

# **DAIHATSU**

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# **F300**

[HD-ENGINE]

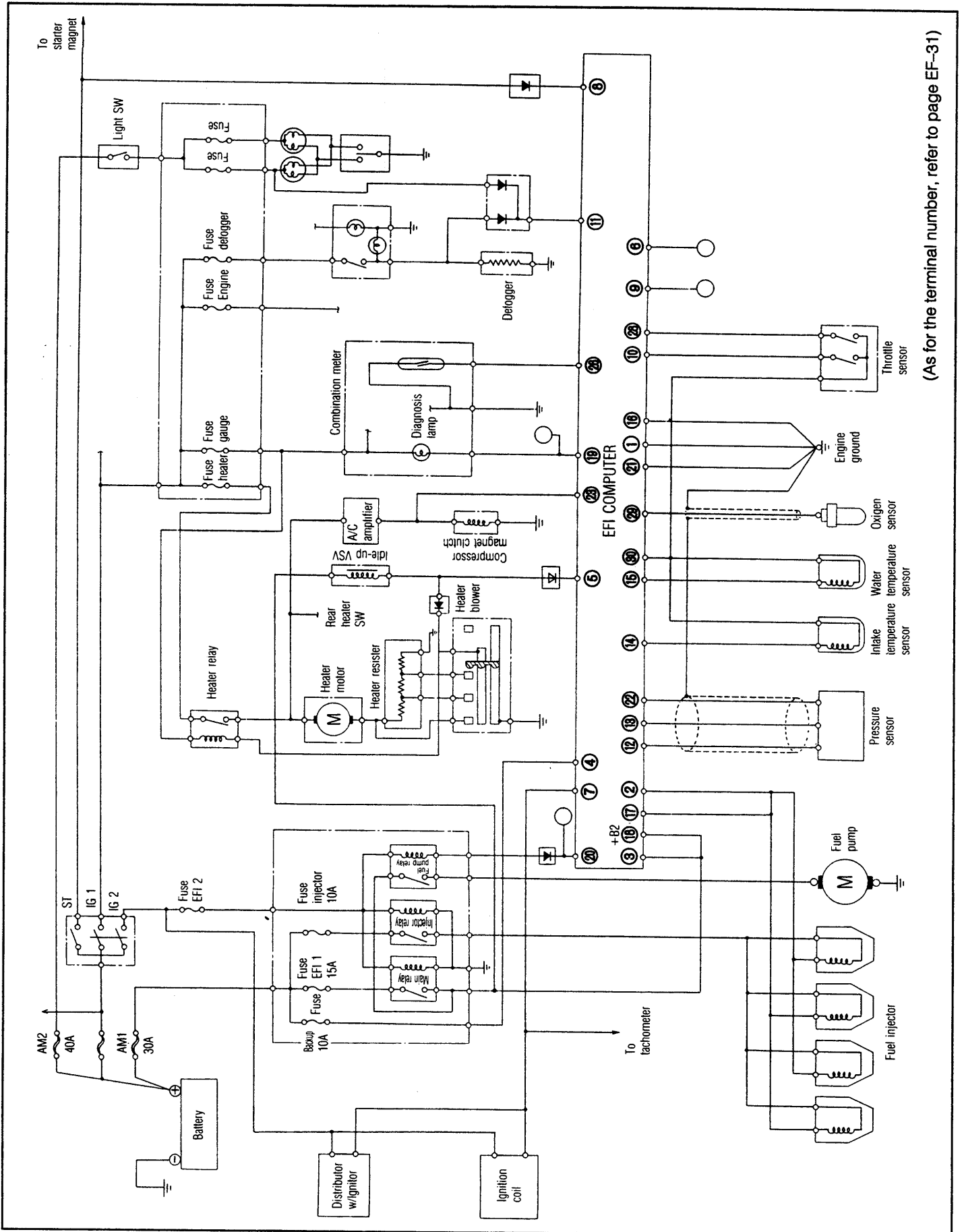
## **EFI SYSTEM**



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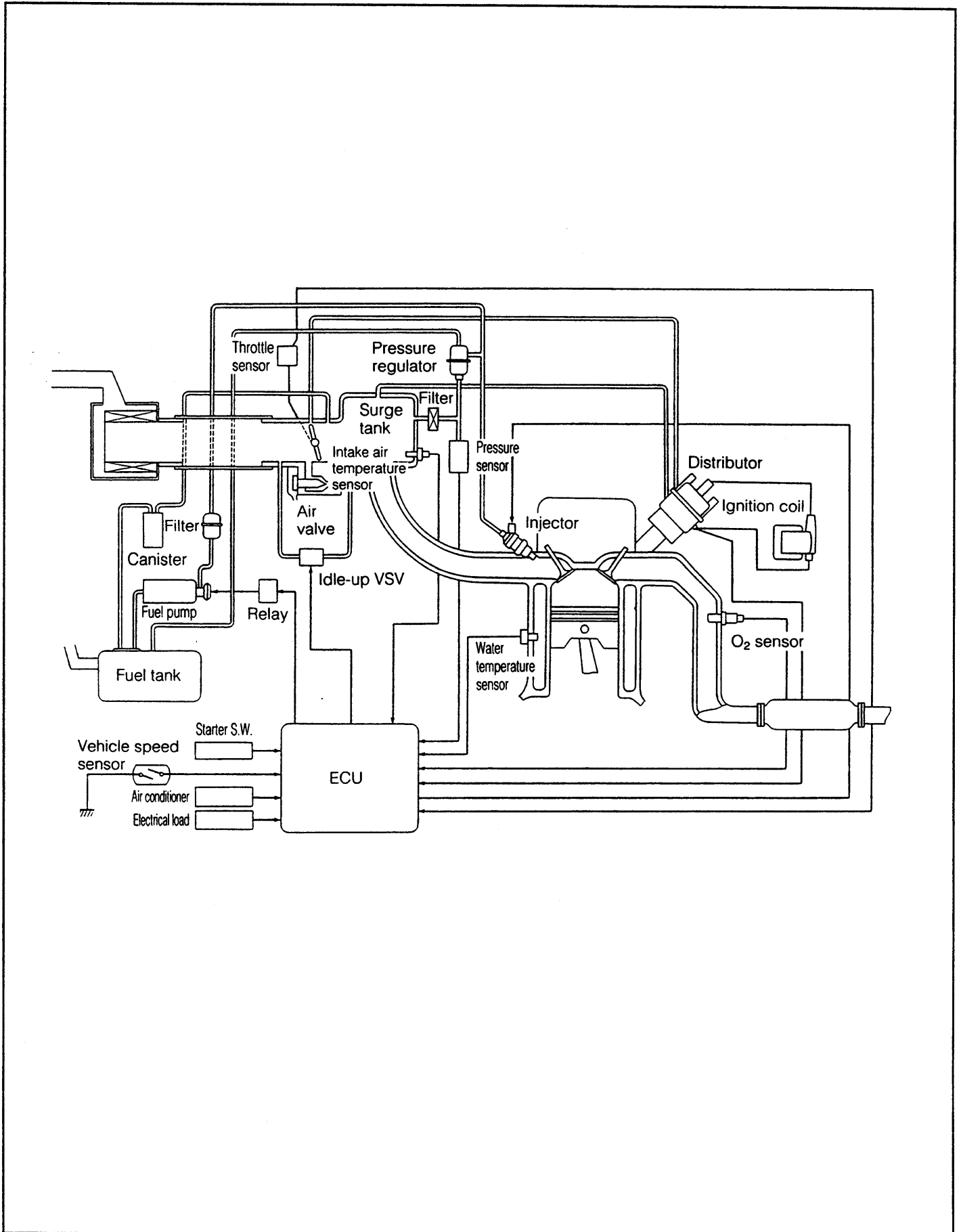
WN88E-EF001

SYSTEM CIRCUIT



(As for the terminal number, refer to page EF-31)

**SCHEMATIC DIAGRAM**



## PRECAUTIONS

1. The engine control system has self diagnosis function. The ECU memorizes malfunction codes for malfunctions which are occurring at present and/or occurred in the past. Memorized malfunction codes are erased when the battery is disconnected. Be sure to read the diagnosis code before starting any operations relating to the encountered malfunctions.
2. Before disconnecting the fuel line system, be sure to disconnect the cable (wire) from the negative terminal of the battery.
3. The fuel line is pressurized to a pressure 2.5 atm. (2.55 kg/cm<sup>2</sup>) higher than the pressure inside the surge tank. Therefore, when disconnecting the fuel line, be sure to prevent the fuel from splashing with a cloth or the like.
4. Do not allow gasoline to get to any parts made of rubber, leather, and/or resin.
5. When cleaning the engine compartment, be very careful to protect the electrical system from water.

