

A1 GENERAL INFORMATION

IMPORTANT SAFETY NOTICE -----	A1 - 1	INSTRUCTIONS FOR SYSTEM	
GENERAL DESCRIPTION-----	A1 - 1	INSPECTION -----	A1 - 21
WARNINGS, CAUTIONS AND		HANDLING INSTRUCTION OF	
NOTES -----	A1 - 1	CONNECTOR-----	A1 - 21
GENERAL WARNINGS-----	A1 - 2	CONNECTOR	
HOW TO USE THIS MANUAL -----	A1 - 3	REMOVAL/INSTALLATION	
ARTICLES TO BE PREPARED -----	A1 - 3	PROCEDURE-----	A1 - 21
REMOVAL AND INSTALLATION		CHECK PROCEDURE OF WIRE	
PROCEDURES -----	A1 - 3	HARNESS AND CONNECTOR -----	A1 - 23
DESCRIPTION OF SERVICE		CIRCUIT INSPECTION OF	
STANDARD VALUE -----	A1 - 4	COMPUTER UNIT-----	A1 - 24
CONTENTS NOT DESCRIBED IN		HANDLING INSTRUCTION OF	
THIS MANUAL -----	A1 - 5	SYSTEM -----	A1 - 25
DEFINITIONS OF TERMS -----	A1 - 5	INSTRUCTIONS FOR RADIO	
ABBREVIATION CODES-----	A1 - 6	INSTALLATION -----	A1 - 26
HOW TO GRASP SPECIFIED		HANDLING INSTRUCTIONS ON	
TIGHTENING TORQUE FOR		CATALYTIC CONVERTER-EQUIPPED	
GENERAL STANDARD BOLT AND		VEHICLES-----	A1 - 26
NUT -----	A1 - 7	PRECAUTION FOR VEHICLES	
DETERMINING PROCEDURE FOR		EQUIPPED WITH SRS AIRBAG AND	
TIGHTENING TORQUE FOR		SEAT BELT PRETENSIONER-----	A1 - 27
GENERAL STANDARD BOLTS AND		INSTRUCTIONS FOR SERVICE	
NUTS -----	A1 - 7	OPERATION -----	A1 - 27
UNIT -----	A1 - 9	VEHICLE IDENTIFICATION -----	A1 - 29
NEW UNIT BECAUSE OF THE		BODY COLOR CODE -----	A1 - 29
INTRODUCTION OF THE SI UNIT -----	A1 - 9	CHASSIS SERIAL NUMBER -----	A1 - 30
GENERAL SERVICE INSTRUCTION ---	A1 - 10	ENGINE TYPE AND ENGINE	
SUPPORTING POINTS FOR JACKS		NUMBER-----	A1 - 30
AND SAFETY STANDS -----	A1 - 12	MANUFACTURER'S PLATE	
JACKING POINTS-----	A1 - 12	POSITION -----	A1 - 31
SUPPORTING POINTS OF SAFETY			
STANDS -----	A1 - 13		
SUPPORTING POINTS OF LIFTS-----	A1 - 14		
SWING ARM TYPE -----	A1 - 14		
PLATE TYPE -----	A1 - 14		
SERVICE INSTRUCTIONS FOR FOUR			
WHEEL DRIVE VEHICLES -----	A1 - 15		
SPEEDOMETER TESTER -----	A1 - 15		
BRAKE TEST -----	A1 - 15		
TOWING INSTRUCTIONS -----	A1 - 16		
DIAGNOSTICS INSTRUCTIONS-----	A1 - 17		
DIAGNOSIS -----	A1 - 17		
DATA LINK CONNECTOR-----	A1 - 19		
DATA LINK CONNECTOR			
TERMINAL ARRANGEMENT -----	A1 - 19		
CONNECTION METHOD OF DATA			
LINK CONNECTOR -----	A1 - 19		
CONNECTION METHOD OF EACH			
SYSTEM -----	A1 - 20		

1 IMPORTANT SAFETY NOTICE

1-1 GENERAL DESCRIPTION

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

1-2 WARNINGS, CAUTIONS AND NOTES

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

WARNING

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

CAUTION

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

NOTE

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

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

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

2 HOW TO USE THIS MANUAL

2-1 ARTICLES TO BE PREPARED

When SST, tool, measuring instrument, a sort of fat and oil to be prepared before operation are necessary, those are described by compiling in the table as preparation tools at the beginning of each item.

However, the general tools, jacks, fixtures as considered being equipped always at the service shop are usually omitted.

2-2 REMOVAL AND INSTALLATION PROCEDURES

1. Block diagrams are posted so as to show the installed state of each part.
2. The application of a sort of fat and oil and sealer are instructed in the figure with arrow. And the indication of a tightening torque and non-reusable parts are also described. The explanation of each code is posted below the block diagram concerned.
3. The removal and installation (disassembling and assembling) procedure list is shown just beneath of components figure.

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

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

NOTE

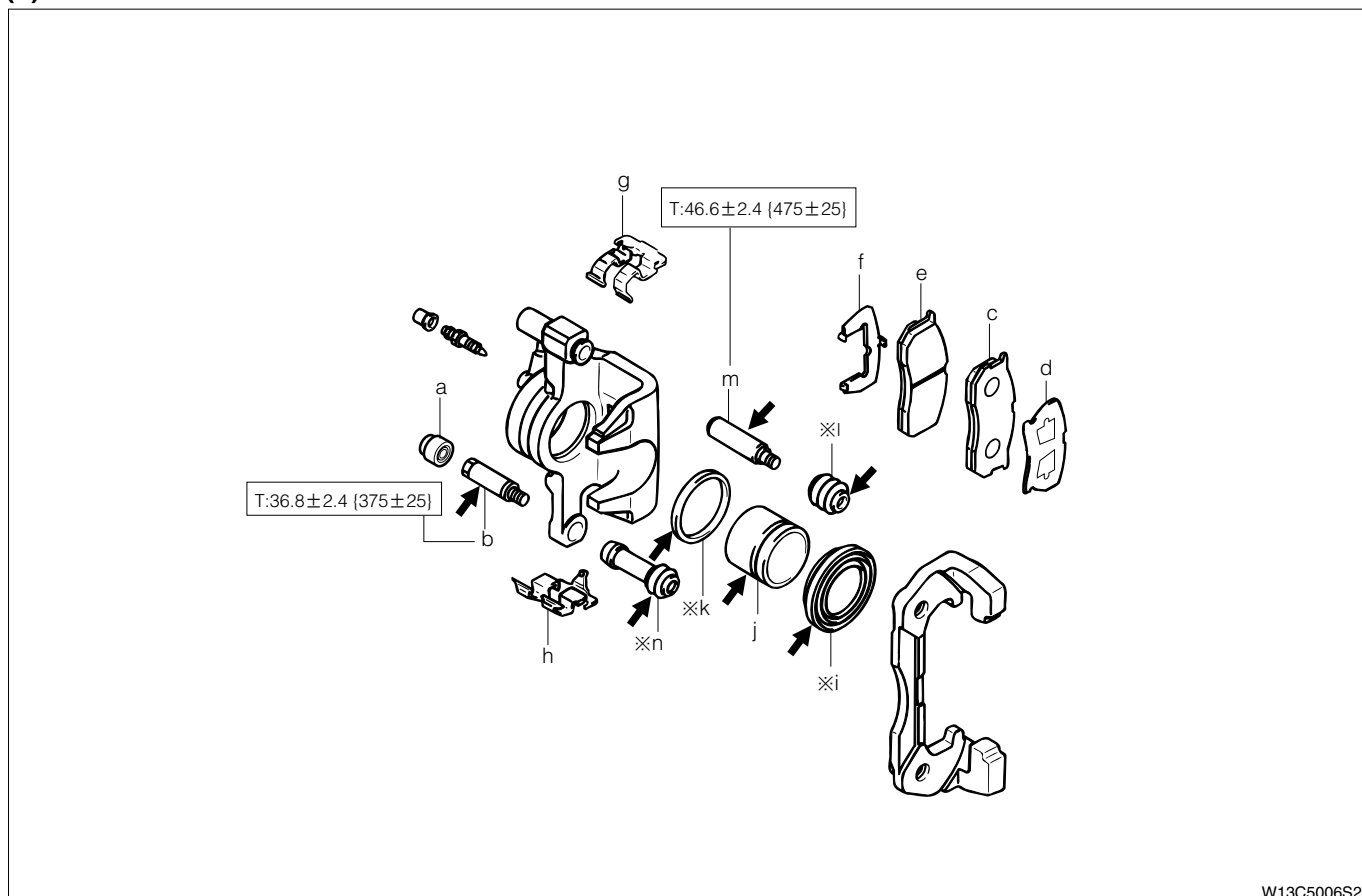
- Only in cases where the installation (or assembly) can not be carried out by reversing the removal (or disassembly) procedure, the installation (or assembly) procedure is provided.

