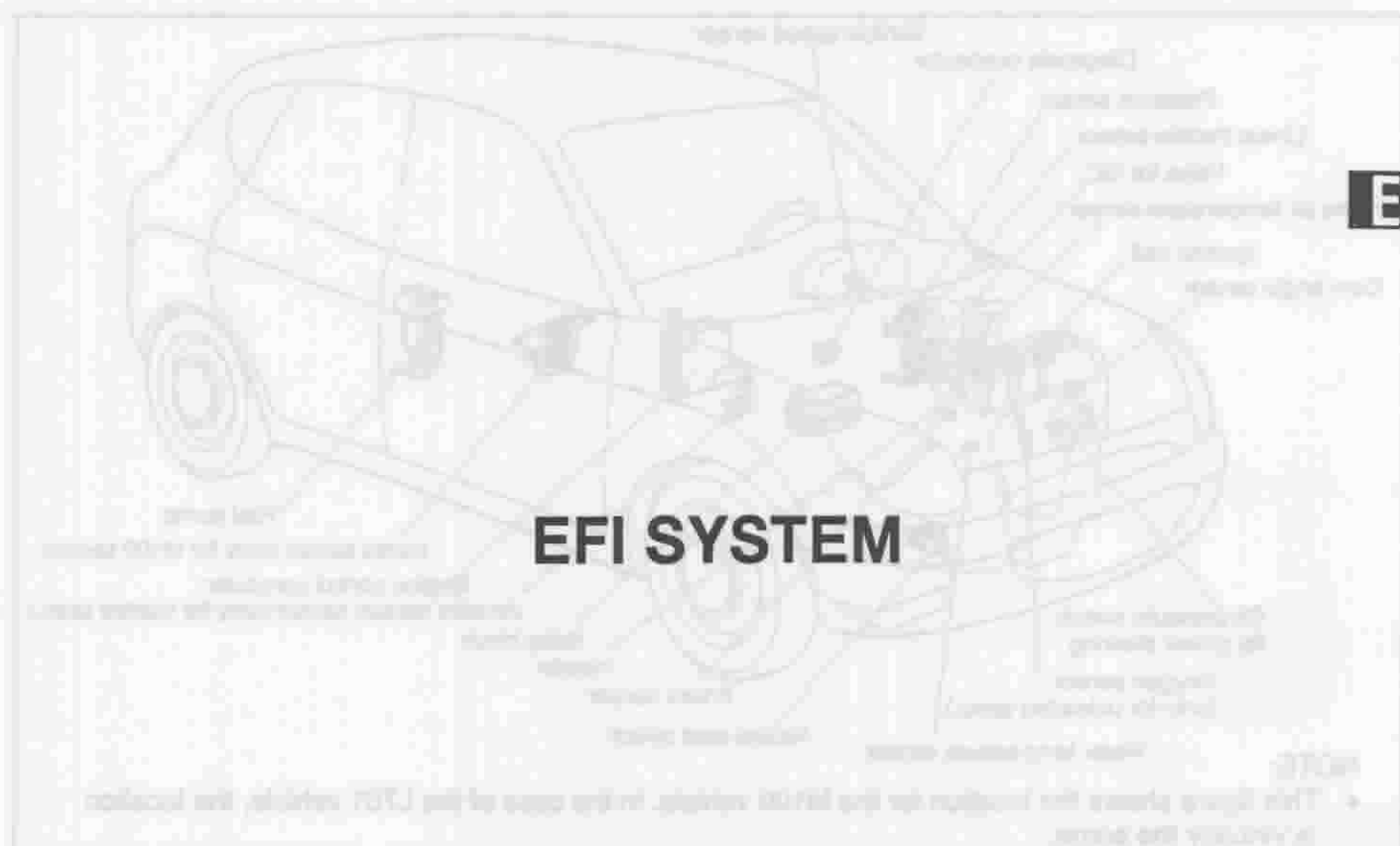


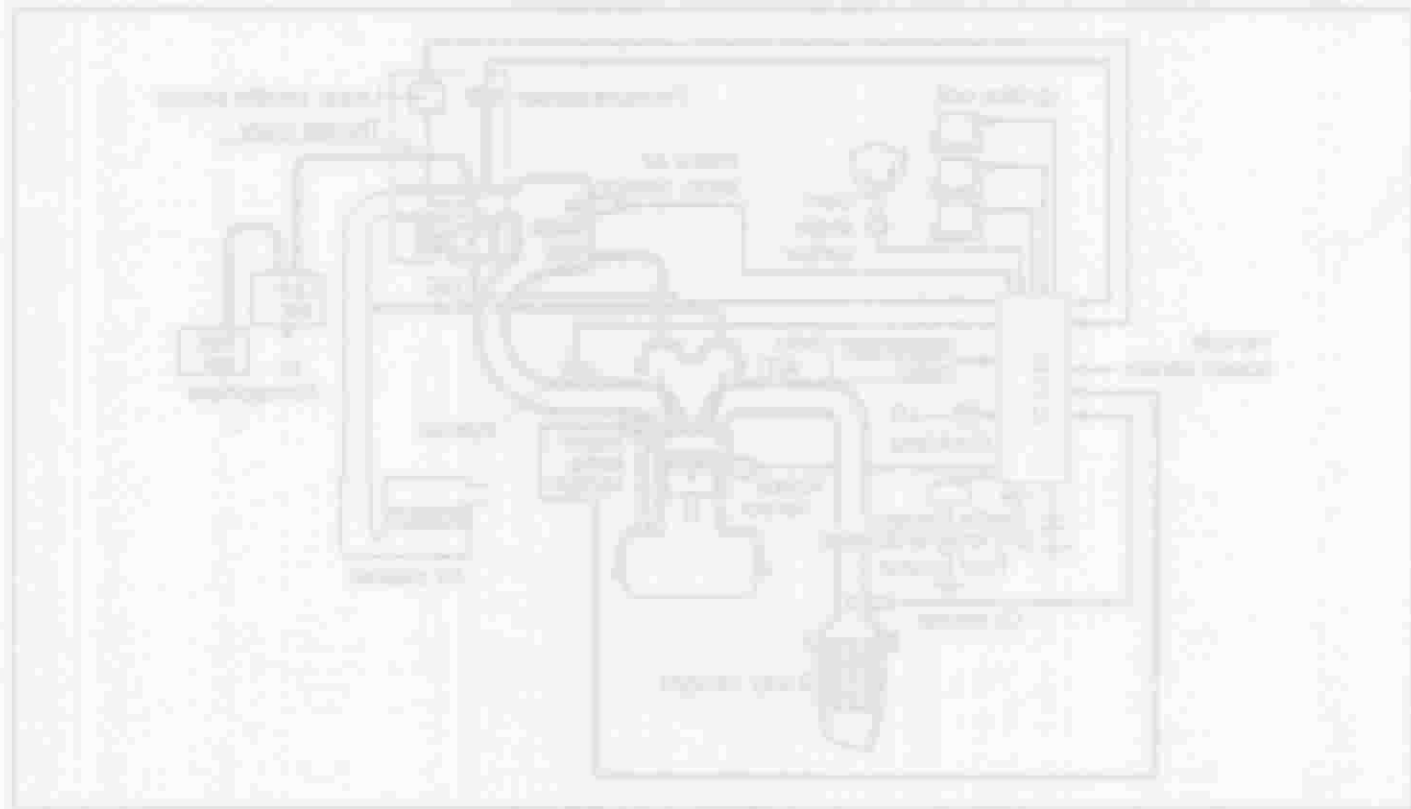
# 1.1 LOCATION OF ELECTRONIC CONTROL PARTS

## 1.2 SYSTEM DESCRIPTION



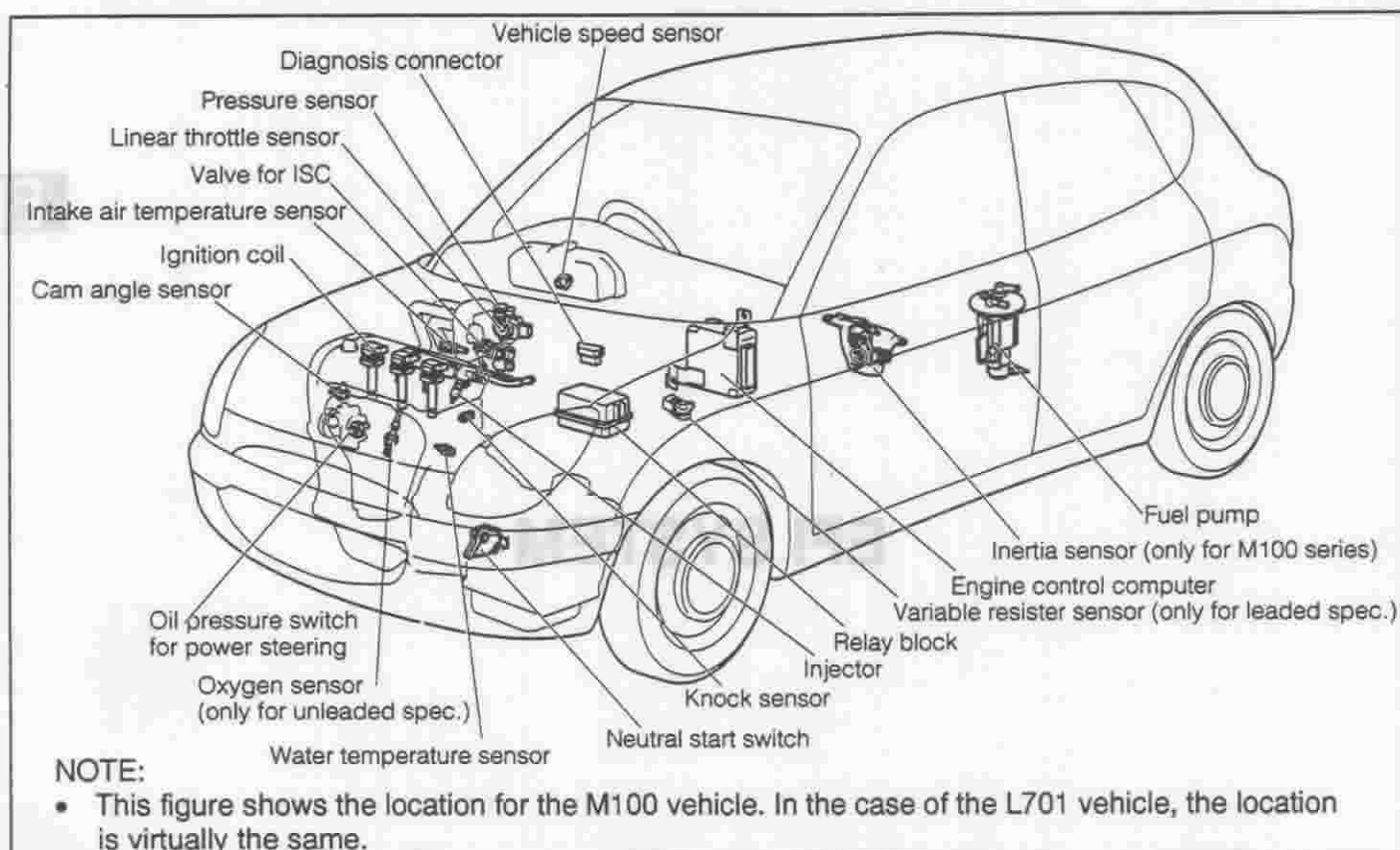
# 1.3 SYSTEMATIC DIAGRAM

## 1.4 SPECIFICATIONS OF SYSTEM FOR VARIOUS MODELS



## 1. SYSTEM DESCRIPTION

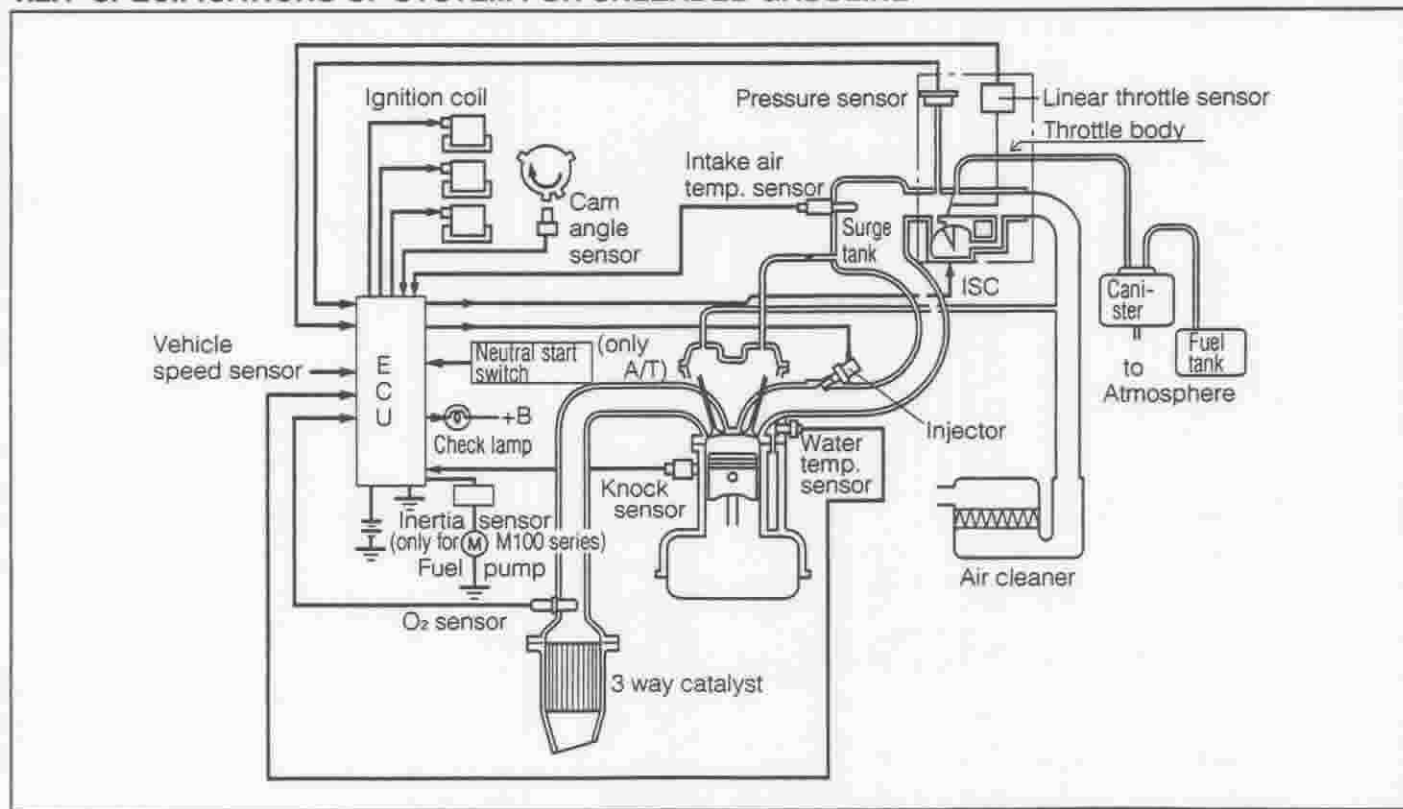
### 1.1 LOCATION OF ELECTRONIC CONTROL PARTS



