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## GROUP 00

# GENERAL

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# HOW TO USE THIS MANUAL

M1001000100682

## SCOPE OF MAINTENANCE, REPAIR AND SERVICING EXPLANATIONS

This manual provides explanations, etc. concerning procedures for the inspection, maintenance, repair and servicing of the subject model. Note, however, that for engine and transmission-related component parts, this manual covers only on-vehicle inspections, adjustments, and the removal and installation procedures for major components. For detailed information concerning the inspection, checking, adjustment, disassembly and reassembly of the engine, transmission and major components after they have been removed from the vehicle, please refer to separate manuals covering the engine and the transmission.

## ON-VEHICLE SERVICE

"On-vehicle Service" is procedures for performing inspections and adjustments of particularly important locations with regard to the construction and for maintenance and servicing, but other inspection (for looseness, play, cracking, damage, etc.) must also be performed.

## INSPECTION

Under this title are presented inspection and checking procedures to be performed by using special tools and measuring instruments and by feeling, but, for actual maintenance and servicing procedures, visual inspections should always be performed as well.

## DEFINITION OF TERMS

### STANDARD VALUE

Indicates the value used as the standard for judging the quality of a part or assembly on inspection or the value to which the part or assembly is corrected and adjusted. It is given by tolerance.

### LIMIT

Shows the standard for judging the quality of a part or assembly on inspection and means the maximum or minimum value within which the part or assembly must be kept functionally or in strength. It is a value established outside the range of standard value.

### REFERENCE VALUE

Indicates the adjustment value prior to starting the work (presented in order to facilitate assembly and adjustment procedures, and so they can be completed in a shorter time).

### DANGER, WARNING, AND CAUTION

DANGER, WARNING, and CAUTION call special attention to a necessary action or to an action that must be avoided. The differences among DANGER, WARNING, and CAUTION are as follows:

- If a DANGER is not followed, the result is severe bodily harm or even death.
- If a WARNING is not followed, the result could be bodily injury.
- If a CAUTION is not followed, the result could be damage to the vehicle, vehicle components or service equipment.

### INDICATION OF TIGHTENING TORQUE

Tightening torques (units: N·m) are set to take into account the central value and the allowable tolerance. The central value is the target value, and the allowable tolerance provides the checking range for tightening torques. If bolts and nuts are not provided with tightening torques, refer to [P.00-30](#).

### MODEL INDICATIONS

The following abbreviations are used in this manual for identification of model types.

2400:Indicates an engine with the 2,378mL <4G69> petrol engine.

MPI:Indicates the multipoint injection.

SOHC:Indicates an engine with the single overhead camshaft.

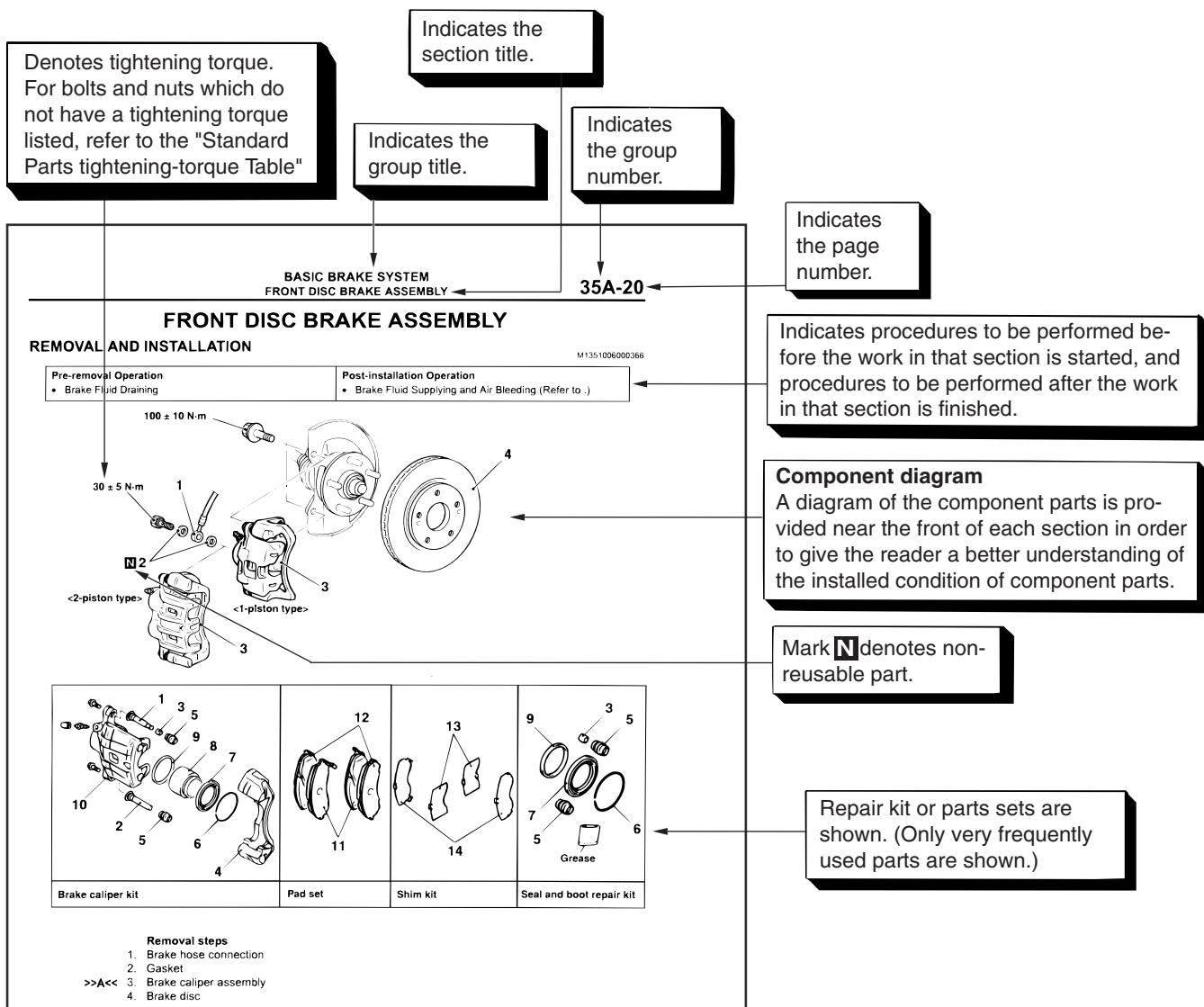
MIVEC:Indicates the mitsubishi innovative valve timing and lift electronic control system

M/T:Indicates the manual transmission.

A/T:Indicates the automatic transmission.

A/C:Indicates the air conditioner.

## EXPLANATION OF MANUAL CONTENTS



### Maintenance and servicing procedures

The numbers provided within the diagram indicate the sequence for maintenance and servicing procedures.

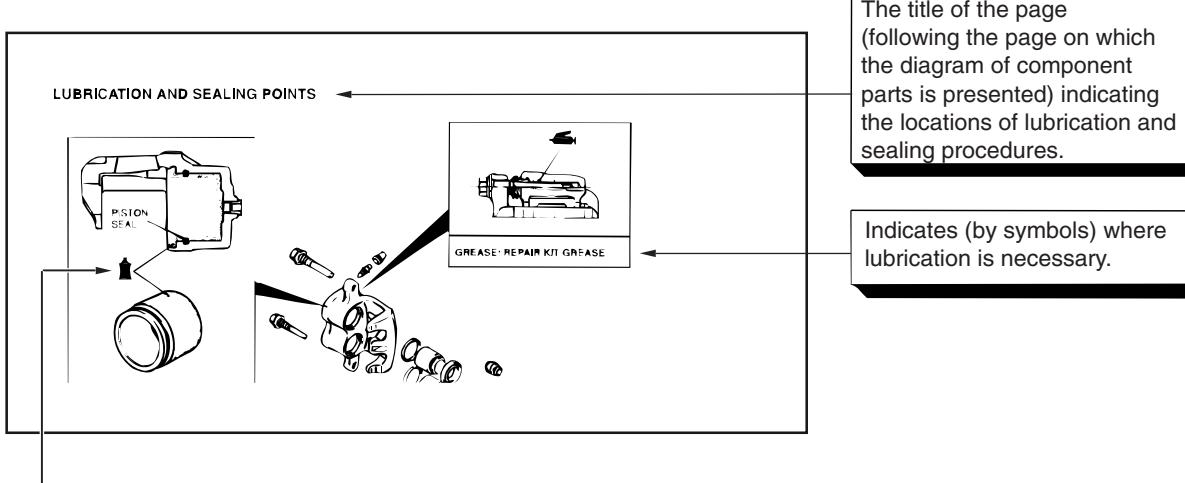
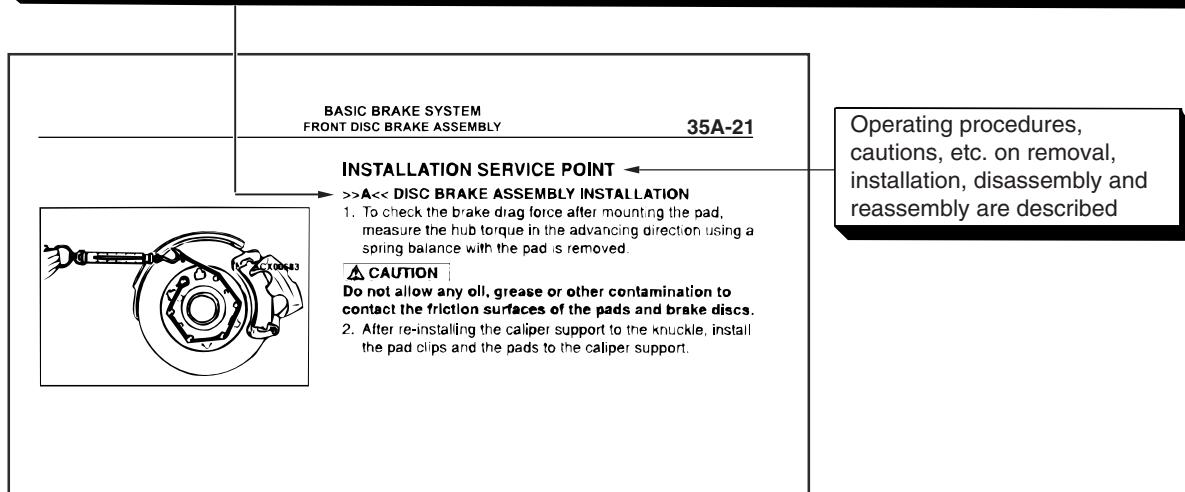
- Removal steps :**  
The part designation number corresponds to the number in the illustration to indicate removal steps.
- Disassembly steps :**  
The part designation number corresponds to the number in the illustration to indicate disassembly steps.

- Installation steps :**  
Specified in case installation is impossible in reverse order of removal steps. Omitted if installation is possible in reverse order of removal steps.
- Reassembly steps :**  
Specified in case installation is impossible in reverse order of removal steps. Omitted if reassembly is possible in reverse order of disassembly steps.

**Classifications of major maintenance / service points**

When there are major points relative to maintenance and servicing procedures (such as essential maintenance and service points, maintenance and service standard values, information regarding the use of special tools, etc.). These are arranged together as major maintenance and service points and explained in detail.

<<A>> : Indicates that there are essential points for removal or disassembly.  
>>A<< : Indicates that there are essential points for installation or reassembly.

**Symbols for lubrication, sealants and adhesives**

Symbols are used to show the locations for lubrication and for application of sealants and adhesives.

These symbols are included in the diagram of component parts or on the page following the component parts page. The symbols do not always have accompanying text to support that symbol.