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

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

2-2-1 ENTRY EXAMPLE

(1) COMPONENTS



W13C5006S24

➡ : Rubber grease

※: Non-reusable part

Unit: N·m {kgf·cm}

(2) DISASSEMBLY AND ASSEMBLY PROCEDURES

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

2-3 DESCRIPTION OF SERVICE STANDARD VALUE

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

2-4 CONTENTS NOT DESCRIBED IN THIS MANUAL

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

- 1.Jacking operation and lifting operation
- 2.Cleaning and cleansing of removed parts to perform at need
- 3.Visual inspection

2-5 DEFINITIONS OF TERMS

SPECIFIED VALUE	This mark shows the standard value at the time of the check or adjustment.
ALLOWABLE LIMIT	This mark shows the maximum or minimum value at the time of the check or adjustment.
DEVIATION	This value refers to the difference between the maximum clearance and the minimum clearance.

3 ABBREVIATION CODES

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

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

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

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

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






Determine the strength division of bolts, based on the table below.
Then, obtain the value, based on the tightening torque table.

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

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

4-1-3 IDENTIFICATION

Identification of strength division by checking bolts themselves

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

Identification by part number


Hexagonal bolt

Example of part number 9 1 1 1 - 4 0 6 2 0

Strength division

Nominal diameter (mm)

Nominal length (mm)



⌀ Nominal diameter

Nominal length

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

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

5 UNIT

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

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

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

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

ITEM	SI unit	Conventional units	Conversion table
Force	N	kgf	1kgf = 9.80665 N
Torque	N·m	kgf·cm	1kgf·cm = 0.0980665 N·m
Pressure	kPa	kgf/cm ²	1kgf/cm ² = 98.0665 kPa
		mmHg	1mmHg = 0.133322 kPa
Spring constant	N/mm	kgf/mm	1kgf/mm = 9.80665 N/mm
Volume	ℓ	cc	1000cc = 1ℓ
Power	kW	PS	1PS = 0.735499 kW

6 GENERAL SERVICE INSTRUCTION

1. Use fender covers, seat covers, and floor sheets so that the vehicle may not get dirty or be scratched.
2. Jacking up
 - (1) When only front section or rear section of a vehicle is jacked up, be sure to place chocks at the wheels so as to insure safe operations.
 - (2) When the vehicle has been jacked up, be sure to support the vehicle at the specified section using the safety stands.
 - (3) When the vehicle has been lifted up, be sure to set the cradle of the lift at the specified location, and lift it up. And after the jacking up, ensure to apply the protective safety device.
And after the jacking up, ensure to apply the protective safety device.
 - (4) The jack—up operation must be carried out only on a level, flat place.
 - (5) Never jack up the vehicle at the front and rear sides at the same time.
3. Installation and removal of battery terminal
 - (1) Before you start performing the electrical works, make certain to disconnect the battery ground cable terminal from the negative terminal of the battery.
 - (2) Before disconnecting the battery ground cable terminal from the negative terminal of the battery, be sure to read out the diagnosis code of the EFI systems if it is equipped.
 - (3) After reconnecting the battery ground cable terminal to the negative terminal of the battery, be sure to reset the watch or radio, if the vehicle is equipped with such equipment.
 - (4) When it becomes necessary to disconnect the battery power supply for the purpose of carrying out checks or repairs, always disconnect the negative terminal of the battery ground cable from the negative terminal of the battery first.
 - (5) To avoid damaging battery plates, after the terminal nut has been loosened, pull out the battery ground cable terminal straight upward, rather than turning or prying the terminal.
 - (6) Be sure to employ a battery terminal puller (commercially available) to remove battery ground cable terminal from the negative terminal of the battery, if any difficulty is encountered.
 - (7) Clean the battery terminal posts or battery ground cable terminals, using a cloth. Never use a file or other abrasive agents.
 - (8) Install the battery cable terminals to the battery posts after loosening the nuts, and tighten the nuts after installation. Never tap the terminals on the battery posts using a hammer or the like.
 - (9) As for the cover at the positive (+) terminal side, be sure to install it at the correct position.
4. Repairing of fuel system
 - (1) Do not work near open flames.
 - (2) Be certain to place a suitable container, a cloth, etc. under the connected section of the fuel line before disconnecting the fuel line.
 - (3) Before the fuel line is disconnected, be sure to release the inner pressure of the fuel tank by detaching the fuel filler cap.
 - (4) Be sure to prevent the fuel from splashing with a cloth or the like, when the union bolt or other connected section of the fuel line is loosened or slackened.
 - (5) Tighten each connecting section to the specified torque.
 - (6) Attach the specified clips to each connecting section.
5. For increased work efficiency and improved accuracy, be sure to utilize the SSTs (Special Service Tools) effectively.

6. Removal, Disassembly

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

7. Check and measurement of parts

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

8. Installation, Assembling

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

9. Adjustment, Operation confirmation

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

10. Handling of hose or the like

- (1) Ensure to insert the fuel hose, water hose or the like without coming out or leakage.
- (2) Be careful that fuel shall not splash on the parts near by when remove the fuel hose. (Deep care shall be paid for engine mount rubber or the like, as there may be possibility to get material deterioration for liquid of gasoline series.)

11. Touch up

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

7 SUPPORTING POINTS FOR JACKS AND SAFETY STANDS

7-1 JACKING POINTS

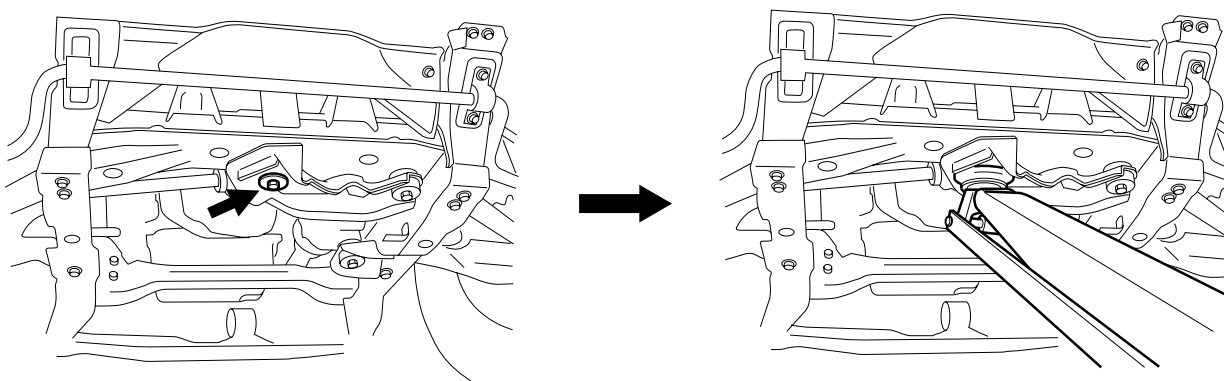
CAUTION

- Be sure to set the jack in such a way that jack may not interfere with the bumper.

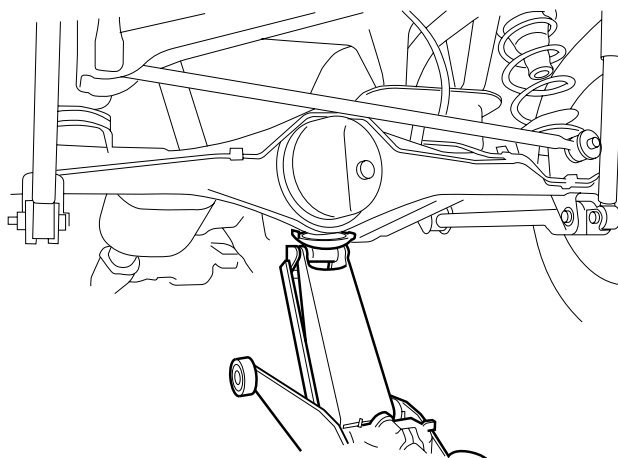
Jacking points

- Front side: Central projection at the front of the front suspension member
- Rear side: Central lower section of the rear differential