WN88E-EF004

## INSPECTION PRECAUTIONS

### Maintenance Precautions

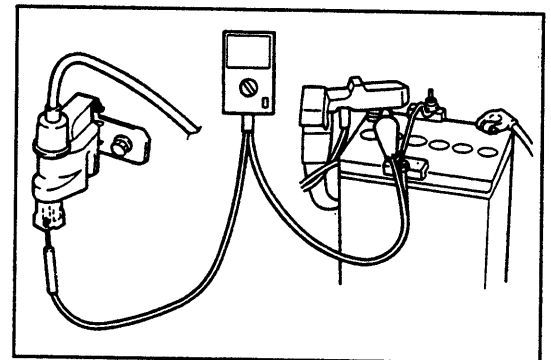
1. Ensure that the engine is correctly tuned up.
2. Precautions during gauge connection
  - (1) Connect the measuring terminal of the tachometer to the negative (-) terminal of the ignition coil.

### NOTE:

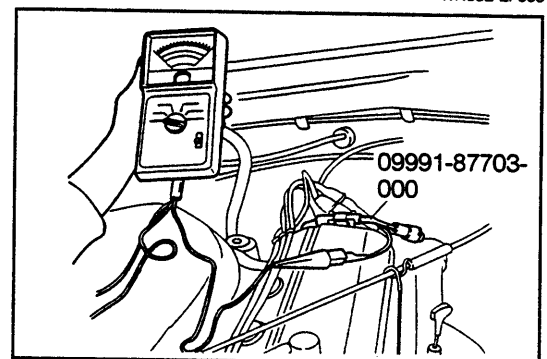
- The ignition coil has no terminal for external connection. Hence, insert an adequate jumper cord from the backside of the connector attached to the ignition coil. Then, connect the other end of the jumper cord to the measuring terminal of the tachometer.
- For the purpose of connecting tachometer, the SST for connecting to the distributor wire is available.  
SST: 09991-87703-000

### CAUTION:

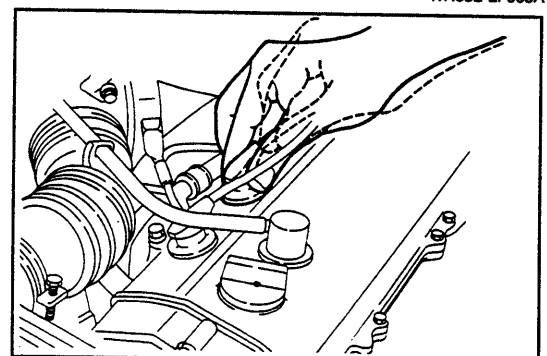
- Never allow the tachometer terminal to touch ground as it could result in damage to the ignitor and/or ignition coil.
  - As some tachometers are not compatible with this ignition system, it is imperative to confirm the compatibility of your meter before it is used.
- (2) Use the battery as power source for a timing light, tachometer and so forth.
3. If engine misfire takes place, the following measures should be taken.
    - (1) Ensure that the battery terminals, etc. are connected properly.
    - (2) Handle the resistive cords carefully.
    - (3) After completion of repairs, ensure that the ignition coil terminals and other ignition system wires are reconnected securely.
  4. Precautions during oxygen sensor handling
    - (1) Never drop the oxygen sensor or hit it to other objects.
    - (2) Do not submerge the oxygen sensor in water, nor put the oxygen sensor in water for the purpose of cooling it.



