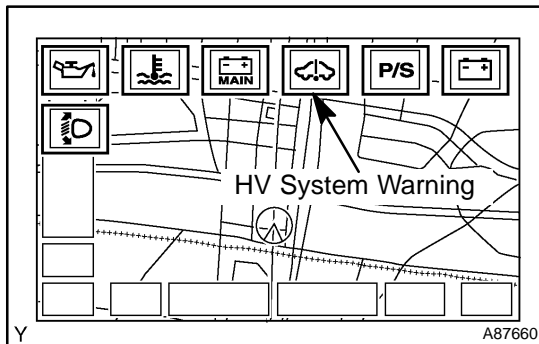


DIAGNOSIS SYSTEM



1. DESCRIPTION

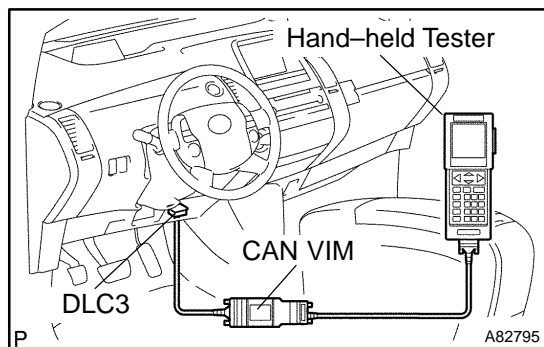
- The battery ECU has a self-diagnosis system. If the computer, the HV battery system or the components operate improperly, the ECU diagnoses improper operation to detect malfunction, and illuminates the master warning lamp in the combination meter together with the HV system warning indicator on the multi-information display.

HINT:

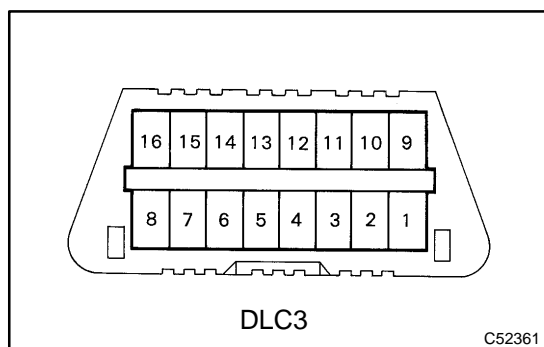
The master warning lamp illuminates when HV battery system fails and it blinks when in inspection mode.

- When troubleshooting OBD II vehicles, the only difference from the usual troubleshooting procedure is that you need to connect the OBD II scan tool complying with SAE J1978 or the hand-held tester to the vehicle, and read various data output from the vehicle's ECUs.
- OBD II regulations require that the vehicle's on-board computer illuminates the Malfunction Indicator Lamp (MIL) in the instrument panel when the computer detects a malfunction in: 1) the emission control systems/components, or 2) the powertrain control components (which affect vehicle emissions), or 3) the computers. In addition, the applicable Diagnostic Trouble Codes (DTCs) prescribed by SAE J2012 are recorded in the battery ECU memory (see page [05-893](#)).

If the malfunction does not recur in 3 consecutive trips, the MIL will go off automatically. However the DTCs remain recorded in the battery ECU memory.



- To check the DTCs, connect the hand-held tester to the Data Link Connector 3 (DLC3) with the CAN vehicle interface module (CAN VIM). Or, connect the OBD II scan tool to the DLC3. The hand-held tester or OBD II scan tool also enables you to erase DTCs and check the freeze frame data and various forms of the HV battery system data (for operating instructions, refer to their respective instruction manuals). The DTCs include SAE controlled codes and manufacturer controlled codes. SAE controlled codes must be set as prescribed by the SAE, while manufacturer controlled codes can be set by a manufacturer within the prescribed limits (see the DTC chart on page 05-893).
- Freeze frame data:
The freeze frame data records the driving condition when malfunction is detected. When troubleshooting, it can help determine if the vehicle was running, braked, stopped, or reversed.



2. CHECK DLC3

The battery ECU uses the ISO 9141-2 for communication protocol. The terminal arrangement of the DLC3 complies with SAE J1962 and matches the ISO 9141-2 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	11 to 14 V	Always
CANH	6	HIGH-level CAN bus line	14 – LOW-level CAN bus line	54 to 69 Ω	Power switch OFF
CANH	6	HIGH-level CAN bus line	16 – Battery positive	1 MΩ or higher	Power switch OFF
CANH	6	HIGH-level CAN bus line	4 – Chassis ground	1 kΩ or higher	Power switch OFF
CANL	14	LOW-level CAN bus line	16 – Battery positive	1 MΩ or higher	Power switch OFF
CANL	14	LOW-level CAN bus line	4 – Chassis ground	1 kΩ or higher	Power switch OFF

HINT:

If the display shows UNABLE TO CONNECT TO VEHICLE when you have connected the cable of the hand-held tester or the OBD II scan tool to the DLC3, turned the power switch ON and operated the tester, there is a problem on the vehicle side or tester side.

- If the communication is normal when the tester or scan tool is connected to another vehicle, inspect the DLC3 on the original vehicle.
- If the communication is still impossible when the tester or scan tool is connected to another vehicle, the problem is probably in the tester or scan tool itself, so consult the Service Department listed in its instruction manual.

3. INSPECT AUXILIARY BATTERY

- (a) Measure the voltage of the auxiliary battery.

Voltage: 11 to 14 V

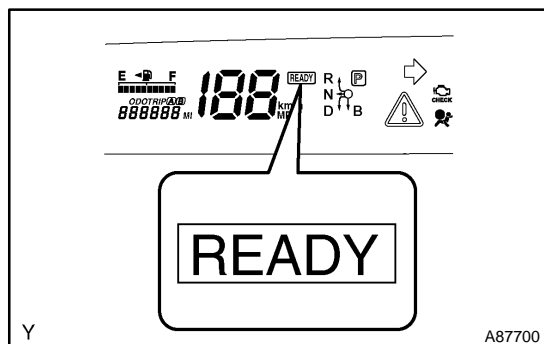
- (b) Inspect the auxiliary battery, fuses, fusible links, wiring harness, connectors and ground.



4. CHECK MIL

- (a) The MIL illuminates when the power switch is turned ON and the "READY" lamp is OFF.

If the MIL is not illuminated, troubleshoot the MIL circuit (see page [05-381](#)).



- (b) When the "READY" turns on, the MIL should turn off. If the MIL remains on, the diagnosis system has detected malfunction or abnormality in the system.