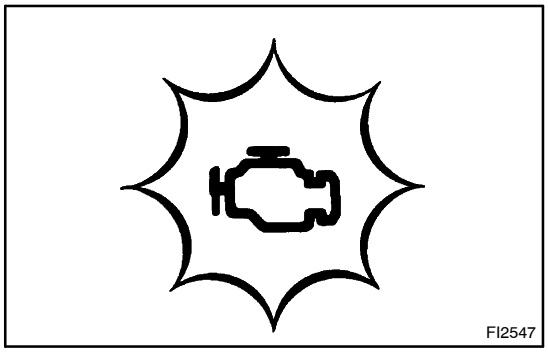
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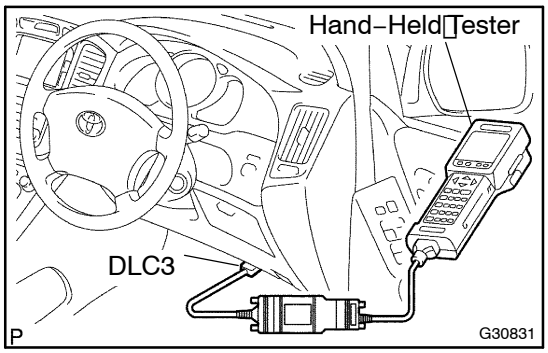
DIAGNOSIS SYSTEM



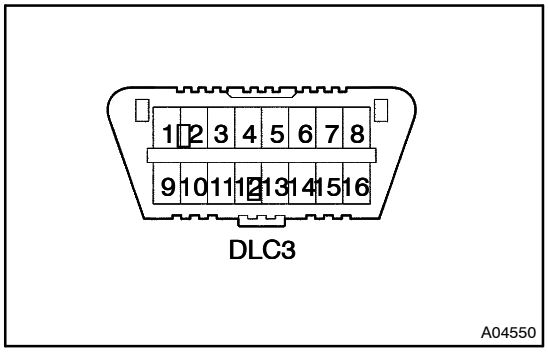
1. DESCRIPTION for M–OBD

- When troubleshooting Multiplex OBD (M–OBD) vehicles, the only difference from the usual troubleshooting procedure is that you connect the hand–held tester to the vehicle, and read the various data output from the vehicle's ECM.
- The vehicle's on–board computer illuminates the check engine warning lamp (CHK ENG (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 05–376).

If the malfunction does not recur, the CHK ENG (MIL) goes off be disappeared by turning the ignition switch to OFF, but the recorded DTCs remain in the ECM memory.



- To check the DTCs, connect the hand–held tester to the Data Link Connector 3 (DLC3) on the vehicle or connect terminals TC and CG on the DLC3.
- 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) (see page 05–370).
- *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 CHK ENG (MIL) will illuminate (2nd trip).
- Freeze frame data:
  The freeze frame data records the engine conditions (fuel system, calculated load, engine coolant temperature, fuel trim, engine speed, vehicle speed, etc.) 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.

(a) The vehicle's ECM uses the ISO 14230 (M–OBD) communication protocol. The terminal arrangement of the DLC3 complies with ISO 15031–3 and matches the ISO 14230 format.

Symbol	Terminal No.	Name	Reference Terminal	Result	Condition
SIL	7	Bus "+" line	5 – Signal ground	Pulse generation	During transmission
CG	4	Chassis ground	Body ground	1 Ω or less	Always
SG	5	Signal ground	Body ground	1 Ω or less	Always
BAT	16	Battery positive	Body ground	9 to 14 V	Always

HINT:

If your display shows "UNABLE TO CONNECT TO VEHICLE" when you have connected the cable of hand–held tester to the DLC3, turned the ignition switch to the ON position and operated the hand–held tester, there is a problem on the vehicle side or tool side.

- If communication is normal when the tool is connected to another vehicle, inspect DLC3 on the original vehicle.
- If communication is still not possible when the tool is connected to another vehicle, the problem is probably in the tool itself, so consult the Service Department listed in the tool's instruction manual.

3. INSPECT BATTERY VOLTAGE

(a) Measure the battery voltage.

Battery Voltage: 11 to 14 V

If the voltage is below 11 V, recharge the battery before proceeding.

4. CHECK CHK ENG (MIL)

(a) The CHK ENG (MIL) comes on when the ignition switch is turned to ON position and the engine is not running.

HINT:

If the CHK ENG (MIL) is not illuminated, troubleshoot the CHK ENG (MIL) circuit (see page 05–151).

(1) When the engine is started, the CHK ENG (MIL) should go off. If the lamp remains on, it means that the diagnosis system has detected a malfunction or abnormality in the system.