DAIHATSU

TERIOS

J100

EF

TO INDEX

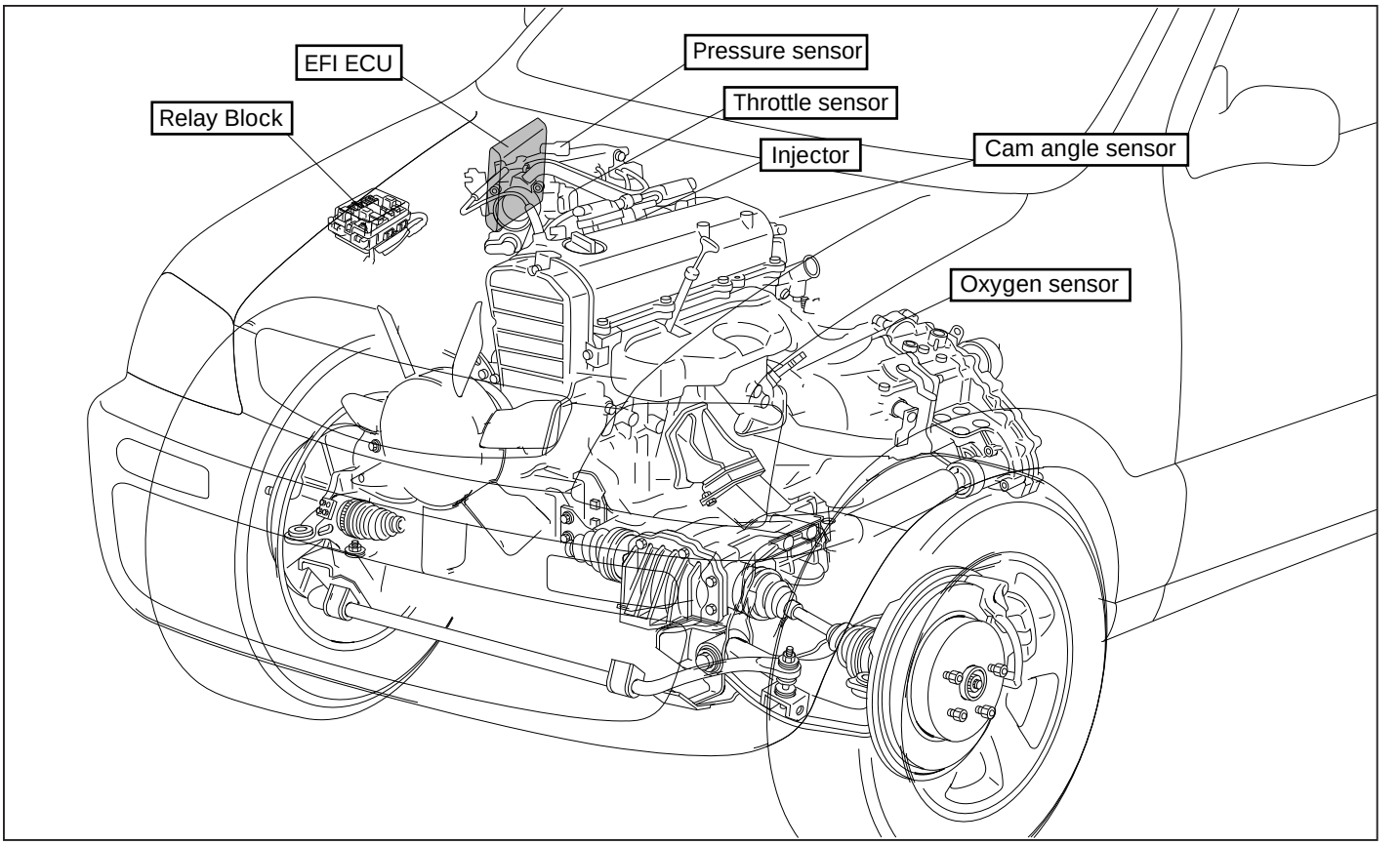
EFI SYSTEM

JEF00001-00001

NO. 9710-JE

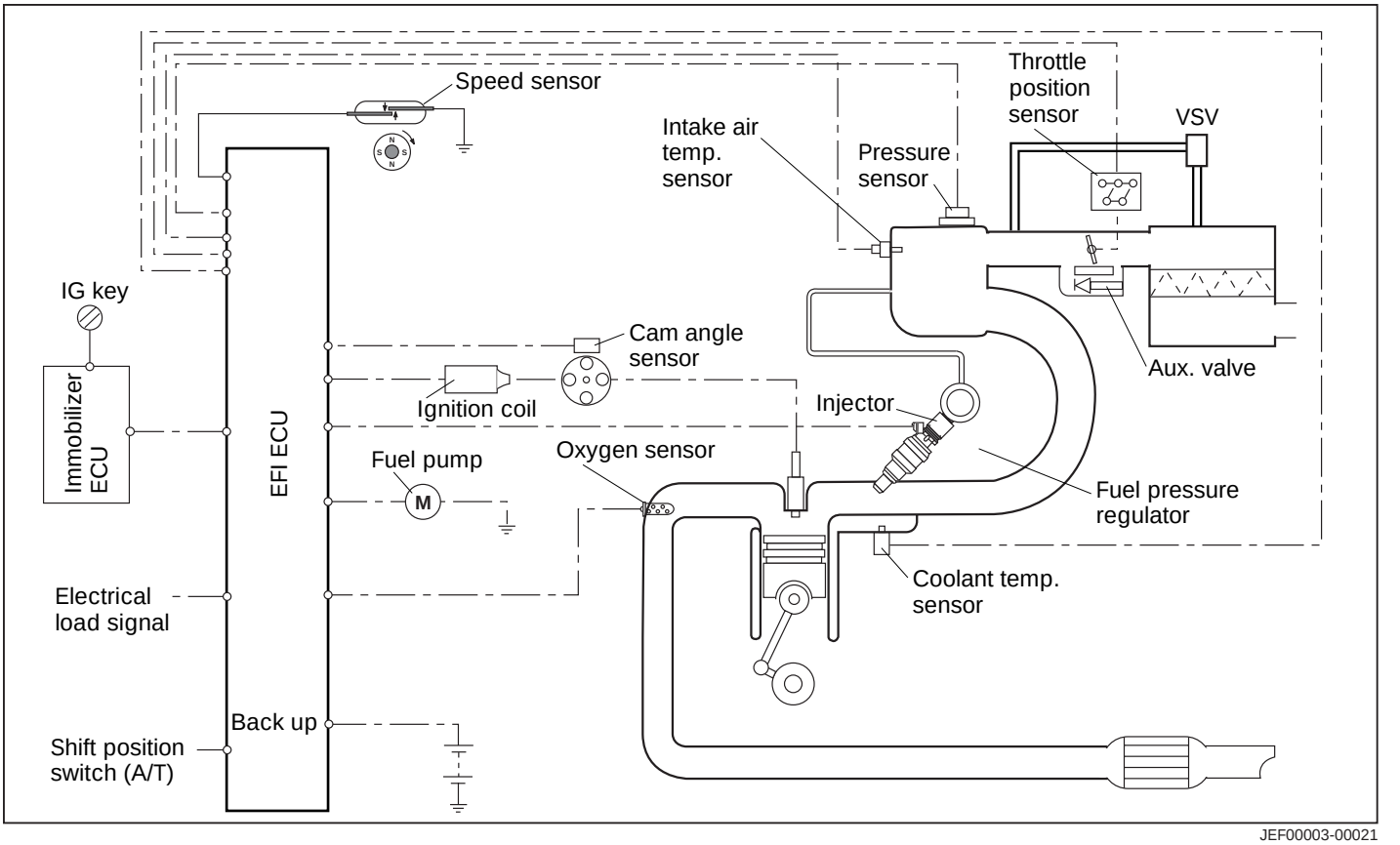
SYSTEM DESCRIPTION

LOCATION OF ELECTRONIC CONTROL PARTS



JEF00002-00011

SYSTEMATIC DIAGRAM

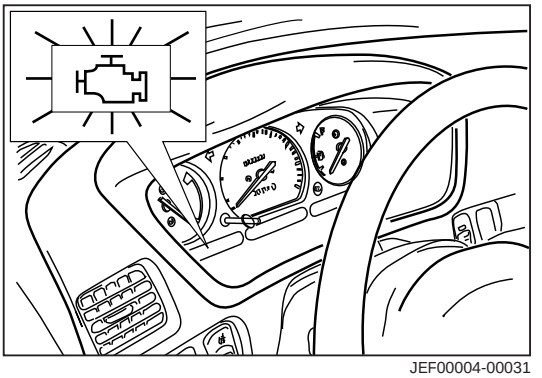


JEF00003-00021

DIAGNOSIS SYSTEM

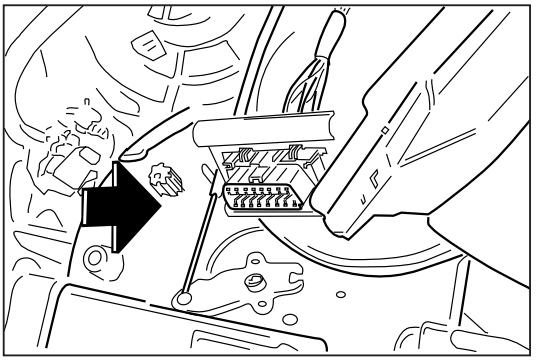
DESCRIPTION

A self-diagnosis system is built in the ECU. If any abnormality should occur in the signal systems of various sensors, the self-diagnosis system memorizes the malfunction code number in the ECU. In respect to important abnormalities, the check engine lamp at the instrument panel goes on, thus warning the driver of the abnormality.
When the abnormality is cleared, the check engine lamp goes out.
When the Test terminal of the diagnosis connector is connected with the earth terminal, the malfunction code number that has been memorized in the ECU will be indicated in a form of blinking of the check engine lamp in the instrument panel.


JEF00004-00031

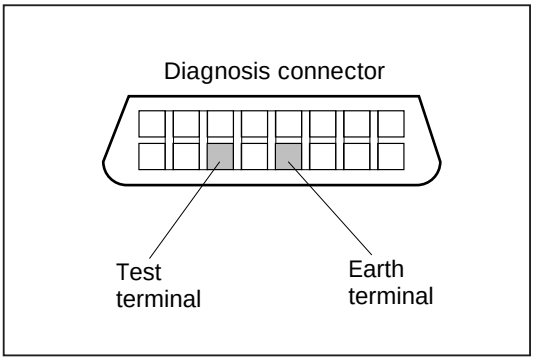
CHECK ENGINE LAMP

1. When the ignition switch is turned on, the check engine lamp goes on.
   (The engine is under a stopped state.)
2. When the engine starts, the check engine lamp goes off.
   If the check engine lamp remains illuminated, it indicates that the diagnosis system has detected system malfunction.


JEF00005-00032

READING OUT OF DIAGNOSIS CODE

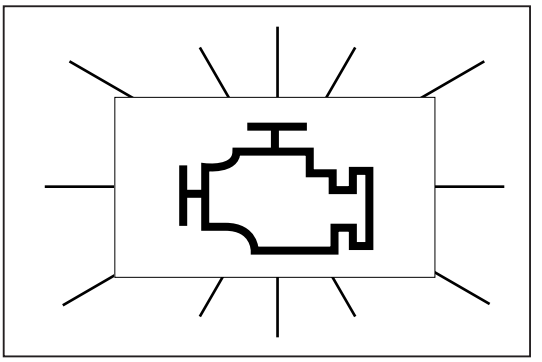
1. Initial conditions
   (1) Battery voltage of 11 volts or more
   (2) Throttle valve fully closed
   (3) All accessory switches turned OFF
2. Reading out of diagnosis code
   (1) Connect the terminal between the test terminal and the earth terminal with a jump wire as indicated in the illustration.
   (2) Turn the ignition switch to the “ON” position. At this time, be careful not to start the engine.
   (3) Read out the diagnosis code by observing the flashing number of the check engine lamp.



JEF00006-00033

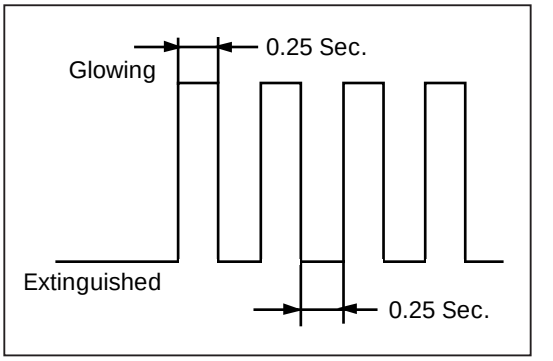
NOTE:

- When system malfunction was detected, go to page EF–18, “TROUBLE SHOOTING ACCORDING TO DIAGNOSIS SYSTEM”.
- If the check engine lamp fails to blink, it is likely that the ECU is malfunctioning. Hence, proceed to the inspection of the diagnosis system circuit.


JEF00007-00034

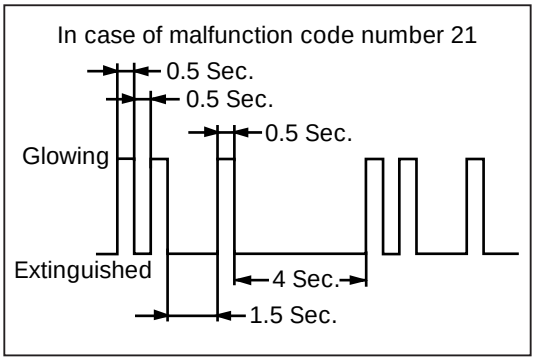
EXPLANATION OF DIAGNOSIS CODES

1. Indication of normal code
   The engine check lamp glows for 0.25 second, 0.25 second after the ignition switch has been turned ON. After a lapse of 0.25 second, the check engine lamp again glows for 0.25 second.
   Then, this pattern will be repeated.



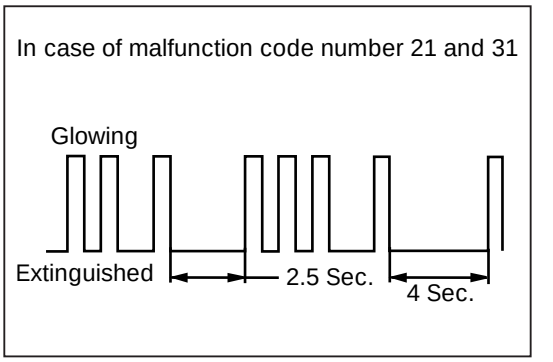
JEF00008-00036

2. Indication of malfunction code
   (1) When a single malfunction code is indicated:
   The diagnosis code is composed of two digits. These two numbers are indicated by blinking of the check engine lamp. Four seconds after the ignition switch has been turned ON, the check lamp indicates first the number of the tens digit of the diagnosis code by glowing the same times as the number. The lamp glows for 0.5 second each time and then it is extinguished for 0.5 second. After a pause of 1.5 seconds, the check lamp indicates the number of the units digit of the diagnosis code by glowing the same times as the number. The lamp glows for 0.5 second each time and then it is extinguished for 0.5 second. Then, this pattern will be repeated after a pause of 4 seconds.



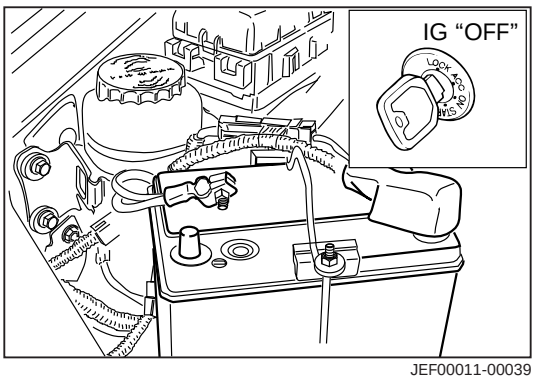
JEF00009-00037

   (2) When plural malfunction codes are indicated:
   In cases where plural malfunction codes have been detected, the two-digit diagnosis codes are indicated in the sequence of the code number, starting from a smaller number. Each diagnosis code is indicated in the above described pattern. A pause of 2.5 seconds occurs between the outputs of respective diagnosis codes, thus separating one from another. After all of the plural diagnosis codes that have been detected are indicated, the check engine lamp is extinguished for four seconds. Then, the detected plural diagnosis codes will be indicated again.



JEF00010-00038

3. Canceling of diagnosis code
   To erase the diagnosis codes memorized in the ECU after malfunctions have been repaired, disconnect the battery ground cable from the negative (–) terminal of the battery for at least 10 seconds with the ignition switch turned OFF. [When ambient temperature is about 20°C.]
   NOTE:
   - After the diagnosis codes have been read, remove the SST at the diagnosis connector.



JEF00011-00039

SUMMARY OF TROUBLE SHOOTINGS

NOTE:

- Prior to the troubleshooting according to malfunction phenomena, conduct the basic inspections so as to narrow down the possible causes for malfunctions. For instance, if the spark inspection of the basic inspection proves to be normal, it can be assumed that the ignition system is functioning normally. Moreover, the information obtained during diagnosis through questions can help further narrow down the possible causes.

Malfunction phenomena / Possible malfunctioning parts		Poor starting				Unstable idling					Engine stalling			Poor running			
		No initial combustion takes place.	Although initial combustion takes place, combustion is not complete.	Hard starting (during cold period)	Hard starting (during hot period)	Fast idle is not effective.	Idle revolution speed is too low.	Idle revolution speed is too high.	Unstable idling	Hunting during idling	Engine stalls at time when vehicle moves off.	Engine stalls when accelerator pedal is released.	Engine stalls during idling.	Hesitation during acceleration period	Hunting during running	Lack of output	Knocking
Control system	Pressure sensor		●	●	●				●	●	●	●	●	●	●	●	●
	Water temperature sensor		●	●	●	●		●	●		●		●	●		●	
	Intake air temperature sensor		●	●	●									●		●	●
	Throttle position sensor										●		●	●	●	●	●
	Air conditioner switch						●	●		●							
	Oxygen sensor								●			●	●				
	Neutral start switch						●										
	Cam angle sensor	●											●	●	●		
Fuel system	Fuel pump system	●	●						●				●	●	●	●	
	Pressure regulator	●	●	●	●	●			●				●	●	●	●	
	Fuel filter	●	●	●	●								●	●	●	●	
	Injector	●	●	●	●	●			●				●	●	●	●	
Ignition system	IG coil	●											●		●		
	Spark plug	●	●	●	●				●				●	●		●	
	Resistive cord	●	●	●	●		●		●				●	●		●	
	Ignition timing		●	●			●				●					●	●
Air intake system	Idle-up VSV						●	●	●	●	●	●					
	Throttle valve			●		●	●	●	●	●						●	
	Throttle body								●	●						●	
	Hose, etc., disconnected		●	●	●				●	●			●	●			
Power supply system	ECU power supply circuit	●															
	IG switch	●															
	Fuel pump relay	●															
	Main relay	●															

JEF00012-00101

CAUTION FOR IMMOBILIZER-EQUIPPED VEHICLE

1. The immobilizer system is formed by communication between the Immobilizer ECU and the EFI ECU by means of the rolling code. The rolling code will be automatically retained both in the immobilizer ECU and in the EFI ECU when the engine is started once with the key of the immobilizer system. The engine will not start if the rolling code in the immobilizer ECU and EFI ECU are not identical. Therefore, the engine will not start when using the EFI ECU which was mounted before on another vehicle with the immobilizer system without resetting the rolling code.

JEF00013-00102

2. Even when the EFI ECU has been replaced according to the check results of the trouble shooting and the relevant malfunction has been remedied, be sure to reinstall the old EFI ECU so as to confirm that the malfunction was obviously caused by the faulty EFI ECU.
   NOTE:
   - Be sure to reset the rolling code in the EFI ECU and Immobilizer ECU using a diagnosis tester (DS-21). Furthermore, registration of the ignition key should be performed when installing the EFI ECU which was mounted on the vehicle equipped with the immobilizer system to another vehicles.
   - Refer to the BE section of the service manual.

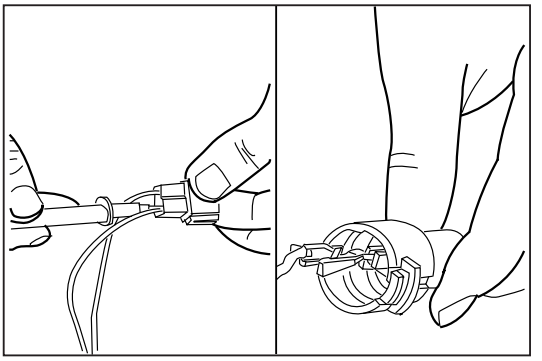
JEF00014-00103

3. However, the engine can start when using the EFI ECU which was mounted on a vehicle without the immobilizer system. However, after completion of the test where this EFI ECU was used for the vehicle with the immobilizer system, if this EFI ECU is returned to the original vehicle, the engine of the original vehicle will not start any more.

JEF00015-00104

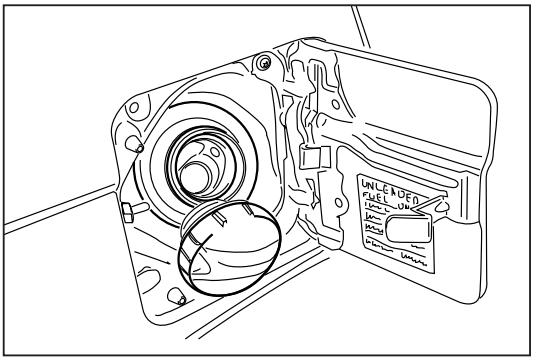
PRECAUTIONS

1. When resistance or voltage measurement is conducted at the connector section, insert a measuring probe from the back of the connector, being very careful not to damage the harness to terminal connections.
   In the case of water-proof type connectors, a measurement is conducted at the connector section, while the measuring probe is in contact with the terminal at the connection side of the connector. Be very careful not to apply any excessive force to the terminal at the connector side.
   As an alternative method, insert a male or femele terminal into the connector terminal or connect an adequate attachment.



