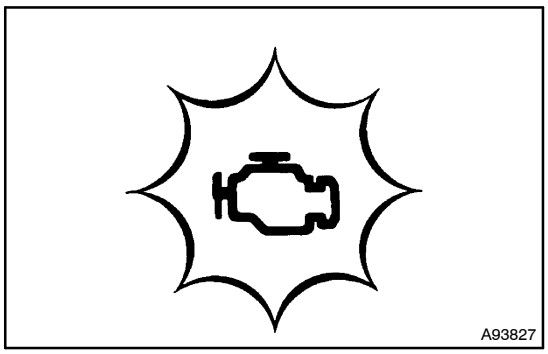
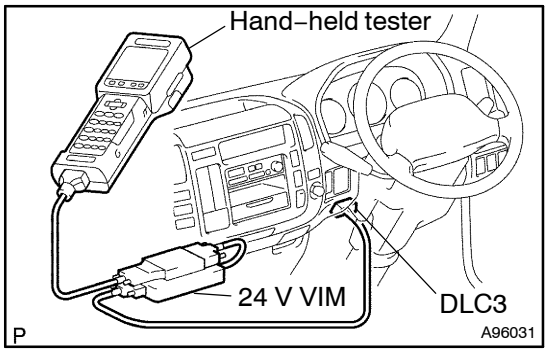
05I7I–02

DIAGNOSIS SYSTEM



1. DESCRIPTION

- When troubleshooting Multiplex OBD (M–OBD) vehicles, the vehicle must be connected to the hand–held tester. Various data output from the vehicle's Engine Control Module (ECM) can then be read.
- The vehicle's on–board computer illuminates the Malfunction Indicator Lamp (MIL) on the instrument panel when the computer detects a malfunction in the computer itself or in drive system components. In addition, the applicable Diagnostic Trouble Codes (DTCs) are recorded in the ECM memory (see page 05–38). If the malfunction does not reoccur, the MIL turns on until the ignition switch is turned OFF, and then the MIL turns off when the ignition switch is turned ON but the DTCs remain recorded in the ECM memory.



NOTICE:

Be sure to use the 24 V VIM, because the hand–held tester will be damaged if you do not use the 24 V VIM.

- To check DTCs, connect the hand–held tester to the Data Link Connector 3 (DLC3) on the vehicle or read the DTC which is indicated on the multi–information display when TC and CG terminals on the DLC3 are connected. The hand–held tester also enables you to erase the DTCs and check the freeze frame data and various forms of engine data (see the instruction manual for the hand–held tester).

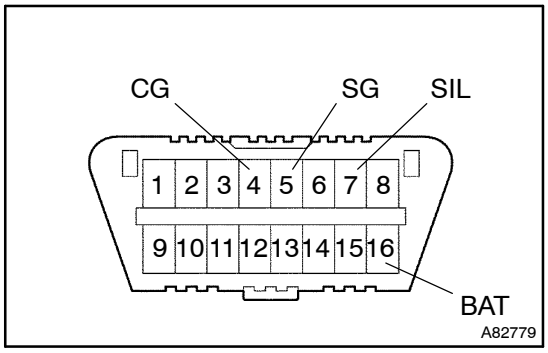
The diagnosis system operates in "normal mode" during normal vehicle use. In normal mode, "2 trip detection logic" is used to ensure accurate detection of malfunctions. A "check mode" is also available to technicians as an option. In check mode, "1–trip detection logic" is used for simulating malfunction symptoms and increasing the system's ability to detect malfunctions, including intermittent malfunctions (hand–held tester only).

2–TRIP DETECTION LOGIC

When a malfunction is first detected, the malfunction is temporarily stored in the ECM memory (1st trip). If the ignition switch is turned OFF and then ON again, and the same malfunction is detected again, the MIL will illuminate (2nd trip).

FREEZE FRAME DATA

Freeze frame data records the engine conditions when a malfunction is detected. When troubleshooting, freeze frame data can help determine if the vehicle was running or stopped, if the engine was warmed up or not, if the air–fuel ratio was lean or rich, and other data from the time the malfunction occurred.



2. CHECK DLC3

The vehicle's ECM uses the ISO 9141–2 (Euro–OBD) communication protocol. The terminal arrangement of the DLC3 complies with ISO 15031–03 and matches the ISO 9141–2 format.

HINT:

Connect the cable of the hand–held tester (with 24 V VIM) to the DLC3, turn the ignition switch ON and attempt to use the hand–held tester. If the screen displays "UNABLE TO CONNECT TO VEHICLE", a problem exists in the vehicle side or the tester side.

If communication is normal when the tester is connected to another vehicle, inspect the DLC3 on the original vehicle.

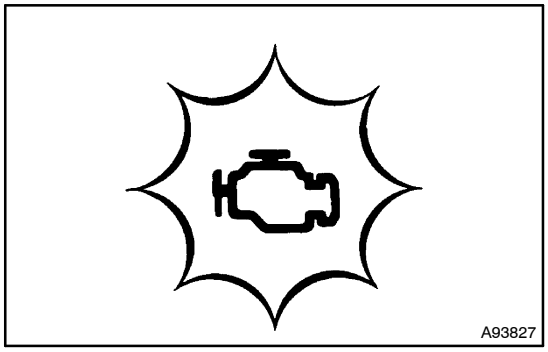
If communication is still impossible when the tester is connected to another vehicle, the problem is probably in the tester itself. Consult the Service Department listed in the tester's instruction manual.

Symbols (Terminals No.)	Terminal Description	Condition	Specified Condition
SIL (7) – SG (5)	Bus "+" line	During transmission	Pulse generation
CG (4) – Body ground	Chassis ground	Constant	Below 1 Ω
SG (5) – Body ground	Signal ground	Constant	Below 1 Ω
BAT (16) – Body ground	Battery positive	Constant	18 to 27 V

3. INSPECT BATTERY VOLTAGE

Battery voltage: 18 to 27 V

If voltage is below 18 V, recharge the battery before proceeding.



4. CHECK MIL

(a) The MIL illuminates when the ignition switch is turned ON and the engine is not running.

HINT:

If the MIL does not illuminate, troubleshoot the MIL circuit (see page 05–163).

(b) When the engine is started, the MIL should turn off. If the lamp remains on, the diagnosis system has detected a malfunction or abnormality in the system.