

FOREWORD

This SUPPLEMENTARY SERVICE MANUAL is a supplement to SY413/SY416/SY418 SERVICE MANUALS.

Applicable model: SY419

Therefore, whenever servicing SY419, refer to this supplement first, and for any section, item or description not found in this supplement, refer to RELATED MANUALS mentioned below.

When replacing parts or servicing by disassembling, it is recommended to use SUZUKI genuine parts, tools and service materials (lubricants, sealants, etc.) as specified in each description.

All information, illustrations and specifications contained in this literature are based on the latest product information available at the time of publication approval. And used as the main subject of description is the vehicle of standard specifications among others. Therefore, note that illustrations may differ from the vehicle being actually serviced. The right is reserved to make changes at any time without notice.

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RELATED MANUALS

Manual Name	Manual No.
SY413/SY416 Service Manual	99500-60G00
SY418 Supplementary Service Manual	99501-62G00
SY416/SY418 Supplementary Service Manual (For Wagon)	99501-60G30
SY413/SY416/SY418 Supplementary Service Manual	99501-60G41
SY413/SY416/SY418 Wiring Diagram Manual	99512-60G40-015
All Models Diesel Diagnosis Manual	99501-66G10-01E (9608E 16/06/1997)
Overhaul Checking Tuning Manual	99501-66G20-01E (967-GB-04/97)

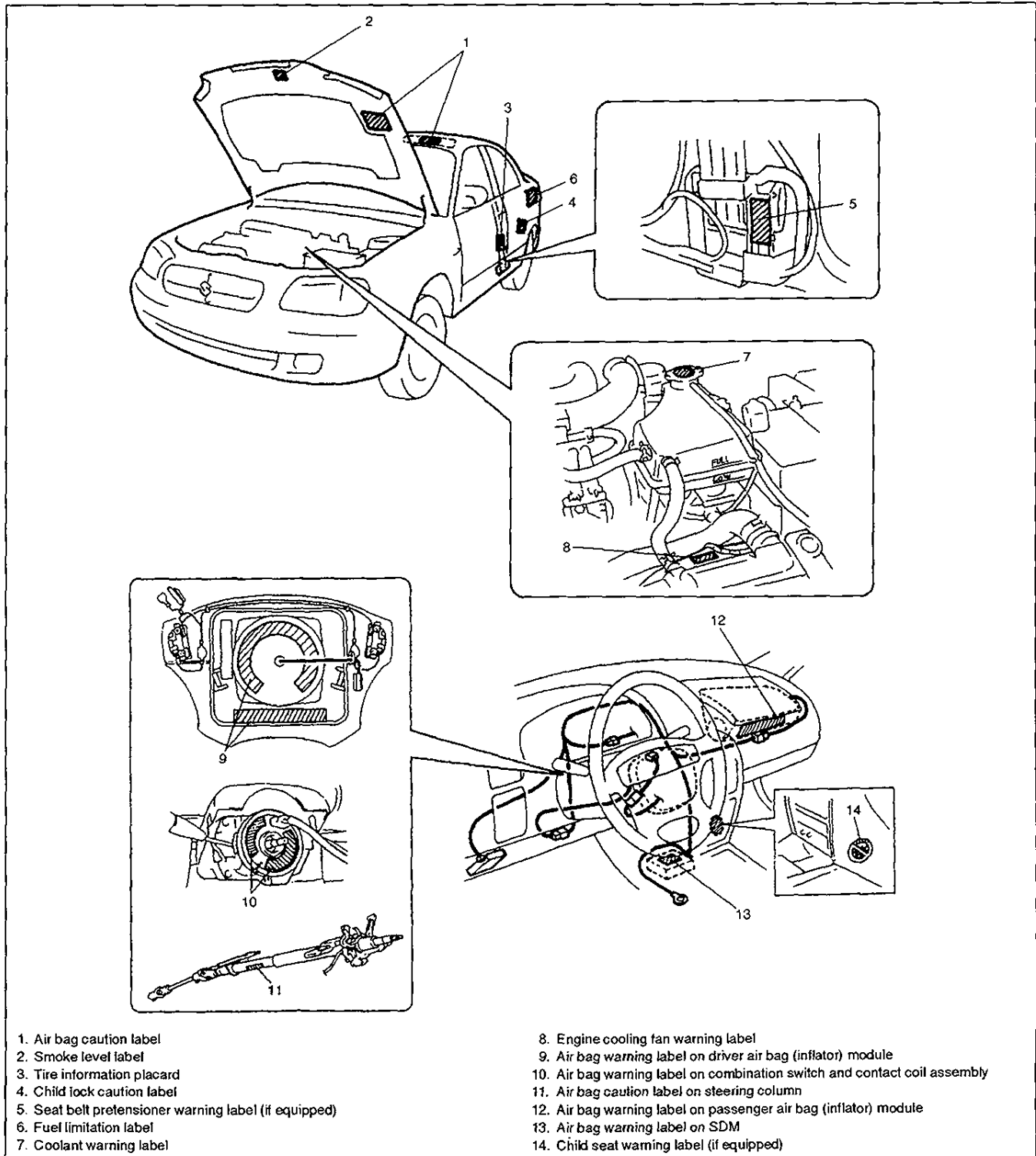
WARNING, CAUTION AND INFORMATION LABELS

The figure below shows main labels among others that are attached to vehicle component parts. When servicing and handling parts, refer to WARNING/CAUTION instructions printed on labels.

If any WARNING/CAUTION label is found stained or damaged, clean or replace it as necessary.