Front side



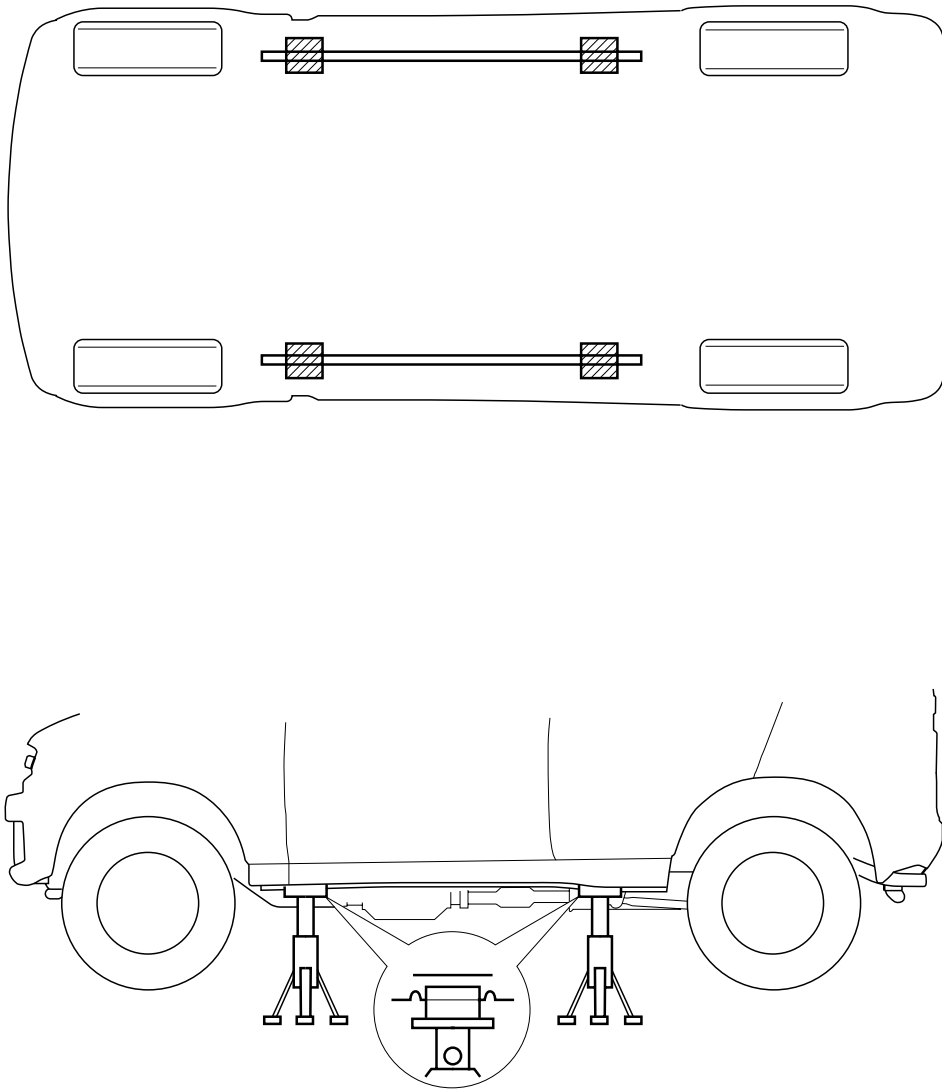
Rear side



7-2 SUPPORTING POINTS OF SAFETY STANDS

CAUTION

- Never support the vehicle at points other than the specified points.

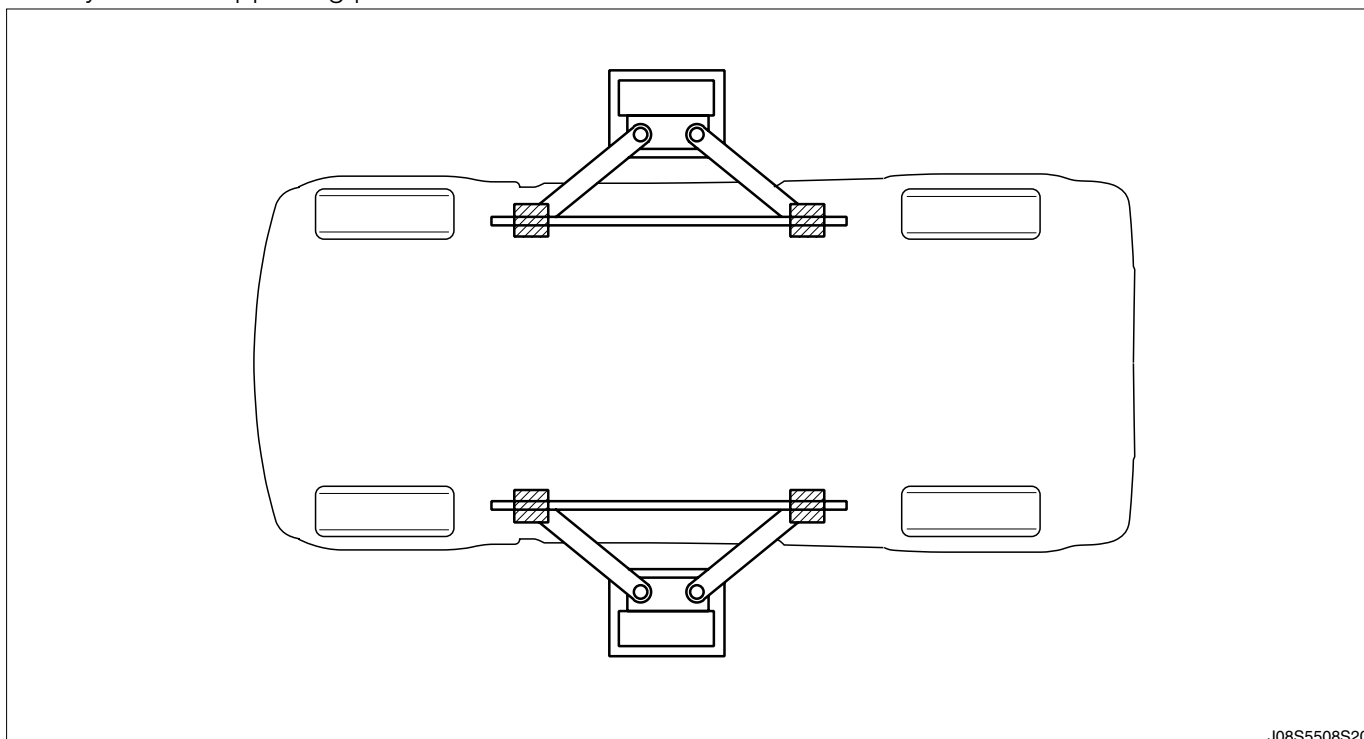


8 SUPPORTING POINTS OF LIFTS

8-1 SWING ARM TYPE

Supporting points of lifts:

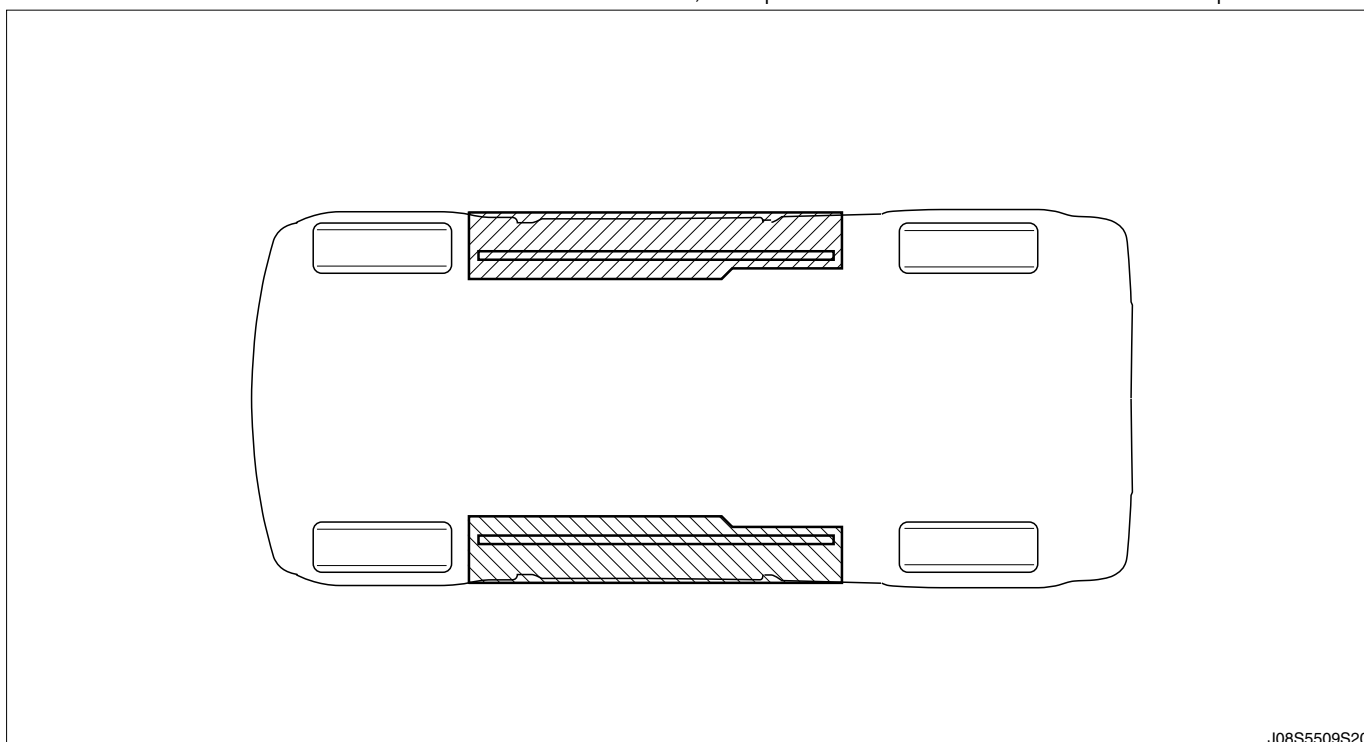
- Safety stands supporting point



8-2 PLATE TYPE

Supporting points of lifts:

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



9 SERVICE INSTRUCTIONS FOR FOUR WHEEL DRIVE VEHICLES

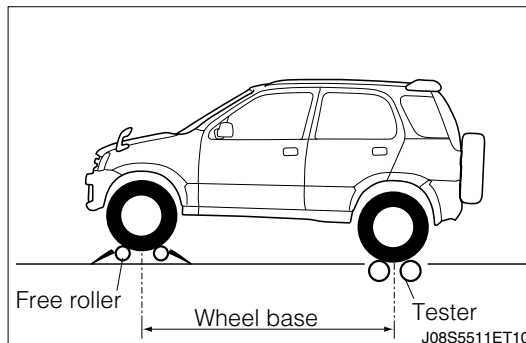
A full time 4WD vehicle cannot make the front wheel or rear wheel free condition due to it's mechanism. Accordingly the brake test and speedometer test at the vehicle inspection shall be performed by setting one axis on the free rollers.

9-1 SPEEDOMETER TESTER

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

Wheel base	2420mm
Front tread	1305, 1315* ¹ mm
Rear tread	1310mm

*1 : European specifications



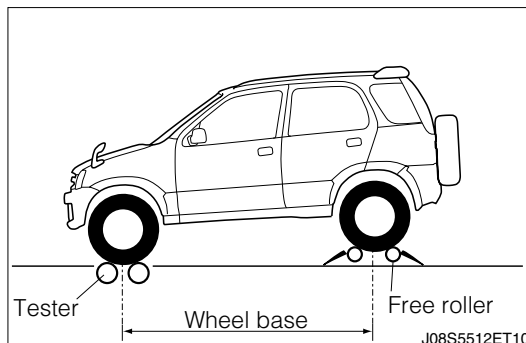
- 2.With the center differential set to a locked state, set the vehicle in such a way that the rear wheels ride on the speedometer tester and the front wheels ride on the free rollers. Then, proceed to the operation of the speedometer test.

CAUTION

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

9-2 BRAKE TEST

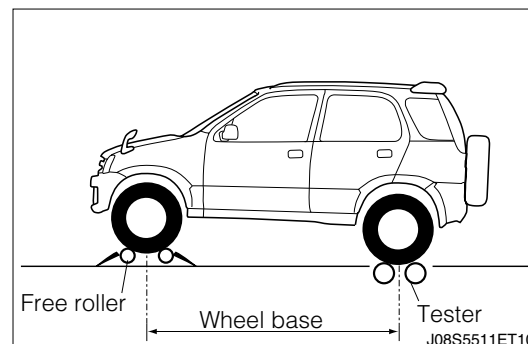
- 1.Ensure to set the free rollers surely on the floor by mating to wheel base of the vehicle and tread of wheel to be measured (front wheel or rear wheel).



2. Set the wheel to be measured (front wheel or rear wheel) on the brake tester and the other wheel (front wheel or rear wheel) on the free rollers, then perform the brake test.

CAUTION

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



9-3 TOWING INSTRUCTIONS

9-3-1 TOWING WITH ROPE (ONLY FOR EMERGENCY)

1. Release parking brake, and turn IG switch to ACC position, and then put the shift lever into neutral range.

CAUTION

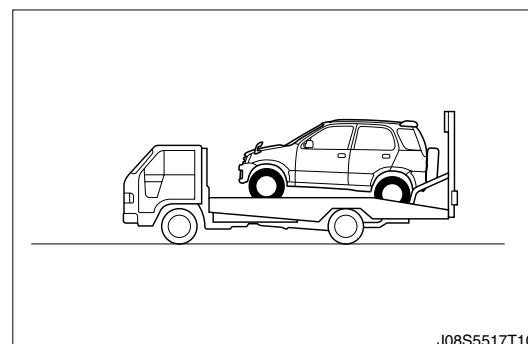
- Never tow with the rope when the running system and/or driving system seems to be abnormal.
- When drive with engine stopping, brake efficiency become less due to no functioning of the brake servo system. Depress the brake pedal more powerfully than the usual.
- For automatic transmission vehicle, be sure to always use a flat bed truck.

9-3-2 USING FLAT BED TRUCK

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

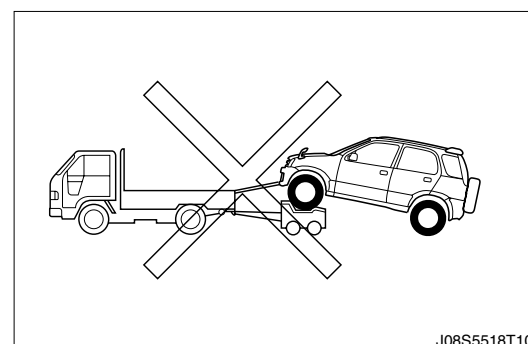
CAUTION

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



9-3-3 TOWING WITH FRONT WHEEL OR REAR WHEEL LIFT TYPE TRUCK

In case of 4WD vehicle, never perform the towing with lifting up only the front wheel or rear wheel, because there shall be possibility to be over heat or sticking of the driving system during towing and running out from the towing dolly.

