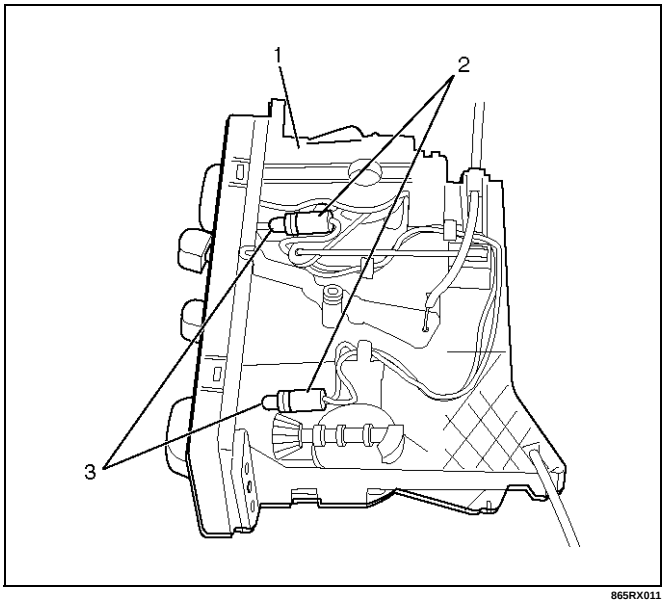
Recommended Fluids and Lubricants

USAGE	FLUID/LUBRICANT
Engine	API SE, SF, SG, SH or ILSAC GF-1 Engine oil (See oil chart on the following page for proper viscosity)
Engine coolant	Mixture of water and good quality ethylene glycol base type antifreeze.
Brake system	DOT-3 hydraulic brake fluid.
Power steering system	DEXRON® II-E Automatic transmission fluid.
Automatic transmission	DEXRON® -III Automatic transmission fluid.
MUA Type Manual transmission & Transfer case	Engine oil (See oil chart on following page for proper viscosity)
Rear axle and front axle	GL-5 gear lubricant (Standard differential) GL-5 Limited slip differential gear lubricant together with limited slip differential lubricant additive (Part No. 8-01052-358-0) or equivalent (If equipped with optional limited slip differential) (See oil chart in this section for proper viscosity)
Clutch system a. Pivot points b. Clutch fork joint c. Master cylinder	 Chassis grease Chassis grease DOT-3 hydraulic brake fluid
Hood latch assembly a. Pivots and spring anchor b. Release pawl	 Engine oil Chassis grease
Hood and door hinges	Engine oil
Chassis lubrication	Chassis grease
Parking brake cables	Chassis grease
Front wheel bearings	Multipurpose grease
Shift on the fly system	GL-5 gear lubricant (SAE 75W-90)
Body door hinge pins and linkage, fuel door hinge, rear compartment lid hinges	Engine oil
Windshield washer solvent	Washer fluid
Key lock cylinder	Synthetic light weight engine oil (SAE 5W-30)
Accelerator linkage	Chassis grease

Control Panel Illumination Bulb

Control Panel Illumination Bulb and Associated Parts



865RX011

Legend

(1) Control Lever Assembly
(2) Bulb Socket
(3) Illumination Bulb

Removal

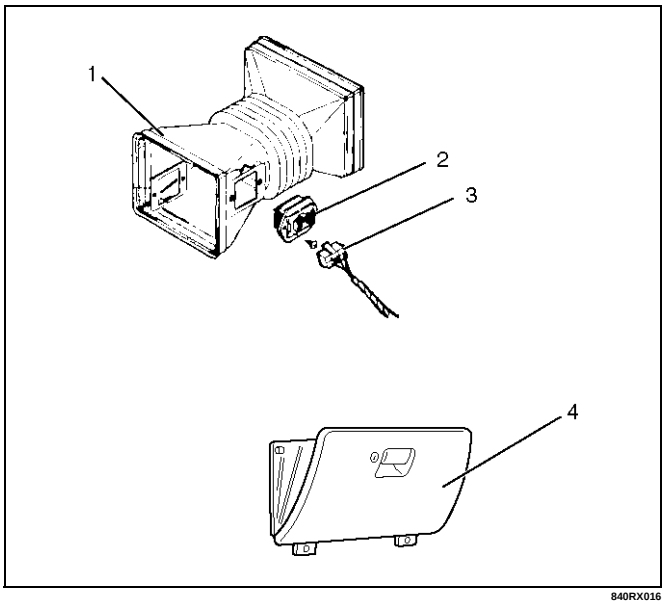
1. Disconnect the battery ground cable.
2. Remove control lever assembly.
   - Refer to Control Lever Assembly in this section.
3. Pull out the bulb socket from the panel by turning it counterclockwise.
4. Pull the illumination bulb from the socket.

Installation

To install, follow the removal steps in the reverse order.

Resistor

Resistor and Associated Parts



840RX016

Legend

(1) Duct (Heater only)
(2) Resistor
(3) Resistor Connector
(4) Glove Box

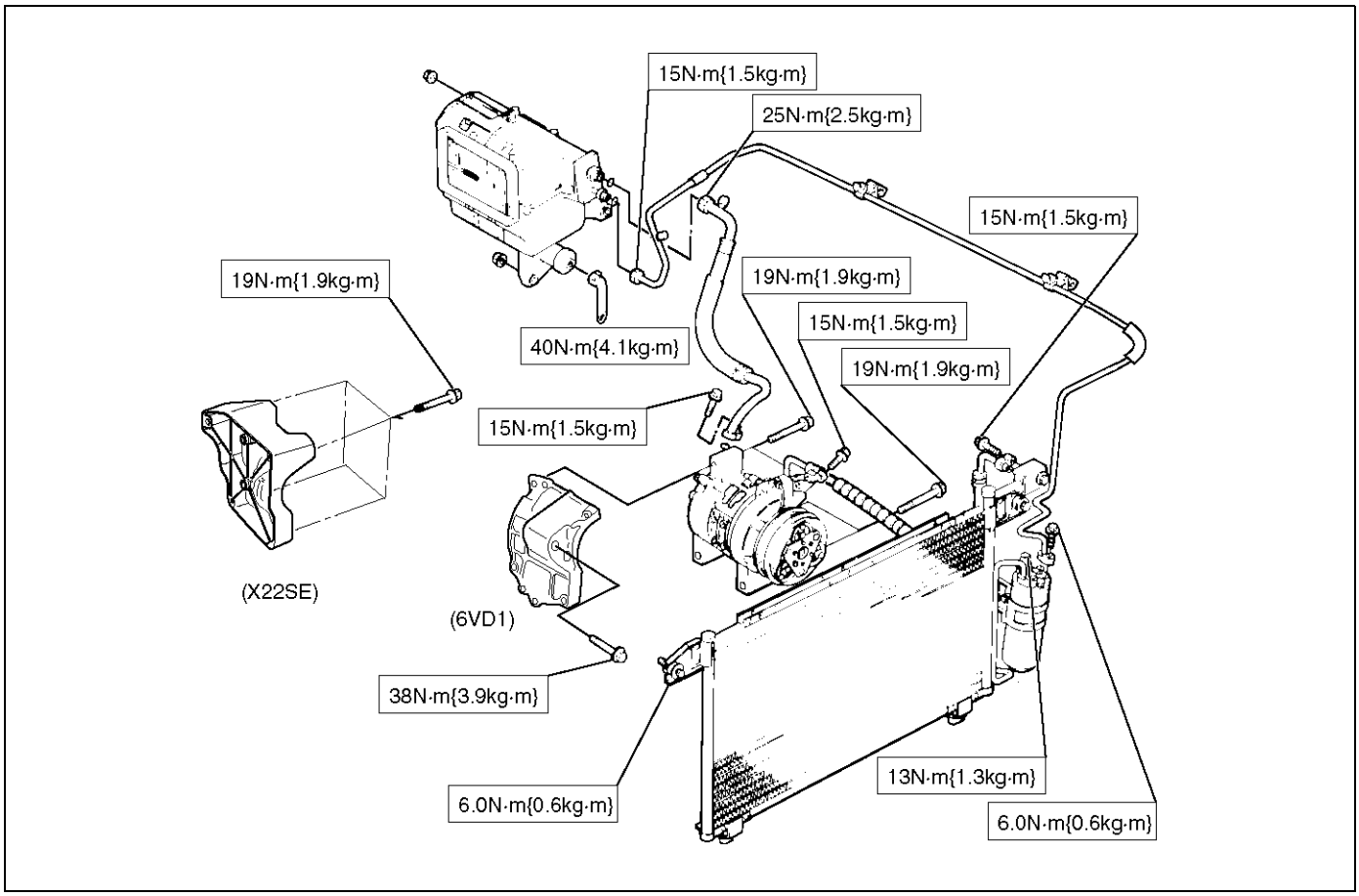
Removal

1. Disconnect the battery ground cable.
2. Remove glove box.
3. Remove resistor connector.
4. Remove duct (heater only).
5. Remove resistor.