- : Grease  
(Multi-purpose grease unless there is a brand or type specified)
- : Sealant or adhesive
- : Brake fluid or automatic transmission fluid
- : Engine oil, gear oil or air conditioning compressor oil
- : Adhesive tape or butyl rubber tape

# HOW TO USE TROUBLESHOOTING/INSPECTION SERVICE POINTS

M1001000200593

## CONTENTS OF TROUBLESHOOTING

### **⚠ CAUTION**

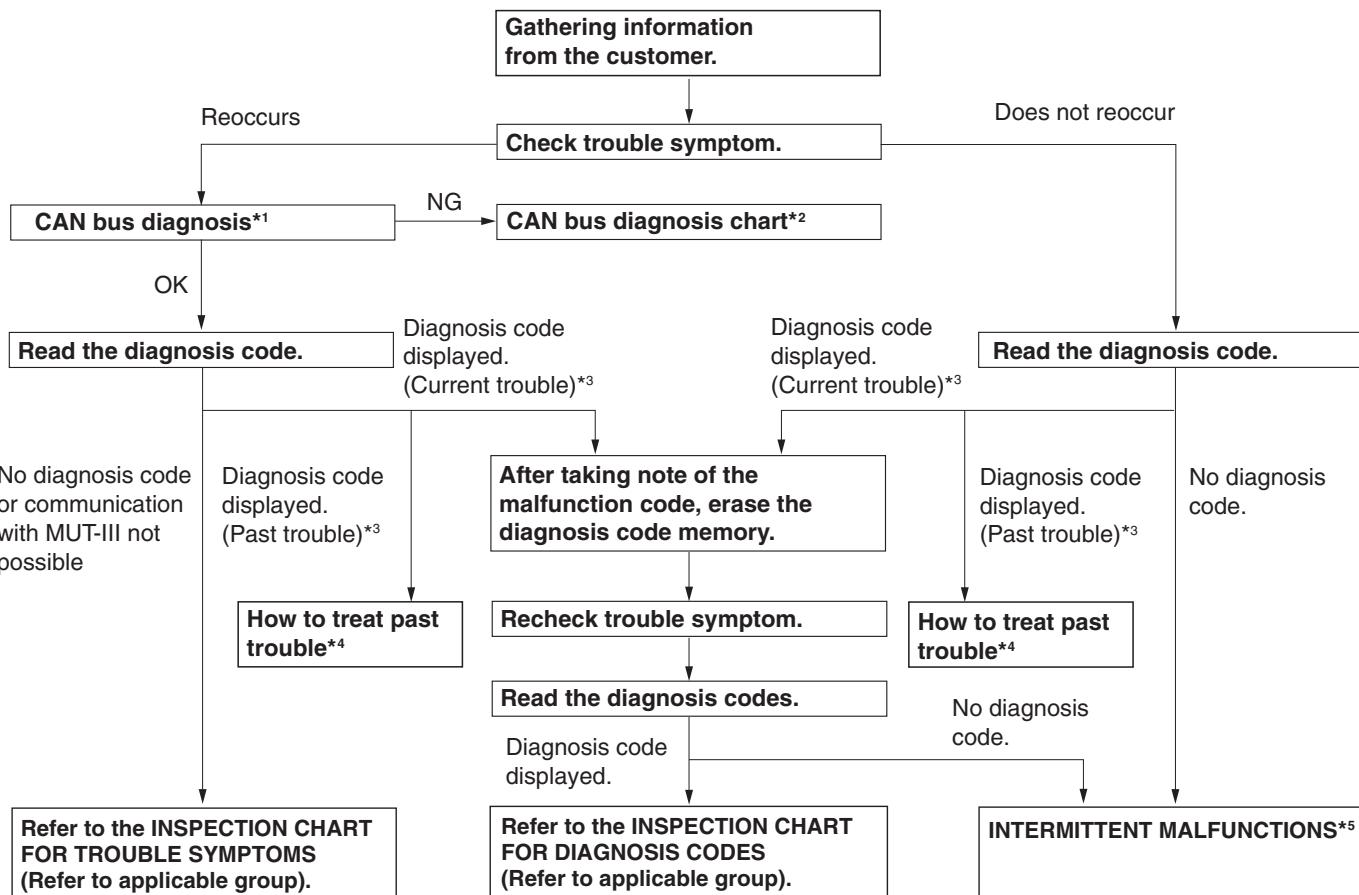
During diagnosis, a diagnosis code code associated with other system may be set when the ignition switch is turned on with connector(s) disconnected. On completion, confirm all systems for diagnosis code(s). If diagnosis code(s) are set, erase them all.

Troubleshooting of electronic control systems for which the MUT-III can be used follows the basic outline described below. Even in systems for which the MUT-III cannot be used, some of these systems still follow this outline.

## 1. STANDARD FLOW OF DIAGNOSIS TROUBLESHOOTING

Troubleshooting sections are based on the diagnostic flow as below. If the diagnostic flow is different from that given below, or if additional explanation is required, the details of such differences or additions will also be listed.

### Diagnosis method



AC311722

- \*<sup>1</sup>: For how to diagnose CAN bus lines, refer to GROUP 54 P.54D-9.

- \*<sup>2</sup>: For the CAN bus diagnostics table, refer to GROUP 54 [P.54D-16](#).
- \*<sup>3</sup>: When the MUT-III detects a diagnosis code, its display informs users whether a mechanical problem currently exists or whether it existed before but normal operation has been restored. The message for the former state identifies it as a "current trouble" and the message for the latter identifies it as a "past trouble". However, if MPI and SRS airbag diagnosis codes are set, "current trouble/past trouble" will not be displayed. In this case, follow the diagnosis procedure for current trouble.
- \*<sup>4</sup>: For how to handle past trouble, refer to .
- \*<sup>5</sup>: For how to cope with intermittent malfunctions, refer to .

## 2. SYSTEM OPERATION AND SYMPTOM VERIFICATION TESTS

If verification of the symptom(s) is difficult, procedures for checking operation and verifying symptoms are shown.

## 3. DIAGNOSIS FUNCTION

Details which are different from those in the "Diagnosis Function" section are described.

## 4. DIAGNOSIS CODE CHART

Diagnostic trouble codes and diagnostic items are shown.

## 5. DIAGNOSIS CODE PROCEDURES

Indicates the inspection procedures corresponding to each diagnosis code (Refer to How to Use Inspection Procedures ).

## 6. TROUBLE SYMPTOM CHART

If there are trouble symptoms even though the MUT-III does not find any diagnosis codes, inspection procedures for each trouble symptom will be found by means of this chart.

## 7. SYMPTOM PROCEDURES

Indicates the inspection procedures corresponding to each symptoms classified in the Symptom Chart (Refer to How to Use Inspection Procedures ).

## 8. SERVICE DATA REFERENCE TABLE

Inspection items and normal judgment values have been provided in this chart as reference information.

## 9. ACTUATOR TEST TABLE

The Actuator Test item numbers, inspection items, and judgment values have been provided in this chart as reference information.

## 10. CHECK AT ECU TERMINALS

Terminal numbers for the ECU connectors, inspection items, and judgment values have been provided in this chart as reference information.

## 11. INSPECTION PROCEDURE BY USING AN OSCILLOSCOPE

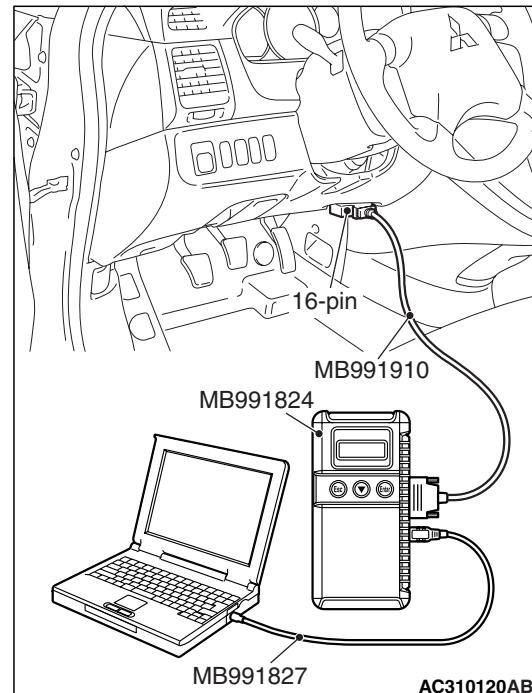
When there are inspection procedures using an oscilloscope, these are described here.

### DIAGNOSIS FUNCTION

#### 1. HOW TO READ DIAGNOSIS CODE

##### CAUTION

Before connecting or disconnecting the MUT-III, turn the ignition switch to the "LOCK" (OFF) position.



Connect the MUT-III to the 16-pin diagnosis connector, and read the diagnosis code.

*NOTE: For details on how to use the MUT-III, refer to the "MUT-III operation manual."*

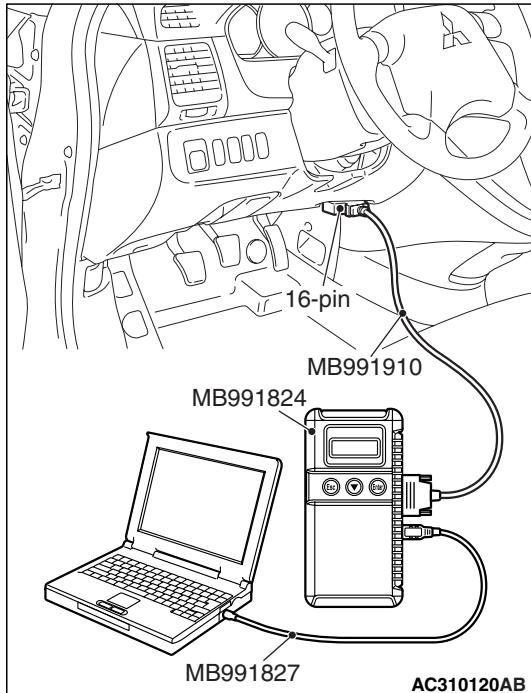
1. Ensure that the ignition switch is at the "LOCK" (OFF).
2. Start up the personal computer.
3. Connect MUT-III USB cable MB991827 to special tool Vehicle Communication Interface (V.C.I.) MB991824 and the personal computer.

4. Connect MUT-III main harness A MB991910 to the V.C.I.
5. Connect the MUT-III main harness A to the diagnosis connector.
6. Turn the V.C.I. power switch to the "ON" position.  
*NOTE: When the V.C.I. is energized, the V.C.I. indicator lamp will be illuminated in a green colour.*
7. Start the MUT-III system on the personal computer and turn the ignition switch to the "ON" position.
8. Read the diagnosis code.
9. Disconnecting the MUT-III is the reverse of the connecting sequence, making sure that the ignition switch is at the "LOCK" (OFF) position.

## **2. ERASING DIAGNOSIS CODE**

**⚠ CAUTION**

**Before connecting or disconnecting the MUT-III, turn the ignition switch to the "LOCK" (OFF) position.**

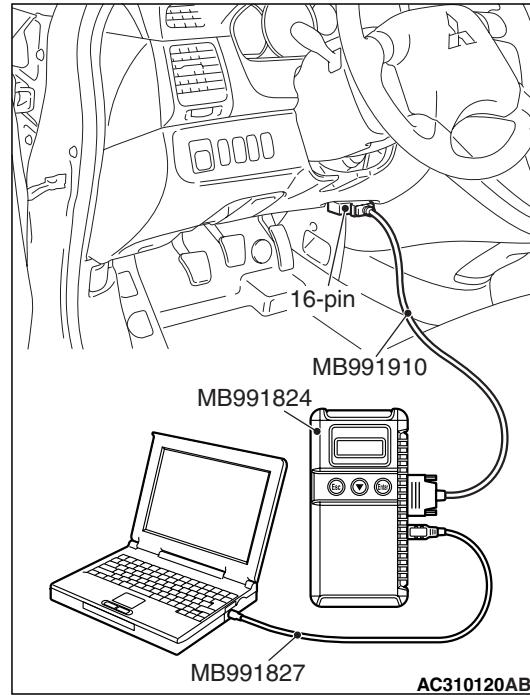


Connect the MUT-III to the diagnosis connector, and erase the diagnosis code. The procedure is the same as "How to Read Diagnosis Code ."

## **3. INPUT SIGNAL CHECK (WHEN USING THE MUT-III) <SWS>**

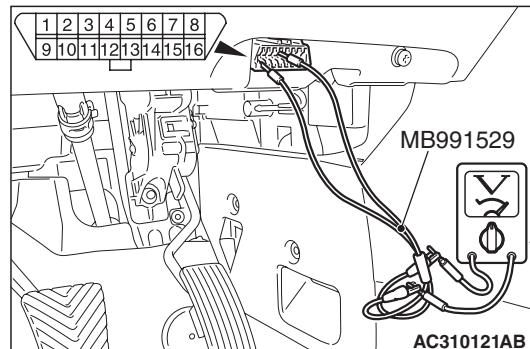
**⚠ CAUTION**

**Before connecting or disconnecting the MUT-III, turn the ignition switch to the "LOCK" (OFF) position.**



1. Connect the MUT-III to the diagnosis connector, and erase the diagnosis code.
2. If the MUT-III buzzer sounds once when each switch is operated (ON/OFF), the input signal for that switch circuit system is normal.

