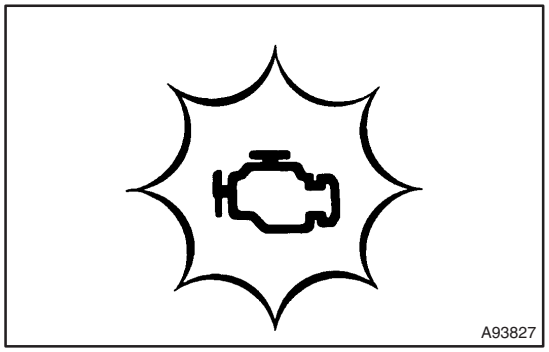
05M4Z–02

DIAGNOSIS SYSTEM

1. DESCRIPTION

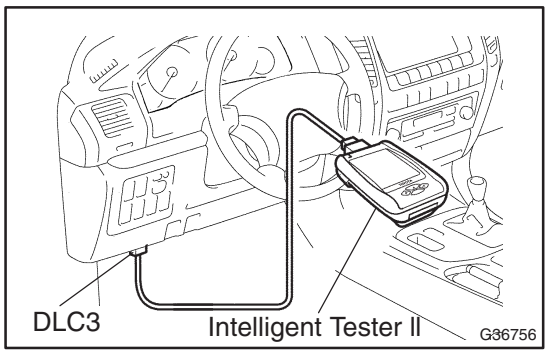
When troubleshooting Euro–OBD (On–Board Diagnostic) vehicle, an intelligent tester II or OBD scan tool must be connected to the DLC3 (Data Link Connector 3) of the vehicle. Various data in the vehicle's ECM (Engine Control Module) can be then read.



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

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

In addition, the applicable DTCs (Diagnostic Trouble Codes) prescribed by ISO 15031–4 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.



To check the DTCs, connect an intelligent tester II to the DLC3. The tester displays DTCs, freeze frame data, and variety of engine data. The DTCs and freeze frame data can be erased with the tester (refer to DTC CHECK/CLEAR on page 05–466).

2. NORMAL MODE AND CHECK MODE

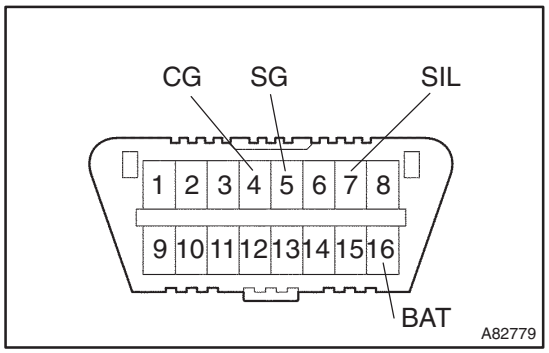
The diagnosis system operates in "normal mode" during normal vehicle use. In normal mode, "2 trip detection logic" is used to ensure accurate detection of malfunctions. "Check mode" is also available to technicians as an option. In check mode, "1 trip detection logic" is used for simulating malfunction symptoms and increasing the system's ability to detect malfunctions, including intermittent malfunctions (see page 05–439).

3. 2 TRIP DETECTION LOGIC

When a malfunction is first detected, the malfunction is temporarily stored in the ECM memory (1st trip). If the same malfunction is detected during the next subsequent drive cycle, the MIL is illuminated (2nd trip).

4. FREEZE FRAME DATA

Freeze frame data records the engine conditions (fuel system, calculated engine 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 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.



5. CHECK DLC3

The vehicle's ECM uses ISO 14230 (M–OBD) communication protocol. The terminal arrangement of the DLC3 complies with ISO 15031–03 and matches the ISO 14230 format.

Symbol	Terminal No.	Name	Reference terminal	Result	Condition
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

HINT:

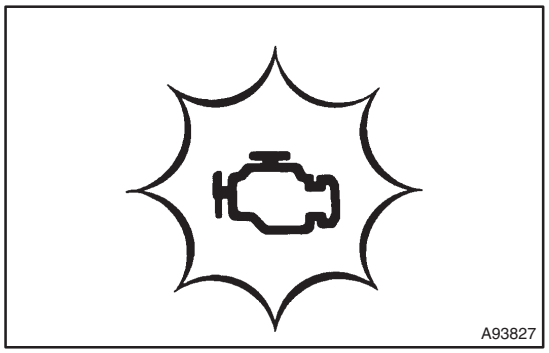
Connect the cable of the intelligent tester II to the DLC3, turn the ignition switch ON and attempt to use the intelligent tester II. If the display informs that a communication error has occurred, there is a problem either with the vehicle or with the tester.

- 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.

6. INSPECT BATTERY VOLTAGE

Battery voltage: 11 to 14 V

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



7. CHECK MIL

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

HINT:

If the MIL is not illuminated, check the MIL circuit (refer to MIL CIRCUIT on page 05–663).

(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.