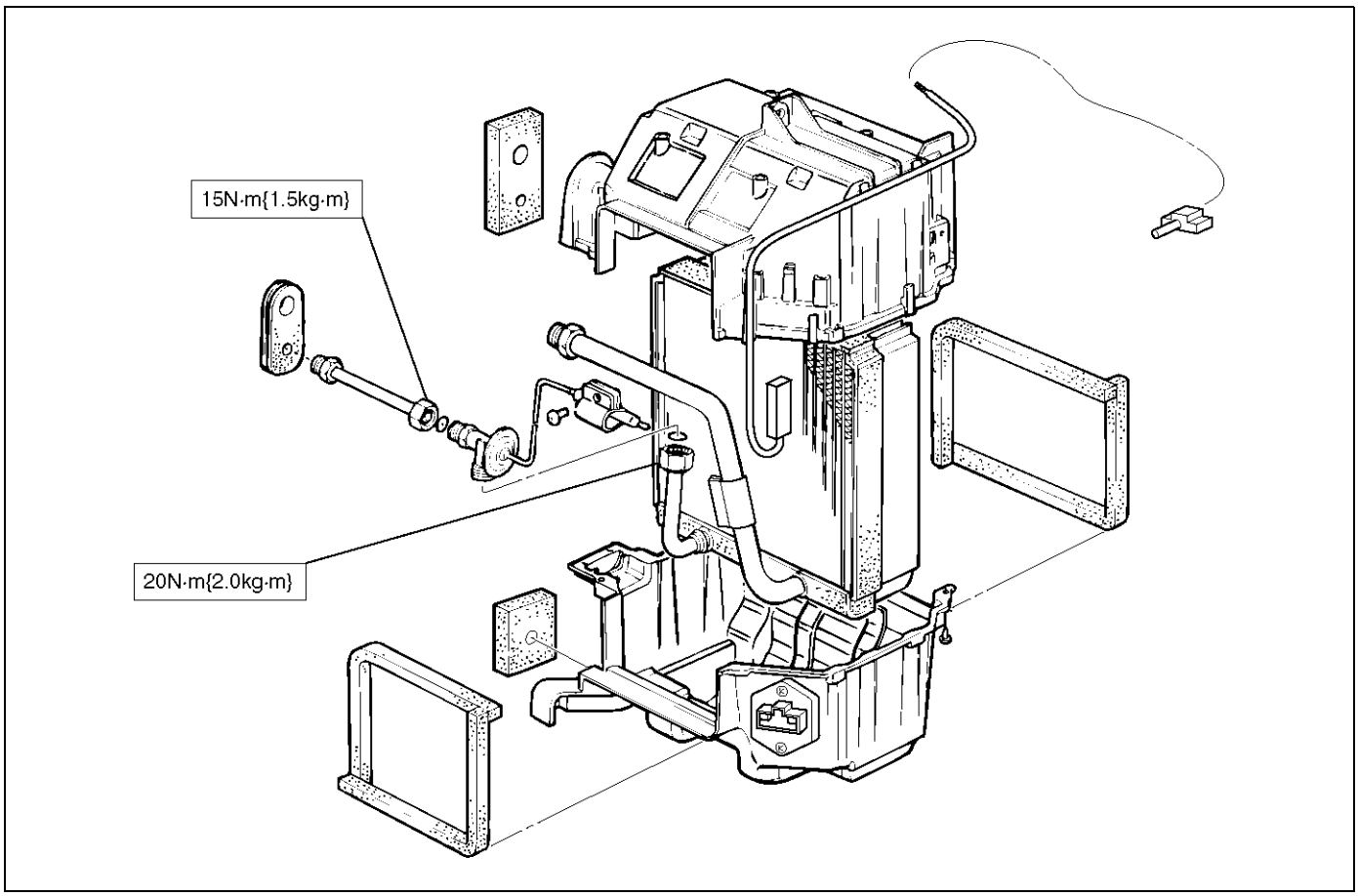
Installation

To install, follow the removal steps in the reverse order.

