

### 3. General Description

#### A: CAUTION

1) Airbag system wiring harness is routed near the ECM, main relay and fuel pump relay.

#### CAUTION:

- Do not use the electrical test equipment on airbag system circuits.
- Be careful not to damage the airbag system wiring harness when servicing the ECM, TCM, main relay and fuel pump relay.

2) Never connect the battery in reverse polarity. Failure to do so will damage the ECM instantly, and other parts will also be damaged.

3) Do not disconnect the battery terminals while the engine is running. A large counter electromotive force will be generated in the generator, and this voltage may damage electronic parts such as ECM etc.

4) Before disconnecting the connectors of each sensor and ECM, be sure to turn the ignition switch to OFF. Perform the Clear Memory Mode after connecting the connectors. <Ref. to EN(H4SO)(diag)-51, Clear Memory Mode.>

5) Measure the voltage or resistance of individual sensor or all electrical control modules using a tapered pin with a diameter of less than 0.6 mm (0.024 in). Do not insert the pin 4 mm (0.16 in) or more into the part.

#### CAUTION:

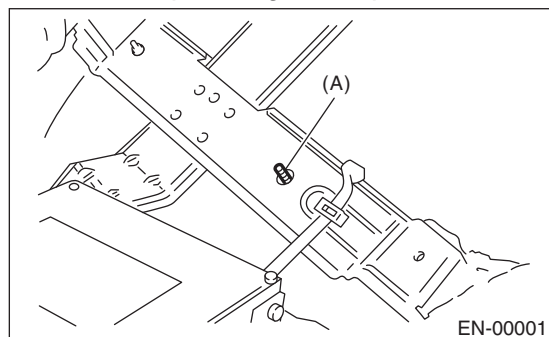
**When replacing the ECM, be careful not to use the wrong spec. ECM to avoid any damage on the fuel injection system.**

#### NOTE:

When replacing the ECM of the models with Immobilizer, immobilizer system must be registered. To do so, all ignition keys and ID cards need to be prepared. For detailed operation procedure, refer to the "PC application help for Subaru Select Monitor".

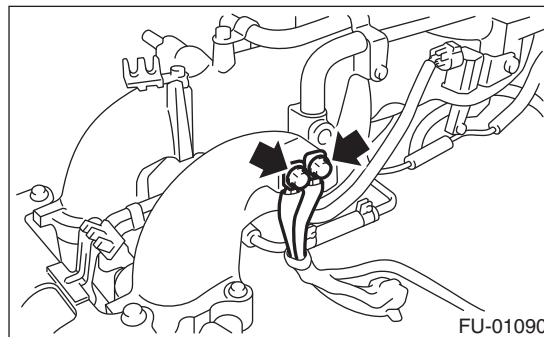
6) Take care not to allow water to get into the connectors when servicing or washing the vehicle in rainy weather. Avoid exposure to water even if the connectors are waterproof.

7) Use ECM mounting stud bolts at the body side grounding point when measuring voltage and resistance inside the passenger compartment.



(A) Stud bolt

8) Use the engine ground terminal or engine assembly for the grounding point to chassis when measuring the voltage and resistance in engine compartment.



9) Every engine control system-related part is a precision part. Do not drop them.

10) Observe the following cautions when installing a radio in vehicle.

#### CAUTION:

- The antenna must be kept as far apart as possible from control unit. (ECM is installed under the passenger's side floor mat.)
- The antenna feeder must be placed as far apart as possible from the ECM and engine control system harness.
- Carefully adjust the antenna for correct matching.
- When mounting a large power type radio, pay special attention to the three items mentioned above.
- Incorrect installation of the radio may affect the operation of ECM.

11) When disconnecting the fuel hose, release the fuel pressure. <Ref. to FU(H4SO)-43, RELEASING OF FUEL PRESSURE, PROCEDURE, Fuel.>

12) ABS warning light may illuminate when performing driving test with jacked-up or lifted-up condition, but this is not a system malfunction. The reason for this is the speed difference between the front and rear wheels. After diagnosis of engine control system, perform the ABS memory clear procedure of self-diagnosis function.