## **3. INPUT SIGNAL CHECK (WHEN USING A VOLTMETER) <SWS>**

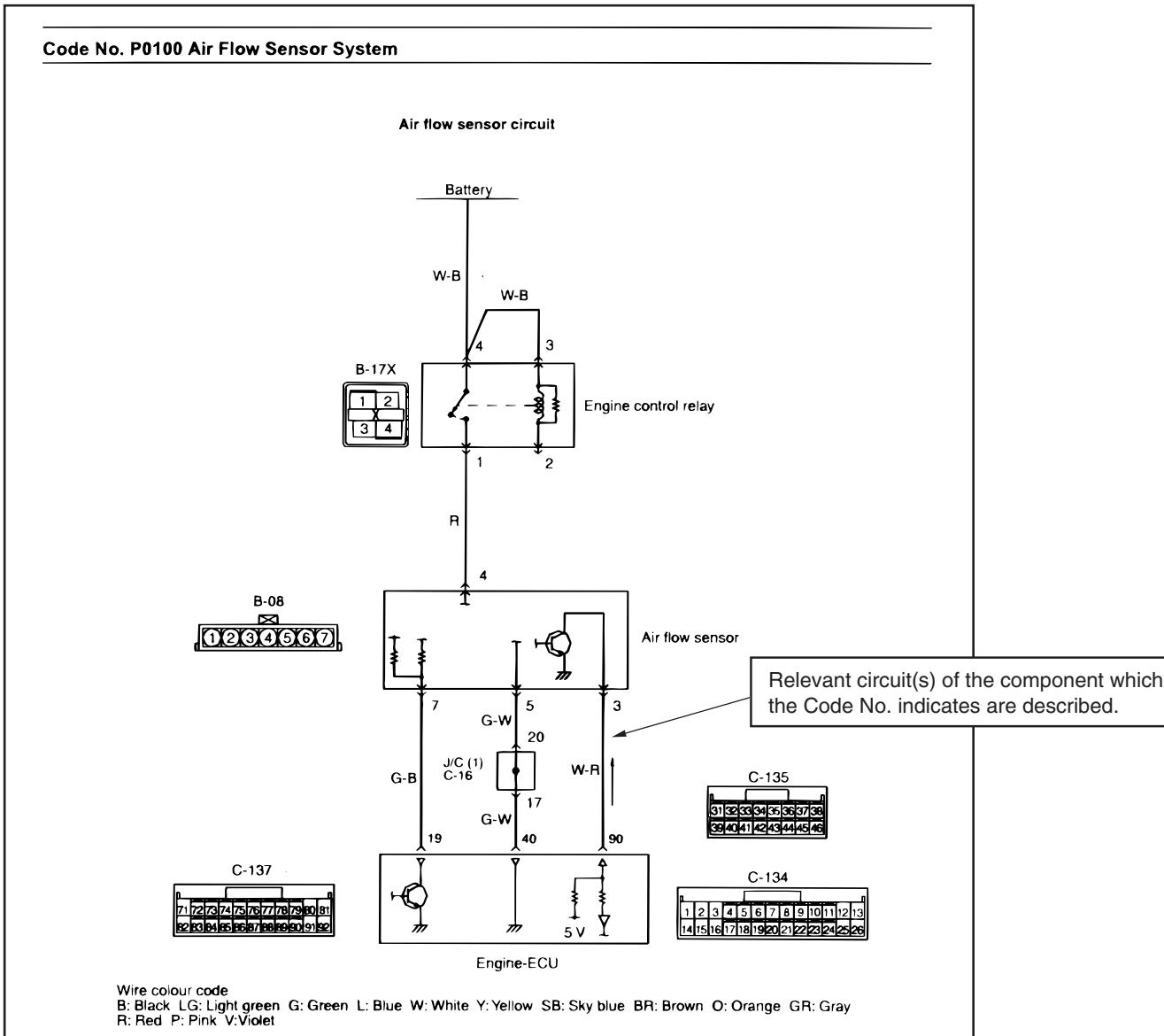


1. Use the special tool diagnosis code check harness (MB991529) to connect the ETACS terminal (terminal 9) and the earth terminals (terminals 4 and 5) of the diagnosis connector to the voltage meter.

2. If the needle of the voltage meter flickers once when each switch is operated (ON/OFF), the input signal for that switch circuit system is normal.

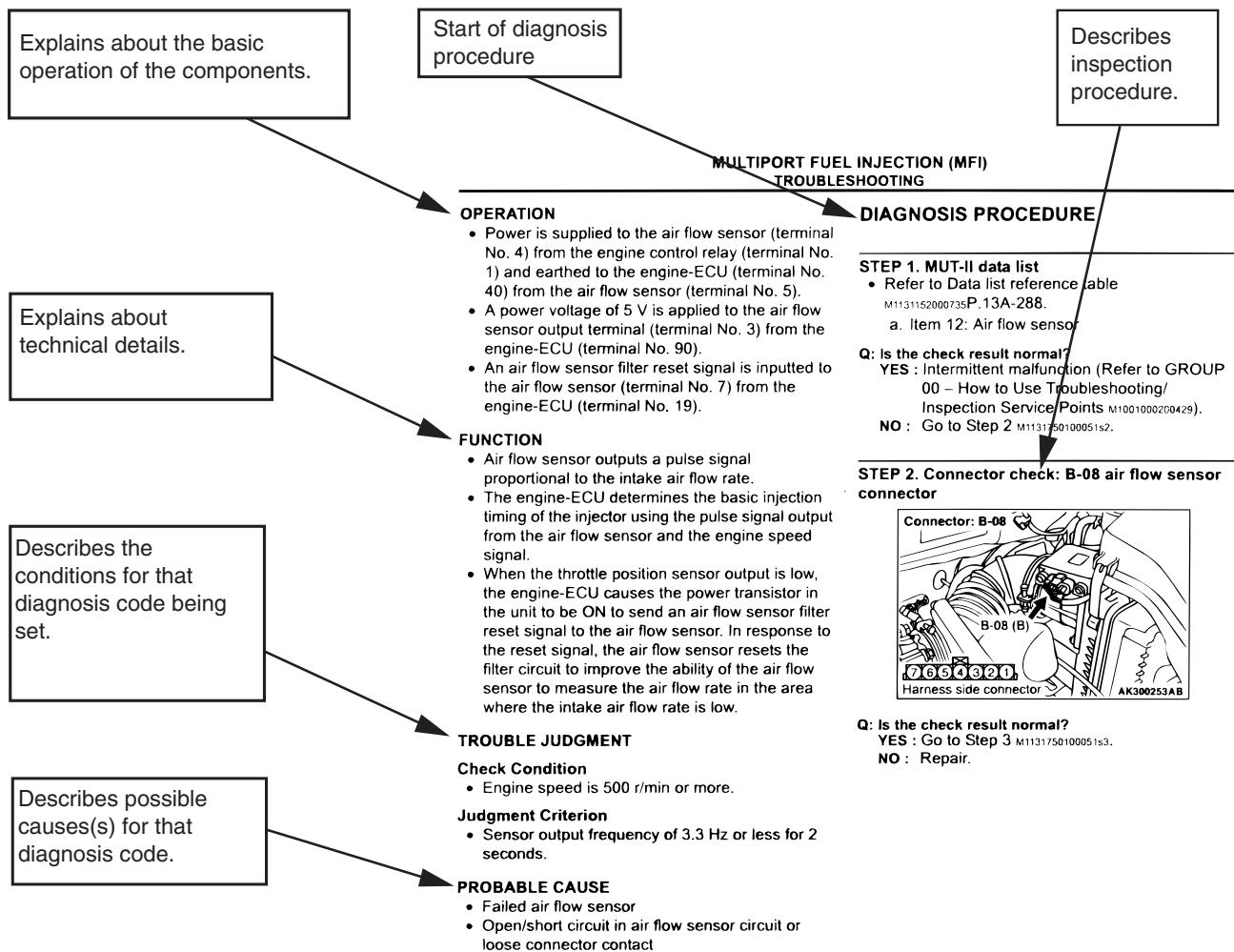
## HOW TO USE THE INSPECTION PROCEDURES

The causes of many of the problems occurring in electric circuitry are generally the connectors, components, the ECU, the wiring harnesses between connectors, in that order. These inspection procedures follow this order. They first try to discover a problem with a connector or a defective component.



## GENERAL

### HOW TO USE TROUBLESHOOTING/INSPECTION SERVICE POINTS



### CURRENT TROUBLE

Indicates that the trouble is currently present. Carry out troubleshooting as described in the applicable inspection procedure.

### PAST TROUBLE

Indicates that the trouble is historic, but normal operation has been restored. Observe the applicable inspection procedure with particular emphasis on connector(s) and wiring harness.

### HARNESS CHECK

Check for an open or short circuit in the harness between the terminals which were faulty according to the connector measurements. Carry out this inspection while referring to the Electrical Wiring Manual. Here, "Check the wiring harness between the power supply and terminal xx" also includes checking for blown fuse. For inspection service points when there is a blown fuse, refer to "Inspection Service Points for a Blown Fuse ."

### MEASURES TO TAKE AFTER REPLACING THE ECU

If the trouble symptoms have not disappeared even after replacing the ECU, repeat the inspection procedure from the beginning.

### CONNECTOR MEASUREMENT SERVICE POINTS

#### **CAUTION**

During diagnosis, a diagnosis code code associated with other system may be set when the ignition switch is turned on with connector(s) disconnected. On completion, confirm all systems for diagnosis code(s). If diagnosis code(s) are set, erase them all.

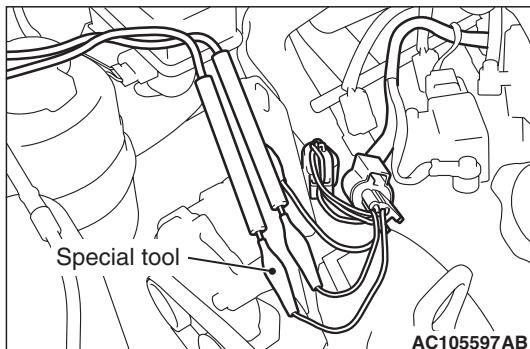
Turn the ignition switch to the "LOCK" (OFF) position when connecting and disconnecting the connectors. Turn the ignition switch to "ON" when measuring, unless there are instructions to the contrary.

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## IF INSPECTING WITH THE CONNECTOR CONNECTED <WATERPROOF CONNECTORS>

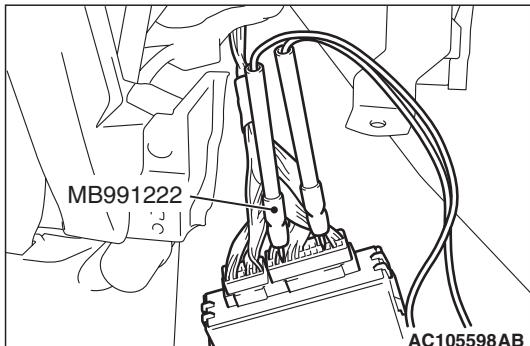
### ⚠ CAUTION

Never insert a test probe from the harness side, as this will reduce the waterproof performance and result in corrosion.



Use the special tools such as test harness, harness connector or check harness.

## IF INSPECTING WITH THE CONNECTOR CONNECTED <ORDINARY (NON-WATERPROOF) CONNECTORS>

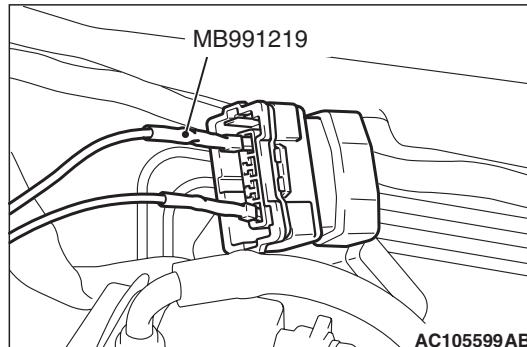


Insert a test bar from the wiring harness side. If a test bar cannot be inserted due to a too small pin cell (e.g. control unit connector pins), use the probe (MB991222) of the special tool Harness Set (MB991223). Never attempt to insert the test bar into a too small pin cell forcibly.

## IF INSPECTING WITH THE CONNECTOR DISCONNECTED <WHEN INSPECTING A FEMALE PIN>

### ⚠ CAUTION

- Use the special tool Check Harness (MB991219). If the test bar is inserted forcibly, it will cause a poor contact.
- If the connector is disconnected, a diagnosis code may be stored for the system to be checked or other systems.

