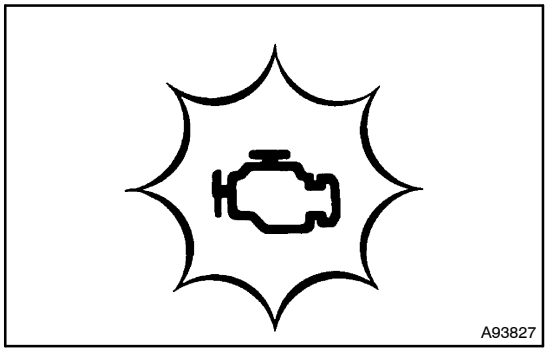
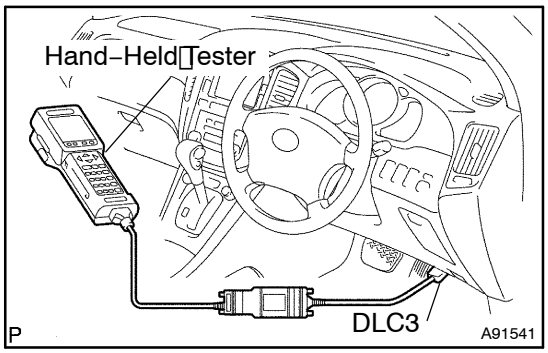
05JXF–01

DIAGNOSIS SYSTEM



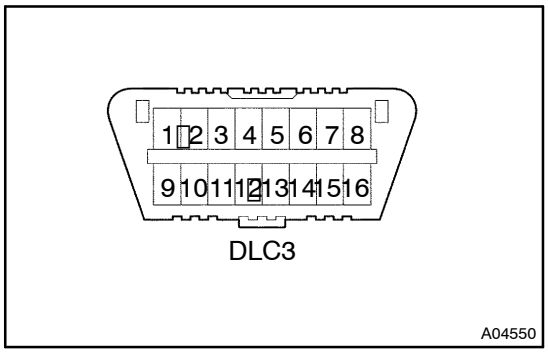
1. DESCRIPTION FOR M–OBD

- 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 off various data output from the vehicle's ECM.
- The vehicle's on–board computer illuminates the check engine warning light (CHK ENG) on the instrument panel when the computer detects a malfunction in the computer itself or in drive system components. In addition to an illumination of the CHK ENG when a malfunction is detected, the applicable Diagnostic Trouble Codes (DTCs) are recorded in the ECM memory. (See page 05–27).
  If the malfunction does not recur, the check engine warning light will be disappeared by turning off the ignition switch but the recorded DTC will be remaining in the ECM memory.



- To check the 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. (for operating instructions, see the instruction book.)
- The diagnosis system operates in the normal mode during normal vehicle use. It also has a check (test) mode for technicians to simulate malfunction symptoms and troubleshoot. Most DTCs use 2 trip detection logic* to prevent erroneous detection, and to ensure a thorough malfunction detection. By switching the ECM to the check (test) mode using hand–held tester when troubleshooting, a technician can cause the CHK ENG to illuminate for a malfunction that is only detected once or momentarily (Hand–held tester only) (See page 05–18).
- *2 trip detection logic
  When a malfunction is first detected, the pending fault code is stored in the ECM memory (1st trip). If the same malfunction is detected again during the second drive test, this second detection causes the CHK ENG to illuminate (2nd trip) (However, the ignition switch must be turned OFF between the 1st trip and 2nd trip).

• Freeze frame data:
Freeze frame data records the engine conditions (fuel system, calculator load, water temperature, fuel trim, engine speed, vehicle speed, etc.) when a malfunction is detected. When troubleshooting, it is useful for determining whether the vehicle was running or stopped, the engine was warmed up or not, the air–fuel ratio was lean or rich, etc. at the time of the malfunction.



2. CHECK DLC3

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 the display shows "UNABLE TO CONNECT TO VEHICLE" when you have connected the cable of the hand–held tester to the DLC3, turned the ignition switch ON 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 the DLC3 on the original vehicle.
• If communication is still impossible is 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. CHECK THE BATTERY VOLTAGE

Standard: 11 to 14 V

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

4. CHECK THE CHK ENG

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

HINT:
If the CHK ENG is not illuminated, troubleshoot the combination meter. (See page 05–1631)

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