

GROUP 00

GENERAL

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# HOW TO USE THIS MANUAL

M1001000101470

## 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.00-32](#).

## MODEL INDICATIONS

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

MPI:Indicates the multipoint injection.

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

SOHC:Indicates an engine with the single overhead camshaft.

DOHC:Indicates an engine with the double overhead camshaft.

2000: Indicates models equipped with the 1,997 mL <4G63> petrol engine.

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

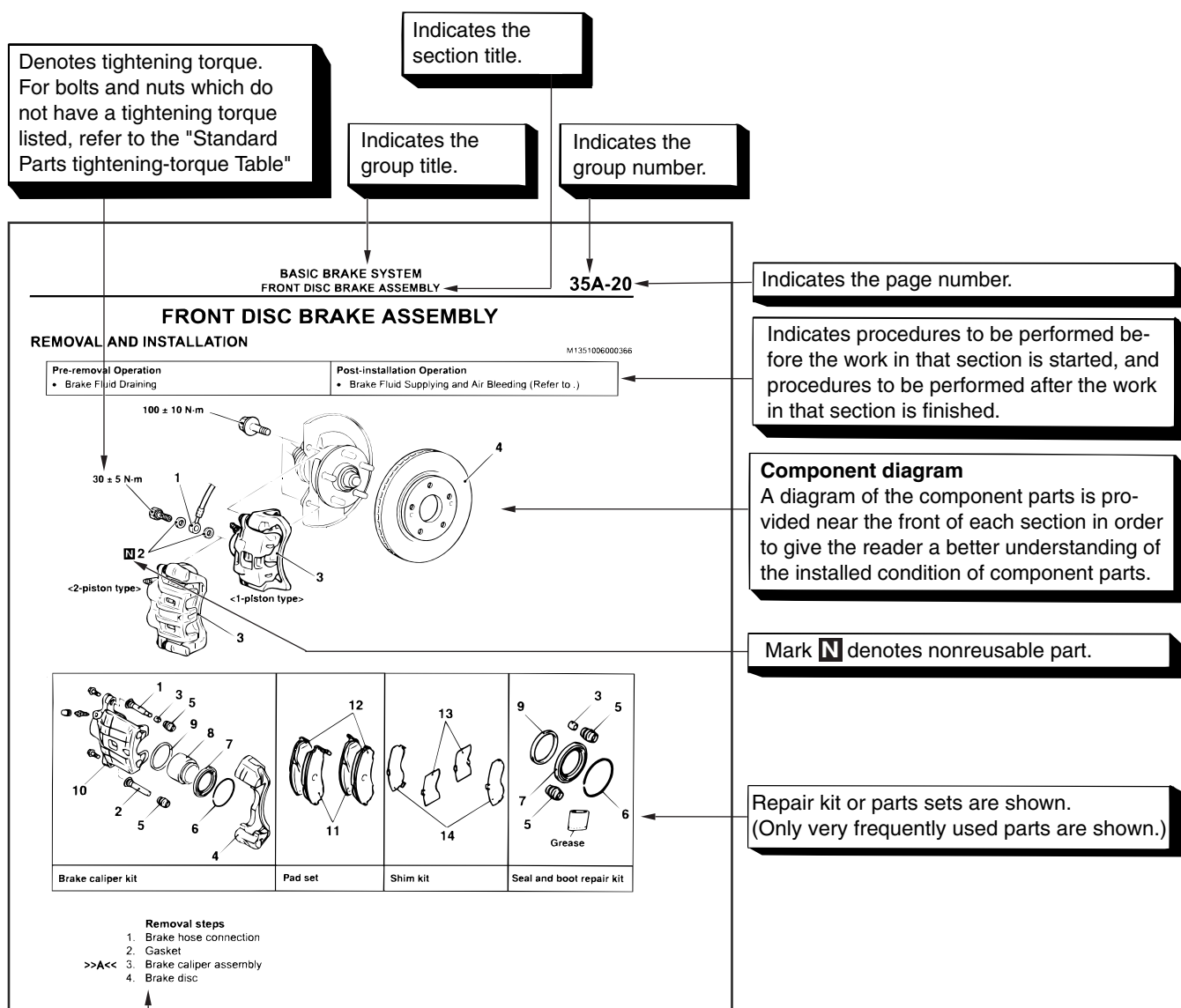
M/T: Indicates the manual transmission.

A/T: Indicates the automatic transmission.

A/C: Indicates the air conditioner.

NOTES

## 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.

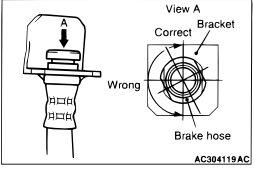
**BASIC BRAKE SYSTEM**  
**FRONT DISC BRAKE ASSEMBLY**

**35A-19**

**INSTALLATION SERVICE POINTS**

**>>A<< BRAKE HOSE INSTALLATION**

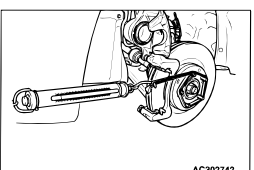
1. Install the brake hose end on the bracket and another end on the front brake assembly.



AC304119AC

2. Twist the brake hose towards the lesser torsion between the brake hose and bracket as shown and secure it to the bracket.

**>>B<< FRONT BRAKE ASSEMBLY INSTALLATION**



AC302742

1. In order to measure the brake drag torque, measure the hub torque with the pads removed by the following procedure.

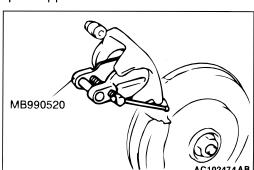
(1) Use a spring balance to measure the hub torque in the forward direction.

(2) Record hub torque with pads removed.

**CAUTION**

Do not let any oil, grease or other contamination get onto the friction surfaces of the pads and brake discs.

2. After re-installing the caliper support to the knuckle, install the pad clips and the pads to the caliper support.



MB990520

AC102474AB

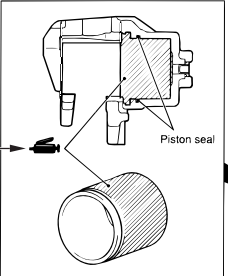
3. Clean the piston and insert into cylinder with special tool disc brake piston expander (MB990520).

4. Install the pad clips and the pads to the caliper support and tighten the pin bolt to the specified torque.

**Tightening torque : 38 ± 4 N·m**

Operating procedures, cautions, etc. on removal, installation, disassembly and reassembly are described

**LUBRICATION POINTS**

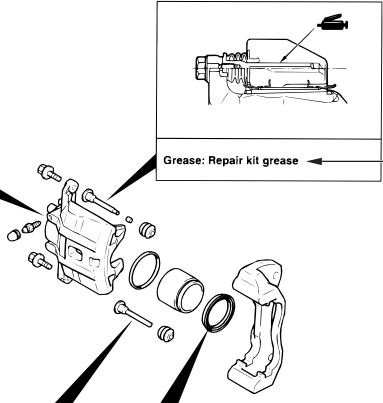


Piston seal

**CAUTION**

The piston seal inside the caliper seal kit is coated with a special grease. Do not wipe this grease off.

Brake fluid: DOT 3 or DOT 4



Grease: Repair kit grease






AC303470AC

The title of the page (following the page on which the diagram of component parts is presented) indicating the locations of lubrication and sealing procedures.

Indicates (by symbols) where lubrication is necessary.

