

Immobilizer - Coupe And Wagon

FASTENER TIGHTENING SPECIFICATIONS

Application	Specification	
	Metric	English
Theft Deterrent Module Bolt/Screw	2 N.m	18 lb in

IMMOBILIZER WIRING SCHEMATICS

[illegible]

Fig. 1: Passkey 3
Courtesy of GENERAL MOTORS COMPANY

DIAGNOSTIC INFORMATION AND PROCEDURES

DIAGNOSTIC CODE INDEX

DIAGNOSTIC CODE INDEX

DTC	Description
<u>DTC B0996 (with ATH)</u>	DTC B0996 00 Vehicle Electronic Control Unit (ECU) VIN Check Error
<u>DTC B0996 (without ATH)</u>	DTC B0996 00 Vehicle Electronic Control Unit (ECU) VIN Check Error
<u>DTC B1015 (with ATH)</u>	DTC B1015 00 Vehicle Identification Number (VIN) Information Error
<u>DTC B1015 (without ATH)</u>	DTC B1015 00 Vehicle Identification Number (VIN) Information Error
<u>DTC B1016 (with ATH)</u>	DTC B1016 00 Vehicle Identification Number (VIN) Information Not Programmed
<u>DTC B1016 (without ATH)</u>	DTC B1016 00 Vehicle Identification Number (VIN) Information Not Programmed
<u>DTC B302A (with ATH)</u>	DTC B302A 00 Telematic Requested Immobilization
<u>DTC B302A (without ATH)</u>	DTC B302A 00 Telematic Requested Immobilization
<u>DTC B3031</u>	DTC B3031 00 Security System Controller In Learn Mode
<u>DTC B3055</u>	DTC B3055 00 No Transponder Modulation or No Transponder
<u>DTC B3060</u>	DTC B3060 00 Unprogrammed Transponder Identification Code Received
<u>DTC B3935</u>	DTC B3935 57 Transponder Authentication Error
<u>DTC B3976</u>	DTC B3976 46 Unconfigured Transponder/Vehicle Configuration Not Programmed
<u>DTC P0513 (with ATH)</u>	DTC P0513 Theft Deterrent Key Incorrect
<u>DTC P0513 (without ATH)</u>	DTC P0513 Theft Deterrent Key Incorrect
<u>DTC P0633 (with ATH)</u>	DTC P0633 Theft Deterrent Key Not Programmed
<u>DTC P0633 (without ATH)</u>	DTC P0633 Theft Deterrent Key Not Programmed
<u>DTC P162B</u>	DTC P162B Remote Vehicle Speed Limiting Signal Message Counter Incorrect
<u>DTC P1630</u>	DTC P1630 Theft Deterrent Learn Mode Active
<u>DTC P1631 (with ATH)</u>	DTC P1631 Theft Deterrent Fuel Enable Signal Not Correct
<u>DTC P1631 (without ATH)</u>	DTC P1631 Theft Deterrent Fuel Enable Signal Not Correct
<u>DTC P1632 (with ATH)</u>	DTC P1632 Theft Deterrent Fuel Disable Signal Received
<u>DTC P1632 (without ATH)</u>	DTC P1632 Theft Deterrent Fuel Disable Signal Received

DTC B0996 (WITH ATH): VEHICLE ELECTRONIC CONTROL UNIT (ECU) VIN CHECK ERROR

Diagnostic Instructions

- Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.

- Review **Strategy Based Diagnosis** for an overview of the diagnostic approach.
- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

DTC Descriptor

DTC B0996 00

Vehicle Electronic Control Unit (ECU) VIN Check Error

Circuit/System Description

After a loss of battery power has been restored, the remote control door lock receiver (RCDLR) will perform a check on the stored vehicle identification number (VIN). If the VIN is CORRECT, the RCDLR will run the VIN Timer for a programmable length of time, typically 10 minutes. The RCDLR will send a message via the serial data circuit to the instrument panel cluster (IPC) to illuminate the SECURITY indicator. After the VIN Timer has timed out, the security indicator will turn OFF. If the VIN is INCORRECT, the RCDLR will send the fuel disable password to the engine control module (ECM), via the serial data circuit. The immobilizer system considers this to be a tamper and will not allow the vehicle to start. The RCDLR will send a message via the serial data circuit to the IPC to flash the SECURITY indicator.

Substitution detection is based on correct response from the following modules: instrument panel cluster (IPC), export body control module (XBCM), driver door module (DDM), passenger door module (PDM). The modules compare their VIN to that stored in the VIN master on every ignition ON cycle and report their status to the theft deterrent module.

Conditions for Running the DTC

Ignition ON

Conditions for Setting the DTC

- The VIN check flag of the RCDLR is true.
- The RCDLR has determined that the battery has been reconnected after a battery disconnect.

Action Taken When the DTC Sets

- The vehicle will not start.
- The RCDLR sends the fuel disable message via the serial data circuit to the ECM.
- The RCDLR will run the VIN Timer for a programmable length of time, typically 10 minutes.
- The RCDLR sends a message to the IPC to illuminate the SECURITY indicator.

Conditions for Clearing the DTC

The RCDLR clears the current DTC when the correct VIN information is present.

Reference Information

Schematic Reference

Immobilizer Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX - COUPE AND WAGON

Description and Operation

Immobilizer Description and Operation (with ATH)

Electrical Information Reference

- **Circuit Testing**
- **Connector Repairs**
- **Testing for Intermittent Conditions and Poor Connections**
- **Wiring Repairs**

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

1. With a scan tool, verify the stored VIN in the following modules matches the actual vehicle VIN:
 - IPC
 - XBCM
 - DDM
 - PDM
 - If any modules stored VIN does not match the actual VIN, perform the setup procedure for that module. If the stored VIN does not match after setup, replace the module.
2. If all modules VIN match, replace the RCDLR.

Repair Instructions

Perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

Control Module References for XBCM, RCDLR, IPC, DDM, PDM replacement, setup, and programming

DTC B0996 (WITHOUT ATH): VEHICLE ELECTRONIC CONTROL UNIT (ECU) VIN CHECK ERROR

Diagnostic Instructions

- Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.
- Review **Strategy Based Diagnosis** for an overview of the diagnostic approach.
- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

DTC Descriptor

DTC B0996 00

Vehicle Electronic Control Unit (ECU) VIN Check Error

Circuit/System Description

After a loss of battery power has been restored, the theft deterrent module (TDM) will perform a check on the stored vehicle identification number (VIN). If the VIN is CORRECT, the TDM will run the VIN Timer for a programmable length of time, typically 10 minutes. The TDM will send a message via the serial data circuit to the instrument panel cluster (IPC) to illuminate the SECURITY indicator. After the VIN Timer has timed out, the security indicator will turn OFF. If the VIN is INCORRECT, the TDM will send the fuel disable password to the engine control module (ECM), via the serial data circuit. The immobilizer system considers this to be a tamper and will not allow the vehicle to start. The TDM will send a message via the serial data circuit to the IPC to flash the SECURITY indicator.

Substitution detection is based on correct response from the following modules: instrument panel cluster (IPC), export body control module (XBCM), driver door module (DDM), passenger door module (PDM). The modules compare their VIN to that stored in the VIN master on every ignition ON cycle and report their status to the theft deterrent module.

Conditions for Running the DTC

Ignition ON

Conditions for Setting the DTC

- The VIN check flag of the TDM is true.
- The TDM has determined that the battery has been reconnected after a battery disconnect.

Action Taken When the DTC Sets

- The vehicle will not start.
- The TDM sends the fuel disable message via the serial data circuit to the ECM.
- The TDM will run the VIN Timer for a programmable length of time, typically 10 minutes.
- The TDM sends a message to the IPC to illuminate the SECURITY indicator.

Conditions for Clearing the DTC

The TDM clears the current DTC when the correct VIN information is present.

Reference Information

Schematic Reference

Immobilizer Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX - COUPE AND WAGON

Description and Operation

Immobilizer Description and Operation (without ATH)

Electrical Information Reference

- Circuit Testing
- Connector Repairs
- Testing for Intermittent Conditions and Poor Connections
- Wiring Repairs

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

1. With a scan tool, verify the stored VIN in the following modules matches the actual vehicle VIN:
 - IPC
 - XBCM
 - DDM
 - PDM
 - If any modules stored VIN does not match the actual VIN, perform the setup procedure for that module. If the stored VIN does not match after setup, replace the module.
2. If all modules VIN match, replace the TDM.

Repair Instructions

Perform the Diagnostic Repair Verification after completing the diagnostic procedure.