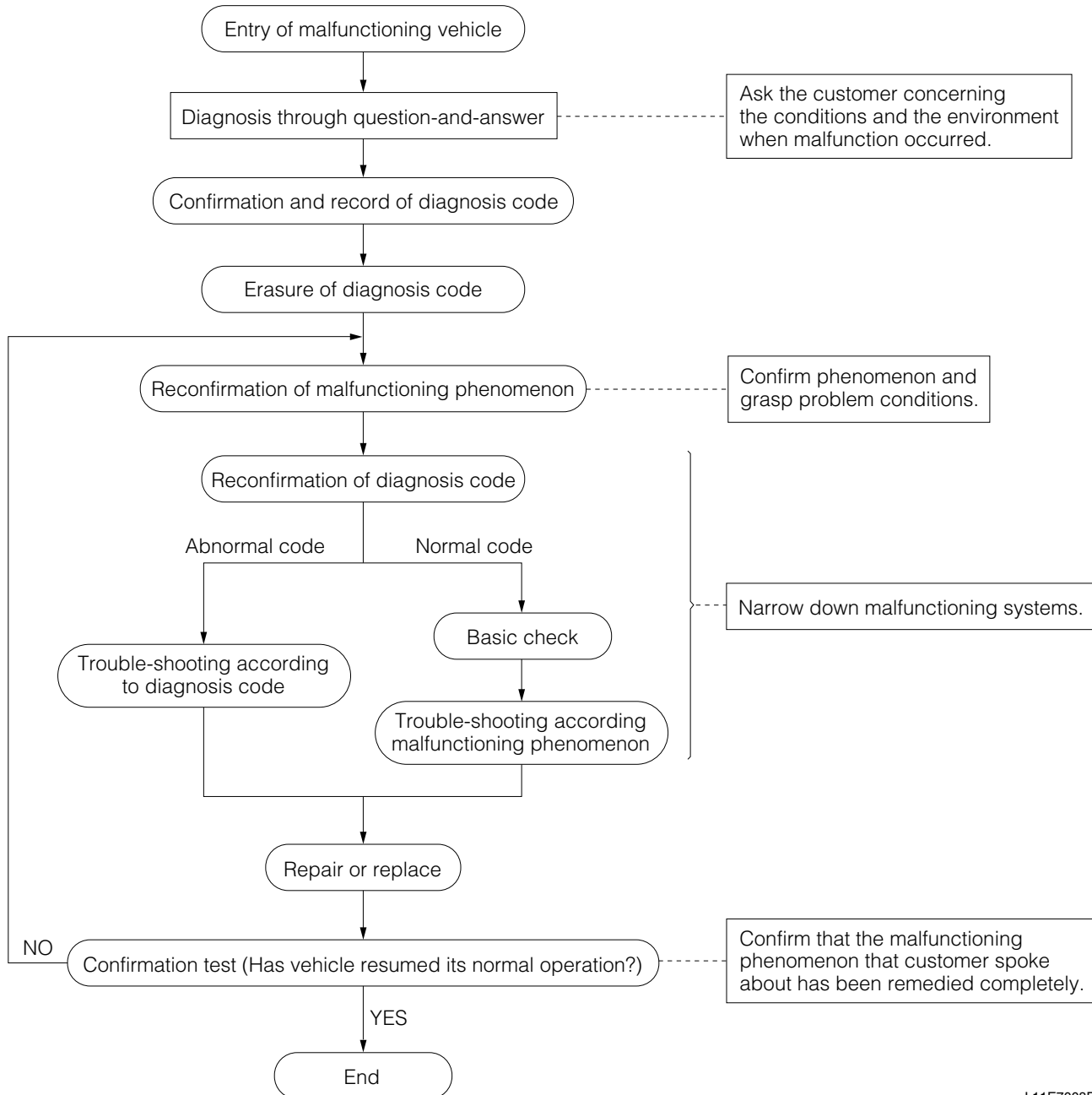


10 DIAGNOSTICS INSTRUCTIONS

10-1 DIAGNOSIS

10-1-1 HOW TO PROCEED DIAGNOSIS

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



10-1-2 SYMPTOM CONFIRMATION

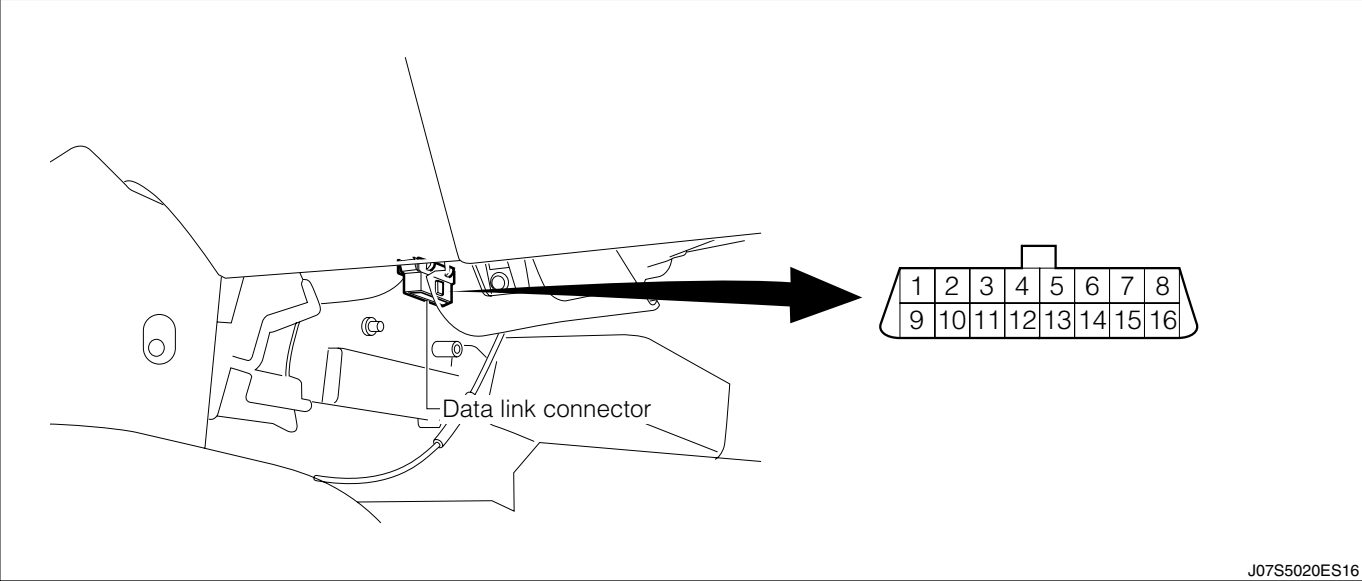
1. When conducting a trouble shooting, the operator cannot pinpoint the cause for the malfunction, unless he actually confirms the phenomenon. For this purpose, it is indispensable to reproduce the malfunctioning phenomenon by creating conditions and environments that are similar to those where the malfunction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

10-1-3 CUSTOMER PROBLEM ANALYSIS

1. For the vehicle which malfunctions occurred, confirm first the malfunction phenomenon, and study the cause and then eliminate the cause. There is possibility that the vehicle does not return to normal condition even if perform many operation without study of cause. An asking about problems is to gather the information from the customer before confirming the malfunction phenomenon, and become an important clue when attempt to reproduce the malfunction. When perform the asking about problem, it is necessary to focus to the items relating to said malfunctions so that information attained with an asking about problems becomes useful reference of trouble shooting.

11 DATA LINK CONNECTOR

11-1 DATA LINK CONNECTOR TERMINAL ARRANGEMENT



No	Terminal code	No	Terminal code
①	BAT(DS-21)	⑨	ITC-T
②	—	⑩	SIO(DS-21)
③	—	⑪	—
④	ECU-T	⑫	E(Signal earth)
⑤	EFI-T	⑬	E(Body earth)
⑥	W (immobilizer)	⑭	TS(EPS)
⑦	—	⑮	—
⑧	REV	⑯	VF

11-2 CONNECTION METHOD OF DATA LINK CONNECTOR

Perform it by connecting the engine control system inspection wire (SST) with the data link connector. Perform the system check of each system by using the terminal for Connect circuit (SST), the terminal for detecting engine speed and the terminal for VF output monitoring (SST).

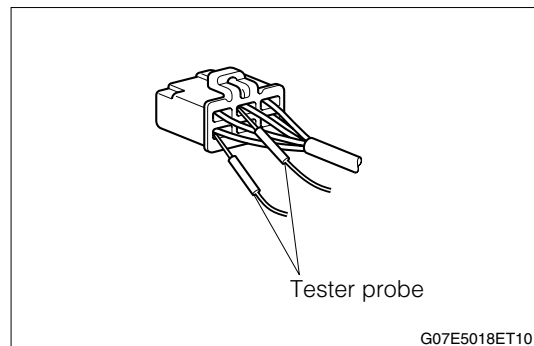
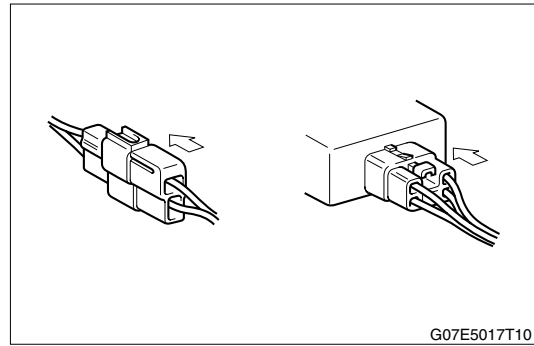
11-3 CONNECTION METHOD OF EACH SYSTEM

- 1.Diagnosis code output of engine control system
: Connect circuit between EFI-T — E
- 2.Functioning check of O₂ sensor for engine control system
: Measure between VF — E
- 3.Engine speed check of engine control system
: Measure between REV — Body earth
- 4.Diagnosis code output of automatic transmission system
: Connect circuit between ECU-T — E
- 5.Diagnosis code output of ABS system
: Connect circuit between ECU-T — E
- 6.Diagnosis code output of EPS system
: Connect circuit between ECU-T — E
- 7.Writing, erasure and confirmation of zero point of the EPS torque sensor
: Connect circuit between TS(EPS) — E
- 8.Diagnosis code output of SRS airbag system
: Connect circuit between ECU-T — E
- 9.Operation check of body integrated controller and hazard lamp system
: Connect circuit between ITC-T — E