Torque Specifications

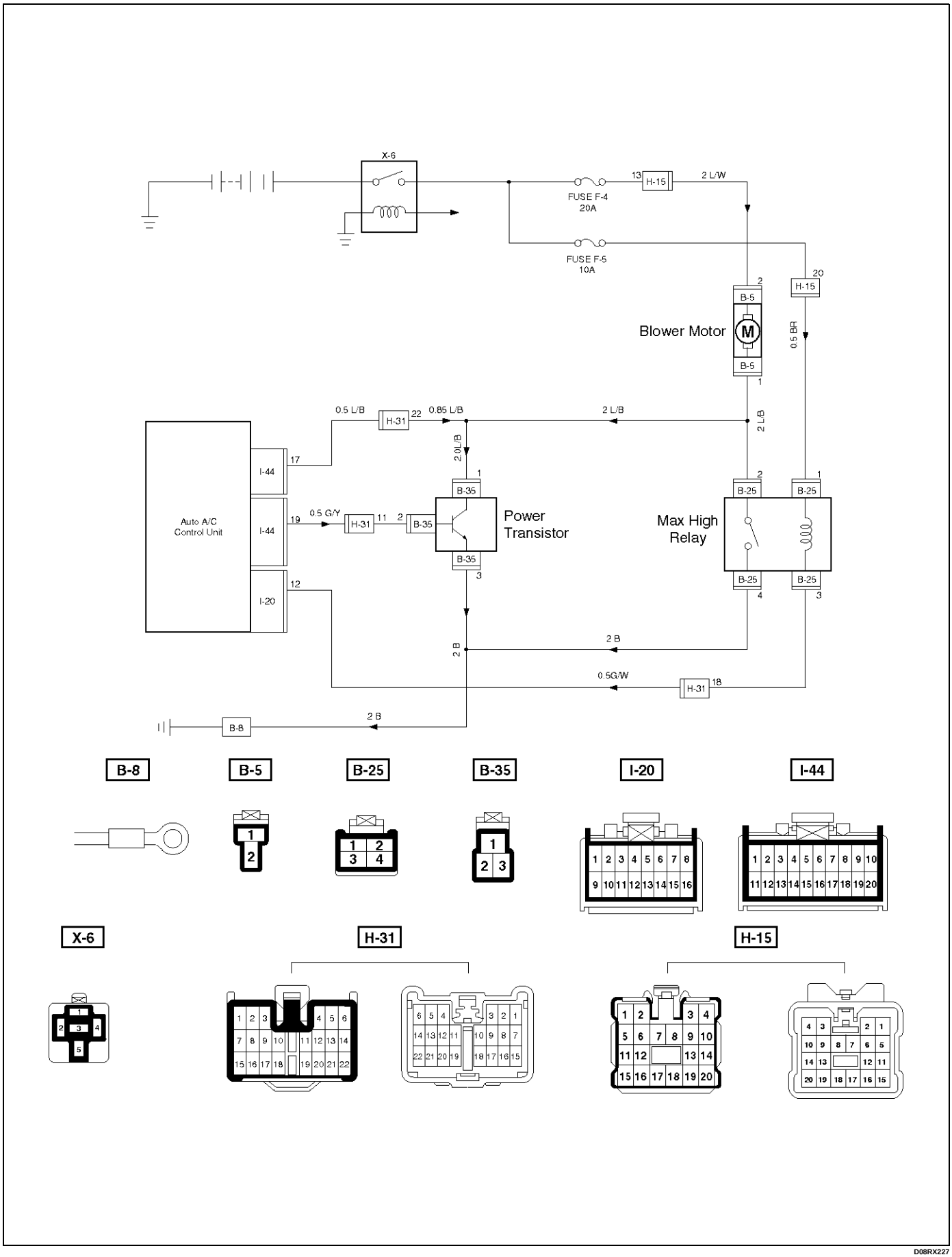


E06RX006



E06RX007

Inspection of the Fan Motor System



D08RX227

SUSPENSION

FRONT SUSPENSION

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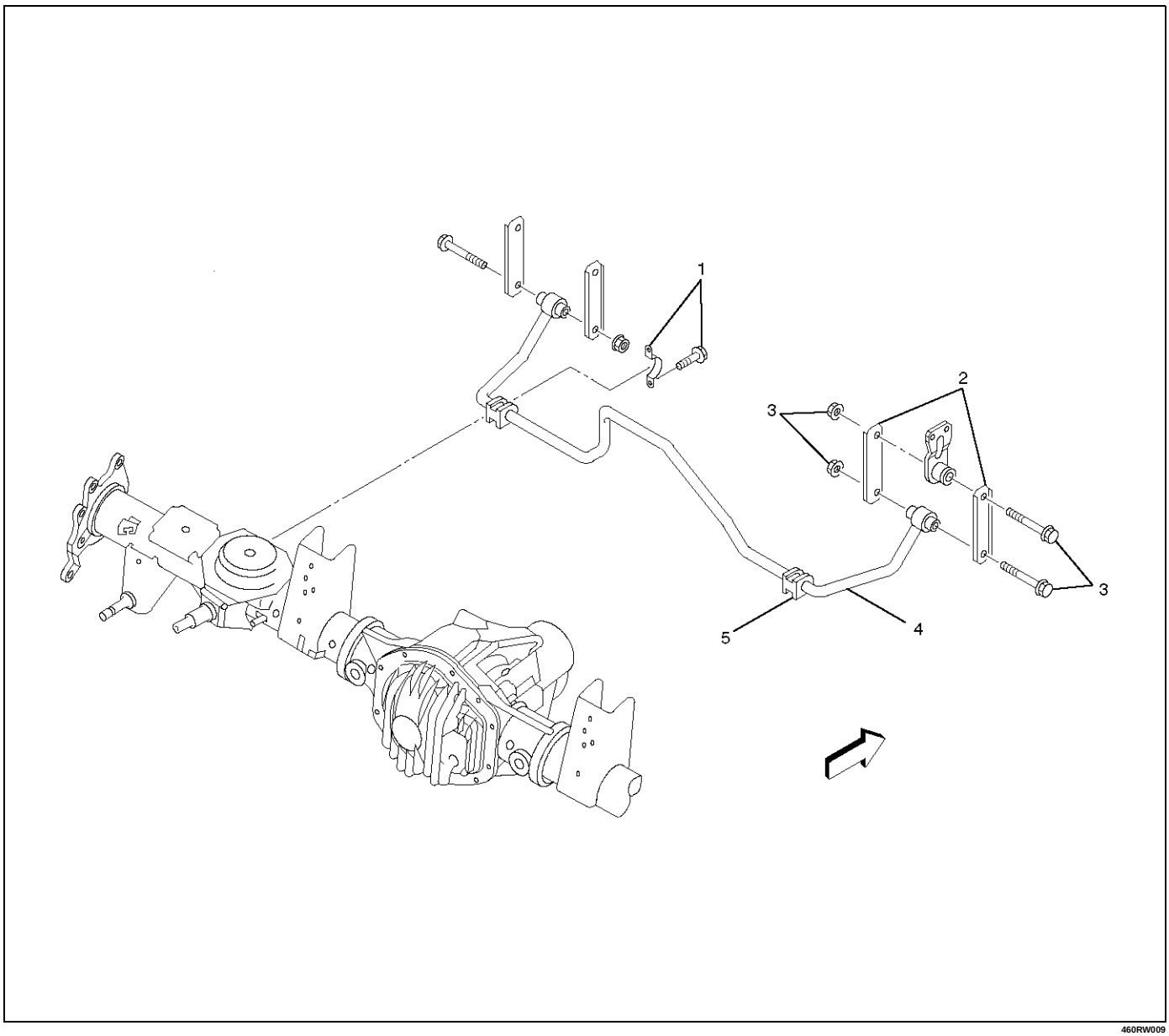
Service Precaution

WARNING: THIS VEHICLE HAS A SUPPLEMENTAL RESTRAINT SYSTEM (SRS). REFER TO THE SRS COMPONENT AND WIRING LOCATION VIEW IN ORDER TO DETERMINE WHETHER YOU ARE PERFORMING SERVICE ON OR NEAR THE SRS COMPONENTS OR THE SRS WIRING. WHEN YOU ARE PERFORMING SERVICE ON OR NEAR THE SRS COMPONENTS OR THE SRS WIRING, REFER TO THE SRS SERVICE INFORMATION. FAILURE TO FOLLOW WARNINGS COULD RESULT IN POSSIBLE AIR BAG DEPLOYMENT, PERSONAL INJURY, OR OTHERWISE UNNEEDED SRS SYSTEM REPAIRS.

CAUTION: Always use the correct fastener in the proper location. When you replace a fastener, use ONLY the exact part number for that application. ISUZU will call out those fasteners that require a replacement after removal. ISUZU will also call out the fasteners that require thread lockers or thread sealant. UNLESS OTHERWISE SPECIFIED, do not use supplemental coatings (Paints, greases, or other corrosion inhibitors) on threaded fasteners or fastener joint interfaces. Generally, such coatings adversely affect the fastener torque and the joint clamping force, and may damage the fastener. When you install fasteners, use the correct tightening sequence and specifications. Following these instructions can help you avoid damage to parts and systems.

Stabilizer Bar

Stabilizer Bar and Associated Parts



460RW009

Legend

(1) Bracket
(2) Link
(3) Bolt and Nut
(4) Stabilizer Bar
(5) Rubber Bushing

Removal

1. Raise the vehicle and support the frame with suitable safety stands.
2. Remove wheel and tire assembly. Refer to Wheel in this section.
3. Remove bolt and nut.
4. Remove link.

CAUTION: Be careful not to damage the ball joint boot.

5. Remove bracket.
6. Remove rubber bushing.

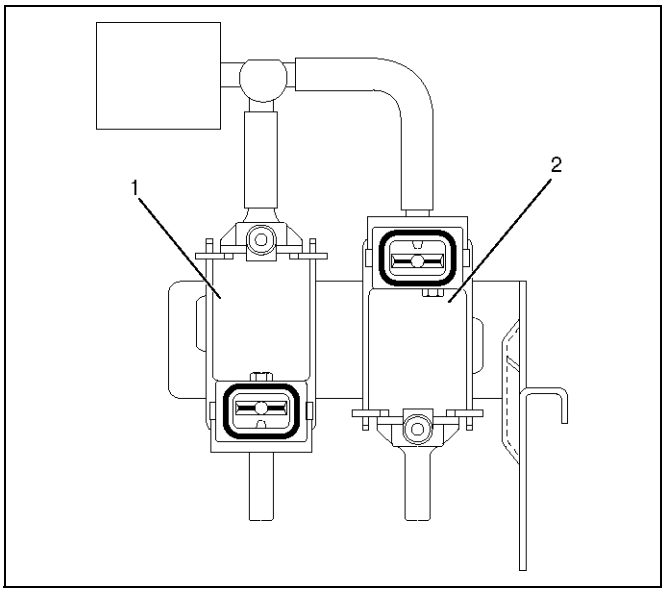
Inspection and Repair

Make necessary correction or parts replacement if wear, damage, corrosion or any other abnormal condition are found through inspection.
Check the following parts:

- Stabilizer bar
- Rubber bushing
- Link

VSV Assembly

Inspect the vehicle side harness as follows:



412RX008

Legend

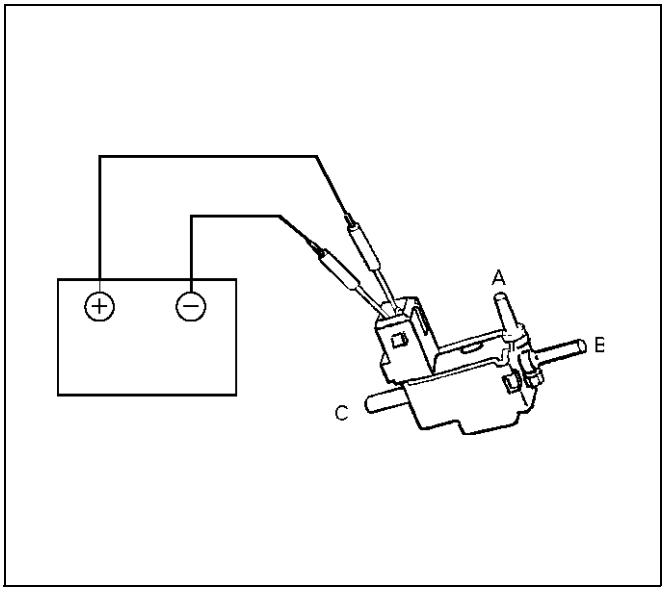
(1) Grey
(2) Blue

1. Remove connector.
2. Shift transfer lever to 2H and start the engine.

NOTE: The vehicle should not be started, with the engine idling.

3. Make sure that there is continuity in the vehicle side of harness. If there is no continuity, check transfer shift switch and wiring.

Inspect the both VSVs as follows



F04RS004

1. With battery not connected (Usual).

A–C:There is continuity

B:Closed

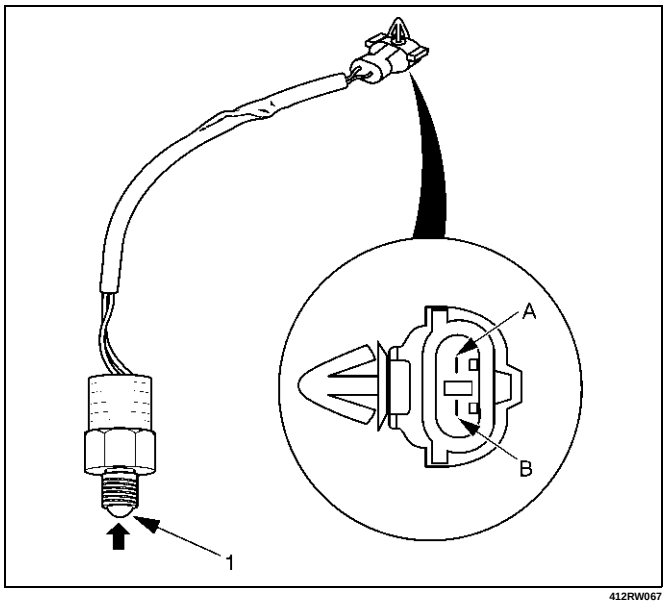
2. With battery connected

A – B:There is continuity

C:Closed

3. If 1) and 2) fail, replace with a new VSV.

Functional Detective Switch



412RW067

1. With ball (1) being free

A–B:There is continuity

2. With ball forced into the switch

A–B:No continuity

3. If 1) and 2) fail, replace with a new switch.

Motor Actuator Assembly

Inspect the function of the motor actuator assembly as follows:

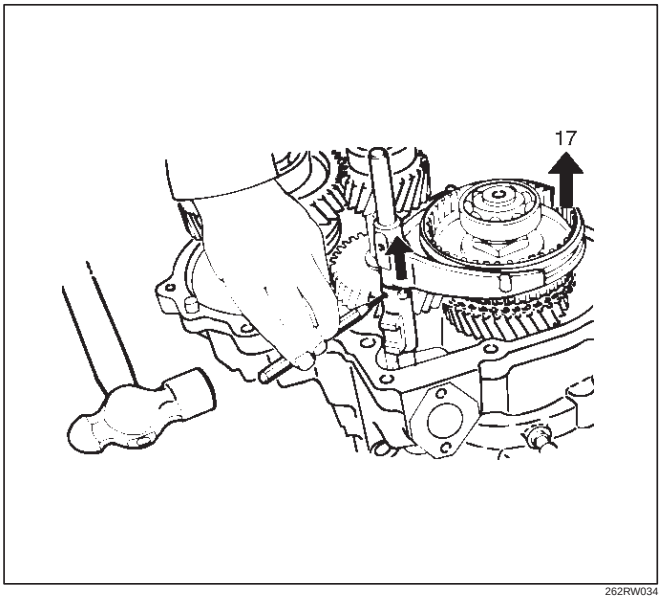
1. Disassemble the motor actuator from transfer rear case.

Inspection and Repair

Refer to “TRANSFER CASE ASSEMBLY” in this section for inspection and repair.

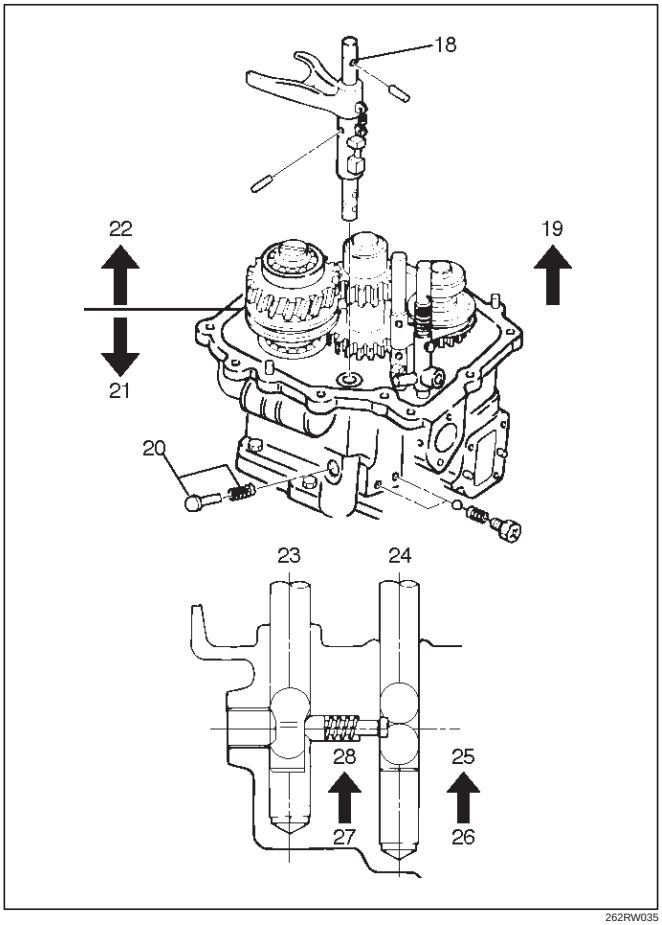
Reassembly

1. Place shift block (15) in transfer case (16).
2. Set shift arm (14) on the High–Low sleeve.
3. Push High–Low shift rod (13) through shift arm (14) and block (15).
4. Engage the High–Low sleeve with the 4H (1) side.
5. Install the spring pin (12) to the shift block (15) and shift arm (14).



262RW034

6. Install select rod assembly (11), joining its lever to shift block (15) groove.
7. Engage the High–Low sleeve with the 4H side and install the interlock pin (9) and spring (10) in the proper direction.
8. Place 2WD–4WD shift block (7) in the transfer case (16).
9. Set 2WD–4WD shift arm (6) on the 2WD–4WD sleeve.
10. Puh 2WD–4WD shift rod (5) through 2WD–4WD shift arm (6) and 2WD–4WD shift block (7).
11. Install the 2WD–4WD shift rod (5) with interlock pin pushed in.