### 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

M1001000201314

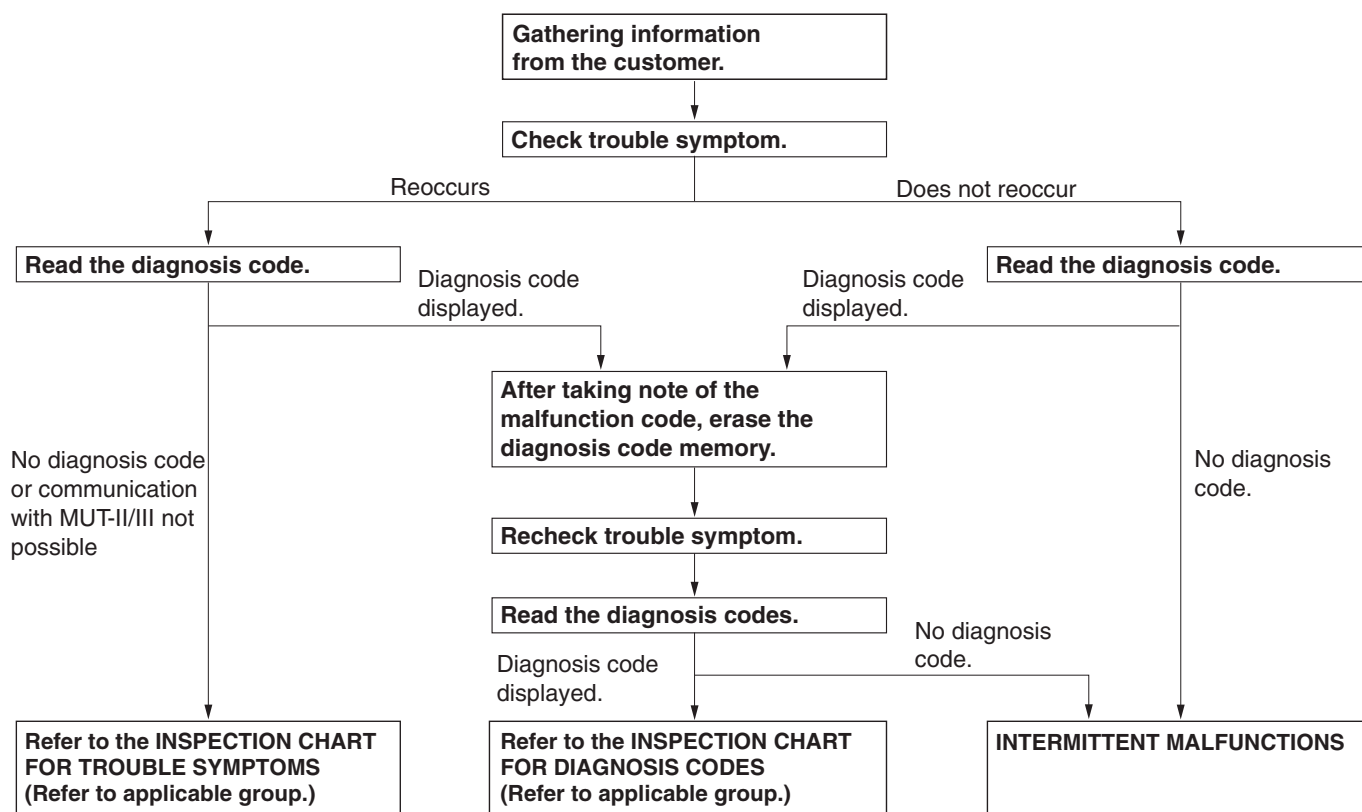
## CONTENTS OF TROUBLESHOOTING

Troubleshooting of electronic control systems for which the M.U.T.-II/III can be used follows the basic outline described below. Even in systems for which the M.U.T.-II/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



AC300864AC

## 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 read inspection procedure [P.00-10](#)).

## 6. TROUBLE SYMPTOM CHART

If there are trouble symptoms even though the M.U.T.-II/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 read inspection procedure P.00-10).

## 8. SERVICE DATA REFERENCE TABLE

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

## 9. CHECK AT ECU TERMINALS

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

## 10. INSPECTION PROCEDURE BY USING AN OSCILLOSCOPE

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

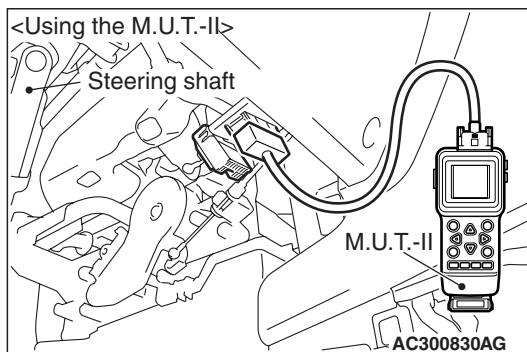
## DIAGNOSIS FUNCTION

### HOW TO READ DIAGNOSIS CODE

#### **⚠ CAUTION**

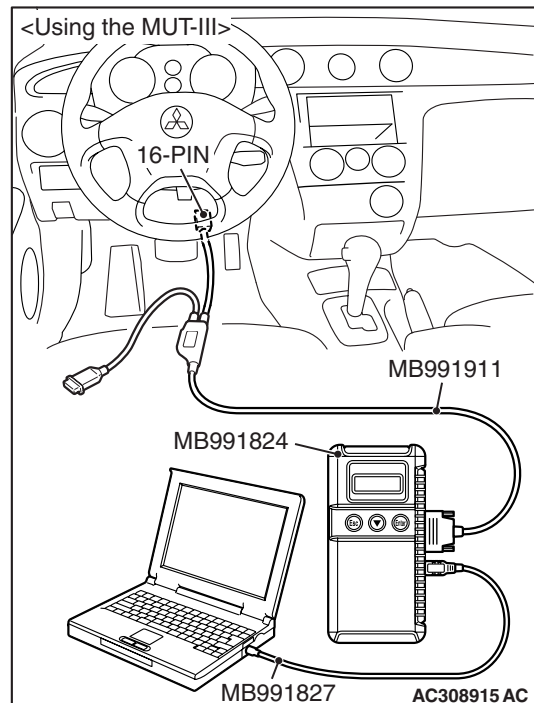
Before connecting or disconnecting the M.U.T.-II/III, turn the ignition switch to the "LOCK" (OFF) position.

#### <Using the M.U.T.-II>



Connect the M.U.T.-II to the diagnosis connector, and read the diagnosis code.

#### <Using the M.U.T.-III>



Connect the M.U.T.-III to the 16-pin diagnosis connector, and read the diagnosis code.

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

1. Ensure that the ignition switch is at the "LOCK" (OFF).
2. Start up the personal computer.
3. Connect M.U.T.-III USB cable MB991827 to special tool Vehicle Communication Interface (V.C.I.) MB991824 and the personal computer.
4. Connect M.U.T.-III main harness B MB991911 to the V.C.I.
5. Connect M.U.T.-III main harness B 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.

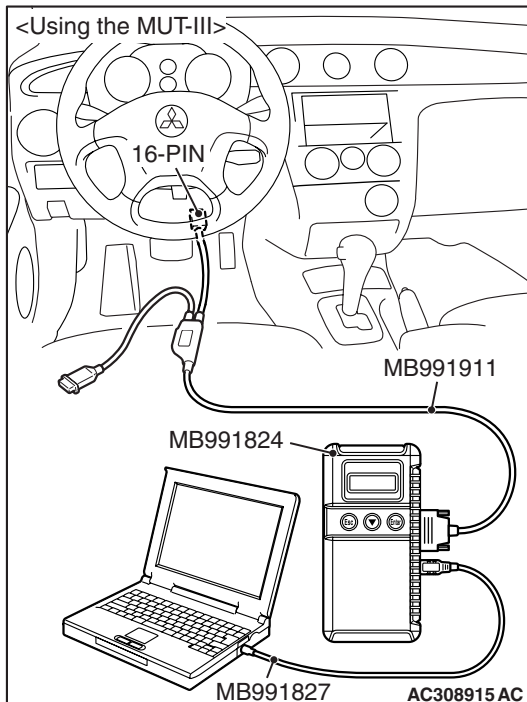
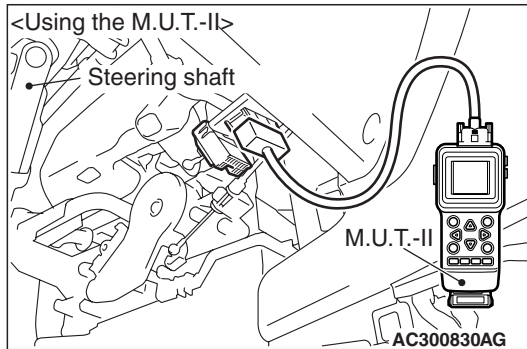
7. Start the M.U.T.-III system on the PC and turn the ignition switch to the "ON" position.
8. Read the diagnosis code.
9. Disconnecting the M.U.T.-III is the reverse of the connecting sequence, making sure that the ignition switch is at the "LOCK" (OFF).

**NOTE:** The ABS warning lamp may flash when the ignition switch is turned ON with the M.U.T.-II/III connected. This is because the diagnosis display function of the ABS warning lamp is activated by grounding the diagnosis connector terminal No.1, and is not detrimental in any way.

## ERASING DIAGNOSIS CODE (BY USING THE M.U.T.-II/III)

### ⚠ CAUTION

Before connecting or disconnecting the M.U.T.-II/III, turn the ignition switch to the "LOCK" (OFF) position.



Connect the M.U.T.-II/III to the diagnosis connector, and erase the diagnosis code. The procedure is the same as "HOW TO READ DIAGNOSIS CODE".

## ERASING DIAGNOSIS CODE (BY USING NO M.U.T.-II/III)

### ⚠ CAUTION

Some diagnosis codes can not be erased according to the procedure below. If you attempt to erase a diagnosis code, refer to an applicable GROUP.