WN88E-EF005



WN88E-EF005A



WN88E-EF006

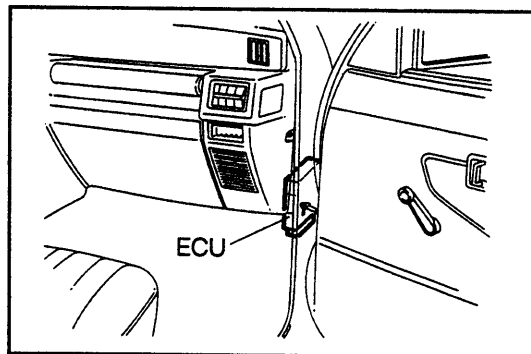
**When the Vehicle is Equipped With Wireless Installation (HAM, CB, etc.):**

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 10W), it may affect the ECU adversely.

Specifically, if antenna or its cord is located near the ECU, the ECU is liable to be effected adversely. Therefore, observe the following precautions.

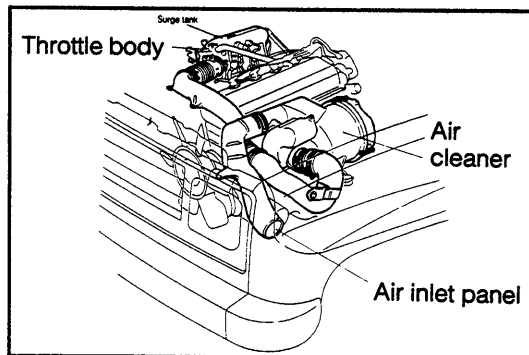
1. Install an antenna at a place as far away as possible from the ECU.  
The ECU is installed at the upper/inner section of the instrument panel in front of the passenger's seat. Therefore, the antenna should be installed at the rear of the vehicle.
2. The antenna cord should be kept at least 20 cm (7.9 inch) away from the engine wire. Never wind the antenna 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.



WN88E-EF007

**Air Induction System**

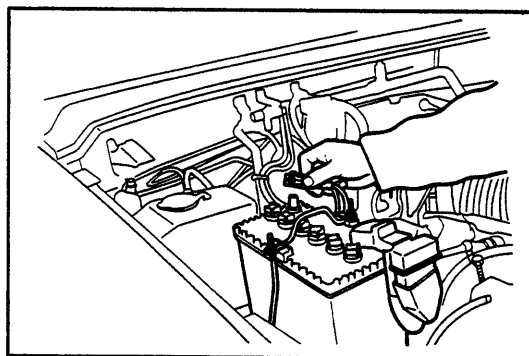
1. Unless all of the oil level gauge, oil filler cap, ventilation hose and so forth are installed securely, engine tune-up can not be performed properly.
2. If air leakage (air admission) is present between the throttle body and the cylinder head, the engine revolution speed can not be adjusted.



WN88E-EF008

**Electronic Control System**

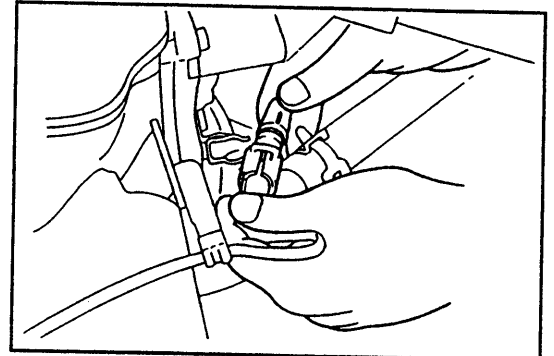
1. When disconnecting the connector of the EFI system wiring, prior to the disconnection, be sure to turn OFF the ignition switch and pull out the back-up fuse. Or disconnect the cable (wire) from the negative battery terminal.  
When disconnecting the ECU connector, be sure to disconnect the cable from the negative battery terminal.