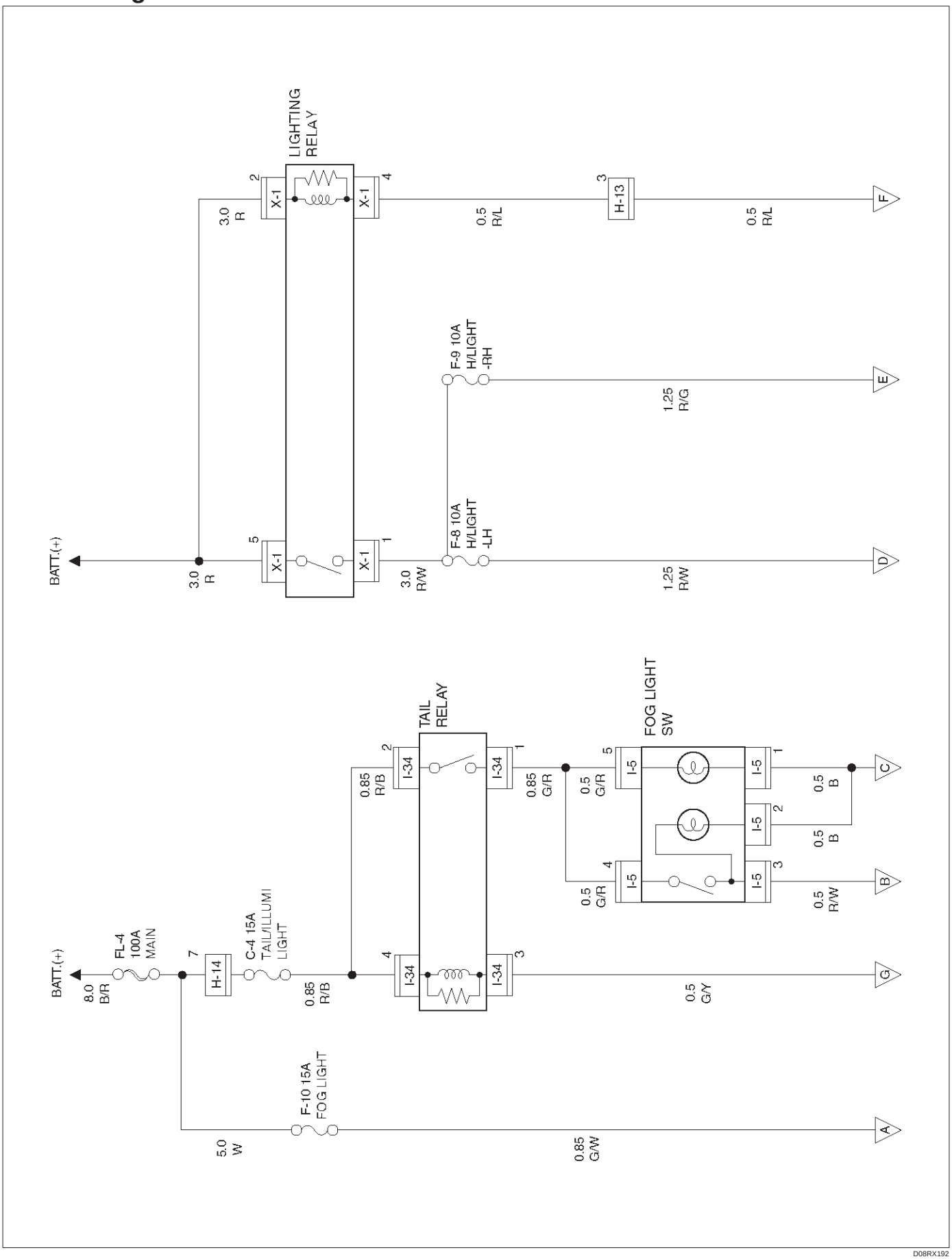


262RW035

Legend

(18) 2WD–4WD
(19) 4H Side
(20) Interlock pin
(21) 2WD
(22) 4WD
(23) Rod: 2–4
(24) Rod: H–L
(25) 4H
(26) 4L
(27) 4×2
(28) 4×4

Circuit Diagram–1



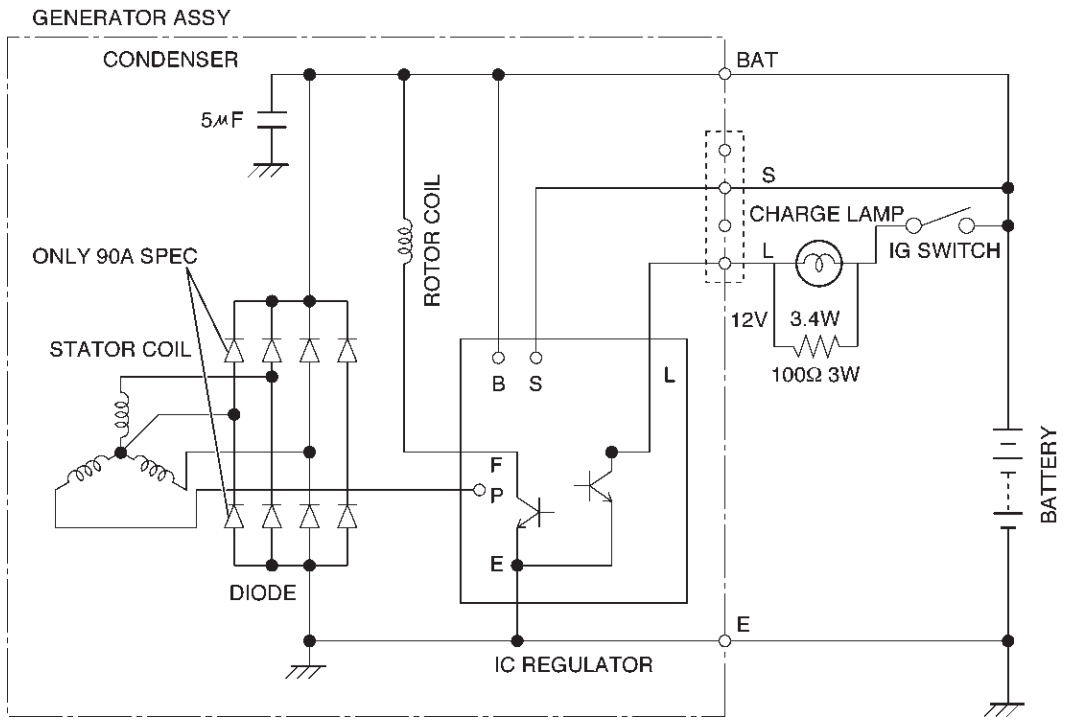
D08RX192

Charging System

General Description

The IC integral regulator charging system and its main components are connected as shown in illustration.
The regulator is a solid state type and it is mounted along with the brush holder assembly inside the generator installed on the rear end cover.
The generator does not require particular maintenance such as voltage adjustment.

The rectifier connected to the stator coil has diodes to transform AC voltage into DC voltage.
This DC voltage is connected to the output terminal of generator.



F06RX002

General On–Vehicle Inspection

A basic wiring diagram is shown in the illustration. When operating normally, the indicator bulb will come on when the switch is turned on, and will then go out when the engine starts. If the indicator operates abnormally, or if an undercharged or overcharged battery condition occurs, the following procedure may be used to diagnose the charging system. Remember that an undercharged battery is often caused by accessories being left on overnight, or by a defective switch which allows a bulb, such as a trunk or glove box light, to stay on.