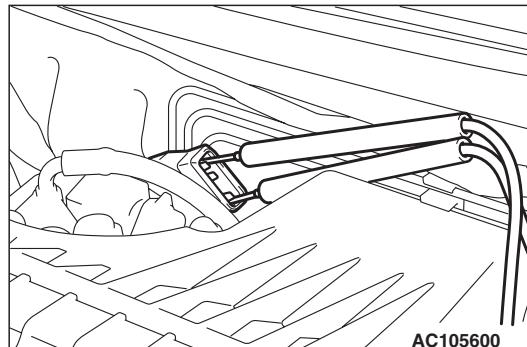


Use the Check Harness (MB991219) of the special tool Harness Set (MB991223).

## IF INSPECTING WITH THE CONNECTOR DISCONNECTED <WHEN INSPECTING A MALE PIN>

### ⚠ CAUTION

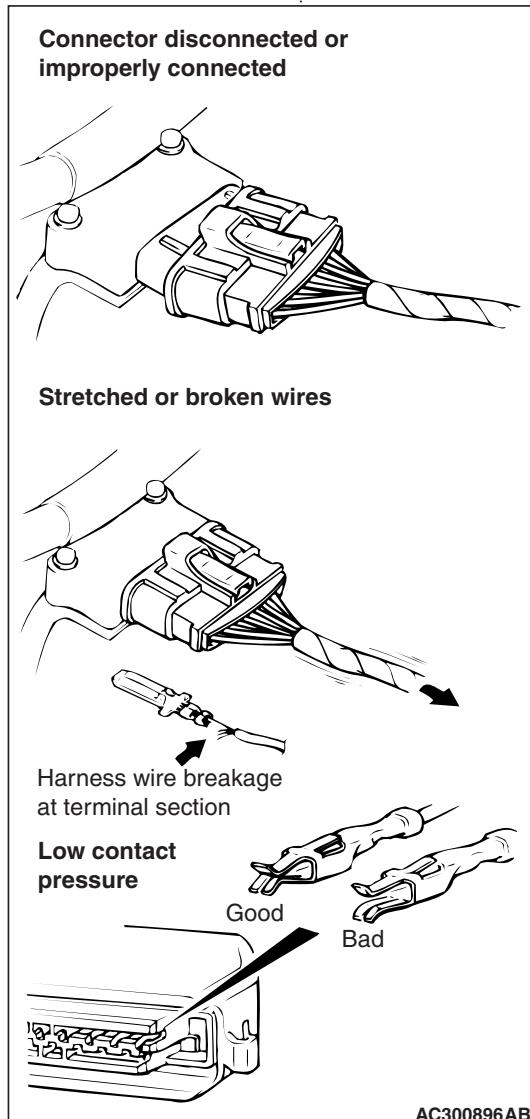
- Be careful not to short the connector pins with the test bars. To do so may damage the circuits inside the ECU.
- If the connector is disconnected, a diagnosis code may be stored for the system to be checked or other systems.



Touch the pin directly with the test bar.

## CONNECTOR INSPECTION SERVICE POINTS

### VISUAL INSPECTION

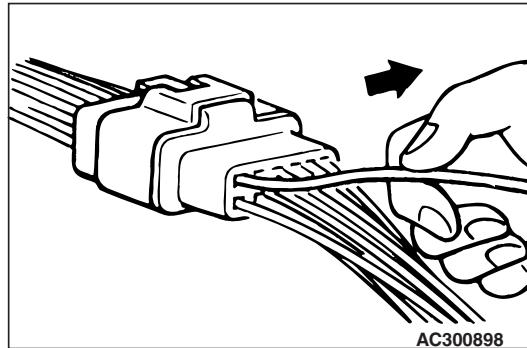


Connector is disconnected or improperly connected

- Connector pins are pulled out
- Due to harness tension at terminal section
- Low contact pressure between male and female terminals

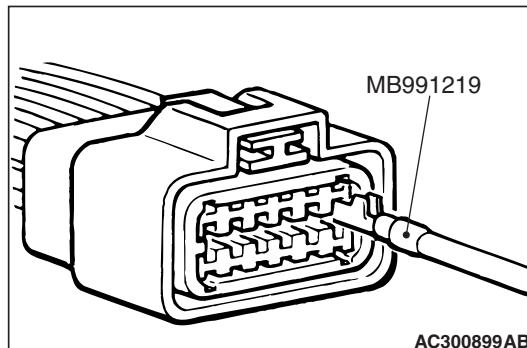
- Low connection pressure due to rusted terminals or foreign matter lodged in terminals

### CONNECTOR PIN INSPECTION



If the connector pin stopper is damaged, the terminal connections (male and female pins) will not be perfect even if the connector body is connected, and the pins may pull out of the reverse side of the connector. Therefore, gently pull the harnesses one by one to make sure that no pins pull out of the connector.

### CONNECTOR ENGAGEMENT INSPECTION

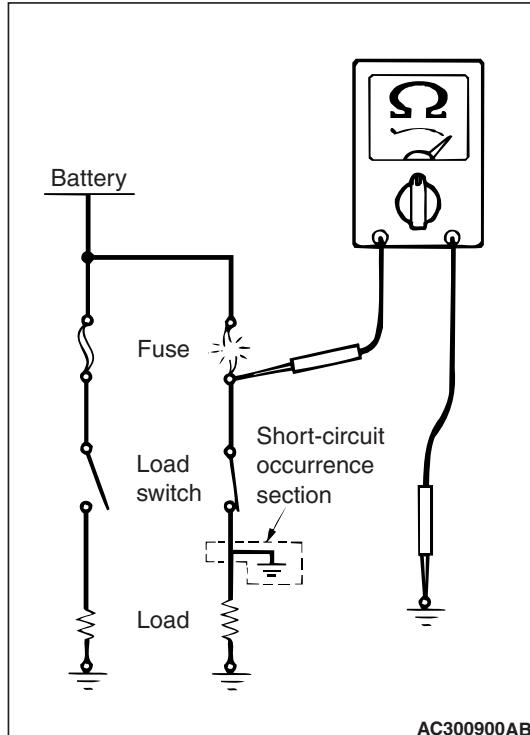


Use special tool inspection harness (MB991219) (connector pin connection pressure inspection harness of the inspection harness set) to inspect the engagement of the male pins and females pins. (Pin drawing force: 1 N or more)

## INSPECTION SERVICE POINTS FOR A BLOWN FUSE

**CAUTION**

A diagnosis code may be stored due to a blown fuse.

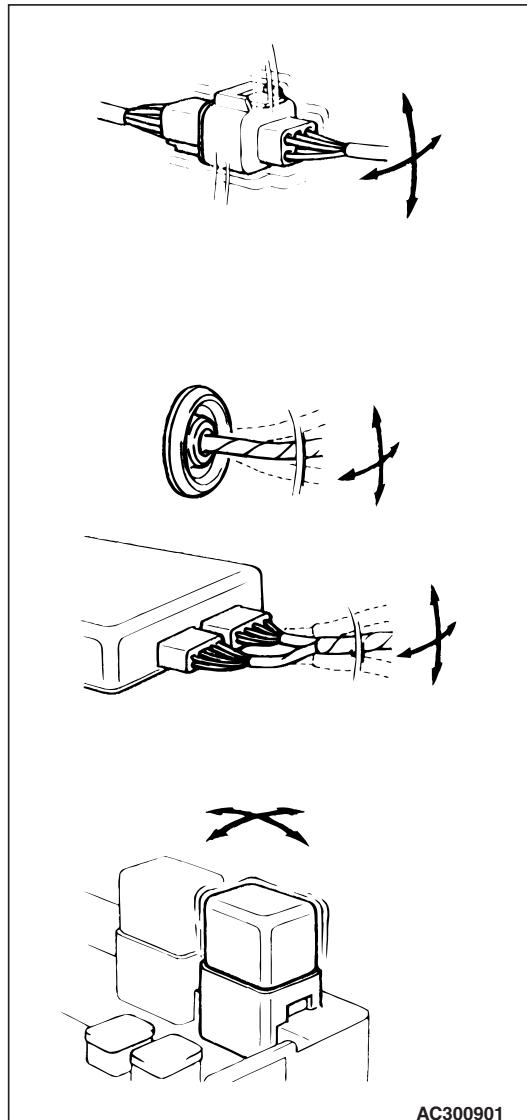


Remove the blown fuse and measure the resistance between the load side of the blown fuse and the earth. Close the switches of all circuits which are connected to this fuse. If the resistance is almost  $0\ \Omega$  at this time, there is a short somewhere between these switches and the load. If the resistance is not  $0\ \Omega$ , there is no short at the present time, but a momentary short has probably caused the fuse to blow.

The main causes of a short circuit are the following.

- Harness being clamped by the vehicle body
- Damage to the outer casing of the harness due to wear or heat
- Water getting into the connector or circuitry
- Human error (mistakenly shorting a circuit, etc.)

## HOW TO COPE WITH INTERMITTENT MALFUNCTIONS



Intermittent malfunctions often occur under certain conditions, and if these conditions can be ascertained, determining the cause becomes simple. In order to ascertain the conditions under which an intermittent malfunction occurs, first ask the customer for details about the driving conditions, weather conditions, frequency of occurrence and trouble symptoms, and then try to recreate the trouble symptoms. Next, ascertain whether the reason why the trouble symptom occurred under these conditions is due to vibration, temperature or some other factor. If vibration is thought to be the cause, carry out the following checks with the connectors and components to confirm whether the trouble symptom occurs. The objects to be checked are connectors and components which are indicated by inspection procedures or given as probable causes (which generates diagnosis codes or trouble symptoms).

- Gently shake the connector up, down and to the left and right.
- Gently shake the wiring harness up, down and to the left and right.
- Gently rock each sensor and relay, etc. by hand.
- Gently shake the wiring harness at suspensions and other moving parts.

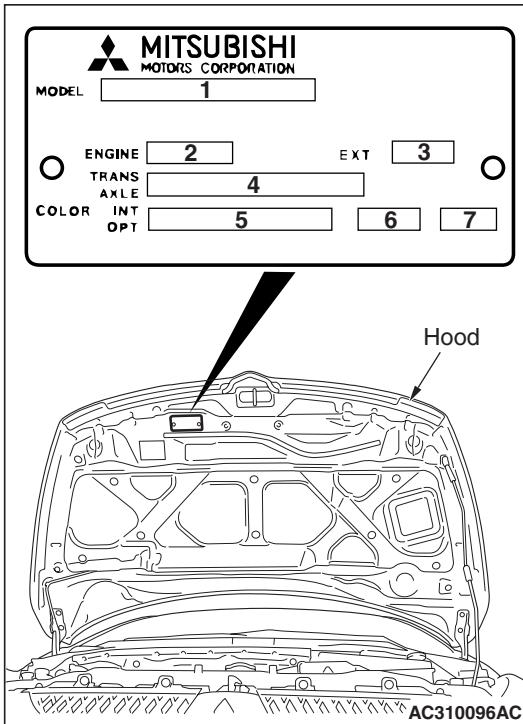
*NOTE: If determining the cause is difficult, the drive recorder function of the MUT-III can also be used. (For details on how to use the MUT-III, refer to the "MUT-III operation manual").*

## HOW TO TREAT PAST TROUBLE

1. Establish from the customer whether a fuse or connector has been replaced or disconnected.
2. If yes, erase the diagnosis code, and then check that no diagnostic code is reset. If no diagnosis code is reset, the diagnosis is complete.
3. If no, follow the applicable Diagnostic Trouble Code Chart. Then check the wiring harness and connector, and refer to "How to Cope with Intermittent Malfunction ."

## VEHICLE IDENTIFICATION

### VEHICLE IDENTIFICATION CODE PLATE



M1001000400768

The vehicle information code plate is riveted to the back of the hood.

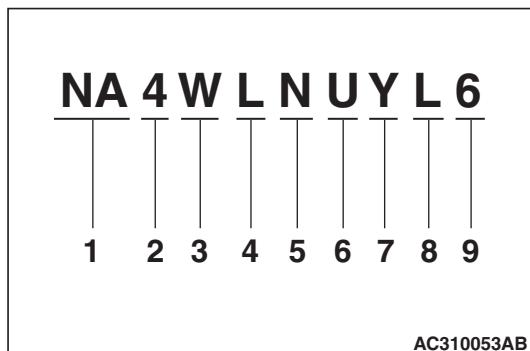
No.	Item	Content	
1	MODEL	NA4W	Vehicle model
		LNHYL6	Model series
2	ENGINE	4G69	Engine model
3	EXT	W32A	Exterior code
4	TRANS AXLE	F5M42	Transmission model
5	COLOR	W32	Body colour code
6	INT	22T	Interior code
7	OPT	Z36	Equipment code

- The plate shows model code, engine model, transmission model and body colour code.
- For monotone colour vehicles, the body colour code shall be indicated.

