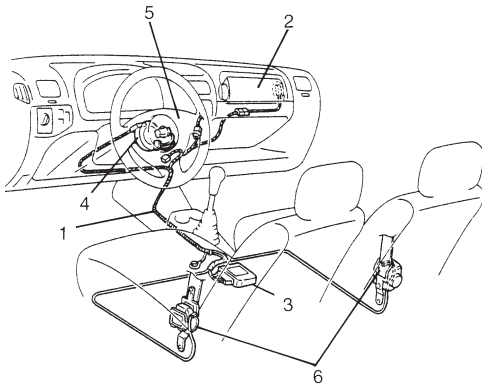


PRECAUTIONS

PRECAUTION FOR VEHICLES EQUIPPED WITH A SUPPLEMENTAL RESTRAINT SYSTEM



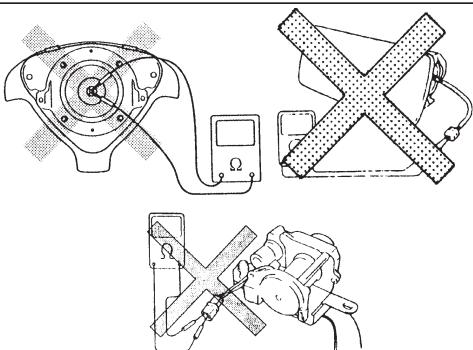
- | | |
|--|-------------------------------------|
| 1. Air bag wire harness | 4. Contact coil |
| 2. Passenger air bag (inflator) module (if equipped) | 5. Driver air bag (inflator) module |
| 3. SDM | 6. Seat belt pretensioner |

WARNING:

- The configuration of air bag system parts are as shown in the figure. When it is necessary to service (remove, reinstall and inspect) these parts, be sure to follow procedures described in SECTION 10B. Failure to follow proper procedures could result in possible air bag system activation, personal injury, damage to parts or air bag system being unable to activate when necessary.
- If the air bag system and another vehicle system both need repair, Suzuki recommends that the air bag system be repaired first, to help avoid unintended air bag system activation.
- Do not modify the steering wheel, dashboard, or any other air bag system components. Modifications can adversely affect air bag system performance and lead to injury.
- If the vehicle will be exposed to temperatures over 93°C (200°F) (for example, during a paint baking process), remove the air bag system components beforehand to avoid component damage or unintended air bag system activation.

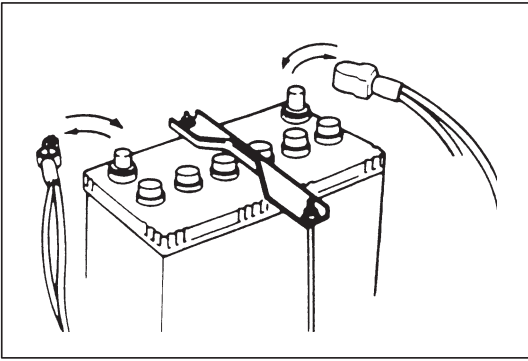
DIAGNOSIS

- When troubleshooting air bag system, be sure to follow “DIAGNOSIS” in SECTION 10B. Bypassing these procedures may result in extended diagnostic time, incorrect diagnosis, and incorrect parts replacement.
- Never use electrical test equipment other than that specified in this manual.

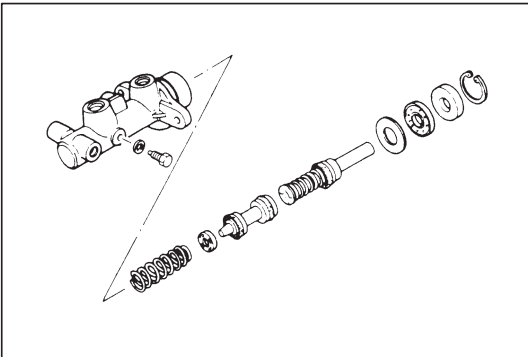


WARNING:

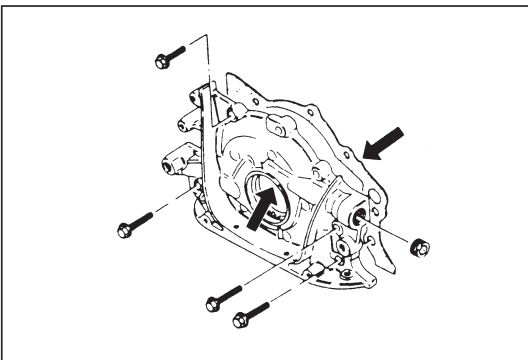
Never attempt to measure the resistance of the air bag (inflator) modules (driver and passenger) and seat belt pretensioners (driver and passenger). It is very dangerous as the electric current from the tester may deploy the air bag or activate the pretensioner.



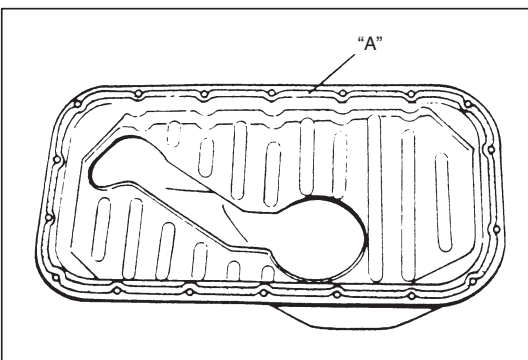
- When removing the battery, be sure to disconnect the negative cable first and then the positive cable. When reconnecting the battery, connect the positive cable first and then the negative cable, and replace the terminal cover.



- When removing parts that are to be reused, be sure to keep them arranged in an orderly manner so that they may be reinstalled in the proper order and position.

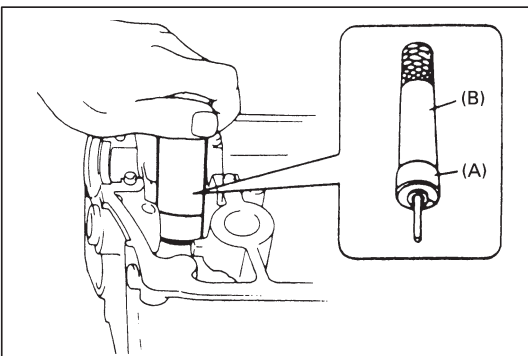


- Whenever you use oil seals, gaskets, packing, O-rings, locking washers, split pins, self-locking nuts, and certain other parts as specified, be sure to use new ones. Also, before installing new gaskets, packing, etc., be sure to remove any residual material from the mating surfaces.