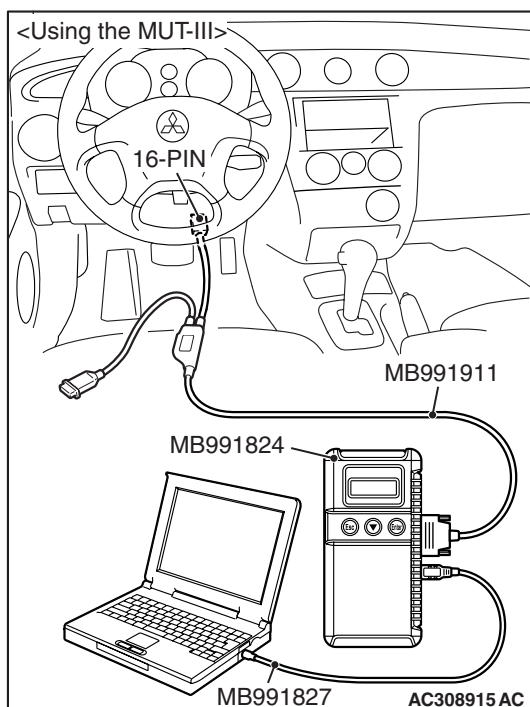
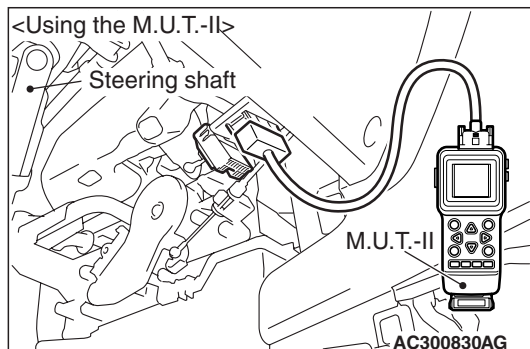
1. Turn the ignition switch to the "LOCK" (OFF) position.
2. Disconnect the negative battery cable, wait for at least 10 minutes, and then reconnect it.
3. Start the engine and let it run at idle for 10 minutes.



## INPUT SIGNAL CHECK (WHEN USING THE M.U.T.-II/III) <SWS>

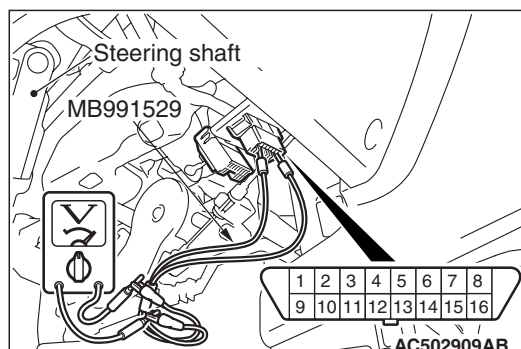
### ⚠ CAUTION

Before connecting or disconnecting the M.U.T.-II/III, turn the ignition switch to the "LOCK" (OFF) position.



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

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



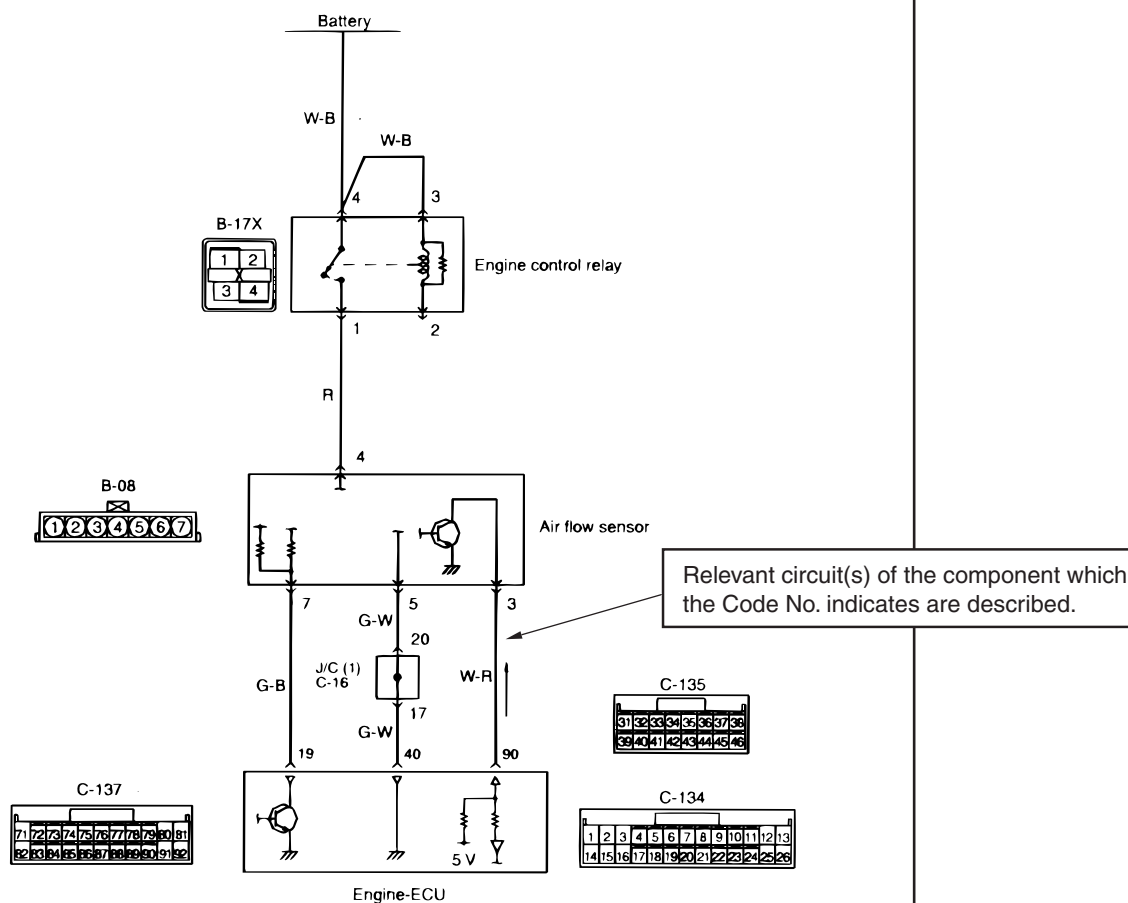
1. Use the special tool diagnosis code check harness (MB991529) to connect the ETACS terminal (terminal 9) and the earth terminals (terminals 4 and 5) of the diagnosis connector to the voltmeter.
2. If the needle of the voltmeter flickers once when each switch is operated (ON/OFF), the input signal for 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.

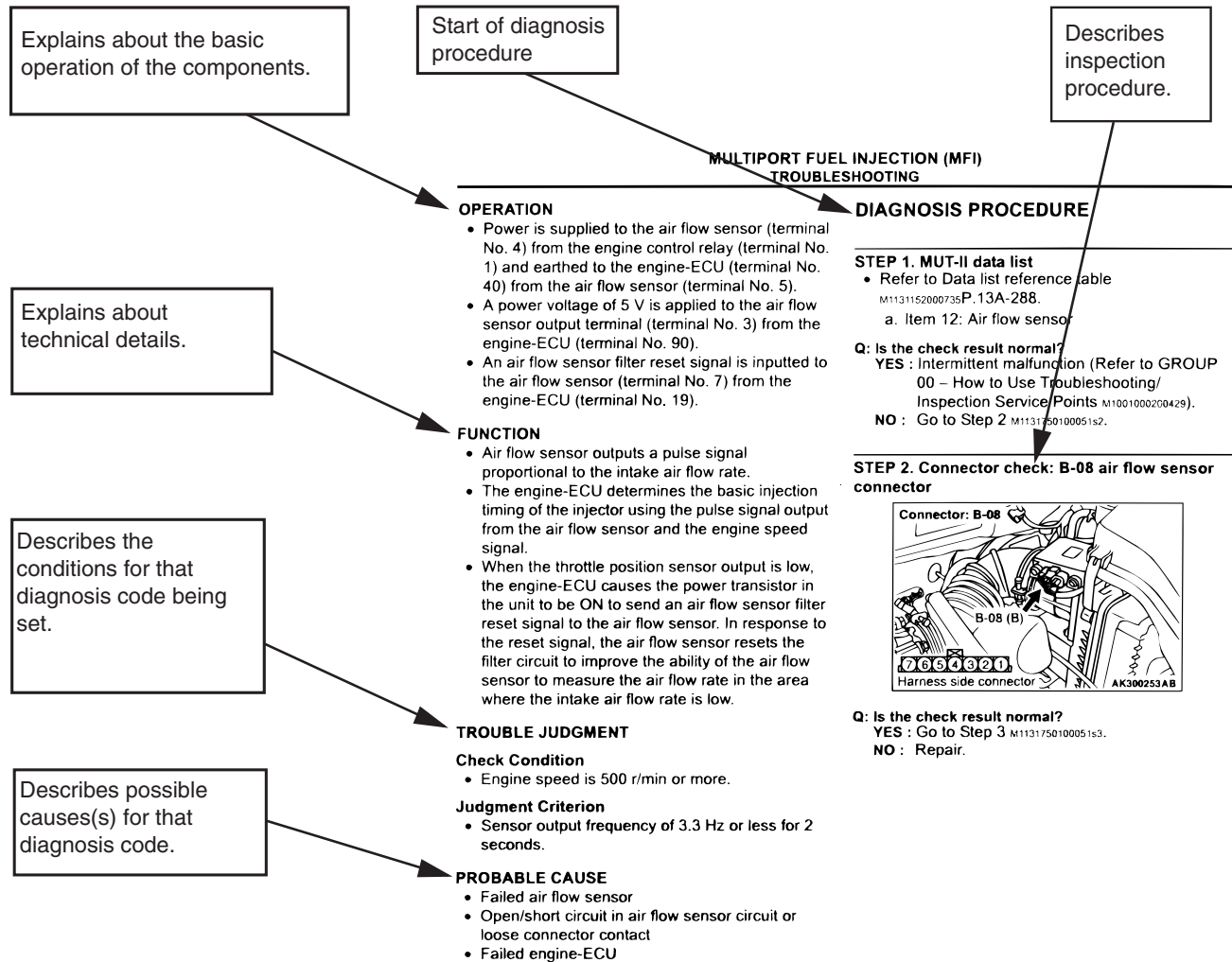
### Code No. P0100 Air Flow Sensor System

