated

J1-3

1-3-2 MANUAL HEADLAMP LEVELING OPERATION CHECK

1. Perform the photometric axis adjustment for the headlamp.

Refer to Page J1-2.

2. Place the screen normally at a distance of three meters ahead of the lamp.

NOTE

- This normal placing can be carried out easily when a screen is affixed to the lens of the headlamp tester.

3. Turn the headlamp leveling switch 0-1-2-3-4-5. At this time, check the vertical movement amount on the photometric axis.

Headlamp leveling switch

Position	Movement amount (mm)
0 – 1	30
1 – 2	30
2 – 3	30
3 – 4	30
4 – 5	30

1-3-3 OPERATION CHECK OF LIGHTING DEVICES

1. Visually check the operation of lamps, etc. provided on the vehicle surface.

- (1) Headlamp(Hi-Lo change)
- (2) Clearance lamp
- (3) Tail lamp
- (4) Stop lamp
- (5) Back-up lamp
- (6) License plate lamp
- (7) Turn signal lamp
- (8) Hazard lamp
- (9) Fog lamp

SPECIFIED VALUE: Illuminates or flashes normally.

2. Visually check the operation of the room lamp.

SPECIFIED VALUE: Illuminates normally.

1-3-4 CHECK OF LIGHTING DEVICE FOR INSTALLING CONDITION

1. Shake the lamps, etc. by hand and check the installing condition.

SPECIFIED VALUE: There should be no excessive play.

2. Check that the lens or reflector of the lamp has no damage such as discoloration and crack. Also check that they are not smeared and that no water has been admitted in the lamp.

SPECIFIED VALUE: There should be no discoloration nor cracks.

SPECIFIED VALUE: There should be no contamination nor admission of water.

1-4 FUNCTION CHECK

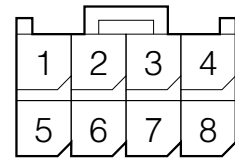
1-4-1 REAR FOG LAMP

- (1) Voltage and continuity test

CAUTION

- Check with the rear fog lamp switch connector disconnected.

1. Check the voltage and continuity between each terminal of the vehicle harness side connector of the switch, and the body earth.



T11H5003T10

Check system	Terminal No. (Terminal code)	Condition	Specified value
Earth	1 – body earth	At all times	Continuity exists
Tail lamp switch	Body earth		0 → 10 – 14V
Power supply	4 – Body earth	At all times	10 – 14V
Head lamp dimmer switch	6 – Body earth	Head lamp dimmer switch "OFF"→"HEAD"	No continuity → Continuity exists
REAR FOG LAMP	8 – Body earth	At all times	Continuity exists

(2) Lighting check

1. Check the lighting condition of the lamp when the head lamp dimmer switch is at "HEAD" position and the rear fog lamp switch is "ON".

SPECIFIED VALUE: Illuminates.

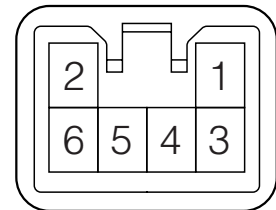
1-4-2 HEADLAMP LEVELING SWITCH

(1) Voltage test

1. With the connector connected, operate the headlamp leveling switch. At this time, working from the back of the connector, check the voltage between the connector terminals using an electrical tester.

Specified value

Switch position	Terminal No.	Voltage (At time of battery voltage of 12 V)
0	4(LH) and 5(RH) – 2(GND)	10.4 – 11.2V
1	4(LH) and 5(RH) – 2(GND)	9.2 – 9.9V
2	4(LH) and 5(RH) – 2(GND)	7.9 – 8.6V
3	4(LH) and 5(RH) – 2(GND)	6.6 – 7.3V
4	4(LH) and 5(RH) – 2(GND)	5.3 – 6.0V
5	4(LH) and 5(RH) – 2(GND)	4.0 – 4.8V



T11H5504T10

J1-5

1-5 UNIT CHECK

1-5-1 HEADLAMP DIMMER SWITCH(VEHICLE WHERE IT IS INSTALLED AT THE LEFT SIDE OF THE COLUMN)

1. Check continuity between terminals in each state.

Light control switch

Switch condition	Terminal No.	Standard
TAIL	10 – 13	Continuity exists.
HEAD	10 – 13, 11 – 12	Continuity exists.

Headlamp dimmer switch

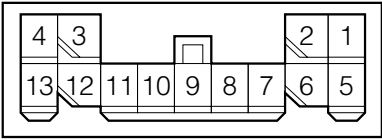
Switch condition	Terminal No.	Standard
FLASH	9 – 11 – 12	Continuity exists.
LOW BEAM	8 – 11	Continuity exists.
HIGH BEAM	9 – 11	Continuity exists.

Turn signal switch

Switch condition	Terminal No.	Standard
RIGHT	6 – 7	Continuity exists.
LEFT	5 – 6	Continuity exists.

Rear fog lamp switch

Switch condition	Terminal No.	Standard
ON	3 – 4	Continuity exists.

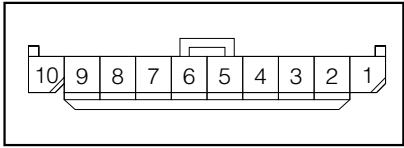


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1-5-2 HAZARD SWITCH(HEATER CONTROL AY)

1. Check continuity between terminals when the hazard switch is turned ON.

Switch condition	Terminal No.	Standard
ON	2 – 3	Continuity exists.

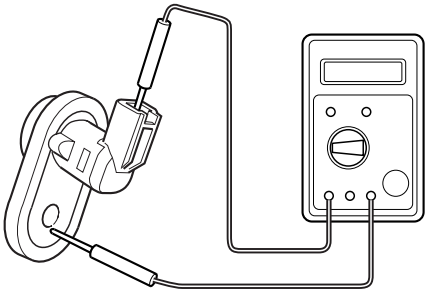


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1-5-3 COURTESY SWITCH

1. Check the continuity between the switch connector terminal and the switch body.

Switch condition	Standard
When free	Continuity exists.
When pushed	No continuity exists.

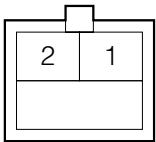


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1-5-4 STOP LAMP SWITCH

1. Check continuity between the switch connector terminals.

Switch condition	Standard
When free	Continuity exists.
When pushed	No continuity exists.



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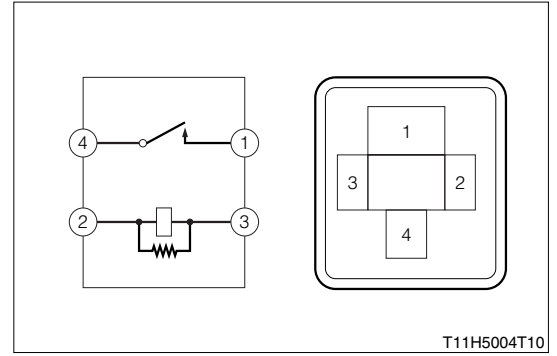
1-5-5 HEADLAMP RELAY

1. Check continuity between the respective terminals of the connector.

Terminal No.	Standard
1 - 4	No continuity exists.
2 - 3	Continuity exists.

2. Apply the battery voltage between the terminals 2 and 3.
At this time, check continuity between the terminals 1 and 4.

SPECIFIED VALUE: Continuity exists.



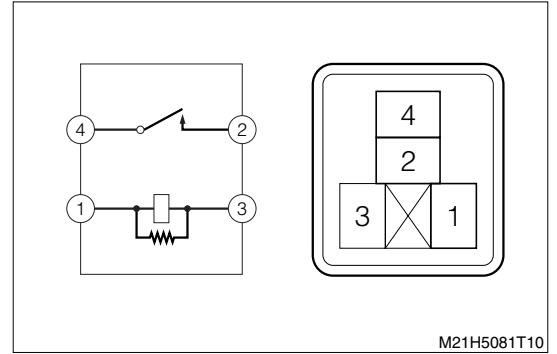
1-5-6 FOG LAMP RELAY

1. Check continuity between the respective terminals of the connector.

Terminal No.	Standard
2 - 4	No continuity exists.
1 - 3	Continuity exists.

2. Apply the battery voltage between the terminals 1 and 3.
At this time, check continuity between the terminals 2 and 4.

SPECIFIED VALUE: Continuity exists.



2 HEADLAMP AY

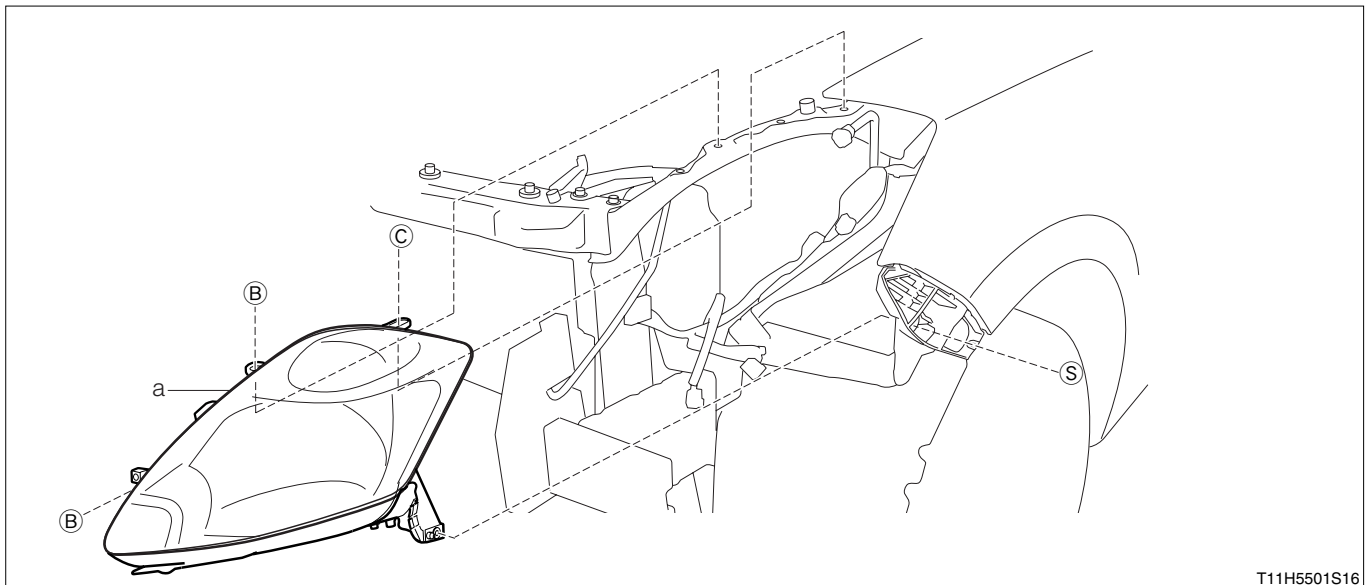
2-1 REMOVAL AND INSTALLATION

2-1-1 OPERATION BEFORE REMOVAL

1. Remove the front bumper cover.
Refer to Page I2-1.

2-1-2 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



(2) Removal and installation procedures

- 1 a Headlamp Ay, RH/LH

2-1-3 OPERATION AFTER INSTALLATION

1. Install the front bumper cover.
Refer to Page I2-1.
2. Perform the photometric axis adjustment for the headlamp.
Refer to Page J1-1.

3 REAR COMBINATION LAMP AY

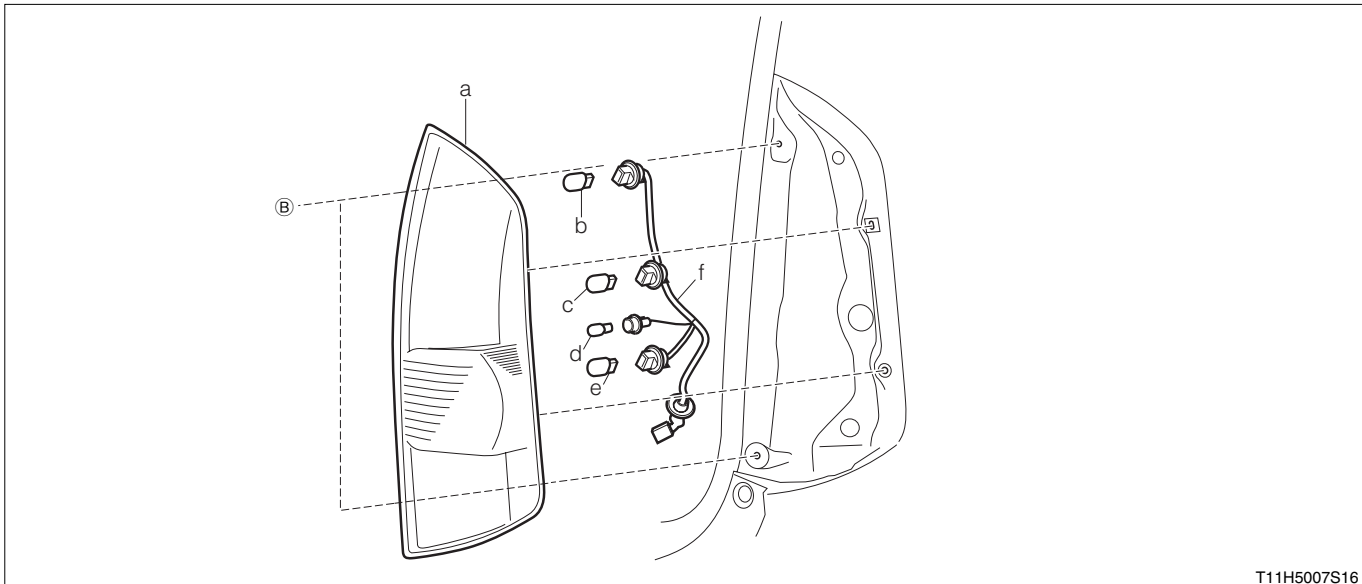
3-1 REMOVAL AND INSTALLATION

3-1-1 OPERATION BEFORE REMOVAL

1. Remove the rear deck trim cover.
Refer to Page I2-39.
2. Remove the rear RH/LH quarter trim panel Ay.
Refer to Page I2-39.

3-1-2 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



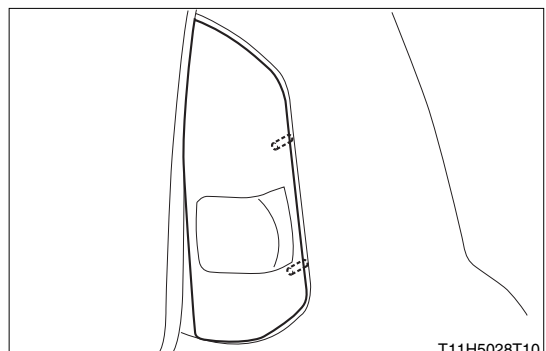
(2) Removal and installation procedures

▼	1	a Lamp Ay, rear combination, RH/LH	6	f Harness Ay
	2	b Bulb (Tail & stop lamp)		
	3	c Bulb (Rear turn signal lamp)		
	4	d Bulb (Back up lamp)		
	5	e Bulb (Rear fog lamp)		

3-1-3 POINTS OF REMOVAL

(1) Lamp Ay, rear combination, RH/LH

1. Remove the two(2) mounting bolts, and then release the stud pin from the grommet (two locations) to disassemble the lamp Ay.



3-1-4 OPERATION AFTER INSTALLATION

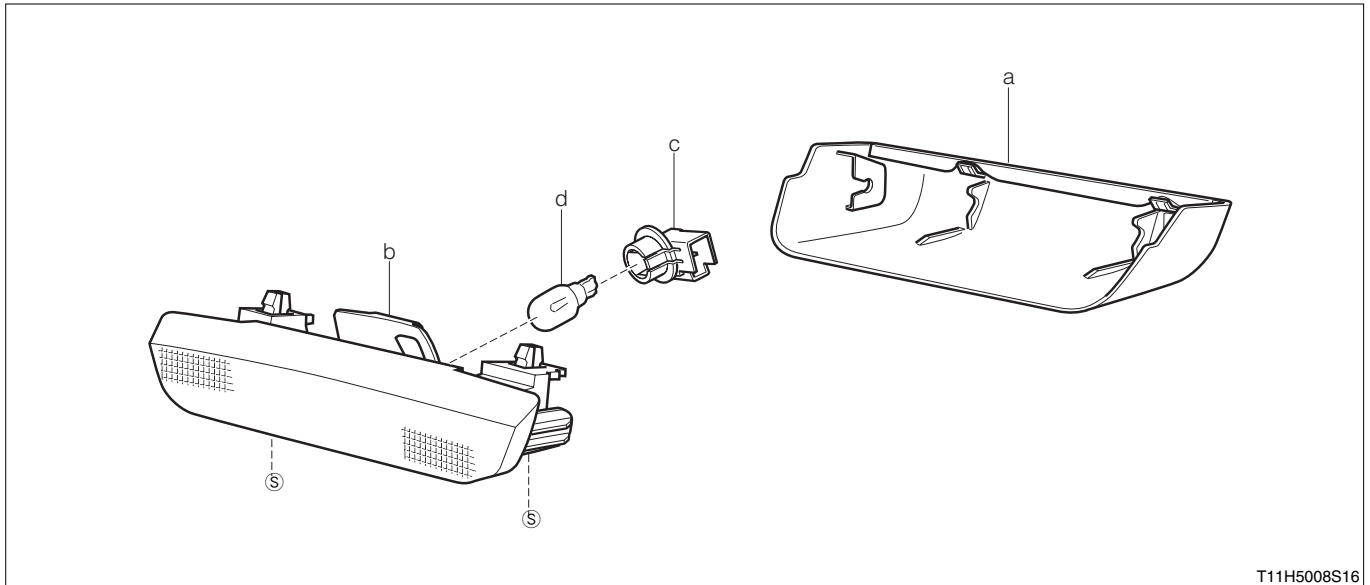
1. Remove the rear RH/LH quarter trim panel Ay.
Refer to Page I2-39.
2. Install the rear deck trim cover.
Refer to Page I2-39.

4 HIGH MOUNTED STOP LAMP AY

4-1 REMOVAL AND INSTALLATION

4-1-1 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



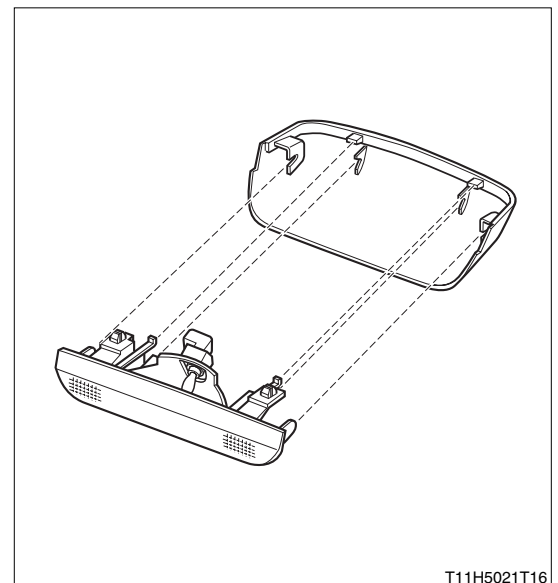
(2) Removal and installation procedures

- ▼ 1 a Cover, center stop lamp
- 2 b Lamp Ay, stop center
- 3 c Socket
- 4 d Bulb

4-1-2 POINTS OF REMOVAL

(1) Cover, center stop lamp

1. Slide the cover toward the rear of the lamp Ay to release and remove from the lamp Ay.



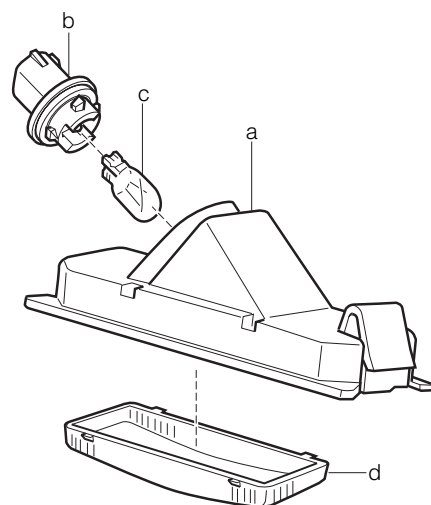
J1-9

5 LICENSE PLATE LAMP AY

5-1 REMOVAL AND INSTALLATION

5-1-1 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



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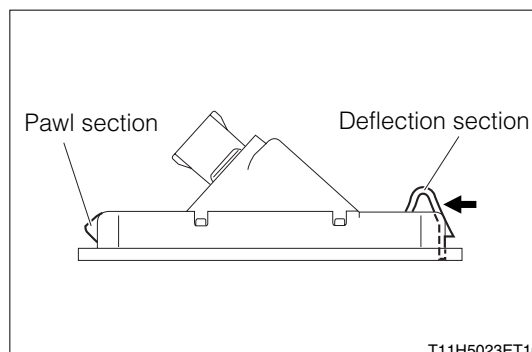
(2) Removal and installation procedures

- ▼ 1 a Lamp Ay, license plate
- 2 b Socket
- 3 c Bulb
- 4 d Lens, license plate lamp

5-1-2 POINTS OF REMOVAL

(1) Lamp Ay, license plate

1. Remove the lamp Ay, while pressing down the deflecting portion.



T11H5023ET10

6 ROOM LAMP AY(FRONT MAP LAMP)

6-1 REMOVAL AND INSTALLATION

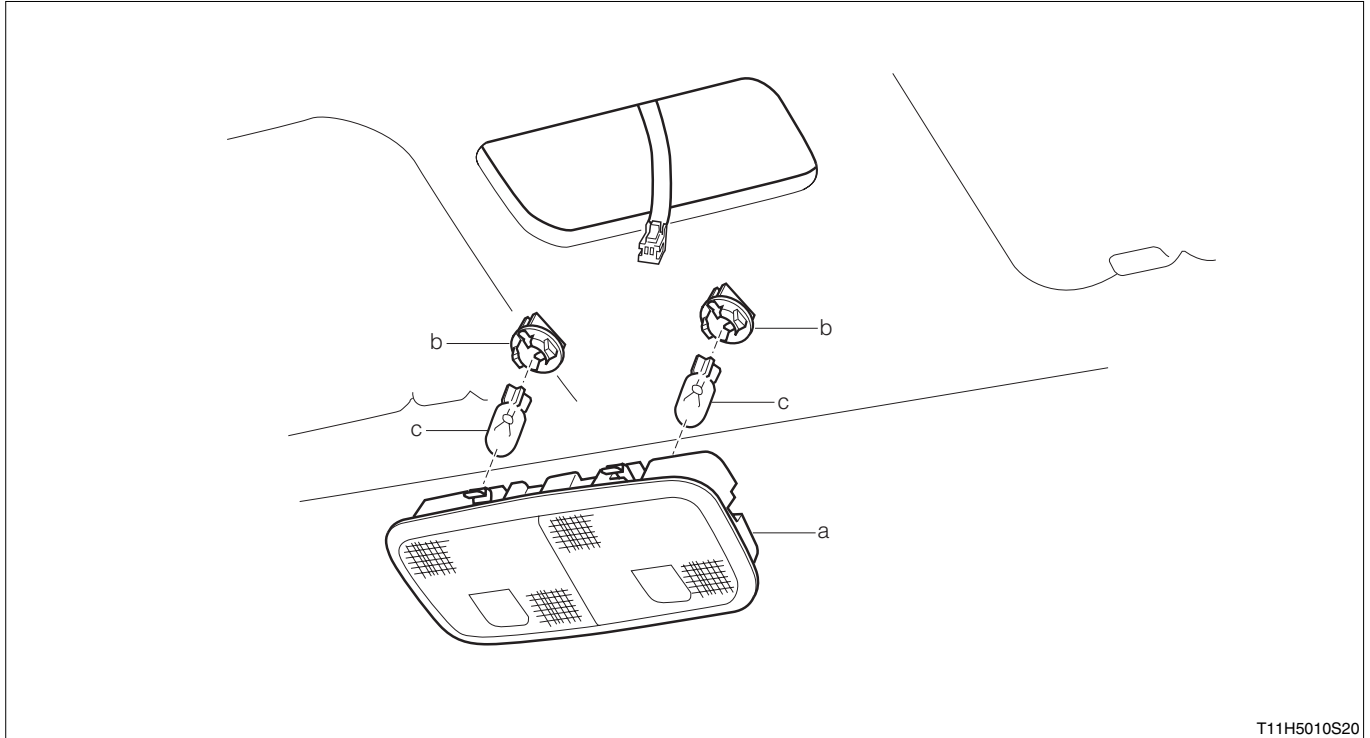
6-1-1 ARTICLES TO BE PREPARED

Lubricant, adhesive, others

Protective tape

6-1-2 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



T11H5010S20

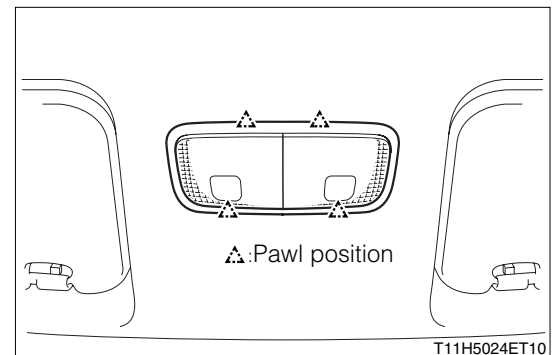
(2) Removal and installation procedures

- ▼ 1 a Lamp Ay, map
- 2 b Socket
- 3 c Bulb

6-1-3 POINTS OF REMOVAL

(1) Lamp Ay, map

1. Remove by disengaging the pawls (at four points), using a flat screwdriver wrapped with a protective tape.



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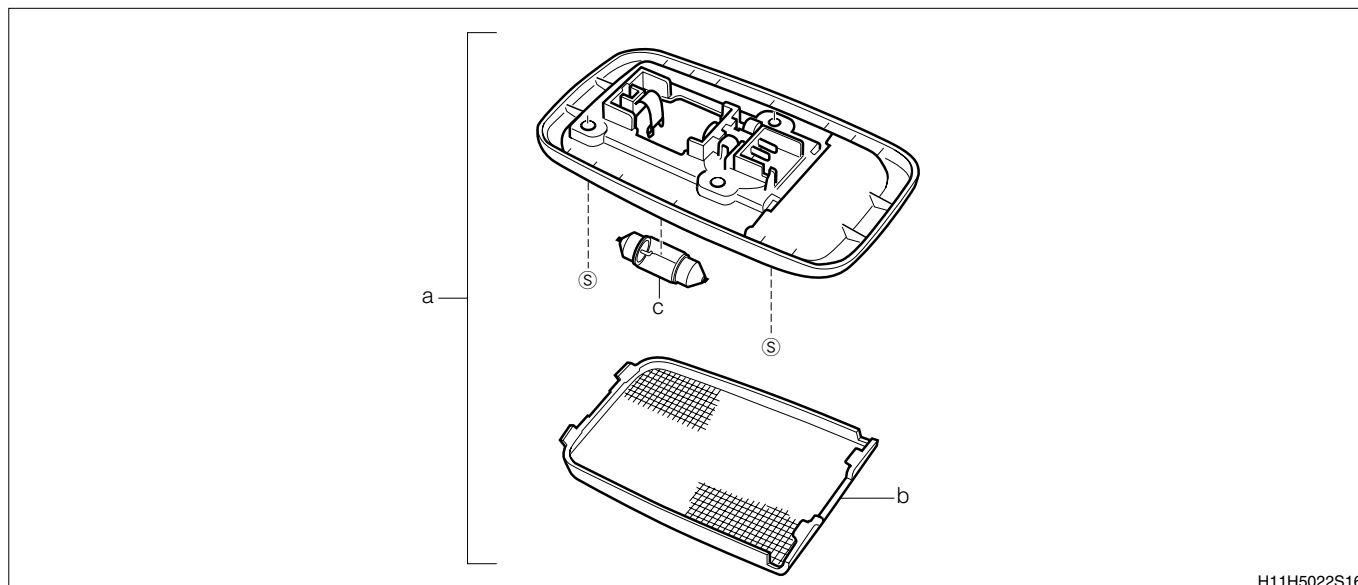
J1-11

7 ROOM LAMP AY

7-1 REMOVAL AND INSTALLATION

7-1-1 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



H11H5022S16

(2) Removal and installation procedures

- 1 b Lens, dome lamp
- 2 c Bulb
- 3 a Lamp Ay, dome

8 ROOM LAMP AY(LUGGAGE ROOM LAMP)

8-1 REMOVAL AND INSTALLATION

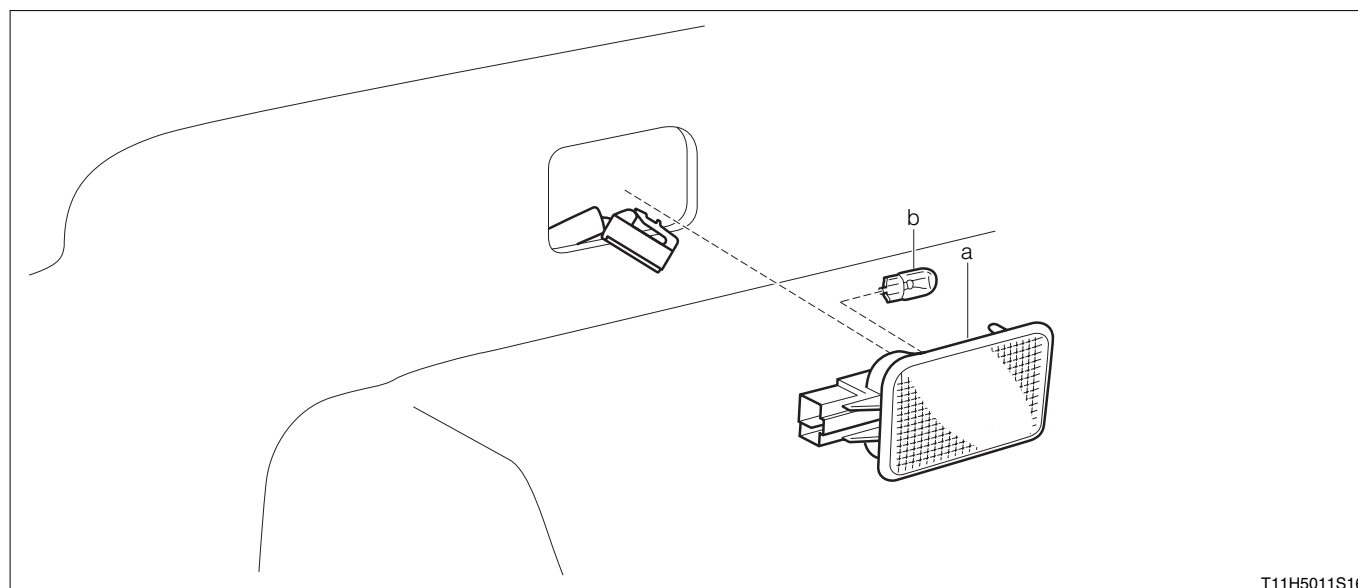
8-1-1 ARTICLES TO BE PREPARED

Lubricant, adhesive, others

Protective tape

8-1-2 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



T11H5011S16

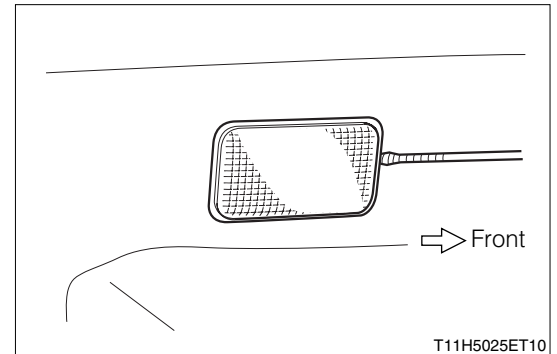
(2) Removal and installation procedures

- ▼ 1 a Lamp Ay, dome
- 2 b Bulb

8-1-3 POINTS OF REMOVAL

(1) Lamp Ay, dome

1. Using a flat (–) screw driver wound with a protective tape, release.

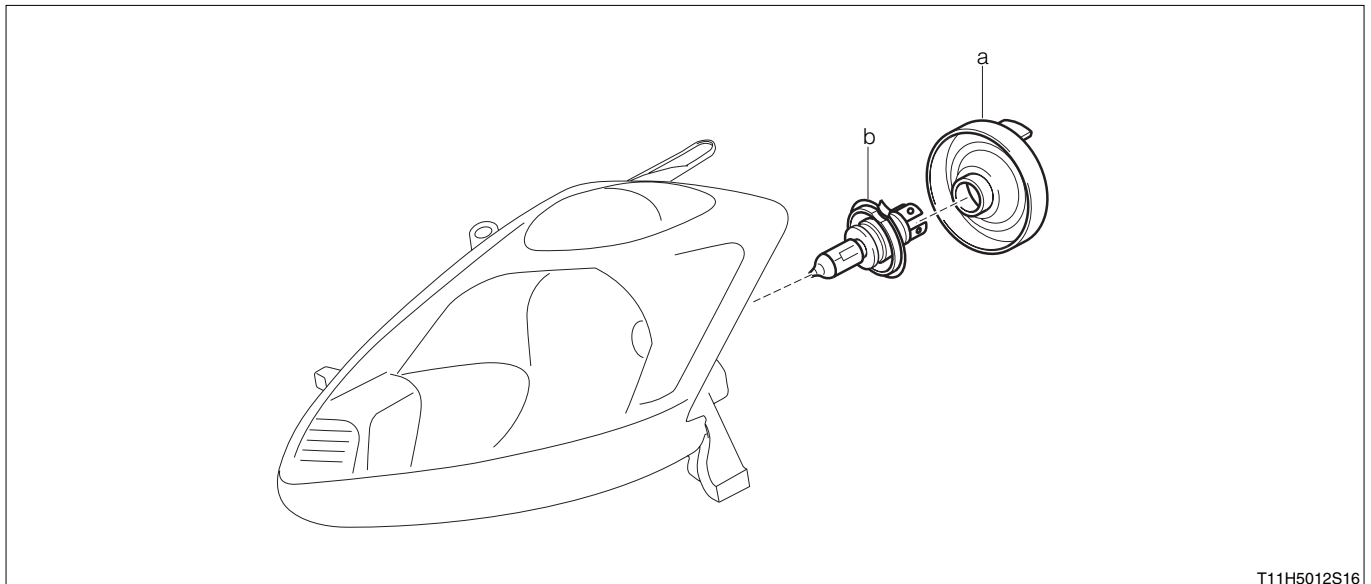


9 HEADLAMP BULB

9-1 REMOVAL AND INSTALLATION

9-1-1 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



(2) Removal and installation procedures

- 1 a Cover, headlamp
- 2 b Bulb(Headlamp)

10 CLEARANCE LAMP BULB

10-1 REMOVAL AND INSTALLATION

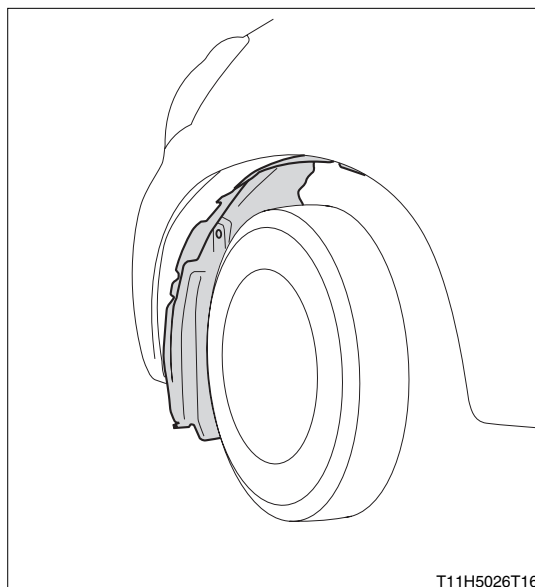
10-1-1 OPERATION BEFORE REMOVAL

1. Turn over the RH/LH front fender liner to provide a space to remove the bulb.

J1-13

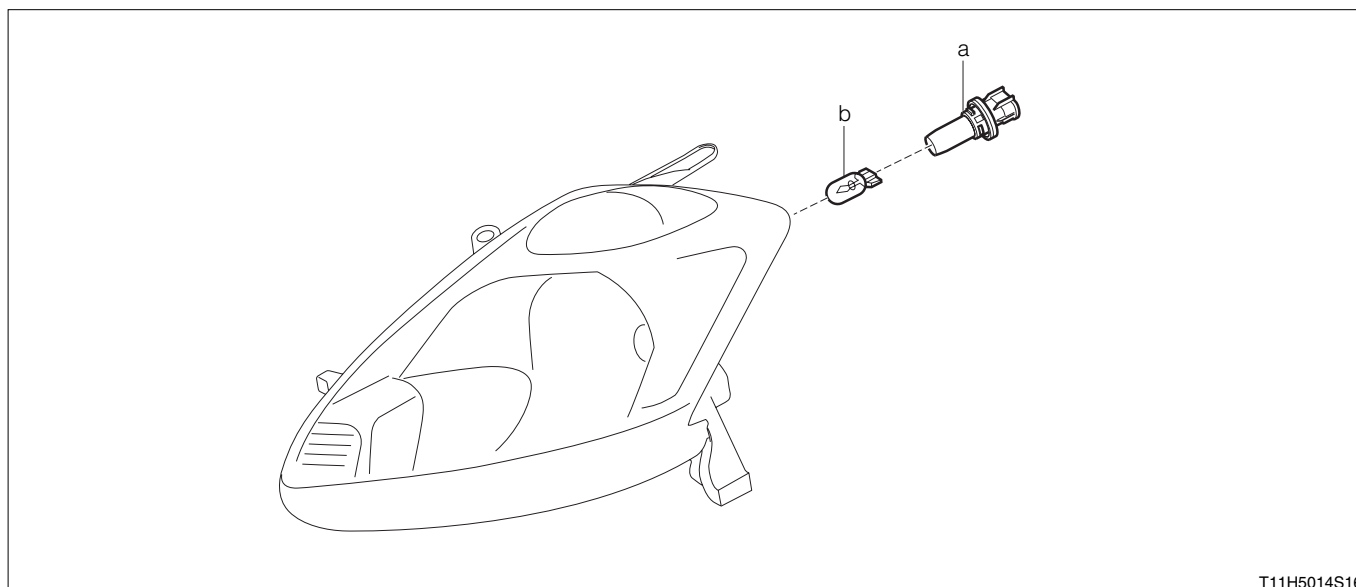
NOTE

- For easier operation, the steering wheel may be kept in a turned state during this operation, thus providing extra work space.
Refer to Page I1-21.



10-1-2 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



(2) Removal and installation procedures

- 1 a Socket (Clearance lamp)
- 2 b Bulb (Clearance lamp)

10-1-3 OPERATION AFTER INSTALLATION

1. Return the RH/LH front fender liner to the original state.
Refer to Page I1-21.

11 FRONT TURN SIGNAL LAMP BULB

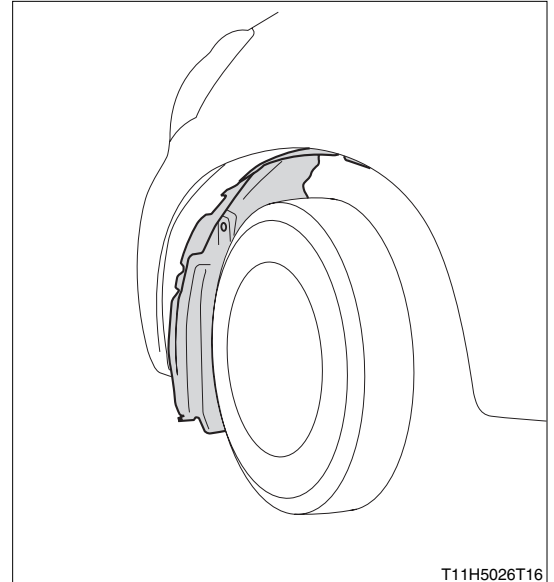
11-1 REMOVAL AND INSTALLATION

11-1-1 OPERATION BEFORE REMOVAL

1. Turn over the LH front fender liner to provide a space to disengage the socket. (When replacing the LH side bulb)
Refer to Page I1-21.

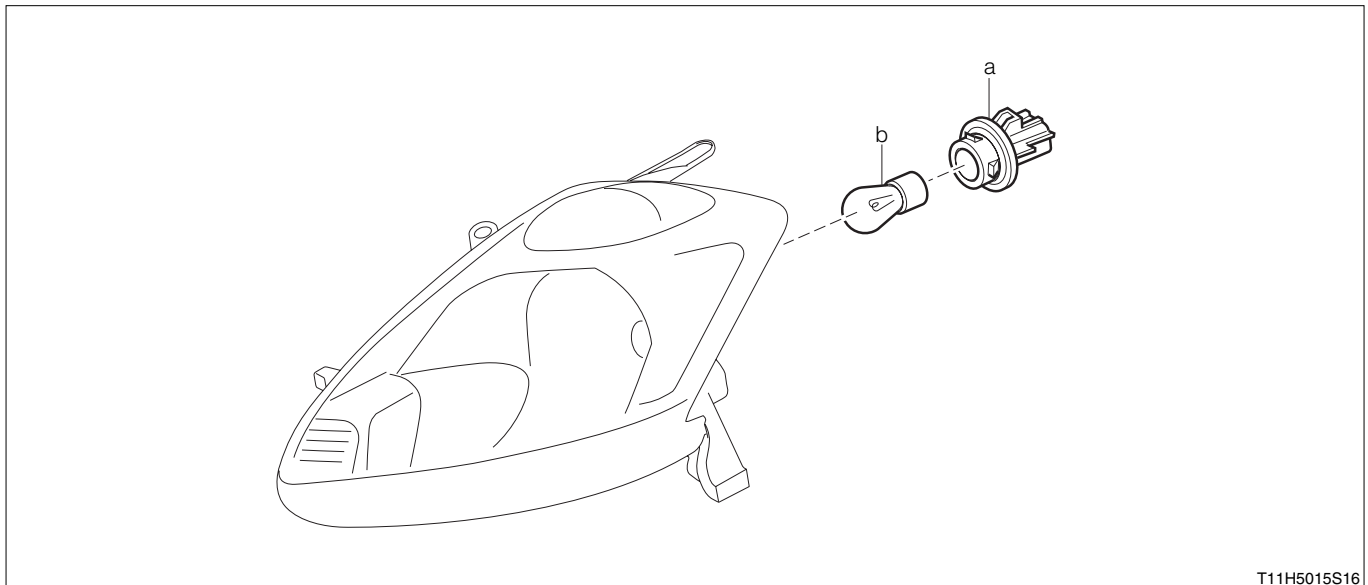
NOTE

- The RH bulb can be replaced from the engine compartment.
- For easier operation, the steering wheel may be kept in a turned state during this operation, thus providing extra work space.



11-1-2 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



(2) Removal and installation procedures

- 1 a Socket (Front turn signal lamp)
- 2 b Bulb (Front turn signal lamp)

11-1-3 OPERATION AFTER INSTALLATION

1. Return the LH front fender liner to the original state.(When replacing the LH side bulb)
Refer to Page I1-21.

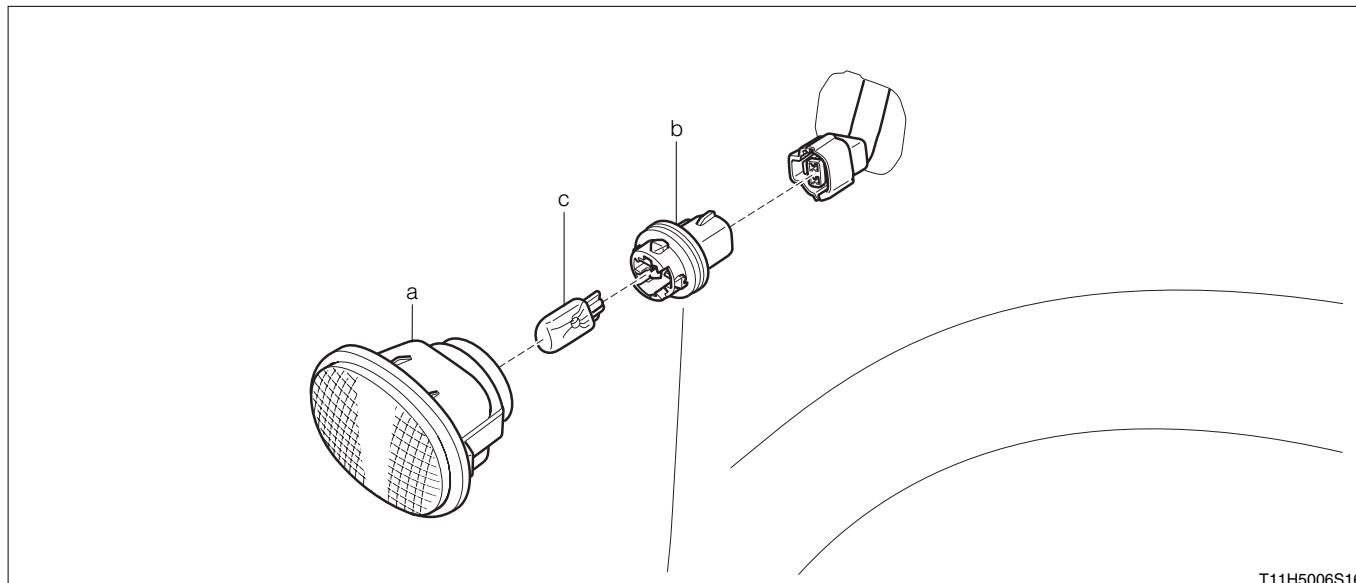
J1-15

12 SIDE TURN SIGNAL LAMP BULB

12-1 REMOVAL AND INSTALLATION

12-1-1 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



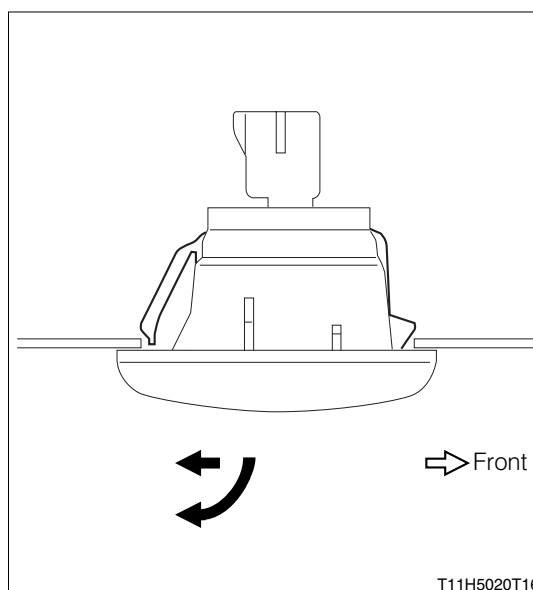
(2) Removal and installation procedures

- ▼ 1 a Lamp Ay, side turn signal(RH/LH)
- 2 b Socket
- 3 c Bulb

12-1-2 POINTS OF REMOVAL

(1) Lamp Ay, side turn signal, RH/LH

1. Removes the lamp Ay by pushing it toward the rear of the vehicle.



13 TAIL AND STOP LAMP BULB

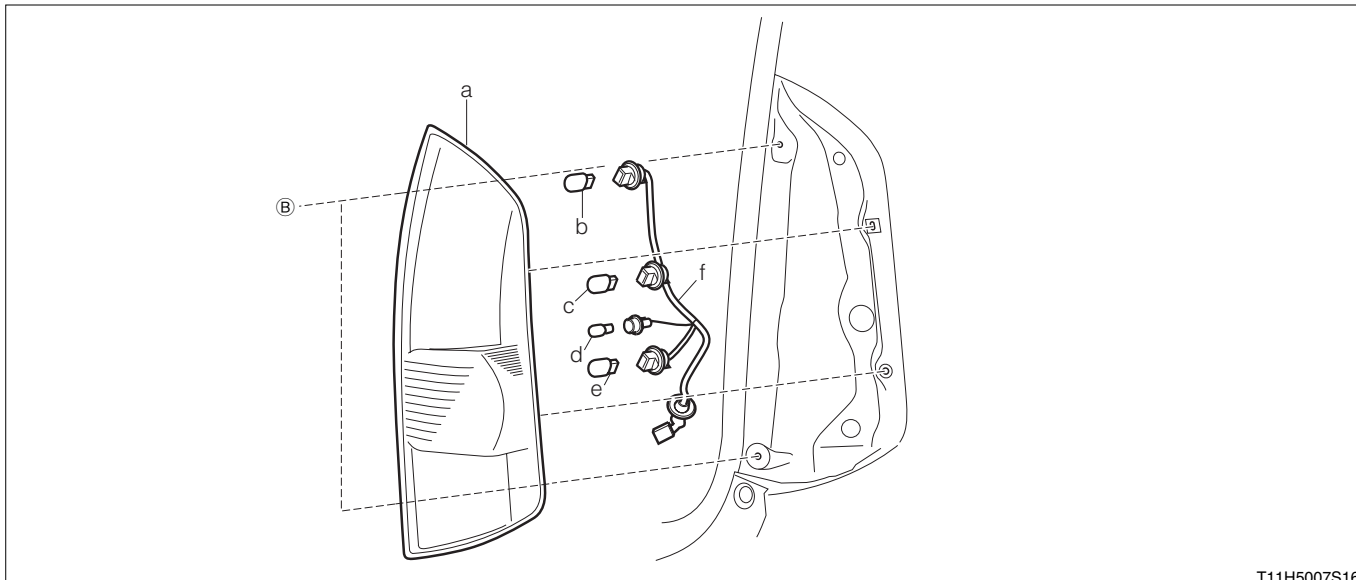
13-1 REMOVAL AND INSTALLATION

13-1-1 OPERATION BEFORE REMOVAL

1. Remove the rear deck trim cover.
Refer to Page I2-39.
2. Remove the rear RH/LH quarter trim panel Ay.
Refer to Page I2-39.

13-1-2 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



T11H5007S16

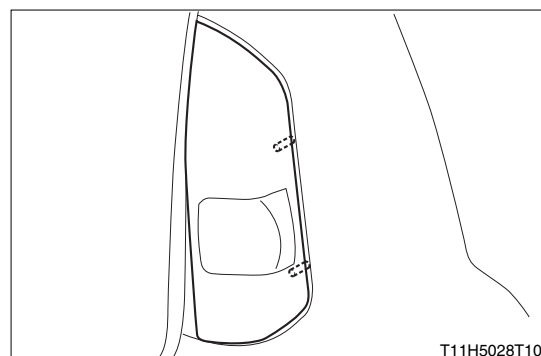
(2) Removal and installation procedures

- ▼ 1 a Lamp Ay, rear combination, RH/LH 6 f Harness Ay
- 2 b Bulb (Tail & stop lamp)
- 3 c Bulb (Rear turn signal lamp)
- 4 d Bulb (Back up lamp)
- 5 e Bulb (Rear fog lamp)

13-1-3 POINTS OF REMOVAL

(1) Lamp Ay, rear combination, RH/LH

1. Remove the two(2) mounting bolts, and then release the stud pin from the grommet (two locations) to disassemble the lamp Ay.



T11H5028T10

13-1-4 OPERATION AFTER INSTALLATION

1. Remove the rear RH/LH quarter trim panel Ay.
Refer to Page I2-39.
2. Install the rear deck trim cover.

14 REAR TURN SIGNAL LAMP BULB

14-1 REMOVAL AND INSTALLATION

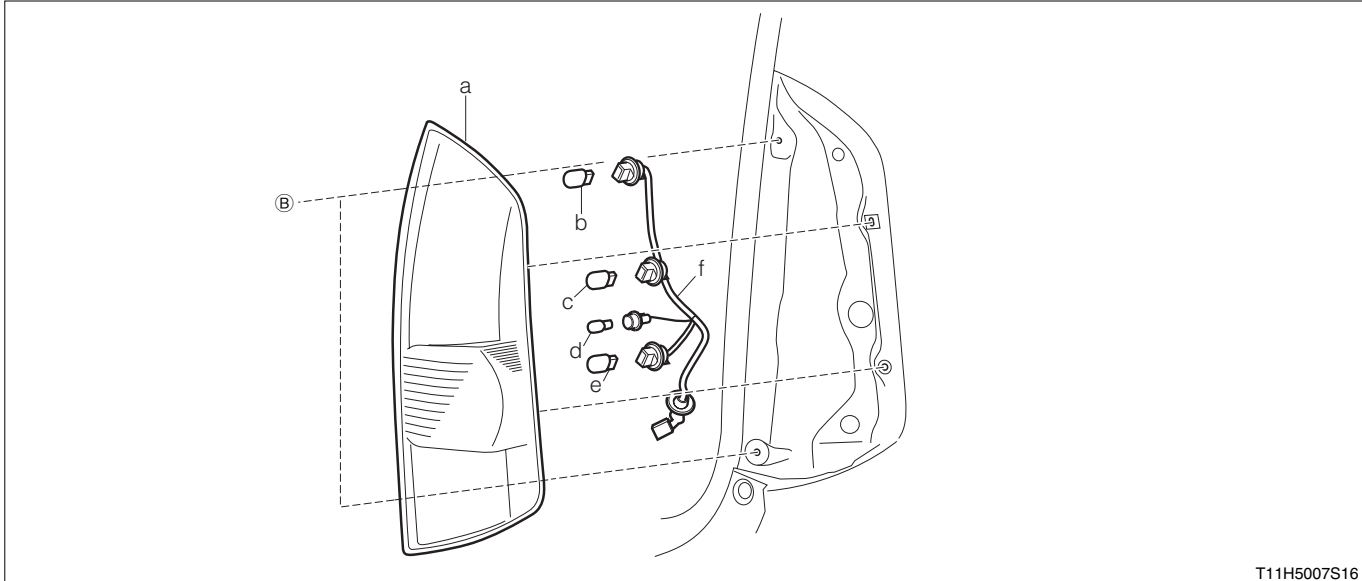
14-1-1 OPERATION BEFORE REMOVAL

1. Remove the rear deck trim cover.
Refer to Page I2-39.
2. Remove the rear RH/LH quarter trim panel Ay.
Refer to Page I2-39.

J1-17

14-1-2 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



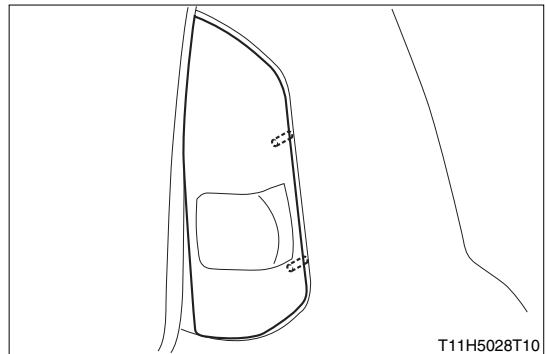
(2) Removal and installation procedures

- ▼ 1 a Lamp Ay, rear combination, RH/LH 6 f Harness Ay
- 2 b Bulb (Tail & stop lamp)
- 3 c Bulb (Rear turn signal lamp)
- 4 d Bulb (Back up lamp)
- 5 e Bulb (Rear fog lamp)

14-1-3 POINTS OF REMOVAL

(1) Lamp Ay, rear combination, RH/LH

1. Remove the two(2) mounting bolts, and then release the stud pin from the grommet (two locations) to disassemble the lamp Ay.