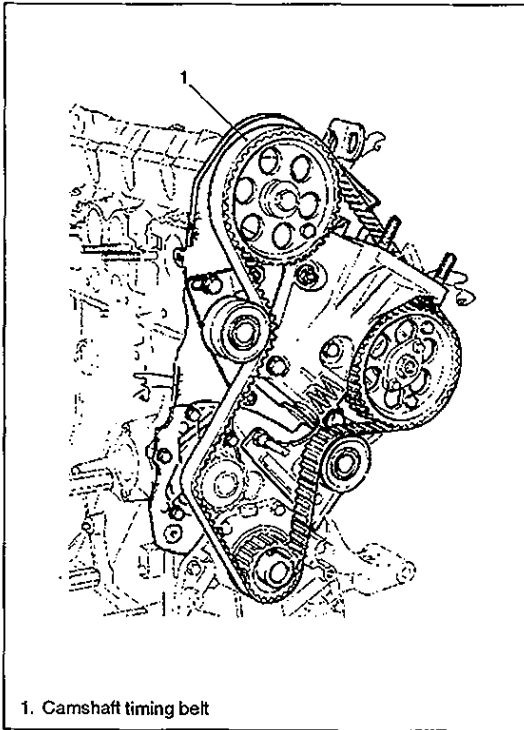
NOTE:

Air bag CAUTION/WARNING labels are attached on the vehicle equipped with air bag system only.



Replacement

Replace drive belt with new one. Refer to "Accessory Drive Belt" in SECTION 6H for replacement procedure.



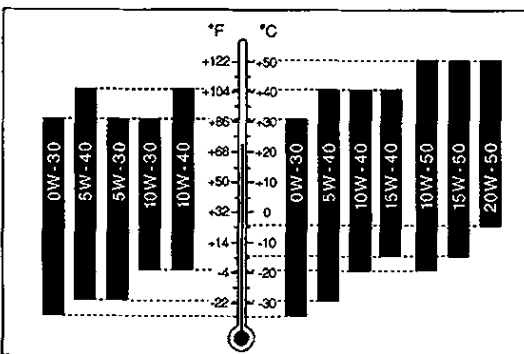
ITEM 1-2

Camshaft Timing Belt Replacement

Replace belt with new one. Refer to "Timing Belt" in SECTION 6A for replacement procedure.

CAUTION:

- Do not bend or twist timing belt.
- Do not allow timing belt to come into contact with oil, water, etc.

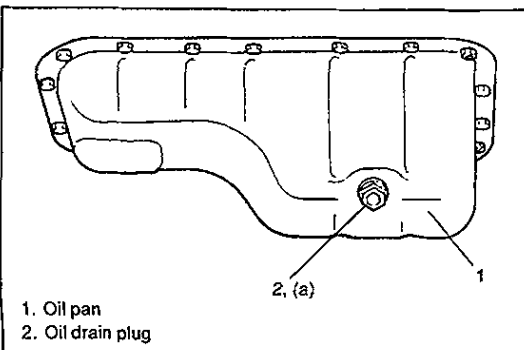


ITEM 1-3

Engine Oil and Oil Filter Change

It is recommended to use engine oil of ACEA B2-96, CCMC PD-2 or API CF (except CF-2) or higher quality level oils.

Select the appropriate oil viscosity according to the left chart. Always change oil and oil filter as soon as possible after driving in a dust storm.



Before draining engine oil, check engine for oil leakage. If any evidence of leakage is found, make sure to correct defective part before performing the following work.

- 1) Drain engine oil by removing drain plug.
- 2) After draining oil, wipe drain plug clean. Reinstall drain plug, and tighten it securely as specified below.

Tightening Torque

(a): 30 N·m (3.0 kg·m, 21.5 lb·ft)

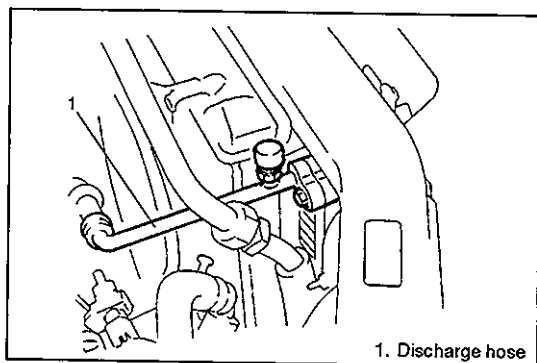
ON-VEHICLE SERVICE

REFRIGERATING SYSTEM

CONDENSER

REMOVAL

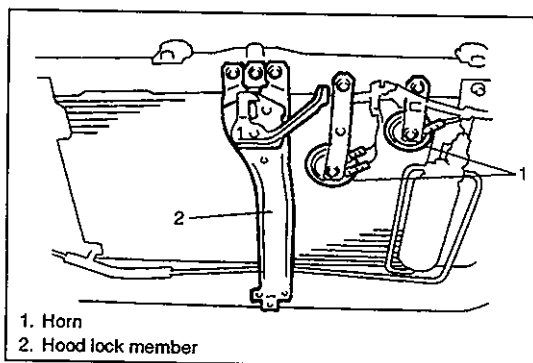
- 1) Disconnect negative (-) cable at battery.
- 2) Recover refrigerant by using recovery and recycling equipment. Be sure to follow the instruction manual for the equipment.
The amount of compressor oil removed must be measured and the same amount added to the system.
- 3) Remove front bumper. Referring to the "BODY SERVICE" section of the Service Manual as mentioned in FOREWORD of this manual.