Control Module References for XBCM, TDM, IPC, DDM, PDM replacement, setup, and programming

DTC B1015 (WITH ATH): VEHICLE IDENTIFICATION NUMBER (VIN) INFORMATION ERROR

Diagnostic Instructions

- Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.
- Review **Strategy Based Diagnosis** for an overview of the diagnostic approach.
- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

DTC Descriptor

DTC B1015 00

Vehicle Identification Number (VIN) Information Error

Circuit/System Description

After a loss of battery power has been restored, the remote control door lock receiver (RCDLR) will perform a check on the stored vehicle identification number (VIN). If the VIN is CORRECT, the RCDLR will run the VIN Timer for a programmable length of time, typically 10 minutes. The RCDLR will send a message via the serial data circuit to the instrument panel cluster (IPC) to illuminate the SECURITY indicator. After the VIN Timer has timed out, the security indicator will turn OFF. If the VIN is INCORRECT, the RCDLR will send the fuel disable password to the engine control module (ECM), via the serial data circuit. The immobilizer system considers this to be a tamper and will not allow the vehicle to start. The RCDLR will send a message via the serial data circuit to the IPC to flash the SECURITY indicator.

Substitution detection is based on correct response from the following modules: instrument panel cluster (IPC), export body control module (XBCM), driver door module (DDM), passenger door module (PDM). The modules compare their VIN to that stored in the VIN master on every ignition ON cycle and report their status to the theft deterrent module.

Conditions for Running the DTC

Ignition ON

Conditions for Setting the DTC

- The VIN check flag of the RCDLR is true.
- The RCDLR has determined that the battery has been reconnected after a battery disconnect.

Action Taken When the DTC Sets

- The vehicle will not start.
- The RCDLR sends the fuel disable message via the serial data circuit to the ECM.
- The RCDLR will run the VIN Timer for a programmable length of time, typically 10 minutes.
- The RCDLR sends a message to the IPC to illuminate the SECURITY indicator.

Conditions for Clearing the DTC

The RCDLR clears the current DTC when the correct VIN information is present.

Reference Information

Schematic Reference

Immobilizer Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX - COUPE AND WAGON

Description and Operation

Immobilizer Description and Operation (with ATH)

Electrical Information Reference

- Circuit Testing
- Connector Repairs
- Testing for Intermittent Conditions and Poor Connections
- Wiring Repairs

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

1. With a scan tool, verify the stored VIN in the BCM matches the actual vehicle VIN.
 - If VIN does not match, perform the BCM Programming/RPO Configuration procedure. If the BCM VIN does not match the actual VIN after programming, replace the BCM.
2. With a scan tool, verify the stored VIN in the following modules match the actual vehicle VIN:
 - IPC
 - XBCM
 - DDM
 - PDM
 - If any modules stored VIN does not match the actual VIN perform the setup procedure for that module. If the stored VIN does not match after setup, replace the module.
3. If all modules stored VIN match the actual VIN, replace the RCDLR.

Repair Instructions

Perform the Diagnostic Repair Verification after completing the diagnostic procedure.

Control Module References for BCM, XBCM, RCDLR, IPC, DDM, PDM replacement, setup, and programming

DTC B1015 (WITHOUT ATH): VEHICLE IDENTIFICATION NUMBER (VIN) INFORMATION ERROR

Diagnostic Instructions

- Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.
- Review **Strategy Based Diagnosis** for an overview of the diagnostic approach.
- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

DTC Descriptor

DTC B1015 00

Vehicle Identification Number (VIN) Information Error

Circuit/System Description

After a loss of battery power has been restored, the theft deterrent module (TDM) will perform a check on the stored vehicle identification number (VIN). If the VIN is CORRECT, the TDM will run the VIN Timer for a programmable length of time, typically 10 minutes. The TDM will send a message via the serial data circuit to the instrument panel cluster (IPC) to illuminate the SECURITY indicator. After the VIN Timer has timed out, the security indicator will turn OFF. If the VIN is INCORRECT, the TDM will send the fuel disable password to the engine control module (ECM), via the serial data circuit. The immobilizer system considers this to be a tamper and will not allow the vehicle to start. The TDM will send a message via the serial data circuit to the IPC to flash the SECURITY indicator.

Substitution detection is based on correct response from the following modules: instrument panel cluster (IPC), export body control module (XBCM), driver door module (DDM), passenger door module (PDM). The modules compare their VIN to that stored in the VIN master on every ignition ON cycle and report their status to the theft deterrent module.

Conditions for Running the DTC

Ignition ON

Conditions for Setting the DTC

- The VIN check flag of the TDM is true.
- The TDM has determined that the battery has been reconnected after a battery disconnect.

Action Taken When the DTC Sets

- The vehicle will not start.
- The TDM sends the fuel disable message via the serial data circuit to the ECM.
- The TDM will run the VIN Timer for a programmable length of time, typically 10 minutes.
- The TDM sends a message to the IPC to illuminate the SECURITY indicator.

Conditions for Clearing the DTC

The TDM clears the current DTC when the correct VIN information is present.

Reference Information

Schematic Reference

Immobilizer Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX - COUPE AND WAGON

Description and Operation

Immobilizer Description and Operation (without ATH)

Electrical Information Reference

- Circuit Testing
- Connector Repairs
- Testing for Intermittent Conditions and Poor Connections
- Wiring Repairs

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

1. With a scan tool, verify the stored VIN in the BCM matches the actual vehicle VIN.
 - If VIN does not match, perform the BCM Programming/RPO Configuration procedure. If the BCM VIN does not match the actual VIN after programming, replace the BCM.
2. With a scan tool, verify the stored VIN in the following modules match the actual vehicle VIN:
 - IPC
 - XBCM
 - DDM
 - PDM
 - If any modules stored VIN does not match the actual VIN perform the setup procedure for that module. If the stored VIN does not match after setup, replace the module.
3. If all modules stored VIN match the actual VIN, replace the TDM.

Repair Instructions

Perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

Control Module References for BCM, XBCM, TDM, IPC, DDM, PDM replacement, setup, and programming

DTC B1016 (WITH ATH): VEHICLE IDENTIFICATION NUMBER (VIN) INFORMATION NOT PROGRAMMED

Diagnostic Instructions

- Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.
- Review **Strategy Based Diagnosis** for an overview of the diagnostic approach.
- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

DTC Descriptor

DTC B1016 00

Vehicle Identification Number (VIN) Information Not Programmed

Circuit/System Description

After a loss of battery power has been restored, the remote control door lock receiver (RCDLR) will perform a check on the stored vehicle identification number (VIN). If the VIN is CORRECT, the RCDLR will run the VIN Timer for a programmable length of time, typically 10 minutes. The RCDLR will send a message via the serial data circuit to the instrument panel cluster (IPC) to illuminate the SECURITY indicator. After the VIN Timer has timed out, the security indicator will turn OFF. If the VIN is INCORRECT, the RCDLR will send the fuel disable password to the engine control module (ECM), via the serial data circuit. The immobilizer system considers this to be a tamper and will not allow the vehicle to start. The RCDLR will send a message via the serial data circuit to the IPC to flash the SECURITY indicator.

Conditions for Running the DTC

Ignition ON

Conditions for Setting the DTC

- The VIN check flag of the RCDLR is true.
- The RCDLR has determined that the battery has been reconnected after a battery disconnect.

Action Taken When the DTC Sets

- The vehicle will not start.
- The RCDLR sends the fuel disable message via the serial data circuit to the ECM.
- The RCDLR sends a message to the IPC to illuminate the SECURITY indicator.

Conditions for Clearing the DTC

The RCDLR clears the current DTC when the correct VIN information is present.

Reference Information

Schematic Reference

Immobilizer Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX - COUPE AND WAGON

Description and Operation

Immobilizer Description and Operation (with ATH)

Electrical Information Reference

- **Circuit Testing**
- **Connector Repairs**
- **Testing for Intermittent Conditions and Poor Connections**
- **Wiring Repairs**

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

With a scan tool, verify DTC B1016 is not set.

- If DTC is set, program the RCDLR. If DTC resets, replace the RCDLR.

Repair Instructions

Perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

Control Module References for RCDLR replacement, setup, and programming

DTC B1016 (WITHOUT ATH): VEHICLE IDENTIFICATION NUMBER (VIN) INFORMATION NOT PROGRAMMED

Diagnostic Instructions

- Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.
- Review **Strategy Based Diagnosis** for an overview of the diagnostic approach.

- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

DTC Descriptor

DTC B1016 00

Vehicle Identification Number (VIN) Information Not Programmed

Circuit/System Description

After a loss of battery power has been restored, the theft deterrent module (TDM) will perform a check on the stored vehicle identification number (VIN). If the VIN is CORRECT, the TDM will run the VIN Timer for a programmable length of time, typically 10 minutes. The TDM will send a message via the serial data circuit to the instrument panel cluster (IPC) to illuminate the SECURITY indicator. After the VIN Timer has timed out, the security indicator will turn OFF. If the VIN is INCORRECT, the TDM will send the fuel disable password to the engine control module (ECM), via the serial data circuit. The immobilizer system considers this to be a tamper and will not allow the vehicle to start. The TDM will send a message via the serial data circuit to the IPC to flash the SECURITY indicator.

Conditions for Running the DTC

Ignition ON

Conditions for Setting the DTC

- The VIN check flag of the TDM is true.
- The TDM has determined that the battery has been reconnected after a battery disconnect.

Action Taken When the DTC Sets

- The vehicle will not start.
- The TDM sends the fuel disable message via the serial data circuit to the ECM.
- The TDM sends a message to the IPC to illuminate the SECURITY indicator.

Conditions for Clearing the DTC

The TDM clears the current DTC when the correct VIN information is present.

Reference Information

Schematic Reference

Immobilizer Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX - COUPE AND WAGON

Description and Operation

Immobilizer Description and Operation (without ATH)

Electrical Information Reference

- **Circuit Testing**
- **Connector Repairs**
- **Testing for Intermittent Conditions and Poor Connections**
- **Wiring Repairs**

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

With a scan tool, verify DTC B1016 is not set.

- If DTC is set, program the TDM. If DTC resets, replace the TDM.

Repair Instructions

Perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

Control Module References for TDM replacement, setup, and programming

DTC B302A (WITH ATH): TELEMATIC REQUESTED IMMOBILIZATION

Diagnostic Instructions

- Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.
- Review **Strategy Based Diagnosis** for an overview of the diagnostic approach.
- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

DTC Descriptor

DTC B302A 00

Telematic Requested Immobilization

Circuit/System Description

As part of the vehicle telematics enhanced services, a request may be sent to the remote control door lock receiver (RCDLR) to disable vehicle starting. If a valid message is received by the RCDLR requesting that starting be disabled, the start enable message will not be sent to the engine control module (ECM).

Conditions for Setting the DTC

A valid start disable from telematics will set DTC B302A only as a history DTC.

Action Taken When the DTC Sets

Vehicle starting will be suspended and the security indicator will be illuminated.

Conditions for Clearing the DTC

- A current DTC will clear when the telematic start disable request is no longer seen.
- A history DTC will clear after 100 ignition cycles in which the telematic start disable request is not seen.

Diagnostic Aids

DTC B302A is only an indicator that a start disable request has been received from the vehicle telematics system and does not indicate a fault in the immobilizer system. B302A will only set as a history DTC.

Reference Information

Schematic Reference

Immobilizer Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX - COUPE AND WAGON

Description and Operation

Immobilizer Description and Operation (with ATH)

Electrical Information Reference

- **Circuit Testing**
- **Connector Repairs**
- **Testing for Intermittent Conditions and Poor Connections**
- **Wiring Repairs**

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

1. Turn the ignition ON.
2. Observe the security indicator. After approximately 10 minutes, the indicator will turn off.

3. Turn the ignition OFF and wait 5 seconds.
4. Repeat steps 2-4 two more times for a total of 3 cycles or 30 minutes.
5. Turn the ignition ON. The start disable will now be cleared.
6. Using the Red Emergency Button, notify the OnStar advisor that the Ignition Block on the vehicle has been cleared and to update the account status.

DTC B302A (WITHOUT ATH): TELEMATIC REQUESTED IMMOBILIZATION

Diagnostic Instructions

- Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.
- Review **Strategy Based Diagnosis** for an overview of the diagnostic approach.
- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

DTC Descriptor

DTC B302A 00

Telematic Requested Immobilization

Circuit/System Description

As part of the vehicle telematics enhanced services, a request may be sent to the theft deterrent module (TDM) to disable vehicle starting. If a valid message is received by the TDM requesting that starting be disabled, the start enable message will not be sent to the engine control module (ECM).

Conditions for Setting the DTC

A valid start disable from telematics will set DTC B302A only as a history DTC.

Action Taken When the DTC Sets

Vehicle starting will be suspended and the security indicator will be illuminated.

Conditions for Clearing the DTC

- A current DTC will clear when the telematic start disable request is no longer seen.
- A history DTC will clear after 100 ignition cycles in which the telematic start disable request is not seen.

Diagnostic Aids

DTC B302A is only an indicator that a start disable request has been received from the vehicle telematics system and does not indicate a fault in the immobilizer system. B302A will only set as a history DTC.

Reference Information

Schematic Reference

Immobilizer Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX - COUPE AND WAGON

Description and Operation

Immobilizer Description and Operation (without ATH)

Electrical Information Reference

- **Circuit Testing**
- **Connector Repairs**
- **Testing for Intermittent Conditions and Poor Connections**
- **Wiring Repairs**

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

1. With a master vehicle key, turn the ignition ON.
2. Observe the security indicator. After approximately 10 minutes, the indicator will turn off.
3. Turn the ignition OFF and wait 5 seconds.
4. Repeat steps 2-4 two more times for a total of 3 cycles or 30 minutes.
5. With a master vehicle key, turn the ignition ON. The start disable will now be cleared.
6. Using the Red Emergency Button, notify the OnStar advisor that the Ignition Block on the vehicle has been cleared and to update the account status.

DTC B3031: SECURITY SYSTEM CONTROLLER IN LEARN MODE

Diagnostic Instructions

- Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.
- Review **Strategy Based Diagnosis** for an overview of the diagnostic approach.
- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

DTC Descriptor

DTC B3031 00

Security System Controller In Learn Mode

Circuit/System Description

When learning a coded key, the theft deterrent module (TDM) is placed in learn mode. DTC B3031 will set automatically as an indicator that the system is in learn mode and not as a fault indicator. Once the coded key is learned, learn mode will be exited and the DTC cleared. If the TDM does not exit learn mode, B3031 will remain current and indicate a fault.

Conditions for Running the DTC

The immobilizer system is the learn coded keys state.

Conditions for Setting the DTC

DTC B3031 will set any time the TDM enters the learn coded keys state.

Action Taken When the DTC Sets

The security indicator will illuminate.

Conditions for Clearing the DTC

- A current DTC B3031 will be cleared upon the successful exit of learn mode.
- A history DTC will be cleared after 100 malfunction-free ignition cycles or when a scan tool is used to clear DTCs.

Reference Information

Schematic Reference

Immobilizer Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX - COUPE AND WAGON

Description and Operation

Immobilizer Description and Operation (with ATH), Immobilizer Description and Operation (without ATH)

Electrical Information Reference

- Circuit Testing
- Connector Repairs
- Testing for Intermittent Conditions and Poor Connections

- **Wiring Repairs**

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

IMPORTANT: When performing the 10-Minute Vehicle Key Relearn Procedure, all keys not learned at that time will be erased and not be recognized. Perform the Adding Keys procedure on all keys or instruct the customer how to perform the Adding Keys procedure should all keys not be present at the time of repair.

1. Verify DTC B3055 is not set.
 - If the DTC is set, refer to **DTC B3055**.
2. Verify the scan tool TDM Learn Coded Key parameter displays Yes.
 - If not the specified value, perform the 10 Minute Vehicle Key Relearn procedure. Refer to **Replacing Keys (Canada, Europe, and Asia)**, **Replacing Keys (North America except Canada)**.
3. Perform the 10 Minute Vehicle Key Relearn procedure. Refer to **Replacing Keys (Canada, Europe, and Asia)**, **Replacing Keys (North America except Canada)**. The TDM should exit the learn coded key state and DTC B3031 should clear.
 - If the TDM does not exit the learn coded key state after the programming attempt, replace the TDM.

Repair Instructions

Perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

Control Module References for TDM replacement, setup and programming

DTC B3055: NO TRANSPONDER MODULATION OR NO TRANSPONDER

Diagnostic Instructions

- Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.
- Review **Strategy Based Diagnosis** for an overview of the diagnostic approach.
- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

DTC Descriptor

DTC B3055 00

No Transponder Modulation or No Transponder

Circuit/System Description

When an ignition key is inserted into the ignition lock cylinder and the ignition is switched ON, the transponder embedded in the head of the key is energized by the exciter coils surrounding the ignition lock cylinder. The energized transponder transmits a signal that contains its unique value, which is received by the theft deterrent module (TDM). The TDM then compares this value to a value stored in memory. This stored value is the learned key code. If the value is correct, the TDM will send the prerelease password via the serial data circuit to the engine control module (ECM). If the learned key code does not match or a transponder value is not received, the TDM will send the start disable password to the ECM.

Conditions for Running the DTC

Ignition is in the Accessory or Run position.