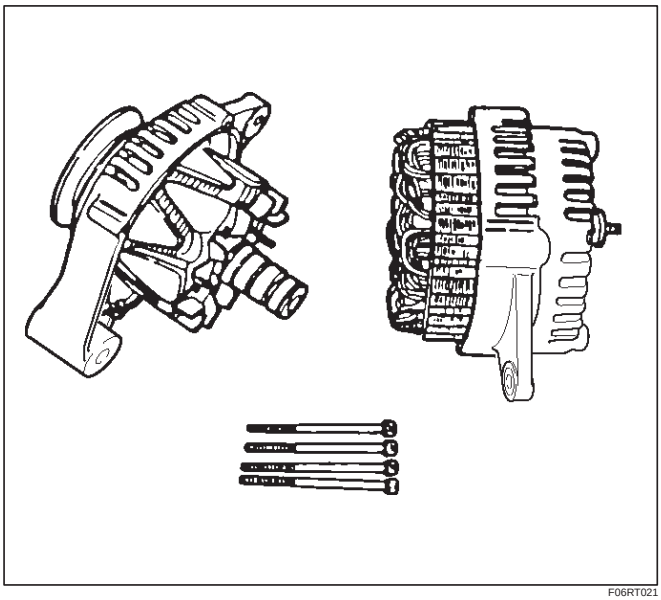
OBSERVE THE FOLLOWING PROCEDURE:

1. Visually check belt and wiring.
2. Go to step 5. for vehicles without charge indicator light.
3. Switch on, engine stopped, light should be on. If not, detach harness at generator, ground “L” terminal lead.
   a. Lamp lights, replace or repair generator.
   b. Lamp dose not light, locate open circuit between grounding lead and ignition switch. Bulb may be open.
4. Switch on, engine running at moderate speed. Light should be off. If not, detach wiring harness at generator.
   a. If light goes off, replace or repair generator.
   b. If light stays on, check for grounded “L” terminal wire in harness.
5. Battery undercharged or overcharged.
   a. Detach wiring harness connector from generator.
   b. With switch on, engine not running connect voltmeter from ground to “L” terminal in wiring harness, and to “IG” terminal. If used. Wiring harness may connect to either “L” or “IG” or both.
   c. Zero reading indicates open circuit between terminal and battery. Connect as required.

Disassembly

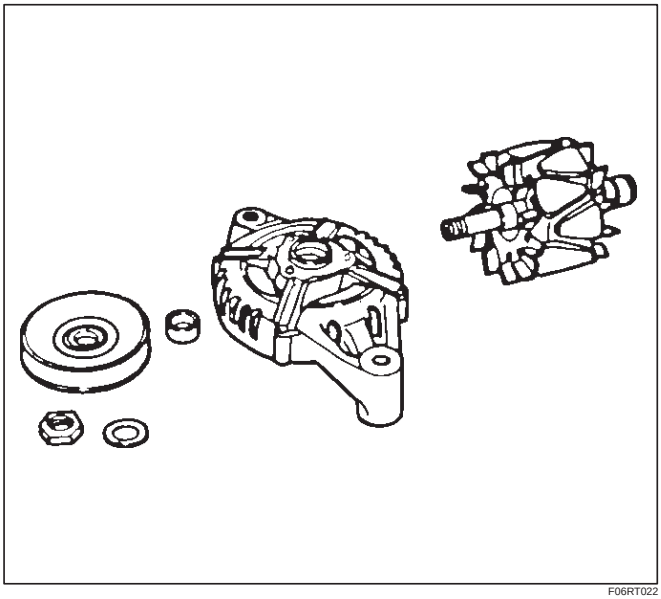
1. Remove the through bolt.
   Insert the tip of a pry bar into the gaps between the front cover and the stator core.
   Pry apart and separate the front cover, rotor, the rear cover and stator.

NOTE: Take care not to scratch or otherwise damage the stator coil with pry bar.