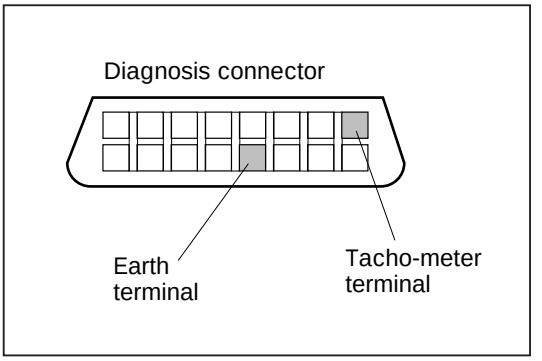
JEF00016-00201

2. The fuel line at the high-pressure side is pressurized to a fuel pressure of about 284 kPa. Therefore, a large amount of gasoline flows out when parts of the fuel line are disconnected. Hence, take the following countermeasures.
   WARNING
   - Release the inner pressure of the fuel tank by removing the fuel filler cap in advance.



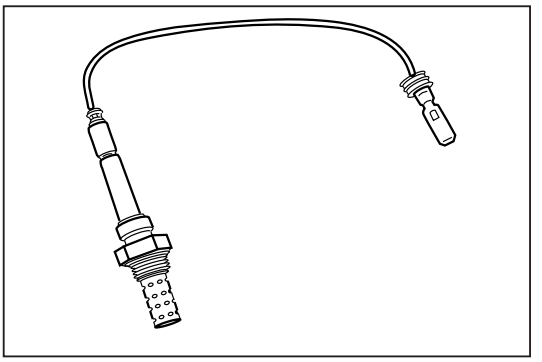
JEF00017-00202

3. Tachometer connection
   Connect a tachometer probe to the measuring terminal of the diagnosis connecter.
   CAUTION:
   - This does not apply if your tachometer is a pick-up type.
   - Never allow the tachometer probe to touch the ground, for it could result in damage to the igniter and/or ignition coil.
   - Some kinds of tachometers may not be suited for the ignition system of the vehicle. Therefore, ensure that your tachometer is compatible with the ignition system of the vehicle.



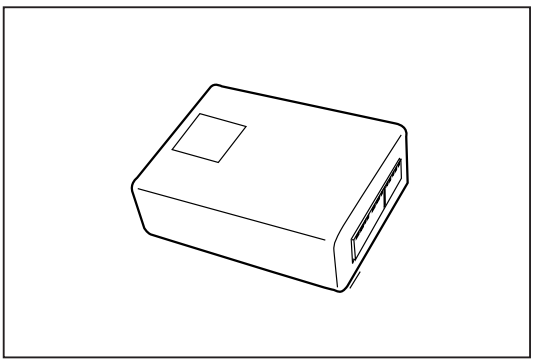
JEF00018-00203

4. Precautions during oxygen sensor handling
   (1) Do not drop the oxygen sensor or hit it to other objects.
   (2) Do not immerse the sensor in water or do not cool it by water.
5. Do not open the cover of the ECU proper.
   (Failure to observe this caution could cause ECU malfunction.)



JEF00019-00204

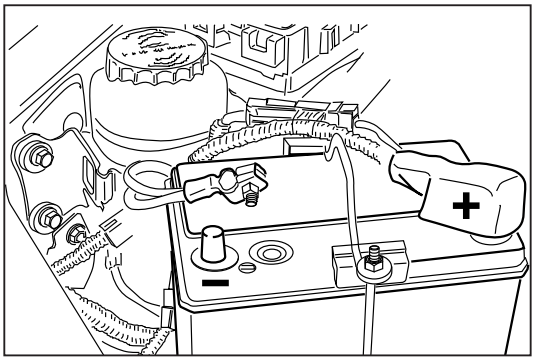
6. Before disconnecting or reconnecting the connector of the ECU proper of the EFI system, be sure to turn off the ignition switch and all accessory switches. Also, disconnect the battery ground cable from the battery negative terminal.
   Failure to observe this caution could cause ECU malfunction.
7. Never apply strong impacts to the EFI parts. Pay utmost attention during the installation/removal.
   Especially, special caution must be exercised as to the handling of the ECU.



JEF00020-00205

8. When installing the battery, care must be exercised not to mistake the battery polarity.
   CAUTION:
   - A battery of 12 volts for automotive use must be used.

9. When the voltage or resistance of the ECU is measured during the check, never touch terminals other than the specified terminals. Failure to observe this caution could cause ECU malfunction.



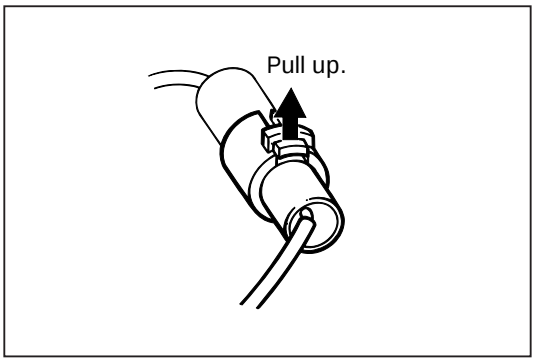
JEF00021-00207

10. When the system is checked on a rainy day, be very careful not to allow water to get to connectors and/or terminals. Also, when the engine compartment is washed, prevent water from splashing the EFI-related parts and connectors.
11. Every EFI part should be replaced as an assembly.

JEF00022-00208

12. When disconnecting or reconnecting the connector, care must be exercised as to the following points.
    (1) Carefully observe the shape of the lock prior to the disconnection/connection.
    (2) Release the lock. Then, disconnect the connector.
    NOTE:
    - When disconnecting the connector, be sure to hold the connector holder, not to pull the wire.

    (3) Insert the connector, until the lock is engaged completely.
    (4) Be sure to keep the number of disconnection/reconnection of the connector at a minimum level.



JEF00023-00209

13. When the vehicle is equipped with wireless installations (HAM, CB, etc.)
    The ECU has been so designed that it is resistant to external influence.
    However, if a vehicle is equipped with a CB wireless installation and so forth (even if its output is only 10 W), it may affect the ECU adversely. Therefore, observe the following precautions.

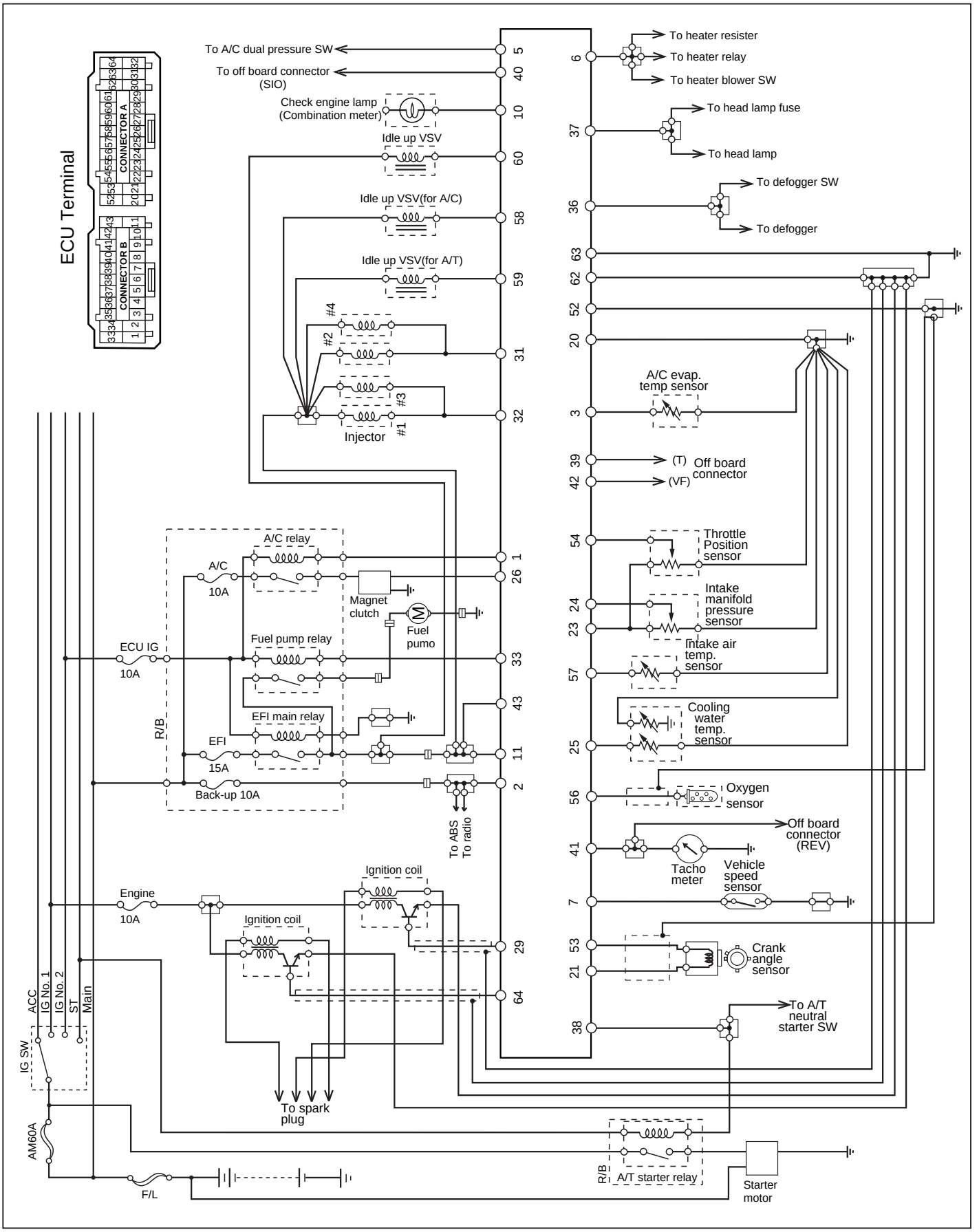
JEF00024-00211

    (1) Install an antenna at a place as far away as possible from the ECU.
    The ECU is installed under the instrument panel.
    Therefore, the antenna should be installed at the rear of the vehicle.
    (2) The antenna cord should be kept at least 20 cm away from the engine wire. Never wind the antenna cord together with the engine wire with tapes.
    (3) Adjust the antenna output correctly.
    (4) Never install a wireless installation with a high output on the vehicle.

JEF00025-00212

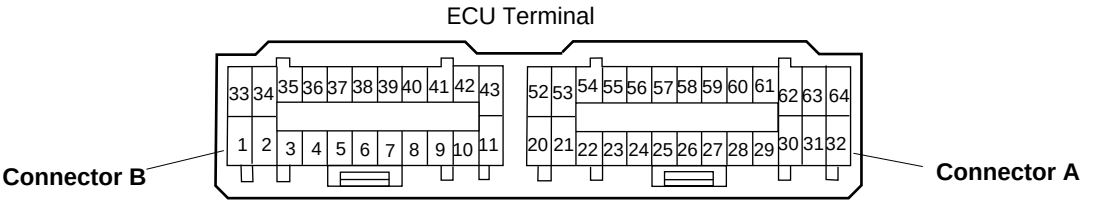
BASIC INSPECTION

WIRING DIAGRAM OF EFI SYSTEM



JEF00026-00301

ARRANGEMENT OF EFI ECU TERMINAL



CONNECTOR A

No.		Contents of connection	No.		Contents of connection
20	E1	Sensor system ground	52	E2	Sensor ground
21	N+	Cam angle sensor (+)	53	N–	Cam angle sensor
22	—	Throttle position sensor (Idle)	54	PSW	Throttle position sensor
23	VC	Pressure sensor power supply	55	—	
24	PIM	Pressure sensor signal	56	Ox	Oxygen sensor
25	THW	Coolant temperature sensor	57	THA	Intake air temperature sensor
26	KNK	A/C lock sensor	58	VSV3	Idle up VSV (for A/C)
27	—		59	VSV2	Idle up VSV (for A/T)
28	ALT	Alternator cut	60	VSV1	Idle up VSV (for electrical load)
29	IG2	Ignition signal (#2,#3 cylinder)	61	—	
30	—		62	E01	Power supply system ground
31	#20	Injector (#2, #4 cylinder)	63	E02	Ignition system ground
32	#10	Injector (#1, #3 cylinder)	64	IG1	Ignition signal (#1, #4 cylinder)

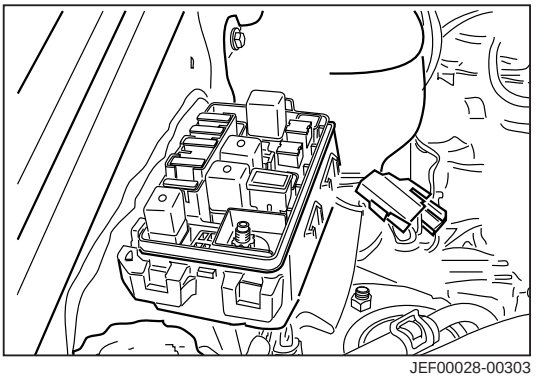
CONNECTOR B

No.		Contents of connection	No.		Contents of connection
1	MGC	A/C Magnet clutch	33	FC2	Fuel pump relay (Without IMB.)
2	BAT	Battery (Back-up power supply)	34	FC1	Fuel pump relay (With IMB.)
3	ACEV	A/C Evaporator temp, sensor	35	—	
4	—		36	DEF	Defogger switch
5	ACSW	A/C Switch	37	H/L	Headlamp switch
6	BLW	Heater blower	38	A/T	Neutral start switch
7	SPD	Vehicle speed sensor	39	T	Test terminal
8	—		40	SIO	Diagnosis tester
9	—		41	REV	Engine speed signal
10	W	Check engine lamp	42	VF	VF monitor terminal
11	+B1	Power supply	43	+B2	Power supply

JEF00027-00302

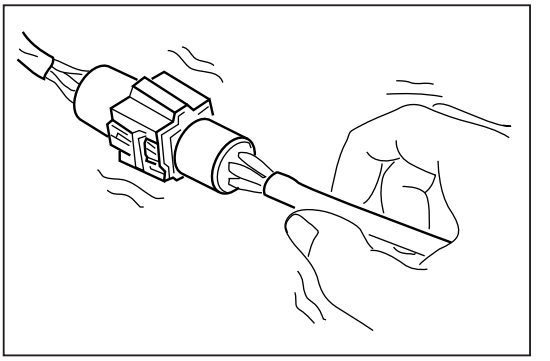
Trouble shooting hints

1. In most cases, engine troubles are attributable to systems other than the EFI system.
   (1) Battery voltage, fuse blown or fusible link blown
   (2) Body earth
   (3) Fuel leakage, fuel filter clogged or fuel pump malfunctioning
   (4) Spark plugs faulty, spark plug wires faulty, distributor faulty, igniter faulty, or ignition timing adjusted improperly
   (5) Admission of air



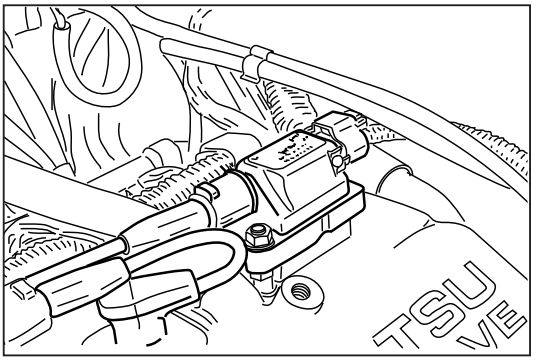
JEF00028-00303

2. Most of troubles related to the EFI system are merely caused by poor wire connections.
   Ensure that connectors are connected securely.
   Check connectors, being careful as to the following points.
   (1) Visually inspect that terminals are not bent.
   (2) Ensure that connectors are securely connected and locked.
   (3) Check to see if the malfunction phenomenon takes place when applying light vibration to the connector or the wire connected to the connector.



JEF00029-00305

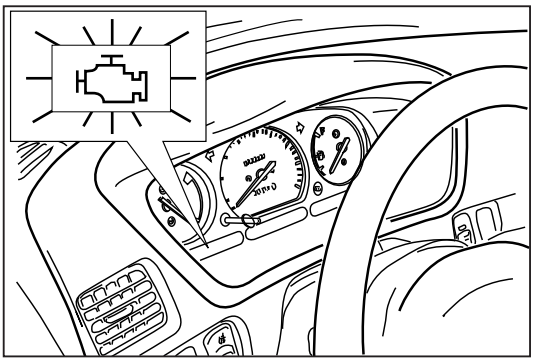
3. If engine misfire takes place, the following measures should be taken.
   (1) Ensure that the battery terminals and so forth are connected properly.
   (2) Handle the spark plug wires carefully.
   (3) After completion of repairs, ensure that the ignition coil terminals and other ignition system wire are reconnected securely.



JEF00030-00306

Check to see if diagnosis detects malfunction code.

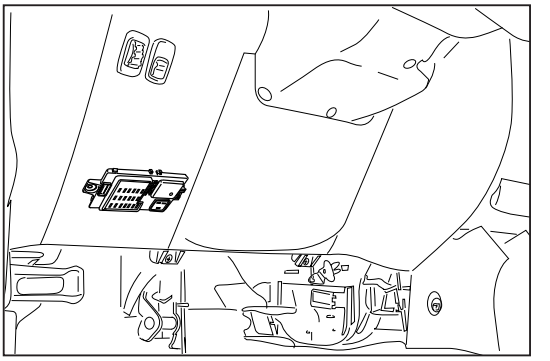
1. Check of diagnosis code
   When the engine starts, the check engine lamp in the combination meter remains illuminated. It indicates that the diagnosis has detected system malfunctions.
2. Read out the diagnosis code.
   NOTE:
   - See page EF–4.
   - When system malfunction has been detected, proceed to page EF–18, “TROUBLE SHOOTING ACCORDING TO DIAGNOSIS SYSTEM”.



JEF00031-00309

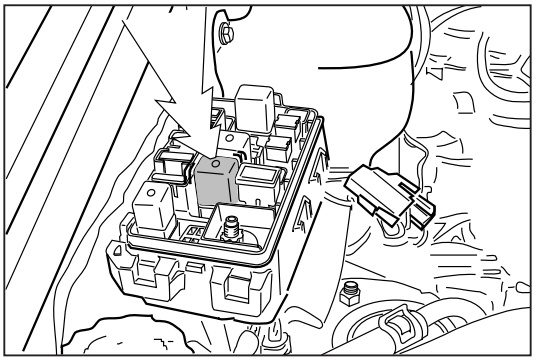
Check of power supply circuit

1. Check the fuses and fusible link.
   If the fuses are blown out, be sure to perform the trouble shooting.



JEF00032-00311

2. Check the EFI main relay.
   (a) Turn the ignition switch to the “ON” position. Check to see if the relay emits an operating sound.

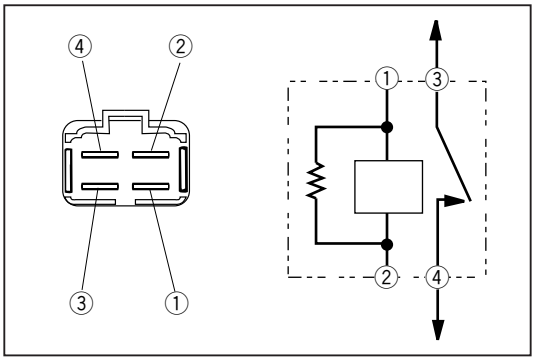


JEF00033-00312

   (b) Remove the EFI main relay from the relay box.
   Check that there is continuity between the terminals 1 and 2.
   Specified Resistance: 40 - 100 Ω

   (c) Check that there is continuity between the terminals 3 and 4 when a voltage of 12 V is applied to across the terminals 1 and 2.

   NOTE:
   - Even when the trouble has not been solved by repairing the relay, check the wire harness.



JEF00034-00313

3. Check the fuel pump relay.
   (a) When the ignition switch is set to the “ON” position, check to see if the relay emits an operating sound.
   (b) Remove the fuel pump relay from the relay box.
   Check that there is continuity between the terminals 1 and 2.
   Specified Resistance: 40 - 100 Ω

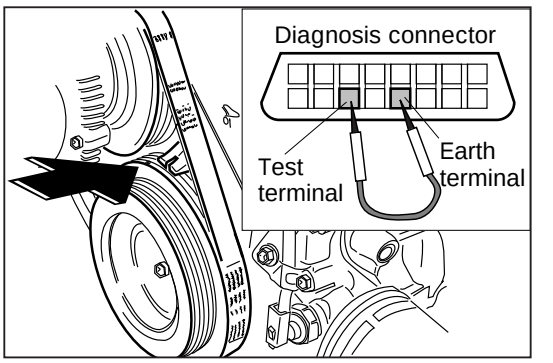
   (c) Check that there is continuity between the terminals 3 and 4 when a voltage of 12 V is applied to across the terminals 1 and 2.

JEF00035-00314

Check of ignition system

1. Connect a timing light to the ignition wire of the No. 1 cylinder.
2. Check to see if the ignition timing mark on the crankshaft pully is aligned with the indicator.
   Specified Value: 0 ± 2° BTDC/ at Idle

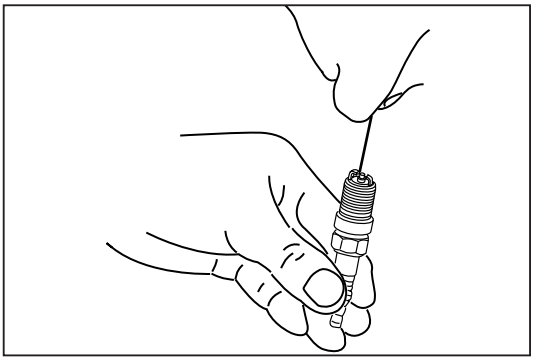
   NOTE:
   - Remove the air cleaner case.
   - Connect the test terminal and the earth terminal with a jump wire at the diagnosis connector.