LEF00002-00001

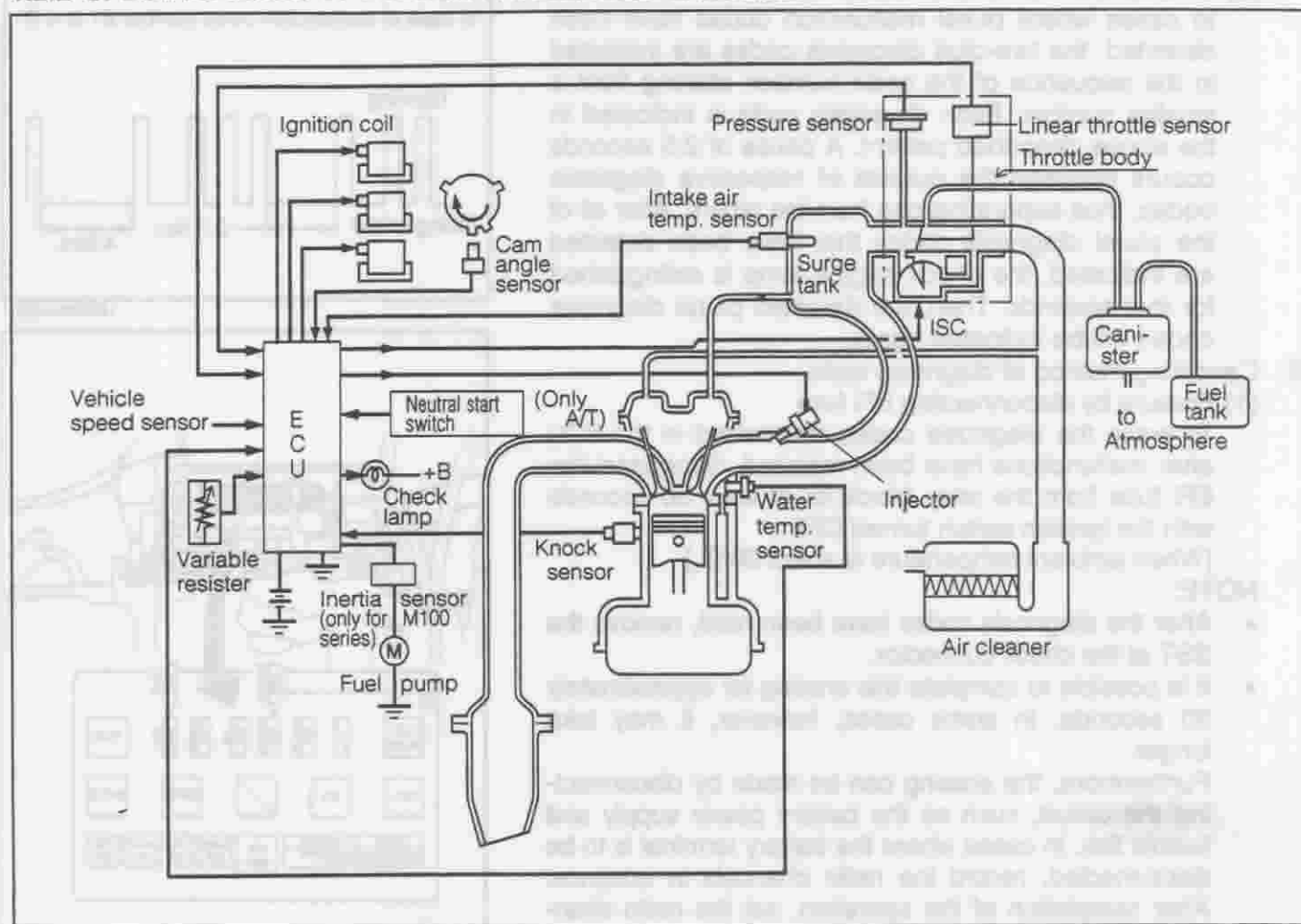
### 1.2 SYSTEMATIC DIAGRAM

#### 1.2.1 SPECIFICATIONS OF SYSTEM FOR UNLEADED GASOLINE



LEF00003-00002

## 1.2.2 SPECIFICATIONS OF SYSTEM FOR LEADED GASOLINE



LEF00004-00003

1.3 DIAGNOSIS SYSTEM  
DESCRIPTION

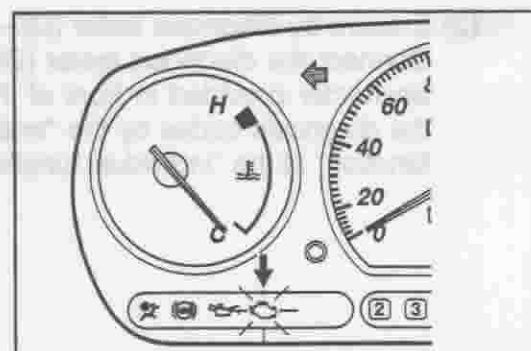
A self-diagnosis system is built in the ECU. If any abnormality should occur in the signal systems of various sensors, the self-diagnosis system memorizes the malfunction code number in the ECU. In respect to important abnormalities, the check engine lamp at the instrument panel goes on, thus warning the driver of the abnormality.

When the abnormality is cleared, the check engine lamp goes out.

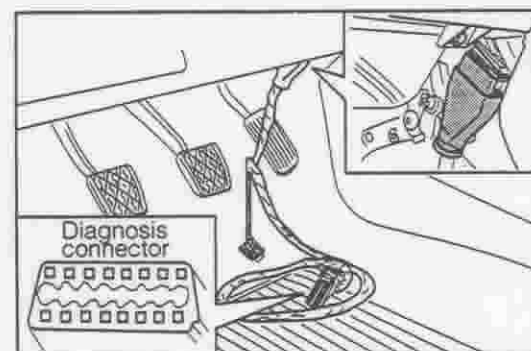
When the Test terminal of the diagnosis connector is connected with the earth terminal, the malfunction code number that has been memorized in the ECU will be indicated in a form of blinking of the check engine lamp in the instrument panel with the ignition switch turned "ON" position.

## 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.



LEF00005-00004



LEF00005-00005

## (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 the others. 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.

## 3. Canceling method of diagnosis code

## (1) Erasure by disconnecting EFI fuse

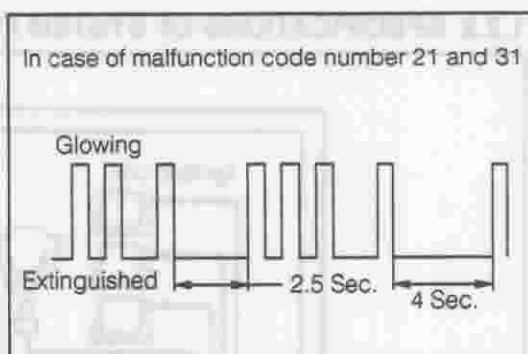
To erase the diagnosis codes memorized in the ECU after malfunctions have been repaired, disconnect the EFI fuse from the relay block for at least 30 seconds with the ignition switch turned OFF.

[When ambient temperature is about 20°C.]

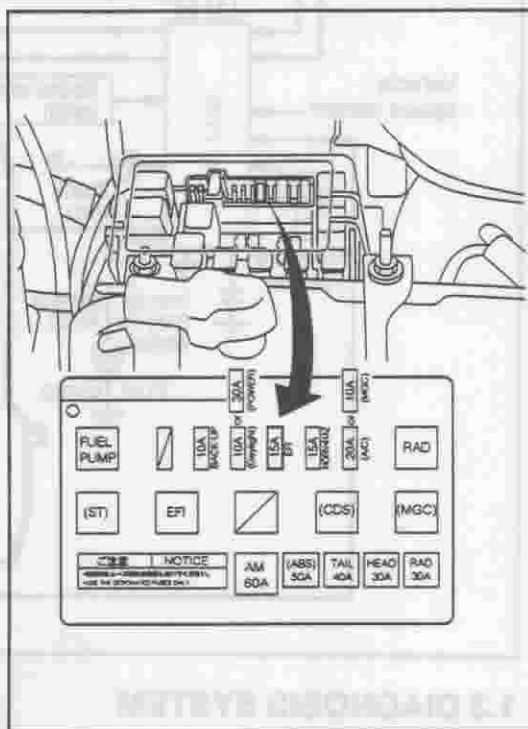
## NOTE:

- After the diagnosis codes have been read, remove the SST at the check connector.
- It is possible to complete this erasing for approximately 30 seconds. In some cases, however, it may take longer.

Furthermore, the erasing can be made by disconnecting the circuit, such as the battery power supply and fusible link. In cases where the battery terminal is to be disconnected, record the radio channels in advance. After completion of the operation, set the radio channels the same as before.



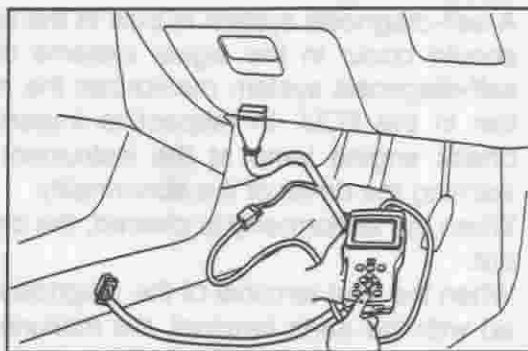
LEF00012-00011



LEF00013-00012

## (2) Erasure by diagnosis tester (DS-21)

Connect the diagnosis tester (DS-21) to the exclusive connector provided in front of the driver's seat. Erase the diagnosis codes by the "malfunction code erasing function" of the "individual function."



LEF00014-00013

### 1.4.2 Diagnosis through inquiries

The diagnosis through inquiries is to collect information from the customer before confirming the malfunction phenomena. The diagnosis through inquiries proves to be very important clues in reproducing malfunction phenomena.

Since the information obtained by the diagnosis through inquiries is referred to during the trouble shooting, it is imperative to make an inquiry of the customer, centering on the items related to the malfunction, instead of simply carrying out the diagnosis through inquiries.

LEF00016-00000

### 1.4.3 Confirmation, record and erasure of diagnosis code

When the diagnosis abnormality code is indicated, confirm whether the malfunction took place in the system or is taking place now. Also it is necessary to check any relation between the code and the reproduced malfunction. For this purpose, the diagnosis code should be indicated twice; in other words before and after the confirmation of the phenomena.

LEF00017-00000

### 1.4.4 Confirmation of reproduction of malfunction phenomena

In carrying out the trouble shooting, it is imperative to reproduce the malfunction phenomena by creating conditions and environments similar to the situation where the malfunction took place, based on the information obtained by the diagnosis through inquiries. As for the phenomenon that is hard to be reproduced, it is most important to try to reproduce it patiently by applying external factors, such as vibration (moving wire harnesses or relays by hand), heat (applying hot wind) and water (giving humidity).

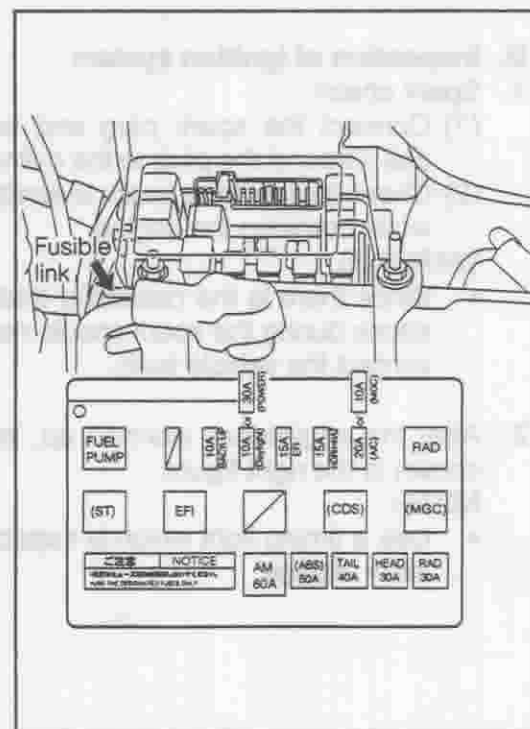
Moreover, if you presume sections (parts) which may have caused the malfunction, connect a tester, etc. to them and check to see if the malfunction takes place, you can evaluate whether the sections (parts) are functioning properly or not, too.