Conditions for Setting the DTC

The TDM is unable to measure the ignition key transponder value.

Action Taken When the DTC Sets

- Vehicle starting will be disabled.
- The security indicator will be illuminated.

Conditions for Clearing the DTC

- A current DTC will be cleared when the TDM detects a valid transponder value from the ignition key.
- A history DTC will be cleared after 100 malfunction-free ignition cycles or when a scan tool is used to clear DTCs.

Diagnostic Aids

In some instances, RF devices attached to a keychain or otherwise in close proximity of the ignition cylinder may cause interference in the immobilizer system and lead to a no-start condition. Some common RF devices that may be attached to a keychain are Speedpass gas station payment device, swipe devices used to gain access locked gates or 24-hour gyms, or other "smart" keys.

These RF devices interfere with the communication between the transponder located in the key and the TDM. The immobilizer system operates at a frequency of 125 kHz. RF devices that operate in the 120 to 135 kHz range, or a multiplier of these frequencies, are most likely to cause interference. If interference occurs, DTC B3055, B3060, or B3935 may be set.

If interference is suspected, remove the suspect device from the keychain and attempt to start the vehicle. If vehicle starting occurs with the device removed, instruct the customer to remove the device from the keychain to prevent further occurrences. It may also be necessary to inspect all of the customer's keychains if the concern is intermittent and doesn't occur with every key.

Reference Information

Schematic Reference

Immobilizer Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX - COUPE AND WAGON

Description and Operation

Immobilizer Description and Operation (with ATH), Immobilizer Description and Operation (without ATH)

Electrical Information Reference

- **Circuit Testing**
- **Connector Repairs**
- **Testing for Intermittent Conditions and Poor Connections**
- **Wiring Repairs**

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

IMPORTANT:

- **When using this diagnostic, more than one vehicle key is required to ensure proper diagnosis. If more than one key is not available at the time of service, contact the customer and ask if any other keys can be provided for service. If unavailable, a new second key can be created.**
- **Interference from an RF device located on the keychain may cause this DTC to set. Remove any RF devices from the keychain before proceeding with the diagnostic.**

1. Inspect all available vehicle keys that they are correct vehicle keys .
 - If not a correct vehicle key, replace the key.
2. While viewing the scan tool TDM Transponder Key parameter, turn ON the ignition with each of the available vehicle keys. The parameter should read Present with all available keys.
 - If only one key results in the parameter reading Not Present, replace the appropriate key.
 - If all available keys result in the parameter reading Not Present, replace the TDM.

Repair Instructions

Perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

- **Replacing Keys (Canada, Europe, and Asia), Replacing Keys (North America except Canada)**
- **Control Module References** for TDM replacement, setup, and programming

DTC B3060: UNPROGRAMMED TRANSPONDER IDENTIFICATION CODE RECEIVED

Diagnostic Instructions

- Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.
- Review **Strategy Based Diagnosis** for an overview of the diagnostic approach.
- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

DTC Descriptor

DTC B3060 00

Unprogrammed Transponder Identification Code Received

Circuit/System Description

When an ignition key is inserted into the ignition lock cylinder and the ignition is switched ON, the transponder embedded in the head of the key is energized by the exciter coils surrounding the ignition lock cylinder. The energized transponder transmits a signal that contains its unique value, which is received by the theft deterrent module (TDM). The TDM then compares this value to a value stored in memory. This stored value is the learned key code. If the value is correct, the TDM will send the prerelease password via the serial data circuit to the engine control module (ECM). If the transponder value does not match the learned key code or a transponder value is not received, the TDM will send the start disable password to the ECM.

Conditions for Running the DTC

Ignition is in the Accessory or Run position.

Conditions for Setting the DTC

The transponder value measured by the TDM is incorrect or not learned to the vehicle.

Action Taken When the DTC Sets

- Vehicle starting will be disabled.
- The security indicator will be illuminated.
- The security indicator will flash (Canada only).

Conditions for Clearing the DTC

- A current DTC will be cleared when the TDM detects a valid transponder value from the ignition key.
- A history DTC will be cleared after 100 malfunction-free ignition cycles or when a scan tool is used to clear DTCs.

Diagnostic Aids

In some instances, RF devices attached to a keychain or otherwise in close proximity of the ignition cylinder may cause interference in the immobilizer system and lead to a no-start condition. Some common RF devices that may be attached to a keychain are Speedpass gas station payment device, swipe devices used to gain access locked gates or 24-hour gyms, or other "smart" keys.

These RF devices interfere with the communication between the transponder located in the key and the TDM. The immobilizer systems operates at a frequency of 125 kHz. RF devices that operate in the 120 to 135 kHz range, or a multiplier of these frequencies, are most likely to cause interference. If interference occurs, DTC B3055, B3060, or B3935 may be set.

If interference is suspected, removed the suspect device from the keychain and attempt to start the vehicle. If vehicle starting occurs with the device removed, instruct the customer to remove the device from the keychain to prevent further occurrences. It may also be necessary to inspect all of the customers keychains if the concern is intermittent and doesn't occur with every key.

Reference Information

Schematic Reference

Immobilizer Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX - COUPE AND WAGON

Description and Operation

Immobilizer Description and Operation (with ATH), Immobilizer Description and Operation (without ATH)

Electrical Information Reference

- **Circuit Testing**
- **Connector Repairs**
- **Testing for Intermittent Conditions and Poor Connections**
- **Wiring Repairs**

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

IMPORTANT: • When using this diagnostic, more than one vehicle key is required to

ensure proper diagnosis. If more than one key is not available at the time of service, contact the customer and ask if any other keys can be provided for service. If unavailable, a new second key can be created.

- Interference from an RF device located on the keychain may cause this DTC to set. Remove any RF devices from the keychain before proceeding with the diagnostic.

1. Perform the 10-Minute Vehicle Key Relearn procedure. Refer to **Replacing Keys (Canada, Europe, and Asia)**, **Replacing Keys (North America except Canada)**.
2. While viewing the scan tool TDM Valid Key parameter, turn ON the ignition with each of the available vehicle keys. The parameter should read Yes with all available keys.
 - If not the specified value, replace the appropriate key.

Repair Instructions

Perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

- **Replacing Keys (Canada, Europe, and Asia)**, **Replacing Keys (North America except Canada)**
- **Control Module References** for TDM replacement, setup, and programming

DTC B3935: TRANSPONDER AUTHENTICATION ERROR

Diagnostic Instructions

- Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.
- Review **Strategy Based Diagnosis** for an overview of the diagnostic approach.
- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

DTC Descriptor

DTC B3935 57

Transponder Authentication Error

Circuit/System Description

When an ignition key is inserted into the ignition lock cylinder and the ignition is switched ON, the transponder embedded in the head of the key is energized by the exciter coils surrounding the ignition lock cylinder. The energized transponder transmits a signal that contains its unique value, which is received by the theft deterrent module (TDM). The TDM then compares this value to a value stored in memory. This stored value is the learned key code. If the value is correct, the TDM will send the prerelease password via the serial data circuit to the engine control module (ECM). If the transponder value does not match the learned key code or a transponder value is not received, the TDM will send the start disable password to the ECM.

Conditions for Running the DTC

- Ignition is in the Accessory or Run position.
- A valid transponder value has been read.

Conditions for Setting the DTC

- The transponder value is valid and matches the value stored in the TDM memory.
- The transponder calculation to the challenge from the TDM does not match the TDM calculation.

Action Taken When the DTC Sets

- Vehicle starting will be disabled.
- The security indicator will be illuminated.

Conditions for Clearing the DTC

- A current DTC will be cleared when a valid transponder value has been read and authenticated.
- A history DTC will be cleared after 100 malfunction-free ignition cycles or when a scan tool is used to clear DTCs.

Diagnostic Aids

In some instances, RF devices attached to a keychain or otherwise in close proximity of the ignition cylinder may cause interference in the immobilizer system and lead to a no-start condition. Some common RF devices that may be attached to a keychain are Speedpass gas station payment device, swipe devices used to gain access locked gates or 24-hour gyms, or other "smart" keys.

These RF devices interfere with the communication between the transponder located in the key and the TDM. The immobilizer systems operates at a frequency of 125 kHz. RF devices that operate in the 120 to 135 kHz range, or a multiplier of these frequencies, are most likely to cause interference. If interference occurs, DTC B3055, B3060, or B3935 may be set.

If interference is suspected, removed the suspect device from the keychain and attempt to start the vehicle. If vehicle starting occurs with the device removed, instruct the customer to remove the device from the keychain to prevent further occurrences. It may also be necessary to inspect all of the customers keychains if the concern is intermittent and doesn't occur with every key.