JEF00036-00319

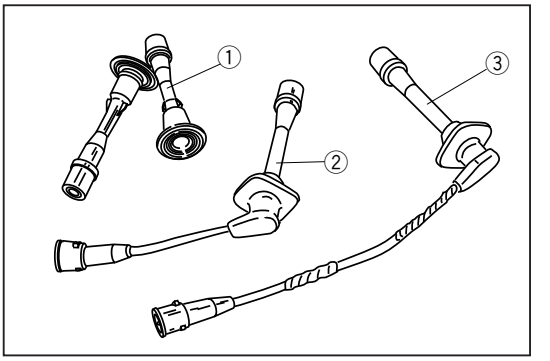
3. Remove the spark plug(s).
4. Visually inspect the spark plug for electrode wear, thread or insulator damage.
5. Measure the electrode gap, using a plug gap gauge.
   Specified Value: 0.9 - 1.0 mm (NGK, DENSO)

   NOTE:
   - If the gap will not conform to the specification, replace the plug.


JEF00037-00320

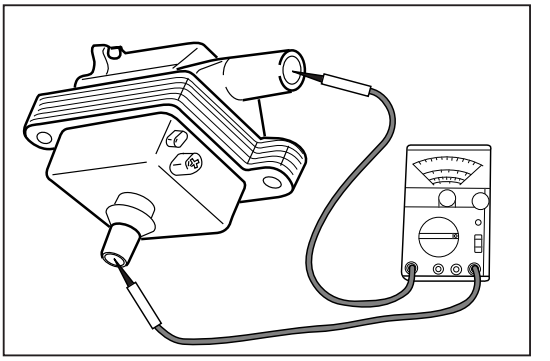
6. Check if the resistance of the the spark plug distance piece and the ignition wire is within the specification.
   Spark Plug Distance Piece 1: 0.3 Ω or less
   Ignition Wire 2: 3.8 kΩ
   Ignition Wire 3: 5.6 kΩ

   NOTE:
   - Remove the ignition coils from the cylinder head cover. Then, remove the wire and distance piece.



JEF00038-00321

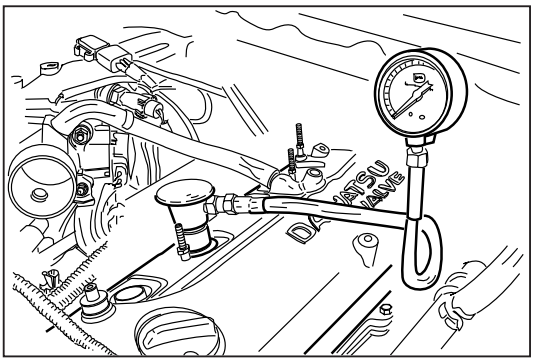
7. Check if the ignition coil resistance is within the specification.
   Secondary Coil: 13.6 - 2.0 kΩ


JEF00039-00322

Check of compression pressure

1. Temporarily remove the main relay and fuel pump relay.
2. Insert a compression gauge into the spark plug hole.
3. Depress the accelerator pedal fully.
4. While cranking the engine, measure the compression pressure.
   Minimum Value: 1030 kPa at 300 rpm

   NOTE:
   - Always use a fully charged battery so that at least a revolution speed of 300 rpm is attained.


JEF00040-00323

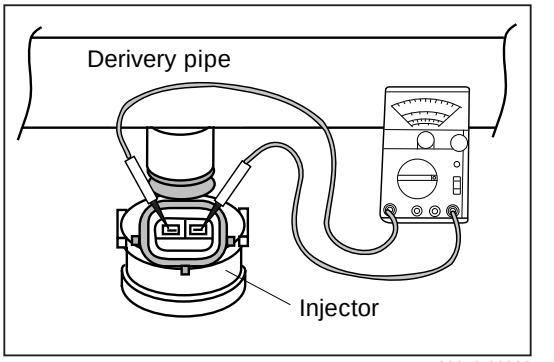
Check of fuel system

1. Using a sound scope, check to see if each injector emits an operating sound when the engine is being started or cranked.
   NOTE:
   - If a sound scope is not available, apply a screwdriver or the like to the injector. So you can feel an operating vibration.
   - If the injector emits no operating sound, check the wiring or connectors. Then, perform the following procedure.

JEF00041-00331

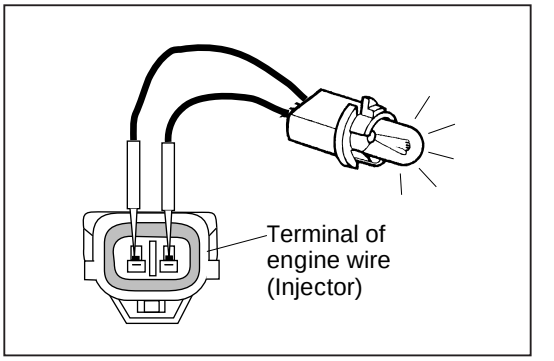
2. Disconnect the injector connector of the engine wire.
3. Measure the resistance between the terminals of each injector.
   Specified Resistance: 11 - 17 Ω (at 20°C)

   NOTE:
   - If the resistance is not within the specification, replace the injector.
   - If the resistance will conform to the specification, perform the following procedure.



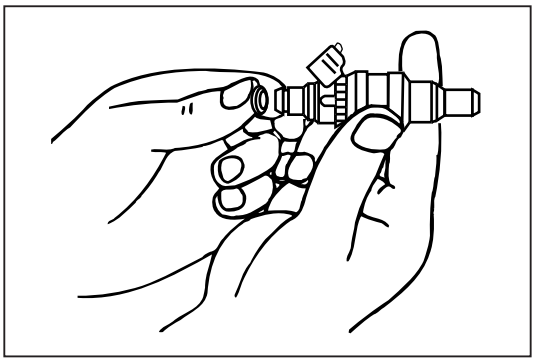
JEF00042-00332

4. Using a test lamp (12 V 6 W), check to see if the lamp will be illuminated as shown in the illustration when the engine is being started or cranked.
   If not, check the wiring harness and ECU output.

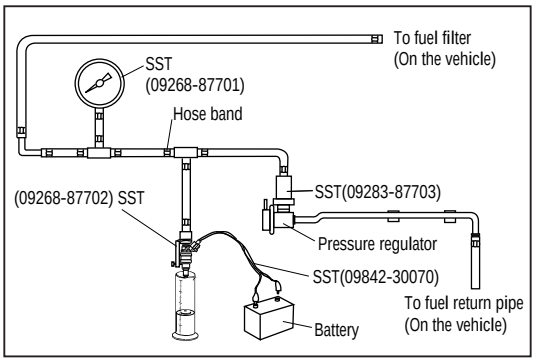


JEF00043-00333

5. Remove the fuel delivery pipe.
   Remove the injectors.
6. Remove the injector grommet and O-ring.
   NOTE:
   - Check to see if the injector grommet exhibits damage.

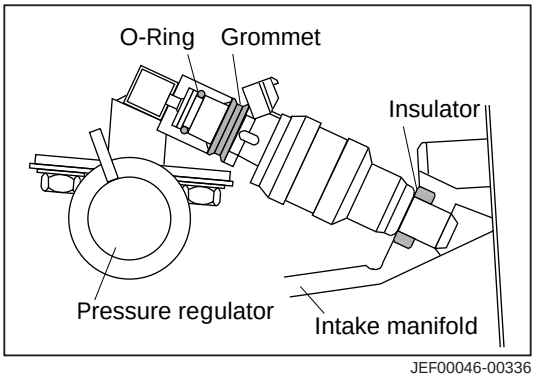

JEF00044-00334

7. Using the following SSTs, connect the injector, as indicated in the figure. Insert the injector into the measuring cylinder.
   SST:
   (1) 09268-87701-000
   (2) 09268-87702-000
   (3) 09842-30070-000



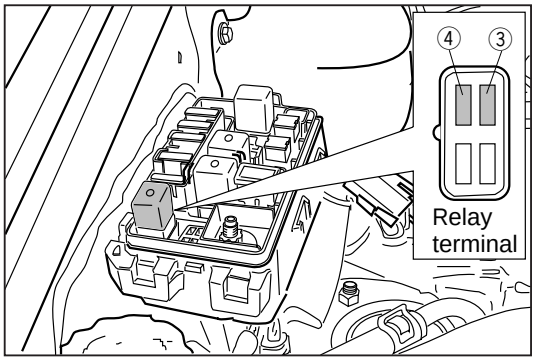
JEF00045-00335

   NOTE:
   - Install a new grommet to the injector.
   - Install a new O-ring to the O-ring seal section.
   - Attach the hose bands to the rubber hose connections.



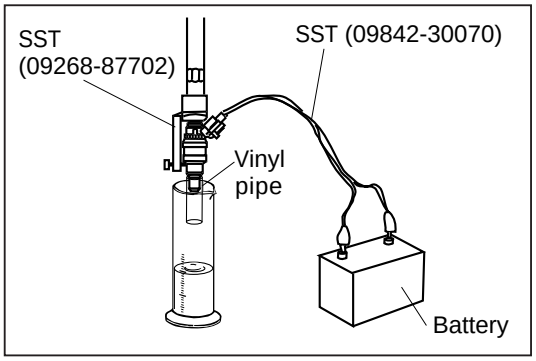
JEF00046-00336

8. Remove the fuel pump relay. Then, connect the terminal with a jump wire as shown in the illustration.
9. Turn the ignition switch to the “ON” position.



JEF00047-00337

10. Connect the SST wire to the battery terminal for 15 seconds.
11. Measure the amount of fuel collected in the measuring cylinder.
    Specified Amount of Fuel: Approx. 42 - 48 ml
    Variation Between Injectors: 5 ml or less



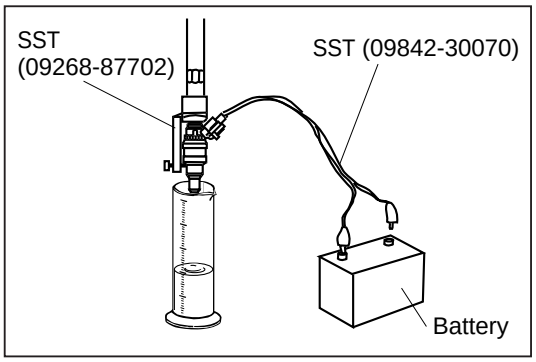
JEF00048-00338

NOTE:
- Attach a suitable vinyl hose to the tip-end of the injector so as to prevent fuel from splashing.
- Conduct the measurement two or three times for each injector.
- Before the injector is pulled out, make certain to turn off the ignition switch.
- When removing the injector, use a suitable cloth or the like so as to prevent fuel from splashing.
- Prior to the test, perform air bleeding for the fuel hose.

JEF00049-00338

12. Ensure that no fuel is leaking from the injector nozzle when the SST wire is removed from the battery terminal.
    Specification: Less than one drop of fuel per minute

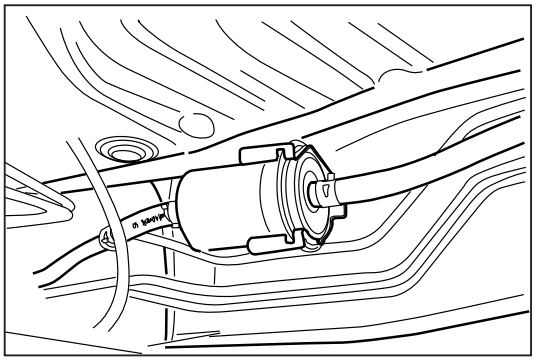
NOTE:
- If the leakage exceeds the specification, replace the injector.



JEF00050-00339

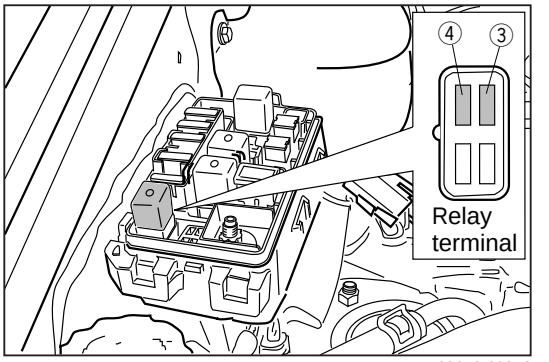
13. Turn off the ignition switch.

14. Loosen the hose band at the fuel filter.
15. Connect a suitable fuel hose (about 2 meter long) to the fuel filter.
16. Insert one end of the fuel hose in a measuring cylinder.
    CAUTION:
    - The fuel pressure of the fuel line is approximately 284 kPa. Hence, be sure to gradually remove the pipe so as to prevent fuel from splashing.
    - Since the fuel will flow out, be certain to place a suitable container or cloth under the fuel filter so that no fuel may get to the resin or rubber parts of the vehicle.



JEF00051-00341

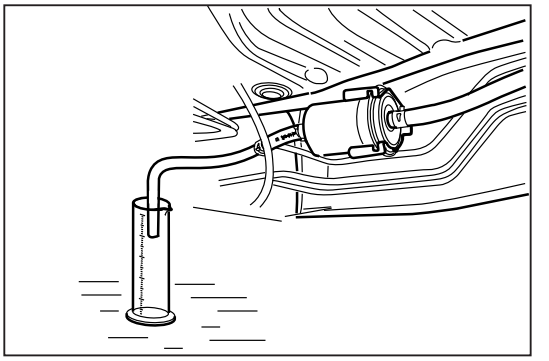
17. Remove the fuel pump relay. Then, connect the terminal with a jump wire as indicated in the illustration.
18. Turn the ignition switch to the “ON” position for 10 seconds. Then, turn off the ignition switch.



JEF00052-00342

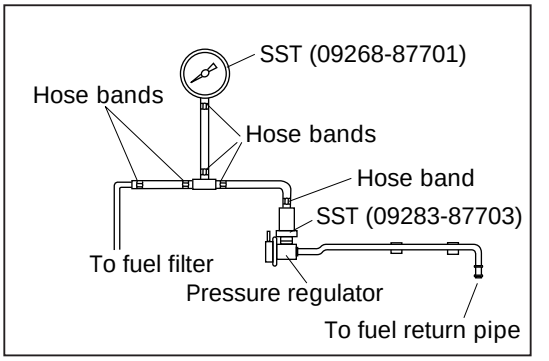
19. Measure the amount of fuel collected in the measuring cylinder.
    Specified Amount of Fuel: 230 ml or more

    NOTE:
    - Check to see if the fuel lines and filter exhibit leakage, deformation or choking.



JEF00053-00343

20. Remove the fuel pressure regulator from the fuel delivery pipe. Then, install a fuel pressure gauge between the pressure regulator and the fuel pipe from the fuel filter as shown in the illustration.
    SST: 09268-87701-000
    09283-87703-000



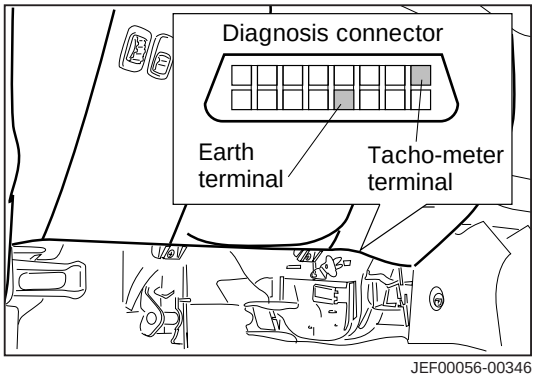
JEF00054-00344

21. Turn the ignition switch to the “ON” position.
22. Check to see if the fuel pressure conforms to the specified pressure.
    Specified Value: 284 ± 5 kPa

    NOTE:
    - If the fuel pressure is less than the specification, check the fuel pump and fuel pressure regulator.

JEF00055-00345

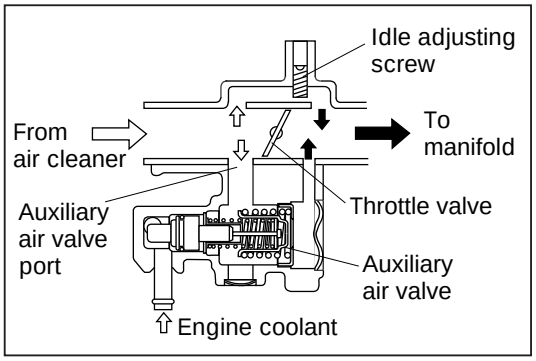
23. Check the idle revolution speed.
    (1) Connect a tachometer to the terminal of the diagnosis connector.
    (2) Check to see if the fast idle revolution speed is within the reference value.
        Reference Value: Around 1400 rpm/25°C



JEF00056-00346

NOTE:
- The fast idle revolution speed can not be adjusted to the specification. If the revolution speed will not conform to the reference value, perform the inspection of the auxiliary air system, following the procedure given below.

    (3) Remove the air cleaner case from the throttle body.
    (4) Start the engine. Check that there is air continuity at the auxiliary air port under the following conditions.
        ① Apply your finger to the auxiliary air valve port. Ensure that the engine speed drops.
        ② When the cooling water temperature is above 70°C, apply your finger to the auxiliary air port. Ensure that the engine speed does not change.



JEF00057-00347

NOTE:
- If the auxiliary air system exhibits malfunction, replace the throttle body.

    (5) Check to see if the idle revolution speed conforms to the specification when the engine water temperature is higher than 80°C.
        Specified Value
        M/T Vehicle: 800 ± 50 rpm
        A/T Vehicle: 850 ± 50 rpm

NOTE:
- If the revolution speed will not conform to the specification, check the EFI ECU unit. See page EF–41.

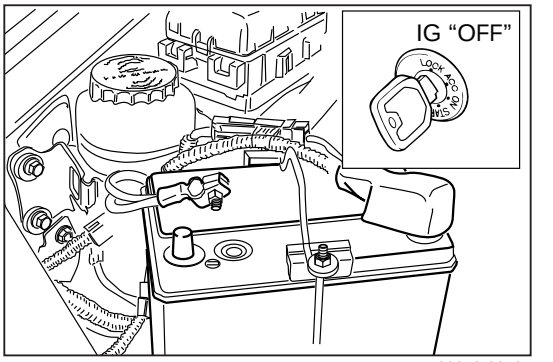
JEF00058-00348

TROUBLE SHOOTING ACCORDING TO DIAGNOSIS CODE

PREPARATION OF TROUBLE SHOOTING WITH SST

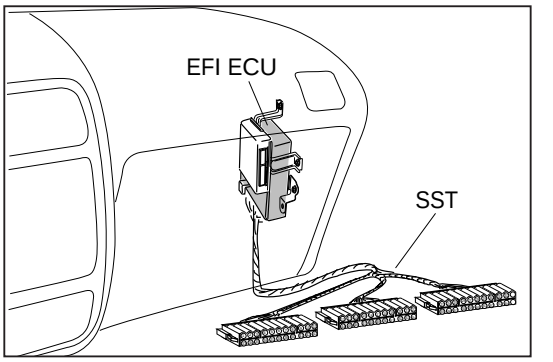
The EFI unit can be checked by measuring the resistance or voltage at the SST terminals.

1. Disconnect the battery ground cable from the negative (–) terminal of the battery.
   CAUTION:
   - Be sure to memorize the malfunction code before disconnecting the battery cable. Otherwise the maifunction code(s) will be erased by disconnecting the battery code.



JEF00059-00401

2. Disconnect the wire harness connectors from the EFI ECU connectors at the cowl side of the passenger seat.
3. Connect the following SST between the wire harness connectors and the EFI ECU connectors.
   SST: 09842-87706-000



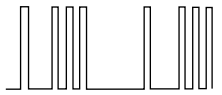
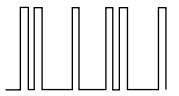
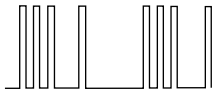
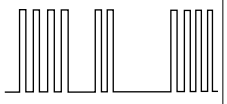
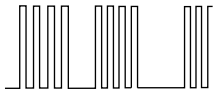
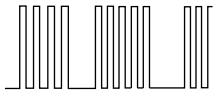
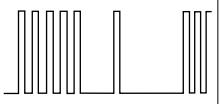
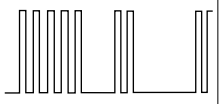
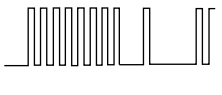
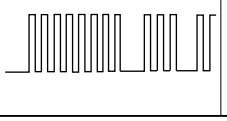
JEF00060-00402

4. Reconnect the battery ground cable to the negative (–) terminal of the battery.
   CAUTION:
   - When disconnecting or reconnecting the EFI ECU connectors, be sure to disconnect the battery ground cable from the negative (–) terminal of the battery with the ignition switch and all accessory switches in the off state.
   - When installing a new battery, care must be exercised not to mistake the battery polarity. Failure to observe this caution could cause ECU malfunction.
   - Before using the SST, be sure to check to see if short or open wire exists between the terminals of the SST.

