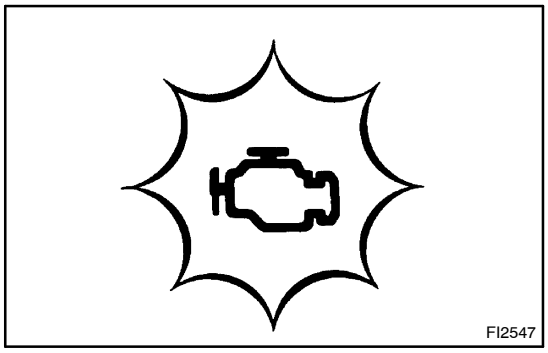
05I1D–01

DIAGNOSIS SYSTEM

EURO–OBD (EUROPE AND TAIWAN)

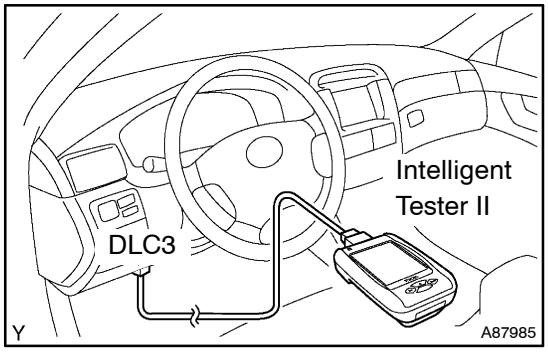
When troubleshooting Europe On–Board Diagnostic (Euro–OBD) vehicles, the vehicle must be connected to an OBD scan tool (complying with ISO 15765–4). Various data output from the vehicle's ECM can then be read.



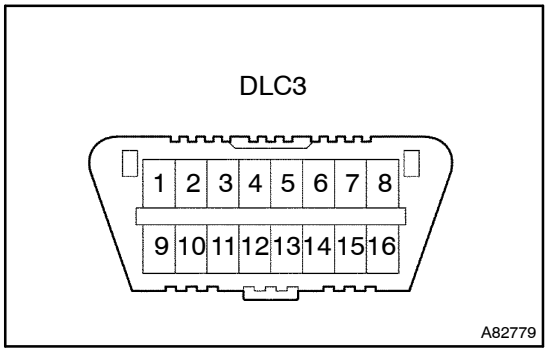
Euro–OBD regulations require that the vehicle's on–board computer illuminates the Malfunction Indicator Lamp (MIL) on the instrument panel when the computer detects a malfunction in:

1) The emission control system/components.
2) The powertrain control components (which affect vehicle emissions).
3) The computer.

In addition, the applicable Diagnostic Trouble Codes (DTCs) prescribed by ISO 15765–4 are recorded in the ECM memory. If the malfunction does not reoccur in 3 consecutive trips, the MIL turns off automatically but the DTCs remain recorded in the ECM memory.

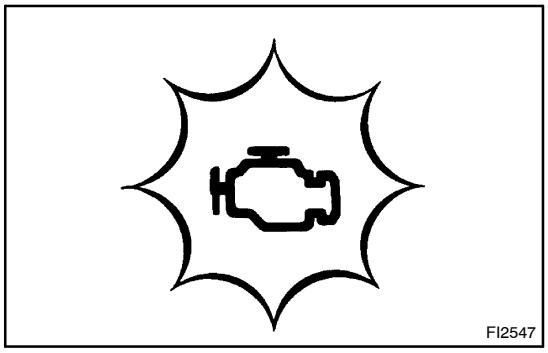


To check DTCs, connect the Intelligent Tester II or OBD scan tool to the Data Link Connector 3 (DLC3) of the vehicle.
The scan tool displays DTCs, the freeze frame data and a variety of the engine data.
The DTCs and freze frame data can be erased with the scan tool (see page 05–551).



M–OBD (EXCEPT EUROPEAN SPEC.)