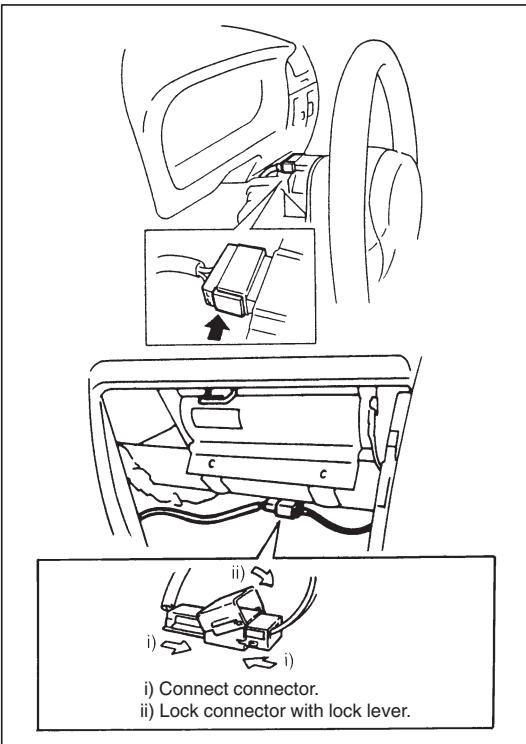
- Make sure that all parts used in reassembly are perfectly clean.
- When use of a certain type of lubricant, bond or sealant is specified, be sure to use the specified type.

“A”: Sealant 99000-31150



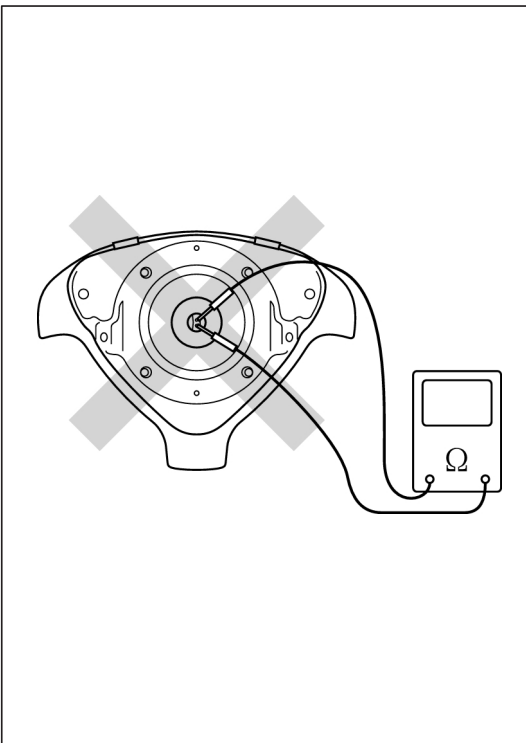
- Be sure to use special tools when instructed.

Special Tool
 (A): 09917-98221
 (B): 09916-58210



ENABLING AIR BAG SYSTEM

- 1) Turn ignition switch to "LOCK" and remove key.
- 2) Connect connector to contact coil assembly, and install steering column upper cover and lower cover.
- 3) Connect Yellow connector of passenger air bag (inflator) module if equipped, and be sure to lock connector with lock lever and close glove box panel.
- 4) Install "AIR BAG" fuse to the circuit fuse box.
- 5) Turn ignition switch to "ON" and verify that "AIR BAG" warning lamp flashes 6 times and then turns OFF.
If it does not operate as described, perform "Air Bag Diagnostic System Check" in SECTION 10B.



HANDLING PRECAUTION

LIVE (UNDEPLOYED) DRIVER AIR BAG (INFLATOR) MODULE

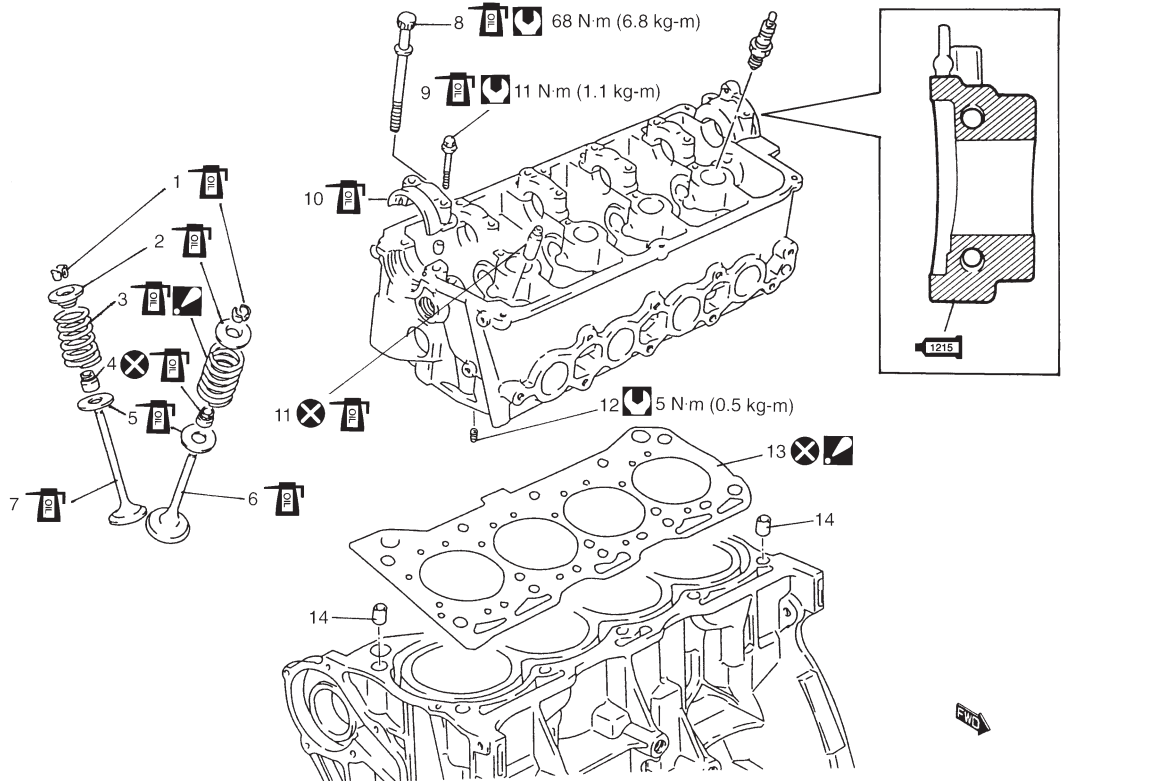
WARNING:

Never attempt to measure the resistance of the air bag (inflator) module. It is very dangerous as the electric current from the tester may deploy the air bag.

Special care is necessary when handling and storing a live (undepleted) air bag (inflator) module. The rapid gas generation produced during deployment of the air bag could cause the air bag (inflator) module, or an object in front of the air bag (inflator) module, to be thrown through the air in the unlikely event of an accidental deployment.

- Never attempt disassembly of the air bag (inflator) module.
- If any abnormality is found, be sure to replace it with new one as an assembly.
- When grease, cleaning agent, oil, water, etc., got on the air bag (inflator) module, wipe it off immediately with a dry cloth.