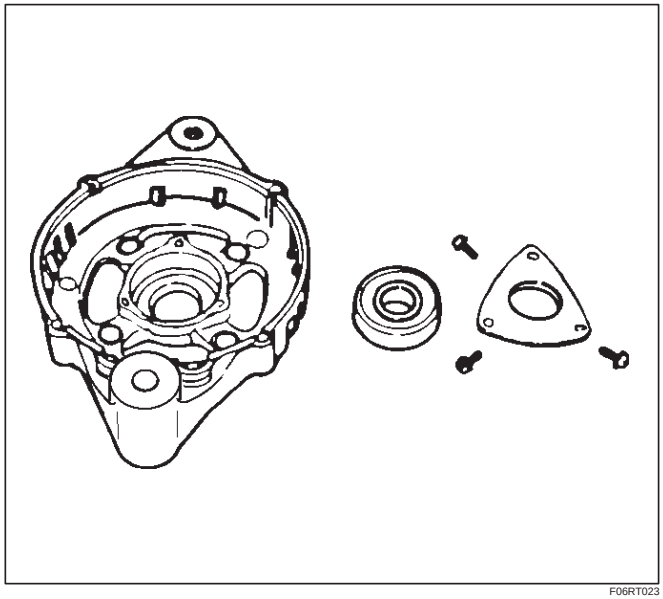
F06RT021

2. Clamp the rotor in a vise and then remove the nut and pulley.
3. Remove the rotor assembly from front cover.



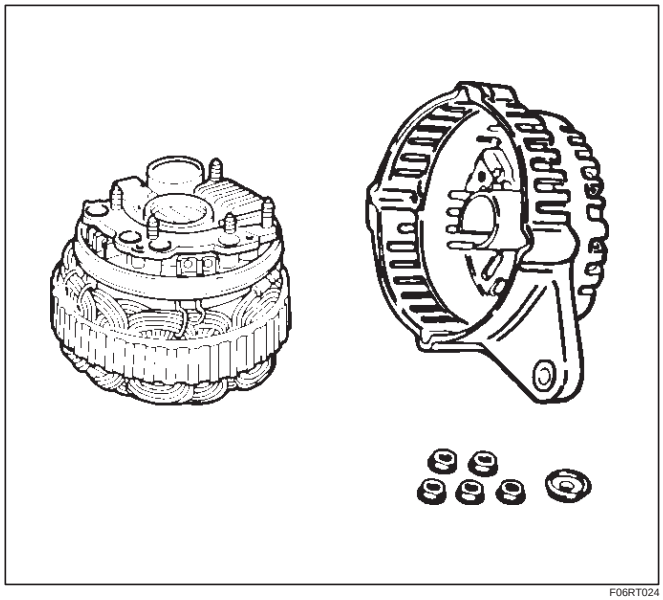
F06RT022

4. Remove screws with bearing retainer from front cover and remove bearing.



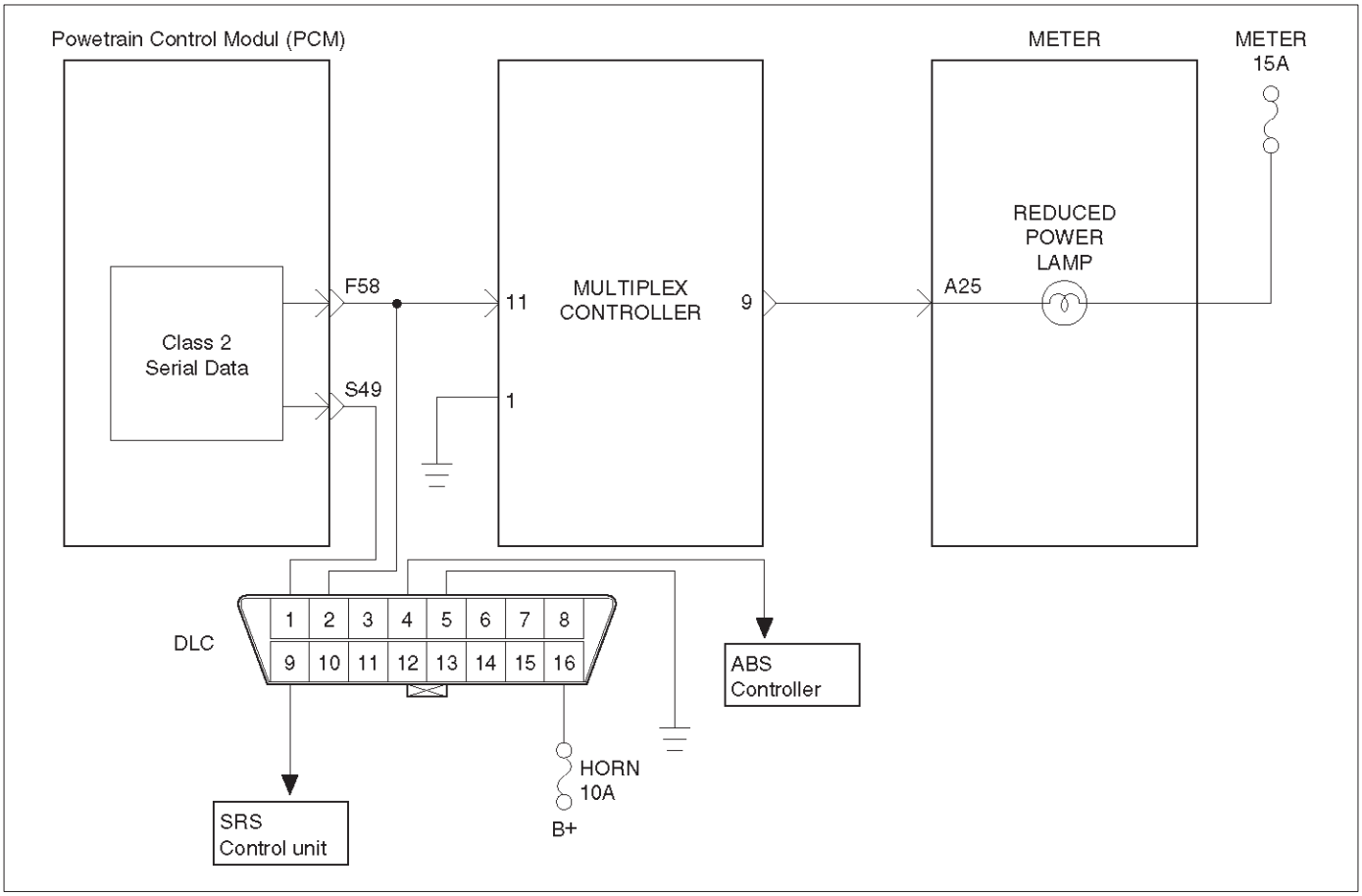
F06RT023

5. Remove the mounting nuts holding the “B” terminal, the diode, and the brush holder.
6. Separate the rear cover from the stator.



F06RT024

No Reduced Power Lamp (RPL)



060R100065

Circuit Description

The Reduced Power lamp (RPL) should be illuminated during 3 seconds with the ignition “ON” and the engine stopped. Ignition feed voltage is supplied to the RPL bulb through the meter fuse. The powertrain control module (PCM) orderes the RPL “ON” signal for Multiplex Control Unit. When Multiplex Control Unit is received RPL “ON” signal that turn RPL “ON” by grounding the RPL driver circuit.

Diagnostic Aids

An intermittent RPL may be caused by a poor connection, rubbed-through wire insulation, or a wire broken inside the insulation. Check for the following items:

- Inspect the PCM and Multiplex Control Unit harness and connections for improper mating, broken locks, improperly formed or damaged terminals, poor terminal to wire connection, and damaged harness.
- If the engine runs OK, check for a faulty light bulb, an open in the MIL driver circuit, or an open in the instrument cluster ignition feed.
- If the engine cranks but will not run, check for an open PCM ignition or battery feed, or a poor PCM to engine ground.

Test Description

Number(s) below refer to the step number(s) on the Diagnostic Chart.

2. A “No RPL” condition accompanied by a no–start condition suggests a faulty PCM ignition feed or battery feed circuit.

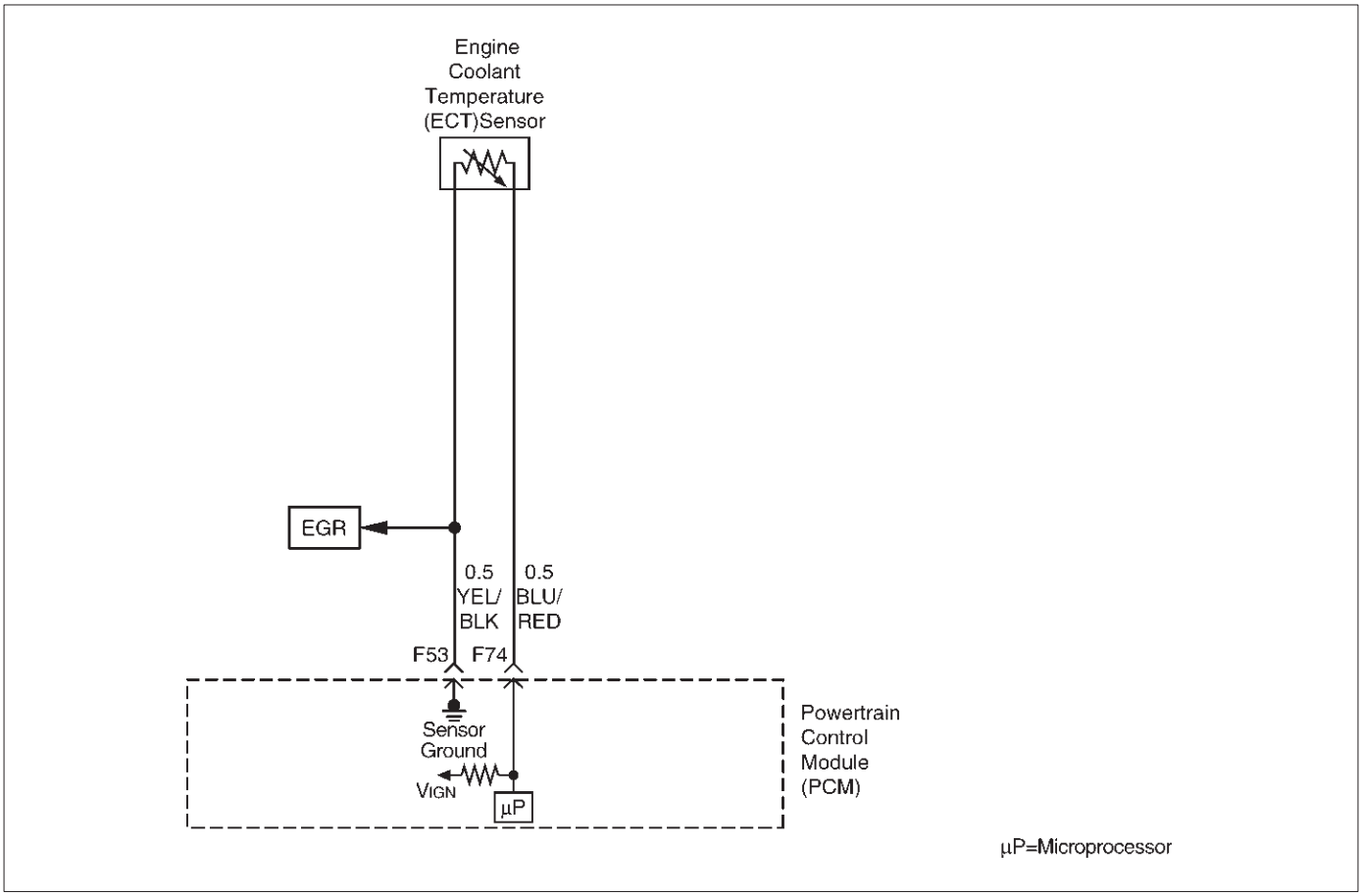
9. Using a test light connected to B+, probe each of the Multiplex Control Unit ground terminals to ensure that a good ground is present. Refer to Multiplex Control Unit Terminal End View for terminal locations of the Unit Terminal End View for terminal locations of the Multiplex Control Unit ground circuits.

12. Using a test light connected to B+, probe each of the PCM ground terminals to ensure that a good ground is present. Refer to PCM Terminal End View for terminal locations of the PCM ground circuits.

21. In this step, temporarily substitute a known good relay for the PCM relay. The horn relay is nearby, and it can be verified as “good” simply by honking the horn. Replace the horn relay after completing this step.

24. This vehicle is equipped with a PCM which utilizes an electrically erasable programmable read only memory (EEPROM). When the PCM is replaced, the new PCM must be programmed. Refer to PCM Replacement and Programming Procedures in Powertrain Control Module (PCM) and Sensors.