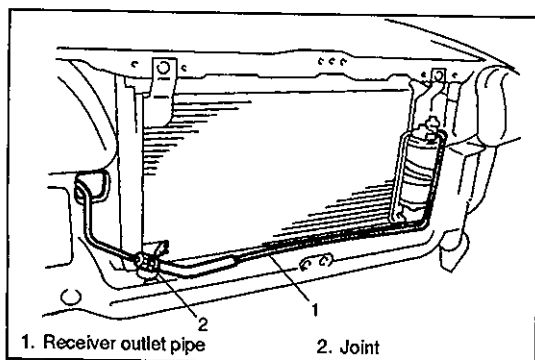
- 4) Disconnect compressor discharge hose from condenser inlet fittings.

NOTE:

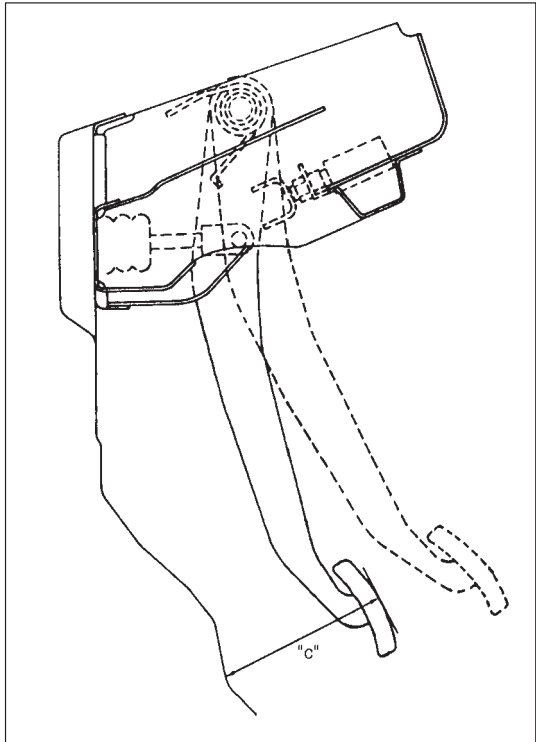
As soon as above hose and pipe are disconnected, cap opened fittings so that moisture and dust do not enter into condenser.



- 5) Remove horn.
- 6) Remove hood latch and hood lock member.



- 7) Disconnect coupler from dual pressure switch.
- 8) Remove receiver outlet pipe.



ON-VEHICLE SERVICE

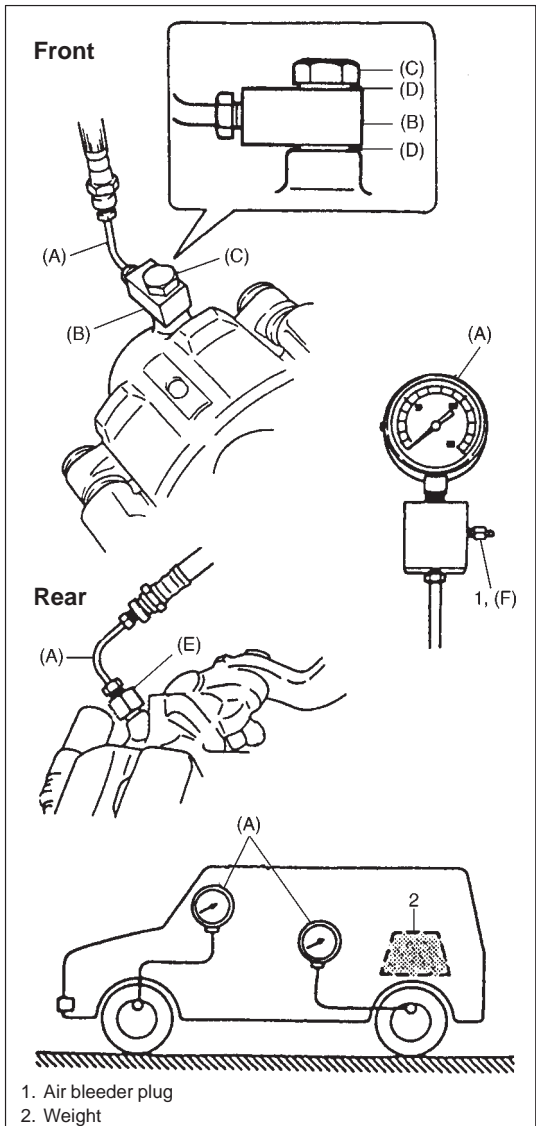
EXCESSIVE PEDAL TRAVEL CHECK

- 1) Start engine.
- 2) Depress brake pedal a few times.
- 3) With brake pedal depressed with approximately 30 kg (66 lbs) load, measure brake pedal to wall clearance "c".

Clearance "c": Over 70 mm (in.)

- 4) If clearance "c" is less than specification, the most possible cause is either rear brake shoes are worn out beyond limit or air is in lines.

Should clearance "c" remain less than specification even after replacement of brake shoes and bleeding of system, other possible but infrequent cause is malfunction of rear brake shoe adjusters or booster push rod length out of adjustment.



FLUID PRESSURE TEST

Test procedure for LSPV assembly is as follows.

Before testing, confirm the following.

- Fuel tank is filled with fuel fully.
 - Vehicle is equipped with spare tire, tools, jack and jack handle.
- 1) Place vehicle on level floor and set 200 kg (442 lbs) weight slowly on axle housing center.
 - 2) Install special tool to front and rear brake.

NOTE:

Pressure gauge should be connected to breather of front (left side brake) and rear (right side brake).

After testing front left side and rear right side, test front right side and rear left side in the same way.