## MODELS

Model code	Engine model	Transmission model	Fuel supply system
NA4W	LNUYL6/R6	4G69-SOHC-MIVEC (2,378 mL)	F5M42 <2WD, 5M/T> F4A4B <2WD, 4A/T with sport mode> F5M42 <2WD, 5M/T> F4A4B <2WD, 4A/T with sport mode>
	LRUYL6/R6		
	LNYL6/R6		
	LRHYL6/R6		

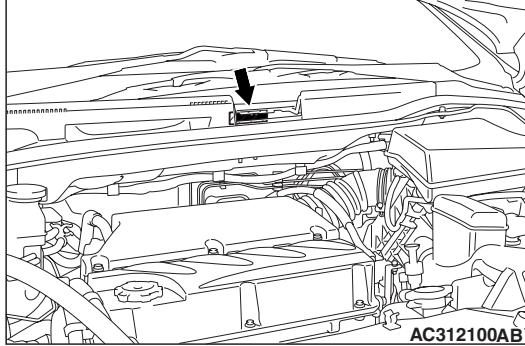
## MODEL CODE



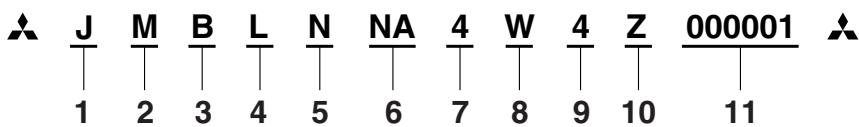
No.	Item	Content
7	Specification engine feature	Y MPI-SOHC-MIVEC
8	Steering wheel location	L Left hand
		R Right hand
9	Destination	6 For Europe

## CHASSIS NUMBER

No.	Item	Content
1	Development	NA GRANDIS
2	Engine type	4 2,378mL
3	Sort	W Wagon
4	Body style	L 4-door station wagon
5	Transmission type	N 5-speed manual transmission
		R 4-speed automatic transmission
6	Trim level	U 7 seating
		H 6 seating



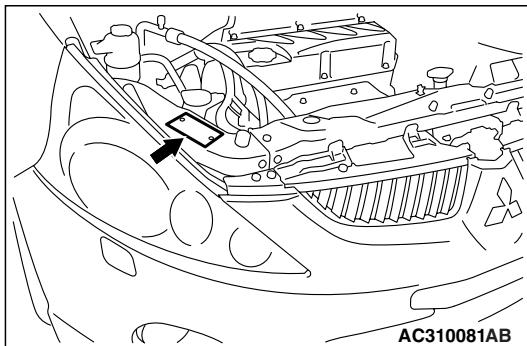
The chassis number is stamped inside the bulkhead as shown in the illustration.



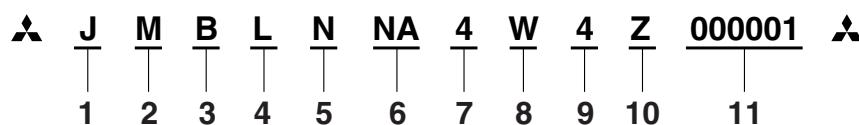
AC310082AB

No.	Item	Content
1	Fixed figure	J Asia
2	Distribution channel	M Japan
3	Destination	A For Europe, right hand drive
		B For Europe, left hand drive
4	Body style	L 4-door station wagon
5	Transmission type	N 5-speed manual transmission
		R 4-speed automatic transmission
6	Development order	NA GRANDIS
7	Engine	4 4G69: 2,378 mL petrol engine
8	Soft	W Station wagon
9	Model year	4 2004
10	Plant	Z Okazaki Motor Vehicle Works
11	Serial number	000001 to 999999

**VEHICLE NAME PLATE**

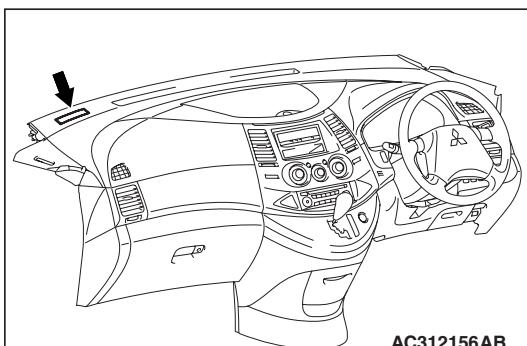


The name plate is riveted to the front end upper bar in the engine room.

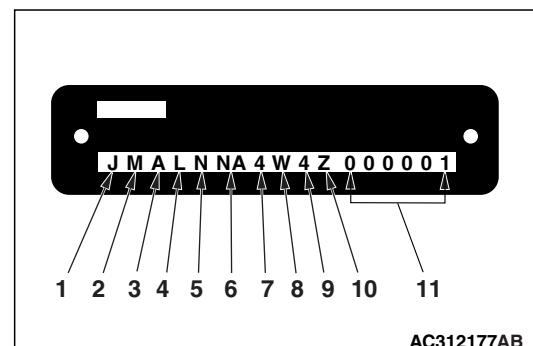


No.	Item	Content	
1	Fixed figure	J	Asia
2	Distribution channel	M	Japan
3	Destination	A	For Europe, right hand drive
		B	For Europe, left hand drive
4	Body style	L	4-door station wagon
5	Transmission type	N	5-speed manual transmission
		R	4-speed automatic transmission
6	Development order	NA	GRANDIS
7	Engine	4	4G69: 2,378 mL petrol engine
8	Soft	W	Station wagon
9	Model year	4	2004
10	Plant	Z	Okazaki Motor Vehicle Works
11	Serial number	000001 to 999999	

**VEHICLES IDENTIFICATION NUMBER  
LOCATION <VEHICLES FOR ENGLAND>**

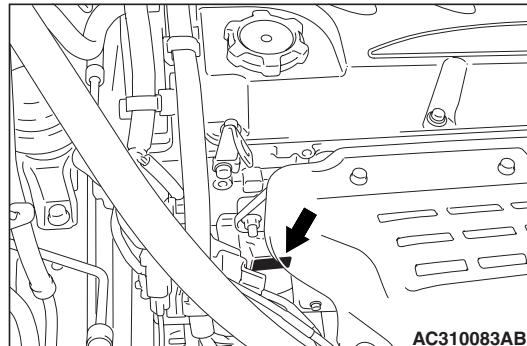


The vehicle identification number (VIN) is located on a plate attached to the left top side of the instrument panel.



No.	Item	Content
1	Fixed figure	J ASIA
2	Distribution channel	M JAPAN
3	Destination	A Vehicles for right hand
4	Body style	L 4-door station wagon
5	Transmission type	N 5-speed manual transmission
		R 4-speed automatic transmission
6	Development order	NA GRANDIS
7	Engine	4 4G69: 2,378 mL petrol engine
8	Sort	W Station wagon
9	Model year	4 2004
10	Plant	Z Okazaki Motor Vehicle Works
11	Serial number	000001 to 999999

## ENGINE MODEL STAMPING



The engine model is stamped on the cylinder block. This engine model numbers is as shown as follow.

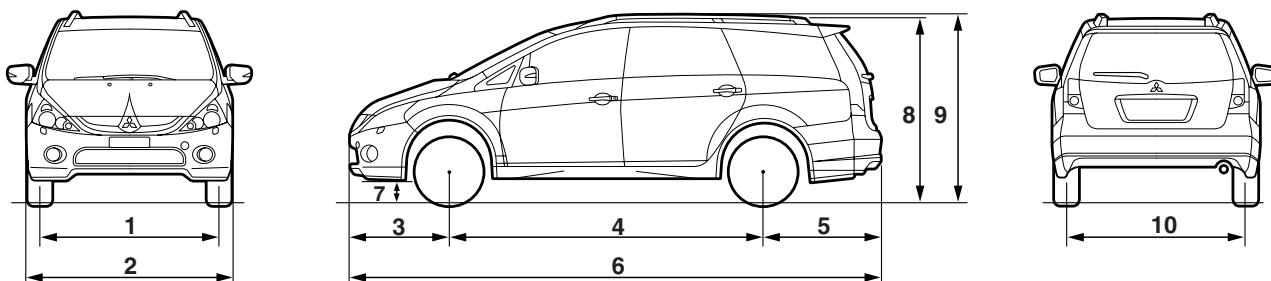
Engine model	Engine displacement
4G69	2,378 mL

The engine serial number is stamped near the engine model number.

Engine serial number	AA0201 to YY9999
----------------------	------------------

## GENERAL DATA AND SPECIFICATIONS

M1001000900592



**GENERAL  
GENERAL DATA AND SPECIFICATIONS**

**00-17**

Item	NA4W						
	LNUYL6/R6		LRUYL6/R6		LNHYL6/R6		
LRHYL6/R6							
Vehicle dimensions mm	Front track	1	1,550	1,550	1,550	1,550	
	Overall width	2	1,795	1,795	1,795	1,795	
	Front overhang	3	900	900	900	900	
	Wheelbase	4	2,830	2,830	2,830	2,830	
	Rear overhang	5	1,035	1,035	1,035	1,035	
	Overall length	6	4,765	4,765	4,765	4,765	
	Ground clearance	7	155 165*	155 165*	155 165*	155 165*	
	Overall height	Without roof rails	8	1,655 1,665*	1,655 1,665*	1,655 1,665*	
		With roof rails	9	1,690 1,700*	1,690 1,700*	1,690 1,700*	
	Rear track	10	1,555	1,555	1,555	1,555	
Vehicle weight kg	Kerb weight		1,645	1,655	1,625	1,635	
	Max. gross vehicle weight		2,250	2,250	2,250	2,250	
	Max. axle weight rating-front		1,100	1,100	1,100	1,100	
	Max. axle weight rating-rear		1,190	1,190	1,190	1,190	
Seating capacity		7	7	6	6	6	
Engine	Model code		4G69	4G69	4G69	4G69	
	Total displacement mL		2,378	2,378	2,378	2,378	
	Maximum output kW(PS)/rpm		121(165)/6,000	121(165)/6,000	121(165)/6,000	121(165)/6,000	
	Maximum torque N·m(kg·m)/rpm		217(22.1)/4,000	217(22.1)/4,000	217(22.1)/4,000	217(22.1)/4,000	
Transmission	Model code		F5M42	F4A4B	F5M42	F4A4B	
	Type		5-speed manual	4-speed automatic	5-speed manual	4-speed automatic	
Fuel system	Fuel supply system		MPI	MPI	MPI	MPI	
Performance	Maximum speed km/h		200	190	200	190	
	Minimum turning radius m	With 16-inch wheel	5.5	5.5	5.5	5.5	
		With 17-inch wheel	5.8	5.8	5.8	5.8	

NOTE: \*: Vehicles with high earth suspensions <LH drive vehicles>

## PRECAUTIONS BEFORE SERVICE

SUPPLEMENTAL RESTRAINT SYSTEM  
(SRS)

## ⚠ CAUTION

1. Items to review when servicing SRS:
  - a. Be sure to read GROUP 52B – Supplemental Restraint System (SRS). For safe operation, please follow the directions and heed all warnings.
  - b. Wait at least 60 seconds after disconnecting the battery cable before doing any further work. The SRS system is designed to retain enough voltage to deploy the air bag even after the battery has been disconnected. Serious injury may result from unintended air bag deployment if work is done on the SRS system immediately after the battery cable is disconnected.
  - c. Warning labels must be heeded when servicing or handling SRS components. Warning labels can be found in the following locations.
    - Air bag module (Driver's and front passenger's)
    - Clock spring
    - Curtain air bag module (Driver's side and front passenger's side)
    - Front impact sensor
    - Glove box
    - Hood
    - Instrument panel
    - Passengers air bag cut off switch
    - Seat belt pre-tensioner
    - Side air bag module (Driver's side and front passenger's side)
    - Side impact sensor
    - SRS-ECU
    - Steering wheel
    - Steering joint cover
    - Sun visor
  - d. Always use the designated special tools and test equipment.
  - e. Store components removed from the SRS in a clean and dry place. The air bag module should be stored on a flat surface and placed so that the pad surface is facing upward. Do not place anything on top of it.
  - f. Never attempt to disassemble or repair the

M1001000500549  
SRS components (SRS-ECU, air bag module and clock spring).