LEF00018-00000

### 1.4.5 Basic check

#### A. Hints for basic check

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, ignition coil faulty, or ignition timing adjusted improperly.
  - (5) Admission of air.



LEF00019-00014

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: 74 - 117  $\Omega$

- (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.

4. Check of inertia sensor for fuel cut. (Only for M100 series)  
Check that the inertia sensor is functioning.

- (a) Turn OFF the ignition switch.
  - (b) Slide the front seat (driver's seat) to the front fully.
  - (c) Turn over the cutout section of the carpet under the front seat (driver's seat). Take out the plug hole cover.

- (d) Check the reset lever (yellow one) for the operating state. Peep through the plug hole and check to see if the embossed letter "OFF" can be seen on the reset lever. If the "OFF" is seen, it means the inertia sensor is functioning. In other words, the power supply circuit is in a cut state.

To restore the power supply circuit, push up the reset lever and keep it in that state for at least one second.

**WARNING:**

- If there is any possibility of fuel leakage, never operate the reset lever.

#### D. Inspection of ignition system

1. Spark check
  - (1) Connect the spark plug and harness to the ignition coil. Ground the plug to the cylinder head cover.
  - (2) Check to see if the spark is emitted at each spark plug while cranking the engine.

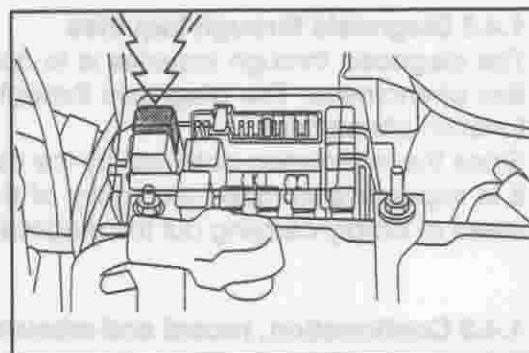
**WARNING:**

- Since there is the possibility that you may have strong shock during the spark check, never allow your body to contact the vehicle body.

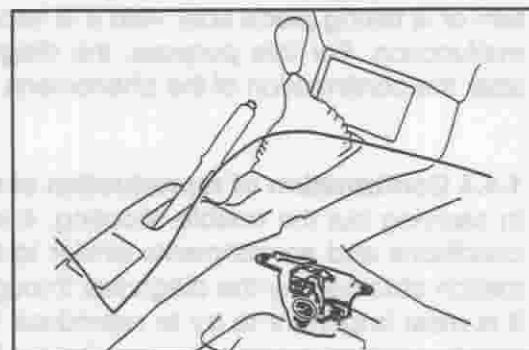
2. After the engine has warmed up, install a timing light, as shown in the right figure.

**NOTE:**

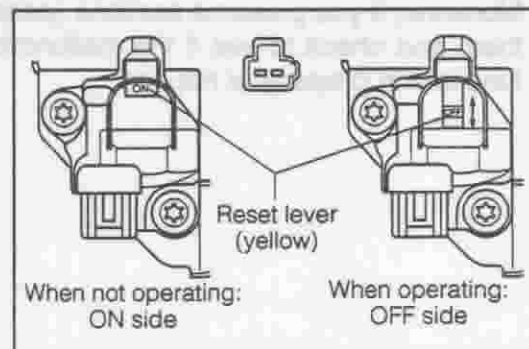
- Use a timing light which is capable of detecting the primary voltage.



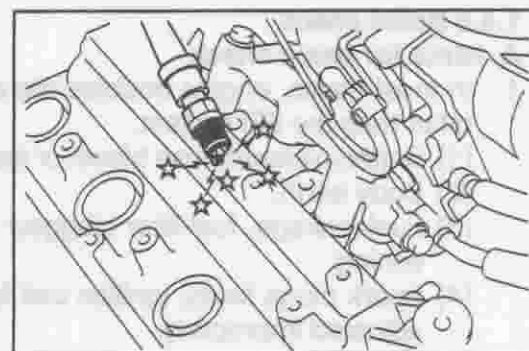
LEF00025-00020



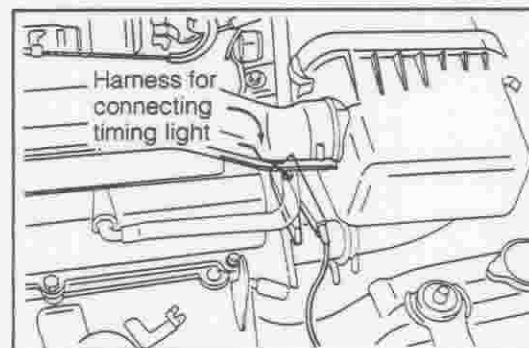
LEF00026-00021



LEF00027-00022



LEF00028-00023



LEF00029-00024

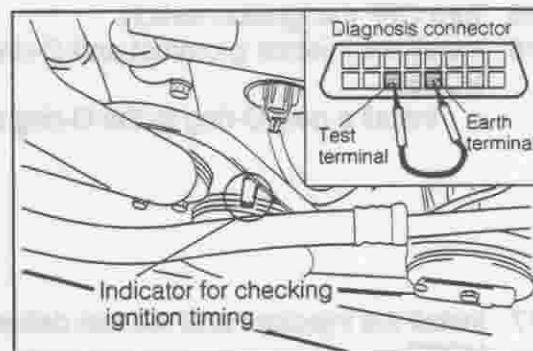


- Confirm that the timing mark of the crankshaft pulley is located within the width of the indicator of the timing belt cover.

Specified Value:  $5^{\circ} \pm 2^{\circ}$  BTDC/ idle rpm

**NOTE:**

- Connect the test terminal and the earth terminal with a jump wire of the diagnosis connector.



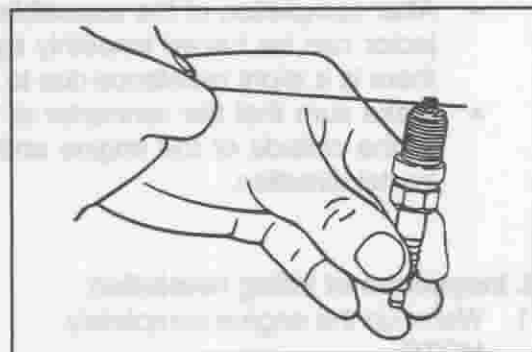
LEF00030-00025

- Remove the ignition coils and the spark plugs.
- Visually inspect the spark plug for electrode wear, thread or insulator damage.
- Measure the electrode gap, using a plug gap gauge.

Specified Value: 1.0 - 1.1 mm

**NOTE:**

- If the gap fails to conform to the specification, replace the plug.



LEF00031-00026

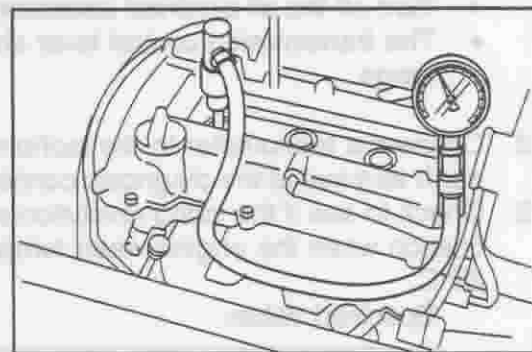
**E. Inspection of compression pressure**

- Warm up the engine.
- With the IG switch turned OFF, remove all of the IG coils and spark plugs.
- Temporarily remove the main relay and fuel pump relay.
- Insert a compression gauge into the spark plug hole.
- Depress the accelerator pedal fully.
- While cranking the engine, measure the compression pressure.

Minimum Value: 1579 - 1755 kPa  
(400 rpm. Difference between cylinders is less than 147 kPa.)

**NOTE:**

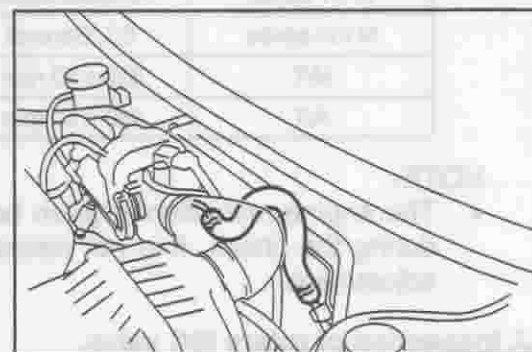
- Be sure to use a fully-charged battery. Also, the measurement should be performed in the shortest possible length of time.



LEF00032-00027

**F. Inspection of fuel flow**

- Loosen the hose band at the fuel pipe. Then remove the fuel hose from the fuel pipe.



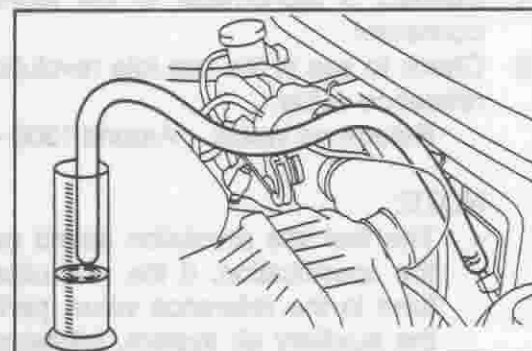
LEF00033-00028

- Connect a suitable fuel hose (about 2 meter long) to the fuel pipe.

- Insert one end of the fuel hose in a measuring cylinder.

**CAUTION:**

- The fuel pressure of the fuel line is approximately 294 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 pipe so that no fuel may get to the resin or rubber parts of the vehicle.

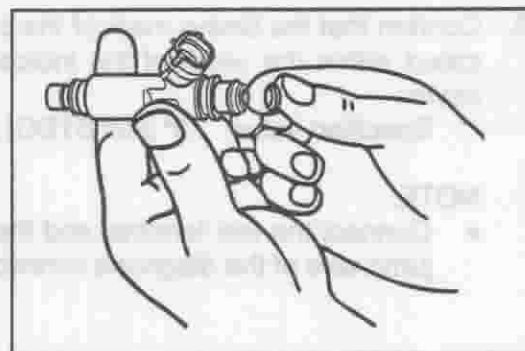


LEF00034-00029

15. Turn OFF the ignition switch.
16. Install the injector grommet and O-ring to the injectors.

**NOTE:**

- Install a new O-ring to the O-ring seal section.

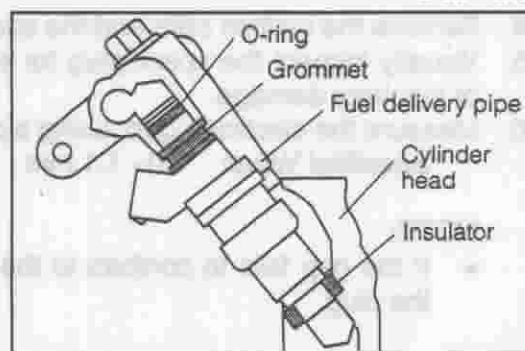


LEF00044-00039

17. Install the injectors and the fuel delivery pipe.

**NOTE:**

- After completion of the assembling, ensure that the injector can be turned smoothly by your hand, although there is a slight resistance due to friction.
- Make sure that the connector of the injector is located at the outside of the engine and is directed in a horizontal direction.



LEF00045-00040

## I. Inspection of idling revolution

1. Warm up the engine completely.

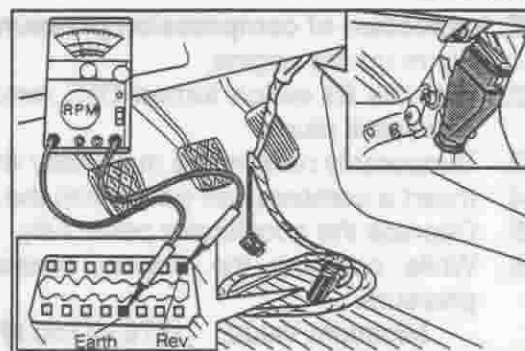
**NOTE:**

- Turn off the all electrical accessory switches.
- The transmission control lever should be in the N or P range.

2. Connect a tachometer to the tachometer terminal and the earth terminal at the diagnosis connector.
3. Check to see if the idling revolution conforms to the specification when the engine water temperature is higher than 80°C.

**Specified Value:**

L701 series	All destinations	—
M100 series	EC, General	AUS, ISRAEL, GCC
M/T	850 ± 50 rpm	900 ± 50 rpm
A/T	850 ± 50 rpm	900 ± 50 rpm



LEF00046-00041

**NOTE:**

- The engine revolution is given here for your reference during the check. It is not necessary to carry out the adjustment.

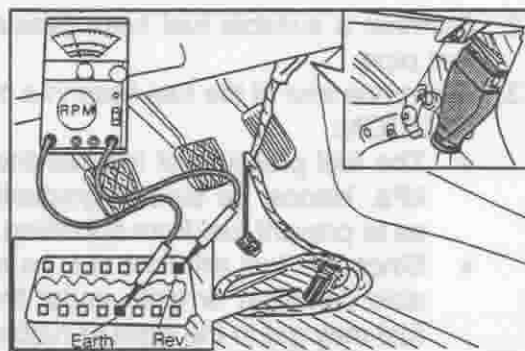
## J. Inspection of rotary ISC valve.