Reference Information

Schematic Reference

Immobilizer Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX - COUPE AND WAGON

Description and Operation

Immobilizer Description and Operation (with ATH), Immobilizer Description and Operation (without ATH)

Electrical Information Reference

- **Circuit Testing**
- **Connector Repairs**
- **Testing for Intermittent Conditions and Poor Connections**
- **Wiring Repairs**

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

IMPORTANT: Interference from an RF device located on the keychain may cause this DTC to set. Remove any RF devices from the keychain before proceeding with the diagnostic.

Replace the suspected inoperative or malfunctioning key. DTC B3935 should not reset and the vehicle should start.

- If the replacement key results in the resetting of DTC B3935, replace the TDM.

Repair Instructions

Perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

- **Replacing Keys (Canada, Europe, and Asia), Replacing Keys (North America except Canada)**
- **Control Module References** for theft deterrent module replacement, setup, and programming

DTC B3976: UNCONFIGURED TRANSPONDER/VEHICLE CONFIGURATION NOT PROGRAMMED

Diagnostic Instructions

- Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.
- Review **Strategy Based Diagnosis** for an overview of the diagnostic approach.
- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

DTC Descriptor

DTC B3976 46

Unconfigured Transponder/Vehicle Configuration Not Programmed

Circuit/System Description

When the theft deterrent module (TDM) is in the learn coded key state, the TDM checks the current key to ensure it has been configured as a proper vehicle key.

Conditions for Running the DTC

- Ignition is in the Accessory or Run position.
- The TDM is in the learn coded key state.

Conditions for Setting the DTC

The TDM has determined the current key is not configured as a proper vehicle key.

Action Taken When the DTC Sets

- The security indicator will be illuminated.
- Vehicle starting will be disabled.

Conditions for Clearing the DTC

- A current DTC will be cleared when the TDM detects a properly configured vehicle key.
- A history DTC will be cleared after 100 malfunction-free ignition cycles or when a scan tool is used to clear DTCs.

Reference Information

Schematic Reference

Immobilizer Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX - COUPE AND WAGON

Description and Operation

Immobilizer Description and Operation (with ATH), Immobilizer Description and Operation (without ATH)

Electrical Information Reference

- **Circuit Testing**
- **Connector Repairs**
- **Testing for Intermittent Conditions and Poor Connections**
- **Wiring Repairs**

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

IMPORTANT: When using this diagnostic, more than one vehicle key is required to ensure proper diagnosis. If more than one key is not available at the time of service, contact the customer and ask if any other keys can be provided for service. If unavailable, a new second key can be created.

While viewing DTCs with a scan tool, attempt to start the vehicle using all of the available keys. The vehicle should start with all available keys.

- If any key results in inoperative starting and DTC B3976 is set, replace the appropriate key.

Repair Instructions

Perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

Replacing Keys (Canada, Europe, and Asia), Replacing Keys (North America except Canada)

DTC P0513 (WITH ATH): THEFT DETERRENT KEY INCORRECT

Diagnostic Instructions

- Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.
- Review **Strategy Based Diagnosis** for an overview of the diagnostic approach.
- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

DTC Descriptor

DTC P0513

Theft Deterrent Key Incorrect

Circuit/System Description

The remote control door lock receiver (RCDLR) sends the prerelease password to the engine control module (ECM) via the serial data circuit. The ECM then sends a challenge to the RCDLR. Both the ECM and RCDLR perform a calculation on this challenge. If the calculated response from the RCDLR equals the calculation performed by the ECM, the ECM will allow vehicle starting.

Conditions for Running the DTC

Ignition is in the ACCESSORY or RUN position.

Conditions for Setting the DTC

The calculated response from the RCDLR does not equal the calculation performed by the ECM.

Action Taken When the DTC Sets

- The security indicator will illuminate.
- Vehicle starting will be disabled.

Conditions for Clearing the DTC

- A current DTC P0513 will be when a valid calculation is received.
- A history DTC will be cleared after 40 malfunction-free ignition cycles or when a scan tool is used to clear DTCs.

Diagnostic Aids

The "key" referenced in the DTC descriptor does not refer to the vehicle key. In this case, "key" is referring to the challenge response.

Reference Information

Schematic Reference

Immobilizer Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX - COUPE AND WAGON

Description and Operation

Immobilizer Description and Operation (with ATH)

Electrical Information Reference

- **Circuit Testing**
- **Connector Repairs**
- **Testing for Intermittent Conditions and Poor Connections**
- **Wiring Repairs**

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

IMPORTANT: Because of normal system communications between the RCDLR and ECM, any theft deterrent B-codes must be diagnosed prior to the diagnosis of P-codes.

Perform the 10-Minute Immobilizer Relearn procedure. Refer to **Immobilizer System Component Programming (with ATH)**. The ECM should successfully complete the password learn and the vehicle should start.

- If the ECM does not complete the learn or vehicle starting remains disabled, replace the ECM.

Repair Instructions

Perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

Control Module References for ECM replacement, setup, and programming

DTC P0513 (WITHOUT ATH): THEFT DETERRENT KEY INCORRECT

Diagnostic Instructions

- Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.
- Review **Strategy Based Diagnosis** for an overview of the diagnostic approach.
- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

DTC Descriptor

DTC P0513

Theft Deterrent Key Incorrect

Circuit/System Description

The theft deterrent module (TDM) sends the prerelease password to the engine control module (ECM) via the serial data circuit. The ECM then sends a challenge to the TDM. Both the ECM and TDM perform a calculation on this challenge. If the calculated response from the TDM equals the calculation performed by the ECM, the ECM will allow vehicle starting.

Conditions for Running the DTC

Ignition is in the ACCESSORY or RUN position.

Conditions for Setting the DTC

The calculated response from the TDM does not equal the calculation performed by the ECM.

Action Taken When the DTC Sets

- The security indicator will illuminate.

- Vehicle starting will be disabled.

Conditions for Clearing the DTC

- A current DTC P0513 will be when a valid calculation is received.
- A history DTC will be cleared after 40 malfunction-free ignition cycles or when a scan tool is used to clear DTCs.

Diagnostic Aids

The "key" referenced in the DTC descriptor does not refer to the vehicle key. In this case, "key" is referring to the challenge response.

Reference Information

Schematic Reference

Immobilizer Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX - COUPE AND WAGON

Description and Operation

Immobilizer Description and Operation (without ATH)

Electrical Information Reference

- **Circuit Testing**
- **Connector Repairs**
- **Testing for Intermittent Conditions and Poor Connections**
- **Wiring Repairs**

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

IMPORTANT: Because of normal system communications between the TDM and ECM, any theft deterrent B-codes must be diagnosed prior to the diagnosis of P-codes.

Perform the 10-Minute Immobilizer Relearn procedure. Refer to **Immobilizer System Component Programming (without ATH)**. The ECM should successfully complete the password learn and the vehicle should start.

- If the ECM does not complete the learn or vehicle starting remains disabled, replace the ECM.

Repair Instructions

Perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

Control Module References for ECM replacement, setup, and programming

DTC P0633 (WITH ATH): THEFT DETERRENT KEY INCORRECT

Diagnostic Instructions

- Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.
- Review **Strategy Based Diagnosis** for an overview of the diagnostic approach.
- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

DTC Descriptor

DTC P0633

Theft Deterrent Key Not Programmed

Circuit/System Description

When learning the prerelease password, as well as the challenge and response sequence, the engine control module (ECM) is placed in learn mode. DTC P0633 will set automatically as an indicator that the system is in learn mode and not as a fault indicator. Once the password and challenge/response are learned, learn mode will be exited when the engine is successfully started. If the ECM does not exit learn mode, P0633 will remain current and indicate a fault.

Conditions for Running the DTC

The ECM is in learn mode.

Conditions for Setting the DTC

DTC P0633 will set any time the ECM enters learn mode.

Action Taken When the DTC Sets

The security indicator will illuminate.

Conditions for Clearing the DTC

- A current DTC P0633 will be cleared upon a successful engine start after exit of learn mode.
- A history DTC will be cleared after 100 malfunction-free ignition cycles or when a scan tool is used to clear DTCs.

Diagnostic Aids

The "key" referenced in the DTC descriptor does not refer to the vehicle key. In this case, "key" is referring to the challenge response.

Reference Information

Schematic Reference

Immobilizer Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX - COUPE AND WAGON

Description and Operation

Immobilizer Description and Operation (with ATH)

Electrical Information Reference

- **Circuit Testing**
- **Connector Repairs**
- **Testing for Intermittent Conditions and Poor Connections**
- **Wiring Repairs**

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

IMPORTANT: Because of normal system communications between the RCDLR and ECM, any theft deterrent B-codes must be diagnosed prior to the diagnosis of P-codes.