JEF00061-00403

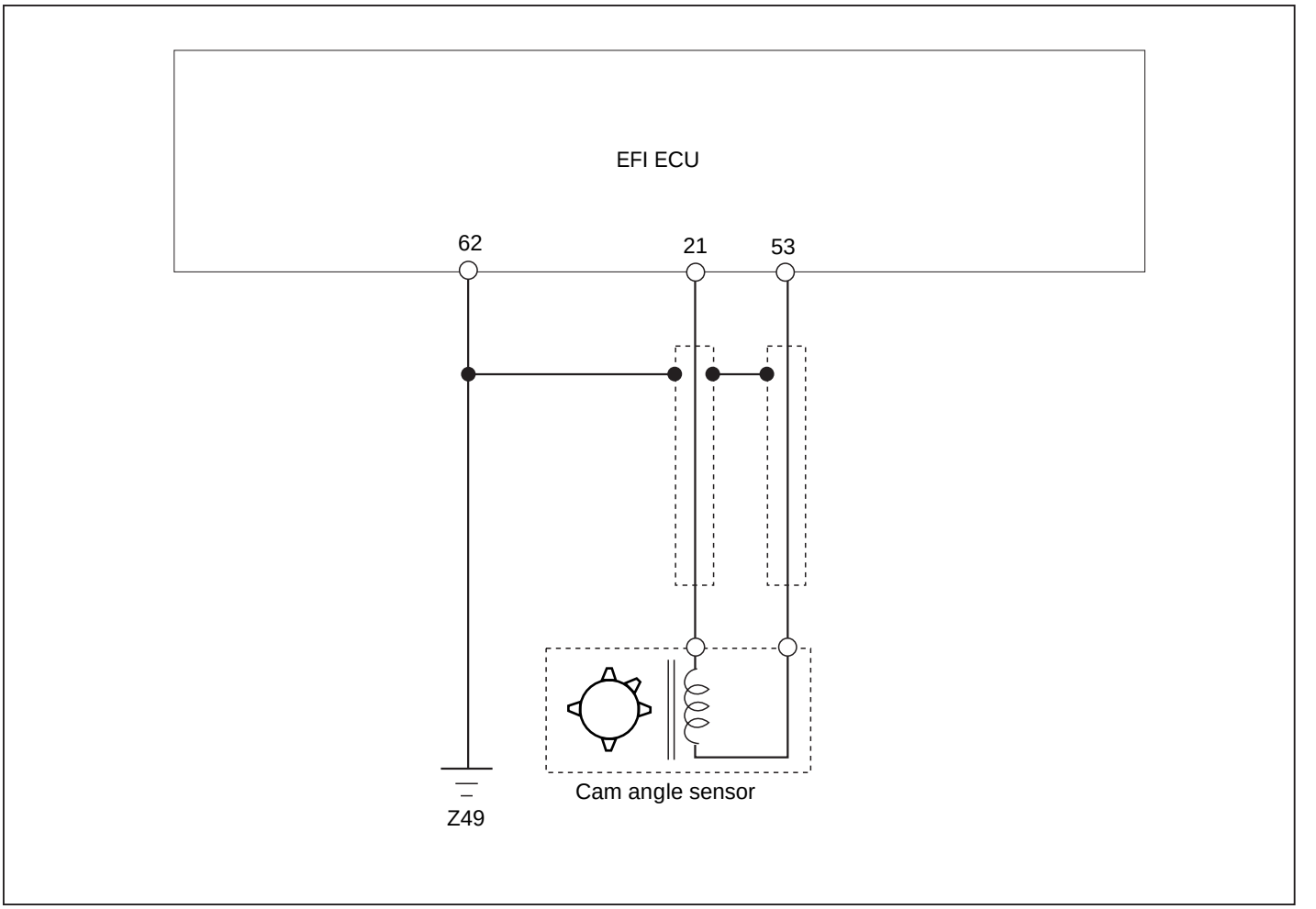
DIAGNOSIS CODE TABLE

When the diagnosis system detects malfunctions, the check engine lamp will go on even if the diagnosis connector test terminal is not connected to the earth terminal.

Code No.	Number of flashing	Diagnosis item	Diagnosis contents	Trouble area	See page
13		Engine revolution signal	• When the engine revolution signal is not inputted while the starter switch is on.	1. Cam angle sensor & circuit	EF–202
21		Oxygen sensor signal	• When the input signal from the oxygen sensor shows too lean air-to-fuel ratio under certain conditions:	1. Oxygen sensor circuit 2. Oxygen sensor	EF–22
31		Pressure sensor signal	• When the input signal from the pressure sensor becomes more than 4.9 V or less than 0.7 V.	1. Pressure sensor circuit 2. Pressure sensor	EF–257
42		Cooling water temperature signal	• When the engine cooling water temperature sensor circuit becomes open or shorted.	1. Water temp. sensor circuit 2. Water temperature sensor	EF–27
43		Intake air temp. signal	• When the intake air temperature sensor circuit becomes open or shorted.	1. Air temperature sensor circuit 2. Air temperature sensor	EF–29
44		A/C evapo. temperature sensor	• When the A/C evaporator temperature sensor circuit exhibits open or short.	1. A/C evaporator temperature sensor circuit 2. A/C evaporator temperature sensor	EF–31
45		A/C compressor	• When the A/C switch is turned on, the rotation signal from the A/C compressor becomes too low because of slipping of the magnet clutch or overload.	1. A/C magnet clutch 2. A/C lock sensor circuit	EF–33
51		Switch signal	• When the A/C switch is turned on, the idle switch is turned off with the test terminal of the diagnosis connector shorted. However no memorizing will take place.	1. A/C switch circuit 2. A/C switch 3. Idle switch circuit 4. Throttle position sensor	EF–35
52		Vehicle speed sensor signal	• When the vehicle speed sensor signal circuit exhibits open wire or or short circuit.	1. Vehicle speed sensor circuit 2. Vehicle speed sensor	EF–37
81		Immobilizer signal	• When the rolling codes can not be exchanged between the EFI ECU and the immobilizer ECU or the rolling codes are not matched.	1. Wire harness between the Immobilizer ECU and EFI ECU 2. Immobilizer ECU 3. EFI ECU	EF–39
83		Immobilizer signal	• When the rolling codes can not be exchanged in the EFI ECU.	1. EFI ECU	EF–39

JEF00062-00405

DIAGNOSIS CODE NO. 13
CAM ANGLE SENSOR & CIRCUIT



JEF00063-00501

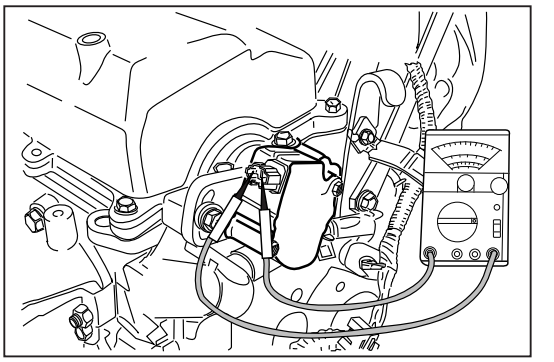
When no cam angle sensor signal is inputted within 2 seconds while the engine is being cranked by the starter motor.

1. Check of cam angle sensor
   (1) Disconnect the connector of the cam angle sensor.
   (2) Check that there is the specified resistance between the respective terminals of the cam angle sensor.
   Specified Value: 205 - 255 Ω

   NOTE:
   - If the resistance will not conform to the specification, replace the signal generator. Refer to the IG section.

   (3) Temporarily remove the EFI main relay at the relay box.
   (4) Check that there is a voltage between the terminals of the cam angle sensor when the engine is being cranked.
   Specified Value: About AC 150 mV/300 R.P.M.

   NOTE:
   - The generating voltage should be measured, using the AC range of a volt meter.
   - If the measured value does not conform to the specification, adjust the gap. See the IG section.



JEF00064-00502

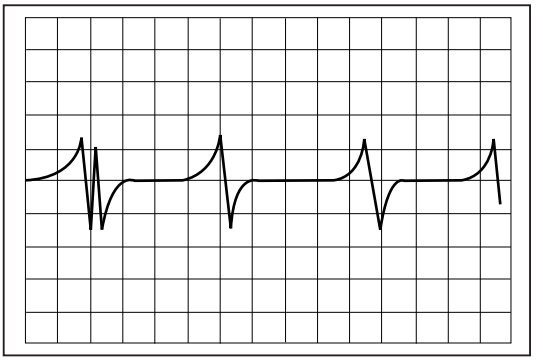
JEF00065-00503

REFERENCE

(1) Prepare an oscilloscope.
(2) Connect a probe to the respective terminals.
(3) Check to see if a signal shown in the graph appears at the terminals when the engine is being cranked.

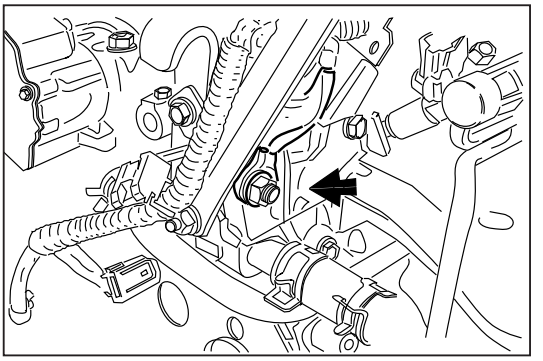
NOTE:

- If not, check the air gap of the signal generator. Refer to the IG section of the service manual.



JEF00066-00504

3. Check the wire harness and ground earth.
   (1) Check to see if the earth bolt exhibits looseness or corrosion.

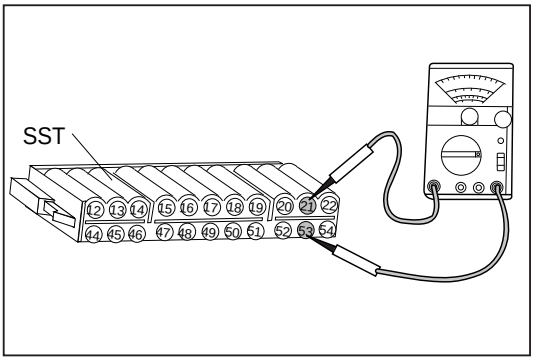


JEF00067-00506

   (2) Connect the connector of the cam angle sensor and the wire harness connector.
   (3) Connect the SST.

NOTE:

- Refer to page EF–18, “Preparation of trouble shooting with SST”.
- At this time, disengage the connector between the SST and the EFI ECU.



JEF00068-00507

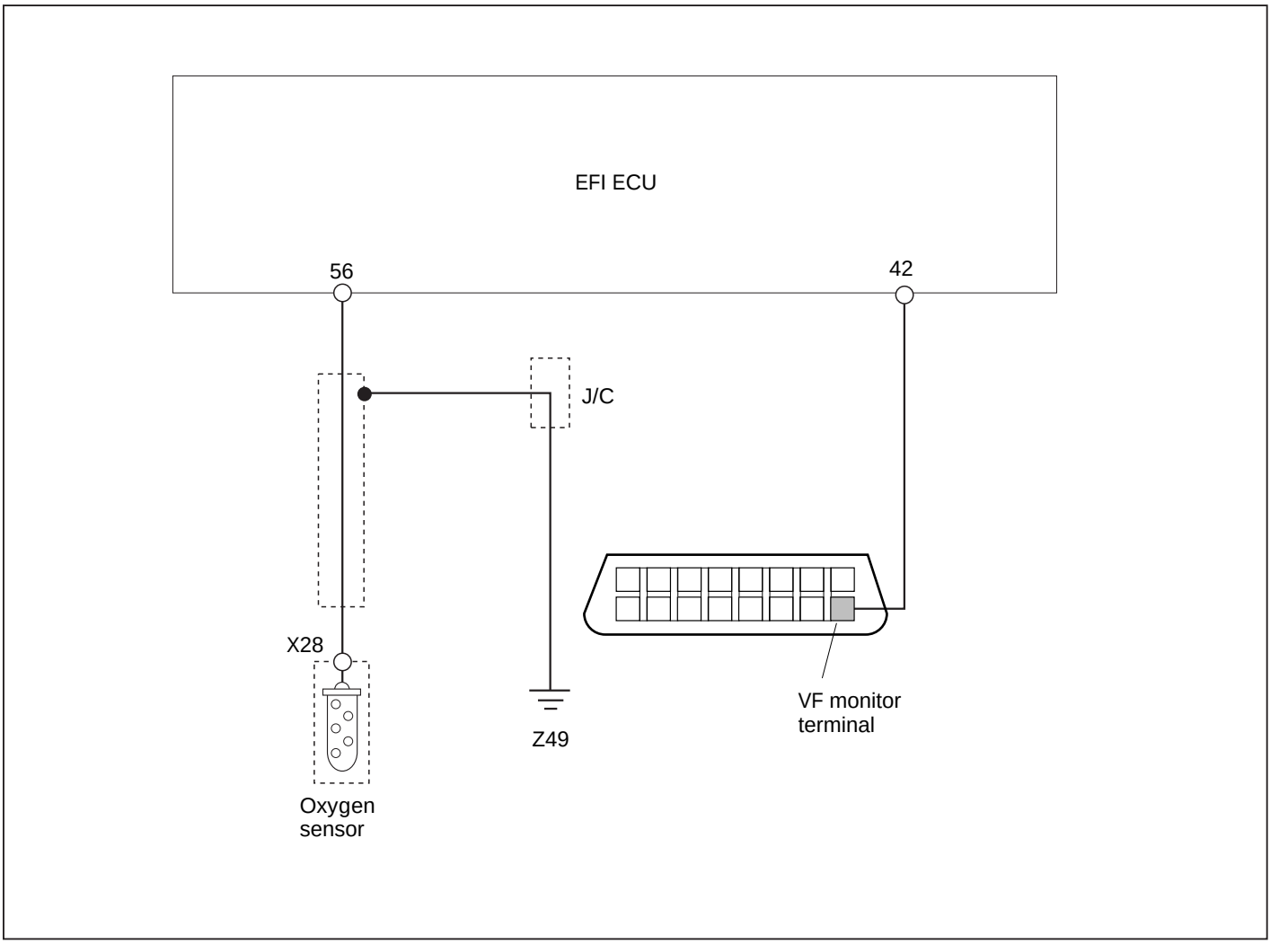
   (4) Measure the resistance between the SST terminals 21 and 53.
   Specified Value: 205 - 255 Ω

NOTE:

- If the trouble has not been solved by repairing the wire harness or parts, then, proceed to page EF–41, Replacement of ECU.

JEF00069-00508

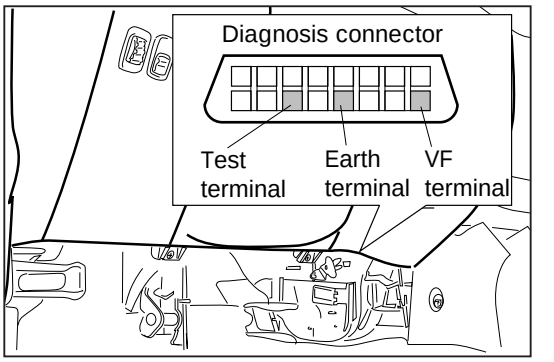
DIAGNOSIS CODE NO. 21
OXYGEN SENSOR & CIRCUIT



JEF00070-00511

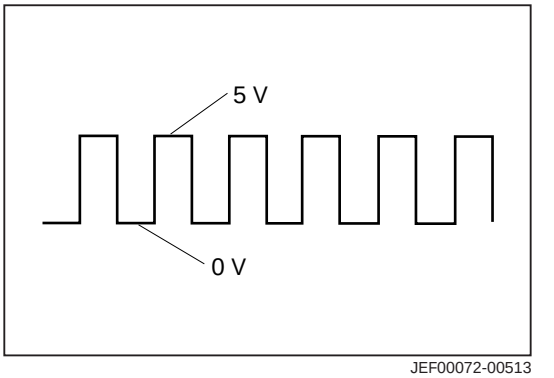
The ECU detects malfunction when the input signal from the oxygen sensor shows too lean air-to-fuel mixture continuously for 2 seconds or more when the engine revolution speed is 1500 rpm or more and the engine is in a hot condition.

1. Inspection of oxygen sensor circuit
   (1) Warm up the engine completely.
   (2) Connect the test terminal and the earth terminal with a jump wire at the diagnosis connector.
   (3) Measure the voltage between the VF terminal and the earth terminal as indicated in the illustration.
   Specified Voltage: 0 - 5 V



JEF00071-00512

   (4) While keeping the engine revolution speed at 3000 rpm for about 2 minutes, count how many times the pointer of the voltmeter swings within 10 seconds.
   8 Times or more: Normal
   0 - 7 Times: Proceed to the following steps.

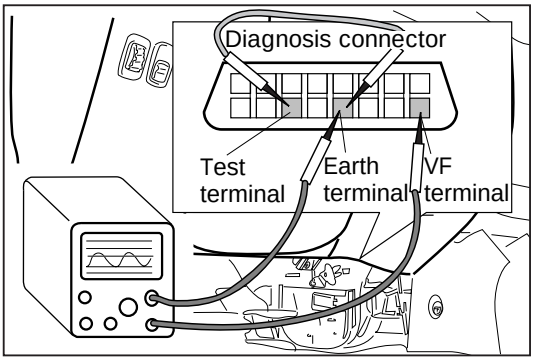


JEF00072-00513

NOTE:
- The throttle valve must be opened.

REFERENCE

(1) Prepare an oscilloscope.
(2) Connect a jump wire to the test terminal and the earth terminal.
(3) Connect a probe to the VF terminal and the earth terminal.
(4) Check to see if a signal shown in the graph appears at the terminals while the engine is rotating at 3000 rpm.



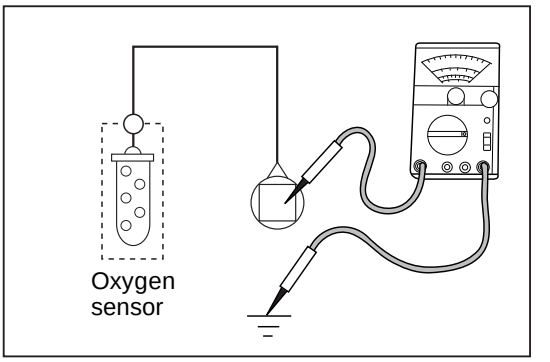
JEF00073-00514

NOTE:
- There are cases where the measurement can not be conducted with a tester having a low reaction speed. Therefore, use a tester having a high reaction speed or oscilloscope.
- If no voltage appears, check the oxygen sensor unit.

JEF00074-00515

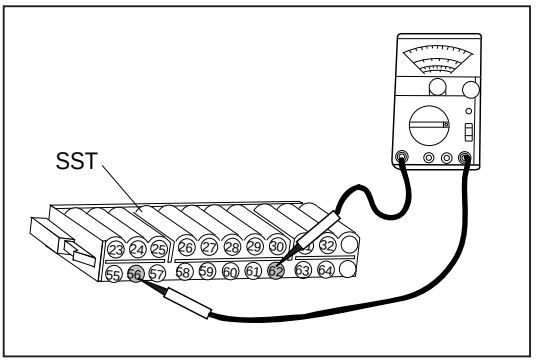
2. Check of oxygen sensor
(1) Warm up the engine completely.
(2) Disconnect the connector of the oxygen sensor.
(3) Connect a voltmeter to the connector terminal of the oxygen sensor.
(4) Hold the engine revolution speed for 2 minutes at about 3000 rpm. At this time, ensure that the reading of the voltmeter registers 0.45 V or more.

NOTE:
- When the oxygen sensor connector has been disconnected, an air-to-fuel mixture ratio of the engine will become rich. The oxygen sensor therefore generates an electromotive force of about 0.45 volts or more.
- Replace the oxygen sensor with a new part, if the reading will not register 0.45 V or more.
- If the reading conforms to the specification, proceed to the following procedure.



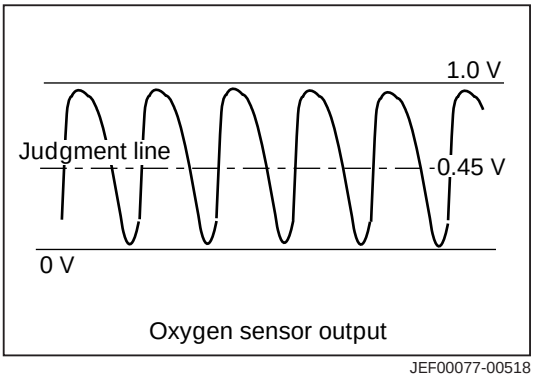
JEF00075-00516

3. Check of wire harness
(1) Connect the SST between the ECU connectors and the wire harness connectors. (See page EF–18.)
(2) Ensure that the voltage between the SST terminals 56 and 62 is the specified value while keeping the engine revolution speed at 3000 rpm.
Specified Voltage: 0.2 - 1.0 V



JEF00076-00517

NOTE:
- At this stage, remove the jump wire from the test terminal and the earth terminal of the diagnosis connector.



JEF00077-00518

(3) Perform the procedure given in the table, according to the measurement results.

Measured voltage	Remedy
0 V	1) Check the oxygen sensor circuit for open wire or short circuit.
The measured voltage varies mainly within a range under 0.45 V.	Remedy causes for too-lean fuel mixture. • Pressure sensor • Pressure regulator • Fuel line • Fuel filter • Fuel pump • Injector
The measured voltage varies within a range of 0 - 1.0 V, centering around 0.45 V. However, the reaction speed the is low. (The pointer of the voltmeter swings less than 8 times within 10 seconds.)	Check the ECU. (Go to page EF–41, REPLACEMENT OF ECU.)
The measured voltage varies mainly within a range above 0.45 V.	Remedy causes for too-rich fuel mixture. • Pressure sensor • Fuel line • Pressure regulator • Injector
1.0 V	Remedy causes for too-rich fuel mixture. • Pressure sensor • Fuel line • Pressure regulator • Injector
More than 1.0 V	Check the oxygen sensor circuit for short circuit with other positive line. Repair or replace the wiring harness.

