DTC P0513, P0633, P1629, P1632, P1648, P1677, P1678, or P1679

Circuit Description

The engine control module (ECM), the powertrain interface module (PIM), and the body control module (BCM) are integral part of the vehicle theft deterrent system. The theft deterrent system authenticates the security code programmed into each of these modules to prevent unauthorized vehicle operation. This authentication process includes the following steps:

1. When the ignition is turned ON or the door is unlocked by remote key the BCM and the key exchange security data to verify the correct key is used.
2. Once the correct key has been confirmed and the ignition is turned ON, the PIM and BCM exchange data to confirm the correct BCM and PIM is being used.
3. Once the correct key, BCM, and PIM is confirmed, the PIM and ECM exchange data to allow the vehicle to start.
4. The data exchange processes conducted use various encrypted data exchanges between each of the devices.

Important: If any of these authentication processes fail, the vehicle will not start and DTCs will set. For further information on the theft deterrent system, refer to Theft Systems Description and Operation .

An immobilizer signal DTC sets if the theft deterrent system authentication process fails.

DTC Descriptor

This diagnostic procedure covers the following DTCs:

- DTC P0513 Incorrect Immobilizer Key
- DTC P0633 Immobilizer Key Not Programmed
- DTC P1629 Theft Deterrent Start Enable Signal Not Received
- DTC P1632 Theft Deterrent Start Disable Signal Received
- DTC P1648 Anti-Theft Device Wrong Security Code
- DTC P1677 Immobilizer Function Deactivated
- DTC P1678 Immobilizer Powertrain Identification Failed
- DTC P1679 Immobilizer Environment Identification Failed

Conditions for Running the DTC

The ignition is ON. The DTC runs in conjunction with the authentication process.

Conditions for Setting the DTC

- If the key is not programmed to the BCM, then the key authentication will fail and the vehicle will be immobilized.

- If the BCM is not linked to the PIM, then PIM to BCM Authentication will fail and the vehicle will be immobilized.
- If the PIM is not linked to the ECM then the ECM to PIM authentication will fail and the vehicle will be immobilized.
- If the PIM, BCM, Key or ECM have corrupt memory, then the authentication will fail and the vehicle will be immobilized.
- If there is a fault with the GMLAN or UART bus, no authentication will occur and the vehicle will be immobilized.

Diagnostic Aids

Since a fault condition in a wiring connector may trigger DTCs, always test the connectors related to this diagnostic procedure for shorted terminals or poor wiring connection before replacing any component. Refer to Testing for Intermittent Conditions and Poor Connections for an intermittent fault condition.

The vehicle will allow engine cranking for up to 5 seconds. If the ignition key, BCM, and PIM do not authenticate the ECM will cease engine cranking, or if the engine has started it will stall. Subsequent engine cranking will not initiate unless the ignition is switched OFF for more than 5 seconds.

Test Description

The numbers below refer to the step numbers on the diagnostic table.

2. This step tests the integrity of the GM LAN serial data communication circuit.

3. This step tests for fault conditions on the vehicle theft deterrent system stored in the PIM.

4. This step tests for fault conditions on the vehicle theft deterrent system stored in the BCM.

Step	Action	Yes	No
Schematic Reference: _Theft Deterrent System Schematics_			
1	Did you perform the Diagnostic System - Vehicle?	Go to Step 2	Go to Diagnostic System Check - Vehicle
2	Using the scan tool, attempt to communicate with the PIM, the ECM, and the BCM. Did the powertrain interface module (PIM), the engine control module (ECM), or the body control module (BCM) fail to communicate?	Go to Symptoms - Computer/Integrating Systems	Go to Step 3
3	Does DTC U1304, U2100, U2105, U2106, U2108, B1000, B1009, B1013, B1014, B3057, B3924, P0633, P1611 or P1678 also set in the PIM?	Go to Diagnostic Trouble Code (DTC) List - Vehicle and diagnose the DTC code set by the PIM	Go to Step 4

4	Does DTC B0002, B0017, B0019, B0020, B0024, or B0025 also set in the BCM?	Go to Diagnostic Trouble Code (DTC) List - Vehicle and diagnose the DTC code set by the BCM	Go to Step 5
5	Does the scan tool display any serial data communication circuit DTCs?	Go to Diagnostic Trouble Code (DTC) List - Vehicle and diagnose the DTC code	Go to Step 6
6	1. Switch OFF the ignition for 30 seconds. 2. Operate the vehicle within the conditions for running the DTC. 3. Using the scan tool, select the DTC display function. Does DTC P0423, U0121, U0155, or U0423 fail this ignition cycle?	Go to Step 7	Refer to Diagnostic Aids
7	Attempt to program the ECM. Was the programming successful?	Go to Step 9	Go to Step 8
8	Replace the ECM. Was the repair completed?	Go to Step 9	--
9	1. Using the scan tool, clear the DTCs. 2. Switch OFF the ignition for 30 seconds. 3. Start the engine. 4. Operate the vehicle within the conditions for running the DTC. Did any of the immobilizer signal DTCs fail this ignition cycle?	Go to Step 2	Go to Step 10
10	Using the scan tool, select the DTC display function. Are there any DTCs displayed?	Go to Diagnostic Trouble Code (DTC) List - Vehicle	System OK