## ON-BOARD DIAGNOSIS [LASER SENSOR]

id0402c4800200

### On-Board Diagnostic (OBD) Test Description

- The OBD test inspects the integrity and function of the laser sensor and outputs the results when requested by the specific tests.
- On-board diagnostic test also:
  - — Provides a quick inspection of the laser sensor usually performed at the start of each diagnostic procedure.
  - — Provides verification after repairs to ensure that no other faults occurred during service.
- The OBD test is divided into 3 tests:
  - — Read/clear diagnostic results, PID monitor and record and active command modes.

### Read/clear diagnostic results

- This function allows you to read or clear DTCs in the laser sensor memory.

### PID/Data monitor and record

- This function allows you to access certain data values, input signals, calculated values, and system status information.

### Reading DTCs Procedure

**CMDTC self test**

1. Connect the M-MDS (IDS) to the DLC-2.
2. After the vehicle is identified, select the following items from the initialization screen of the IDS.
   (1) Select “Self Test”.
   (2) Select “All CMDTCs”.
3. Verify the DTC according to the directions on the screen.
   - If any DTCs are displayed, perform troubleshooting according to the corresponding DTC inspection.
4. After completion of repairs, clear all DTCs stored in the laser sensor. (See Clearing DTCs Procedure.)

**Note**

- Snapshot data appears at the top of the help screen when the displayed DTC is selected.
- The data for all DTCs currently detected is stored.

### Clearing DTCs Procedure

**CMDTC clearing DTCs procedure**

1. Connect the M-MDS (IDS) to the DLC-2.
2. After the vehicle is identified, select the following items from the initialization screen of the IDS.
   (1) Select “Self Test”.
   (2) Select “All CMDTCs”.
3. Verify the DTC according to the directions on the screen.
4. Press the clear button on the DTC screen to clear the DTC.
5. Switch the ignition to off.
6. Switch the ignition to ON and wait for **5 s or more**.
7. Perform DTC inspection. (See Reading DTCs Procedure.)
8. Verify that no DTCs are displayed.

### PID/Data Monitor and Record Procedure

1. Connect the M-MDS (IDS) to the DLC-2.
2. After the vehicle is identified, select the following items from the initialization screen of the IDS.
   (1) Select “DataLogger”.
   (2) Select “Modules”.
   (3) Select “SCBS”.
3. Select the applicable PID from the PID table.
4. Verify the PID data according to the directions on the screen.

**Note**

- The PID data screen function is used for monitoring the calculated value of input/output signals in the module. Therefore, if the monitored value of the output parts is not within the specification, it is necessary to inspect the monitored value of input parts corresponding to the applicable output part control. In addition, because the system does not display an output part malfunction as an abnormality in the monitored value, it is necessary to inspect the output parts individually.

### Snapshot Data Access Procedure

1. Connect the M-MDS (IDS) to the DLC-2.

2. After the vehicle is identified, select the following items from the initialization screen of the IDS.
   (1) Select “Self Test”.
   (2) Select “Modules”.
   (3) Select “SCBS”.
3. Then, select the “Retrieve CMDTCs” and perform procedures according to directions on the IDS screen.
4. Retrieve the snapshot data according to the directions on the IDS screen.

**Note**
- Snapshot data appears at the top of the help screen when the displayed DTC is selected.
- The snapshot data stores the currently detected DTC data.

**DTC Table**
×: Applicable
-: Not applicable

| DTC No. | Master warning light | Message in the TFT LCD display | Malfunction location | Fail-safe | Drive cycle | Self test type*1 | Memory function | Page |
|---|---|---|---|---|---|---|---|---|
| U0001:00<br>U0100:00<br>U0121:00<br>U0131:00<br>U0155:00 | Illuminated | SCBS Inspection Required | CAN line | × | - | C | × | (See DTC U0001:00/ U0100:00/U0121:00/ U0131:00/U0155:00 [LASER SENSOR].) |
| U0401:68 | Illuminated | SCBS Inspection Required | Abnormal message from PCM | × | - | C | × | (See DTC U0401:68 [LASER SENSOR].) |
| U0415:68 | Illuminated | SCBS Inspection Required | Abnormal message from DSC HU/CM | × | - | C | × | (See DTC U0415:68 [LASER SENSOR].) |
| U0420:68 | Illuminated | SCBS Inspection Required | Abnormal message from EPS CM | × | - | C | × | (See DTC U0420:68 [LASER SENSOR].) |
| U0423:68 | Illuminated | SCBS Inspection Required | Abnormal message from instrument cluster | × | - | C | × | (See DTC U0423:68 [LASER SENSOR].) |
| U1A14:49 | Illuminated | SCBS Inspection Required | Laser sensor | × | - | C | × | (See DTC U1A14:49 [LASER SENSOR].) |
| U2300:55<br>U2300:56 | Illuminated | SCBS Inspection Required | Configuration data not recorded or data error | × | - | C | × | (See DTC U2300:55/ U2300:56 [LASER SENSOR].) |
| U3000:00<br>U3000:64 | Illuminated | SCBS Inspection Required | Laser sensor (internal malfunction) | × | - | C | × | (See DTC U3000:00/ U3000:64 [LASER SENSOR].) |
| U3000:66 | Illuminated | SCBS Inspection Required | Laser sensor | × | - | C | × | (See DTC U3000:66 [LASER SENSOR].) |