Special Tool

Front brake

- (A): 09956-02310
- (B): 09952-36320
- (C): 09360-10026 (Union bolt as spare part)
- (D): 09161-10009 (Washer as spare part)

Rear brake

- (A): 09956-02310
- (E): 09952-36310
- (F): 55473-82030 (Air bleeder plug as a spare part)

NOTE:

Special tool (B) or (E) is used instead of thread diameter 10 mm attachment of special tool (A).

So remove the attachment from (A) and install (B) or (E) as shown in figure.

INJECTOR SHIELD

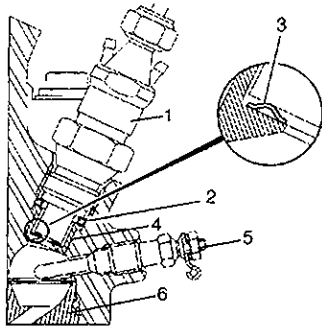
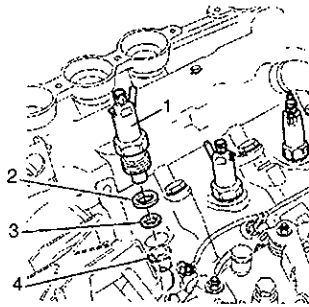
REMOVAL

- 1) Remove injector shield with finger.

NOTE:

If injector shield can not be removed, tap injector shield out using suitable brass drift from swirl chamber side.

- i) Remove fuel injectors and glow plugs.
- ii) Remove cylinder head.
- iii) Remove swirl chamber.
- iv) Use a suitable brass drift, tap injector shield out.



1. Fuel injector
2. Copper washer
3. Flame ring
4. Injector shield
5. Glow plug
6. Swirl chamber

INSTALLATION

- 1) Position old copper washer on its outer diameter and tap it into cylinder head using a suitable drift against copper washer.
- 2) Final positioning of injector shield can be left until it is pushed into place when fitting injector.

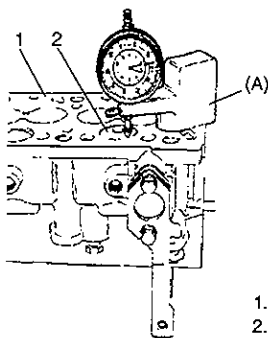
SWIRL CHAMBER

INSPECTION

- 1) Check protrusion of swirl chamber. Refer to "Reconditioning the cylinder head" and "Swirl chambers" in "Overhaul checking tuning manual".

Special tool:

(A): 09910-26510/OUT 0000005



1. Cylinder head
2. Swirl chamber

REMOVAL

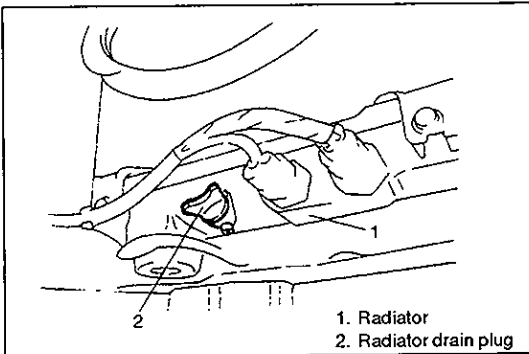
- 1) Remove injectors and glow plugs.
- 2) Remove cylinder head.
- 3) Identify each swirl chamber with its original location.
- 4) Use a suitable brass drift, tap the swirl chamber out.



ON-VEHICLE SERVICE

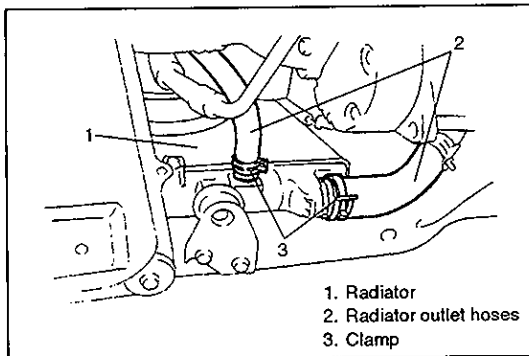
WARNING:

- Check to make sure that engine coolant temperature is cold before removing any part of cooling system.
- Also be sure to disconnect negative cord from battery terminal before removing any part.



COOLING SYSTEM DRAINING

- 1) Remove degassing tank cap.
- 2) Loosen drain plug on radiator to drain coolant.
- 3) After draining coolant, be sure to tighten drain plug securely.
- 4) Fill cooling system. (Refer to Item COOLANT of MAINTENANCE.)



COOLING WATER PIPES OR HOSES

REMOVAL

- 1) Drain cooling system.
- 2) To remove these pipes or hoses, loosen clamp on each hose and pull hose end off.