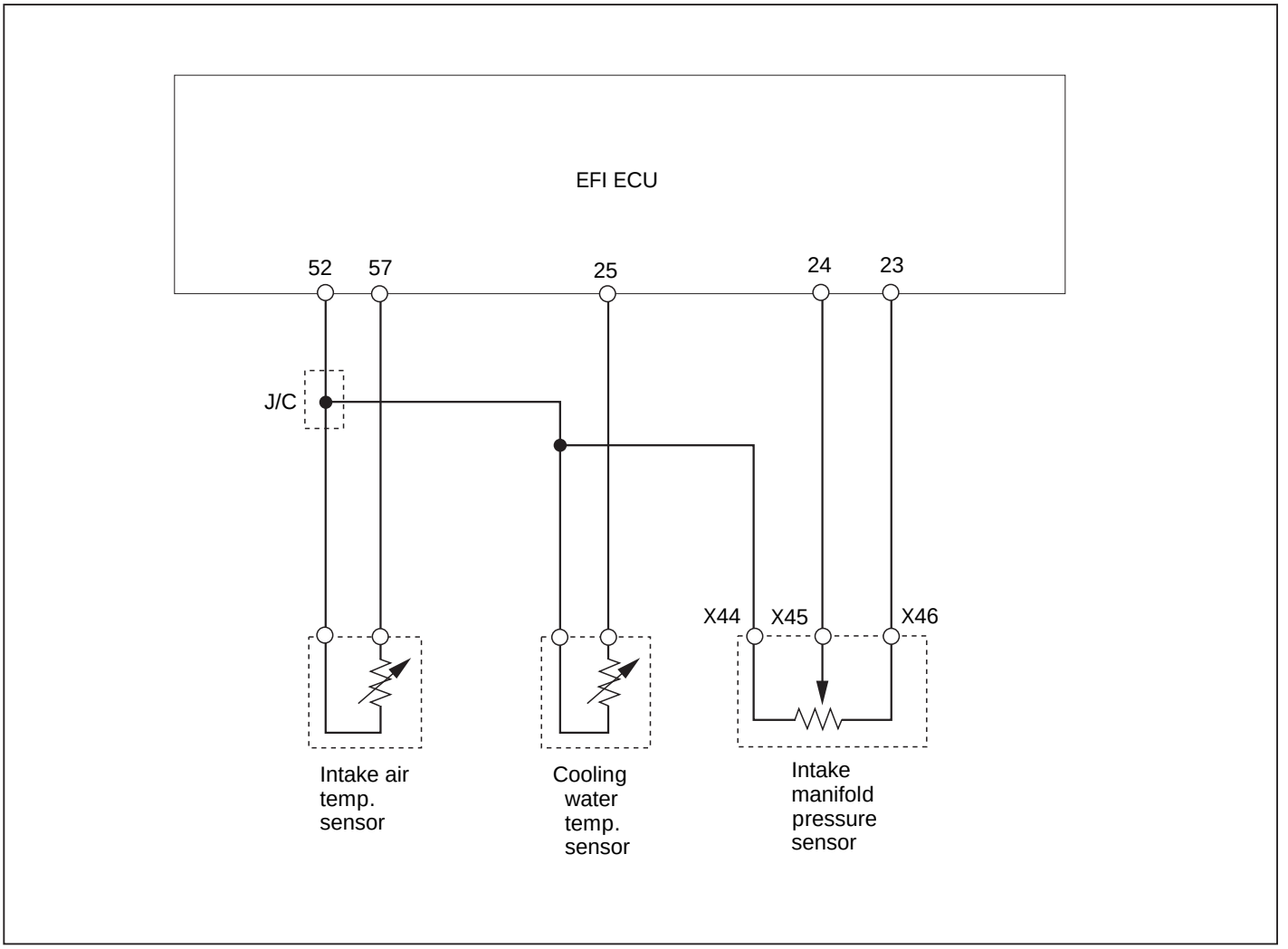
JEF00078-00519

NOTE:

- If the trouble has not been solved by repairing the wire harness or parts, then, proceed to page EF–41, Replacement of ECU.

JEF00079-00520

DIAGNOSIS CODE NO. 31
PRESSURE SENSOR & CIRCUIT



JEF00080-00521

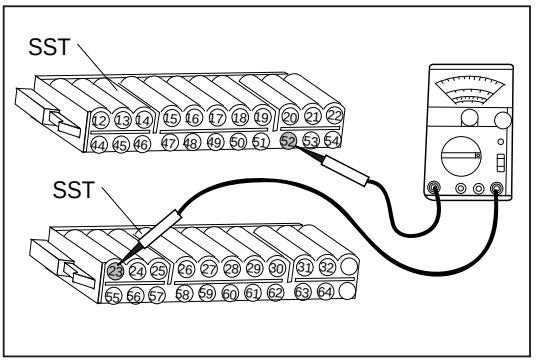
When the pressure sensor becomes open or shorted:

1. Check the pressure sensor.
   (1) Connect the SST between the ECU connectors and the wire harness connectors.
   (2) Ensure that the voltage between the SST terminals 23 and 52 is within the specified value when the ignition switch is turned to the ON position.
   Specified Value: 4.5 - 5.5 V

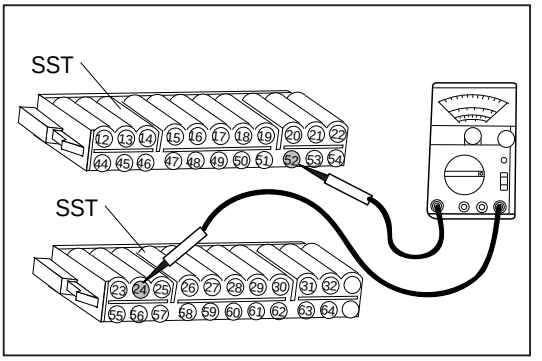
   NOTE:
   - If no voltage appears, check the ECU power supply circuit, ECU ground circuit and the wire harness.

   (3) Ensure that the voltage between the SST terminals 24 and 52 is within the following specified voltage when the ignition switch is turned to the ON position.

Altitude (From sea level) m	Atmospheric pressure kPa (mmHg)	Voltage
0	101.3 (760)	3.30 - 4.0 V
500	95.5 (716)	3.10 - 3.8 V
1000	89.9 (674)	2.95 - 3.65 V



JEF00081-00522



JEF00082-00523

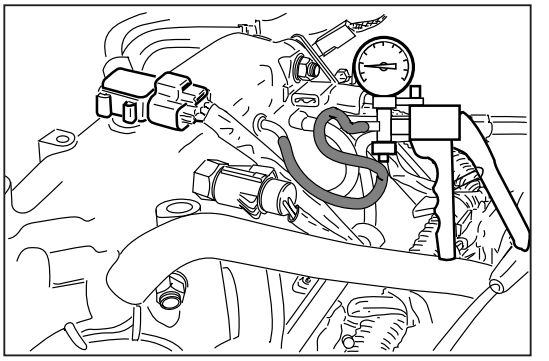
(4) Temporarily connect a vacuum gauge (The MityVac may be used) to the negative pressure port of the VSV so that the inner pressure of the intake manifold may be measured. Next, start the engine and keep it idling. At this time, ensure that the gauge reading and the voltage across the SST terminals 24 and 52 satisfy the following formula given below.

$V = 0.004 \times P_1 + 0.6$

Where:

V = P sensor output during idling (V)

P_1 = Intake manifold negative pressure during idling (–mmHg)



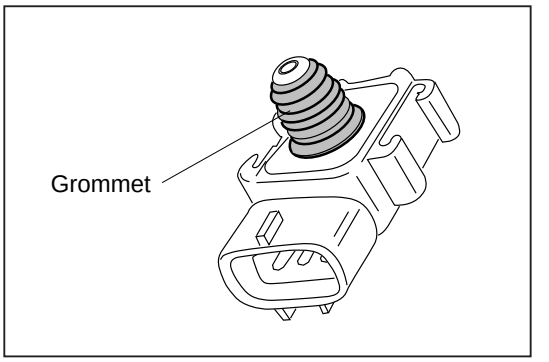
JEF00083-00524

CAUTION:

- Once the pressure sensor is removed from the intake manifold, even for the purpose of inspection, never re-use the pressure sensor. This is because the grommet of the sensor will be damaged by the removal.

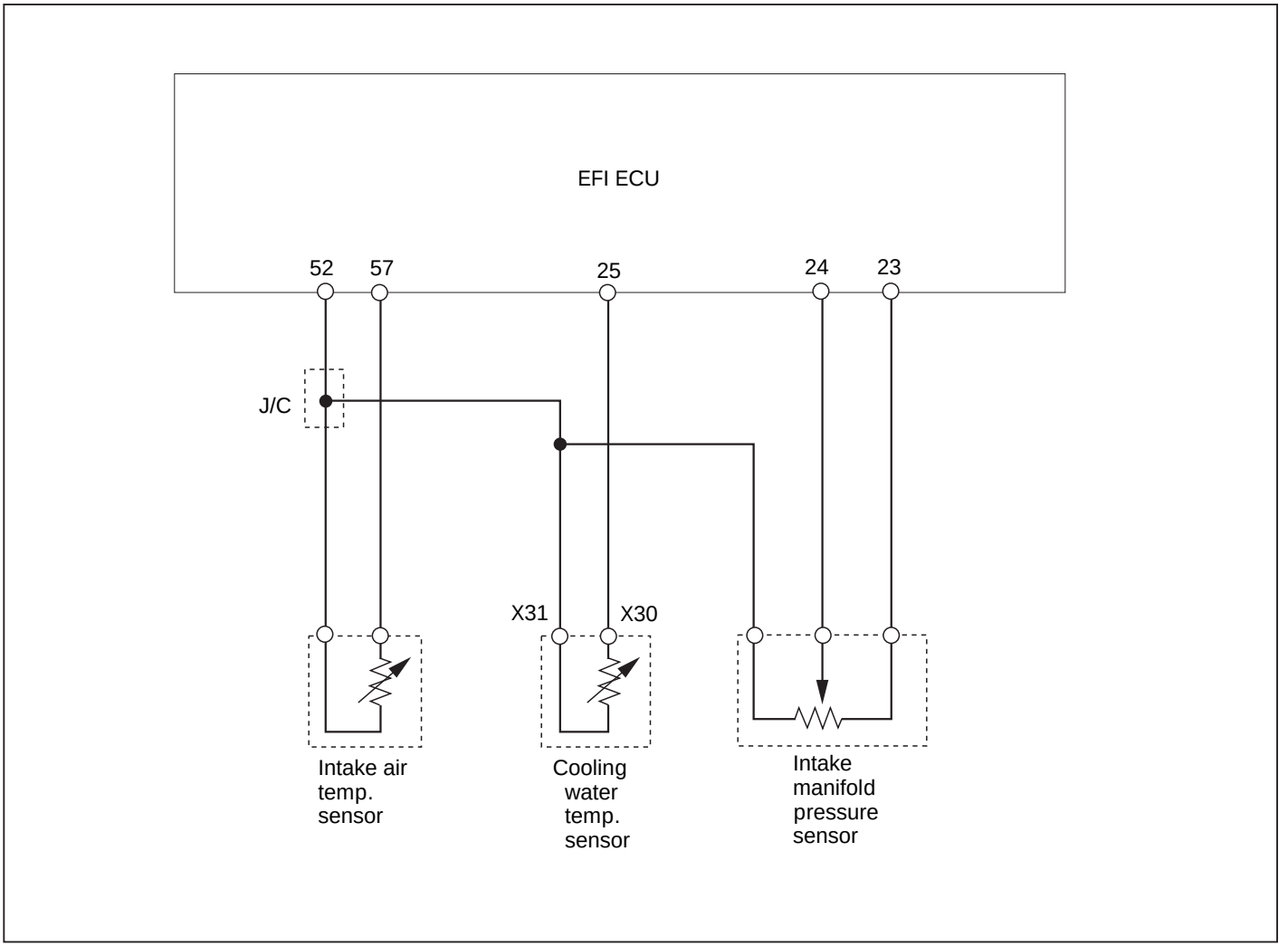
NOTE:

- If the measured voltage fails to drop by the specified value, replace the pressure sensor.
- If the measured voltage does not conform to the specifications, check the wire harness.
- If the trouble has not been solved by repairing of the wire harness or parts, proceed to page EF–41, Replacement of ECU.



JEF00084-00525

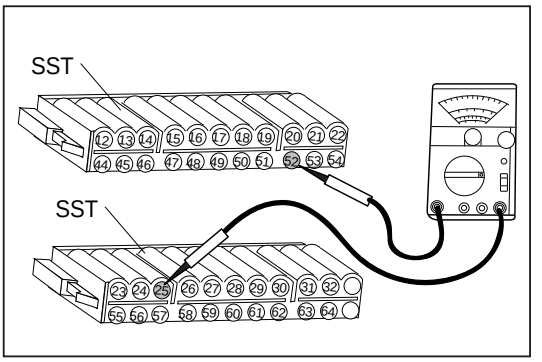
DIAGNOSIS CODE NO. 42
WATER TEMPERATURE SENSOR & CIRCUIT



JEF00085-00531

When the pressure sensor becomes open or shorted:

1. Check to see if the connector is connected properly.
2. Check of wire harness
   (1) Connect the SST between the ECU connectors and the wire harness connectors.
   (2) Ensure that the voltage between the SST terminals 25 and 52 is within the specified value when the ignition switch is turned to the ON position.



JEF00086-00532

NOTE:

- If the measured voltage does not conform to the specifications, check the wire harness.

Measuring points Temperature ϒC	Voltage
20	2.450 ± 0.15
80 - 90	0.318 ± 0.01

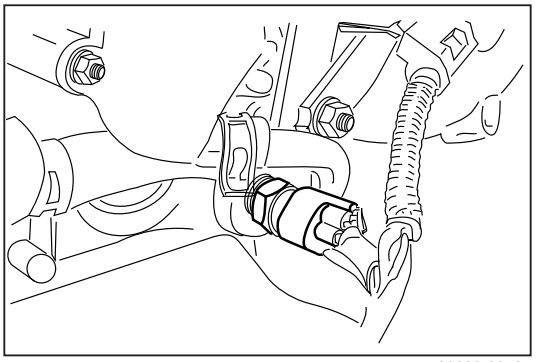
JEF00087-00533

3. Check the water temperature sensor unit.
   (1) Turn off the ignition switch.
   (2) Disconnect the connector of the water temperature sensor.
   (3) Drain the engine cooling water.
   (4) Remove the water temperature sensor unit.

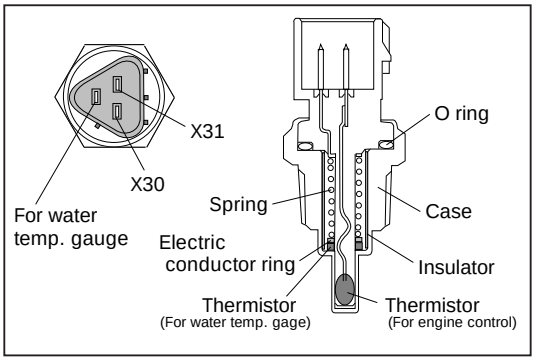
   NOTE:
   - Be certain to perform the replacement and repairs of the sensor only after the intake manifold has been removed from the cylinder head.

   (5) Check that the resistance between the terminals X30 and X31 of the water temperature sensor is within the specified value in the table. See page EF–27.

   NOTE:
   - If the trouble has not been solved by repairing the wire harness or parts, proceed to page EF–41, Replacement of ECU.

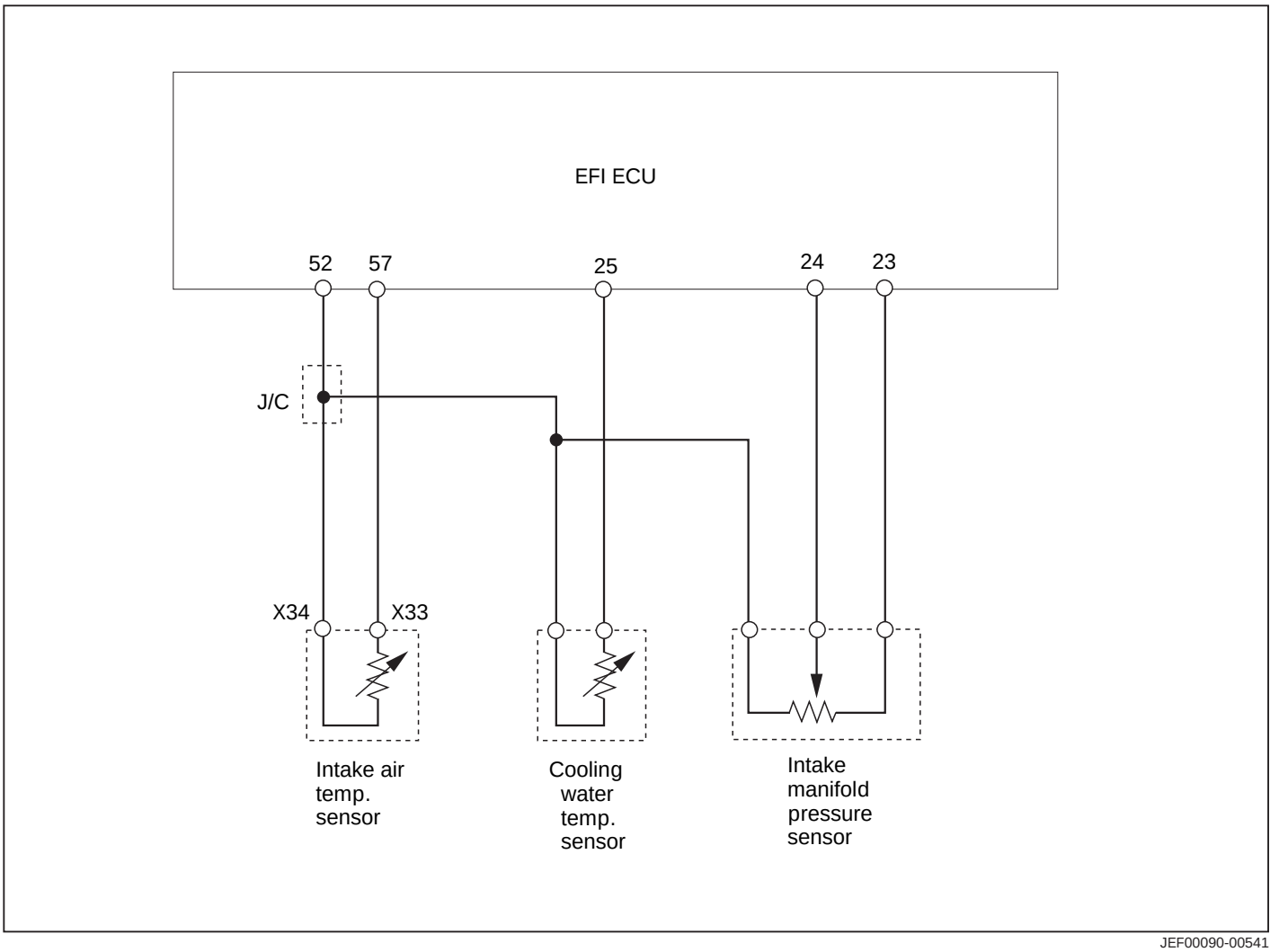


JEF00088-00534



JEF00089-00535

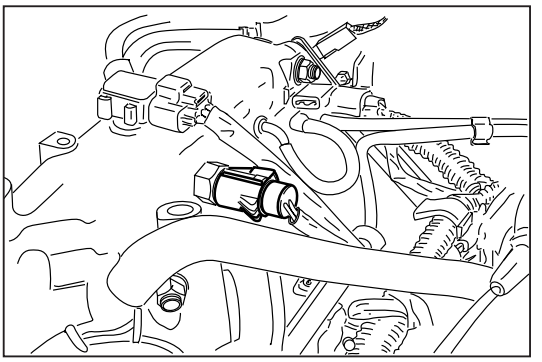
DIAGNOSIS CODE NO. 43
INTAKE AIR TEMPERATURE SENSOR & CIRCUIT



JEF00090-00541

When the pressure sensor becomes open or shorted:

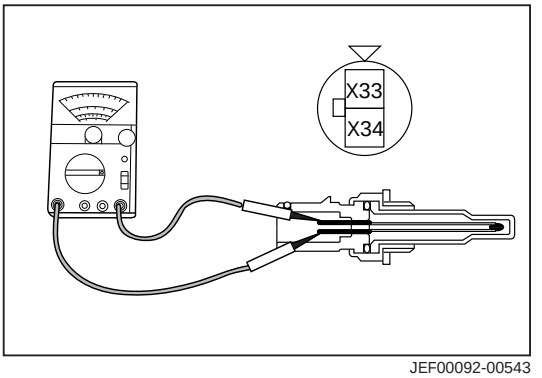
1. Check to see if the wire harness connectors are connected properly.
2. Disconnect the connector of the intake air temperature sensor.
   NOTE:
   - Before the wire harness connector is disconnected, be sure to turn off the ignition switch.



JEF00091-00542

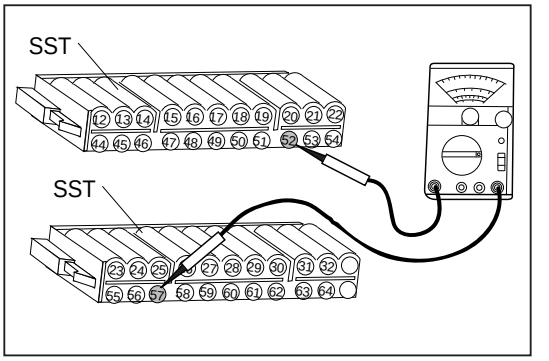
3. Check that the resistance between the terminals X33 and X34 of the intake air temperature sensor is within the specified value.