WN88E-EF009

# EFI SYSTEM

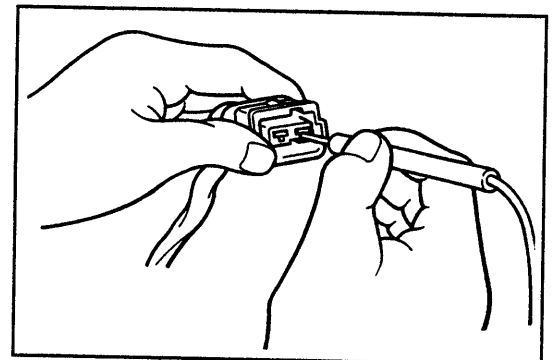
2. When installing the battery, care must be exercised not to mistake the battery polarity.
3. Never apply strong impacts to the parts. Pay utmost attention during the installation/removal.  
It is not permitted to reuse any EFI-related parts which have been dropped or undergone strong impacts.
4. During repairs, do not tamper those terminals other than those specified.  
Slight contact of terminals could damage the transistorized circuits, causing serious malfunctions.
5. Never open the cover of the ECU.
6. When the system is checked on a rainy day, be very careful not to allow water to get into connector terminals.  
When the engine compartment is washed, prevent water from being splashed to the EFI related parts and wiring connectors.
7. Every part should be replaced as an assembly.
8. Before connecting or disconnecting the wiring connector, confirm the lock shape.
  - (1) Release the lock. Disconnect the connector.
  - (2) Insert the connector until the lock is engaged completely.
9. When the connector terminal is checked by means of a circuit tester.  
Avoid applying excessive force so that the terminal may not be deformed.



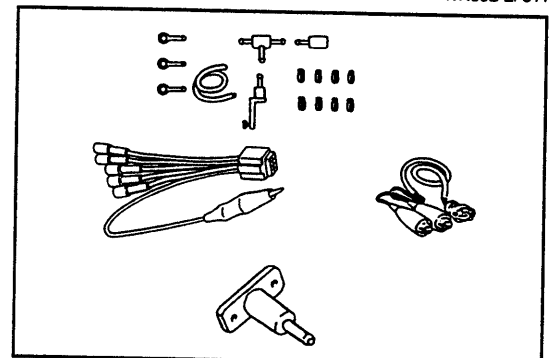
WN88E-EF010

10. When checking the injector and cold start injector, use the following SSTs.

SST: 09268-87702-000  
09842-30070-000  
09991-87702-000  
09283-87703-000



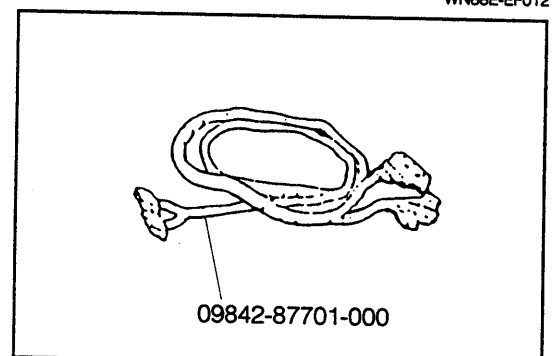
WN88E-EF011



WN88E-EF012

11. When measuring voltages for each system, use the following SST.

SST: 09842-87701-000



WN88E-EF013

**Fuel System**

1. The fuel line is pressurized to a pressure of 2.55 kg/m<sup>2</sup> (36.3 psi). Therefore, when disconnecting part of the fuel line, prevent the fuel from splashing, using a cloth or the like. Since a large amount of gasoline flows out, perform the operation, following the procedure given below.
  - (1) Place an adequate container or a piece of cloth, etc. under a connection.
  - (2) Loosen the connection slowly, while preventing the fuel from splashing, using a cloth or the like.
  - (3) Disconnect the connection.
  - (4) Plug the connection with a rubber plug or the like so that no dust may enter into the fuel line.
2. When connecting the flare nut or union bolt of the high-pressure pipe, observe the following instructions.