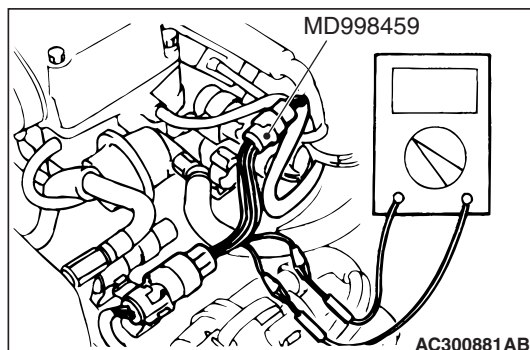
Air flow sensor circuit



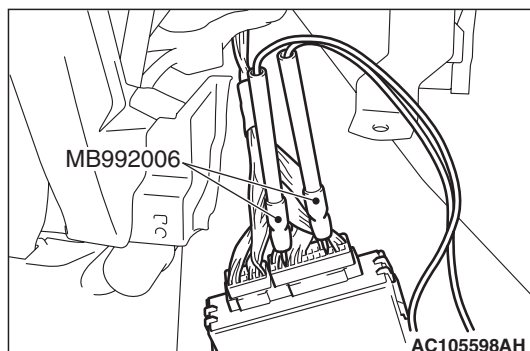
#### Wire colour code

B: Black LG: Light green G: Green L: Blue W: White Y: Yellow SB: Sky blue BR: Brown O: Orange GR: Grey  
R: Red P: Pink V: Violet

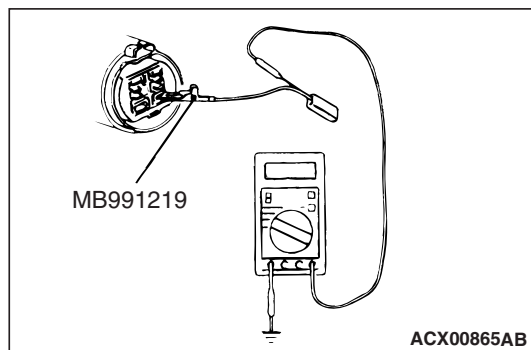


**IF INSPECTING WITH THE CONNECTOR CONNECTED****<Waterproof Connectors>**

Be sure to use special tool harness connector (MD998459). Never insert a test probe from the harness side, as this will reduce the waterproof performance and result in corrosion.

**<Ordinary (non-waterproof) Connectors>**

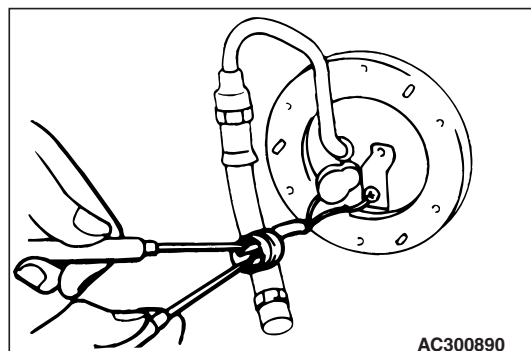
Inspect by inserting a test probe from the harness side. If the connector is too small to insert a test probe (e.g. control unit connector), do not insert it forcibly. Use special tool extra fine probe (MB992006).

**IF INSPECTING WITH THE CONNECTOR DISCONNECTED****<When Inspecting a Female Pin>**

Use the special tool inspection harness (MB991219) (inspection harness for connector pin contact pressure in the harness set for inspection). The inspection harness for connector pin contact pressure should be used. the test bar should never be forcibly inserted, as it may cause a defective contact.

**<When Inspecting a Male Pin>**

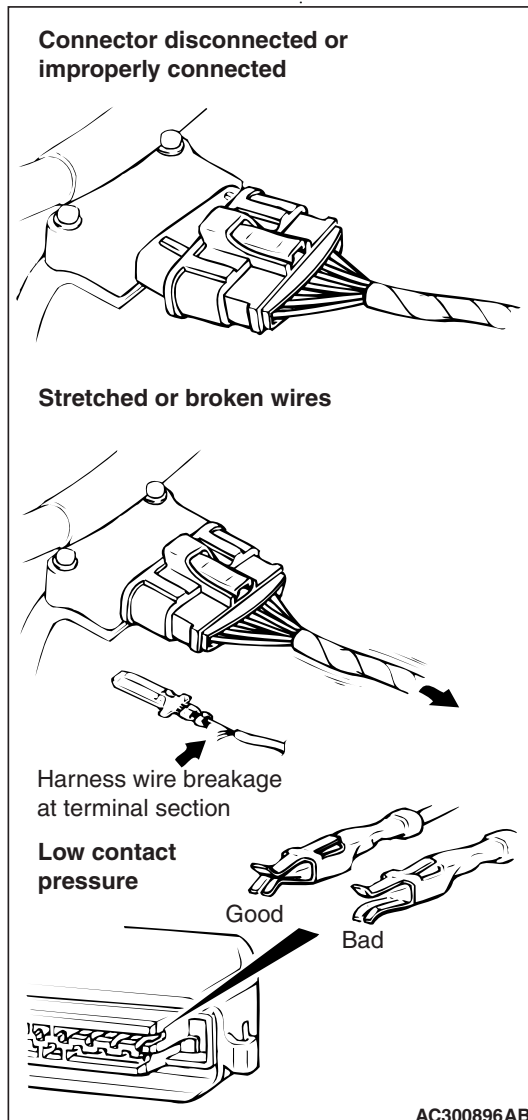
**CAUTION**



At this time, be careful not to short the connector pins with the test bars. To do so may damage the circuits inside the ECU. Touch the pin directly with the test bar.

## CONNECTOR INSPECTION SERVICE POINTS

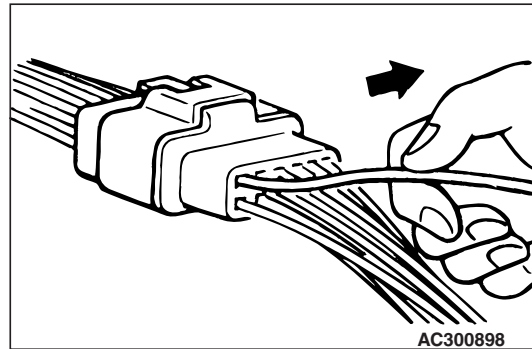
### VISUAL INSPECTION



Connector is disconnected or improperly connected

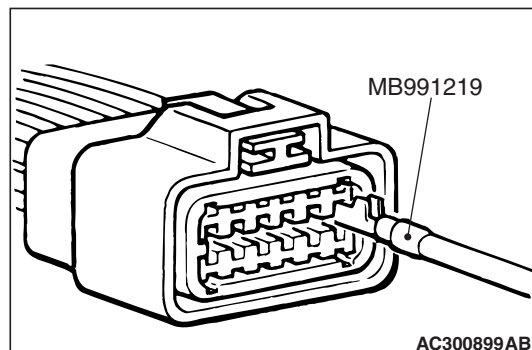
- Connector pins are pulled out
- Due to harness tension at terminal section
- Low contact pressure between male and female terminals
- Low connection pressure due to rusted terminals or foreign matter lodged in terminals

### CONNECTOR PIN INSPECTION

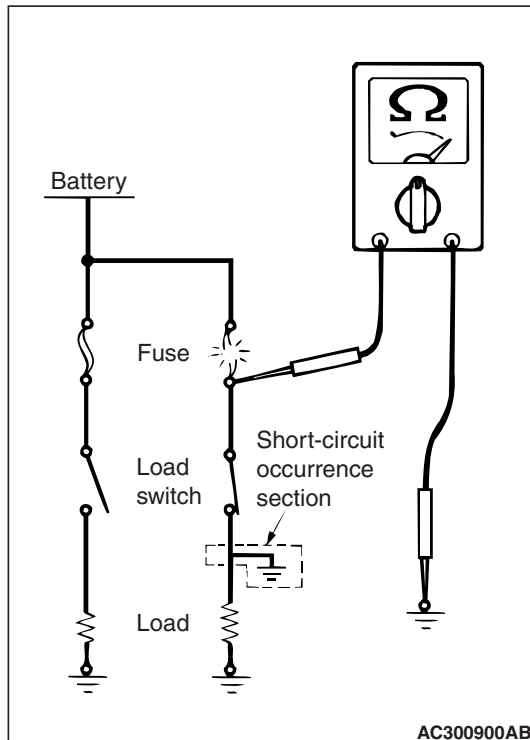


If the connector pin stopper is damaged, the terminal connections (male and female pins) will not be perfect even if the connector body is connected, and the pins may pull out of the reverse side of the connector. Therefore, gently pull the harnesses one by one to make sure that no pins pull out of the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