Temperature ϒC	Resistance kΩ
40	1.140 ± 0.3
20	2.450 ± 0.5
0	5.880 ± 1.5



JEF00092-00543

4. Check of wire harness
   (1) Connect the SST between the ECU connectors and the wire harness connectors.
   (2) Check that the voltage between the SST terminals 52 and 57 is within the specified value when the ignition switch is turned to the ON position.
   Reference: 20°C 1.8 - 2.9 V



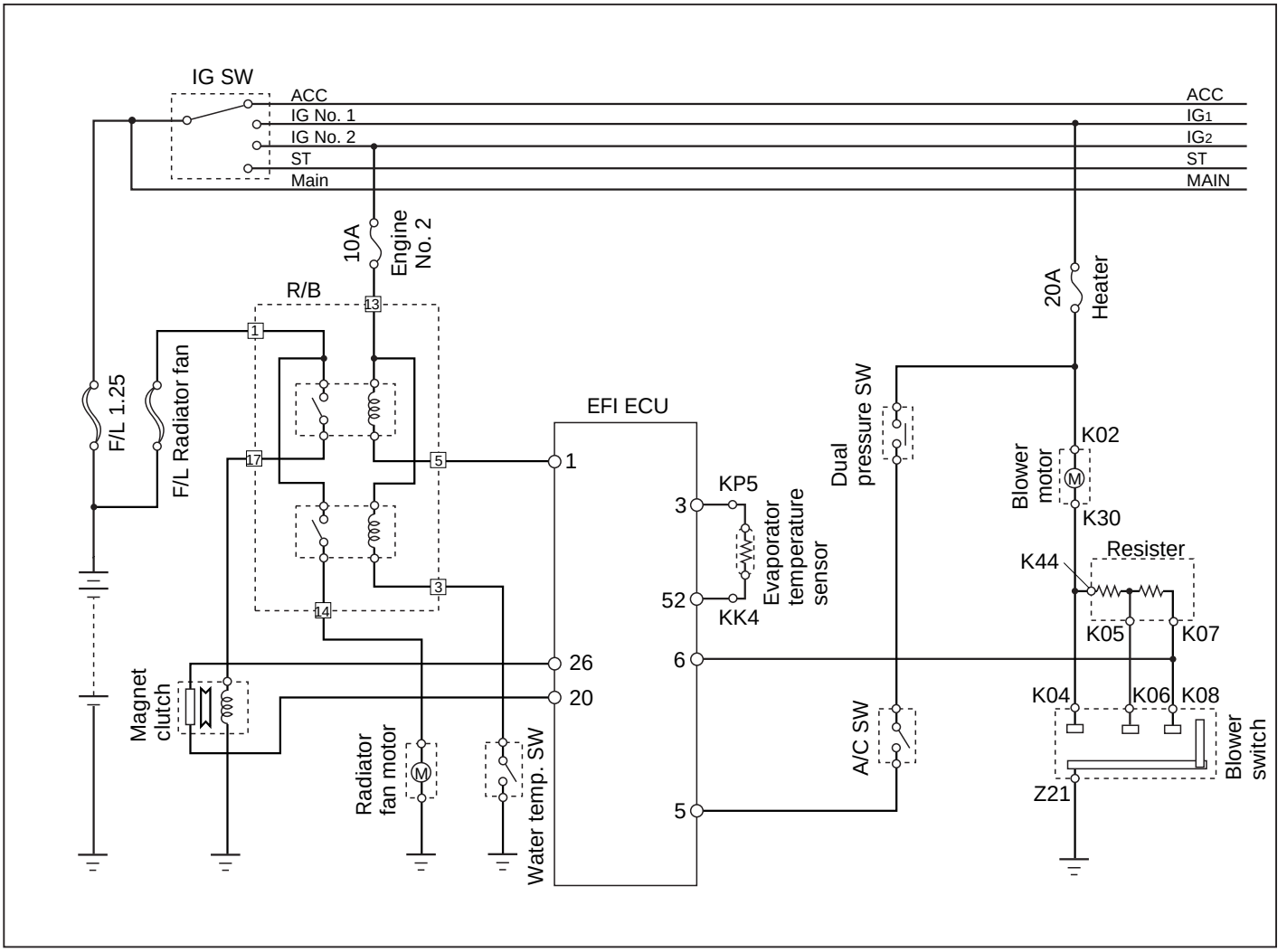
JEF00093-00544

NOTE:
- If the measured voltage does not conform to the specifications, check the wire harness.
- If the diagnosis code No. 43 is flashing, most likely it denotes that open wire occurs intermittently or the shielding is poor.
- If the trouble has not been solved by repairing the wire harness or parts, then, proceed to page EF–41, Replacemeny of ECU.

JEF00094-00545

DIAGNOSIS CODE NO. 44

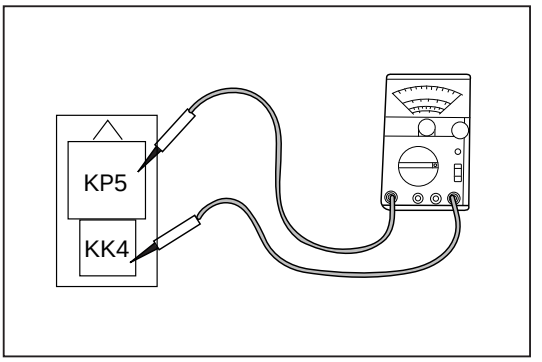
AIR CONDITIONER EVAPORATOR TEMPERATURE SENSOR & CIRCUIT



JEF00095-00551

When the air conditioner evaporator temperature sensor and circuit becomes open or shorted:

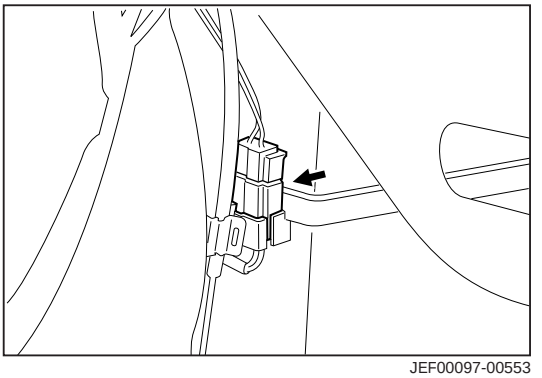
1. Check to see if the wire harness connectors are connected properly.
2. Disconnect the connector of the evaporator temperature sensor.
   NOTE:
   - Before the wire harness connector is disconnected, be sure to turn off the ignition switch.



JEF00096-00552

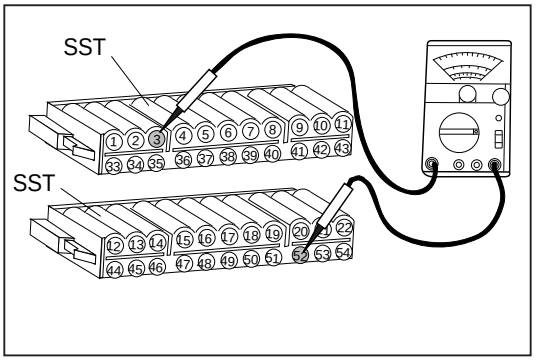
3. Check the resistance between the terminals.

Temperature ϒC	Resistance kΩ
25	1.500 ± 0.15
15	2.340 ± 0.23
0	4.850 ± 0.24



JEF00097-00553

4. Check of wire harness
   (1) Connect the SST between the ECU connectors and the wire harness connectors.
   (2) Check that the voltage between the SST terminals 3 and 52 is within the specified value when the ignition switch is turned to the ON position.
   Reference: 20°C 1.8 - 2.9 V

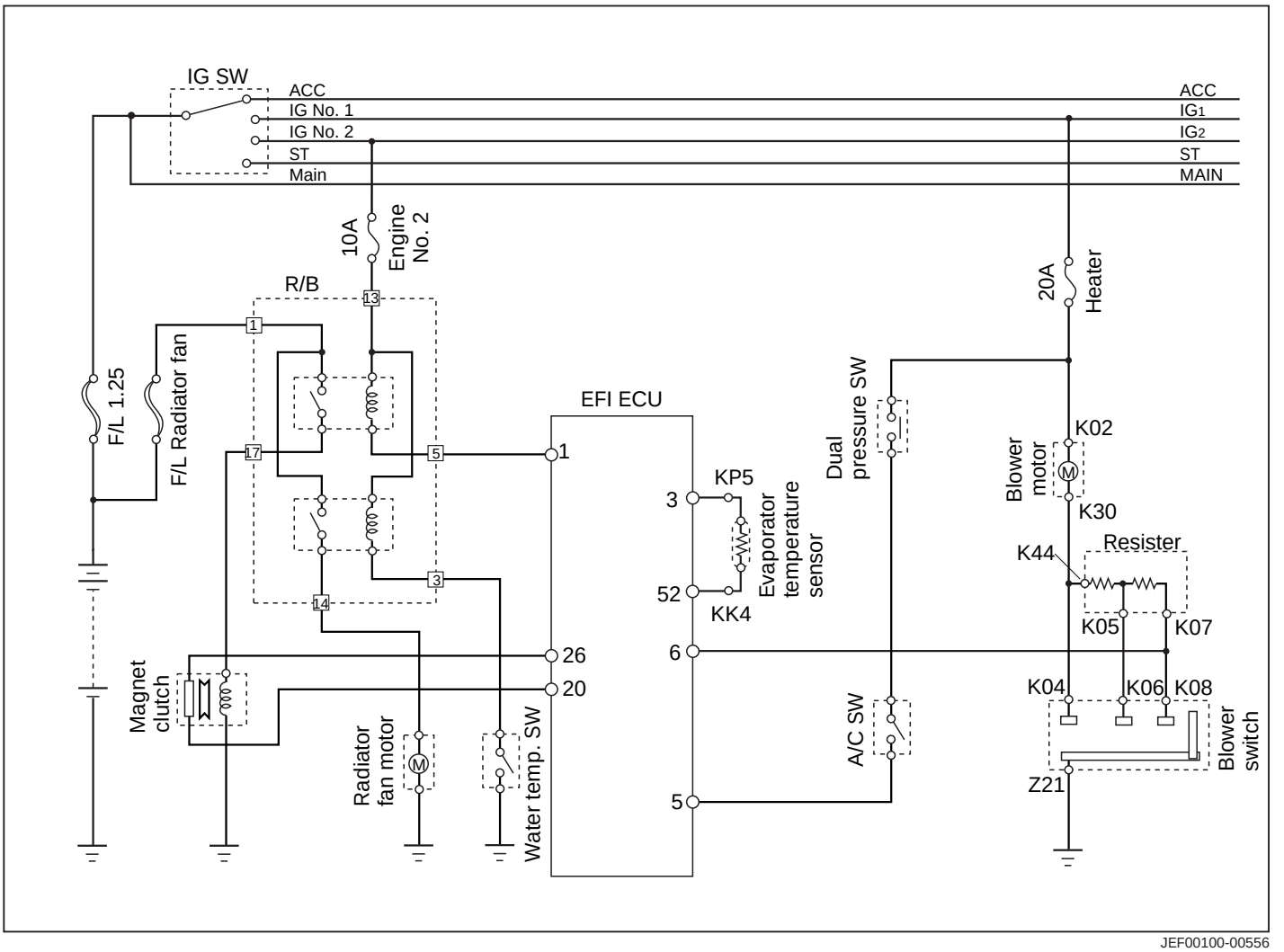


JEF00098-00554

NOTE:
- If the measured voltage does not conform to the specification, check the wire harness.
- If the trouble has not been solved by repairing the wire harness or parts, then, proceed to page EF–41, Replacement of ECU.

JEF00099-00555

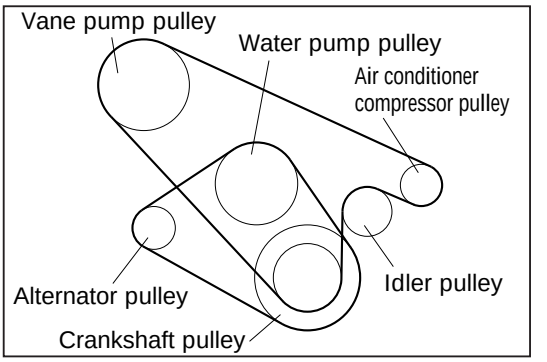
DIAGNOSIS CODE NO. 45
AIR CONDITIONER LOCK SENSOR & CIRCUIT



JEF00100-00556

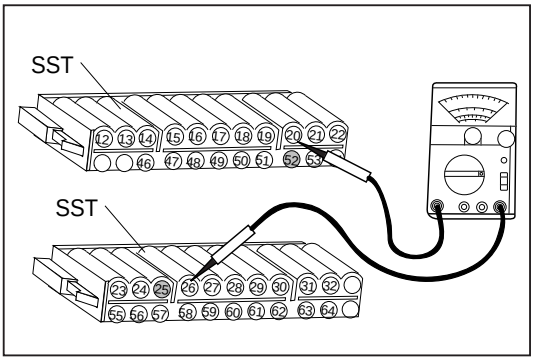
When the ECU detects malfunction of the A/C lock sensor circuit.

1. Check the drive belt tension of the A/C compresser. Check the A/C compresser for sticking before checking the A/C lock sensor circuit.
2. Check the connection of the A/C lock sensor connector.
   NOTE:
   - This code will not be memorized.
   - The diagnosis code will be indicated only when the test terminal is connected with the ground terminal.



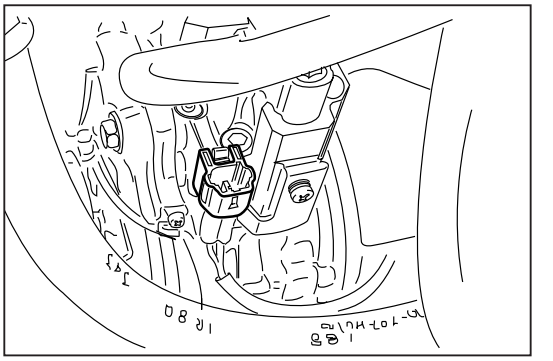
JEF00101-00557

3. Check the A/C lock sensor and circuit.
   (1) Connect the SST between the ECU and the cowl wire.
   (2) Check the output voltage across the SST terminals 26 and 20 when the A/C compresser is operating.
   Specified Value: 0.1 - 3 V (Pulse signal)



JEF00102-00558

4. Check of wire harness
   (1) If the measured voltage is o volt, check the wiring between the ECU and the A/C lock sensor connector for open wire or short circuit.
   (2) Check the A/C lock sensor by measuring the output voltage at the sensor connector.



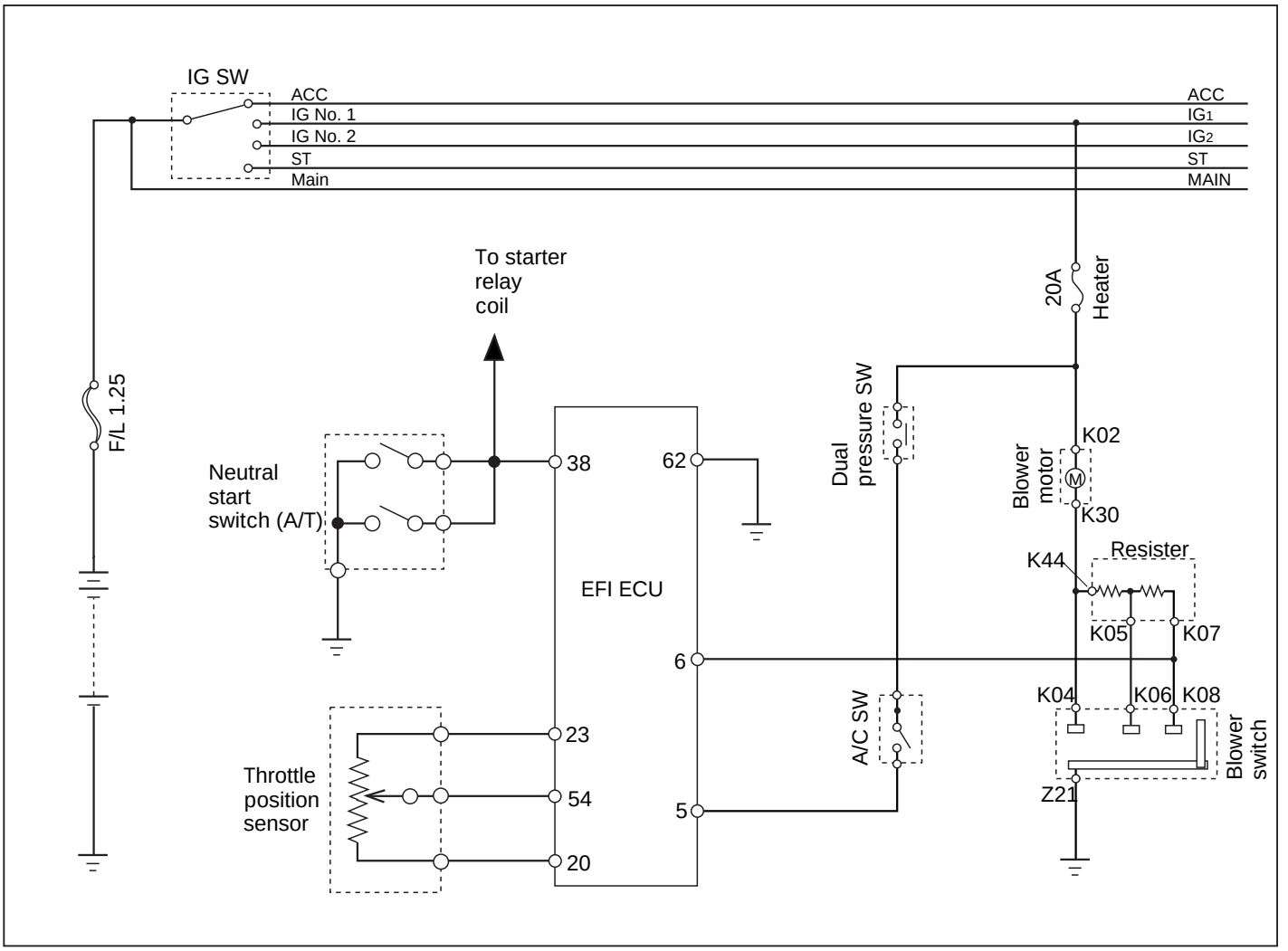
JEF00103-00559

NOTE:

- If the trouble has not been solved by repairing the wire harness or parts, then, proceed to page EF–41, Replacement of ECU.

JEF00104-00560

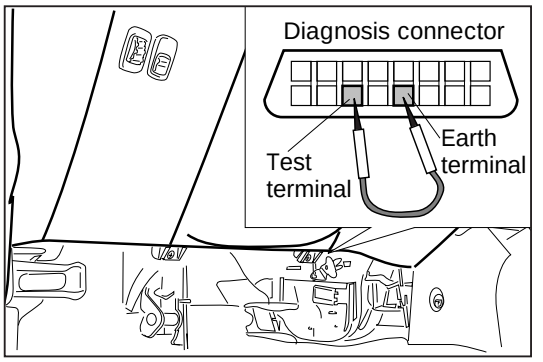
DIAGNOSIS CODE NO. 51
SWITCHING SIGNAL CIRCUIT



JEF00105-00561

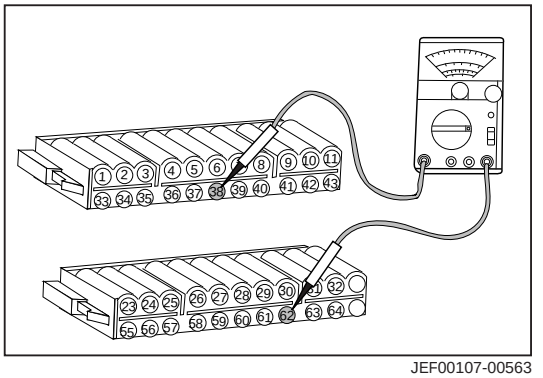
When the ECU detects malfunction of the switching circuit.

1. Check that the following wire harness connector or switching circuits are connected properly.
   (1) Throttle position sensor circuit
   (2) A/C switch circuit
   (3) Neutral start switch circuit of the A/T.
   NOTE:
   - This code will not be memorized.
   - The diagnosis code will be indicated only when the test terminal is connected with the earth terminal as shown in the illustration.



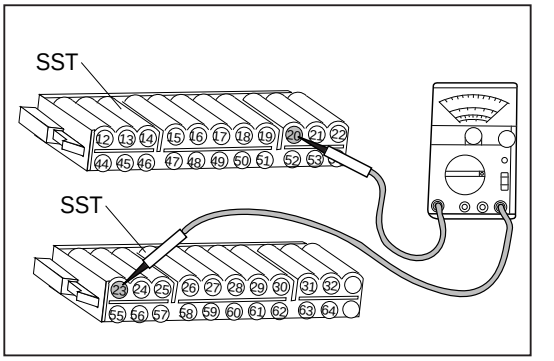
JEF00106-00562

2. Check of wire harness and switches
   (1) Connect the SST between the ECU connectors and the wire harness connectors.
   (2) Check that there is continuity between the SST terminals 62 and 38 when the A/T shift lever is shifted to the P or N position.