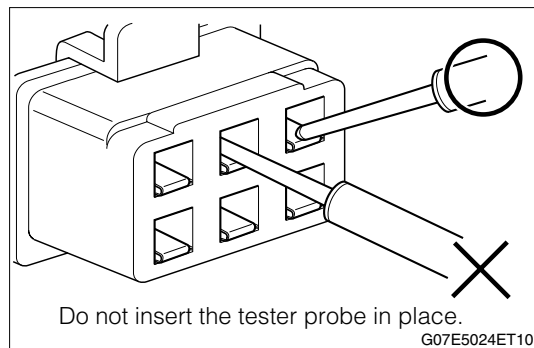
12 INSTRUCTIONS FOR SYSTEM INSPECTION

12-1 HANDLING INSTRUCTION OF CONNECTOR

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



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



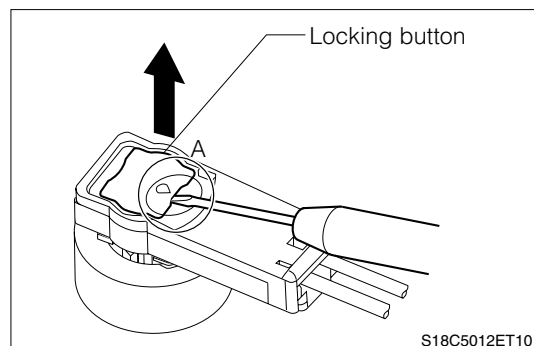
12-2 CONNECTOR REMOVAL/INSTALLATION PROCEDURE

12-2-1 CONNECTOR WITH LOCKING BUTTON

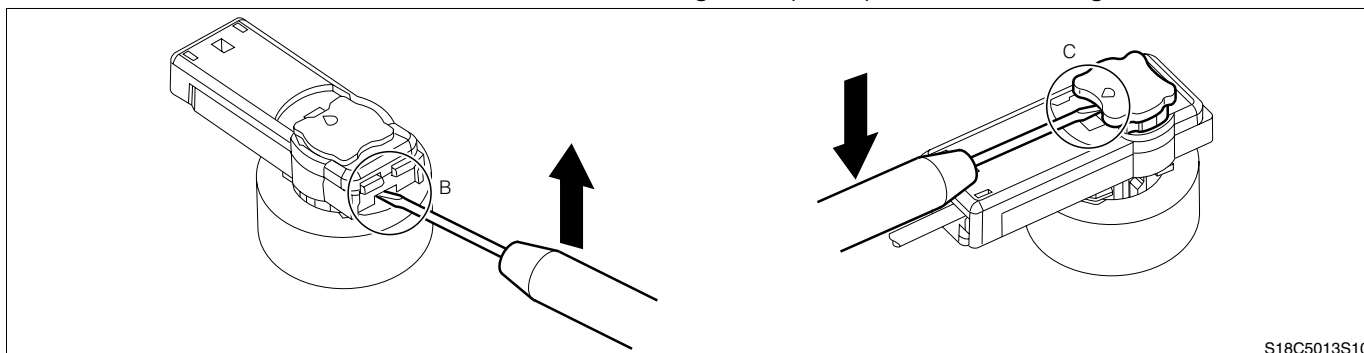
(1) Type 1

① POINTS OF REMOVAL

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

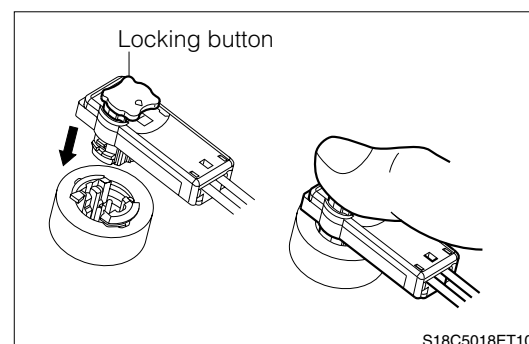


2. Insert a flat screwdriver with a thin forward end (approx. 2 mm wide) at the point B or C. Pry the point with the screwdriver in the arrow direction, utilizing lever principle, thus removing the connector.



② POINTS OF INSTALLATION

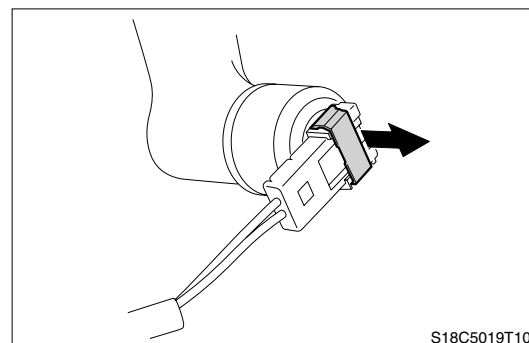
1. Insert the connector firmly as far as it goes. Push and lock the connector, until the locking button clicks.



(2) Type 2

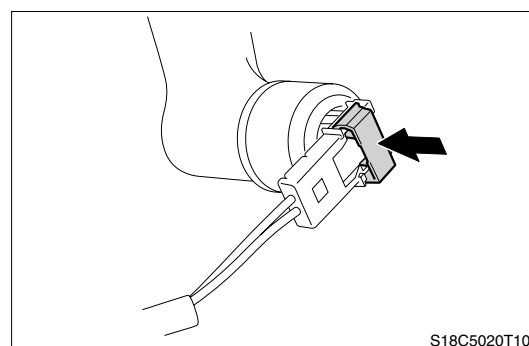
① POINTS OF REMOVAL

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



② POINTS OF INSTALLATION

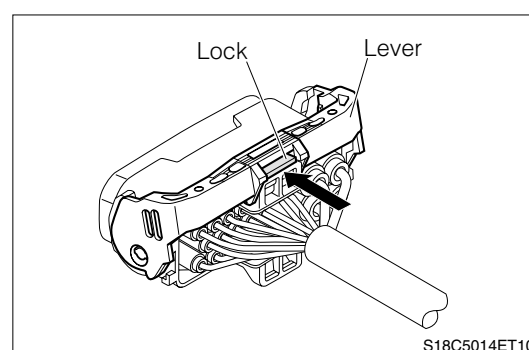
1. Insert the connector firmly as far as it goes. Push and lock the connector, until the locking button clicks.



12-2-2 CONNECTOR WITH LEVER LOCK

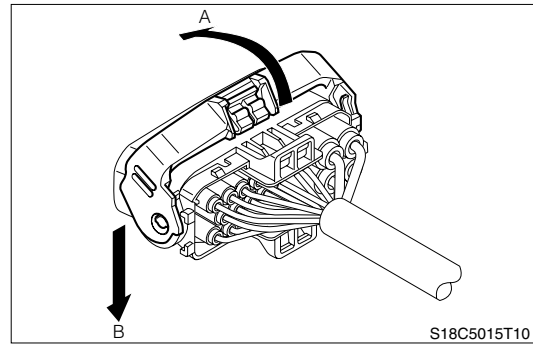
(1) POINTS OF REMOVAL

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



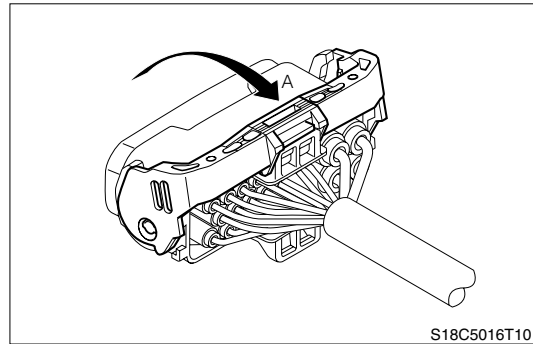
A1-23

2. Turn the lever about 40° in the direction A. Then, apply force in the direction B to turn the lever.
3. Ensure that the lever has been turned fully. Then, remove the connector.