Perform the 10-Minute Immobilizer Relearn procedure. Refer to **Immobilizer System Component Programming (with ATH)**. The ECM should successfully complete the password learn and the vehicle should start.

- If the ECM does not complete the learn or vehicle starting remains disabled, replace the ECM.

Repair Instructions

Perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

Control Module References for ECM replacement, setup, and programming

DTC P0633 (WITHOUT ATH): THEFT DETERRENT KEY NOT PROGRAMMED

Diagnostic Instructions

- Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.
- Review **Strategy Based Diagnosis** for an overview of the diagnostic approach.
- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

DTC Descriptor

DTC P0633

Theft Deterrent Key Not Programmed

Circuit/System Description

When learning the prerelease password, as well as the challenge and response sequence, the engine control module (ECM) is placed in learn mode. DTC P0633 will set automatically as an indicator that the system is in learn mode and not as a fault indicator. Once the password and challenge/response are learned, learn mode will be exited when the engine is successfully started. If the ECM does not exit learn mode, P0633 will remain current and indicate a fault.

Conditions for Running the DTC

The ECM is in learn mode.

Conditions for Setting the DTC

DTC P0633 will set any time the ECM enters learn mode.

Action Taken When the DTC Sets

The security indicator will illuminate.

Conditions for Clearing the DTC

- A current DTC P0633 will be cleared upon a successful engine start after exit of learn mode.
- A history DTC will be cleared after 100 malfunction-free ignition cycles or when a scan tool is used to clear DTCs.

Diagnostic Aids

The "key" referenced in the DTC descriptor does not refer to the vehicle key. In this case, "key" is referring to the challenge response.

Reference Information

Schematic Reference

Immobilizer Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX - COUPE AND WAGON

Description and Operation

Immobilizer Description and Operation (without ATH)

Electrical Information Reference

- **Circuit Testing**
- **Connector Repairs**
- **Testing for Intermittent Conditions and Poor Connections**
- **Wiring Repairs**

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

IMPORTANT: Because of normal system communications between the TDM and ECM, any theft deterrent B-codes must be diagnosed prior to the diagnosis of P-codes.

Perform the 10-Minute Immobilizer Relearn procedure. Refer to **Immobilizer System Component Programming (without ATH)**. The ECM should successfully complete the password learn and the vehicle should start.

- If the ECM does not complete the learn or vehicle starting remains disabled, replace the ECM.

Repair Instructions

Perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

Control Module References for ECM replacement, setup, and programming

DTC P162B: REMOTE VEHICLE SPEED LIMITING SIGNAL MESSAGE COUNTER INCORRECT

Diagnostic Instructions

- Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.
- Review **Strategy Based Diagnosis** for an overview of the diagnostic approach.
- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

DTC Descriptor

DTC P162B

Remote Vehicle Speed Limiting Signal Message Counter Incorrect

Circuit/System Description

When a remote slow-down request is sent from OnStar, the vehicle communication interface module sends a serial data message to the engine control module (ECM) indicating that reduced vehicle speed has been requested. Once the request is active, the ECM begins reducing engine torque to match requested vehicle speed and the REDUCED ENGINE POWER message is displayed.

Conditions for Running the DTC

- The engine run time is greater than 5 seconds.
- A remote slow-down request is sent from OnStar

Conditions for Setting the DTC

- The VIN embedded in the slow-down request does not match the VIN stored in the ECM.
- The rolling code counter embedded in the slow-down request does not increment for ten consecutive messages.

Action Taken When the DTC Sets

- ECM ignores all reduced vehicle speed request messages from the vehicle communication interface module.
- The ECM stores DTC P162B in history.

Conditions for Clearing the DTC

- The condition responsible for setting the DTC no longer exists.
- A history DTC will clear after 40 malfunction-free ignition cycles have occurred.

Reference Information

Schematic Reference

OnStar/Telematics Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX - COUPE AND WAGON

Description and Operation

Remote Vehicle Speed Limiting Description and Operation

Electrical Information Reference

- **Circuit Testing**
- **Connector Repairs**
- **Testing for Intermittent Conditions and Poor Connections**
- **Wiring Repairs**

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

Perform the scan tool Stolen Vehicle Slow-Down Clear. Verify DTC P162B is not set.

- If the DTC is set, replace the vehicle communication interface module and retest. If the DTC sets again, replace the ECM.

Repair Instructions

Perform the **Diagnostic Repair Verification** after completing the repair.

Control Module References for vehicle communication interface module and ECM replacement, setup, and programming

DTC P1630: REMOTE VEHICLE SPEED LIMITING SIGNAL MESSAGE COUNTER INCORRECT

Diagnostic Instructions

- Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.
- Review **Strategy Based Diagnosis** for an overview of the diagnostic approach.
- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

DTC Descriptor

DTC P1630

Theft Deterrent Learn Mode Active

Circuit/System Description

When replacing a remote control door lock receiver (RCDLR), the engine control module (ECM) must learn the new fuel enable password from the replacement RCDLR. If the ECM is replaced with a service replacement part, it is in a functional state to automatically learn the fuel enable password. If the RCDLR is replaced, the ECM must be placed in learn mode so it can learn the new RCDLR password. This DTC indicates the ECM is

in a functional state to learn the RCDLR fuel enable password.

Conditions for Running the DTC

The ECM is in learn mode.

Conditions for Setting the DTC

DTC P1630 will set any time the ECM enters learn mode.

Action Taken When the DTC Sets

The security indicator will illuminate.

Conditions for Clearing the DTC

- A current DTC will be cleared upon a successful engine start after exit of learn mode.
- A history DTC will be cleared after 100 malfunction-free ignition cycles.

Reference Information

Schematic Reference

Immobilizer Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX - COUPE AND WAGON

Description and Operation

Immobilizer Description and Operation (with ATH), Immobilizer Description and Operation (without ATH)

Electrical Information Reference

- **Circuit Testing**
- **Connector Repairs**
- **Testing for Intermittent Conditions and Poor Connections**
- **Wiring Repairs**

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

Perform the 10-Minute Immobilizer Relearn procedure. Refer to **Immobilizer System Component Programming (without ATH)**, **Immobilizer System Component Programming (with ATH)**. The ECM should successfully complete the password learn and the vehicle should start.

- If the ECM does not complete the learn or vehicle starting remains disabled, replace the ECM.

Repair Instructions

Perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

Control Module References for ECM replacement, setup, and programming

DTC P1631 (WITH ATH): REMOTE VEHICLE SPEED LIMITING SIGNAL MESSAGE COUNTER INCORRECT

Diagnostic Instructions

- Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.
- Review **Strategy Based Diagnosis** for an overview of the diagnostic approach.
- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

DTC Descriptor

DTC P1631

Theft Deterrent Fuel Enable Signal Not Correct

Circuit/System Description

The remote control door lock receiver (RCDLR) sends the prerelease password to the engine control module (ECM) via the serial data circuit. The ECM then sends a challenge to the RCDLR. Both the ECM and RCDLR perform a calculation on this challenge. If the calculated response from the RCDLR equals the calculation performed by the ECM, the ECM will allow vehicle starting.

Conditions for Running the DTC

Ignition is in the ACCESSORY or RUN position.

Conditions for Setting the DTC

The ECM receives an incorrect prerelease password from the RCDLR.

Action Taken When the DTC Sets

- The security indicator will illuminate.
- Vehicle starting will be disabled.

Conditions for Clearing the DTC

- A current DTC P1631 will be when a correct fuel enable password is received.
- A history DTC will be cleared after 40 malfunction-free ignition cycles or when a scan tool is used to clear DTCs.

Reference Information

Schematic Reference

Immobilizer Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX - COUPE AND WAGON

Description and Operation

Immobilizer Description and Operation (with ATH)

Electrical Information Reference

- Circuit Testing
- Connector Repairs
- Testing for Intermittent Conditions and Poor Connections
- Wiring Repairs

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

IMPORTANT: Because of normal system communications between the RCDLR and ECM, any theft deterrent B-codes must be diagnosed prior to the diagnosis of P-codes.

Perform the 10-Minute Immobilizer Relearn procedure. Refer to Immobilizer System Component Programming (with ATH). The ECM should successfully complete the password learn and the vehicle should start.

- If the ECM does not complete the learn or vehicle starting remains disabled, replace the ECM.

Repair Instructions

Perform the Diagnostic Repair Verification after completing the diagnostic procedure.