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 1300 - 1900 rpm/25°C

**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.



LEF00047-00042



## 2. 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 or terminal connections.

In the case of water-proof type connector, a measurement is conducted at the connector section with the measuring probe put into contact with the terminal at the connection side of the connector. Be very careful not to apply excessive force to the terminal at the connector side.

As an alternative method, insert a male or female terminal into the connector terminal or connect an adequate attachment.

2. The fuel line at the high-pressure side is pressurized to a fuel pressure of about 250 kPa. Therefore, a large amount of gasoline flows out when parts of the fuel line are disconnected. Hence, take the following countermeasures.

### WARNING

- Be sure to release the inner pressure of the fuel tank by removing the fuel filler cap in advance.

3. Tachometer connection

Connect the tachometer probe to the measuring terminal of the diagnosis connector.

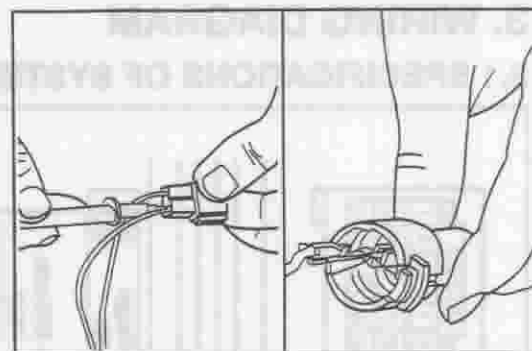
### CAUTION:

- 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 ignitor 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.

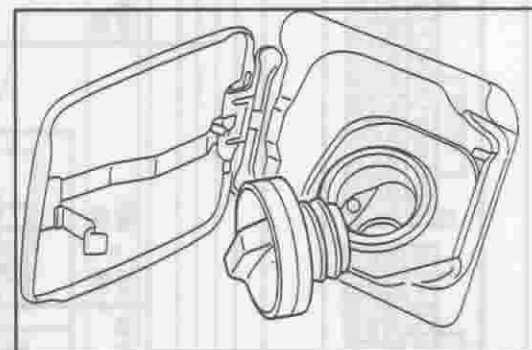
4. Precautions during oxygen sensor handling

- (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.

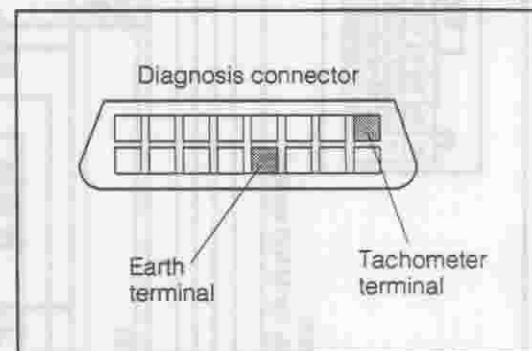
5. Do not open the cover of the ECU proper.  
(Failure to observe this caution could cause ECU malfunction.)