(2) POINTS OF INSTALLATION

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



12-3 CHECK PROCEDURE OF WIRE HARNESS AND CONNECTOR

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

12-3-1 CONTINUITY INSPECTION

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

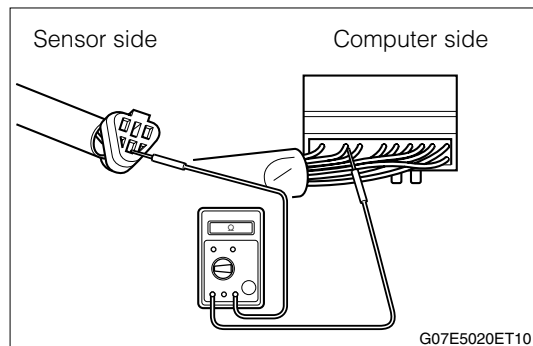
SPECIFIED VALUE: Not more than $1\ \Omega$

CAUTION

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

NOTE

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



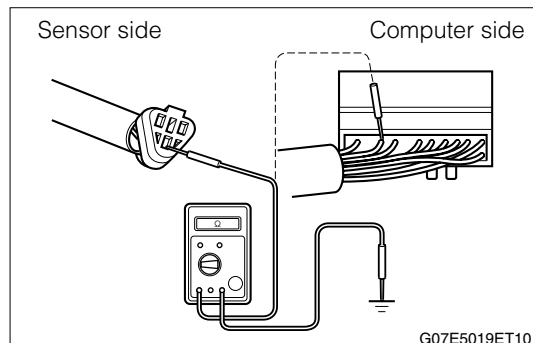
12-3-2 SHORT CIRCUIT INSPECTION

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

SPECIFIED VALUE: Not less than $1\text{M}\ \Omega$

CAUTION

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



3. Measure electrical resistance between terminals in same connector with the connector of corresponding terminal (except between each power supply lines or earth lines). In addition to above, perform the inspection at the connector of both sides.

SPECIFIED VALUE: Not less than 1M Ω

CAUTION

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

12-3-3 VISUAL INSPECTION, CONTACT FORCE INSPECTION

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

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

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

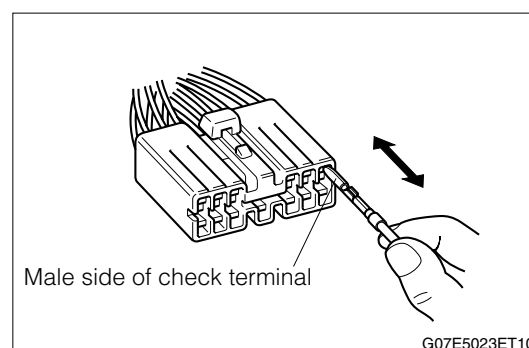
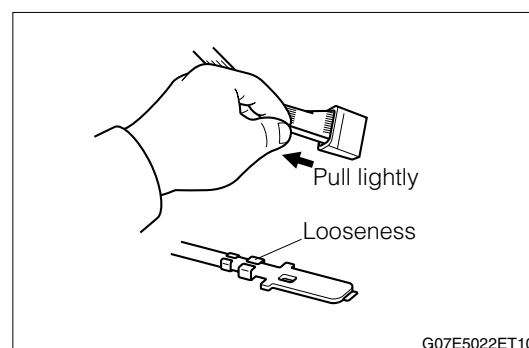
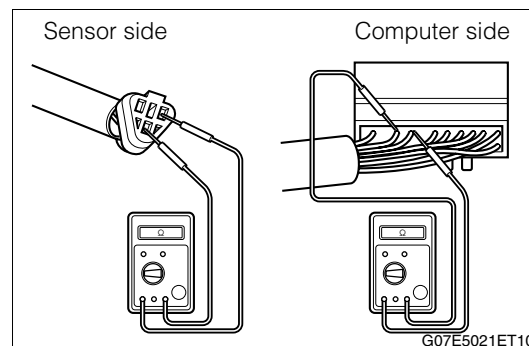
CAUTION

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

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

12-4 CIRCUIT INSPECTION OF COMPUTER UNIT

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



1.VISUAL CHECK OF CONNECTOR PORTION, CONTACT FORCE INSPECTION

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

2.COMPUTER UNIT EARTH CONNECTING INSPECTION

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

SPECIFIED VALUE: VOLTAGE OF EACH POWER SUPPLY TERMINAL

CAUTION

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

12-5 HANDLING INSTRUCTION OF SYSTEM

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

13 INSTRUCTIONS FOR RADIO INSTALLATION

CAUTION

- For those motor vehicles equipped with a mobile communication system, such as a bidirectional wireless telephone and cellular phone, be sure to observe the following precautionary measures.
1. Install the antenna as far away as possible from electronic control system.
 2. As the electromagnetic wave is radiated from antenna feeder, set the antenna feeder within the distance at least not less than 300 mm apart from computer unit and ECU harness. Do not arrange both line in parallel for long distance.
 3. Never bind the antenna feeder together with the engine harness with binding tape.
 4. Regulate the antenna and the feeder to get rid of radio interference.
 5. Never install a strong mobile communication system (exceeding 10 kW).

14 HANDLING INSTRUCTIONS ON CATALYTIC CONVERTER-EQUIPPED VEHICLES

WARNING

- When a great amount of unburnt gas is admitted into the catalytic converter, overheating is prone to occur, resulting in a fire hazard.
 - To avoid such trouble in advance, be certain to observe the following precautions. Also be sure to explain such precautions to your customers.
1. Use only unleaded gasoline to catalytic converter — equipped vehicles.
 2. Be sure to observe following points when performing the spark jump test.
 - (1) The spark jump test must be limited to cases where such test is absolutely necessary. Also, be sure to finish the test in the shortest possible time.
 - (2) Never race the engine during the test.
 - (3) Be sure to shut off the fuel supply in advance when performing the spark jump test.
 3. Do not run the engine when the fuel tank becomes nearly empty.

Failure to observe this caution will cause misfiring. Also it will apply excessive load to the catalytic converter, even leading to catalyst damage.
 4. Do not dispose the waste catalyst along with parts contaminated with gasoline or oil.

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

15-1 INSTRUCTIONS FOR SERVICE OPERATION

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

15-1-1 PRECAUTION PRIOR TO SERVICE OPERATION

1. Before servicing the airbag components or the seat belt pretensioner device, perform the following procedures.

- (1) Check the status of airbag warning lamp.
- (2) Read the diagnosis codes and put it on record
- (3) Turn OFF the ignition switch and detach the negative terminal of the battery cable.
- (4) Then, wait for at least 60 seconds to prevent the airbag from the deployment.

WARNING

- If the operation is started within 60 seconds from disconnecting the negative terminal of the battery cable, the airbag may be deployed.

NOTE

- As airbag system provide the back up capacitor (for ignition purpose), about 60 seconds is necessary as discharging time even though the battery negative terminal cable is disconnected. (natural discharge)

CAUTION

- Be careful that memory of computer of other system (such as engine control) may be erased simultaneously when the battery negative terminal cable is disconnected.

2. Ensure to use the digital circuit tester for the electric inspection of the vehicle equipped with the airbag, pretensioner, and use the circuit tester which satisfy the following standard.

WARNING

- Ensure beforehand to measure the electric current value of circuit tester to be used for an operation, and confirm if it satisfy the following specified value. When the circuit tester exceeding specified value is used, there may be possibility that malfunction or deterioration of airbag occur. In addition to above, measure the electric current of the circuit tester with minimal resistance (Ω) range.

SPECIFIED VALUE: Not more than 50 mA (0.05A)

15-1-2 PRECAUTION TO PREVENT MISS OPERATION

1. Be sure not to drop the airbag system component parts during removal and installation.
2. Be sure not to give impact or damage when removing the airbag system component parts.
3. Be sure to put the pad Ay and assistant driver's seat airbag unit with deployment surface upward during the operation though it is temporary operations. And never stack the pad Ay. (It may lead to serious accidents if metal surface is facing upward at an emergency)
4. Keep the airbag system component parts in the place where the effect of electricity noise, the high-temperature (not less than atmosphere temperature 85°C), and high humidity can be avoided.
5. Do not expose the airbag system component parts directly to high-temperature or flames.
6. Considering the case an airbag is actuated at an emergency, perform the service operation with posture as not to get your body close to deploying portion as much as possible.

15-1-3 GENERAL SERVICE INSTRUCTION

1. Follow the indication of the caution plate affixed on the airbag system related parts.
2. Be sure to mate the center when the steering roll connector is installed.
3. Be sure to perform the mating of the center for steering roll connector and marking to the separating portion when repair the related parts described below. If the relation of mutual position of parts are changed, the harness of roll connector may be snapped when the steering wheel is operated.

(1) STEERING CONCERNED

1. Steering wheel, steering column, steering gear or the like

(2) VEHICLE BODY CONCERNED

1. Instrument panel or the like
2. Body electrical malfunctioned
3. Multi-use lever switch or the like

(3) POWER TRAIN CONCERNED

1. The case when separate the connection of steering gear at the removal and installation of the engine and transmission and so on.

15-1-4 PRECAUTION PRIOR TO BODY AND PAINT OPERATION

1. Perform the operation after removing airbag system component parts when use of electric welding machine is needed.
2. Perform the operation after removing the airbag system component parts when use of impact and the high temperature is needed.
3. Do not expose the painting surface near the airbag related parts to high temperature (85°C or more) during drying it.
4. Be sure to change with new parts when an airbag related parts have the external scratch, deformation.