# General Description

## ENGINE (DIAGNOSTICS)

### B: INSPECTION

Before performing diagnostics, check the following item which might affect engine problems.

#### 1. BATTERY

1) Measure the battery voltage and specific gravity of the electrolyte.

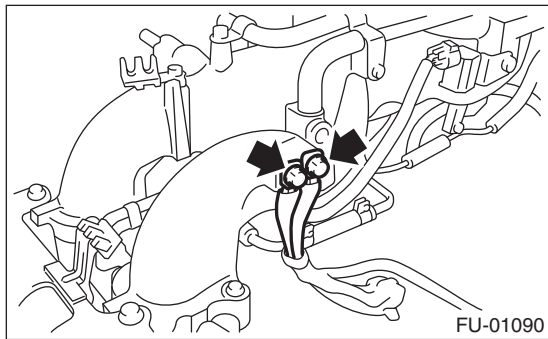
**Standard voltage: 12 V**

**Specific gravity: 1.260 or more**

2) Check the condition of the main and other fuses, and harnesses and connectors. Also check for proper grounding.

#### 2. ENGINE GROUND

Check if the engine ground terminal is properly connected to engine.



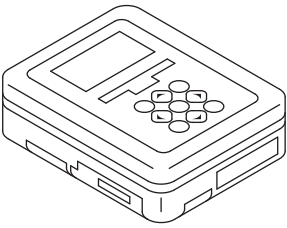
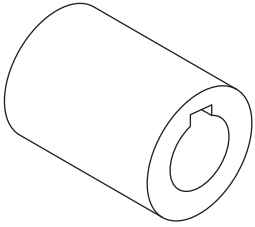
### C: NOTE

- The on-board diagnostic (OBD) system detects and indicates a fault in various inputs and outputs of the complex electronic throttle control. Malfunction indicator light in the combination meter indicates occurrence of a fault or trouble.
- Further, against such a failure or sensors as may disable the drive, the fail-safe function is provided to ensure the minimal driveability.
- The OBD system incorporated with the vehicles within this type of engine complies with OBD-II regulations. The OBD system monitors the components and the system malfunction listed in "Engine Section" which affects on emissions.
- When the system decides that a malfunction occurs, malfunction indicator light illuminates. At the same time of the malfunction indicator light illumination or blinking, a DTC and a freeze frame engine conditions are stored into on-board computer.
- The OBD system stores freeze frame engine condition data (engine load, engine coolant temperature, fuel trim, engine speed and vehicle speed, etc.) into on-board computer when it detects a malfunction.
- The freeze frame engine condition data are stored until DTCs are cleared. However, if any faults concerning fuel trim or misfiring are detected while the freeze frame engine condition data are stored, these data are rewritten to those concerning fuel trim or misfiring.
- When the malfunction does not occur again for three consecutive driving cycles, malfunction indicator light is turned off, but DTC remains at on-board computer.
- When troubleshooting the vehicle which complies with OBD-II regulations, connect the Subaru Select Monitor or general scan tool to the vehicle.

## General Description

ENGINE (DIAGNOSTICS)

### D: PREPARATION TOOL

| ILLUSTRATION                                                                                      | TOOL NUMBER                      | DESCRIPTION                      | REMARKS                                         |
|---------------------------------------------------------------------------------------------------|----------------------------------|----------------------------------|-------------------------------------------------|
| <br>ST1B022XU0   | 1B022XU0<br>(Newly adopted tool) | SUBARU SELECT<br>MONITOR III KIT | Used for troubleshooting the electrical system. |
| <br>ST-499987500 | 499987500                        | CRANKSHAFT<br>SOCKET             | Used for rotating crankshaft.                   |