14-1-4 OPERATION AFTER INSTALLATION

1. Remove the rear RH/LH quarter trim panel Ay.
Refer to Page I2-39.
2. Install the rear deck trim cover.

15 BACK UP LAMP BULB

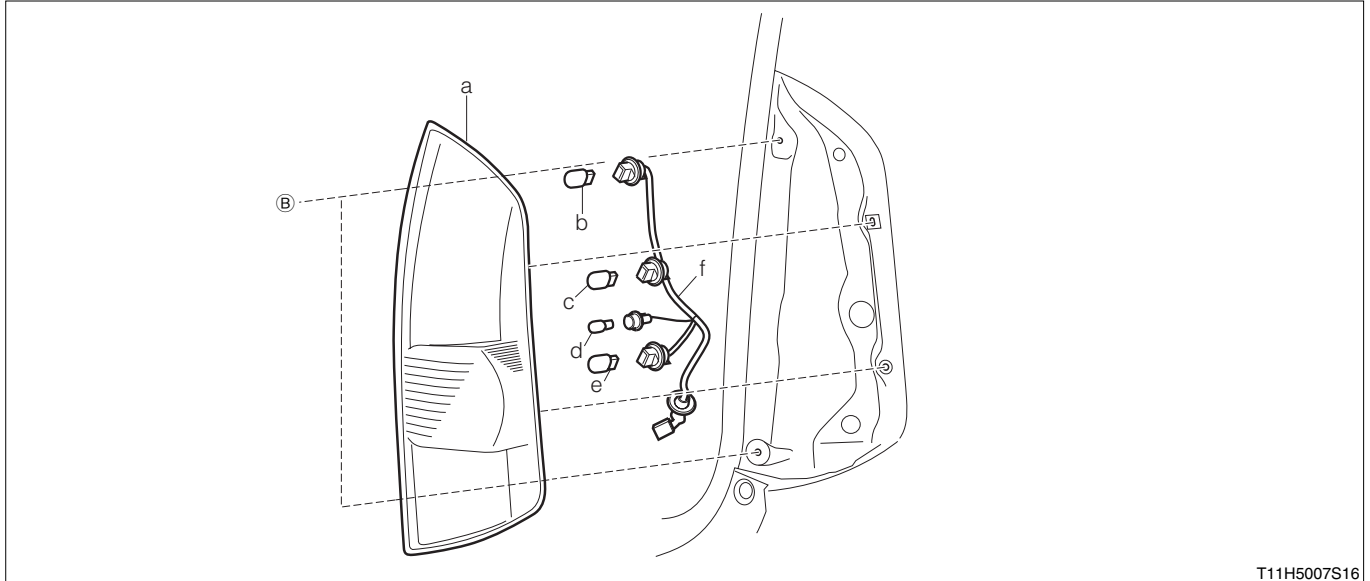
15-1 REMOVAL AND INSTALLATION

15-1-1 OPERATION BEFORE REMOVAL

1. Remove the rear deck trim cover.
Refer to Page I2-39.
2. Remove the rear RH/LH quarter trim panel Ay.
Refer to Page I2-39.

15-1-2 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



T11H5007S16

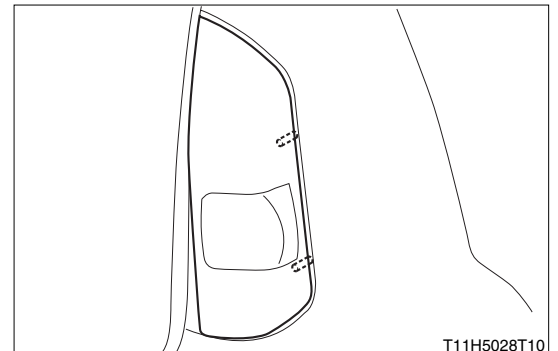
(2) Removal and installation procedures

- ▼ 1 a Lamp Ay, rear combination, RH/LH
- 2 b Bulb (Tail & stop lamp)
- 3 c Bulb (Rear turn signal lamp)
- 4 d Bulb (Back up lamp)
- 5 e Bulb (Rear fog lamp)
- 6 f Harness Ay

15-1-3 POINTS OF REMOVAL

(1) Lamp Ay, rear combination, RH/LH

1. Remove the two(2) mounting bolts, and then release the stud pin from the grommet (two locations) to disassemble the lamp Ay.



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15-1-4 OPERATION AFTER INSTALLATION

1. Remove the rear RH/LH quarter trim panel Ay.
Refer to Page I2-39.
2. Install the rear deck trim cover.

16 REAR FOG LAMP BULB

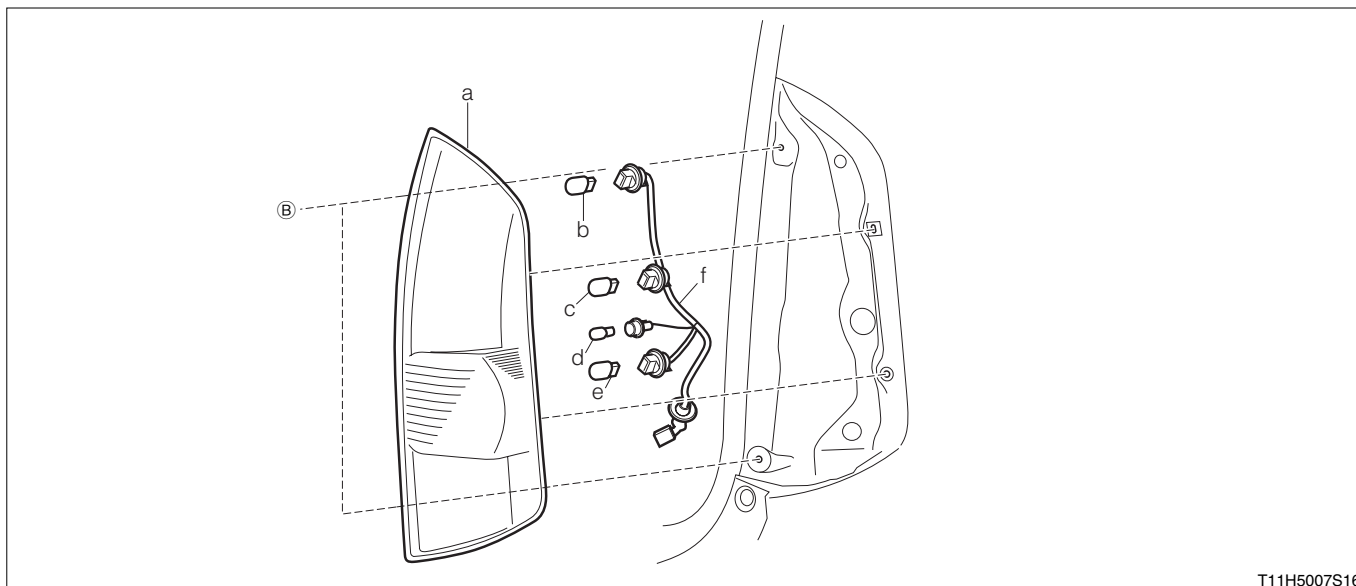
16-1 REMOVAL AND INSTALLATION

16-1-1 OPERATION BEFORE REMOVAL

1. Remove the rear deck trim cover.
Refer to Page I2-39.
2. Remove the rear RH/LH quarter trim panel Ay.
Refer to Page I2-39.

16-1-2 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



T11H5007S16

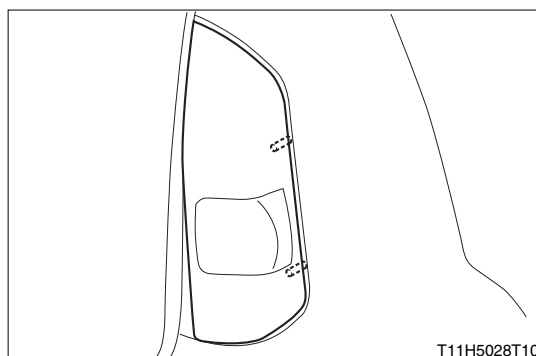
(2) Removal and installation procedures

- ▼ 1 a Lamp Ay, rear combination, RH/LH
- 2 b Bulb (Tail & stop lamp)
- 3 c Bulb (Rear turn signal lamp)
- 4 d Bulb (Back up lamp)
- 5 e Bulb (Rear fog lamp)
- 6 f Harness Ay

16-1-3 POINTS OF REMOVAL

(1) Lamp Ay, rear combination, RH/LH

1. Remove the two(2) mounting bolts, and then release the stud pin from the grommet (two locations) to disassemble the lamp Ay.



T11H5028T10

16-1-4 OPERATION AFTER INSTALLATION

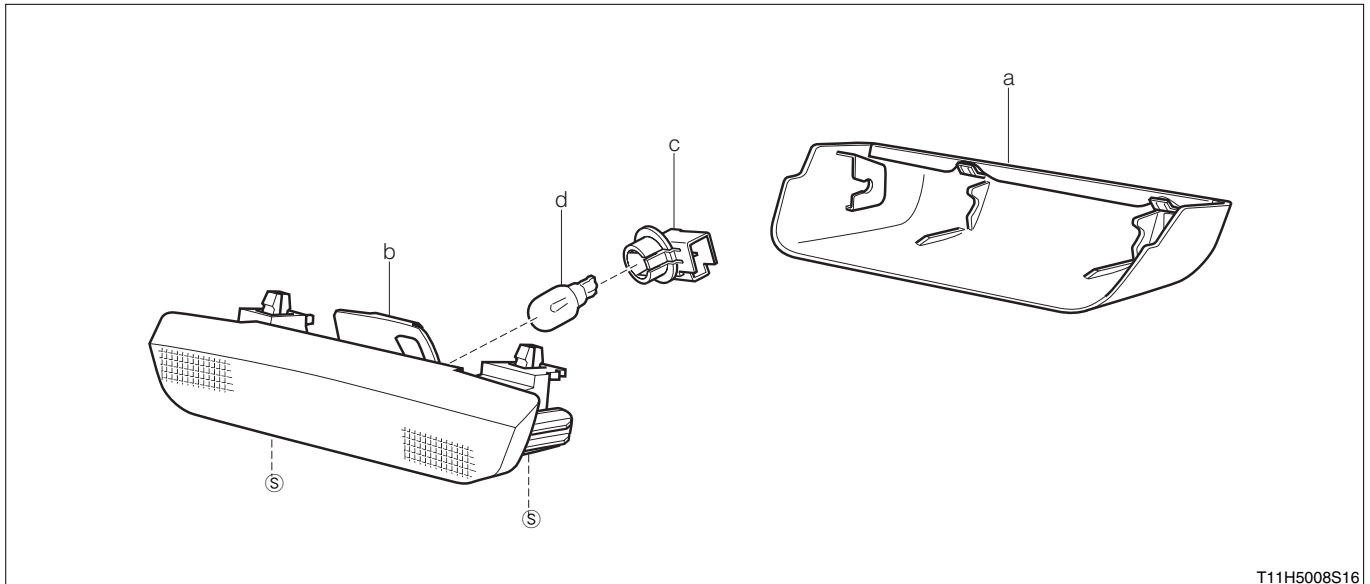
1. Remove the rear RH/LH quarter trim panel Ay.
Refer to Page I2-39.
2. Install the rear deck trim cover.

17 HIGH MOUNTED STOP LAMP BULB

17-1 REMOVAL AND INSTALLATION

17-1-1 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



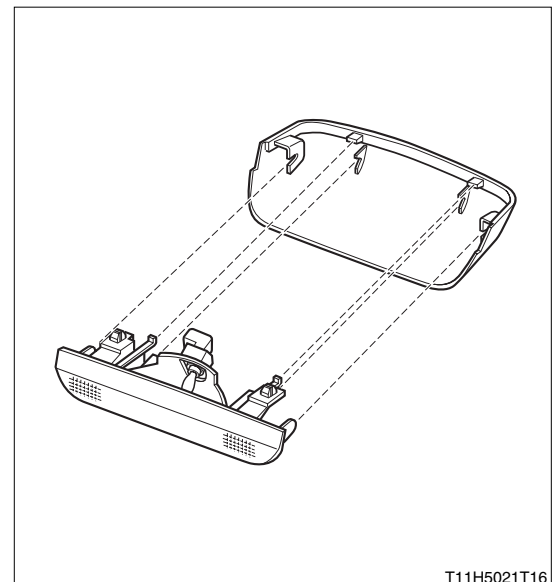
(2) Removal and installation procedures

- ▼ 1 a Cover, center stop lamp
- 2 b Lamp Ay, stop center
- 3 c Socket
- 4 d Bulb

17-1-2 POINTS OF REMOVAL

(1) Cover, center stop lamp

1. Slide the cover toward the rear of the lamp Ay to release and remove from the lamp Ay.

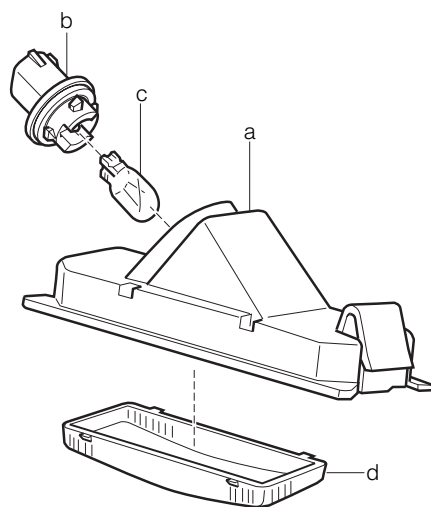


18 LICENSE PLATE LAMP BULB

18-1 REMOVAL AND INSTALLATION

18-1-1 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



T11H5016S16

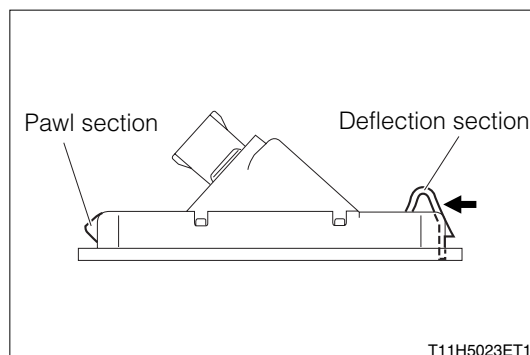
(2) Removal and installation procedures

- ▼ 1 a Lamp Ay, license plate
- 2 b Socket
- 3 c Bulb
- 4 d Lens, license plate lamp

18-1-2 POINTS OF REMOVAL

(1) Lamp Ay, license plate

1. Remove the lamp Ay, while pressing down the deflecting portion.



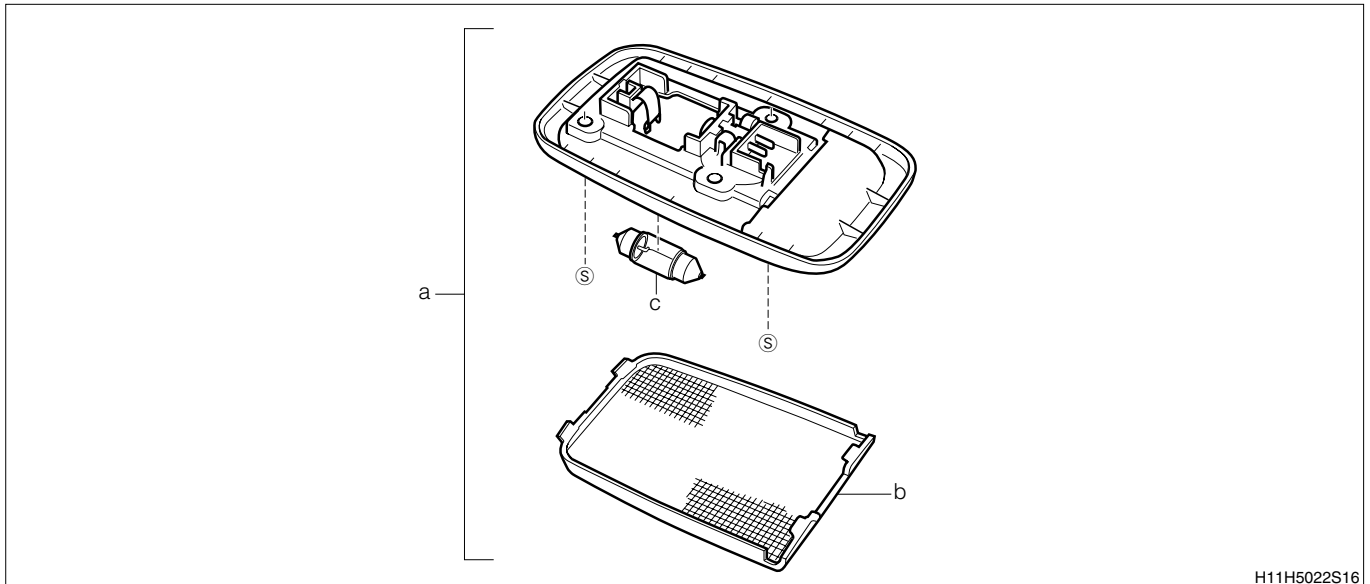
T11H5023ET10

19 ROOM LAMP AY

19-1 REMOVAL AND INSTALLATION

19-1-1 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



H11H5022S16

(2) Removal and installation procedures

- 1 b Lens, dome lamp
- 2 c Bulb
- 3 a Lamp Ay, dome

20 ROOM LAMP AY(FRONT MAP LAMP)

20-1 REMOVAL AND INSTALLATION

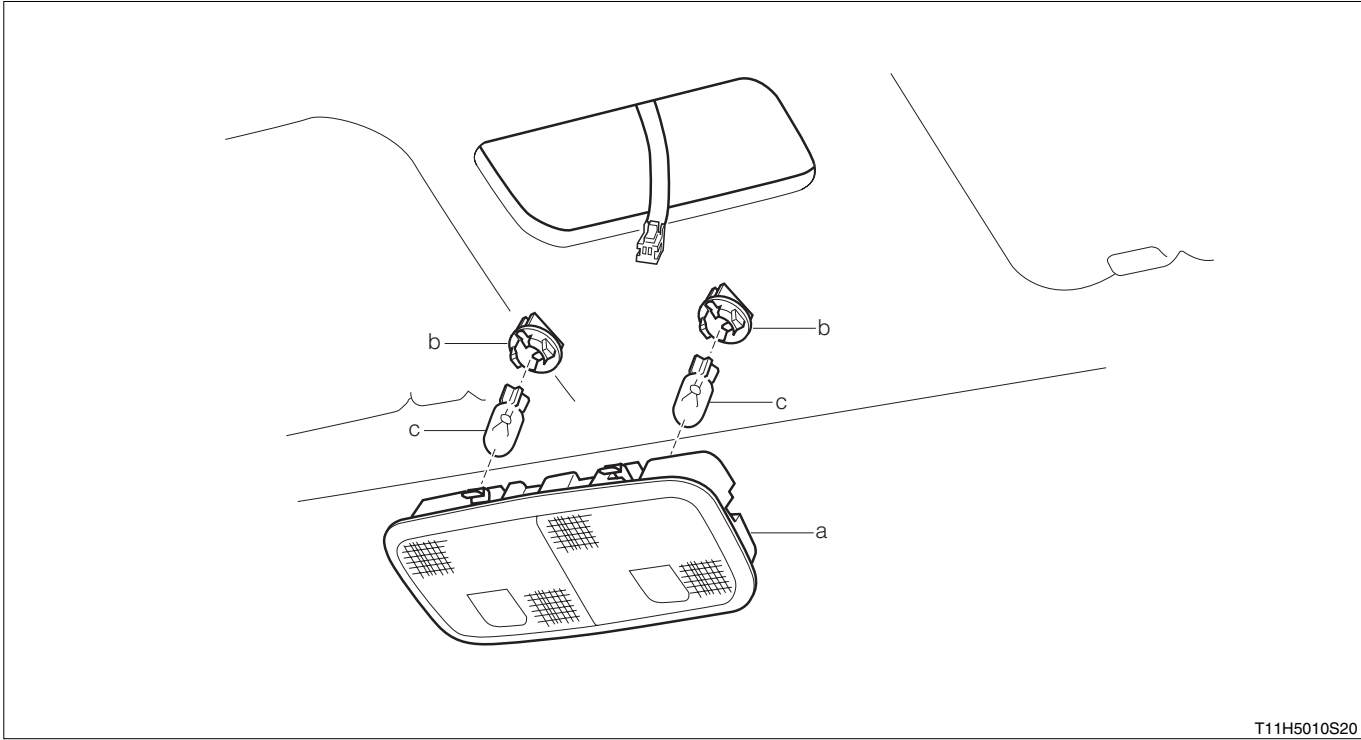
20-1-1 ARTICLES TO BE PREPARED

Lubricant, adhesive, others

Protective tape

20-1-2 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



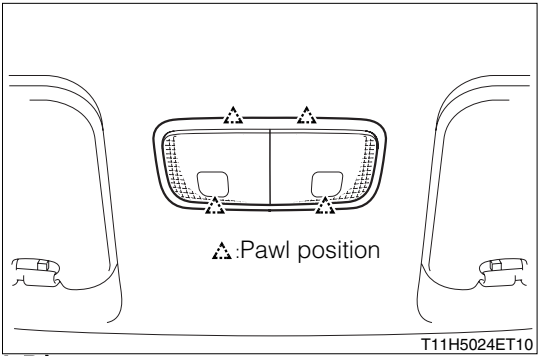
(2) Removal and installation procedures

- ▼ 1 a Lamp Ay, map
- 2 b Socket
- 3 c Bulb

20-1-3 POINTS OF REMOVAL

(1) Lamp Ay, map

- 1. Remove by disengaging the pawls (at four points), using a flat screwdriver wrapped with a protective tape.



21 ROOM LAMP BULB(LUGGAGE ROOM LAMP BULB)

21-1 REMOVAL AND INSTALLATION

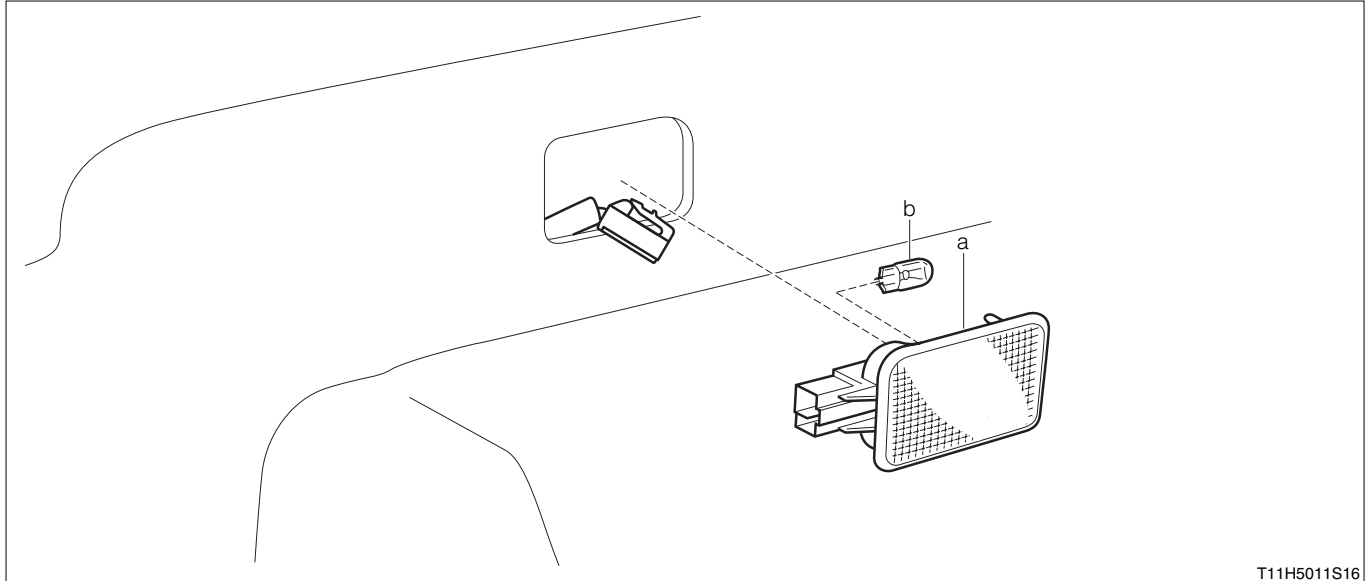
21-1-1 ARTICLES TO BE PREPARED

Lubricant,adhesive,others

Protective tape

21-1-2 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



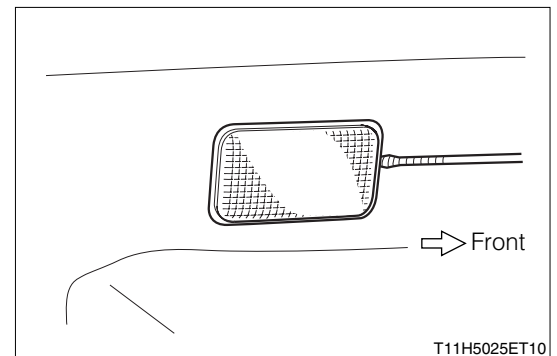
(2) Removal and installation procedures

- ▼ 1 a Lamp Ay, dome
- 2 b Bulb

21-1-3 POINTS OF REMOVAL

(1) Lamp Ay, dome

1. Using a flat (—) screw driver wound with a protective tape, release.



22 HEADLAMP DIMMER SWITCH AY

22-1 REMOVAL AND INSTALLATION

22-1-1 ARTICLES TO BE PREPARED

Lubricant, adhesive, others

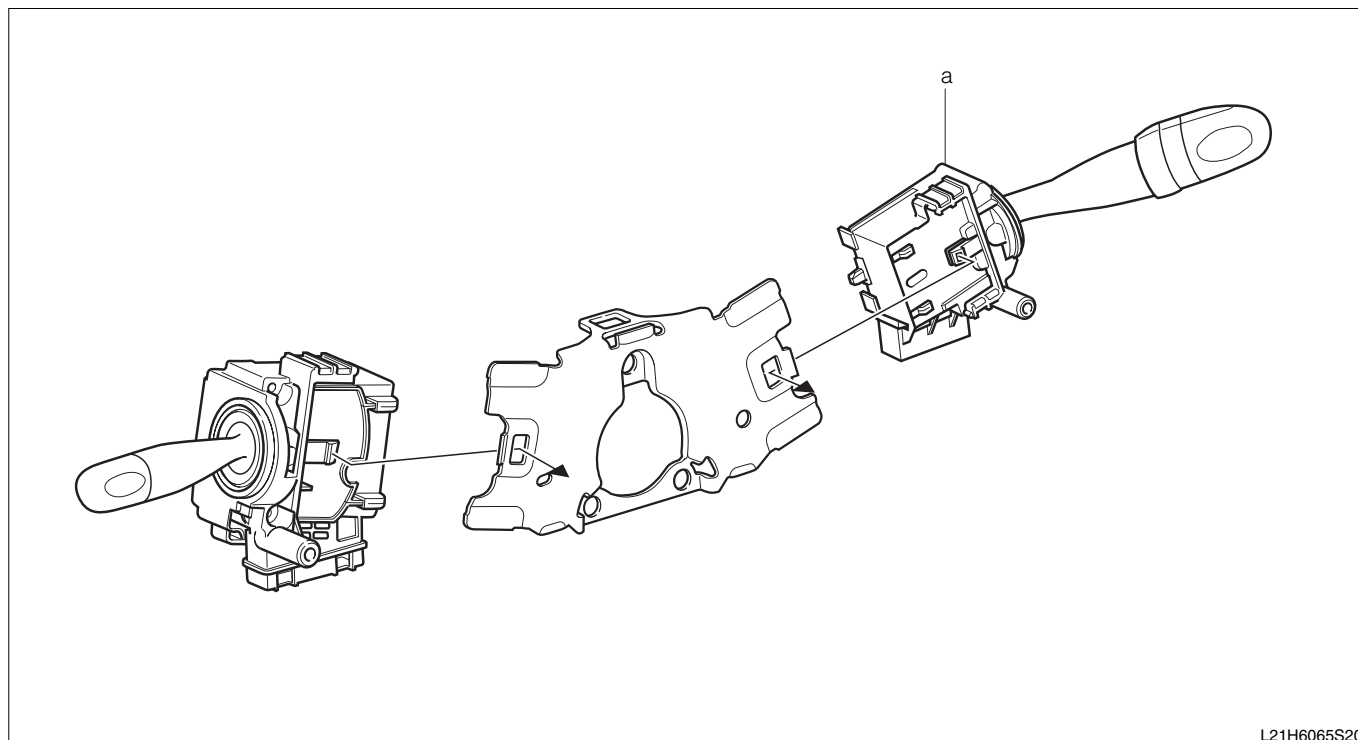
Protective tape

22-1-2 OPERATION BEFORE REMOVAL

1. Remove the lower steering column cover.
Refer to Page G1-4.
2. Remove the upper steering column cover.
Refer to Page G1-4.

22-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



L21H6065S20

(2) Removal and installation procedures

- ▼ 1 a Switch Ay, headlamp dimmer

22-1-4 POINTS OF REMOVAL

(1) Switch Ay, headlamp dimmer

1. Using a flat (—) screwdriver wound with a protective tape, release the fitting of the the claw.

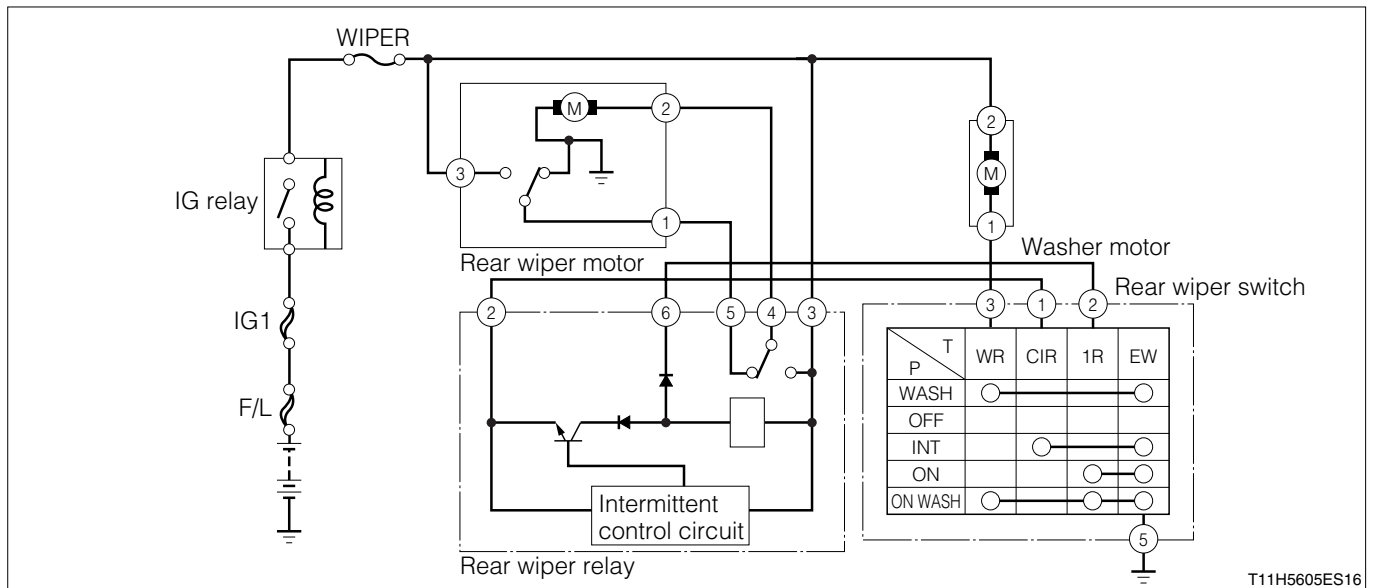
22-1-5 OPERATION AFTER INSTALLATION

1. Install the upper steering column cover.
Refer to Page G1-4.
2. Install the lower steering column cover.
Refer to Page G1-4.

J2 WIPER & WASHER

WIPER AND WASHER-----	J2—1
ARTICLES TO BE PREPARED -----	J2—1
SYSTEM DRAWING-----	J2—1
BASIC CHECK AND ADJUSTMENT ---	J2—2
UNIT CHECK-----	J2—5
FRONT WIPER -----	J2—9
REMOVAL AND INSTALLATION-----	J2—9
REAR WIPER -----	J2—12
REMOVAL AND INSTALLATION-----	J2—12
REAR WIPER RELAY -----	J2—13
REMOVAL AND INSTALLATION-----	J2—13
WASHER TANK -----	J2—14
REMOVAL AND INSTALLATION-----	J2—14
WASHER HOSE(FRONT)-----	J2—15
REMOVAL AND INSTALLATION-----	J2—15
WASHER HOSE(ROOF)-----	J2—16
REMOVAL AND INSTALLATION-----	J2—16
WASHER HOSE(REAR) -----	J2—16
REMOVAL AND INSTALLATION-----	J2—16
WIPER SWITCH AY-----	J2—17
REMOVAL AND INSTALLATION-----	J2—17

1-2-2 REAR WIPER & WASHER (VEHICLES FOR EUROPE WITH INTERMITTENT FUNCTION)



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1-3 BASIC CHECK AND ADJUSTMENT

1-3-1 CHECK OF WIPER, WASHER

1. Check the wiper for proper operation with the ignition switch turned "ON" and the wiper switch activated.

SPECIFIED VALUE:

- "Lo" position: Low-speed operation.
- "Hi" position: High-speed operation.
- "INT" position: Intermittent operation.
- "MIST" position: activates wiper for a single wipe and stops.

2. Check the wiper for wiping performance.

SPECIFIED VALUE: Good.

3. Check the direction and height of the washer fluid flows when the washer fluid is squirted.

SPECIFIED VALUE: Good.

4. Visually check the washer level in the washer tank.

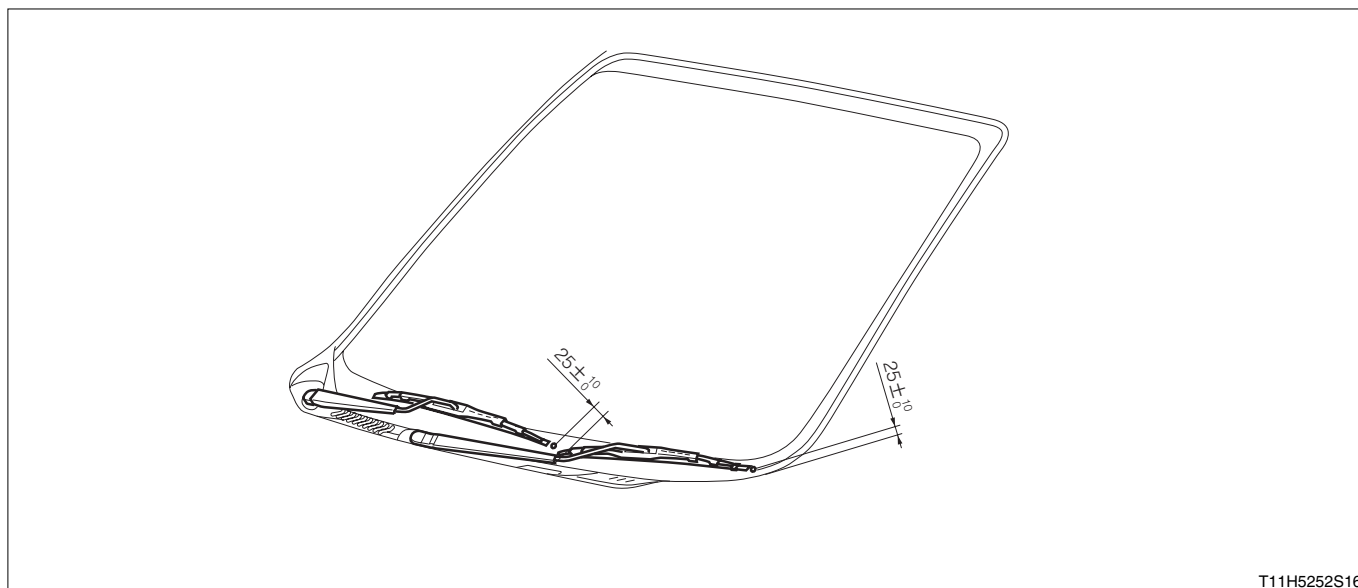
SPECIFIED VALUE: Good.

1-3-2 CHECK AND ADJUSTMENT OF STOP POSITION OF WIPER BLADE

Check the wiper blade stop position and adjust as shown in the illustration.

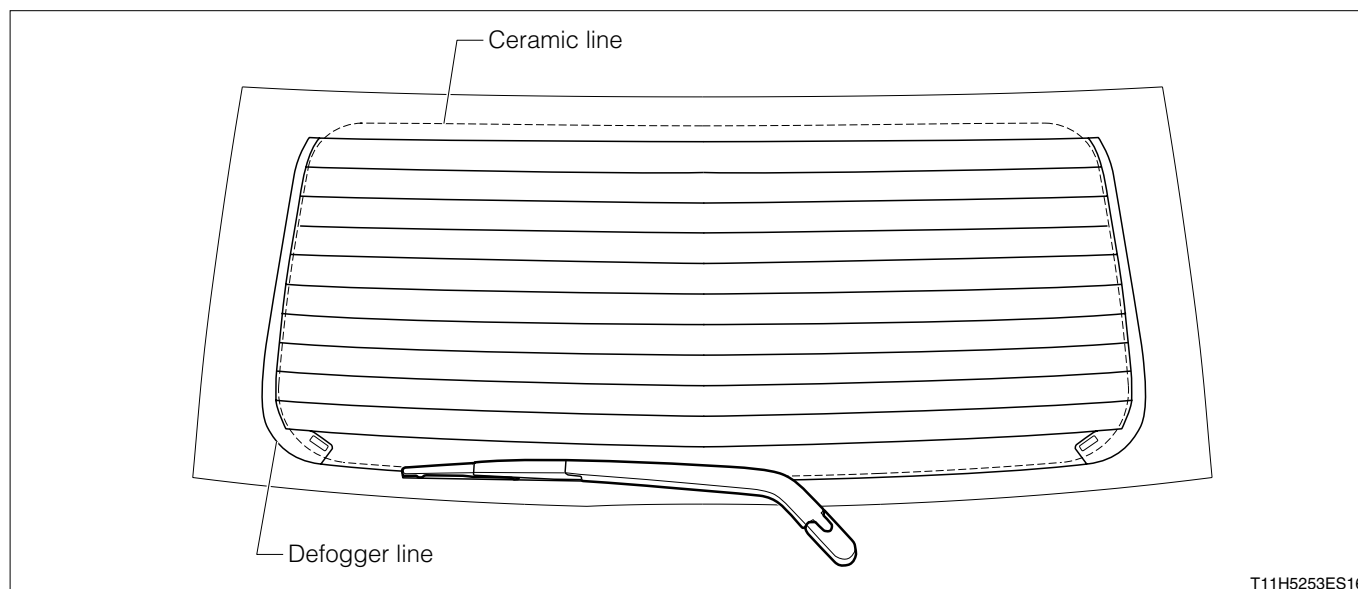
J2-3

(1) Front



Unit : mm

(2) Rear

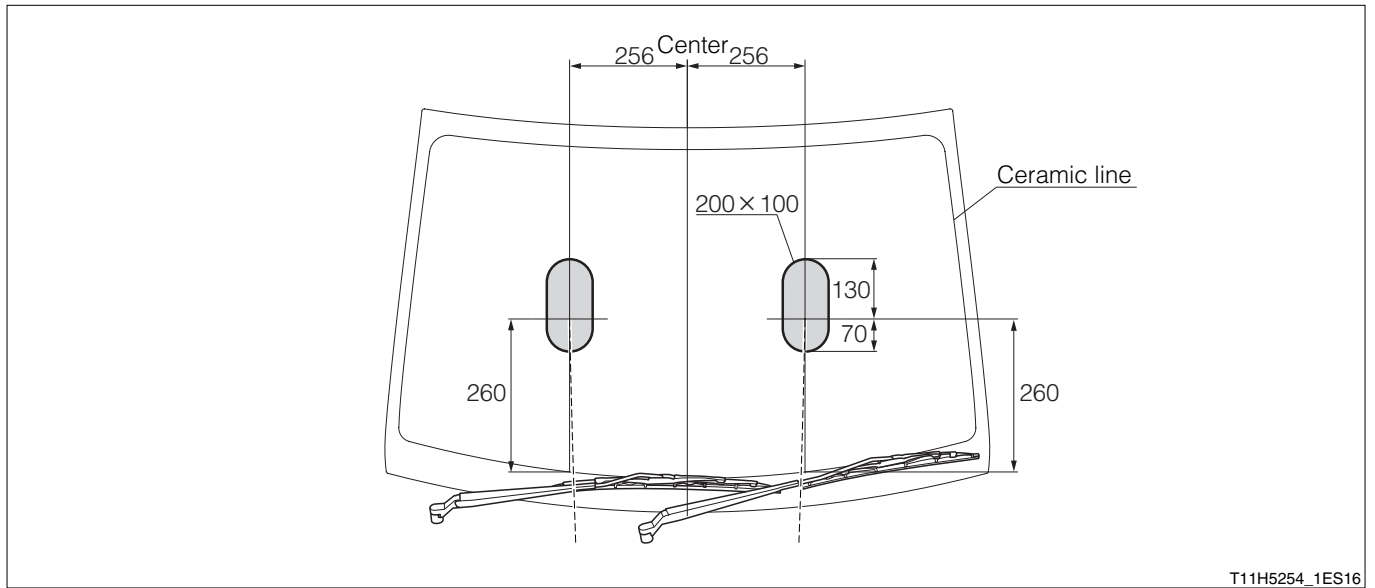


SPECIFIED VALUE: Ensure that the wiper blade is ± 5 mm above and below the defogger line.

1-3-3 CHECK AND ADJUSTMENT OF WASHER FLUID FLOW PATTERNS

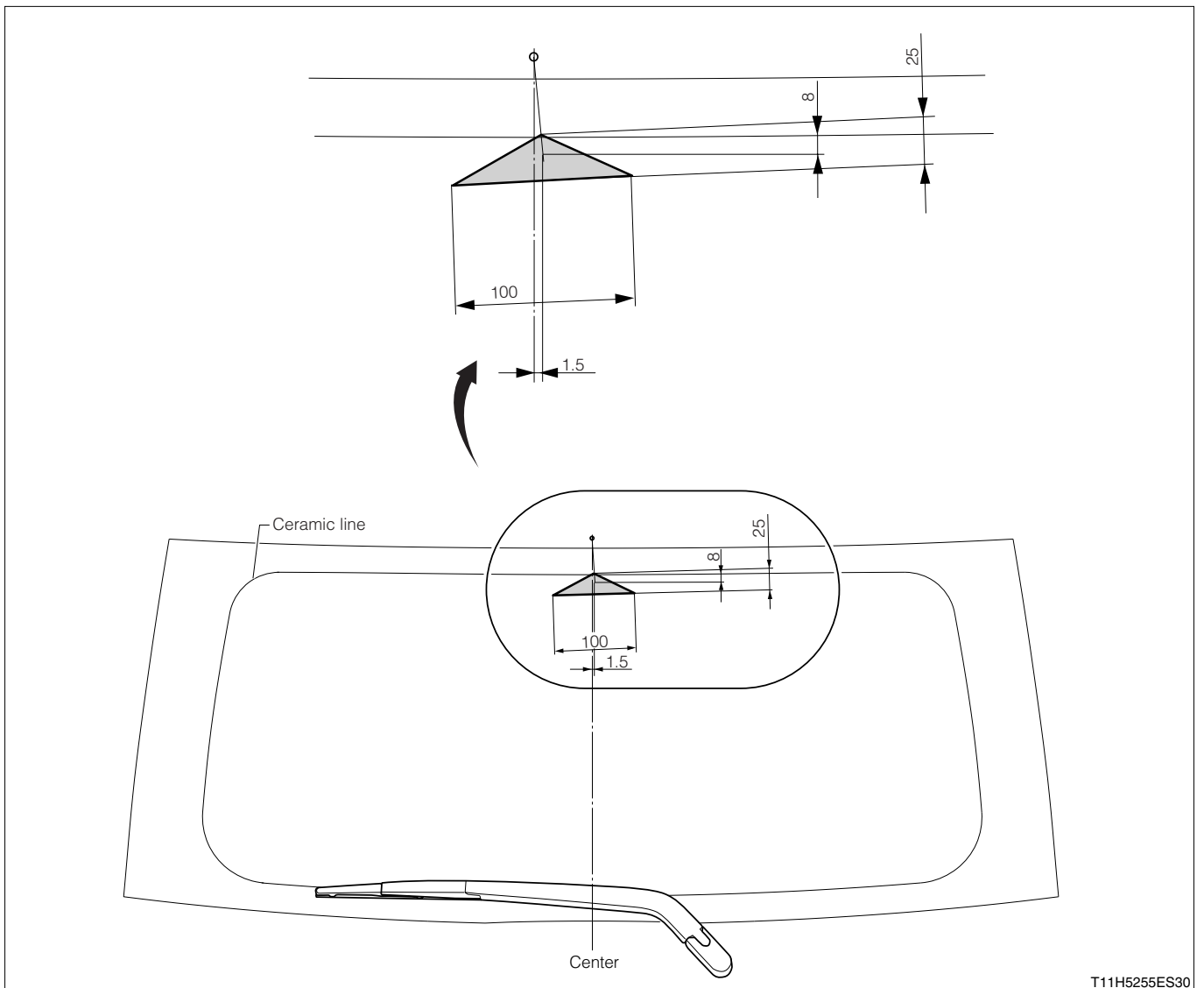
Check the washer fluid flow patterns and adjust as shown in the illustration.

(1) Front



Unit : mm

(2) Rear



Unit : mm

J2-5

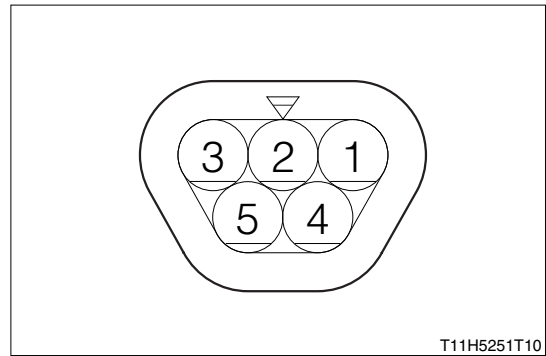
1-4 UNIT CHECK

1-4-1 FRONT WIPER MOTOR (RIGHT-HAND DRIVE VEHICLE)

(1) Low operation check

1. Connect the front wiper motor terminal 4(E) to the battery negative (−) terminal.
2. Connect the terminal 5(+1) to the battery positive (+) terminal and check the motor for proper operation.

SPECIFIED VALUE: Operate at low-speed.



(2) High operation check

1. Connect the front wiper motor terminal 4(E) to the battery negative (−) terminal.
2. Connect the terminal 3(+2) to the battery positive (+) terminal and check the motor for proper operation.

SPECIFIED VALUE: Operate at high-speed.

(3) Operation check for automatic stop position

1. In the Lo operation check, while operating the wiper motor at a low speed, remove the terminal 5(+1) from the positive (+) terminal of the battery, thereby stopping the motor crank at a position other than the automatic stop position.
2. After short-circuiting the terminal 5(+1) to the terminal 1(S), connect the terminal 2(WB) to the battery positive (+) terminal. Then check the motor's operation and the crank's stop position.

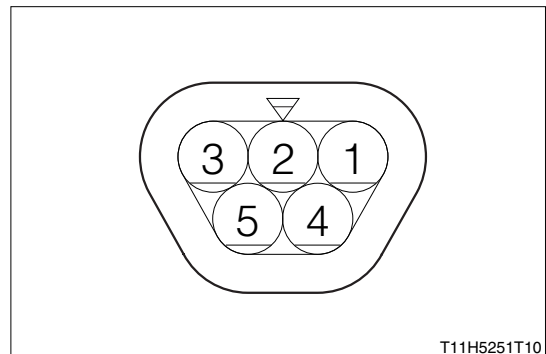
SPECIFIED VALUE: The motor restarts at a low speed, and the crank stops at the automatic stop position

1-4-2 FRONT WIPER MOTOR (LEFT-HAND DRIVE VEHICLE)

(1) Low operation check

1. Connect the front wiper motor terminal 5(E) to the battery negative (−) terminal.
2. Connect the terminal 1(+1) to the battery positive (+) terminal and check the motor for proper operation.

SPECIFIED VALUE: Operate at low-speed.



(2) High operation check

1. Connect the front wiper motor terminal 5(E) to the battery negative (−) terminal.
2. Connect the terminal 4(+2) to the battery positive (+) terminal and check the motor for proper operation.

SPECIFIED VALUE: Operate at high-speed.

(3) Operation check for automatic stop position

1. In the Lo operation check, while operating the wiper motor at a low speed, remove the terminal 1(+1) from the positive (+) terminal of the battery, thereby stopping the motor crank at a position other than the automatic stop position.
2. After short-circuiting the terminal 1(+1) to the terminal 3(S), connect the terminal 2(WB) to the battery positive (+) terminal. Then check the motor's operation and the crank's stop position.

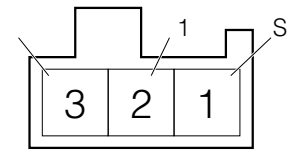
SPECIFIED VALUE: The motor restarts at a low speed, and the crank stops at the automatic stop position

1-4-3 REAR WIPER MOTOR(VEHICLES FOR EUROPE WITH INTERMITTENT FUNCTION)

(1) Operation check

1. Check the motor for proper operation, with the rear wiper motor terminal 2(+1) connected to the battery positive (+) terminal, and the battery negative terminal to the bracket (earth).

SPECIFIED VALUE: The motor operates.



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(2) Check of automatic stop function

1. Stop the motor shaft at a position other than the automatic stop position.
2. Connect the rear wiper motor terminal 3(+) to the battery positive (+) terminal, and the battery negative terminal to the bracket (earth).
3. When the rear wiper motor terminal 2(+) is connected to the terminal 1(S), check the motor operation and shaft stopping position.

SPECIFIED VALUE: The motor shall restart and the shaft stops at the automatic stop position.

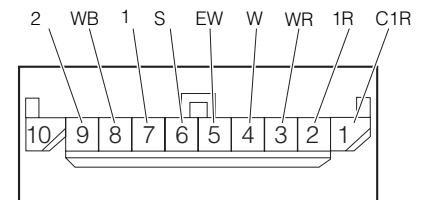
1-4-4 WINDSHIELD WIPER SWITCH(VEHICLE WHERE IT IS INSTALLED AT THE RIGHT SIDE OF THE COLUMN)

(1) Front wiper switch

① Continuity check

1. Check the continuity between each connector terminal, in each switch position.

Switch condition	Terminal No. (Terminal code)	Standard
MIST	7(+1) – 8(WB)	Continuity exists
OFF	6(+S) – 7(+1)	
INT	6(+S) – 7(+1)	
LO	7(+1) – 8(WB)	
HI	8(WB) – 9(+2)	



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② Intermittent operation check (Wiper with an intermittent function)

1. Connect the battery positive (+) terminal to the terminal 8(WB) and the battery negative (–) terminal to the terminal 5(EW) and the terminal 6(+S).
2. Set the wiper switch to "INT" position.
3. Disconnect the terminal 6(+S) from the battery negative (–) terminal. Then, connect the terminal 6(+S) to the battery positive (+) terminal for five seconds.
4. After the step 3, connect the terminal 6(+S) to the battery negative (–) terminal, thus actuating the relay. At this time, measure the voltage between the terminal 7(+1) and the terminal 5(EW).

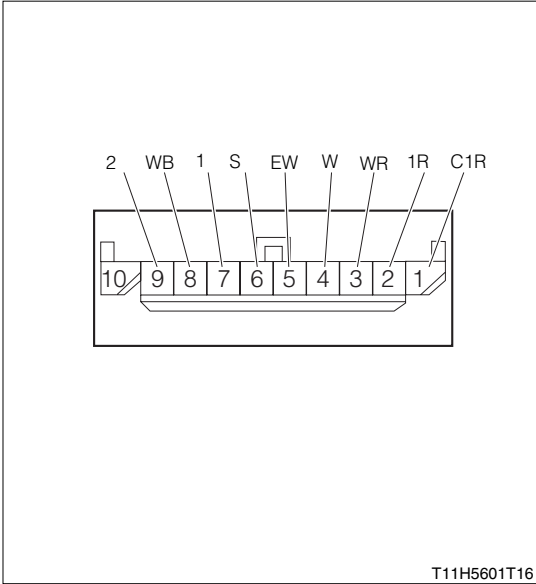
SPECIFIED VALUE: Approx. 3 seconds after connecting the battery negative (–) terminal: 1V or below

Approx. 3 seconds after connecting the negative battery (–) terminal: 10 – 14V

(2) Front washer switch

① Continuity check

1. Turn "ON" the washer switch and check the continuity between the terminal 5(EW) and the terminal 4(W).
SPECIFIED VALUE: Continuity exists.



② Operation check (Wiper with an intermittent function)

1. Set the wiper switch to "OFF" position.
2. Connect the battery positive (+) terminal to the terminal 8(WB), and the battery negative (−) terminal to the terminal 5(EW) and the terminal 6(+S).
3. Under the condition in Step 2, turn "ON" and "OFF" the wiper switch. Then measure the voltage between the terminal 7(+1) and the terminal 5(EW).
SPECIFIED VALUE: Period from approx. 0.3 second after turning "ON" to approx. 2.2 seconds after turning "OFF": 10 – 14V
Other than period above: 1V or less

(3) Rear wiper & washer switch

1. Check the continuity between each connector terminal, in each switch position.

Continuity table of rear wiper switch(Except vehicles with intermittent function)

Switch condition	Terminal No. (Terminal code)	Standard
WASH	5(EW) – 3(WR)	Continuity exists
ON	5(EW) – 2(+1R)	
ON WASH	5(EW)–3(WR) – 2(+1R)	

Continuity table of rear wiper switch(Vehicles with intermittent function)

Switch condition	Terminal No. (Terminal code)	Standard
WASH	5(EW) – 3(WR)	Continuity exists
INT	5(EW) – 1(C1R)	
ON	5(EW) – 2(+1R)	
ON WASH	5(EW)–3(WR) – 2(+1R)	

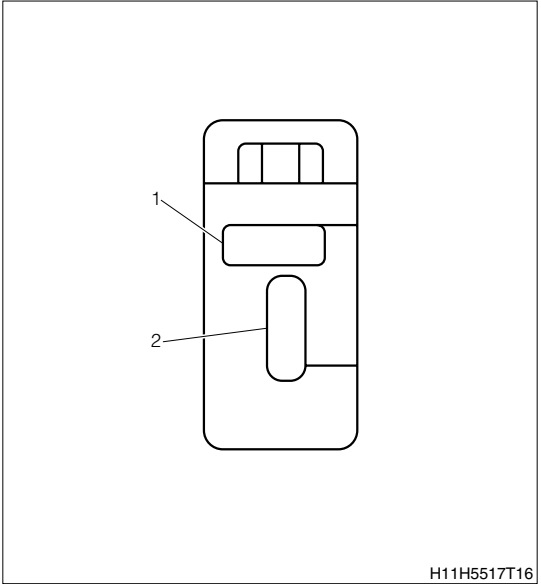
Other than period above: 1V or less

J2-9

1-4-5 WINDSHIELD WASHER MOTOR & PUMP

- 1. Put water into the washer tank.
- 2. Connect the motor & pump connector terminal 1 to the battery negative (－) terminal, and the terminal 2 to the battery positive (+) terminal. Then check whether water is pressure fed from the motor & pump.

SPECIFIED VALUE: Water is pressure fed.