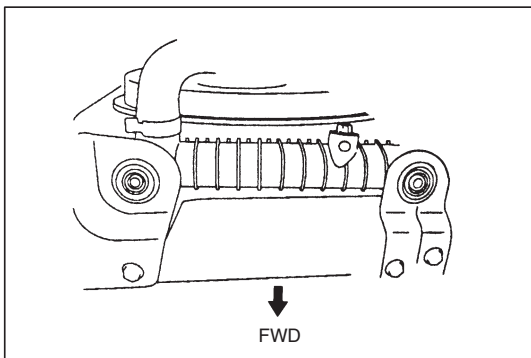
VALVES AND CYLINDER HEAD



- 1. Valve cotters:
Apply engine oil.
- 2. Valve spring retainer:
Apply engine oil.
- 3. Valve spring:
Apply engine oil.
Be sure to position spring in place with its bottom end (small-pitch end) facing the bottom (valve spring seat side).
- 4. Valve stem seal:
Apply engine oil.

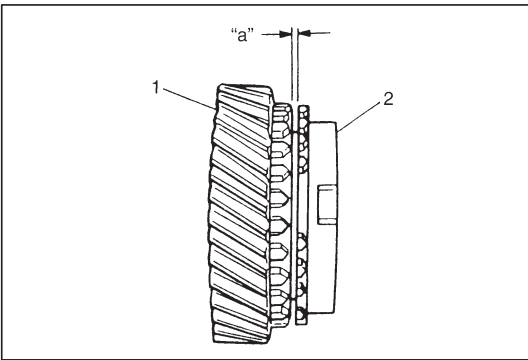
- 5. Valve spring seat:
Apply engine oil.
- 6. Exhaust valve:
Apply engine oil to valve stem.
- 7. Intake valve:
Apply engine oil to valve stem.
- 8. Cylinder head bolt:
Apply engine oil.
- 9. Camshaft housing bolt:
Apply engine oil.

- 10. Camshaft housing:
Apply engine oil to sliding surface of each housing against camshaft journal.
 Apply sealant to mating surface of No.6 housing.
- 11. Valve guide:
Apply engine oil to valve guide bore.
- 12. Oil venturi plug
- 13. Cylinder head gasket:
"TOP" mark provided on gasket comes to crankshaft pulley side, facing up (toward cylinder head side).
- 14. Dowel pin



REMOVAL

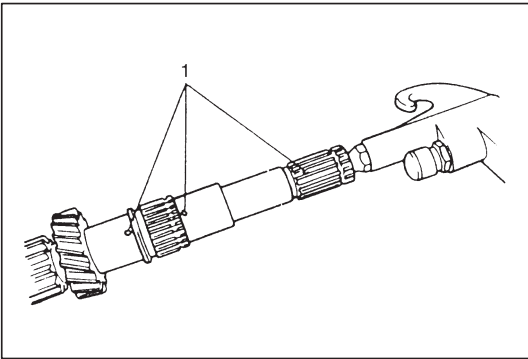
- 1) Relieve fuel pressure according to procedure described in Section 6.
- 2) Disconnect negative cable at battery.
- 3) Drain cooling system.
- 4) Remove air cleaner outlet hose No.1 and No.2 with intake joint and suction pipe as previously outlined.



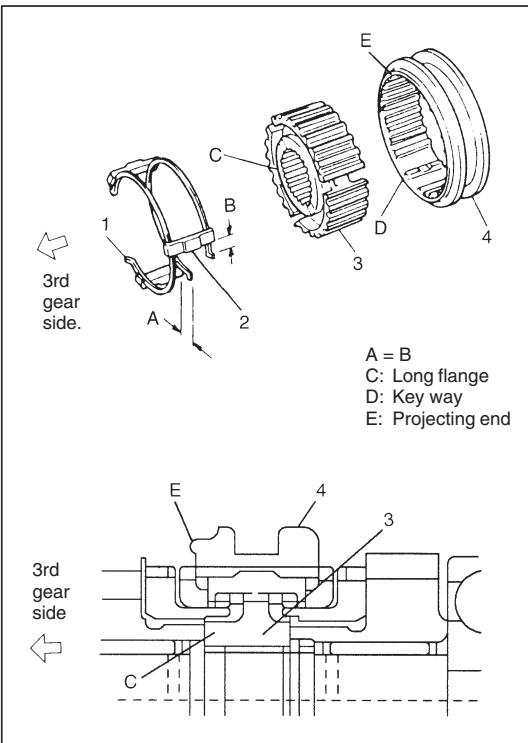
INSPECTION AND REASSEMBLY

- 1) Clean all components thoroughly, inspect them for any abnormality and replace with new ones as necessary.
- 2) If synchronizer parts need to be repaired, check clearance "a" between ring (2) and gear (1), each chamfered tooth of gear, ring and sleeve, then determine parts replacement.

**Clearance "a": Standard 1.0 – 1.4 mm (0.039 – 0.055 in.)
Service limit 0.5 mm (0.019 in.)**



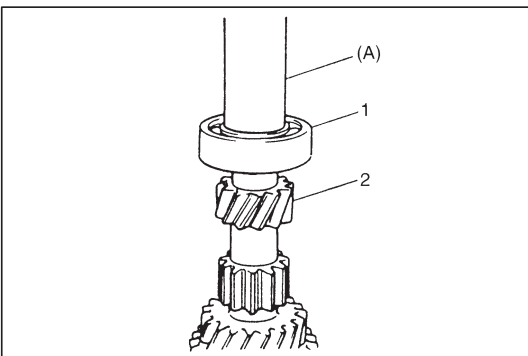
- 3) To ensure lubrication, air blow oil holes (1) and make sure that they are free from any obstruction.



- 4) Fit high speed synchronizer sleeve (4) to hub (3), insert 3 keys (2) in it and then set springs (1) as shown in figure.