Control Module References for ECM replacement, setup and programming

DTC P1631 (WITHOUT ATH): THEFT DETERRENT FUEL ENABLE SIGNAL NOT CORRECT

Diagnostic Instructions

- Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.
- Review **Strategy Based Diagnosis** for an overview of the diagnostic approach.
- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

DTC Descriptor

DTC P1631

Theft Deterrent Fuel Enable Signal Not Correct

Circuit/System Description

The theft deterrent module (TDM) sends the prerelease password to the engine control module (ECM) via the serial data circuit. The ECM then sends a challenge to the TDM. Both the ECM and TDM perform a calculation on this challenge. If the calculated response from the TDM equals the calculation performed by the ECM, the ECM will allow vehicle starting.

Conditions for Running the DTC

Ignition is in the ACCESSORY or RUN position.

Conditions for Setting the DTC

The ECM receives an incorrect prerelease password from the TDM.

Action Taken When the DTC Sets

- The security indicator will illuminate.
- Vehicle starting will be disabled.

Conditions for Clearing the DTC

- A current DTC P1631 will be when a correct fuel enable password is received.
- A history DTC will be cleared after 40 malfunction-free ignition cycles or when a scan tool is used to clear DTCs.

Reference Information

Schematic Reference

Immobilizer Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX - COUPE AND WAGON

Description and Operation

Immobilizer Description and Operation (without ATH)

Electrical Information Reference

- **Circuit Testing**
- **Connector Repairs**
- **Testing for Intermittent Conditions and Poor Connections**
- **Wiring Repairs**

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

IMPORTANT: Because of normal system communications between the TDM and ECM, any theft deterrent B-codes must be diagnosed prior to the diagnosis of P-codes.

Perform the 10-Minute Immobilizer Relearn procedure. Refer to **Immobilizer System Component Programming (without ATH)**. The ECM should successfully complete the password learn and the vehicle should start.

- If the ECM does not complete the learn or vehicle starting remains disabled, replace the ECM.

Repair Instructions

Perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

Control Module References for ECM replacement, setup and programming

DTC P1632 (WITH ATH): THEFT DETERRENT FUEL DISABLE SIGNAL RECEIVED

Diagnostic Instructions

- Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.
- Review **Strategy Based Diagnosis** for an overview of the diagnostic approach.
- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

DTC Descriptor

DTC P1632

Theft Deterrent Fuel Disable Signal Received

Circuit/System Description

The remote control door lock receiver (RCDLR) sends the prerelease password to the engine control module (ECM) via the serial data circuit. The ECM then sends a challenge to the RCDLR. Both the ECM and RCDLR perform a calculation on this challenge. If the calculated response from the RCDLR equals the calculation performed by the ECM, the ECM will allow vehicle starting.

Conditions for Running the DTC

Ignition is in the RUN position.

Conditions for Setting the DTC

A fuel disable signal from the RCDLR is received by the ECM.

Action Taken When the DTC Sets

- The security indicator will illuminate.
- Vehicle starting will be disabled.

Conditions for Clearing the DTC

- A current DTC P1632 will be when a valid calculation is received.
- A history DTC will be cleared after 40 malfunction-free ignition cycles or when a scan tool is used to clear DTCs.

Diagnostic Aids

The prerelease password sent to the ECM by the RCDLR is reliant on the communications between the transponder located in the vehicle key and the RCDLR. Failure to establish communications or an interruption in the communications between the vehicle key and the RCDLR will cause the fuel disable message to be sent and the setting of DTC B1632. DTC B3055 or B3060 will be set in the RCDLR. To properly diagnose DTC P1632, DTC B3055 or B3060 must be diagnosed and corrected first.

Reference Information

Schematic Reference

Immobilizer Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX - COUPE AND WAGON

Description and Operation

Immobilizer Description and Operation (with ATH)

Electrical Information Reference

- **Circuit Testing**
- **Connector Repairs**
- **Testing for Intermittent Conditions and Poor Connections**
- **Wiring Repairs**

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

IMPORTANT: Because of normal system communications between the RCDLR and ECM, any theft deterrent B-codes must be diagnosed prior to the diagnosis of P-codes.

Perform the 10-Minute Immobilizer Relearn procedure. Refer to **Immobilizer System Component Programming (with ATH)**. The ECM should successfully complete the password learn and the vehicle should start.

- If the ECM does not complete the learn or vehicle starting remains disabled, replace the ECM.

Repair Instructions

Perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

Control Module References for ECM replacement, setup and programming

DTC P1632 (WITHOUT ATH): THEFT DETERRENT FUEL DISABLE SIGNAL RECEIVED

Diagnostic Instructions

- Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.
- Review **Strategy Based Diagnosis** for an overview of the diagnostic approach.
- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

DTC Descriptor

DTC P1632

Theft Deterrent Fuel Disable Signal Received

Circuit/System Description

The theft deterrent module (TDM) sends the prerelease password to the engine control module (ECM) via the serial data circuit. The ECM then sends a challenge to the TDM. Both the ECM and TDM perform a calculation on this challenge. If the calculated response from the TDM equals the calculation performed by the ECM, the ECM will allow vehicle starting.

Conditions for Running the DTC

Ignition is in the RUN position.

Conditions for Setting the DTC

A fuel disable signal from the TDM is received by the ECM.

Action Taken When the DTC Sets

- The security indicator will illuminate.
- Vehicle starting will be disabled.

Conditions for Clearing the DTC

- A current DTC P1632 will be when a valid calculation is received.
- A history DTC will be cleared after 40 malfunction-free ignition cycles or when a scan tool is used to clear DTCs.

Diagnostic Aids

The prerelease password sent to the ECM by the TDM is reliant on the communications between the transponder located in the vehicle key and the TDM. Failure to establish communications or an interruption in the communications between the vehicle key and the TDM will cause the fuel disable message to be sent and the setting of DTC B1632. DTC B3055 or B3060 will be set in the TDM. To properly diagnose DTC P1632, DTC B3055 or B3060 must be diagnosed and corrected first.

Reference Information

Schematic Reference

Immobilizer Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX - COUPE AND WAGON

Description and Operation

Immobilizer Description and Operation (without ATH)

Electrical Information Reference

- **Circuit Testing**
- **Connector Repairs**
- **Testing for Intermittent Conditions and Poor Connections**
- **Wiring Repairs**

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

IMPORTANT: Because of normal system communications between the TDM and ECM, any theft deterrent B-codes must be diagnosed prior to the diagnosis of P-codes.

Perform the 10-Minute Immobilizer Relearn procedure. Refer to **Immobilizer System Component Programming (without ATH)**. The ECM should successfully complete the password learn and the vehicle should start.

- If the ECM does not complete the learn or vehicle starting remains disabled, replace the ECM.

Repair Instructions

Perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

Control Module References for ECM replacement, setup and programming

SYMPTOMS - IMMOBILIZER

IMPORTANT: The following steps must be completed before using the symptom tables.

1. Perform the **Diagnostic System Check - Vehicle** before using the symptom tables in order to verify that all of the following are true:
 - There are no DTCs set.
 - The control modules can communicate via the serial data links.
2. Review the system operation in order to familiarize yourself with the system functions. Refer to **Immobilizer Description and Operation (with ATH)**, **Immobilizer Description and Operation (without ATH)**.

Visual/Physical Inspection

- Inspect for aftermarket devices which could affect the operation of the systems. Refer to **Checking Aftermarket Accessories**.
- Inspect the easily accessible or visible system components for obvious damage or conditions which could

cause the symptom.

Intermittent

Faulty electrical connections or wiring may be the cause of intermittent conditions. Refer to **Testing for Intermittent Conditions and Poor Connections**.

Symptom List

Refer to **OnStar Stolen Vehicle Slowdown Active** to diagnose the symptom.

ONSTAR STOLEN VEHICLE SLOWDOWN ACTIVE

Diagnostic Instructions

NOTE: This procedure is not used in Brazil.

- Perform the **Diagnostic System Check - Vehicle** prior to using this diagnostic procedure.
- Review **Strategy Based Diagnosis** for an overview of the diagnostic approach.
- **Diagnostic Procedure Instructions** provides an overview of each diagnostic category.

Circuit/System Description

When a remote slow-down request is sent from OnStar, the vehicle communication interface module sends a serial data message to the engine control module (ECM) indicating that reduced vehicle speed has been requested. Once the request is active, the ECM begins reducing engine torque to match requested vehicle speed and the REDUCED ENGINE POWER message is displayed.

Reference Information

Schematic Reference

OnStar/Telematics Schematics

Connector End View Reference

COMPONENT CONNECTOR END VIEWS - INDEX - COUPE AND WAGON

Description and Operation

Remote Vehicle Speed Limiting Description and Operation

Electrical Information Reference

- **Circuit Testing**
- **Connector Repairs**

- Testing for Intermittent Conditions and Poor Connections
- Wiring Repairs

Scan Tool Reference

Control Module References for scan tool information

Circuit/System Verification

Verify the vehicle is not in the OnStar initiated Stolen Vehicle Slowdown mode. Verify the scan tool ECM Reduced Engine Power History parameter is not Spd Limit Active.