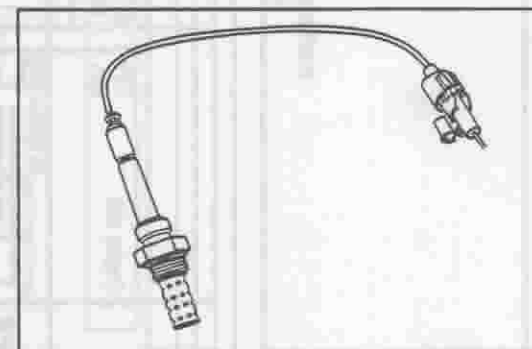
LEF00063-00047



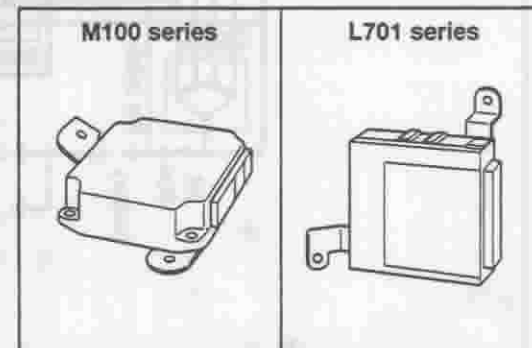
LEF00054-00048



LEF00055-00049



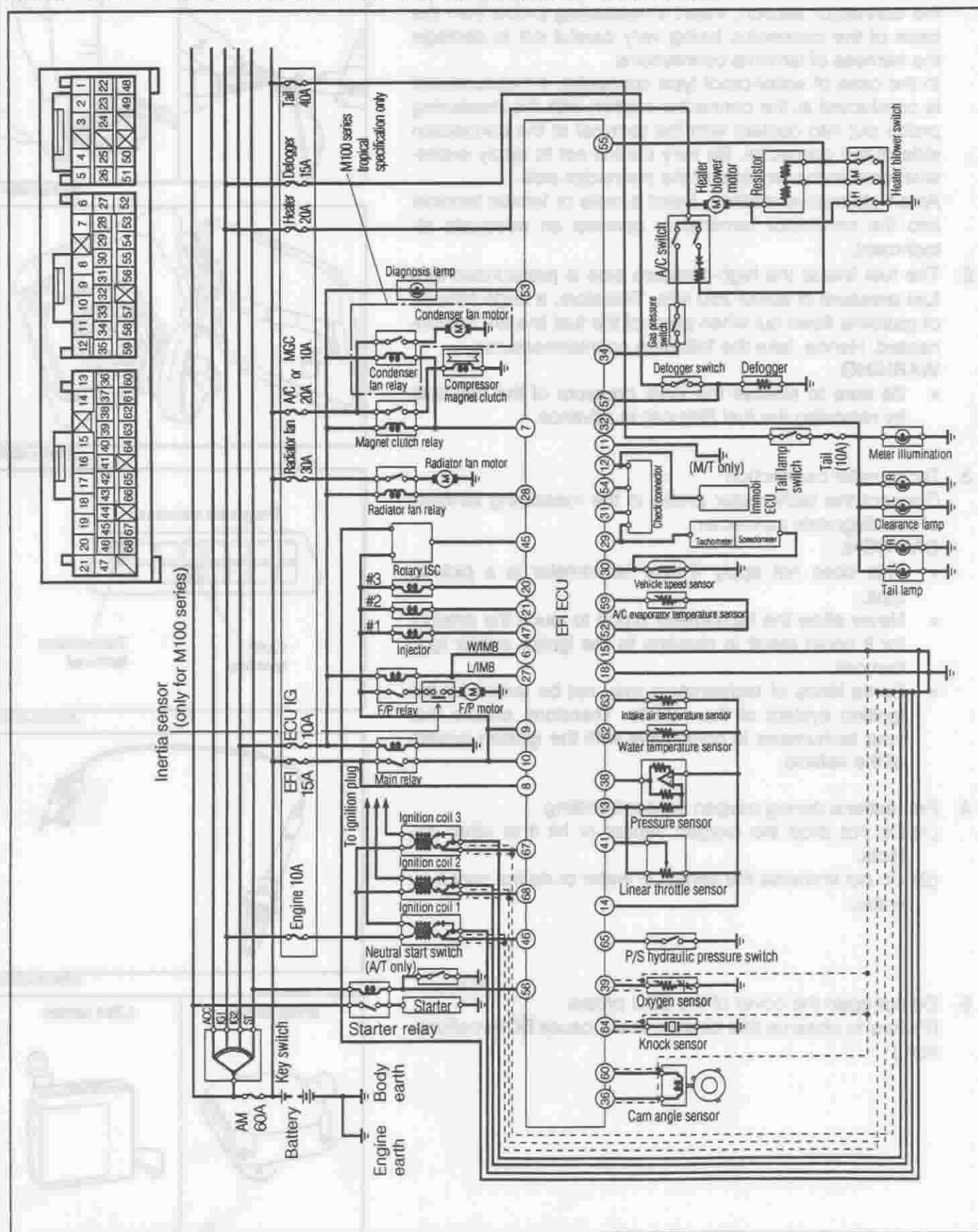
LEF00056-00050



LEF00057-00051

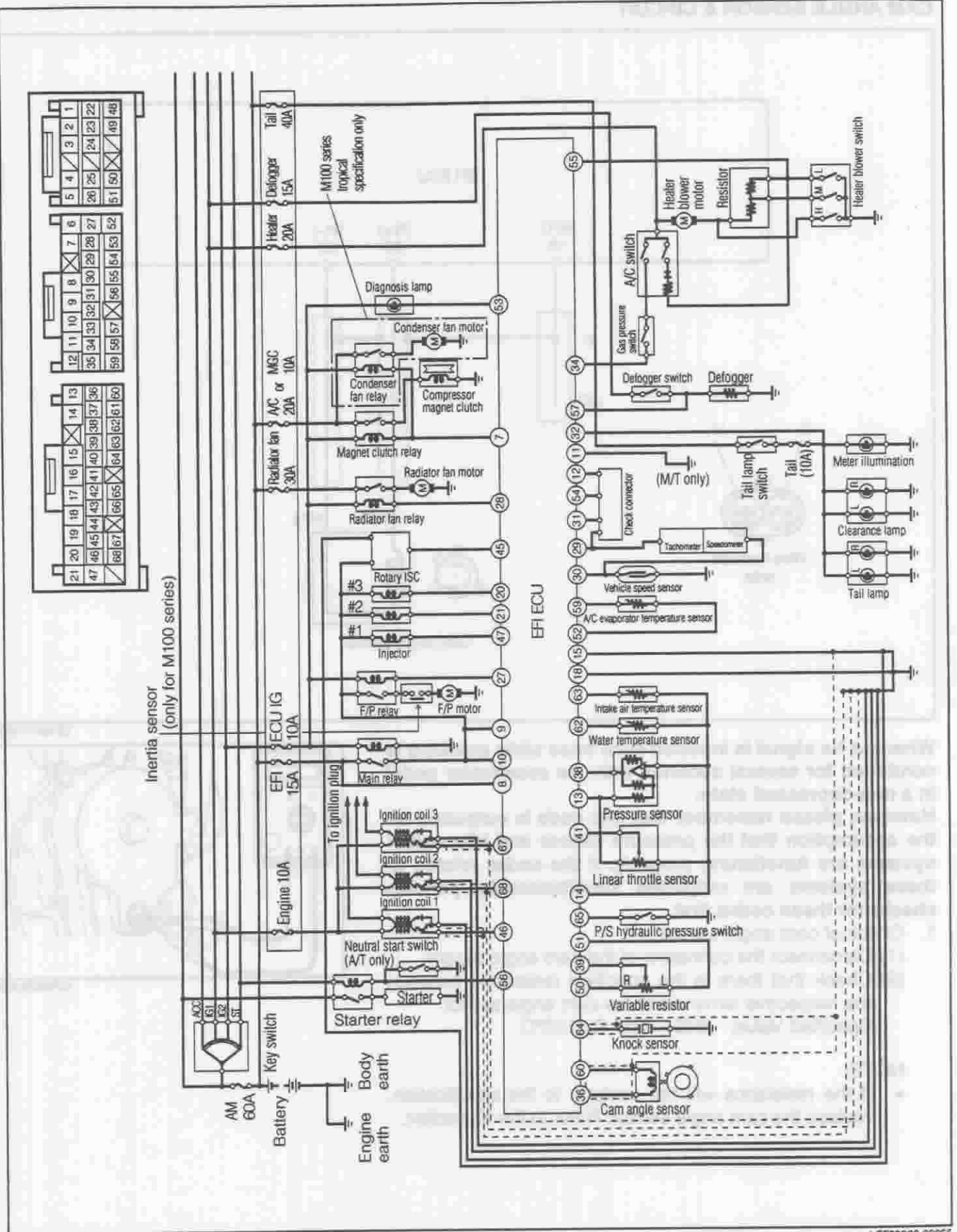
### 3. WIRING DIAGRAM

### 3.1 SPECIFICATIONS OF SYSTEM FOR UNLEADED GASOLINE

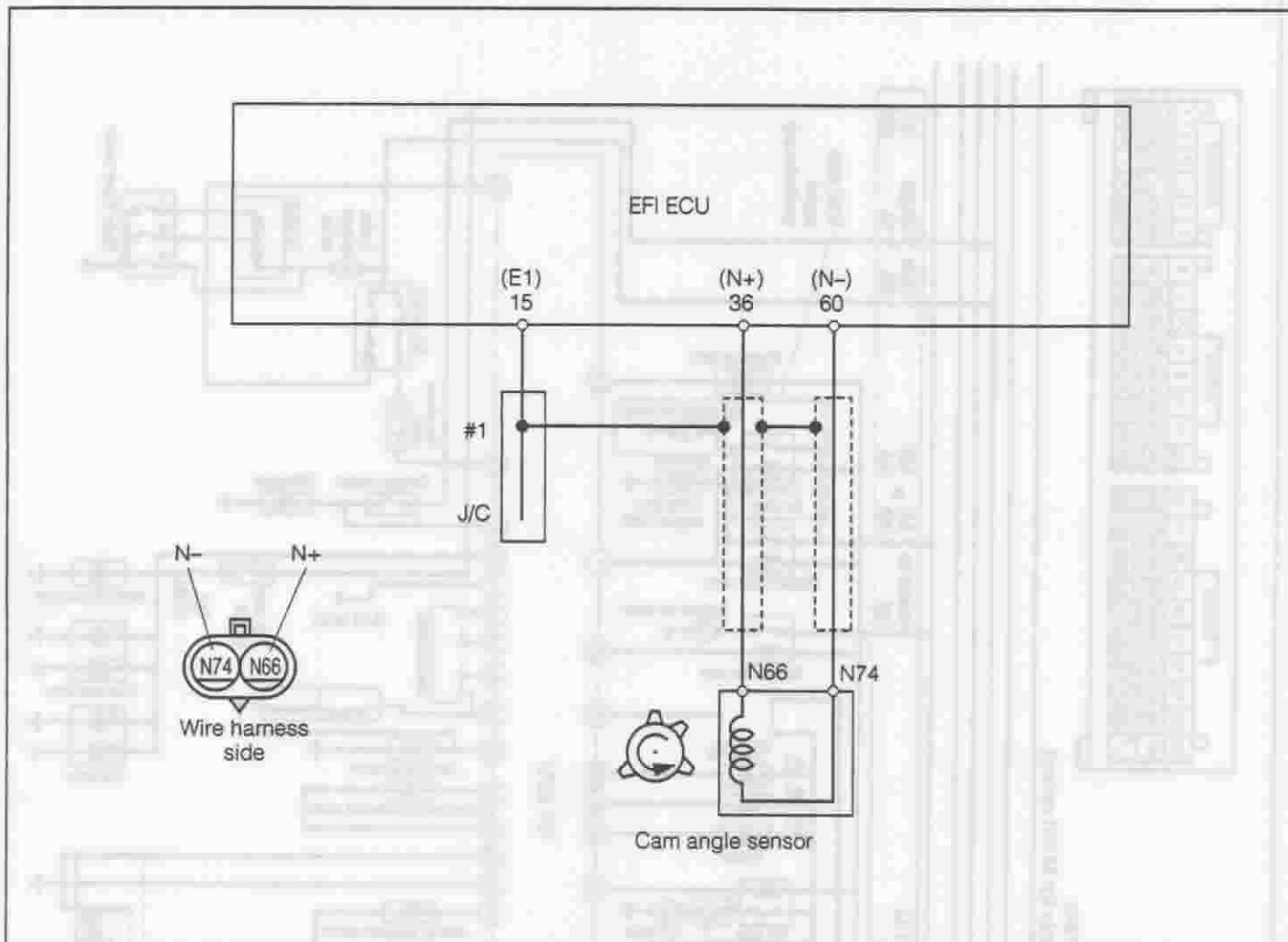


LEF00061-00054

### 3.2 SPECIFICATIONS OF SYSTEM FOR LEADED GASOLINE



### 5.3 DIAGNOSIS CODE NO. 13 CAM ANGLE SENSOR & CIRCUIT



LEF00071-00060

When no Ne signal is inputted even once while cranking is continued for several seconds with the accelerator pedal in a non-depressed state:

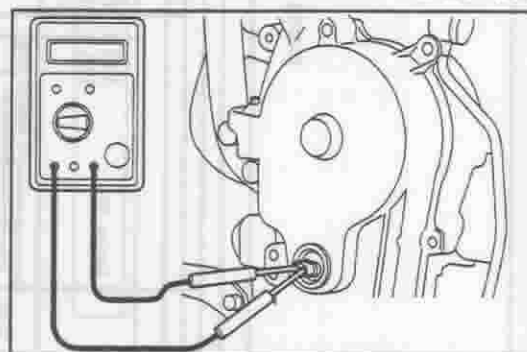
However, please remember that this code is outputted on the assumption that the pressure sensor and idle switch systems are functioning properly. If the codes related to these systems are outputted simultaneously, perform checks for these codes first.

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: 950 - 1250  $\Omega$  at 20°C

#### NOTE:

- If the resistance will not conform to the specification, replace the cam angle sensor. Refer to the IG section.



LEF00072-00061

- (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: 3 - 6 V (AC)

**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.

LEF00073-00000

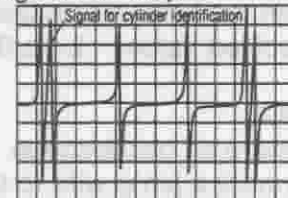
**REFERENCE**

- (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.

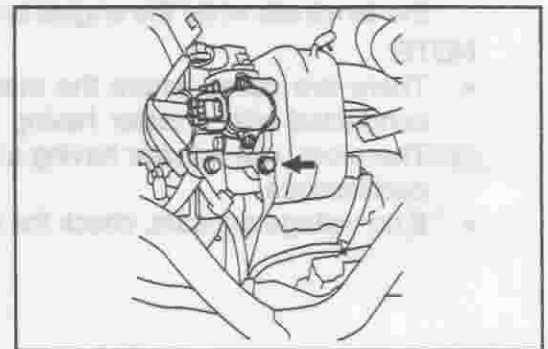
Cam angle sensor output



The rotation angle sensor signal will be outputted as shown in the figure above when an oscilloscope is used.  
(The frequency and voltage differ, depending upon the rotation speed.)

LEF00074-00062

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



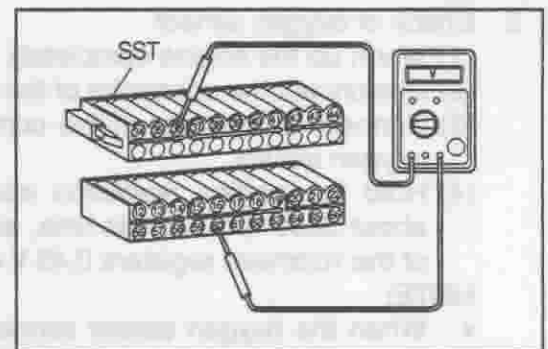
LEF00075-00063

- (2) Connect the wire harness connector to the connector of the cam angle sensor.
- (3) Connect the SST between the ECU connectors and the wire harness connectors.

**NOTE:**

- Refer to page EF-21, "Preparation of trouble shooting with SST".
- At this time, disengage the connector between the SST and the EFI ECU.

SST: 09842-97201-000



LEF00076-00064

- (4) Measure the resistance between the SST terminals 36 and 60.
- Specified Value: 950 - 1250  $\Omega$  at 20°C

**NOTE:**

- If the trouble has not been solved by repairing the wire harness or parts, then, proceed to page EF-47, Replacement of ECU.

- (5) While keeping the engine revolution speed at 3000 rpm, 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 step.

**NOTE:**

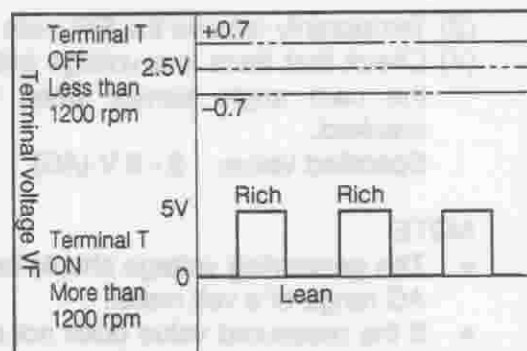
- There are cases where the measurement can not be conducted with a tester having a low reaction speed.
- (6) Measure the voltage between the VF terminal and the earth terminal while keeping the engine idle revolution when the jump wire is disconnected.
- Specified Value:  $2.5 \pm 0.7$  V

**REFERENCE**

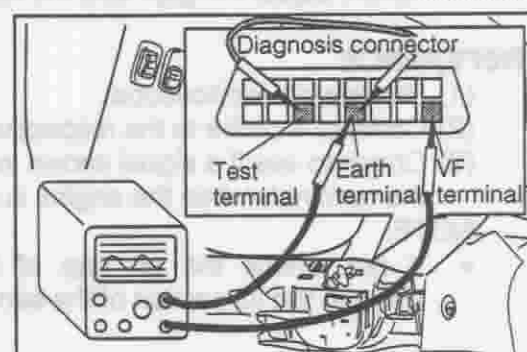
- Prepare an oscilloscope.
- Connect a jump wire to the test terminal and the earth terminal.
- Connect a probe to the VF terminal and the earth terminal.
- Check to see if a signal shown in the graph appears at the terminals while the engine is rotating at 3000 rpm.

**NOTE:**

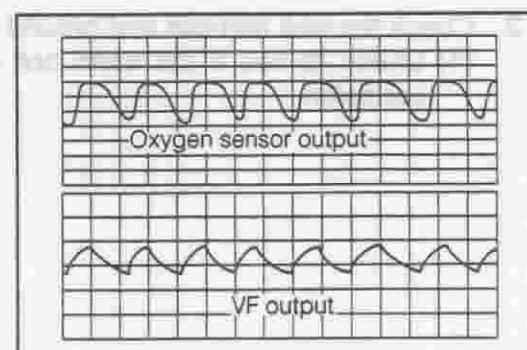
- There are cases where the measurement can not be conducted with a tester having a low reaction speed. Therefore, use a tester having a high reaction speed or oscilloscope.
- If no voltage appears, check the oxygen sensor unit.



LEF00085-00073



LEF00086-00074



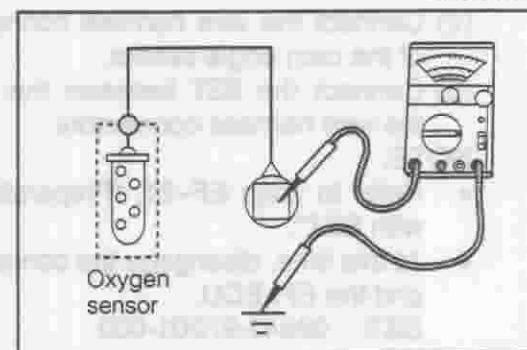
LEF00087-00075

**2. Check of oxygen sensor**

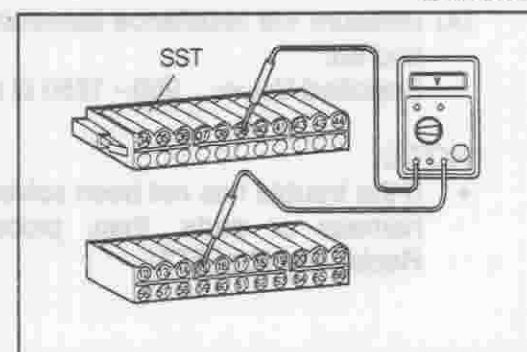
- Warm up the engine completely.
- Disconnect the connector of the oxygen sensor.
- Connect a voltmeter to the connector terminal of the oxygen sensor.
- Hold the engine revolution speed for 2 minutes at about 3000 rpm. At this time, ensure that the reading of the voltmeter registers 0.45 V or more.

**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.



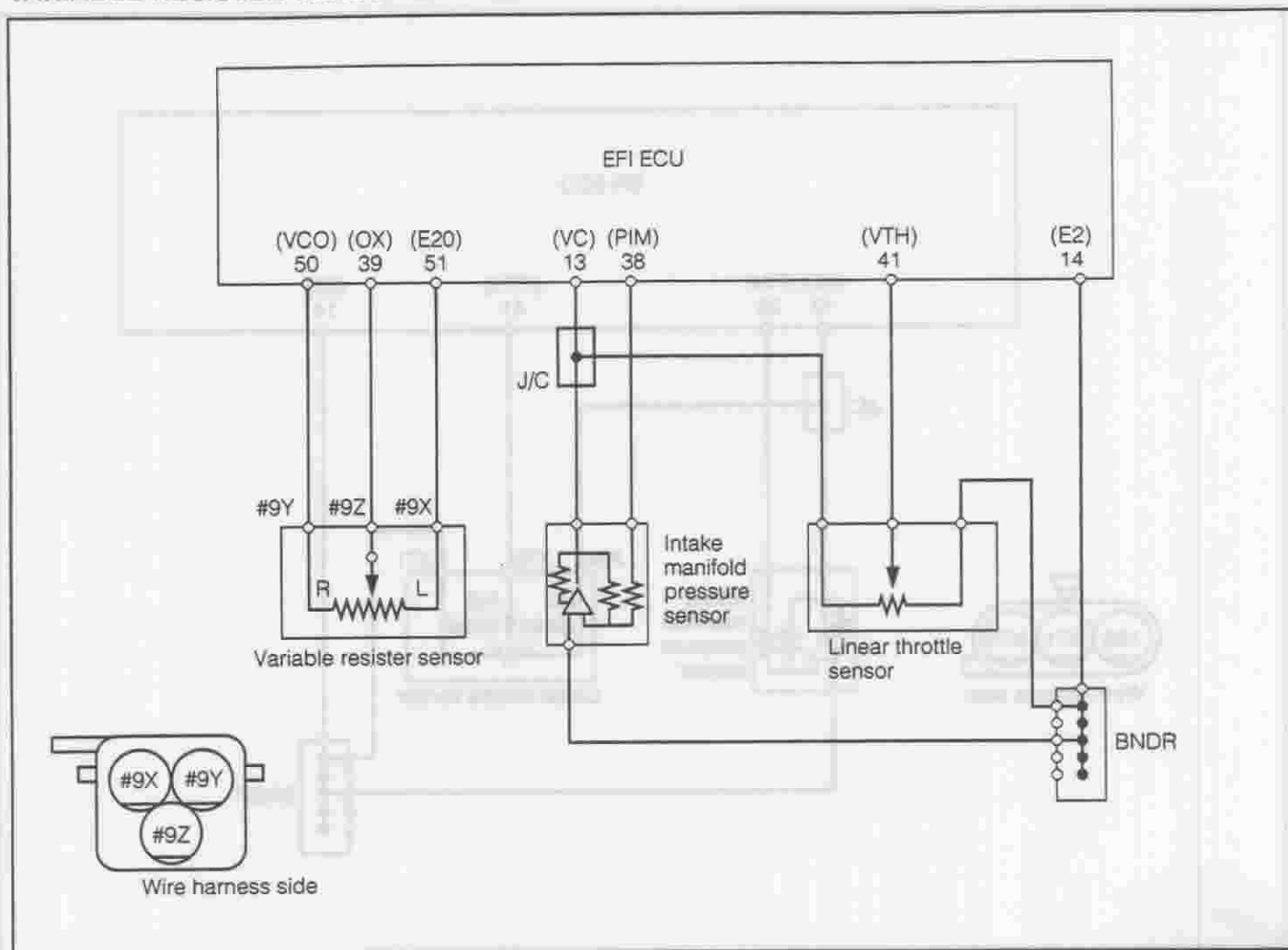
LEF00088-00076



LEF00090-00077



## 5.6 DIAGNOSIS CODE NO. 24 VARIABLE RESISTER SENSOR & CIRCUIT

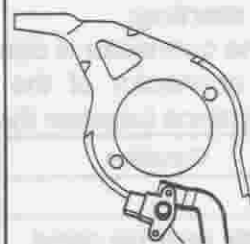


LEF00092-00079

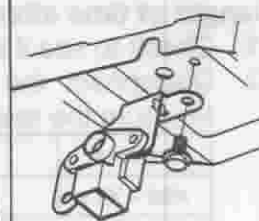
**When the signal from the variable resistor sensor is 4.8 V or more or less than 0.2 V continuously for more than a certain length of time:**