- g. Whenever you finish servicing the SRS, check the SRS warning lamp operation to make sure that the system functions properly.
- h. Be sure to deploy the air bag before disposing of the air bag module or disposing of a vehicle equipped with an air bag (Refer to GROUP 52B – Air Bag Module Disposal Procedures [P.52B-246](#)).
2. Observe the following when carrying out operations on places where SRS components are installed, including operations not directly related to the SRS air bag.
  - a. When removing or installing parts, do not allow any impact or shock to the SRS components.
  - b. If heat damage may occur during paint work, remove the SRS-ECU, the air bag module, clock spring, the front impact sensor, the side impact sensor, and the seat belt pre-tensioner.
    - SRS-ECU, air bag module, clock spring, front impact sensor, the side impact sensor: 93 °C or more
    - Seat belt pre-tensioner: 90 °C or more

INITIALIZATION PROCEDURE FOR  
LEARNING VALUE IN MPI ENGINE  
INITIALIZATION PROCEDURE

1. After the ignition switch is in "LOCK" (OFF) position, connect MUT-III with the diagnosis connector.
2. Select the item on the screen of the initialisation for learning, and perform the initialisation.

Service	Item
At replacing engine assembly *1,*2	All ranges
_ *3	Misfire-related
At replacing injector and at cleaning *2	Learning value for air/fuel ratio
At replacing throttle body and at cleaning *2	Idle speed control-related
At replacing detonation sensor	Learning value for knocking

NOTE: \*<sup>1</sup>: Initialize A/T-related learning value.

**NOTE:** <sup>\*2</sup>: After initialising the learning value, the idling learning in MPI engine is required (Refer to LEARNING PROCEDURE FOR IDLING IN MPI ENGINE).

**NOTE:** <sup>\*3</sup>: The datum items on MUT-III display are shown, but do not use them.

## LEARNING PROCEDURE FOR IDLING IN MPI ENGINE

### PURPOSE

When the engine-ECU <M/T> or the engine-A/T-ECU <A/T> is replaced, or when the learning value is initialized, the idling is not stabilized because the learning value in MPI engine is not completed. In this case, carry out the learning method for the idling through the following procedures.

### LEARNING PROCEDURE

1. Start the engine and carry out the warm-up for the engine coolant temperature to reach 80°C or more.
2. When the engine coolant temperature is 80°C or more, the warm-up is not needed if the ignition switch is in "ON" position once.
3. Place the ignition switch in "LOCK" (OFF) position and stop the engine.
4. After 10 seconds or more, start the engine again.
5. For 10 minutes, carry out the idling under the condition shown below and then confirm the engine has the normal idling.

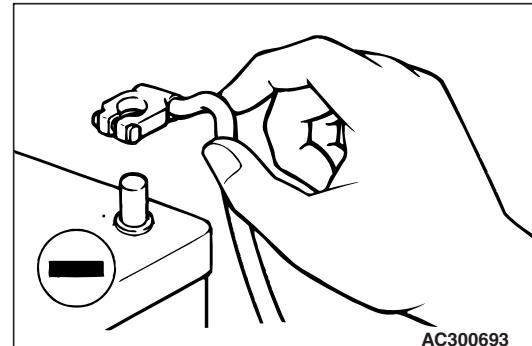
- Transmission: Neutral (A/T: "P" range)
- Operation in ignition-related, fan and attachments: Not to be operated
- Engine coolant temperature: 80°C or more

**NOTE:** When the engine stalls during the idling, check the dirtiness (on the throttle valve) of the throttle body and then perform the service from Procedure 1 again.

## SERVICING ELECTRICAL SYSTEM

### CAUTION

Before connecting or disconnecting the negative (-) cable, be sure to turn off the ignition switch and the lighting switch (If this is not done, there is the possibility of semiconductor parts being damaged).



Before replacing a component related to the electrical system and before undertaking any repair procedures involving the electrical system, be sure to first disconnect the negative (-) cable from the battery in order to avoid damage caused by short-circuiting.

## APPLICATION OF ANTI-CORROSION AGENTS AND UNDERCOATS

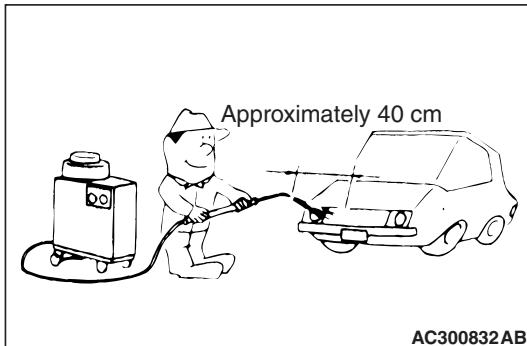
If oil or grease gets onto the oxygen sensor, it will cause a drop in the performance of the sensor. Cover the oxygen sensor with a protective cover when applying anti-corrosion agents and undercoats.

## PRE-INSPECTION CONDITION

"Pre-inspection condition" refers to the condition that the vehicle must be in before proper engine inspection can be carried out. If you see the words "Set the vehicle to the pre-inspection condition". In this manual, it means to set the vehicle to the following condition.

- Engine coolant temperature 80 to 90°C
- Lamps, electric cooling fan and all accessories: OFF
- M/T: Neutral
- A/T: N range

## VEHICLE WASHING



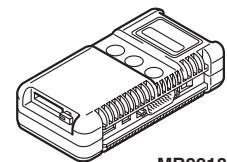
If high-pressure car-washing equipment or steam car-washing equipment is used to wash the vehicle, be sure to note the following information in order to avoid damage to plastic components, etc.

- Spray nozzle distance: Approx. 40 cm or more
- Spray pressure: 3,900 kPa or less
- Spray temperature: 82°C or less
- Time of concentrated spray to one point: within 30 sec.

## MUT-III

## MUT-III sub assembly

Vehicle communication interface (V.C.I.)



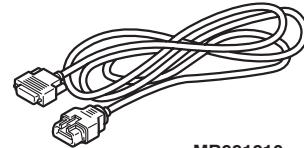
MB991824

## MUT-III USB cable



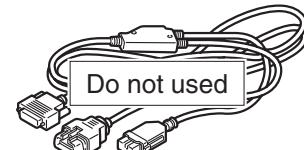
MB991827

## MUT-III main harness A



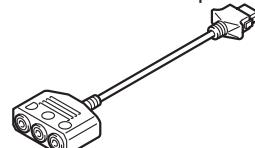
MB991910

## MUT-III main harness B



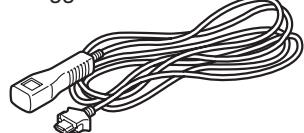
MB991911

## MUT-III measurement adapter



MB991825

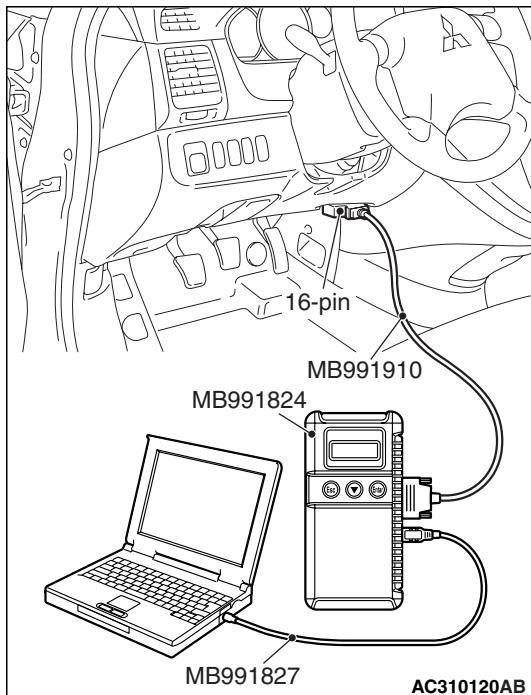
## MUT-III trigger harness



MB991826

AC305090AC

Refer to the "MUT-III OPERATING INSTRUCTIONS" for instructions on handling the MUT-III.

**CAUTION**

**Turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting the MUT-III.**

Connect the MUT-III to the diagnosis connector as shown in the illustration.

## IN ORDER TO PREVENT VEHICLES FROM FIRE

"Improper installation of electrical or fuel related parts could cause a fire. In order to retain the high quality and safety of the vehicle, it is important that any accessories that may be fitted or modifications/repairs that may be carried out which involve the electrical or fuel systems, MUST be carried out in accordance with MMC's information/Instructions".

## ENGINE OILS

### HEALTH WARNING

Prolonged and repeated contact with mineral oil will result in the removal of natural fats from the skin, leading to dryness, irritation and dermatitis. In addition, used engine oil contains potentially harmful contaminants which may cause skin cancer.

Adequate means of skin protection and washing facilities must be provided.

## RECOMMENDED PRECAUTIONS

The most effective precaution is to adapt working practices which prevent, as far as practicable, the risk of skin contact with mineral oils, for example by using enclosed systems for handling used engine oil and by degreasing components, where practicable, before handling them.

Other precautions:

- Avoid prolonged and repeated contact with oils, particularly used engine oils.
- Wear protective clothing, including impervious gloves where practicable.
- Avoid contaminating clothes, particularly underpants, with oil.
- Do not put oily rags in pockets, the use of overalls without pockets will avoid this.
- Do not wear heavily soiled clothing and oil-impregnated foot-wear. Overalls must be cleaned regularly and kept separately from personal clothing.
- Where there is a risk of eye contact, eye protection should be worn, for example, chemical goggles or face shields; in addition an eye wash facility should be provided.
- Obtain First Aid treatment immediately for open cuts and wounds.
- Wash regularly with soap and water to ensure all oil is removed, especially before meals (skin cleansers and nail brushes will help). After cleaning, the application of preparations containing lanolin to replace the natural skin oils is advised.
- Do not use petrol, kerosine, diesel fuel, gas oil, thinners or solvents for cleaning skin.
- Use barrier creams, applying them before each work period, to help the removal of oil from the skin after work.
- If skin disorders develop, obtain medical advice without delay.

## SUPPLEMENTAL RESTRAINT SYSTEM (SRS) AND SEAT BELT WITH PRE-TENSIONER

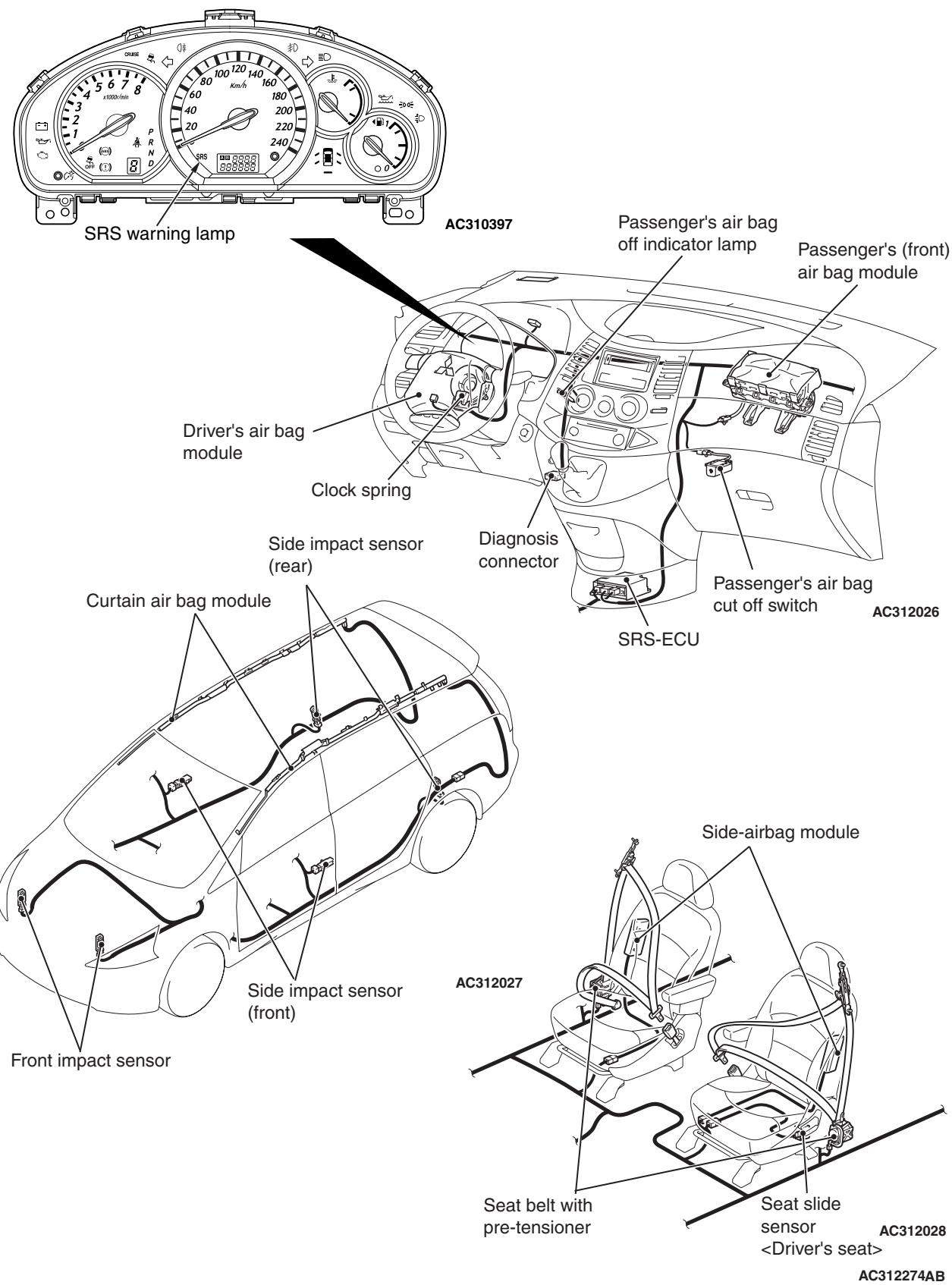
The Supplemental Restraint System (SRS) and seat belt with pre-tensioner is designed to supplement the driver's and front passenger's seat belts to help reduce the risk or severity of injury to the driver and front passenger by activating and deploying both front air bags in certain frontal collisions.