Diagnostic Trouble Code (DTC) P0118 ECT Sensor Circuit High Voltage



D06RY00148

Circuit Description

The engine coolant temperature (ECT) sensor is a thermistor mounted in on a coolant crossover pipe at the front of the engine. The powertrain control module (PCM) applies a voltage (about 5 volts) through a pull-up resistor to the ECT signal circuit. When the engine coolant is cold, the sensor (thermistor) resistance is high, therefore the PCM will measure a high signal voltage. As the engine coolant warms, the sensor resistance becomes less, and the ECT signal voltage measured at the PCM drops. With a fully warmed-up engine, the ECT signal voltage should measure about 1.5 to 2.0 volts.

Conditions for Setting the DTC

- Engine running time is longer than 90 seconds.
- The ECT sensor signal indicates an engine coolant temperature of –39˚C (–38˚F) or less (about 5 volts) for a total of 50 seconds over a 100-second period.

Action Taken When the DTC Sets

- The PCM will ON the MIL after second trip with detected fault.
- The PCM will substitute the ECT reading with a default engine coolant temperature value. The default value is based on start-up intake air temperature and running time.
- The PCM will store conditions which were present when the DTC was set as Freeze Frame and in the Failure Records data.

Conditions for Clearing the MIL/DTC

- The PCM will turn the MIL “OFF” on the third consecutive trip cycle during which the diagnostic has been run and the fault condition is no longer present.
- A history DTC P0118 will clear after 40 consecutive warm-up cycles have occurred without a fault.
- DTC P0118 can be cleared by using the Tech 2 “Clear Info” function.

Diagnostic Aids

Check for the following conditions:
The ECT shares a ground with the Transmission Fluid Temperature sensor, the Fuel Tank Pressure sensor, and the MAP sensor.
Check the ground if these DTCs are also set.

- Poor connection at PCM – Inspect harness connectors for backed-out terminals, improper mating, broken locks, improperly formed or damaged terminals, and poor terminal-to-wire connection.
- Damaged harness – Inspect the wiring harness for damage. If the harness appears to be OK, observe the ECT display on the Tech 2 while moving connectors and wiring harnesses related to the ECT sensor. A change in the ECT display will indicate the location of the fault.

If DTC P0118 cannot be duplicated, the information included in the Failure Records data can be useful in determining vehicle mileage since the DTC was last set. If it is determined that the DTC occurs intermittently, performing the DTC P1115 Diagnostic Chart may isolate the cause of the fault.

Diagnostic Trouble Code (DTC) P0302 Cylinder Misfire Detected

Circuit Description

Misfire is monitored as a function of the combustion quality (CQ) signals generated from the ignition current sense system. Combustion signals represent the degree of combustion in each cylinder. Misfire is detected when the combustion signal is below a predetermined value. This DTC P0302 will determine if the No.2 cylinder misfire is occurring by monitoring the Combustion Quality.

Conditions for Setting the DTC

- None of the following DTCs occur: TP sensor, MAF sensor, vehicle speed sensor, ECT sensor.
- The engine speed is between 600 and 6250 RPM.
- The system voltage is between 11 and 16 volts.
- The ECT indicates an engine temperature between –7˚C (28˚F) and 110˚C (230˚F).
- The throttle angle is steady and throttle change less than 0.4% per 125 milliseconds.

Action Taken When the DTC Sets

- The PCM will illuminate the malfunction indicator lamp (MIL) the first time the fault is detected.
- If the misfire is severe enough to cause possible catalyst damage, the PCM will flash the MIL for as long as the misfire remains at catalyst damaging levels.
- The PCM will store conditions which were present when the DTC was set as Freeze Frame and in the Failure Records data.

Conditions for Clearing the MIL/DTC

- The PCM will turn the MIL “OFF” on the third consecutive ignition cycle in which the diagnostic has been run and the fault condition is no longer present.
- A history DTC P0302 will clear after 40 consecutive ignition cycles occur without a fault.
- DTC P0302 can be cleared by using the Tech 2 “Clear Info” function.

Diagnostic Aids

Check for the following conditions:

- System grounds – Ensure all connections are clean and properly tightened.
- Injector – Perform the injector coil/balance test to locate a faulty injector that contributes to a lean condition on the affected cylinder. In addition to the above test, check the condition of the injector O-ring.
- Faulty spark plug – Check for a cracked insulator, carbon tracking, incorrect gap, and worn electrodes.
- Damaged or faulty ignition coil – Check for cracks, carbon tracking or other damage.
- Substitute a known good coil – Swap the ignition coils and retest. If the misfire follows the coil, replace the ignition coil.

DTC P0302 – Cylinder Misfire Detected

Step	Action	Value(s)	Yes	No
1	Was the “On-Board Diagnostic (OBD) System Check” performed?	—	Go to *Step 2*	Go to *OBD System Check*
2	1. Start the engine. Run the engine at idle. 2. Review and record Tech 2 Freeze Frame data. 3. Monitor “Misfire Cur. #2” on the Tech 2. Is “Misfire Cur. #2” increasing (indicating a misfire currently occurring)?	—	Go to *Step 4*	Go to *Step 3*
3	Monitor “Misfire Hist. #2” while operating the vehicle to duplicate the conditions present when the DTC was set (as defined by the Freeze Frame data recorded in Step 2). Is “Misfire Hist. #2” increasing (indicating a misfire currently occurring)?	—	Go to *Step 4*	Refer to *Diagnostic Aids*
4	1. Visually and physically inspect the vacuum hoses for splits, kinks, and improper connections. Also, inspect the intake manifold for a vacuum leak. 2. If a problem is found, repair it as necessary. Did the inspection reveal a problem?	—	Verify repair	Go to *Step 5*
5	1. Install a spark tester at the spark plug end of the cylinder #2 ignition coil. 2. Crank the engine while observing the spark tester. A crisp, blue spark should be observed. Is adequate spark present?	—	Go to *Step 8*	Go to *Step 6*

Clutch Switch

Removal and Installation

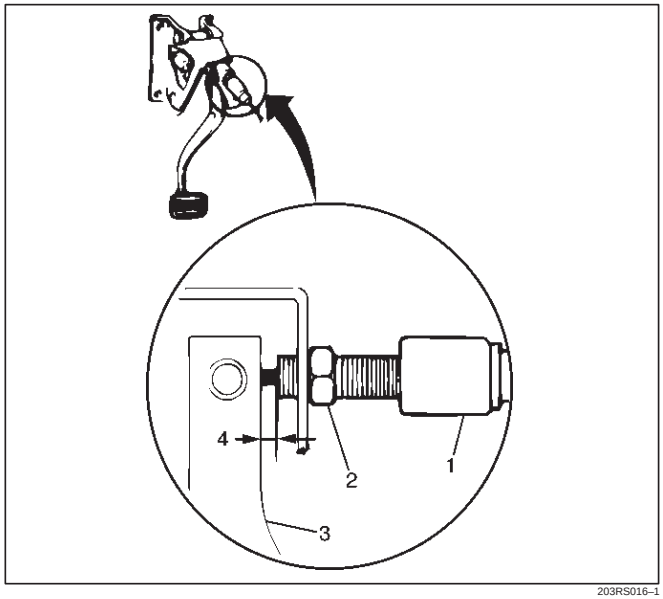
Refer to the Clutch Control removal and installation steps in Clutch section.

Adjustment

1. Turn the clutch switch (1) until the switch plunger is fully retracted against the clutch pedal arm.
2. Adjust clutch switch by backing it out half a turn and measure the clearance (4) between the clutch pedal arm (3) and the clutch switch.
3. Lock the lock nut(2).
4. Connect clutch switch connector.

Clutch Switch (bolt) and Clutch Pedal Clearance

0.5 – 1.5 mm (0.020 – 0.059 in)



203RS016–1

Powertrain Control Module (PCM)

Removal and Installation

Refer to Powertrain Control Module (PCM) in Engine section.

Mode Switch

Removal and Installation

Refer to Mode Switch in Automatic Transmission section.