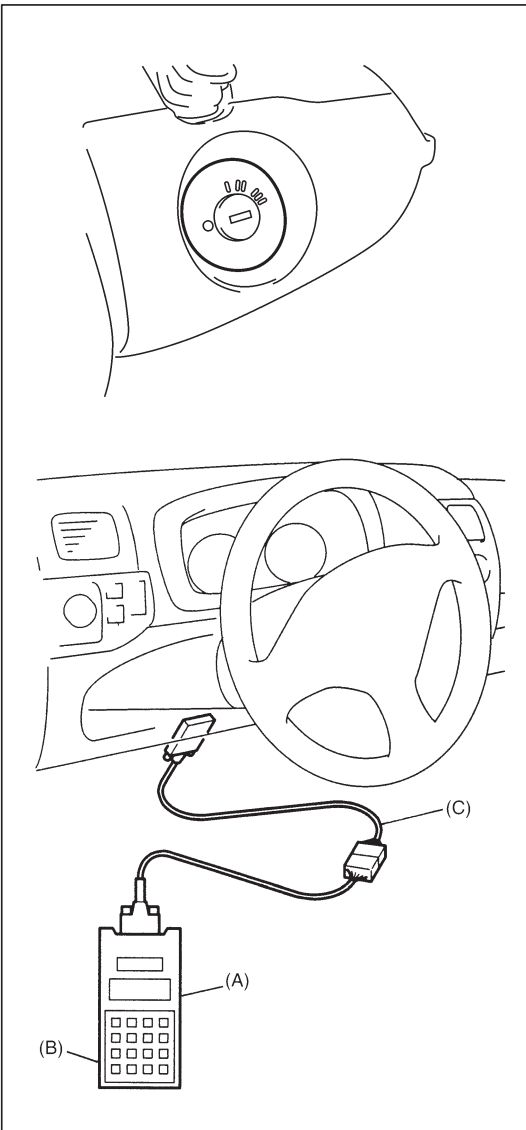
NOTE:

- No specific direction is assigned to each key but it is assigned as sleeve & hub assembly.
- Size of high speed synchronizer sleeve, hub, keys and springs is between those of low speed and 5th speed ones.



- 5) Drive in right bearing (1) to input shaft (2) by using special tool and hammer.

**Special Tool
(A): 09913-80112**



DIAGNOSTIC TROUBLE CODE (DTC) CHECK IMMOBILIZER CONTROL MODULE

- 1) Prepare SUZUKI scan tool.
- 2) With ignition switch OFF to position (), connect it to data link connector (DLC) located under instrument panel at driver's seat side.

Special Tool:

(A): SUZUKI scan tool

(B): Mass storage cartridge

(C): 16/14 pin OBD-II adapter cable

(D): 14/26 pin DLC cable (Use this cable if 14/26 pin DLC cable is not available)

- 3) Turn ignition switch to ON position (II).
Read DTC according to instructions displayed on scan tool and print it or write it down.
Refer to scan tool operator's manual for further details.
If communication between scan tool and immobilizer control module is not possible, check if scan tool is communicable by connecting it to immobilizer control system in another vehicle. If communication is possible in this case, scan tool is in good condition. Then check data link connector and serial data line (circuit) in the vehicle with which communication was not possible.

NOTE:

DTC No. B3040, B3042 and B3043 can not be confirmed by scan tool unless W-line circuit is repaired.

- 4) After completing the check, turn ignition switch to OFF position and disconnect scan tool from data link connector.

ECM

Refer to DTC CHECK in SECTION 6.

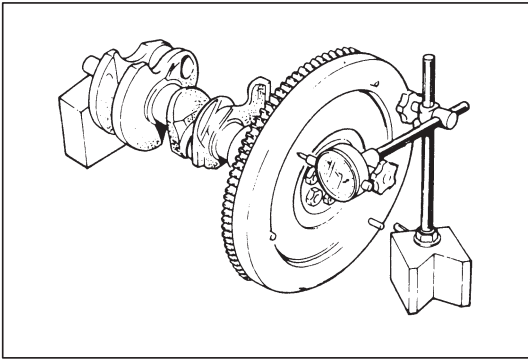
DIAGNOSTIC TROUBLE CODE (DTC) CLEARANCE

IMMOBILIZER CONTROL MODULE

- 1) Connect SUZUKI scan tool to data link connector in the same manner as when making this connection for DTC check.
- 2) Turn ignition switch to ON position.
- 3) Erase DTC according to instructions displayed on scan tool. Refer to scan tool operator's manual for further details.
- 4) After completing the clearance, turn ignition switch to OFF position and disconnect scan tool from data link connector.

ECM

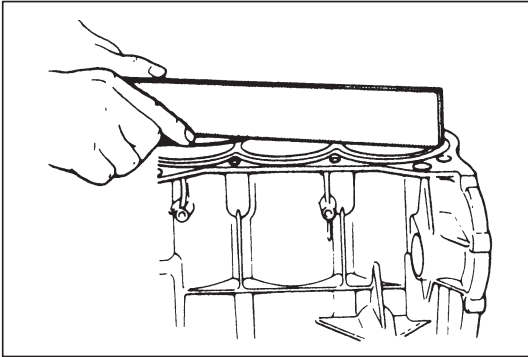
Refer to DTC CLEARANCE in SECTION 6.



Flywheel

- If ring gear is damaged, cracked or worn, replace flywheel.
- If the surface contacting clutch disc is damaged, or excessively worn, replace flywheel.
- Check flywheel for face runout with dial gauge. If runout exceeds its limit, replace flywheel.

Limit on runout: 0.2 mm (0.0078 in.)



Cylinder Block

Distortion of gasketed surface

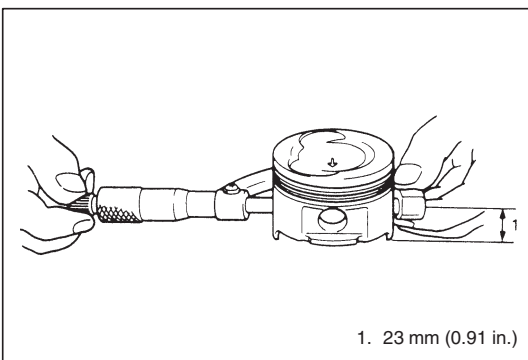
Using straightedge and thickness gauge, check gasketed surface for distortion and, if flatness exceeds its limit, correct it.

Item	Standard	Limit
Flatness	0.03 mm (0.0012 in.)	0.06 mm (0.0024 in.)

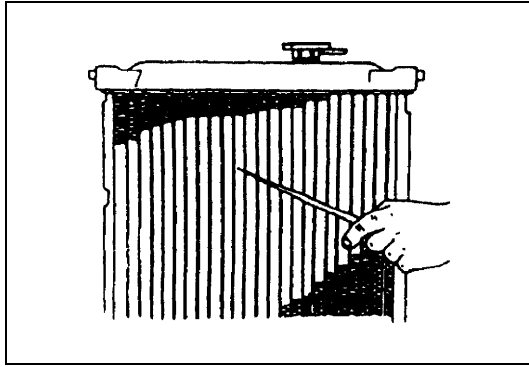
Honing or reboring cylinders

- 1) When any cylinder needs reboring, all other cylinders must also be rebored at the same time.
- 2) Select oversized piston according to amount of cylinder wear.

Size	Piston diameter
O/S 0.25	74.220 – 74.230 mm (2.9220 – 2.9224 in.)
O/S 0.50	74.470 – 74.480 mm (2.9319 – 2.9323 in.)



- 3) Using micrometer, measure piston diameter.



Radiator Inspection

Check radiator for leakage or damage. Straighten bent fins, if any.

Radiator Cleaning

Clean frontal area of radiator cores.