2 FRONT WIPER

2-1 REMOVAL AND INSTALLATION

2-1-1 ARTICLES TO BE PREPARED

Tool

TORX® wrench T30

Instrument

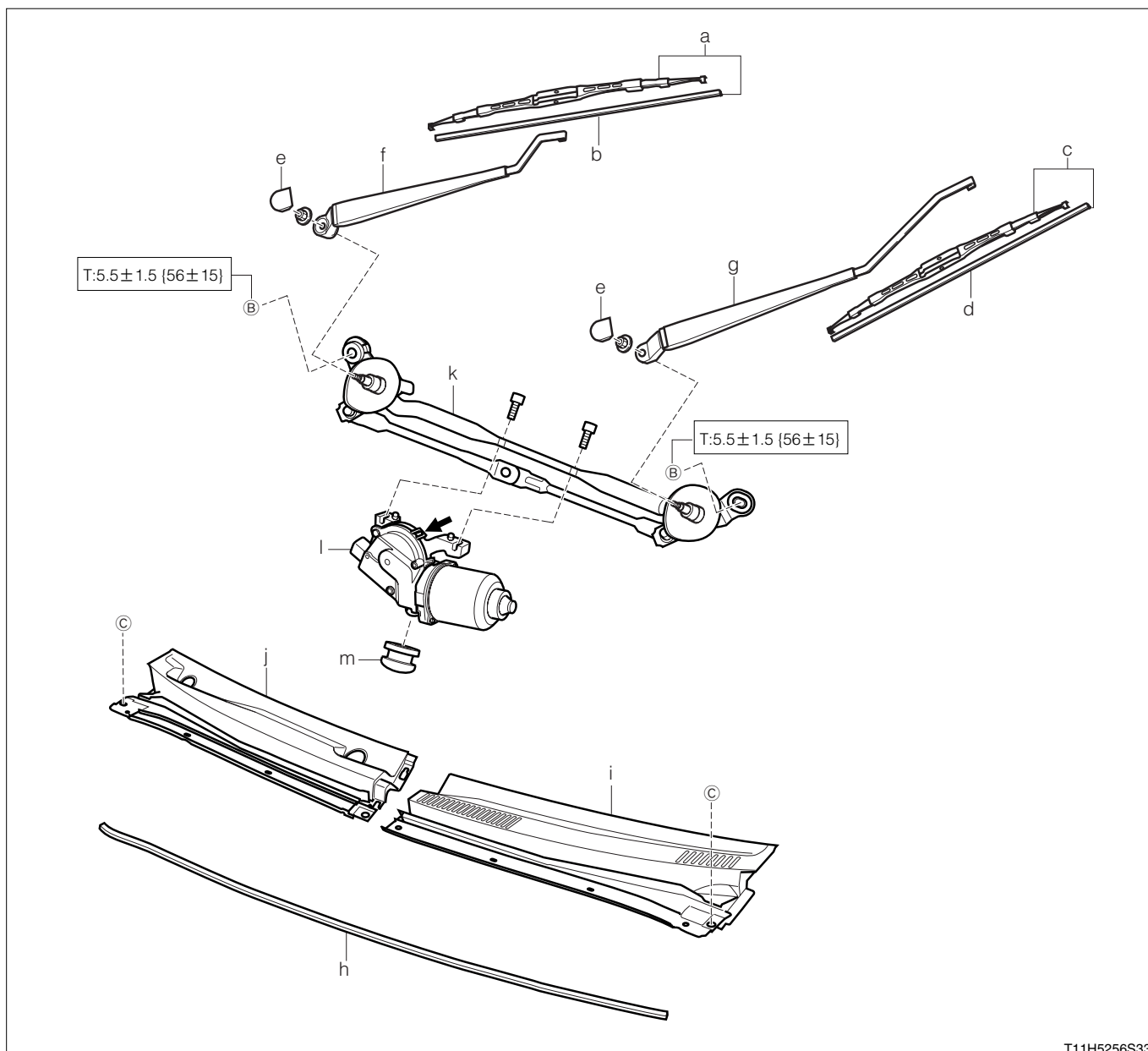
Torque wrench

Lubricant,adhesive,others

DENSO No.50 grease or equivalent

2-1-2 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



T11H5256S33

Unit:N·m{kgf·cm}

➡: DENSO No.50 grease or equivalent

(2) Removal and installation procedures

▲ 1	a Blade, front wiper, RH	8	h Seal, hood to cowl top
2	b Rubber, wiper blade (RH)	▼ 9	i Louver, cowl top ventilator, LH
▲ 3	c Blade, front wiper, LH	▼ 10	j Louver, cowl top ventilator, RH
4	d Rubber, wiper blade (LH)	11	k Link Ay, front wiper
5	e Cap, wiper arm head	▼ ▲ 12	l Motor Ay, front wiper
▲ 6	f Arm, front wiper, RH	13	m Rubber, mount
▲ 7	g Arm, front wiper, LH		

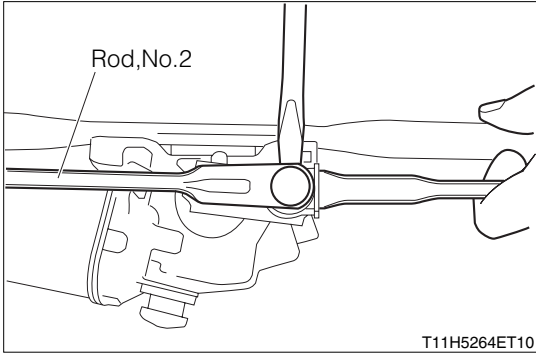
2-1-3 POINTS OF REMOVAL

(1) Louver, cowl top ventilator, RH/LH

Refer to Page I2-4.

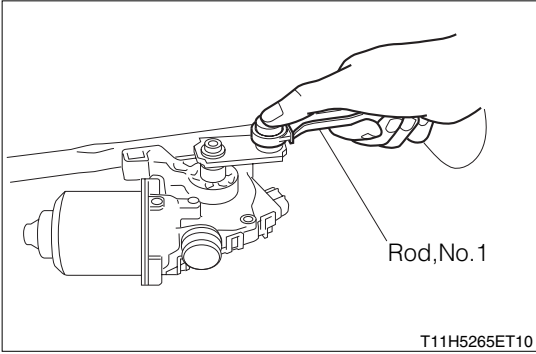
(2) Motor Ay, front wiper

- 1. Remove the No.2 rod of the front wiper link Ay, using a flat screwdriver.



- 2. Remove the No.1rod of the front wiper link Ay from the crank arm of the motor Ay.
- 3. Remove the motor Ay by removing the TORX bolts (two pcs.).

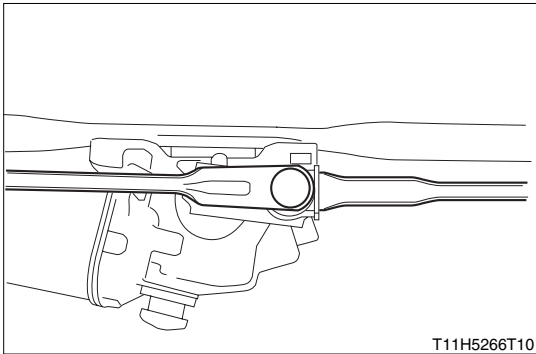
TOOL: TORX® wrench T30



2-1-4 POINTS OF INSTALLATION

(1) Front wiper motor Ay

- 1. Install the motor Ay to the front wiper link Ay.
- 2. Apply grease to the pivot area on the crank arm motor Ay and assemble the rod.
LUBRICANT: DENSO No.50 grease or equivalent
- 3. After assembling the rod, connect the motor Ay to the vehicle harness. Then activate and stop the wiper at the automatic stop position.

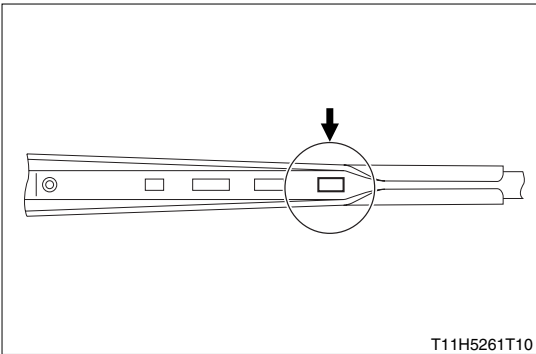


(2) Arm, front wiper, RH/LH

- 1. The shapes of the arms differ between the right and left. Therefore, check the identification code stamped on the arm before installation.

Arm,identification code

	Driver's seat side	Front passenger seat side
RHD EU specifications	ED	EP
LHD	LD	LP



- 2. Match the blade stop position with the regular position and install the arm.
Refer to Page J2-2.

(3) Blade, front wiper, RH/LH

1. Since the length differs between the right and left, refer to the blade length below for proper installation.

Wiper blade dimensions

	Driver's seat side	Front passenger seat side
Blade length (mm)	500	400

3 REAR WIPER

3-1 REMOVAL AND INSTALLATION

3-1-1 ARTICLES TO BE PREPARED

Instrument

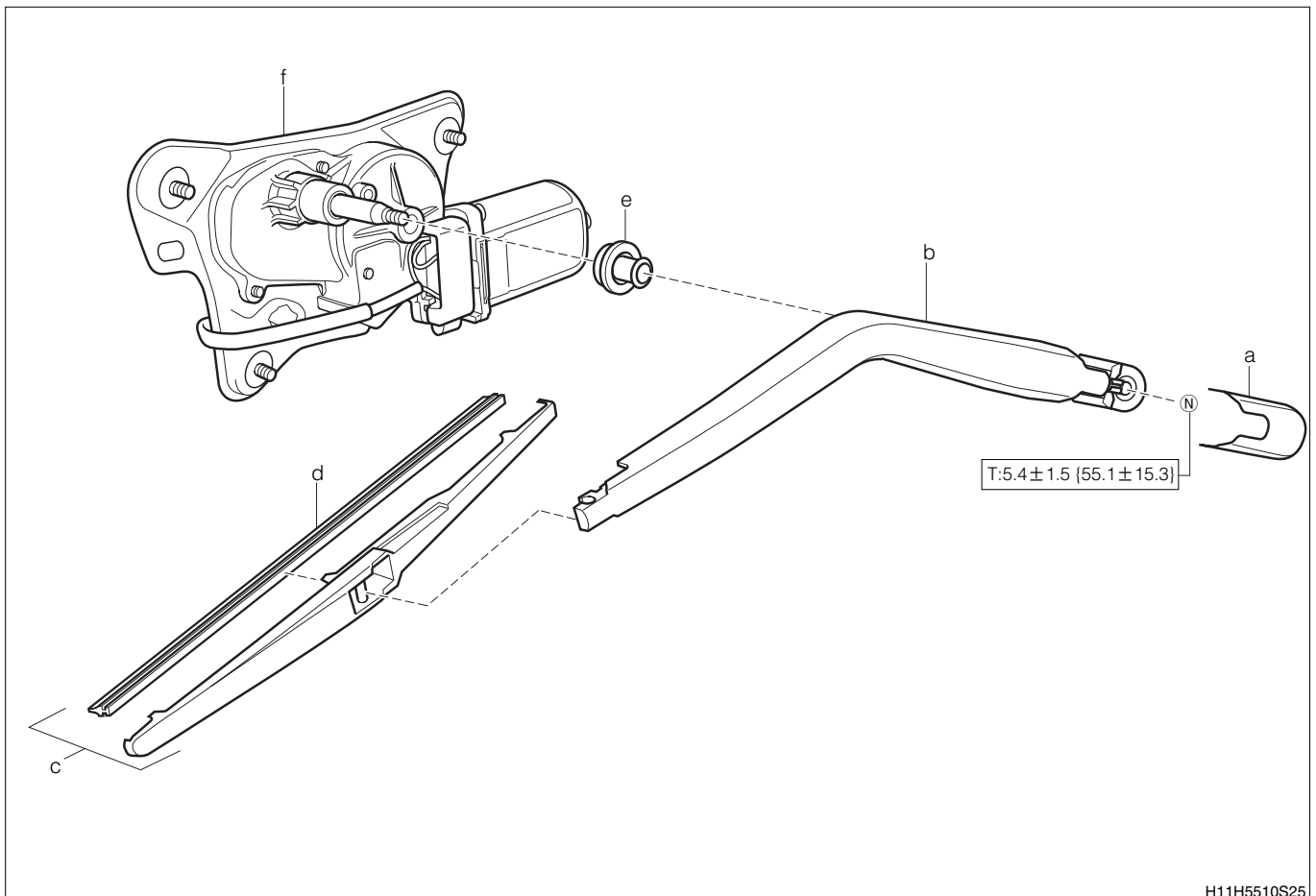
Torque wrench

3-1-2 OPERATION BEFORE REMOVAL

1. Remove the back door trim Ay.
Refer to Page I1-20.

3-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



Unit: N·m {kgf·cm}

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J2-13

(2) Removal and installation procedures

- 1 a Cap, wiper arm head
- ▲ 2 b Arm, rear wiper
- 3 c Blade, rear wiper
- 4 d Rubber, wiper blade
- 5 e Cap, rear wiper link
- ▲ 6 f Motor Ay, rear wiper

3-1-4 POINTS OF INSTALLATION

(1) Motor Ay, rear wiper

1. When the unit check for the motor Ay has been performed, before the installation, ensure that the motor Ay is at the automatic stop position.
Refer to Page J2-3.

(2) Arm, rear wiper

1. Match the blade stop position with the regular position and install the arm.
Refer to Page J2-2.

3-1-5 OPERATION AFTER INSTALLATION

1. Install the back door trim Ay.
Refer to Page I1-20.

4 REAR WIPER RELAY

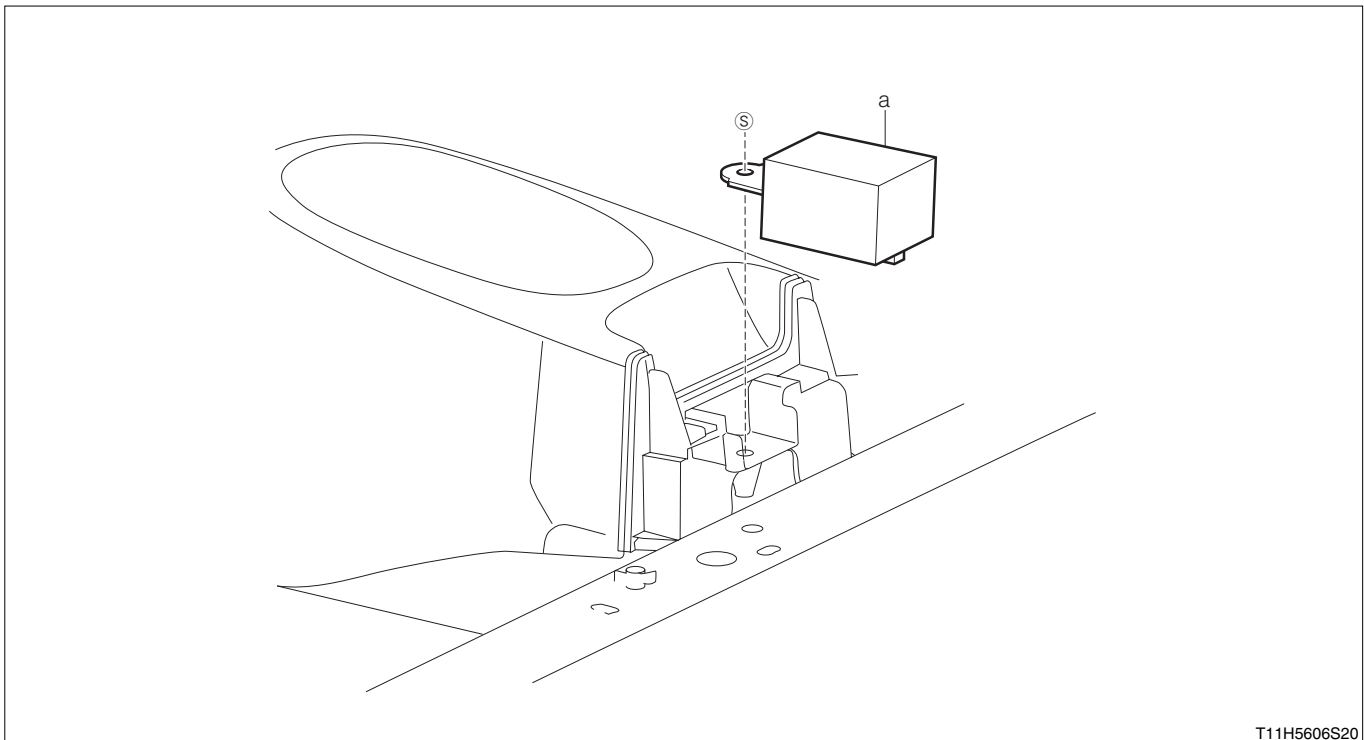
4-1 REMOVAL AND INSTALLATION

4-1-1 OPERATION BEFORE REMOVAL

1. Remove the box S/A, console, rear.
Refer to Page I2-23.

4-1-2 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



(2) Removal and installation procedures

- 1 a Relay Ay, Windshield wiper

4-1-3 OPERATION AFTER INSTALLATION

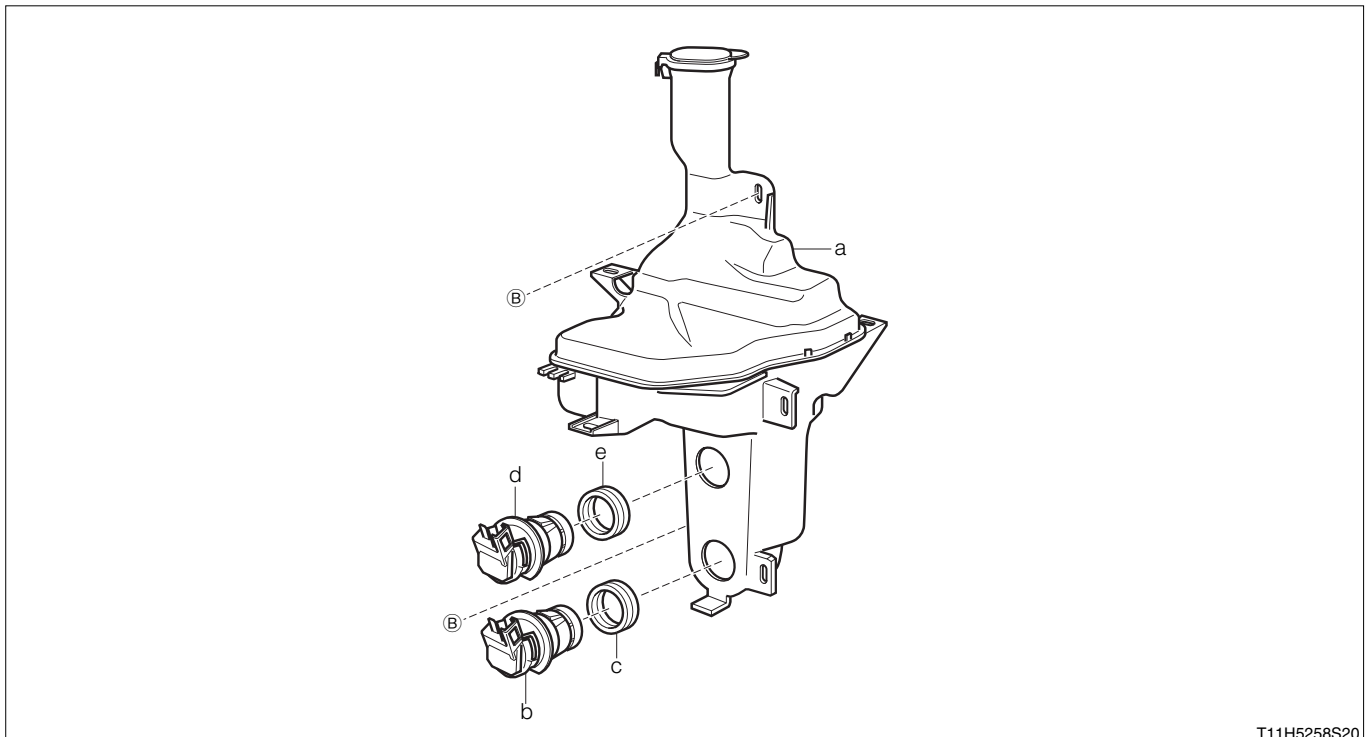
1. Install the box S/A, console, rear.
Refer to Page I2-23.

5 WASHER TANK**5-1 REMOVAL AND INSTALLATION****5-1-1 OPERATION BEFORE REMOVAL**

1. Remove the front bumper cover.
Refer to Page I2-1.

2. Remove the RH head lamp Ay.
Refer to Page J1-6.

3. Drain the washer fluid.

5-1-2 REMOVAL AND INSTALLATION PROCEDURES**(1) Components**

T11H5258S20

(2) Removal and installation procedures

- 1 a Jar&pomp Ay, front washer
- 2 b Motor&pomp Ay, washer (Front)
- 3 c Grommet
- 4 d Motor&pomp Ay, washer (Rear)
- 5 e Grommet

5-1-3 OPERATION AFTER INSTALLATION

1. Refill the washer fluid.
2. Install the RH head lamp Ay.
Refer to Page J1-6.
3. Install the front bumper cover.
Refer to Page I2-1.

6 WASHER HOSE(FRONT)

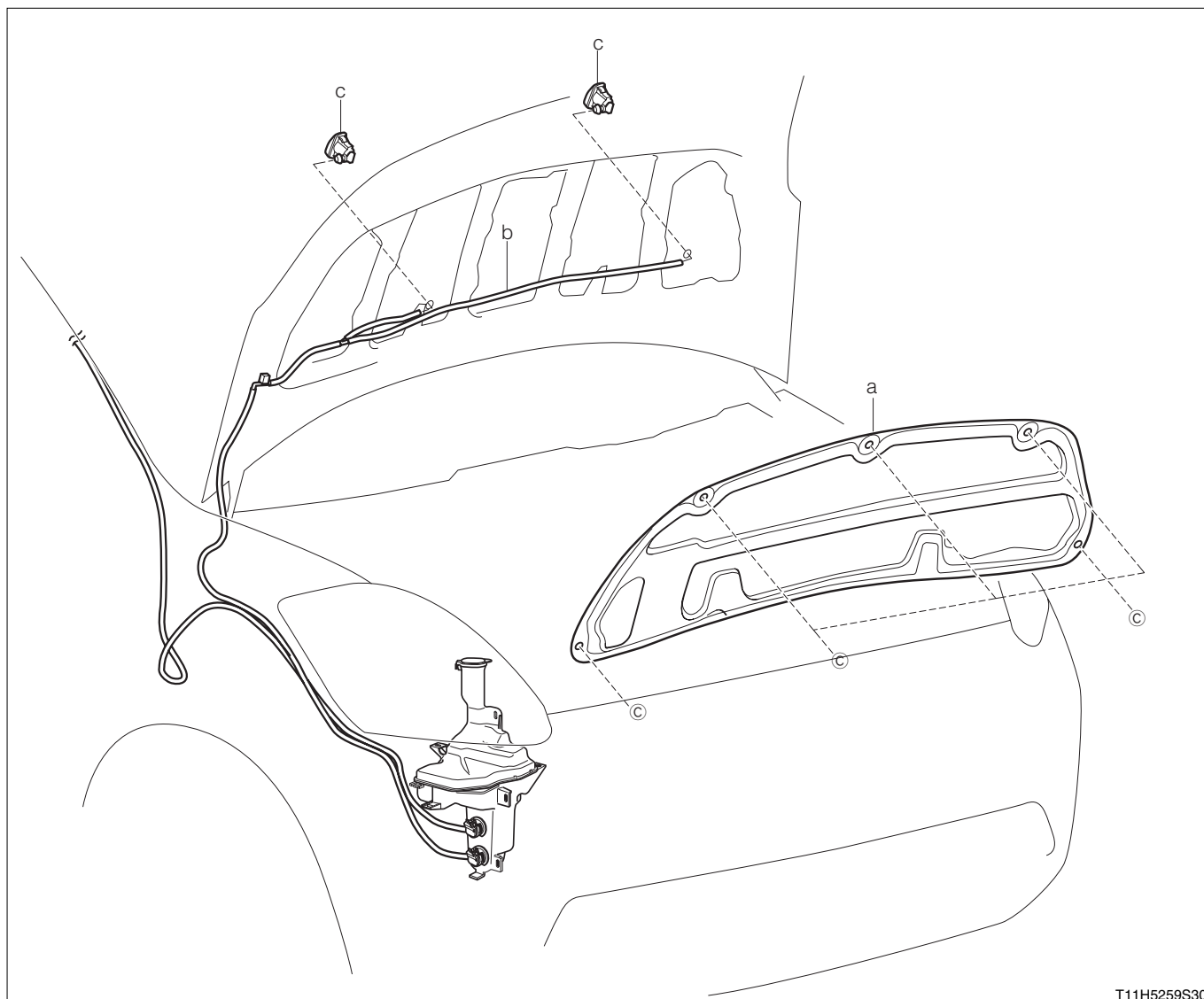
6-1 REMOVAL AND INSTALLATION

6-1-1 OPERATION BEFORE REMOVAL

1. Remove the RH front fender liner .
Refer to Page I1-21.

6-1-2 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



T11H5259S30

(2) Removal and installation procedures

- 1 a Insulator, hood
- 2 b Hose Ay, washer
- ▲ 3 c Nozzle, front washer

6-1-3 POINTS OF INSTALLATION**(1) Nozzle, front washer**

1. After the nozzle is installed, check the washer fluid flow patterns and adjust.
Refer to Page J2-4.

6-1-4 OPERATION AFTER INSTALLATION

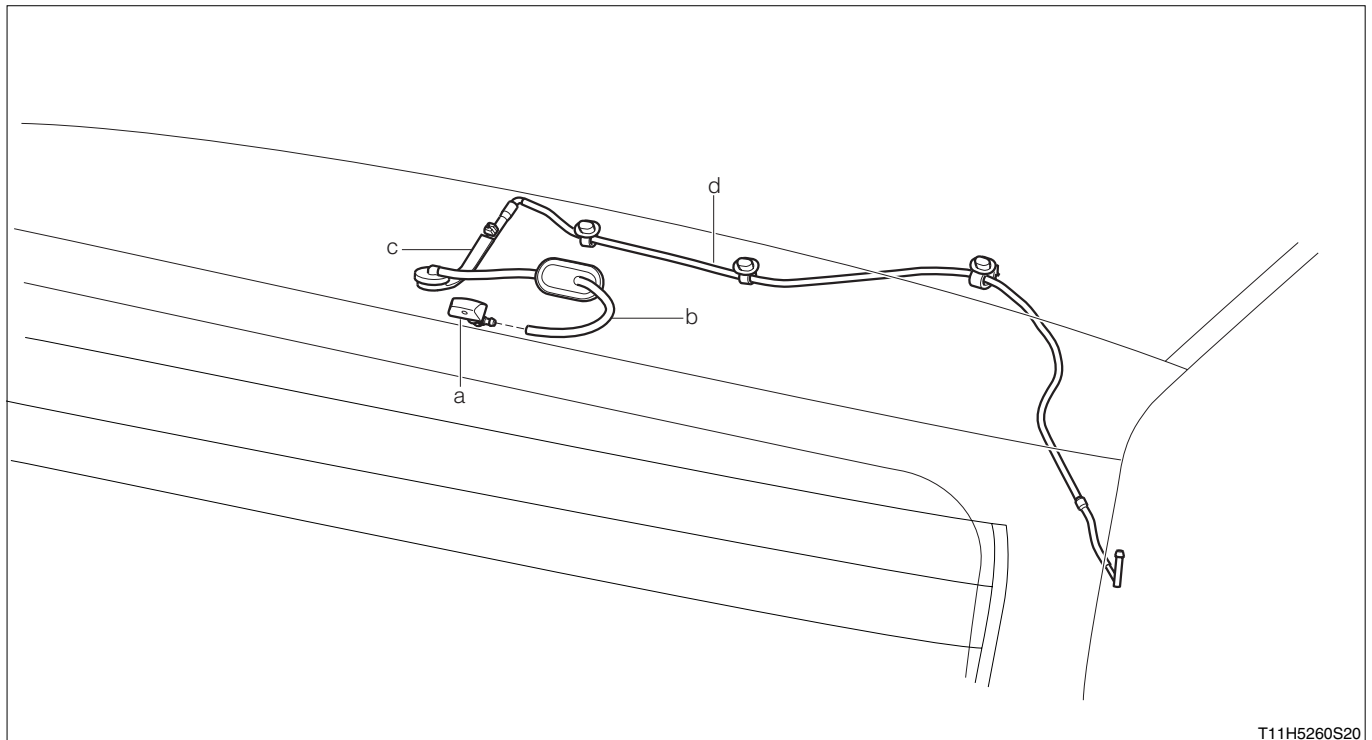
1. Install the RH front fender liner.
Refer to Page I1-21.

7 WASHER HOSE(ROOF)**7-1 REMOVAL AND INSTALLATION**

Refer to Page I2-43.

8 WASHER HOSE(REAR)**8-1 REMOVAL AND INSTALLATION****8-1-1 OPERATION BEFORE REMOVAL**

1. Remove the stop center lamp Ay.
Refer to Page J1-8.

8-1-2 REMOVAL AND INSTALLATION PROCEDURES**(1) Components**

T11H5260S20

(2) Removal and installation procedures

- ▲ 1 a Nozzle Ay, washer
- 2 b Hose Ay, washer
- 3 c Grommet S/A, washer
- 4 d Hose Ay, washer

J2-17

8-1-3 POINTS OF INSTALLATION

(1) Nozzle Ay, washer

1. After the nozzle Ay is installed, check the washer fluid flow patterns and adjust.

Refer to Page J2-4.

8-1-4 OPERATION AFTER INSTALLATION

1. Install the stop center lamp Ay.

Refer to Page J1-8.

9 WIPER SWITCH AY

9-1 REMOVAL AND INSTALLATION

9-1-1 ARTICLES TO BE PREPARED

Lubricant, adhesive, others

Protective tape

9-1-2 OPERATION BEFORE REMOVAL

1. Remove the upper steering column cover.

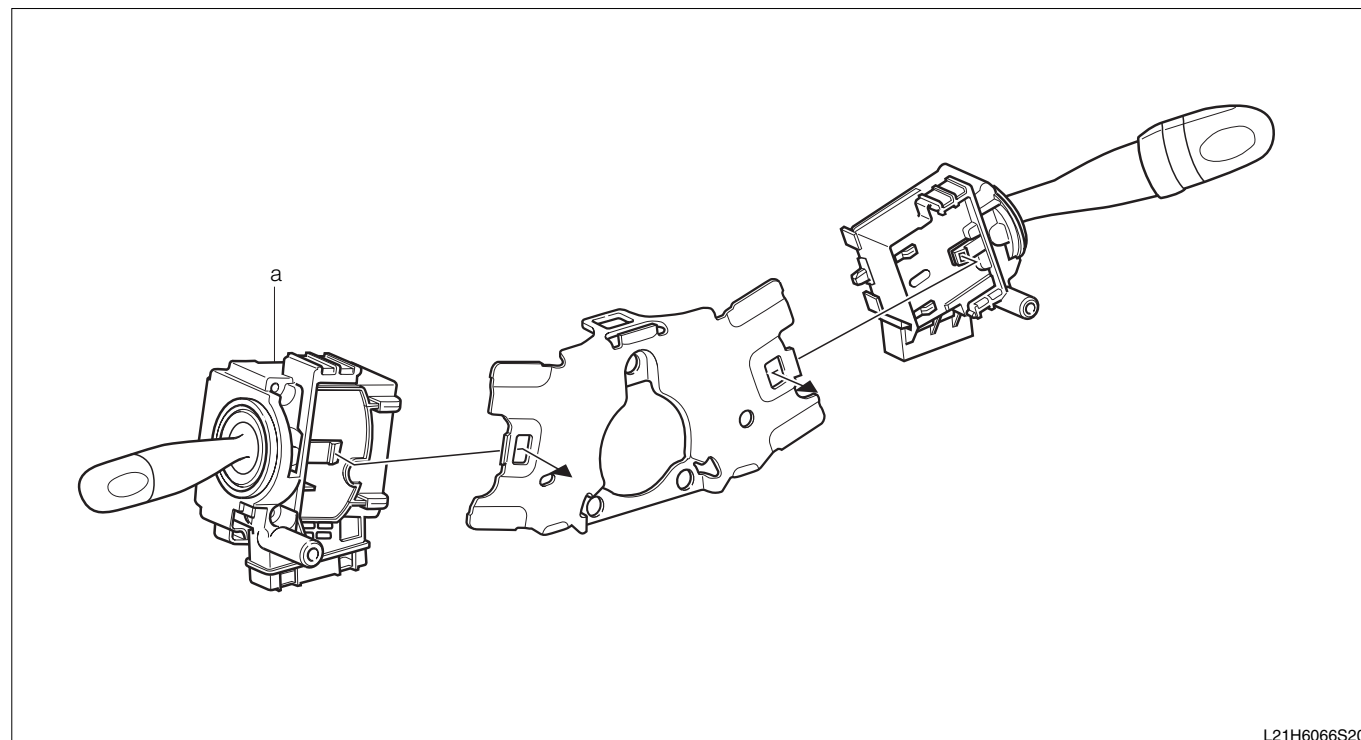
Refer to Page G1-4.

2. Remove the lower steering column cover.

Refer to Page G1-4.

9-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



L21H6066S20

(2) Removal and installation procedures

- ▼ 1 a Switch, windshield wiper

9-1-4 POINTS OF REMOVAL

(1) Switch, windshield wiper

1. Disengage the pawl, using a flat screwdriver wrapped with a protective tape.

9-1-5 OPERATION AFTER INSTALLATION

1. Install the lower steering column cover.
Refer to Page G1-4.
2. Install the upper steering column cover.
Refer to Page G1-4.

J3 METER

METER-----	J3-1
ARTICLES TO BE PREPARED -----	J3-1
FUNCTION CHECK-----	J3-1
COMBINATION METER-----	J3-2
REMOVAL AND INSTALLATION-----	J3-2
CONTROL SYSTEM -----	J3-2
ARTICLES TO BE PREPARED -----	J3-2
HANDLING INSTRUCTIONS OF CON- TROL SYSTEM -----	J3-3
CONTROL SYSTEM -----	J3-4
SYSTEM WIRING DIAGRAM -----	J3-4
ARRANGEMENT OF ECU TERMINAL--	J3-6
ARRANGEMENT OF VEHICLE HAR- NESS SIDE CONNECTOR TERMINALS -----	J3-7
LOCATION OF COMPONENTS-----	J3-8
HOW TO PROCEED WITH TROUBLE SHOOTING -----	J3-8
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CONFIRMATION, RECORD AND ERA- SURE OF DIAGNOSIS CODE-----	J3-10
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TROUBLE SHOOTING ACCORDING TO DIAGNOSIS CODE-----	J3-14
TROUBLE SHOOTING ACCORDING TO MALFUNCTION PHENOMENA----	J3-15
UNIT CHECK-----	J3-20

1 METER

1-1 ARTICLES TO BE PREPARED

Instrument

Oscillo scope

1-2 FUNCTION CHECK

1-2-1 VEHICLE SPEED SIGNAL

(1) Vehicle speed signal output check

- 1. Check the frequency of the voltage pulse between the terminal 12(SPOUT) - 18(GND) at the vehicle speed of 10 km/h.

Terminal No. (Nomenclature of terminal)	Frequency
12(SPOUT) - 18(GND)	About 7Hz

CAUTION

- With the connector connected, perform the check from behind the connector at the vehicle harness side.

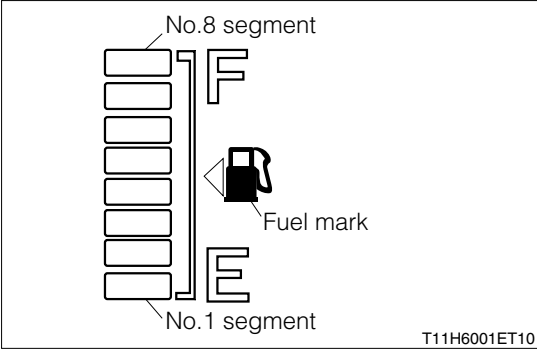
NOTE

- Take the following procedures for easy checking .
 - 1. Insert a lead wire to the backside of the vehicle harness side connector.
 - 2. Secure the vehicles harness and the lead with tape.
 - 3. Check the signal through the lead wire.

1-2-2 FUEL GAUGE

- 1. Disconnect the connector from the fuel sender gage.
- 2. Check fuel gauge state when the ignition switch is turned "ON" (without starting the engine).

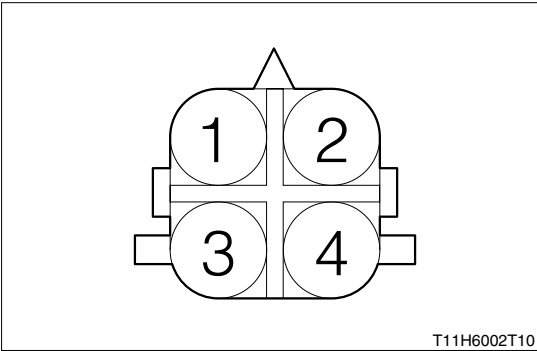
SPECIFIED VALUE: No.1 segment shall blink.
 Fuel mark shall blink.



- 3. Short-circuit the vehicle harness side connector terminals 1and 2 of the fuel sender gage.

- 4. Check the fuel gauge state when the ignition switch is turned "ON" (without starting the engine).

SPECIFIED VALUE: No.1 - No.8 segments shall illuminate.
 Fuel mark shall illuminate.

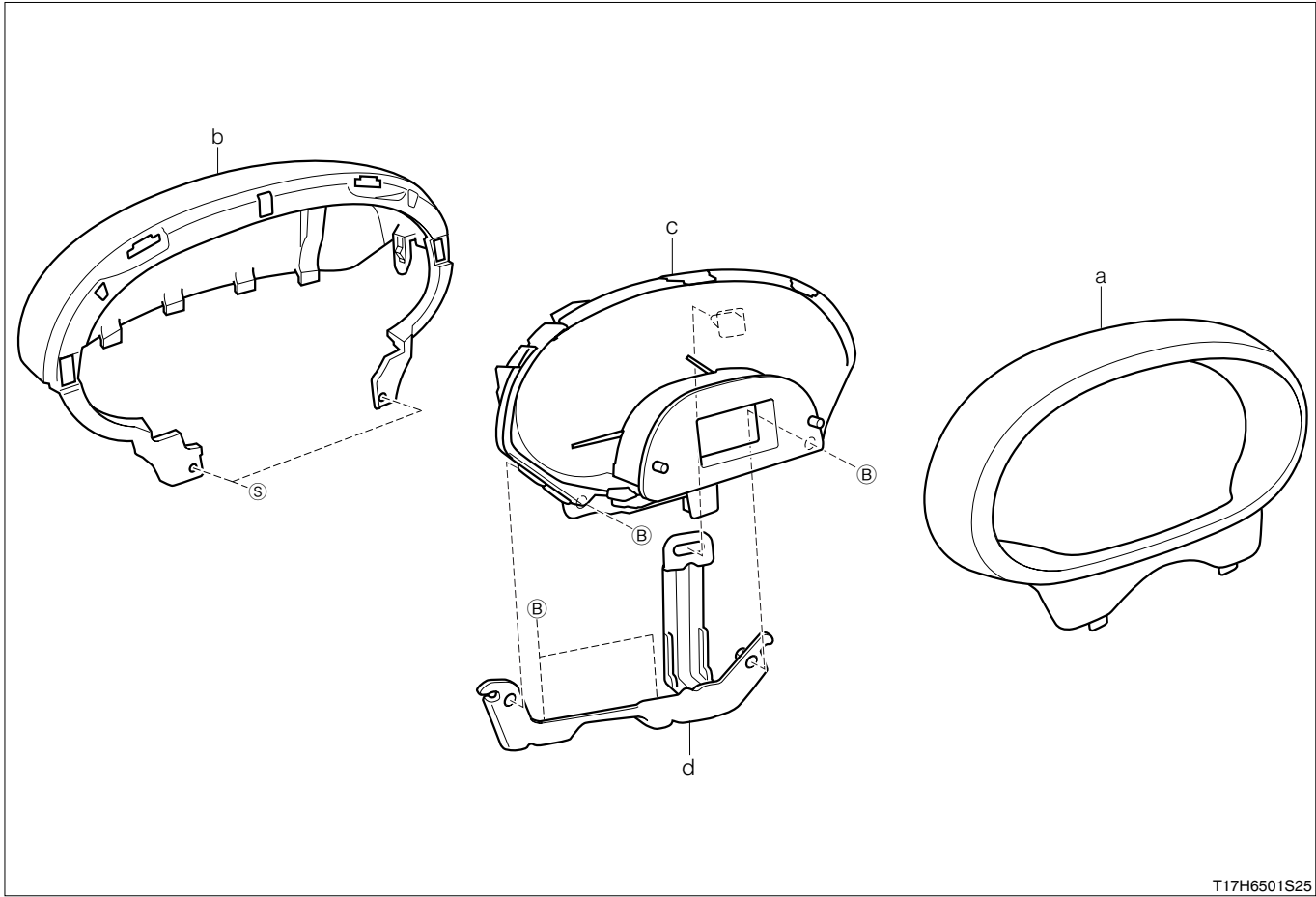


1-2-3 OIL PRESSURE WARNING LAMP

- 1. Disconnect the connector from the engine oil pressure switch.
- 2. Turn ON the ignition switch.
- 3. Check the oil pressure warning lamp status when the vehicle wire harness connector terminal is short-circuited to the body earth.



2 COMBINATION METER
2-1 REMOVAL AND INSTALLATION
2-1-1 REMOVAL AND INSTALLATION PROCEDURES
(1) Components



T17H6501S25

- (2) Removal and installation procedures
- 1 a Panel S/A, cluster finish
 - 2 b Cover, meter opening
 - 3 c Meter Ay, combination
 - 4 d Bracket, meter

3 CONTROL SYSTEM
3-1 ARTICLES TO BE PREPARED
SST

Shape	Part No.	Part name
	09991-87403-000	Wire,diagnosis check
	09991-87404-000 (09991-87401-000)	Wire,engine control system inspection

Instrument
Electrical tester,Tachometer

3-2 HANDLING INSTRUCTIONS OF CONTROL SYSTEM

3-2-1 CAN COMMUNICATION DESTINATION INFORMATION

(1) Description

1. In CAN communication, the meter itself stores information on which ECU the meter is connected with as CAN communication destination information. The meter, based on this CAN communication destination information, determines which indicator and/or warning lamp should be turned on. Therefore, it is necessary to set up CAN communication destinations when the meter is replaced.

NOTE

- The CAN communication destination information that meter stores is to recognize whether EFI ECU, A/T ECU, and ABS ECU are present.

(2) Setup procedures for CAN communication destinations

1. Check vehicle specifications.

NOTE

- Check vehicle specifications as to whether the transmission and ABS exist or not.

2. Set the IG switch to LOCK.
3. Use SST to short-circuit the ECU-T terminal and E terminal of DLC located beneath the instrument panel.

CAUTION

- Connecting the connector in the wrong location could cause a malfunction. Therefore, make sure the connection is correct.

SST: 09991-87403-000

09991-87404-000

4. Turn the IG switch ON, while the odometer/trip selection switch remains ON.
5. Set the odometer/trip selection switch to OFF.
6. Set the odometer/trip selection switch to ON again and hold more than 3 seconds.

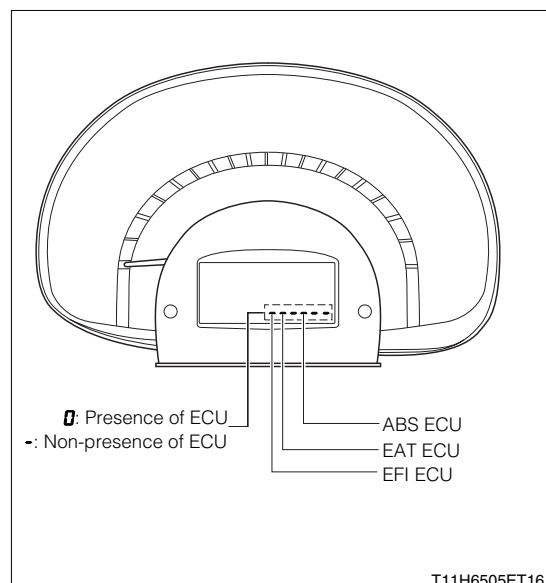
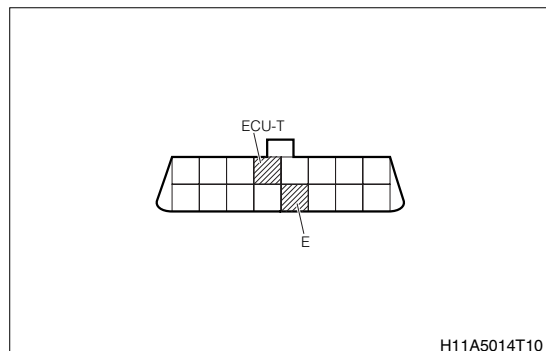
NOTE

- When held for more than 3 seconds, the LCD display will indicate "b-0000" and blinks.

7. A buzzer sounds in about 6 seconds, CAN communication destination information is stored, and the setup is now complete.
8. The CAN communication destination information is displayed on the LCD display. Check whether the vehicle specification matches the information displayed.

NOTE

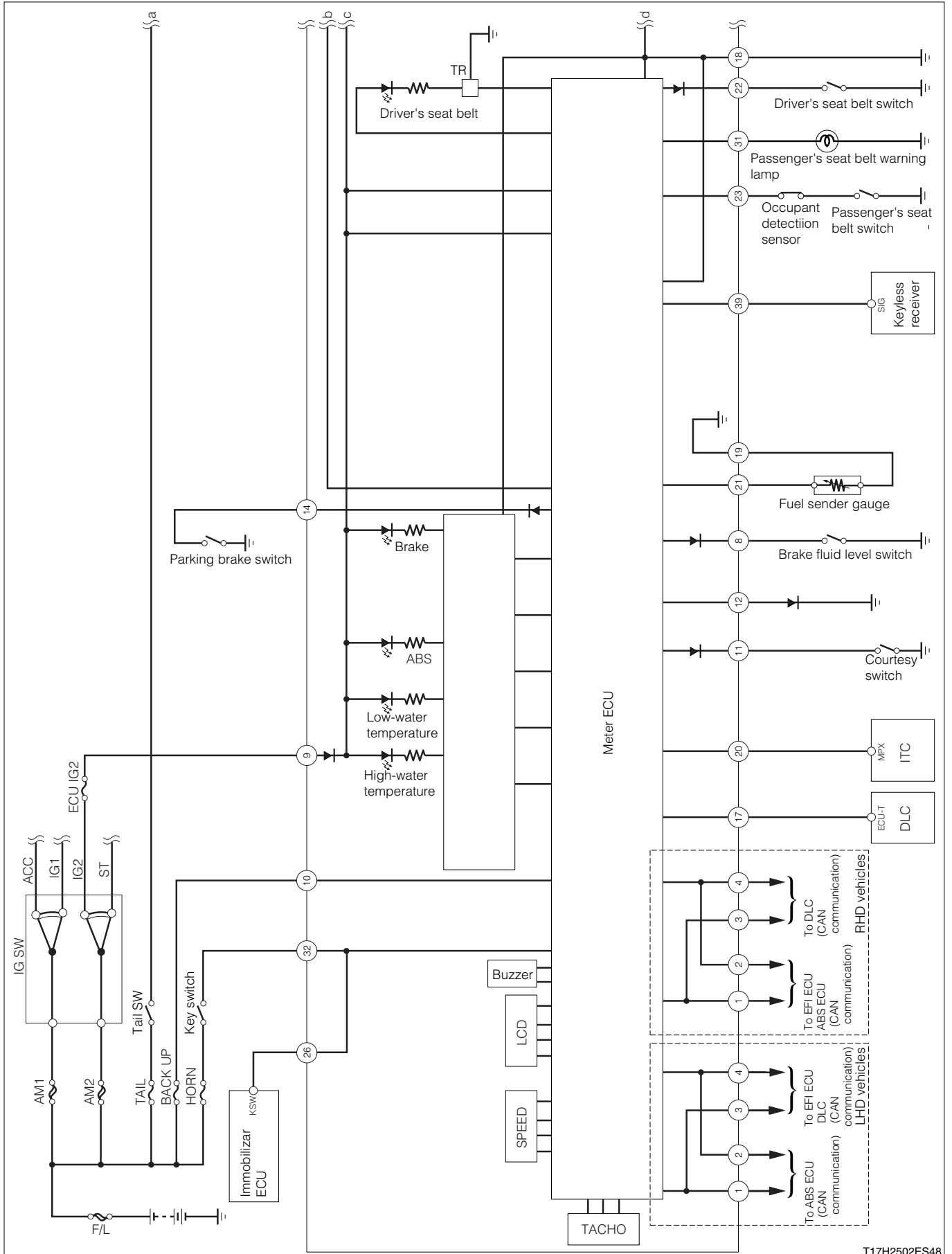
- The factory setting for CAN communication destination of the meter is that the vehicle is a M/T vehicle with no ABS equipped.
- The CAN communication destination information will not be erased even if the battery or the connector of the meter is removed.

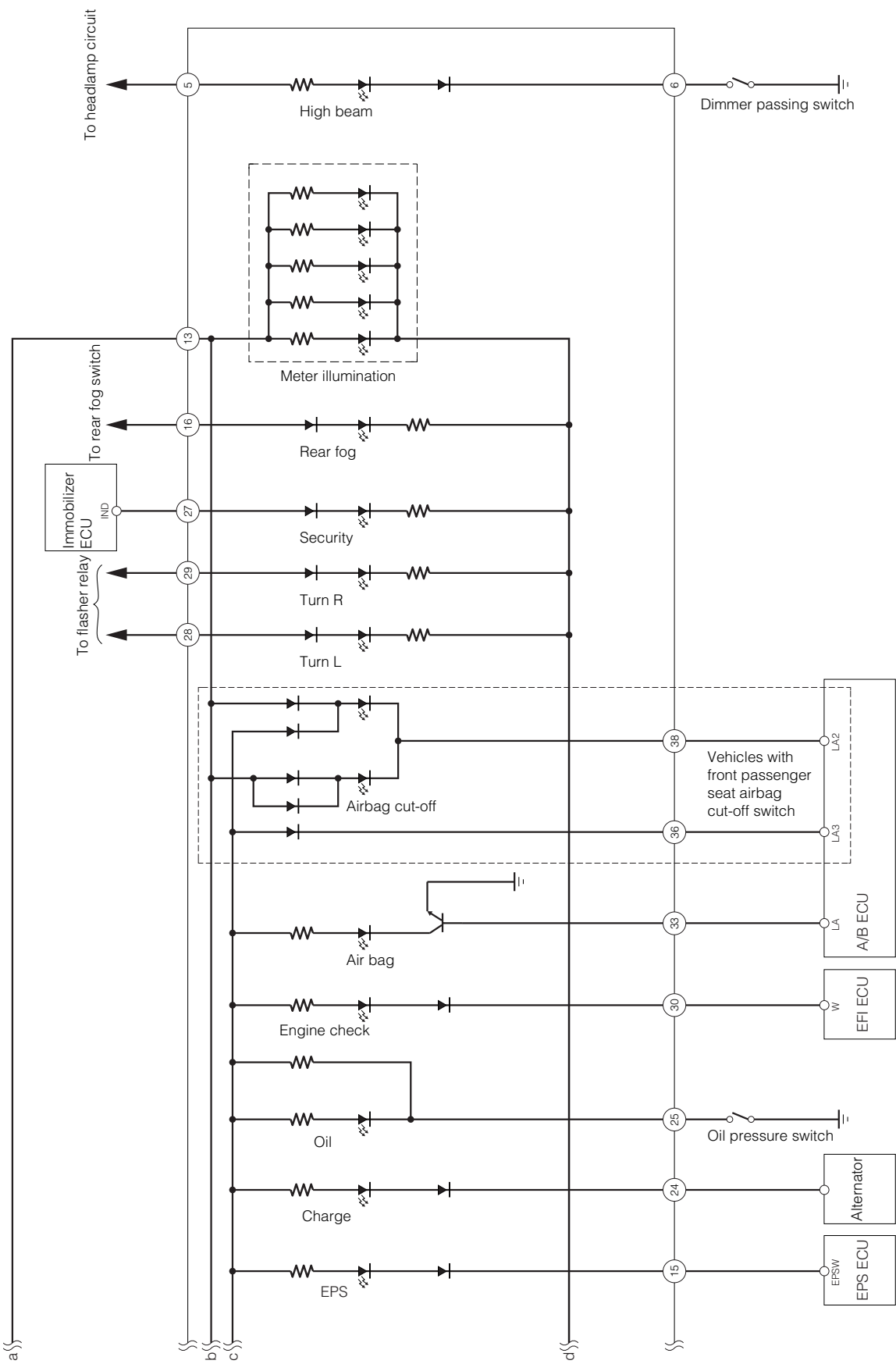


4 CONTROL SYSTEM

4-1 SYSTEM WIRING DIAGRAM

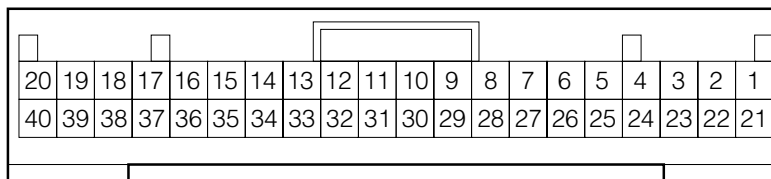
4-1-1 COMBINATION METER





4-2 ARRANGEMENT OF ECU TERMINAL

4-2-1 COMBINATION METER

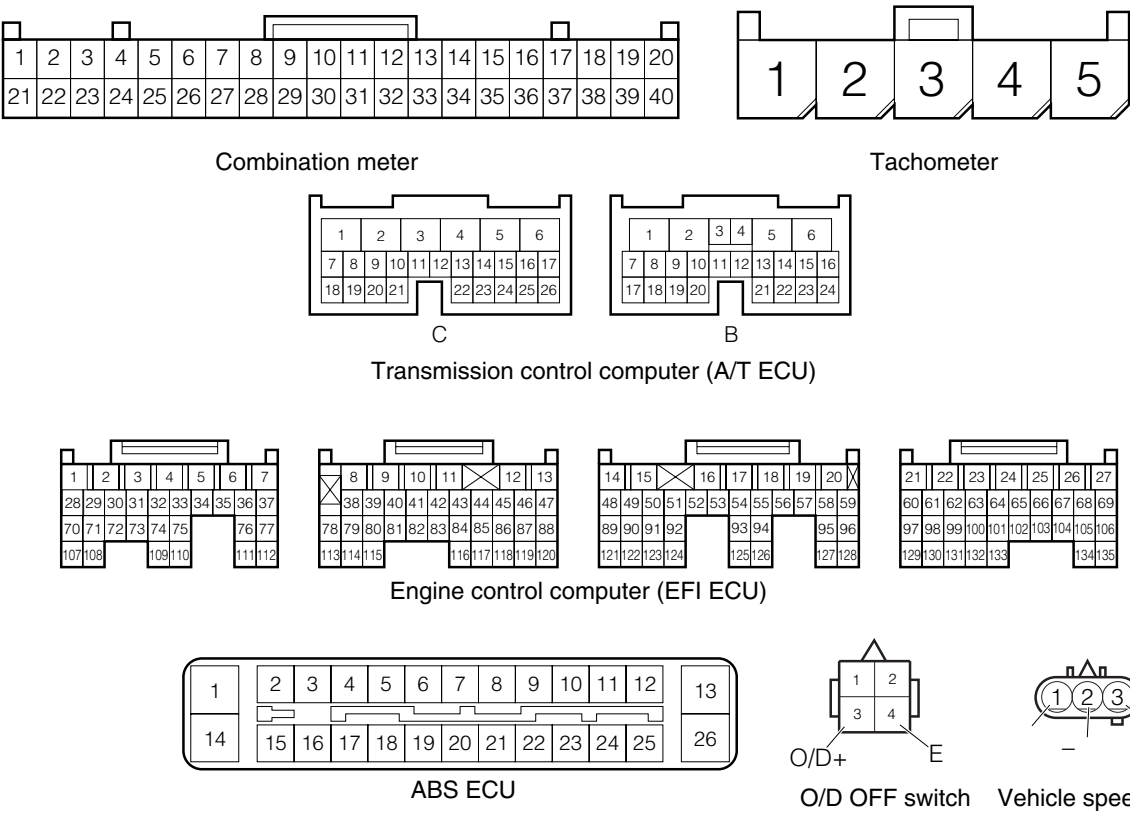


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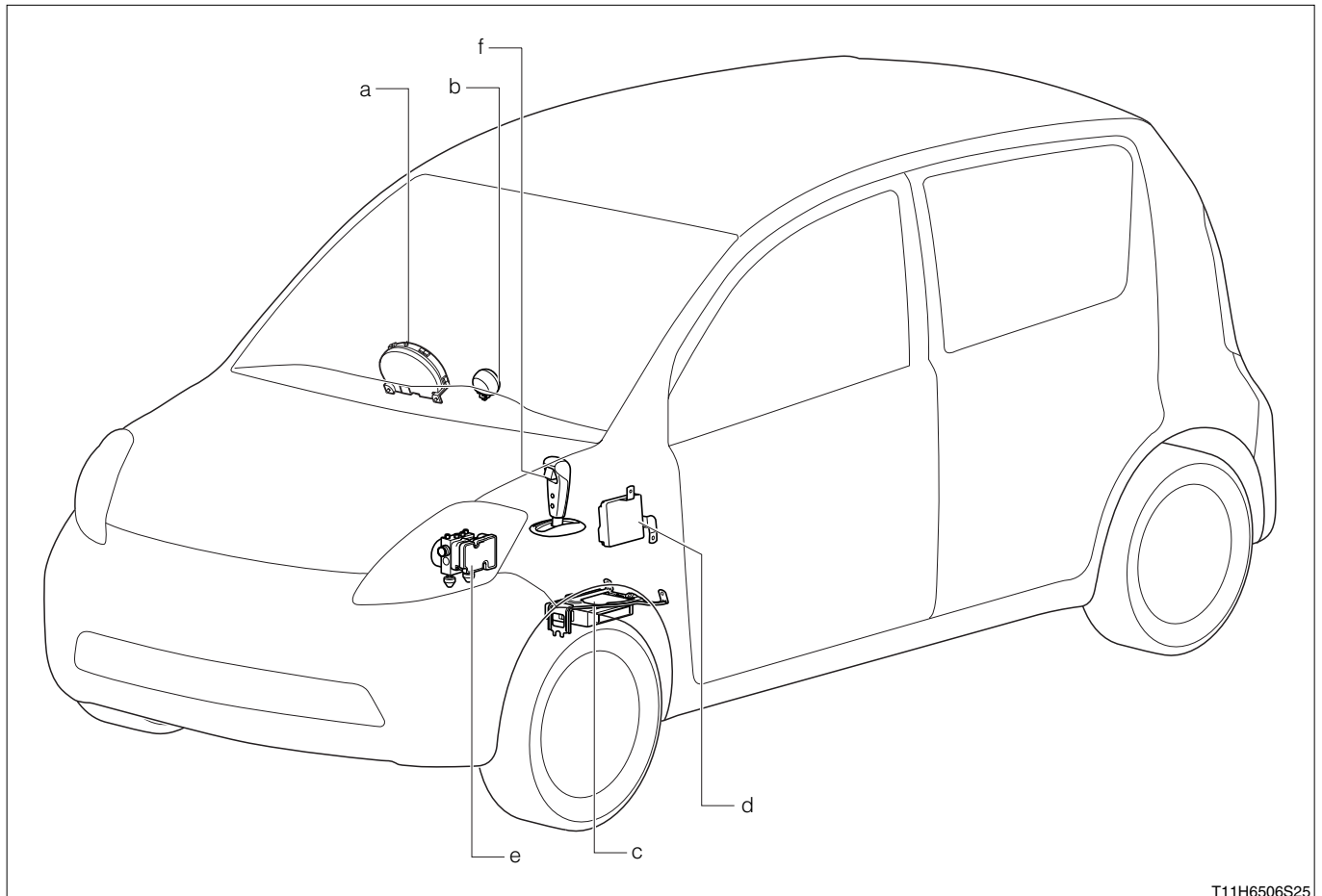
Meter terminal name

Terminal No.	Terminal code	Terminal name
1	CANH	CAN communication HI (EFI)
2	CANL	CAN communication LO (EFI)
3	HCAN	CAN communication HI (DLC)
4	LCAN	CAN communication LO (DLC)
5	BEAM+	High beam +
6	BEAM-	High beam -
7	-	-
8	BRK	Input of brake fluid signal
9	IG2	IG power supply
10	+B	+B power supply
11	DOOR	Input of courtesy switch signal
12	SPOUT	Output of vehicle speed signal
13	TAIL	Illumination +
14	PKBSW	Parking brake
15	EPS	EPS
16	RR-FOG	REAR FOG LAMP
17	ECU-T	ECU-T terminal signal input
18	GND	Earth
19	-	-
20	LIN	LIN communication input/output
21	FUEL	Input of fuel signal
22	D-BELT	Seat belt at driver's seat side
23	P-BELT	Front passenger seat side seat belt signal input
24	CHG	Charge
25	OIL	Oil
26	KEY2	Output of key switch signal
27	SEC	Security
28	TURNL	Turn LH
29	TURNR	Turn RH
30	CHK E/G	Check engine
31	P-BELOUT	Front passenger seat side seat belt signal output
32	KEY	Input of key switch signal
33	A/B	Airbag
34	-	-
35	LEVELING	Headlamp auto-leveling
36	-	-
37	F-FOG	Front fog lamp
38	-	-
39	KLS	Keyless receiver signal input
40	-	-

4-3 ARRANGEMENT OF VEHICLE HARNESS SIDE CONNECTOR TERMINALS



4-4 LOCATION OF COMPONENTS



T11H6506S25

The illustration represents the RHD vehicles. In the case of the LHD vehicles, the illustration is symmetrical except the A/T ECU and ABS ECU.

a	Combination meter
b	Tachometer
c	EFI ECU
d	ABS ECU

4-5 HOW TO PROCEED WITH TROUBLE SHOOTING

1. This system incorporates diagnosis functions that will locate malfunctioning parts, thus providing a vital clue in trouble shooting.