*1 : C: CMDTC self-test

**PID/DATA Monitor Table**

| PID name (definition) | Unit/Condition | Operation condition (reference) | Action |
|---|---|---|---|
| DIST_BMP_TGT | m | Changes according to the distance from bumper to target that the laser sensor has detected | Perform the DTC inspection for the laser sensor.<br>(See Reading DTCs Procedure.) |

| PID name (definition) | Unit/Condition | Operation condition (reference) | Action |
|---|---|---|---|
| VPWR_IG1 | V | Module supply voltage (IG1) | Inspect the battery.<br>(See BATTERY INSPECTION [SKYACTIV-G 2.0, SKYACTIV-G 2.5].)<br>(See BATTERY INSPECTION [SKYACTIV-G 2.0, SKYACTIV-G 2.5 (WITHOUT i-stop)].)<br>(See BATTERY INSPECTION [SKYACTIV-D 2.2].)<br>Inspect the push button start.<br>(See PUSH BUTTON START INSPECTION.) |
| VSPD | KPH, MPH | Vehicle speed | Inspect the DSC HU/CM.<br>(See DSC HU/CM INSPECTION.) |

**Snapshot Data Table**

**Note**
- The laser sensor stores the following two types of information when a DTC is detected and displays snap shot data in the M-MDS.
  - — Vehicle information detected by laser sensor
  - — Vehicle information detected by instrument cluster and received by start stop unit via CAN signal
- Refer to PID monitor table for confirm the laser sensor operation status while the laser sensor does not store the DTC. (See PID/DATA Monitor Table.)
- Snapshot data items are not displayed, according to detected DTC.

| Snapshot data item | Unit | Data contents | Data read/use method | Corresponding data monitor items |
|---|---|---|---|---|
| DSC_R_BRK | OK/Error | DSC response against brake request from SCBS module | Not applicable | Not applicable |
| DSC_R_BRK_C | OK/Error | DSC response against brake assist threshold change from SCBS module | Not applicable | Not applicable |
| DSC_R_NOREQ | OK/Error | DSC response while no request from SCBS module | Not applicable | Not applicable |
| DSC_R_PRECH | OK/Error | DSC response against pre-charge request from SCBS module | Not applicable | Not applicable |
| DSC_SYSTEM | OK/Error | DSC system condition | Not applicable | Not applicable |
| ECU_IN_TEMP | °C | ECU internal temperature | Not applicable | Not applicable |
| PCM_R_NOREQ | OK/Error | PCM response while no request from SCBS module | Not applicable | Not applicable |
| PCM_R_REQ | OK/Error | PCM response against request from SCBS module | Not applicable | Not applicable |
| PCM_SYSTEM | OK/Error | PCM system condition | Not applicable | Not applicable |
| TOTAL_DIST | km/miles | Accumulated total traveled distance from completion of vehicle until laser sensor detects DTC (Odometer value in instrument cluster) | The distance traveled when the laser sensor detected a DTC can be calculated by performing the following procedure.<br>1. Verify the odometer value in the instrument cluster.<br>2. Verify the snap shot data item TOTAL_DIST.<br>3. Subtract 2 from 1. | Not applicable |

| Snapshot data item | Unit | Data contents | Data read/use method | Corresponding data monitor items |
|---|---|---|---|---|
| TOTAL_TIME | hh:mm:ss*1 | Accumulated total elapsed time since vehicle completion until laser sensor detects a DTC<br><br>**Note**<br>• When the ROOM removed, and the ignition is switched to off, the time is not included in the elapsed time. | The elapsed time when the laser sensor detected a DTC can be calculated by performing the following procedure.<br>1. Verify the PID item TOTAL_TIME of the instrument cluster.<br>2. Verify the snap shot data item TOTAL_TIME.<br>3. Subtract 2 from 1. | TOTAL_TIME*2 |
| VPWR | V | Power supply | Not applicable | Not applicable |
| VSPD | KPH, MPH | Vehicle speed | Not applicable | VSPD |

*1 : The seconds may be indicated after the decimal point.
*2 : Instrument cluster PID (See PID/DATA MONITOR TABLE [INSTRUMENT CLUSTER].)