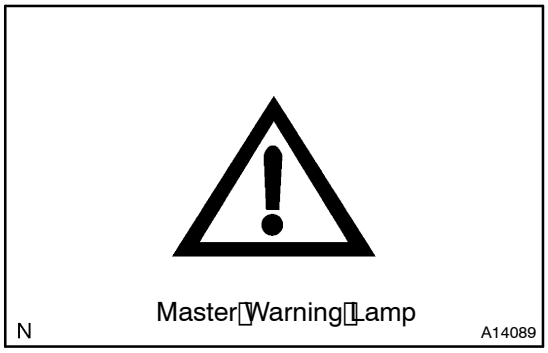
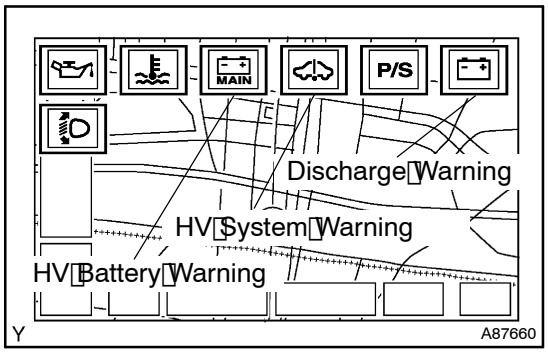
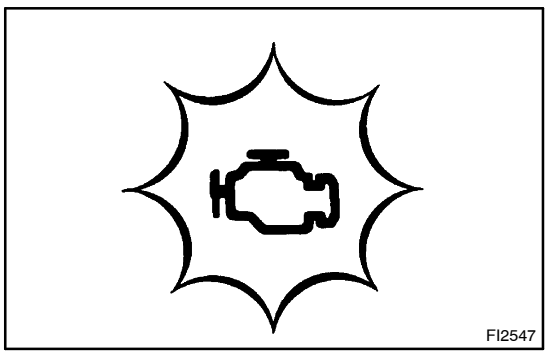
05IH9–01

DIAGNOSIS SYSTEM







1. DESCRIPTION

(a) The HV control ECU has a self–diagnosis system. If the computer, the hybrid vehicle control 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 any of indicators on the multi–information display, the HV system warning, the HV battery warning or the discharge warning.

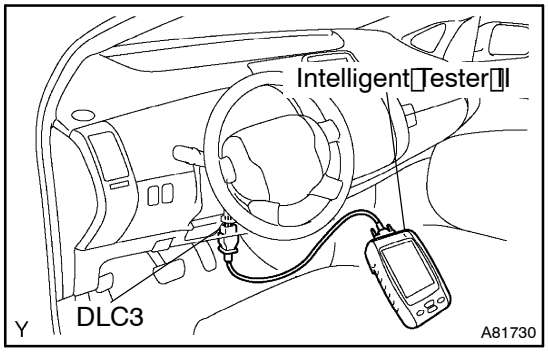
HINT:

The master warning lamp illuminates when THS II fails and it blinks when in inspection mode.

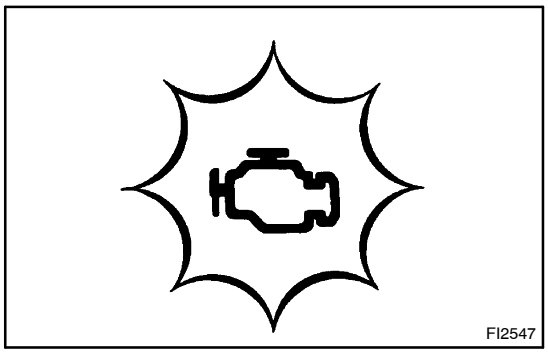
(b) Description for Euro–OBD (European spec.)

- When troubleshooting Euro–OBD vehicles, the only difference from the usual troubleshooting procedure is that you need to connect the OBD scan tool complying with ISO 15031–4 or the intelligent tester II to the vehicle, and read various data output from the vehicle's ECUs.
- Euro–OBD regulations require that the vehicle's on–board computer illuminates the check engine warning lamp (CHK ENG) in the instrument panel when the computer detects 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 ISO 15031–4 are recorded in the HV control ECU memory (see page 05–268).

If the malfunction does not recur in 3 consecutive trips, the CHK ENG will go off automatically. However the DTCs remain recorded in the HV control ECU memory.