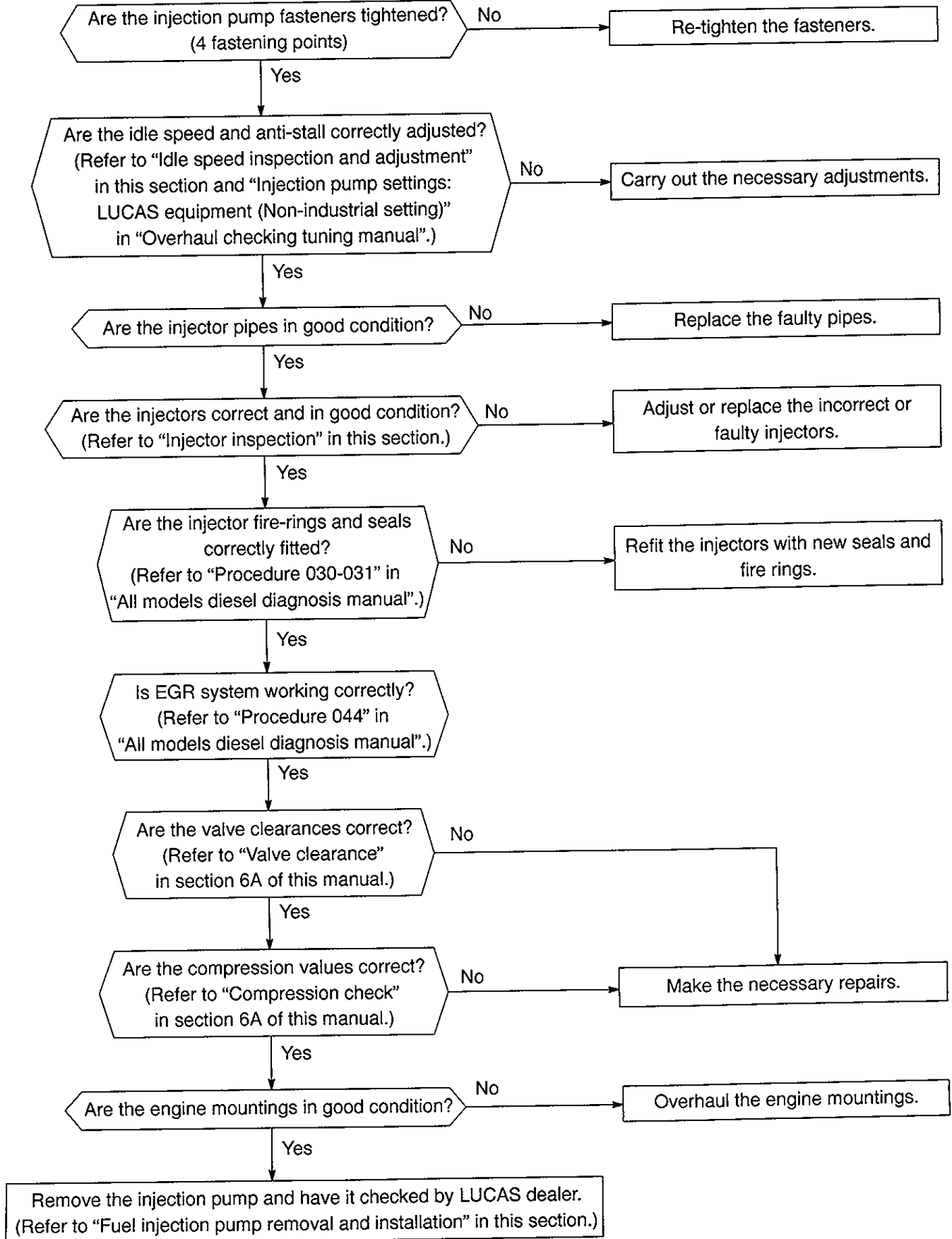
INSTALLATION

Install removed parts in reverse order of removal procedure, noting the following.

- Tighten each clamp securely.
- Refill cooling system with proper coolant, referring to description on COOLANT of MAINTENANCE.

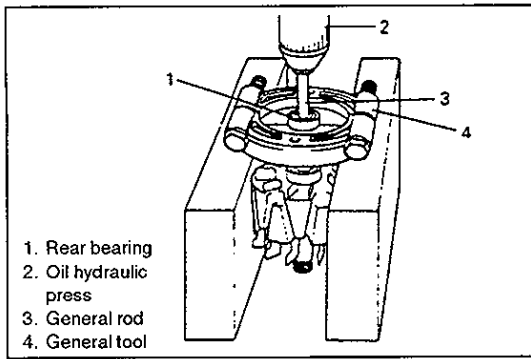
PROCEDURE 007

Vibration at idle

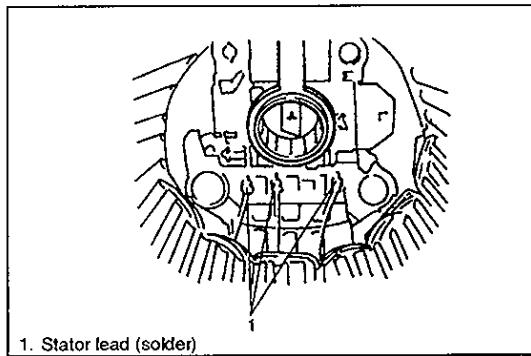


TIGHTENING TORQUE SPECIFICATIONS

FASTENING PARTS	TIGHTENING TORQUE		
	N-m	kg-m	lb-ft
Coolant temp. switch (on water outlet box)	17.5	1.8	12.9
Fuel injection pump nut, bolt	20.0	2.0	14.7
Fuel injection pump pulley nut	50.0	5.1	36.9
Fuel injector pipe nut	25.0	2.5	18.4
Fuel injector assembly	130.0	13.3	95.9
Fuel injector	95.0	9.5	70.1
Fast idle thermo device	27.0	2.7	19.9
Fuel feed pipe bolt (on fuel injection pump)	25.0	2.5	18.4
Fuel return pipe bolt (on fuel injection pump)	25.0	2.5	18.4
Fuel feed pipe bolt bleeding screw (on fuel injection pump)	4.5	0.5	3.3
Fast idle control cable fix bolt	4.0	0.4	3.0
Fast idle control cable adjusting nut	6.0	0.6	4.4
Glow plug	22.0	2.2	16.2
Glow plug wiring nut	4.0	0.4	2.9
Vacuum pump bolt and nut	25.0	2.5	18.4
Fuel filter outlet pipe bolt	39.5	4.0	29.1
Fuel filter inlet pipe bolt	39.5	4.0	29.1
Fuel filter inlet pipe bolt bleeding screw	5.0	0.5	3.7
Fuel filter element bolt	9.0	0.9	6.6
Fuel filter water bleeding screw	3.5	0.4	2.6