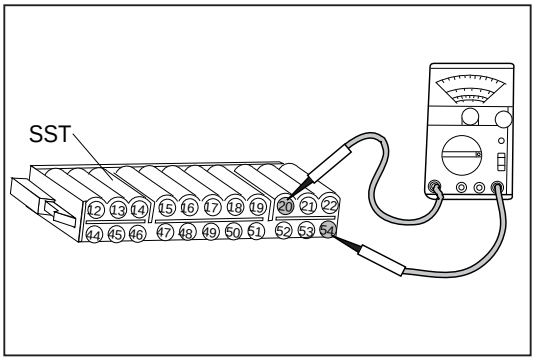
JEF00107-00563

(3) Check the voltage between the SST terminals 20 and 23 when the throttle valve is opened and the ignition switch is turned on.
Specified Value: 4.5 - 5.5 V



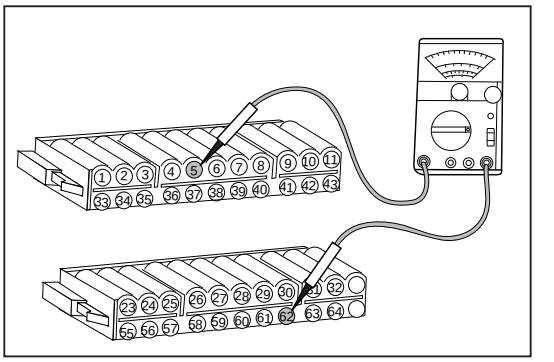
JEF00108-00564

(4) Check the voltage between the SST terminals 20 and 54 when the throttle valve is fully closed and the ignition switch is turned on.
Specified Value: 0.4 - 0.8 V



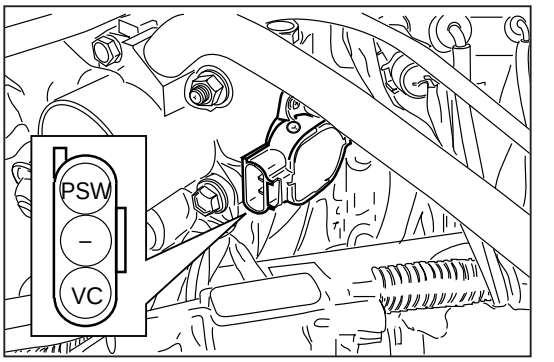
JEF00109-00565

(5) Check the voltage between the SST terminals 5 and 62 when the A/C switch is turned on.
Specified Value: Battery voltage



JEF00110-00566

(6) Turn off the ignition switch. Then, disconnect the connector of the throttle position sensor.
(7) Check the resistance between the terminals PSW and VC of the throttle position sensor.
Specified Value: 2.5 - 6.0 kΩ

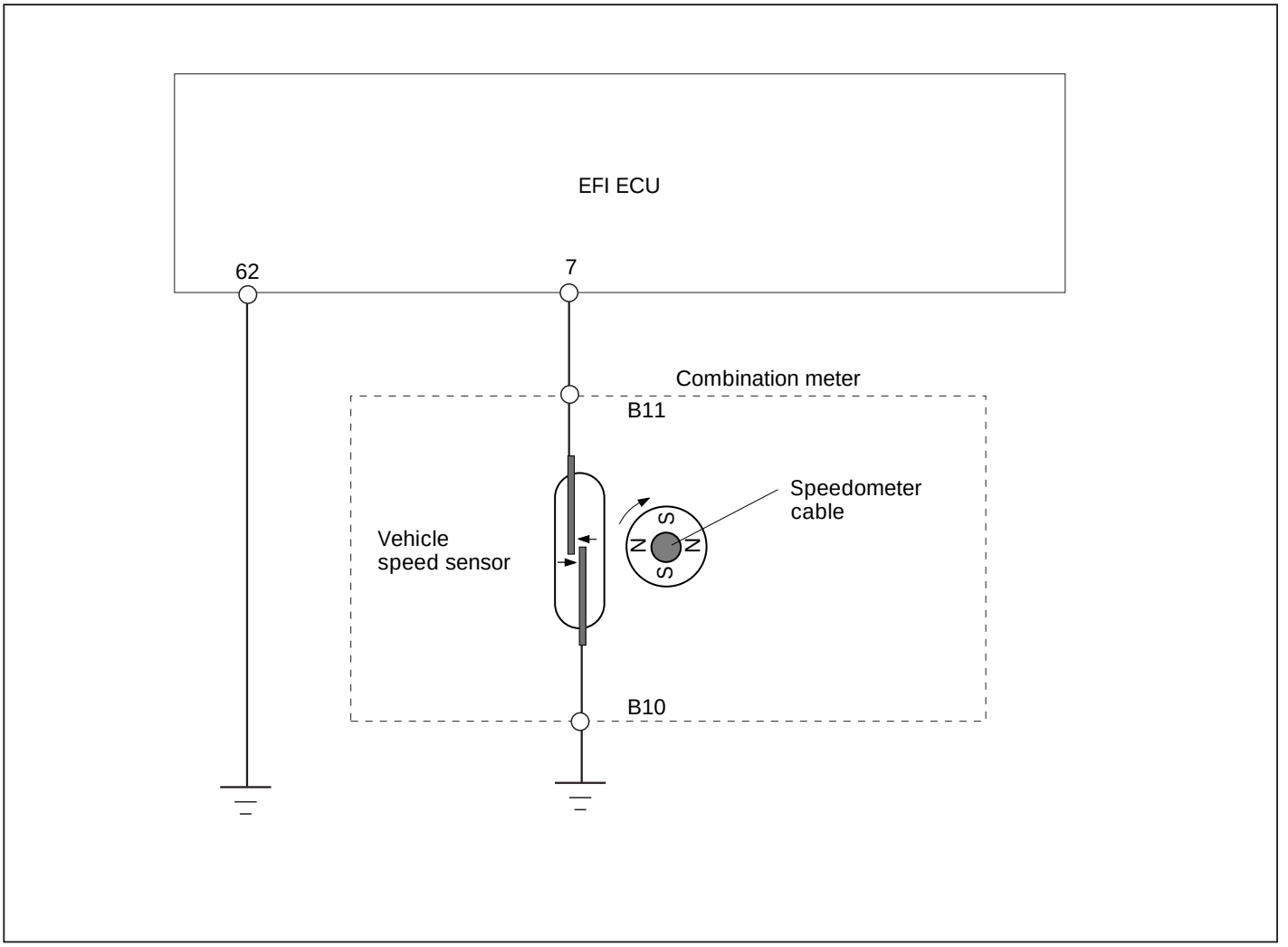


JEF00111-00567

NOTE:
- If the trouble has not been solved by repairing the wire harness or parts, then, proceed to page EF–41, Replacement of ECU.

JEF00112-00568

DIAGNOSIS CODE NO. 52
VEHICLE SPEED SENSOR & CIRCUIT



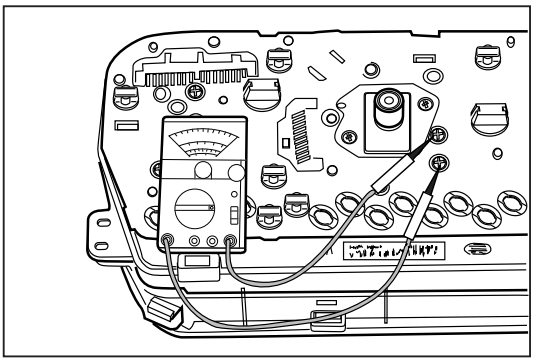
JEF00113-00571

When the pressure sensor becomes open or shorted:

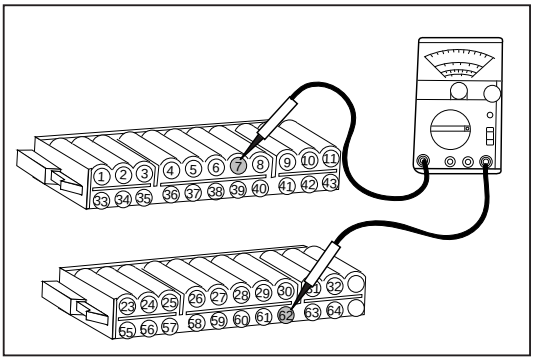
1. Check of the reed switch
   (1) Remove the combination meter.
   (2) Ensure that continuity occurs four times at the terminals B10 and B11 of the combination meter while the speedometer drive shaft completes a turn.

   NOTE:
   - The sensor has been so constructed that its rotary shaped-magnet rotates at the same revolution speed as the speedometer cable turns ON/OFF reed switch, thereby making it possible to input the vehicle speed to the computer. Four pulses are generated as the speedometer cable completes its one turn.

2. Check of wire harness
   (1) Connect the SST between the ECU connectors and the wire harness connectors.
   (2) Check that the voltage between the SST terminals 7 and 62 is within the following specified value when the vehicle moves and the ignition switch is turned to the ON position.
   Specified Value: 0 - 5 V for pulse signal



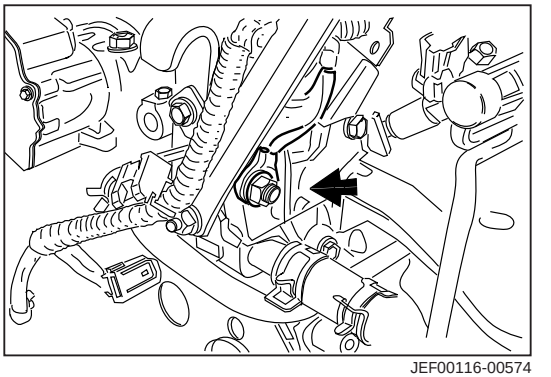
JEF00114-00572



JEF00115-00573

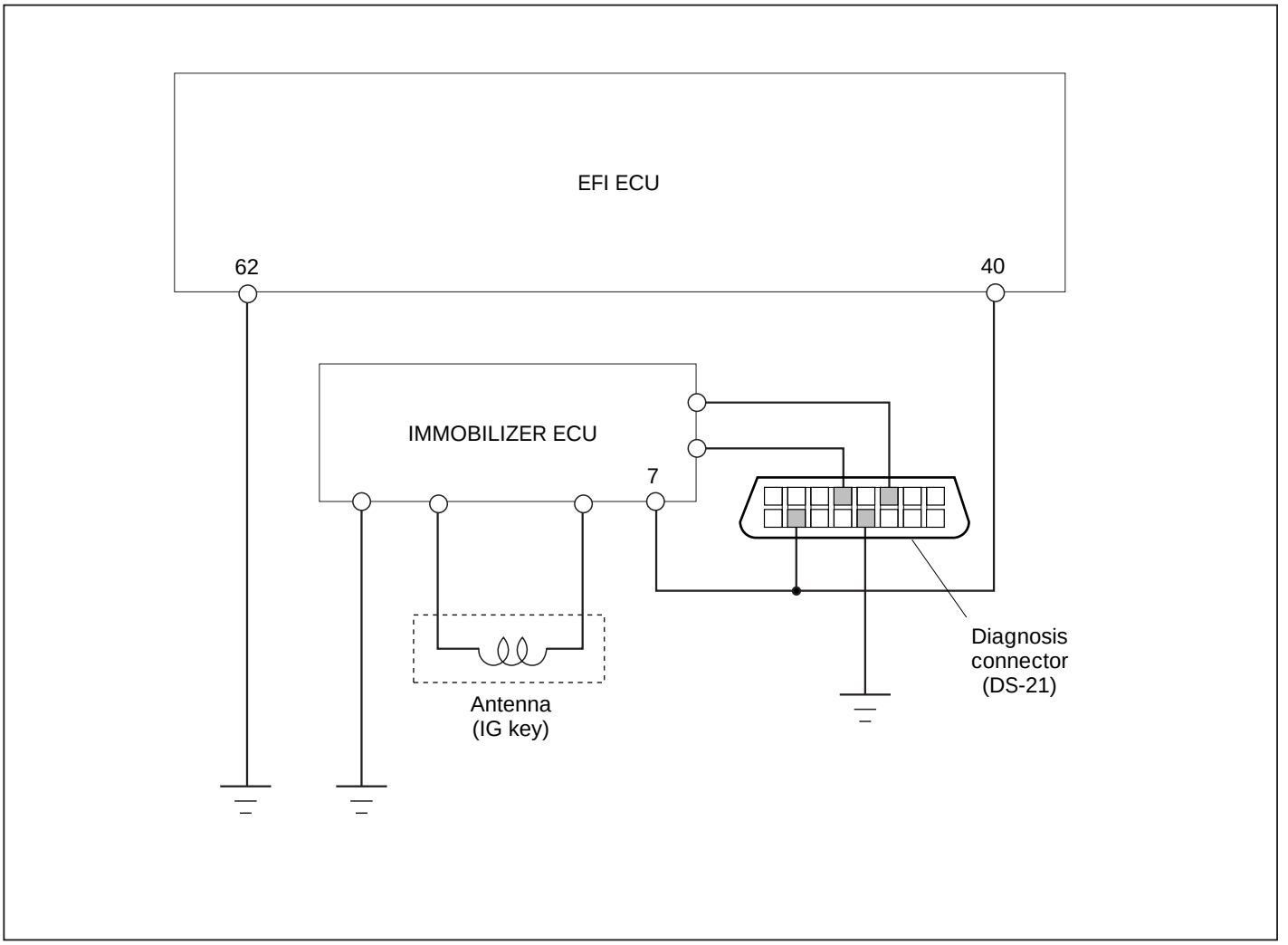
NOTE:

- If the measured voltage is 0 volt, check that the wire harness or connector is shorted.
- If the measured voltage is still 5 volts, check that the wire harness or connector exhibits open wire.
- If the diagnosis code No. 43 is flashing, most likely it denotes that open wire occurs intermittently or the shielding is poor.
- Check to see if the earth bolt exhibits looseness or corrosion.
- If the trouble has not been solved by repairing the wire harness or parts, then, proceed to page EF–41, Replacement of ECU.



JEF00116-00574

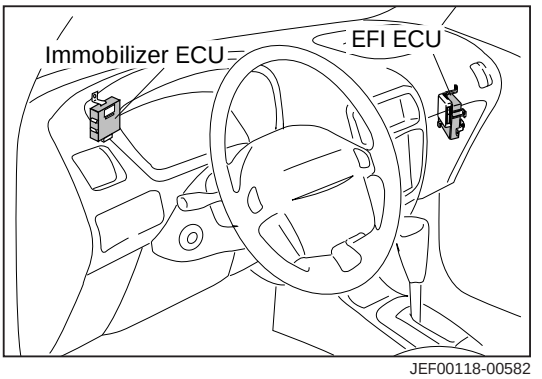
DIAGNOSIS CODE NO. 81
IMMOBILIZER SIGNAL CIRCUIT



JEF00117-00581

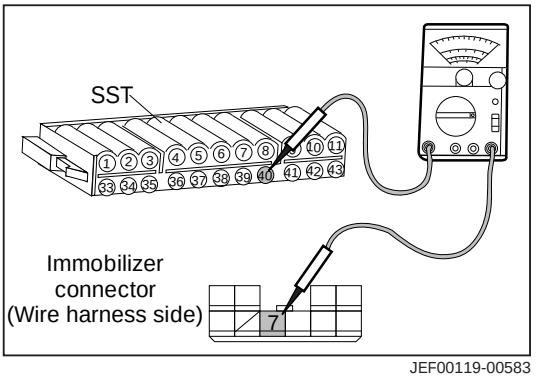
When the rolling codes cannot be exchanged between the engine EFI ECU and the immobilizer ECU or the rolling codes are not matched.

1. Check of wire harness
   (1) Connect the SST between the ECU connectors and the wire harness connectors.
   (2) Remove the screws of the glove compartment sub-assembly.
   (3) Disconnect the connector of the Immobilizer ECU.



JEF00118-00582

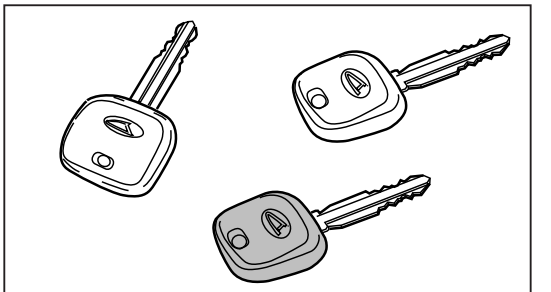
   (4) Check that continuity exists between the terminal 7 (Cowl wire side terminal of the Immobilizer ECU) and terminal 40 (SST terminal).
   If not, check the wire harness.



JEF00119-00583

   NOTE:
   - If the diagnosis code No. 43 is flashing, most likely it denotes that open wire occurs intermittently or the shielding is poor.
   - If the trouble has not been solved by repairing the wire harness or connectors, then, proceed to the following steps.

2. Check the Immobilizer system.
   NOTE:
   - In cases where the ECU is replaced with a new EFI ECU, be sure to use the master key to start the engine for the first time. The engine will not start with a key other than the master key. In cases where the ECU is replaced with an EFI ECU other than a new one, the engine will not start even if the master key is used. For details, refer to the immobilizer manual.
   - When the diagnosis code No. 81 occurs because of reasons other than abnormality of the wire harness, most likely the immobilizer ECU is malfunctioning.
     Refer to the immobilizer manual.


Master key
(black)

JEF00120-00585

REPLACEMENT OF ECU

INSPECTION

NOTE:

- Even when the replacement of the ECU is required in previous checks, make sure that the ECU malfunction has not been caused by factors other than the ECU by carrying out the following checks. Then, proceed to replace the ECU.
- The measurement of voltage should be conducted while all of the connectors are connected.

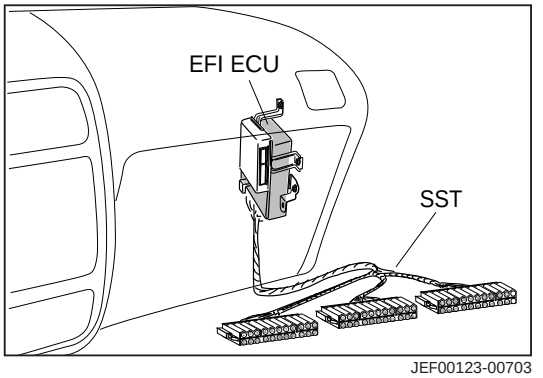
JEF00121-00701

CAUTION:

- In cases where the ECU is replaced with a new EFI ECU, be sure to use the master key and connect the test terminal with the earth terminal to start the engine for the first time. The engine will not start with a key other than the master key.
- In cases where the ECU is replaced with an EFI ECU other than a new one, the engine will not start even if the master key is used.
  For details, refer to the immobilizer manual.

JEF00122-00702

1. Install the SST.
   See page EF–18, “Preparation of trouble shooting with SST”.
2. Measurement of voltage or resistance
   (1) Measure the voltage or resistance between respective terminals.
   (2) Check to see if the measured voltage or resistance conforms to the specifications in accordance with the following “CHARACTERISTICS OF ECU OUTPUT” table.



JEF00123-00703

CHARACTERISTICS OF ECU OUTPUT (1)

Followings are standard voltage or resistance at ECU.

Item	Terminal	Condition	Standard voltage or resistance	Remedies
Power supply	2 – 62	All times	Battery voltage	Check back-up fuse in the relay box.
	11 – 62 43 – 62	Ignition switch is turned on.	Battery voltage	Check main relay in the relay box.
Earth group	20 52 62 63	All times	1 Ω or less	Check ground earth of wiring harness.
Pressure sensor	23 – 52	Ignition switch is turned on.	4.5 - 5.5 V	Check ECU power supply.
	24 – 52	Ignition switch is turned on. Atmospheric pressure is 101 kPa.	3.3 - 4.0 V	Check pressure sensor.
Water temp. sensor	25 – 52	Ignition switch is turned on. After engine has warmed up fully. (Cooling water temperature is 80 - 90ϒC.)	0.4 - 0.65 V	Check cooling water temperature sensor.
Intake air temp. sensor	57 – 52	Ignition switch is turned on. Air temperature sensor inside the surge tank is 20 (68).	1.8 - 2.9 V	Check air temp. sensor.
Oxygen sensor	56 – 62	Engine is rotating at about 3000 r.p.m., after engine has warmed up fully.	Voltage varies within 0.2 - 1.0 V	Check oxygen sensor.
Cam angle sensor	21 – 53	While the engine is being cranked by the starter motor.	0.1 - 0.3 V (AC range)	Check crank angle sensor.
Throttle position sensor	23 – 20	Ignition switch is turned on.	4.5 - 5.5 V	Check throttle position sensor.
	54 – 20	Ignition switch is turned on. Throttle valve is fully closed.	1.0 V or less	
		Ignition switch is turned on. Throttle valve is fully opened.	3.5 - 4.1 V	
Vehicle speed sensor	7 – 62	Ignition switch is turned on. When vehicle is moved. (Measured voltage changes 4 times for movement of 1.6 m)	Change in voltage between 0.1 V and approx. 5 V	Check speed sensor.
Ignition coil drive	63 – 29 63 – 64	Ignition switch is turned on.	3 V or less	Check ignition coil.
Injector drive	31 – 62 32 – 62	Ignition switch is turned on.	Approx. battery voltage	Check injector(s).
Fuel pump drive	33 – 62 or 34 – 62	Ignition switch is turned on.	Approx. battery voltage	Check fuel pump relay. The terminal 34 is for immobilizer system.
VF monitor	42 – 62	Engine is rotating at about 3000 r.p.m. after engine has warmed up fully.	1.8 - 3.2 V	Check oxygen sensor.
Alternator	28 – 62	Engine is running.	Approx. battery voltage	Check alternator.

JEF00124-00704

CHARACTERISTICS ECU OUTPUT (2)

Followings are standard voltage or resistance at ECU.

Item	Terminal	Condition	Standard voltage or resistance	Remedies
Electrical load	37 – 62	Headlamp switch is turned on.	Approx. battery voltage	Check headlamp fuse or switch.
	36 – 62	Ignition switch is turned on and defogger switch is turned on.	Approx. battery voltage	Check defogger fuse or switch.
	6 – 62	Ignition switch is turned on and heater blower switch is turned on.	0.1 V or less	Check heater blower switch.
		Heater blower switch is turned off.	Approx. battery voltage	Check gauge fuse or heater blower relay.
Tachometer signal	41 – 62	Ignition switch is turned on.	0.1 V or less	Check tachometer.
		Engine is rotating at idling speed.	Approx. 6 V (AC range)	Replace ECU.
Automatic transmission signal	38 – 62	When A/T shift lever is in P or N range.	1 Ω or less	Check wire harness.
Air conditioner signal	5 – 62	When ignition SW is turned on and A/C switch is turned on.	Approx. battery voltage	Check wire harness.
	1 – 62	Engine is running at idling speed and A/C SW is turned on.	3.0 V or less	Check wire harness.
	26 – 62	Engine is running at idling speed and A/C switch is turned on.	0.1 V - 0.4 V (AC range)	Check wire harness.
	3 – 62	Ignition SW is turned ON.	0.15 - 4.8 V	Check wire harness.
Idle-up VSV control	60 – 62	Engine is running at idling speed and headlamp switch, defogger switch or heater switch is turned on.	0.5 V or less	Check wire harness.
	59 – 62	Engine is running at idling speed and headlamp switch, defogger switch or heater switch is turned on.	0.5 V or less	Check wire harness.
	58 – 62	Engine is running at idling speed and A/C switch is turned on.	0.5 V or less	Check wire harness.
Test terminal	39 – 62	Ignition switch is turned on.	4.5 - 5.5 V	Check ECU.
Check engine lamp	10 – 62	Ignition switch is turned on.	Approx. battery voltage	Check wire harness.