### CONNECTOR ENGAGEMENT INSPECTION



Use the 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**

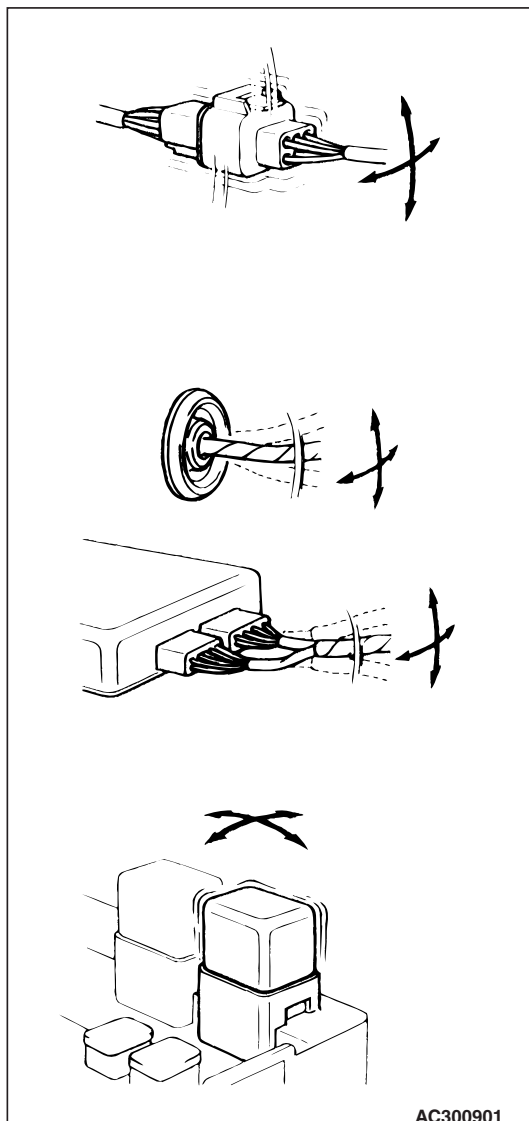
Remove the blown fuse and measure the resistance between the load side of the blown fuse and the earth. Close the switches of all circuits which are connected to this fuse. If the resistance is almost  $0\ \Omega$  at this time, there is a short somewhere between these switches and the load. If the resistance 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

*NOTE: If determining the cause is difficult, the flight recorder function of the M.U.T.-II/III can also be used.*



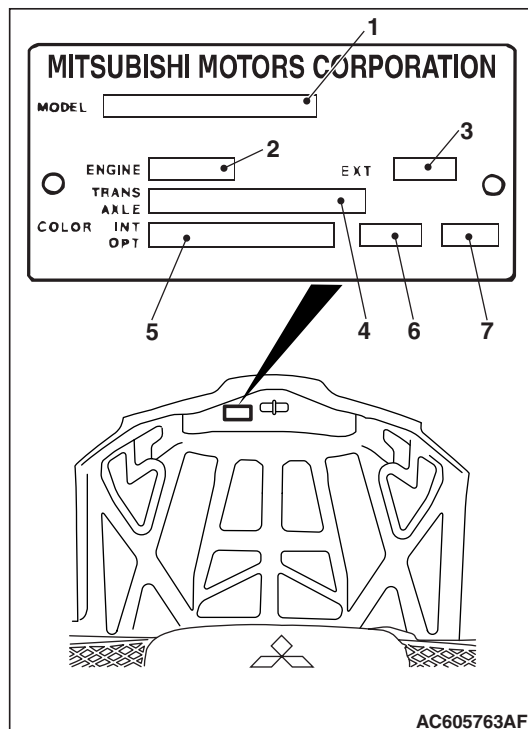
Intermittent malfunctions often occur under certain conditions, and if these conditions can be ascertained, determining the cause becomes simple. In order to ascertain the conditions under which an intermittent malfunction occurs, first ask the customer for details about the driving conditions, weather 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.

# VEHICLE IDENTIFICATION

M1001000401954

## VEHICLE IDENTIFICATION CODE PLATE



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

The plate shows model code, engine model, transmission model and body colour code.

No.	Item	Content	
1	MODEL	CU2WXNMM L6	CU2W: Vehicle model
			XNMMML6: Model series
2	ENGINE	4G63	Engine model
3	EXT	W83A	Exterior code
4	TRANS AXLE	F5M42	F5M42: Transmission model
5	COLOUR	W83	W83: Body colour code
6	INT	62A	62A: Interior code
7	OPT	ZP3	ZP3: Equipment code

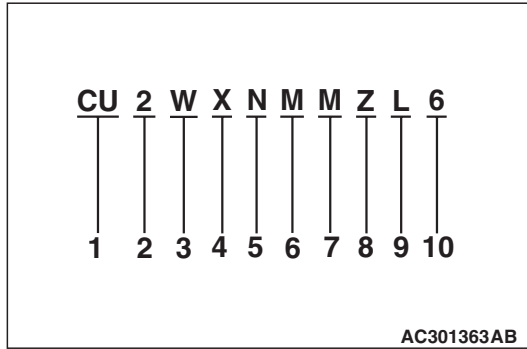
For monotone colour vehicles, the body colour code shall be indicated.

## MODELS

Model code		Engine model	Price class	Transmission model	Fuel supply system
CU2W	XNMMML6	4G63-DOHC (1,997 mL)	Invite	F5M42 <2WD, 5M/T>	MPI
	XNMMZL6			W5M42 <4WD, 5M/T>	
	XNHMZL6		Intense		
	XNXFZL6	4G63-DOHC with intercooler, turbocharger (1,997 mL)	Turbo	W5M51 <4WD, 5M/T>	
CU5W	XNHYZL6	4G69-SOHC MIVEC (2,378 mL)	Intense	W5M42 <4WD, 5M/T>	
	XRHYZL6			W4A4B <4WD, 4A/T with sport mode>	



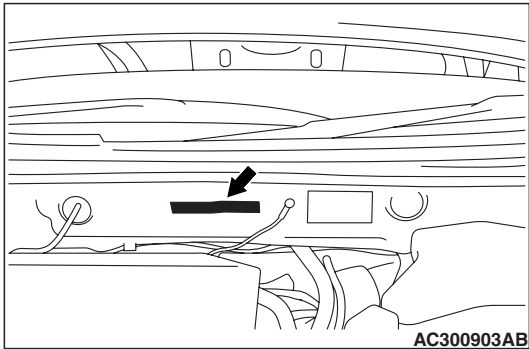
**MODEL CODE**



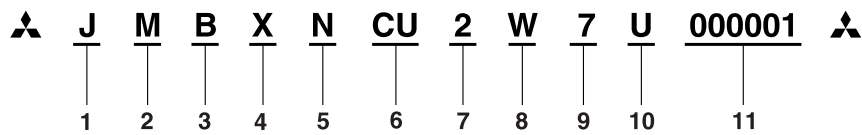
No.	Item	Content
1	Development	CU: MITSUBISHI OUTLANDER
2	Engine type	2: 1,997 mL petrol engine 5: 2,378 mL petrol engine
3	Sort	W: Wagon
4	Body style	X: 5-door hatchback

No.	Item	Content
5	Transmission type	N: 5-speed manual transmission R: 4-speed automatic transmission
6	Trim level	M: INVITE H: INTENSE X: TURBO
7	Specification engine feature	F: Turbochager M: DOHC Y: MIVEC, SOHC
8	Special feature	None: 2WD Z: 4WD
9	Steering wheel location	L: Left hand
10	Destination	6: For Europe

CHASSIS NUMBER



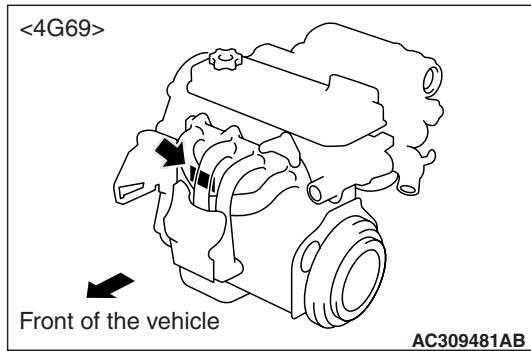
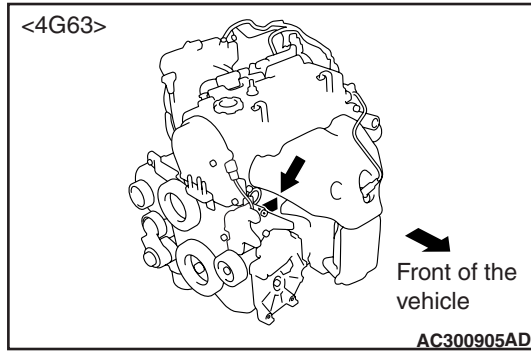
The chassis number is stamped on the toeboard inside the engine compartment.