▷1. Bringing malfunctioning vehicle to workshop

▼ Go to Step ▷2.

▷2. Diagnosis by interview

1. Gather enough information from the customer on conditions, environment, and phenomenon in which the malfunction took place.

▼ Go to Step ▷3.

▷3. Check the meter LCD diagnostic code indication for proper operation

1. Use the SST to short-circuit the DLC terminals between 4(ECU-T) - 13(E).

SST: 09991-87403-000

2. Check whether the meter LCD displays a diagnostic code (including the normal code).

SPECIFIED VALUE: Shall display properly.

NOTE

- Codes other than the CAN-related code are acceptable.

▼ If it is OK, go to Step ▷4.

▼ In the case of NG, check the meter for the following conditions. Replace the meter if no problem is found.

- (1) Check the harness between the meter - DLC, and the DLC - body earth.
- (2) Check of meter power supply system and earth system.

▷4. Check the diagnostic code (CAN-related)

1. Check that the LCD of the meter does not display a CAN-related diagnostic code (code No.00 51-00 53).

SPECIFIED VALUE: Shall not display the code No.00 51-00 53.

▼ If it is OK, go to Step ▷5.

▼ In the case of NG, refer to the CAN communication system section.

Refer to Page L2-1.

▷5. Check and record the diagnostic code (meter-related)

1. Check and record the meter-related diagnostic code (code No.00 41 - 00 43, 61) displayed on the meter LCD.

NOTE

- The meter LCD displays diagnosis codes for the CAN communication system and LIN communication system, in addition to a meter-related diagnostic code.

▼ Go to Step ▷6.

▷6. Basic check

1. Perform the basic checks.

Refer to Page J3-11.

▼ Go to Step ▷7.

▷7. Recheck the diagnostic code (CAN-related)

1. Recheck the meter related diagnostic code (code No.00 41 - 00 43, 61) displayed on the meter LCD.

▼ Go to Step ▷8, if an abnormality code is displayed.

▼ Go to Step ▷9, if the normal code is displayed.

➤8. Trouble shooting according to the diagnostic code

1. Perform troubleshooting for the outputted diagnostic code.
Refer to Page J3-11.

▼ Go to Step ➤10 when the repair is complete.

➤9. Trouble-shooting according to malfunction phenomenon

1. Perform troubleshooting for the malfunction phenomenon which is taking place.
Refer to Page J3-15.

▼ Go to Step ➤10 when the repair is complete.

➤10. Confirmation test

1. Ensure that the problem that the customer described has been completely corrected and the operation is back to normal.
▼ If it is OK, finish the trouble shooting.
▼ In the case of NG, go back to Step ➤3 for a recheck.

4-6 INQUIRY

1. In an effort to remove causes for malfunction from the vehicle concerned, it is impossible to determine the cause without confirming the malfunction phenomenon. If the phenomenon is not confirmed, the vehicle may not be able to return to the normal conditions even if you continue your work. The diagnosis through interviews is to collect information from the customer before confirming the malfunction phenomena. The diagnosis through interviews provides very important clues in reproducing malfunction phenomena.
2. Since the information obtained by the diagnosis through interviews is referred to during the trouble shooting, it is imperative to make an inquiry of the customer, centering on the items related to the malfunction, instead of simply asking general questions.

4-7 CONFIRMATION, RECORD AND ERASURE OF DIAGNOSIS CODE

1. The error message of the diagnostic code remains displayed as long as the communication failure exists, and will be erased when the communication is back to normal.

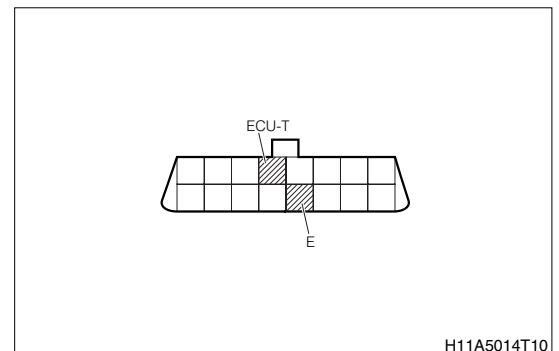
4-7-1 CHECKING METHOD OF DIAGNOSIS

1. Stop the vehicle.
2. Set the IG switch to LOCK and use SST to short-circuit the ECU-T terminal and E terminal of DLC located beneath the instrument panel.

CAUTION

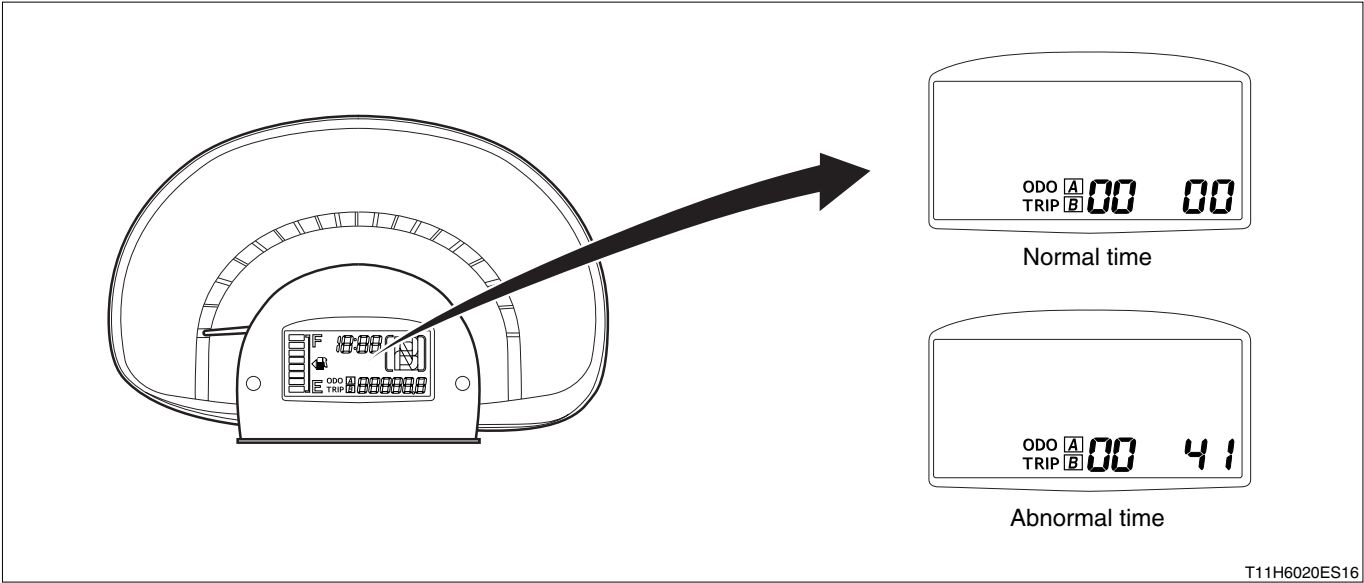
- Connecting the connector in the wrong location could cause a malfunction. Therefore, make sure the connection is correct.

SST: 09991-87403-000
09991-87404-000



H11A5014T10

3. With the IG switch turned ON, read the diagnosis code that is indicated on the LCD (Liquid Crystal Display) using numerals.



NOTE

- The meter LCD displays diagnostic codes for the CAN communication system, and LIN communication system, in addition to a meter-related diagnostic code.
- When plural codes are to be outputted, they are outputted, starting from a smaller code number. Furthermore, when one cycle of indications is completed, these codes are repeatedly outputted at intervals of four seconds.

4-7-2 CANCELING METHOD OF DIAGNOSIS

1. The diagnosis code will be erased automatically when the problem has been solved.

4-7-3 CONTENTS OF DIAGNOSIS

Code No.		Warning indication (Provided: ○, Not provided: ✕)	Code memory (Provided: ○, Not provided: ✕)	Contents of diagnosis
LCD	4 digits			
00 00	—	✕	✕	Normal
00 43	—	✕	✕	Unable to read CAN communication system connected ECU information
00 61	—	✕	✕	Low voltage error

NOTE

- The meter LCD displays diagnosis codes for the CAN communication system and LIN communication system, in addition to a meter-related diagnostic code.

CAN communication system (00 51 - 00 53)

Refer to Page L2-9.

LIN communication system (00 11, 00 21)

Refer to Page L2-18.

4-8 BASIC CHECK

4-8-1 BATTERY VOLTAGE CHECK

1. Measure the battery voltage with the engine stopped.

SPECIFIED VALUE: 10 - 14V

4-8-2 POWER SUPPLY CIRCUIT CHECK

1. Disconnect the connector of the meter. Measure the voltage between the following harness side connector terminal and the body earth.
 - (1) Between the meter harness side connector 9(IG2) and the body earth.
 - (2) Between the meter harness side connector 10(+B) and the body earth.

SPECIFIED VALUE: 10 - 14V

4-8-3 EARTH CIRCUIT CHECK

1. After setting the IG switch to "LOCK" remove the battery negative (-) terminal.
2. Disconnect the connector of the meter. Check continuity between the following harness side connector terminal and the body earth.
 - (1) Between the meter harness side connector 18(GND) and the body earth.

SPECIFIED VALUE: Continuity exists.

4-8-4 SPEEDOMETER CHECK

1. Place the vehicle on the speedometer tester.
2. Check the indication on the speedometer, and the measured speed of the speedometer tester.

EU region (MPH indication)

Tester indication standard speed (MPH)	Permissible range (MPH) of meter indication value
40	41.5 — 44.0
60	61.9 — 65.1
80	82.3 — 86.3
100	103.0 — 107.4
120	123.6 — 126.5
140	144.3 — 149.6

EU region (km/h indication)

Tester indication standard speed (km/h)	Permissible range (km/h) of meter indication value
40	41.9 — 45.2
60	62.3 — 65.8
80	82.7 — 87.7
100	103.1 — 108.9
120	123.5 — 130.1
140	143.9 — 151.3
160	164.4 — 172.5
180	184.8 — 193.7
200	205.2 — 214.9

NOTE

- Improper air pressure and/or wear of a tire will lead to a meter reading error.

3. Check the deflection (without vibration) of the speedometer pointer.

SPECIFIED VALUE: Shall be within ± 0.3 km/h.

4. Check the odometer for proper operation.

SPECIFIED VALUE: Shall operate properly.

4-8-5 TACHOMETER CHECK

- 1. Connect a rev counter to the vehicle.
- 2. Check the error in the reading of the tachometer and the rev counter.

Rev counter reading (r/min)	Permissible range of tachometer reading (r/min)
700	630 — 770
1000	(900 — 1100)
2000	(1850 — 2150)
3000	2800 — 3200
4000	(3800 — 4200)
5000	4800 — 5200
6000	(5750 — 6250)
7000	6700 — 7300
8000	(7700 — 8300)

CAUTION

- Do not run the engine beyond the permissible engine speed (above the red zone on the tachometer).

NOTE

- Figures in () show reference values.

4-8-6 CHECK OF WARNING LAMP INDICATOR

1. Check the lighting condition of the warning lamp indicator under conditions provided below.

CAUTION

- Perform checks with the engine stopped and the IG switch turned "ON".

Detected item		Condition	Standard
	Turn	When the turn signal switch is operated for the right turning	Right side flashing
		When the turn signal switch is operated for the left turning	Left side flashing
	High beam	When the dimmer passing switch HI is being operated	Illuminated
	Charge	The IG switch turned "OFF"→the IG switch turned "ON"(Engine stopped)→ the IG switch turned "ON"(Engine started)	Extinguished→Illuminated→Extinguished
	Oil	The IG switch turned "OFF"→the IG switch turned "ON"(Engine stopped)→ the IG switch turned "ON"(Engine started)	Extinguished→Illuminated→Extinguished
	MIL	The IG switch turned "OFF"→the IG switch turned "ON"(Engine stopped)→ the IG switch turned "ON"(Engine started)	Extinguished→Illuminated→Extinguished
	Brake	With the parking brake turned "OFF", the IG switch turned "OFF"→ the IG switch turned "ON"	Extinguished →Illuminated (for 3sec.)→Extinguished
	Driver's seat belt	Unengaged driver's seat belt→Engaged	Flashing→Extinguished
PASSENGER 	Passenger's seat belt	Unengaged front passenger's seat belt the occupant seating on the front passenger seat →Engaged	Flashing→Extinguished
	Airbag	IG switch OFF→IG switch ON	Extinguished →Illuminated (for 6sec.)→Extinguished
	ABS	IG switch OFF→IG switch ON	Extinguished →Illuminated (for 3sec.)→Extinguished
	High-water temperature	IG switch OFF→IG switch ON	Extinguished →Illuminated (for 3sec.)→Extinguished
	Low-water temperature	With the water temperature above 40°C IG switch turned "OFF"→ the IG switch turned "ON"	Extinguished →Illuminated (for 3sec.)→Extinguished
EPS	EPS	IG switch OFF→IG switch ON	Extinguished →Illuminated (for 2sec.)→Extinguished
O/D OFF	O/D OFF	When O/D OFF switch is turned ON:	Illuminated
	Security	Key insertion switch OFF→Key insertion switch ON	Flashing→Extinguished
	Rear fog	When the rear fog lamp is illuminated	Illuminated
—	Shift position	Each shift position	The shift indicator concerned is indicated.

T11H6504ES37

4-9 TROUBLE SHOOTING ACCORDING TO DIAGNOSIS CODE

4-9-1 NO.00 43 (UNABLE TO READ CAN COMMUNICATION SYSTEM CONNECTED ECU INFORMEITION.)

▷1. Check of meter power supply system and earth system

1. Check voltage between the vehicles harness side connector power supply terminal of the meter, earth terminal, and the body earth.

SPECIFIED VALUE: 10 - 14V

▼ If it is OK, the meter is defective.

▼ If it is NG, repair or replace the wire harness.

J3-15

4-9-2 NO.00 61 (LOW VOLTAGE ERROR)

1. Check voltage between the vehicle harness side connector power supply terminal of the meter, earth terminal, and the body earth.

SPECIFIED VALUE: 10 - 14V

- ▼ If it is OK, the meter is defective.
- ▼ If it is NG, repair or replace the wire harness.

4-10 TROUBLE SHOOTING ACCORDING TO MALFUNCTION PHENOMENA

4-10-1 SPEEDOMETER FAULTY(ABS OR VSC EQUIPPED VEHICLE)

▷1. Diagnostic code check (CAN-related)

1. Check that the meter LCD does not display a CAN-related diagnostic code (code No.00 51 - 00 54).

SPECIFIED VALUE: Shall not display the code No.00 51 - 00 54.

- ▼ If it is OK, go to Step ▷2.
 - ▼ In the case of NG, refer to the CAN communication system section.
- Refer to Page L2-1.

▷2. Diagnostic code check (ABS or VSC-related)

1. Check the VSC ECU/ABS ECU diagnostic code.

SPECIFIED VALUE: Shall not display the code No.21 - 29.

- ▼ If it is OK, go to Step ▷3.
- ▼ In the case of NG, perform troubleshooting for the outputted diagnostic code.

vehicles with VSC

Refer to Page E3-21.

▷3. Check of meter power supply system and earth system

1. Check voltage between the vehicle harness side connector power supply terminal of the meter, earth terminal, and the body earth.

SPECIFIED VALUE: 10 - 14V

- ▼ If it is OK, go to Step ▷4.
- ▼ If it is NG, repair or replace the wire harness.

▷4. Check of ABS/VSC ECU power supply system and earth system

1. Check voltage between the vehicle harness side connector power supply terminal of the ABS/VSC ECU, earth terminal, and the body earth.

SPECIFIED VALUE: 10 - 14V

- ▼ If it is OK, replace the meter. If the problem is not solved after the replacement, replace the ABS/VSC ECU, too.
- ▼ If it is NG, repair or replace the wire harness.

4-10-2 ODOMETER FAULTY, TRIP METER FAURLTY(ABS OR VSC EQUIPPED VEHICLE)

▷1. Diagnostic code check (CAN-related)

1. Check that the meter LCD does not display a CAN-related diagnostic code (code No.00 51 - 00 54).
SPECIFIED VALUE: Shall not display the code No.00 51 - 00 54.

▼ If it is OK, go to Step ▷2.

▼ In the case of NG, refer to the CAN communication system section.
Refer to Page L2-1.

▷2. Diagnostic code check (ABS or VSC-related)

1. Check the ABS or VSC ECU diagnostic code.
SPECIFIED VALUE: Shall not display the code No.21 - 29.

▼ If it is OK, go to Step ▷3.

▼ In the case of NG, perform troubleshooting for the outputted diagnostic code.
Refer to Page E3-21.

▷3. Check of meter power supply and earth system

1. Check voltage between the vehicle harness side connector power supply terminal of the meter, earth terminal, and the body earth.
SPECIFIED VALUE: 10 - 14V

▼ If it is OK, go to Step ▷4.

▼ If it is NG, repair or replace the wire harness.

▷4. Check of VSC ECU/ABS ECU power supply system and earth system

1. Check voltage between the vehicle harness side connector power supply terminal of the VSC ECU/ABS ECU, earth terminal, and the body earth.
SPECIFIED VALUE: 10 - 14V

▼ If it is OK, replace the meter. If the problem is not solved after the replacement, replace the ABS ECU, too.

▼ If it is NG, repair or replace the wire harness.

4-10-3 HIGH WATER TEMPERATURE WARNING LAMP DEFECTIVE, LOW WATER TEMPERATURE INDICATOR LAMP DEFECTIVE**▷1. Diagnostic code check (CAN-related)**

1. Check that the meter LCD does not display a CAN-related diagnostic code (code No.00 51 - 00 54).
SPECIFIED VALUE: Shall not display the code No.00 51 - 00 54.

▼ If it is OK, go to Step ▷2.

▼ In the case of NG, refer to the CAN communication system section.

▷2. Diagnostic code check (EFI-related)

1. Check the EFI ECU diagnostic code.
SPECIFIED VALUE: Shall not display the code No.42.

▼ If it is OK, go to Step ▷3.

▼ In the case of NG, perform troubleshooting for the EFI ECU diagnostic code No.42.
Refer to Page B8-43.

▷3. Check of meter power supply system and earth system

1. Check voltage between the vehicle harness side connector power supply terminal of the meter, earth terminal, and the body earth.

SPECIFIED VALUE: 10 - 14V

- ▼ If it is OK, go to Step ▷4.
- ▼ If it is NG, repair or replace the wire harness.

▷4. Check of EFI ECU power supply system and earth system

1. Check voltage between the vehicle harness side connector power supply terminal of the EFI ECU, earth terminal, and the body earth.

SPECIFIED VALUE: 10 - 14V

- ▼ If it is OK, replace the meter. If the problem is not solved after the replacement, replace the EFI ECU as well.
- ▼ If it is NG, repair or replace the wire harness.

4-10-4 BRAKE WARNING LAMP REMAINS ILLUMINATED EVEN AFTER IGNITION SWITCH IS TURNED ON.(IN THE CASE OF ABS—EQUIPPED VEHICLES WHERE NO ABS DIAGNOSIS CODE IS OUTPUTTED)

▷1. Diagnostic code check (CAN-related)

1. Check that the meter LCD does not display a CAN-related diagnostic code (code No.00 51 - 00 53).

SPECIFIED VALUE: Shall not display the code No.00 51 - 00 53.

- ▼ If it is OK, go to Step ▷2.
 - ▼ In the case of NG, refer to the CAN communication system section.
- Refer to Page L2-1.

▷2. Brake fluid level check

1. Check whether the master cylinder reservoir contains the specified level of brake fluid.

SPECIFIED VALUE: The level shall be as specified.

- ▼ If it is OK, go to Step ▷3.
- ▼ In the case of NG, fill the brake fluid to the specified level.

▷3. Level warning switch check

1. Check continuity between the level warning switch terminals.

Switching	Standard
ON	Continuity exists
OFF	No continuity exists

- ▼ If it is OK, go to Step ▷4.
- ▼ If it is NG, replace the level warning switch.

▷4. Wiring harness check

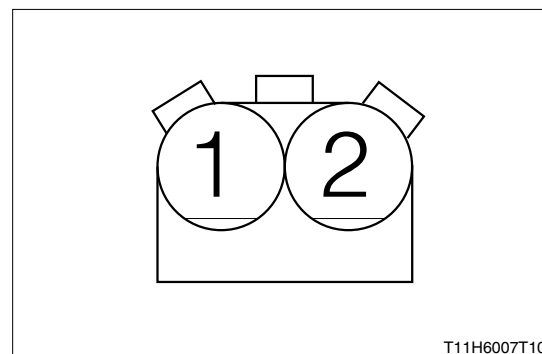
1. Check the following harnesses for continuity.

- (1) The vehicle harness side connector 8 of the meter - the vehicles harness side connector 1 of the level warning switch
- (2) The vehicle harness side connector 2 of the level warning switch - the body earth

SPECIFIED VALUE: Continuity shall exist, without short-circuiting.

▼ If it is OK, go to Step ▷5.

▼ If it is NG, repair or replace the wire harness.



▷5. Parking brake switch check

1. Check continuity between the parking brake switch and the body earth.

Switching	Standard
ON	Continuity exists
OFF	No continuity exists

▼ If it is OK, go to Step ▷6.

▼ If it is NG, replace the parking brake switch.

▷6. Wiring harness check

1. Check the following harness for continuity.

- (1) The vehicle harness side connector 14 of the meter - the vehicle harness side connector of the parking brake switch

SPECIFIED VALUE: Continuity shall exist, without short-circuiting.

▼ If it is OK, go to Step ▷7.

▼ If it is NG, repair or replace the wire harness.

▷7. Check of meter power supply system and earth system

1. Check voltage between the vehicle harness side connector power supply terminal of the meter, earth terminal, and the body earth.

SPECIFIED VALUE: 10 - 14V

▼ If it is OK, go to Step ▷8.

▼ If it is NG, repair or replace the wire harness.

▷8. Check of ABS ECU power supply system and earth system

1. Check voltage between the vehicle harness side connector power supply terminal of the ABS ECU, earth terminal, and the body earth.

SPECIFIED VALUE: 10 - 14V

▼ If it is OK, replace the meter. If the problem is not solved after the replacement, replace the ABS ECU, too.

▼ If it is NG, repair or replace the wire harness.

4-10-5 THE BRAKE WARNING LAMP DOES NOT GO ON FOR THREE SECONDS AFTER IG SWITCH IS SET TO ON POSITION.

▷1. Diagnostic code check (CAN-related)

1. Check that the meter LCD does not display a CAN-related diagnostic code (code No.00 51 - 00 54).

SPECIFIED VALUE: Shall not display the code No.00 51 - 00 54.

▼ If it is OK, go to Step ▷2.

▼ In the case of NG, refer to the CAN communication system section.

Refer to Page L2-1.

▷2. Check of meter power supply system and earth system

1. Check voltage between the vehicle harness side connector power supply terminal of the meter, earth terminal, and the body earth.

SPECIFIED VALUE: 10 - 14V

▼ If it is OK, the meter is defective.

▼ If it is NG, repair or replace the wire harness.

4-10-6 THE BRAKE WARNING LAMP DOES NOT GO ON FOR THREE SECONDS AFTER IG SWITCH IS SET TO ON POSITION.

▷1. Diagnostic code check (CAN-related)

1. Check that the meter LCD does not display a CAN-related diagnostic code (code No.00 51 - 00 53).

SPECIFIED VALUE: Shall not display the code No.00 51 - 00 53.

▼ If it is OK, go to Step ▷2.

▼ In the case of NG, refer to the CAN communication system section.

Refer to Page L2-1.

▷2. Check of meter power supply system and earth system

1. Check voltage between the vehicle harness side connector power supply terminal of the meter, earth terminal, and the body earth.

SPECIFIED VALUE: 10 - 14V

▼ If it is OK, the meter is defective.

▼ If it is NG, repair or replace the wire harness.

4-10-7 THE ABS WARNING LAMP DOES NOT GO ON FOR THREE SECONDS AFTER IG SWITCH IS SET TO ON POSITION.

▷1. Diagnostic code check (CAN-related)

1. Check that the meter LCD does not display a CAN-related diagnostic code (code No.00 51 - 00 53).

SPECIFIED VALUE: Shall not display the code No.00 51 - 00 53.

▼ If it is OK, go to Step ▷2.

▼ In the case of NG, refer to the CAN communication system section.

Refer to Page L2-1.

➤2. Check of meter power supply system and earth system

1. Check voltage between the vehicle harness side connector power supply terminal of the meter, earth terminal, and the body earth.

SPECIFIED VALUE: 10 - 14V

- ▼ If it is OK, the meter is defective.
- ▼ If it is NG, repair or replace the wire harness.

4-10-8 FUEL CONSUMPTION INDICATOR MALFUNCTION

➤1. Confirmation of diagnosis code (CAN-RELATED)

1. Confirm that the LCD in the meter does not display CAN-related diagnosis codes (Codes 0051 through 0054).

SPECIFIED VALUE: Codes No.00 51 - 00 54 are not displayed.

- ▼ If no abnormalities are found, proceed to ➤2.
- ▼ If an abnormality is found, refer to the section on CAN communication systems.
Refer to Page L2-1.

➤2. Confirmation of diagnosis code (EFI-RELATED)

1. Check the EFI ECU diagnostic code.

SPECIFIED VALUE: Does not display a code.

- ▼ If no abnormalities are found, proceed to ➤3.
- ▼ If an abnormality is found, perform troubleshooting for the output diagnostic code.

Vehicle with Type 1KR-FE engine

Refer to Page B8-43.

➤3. Check of meter power supply system and earth system

1. Check the voltage between the vehicle harness side connector power supply terminal of the meter, the earth terminal, and the body earth.

SPECIFIED VALUE: 10 - 14V

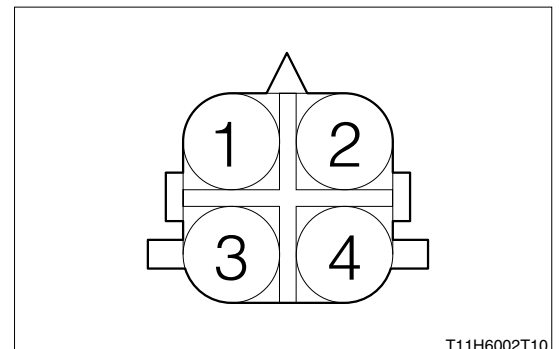
- ▼ If no abnormalities are found, proceed to ➤4.
- ▼ If an abnormality is found, repair or replace the wire harness.

➤4. Check of EFI ECU power supply system and earth system

1. Check the voltage between the vehicle harness side connector power supply terminal of the EFI ECU, the earth terminal, and the body earth.

SPECIFIED VALUE: 10 - 14V

- ▼ If no abnormalities are found, replace the meter. If replacing the meter does not solve the problem, replace the EFI ECU as well.
- ▼ If an abnormality is found, repair or replace the wire harness.



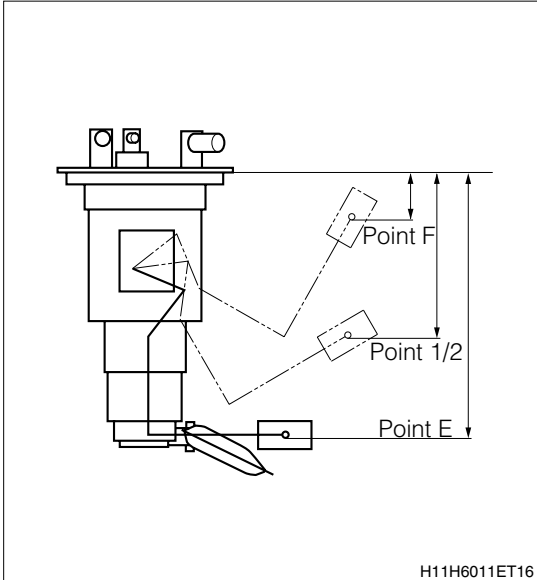
4-11 UNIT CHECK

4-11-1 FUEL SENDER GAGE

1. Ensure that the float can move without any binding.

2. Check resistance between the terminals 1 - 2, when the float position is shifted from Point E to F.

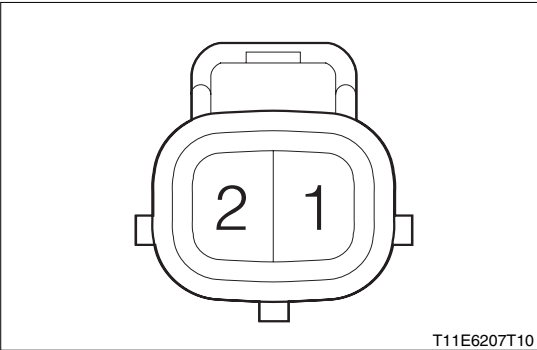
Level	Float position	Resistance (Ω)
F	33.7	3.0 ± 1.0
1/2	107.4	32.5 ± 3.0
E	175.6	120.0 ± 1.0



4-11-2 WATER TEMPERATURE SENSOR

1. Check resistance between the terminal 1 - 2.

Temperature ($^{\circ}\text{C}$)	Resistance (Ω)
20	2450
80	318 ± 8
110	141.7 ± 1.8



J4 AUDIO & VISUAL SYSTEM

TUNER AY -----	J4—1
REMOVAL AND INSTALLATION-----	J4—1
SPEAKER(FRONT SPEAKER)-----	J4—2
REMOVAL AND INSTALLATION-----	J4—2
SPEAKER(REAR SPEAKER) -----	J4—2
REMOVAL AND INSTALLATION-----	J4—2
ANTENNA -----	J4—3
REMOVAL AND INSTALLATION-----	J4—3
STEREO JACK ADAPTER-----	J4—4
REMOVAL AND INSTALLATION-----	J4—4

J4-1

1 TUNER AY

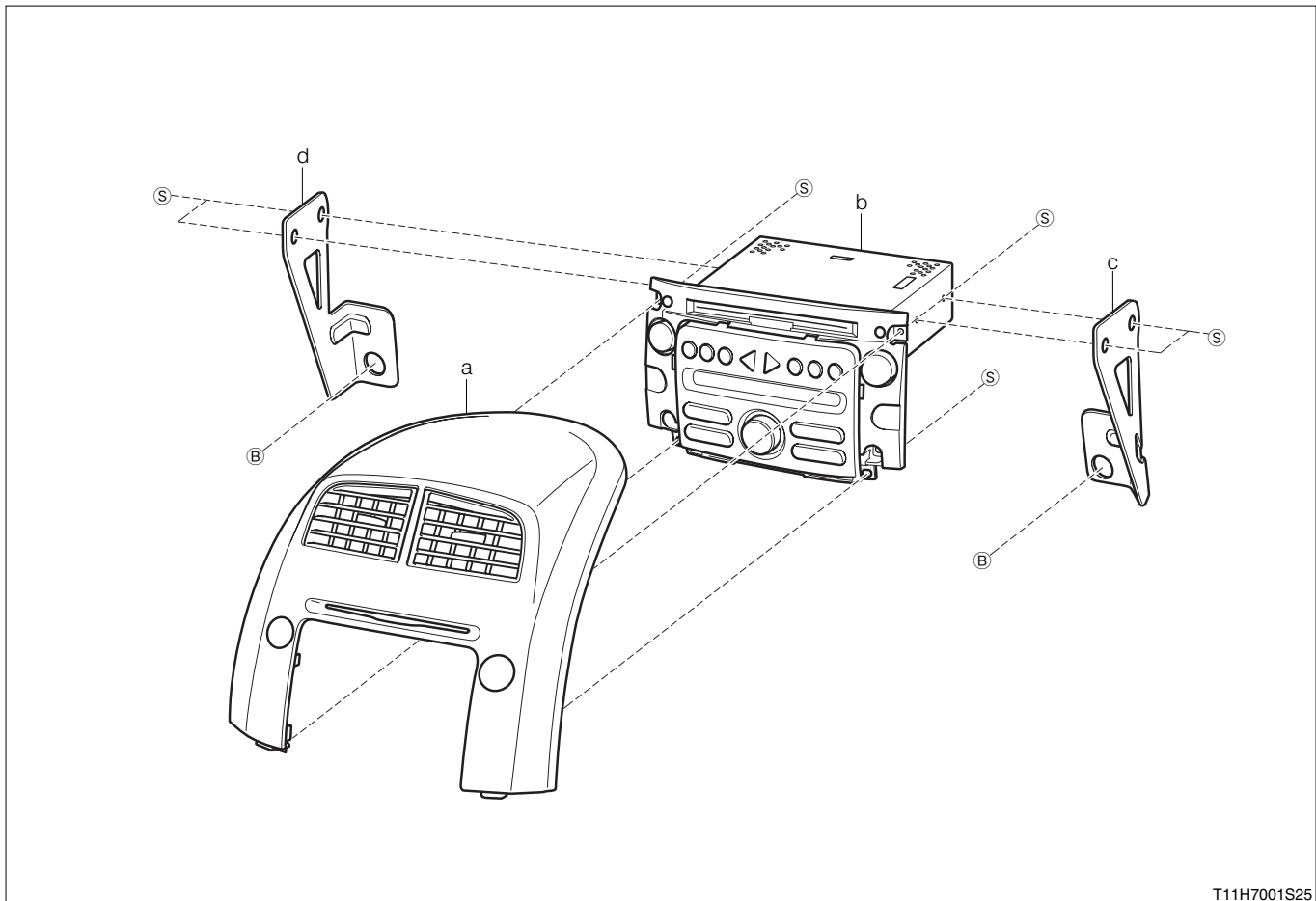
1-1 REMOVAL AND INSTALLATION

1-1-1 OPERATION BEFORE REMOVAL

1. Remove the lower instrument panel finish panel S/A.
Refer to Page I2-15.
2. Remove the lower center instrument cluster finish panel S/A.
Refer to Page I2-15.
3. Move the heater control Ay until the bolts (2pcs) securing the stereo component tuner Ay can be removed.
Refer to Page K1-6.

1-1-2 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



T11H7001S25

(2) Removal and installation procedures

- 1 a Panel S/A, instrument cluster finish, center
- 2 b Tuner Ay, stereo component
- 3 c Bracket, radio receiver A
- 4 d Bracket, radio receiver B

1-1-3 POINTS OF REMOVAL

(1) Tuner Ay, stereo component

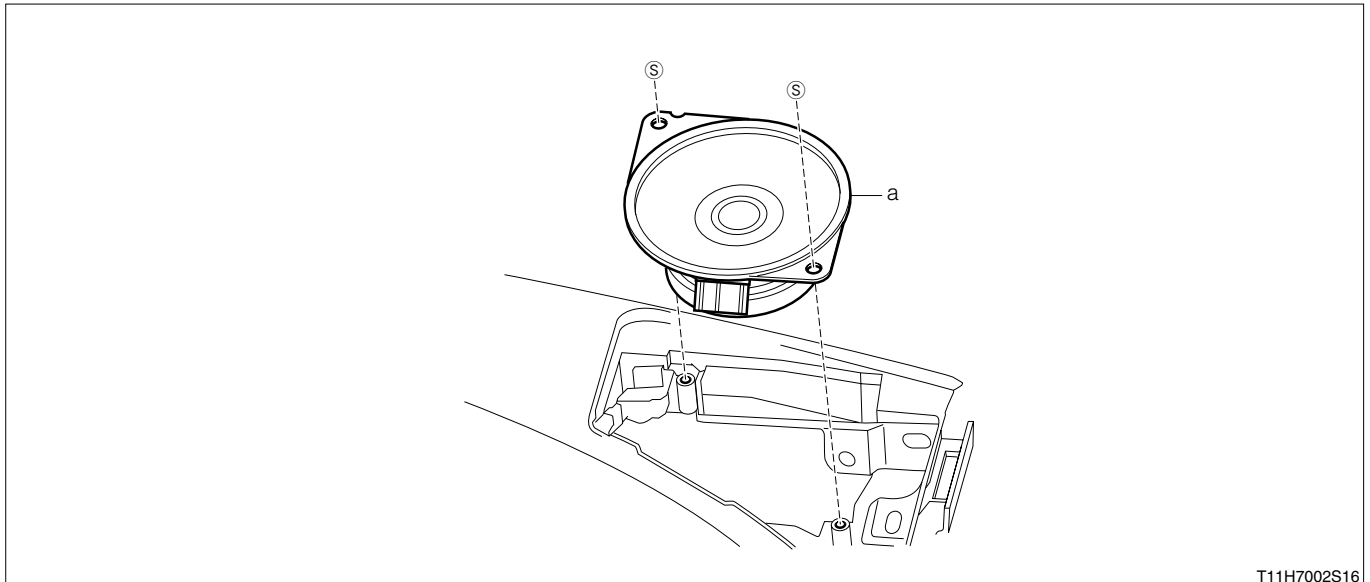
1. The tuner Ay is secured on the center instrument cluster finish panel S/A by screws (4pcs). First remove the whole panel S/A from the vehicle. Then remove the screws (4pcs) to remove the tuner Ay.

1-1-4 OPERATION AFTER INSTALLATION

1. Reinstall the heater control Ay.
Refer to Page K1-6.
2. Install the lower center instrument cluster finish panel S/A.
Refer to Page I2-15.
3. Install the lower instrument panel finish panel S/A.
Refer to Page I2-15.

2 SPEAKER(FRONT SPEAKER)**2-1 REMOVAL AND INSTALLATION****2-1-1 OPERATION BEFORE REMOVAL**

1. Remove the RH/LH speaker grille.
Refer to Page I2-15.

2-1-2 REMOVAL AND INSTALLATION PROCEDURES**(1) Components**

T11H7002S16

(2) Removal and installation procedures

- 1 a Speaker Ay, radio (RH/LH)

2-1-3 OPERATION AFTER INSTALLATION

1. Install the RH/LH speaker grille.
Refer to Page I2-15.

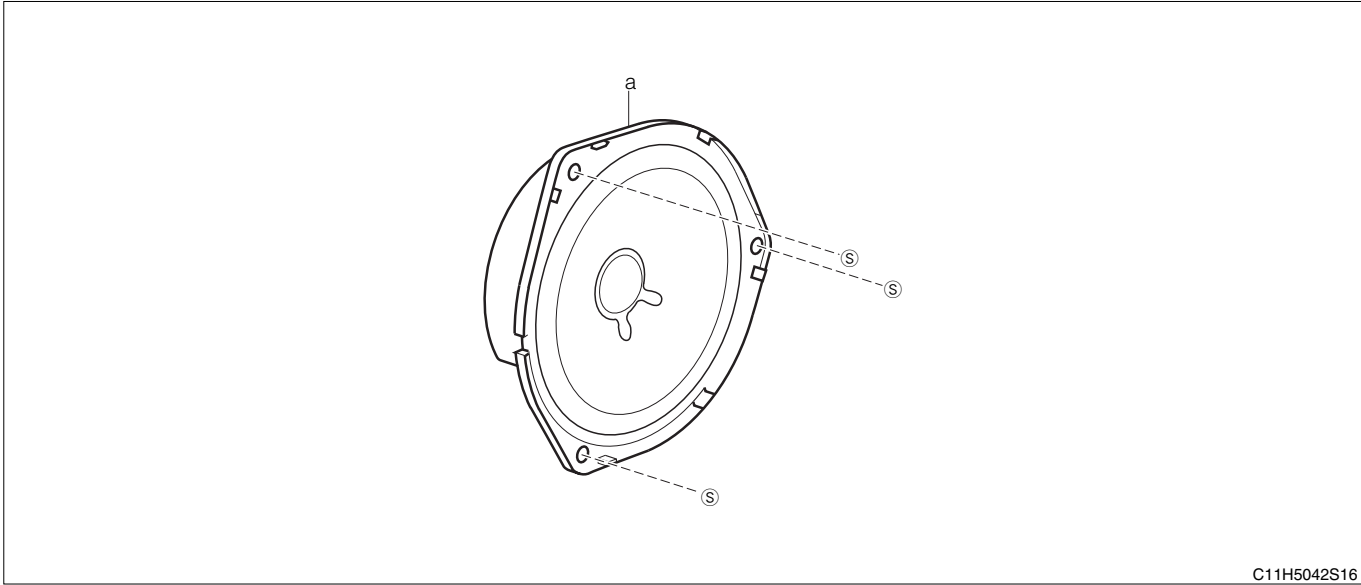
3 SPEAKER(REAR SPEAKER)**3-1 REMOVAL AND INSTALLATION****3-1-1 OPERATION BEFORE REMOVAL**

1. Remove the lower RH/LH rear door trim board Ay.
Refer to Page I1-14.

J4-3

3-1-2 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



(2) Removal and installation procedures

- 1 a Speaker Ay, radio (RH/LH)

3-1-3 OPERATION AFTER INSTALLATION

- 1. Install the lower RH/LH rear door trim board Ay.
Refer to Page I1-14.

4 ANTENNA

4-1 REMOVAL AND INSTALLATION

4-1-1 ARTICLES TO BE PREPARED

Instrument

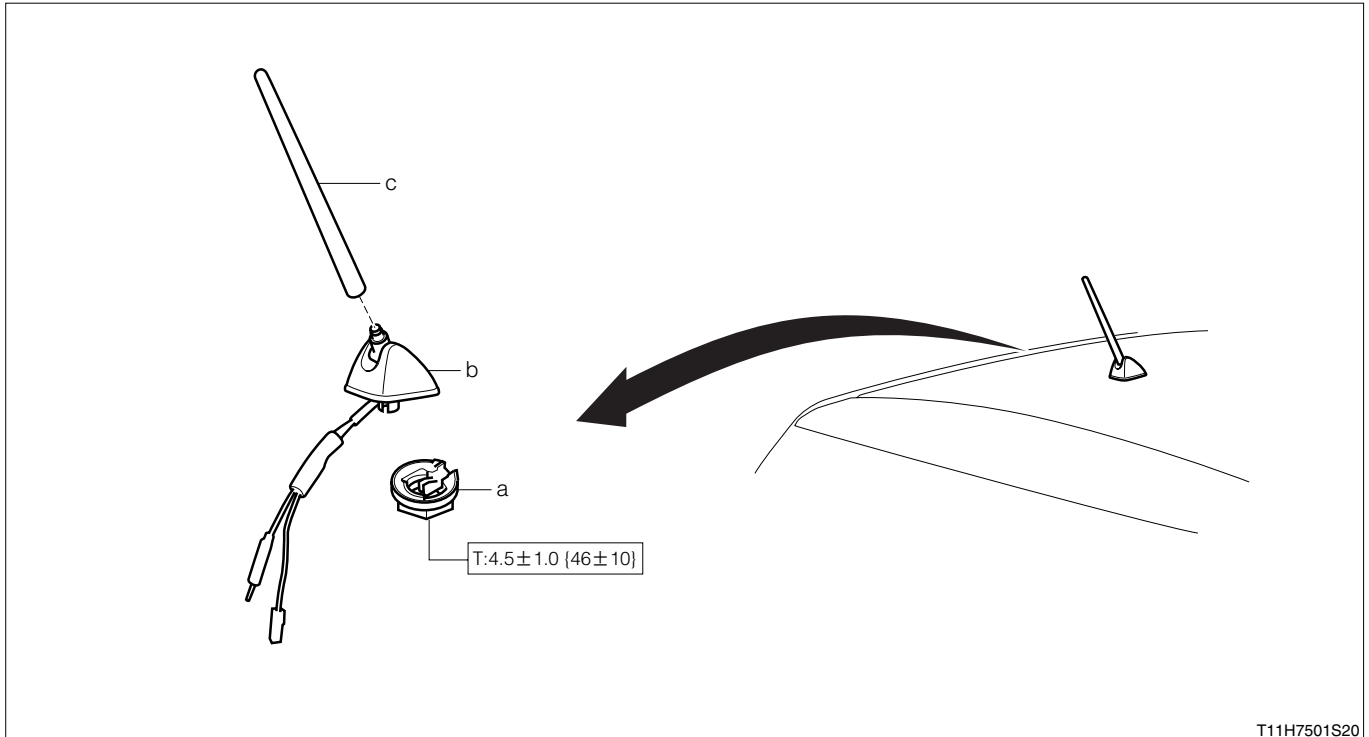
Torque wrench

4-1-2 OPERATION BEFORE REMOVAL

- 1. Remove the roof head lining Ay.
Refer to Page I2-43.

4-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



Unit: N·m {kgf·cm}

(2) Removal and installation procedures

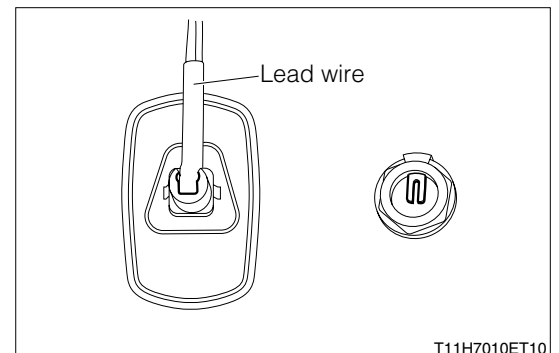
- ▲ 1 a Nut, antenna
- 2 b Antenna Ay, amplifier
- 3 c Rod, antenna

4-1-4 POINTS OF INSTALLATION

(1) Nut, antenna

1. Place a lead along the U-shaped slot of the antenna Ay amplifier. Place the nut in the direction of the lead, and tighten it to the specified torque.

TIGHTENING TORQUE: $4.5 \pm 1.0 \text{ N} \cdot \text{m}$ { $46 \pm 10 \text{ kgf} \cdot \text{cm}$ }



4-1-5 OPERATION AFTER INSTALLATION

1. Install the roof head lining Ay.
Refer to Page I2-43.

5 STEREO JACK ADAPTER

5-1 REMOVAL AND INSTALLATION

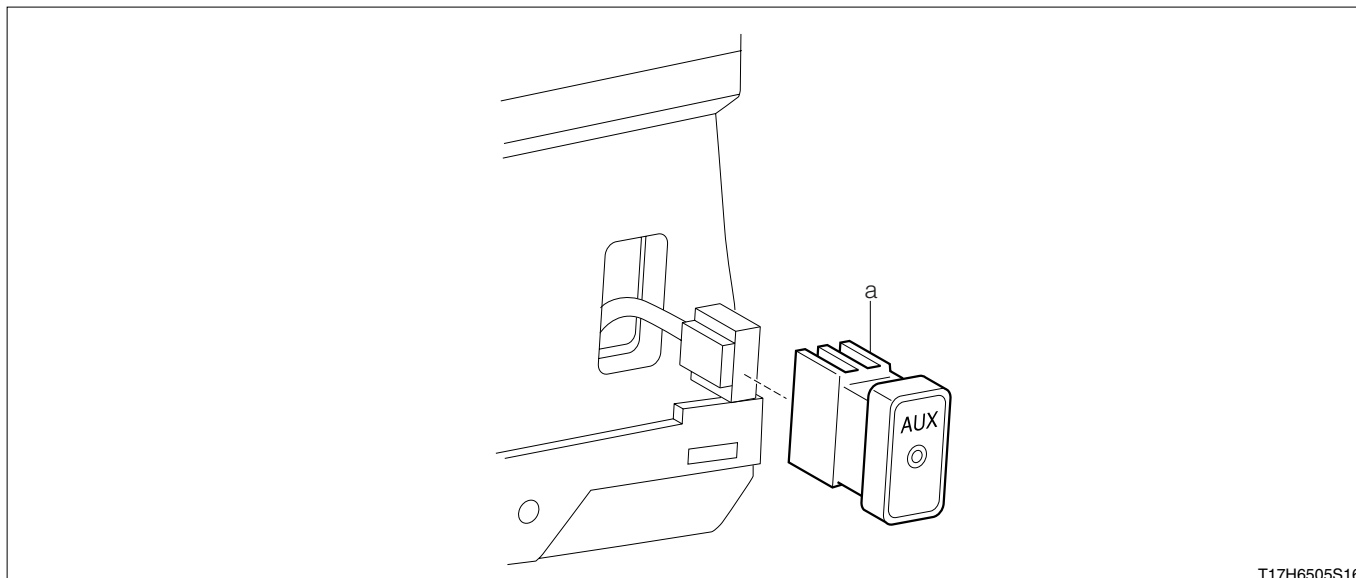
5-1-1 OPERATION BEFORE REMOVAL

1. Disconnect the battery negative (—) terminal.

J4-5

5-1-2 REMOVAL AND INSTALLATION PROCEDURES

(1) Components

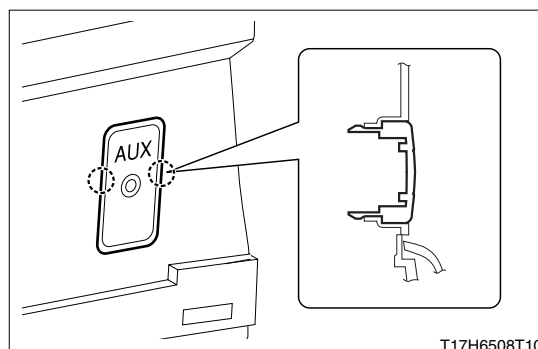


(2) Removal and installation procedures

- ▼ 1 a Adapter Ay, stereo jack

5-1-3 POINTS OF REMOVAL

1. Detach the claw indicated in the figuree.



5-1-4 OPERATION AFTER INSTALLATION

1. Connect the battery negative terminal.

J5 WIRING

WIRING-----	J5-1
BASIC CHECK AND ADJUSTMENT ---	J5-1
UNIT CHECK-----	J5-2
BATTERY-----	J5-2
REMOVAL AND INSTALLATION-----	J5-2

1 WIRING

1-1 BASIC CHECK AND ADJUSTMENT

1-1-1 CHECK OF ELECTRIC WIRING CONNECTION FOR LOOSING OR DAMAGE.

1. Manually move the wiring in the engine compartment to check for loose connection.

SPECIFIED VALUE: Shall have no loose connection.

2. Visually check for damage in electric wiring or loosening of clamps.

SPECIFIED VALUE: Shall be free from damage or loosening.

3. Check that the electric wiring will not interfere with other parts.

SPECIFIED VALUE: Shall have no interference.

1-1-2 CHECK OF BATTERY TERMINAL CONNECTION

1. Visually check for the faulty connection of the terminal due to loosening or corrosion.

SPECIFIED VALUE: Shall be free from faulty connection due to loosening or corrosion.

SPECIFIED VALUE: Shall be free from fault.

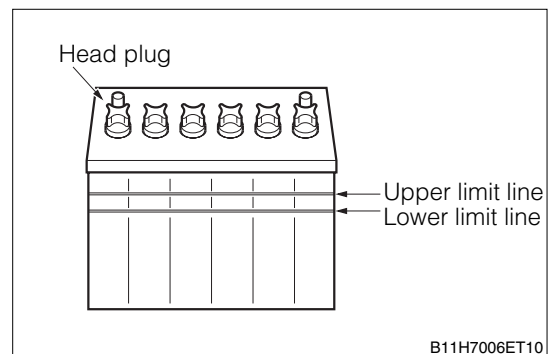
1-1-3 CHECK OF BATTERY FLUID LEVEL

1. Visually check the fluid level in each battery tank (cell).

SPECIFIED VALUE: Shall be within the specified range.

2. Check that the case is free from cracks and that the head plug of each battery tank (cell) is free from cracks, damage, or clogging in the air vent hole.

SPECIFIED VALUE: Check that each component is free from cracks, damage, or clogging in the air vent hole.



1-1-4 SPECIFIC GRAVITY CHECK OF THE BATTERY

1. Check that the specific gravity of the battery tank (cell) is within the prescribed limits, using a hydrometer.

SPECIFIED VALUE: Reference value (fluid temperature 20°C) : 1.25 – 1.29

Difference between tanks (fluid temperature 20°C) : 0.04 or below

1-2 UNIT CHECK

1-2-1 LGNITION SWITCH

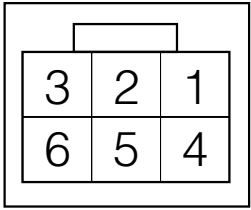
1. Check continuity between terminals in each state.

Ignition switch

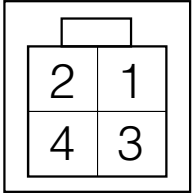
Switch condition	Terminal No.	Standard
ACC	1 – 3	Continuity exists.
ON	1 – 2 – 3, 5 – 6	Continuity exists.
START	1 – 2, 4 – 5 – 6	Continuity exists.

Key switch

Switch condition	Terminal No.	Standard
When the key is inserted	1 – 2	Continuity exists.
When the key is not inserted	1 – 2	No continuity exists.