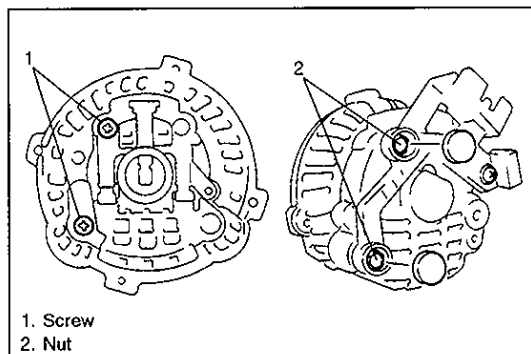
7) When removing rear bearing, use hydraulic press.



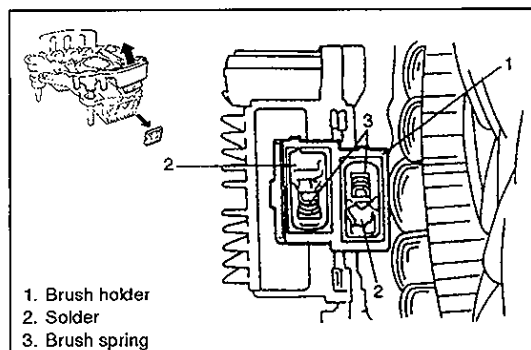
8) Unsolder stator leads by using a soldering iron and remove stator from rear housing.

CAUTION:
When unsoldering stator for removal, never apply heated soldering iron to stator lead and its terminal for longer than 5 seconds continuously. If excessively heated, semiconductor components in regulator and rectifier will be overheated and affected adversely.

NOTE:
Recommend output of the soldering iron: 180 W – 270 W



9) Remove screws and nuts as shown.
10) Remove regulator assembly with rectifier from rear housing.



11) To remove brush, remove holder cover from brush holder and then disconnect brush wire from regulator terminal by using soldering iron.

ON-VEHICLE SERVICE

OIL CHANGE

- 1) Before changing or inspecting oil, be sure to stop engine and lift vehicle horizontally.
- 2) With vehicle lifted up, check oil level and leakage.
If leakage exists, correct it.
- 3) Drain old oil and fill new specified oil by specified amount (up to level hole).
- 4) Torque drain and level/filler plugs as specified below. Apply sealant to thread of drain plug before installation.

“A”: Sealant 99000-31110

Tightening Torque

(a): 21 N·m (2.1 kg-m, 15.5 lb-ft)

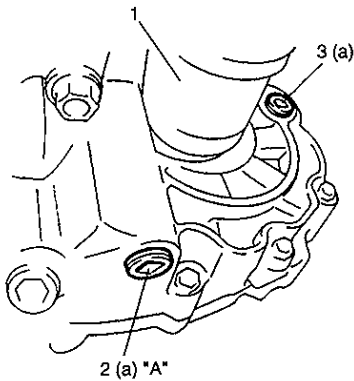
NOTE:

- It is recommended to use API GL-4 75W-90 gear oil.
- Whenever vehicle is hoisted for any other service work than oil change, also be sure to check for oil leakage.

Oil specification: API GL-4

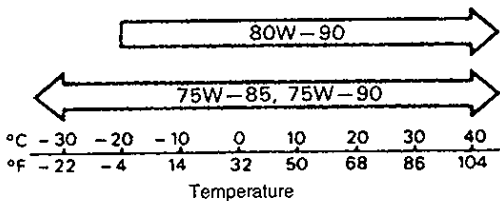
For SAE classification, refer to viscosity chart at the left.

Oil capacity: 2.2 liters (4.6/3.9 US/Imp. pt)



1. Drive shaft (LH)
2. Oil drain plug
3. Oil level/filler plug

Viscosity chart
SAE



GEAR SHIFTER

Gear Shift and Select Shaft Assembly

- 1) To disassemble component parts, use special tools and 2.8 – 3.0 mm (0.11 in.) pin remover in addition.

Special Tool

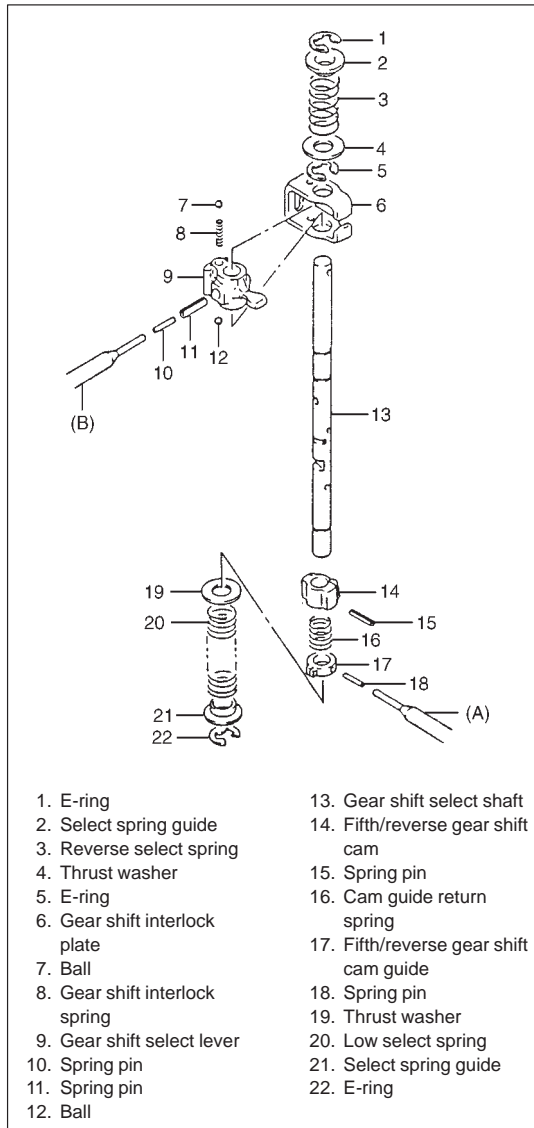
(A): 09922-85811(4.5 mm)

