SYSTEM DESCRIPTION

1. ENGINE IMMOBILISER SYSTEM DESCRIPTION

The engine immobiliser system is designed to prevent the vehicle from being stolen. This system uses a transponder key ECU that stores the key codes of authorized ignition keys. If an attempt is made to start the engine using an unauthorized key, the ECU sends a signal to the ECM to prohibit fuel delivery and ignition, effectively disabling the engine.

2. FUNCTION OF MAIN COMPONENT

Component	Outline
Transponder key coil/amplifier	When key is inserted into ignition key cylinder, key coil receives key code. Then amplifier amplifies ID code and outputs it to transponder key ECU.
Unlock warning switch assembly	Detects whether key is in ignition key cylinder and outputs results to transponder key ECU
ECM	Through SFI communication, ECM receives ID verification results from transponder key ECU. ECM also verifies ECUs. Then ECM judges whether or not to immobilize engine.
Security indicator light	Depending on operation of transponder key ECU, interior security indicator light comes on or starts blinking

3. SYSTEM FUNCTION

- When the transponder key ECU detects that the unlock warning switch is ON, the ECU provides current to the transponder key coil and produces a faint electric wave. A transponder chip in the key grip receives the wave and outputs a key ID code signal. The transponder key coil receives this signal, the transponder key amplifier amplifies it, and then the signal is transmitted to the ECU. The ECU matches the key's ID code with the vehicle's ID code, which was previously registered in the ECU and then communicates the results to the ECM using SFI communication.
- After the identification results show that the key's ID code matches the vehicle's ID code and the ECU has confirmed their match: 1) the engine immobiliser system is canceled and the engine starting controls (fuel injection control and ignition control) enter standby mode; and 2) the ECU receives a security indicator light signal, and turns the security indicator light OFF.

HOW TO PROCEED WITH TROUBLESHOOTING

HINT:
Use these procedures to troubleshoot the engine immobiliser system.
*: Use the intelligent tester.

1 VEHICLE BROUGHT TO WORKSHOP

NEXT

2 INSPECT BATTERY VOLTAGE

Standard voltage:
11 to 14 V
If the voltage is below 11 V, recharge or replace the battery before proceeding.

NEXT

3 CRANK ENGINE FOR MORE THAN 10 SECONDS

NEXT

4 CHECK FOR DTC*

(a) Check for DTCs and make a note of any codes that are output (see page EI-18).
(b) Clear the DTC.
(c) Recheck for DTCs. Based on the DTC output above, try to cause the output of the same SFI system DTC or engine immobiliser system DTC by simulating the original activity indicated by the DTC.
Result:

Result	Proceed to
DTC output does not reoccur	A
SFI system DTC output reoccurs	B
Engine immobiliser system DTC output reoccurs	C

B → **Go to SFI SYSTEM**

D → **Go to step 7**

A

EI

5 **PROBLEM SYMPTOMS TABLE**

Result:

Result	Proceed to
Fault is not listed in problem symptoms table	A
Fault is listed in problem symptoms table	B

B → **Go to step 7**

A

6 **OVERALL ANALYSIS AND TROUBLESHOOTING***

(a) DATA LIST / ACTIVE TEST (see page EI-19)
(b) Terminals of ECU (see page EI-13)
(c) Inspection (see page EI-43)

NEXT

7 **ADJUST, REPAIR OR REPLACE**

NEXT

8 **CONFIRMATION TEST**

NEXT

END