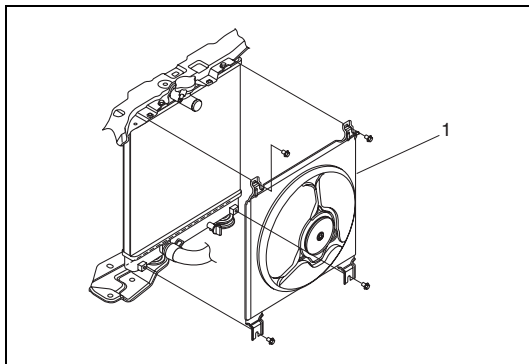
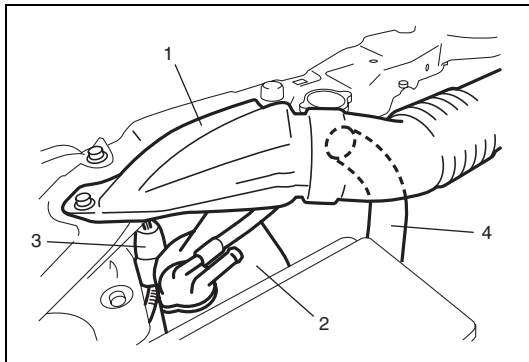
Radiator Cooling Fan Relay Inspection

Refer to “Main Relay, Fuel Pump Relay and Radiator Fan Relay” in Section 6E2.

Radiator Cooling Fan Removal and Installation

Removal

- 1) Disconnect negative cable at battery.
- 2) Drain coolant referring to “Cooling System Draining” in this section.
- 3) Remove air cleaner suction pipe (1) and reservoir (2).
- 4) Disconnect cooling fan motor connector (3).
- 5) Remove radiator inlet hose (4) from radiator.



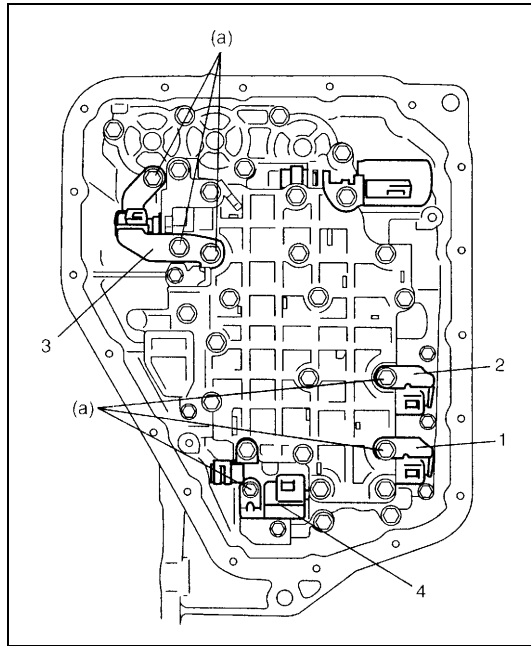
- 6) Remove radiator cooling fan motor (1) from radiator.

Installation

Reverse removal procedure for installation noting the following.

- Refill cooling system referring to step 7) to 18) of “Cooling System Flush and Refill” in this section.
- After installation, verify there is no coolant leakage at each connection.

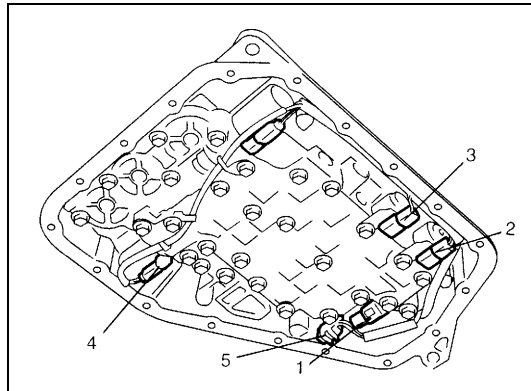
Installation



- 1) Install shift solenoid valve-A (No.1) (1), shift solenoid valve-B (No.2) (2), TCC solenoid valve (3) and timing solenoid valve (4).

Tightening torque

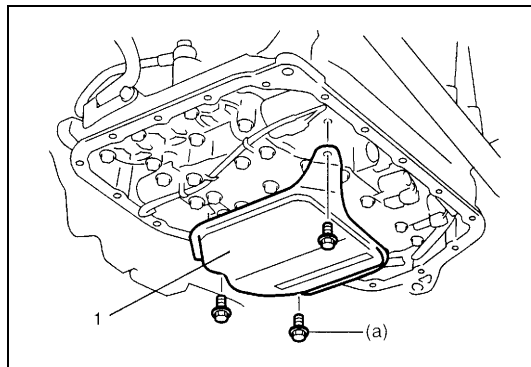
Solenoid valve bolt (a): 11 N·m (1.1 kg-m, 8.0 lb-ft)



- 2) Connect solenoid connectors identifying their installing positions by wire color.

Solenoid coupler	Wire color
Shift solenoid valve-A (No.1) (2)	White
Shift solenoid valve-B (No.2) (3)	Black
Timing solenoid valve (1)	Yellow
TCC solenoid valve (4)	Light Green

- 3) Install transmission fluid temperature sensor (5) to sensor clamp.

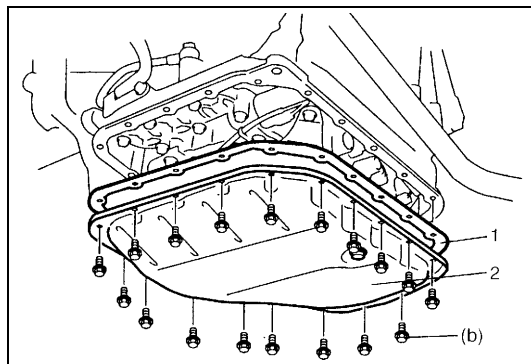


- 4) Install oil strainer assembly (1).