(B): 09925-78210 (6.0 mm)

- 2) Clean all parts thoroughly, inspect them and replace with new ones as required.
- 3) Assemble component parts by reversing removal procedure.

NOTE:

- When driving in spring pins, prevent shaft from being bent by supporting it with wood block.
- Assemble 5th & REV gear shift cam by winding cam guide return spring, and then drive in spring pin.
- Locate low speed select spring (Lower position) and reverse select spring (Yellow-Upper position) correctly.



DIFFERENTIAL ASSEMBLY

Disassembly

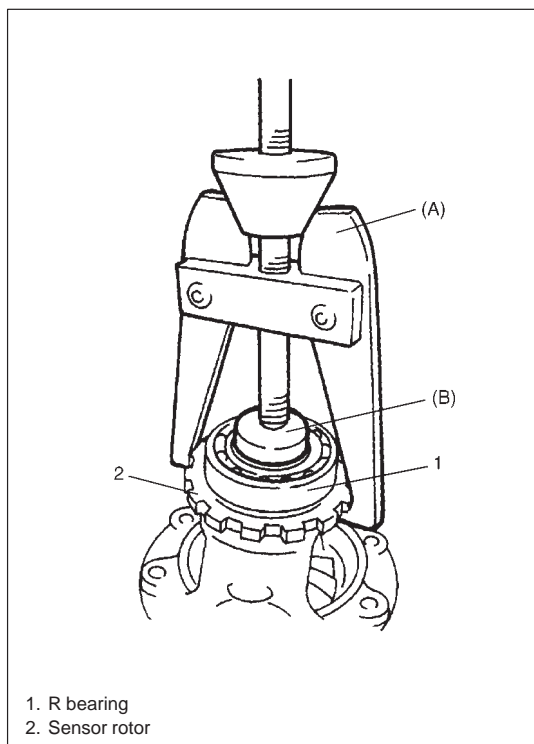
- 1) Using special tool, remove R bearing and sensor rotor.

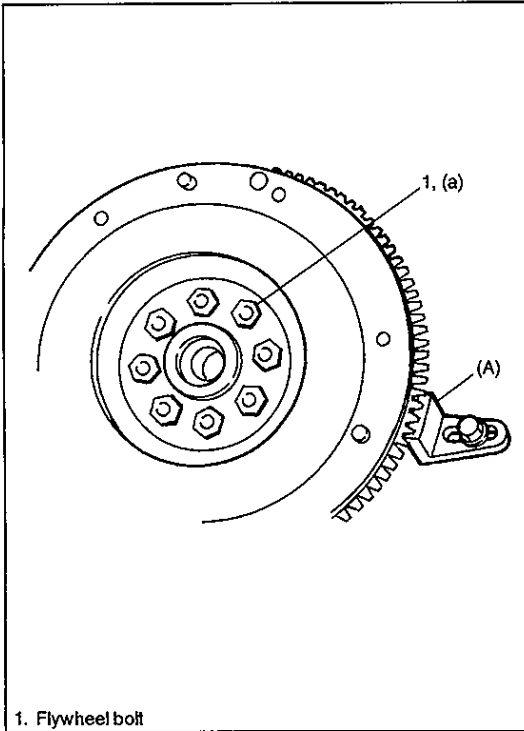
Special Tool

(A): 09913-60910

(B): 09925-88210

- 2) Remove L bearing by using puller while supporting its center shaft as described above.
- 3) Support differential case with soft jawed vise and remove 8 final gear bolts then take out final gear.





INSTALLATION

NOTE:

Before assembling, make sure that flywheel surface and pressure plate surface have been cleaned and dried thoroughly.

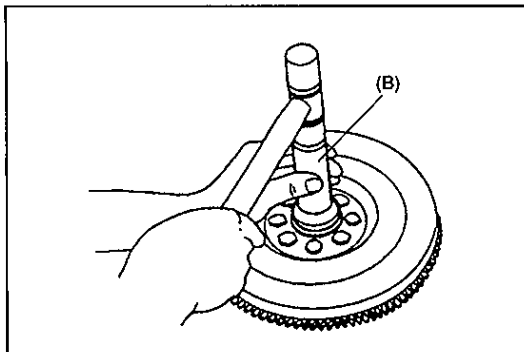
- 1) Install flywheel to crankshaft and tighten bolts to specification.