JEF00125-00705

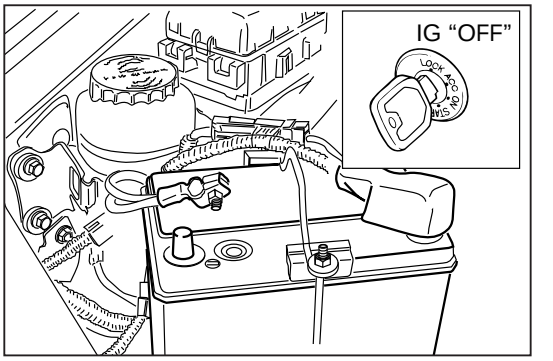
After completion of inspection

(1) Disconnect the ground cable terminal from the negative (–) terminal of the battery.
(2) Remove the SST by disconnecting its connectors from the ECU and engine wire connectors.
(3) Connect the wire harness connectors to the ECU.
(4) Reconnect the ground cable terminal to the negative (–) terminal of the battery.

JEF00126-00706

ECU REPLACEMENT

1. Disconnect the ground cable terminal from the negative (–) terminal of the battery.
2. Remove the glove compartment subassembly.



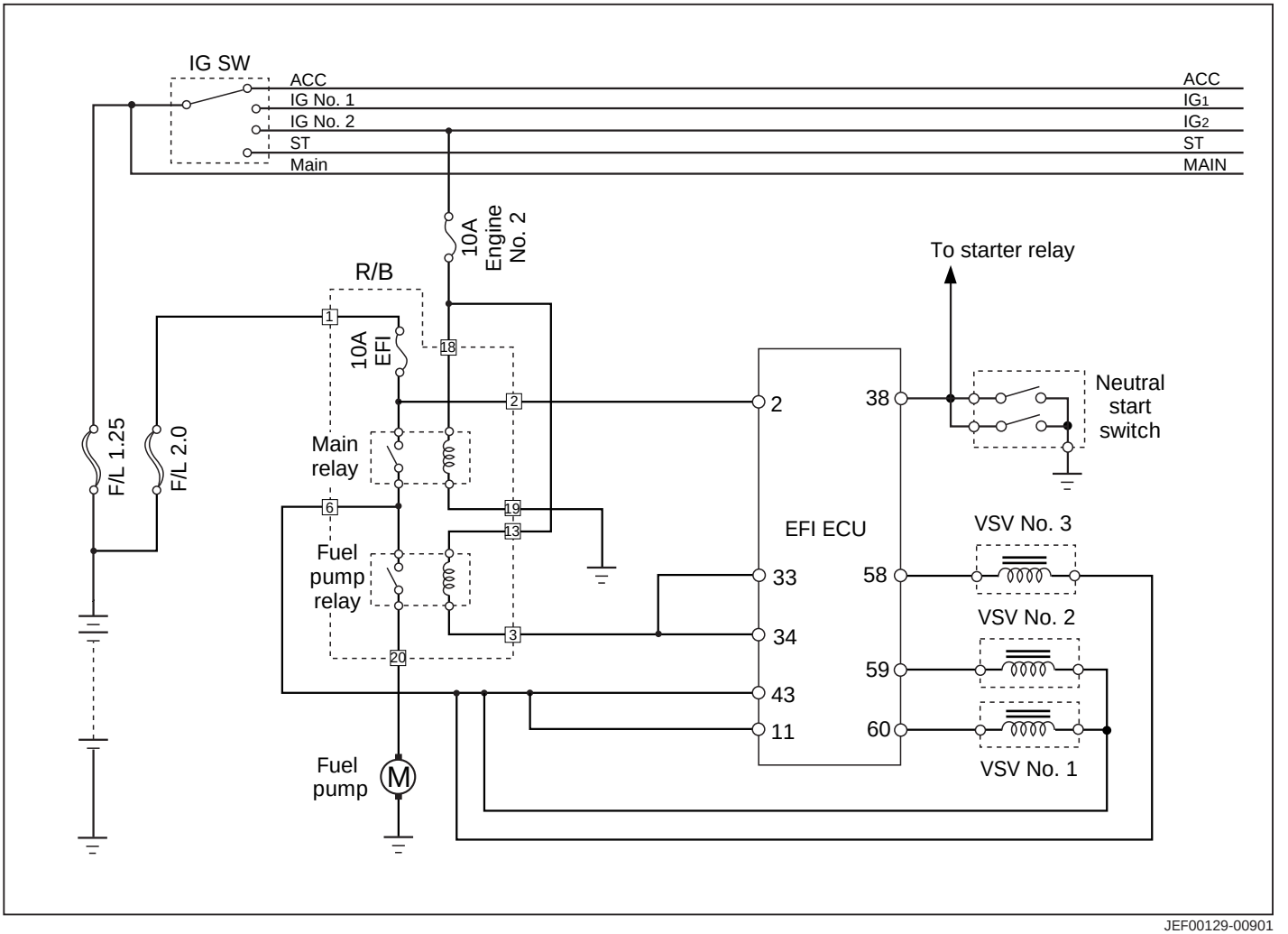
JEF00127-00707

3. Disconnect the wire harness connector from the ECU.
4. Remove the ECU by removing the attaching bolts and nuts.
5. Install a new ECU.
   CAUTION:
   - Never touch the bracket screws mounted on the ECU proper. This tampering will cause an ECU malfunction.
6. Connect the wire harness connector to the ECU.
7. Install the glove compartment subassembly.
8. Connect the ground cable terminal to the negative (–) terminal of the battery.

JEF00128-00708

INSPECTION OF IDLE-UP CONTROL SYSTEM

WIRING DIAGRAM

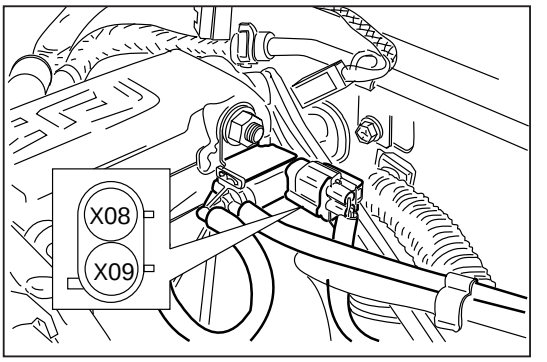


JEF00129-00901

UNIT INSPECTION

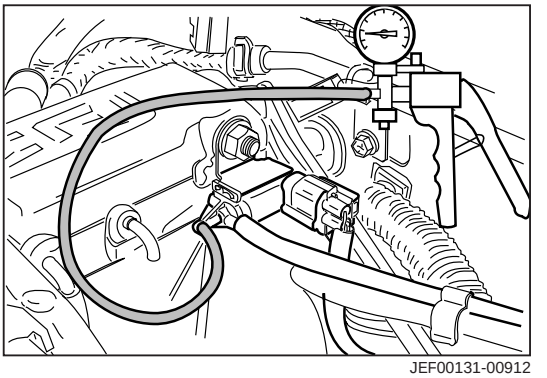
1. Remove the air cleaner case subassembly and its relevant parts.
2. Disconnect the connector of the idle-up VSV.
3. Measure the resistance between the respective terminals of the VSV.
4. Ensure that the specified resistance exists between the terminals described below.
   Specified Value: $32 \pm 5\ \Omega$

   NOTE:
   - If the resistance will not conform to the specified value, replace the idle-up VSV.



JEF00130-00911

5. Apply a negative pressure of 13.3 kPa (100 mmHg) to the VSV, using a MityVac or a vacuum pump.
6. Check to see if the negative pressure applied in the step 5 becomes zero when the battery voltage is applied to the terminals of the VSV.
   NOTE:
   - If not, replace the idle-up VSV.



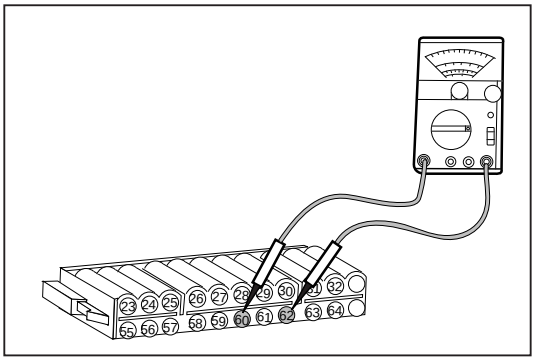
JEF00131-00912

SYSTEM INSPECTION

VSV No. 1

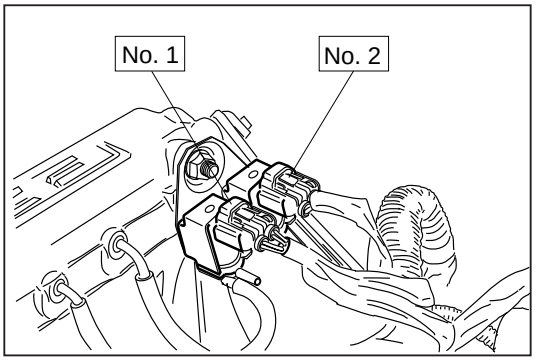
1. Connect the SST between the EFI ECU connector and the wire harness connectors. See page EF–18.
2. With the engine running, measure the voltage between the terminals 60 and 62 of the SST.

	Condition	Specified value
1	Until engine is warmed up fully after engine starting from engine cold state.	0.5 V or less
2	Defogger switch is turned on.	
3	Heater blower switch is turned on.	
4	Headlamp switch is turned on.	



JEF00132-00941

NOTE:
- The measurement should not be performed when plural conditions of those discribed above one met concurrently.
- If the check results will not conform to the requirements given in the table, check and repair those related systems.

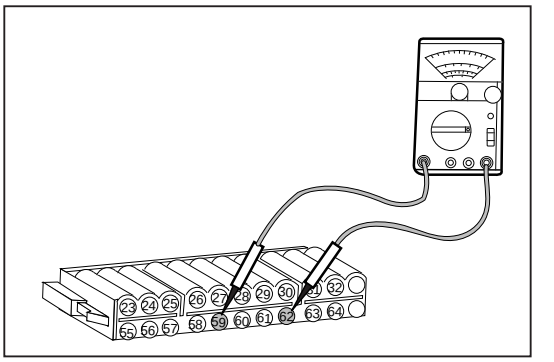


JEF00133-00942

VSV No. 2

1. Connect the SST between the EFI ECU connector and the wire harness connectors. See page EF–18.
2. With the engine running, measure the voltage between the terminals 59 and 62 of the SST.

	Condition	Specified value
1	Until engine is warmed up fully after engine starting from engine cold state.	0.5 V or less
2	The shift lever has been moved from D, 2, L or R to P or N.	
3	Defogger switch, heater blower switch and headlamp switch have been turned on.	



JEF00134-00943

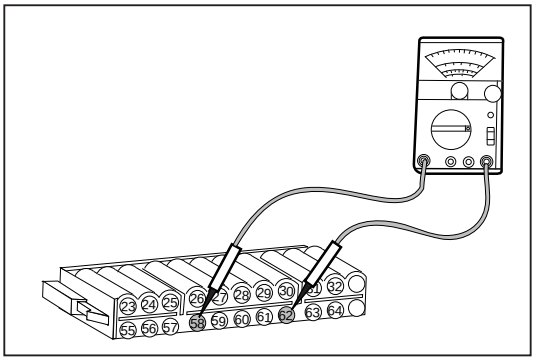
NOTE:
- This VSV is equipped on A/T vehicles only.
- If the check results will not conform to the requirements given in the table, check and repair those related systems.

JEF00135-00944

VSV No. 3

1. Connect the SST between the EFI ECU connector and the wire harness connectors. See page EF–18.
2. With the engine running and air conditioner switch turned on, measure the voltage between the terminals 58 and 62 of the SST.

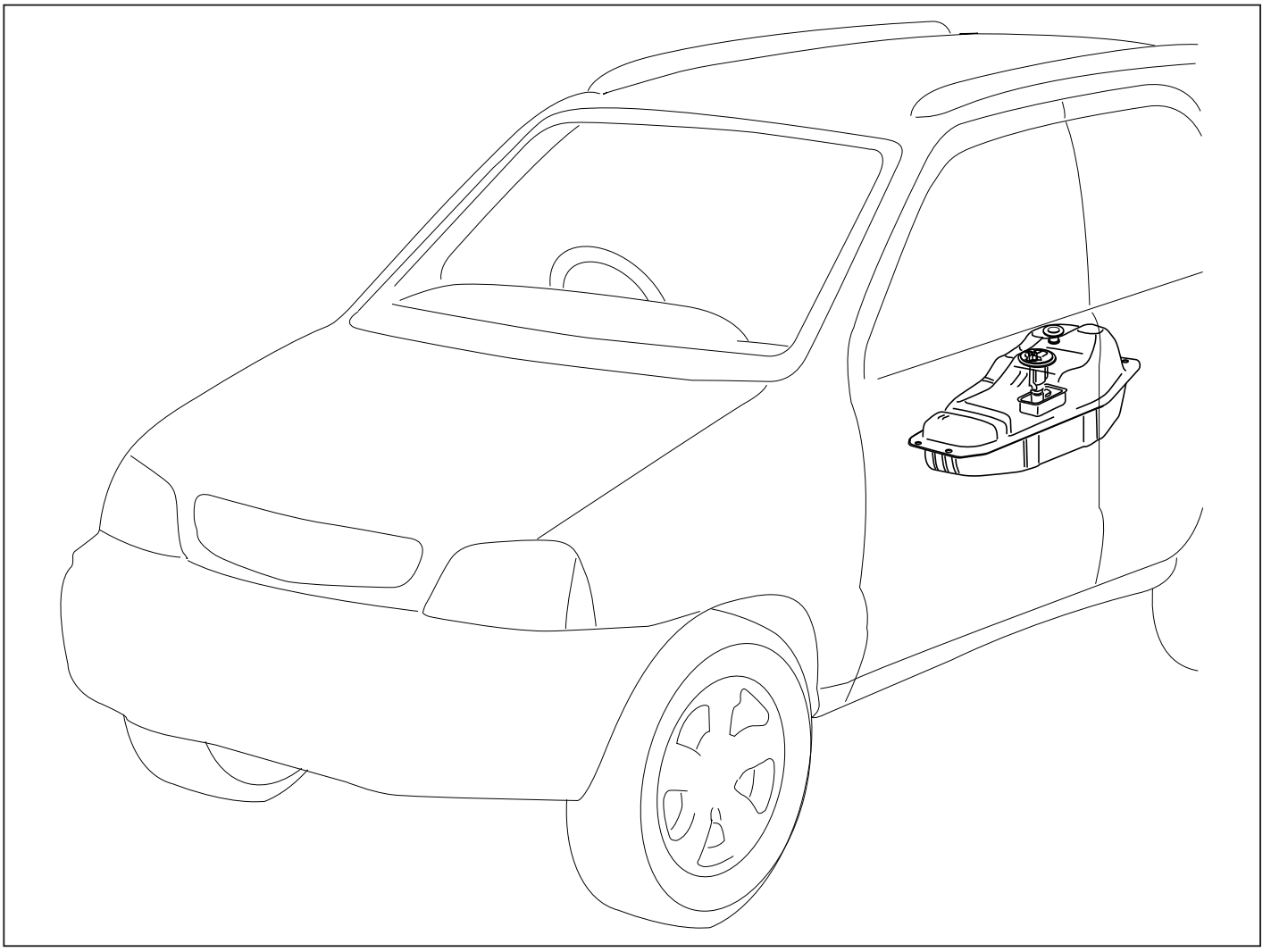
   Specified Value: 0.5 V or less



JEF00136-00945

NOTE:
- This VSV is used for the air conditioner system.
- If the check results will not conform to the requirements given in the table, check and repair those related systems.

INSPECTION OF FUEL SYSTEM

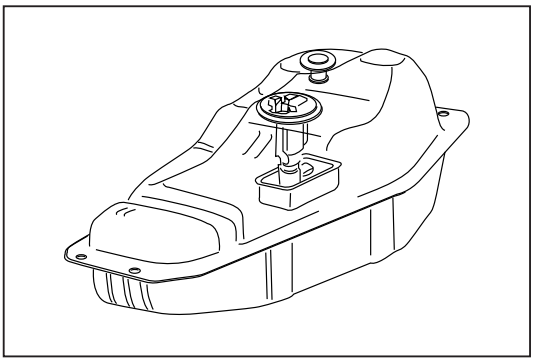


JEF00137-01001

FUEL TANK

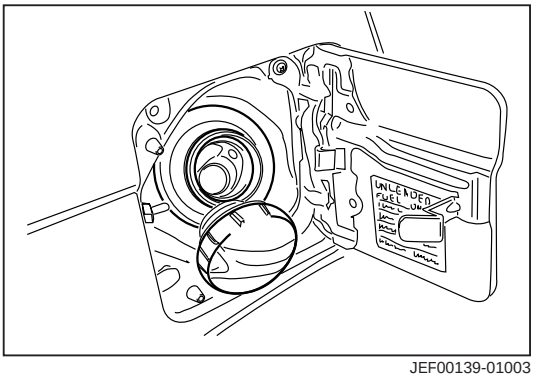
UNIT INSPECTION

1. Check the fuel tank for deformation, cracks or fuel leakage.
2. Check the filler neck for damage or fuel leakage.
3. Check to see if the hose and tube connections are installed as shown in the right figure.



JEF00138-01002

4. Check to see if the fuel tank cap and gasket exhibit damage.
   NOTE:
   - If the fuel tank and its related parts exhibit any defect, repair or replace the fuel tank.
   - Replace the gasket if it is damaged. Also, replace the fuel tank cap if it exhibits damage.



JEF00139-01003

FUEL PUMP

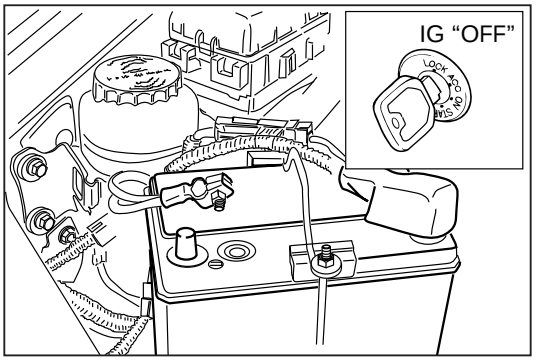
INSPECTION

See page EF–14, Check of fuel system.

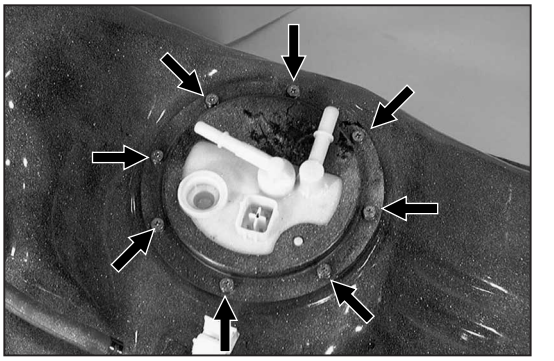
REMOVAL

1. Disconnect the battery ground cable from the negative (–) terminal of the battery.
2. Remove the fuel tank.
   Refer to the BO section of the sevice manual.
   WARNING:
   - Never allow any fire to be brought near the working site.

3. Remove the fuel pump assembly.



JEF00140-01011



JEF00141-01012

INSTALLATION

1. Install a new fuel pump assembly to the fuel tank with a new gasket interposed.
2. Tighten the attaching screws.
   Tightening Torque: 1.5 - 2.5 N·m

3. Install the fuel tank and its related parts to the body.
   Refer to the BO section of the service manual.

FUEL LINE

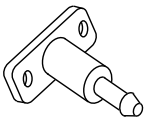
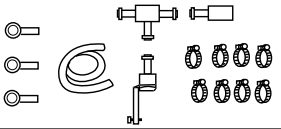
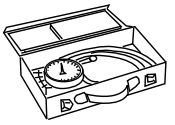
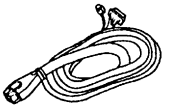
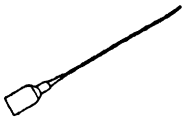
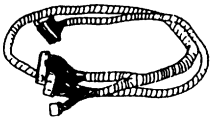
REMOVAL & INSTALLATION OF QUICK CONNECTOR

Refer to the BO section of the service manual.
WARNING:
- Always keep fire away from the working site.

NOTE:
- Always use a new gasket and a hose band (clip) when replacing the fuel tank or components.
- Each part should be tightened securely to the specified torque.

JEF00142-01013

SST (Special Service Tools)

Shape	Part No. and name	Purpose	Remarks
	09283-87703-000 Pressure regulator adapter	* Inspection of injectors * Inspection of pressure regulator * Inspection of fuel pressure	Used in combination with 09268-87702-000
	09268-87702-000 Injection measuring tool set	* Inspection of injectors * Inspection of pressure regulator * Inspection of fuel pressure	Used in combination with 09283-87703-000
	09268-87701-000 EFI fuel pressure gauge	Inspection of fuel pressure	
	09842-30070-000 EFI inspection wire	Inspection of fuel injectors	
	09991-87401-000 Engine control system inspection wire	Measurement of engine revolution speed Shorting terminal T	
	09991-87402-000 Tacho-pluse pick-up wire	Measurement of engine revolution speed	
	09991-87403-000 Diagnosis check wire	Shorting terminal T	
	09842-87706-000 EFI-II computer check subharness	Inspection of computer input/output voltage	

JEF00143-01101

TIGHTENING TORQUE

Tightening components	Tightening torque		Remarks
	N·m	kgf-m	
Ignition coil × Cylinder head over	5.9 - 8.8	0.6 - 0.9	
Spark plug × Cylinder head	14.7 - 21.6	1.5 - 2.2	
Cam angle sensor × Cylinder head	14.7 - 21.6	1.5 - 2.2	
Oxygen sensor × Exhaust manifold	29.4 - 39.2	3.0 - 4.0	
Cooling water temperature sensor × Cylinder head	24.5 - 34.3	2.5 - 3.5	
Intake air temperature sensor × Intake head	29.5 - 39.2	3.0 - 4.0	
Idle-up VSV × Intake manifold	14.7 - 21.6	1.5 - 2.5	
Delivery pipe × Intake manifold	14.7 - 21.6	1.5 - 2.2	
Fuel pump × Intake manifold	1.5 - 2.5	0.15 - 0.25	

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