Tightening torque

Oil strainer bolt

(a): 10 N·m (1.0 kg-m, 7.5 lb-ft)



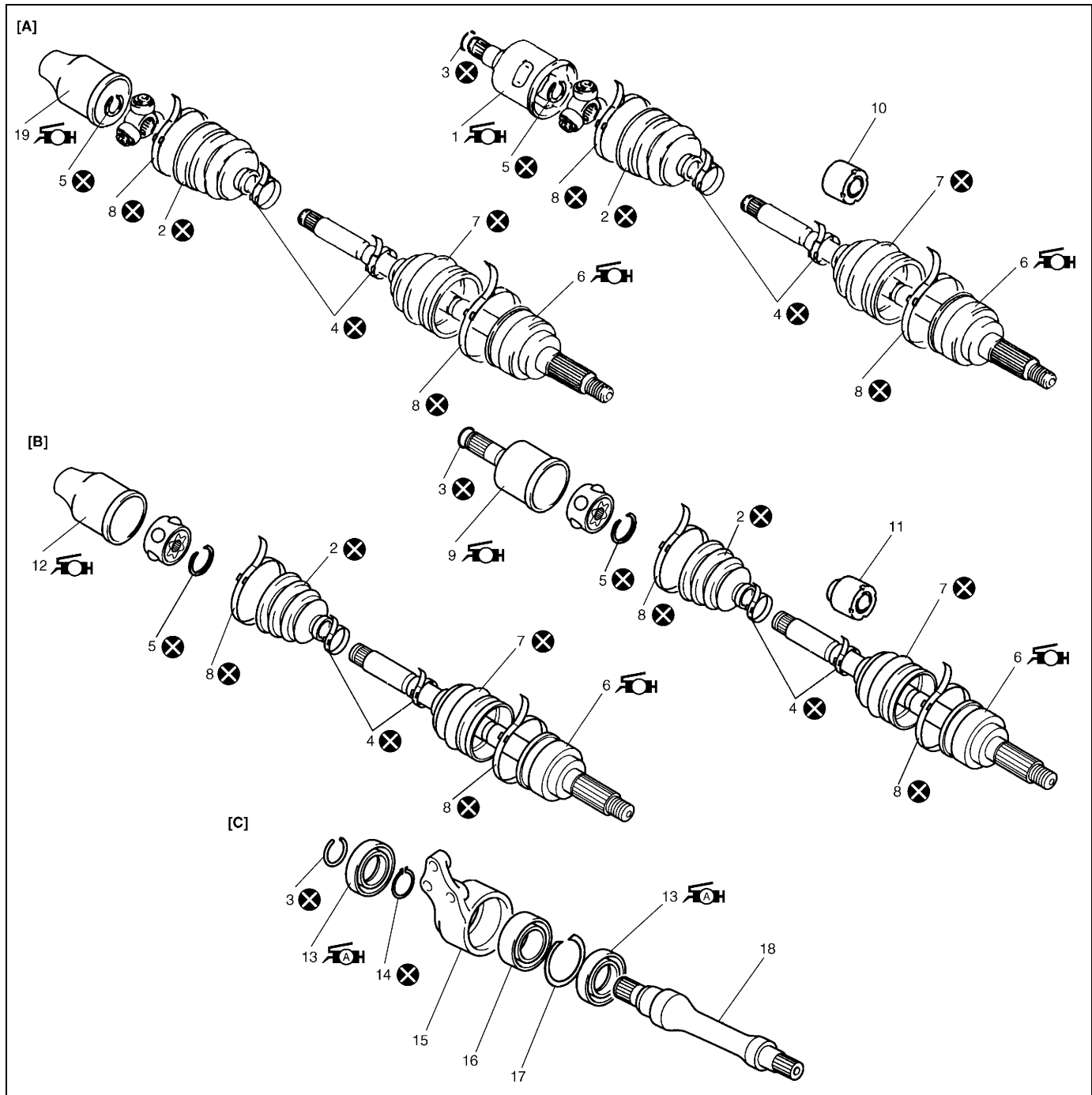
- 5) Install new oil pan gasket (1) and oil pan (2).

Tightening torque

Oil pan bolt

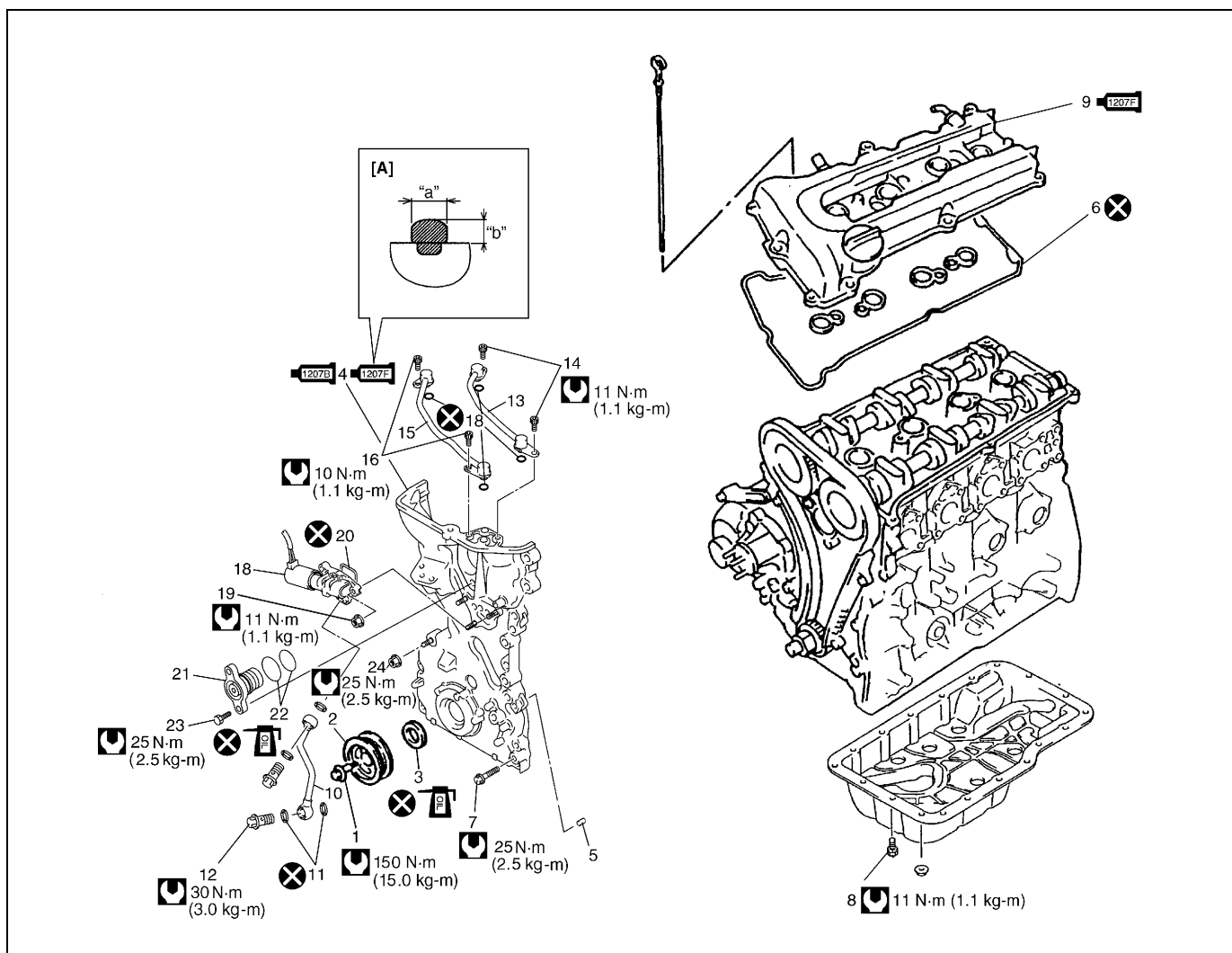
(b): 7.0 N·m (0.7 kg-m, 5.0 lb-ft)