AC606531AB

No.	Item		Content
1	Fixed figure	J	Asia
2	Distribution channel	M	Japan channel
3	Destination	B	For Europe, left hand drive
4	Body style	X	5-door hatchback
5	Transmission type	N	5-speed manual transmission
		R	4-speed automatic transmission
6	Development order	CU	OUTLANDER
7	Engine	2	1,997 mL petrol engine
		5	2,378 mL petrol engine
8	Soft	W	Station wagon
9	Model year	7	2007
10	Plant	U	Mizushima
11	Serial number	—	—

## ENGINE MODEL STAMPING



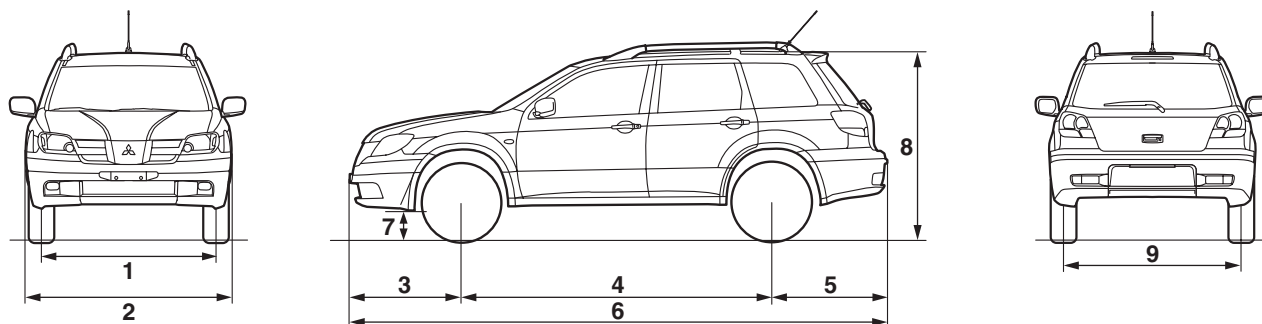
The engine model is stamped on the cylinder block. This engine model numbers are shown as follows.

Engine model	Engine displacement
4G63	1,997 mL
4G69	2,378 mL

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

## GENERAL DATA AND SPECIFICATIONS

M1001000901603



AC300072AB

Items			CU2W				CU5W	
			XNMML6	XNMMZL6	XNHMZL6	XNXFZL6	XNHYZL6	XRHYZL6
Vehicle dimensions mm	Front track	1	1,495		1,510			
	Overall width	2	1,750		1,780			
	Front overhang	3	945					
	Wheel base	4	2,625					
	Rear overhang	5	975					
	Overall length	6	4,545					
	Ground clearance (unladen)	7	195			170	195	
	Overall height (unladen)	8	1,620/1,670*					
	Rear track	9	1,505		1,520			
Vehicle weight kg	Kerb weight		1,440	1,540	1,550	1,595	1,555	1,575
	Max. gross vehicle weight		1,970	2,070				
	Max. axle weight rating-front		1,050			1,070		
	Max. axle weight rating-rear		1,065			1,075		
	Max. trailer weight	With brake	1,500					
		Without brake	570					
	Max. trailer-nose weight		75					
Seating capacity			5					
Engine	Model code		4G63				4G69	
	Total displacement mL		1,997				2,378	
Transmission	Model code		F5M42	W5M42		W5M51	W5M42	W4A4B
	Type		5-speed manual				5-speed manual	4-speed automatic
Fuel system	Fuel supply system		MPI					

NOTE: \*: Vehicles with roof rails

## PRECAUTIONS BEFORE SERVICE

M1001000501274

### SUPPLEMENTAL RESTRAINT SYSTEM (SRS)

#### CAUTION

Items to review when servicing SRS:

1. Be sure to read GROUP 52B – Supplemental Restraint System (SRS). For safe operation, please follow the directions and heed all warnings.
2. 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.
3. Warning labels must be heeded when servicing or handling SRS components. Warning labels can be found in the following locations.
  - Front impact sensor
  - Sun visor
  - SRS-ECU
  - Steering wheel
  - Clock spring
  - Air bag module (Driver's or front passenger's)
  - Side air bag module (Driver's side or front passenger's side)
  - Side impact sensor
  - Seat belt pre-tensioner
  - Instrument panel
4. Always use the designated special tools and test equipment.
5. 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.
6. Never attempt to disassemble or repair the SRS components (SRS-ECU, air bag module and clock spring).
7. Whenever you finish servicing the SRS, check the SRS warning lamp operation to make sure that the system functions properly.

8. 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).

Observe the following when carrying out operations on places where SRS components are installed, including operations not directly related to the SRS air bag.

1. When removing or installing parts, do not allow any impact or shock to the SRS components.
2. 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 M.U.T.-II/III with the diagnosis connector.
2. Select the item on the screen of the initialization for learning, and perform the initialization.

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: \*1: Initialize A/T-related learning value.

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

NOTE: \*3: The datum items on M.U.T.-II/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.

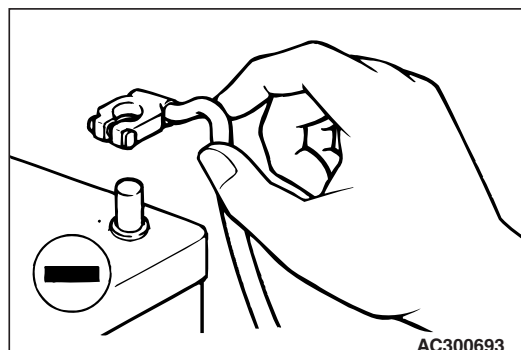
**Learning Procedure**

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**

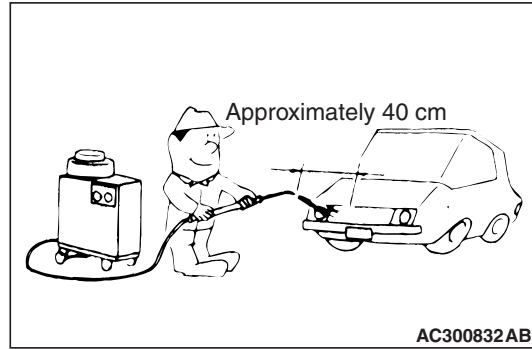
If oil or grease gets onto the oxygen sensor, it will cause a drop in the performance of the sensor. Cover the oxygen sensor with a protective cover when applying anti-corrosion agents and undercoats.

## 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.

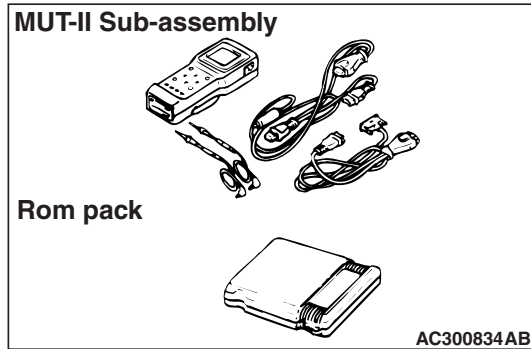
- Engine coolant temperature 80 to 90°C
- Lamps, electric cooling fan and all accessories: OFF
- M/T: Neutral
- A/T: P range

## VEHICLE WASHING

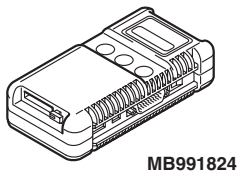


If high-pressure car-washing equipment or steam car-washing equipment is used to wash the vehicle, be sure to note the following information in order to avoid damage to plastic components, etc.

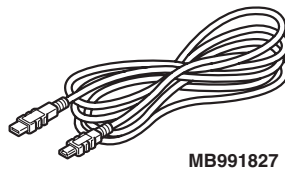
- Spray nozzle distance: Approx. 40 cm or more
- Spray pressure: 3,900 kPa or less
- Spray temperature: 82°C or less
- Time of concentrated spray to one point: within 30 sec.

**M.U.T.-II/III****M.U.T.-III sub assembly**

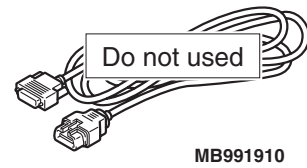
Vehicle communication interface (V.C.I.)



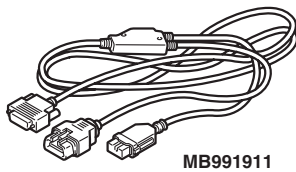
M.U.T.-III USB cable



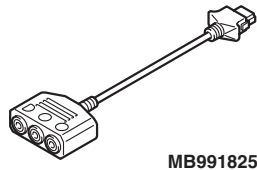
M.U.T.-III main harness A



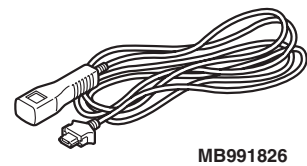
M.U.T.-III main harness B



M.U.T.-III measurement adapter



M.U.T.-III trigger harness

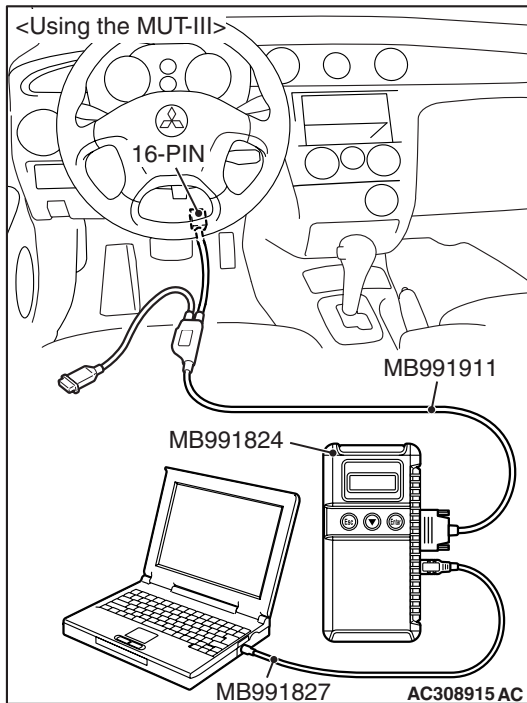
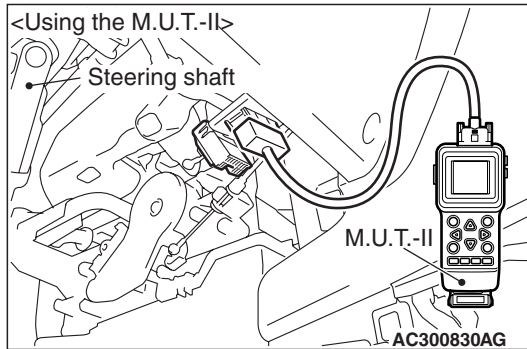


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Refer to the "M.U.T.-II REFERENCE MANUAL",  
"M.U.T.-II OPERATING INSTRUCTIONS" or  
"M.U.T.-III OPERATION MANUAL" for instructions on  
handling the M.U.T.-II/III.