The SRS and seat belt pre-tensioner systems consist of air bag modules, SRS-ECU, two front impact sensors, four side impact sensors, SRS warning lamp, clock spring, seat slide sensor, passenger air bag cut off switch, passenger air bag off indicator lamp and seat belt pre-tensioner. Airbag modules are installed at the centre of the steering wheel, on the globe box, in the front seatback and the roof-side area (from the front pillars of driver- and passenger-side to the rear pillar in rear area of vehicle). Each air bag has a safing folded air bag and an inflator. SRS-ECU, installed at the depths of the centre console, monitors the system. The front

impact sensor is assembled in the radiator support panel to monitor collision upon frontal impact. The side impact sensor is assembled in the centre pillar and quarter panel lower to monitor collision upon side impact. The warning lamp on the instrument panel indicates the operational status of the SRS. The clock spring is installed in the steering column. The seat slide sensor is attached to the seat rail and provides the air bag control unit with information on the seat position. The passenger air bag cut off switch is located above inside the glove box. The passenger air bag off indicator lamp is located above the centre panel in the instrument panel. The seat belt pre-tensioner is incorporated in the seat belt retractor.

Only authorized service personnel should do work on or around the SRS components. Those service personnel should read this manual carefully before starting any such work.

M1001009800053



## SERVICE PRECAUTIONS

M1001006000069

**DANGER**

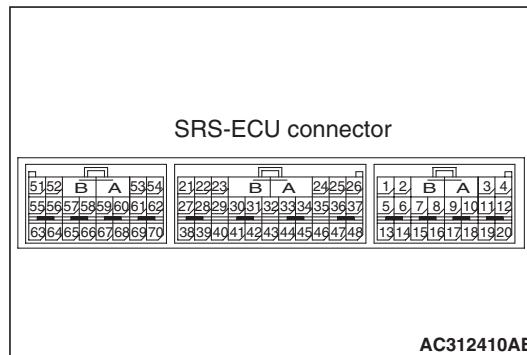
*In order to avoid injury to yourself or others from accidental deployment of the air bag during servicing, read and carefully follow all the precautions and procedures described in this manual.*

**CAUTION**

- Do not use any electrical test equipment on or near SRS components, except those specified on [P.52B-12](#).
- Never Attempt to Repair the Following Components:
  1. SRS air bag control unit (SRS-ECU)
  2. Clock spring
  3. Driver's and front passenger's air bag modules
  4. Side air bag module
  5. Curtain air bag module
  6. Front impact sensor
  7. Side impact sensor
  8. Seat belt with pre-tensioner

*NOTE: If any of these components are diagnosed as faulty, they should only be replaced, in accordance with the INDIVIDUAL COMPONENTS SERVICE procedures in this manual, starting at page*

[P.52B-218](#).

**CAUTION**

**Do not attempt to repair the wiring harness connectors of the SRS. If a defective wiring harness is found, repair or replace it by referring to the table below.**

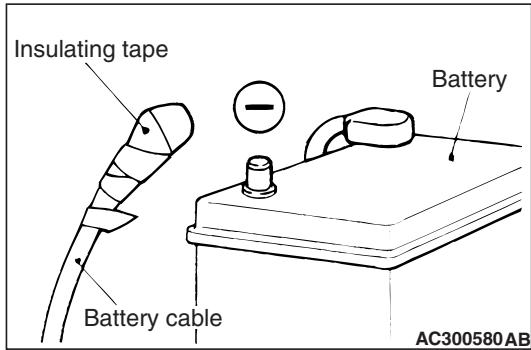
SRS-ECU terminal No.	Destination of harness	Remedy
1, 2	Floor wiring harness → Seat slide sensor	Correct or replace the floor wiring harness.
5, 6	Floor wiring harness → Rear floor wiring harness → Curtain air bag module (LH)	Correct or replace each wiring harness.
7, 8	Floor wiring harness → Seat belt pre-tensioner (LH)	Correct or replace the floor wiring harness.
9, 10	Floor wiring harness → Side air bag module (LH)	Correct or replace the floor wiring harness.
15, 16	Floor wiring harness → Side impact sensor (rear) (LH)	Correct or replace the floor wiring harness.
19, 20	Floor wiring harness → Side impact sensor (front) (LH)	Correct or replace the floor wiring harness.
21	Instrument panel wiring harness → Passenger's air bag off indicator lamp	Correct or replace the instrument panel wiring harness.
23	Instrument panel wiring harness → Junction block (fuse No.3)	Correct or replace the instrument panel wiring harness.

SRS-ECU terminal No.	Destination of harness	Remedy
24	Instrument panel wiring harness → Junction block (fuse No.2)	Correct or replace the instrument panel wiring harness.
27, 28	Instrument panel wiring harness → Air bag module (Front passenger's side) <1st squib side>	Correct or replace the instrument panel wiring harness.
29	Instrument panel wiring harness → Passenger's air bag cut off switch ON terminal	Correct or replace the instrument panel wiring harness.
30, 31	Instrument panel wiring harness → Air bag module (Front passenger's side) <2nd squib side>	Correct or replace the instrument panel wiring harness.
32	Instrument panel wiring harness → Can_H line	Correct or replace the can line.
33, 34	Instrument panel wiring harness → Clock spring → Air bag module (Driver's side) <2nd squib side>	Correct or replace instrument panel wiring harness. Replace the clock spring.
35	Instrument panel wiring harness → Passenger's air bag cut off switch COM terminal	Correct or replace the instrument panel wiring harness.
36, 37	Instrument panel wiring harness → Clock spring → Air bag module (Driver's side) <1st squib side>	Correct or replace instrument panel wiring harness. Replace the clock spring.
38, 39	Front wiring harness → Instrument panel wiring harness → Front impact sensor (LH)	Correct or replace each wiring harness.
40	Instrument panel wiring harness → Earth	Correct or replace the instrument panel wiring harness.
41	Instrument panel wiring harness → Passenger's air bag cut off switch OFF terminal	Correct or replace the instrument panel wiring harness.
43	Instrument panel wiring harness → Can_L line	Correct or replace the can line.
44	Instrument panel wiring harness → Diagnosis connector	Correct or replace the instrument panel wiring harness.
47, 48	Front wiring harness → Instrument panel wiring harness → Front impact sensor (RH)	Correct or replace each wiring harness.
57, 58	Floor wiring harness → Side air bag module (RH)	Correct or replace the floor wiring harness.
59, 60	Floor wiring harness → Seat belt pre-tensioner (RH)	Correct or replace the floor wiring harness.

SRS-ECU terminal No.	Destination of harness	Remedy
61, 62	Floor wiring harness → Curtain air bag module (RH)	Correct or replace the floor wiring harness.
63, 64	Floor wiring harness → Side impact sensor (front) (RH)	Correct or replace the floor wiring harness.
67, 68	Floor wiring harness → Side impact sensor (rear) (RH)	Correct or replace the floor wiring harness.

**DANGER**

*to retain enough voltage to deploy the air bag for a short time even after the battery*

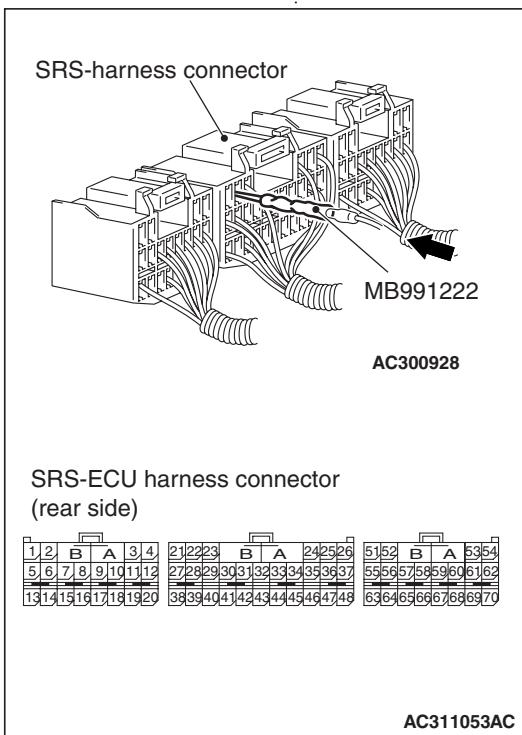


***After disconnecting the battery cable, wait 60 seconds or more before proceeding with the following work. In addition, insulate the negative battery terminal with a tape. The condenser inside the SRS-ECU is designed***

*has been disconnected, so serious injury may result from unintended air bag deployment if work is done on the SRS system immediately after the battery cables are disconnected.*

**△ CAUTION**

- The SRS components and seat belt with pre-tensioner should not be subjected to heat, so remove the SRS-ECU, driver's and front passenger's air bag modules, clock spring, side air bag modules, and seat belt pre-tensioner before drying or baking the vehicle after painting.
  1. SRS-ECU, air bag modules, clock spring, impact sensors: 93°C or more
  2. Seat belt with pre-tensioner: 90°C or more
- Whenever you finish servicing the SRS, always erase the diagnosis code and check warning lamp operation to make sure that the system functions properly.



If checks are carried out by using the SRS-ECU harness connector, observe the following procedures: Insert the special tool probe in the harness set (MB991222) into connector from harness side (rear side), and connect the tester to this probe. If any tool than special tool is used, damage to the harness and other components will result. Never insert the probe directly to the terminals from the front of the connector. The terminals are plated to increase their conductivity, so that if they are

touched directly by the probe, the plating may break, which will cause drops in reliability.

# SUPPORT LOCATIONS FOR LIFTING AND JACKING

M1001000700145

## SUPPORT POSITIONS FOR A GARAGE JACK, AXLE STANDS, SINGLE-POST LIFT OR DOUBLE-POST LIFT AND PLATE TYPE LIFT

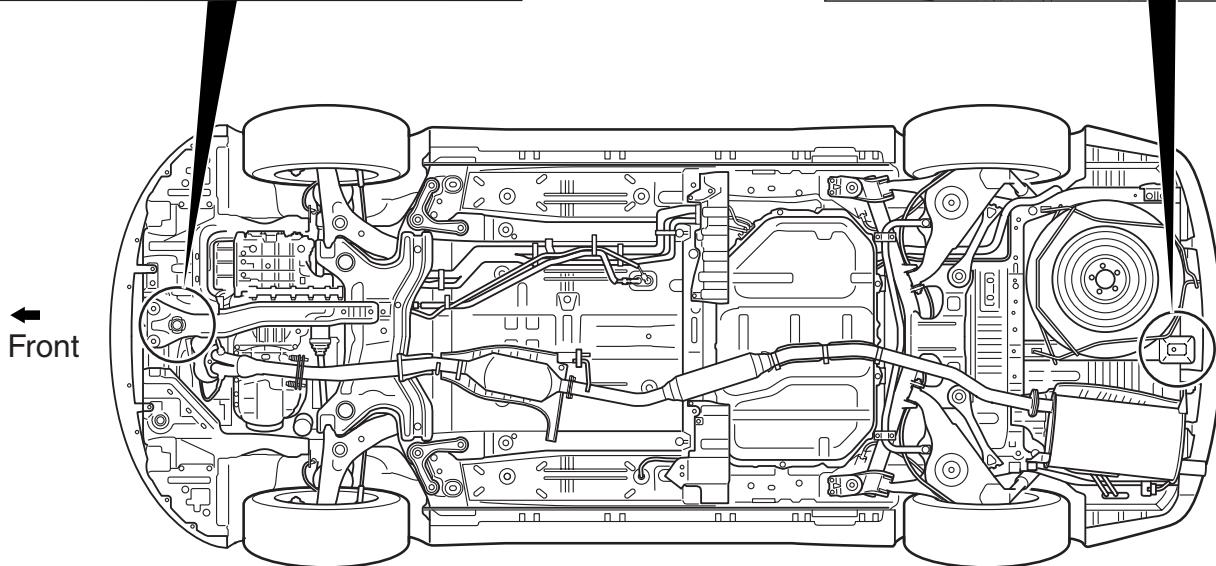
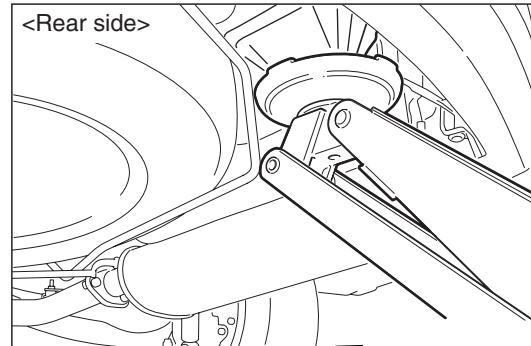
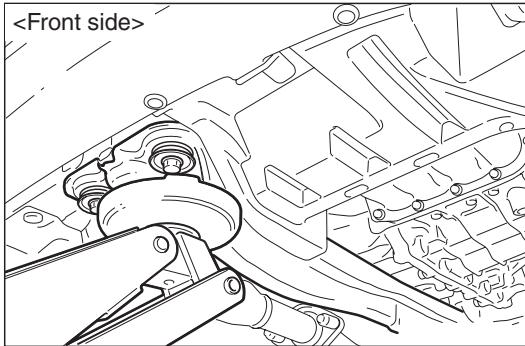
### **⚠ CAUTION**