16 VEHICLE IDENTIFICATION

16-1 BODY COLOR CODE

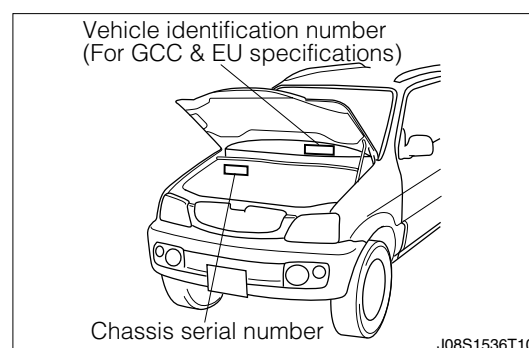
Body color name	Color code	
White	Mono-tone	W09
Silver metallic	Mono-tone	S07
Black metallic	Mono-tone	6A5
Champagne metallic	Mono-tone	586
White/ Silver metallic	Two-tone	NC1 (W09/S07)
Black metallic/ Silver metallic	Two-tone	NF2 (6A5/S07)
Red/ Silver metallic	Two-tone	NJ9 (R29/S07)
Light rose metallic/ Silver metallic	Two-tone	NK1 (T16/S07)
Jade green metallic/ Silver metallic	Two-tone	NH4 (G31/S07)
Blue mica metallic/ Silver metallic	Two-tone	NK0 (B50/S07)
White/ Resin material color	Standard*	NK4 (W09/Plain)
Silver metallic/ Resin material color	Standard*	NK2 (S07/Plain)
Black metallic/ Resin material color	Standard*	NK3 (6A5/Plain)
Light rose metallic/ Resin material color	Standard*	NK9 (T16/Plain)
Jade green metallic/ Resin material color	Standard*	NK5 (G31/Plain)
Blue mica metallic/ Resin material color	Standard*	NK8 (B50/Plain)

* : The table describes the color codes in the case of the lower body of resin material color (Plain).

Body color name	Daihatsu	AKZO	DUPONT	GLASURIT	NEXA AUTO COLOR	SPIES HECKER	STANDOX
White	W09	DAHW09	K9344	DAI-W09	XM48	16461	W09
Silver metallic	S07	DAHS07	L8842	DAI-S07	B127B	97076	S07
Black metallic	6A5	DAH6A5	G8742	DAI-6A5	A403B	96326	6A5
Champagne metallic	586	DAH586	X0618	DAI-586	3JXNB	740870	586
White/ Silver metallic	NC1 W09/S07	DAHW09/ DAHS07	K9344/ L8842	DAI-W09/ DAI-S07	XM48/ B127B	16461/ 97076	NC1 (W09/S07)
Black metallic/ Silver metallic	NF2 (6A5/S07)	DAH6A5/ DAHS07	G8742/ L8842	DAI-6A5/ DAI-S07	A403B/ B127B	96326/ 97076	NF2 (6A5/S07)
Red/ Silver metallic	NJ9 R29/S07	DAHR29/ DAHS07	F7986/ L8842	DAI-R29/ DAI-S07	MXR4/ B127B	34453/ 97076	NJ9 (R29/S07)
Light rose metallic/ Silver metallic	NK1 (T16/S07)	DAHT16/ DAHS07	M6984/ L8842	DAI-T16/ DAI-S07	WVF4B/ B127B	35562/ 97076	NK1 (T16/S07)
Jade green metallic/ Silver metallic	NH4 (G31/S07)	DAHG31/ DAHS07	F5146/ L8842	DAI-G31/ DAI-S07	NMH2B/ B127B	65649/ 97076	NH4 (G31/S07)
Blue mica metallic/ Silver metallic	NK0 (B50/S07)	DAHB50/ DAHS07	M6981/ L8842	DAI-B50/ DAI-S07	WVF5B/ B127B	69136/ 97076	NK0 (B50/S07)
White/Resin material color	NK4 (W09/Plain)	DAHW09/ DAH8004	K9344/ F2140	DAI-W09/ DAI-8004	XM48/ EJF2	16461/ 15344	W09/8004
Silver metallic/ Resin material color	NK2 (S07/Plain)	DAHS07/ DAH5101	L8842/ F2231	DAI-S07/ DAI-5101	B127B/ FPD4	97076/ 73260	S07/5101
Black metallic/ Resin material color	NK3 (6A5/Plain)	DAH6A5/ DAH202	G8742/ 47600	DAI-6A5/ DAI-202	A403B/ KE18	96326/ 72942	6A5/202
Light rose metallic/ Resin material color	NK9 (T16/Plain)	DAHT16/ DAH5T08	M6984/ P2263	DAI-T16/ DAI-5T08	WVF4B/ YXN4	35562/ 39556	T16/5T08
Jade green metallic/ Resin material color	NK5 (G31/Plain)	DAHG31/ DAH202	F5146/ 47600	DAI-G31/ DAH202	NMH2B/ KE18	65649/ 72942	G31/202
Blue mica metallic/ Resin material color	NK8 (B50/Plain)	DAHB50/ DAH202	M6981/ 47600	DAI-B50/ DAI-202	WVF5B/ KE18	69136/ 72942	B50/202

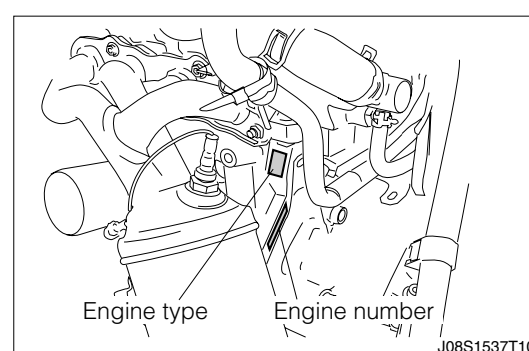
16-2 CHASSIS SERIAL NUMBER

- 1.The chassis serial number is stamped on the position as shown in the illustration.



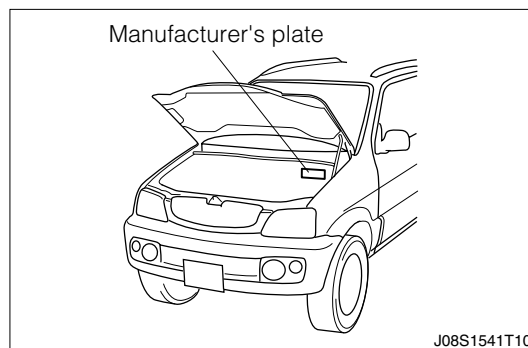
16-3 ENGINE TYPE AND ENGINE NUMBER

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



16-4 MANUFACTURER'S PLATE POSITION

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



16-4-1 CONTENTS OF MANUFACTURER'S PLATE

(1) General, Australia specifications

No.	Contents of indication
①	Manufacturer's name, Country
②	Vehicle model
③	Chassis No.
④	Engine type
⑤	Engine displacement
⑥	Body colors
⑦	Trim code
⑧	Production month—year (Only for Aus spec.)
⑨	Engine number
⑩	Manufacturer's name in Japanese

① DAIHATSU MOTOR CO.,LTD. JAPAN

② TYPE

③ CHASSIS NO

④ ENGINE

⑤ CC

⑥ COLOR

⑦ TRIM

⑧ BUILT DATE

⑨ ENGINE NO

⑩ ダイハツ工業株式会社

C13S1543T10

(2) European specifications

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

① DAIHATSU MOTOR CO.,LTD

②

③

④

⑤ Kg

⑥ 1 Kg

⑦ 2 Kg

⑧ TYPE

⑨ ENGINE

⑩ COLOR

C13S1542T10

16-4-2 CONTENTS OF CERTIFICATION REGULATION PLATE

(1) GCC specifications

No.	Contents of indication
①	Manufacturer's name, Country
②	Production month—year
③	GVM
④	GAW
⑤	GAW FR
⑥	GAW RR
⑦	Statement of conformity with Gulf Standards
⑧	Vehicle ID
⑨	Vehicle category

① اسم الصانع وبلد الصانع : شركة دايهاتسو موتور المحدودة اليابان

② سنة وشهر الإنتاج :

③ الوزن الأقصى للسيارة (kg)

④ الوزن الأقصى على كل محور (kg) امامي خلفي

⑤

⑥

⑦ تطابق هذه السيارة جميع المواصفات القياسية الخليجية

⑧ الرقم للميز :

⑨ صنف : شاحنة

V11S1544T10