B11H7007T10



B11H7008T10

2 BATTERY

2-1 REMOVAL AND INSTALLATION

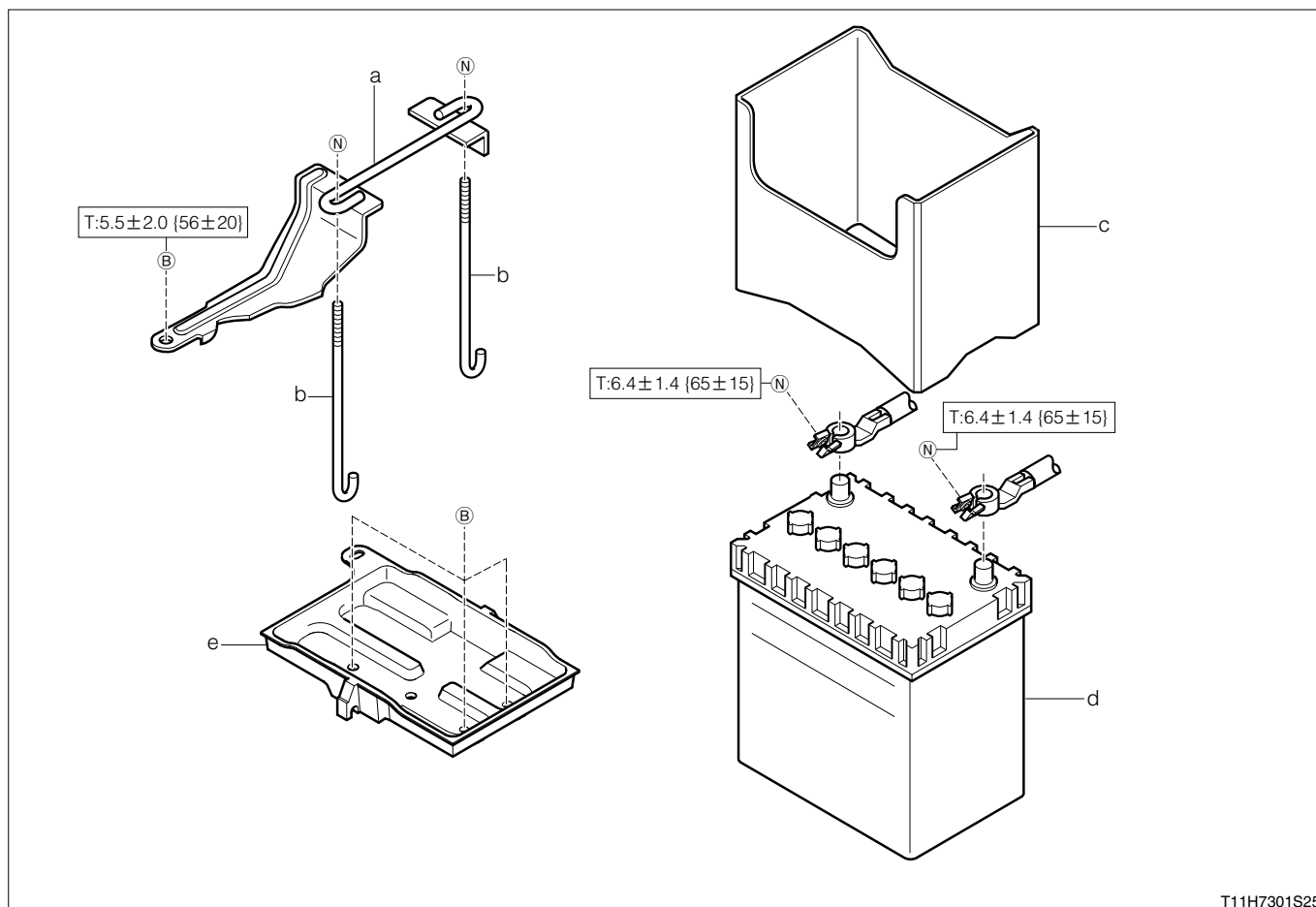
2-1-1 ARTICLES TO BE PREPARED

Instrument

Torque wrench

2-1-2 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



Unit: N·m {kgf·cm}

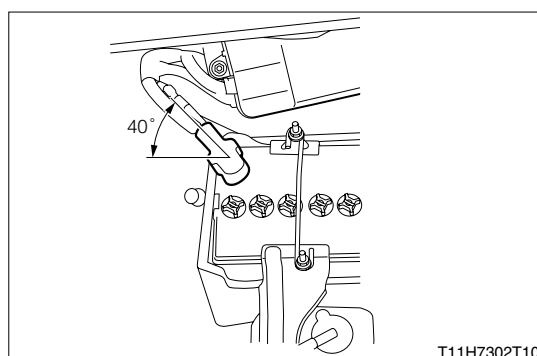
(2) Removal and installation procedures

- ▲ 1 a Clamp S/A, battery hold down
- 2 b Bolt, battery clamp
- ▲ 3 c Cover S/A, battery
- ▲ 4 d Battery
- 5 e Carrier, battery

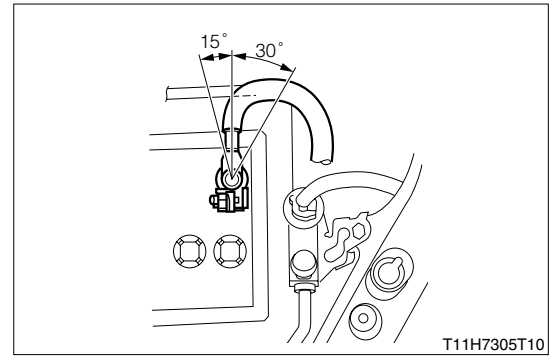
2-1-3 POINTS OF INSTALLATION

(1) Battery

1. Connect the battery positive (+) terminal so that the terminal wire will stay in the range shown in the illustration.



2. Connect the battery negative (—) terminal so that the terminal wire will stay in the range shown in the illustration.



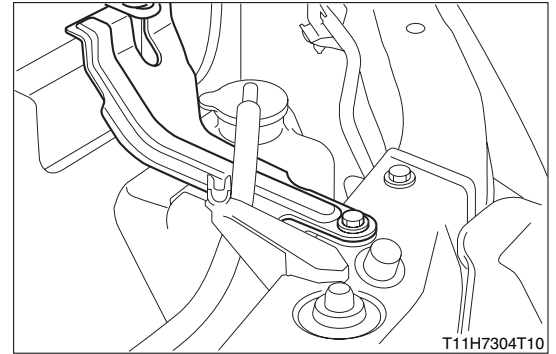
(2) Cover S/A, battery

1. Install the cover so that the larger notching will face the vehicles front.

(3) Clamp S/A, battery hold down

1. Install the clamp S/A and the radiator reserve tank Ay to the radiator upper support to the specified torque.

TIGHTENING TORQUE: $5.5 \pm 2.0 \text{ N} \cdot \text{m} \{56 \pm 20 \text{ kgf} \cdot \text{cm}\}$



J6 OTHER ELECTRICAL PARTS

HORN SYSTEM-----	J6—1
BASIC CHECK AND ADJUSTMENT ---	J6—1
HORN-----	J6—1
REMOVAL AND INSTALLATION(STANDARD-BUMPER EQUIPPED VEHICLE)-----	J6—1

J6-1

1 HORN SYSTEM

1-1 BASIC CHECK AND ADJUSTMENT

1-1-1 CHECK OF HORN OPERATION

1. Check that the horn sounds when the horn button is pushed, while the steering wheel is being turned.

SPECIFIED VALUE: The horn shall sound.

2. Check whether the volume level and quality of sound stay constant.

SPECIFIED VALUE: The quality of sound shall stay constant.

2 HORN

2-1 REMOVAL AND INSTALLATION(STANDARD-BUMPER EQUIPPED VEHICLE)

2-1-1 ARTICLES TO BE PREPARED

Instrument

Torque wrench

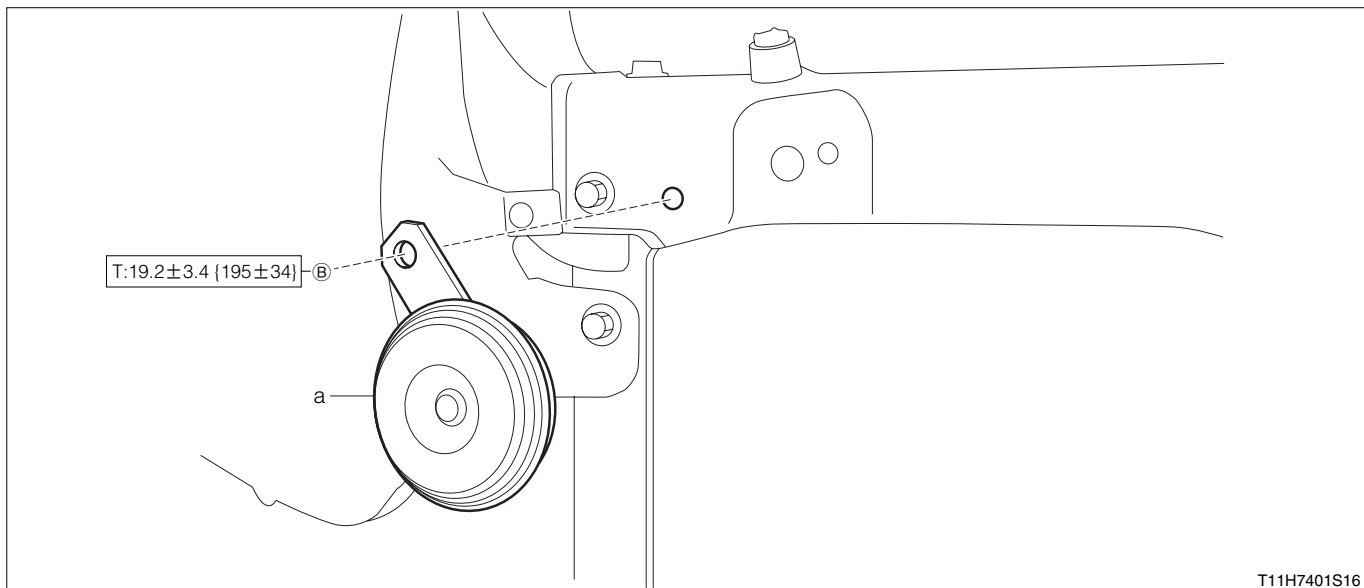
2-1-2 OPERATION BEFORE REMOVAL

1. Remove the battery negative (—) terminal.
2. Remove the front bumper cover.

Refer to Page I2-1.

2-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



T11H7401S16

Unit:N·m{kgf·cm}

(2) Removal and installation procedures

- 1 a Horn Ay,high-pitch

2-1-4 OPERATION AFTER INSTALLATION

1. Install the front bumper cover.

Refer to Page I2-1.

2. Install the battery negative (—) terminal.

K1 HEATER & AIR CONDITIONER

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LOCATION OF COMPONENTS(RHD)			

1 HEATER AND AIR CONDITIONER

1-1 INSTRUCTIONS FOR SERVICE OPERATION

1-1-1 REFRIGERANT AND COMPRESSOR OIL SPECIFICATIONS

Refrigerant	HFC—134a
Refrigerant replenishing amount (g)	300±30
Compressor oil	ND—OIL8

CAUTION

- When adjusting the amount of refrigerant, remove all the refrigerant in the cycle, and then refill the amount provided above [additional refill is not allowed].

NOTE

- Refrigerant service can (300 g) : 999-01090-C9-006

1-1-2 INSTRUCTIONS FOR REFRIGERANT AND SERVICE CAN

WARNING

- Any wrong handling may cause toxic substances to generate or the service can to explode, thus leading to serious injuries. Or, the liquid may splash, resulting in blindness, frostbite, etc.

1. Be sure to use the refrigerant HFC—134a.
2. When taking out the refrigerant during the repair, etc. of the air conditioner, be sure to use a refrigerant recovery machine. Never allow the refrigerant to be discharged to the atmosphere.
3. Be sure to recover the refrigerant when the vehicle is scrapped or the car air conditioner is disposed of.
4. When the refrigerant gas is exposed to open flame or very high temperature, it will be dissolved, thus generating toxic substances. Therefore, utmost care must be exercised so that the refrigerant gas may not leak at such a place.
5. Do not perform operations at a place with poor ventilation.
6. Never use a halide torch-type leak detector. This type of detector does not detect HFC—134a gas leak. Also, it decomposes the HFC—134a, thus generating a toxic substance.
7. Do not heat up the service can. When heating of the service can is absolutely necessary, use hot water at a temperature below 40°C.
8. Do not recycle the can by returning the refrigerant into the service can.
9. Be very careful not to shake the service can strongly. There is a danger that the can valve may be detached if it has been installed improperly.
10. Do not handle the can near your face in preparation for the explosion of the can. Also, be certain to wear protective goggles.
11. Do not open the valve of the manifold gauge at the high-pressure side while the engine is running. There is a danger that the high-pressure gas flows backward, thus leading to the explosion of the can.
12. In cases where the refrigerant should enter your eyes, do not rub your eyes with your hands or handkerchief, but immediately wash your eyes with clean water for more than 15 minutes. Then, immediately receive medical treatment at an eye doctor.

1-1-3 INSTRUCTIONS FOR COMPRESSOR OIL

1. Be sure to use the designated compressor oil.
2. The compressor oil has high moisture-absorption characteristics. Hence, when an air conditioner part is removed, be sure to immediately shut off the exposure to the atmosphere, using plugs, vinyl tape, etc.
3. The compressor oil has an adverse influence on the paint surface and resin. Therefore, utmost care must be exercised so that the compressor oil may not adhere to such places. If the compressor oil should be adhered to such places, immediately wipe off the oil, using cloth.

1-1-4 INSTRUCTIONS FOR INSTALLATION OF O-RINGS AND PIPES

1. Be certain to use O-rings for HFC – 134a.
2. Be sure to use new O-rings when the pipes are connected.
3. When the O-rings are detached, use a soft object, such as a toothpick, being very careful not to damage the pipes.
4. Liberally apply compressor oil to the O-ring.
5. Route the hose pipes naturally. Be very careful not to twist them or bend them forcibly.
6. If a foreign substance, such as a lint, is adhered to the joint section of the pipes and O-rings, it will cause the refrigerant gas to leak. Therefore, make sure that no foreign substance is present before connecting the pipes. Also, do not touch the joint section of the pipes and O-rings with cotton work gloves.
7. When the pipes are replaced with new ones, replenish the following amount of compressor oil.

REPLACEMENT PARTS	Pipes and hoses
Replenishing amount of compressor oil	5 cc (per 1 piece)

1-2 ARTICLES TO BE PREPARED

Instrument

Dial gauge, Torque wrench, Tachometer, Dry and wet bulb hygrometer, Temperature gauge

Tool

Manifold gauge

1-3 BASIC CHECK AND ADJUSTMENT

1-3-1 CHECK OF COOLING PERFORMANCE

1. Install a manifold gauge.
2. Set the vehicle to the following conditions.

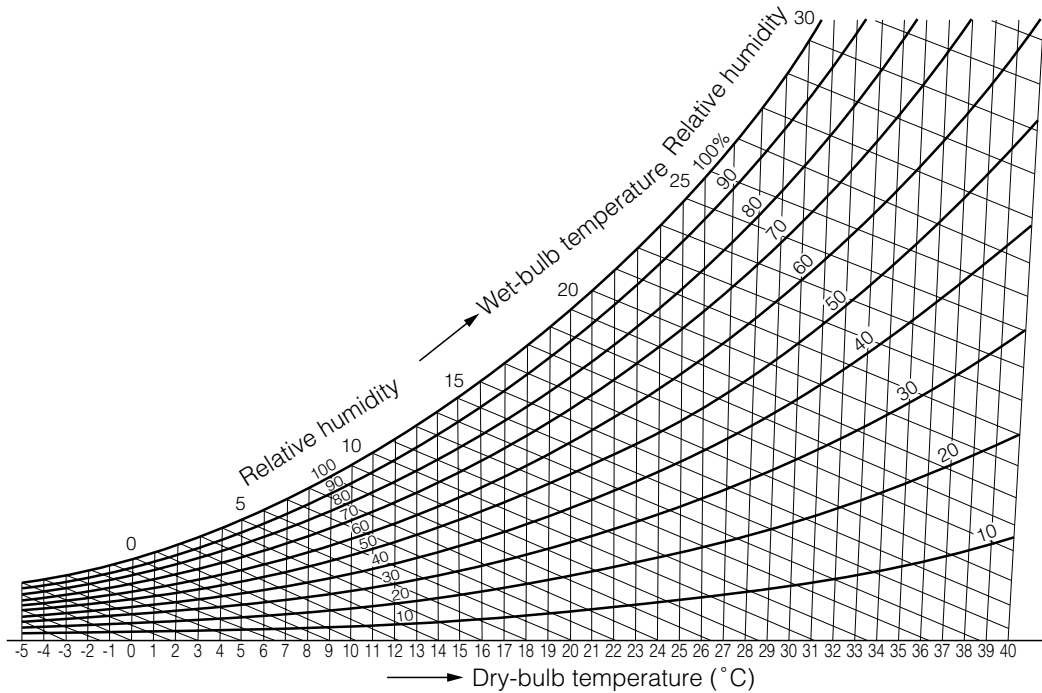
Detected item	Condition
Vehicle body	Parked state in a shaded area
Hood door	Fully opened
A/C switch (magnet clutch)	ON
Engine revolution speed	2000rpm
Switching of inside and outside air	Inside air
Register	VENT
Set temperature	MAX COOL
Blower speed	HI
Temperature at cooling unit intake port ^{*1}	25 - 35°C
Gauge high-pressure side pressure ^{*2}	1.5MPa {15.5kgf/cm ² }

CAUTION

- ^{*1} To ensure accurate measurements, the temperatures at the air intake port of the cooling unit must be somewhere between 25 - 35°C. If the temperature is too low, postpone the testing.
- ^{*2} When the pressure is too high, pour water on the condenser to reduce the pressure. Conversely, if the pressure is too low, cover the front part of the condenser to raise the pressure.

K1-3

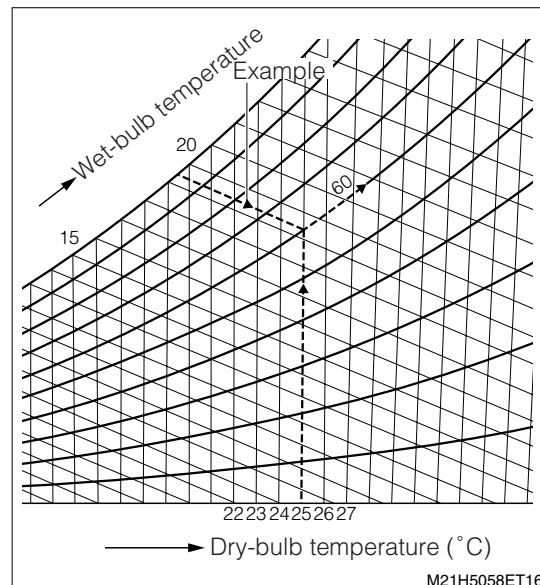
3. Remove the glove box. Place a wet and dry bulb thermometer (necessary for measuring humidity) at the air intake port of the cooling unit.
4. Insert the bulb section of the wet and dry bulb thermometer into the center of the register.
5. Start the operation under the condition of Item 2, thus stabilizing the temperature at the register. (Approx. 5 to 6 minutes)
6. Measure dry-bulb and wet-bulb temperatures of the air intake port and the register temperature.
7. Determine the relative humidity using the air diagram from the measured temperatures of the wet and dry bulb of the air intake port.



M21H5057ES20

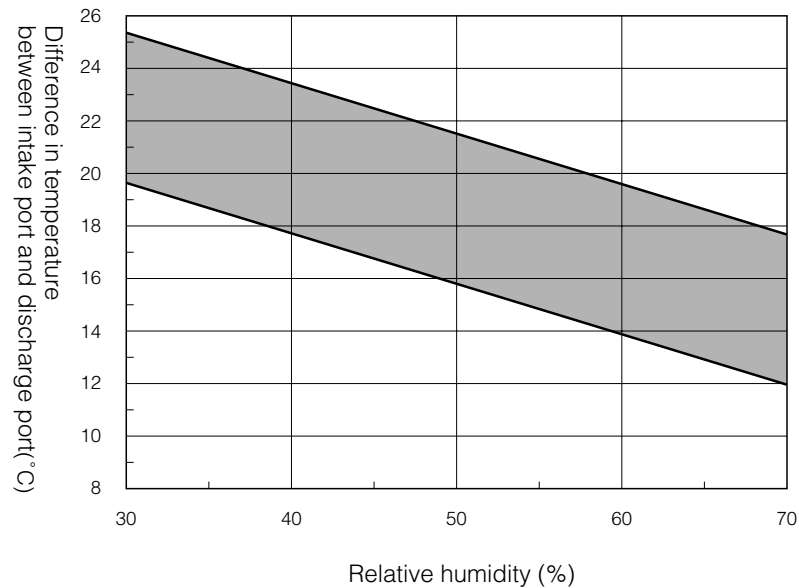
NOTE

- When the dry-bulb temperature of the wet and dry bulb thermometer that has been set to the air intake port is 25°C and the wet-bulb temperature is 19.5°C, the intersection of the dotted lines in the diagram indicates the relative humidity. In this case, the relative humidity is 60%.



M21H5058ET16

8. Check the difference between measured temperatures of the air intake port and the register as well as their relative humidity using the standard performance table.

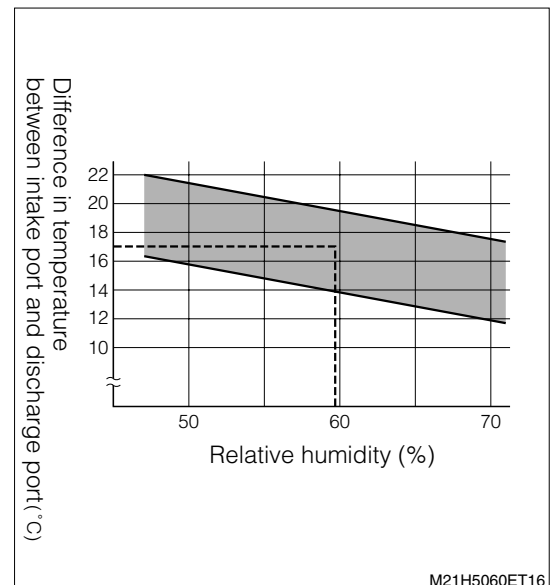


M21H5059ES20

SPECIFIED VALUE: Ensure that the check results are within the range of the slant line section in the figure.

NOTE

- The example shows how to evaluate performance using the standard performance table, where the difference between the dry-bulb temperatures of the air intake port and the register is 17°C and the relative humidity is 60%.
9. In cases where an abnormality is confirmed, check and repair the air conditioner system according to the trouble-shooting.



M21H5060ET16

1-3-2 CHECK AND ADJUSTMENT OF AIR CONDITIONER COMPRESSOR BELT TENSION (DEFLECTION AMOUNT)

Refer to Page B1-4.

K1-5

1-3-3 CHECK AND ADJUSTMENT OF MAGNET CLUTCH AIR GAP

1. Remove the compressor.

Refer to Page K1-20.

2. Install the dial gauge to the magnet clutch hub vertically.
3. Connect the connector terminal of the magnet clutch to the positive (+) terminal of the battery, and the body earth of the compressor to the negative (-) terminal of the battery. Then, start the operation of the magnet clutch. At this time, check the air gap.

SPECIFIED VALUE: $0.5^{+0.15}_{-0.20}$ mm

4. If the check results fail to conform to the specified value, remove the magnet clutch hub and perform the adjustment by means of the plate washer.

CAUTION

- The number of plate washers to be used should be 3 pcs. or less.

Refer to Page K1-22.

1-3-4 CHECK OF DEFROSTER OPERATION

1. Check that air blows out the defroster vent, when the IG switch is turned "ON".
2. Checks that air volume changes according to the blower switch operation.

2 REFRIGERANT

2-1 REPLACEMENT

CAUTION

- When adjusting the amount of refrigerant, remove all the refrigerant in the cycle, and then refill the amount below [additional refill is not allowed].

2-1-1 ARTICLES TO BE PREPARED

Tool

Vacuum pump, Manifold gauge, Halogen leak detector

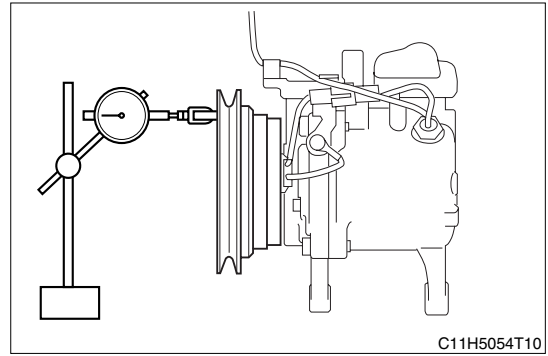
Lubricant, adhesive, others

Chlorofluorocarbon recovery and regenerating machine, Refrigerant gas HFC-134a(R134a)

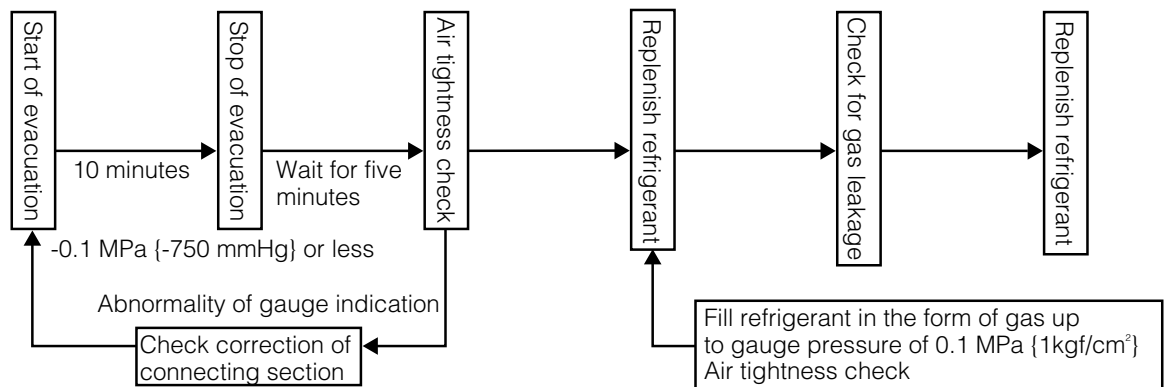
2-1-2 REPLACING PROCEDURE

(1) Recovery procedure

1. Turn ON the A/C switch.
2. Start the engine and operate the compressor for about 5 to 6 minutes so that the residual compressor oil in each function part may circulate with the refrigerant and be recovered to the compressor.
3. Recover the refrigerant, following the instruction manual of the refrigerant recovery and recycling machine to be used.



(2) Replenishing procedure



SPECIFIED VALUE: Replenishing amount of refrigerant: $300 \pm 30\text{g}$

C11H5050_1ES16

NOTE

- Refrigerant service can (300 g) : 999-01090-C9-006

3 HEATER CONTROL PANEL**3-1 REMOVAL AND INSTALLATION****3-1-1 ARTICLES TO BE PREPARED**

Tool

Snap ring pliers

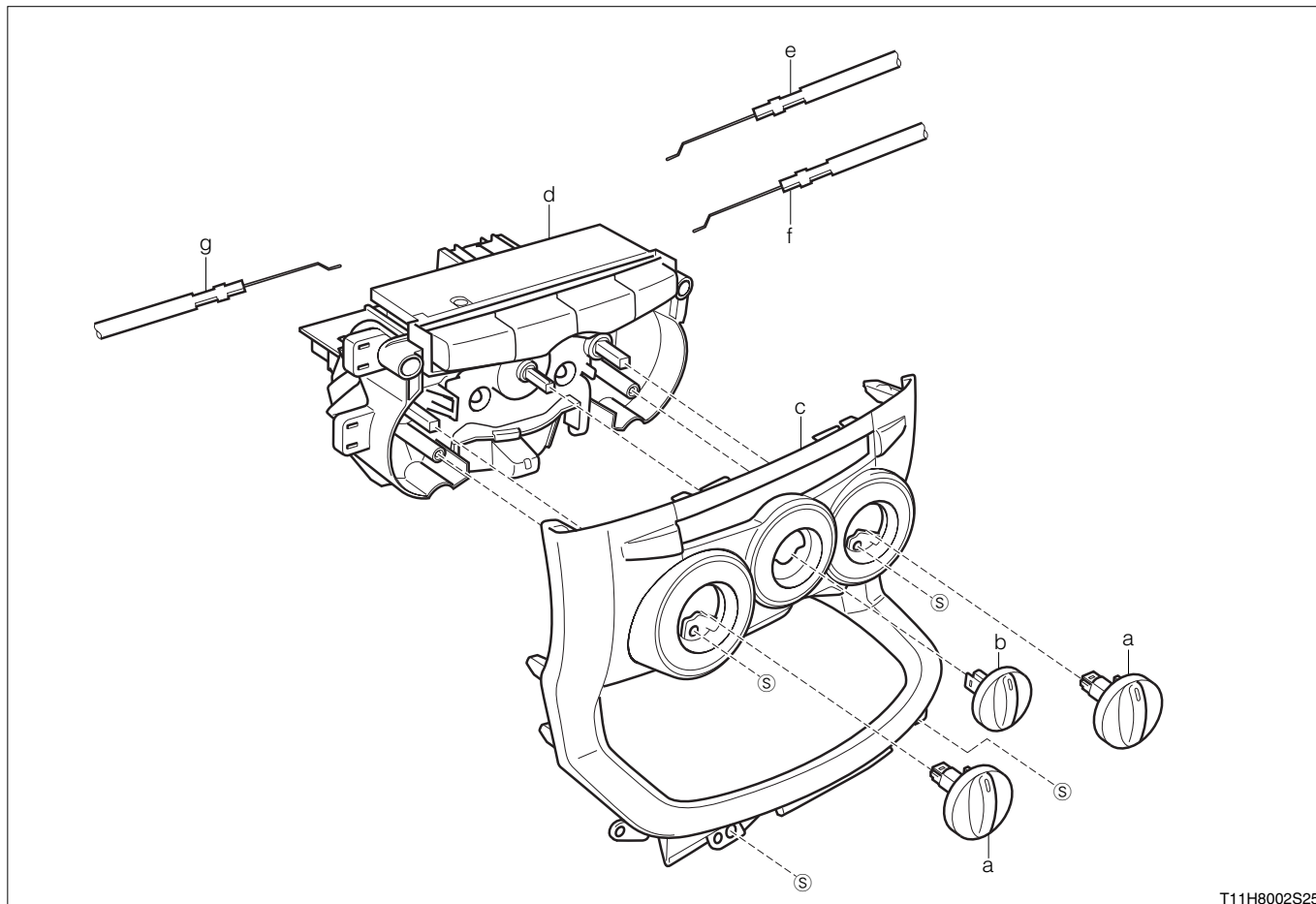
3-1-2 OPERATION BEFORE REMOVAL

1. Remove the panel S/A, instrument panel finish lower.
Refer to Page I2-13.

K1-7

3-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



T11H8002S25

(2) Removal and installation procedures

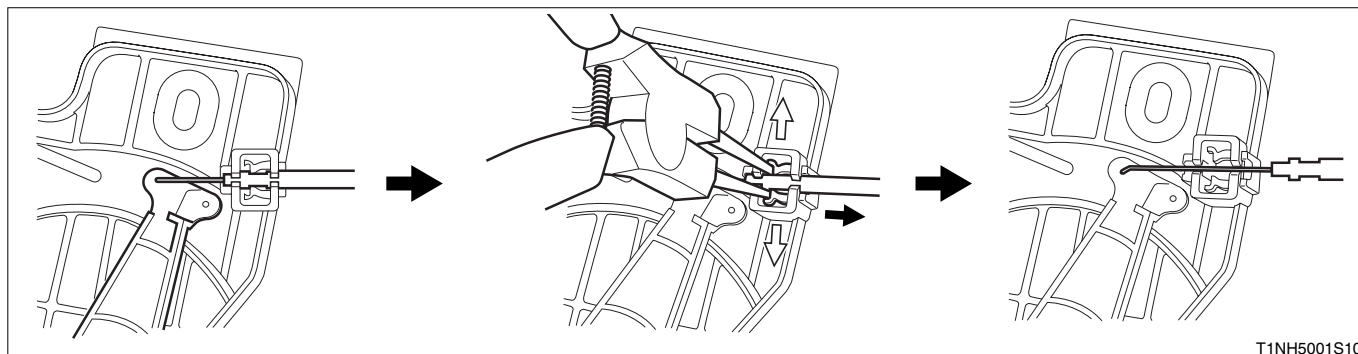
▼ ▲ 1	a Knob S/A, control (temperature control mode)	▼ ▲ 6	f Cable S/A, temp damper control
2	b Knob S/A, control (blower)	▼ ▲ 7	g Cable S/A, air inlet damper control
3	c Panel S/A, instrument cluster finish, lower center		
▼ 4	d Control S/A, heater		
▼ ▲ 5	e Cable S/A, defroster damper control		

3-1-4 POINTS OF REMOVAL

(1) Control S/A, heater

1. Disconnect the cooling unit side cable S/A to remove the control Ay together with the cable S/A.

(2) Cable S/A, defroster damper control, Cable S/A, temp damper control, Cable S/A, air inlet damper control



T1NH5001S10

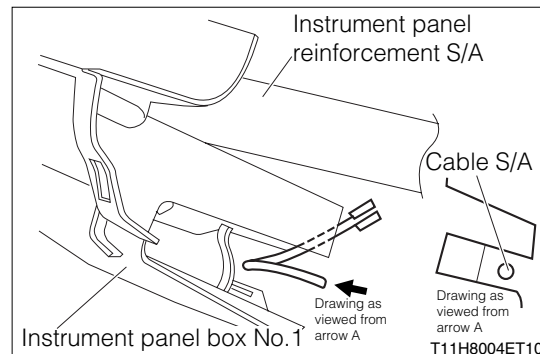
CAUTION

- The cable at the switch, heater blower side is of a pawl securing type. Therefore, there is the possibility that, if the pawl is opened forcibly, the securing force becomes weak, thus becoming unable to secure the cable again. Hence, be sure to use snap ring pliers.

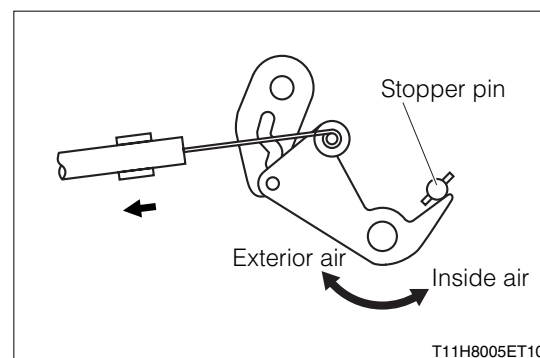
TOOL: Snap ring pliers

3-1-5 POINTS OF INSTALLATION**(1) Cable S/A, air inlet damper control****① RHD vehicles**

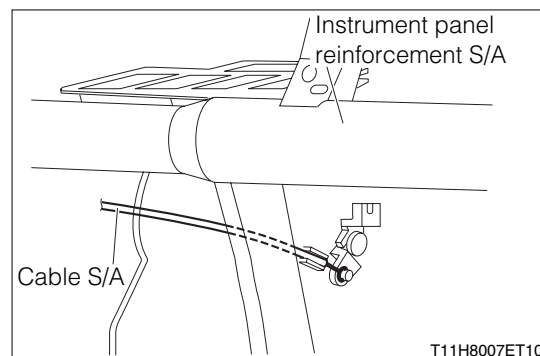
1. Route the cable S/A on the vehicle front side of the No.1 instrument panel box.



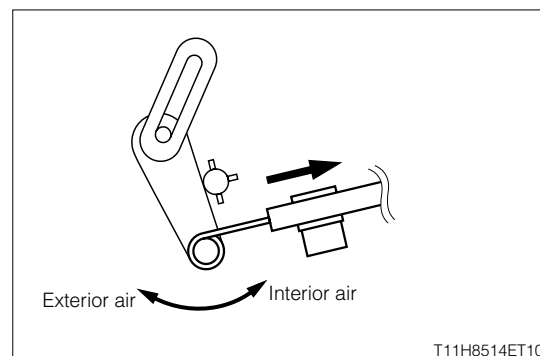
2. Set the inside/outside air selection lever to the inside air.
3. Push the inside/outside air selection link of the unit assembly, air conditioner against the stopper pin at the inside air side.
4. While pulling the cable outer in the arrowheaded direction, clamp the cable.

**② LHD vehicles**

1. Route the cable S/A between the brace and the vehicle harness.



2. Set the inside/outside air selection lever to the inside air.
3. Push the inside/outside air selection link of the unit assembly, air conditioner against the stopper pin at the inside air side.
4. While pulling the cable outer in the arrowheaded direction, clamp the cable.

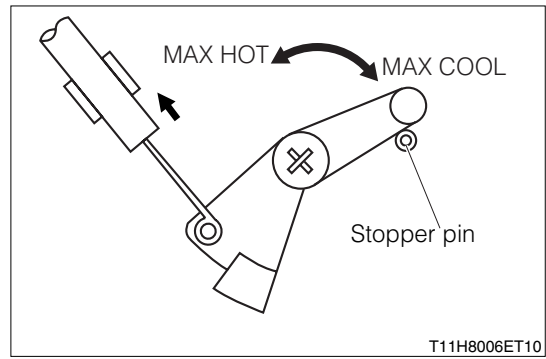


K1-9

(2) Cable S/A, temp damper control

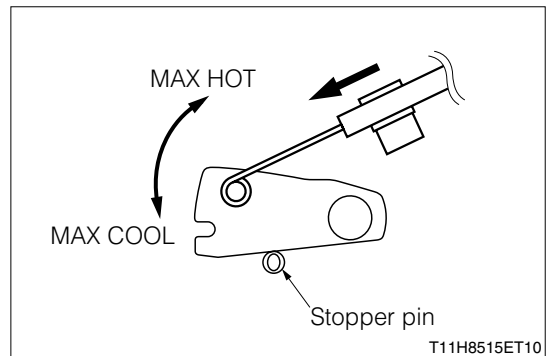
① RHD vehicles

1. Set the temperature adjusting dial to the MAX COOL.
2. Push the control link of the heater radiator Ay against the MAX COOL side stopper pin.
3. While pushing the cable outer in the arrowheaded direction, clamp the cable.



② LHD vehicles

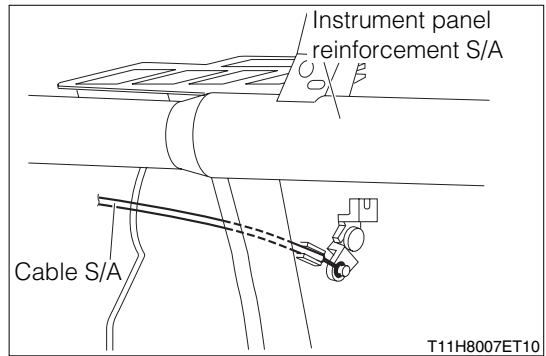
1. Set the temperature adjusting dial to the MAX COOL.
2. Push the control link of the heater radiator Ay against the MAX COOL side stopper pin.
3. While pushing the cable outer in the arrowheaded direction, clamp the cable.



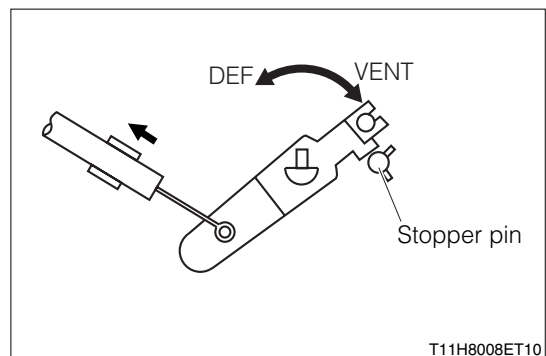
(3) Cable S/A, defroster damper control

① RHD vehicles

1. Route the cable S/A between the brace and the vehicle harness.

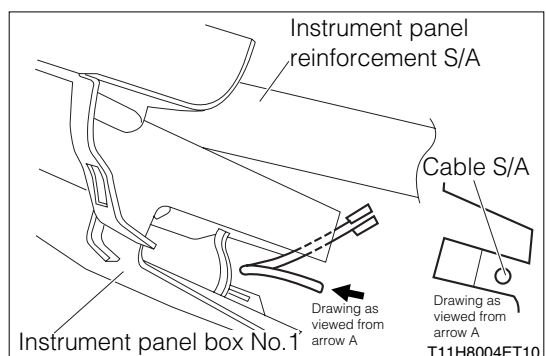


2. Set the register selection dial to the VENT position.
3. Push the mode link of the heater radiator Ay against the VENT side stopper pin.
4. While pulling the cable outer in the arrowheaded direction, clamp the cable.

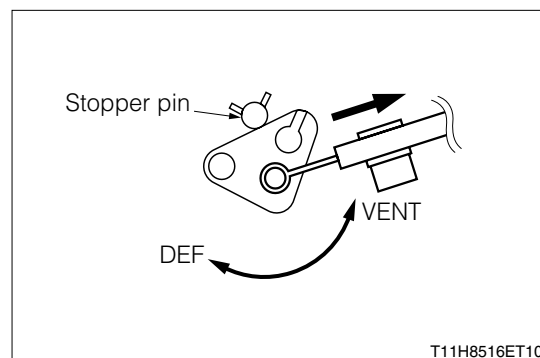


② LHD vehicles

1. Route the cable S/A on the vehicle front side of the No.1 instrument panel box.



2. Set the register selection dial to the VENT position.
3. Push the mode link of the heater radiator Ay against the VENT side stopper pin.
4. While pulling the cable outer in the arrowheaded direction, clamp the cable.



3-1-6 OPERATION AFTER INSTALLATION

1. Install the panel S/A, instrument panel finish lower.
Refer to Page I2-15.

4 COOLING UNIT

4-1 REMOVAL AND INSTALLATION(RHD VEHICLES)

4-1-1 ARTICLES TO BE PREPARED

Instrument

Torque wrench

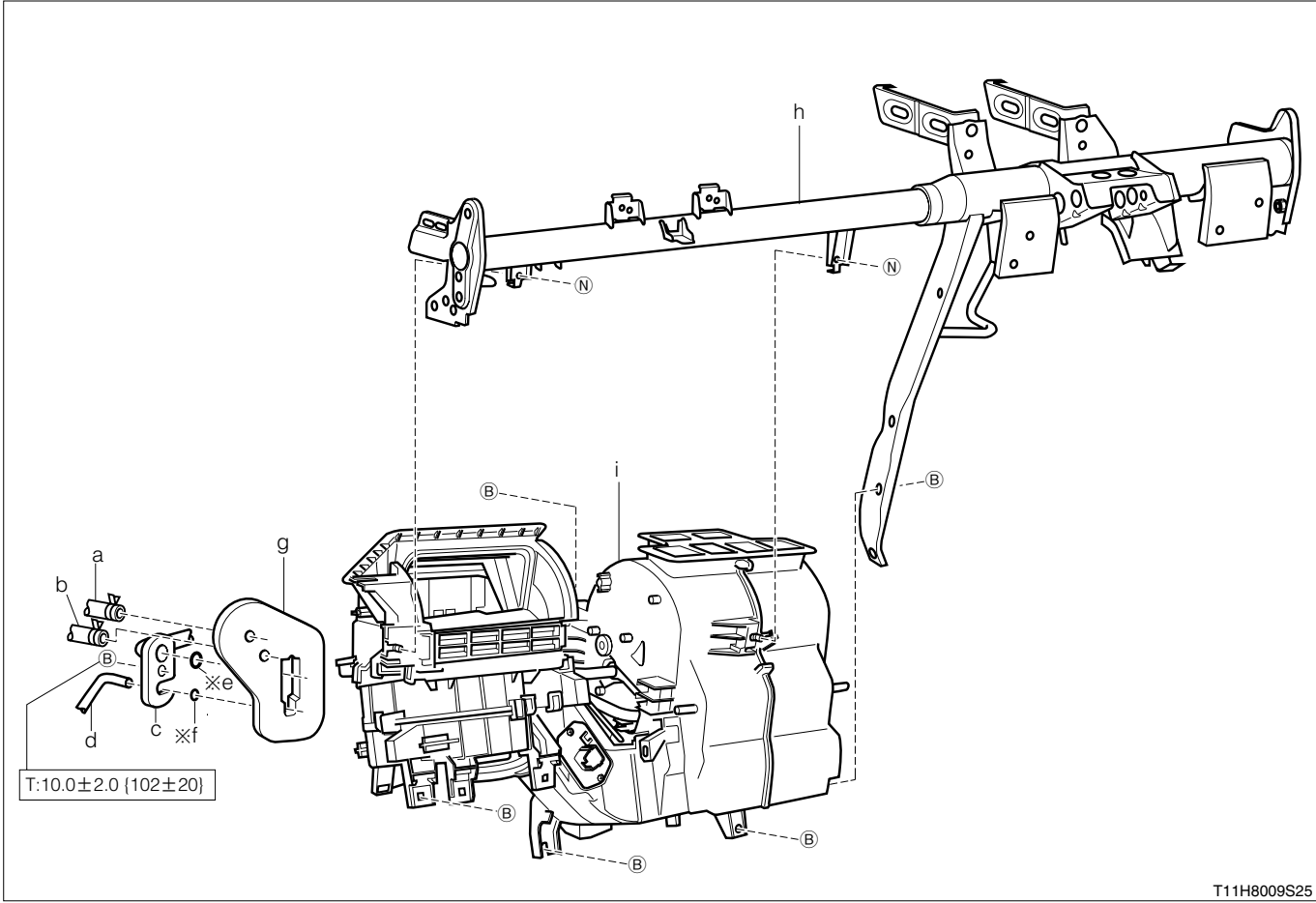
4-1-2 OPERATION BEFORE REMOVAL

1. Drain refrigerant.
Refer to Page K1-5.
2. Drain the cooling water.
3. Remove the panel, instrument.
Refer to Page I2-15.

K1-11

4-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



Unit: N•m{kgf•cm}

※: Non-reusable parts

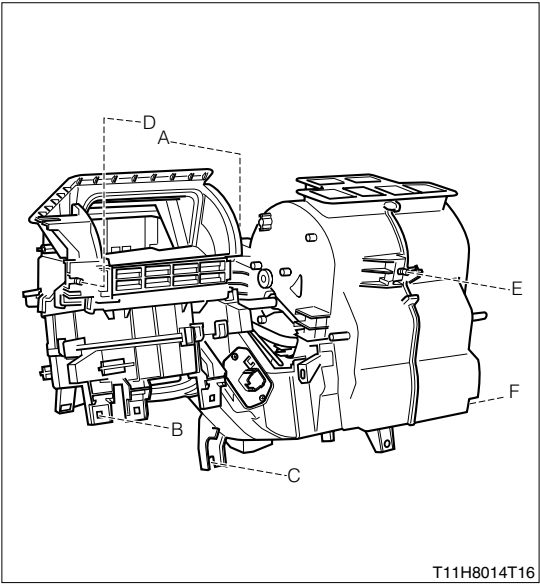
(2) Removal and installation procedures

1	a	Hose, water	6	f	Ring, O
2	b	Hose, water, No.2	7	g	Packing
3	c	Hose, suction	8	h	Reinforcement S/A, instrument panel
4	d	Tube, liquid, No.1	▼ ▲ 9	i	Unit Ay, air conditioner
5	e	Ring, O			

4-1-4 POINTS OF REMOVAL

(1) Unit Ay, air conditioner

1. Remove "A" from the engine compartment side.
2. Remove the bolts in the sequence of "B" and "C".
3. Remove the bolts from the instrument panel reinforcement S/A in the sequence of "D".
4. Move the instrument panel reinforcement S/A toward the back of the vehicle and remove the unit Ay.



4-1-5 POINTS OF INSTALLATION

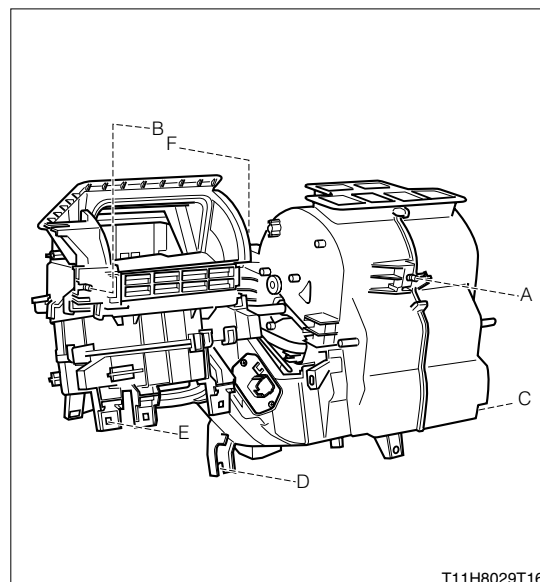
(1) Unit Ay, air conditioner

- When the unit assembly is replaced with a new one, replenish the following amount of compressor oil.

REPLACEMENT PARTS	Unit Ay
Replenishing amount of compressor oil	25

LUBRICANT: Compressor oil (ND — OIL8)

- Reinstall the unit Ay to the instrument panel reinforcement S/A in the sequence of "A".
- Move the instrument panel reinforcement S/A toward the front of the vehicle and tighten the bolts in the sequence of "D" and "E".
- Install "F" from the engine compartment side.



T11H8029T16

4-1-6 OPERATION AFTER INSTALLATION

- Install the panel instrument.
Refer to Page I2-15.

- Fill cooling water.
- Replenish refrigerant.
Refer to Page K1-5.

4-2 DISASSEMBLING AND ASSEMBLING(RHD VEHICLES)

4-2-1 ARTICLES TO BE PREPARED

Lubricant, adhesive, others

Compressor oil (ND — OIL8)

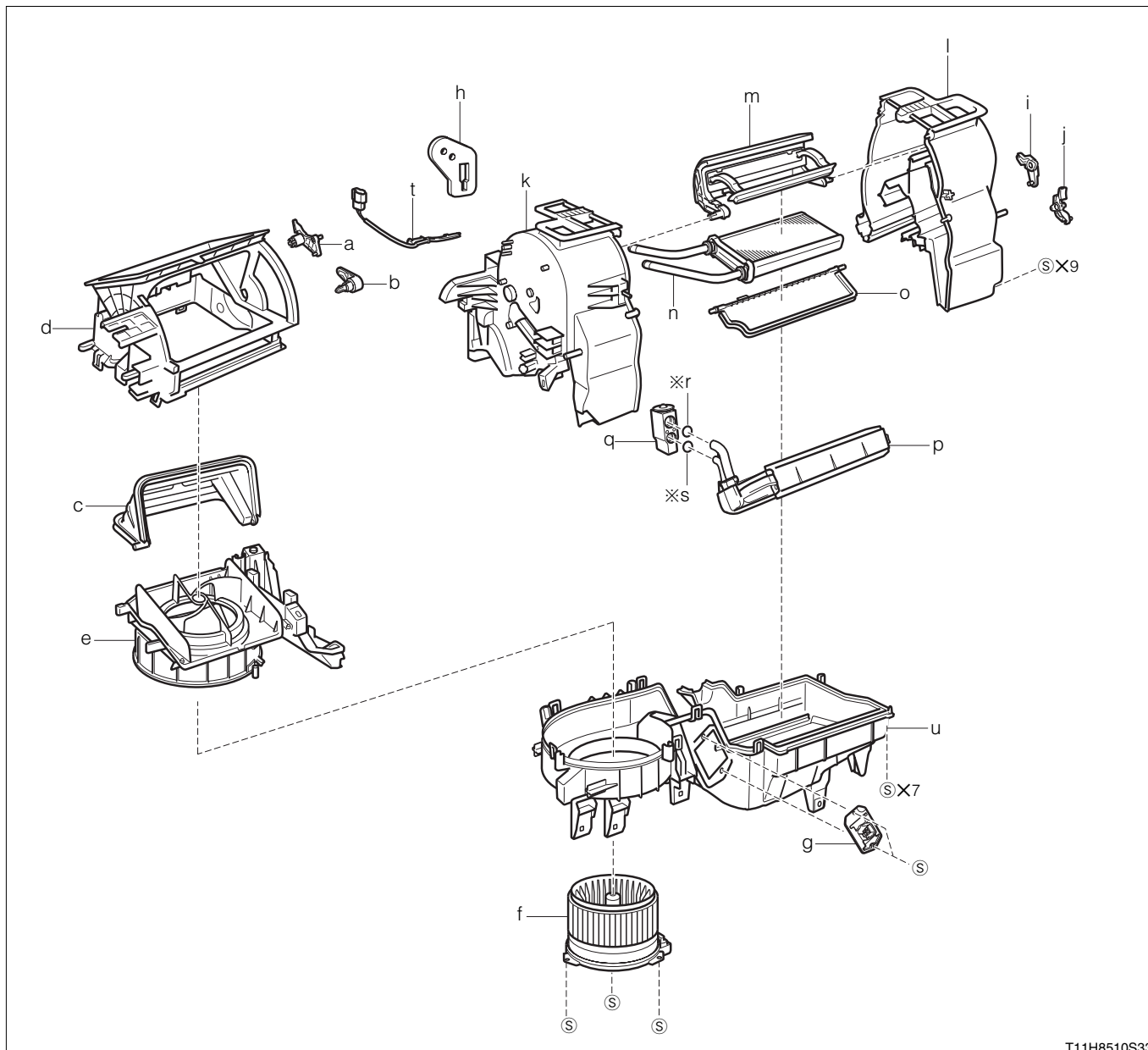
4-2-2 OPERATION BEFORE DISASSEMBLY

- Remove the unit assembly, air conditioner.
Refer to Page K1-10.

K1-13

4-2-3 DISASSEMBLY AND ASSEMBLY PROCEDURES

(1) Components



T11H8510S33

※: Non-reusable parts

(2) Disassembling and assembling procedure

1 a Lever (for inside-and-outside mind doors)	12 l Case, heater, RH
2 b Lever (for inside-and-outside air cable)	13 m Door S/A (for mode selection)
3 c Door S/A (for inside-and-outside air)	14 n Core S/A, heater
▲ 4 d Case S/A, blower (for inside-and-outside air)	15 o Door S/A (for air mixture)
5 e Case S/A, blower (blower upper)	16 p Evaporator S/A
6 f Motor Ay, w/fan	17 q Valve, expansion
7 g Resistor, blower	18 r Ring, O
8 h Packing	19 s Ring, O
9 i Lever (for mode selection)	20 t Thermistor, cooler
10 j Lever (for air mixture)	▲ 21 u Case S/A, blower (blower lower)
11 k Case, heater, LH	

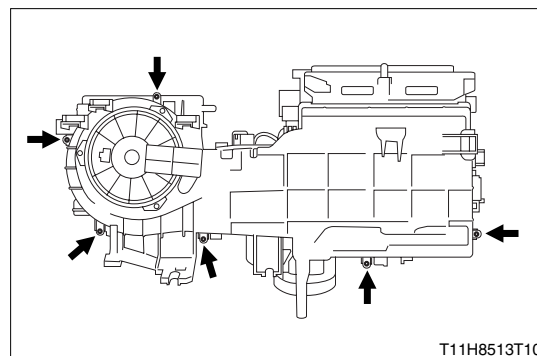
4-2-4 POINTS OF ASSEMBLY

(1) Case S/A, blower (Blower lower)

1. When the case is used again, attach and tighten the screws supplied as replacement parts at the (six) positions shown in the right figure.

NOTE

- Screw part number : 88466-87202-000

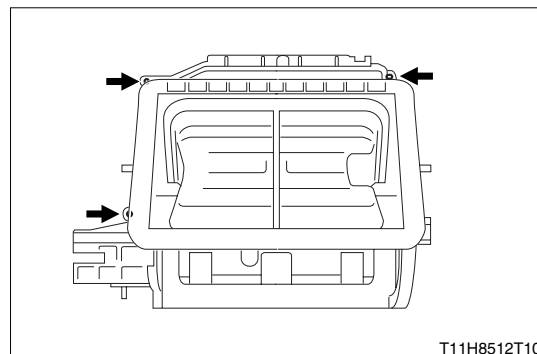


(2) Case S/A, blower (For inside-and-outside air)

1. When the case is used again, attach and tighten the screws supplied as replacement parts at the (three) positions shown in the right figure.