Do not support the vehicles at locations other than specified supporting points. Doing so will cause damage, etc.

### Garage jack

### **⚠ CAUTION**

Never support any point other than the specified one, or that point will be deformed.



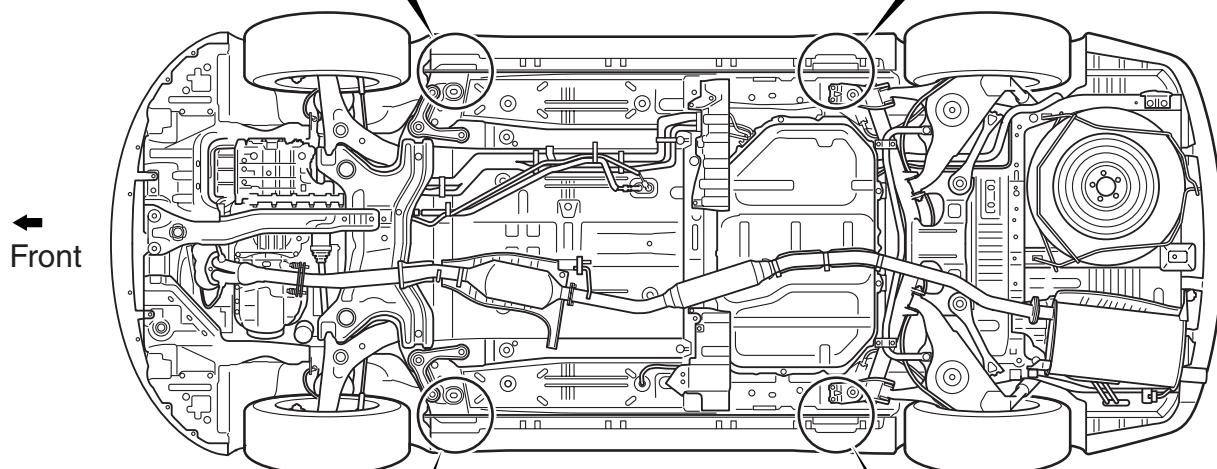
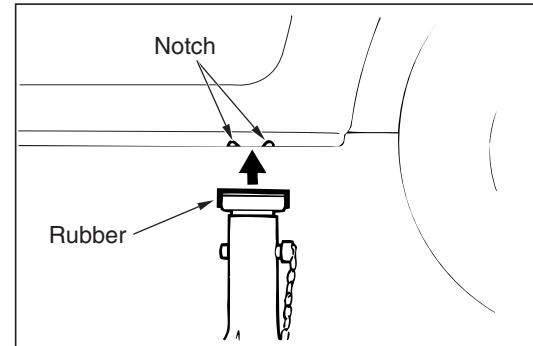
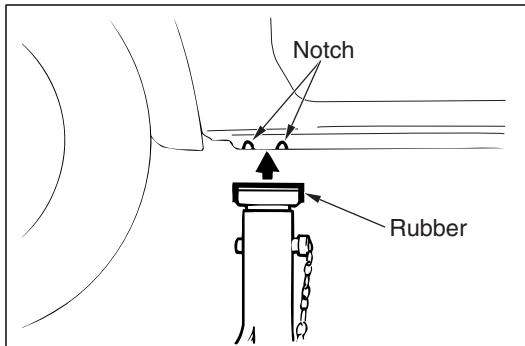
AC309954AB

**Axle stands and a single-post lift or double-post lift**

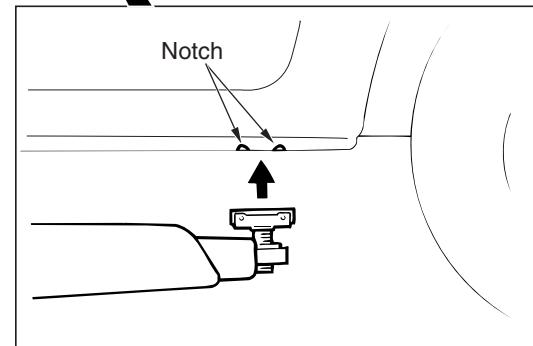
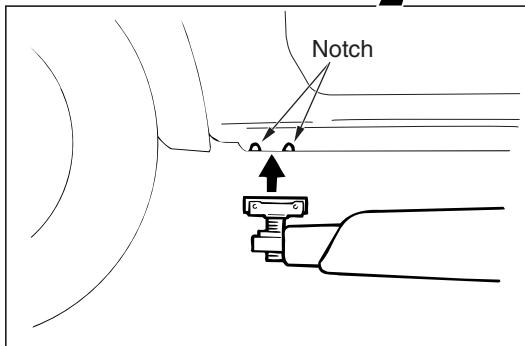
**CAUTION**

- If rubber attachments with grooves that are too thick are used at the front support positions, the front fender may become bent, so be sure to use rubber attachments with groove thicknesses of 18 mm or less.
- If attachments which are not high enough are used, they may damage areas such as the side sill garnish. Be sure to use attachments which are high enough, or remove the side sill garnish if not using attachments.

**<Axe stands>**



**<Single-post lift or double-post lift>**



## Plate type lift

**CAUTION**

Insert a spacer between the notch and the lift to avoid damage to the side sill garnish. Be careful not to contact the spacer against the side sill.

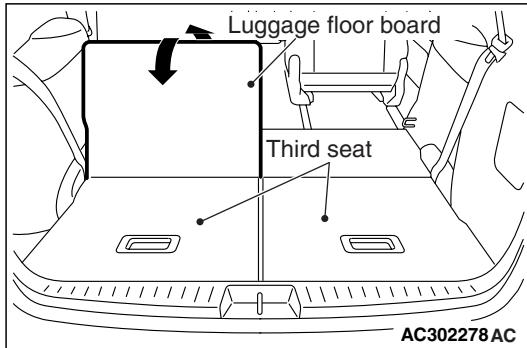
Support the notch with a spacer (100-mm width, 100-mm height and 200-mm depth).

**TOWING AND HOISTING**

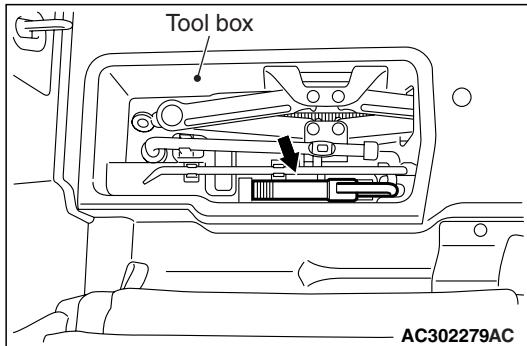
M1001000800421

**HOW TO SECURE THE TOWING HOOK**

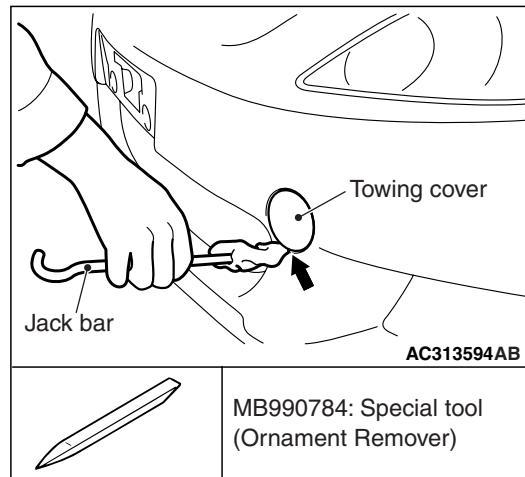
When towing this vehicle, attach the towing hook according to the procedure below.



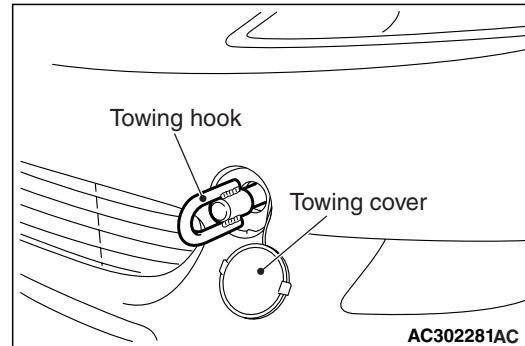
1. Fold the third seat and open the luggage floor board.



2. Withdraw the towing hook and jack bar from the tool box under the luggage floor.



3. Insert special tool MB990784 (Ornament Remover) or a jack bar as shown, and remove the towing cover from the front bumper.



4. Secure the towing hook.

**STANDARD PART/TIGHTENING-TORQUE TABLE**

M1001001100447

Each torque value in the table is a standard value for tightening under the following conditions.

1. Bolts, nuts and washers are all made of steel and plated with zinc.
2. The threads and bearing surface of bolts and nuts are all in dry condition.

The values in the table are not applicable:

1. If toothed washers are inserted.
2. If plastic parts are fastened.
3. If bolts are tightened to plastic or die-cast inserted nuts.
4. If self-tapping screws or self-locking nuts are used.

**Standard bolt and nut tightening torque**

Thread size		Torque N·m		
Bolt nominal diameter (mm)	Pitch (mm)	Head mark "4"	Head mark "7"	Head mark "8"
M5	0.8	2.5 ± 0.5	5.0 ± 1.0	6.0 ± 1.0
M6	1.0	5.0 ± 1.0	9.0 ± 2.0	10 ± 2
M8	1.25	12 ± 2	22 ± 4	25 ± 4
M10	1.25	24 ± 4	44 ± 10	53 ± 7
M12	1.25	41 ± 8	83 ± 12	98 ± 12
M14	1.5	73 ± 12	140 ± 20	155 ± 25
M16	1.5	110 ± 20	210 ± 30	235 ± 35
M18	1.5	165 ± 25	300 ± 40	340 ± 50
M20	1.5	225 ± 35	410 ± 60	480 ± 70
M22	1.5	300 ± 40	555 ± 85	645 ± 95
M24	1.5	395 ± 55	735 ± 105	855 ± 125

**FLANGE BOLT AND NUT TIGHTENING TORQUE**

Thread size		Torque N·m		
Bolt nominal diameter (mm)	Pitch (mm)	Head mark "4"	Head mark "7"	Head mark "8"
M6	1.0	5.0 ± 1.0	10 ± 2	12 ± 2
M8	1.25	13 ± 2	24 ± 4	27 ± 5
M10	1.25	26 ± 4	49 ± 9	58 ± 7
M10	1.5	24 ± 4	45 ± 8	55 ± 10
M12	1.25	46 ± 8	95 ± 15	105 ± 15
M12	1.75	43 ± 8	83 ± 12	98 ± 12

**NOTE:**

- Be sure to use only the specified bolts and nuts, and always tighten them to the specified torques.
- Bolts marked with indications such as 4T or 7T are reinforced bolts. The larger the number, the greater the bolt strength.