[Union bolt type]

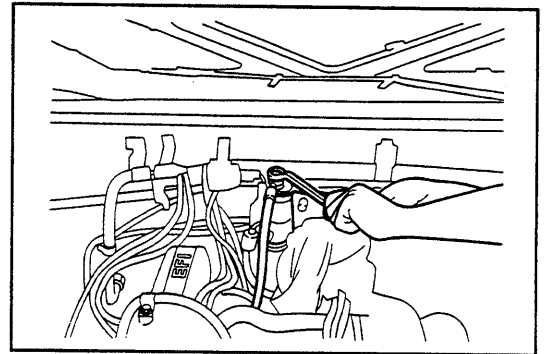
- (1) Always use new gaskets.
- (2) First tighten the union bolt with your fingers.
- (3) Next, tighten the union bolt to the specified torque.  
**Tightening Torque: 3.5 - 4.5 kg-m (25.3 - 32.5 ft-lb)**

[Flare nut type]

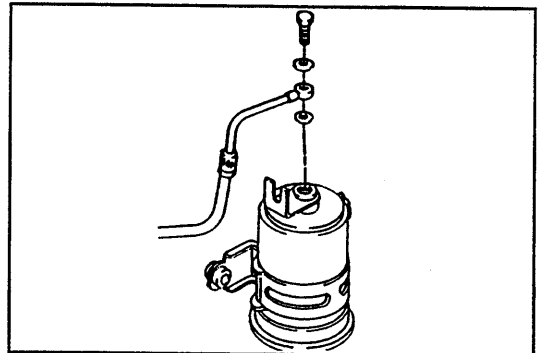
- (1) Coat the flare nut with a thin film of engine oil. Tighten the flare nut fully with your fingers.
- (2) Tighten the flare nut to the specified torque.  
**Tightening Torque: 3.5 - 4.4 kg-m (25.3 - 31.8 ft-lb)**

3. When removing/installing the injector, observe the following instruction.
  - (1) Do not reuse the "O" ring.
  - (2) When installing the "O" ring to the injector, be careful not to damage the "O" ring.
  - (3) Before connecting the injector with the delivery pipe, apply silicon oil or gasoline to the "O" ring.  
 (Never use engine oil, gear oil, brake oil and so forth.)

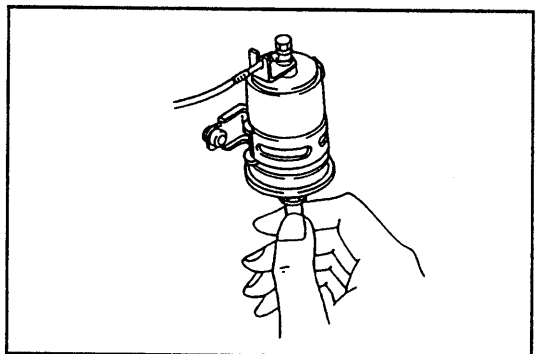
4. Install the injector to the delivery pipe and cylinder head, as shown in the figure.



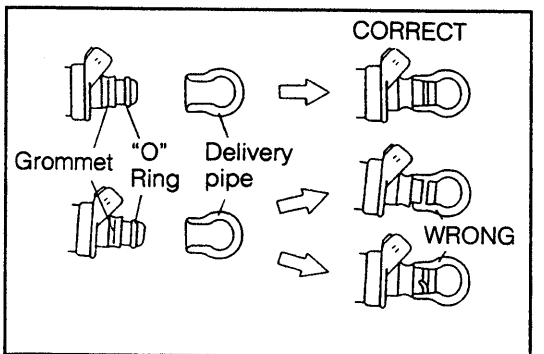
WN88E-EF014



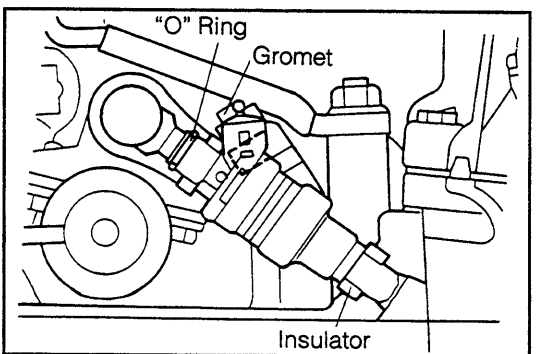
WN88E-EF015



WN88E-EF016



WN88E-EF017



WN88E-EF018

## EFI SYSTEM

5. When part of the fuel line is disconnected, e.g. during repairs, check the fuel line for fuel leakage after the operation has been completed, as follows:

- (1) Short the terminal F (White/Black) with the ground terminal (Black) of the check terminal, using following SST.  
SST: 09991-87702-000

**NOTE:**

The check terminal is located at the fender RH for L.H.D vehicles and the dash board left side for R.H.D vehicles.