NOTE

- Screw part number : 88466-87202-000



4-2-5 OPERATION AFTER ASSEMBLY

1. Install the unit assembly, air conditioner.
Refer to Page K1-10.

4-3 REMOVAL AND INSTALLATION(LHD VEHICLES)

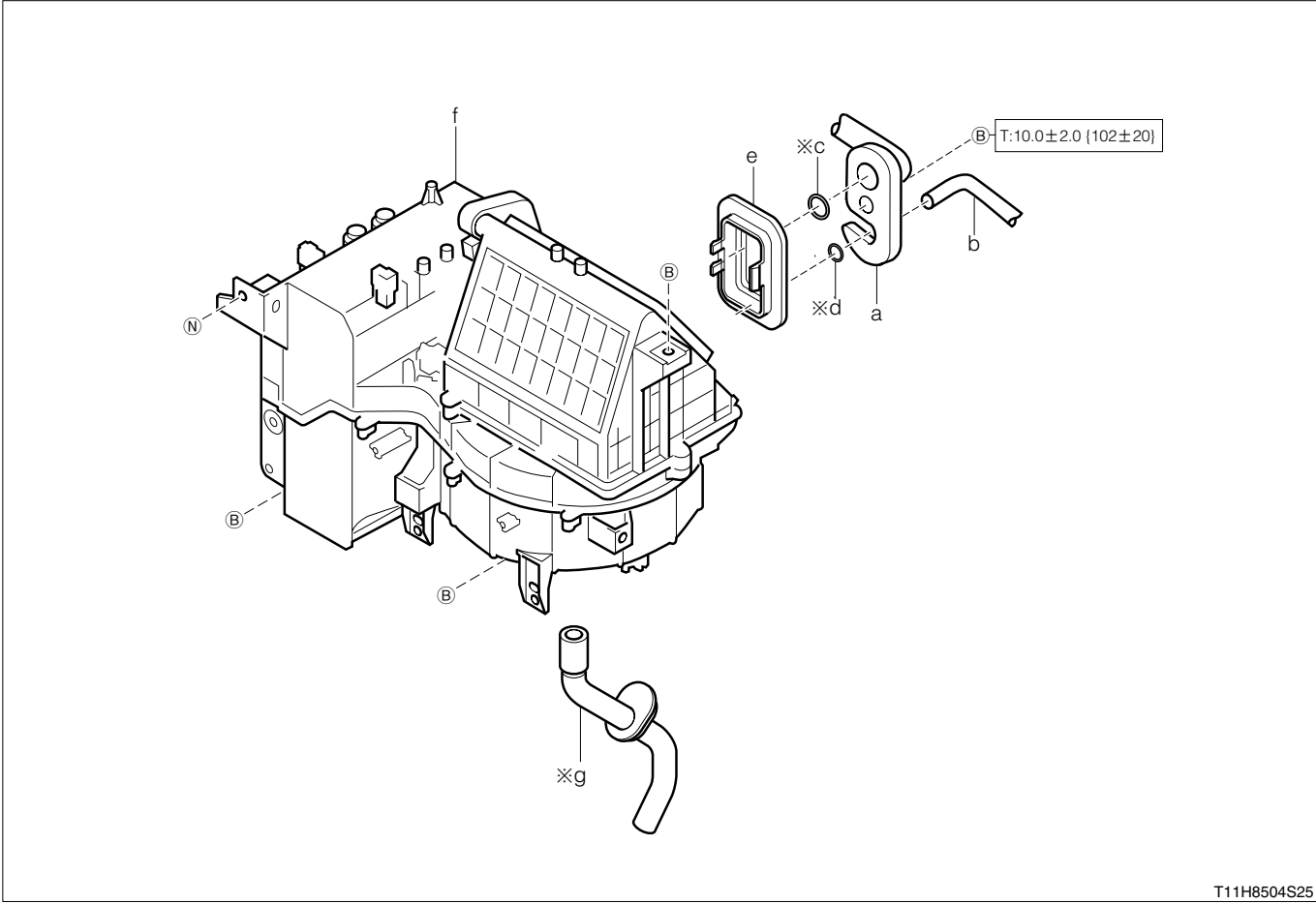
4-3-1 OPERATION BEFORE REMOVAL

1. Drain refrigerant.
Refer to Page K1-5.
2. Drain the cooling water.
3. Remove the panel, instrument.
Refer to Page I2-15.

K1-15

4-3-2 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



T11H8504S25

Unit: N•m{kgf•cm}

※: Non-reusable parts

(2) Removal and installation procedures

1	a	Tube, suction, No.1	6	f	Unit Ay, air conditioner
2	b	Tube, liquid, No.1	7	g	Hose, drain cooler
3	c	Ring, O			
4	d	Ring, O			
5	e	Cover, cooler, No.1			

4-3-3 OPERATION AFTER INSTALLATION

1. Install the panel instrument.
Refer to Page I2-15.

2. Fill cooling water.
3. Replenish refrigerant.
Refer to Page K1-5.

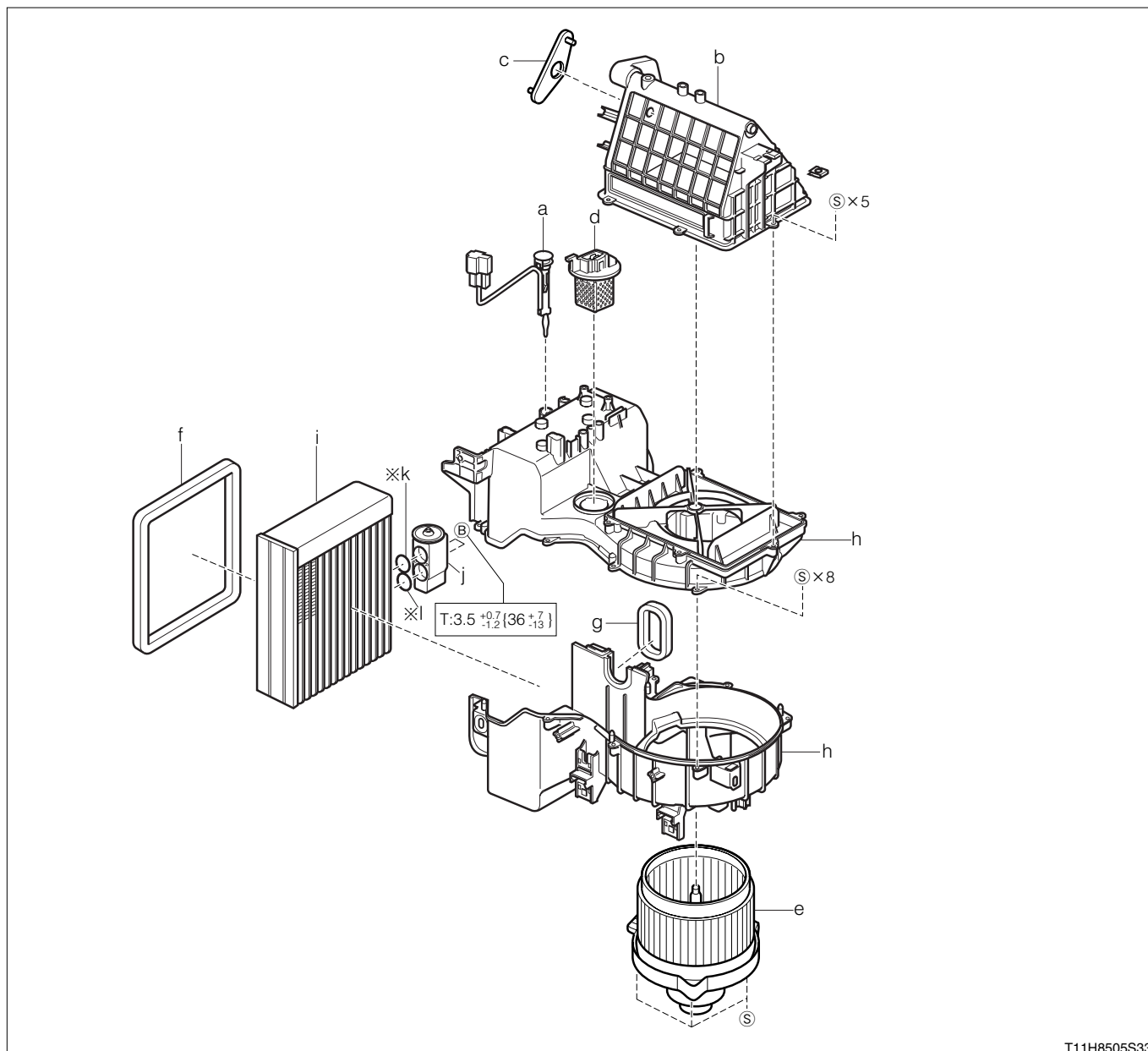
4-4 DISASSEMBLING AND ASSEMBLING(LHD VEHICLES)

4-4-1 OPERATION BEFORE DISASSEMBLY

1. Remove the unit assembly, air conditioner.
Refer to Page K1-14.

4-4-2 DISASSEMBLY AND ASSEMBLY PROCEDURES

(1) Components



T11H8505S33

Unit: N•m{kgf•cm}

※: Non-reusable parts

(2) Disassembling and assembling procedure

1 a Thermistor, cooler	7 g Packing, cooler
2 b Case, air damper	8 h Case S/A, cooling unit
3 c Element, air refiner	9 i Evaporator S/A
4 d Resistor, blower	10 j Valve, expansion
5 e Motor S/A, blower w/fan	11 k Ring, O
6 f Packing, cooler	12 l Ring, O

4-4-3 OPERATION AFTER ASSEMBLY

1. Install the unit assembly, air conditioner.
Refer to Page K1-14.

5 HEATER UNIT

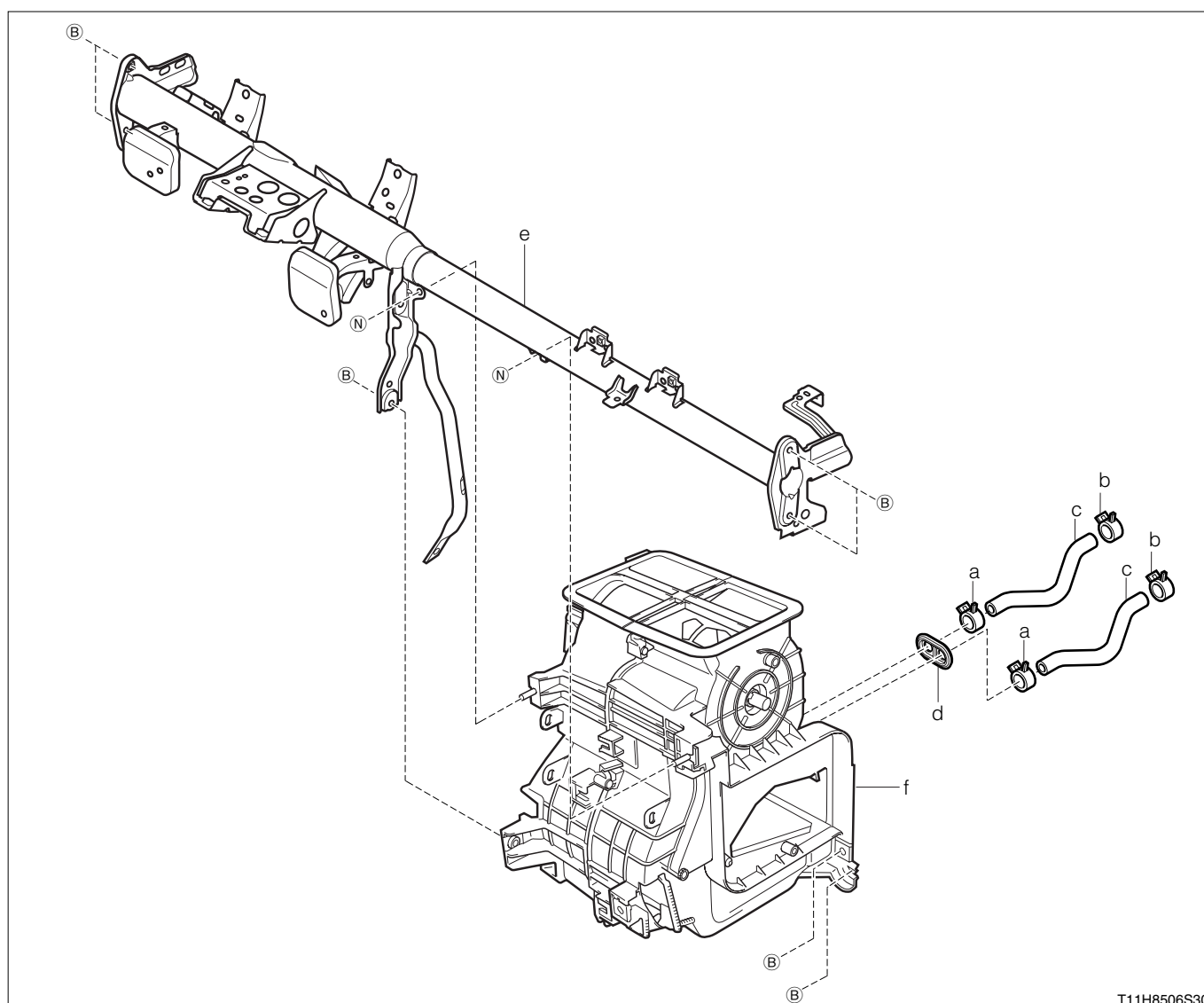
5-1 REMOVAL AND INSTALLATION(LHD VEHICLES)

5-1-1 OPERATION BEFORE REMOVAL

1. Drain refrigerant.
Refer to Page K1-5.
2. Drain the cooling water.
3. Remove the panel, instrument.
Refer to Page I2-15.
4. Remove the unit assembly, air conditioner.
Refer to Page K1-10.

5-1-2 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



(2) Removal and installation procedures

1	a	Clip	6	f	Radiator Ay, heater
2	b	Clip			
3	c	Hose, water, No.1			
4	d	Grommet			
5	e	Reinforcement S/A, instrument panel			

5-1-3 OPERATION AFTER INSTALLATION

1. Install the unit assembly, air conditioner.

Refer to Page K1-10.

2. Install the panel instrument.

Refer to Page I2-15.

3. Fill cooling water.

4. Replenish refrigerant.

Refer to Page K1-5.

5-2 DISASSEMBLING AND ASSEMBLING(LHD VEHICLES)

5-2-1 OPERATION BEFORE DISASSEMBLY

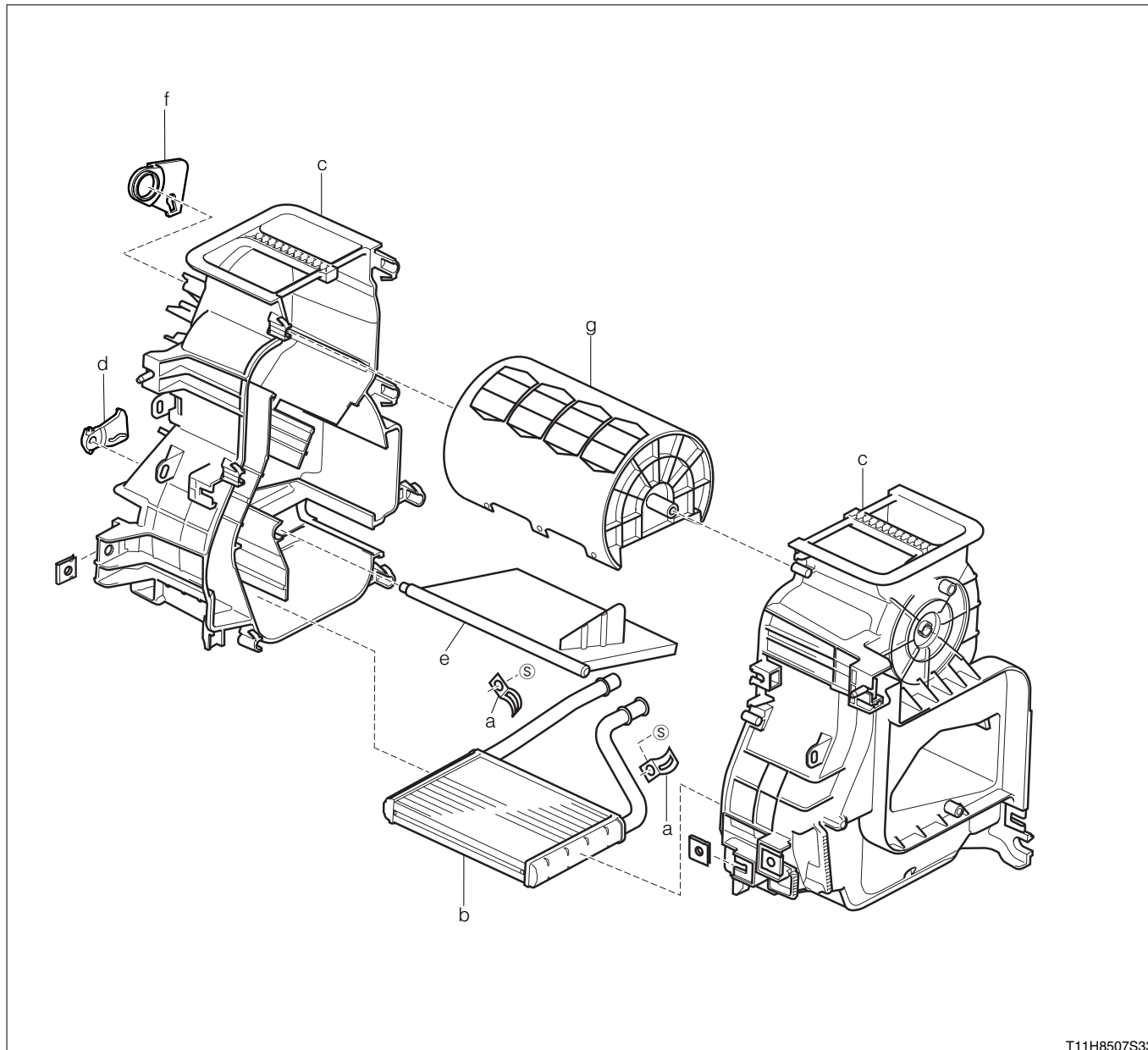
1. Remove the radiator assembly, heater.

Refer to Page K1-17.

K1-19

5-2-2 DISASSEMBLY AND ASSEMBLY PROCEDURES

(1) Components



T11H8507S33

(2) Disassembling and assembling procedure

1	a	Clamp, cooler, No.1	6	f	Element, air refiner (for mode selection)
2	b	Unit S/A, radiator heater	7	g	Damper, heater duct (for mode selection)
▲ 3	c	Case, heater, RH/LH			
4	d	Element, air refiner (for air mixture)			
5	e	Damper, heater duct (for air mixture)			

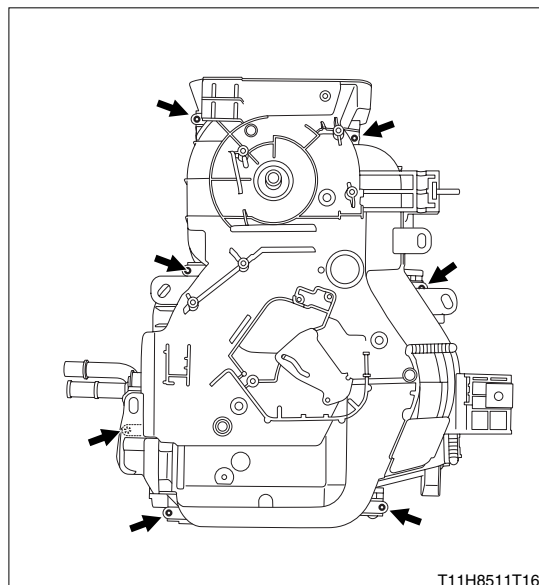
5-2-3 POINTS OF ASSEMBLY

(1) Case, heater, RH/LH

1. When the case is used again, attach and tighten the screws supplied as replacement parts at the (seven) positions shown in the right figure.

NOTE

- Screw part number : 88466-87202-000



5-2-4 OPERATION AFTER ASSEMBLY

1. Install the radiator assembly, heater.
Refer to Page K1-17.

6 COMPRESSOR

6-1 REMOVAL AND INSTALLATION

6-1-1 ARTICLES TO BE PREPARED

Instrument

Torque wrench

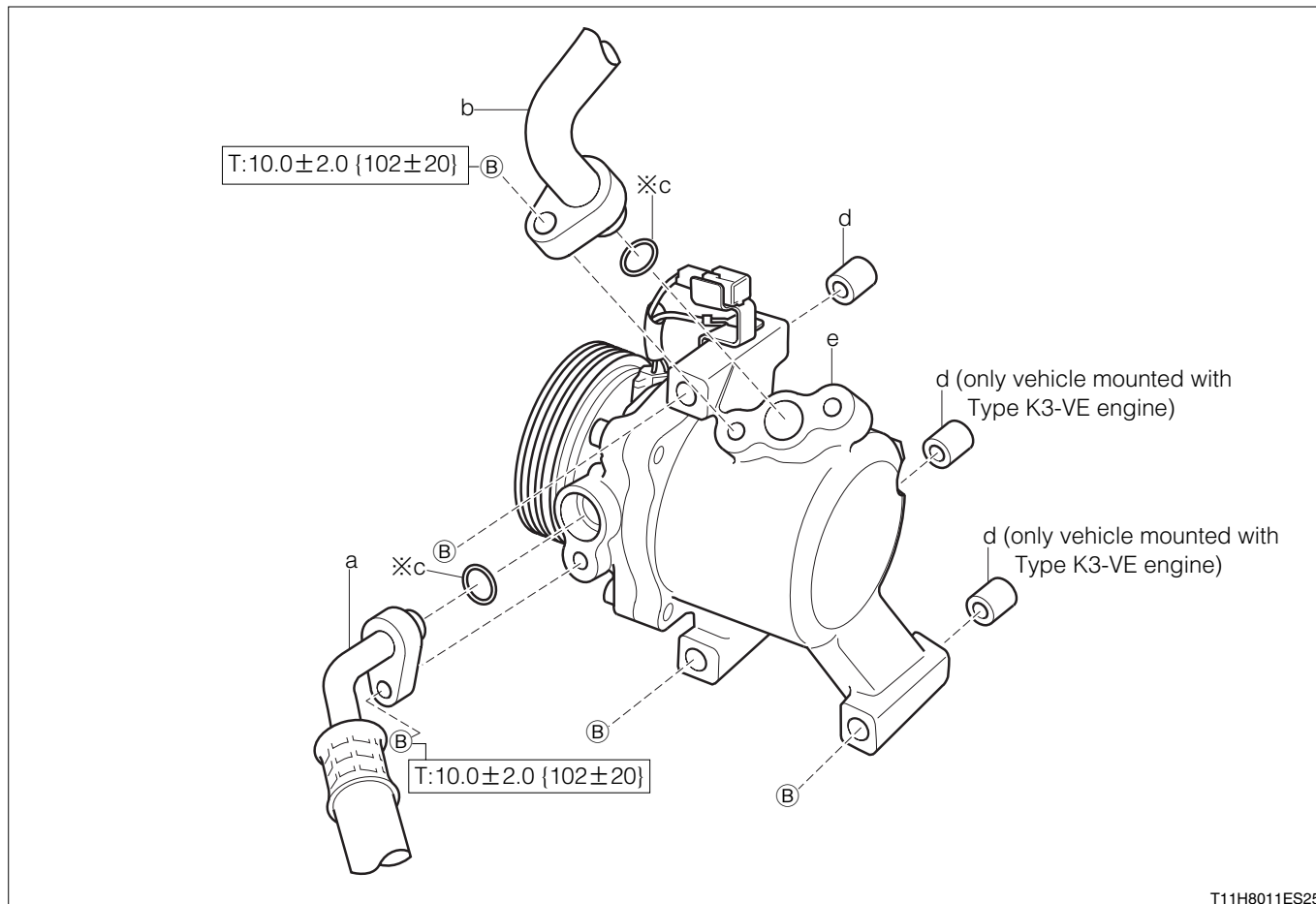
6-1-2 OPERATION BEFORE REMOVAL

1. Drain refrigerant.
Refer to Page K1-5.
2. Remove the cover, front bumper.
Refer to Page I2-1.
3. Remove the V-ribbed belt.

K1-21

6-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



T11H8011ES25

Unit: N·m{kgf·cm}

※: Non-reusable parts

(2) Removal and installation procedures

- 1 a Hose, suction
- 2 b Hose, discharge
- 3 c Ring, O
- 4 d Stay, compressor
- ▲ 5 e Compressor Ay, W/magnet clutch

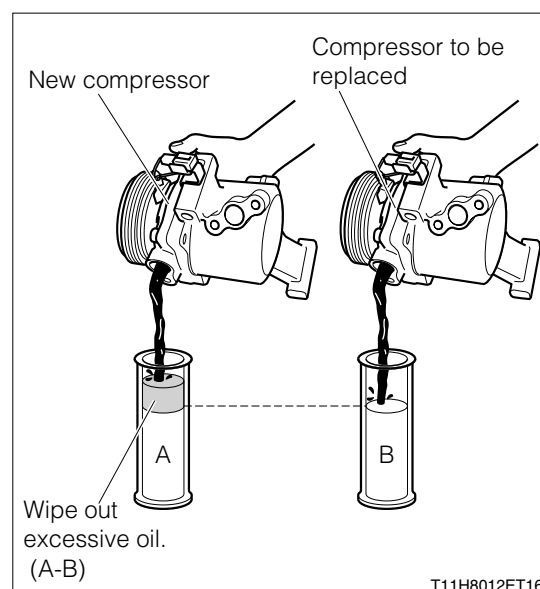
6-1-4 POINTS OF INSTALLATION

(1) Compressor Ay, W/magnet clutch

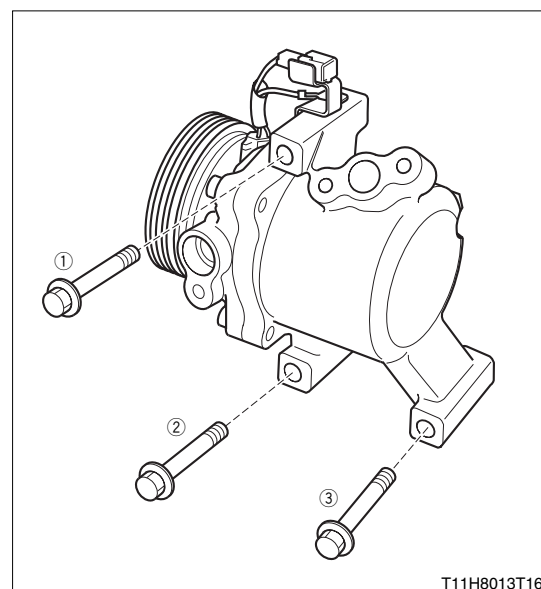
1. When a new compressor assembly is installed, drain the excessive oil of the new compressor so that the amount of the oil may become the same as that of the oil inside the compressor to be replaced.

NOTE

- The new compressor Ay contains the amount of oil required for the full air-conditioning cycle. Therefore, if only the compressor Ay is to be replaced, it is necessary to drain the excess oil which remains in the condenser and the cooling unit.



2. Make sure to tighten the mounting bolts for mounting the compressor Ay in the sequence of ①→②→③ in order to prevent abnormal sound and/or loosening of a belt.



6-1-5 OPERATION AFTER INSTALLATION

1. Replenish refrigerant.
Refer to Page K1-5.
2. Reinstall the V-ribbed belt.
3. When a new belt has been assembled, operate the compressor for five minutes or more. Then, adjust the belt tension (deflection amount) again.
Refer to Page K1-4.
4. Install the front bumper cover.
Refer to Page I2-1.

6-2 DISASSEMBLING AND ASSEMBLING

6-2-1 ARTICLES TO BE PREPARED

Tool

Snap ring pliers

K1-23

Instrument

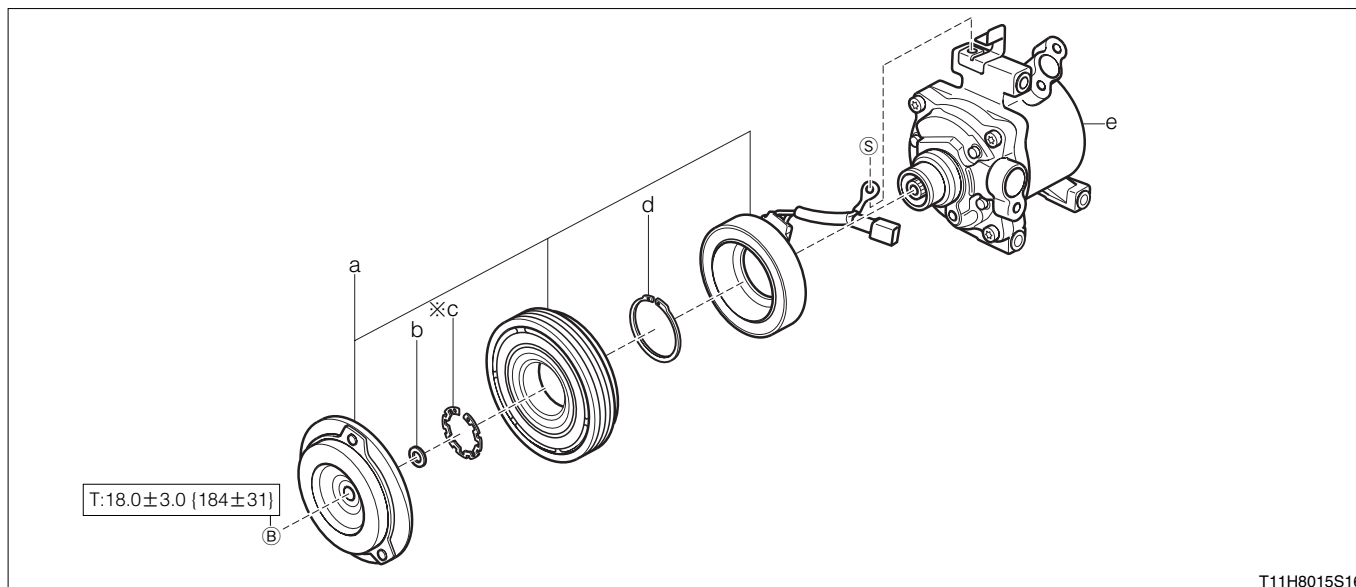
Torque wrench

6-2-2 OPERATION BEFORE DISASSEMBLY

1. Remove the compressor Ay, w/magnet clutch.
Refer to Page K1-20.

6-2-3 DISASSEMBLY AND ASSEMBLY PROCEDURES

(1) Components



Unit: N·m{kgf·cm}

※: Non-reusable parts

(2) Disassembling and assembling procedure

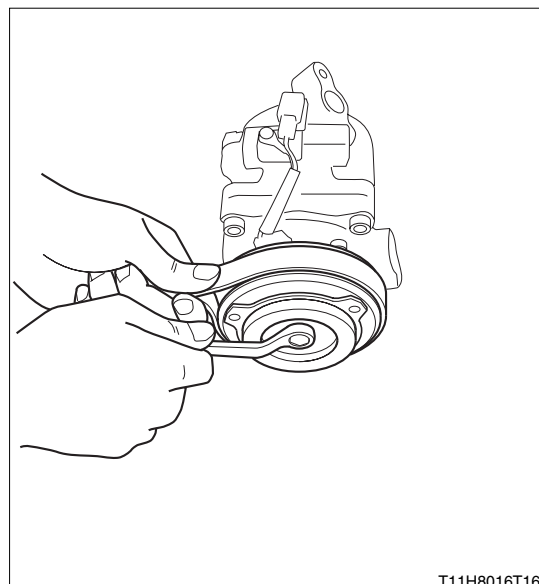
- ▼ ▲ 1 a Clutch Ay, magnet
- 2 b Washer, plate
- 3 c Ring, snap
- ▲ 4 d Ring, snap
- ▲ 5 e Compressor Ay

6-2-4 POINTS OF DISASSEMBLY

(1) Clutch Ay, magnet

1. Energize the clutch assembly, thus securing the hub and rotor.

2. Wind the V-belt around the pulley section and secure it by your hand.
3. Remove the bolt.



T11H8016T16

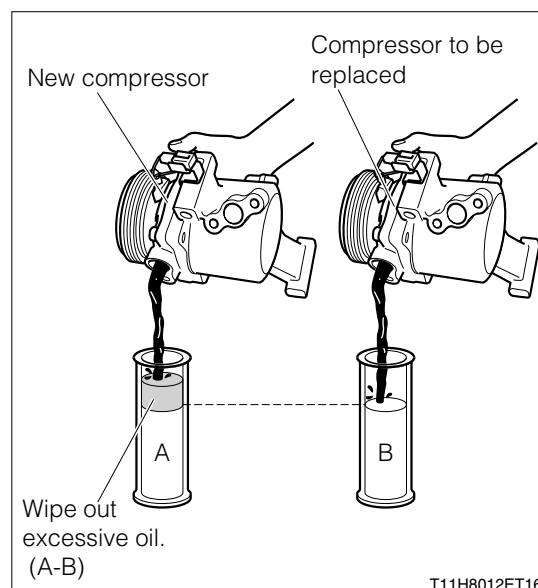
6-2-5 POINTS OF ASSEMBLY

(1) Compressor Ay

1. When a new compressor assembly is installed, drain the excessive oil of the new compressor so that the amount of the oil may become the same as that of the oil inside the compressor to be replaced.

NOTE

- The new compressor Ay contains the amount of oil required for the full air-conditioning cycle. Therefore, if only the compressor Ay is to be replaced, it is necessary to drain the excess oil which remains in the condenser and the cooling unit.



T11H8012ET16

(2) Snap ring

1. Assemble the ring with a chamfered surface on the pulley side.

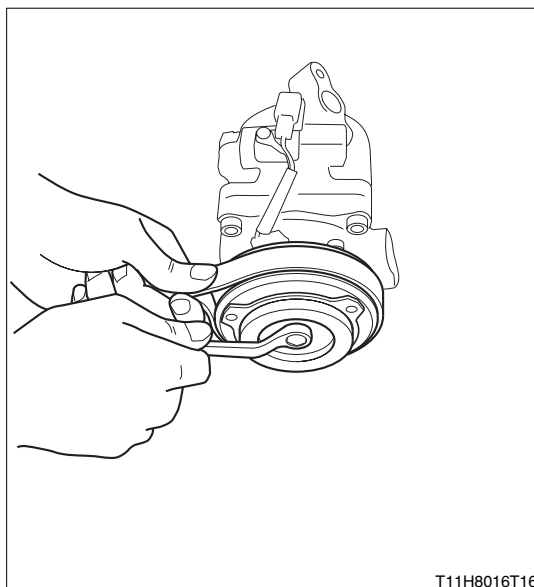
TOOL: Snap ring pliers

(3) Magnet clutch Ay

1. Tighten the clutch assembly attaching bolt as far as it can be tightened.
2. Energize the clutch assembly, thus securing the hub and rotor.

K1-25

3. Wind the V-belt around the pulley section and secure it by your hand.
4. Securely tighten the bolt.
5. Check the air gap of the clutch assembly. If the check results fail to conform to the specified value, remove the magnet clutch hub and perform the adjustment by means of the washer.
Refer to Page K1-2.



6-2-6 OPERATION AFTER ASSEMBLY

1. Install the compressor Ay W/magnet clutch .
Refer to Page K1-20.

7 CONDENSER

7-1 REMOVAL AND INSTALLATION

7-1-1 ARTICLES TO BE PREPARED

Instrument

Torque wrench

Lubricant,adhesive,others

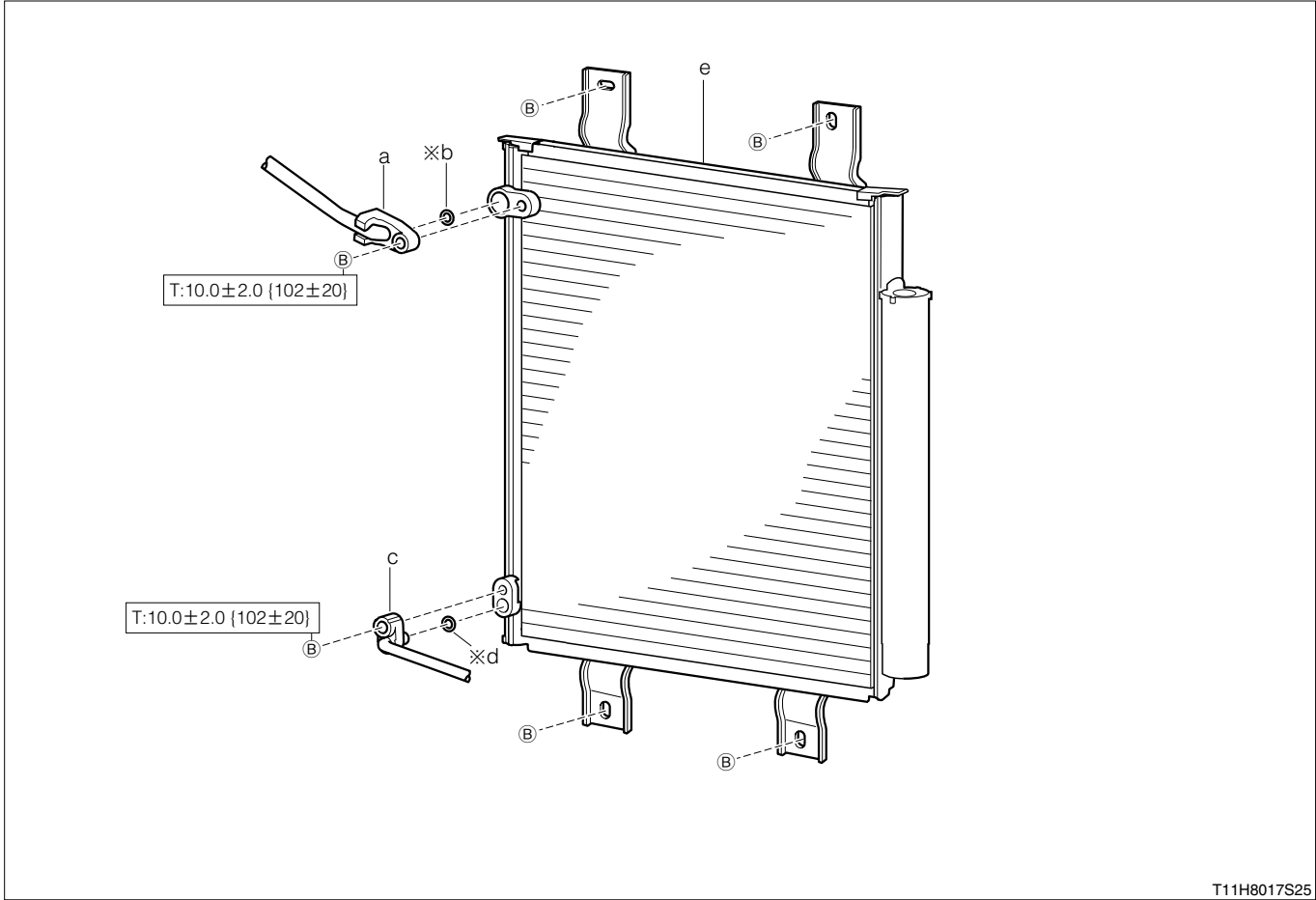
Compressor oil (ND—OIL8)

7-1-2 OPERATION BEFORE REMOVAL

1. Drain refrigerant.
Refer to Page K1-5.
2. Remove the front bumper cover.
Refer to Page I2-1.
3. Remove the upper radiator support.
Refer to Page B6-4.

7-1-3 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



Unit: N•m{kgf•cm}

※: Non-reusable parts

(2) Removal and installation procedures

- 1 a Hose, suction
- 2 b Ring, O
- 3 c Hose, discharge
- 4 d Ring, O
- ▲ 5 e Condenser Ay

7-1-4 POINTS OF INSTALLATION

(1) Condenser Ay

1. When the condenser is replaced with a new one, replenish the following amount of compressor oil.

REPLACEMENT PARTS	Condenser
Replenishing amount of compressor oil	20

LUBRICANT: Compressor oil (ND—OIL8)

K1-27

7-1-5 OPERATION AFTER INSTALLATION

1. Install the upper radiator support.
Refer to Page B6-4.
2. Install the front bumper cover.
Refer to Page I2-1.
3. Replenish refrigerant.
Refer to Page K1-5.

8 BLOWER MOTOR

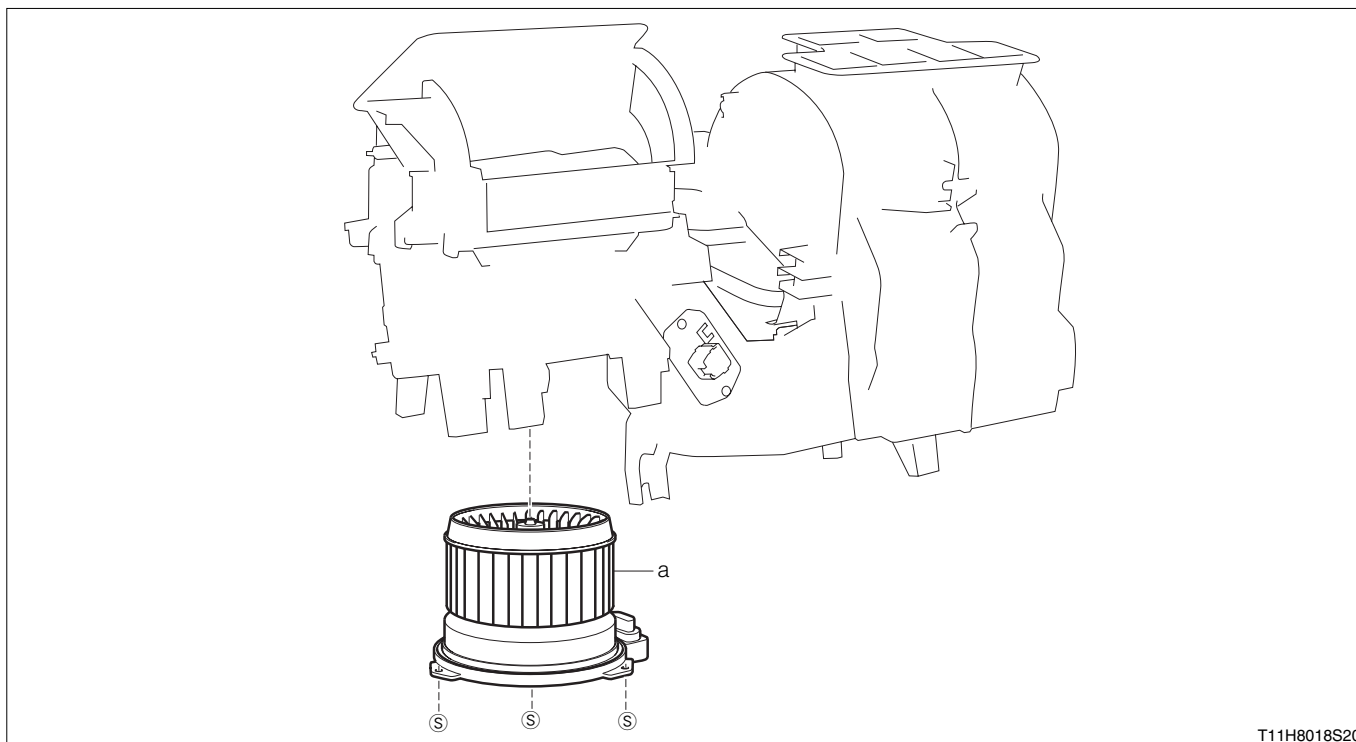
8-1 REMOVAL AND INSTALLATION(RHD VEHICLES)

8-1-1 OPERATION BEFORE REMOVAL

1. Remove the No.1 instrument panel under cover.
Refer to Page I2-15.
2. Remove the fuel injection computer Ay.
Refer to Page B8-1.

8-1-2 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



T11H8018S20

(2) Removal and installation procedures

- 1 a Motor Ay, W/fan

8-1-3 OPERATION AFTER INSTALLATION

1. Install the fuel injection computer Ay.
Refer to Page B8-1.
2. Install the No.1 instrument panel under cover.
Refer to Page I2-15.

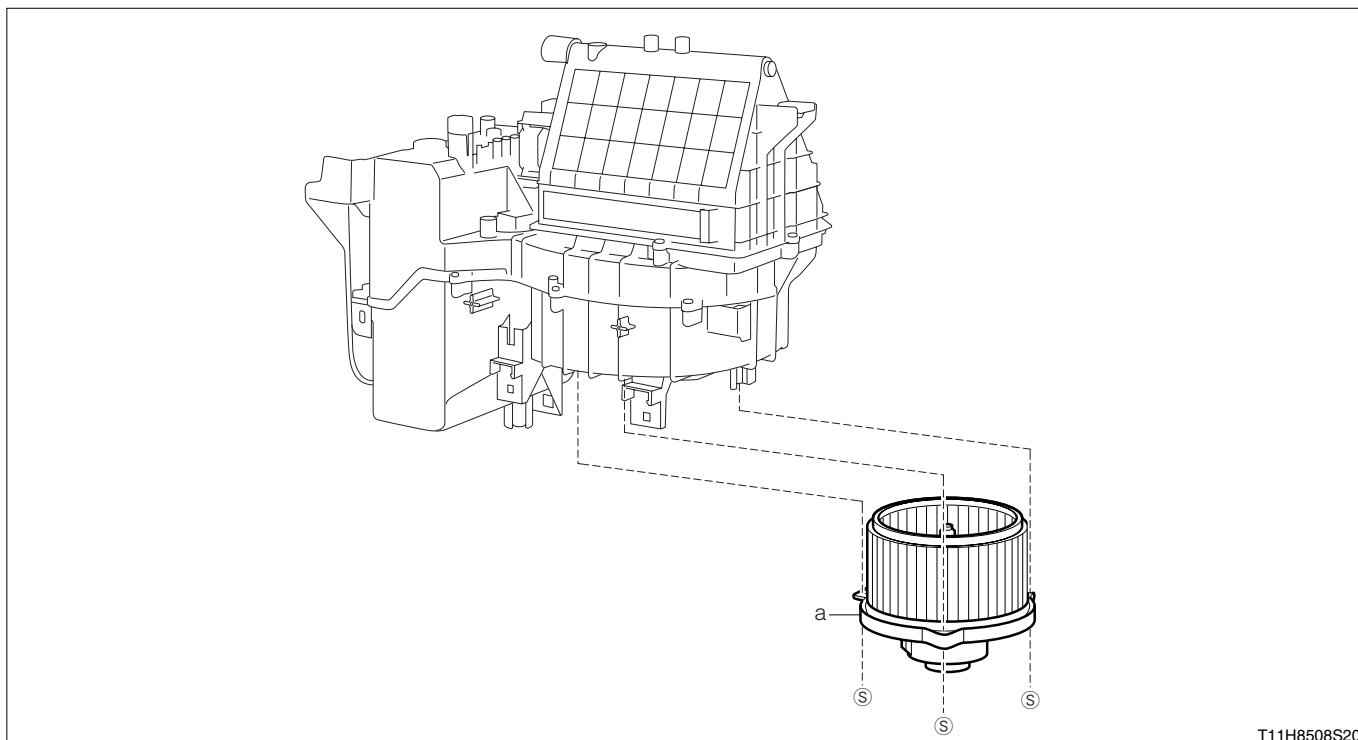
8-2 REMOVAL AND INSTALLATION(LHD VEHICLES)

8-2-1 OPERATION BEFORE REMOVAL

1. Remove the No.1 instrument panel under cover.
Refer to Page I2-15.
2. Remove the fuel injection computer Ay.
Refer to Page B8-1.

8-2-2 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



T11H8508S20

(2) Removal and installation procedures

- 1 a Motor S/A, blower W/fan

8-2-3 OPERATION AFTER INSTALLATION

1. Install the fuel injection computer Ay.
Refer to Page B8-1.
2. Install the No.1 instrument panel under cover.
Refer to Page I2-15.

9 BLOWER RESISTOR

9-1 REMOVAL AND INSTALLATION(RHD VEHICLES)

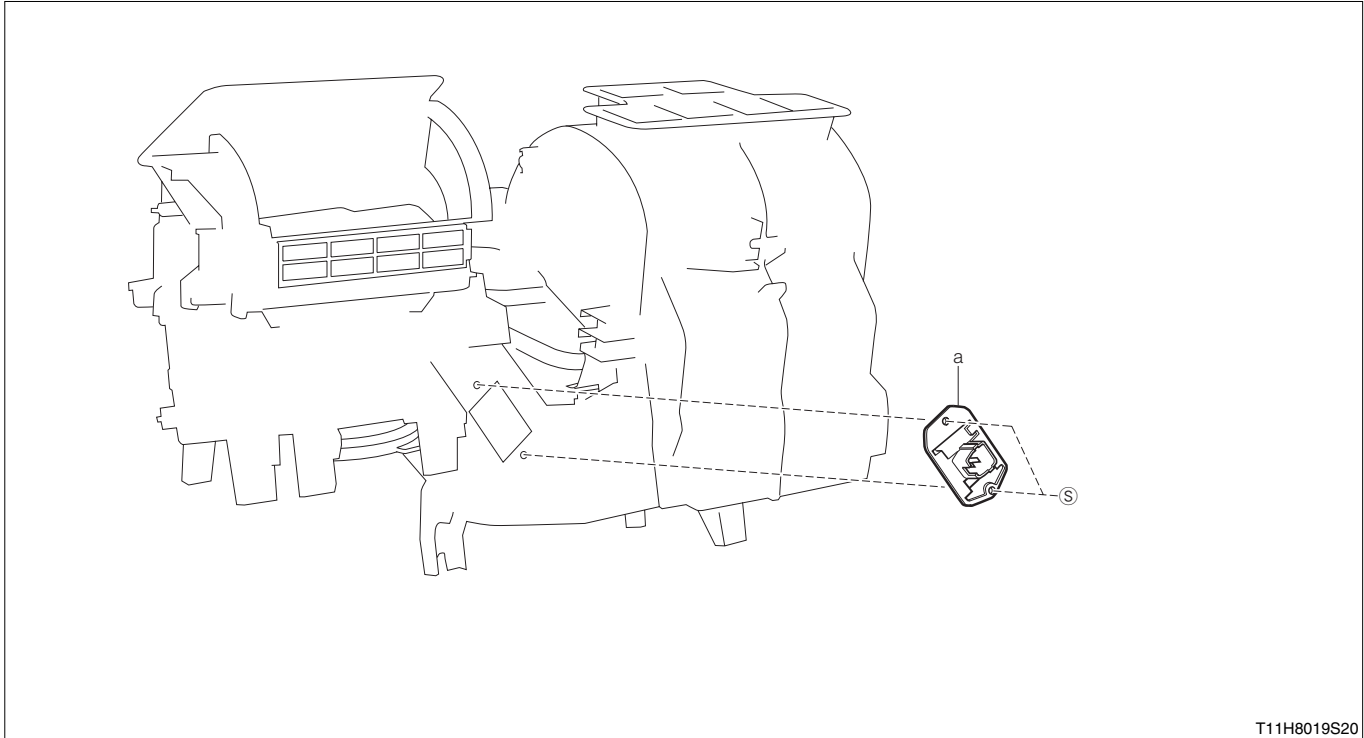
9-1-1 OPERATION BEFORE REMOVAL

1. Remove the No.1 instrument panel under cover.
Refer to Page I2-15.

K1-29

9-1-2 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



T11H8019S20

(2) Removal and installation procedures

- 1 a Resistor, blower

9-1-3 OPERATION AFTER INSTALLATION

1. Install the No.1 instrument panel under cover.
Refer to Page I2-15.

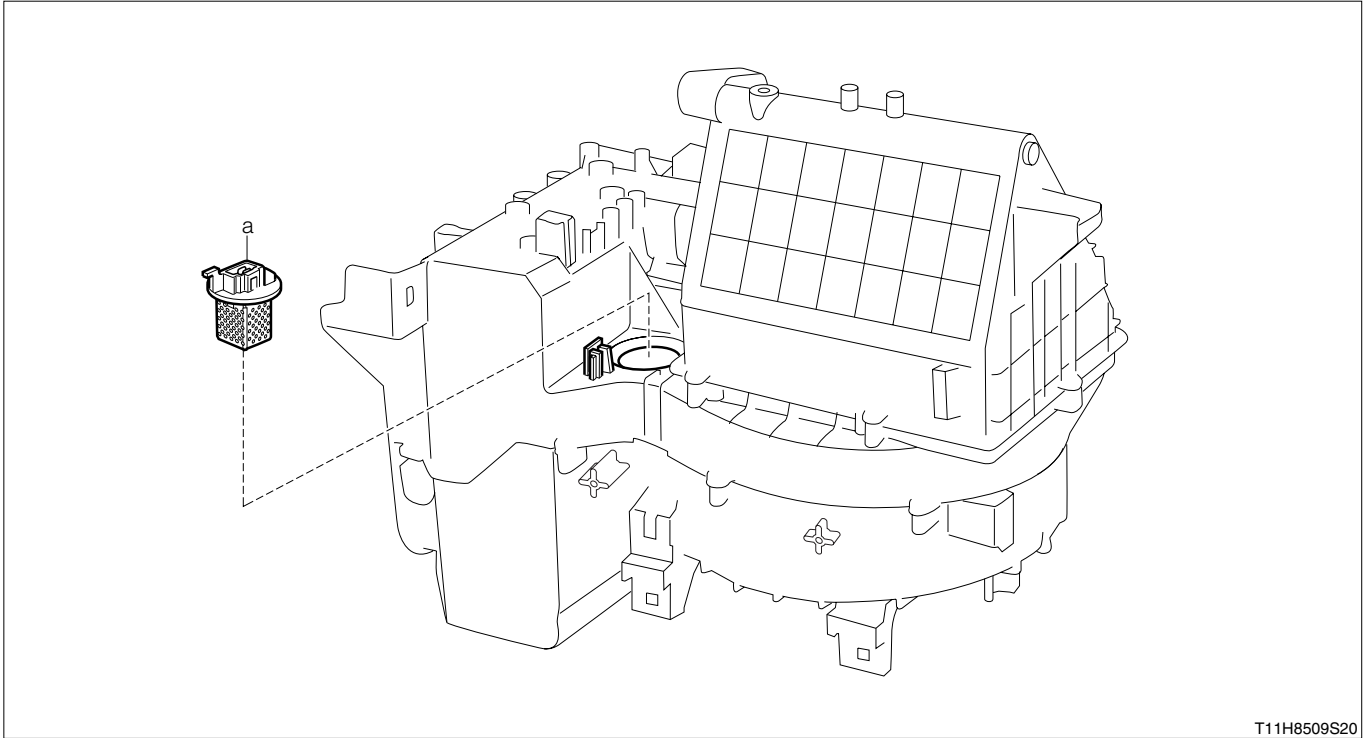
9-2 REMOVAL AND INSTALLATION(LHD VEHICLES)

9-2-1 OPERATION BEFORE REMOVAL

1. Remove the instrument panel door.
Refer to Page I2-15.
2. Remove the No.1 instrument panel box.
Refer to Page I2-15.

9-2-2 REMOVAL AND INSTALLATION PROCEDURES

(1) Components



T11H8509S20

(2) Removal and installation procedures

- 1 a Resistor, blower

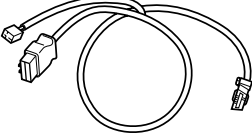
9-2-3 OPERATION AFTER INSTALLATION

- 1. Install the No.1 instrument panel box.
Refer to Page I2-15.
- 2. Install the instrument panel door.
Refer to Page I2-15.