**CAUTION**



**Turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting the M.U.T.-II/III.**

Connect the M.U.T.-II/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.

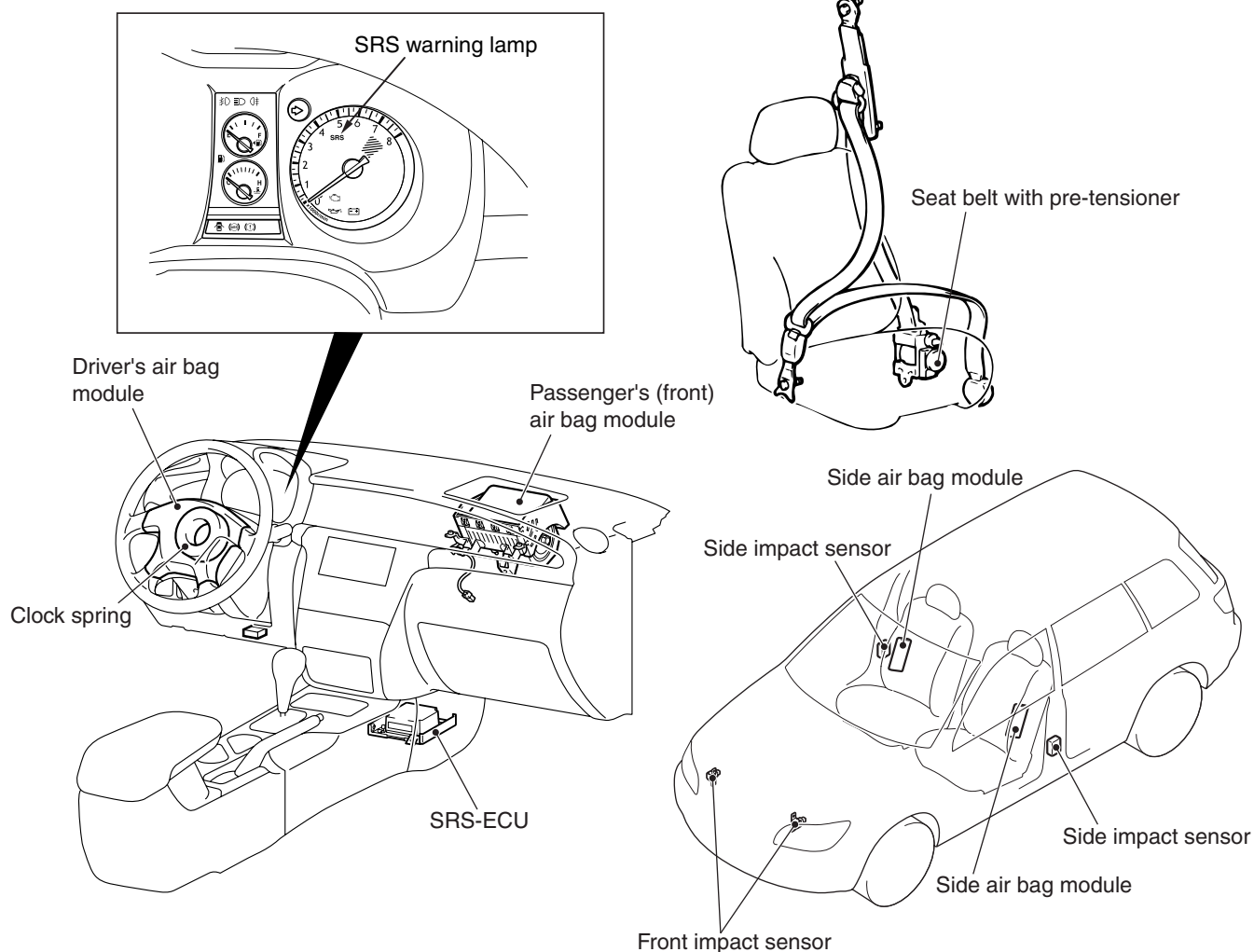
## SUPPLEMENTAL RESTRAINT SYSTEM (SRS)

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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 consist of four air bag modules, SRS air bag control unit (SRS-ECU), two front impact sensors, two side impact sensors, SRS warning lamp, clock spring and seat belt pre-tensioner. Front air bags are located in the centre of the steering wheel and above the glove box. Side air bag are located inside the front seatback assemblies. Each air bag is made up of a folded air bag and an inflator unit. The SRS-ECU under the front floor console monitors the

system and has a front air bag safing G-sensor, front air bag analog G-sensor and a side air bag safing G-sensor. The front impact sensor is assembled outside the headlamp support panel to monitor impact in case of front impact. The side impact sensors inside the centre pillars monitor the shock incurred by the sides of the vehicle. 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 belt pre-tensioner is built into the driver's and passenger's front 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.



# SRS SERVICE PRECAUTIONS

M1001006000434

## **⚠ 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-9](#).**

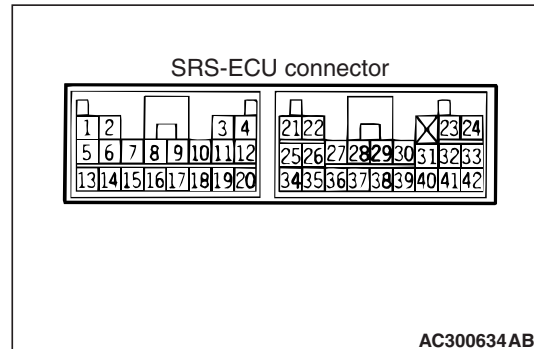
## **⚠ CAUTION**

**Never Attempt to Repair the Following Components:**

1. SRS air bag control unit (SRS-ECU)
2. Front impact sensor
3. Clock spring
4. Driver's and front passenger's air bag modules
5. Side air bag module
6. Side impact sensor
7. 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-130](#).*

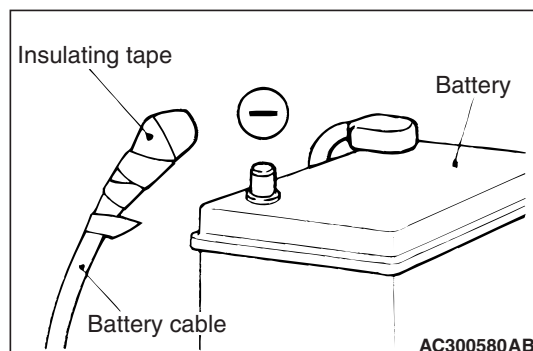
## **⚠ CAUTION**



**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	Instrument panel wiring harness → Front wiring harness (RH) → Front impact sensor (RH)	Correct or replace each wiring harness.
3, 4	Instrument panel wiring harness → Front wiring harness (LH) → Front impact sensor (LH)	Correct or replace each wiring harness.
7	Instrument panel wiring harness → Earth	Correct or replace the instrument panel wiring harness.
8	Instrument panel wiring harness → SRS warning lamp	Correct or replace the instrument panel wiring harness.
9, 10	Instrument panel wiring harness → Air bag module (Front passenger's side)	Correct or replace the instrument panel wiring harness.
11, 12	Instrument panel wiring harness → Clock spring → Air bag module (Driver's side)	Correct or replace instrument panel wiring harness. Replace the clock spring.
13	Instrument panel wiring harness → Junction block (fuse No.3)	Correct or replace the instrument panel wiring harness.
16	Instrument panel wiring harness → Junction block (fuse No.2)	Correct or replace the instrument panel wiring harness.