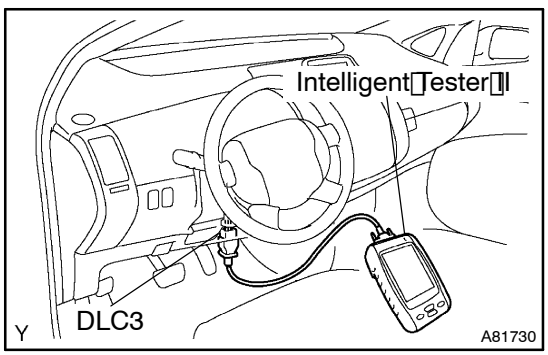
- To check the DTCs, connect the intelligent tester II or OBD scan tool to the Data Link Connector 3 (DLC3) of the vehicle. The intelligent tester II or OBD scan tool also enables you to erase the DTCs and check the freeze frame data and various forms of the THS II data (for operating instructions, refer to their respective instruction manuals). The DTCs include ISO controlled codes and manufacturer controlled codes. ISO controlled codes must be set as prescribed by the ISO, while manufacturer controlled codes can be set by a manufacturer within the prescribed limits (see the DTC chart on page 05–268).
- 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.



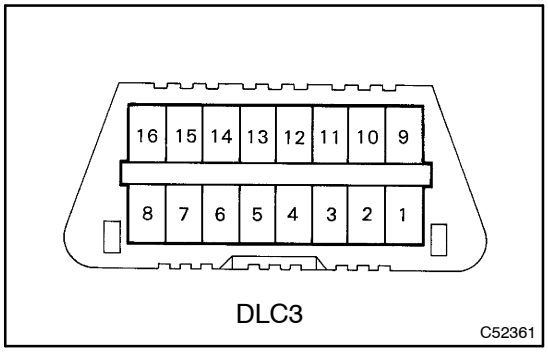
(c) Description for M–OBD (Except European spec.)

- When troubleshoot Multiplex OBD (M–OBD) vehicles, the only difference from the usual troubleshooting procedure is that you need to connect the intelligent tester II to the vehicle, and read various data output from the vehicle's ECU.
- The vehicle's on–board computer illuminates the check engine warning lamp (CHK ENG) in the instrument panel when the computer detects malfunction in the computer itself or in drive system components. In addition, the applicable Diagnostic Trouble Codes (DTCs) are recorded in the HV control ECU memory (see page 05–268).

If the malfunction does not recur, the CHK ENG will go off when the power switch is turned OFF. However the DTCs remain recorded in the HV control ECU memory.



- To check the DTCs, connect the intelligent tester II to the Data Link Connector 3 (DLC3) of the vehicle. The intelligent tester II also enables you to erase the DTCs and check the freeze frame data and various forms of THS II data (for operating instructions, refer to its instruction manual).



2. CHECK DLC3

The HV control ECU uses the ISO 9141–2 (Euro–OBD)/ISO 14230 (M–OBD) for communication protocol. The terminal arrangement of the DLC3 complies with ISO 15031–03 and matches the ISO 9141–2/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	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 no information available when you have connected the cable of intelligent tester II to the DLC3, turned the power switch ON and operated the intelligent tester II, there is a problem on the vehicle side or tester side.

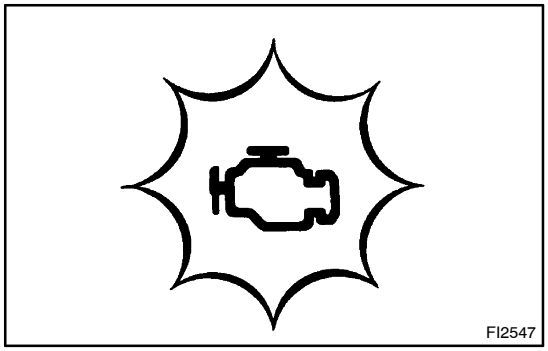
- If the communication is normal when the tester is connected to another vehicle of the same model, inspect the DLC3 and communication bus on the original vehicle.
- If the communication is still impossible when the tester is connected to another vehicle of the same model, the problem is probably in the tester 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

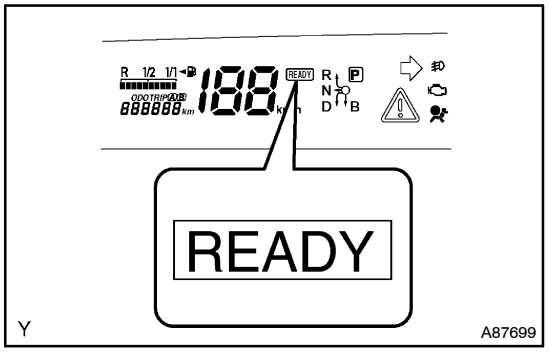
(b) Inspect the auxiliary battery, fuses, fusible links, wiring harness, connectors and ground.



4. CHECK CHK ENG

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

If the CHK ENG is not illuminated, troubleshoot the CHK ENG circuit (see page 05–209).



(b) When the ”READY” turns on, the CHK ENG should turn off.

If the CHK ENG remains on, the diagnosis system has detected malfunction or abnormality in the system.