Front Drive Shaft Components



[A]: Tripod joint type	6. Wheel side joint (Constant velocity ball joint) : Apply Black grease included in spare part to joint.	14. Circlip
[B]: DOJ type	7. Boot (Wheel side)	15. Center bearing support
[C]: Center shaft for 2WD model with M13 engine	8. Boot band (Large)	16. Center bearing
1. Differential side joint (Right side of 4WD model with M13 engine) : Apply Black grease included in spare part to joint.	9. Differential side joint (LH of all models) : Apply Black grease included in spare part to joint.	17. Circlip
2. Boot (Differential, transfer or center shaft side)	10. Damper (Right side of G10 engine)	18. Center shaft
3. Circlip	11. Damper (Other than right side of G10 engine)	19. Center shaft side joint (Right side of 2WD model with M13 engine) : Apply Dark brown grease included in spare part to joint.
4. Boot band (Small)	12. Center shaft side joint (Right side of 2WD model with M13 engine)	Tightening torque
5. Snap ring	13. Oil seal : Apply grease 99000-25010 to oil seal lip.	Do not reuse.

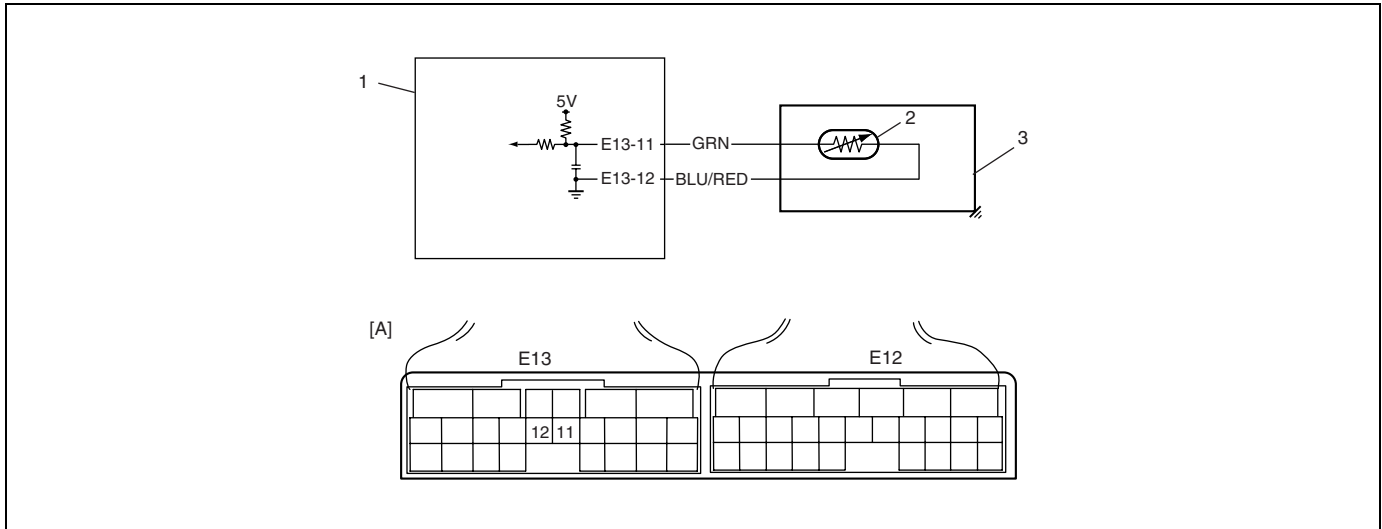
Timing Chain Cover Components



[A]: Sealant application amount	8. Oil pan mounting bolt and nut	18. Oil control valve
"a": 3 mm (0.12 in.)	9. Cylinder head cover : Apply sealant 99000-31250 to the sealing point for timing chain cover mating surface and cylinder head gasket sealing point referring to "Installation" under "Cylinder Head Cover Removal and Installation" in this section.	19. Oil control valve mounting nut
"b": 2 mm (0.08 in.)	10. Oil gallery pipe No.1	20. O-ring
1. Crankshaft pulley bolt	11. Copper washer	21. Water outlet cap
2. Crankshaft pulley	12. Oil gallery pipe No.1 bolt	22. O-ring
3. Oil seal : Apply engine oil to oil seal lip.	13. Oil gallery pipe No.2	23. Water outlet cap bolt
4. Timing chain cover : Apply sealant 99000-31140 to the mating surface of cylinder and cylinder head. : Apply sealant 99000-31250 to the mating surface of timing chain cover referring to the figure of Step 1) of "Installation" under "Timing Chain Cover Removal and Installation" in this section.	14. Oil gallery pipe No.2 bolt	24. Timing chain cover mounting nut
5. Pin	15. Oil gallery pipe No.3	Tightening torque
6. Cylinder head cover gasket	16. Oil gallery pipe No.3 bolt	Do not reuse.
7. Timing chain cover mounting bolts	17. O ring	

DTC P0712 Transmission Fluid Temperature Sensor Circuit Low

Wiring Diagram



1. TCM	3. A/T
2. Transmission fluid temperature sensor	[A]: Terminal arrangement of TCM connector (viewed from harness side)

DTC Detecting Condition and Trouble Area

DTC DETECTING CONDITION	TROUBLE AREA
Transmission temperature sensor terminal voltage is less than 0.05 V for 5 minutes or more after turning ignition switch ON.	<ul style="list-style-type: none"> Transmission fluid temperature sensor or its circuit malfunction. TCM