1. Check to see if the connector is connected properly.
2. Turn off the ignition switch.

M100 series



L701 series

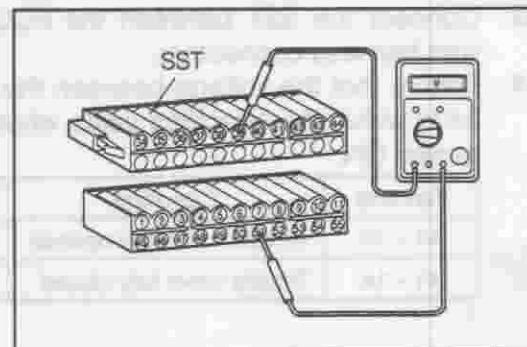


LEF00093-00080

3. Check wire harness.
  - (1) Connect the SST between the ECU connectors and the wire harness connectors.
  - (2) Ensure that the voltage between the SST terminals 39 and 51 is within the specified value when the ignition switch is turned to the ON position.  
Specified Value: 0.2 V or more, but less than 4.8 V

### NOTE:

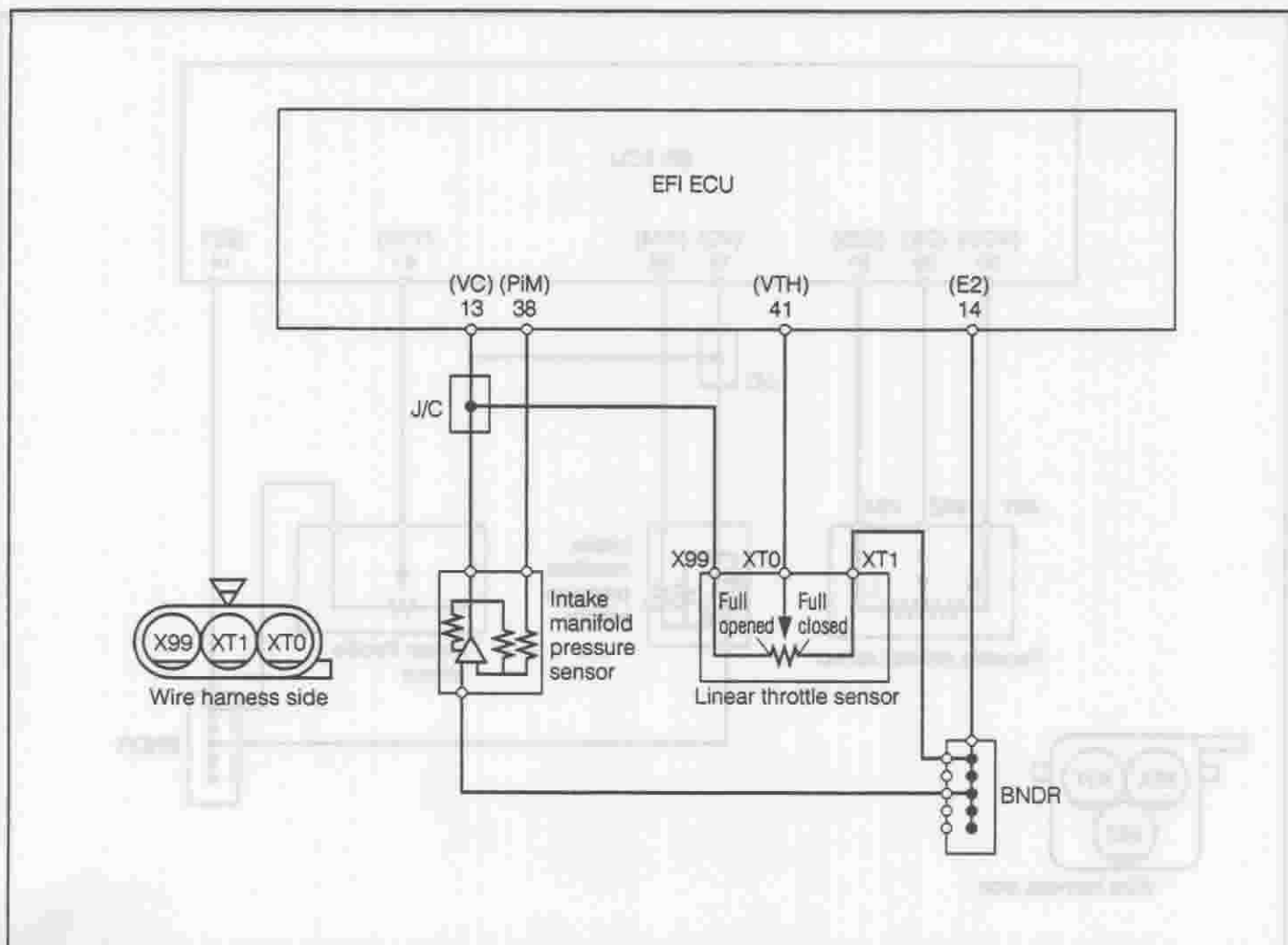
- If the measured voltage does not conform to the specifications, check the wire harness.



LEF00094-00081

## 5.8 DIAGNOSIS CODE NO. 41

### LINEAR THROTTLE SENSOR & CIRCUIT



LEF00103-00090

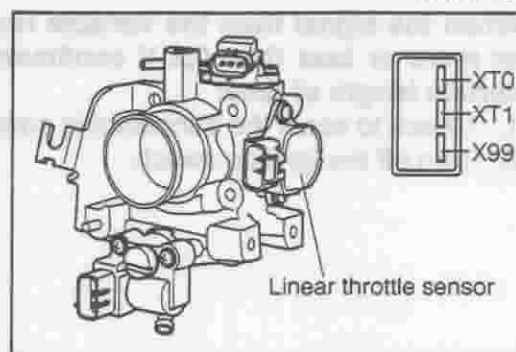
When the signal from the throttle sensor is 4.8 V or more or less than 0.2 V continuously for more than a certain length of time after starting:

1. Check to see if the connector is connected properly.
2. Disconnect the connector of the linear throttle sensor. Measure the resistance between the respective terminals.

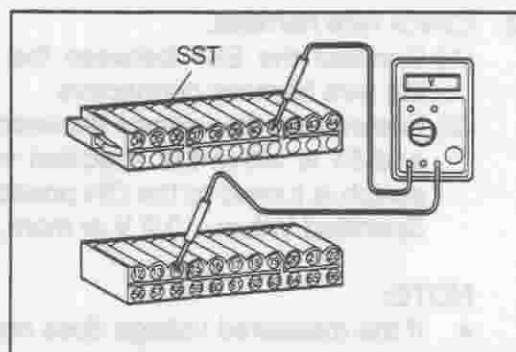
Terminal	Condition	Standard value k $\Omega$
X99 - XT1		2.5 - 6.0
XT1 - XT0	Throttle valve fully closed	0.1 - 1.3
XT1 - XT0	Throttle valve fully opened	1.7 - 4.2

3. Connect the SST between the ECU connectors and the wire harness connectors.
4. Ensure that the voltage between the SST terminals 41 and 14 is within the specified value when the ignition switch is turned ON.

Terminal	Condition	Standard value
41 - 14	Throttle valve fully opened	4.5 - 5.5 V
41 - 14	Throttle valve fully closed	0.4 - 0.8 V



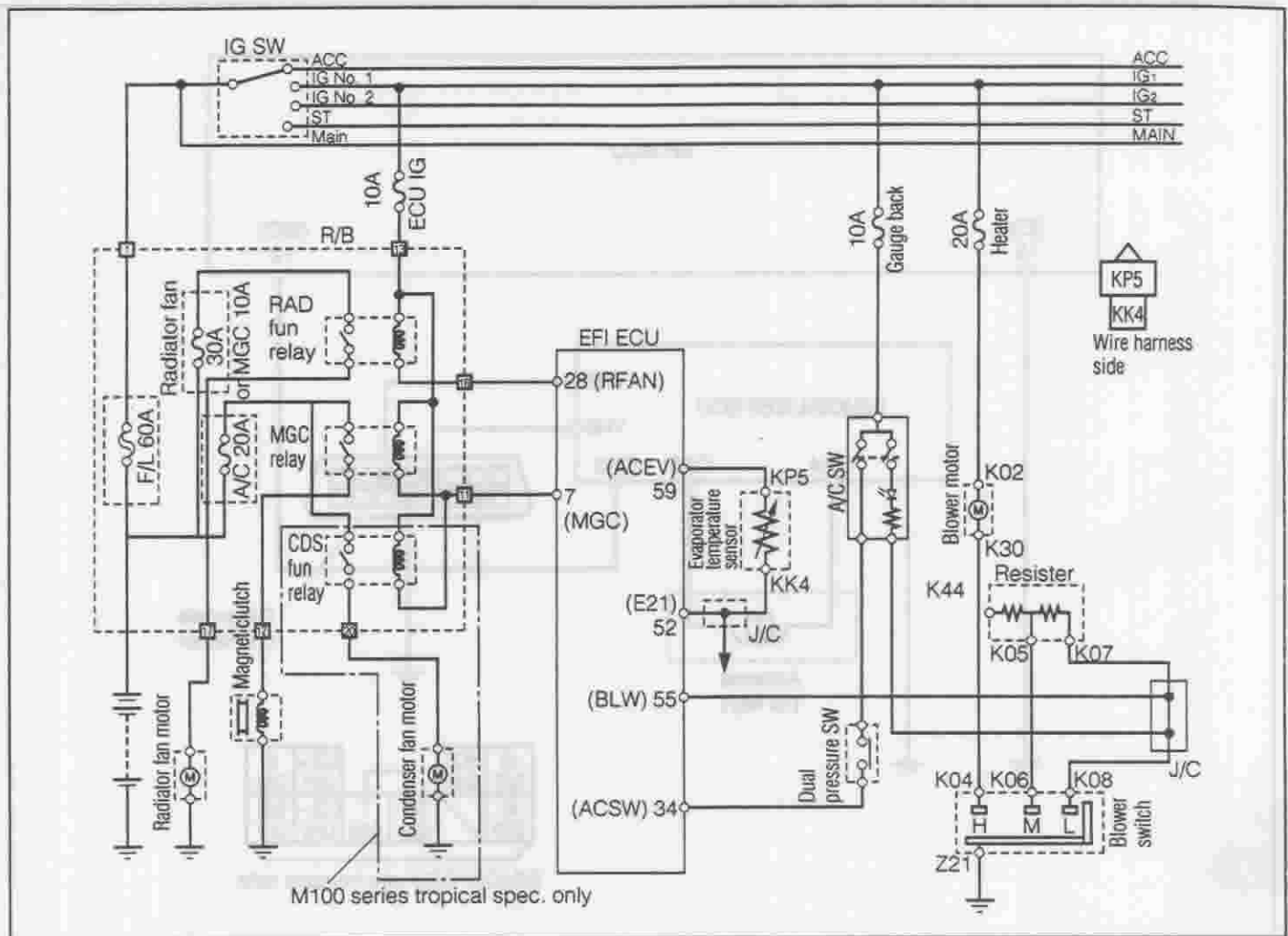
LEF00104-00091



LEF00105-00092

## 5.11 DIAGNOSIS CODE NO. 44

## AIR CONDITIONER EVAPORATOR TEMPERATURE SENSOR &amp; CIRCUIT



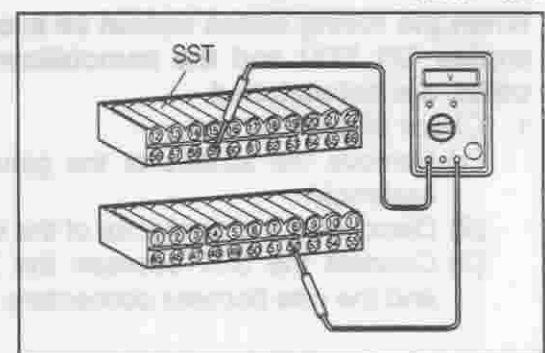
LEF00114-00100

When the signal from the air conditioner evaporator temperature sensor is 4.85 V or more or less than 0.098 V continuously for more than a certain length of time with the air conditioner switch turned ON:

1. Check to see if the wire harness connectors are connected properly.
  2. Turn off the ignition switch.
  3. 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 59 and 52 is within the specified value when the ignition switch is turned to the ON position.
- Specified Value: 0.1 - 4.8 V  
(Reference: 1.8 - 2.9 V at 20°C)

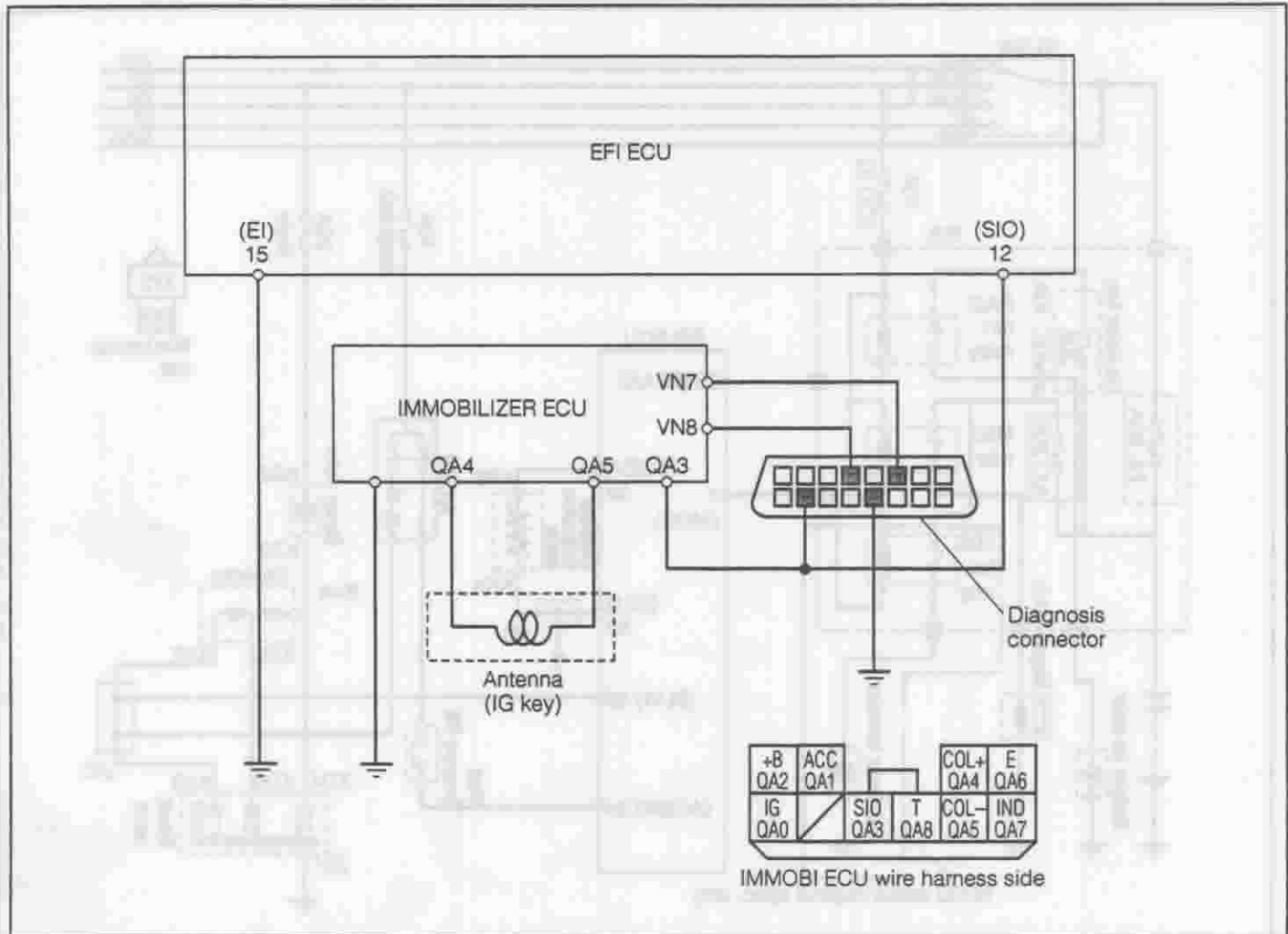
## NOTE:

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



LEF00115-00101

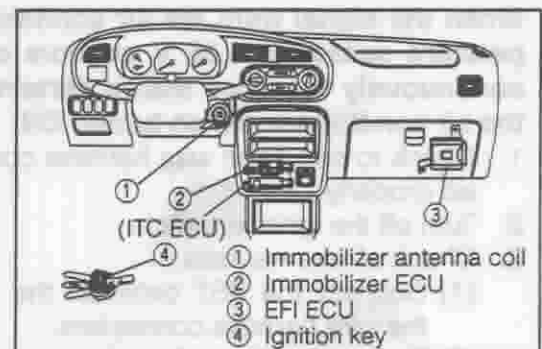
## 5.14 DIAGNOSIS CODE NO. 81 IMMOBILIZER SIGNAL CIRCUIT



LEF00129-00115

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

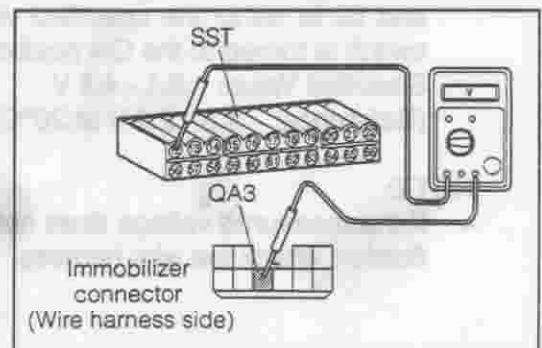


LEF00130-00116

- (4) Check that continuity exists between the terminal QA3 (Cowl wire side terminal of the Immobilizer ECU) and terminal 12 (SST terminal).  
If not, check the wire harness.

### NOTE:

- If the diagnosis code No. 81 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.



LEF00131-00117

## 6. REPLACEMENT OF ECU

### 6.1 INSPECTION

#### NOTE:

- Even when the replacement of the ECU is required in the previous check, 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. [Except for vehicles equipped with an immobilizer system]
- The measurement of voltage should be conducted with all of the connectors connected.

#### CAUTION:

- In cases where the ECU is replaced with a new 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 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.

LEF00134-00000

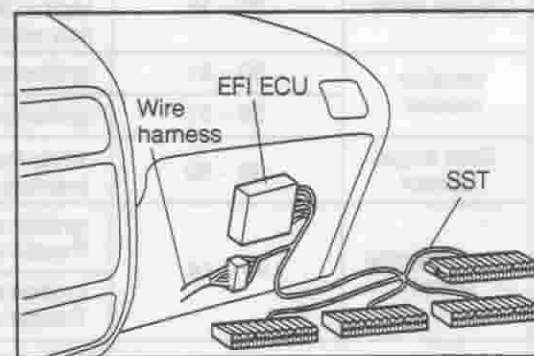
#### 1. Install the SST.

See page EF-57, "Preparation of trouble shooting with SST".

SST: 09842-97201-000

#### 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 conform to the specifications in accordance with the following "CHARACTERISTICS OF ECU OUTPUT" table.



LEF00135-00120

## 6.2 CHARACTERISTICS OF ECU OUTPUT

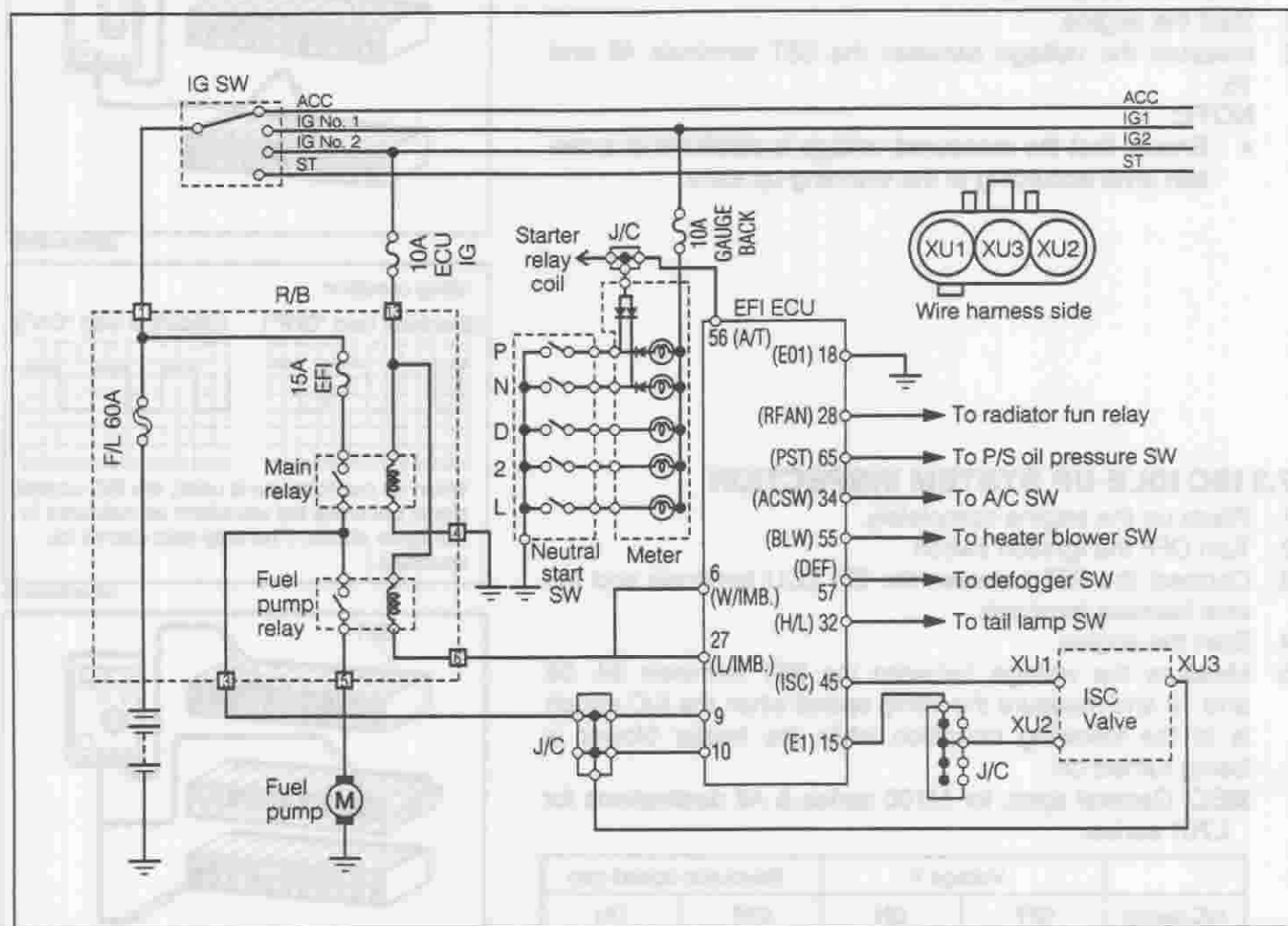
The following are standard voltages or resistances at ECU.

Item	Terminal	Condition	Standard voltage or resistance	Remedies
Power supply	8 - 15	All times	Battery voltage	Check EFI fuse in the relay block.
	10 - 15 9 - 15	Ignition switch is turned on.	Battery voltage	Check main relay in the relay block.
Earth group	15 14 18	All time	1 $\Omega$ or less	Check earth of wiring harness.
Pressure sensor	13 - 14	Ignition switch is turned on.	4.5 - 5.5 V	Check ECU power supply.
	38 - 14	Ignition switch is turned on. Atmospheric pressure is 101 kPa.	3.3 - 4.0 V	Check pressure sensor.
Water temp. sensor	62 - 14	When ignition switch is turned on. (Cooling water temperature is 80 - 90°C after engine has fully warmed up)	0.2 - 4.8 V (0.4 - 0.65 V)	Check cooling water temperature sensor.
Intake air temp. sensor	63 - 14	Ignition switch is turned on. (Air temperature is 20°C)	0.2 - 4.8 V (1.8 - 2.9 V)	Check air temp. sensor.
Oxygen sensor	39 - 15	While engine speed is being kept at 3000 rpm with engine fully warmed up.	Voltage varies within a range of 0.2 - 1.0 V	Check oxygen sensor.
Variable resister	50 - 51	Ignition switch is turned on.	4.5 - 5.5 V	Check ECU power supply.
	39 - 51	Ignition switch is turned on.	0.2 - 4.8 V	Check variable resister sensor.
Cam angle sensor	36 - 60	While the engine is being cranked by the starter motor.	3 - 6 V (AC range)	Check cam angle sensor.
Linear throttle sensor	41 - 14	Ignition switch is turned on. Throttle valve is fully closed.	0.4 - 0.8 V	Check throttle position sensor.
		Ignition switch is turned on. Throttle valve is fully opened.	4.5 - 5.5 V	
Vehicle speed sensor	30 - 14	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 or less and approx. 5 V	Check speed sensor.
Ignition coil drive	46 - 14 68 - 14 67 - 14	While the engine is being cranked by the starter motor.	0.1 - 0.3 V (AC range)	Check ignition coil.
Injector drive	47 - 18 21 - 18 20 - 18	Ignition switch is turned on.	Approx. battery voltage	Check injector(s).
Fuel pump drive	6 - 18 27 - 18	Ignition switch is turned on.	Voltage is 1 V or less for two second after ignition switch has been turned on. Then, voltage becomes battery voltage.	Check fuel pump relay The terminal 6 is for immobilizer system.
VF monitor	54 - 14	While engine speed is being kept at the idling revolution with engine fully warmed up.	1.8 - 3.2 V	Check oxygen sensor.