**CAUTION:**

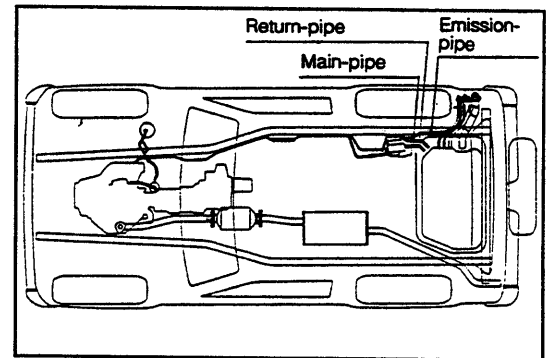
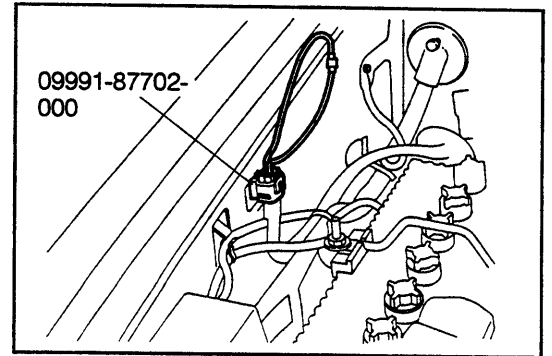
As for the terminals other than those specified, never allow them to be connected or shorted.

- (2) Turn ON the ignition switch. (with the engine in a stopped state)

At this time, a fuel pressure of  $2.55 \text{ kg/cm}^2$  (36.3 psi) is being applied to the fuel line.

Under this conditions, check the fuel line system for evidence of leakage.

If any leakage is present at the fuel line system, repair leaky points. Recheck the system for leakage.





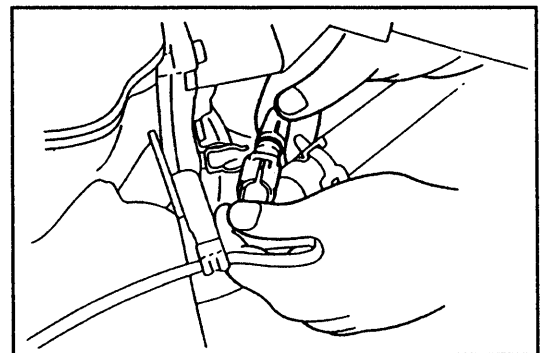
# TROUBLE SHOOTING

## Trouble Shooting Hints

1. In most cases, engine troubles are attributable to systems other than the EFI system. Prior to starting the trouble shooting or the EFI system, check other systems.
  - (1) Power supply
    - Battery voltage
    - Fuse blown
    - Fusible link blown
  - (2) Body ground
  - (3) Fuel supply
    - Fuel leakage
    - Fuel filter clogged
    - Fuel pump malfunctioning
  - (4) Ignition system
    - Spark plugs faulty
    - Resistive cords faulty
    - Distributor and igniter faulty
    - Ignition coil faulty
  - (5) Air induction system
    - Admission of air
  - (6) Others
    - Ignition timing adjusted improperly
    - Idle speed adjusted improperly
    - Idle-up VSV malfunctioning

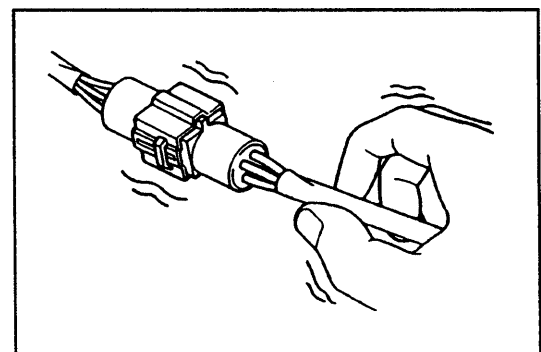
WN88E-EF021

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.



WN88E-EF022

- (3) Check to see if the malfunction phenomenon takes place when applying light vibration to the connector or the wire connected to the connector.