Special Tool

(A): 09916-96510/OUT0000049

Tightening Torque

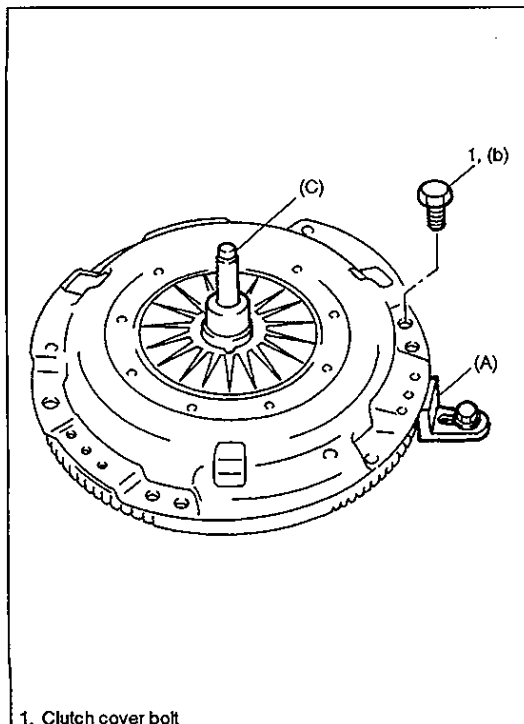
(a): 50 N·m (5.0 kg·m, 36.2 lb-ft)



- 2) Using special tool, install input shaft bearing to flywheel.

Special Tool

(B): 09913-76010



- 3) Aligning clutch disc with flywheel center by using special tool, install clutch cover and bolts. Then tighten bolts to specification.

NOTE:

- While tightening clutch cover bolts, compress clutch disc with special tool (clutch center guide) by hand so that disc is centered.
- Tighten cover bolts little by little evenly in diagonal order.

Special Tool

(A): 09916-96510/OUT0000049

(C): 09923-36330

Tightening Torque

(b): 25 N·m (2.5 kg·m, 18.0 lb-ft)

DIAGNOSIS

COMBINATION METER

Trouble	Possible Cause	Correction
Speedometer shows no operation.	IG. fuse blown Vehicle speed sensor faulty Speedometer faulty Wiring or grounding faulty Signal rotor on differential case faulty	Replace fuse to check for short. Check vehicle speed sensor. Replace speedometer. Repair. Check signal rotor.
Tachometer shows no operation.	IG. fuse blown Engine speed sensor faulty Tachometer faulty Wiring or grounding faulty Signal slit on flywheel faulty	Replace fuse to check for short. Check engine speed sensor. Replace tachometer. Repair. Check signal slit.
Engine coolant temperature warning light shows no lighting or no lighting off.	IG. fuse blown Bulb burn out Engine coolant temperature warning switch faulty Wiring or grounding faulty	Replace fuse to check for short. Replace bulb. Check engine coolant temperature warning switch. Repair.
Fuel level meter shows no operation.	IG. fuse blown Fuse meter faulty Fuel level gauge unit faulty Wiring or grounding faulty	Replace fuse to check for short. Check meter. Check gauge unit. Repair.
Engine coolant temperature meter shows no operation.	IG. fuse blown Engine coolant temperature meter faulty Engine coolant temperature sending unit faulty Wiring or grounding faulty	Replace fuse to check for short. Check meter. Check sending unit. Repair.
Oil pressure light shows no lighting.	IG. fuse blown Bulb burnt out Oil pressure switch faulty Wiring or grounding faulty	Replace fuse to check for short. Replace bulb. Check switch. Repair.
Brake warning light (parking brake light) shows no lighting.	IG. fuse blown Bulb burnt out Parking brake switch faulty Wiring or grounding faulty	Replace fuse to check for short. Replace bulb. Check parking brake switch. Repair.

SYSTEM CHECK

CAUTION:

After replacing immobilizer control module, be sure to register transponder code and fuel pump/immobilizer control module code in immobilizer control module and fuel pump by performing procedure described in "Procedure After Immobilizer Control Module Replacement". Otherwise, immobilizer control system can not be operated.

STEP	ACTION	YES	NO
1	Using ignition key whose transponder code has been registered in immobilizer control module, check malfunction indicator lamp ("CHECK ENGINE" light) with ignition switch kept at its ON position. After turning it ON for about 2 seconds, does malfunction indicator lamp ("CHECK ENGINE" light) turn OFF?	Go to Step 2.	Go to Step 3.
2	Check if communication is possible by using SUZUKI scan tool. Refer to "Communication Check with SUZUKI Scan Tool".	Immobilizer control system is in good condition.	Check data link circuit. If OK, then check immobilizer control module for specification, referring to "Immobilizer Control Module".
3	After turning ON for about 6 seconds, does malfunction indicator lamp ("CHECK ENGINE" light) turn OFF?	Fault in data link circuit or battery voltage is too low. Check and repair following items. <ul style="list-style-type: none"> • Data link circuit • Power circuit for immobilizer control module • Battery voltage 	Go to Step 4.
4	After turning ON for about 2 seconds, does malfunction indicator lamp ("CHECK ENGINE" light) flash?	DTC is displayed by flashing "CHECK ENGINE" light. Check DTC, referring to "DTC Table" and repair according to flow table corresponding to that DTC.	Go to Step 5.
5	After ignition switch is turned to ON position, does malfunction indicator lamp ("CHECK ENGINE" light) remain ON?	Malfunction indicator lamp ("CHECK ENGINE" light) remains ON. Check and repair ground circuit for malfunction indicator lamp ("CHECK ENGINE" light). If above circuit is in good condition, substitute a known-good immobilizer control module and recheck.	Malfunction indicator lamp ("CHECK ENGINE" light) does not turn ON. Check and repair following items. <ul style="list-style-type: none"> • Power circuit for malfunction indicator lamp ("CHECK ENGINE" light) • Ground circuit for malfunction indicator lamp ("CHECK ENGINE" light) If above circuits are in good condition, substitute a known-good immobilizer control module and recheck.