SRS-ECU terminal No.	Destination of harness	Remedy
20	Instrument panel wiring harness → Diagnosis connector	Correct or replace the instrument panel wiring harness.
21, 22	Floor wiring harness (LH) → Side air bag module (LH)	Correct or replace the floor wiring harness.
23, 24	Floor wiring harness (RH) → Side air bag module (RH)	Correct or replace the floor wiring harness.
27, 28	Floor wiring harness (RH) → Seat belt pre-tensioner (Front passenger's side)	Connect or replace the floor wiring harness.
29, 30	Floor wiring harness (RH) → Floor wiring harness (LH) → Seat belt pre-tensioner (driver's side)	Connect or replace the floor wiring harness.
34, 36	Floor wiring harness (RH) → Floor wiring harness (LH) → Side impact sensor (LH)	Connect or replace the floor wiring harness.
40, 42	Floor wiring harness (RH) → Side impact sensor (RH)	Connect or replace the floor wiring harness.

**⚠ DANGER**

**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 to**

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

- SRS-ECU, air bag modules, clock spring, impact sensors: 93°C or more
- Seat belt with pre-tensioner: 90°C or more

**If checks are carried out by using the SRS-ECU harness connector, observe the following procedures: Insert the special tool (extra fine probe) MB992006 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

M1001000700491

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

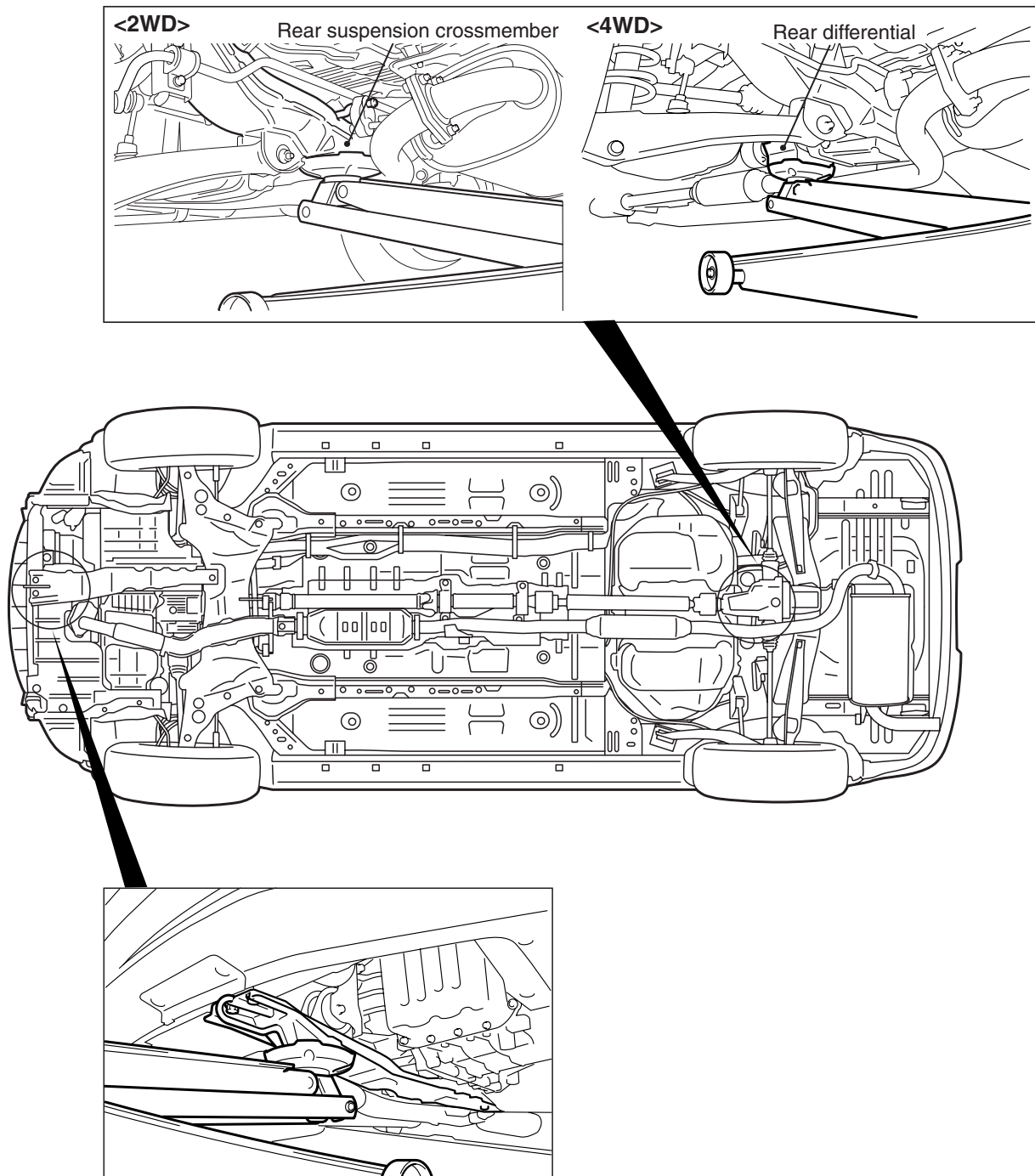
**⚠ CAUTION**

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.



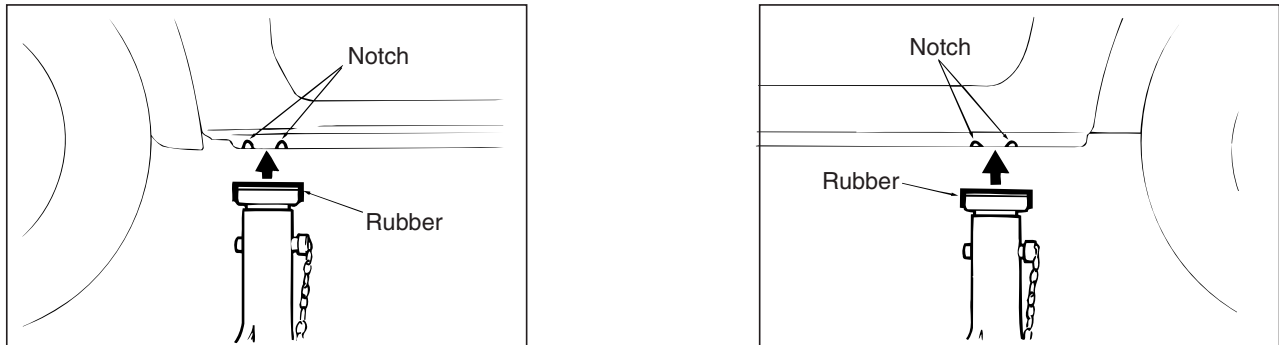


## AXLE STANDS AND A SINGLE-POST LIFT OR DOUBLE-POST LIFT

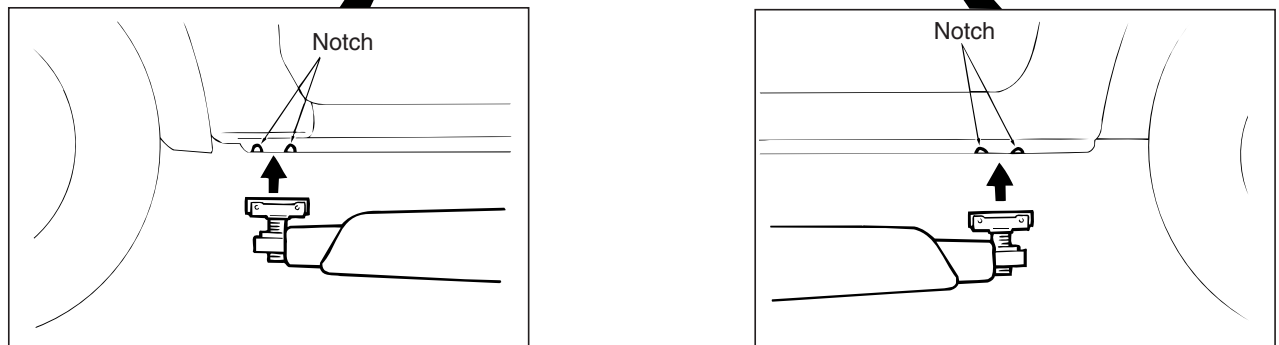
### **⚠ CAUTION**

- 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 step. Be sure to use attachments which are high enough, or remove the side step if not using attachments.

### AXLE STANDS



### SINGLE-POST LIFT OR DOUBLE-POST LIFT



## PLATE TYPE LIFT

**⚠ CAUTION**

To avoid damaging the side sill garnish, put a wooden block between the side sill and a lift.  
Support the side sill flange with a lift.

## STANDARD PART/TIGHTENING-TORQUE TABLE

M1001001100920

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	8.5 ± 1.5	10 ± 2
M8	1.25	11 ± 2	20 ± 4	24 ± 4
M10	1.25	23 ± 4	42 ± 8	53 ± 7
M12	1.25	42 ± 8	80 ± 10	93 ± 12
M14	1.5	70 ± 10	130 ± 20	150 ± 20
M16	1.5	105 ± 15	195 ± 25	230 ± 30
M18	1.5	150 ± 20	290 ± 40	335 ± 45
M20	1.5	210 ± 30	400 ± 60	465 ± 65
M22	1.5	290 ± 40	540 ± 80	630 ± 90
M24	1.5	375 ± 55	705 ± 105	820 ± 120

## 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	28 ± 5
M10	1.25	26 ± 5	50 ± 5	58 ± 7
M10	1.5	25 ± 4	46 ± 8	55 ± 5
M12	1.25	47 ± 9	93 ± 12	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.