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Service Category: Engine/Hybrid System	Section: Engine Control	
Model Year: 2008	Model: LX570	Doc ID: RM000000PDJ07SX
Title: 3UR-FE ENGINE CONTROL: SFI SYSTEM: DIAGNOSIS SYSTEM (2008 LX570)		

DIAGNOSIS SYSTEM

1. DESCRIPTION

When troubleshooting OBD II (On-Board Diagnostics) vehicles, the Techstream (complying with SAE J1987) must be connected to the DLC3 (Data Link Connector 3) of the vehicle. Various data in the vehicle ECM (Engine Control Module) can be then read.

OBD II regulations require that the vehicle on-board computer illuminate the MIL (Malfunction Indicator Lamp) on the instrument panel when the computer detects a malfunction in:



In addition, the applicable DTCs prescribed by SAE J2012 are stored in the ECM memory. If the malfunction does not recur in 3 consecutive trips, the MIL turns off automatically but the DTCs remain stored in the ECM memory.

To check the DTCs, connect the Techstream to the DLC3. The Techstream displays output DTCs, freeze frame data, and a variety of the engine data. The DTCs and freeze frame data can be cleared with the Techstream INFO. In order to enhance OBD function on vehicles and develop the Off-Board diagnosis system, Controller Area Network (CAN) communication is used in this system. CAN is a network which uses a pair of data transmission lines spanning multiple computers and sensors. It allows for high speed communications between the systems and simplification of the wire harness connections.

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 as an option for technicians. In check mode, 1 trip detection logic is used for simulating malfunction symptoms and increasing the system ability to detect malfunctions, including intermittent problems (Techstream only).

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

The ECM records vehicle and driving condition information as freeze frame data the moment a DTC is stored. When troubleshooting, freeze frame data can be helpful in determining whether the vehicle was running or stopped, whether the engine was warmed up or not, whether the air-fuel ratio was lean or rich, as well as other data recorded at the time of a malfunction.

5. DLC3 (Data Link Connector 3)

Check the DLC3 INFO.

6. BATTERY VOLTAGE

Standard voltage:
11 to 14 V

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

7. MIL (Malfunction Indicator Lamp)

- (a) The MIL is illuminated when the engine switch is first turned on (IG) (the engine is not running).
- (b) The MIL should turn off when the engine is started. If the MIL remains illuminated, the diagnosis system has detected a malfunction or abnormality in the system.

HINT:

If the MIL is not illuminated when the engine switch is first turned on (IG), check the MIL circuit INFO.

8. ALL READINESS

HINT:

- With "All Readiness" you can check whether or not the DTC judgment has been completed by using the Techstream.
 - You should check "All Readiness" after simulating malfunction symptoms or for validation after finishing repairs.
- (a) Connect the Techstream to the DLC3.
 - (b) Turn the engine switch on (IG).
 - (c) Turn the Techstream on.
 - (d) Clear the DTCs INFO.
 - (e) Perform the DTC judgment driving pattern to run the DTC judgment.
 - (f) Enter the following menus: Powertrain / Engine and ECT / Utility / All Readiness.
 - (g) Input the DTCs to be confirmed.
 - (h) Check the DTC judgment result.

Techstream

DISPLAY ITEM	DESCRIPTION
NORMAL	• DTC judgment completed • System normal
ABNORMAL	• DTC judgment completed • System abnormal
INCOMPLETE	• DTC judgment not completed • You should perform driving pattern after confirming DTC enabling conditions
UNKNOWN	• Unable to perform DTC judgment • Number of DTCs which do not fulfill DTC preconditions has reached ECU memory limit