10MANUAL AIR CONDITIONER SYSTEM

10-1 ARTICLES TO BE PREPARED

SST

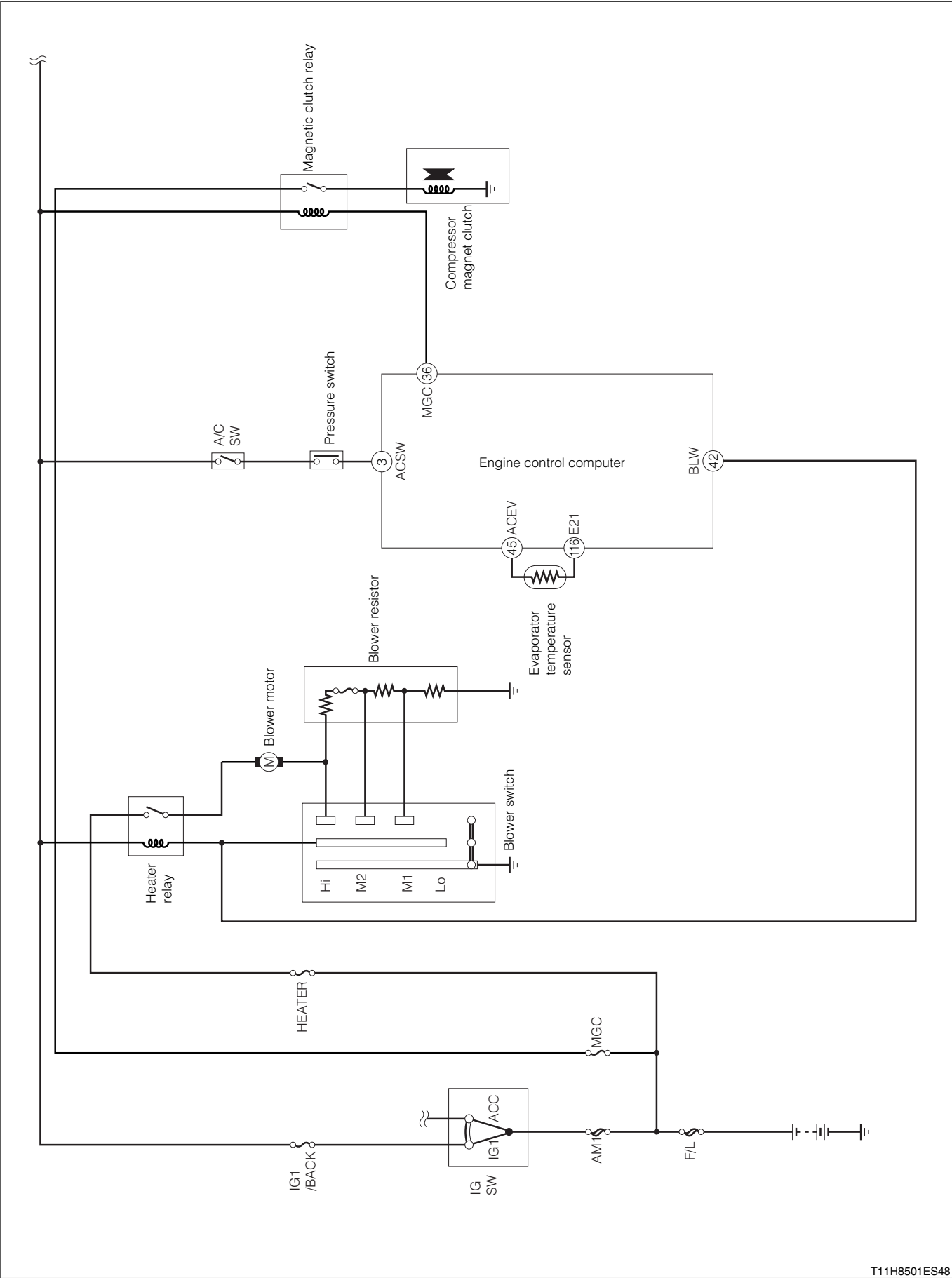
Shape	Part No.	Part name
	09991-87404-000 (09991-87401-000)	Wire,engine control system inspection
	09991-87403-000	Wire,diagnosis check

Instrument

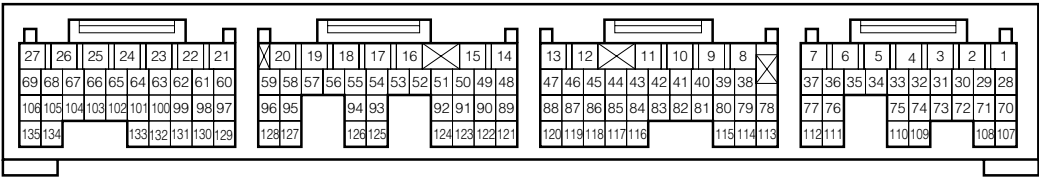
Electrical tester

Tool

Manifold gauge



10-3 ARRANGEMENT OF ECU TERMINAL

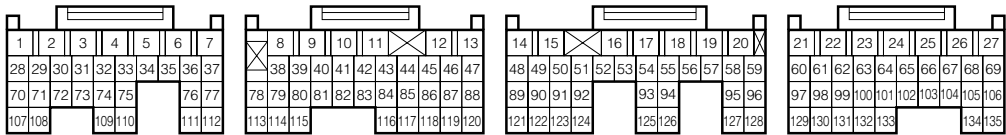


H11E6091S10

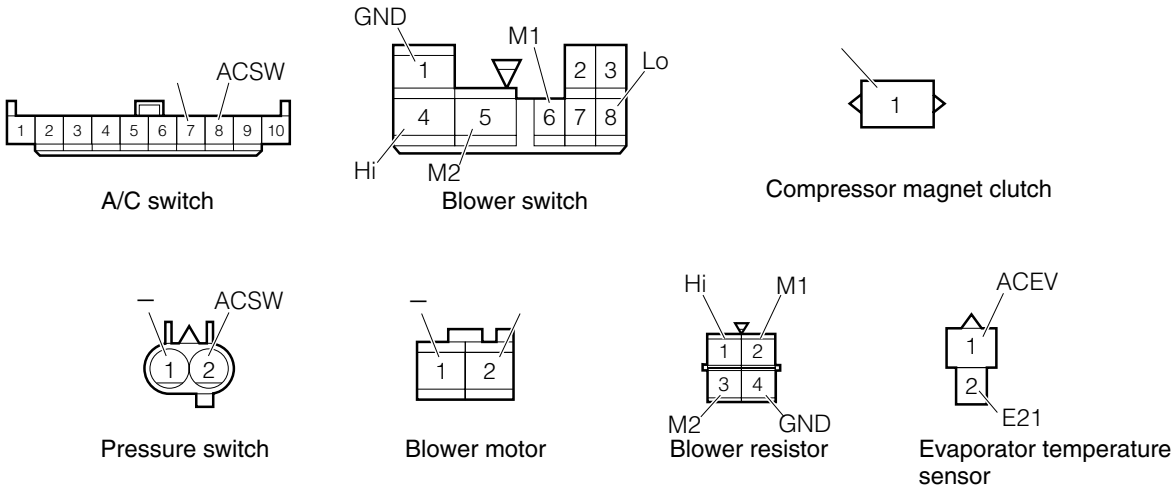
Engine Control Computer terminal name

Terminal No.	Terminal code	Terminal name
3	ACSW	A/C switch input
36	MGC	Magnet clutch drive output
42	BLW	Heater blower operation input
45	ACEV	Evaporator temperature sensor input
116	E21	Sensor earth

10-4 ARRANGEMENT OF VEHICLE HARNESS SIDE CONNECTOR TERMINALS



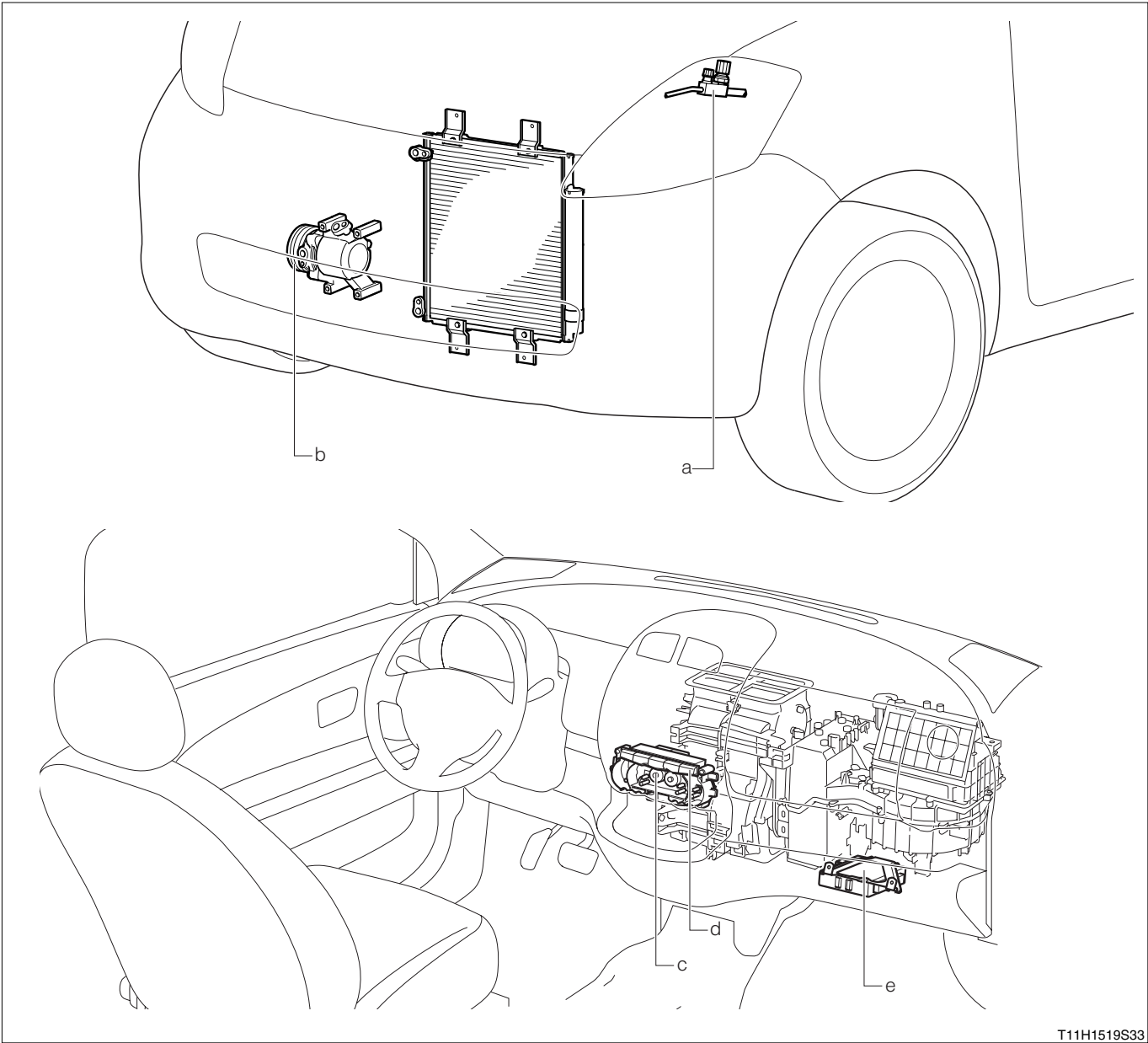
Engine control computer



T11H8502ES25

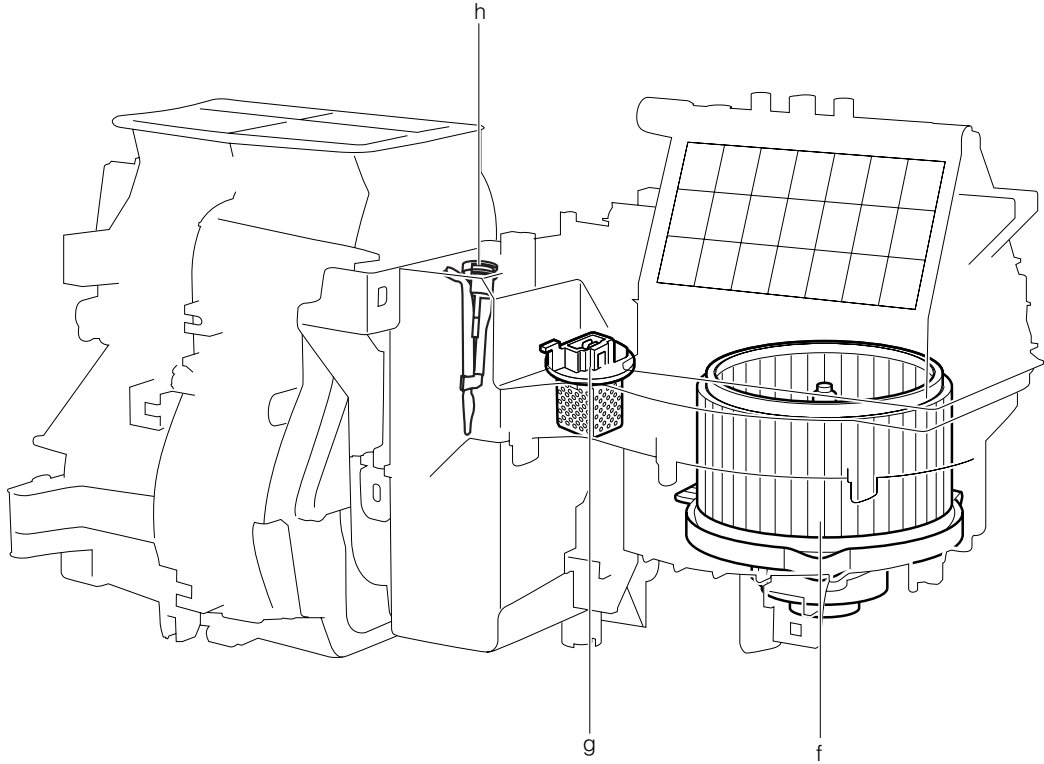
K1-33

10-5 LOCATION OF COMPONENTS(LHD)



T11H1519S33

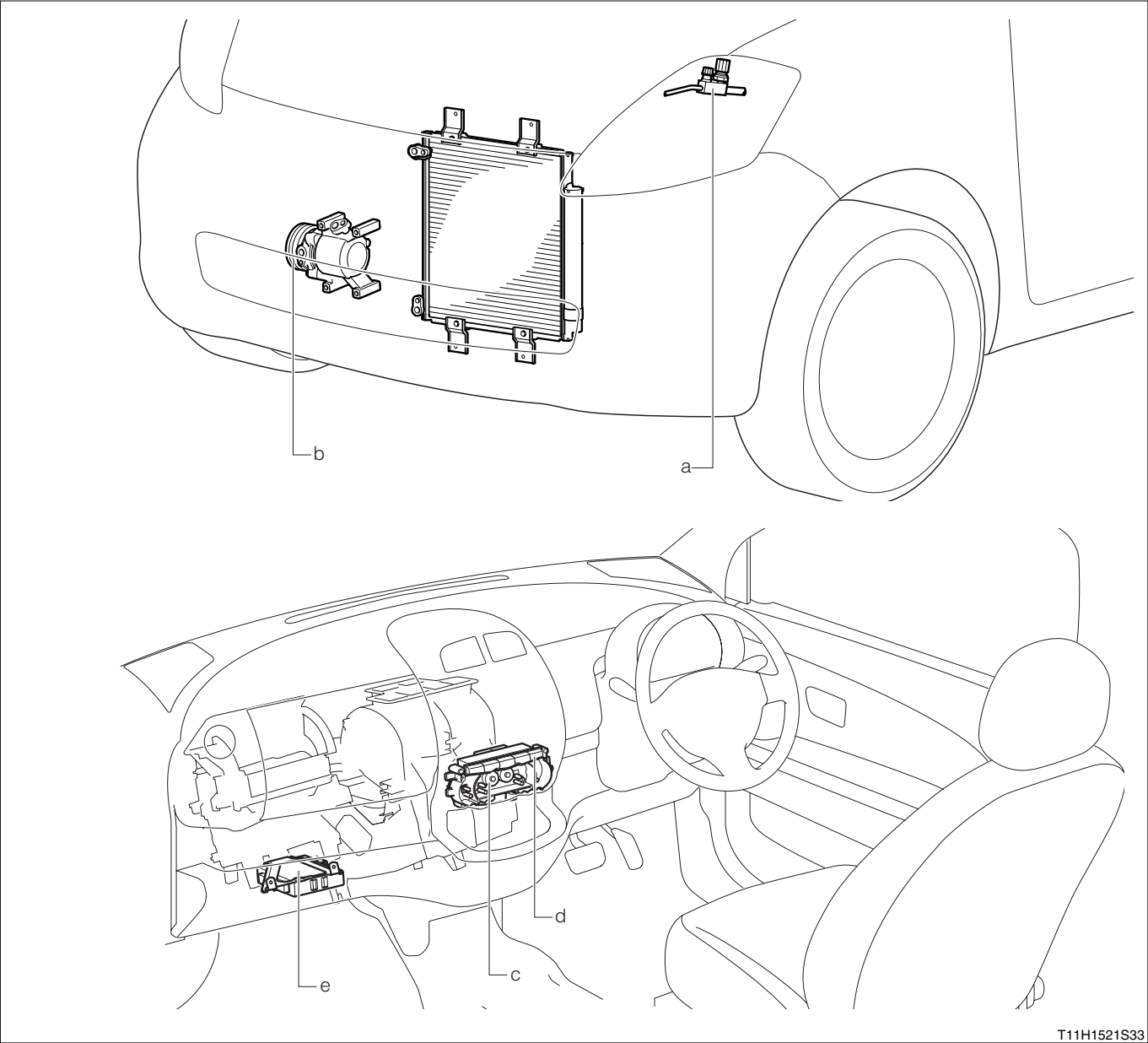
a	Pressure switch
b	Compressor magnet clutch
c	Blower switch
d	A/C switch
e	Engine control computer



T11H1520S25

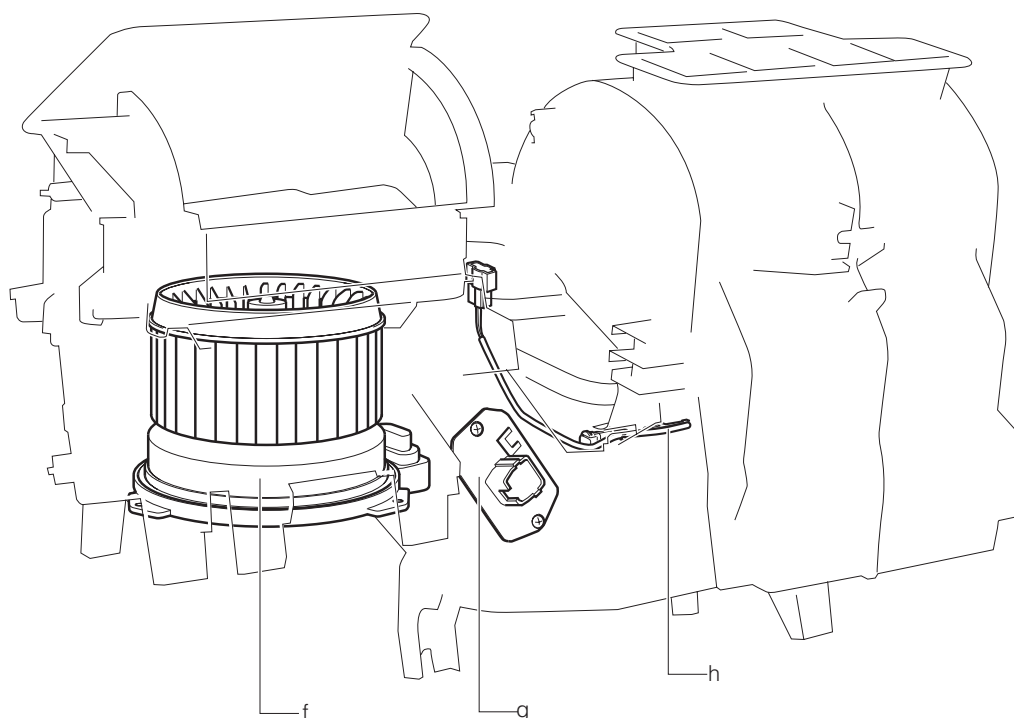
f	Blower motor
g	Blower resistor
h	Evaporator temperature sensor

10-6 LOCATION OF COMPONENTS(RHD)



T11H1521S33

a	Pressure switch
b	Compressor magnet clutch
c	Blower switch
d	A/C switch
e	Engine control computer



T11H1522S25

f	Blower motor
g	Blower resistor
h	Evaporator temperature sensor

10-7 HOW TO PROCEED WITH TROUBLE SHOOTING

10-7-1 INQUIRY

1. In your attempt to remove the causes for a malfunction of the vehicle, you will not be able to remove the causes unless you actually confirm the malfunctioning phenomenon. No matter how long you continue operations, the vehicle may not resume the normal state unless you confirm the malfunctioning phenomenon. The inquiry with the customer is a vital information collecting activity which is to be conducted previous to the confirmation of malfunctioning phenomenon.
2. This inquiry will provide you with an important clue in an effort to reproduce the malfunctioning phenomenon. Furthermore, the information obtained by the inquiry can be referred to during the trouble-shooting. Hence, instead of making general questions, it is necessary to focus your questions on the items related to the malfunction.

(1) DIAGNOSIS BY INTERVIEW SHEET FOR HEATER AND AIR CONDITIONER SYSTEM

Checked by		Check date	Day Month (day of week)

Customer information

Name of customer		Gender of customer (Male, female)	Age [approx.]	Occupation []
	Mr./Ms.	Area where vehicle is mainly used	Urban, suburb, seashore, mountain, others	Parking place Outdoor, indoor

K1-37

Details of vehicle

Date when vehicle was brought to workshop	Day Month (day of week)	Date when malfunction took place	Day Month (day of week)	Repair history	No, Yes (How many times?)	
Frame No.		Registration date	Day Month Year	Vehicle model		
Engine type		Transmission	5M/T · 3A/T · 4A/T · CVT electronically-controlled 4A/T		Driving	2WD · 4WD
Running distance	km	Equipment	Tire [] · Wheel [Steel · Aluminum]			

Weather

☐ Fine	☐ Cloudy	☐ Rainy	☐ Snow	☐ Other()
Temperature(Approx. °C)				

Frequency of malfunction

☐ Always	☐ Under certain condition()	☐ Sometimes()

Phenomenon

☐ Poor cooling performance.
☐ The blower motor will not rotate.
☐ The blower motor will not change its speed.
☐ The temperature of the air outlet does not change.
☐ The air outlet can not be switched.
☐ No switching can be made between the indoor air and outdoor air.
☐ The compressor magnet clutch will not be turned ON.
☐
☐ Other

10-8 TROUBLE SHOOTING ACCORDING TO MALFUNCTION PHENOMENA

10-8-1 LIST OF POINTS TO BE CHECKED ACCORDING TO MALFUNCTION PHENOMENA

Malfunction phenomena	Check points	Reference page
Poor cooling performance.	1. Check of cooling performance. 2. Confirmation of normal operation of compressor 3. Confirmation of normal operation of radiator fan 4. Confirmation of normal operation of blower motor 5. Measurement of refrigerant pressure	※1
The blower motor will not rotate.	1. Check of fuse 2. Check of heater relay system 3. Check of blower motor system 4. Check of blower switch system 5. Check of blower register system 6. Check of wire harness and connector	1. — 2. ※2 3. ※2 4. ※2 5. ※2 6. —
The blower motor will not change its speed.	1. Check of blower switch system 2. Check of blower register system 3. Check of wire harness and connector	1. ※2 2. ※2 3. —
The compressor magnet clutch will not be turned ON.	1. Check of fuse 2. Check of magnet clutch relay system 3. Check of compressor magnet clutch system 4. Check of engine control computer switch signal system (Air conditioner switch system) 5. Check of pressure switch system 6. Check of air conditioner switch system 7. Check of evaporator temperature sensor 8. Check of engine control computer 9. Check of wire harness and connector	1. — 2. ※2 3. ※2 4. ※4 5. ※2 6. ※2 7. ※5 8. ※3 9. —

※1

Refer to Page K1-2.

※2

Refer to Page K1-41.

※3

Refer to Page K1-43.

※4

Refer to Page B8-200.

※5

Refer to Page B8-207.

10-8-2 TROUBLE-SHOOTING ACCORDING TO MALFUNCTION PHENOMENON ITEMS

(1) Poor cooling performance

▷1. Check of cooling performance

1. Check cooling performance.

Refer to Page K1-2.

▼ If it is OK, the cooling performance is satisfactory.▼ If it is NG, go to step ▷2.

K1-39

▷2. Compressor operation check

1. Check the operation of the compressor when the A/C switch is turned "ON".

SPECIFIED VALUE: The magnet clutch is turned "ON" and the compressor is activated.

▼ If it is OK, go to step ▷3).

▼ In the case of NG, perform the troubleshooting for the problem "Compressor magnet clutch is not turned ON."

Refer to Page K1-38.

▷3. Radiator fan operation check

1. Check the operation of the radiator fan when the compressor is turned "ON".

SPECIFIED VALUE: The fan shall rotate.

▼ If it is OK, go to step ▷4.

▼ In the case of NG, check the radiator fan circuit.

Refer to Page B8-182.

▷4. Blower motor operation check

1. Check the operation of the blower motor.

SPECIFIED VALUE: Air volume shall change according to the blower switch operation.

▼ If it is OK, go to step ▷5.

▼ In the case of NG, perform the troubleshooting for the problem "Blower motor does not change speed".

Refer to Page K1-38.

▷5. Measurement of refrigerant pressure

1. Install a manifold gauge.
2. After warming up the engine, set the vehicle to the following conditions.

Detected item	Condition
Vehicle body	Vehicle stopped in a shaded place with no wind
Hood door	Fully opened
A/C switch (magnet clutch)	ON
Engine revolution speed	1500rpm
Switching of inside and outside air	Inside air
Set temperature	MAX COOL
Blower speed	HI
Outside air temperature	30°C
Humidity	0.5

3. Measure the pressure of refrigerant.

Normal pressure (reference value)

Gauge	Pressure value
High-pressure side	1.4 - 1.8MPa
Low-pressure side	0.21 - 0.28MPa

NOTE

- The values given above are provided just for reference only, since the pressures change according to environmental conditions (outside temperature, solar radiation, ground heat, wind), vehicle conditions (engine heat, vehicle heat load), etc.

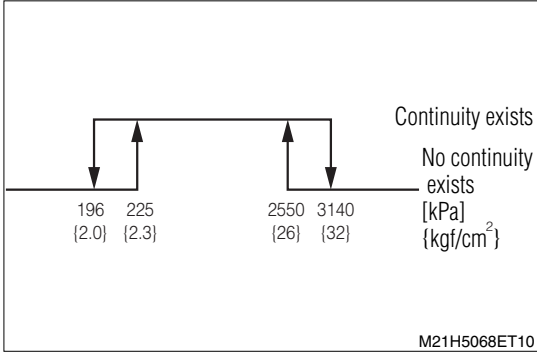
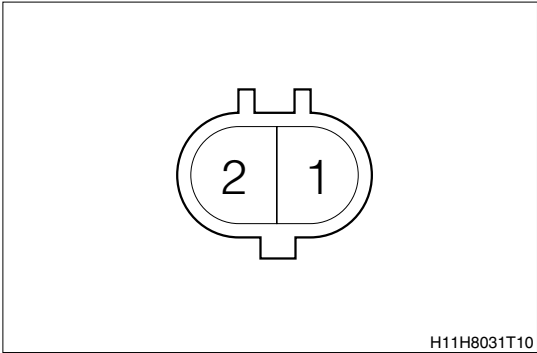
(1) Based on the measurement results, determine the action by referring to the following table.

Phenomena	Causes	Diagnosis	Remedies
* During the operation, the pressure at the low-pressure side becomes vacuum at one time and normal at another time.	* The moisture admitted into the cooler system is frozen at the expansion valve port. As a result, the refrigerant will not circulate temporarily. However, the normal condition is restored.	* The drier is supersaturated. * The moisture of the cooler system is frozen at the expansion valve port, thus shutting the circulation of the refrigerant gas.	1 Remove the moisture from the cycle by performing the vacuum evacuation repeatedly. 2 If the problem persists, replace the condenser.
* The pressure at both high-pressure side and low-pressure side is low. * The cooling performance is not enough.	* The gas is leaking from somewhere in the cooler system.	* The refrigerant gas is not enough. * Leakage of refrigerant gas	1 Check that the refrigerant gas is not leaking. Repair, as required. 2 If the repair has been carried out, perform the vacuum evacuation and check the air tightness positively. 3 After all refrigerant has been recovered, replenish an optimum amount of refrigerant again.
* The low-pressure side becomes negative pressure.	* Dust, etc. admitted into the expansion valve and condenser is blocking the flow of refrigerant.	* The expansion valve is clogged. * The condenser is clogged.	1 Check the expansion valve. 2 Check the condenser.
* The pressures at both high-pressure side and low-pressure side are too high.	* Excessive refrigerant * The condenser is not cooled adequately. * Air has been admitted into the cooler system.	* Excessive refrigerant * The condenser is not cooled adequately. * Air has been admitted into the cooler system. * The vacuum evacuation is not enough.	1 Clean the condenser fin. 2 If Item 1 is normal, recover all refrigerant and check that the compressor oil is not smeared or insufficient. Then, replenish an optimum amount of refrigerant.
* There is almost no difference between the pressure at the low-pressure side and that at the high-pressure side.	* Leakage inside compressor	* Poor compression * Leakage at valve or breakage of sliding parts	1 Repair or replace the compressor.
* The pressure exhibits no abnormality.	* There is the possibility that the pressure value has fluctuated because of the slight difference between the normal condition and the measurement environment, changes in the vehicle due to passage of time, etc.	* There is the possibility that the pressure value has fluctuated because of the slight difference between the normal condition and the measurement environment, changes in the vehicle due to passage of time, etc.	1 Observe for a while. If the condition will not improve, recover all refrigerant. Then, replenish an optimum amount of refrigerant.

10-9 UNIT CHECK

10-9-1 PRESSURE SWITCH

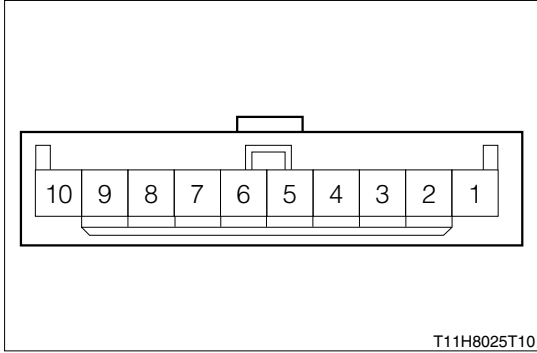
1. Check continuity between the respective terminals of the connector of the pressure switch (on the liquid tube).
- SPECIFIED VALUE: The condition becomes as indicated in the figure, depending on the refrigerant pressure.



10-9-2 HIATER CONTROL

(1) Air conditioner switch

1. Operate the air conditioner switch. At this time, check continuity between the terminals 8 and 9.
2. With the switch turned "ON".
- SPECIFIED VALUE: Illuminates.



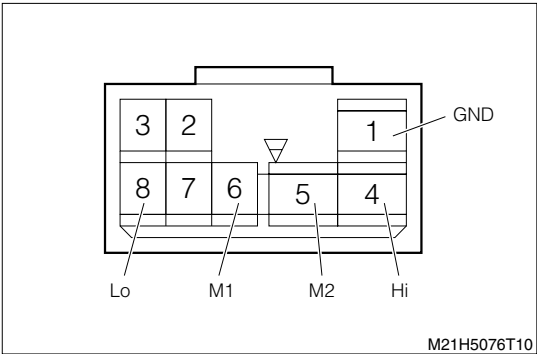
(2) Blower switch

1. Check that continuity exists between the blower switch connector terminals as per the continuity table.

○—○:Continuity exists

Terminal Position	GND	Lo	M1	M2	Hi
OFF	○				
1	○—○				
2	○—○	○—○			
3	○—○	○—○		○—○	
4	○—○	○—○			○—○

M21H5077EL08

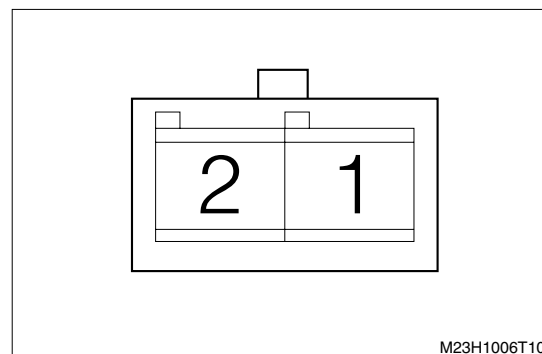


2. Check the illumination status when the battery positive (+) terminal is connected to the terminal 2 and the battery negative (-) terminal to the terminal 3.
- SPECIFIED VALUE: Illuminates.

10-9-3 BLOWER MOTOR

1. Check operation of the motor when the battery positive (+) terminal is connected to the blower motor connector terminal 2 and the battery negative (-) terminal to the terminal 1.

SPECIFIED VALUE: Shall rotates normally without an abnormal noise.



10-9-4 BLOWER RESISTOR

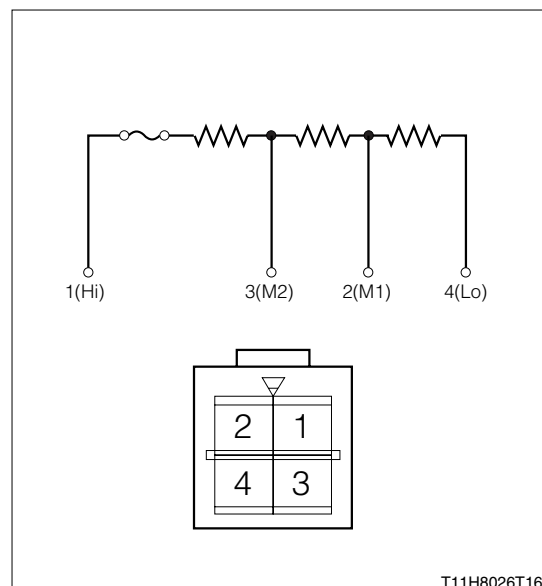
1. Check resistance between the connector terminals of the resistor.

RHD vehicles

SPECIFIED VALUE: HI — M2 : 0.44 - 0.50(Ω)
 HI — M1 : 0.96 - 1.10(Ω)
 HI — L0 : 3.19 - 3.67(Ω)

LHD vehicles

SPECIFIED VALUE: HI — M2 : 0.50(Ω)
 M1 — M2 : 0.82(Ω)
 M1 — L0 : 1.8(Ω)



10-9-5 MAGNET CLUTCH

1. Check operation of the magnet clutch when the battery positive (+) terminal is connected to the magnet clutch connector terminal and the battery negative (-) terminal to the compressor unit.

SPECIFIED VALUE: The magnet clutch hub is locked with the rotor, emitting operating sound.

10-9-6 EVAPORATOR TEMPERATURE SENSOR

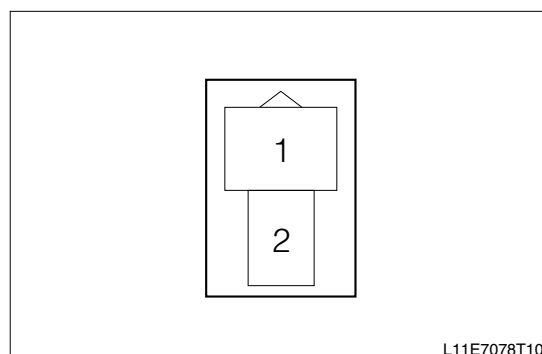
1. Check resistance between the connector terminals of the thermistor.

RHD vehicles

Temperature (°C)	Resistance (kΩ)
0	4.6 - 5.1
15	2.1 - 2.6

LHD vehicles

Temperature (°C)	Resistance (kΩ)
0	4.6 - 5.1
15	2.1 - 2.6



K1-43

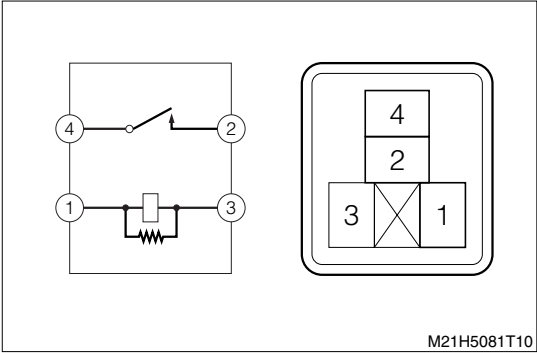
10-9-7 MAGNET CLUTCH RELAY AND HEATER RELAY

1. Check continuity between each connector terminal.

Terminal No.	Standard
2 - 4	No continuity exists
1 - 3	Continuity exists.

2. Apply the battery voltage between the terminals 1 and 3.
At this time, check continuity between the terminals 2 and 4.

SPECIFIED VALUE: Continuity exists.



10-10 ECU INPUT/OUTPUT SIGNAL CHECK

10-10-1 CHECKING METHOD

1. Check voltage and continuity between each connector terminal.

CAUTION

- With the connector connected, perform the check from behind the connector at the vehicle harness side.

10-10-2 SPECIFIED VALUE FOR INPUT/ OUTPUT SIGNAL

(1) Engine control computer

Check system	Terminal No. (Nomenclature of terminal)	Input and output	Detected item	Measurement condition	Specified value
AIR CONDITIONER RELAY	36(MGC) - 125(E1)	Output	Voltage	When the air-conditioner relay is "ON".	Approx. 0V
				When the air-conditioner relay is "OFF".	Battery voltage
Air conditioner switch	3(ACSW) - 125(E1)	Input	Voltage	When the air-conditioner is in operation.	Battery voltage
				When the air-conditioner is not in operation.	0 - 0.5V
Blower	42(BLW) - 125(E1)	Input	Voltage	When the heater blower switch is "ON".	0 - 0.5V
				When the heater blower switch is "OFF".	Battery voltage
Evaporator temperature sensor	45(ACEV) - 116(E21)	Input	Voltage	When the air-conditioner is "ON".	0.15 - 4.8V

L2 MULTIPLEX COMMUNICATION SYSTEM

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CAN COMMUNICATION SYSTEM-----	L2—1
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ARRANGEMENT OF VEHICLE HAR- NESS SIDE CONNECTOR TERMINALS -----	L2—5
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INQUIRY -----	L2—23
CONFIRMATION, RECORD AND ERA- SURE OF DIAGNOSIS CODE-----	L2—23
TROUBLE SHOOTING ACCORDING TO DIAGNOSIS CODE-----	L2—25

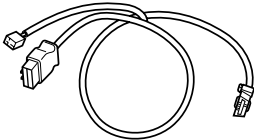
L2-1

■ CAN COMMUNICATION SYSTEM

1 CAN COMMUNICATION SYSTEM

1-1 ARTICLES TO BE PREPARED

SST

Shape	Part No.	Part name
	09991-87403-000	Wire,diagnosis check
	09991-87404-000 (09991-87401-000)	Wire,engine control system inspection

Instrument
Electrical tester

1-2 HANDLING INSTRUCTIONS OF CONTROL SYSTEM

1-2-1 MAINTENANCE INSTRUCTION

1. Pay attention to the following points when performing checking and maintenance of the CAN.

CAUTION

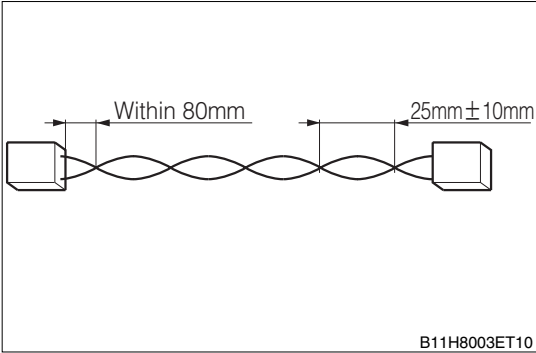
- When repairing the communication failure, perform repairing without disconnecting the negative terminal of the battery until the checking of the connection condition of the connector is finished.
- When disconnecting the negative terminal of the battery, record all of the diagnosis codes memorized.
- When performing checking and repairing of the CAN line, perform the operation after discharging the static electricity charged in the body.
- When measuring the resistance value of the CAN line, turn IG switch to "LOCK".
- There is a risk of damaging the ECU if the terminals are mistaken, when measuring the resistance within the CAN line and ECU.
- When measuring the resistance within the ECU, do not apply voltage of 7.0V or above to the measuring terminals.
- Perform measurements swiftly.

1-2-2 PRECAUTIONS DURING HARNESS REPAIR

1. Perform tape wind after soldering the repair section.

CAUTION

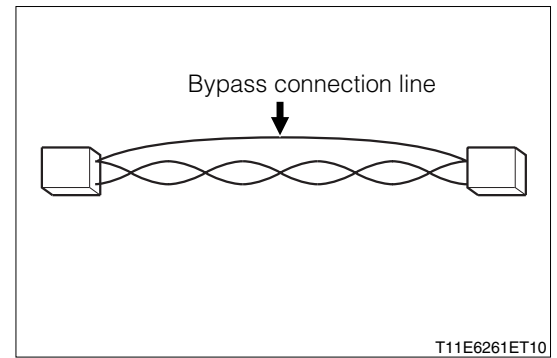
- Make sure that the bus (communication wire) is twisted when assembling. In so doing, do not make any gap between the CAN-H and CAN-L.
- Keep the difference of length of the CAN-H and CAN-L within 100 mm.
- Keep the fray of the twist of the connector connection within 80 mm.
- The pitch of the twist shall be set to 25mm±10mm.



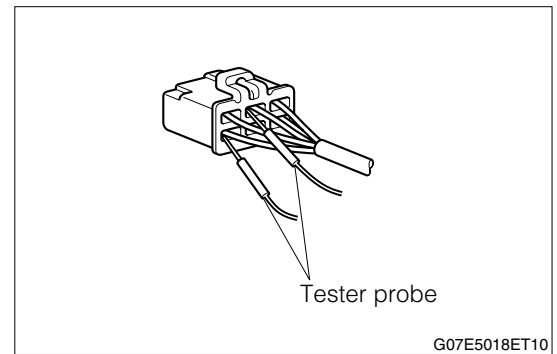
2. Do not connect the bypass wiring of the repaired section.

CAUTION

- If bypass wiring is connected, the characteristic features of the twist line will be lost.

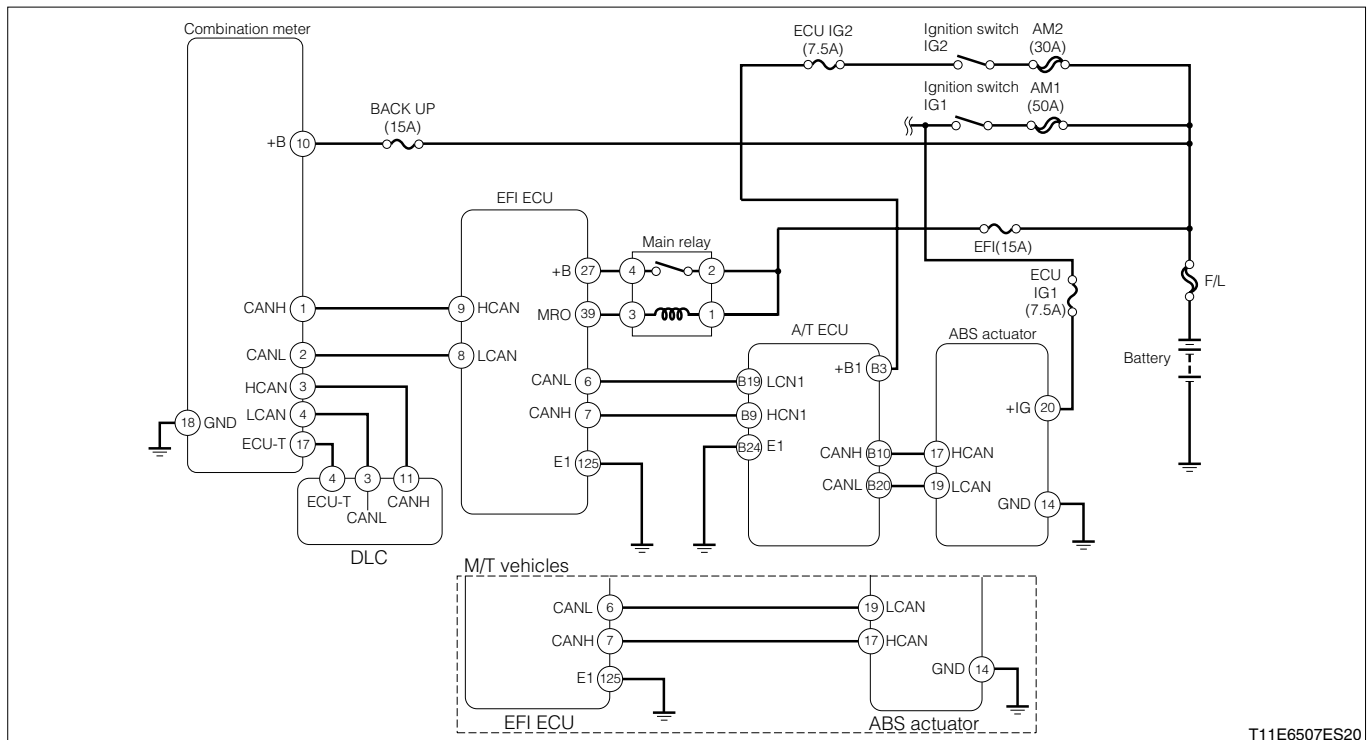


3. Generally, continuity check is performed by applying a tester from behind the connector.

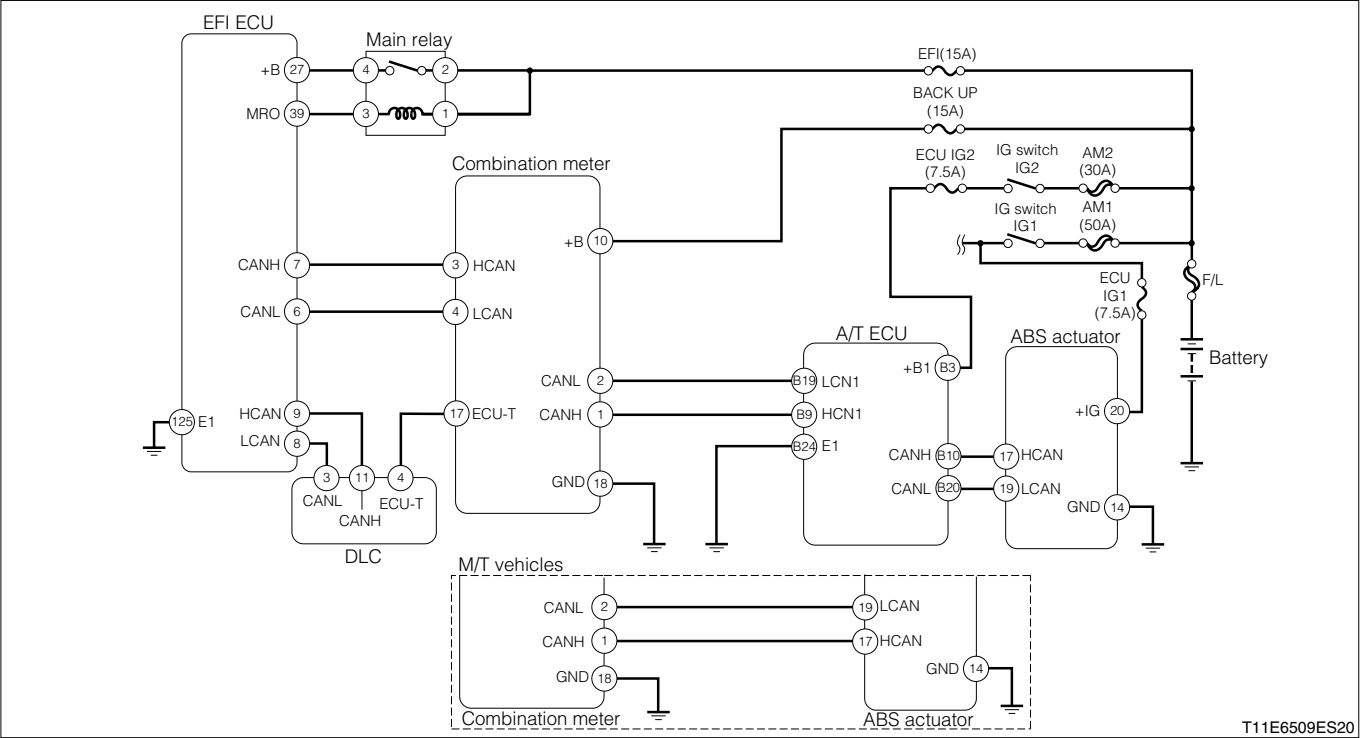


1-3 SYSTEM WIRING DIAGRAM

RHD vehicles

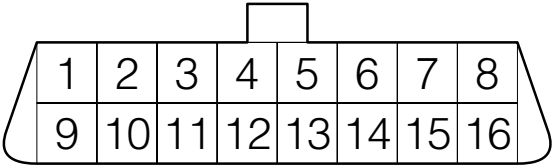


LHD vehicles



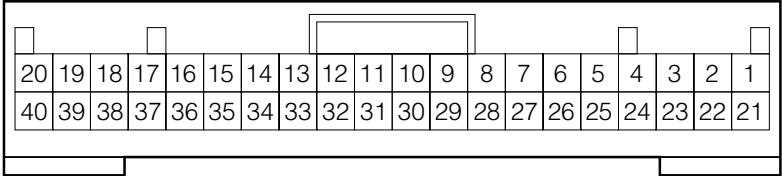
1-4 ARRANGEMENT OF ECU TERMINAL

DLC terminal arrangement diagram



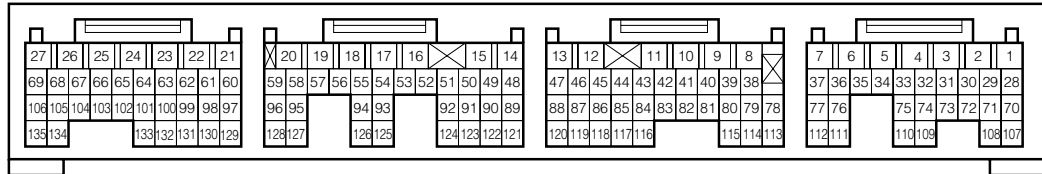
Terminal No.	Terminal code	Terminal name
3	CANL	CAN communication LO
11	CANH	CAN communication HI

Combination meter side terminal arrangement diagram



Terminal No	Terminal code	Terminal name
1	CANH	CAN communication HI (1)
2	CANL	CAN communication LO (1)
3	HCAN	CAN communication HI (2)
4	LCAN	CAN communication LO (2)
10	+B	+ B power supply
18	GND	Earth

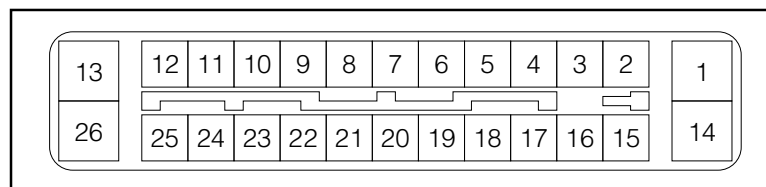
EFI ECU side terminal arrangement diagram



H11E6091S10

Terminal No	Terminal code	Terminal name
6	CANL	CAN communication LO (1)
7	CANH	CAN communication HI (1)
8	LCAN	CAN communication LO (2)
9	HCAN	CAN communication HI (2)
27	+B	EFI ECU power supply
125	E1	Computing system earth

ABS actuator side terminal arrangement diagram



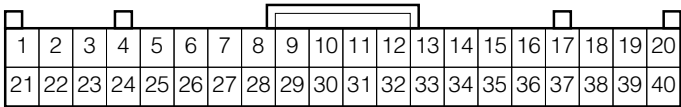
T11C5001S10

Terminal No	Terminal code	Terminal name
14	GND	Earth
17	HCAN	CAN communication HI
19	LCAN	CAN communication LO
20	+IG	IG power supply

L2-5

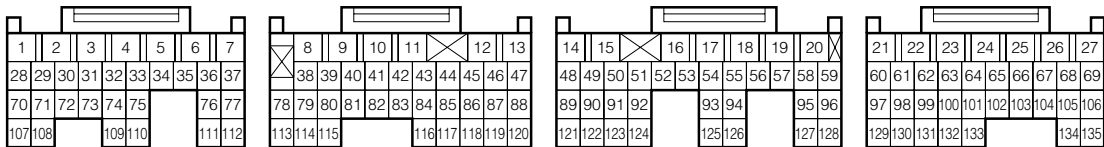
1-5 ARRANGEMENT OF VEHICLE HARNESS SIDE CONNECTOR TERMINALS

Combination meter connection vehicle harness side connector



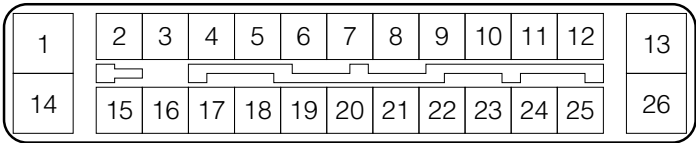
T11E6255S10

EFI ECU connection vehicle harness side connector



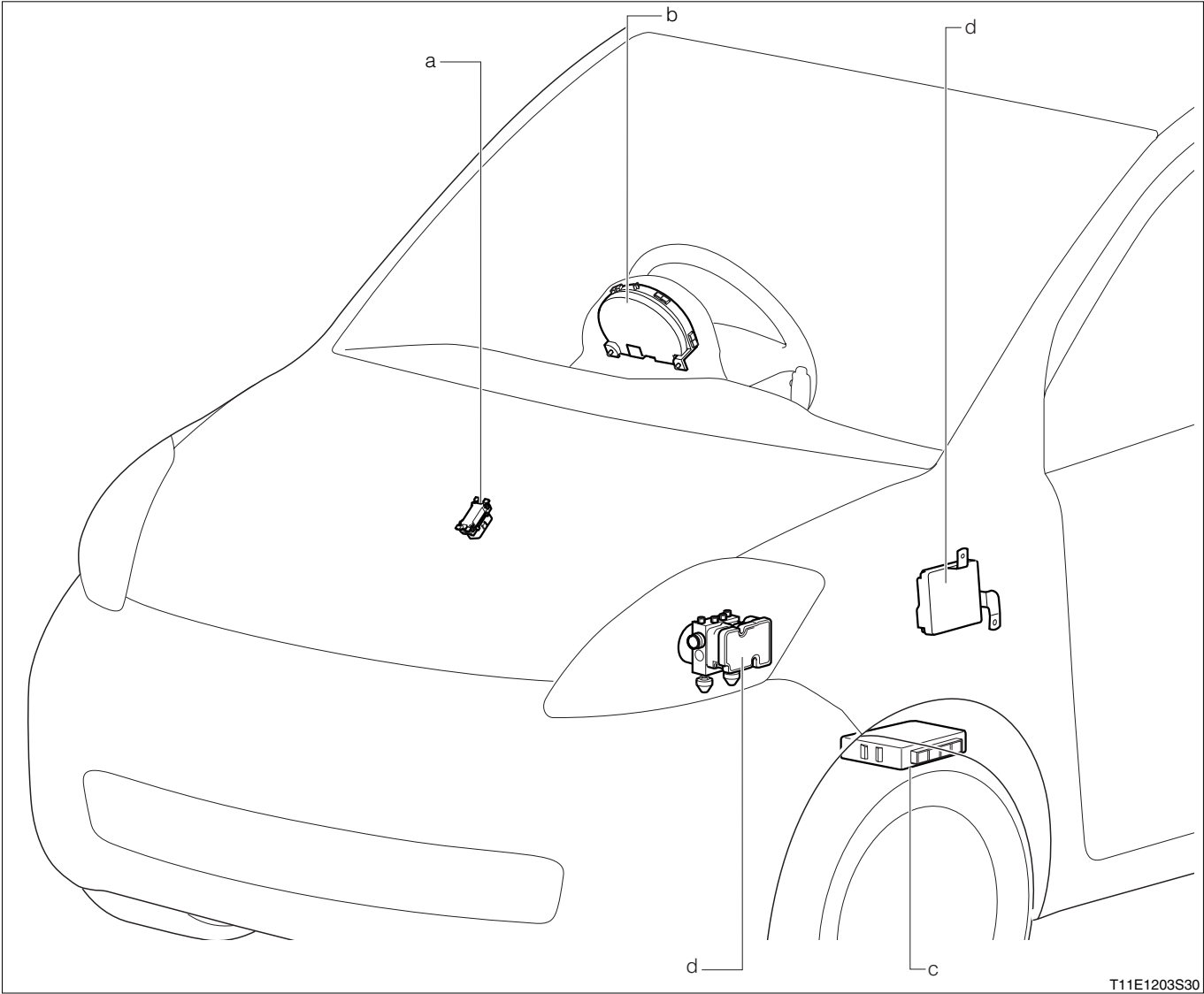
H11E6051S10

ABS actuator connection vehicle harness side connector



T11C5002S10

1-6 LOCATION OF COMPONENTS



T11E1203S30

	Part name
a	DLC
b	Combination meter (meter ECU)
c	Engine control computer (EFI ECU)
d	ABS actuator (ABS ECU) (ABS-equipped vehicles)

1-7 HOW TO PROCEED WITH TROUBLE SHOOTING

1. This system incorporates diagnosis functions that will locate malfunctioning parts, thus providing a vital clue in trouble shooting.

▷1. Bringing malfunctioning vehicle to workshop

▼ Go to ▷2.

▷2. Diagnosis by interview

1. Gather enough information from the customer on conditions, environment, and phenomenon in which the malfunction took place.

▼ Go to ▷3.

L2-7

▷3. Normal operation confirmation of the diagnosis code indication of the LCD in meter

1. Use the SST to short-circuit the DLC terminals between 4(ECU-T) - 13(E).

SST: 09991-87403-000

09991-87404-000

2. Check that the meter LCD indicates the diagnosis code (including the normal codes).

SPECIFIED VALUE: It indicates.

NOTE

- It is fine even if the codes that are not related to CAN are outputted.

▼ If it is OK, proceed to ▷4.

▼ If it is NG, perform following checks of the meter. Replace the meter if there are no problems.

(1) Harness check between the meter - DLC and DLC - body earth.

(2) Meter power supply system and earth system check

▷4. Confirmation and recording of diagnostic code of meter LCD (CAN related)

1. Check and record the CAN-related diagnostic code (codes 0051 - 0053) outputted on the meter LCD.

SPECIFIED VALUE: Codes 0051 - 0053 are not indicated.

▼ If it is OK, proceed to ▷8.

▼ If it is NG, proceed to ▷5.

▷5. Basic check

1. Perform basic check.

Refer to Page L2-10.

▼ Proceed to ▷6.