## 7. INSPECTION OF ROTARY ISC SYSTEM

### 7.1 WIRING DIAGRAM



LEF00141-00123

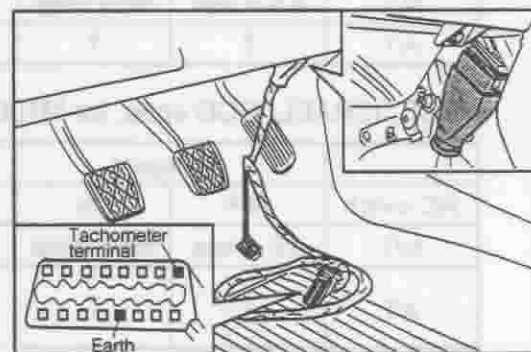
### 7.2 ISC SYSTEM BASIC INSPECTION

1. Ensure that the engine revolution speed is high during the cold period. Also, ensure that the engine revolution speed drops as the engine warms up and that the idle speed is maintained.

Specified Value:

850 rpm (A/T & M/T)... EC, General spec. for M100 series & All destination for L701 series.

900 rpm (A/T & M/T)... AUS, ISRAEL and GCC spec. for M100 series.



LEF00142-00124

2. After the engine has warmed up completely, disconnect the connector of the ISC valve. At this time, ensure that the idle speed rises. (This confirmation should be conducted with no load, such as air conditioner and electric load, applied.)

Specified Value: idle → 1600 rpm

#### NOTE:

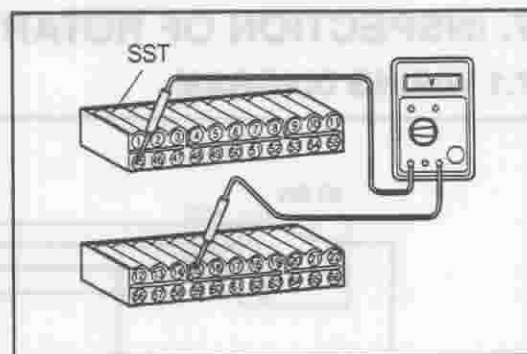
- The above inspection should be conducted only when the engine coolant temperature is above 80°C.

LEF00143-00000

3. Turn OFF the ignition switch.
4. Connect the SST between the EFI ECU terminals and the wire harness terminals.
5. Start the engine.
6. Measure the voltage between the SST terminals 45 and 15.

**NOTE:**

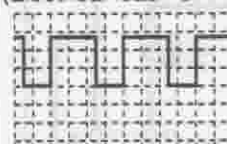
- Ensure that the measured voltage is stabilized at a certain level according to the warming-up state.



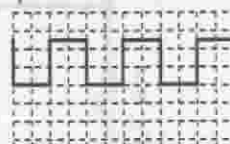
LEF00144-00125

**Idling condition**

(Electrical load "OFF")



(Electrical load "ON")



When an oscilloscope is used, the ISC control signal becomes the waveform as indicated in the figure above. (The duty ratio cannot be specified.)

LEF00000-00126

## 7.3 ISC IDLE-UP SYSTEM INSPECTION

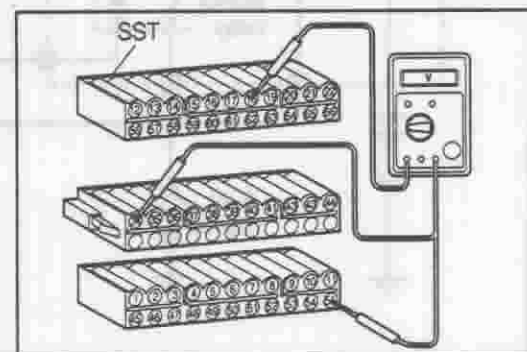
1. Warm up the engine completely.
2. Turn OFF the Ignition switch.
3. Connect the SST between the EFI ECU terminals and the wire harness terminals.
4. Start the engine.
5. Measure the voltage between the SST terminals 34, 55 and 18 and measure the idling speed when the A/C switch is in the following condition while the heater blower is being turned on.

■EC, General spec. for M100 series & All destinations for L701 series.

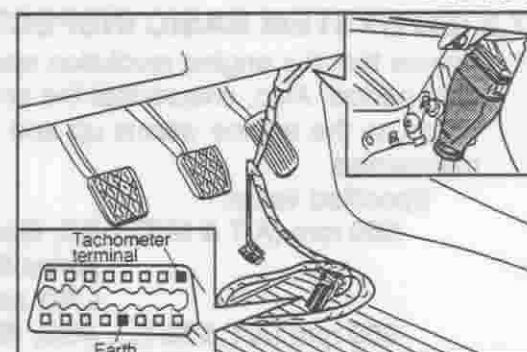
A/C switch	Voltage V		Revolution speed rpm	
	OFF	ON	OFF	ON
M/T	0.5 or less	Battery voltage	850	950
A/T	↑	↑	850	900

■AUS, ISRAEL, GCC spec. for M100 series.

A/C switch	Voltage V		Revolution speed rpm	
	OFF	ON	OFF	ON
M/T	0.5 or less	Battery voltage	900	950
A/T	↑	↑	900	900



LEF00145-00127



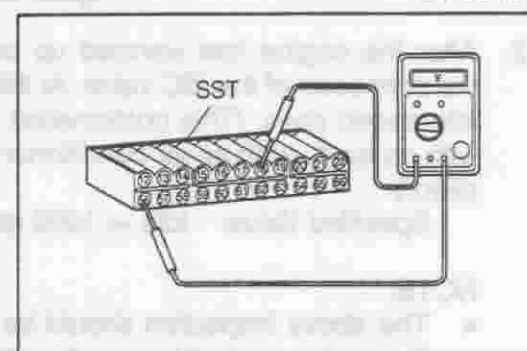
LEF00000-00128

6. Measure the voltage between the SST terminals 56 and 18 when the neutral start switch is in the following condition.

Specified Value: P or N range 0.5 V or less  
Other than P and N ranges Battery voltage

**NOTE:**

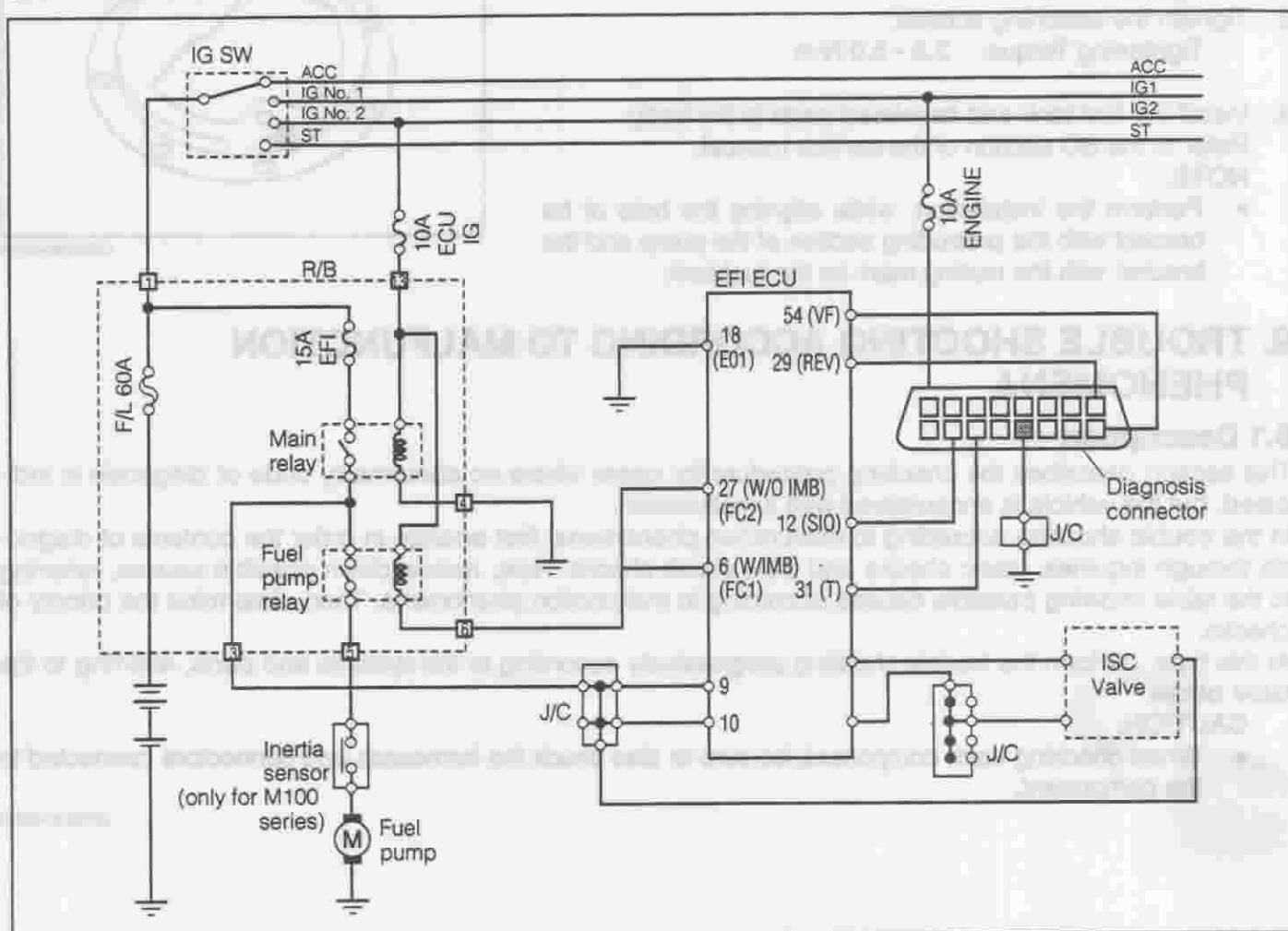
- Make sure that the idle speed will not change when the shift lever is shifted to a position other than the P and N ranges.



LEF00146-00129

## 8. INSPECTION OF FUEL SYSTEM

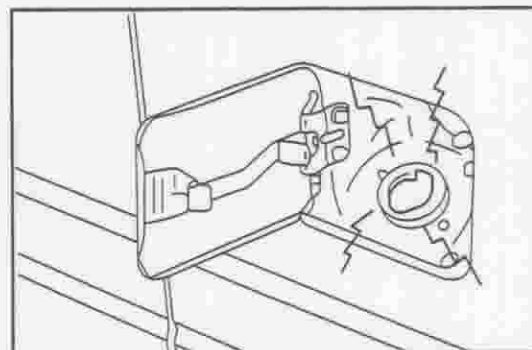
### 8.1 WIRING DIAGRAM



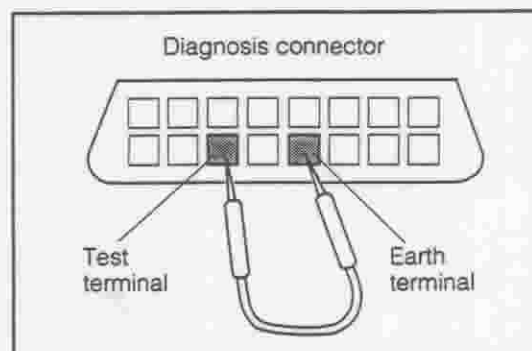
LEF00152-00135

### 8.2 INSPECTION OF FUEL PUMP OPERATION

1. Check to see if the wire harness connectors are connected properly.
2. Check that you can hear fuel pump operating sound for 8 seconds when the ignition switch is turned on while connecting the terminals with a jump wire as indicated in the illustration.
3. If not, check the wire harness.
  - (1) Turn off the ignition switch.
  - (2) Connect the SST between the ECU connectors and the wire harness connectors.
  - (3) Check that the voltage between the SST terminals 6.27 and 18 is within the following specified value when the ignition switch is turned to ON position.



LEF00153-00136



LEF00154-00137

## INSTALLATION

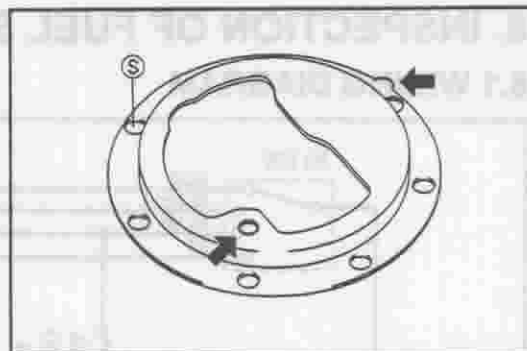
1. Install a new fuel pump assembly to the fuel tank with a new gasket.
2. Tighten the attaching screws.

Tightening Torque: 2.5 - 5.0 N·m

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

**NOTE:**

- Perform the installation, while aligning the hole of the bracket with the protruding section of the pump and the bracket with the mating mark on the fuel tank.



LEF00160-00143

## 9. TROUBLE SHOOTING ACCORDING TO MALFUNCTION PHENOMENA

### 9.1 Description

This section describes the checking procedure for cases where no abnormality code of diagnosis is indicated, but the vehicle is encountered with a malfunction.

In the trouble shooting according to malfunction phenomena, first arrange in order the contents of diagnosis through inquiries, basic checks and ECU circuit checks. Next, narrow down possible causes, referring to the table showing possible causes according to malfunction phenomena. Then, determine the priority of checks.

At this time, perform the trouble shooting progressively according to the systems and parts, referring to the table below.

**CAUTION:**

- When checking each component, be sure to also check the harnesses and connectors connected to the component.