When troubleshooting Multiplex On–Board Diagnostic (M–OBD) vehicles, the vehicle must be connected to the Intelligent Tester II. Various data output from the ECM can then be read.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OBD II regulations require that the vehicle's on–board computer illuminates the MIL on the instrument panel when the computer detects a malfunction in:

1) The emission control system / components
2) The power train control components (which affect vehicle emissions)
3) The computer

In addition to, the applicable DTCs are recorded in the ECM memory. If the malfunction does not recur in 3 consecutive trips, the MIL turns off automatically but the DTCs remain recorded in the ECM memory.

NORMAL MODE AND CHECK MODE

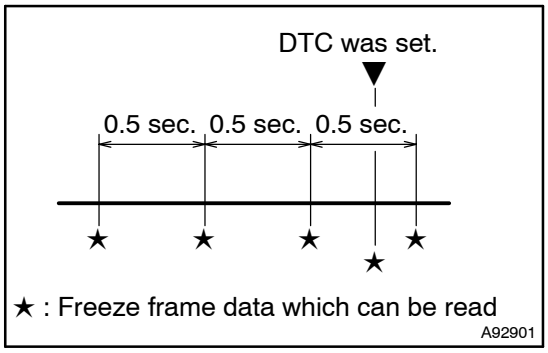
The diagnosis system operates in "normal mode" during normal vehicle use. In normal mode, "2 trip detection logic" is used to ensure accurate detection of malfunctions. "Check mode" is also available to technicians as an option. In check mode, "1–trip detection logic" is used for simulating malfunction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

2–TRIP DETECTION LOGIC

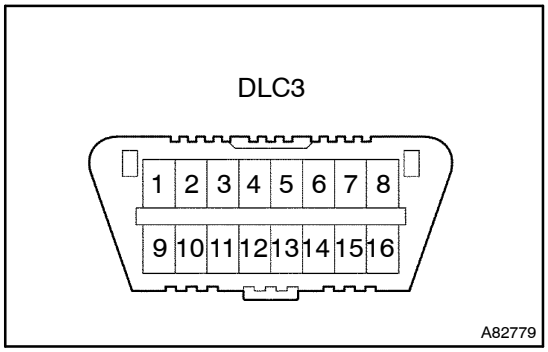
When a malfunction is first detected, the malfunction is temporarily stored in the ECM memory (1st trip). If the ignition switch is turned OFF and then ON again, and the same malfunction is detected again, the MIL will illuminate.

FREEZE FRAME DATA

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.



The Intelligent Tester II records freeze frame data in five different instances: 1) 3 times before the DTC is set, 2) once when the DTC is set, and 3) once after the DTC is set. These data can be used to simulate the vehicle's condition around the time when the malfunction occurred. The data may help find the cause of the malfunction, or judge if the DTC is being caused by a temporary malfunction or not.



DLC3 (Data Link Connector 3)

The vehicle's ECM uses the ISO 15765–4 for communication protocol. The terminal arrangement of the DLC3 complies with ISO 15031–03 and matches the ISO 15765–4 format.

HINT:

Connect the cable of the Intelligent Tester II to the DLC3, turn the ignition switch ON and attempt to use the Intelligent Tester II. If the screen displays UNABLE TO CONNECT TO VEHICLE, a problem exists in the vehicle side or the tester side.

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

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

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
CANH	6	HIGH–level CAN bus line	CANL	54 to 69 Ω	IG switch OFF
CANH	6	HIGH–level CAN bus line	Battery positive	1 MΩ or higher	IG switch OFF
CANH	6	HIGH–level CAN bus line	CG	1 kΩ or higher	IG switch OFF
CANL	14	LOW–level CAN bus line	Battery positive	1 MΩ or higher	IG switch OFF
CANL	14	LOW–level CAN bus line	CG	1 kΩ or higher	IG switch OFF

INSPECT BATTERY VOLTAGE

Battery Voltage: 11 to 14 V

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

CHECK MIL

(a) Check that the MIL illuminates when turning the ignition switch ON.

If the MIL does not illuminate, there is a problem in the MIL circuit (refer to MIL CIRCUIT on page 05–229).

(b) When the engine is started, the MIL should turn off.

ALL READINESS

For this vehicle, using the Intelligent Tester II allows readiness codes corresponding to all DTCs to be read. When diagnosis (normal or malfunctioning) has been complete, readiness codes are set.