DTC Confirmation Procedure

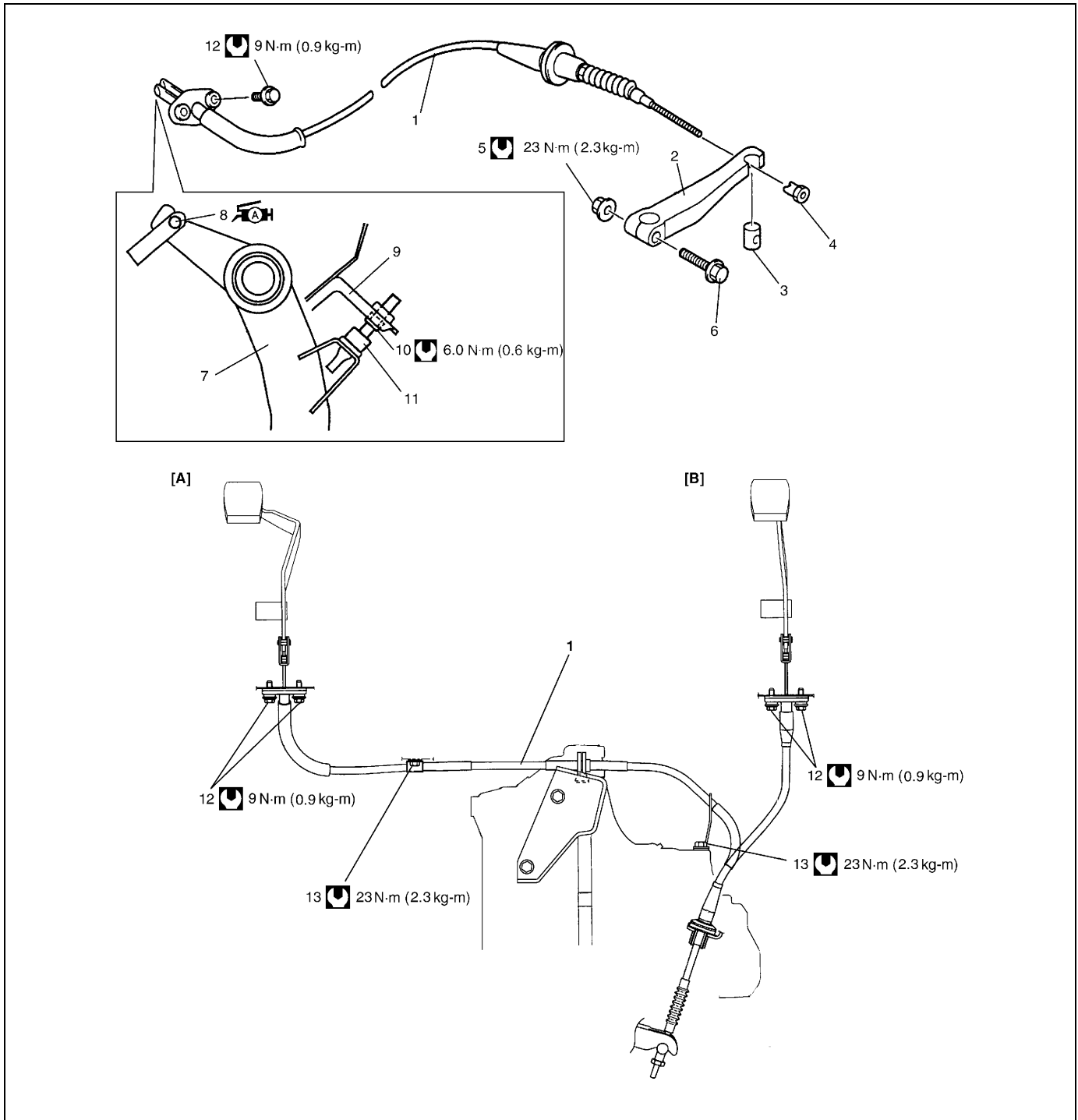
WARNING:




- When performing a road test, select a place where there is no traffic or possibility of a traffic accident and be very careful during testing to avoid occurrence of an accident.
- Road test should be carried out with 2 persons, a driver and tester, on a level road.

- Connect scan tool to DLC with ignition switch OFF if available.
- Clear DTC in TCM memory and start engine.
- Keep engine running at idle speed for 10 minutes or more.
- Stop vehicle and check DTC.

On-Vehicle Service

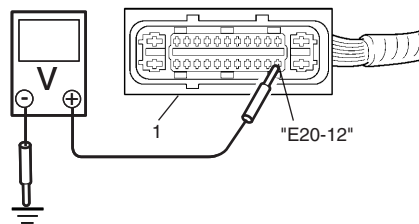
Clutch Cable



[A]: For RH vehicle	5. Clutch release lever nut	11. Adjust bolt
[B]: For LH vehicle	6. Clutch release lever bolt	12. Clutch cable outer bolt
1. Clutch cable	7. Clutch pedal	13. Clamp bolt
2. Clutch release lever	 8. Clutch cable hook : Apply grease 99000-25010 to cable hook.	 Tightening torque
 3. Clutch cable joint pin : Apply grease 99000-25010 to joint pin.	9. Pedal bracket	
4. Clutch cable joint nut	10. Lock nut	

Result	Cause Of Fault
E09	<ul style="list-style-type: none"> • Short circuit to voltage between: Fuel pump relay - Socket terminal E52-3 & Fuel pump assembly - Wiring harness connector (wiring harness side) terminal R02-3 & Fuel injector No.1 - Wiring harness connector (wiring harness side) terminal C09-1 & Fuel injector No.2 - Wiring harness connector (wiring harness side) terminal C10-1 & Fuel injector No.3 - Wiring harness connector (wiring harness side) terminal C11-1 & Fuel injector No.4 - Wiring harness connector (wiring harness side) terminal C12-1 <p>or</p> <ul style="list-style-type: none"> • Defective component: Fuel pump assembly
E10	<ul style="list-style-type: none"> • Short circuit to voltage between: Fuel pump relay - Socket terminal E52-1 & ECM - Wiring harness connector (wiring harness side) terminal G21-62
E11	<ul style="list-style-type: none"> • Circuit interruption between: Fuel pump relay - Socket terminal E52-2 & Main Relay - Socket terminal E56-3
E12	<ul style="list-style-type: none"> • Circuit interruption between: Circuit Fuse - Output contact & Fuel pump relay - Socket terminal E52-4
E13	<ul style="list-style-type: none"> • Short circuit to voltage between: Fuel injector No.4 Wiring harness connector (wiring harness side) terminal C12-1 & ECM - Wiring harness connector (wiring harness side) terminal C36-19 (Z12XEP) <p>or</p> <ul style="list-style-type: none"> • Defective component: ECM <p>NOTE: If ECM is replaced, register password (PWD) and secret key code (SKC) to ECM referring to “Procedure after ECM Replacement” in Section 8G3.</p>

Step	Action	Yes	No
6	Check for vehicle speed signal circuit. 1) Turn ignition switch to OFF position. 2) Connect ECM connector "G88". 3) Disconnect multi information display connector "G97". 4) Turn ignition switch to ON position and measure voltage between "G88-89" and vehicle body ground. Is it voltage 10 – 14 V?	Go to step 7.	Check open or shorted to ground in "PPL" wire. If circuit is OK, substitute a known-good ECM and recheck.
7	Is vehicle equipped with EPS?	Go to step 7.	Substitute a known-good ABS hydraulic unit/control module and recheck.
8	Check for vehicle speed signal circuit. 1) Turn ignition switch to OFF position. 2) Disconnect ECM connector "G88". 3) Connect P/S control module connector "G14". 4) Turn ignition switch to ON position, and measure voltage between "E20-12" and vehicle body ground. Is it voltage 4 – 6 V?	Substitute a known-good ABS hydraulic unit/control module.	Check open or shorted to ground in "PPL" wire. If circuit is OK, substitute a known-good P/S control module and recheck.



1. ABS hydraulic unit/control module connector "E20"