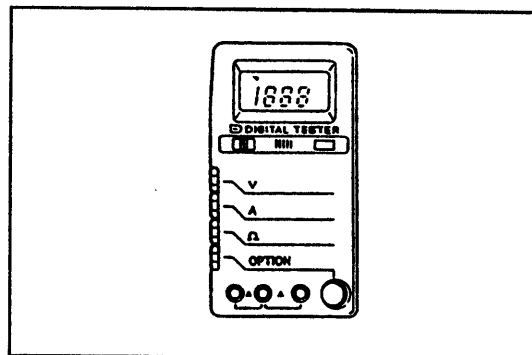


WN88E-EF023

3. Check the ECU thoroughly before replacing the ECU.  
The ECU is an expensive, sophisticated part.  
When the ECU has been replaced according to an instruction appearing in the trouble shooting, be sure to reinstall the old ECU and ensure that the malfunction takes place again. In this way, confirm that the malfunction is obviously attributable to the old ECU.

WN88E-EF024

4. For the trouble shooting, use a volt/ohmmeter whose internal resistance is 10 kΩ/V or more.  
Use of a volt/ohmmeter whose internal resistance is less than 10 kΩ/V may cause an ECU malfunction or wrong diagnosis.  
Furthermore, be sure to employ a meter whose resolution is 0.1V or more, 0.5Ω or more and whose accuracy is ±2% or more.



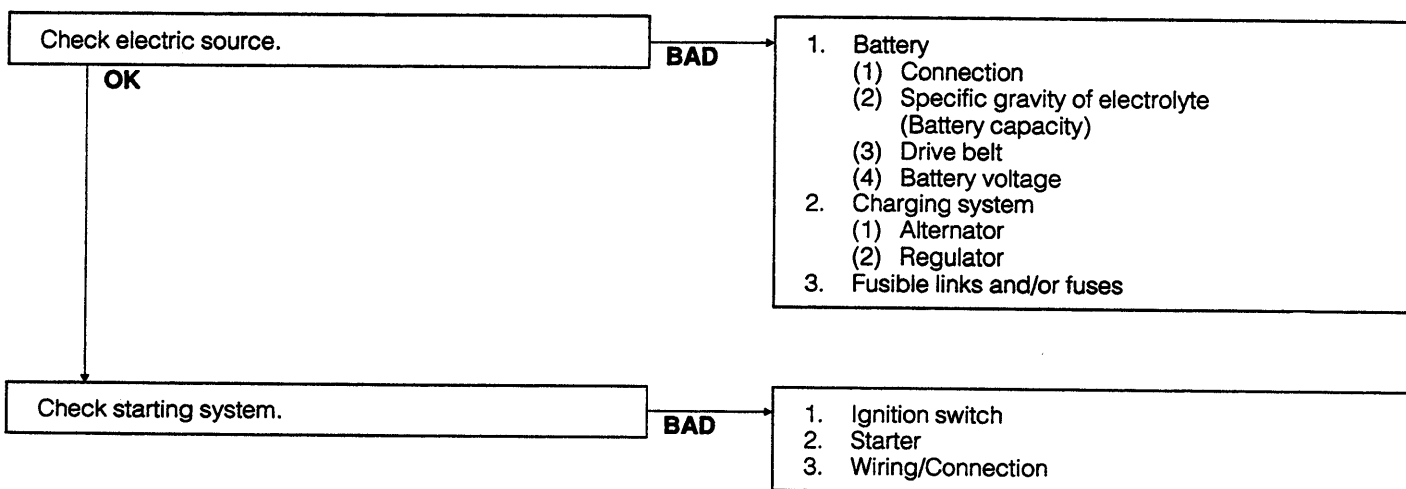
WN88E-EF025

5. In this trouble shooting, no consideration has been made to any displacement of timing belt teeth. Hence, if the trouble persists even after the trouble shooting has been carried out, check to see if the timing belt exhibits any tooth skipping.

WN88E-EF025A

## TROUBLE SHOOTING PROCEDURE

- 1 Symptom .... Engine will not start.  
(Engine will not crank or cranks slowly.)



WN88E-EF026