▷6. Reconfirmation of diagnosis code of meter LCD (CAN related)

1. Reconfirm the diagnosis codes (codes 0051 - 0053) related to CAN indicted in the meter LCD.

SPECIFIED VALUE: Codes 0051 - 0053 are not indicated.

▼ If it is OK, proceed to ▷8.

▼ If it is NG, proceed to ▷7.

▷7. Trouble shooting according to diagnosis code

1. Perform troubleshooting for the outputted diagnostic code.

Refer to Page B8-43.

▼ Go to ▷8.

▷8. Diagnosis code erasure

1. Erase the diagnosis code of the CAN communication employed system.

- (1) Erasing procedures of diagnosis code of combination meter
- (2) Erasing procedures of diagnosis code of EFI ECU

Refer to Page B8-23.

- (3) Erasing procedures of diagnosis code of ABS actuator

Refer to Page E3-16.

▼ Proceed to ▷9.

▷9. Reconfirmation of diagnosis code of meter LCD (CAN related)

1. Reconfirm the diagnosis codes (codes 0051 - 0053) related to CAN indicated in the meter LCD.

SPECIFIED VALUE: Codes 0051 - 0053 are not indicated.

▼ If it is OK, proceed to ▷10.

▼ If it is NG, proceed to ▷5 for a recheck.

▷10. Confirmation test

1. Ensure that the problem that the customer described has been completely corrected and the operation is back to normal.

▼ If it is OK, finish the trouble shooting.

▼ In the case of NG, go back to ▷3 for a recheck.

1-8 INQUIRY

1. In an effort to remove causes for malfunction from the vehicle concerned, it is impossible to determine the cause without confirming the malfunction phenomenon. If the phenomenon is not confirmed, the vehicle may not be able to return to the normal conditions even if you continue your work. The diagnosis through interviews is to collect information from the customer before confirming the malfunction phenomena. The diagnosis through interviews provides very important clues in reproducing malfunction phenomena.
2. Since the information obtained by the diagnosis through interviews is referred to during the trouble shooting, it is imperative to make an inquiry of the customer, centering on the items related to the malfunction, instead of simply asking general questions.

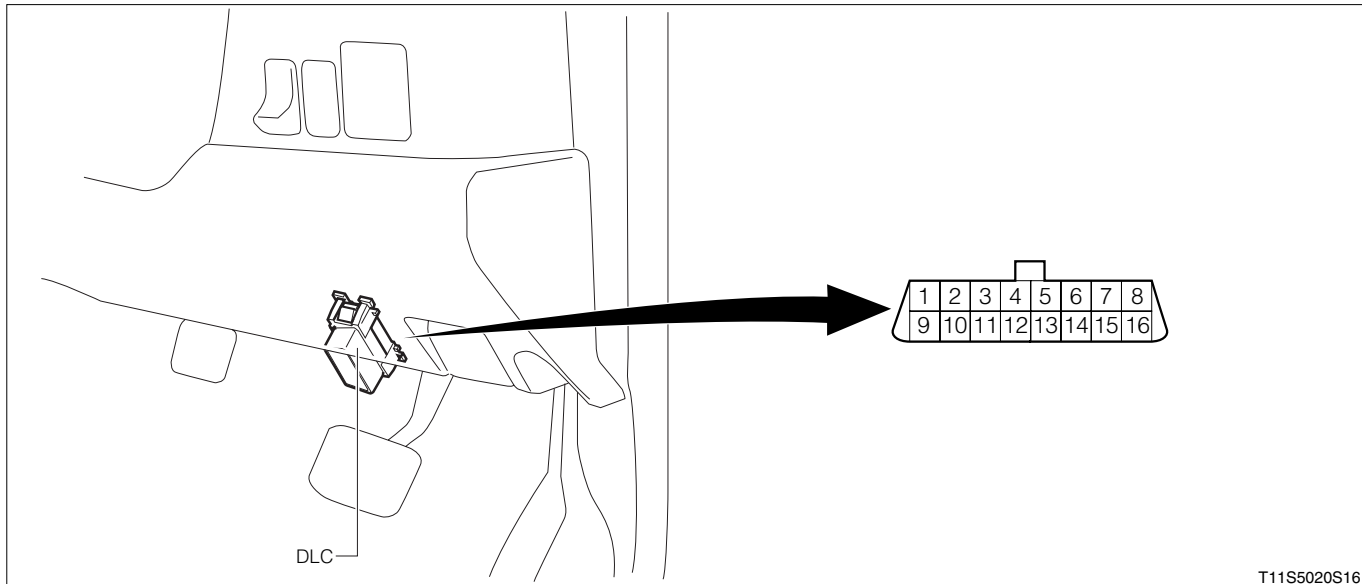
1-9 CONFIRMATION, RECORD AND ERASURE OF DIAGNOSIS CODE

1. The diagnostic code remains displayed as long as the communication failure exists, and will be erased when the communication is back to the normal state. It is necessary, therefore, to record diagnostic codes before removing the battery negative (-) terminal.

1-9-1 CHECKING METHOD OF DIAGNOSIS

1. Stop the vehicle.
2. Turn IG switch to "LOCK".
3. Short the terminals 4 (ECU-T) and 13 (E) of DLC, using SST.

SST: 09991-87403-000
09991-87404-000

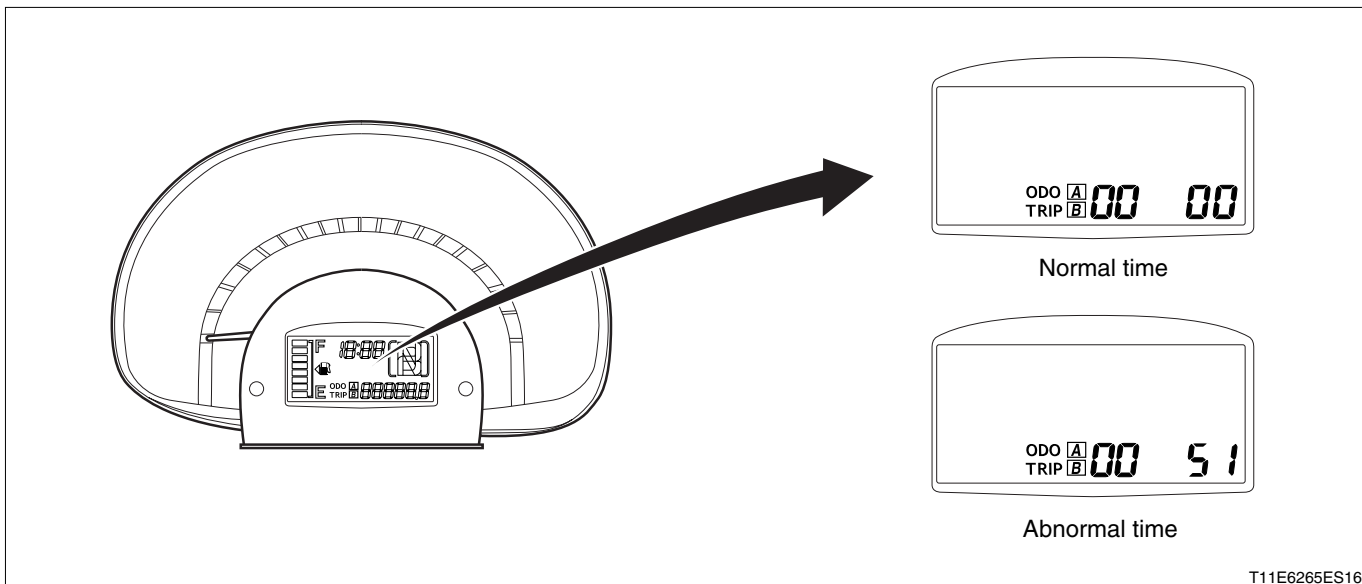


T11S5020S16

CAUTION

- Do not mistake the connection position of the connectors since it may cause malfunction.

4. Turn ON the IG switch and read the diagnosis code indicated in figures on the meter LCD.



T11E6265ES16

NOTE

- Other than the diagnosis codes related to the CAN communication system, diagnosis codes of the Immobilizer system, meter, LIN communication system are also indicated on the meter LCD.
- When plural codes are to be outputted, they are outputted, starting from a smaller code number. Furthermore, when one cycle of indications is completed, these codes are repeatedly outputted at intervals of four seconds.

1-9-2 CANCELING METHOD OF DIAGNOSIS

1. There are following two ways to erase diagnostic codes.

- (1) The communication error diagnosis code will be erased automatically when the communication problem has been solved.
- (2) Turn the IG switch to "LOCK"

1-9-3 CONTENTS OF DIAGNOSIS

Code No.		Warning indication (Provided: ○, Not provided: ×)	(Provided: ○, Not provided: ×)	Contents of diagnosis
LCD	4-digit			
0	—	×	×	Normal
51	—	×	×	Communication failure with EFI ECU
53	—	×	×	Communication failure with ABS ECU

NOTE

- The meter LCD displays diagnosis codes for the meter, and LIN communication system, in addition to those for the CAN communication system.

Meter (0041 - 0041, 0061)

Refer to Page J3-11.

LIN communication system (0011 - 0021)

Refer to Page L2-19.

1-10 BASIC CHECK

▷1. CAN line resistance value check

1. Measure the resistance value between the following terminals.

- (1) Between DLC3 (CANL) - DLC11 (CANH)

SPECIFIED VALUE: 55 - 65 Ω

NOTE

- When the wires between DLC3 (CANL) - DLC11 (CANH) are short circuited, the resistance value is about 0 Ω .
When the CAN line has open wire between the combination meter - EFI ECU, the resistance value is about 120 Ω .

Measured value	SPECIFICATIONS	Judgment
In the case of OK	—	a
If the reading is 55 Ω or below.	RHD vehicles	b
	LHD vehicles	c
If the reading is 65 Ω or above.	RHD vehicles	d
	LHD vehicles	e

▼ In case of a, proceed to ▷6.

▼ In case of b, proceed to ▷2.

▼ In case of c, proceed to ▷3.

▼ In case of d, proceed to ▷4.

▼ In case of e, proceed to ▷5.

▷2. Short-circuit check with CAN line (RHD vehicles)

1. Perform checking of the harness and connectors between the following terminals.

- (1) Between DLC11 (CANH) - combination meter connection vehicle harness side connector 3 (HCAN)
- (2) Between combination meter connection vehicle harness side connector 1 (CANH) - EFI ECU connection vehicle harness side connector 9 (HCAN)
- (3) Between combination meter connection vehicle harness side connector 2 (CANL) - EFI ECU connection vehicle harness side connector 8 (LCAN)
- (4) Between EFI ECU connection vehicle harness side connector 6 (CANL) 14 (GND) ABS actuator connection vehicle harness side connector 19 (LCAN)
- (5) Between EFI ECU connection vehicle harness side connector 7 (CANH) - ABS actuator connection vehicle harness side connector 17 (HCAN)

▷3. Check of CAN line for short-circuit (LHD vehicles)

1. Perform checking of the harness and connectors between the following terminals.

- (1) Between DLC3 (CANL) - combination meter connection vehicle harness side connector 4 (LCAN)
- (2) Between DLC11 (CANH) - combination meter connection vehicle harness side connector 9 (HCAN)
- (3) Between EFI ECU connection vehicle harness side connector 6 (CANL) - combination meter connection vehicle harness side connector 4 (LCAN)
- (4) Between EFI ECU connection vehicle harness side connector 7 (CANH) - combination meter connection vehicle harness side connector 3 (HCAN)
- (5) Between combination meter connection vehicle harness side connector 1 (CANH) - ABS actuator connection vehicle harness side connector 19 (LCAN)
- (6) Between combination meter connection vehicle harness side connector 2 (CANL) - ABS actuator connection vehicle harness side connector 19 (LCAN)

▷4. Check of CAN line for open wire (RHD vehicles)

1. Perform checking of the harness and connectors between the following terminals.

- (1) Between DLC3 (CANL) - combination meter connection vehicle harness side connector 4 (LCAN)
- (2) Between DLC11 (CANH) - combination meter connection vehicle harness side connector 3 (HCAN)
- (3) Between combination meter connection vehicle harness side connector 1 (CANH) - EFI ECU connection vehicle harness side connector 9 (HCAN)
- (4) Between combination meter connection vehicle harness side connector 2 (CANL) - EFI ECU connection vehicle harness side connector 8 (LCAN)

▷5. Check of CAN line for open wire (LHD vehicles)

1. Check the harness and the connector between the following terminals.

- (1) Between DLC3 (CANL) - EFI ECU connection vehicle harness side connector 8 (LCAN)
- (2) Between DLC11 (CANH) - EFI ECU connection vehicle harness side connector 9 (HCAN)
- (3) Between EFI ECU connection vehicle harness side connector 6 (CANL) - combination meter connection vehicle harness side connector 4 (LCAN)
- (4) Between EFI ECU connection vehicle harness side connector 7 (CANH) - combination meter connection vehicle harness side connector 3 (HCAN)

▷6. Check of CAN line for short-circuit

1. Perform continuity check between the following terminals.0252

- (1) Between DLC3 (CANL) - battery positive (+) terminal
- (2) Between DLC11 (CANH) - battery positive (+) terminal
- (3) Between DLC3 (CANL) - body earth
- (4) Between DLC11 (CANH) - body earth

SPECIFIED VALUE: No continuity exists.

▼ If it is OK, proceed to ▷7.

▼ If it is NG, repair or replace the malfunctioning sections

▷7. Connector connection check

1. Check the connecting conditions of the connectors in the following sections.

NOTE

- Check connectors especially for loosening or half fit.

- (1) DLC
- (2) Combination meter
- (3) EFI ECU
- (4) ABS actuator

SPECIFIED VALUE: No failure exists.

▼ If it is OK, proceed to ▷8.

▼ If it is NG, repair or replace the malfunctioning sections.

▷8. Connector condition check

1. Turn IG switch to "LOCK".
2. Disconnect the negative terminal of the battery.

NOTE

- Record the diagnosis codes of all the systems before disconnecting the negative terminal of the battery.

3. Disconnect all the connectors of the ECU of the CAN communication employed system.
4. Perform the following checks for the ECU connection vehicle harness side connector of the CAN communication employed system and the DLC connector and each terminal.

- (1) Falling off
- (2) Bend
- (3) Poor fit

SPECIFIED VALUE: No failure exists.

▼ If it is OK and the vehicle is a RHD vehicle, go to ▷9.

▼ If it is OK and the vehicle is a LHD vehicle, go to ▷10.

▼ If it is NG, repair or replace the malfunctioning sections.

L2-13

▷9. Harness check (RHD vehicles)

1. Disconnect all the connectors of the combination meter, EFI ECU, and ABS actuator.
2. Perform continuity check between the following terminals.
 - (1) Between DLC3 (CANL) - combination meter connection vehicle harness side connector 4 (LCAN)
 - (2) Between DLC11 (CANH) - combination meter connection vehicle harness side connector 3 (HCAN)
 - (3) Between combination meter connection vehicle harness side connector 1 (CANH) - EFI ECU connection vehicle harness side connector 9 (HCAN)
 - (4) Between combination meter connection vehicle harness side connector 2 (CANL) - EFI ECU connection vehicle harness side connector 8 (LCAN)
 - (5) Between EFI ECU connection vehicle harness side connector 6 (CANL) - ABS actuator connection vehicle harness side connector 19 (LCAN)
 - (6) Between EFI ECU connection vehicle harness side connector 7 (CANH) - ABS actuator connection vehicle harness side connector 19 (LCAN)

SPECIFIED VALUE: Continuity exists.

▼ If it is OK, proceed to ▷11.

▼ If it is NG, repair or replace the malfunctioning sections.

▷10. Wire harness check (LHD vehicle)

1. Remove all the connectors on the EFI ECU, combination meter, and ABS actuator.
2. Check continuity between the following terminals.
 - (1) Between DLC3 (CANL) - EFI ECU connection vehicle harness side connector 8 (LCAN)
 - (2) Between DLC4 (HCAN) - EFI ECU connection vehicle harness side connector 9 (HCAN)
 - (3) Between EFI ECU connection vehicle harness side connector 6 (CANL) - combination meter connection vehicle harness side connector 4 (LCAN)
 - (4) Between EFI ECU connection vehicle harness side connector 7 (CANH) - combination meter connection vehicle harness side connector 3 (HCAN)
 - (5) Between combination meter connection vehicle harness side connector 1 (CANH) - ABS actuator connection vehicle harness side connector 17 (HCAN)
 - (6) Between combination meter connection vehicle harness side connector 2 (CANL) - ABS actuator connection vehicle harness side connector 19 (LCAN)

SPECIFIED VALUE: Continuity exists

▼ If it is OK, go to ▷11.

▼ In the case of NG, repair or replace the malfunctioning sections.

▷11. Combination meter voltage check

1. Connect the connectors of the EFI .

NOTE

- When connecting, connect so that there are no half fit connectors.

2. Turn "ON" the IG switch.
3. Measure the voltage between the following terminals.

- (1) Between combination meter connection vehicle harness side connector 10 (+B) - body earth

SPECIFIED VALUE: Battery voltage

▼ If it is OK, proceed to ▷12.

▼ If it is NG, check the power supply system of the combination meter.

▷12. Combination meter earth check

1. Turn the IG switch to "LOCK".
2. Perform continuity check between the following terminals.
 - (1) Between combination meter connection vehicle harness side connector 18 (GND) - body earth
 SPECIFIED VALUE: Continuity exists.

▼ If it is OK, proceed to ▷13.

▼ If it is NG, repair or replace the malfunctioning section.

▷13. ECU power supply voltage check

1. Turn "ON" the IG switch.
2. Measure the voltage between the terminals of the CAN communication employed system.
 - (1) Between EFI ECU connection vehicle harness side connector 27 (+B) - body earth
 - (2) Between ABS actuator connection vehicle harness side connector 20 (+IG) - body earth
 SPECIFIED VALUE: Battery voltage

▼ If it is OK, proceed to ▷14.

▼ If it is NG, repair or replace the malfunctioning section.

▷14. ECU earth check

1. Turn the IG switch to "LOCK".
2. Perform continuity check between the terminals of the CAN communication employed system.
 - (1) Between EFI ECU connection vehicle harness side connector 125 (E1) - body earth
 - (2) Between ABS actuator connection vehicle harness side connector 14 (GND) - body earth
 SPECIFIED VALUE: Continuity exists

▼ If it is OK, perform circuit check of each ECU.

▼ If it is NG, repair or replace the malfunctioning section.

1-11 TROUBLE SHOOTING ACCORDING TO DIAGNOSIS CODE

1-11-1 NO.0051 (EFI ECU COMMUNICATION FAILURE)

(1) Output conditions

1. When the CAN communication (meter reception) between the combination meter - EFI ECU has been disrupted for 12 seconds or more.

(2) Checking points

1. Is the harness between the combination meter - EFI ECU normal?
2. Is there any abnormality in the connectors of the EFI ECU?
3. Is the combination meter normal?
4. Is the EFI ECU normal?

(3) Checking method

▷1. Diagnosis code confirmation

1. Check if the diagnosis codes related to CAN are outputted in the meter LCD.

▼ If No.0053 is outputted simultaneously, refer to the trouble shooting of "No.0051, No.0053 simultaneous output".

▼ If only No.0051 is output, proceed to ▷2.

L2-15

▷2. CAN basic check

1. Perform basic check of CAN.
Refer to Page L2-10.

▼ Proceed to ▷3.

▷3. EFI ECU internal resistance check

1. Disconnect all connectors of the EFI ECU.
 2. Measure the resistance value between the following terminals.
 - (1) Between EFI ECU side connector 6 (CANL) - EFI ECU side connector 7 (CANH)
 - (2) Between EFI ECU side connector 8 (LCAN) - EFI ECU side connector 9 (HCAN)
- SPECIFIED VALUE: 110 - 130 Ω

▼ If it is OK, proceed to ▷4.

▼ If it is NG, replace the EFI ECU.

▷4. Combination meter internal resistance check

1. Disconnect all the connectors of the combination meter.
 2. Measure the resistance value between the following terminals.
 - (1) Between combination meter side connector 1 (CANH) - combination meter side connector 2 (CANL)
 - (2) Between combination meter side connector 3 (HCAN) - combination meter side connector 4 (LCAN)
- SPECIFIED VALUE: 110 - 130 Ω

▼ If it is OK, perform circuit check of the combination meter and the EFI ECU.

▼ If it is NG, replace the combination meter.

1-11-2 NO.0053 (ABS ECU COMMUNICATION FAILURE)

(1) Output conditions

1. When the CAN communication (meter reception) between the combination meter - ABS actuator has been disrupted for 12 seconds or more.

(2) Checking points

① Right hand drive vehicles

1. Is the harness between EFI ECU - ABS ECU normal? .
2. Is there any abnormality in the connectors of the ABS ECU?
3. Is the ABS ECU normal?

② Left handle drive vehicles

1. Is the harness between the combination meter and ABS ECU normal? .
2. Is the ABS ECU connector normal?
3. Is the ABS ECU normal?

(3) Checking method

▷1. Diagnosis code confirmation

1. Check if the diagnosis codes related to CAN are outputted in the meter LCD.
 - ▼ If No.0051 is outputted simultaneously, refer to the trouble shooting of "No.0051, No.0053 simultaneous output".
Refer to Page L2-17.

▼ If only No.0053 is outputted, proceed to ▷2.

▷2. CAN basic check

1. Perform basic check of CAN.

Refer to Page L2-10.

▼ Proceed to ▷3.

▷3. Short-circuit check between CAN lines

1. Turn IG switch to "LOCK".
2. Disconnect the negative terminal of the battery.
3. Disconnect all connectors of the EFI ECU and ABS actuator.
4. Perform continuity check between the following terminals.
 - (1) Between EFI ECU connection vehicle harness side connector 6 (CANL) - EFI ECU connection vehicle harness side connector 7 (CANH)
 - (2) Between ABS actuator connection vehicle harness side connector 17 (HCAN) - ABS actuator connection vehicle harness side connector 19 (LCAN)

SPECIFIED VALUE: No continuity exists.

▼ If it is OK, proceed to ▷4.

▼ If it is NG, repair or replace the malfunctioning section.

▷4. CAN line short-circuit check

1. Perform continuity check between the following terminals.
 - (1) Between ABS actuator connection vehicle harness side connector 17 (HCAN) - battery positive (+) terminal
 - (2) Between ABS actuator connection vehicle harness side connector 19 (LCAN) - battery positive (+) terminal
 - (3) Between ABS actuator connection vehicle harness side connector 17 (HCAN) - body earth
 - (4) Between ABS actuator connection vehicle harness side connector 19 (LCAN) - body earth

SPECIFIED VALUE: No continuity exists.

▼ If it is OK, proceed to ▷5.

▼ If it is NG, repair or replace the malfunctioning section.

▷5. EFI ECU internal resistance check

1. Disconnect all the connectors of the EFI ECU.
2. Measure the resistance value between the following terminals.
 - (1) Between EFI ECU side connector 6 (CANL) - EFI ECU side connector 7 (CANH)
 - (2) Between EFI ECU side connector 8 (LCAN) - EFI ECU side connector 9 (HCAN)

SPECIFIED VALUE: 110 - 130 Ω

▼ If it is OK, proceed to ▷6.

▼ If it is NG, replace the EFI ECU.

L2-17

▷6. Combination meter internal resistance check

1. Disconnect the connectors of the combination meter.
2. Measure the resistance value between the following terminals.
 - (1) Between combination meter side connector 1 (CANH) - combination meter side connector 2 (CANL)
 - (2) Between combination meter side connector 3 (HCAN) - combination meter side connector 4 (LCAN)

SPECIFIED VALUE: 110 - 130 Ω

▼ If it is OK, proceed to ▷7.

▼ If it is NG, replace the combination meter.

▷7. ABS actuator internal circuit check

1. Disconnect the connectors of the ABS actuator.
2. Perform continuity check between the following terminals.
 - (1) Between ABS actuator side connector 17 (HCAN) - ABS actuator side connector 19 (LCAN)

SPECIFIED VALUE: Continuity exists (less than 1MΩ)

▼ If it is OK, check circuits of the EFI ECU, ABS actuator, and combination meter.

Refer to Page A1-21.

▼ If it is NG, replace the ABS actuator.

Refer to Page E3-1.

▼ If everything is OK, perform circuit check of the EFI ECU, the ABS actuator and the combination meter.

1-11-3 NO.0051, NO.0053 SIMULTANEOUS OUTPUT

(1) Checking points

1. Is the EFI ECU normal?
2. Is the ABS actuator normal?
3. Is the harness between the combination meter - EFI ECU normal?
4. Is the harness between the combination meter - DLC normal? (RHD vehicles)
5. Is the harness between the EFI ECU - DLC normal? (LHD vehicles)

(2) Checking method

▷1. CAN basic check

1. Perform basic check of CAN.
Refer to Page L2-10.

▼ Proceed to ▷2.

▷2. Short-circuit check between CAN lines

1. Turn IG switch to "LOCK".
2. Disconnect the negative terminal of the battery.
3. Disconnect all the connectors of the combination meter, the EFI ECU, the A/T ECU and the ABS actuator.
4. In the case of RHD vehicles, perform continuity check between the following terminals.
 - (1) Between combination meter connection vehicle harness side connector 3 (HCAN) - combination connection vehicle harness side connector 4 (LCAN)
 - (2) Between EFI ECU connection vehicle harness side connector 6 (CANL) - EFI ECU connection vehicle harness side connector 7 (CANH)
 - (3) Between ABS actuator connection vehicle harness side connector 17 (HCAN) - ABS actuator connection vehicle harness side connector 19 (LCAN)

5. In the case of LHD vehicles, perform continuity check between the following terminals.

- (1) Between combination meter connection vehicle harness side connector 1 (CANH) - combination connection vehicle harness side connector 2 (CANL)
- (2) Between ABS actuator connection vehicle harness side connector 17 (HCAN) - ABS actuator connection vehicle harness side connector 19 (LCAN)

SPECIFIED VALUE: No continuity exists.

▼ If it is OK, proceed to [▷3.](#)

▼ If it is NG, repair or replace the malfunctioning section.

▷3. CAN line earth side short-circuit check

1. Perform continuity check between the following terminals.

- (1) Between combination meter connection vehicle harness side connector 1 (CANH) - body earth terminal
- (2) Between combination meter connection vehicle harness side connector 2 (CANL) - body earth terminal

SPECIFIED VALUE: Continuity exists.

▼ If it is OK, proceed to [▷4.](#)

▼ If it is NG, repair or replace the malfunctioning section.

▷4. CAN line +B side short-circuit check

1. Perform continuity check between the following terminals.

- (1) Between combination meter connection vehicle harness side connector 1 (CANH) - battery positive (+) terminal
- (2) Between combination meter connection vehicle harness side connector 2 (CANL) - battery positive (+) terminal

SPECIFIED VALUE: Continuity exists.

▼ If it is OK, proceed to [▷5.](#)

▼ If it is NG, repair or replace the malfunctioning section.

▷5. EFI ECU internal resistance check

1. Disconnect all the connectors of the EFI ECU.

2. Measure the resistance value between the following terminals.

- (1) Between EFI ECU side connector 6 (CANL) - EFI ECU side connector 7 (CANH)
- (2) Between EFI ECU side connector 8 (LCAN) - EFI ECU side connector 9 (HCAN)

SPECIFIED VALUE: 110 - 130 Ω

▼ If it is OK, proceed to [▷6.](#)

▼ If it is NG, replace the EFI ECU.

Refer to Page B8-1.

➤6. ABS actuator internal circuit check

- 1. Disconnect the connectors of the ABS actuator.
 - 2. Perform continuity check between the following terminals.
 - (1) Between ABS actuator side connector 17 (HCAN) - ABS actuator side connector 19 (LCAN)
- SPECIFIED VALUE: Continuity exists (less than 1MΩ)

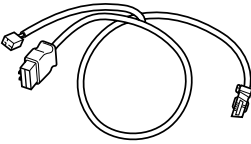
- ▼ If it is OK, perform circuit check of the EFI ECU and the ABS actuator.
- ▼ If it is NG, replace the ABS actuator.

■ LIN COMMUNICATION SYSTEM

1 LIN COMMUNICATION SYSTEM

1-1 ARTICLES TO BE PREPARED

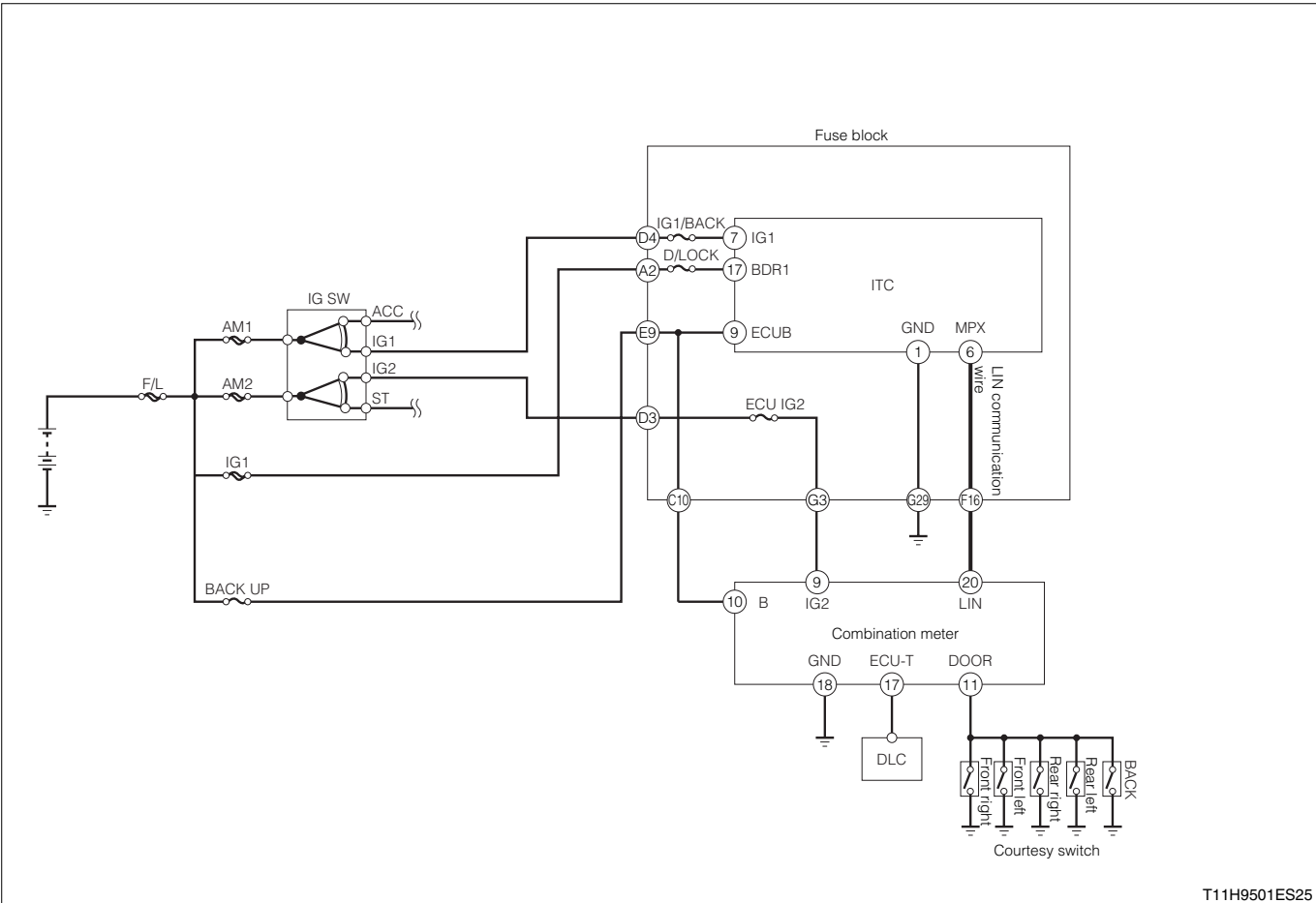
SST

Shape	Part No.	Part name
	09991-87403-000	Wire,diagnosis check
	09991-87404-000 (09991-87401-000)	Wire,engine control system inspection

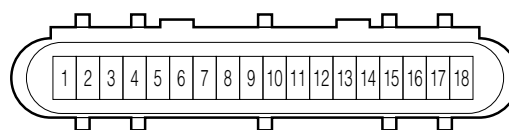
Instrument

Electrical tester

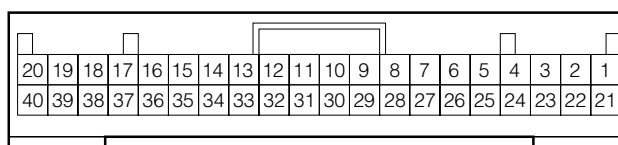
1-2 SYSTEM WIRING DIAGRAM



1-3 ARRANGEMENT OF ECU TERMINAL



ITC



Combination meter

T11H9502ES20

Meter terminal name (Multiplex communication system)

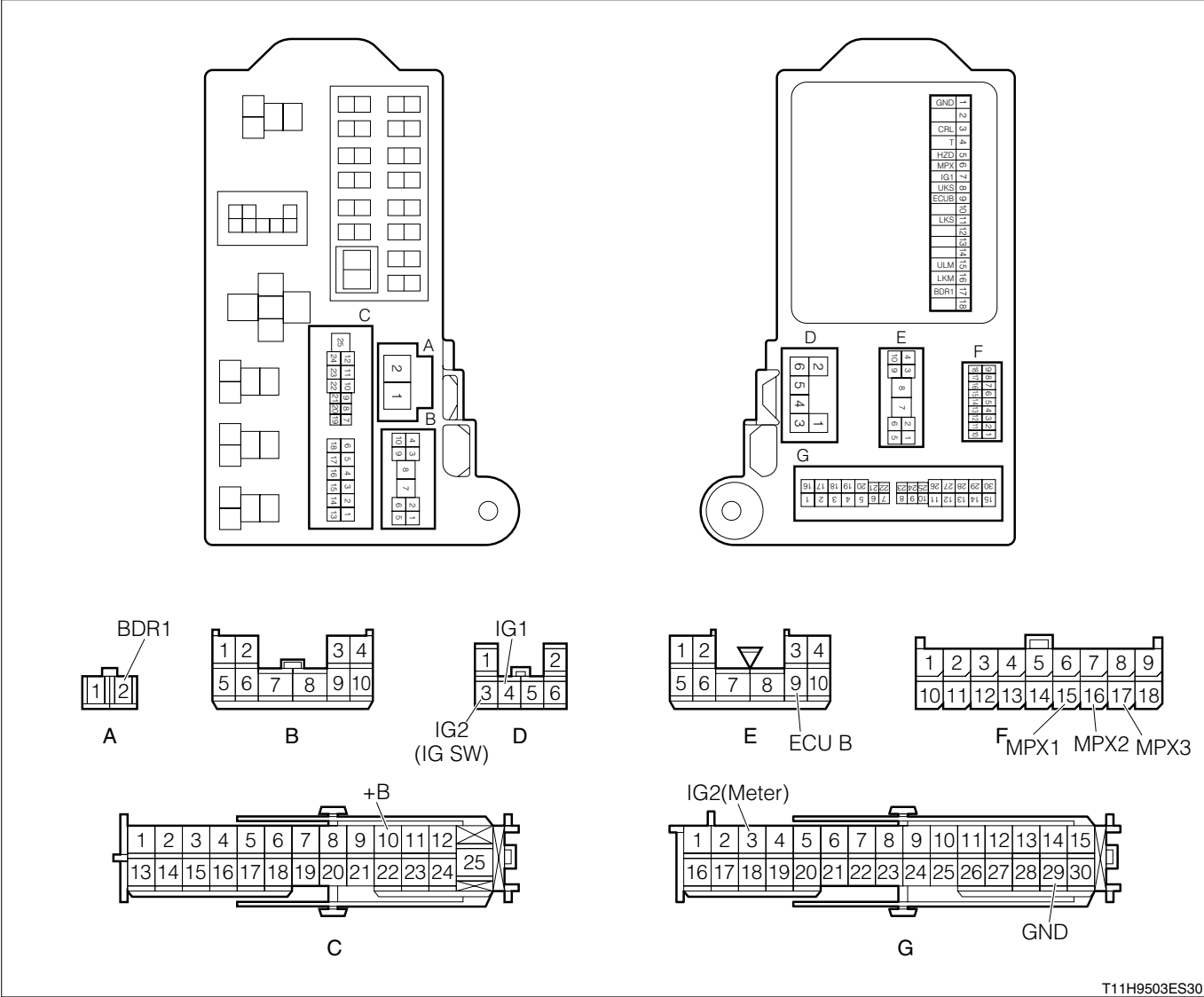
Terminal No.	Terminal code	Terminal name
9	IG2	IG power supply
10	+B	+ B power supply
11	DOOR	Input of courtesy switch signal
17	ECU-T	ECU-T terminal signal input
18	GND	Earth
20	LIN	LIN communication input/output

ITC terminal name (Multiplex communication system)

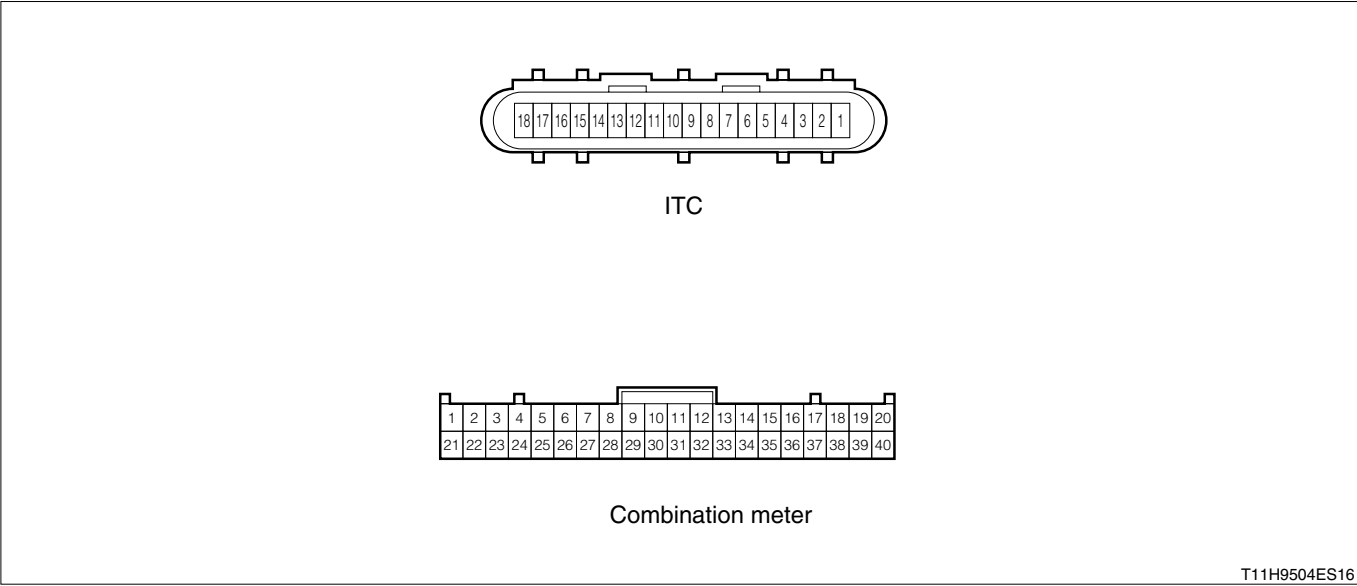
Terminal No.	Terminal code	Terminal name
1	GND	Earth
6	MPX	Multiple communication input/output
7	IG1	ECU power supply
9	ECU B	ECU power supply
17	BDR1	Power supply

1-4 ARRANGEMENT OF VEHICLE HARNESS SIDE CONNECTOR TERMINALS

Fuse block

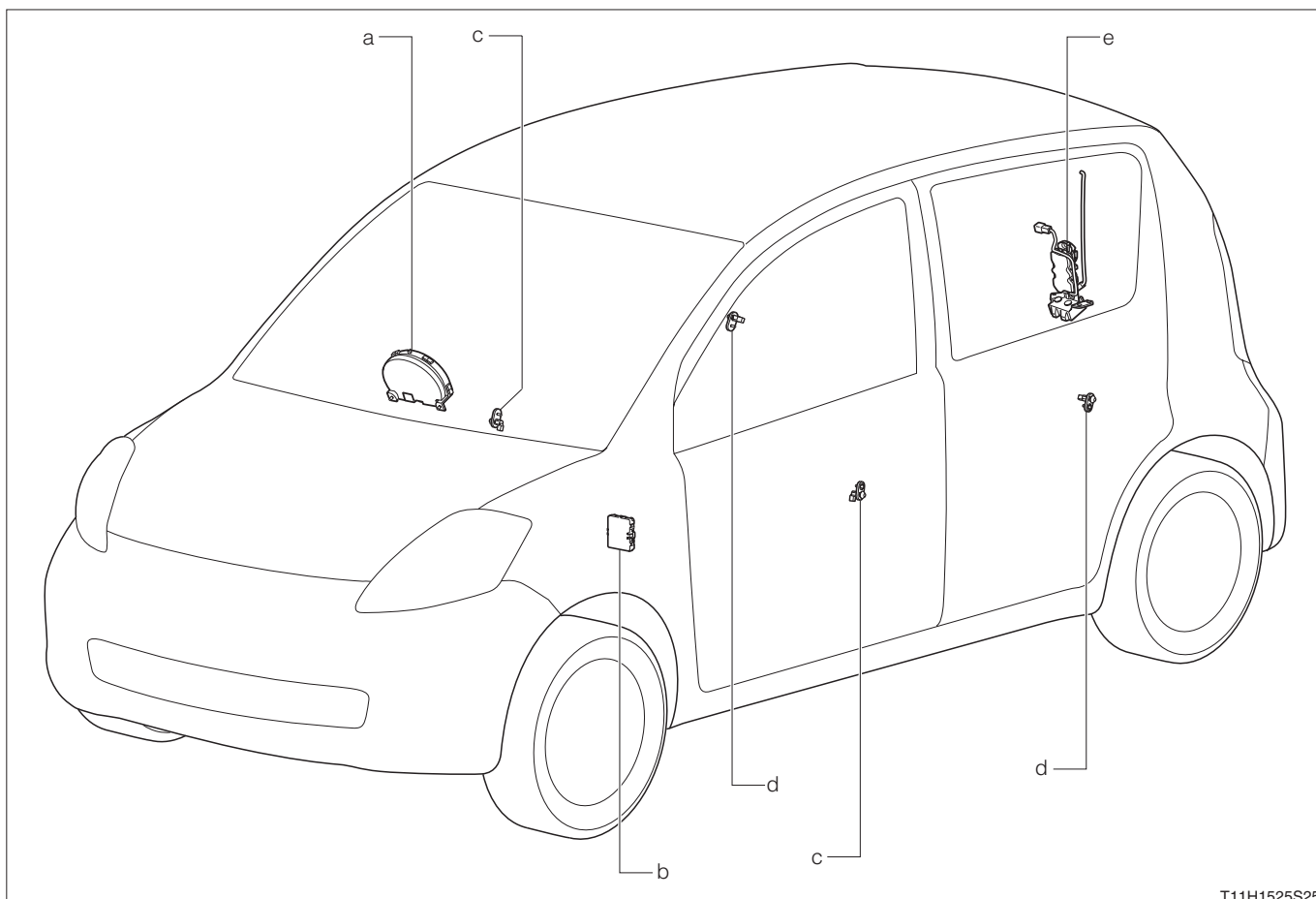


T11H9503ES30



T11H9504ES16

1-5 LOCATION OF COMPONENTS



T11H1525S25

The illustration represents the RHD vehicle. In the case of the LHD vehicle, the combination meter is located at the left side.

a	Meter ECU (inside the combination meter)
b	ITC
c	Front door courtesy switch
d	Rear door courtesy switch
e	Back door courtesy switch (inside the back door lock cylinder)

1-6 HOW TO PROCEED WITH TROUBLE SHOOTING

1. This system incorporates diagnosis functions that will locate malfunctioning parts, thus providing a vital clue in trouble shooting.

➤1. Bringing malfunctioning vehicle to workshop

▼ Go to Step ➤2.

➤2. Diagnosis by interview

1. Gather enough information from the customer on conditions, environment, and phenomenon in which the malfunction took place.

▼ Go to Step ➤3.

➤3. Diagnostic code check and record

1. Use the SST to short-circuit the DLC terminals between 4(ECU-T) - 13(E).

SST: 09991-87403-000

2. Check and record the diagnostic code outputted on the meter LCD.

▼ Go to Step ➤4.

▷4.Reproduction and confirmation of malfunction phenomenon

1. Check the problems and their conditions.

▼ Go to Step ▷5.

▷5.Trouble-shooting according to diagnosis code

1. Perform troubleshooting for the outputted diagnostic code.

▼ Go to Step ▷6.

▷6.Confirmation test

1. Ensure that the problem that the customer described has been completely corrected and the operation is back to normal.

▼ If it is OK, finish the trouble shooting.

▼ In the case of NG, go back to Step ▷3 for a recheck.

1-7 INQUIRY

1. In an effort to remove causes for malfunction from the vehicle concerned, it is impossible to determine the cause without confirming the malfunction phenomenon. If the phenomenon is not confirmed, the vehicle may not be able to return to the normal conditions even if you continue your work. The diagnosis through interviews is to collect information from the customer before confirming the malfunction phenomena. The diagnosis through interviews provides very important clues in reproducing malfunction phenomena.
2. Since the information obtained by the diagnosis through interviews is referred to during the trouble shooting, it is imperative to make an inquiry of the customer, centering on the items related to the malfunction, instead of simply asking general questions.

1-8 CONFIRMATION, RECORD AND ERASURE OF DIAGNOSIS CODE

1. The error message of the diagnostic code remains displayed as long as the communication failure exists, and will be erased when the communication is back to normal. If the battery negative (-) terminal is disconnected during the communication failure, any of the diagnostic error codes for communication with the exception of short-circuit will not be displayed again. It is necessary, therefore, to record diagnostic codes before removing the battery negative (-) terminal.

1-8-2 CHECKING METHOD OF DIAGNOSIS

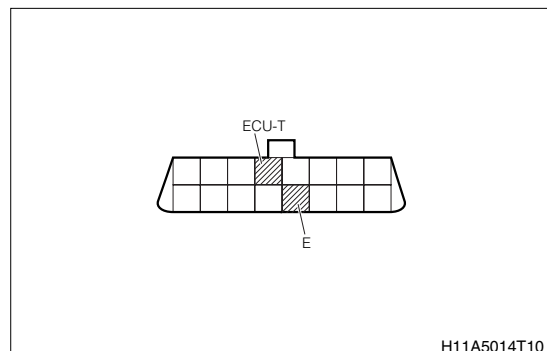
1. Stop the vehicle.
2. Turn the IG switch to "LOCK".

CAUTION

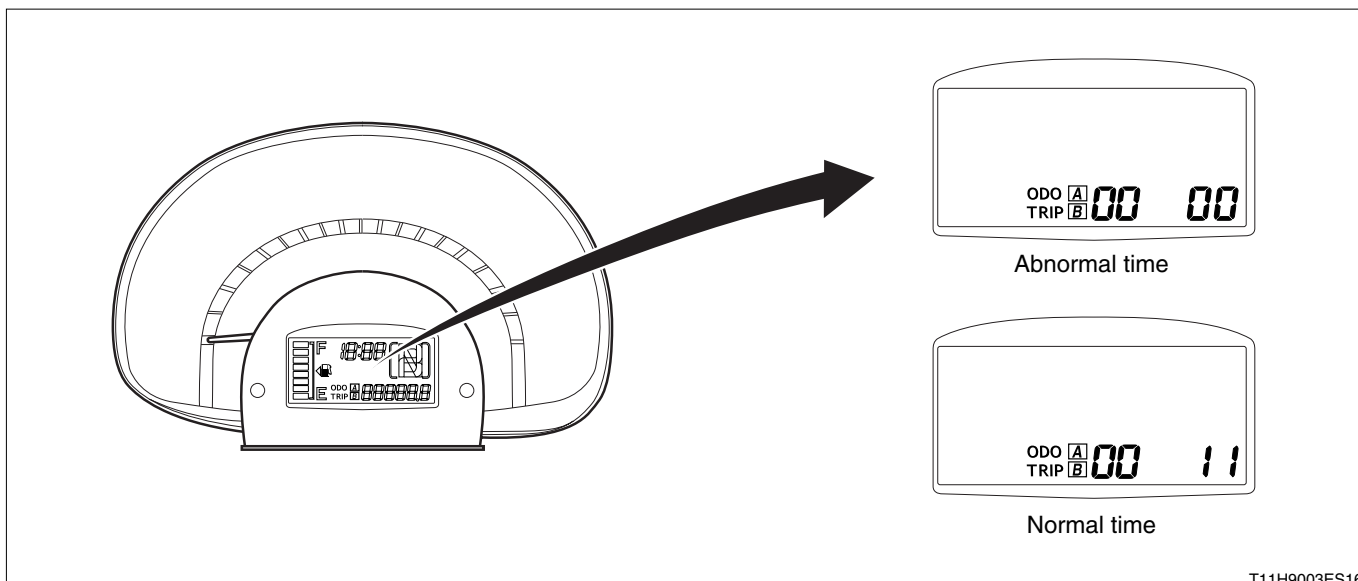
- Connecting the connector in the wrong location could cause a malfunction. Therefore, make sure the connection is correct.

SST: 09991-87403-000

09991-87404-000



3. With the IG switch turned ON, read the diagnosis code that is indicated on the LCD (Liquid Crystal Display) using numerals.



T11H9003ES16

CAUTION

- If battery power has been restored while ECU communication fails, or the ECU is removed, the ITC will not display a malfunction code, but will display the normal code of "00 00".

NOTE

- The meter LCD displays diagnosis codes for the meter, and CAN communication system, in addition to those for the LIN communication system.
- When plural codes are to be outputted, they are outputted, starting from a smaller code number. Furthermore, when one cycle of indications is completed, these codes are repeatedly outputted at intervals of four seconds.

1-8-3 CANCELING METHOD OF DIAGNOSIS

There are following two ways to erase diagnostic codes.

1. The diagnosis error code will be erased automatically when the communication problem has been solved.
2. Turn the IG switch to "LOCK".

CAUTION

- During the repair work of communication failures with the exception of short-circuit repair, keep the battery negative (-) terminal connected until connection of the connector has been checked. (Code No.00 11)

L2-25

1-8-4 CONTENTS OF DIAGNOSIS

Code No.		Warning indication (Provided: ○, Not provided: ×)	Code memory (Provided: ○, Not provided: ×)	Contents of diagnosis
LCD	4 digits			
00 00	—	×	×	The status is normal, or diagnostic codes 00 11 is not re-outputted due to the battery negative (-) terminal being disconnected.
00 11	—	×	×	ITC communication failure (except for short-circuit)
00 21	—	×	×	Short-circuit in communication wire/short-circuit in ECU internal communication circuit

NOTE

- The meter LCD displays diagnosis codes for the meter, and CAN communication system, in addition to those for the LIN communication system.

Meter (00 41 - 00 43, 00 61)

Refer to Page J3-11.

CAN communication system (00 51 - 00 53)

Refer to Page L2-10.

1-9 TROUBLE SHOOTING ACCORDING TO DIAGNOSIS CODE

1-9-1 NO.00 11 (ITC COMMUNICATION FAILURE (EXCEPT FOR SHORT-CIRCUIT))

CAUTION

- During the repair work of communication failures, keep the battery negative (-) terminal connected until connection of the connector has been checked.

▷1.Check of ITC connector connecting state

1. Short-circuit the ECU-T terminal to the E terminal of the DLC, and turn the IG switch to "ON" to display a diagnostic code.
2. With the battery negative (-) terminal connected, shake the ITC lightly in an up-and-down direction and a right-and-left direction. Check the display status of the diagnostic code.

SPECIFIED VALUE: Code No.00 11 shall disappear.

▼ If it is OK, plug the connector securely and see what happens.

▼ If it is NG, go to step ▷2.

▷2. Check of meter connector connecting state

1. With the battery negative (-) terminal connected, shake the meter connecting connector lightly in an up-and-down direction and a right-and-left direction. Check the display status of the diagnostic code.

SPECIFIED VALUE: Code No.00 11 shall disappear.

▼ If it is OK, plug the connector securely and see what happens.

▼ If it is NG, go to step ▷3.

Σ3. Check of fuse block connector connecting state

1. With the battery negative (-) terminal connected, shake the fuse block connecting connector lightly in an up-and-down direction and a right-and-left direction. Check the display status of the diagnostic code.

SPECIFIED VALUE: Code No.00 11 shall disappear.

▼ If it is OK, plug the connector securely and see what happens.

▼ If it is NG, go to step Σ4.

Σ4. Wiring harness check

1. Check the following wire harness for continuity.

- (1) The vehicle harness side connector terminal F16(MPX2) of the fuse block - the vehicle harness side connector terminal 20(LIN) of the meter.

SPECIFIED VALUE: Continuity exists.

▼ If it is OK, go to step Σ5).

▼ If it is NG, repair or replace the wire harness.

Σ5. Fuse block check

1. Check the following fuse block terminals for continuity.

- (1) The ITC fuse block side connector terminal 6 (MPX) - the fuse block connector terminal F16(MPX2).

SPECIFIED VALUE: Continuity exists.

▼ If it is OK, go to step Σ6.

▼ If it is NG, replace the fuse block.

Σ6. Check of ITC power supply system and earth system

1. Disconnect the ITC from the fuse block.
2. Check voltage between the ITC fuse block side connector power supply terminal, earth terminal, and the body earth.

SPECIFIED VALUE: 10 - 14V

▼ If it is OK, go to step Σ7.

▼ In the case of NG, repair or replace the fuse block and wire harness.

▷7. Check of meter power supply system and earth system

1. Disconnect the connector from the meter.
2. Check voltage between the vehicle harness side connector power supply terminal of the meter, earth terminal, and the body earth.

SPECIFIED VALUE: 10 - 14V

▼ If it is OK, replace the ITC. If the problem is not solved after the replacement, replace the meter, too.

▼ If it is NG, repair or replace the wire harness.

1-9-2 NO.00 21 SHORT-CIRCUIT IN COMMUNICATION WIRE/SHORT-CIRCUIT IN ECU INTERNAL COMMUNICATION CIRCUIT

NOTE

- When the code No.0021 is outputted, if abnormality takes place in an ECU, it is impossible to identify the malfunctioning ECU. Therefore, remove the ECU other than the meter ECU to identify the malfunctioning ECU.
- If the code can not be erased, there may be a short circuit in the harness.
- If there is no abnormality given above, the meter ECU might be causing the abnormality.

▷1. Diagnosis code confirmation (at time of ITC removal)

1. After removing the battery negative (-) terminal, remove the ITC from the fuse block. Install the battery negative (-) terminal.
2. Install the battery negative (-) terminal.
3. After short circuiting the terminals ECU-T and E of the DLC, turn ON the IG switch to indicate the diagnosis code.
4. Check the indicating condition of the diagnosis code.

SPECIFIED VALUE: Code No.00 21 shall disappear.

▼ If it is OK, go to step ▷2.

▼ If it is NG, go to step ▷3).

▷2. Check of ITC power supply system and earth system

1. Check the voltage between the ITC fuse block side connector power supply terminal, earth terminal and body earth.

SPECIFIED VALUE: 10 - 14V

▼ If OK, replace the ITC.

▼ If NG, repair or replace the fuse block and wire harness.

▷3. Wiring harness check

1. Check the following wire harness for continuity.
(1) The vehicle harness side connector terminal F16(MPX2) of the fuse block - the vehicle harness side connector terminal 20(LIN) of the meter.

SPECIFIED VALUE: Between the wire harness connector terminal concerned and body earth: No short circuit exists.
Between the wire harness connector terminal concerned and other terminal in the same connector: No short circuit exists.

▼ If it is OK, go to step ▷3.

▼ If it is NG, repair or replace the wire harness.

▷4. Fuse block check

1. Check the following fuse block terminals for continuity.

- (1) ITC fuse block side connector terminal 6(MPX) - fuse block connector terminal F16(MPX2) - F15(MPX1) - F17(MPX3)

SPECIFIED VALUE: Between the connector terminal concerned and body earth: No short circuit exists.
Between the connector terminal concerned and other terminal in the same connector:
(Except between terminals 16(MPX2) - F15(MPX1) - F17(MPX3)): No short circuit exists.

▼ If it is OK, go to step ▷5.

▼ If it is NG, replace the fuse block.

▷5. Check of meter power supply system and earth system

1. Disconnect the connector from the meter.

2. Check voltage between the vehicle harness side connector power supply terminal of the meter, earth terminal, and the body earth.

SPECIFIED VALUE: 10 - 14V

▼ If OK, replace the meter.

▼ If it is NG, repair or replace the wire harness.