- If the parameter is Spd Limit Active, perform the scan tool VCIM Stolen Vehicle Slowdown Clear. When the Stolen Vehicle Slowdown Clear is complete, press the blue OnStar button and inform the advisor that you need to be transferred to the stolen vehicle team to update the vehicle account.

REPAIR INSTRUCTIONS

THEFT DETERRENT MODULE REPLACEMENT

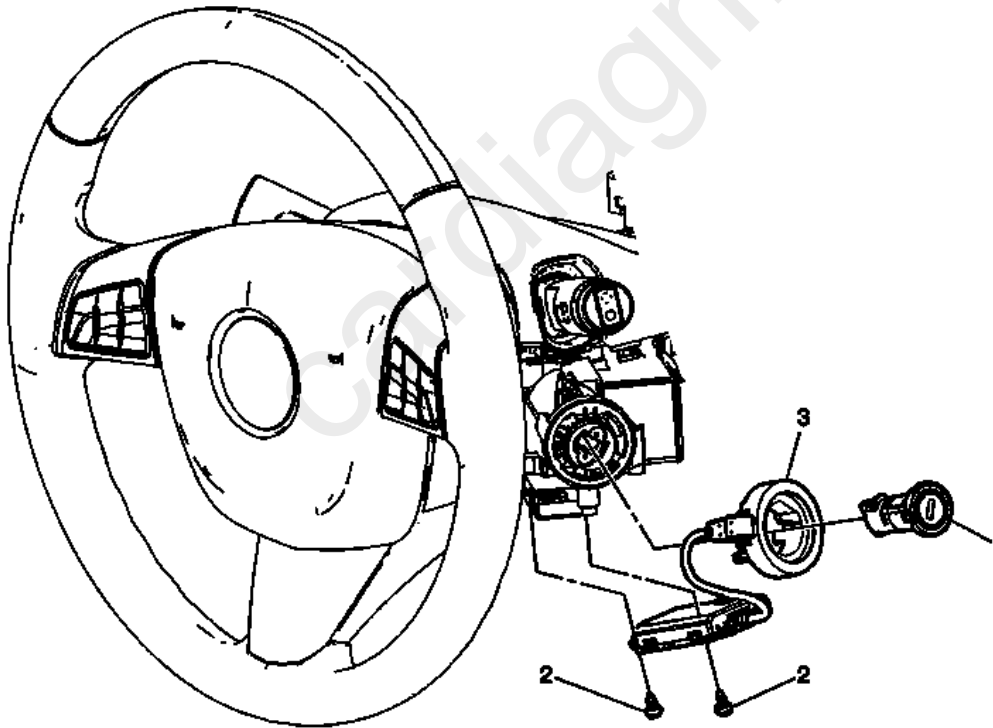


Fig. 2: Theft Deterrent Module
Courtesy of GENERAL MOTORS COMPANY

Theft Deterrent Module Replacement

Callout	Component Name
---------	----------------

Preliminary Procedure

Remove the steering column shrouds. Refer to **Steering Column Shroud Replacement (Without Key Release Lever Knob)** , **Steering Column Shroud Replacement (With Key Release Lever Knob)** .

1	Ignition Lock Cylinder Refer to <u>Ignition Lock Cylinder Replacement</u>
2	Theft Deterrent Module Bolt/Screw (Qty: 2) CAUTION: Refer to <u>Fastener Caution</u> . Tighten 2 N.m (18 lb in)
3	Theft Deterrent Module Procedure 1. Disconnect the electrical connector. 2. Refer to <u>Control Module References</u> for programming and set up procedures.

IMMOBILIZER SYSTEM COMPONENT PROGRAMMING (WITH ATH)

10-Minute Immobilizer Relearn

This 10-minute relearn procedure will relearn the fuel enable password between the remote control door lock receiver (RCDLR) and the engine control module (ECM).

1. Connect a scan tool to the vehicle in the pass-thru arrangement.
2. Turn ON the ignition, with the engine OFF.
3. Ensure that all power consuming devices are turned OFF on the vehicle.
4. On the Techline Terminal, select Service Programming System and follow the Techline Terminal on-screen instructions, using the Pass-Thru method. Ensure the correct programming selection is chosen based on component being replaced or programmed. Ensure the correct Vehicle Theft Deterrent Learn for Powertrain System selection is chosen based on the engine RPO of the vehicle being programmed.
5. At this point the scan tool must remain connected for the duration of the 10-minute relearn procedure.

IMPORTANT:

- The scan tool will initially display 12 Minutes. The first 2 minutes allow the scan tool to initialize the appropriate control module. The remaining 10 minutes is the relearn timer.
 - On some vehicles the security indicator may be illuminated for the duration of the 10-minute relearn procedure.
6. Observe the scan tool, after approximately 10 minutes the scan tool will display "Programming Successful, Turn OFF Ignition". The vehicle is now ready to relearn the key information and/or the

passwords on the next ignition switch transition from OFF to CRANK.

7. Turn OFF the ignition and wait 2 minutes.
8. Turn the ignition to the RUN position for 15 seconds, then start the vehicle. The RCDLR and ECM have now relearned the fuel continue password.
9. With a scan tool, clear any DTCs.

IMMOBILIZER SYSTEM COMPONENT PROGRAMMING (WITHOUT ATH)

10-Minute Immobilizer Relearn

This 10-minute relearn procedure will relearn the prerelease password and the challenge/response data between the theft deterrent module (TDM) and the engine control module (ECM).

1. Connect a scan tool to the vehicle in the pass-thru arrangement.
2. Turn ON the ignition, with the engine OFF.
3. Ensure that all power consuming devices are turned OFF on the vehicle.
4. On the Techline Terminal, select Service Programming System and follow the Techline Terminal on-screen instructions, using the Pass-Thru method. Ensure the correct programming selection is chosen based on component being replaced or programmed. For this procedure, go to the V.T.D. Vehicle Theft Deterrent Learn menu and choose the Vehicle Theft Deterrent Learn, ECM, or PK3 Replaced selection.
5. At this point the scan tool must remain connected for the duration of the 10-minute relearn procedure.

IMPORTANT:

- **The scan tool will initially display 12 Minutes. The first 2 minutes allow the scan tool to initialize the appropriate control module. The remaining 10 minutes is the relearn timer.**
- **On some vehicles the security indicator may be illuminated for the duration of the 10-minute relearn procedure.**

6. Observe the scan tool, after approximately 10 minutes the scan tool will display "Programming Successful, Turn OFF Ignition". The vehicle is now ready to relearn the key information and/or the passwords on the next ignition switch transition from OFF to CRANK.
7. Turn OFF the ignition and wait 2 minutes.
8. With a master vehicle key, turn the ignition to the RUN position for 15 seconds, then start the vehicle. The TDM and ECM have now relearned the pre-release password and the challenge/response data.
9. With a scan tool, clear any DTCs.

ADDING KEYS (EUROPE AND ASIA)

IMPORTANT:

- **To initiate, this procedure requires that 2 learned master keys be available.**
- **A total of 10 master keys or valet keys may be programmed to a single vehicle.**
- **This procedure adds keys only. The procedure does not erase previously**

learned keys.

- **The keys to be learned must duplicate the mechanical cut of the current key.**
- **If more than one valet key is to be learned, immediately precede each valet key with a learned master key.**

1. With the first previously learned vehicle key, turn ON the ignition, with the engine OFF.
2. Turn OFF the ignition and remove the key.
3. With the second previously learned vehicle key, turn ON the ignition, with the engine OFF.
4. Turn OFF the ignition and remove the key.
5. Within 10 seconds insert the key to be learned. Turn ON the ignition with the engine OFF. The vehicle has now learned the new key.

ADDING KEYS (NORTH AMERICA)

IMPORTANT:

- **To initiate, this procedure requires that a learned master key be available.**
- **A total of 10 master keys or valet keys may be programmed to a single vehicle.**
- **This procedure adds keys only. The procedure does not erase previously learned keys.**
- **The keys to be learned must duplicate the mechanical cut of the current key.**
- **If more than one valet key is to be learned, immediately precede each valet key with a learned master key.**

1. With a previously learned master key, turn ON the ignition, with the engine OFF.
2. Turn OFF the ignition and remove the key.
3. Within 10 seconds of turning OFF the ignition, insert the key to be learned and turn ON the ignition. The vehicle has now learned the new key.

REPLACING KEYS (NORTH AMERICA EXCEPT CANADA)

10-Minute Vehicle Key Relearn

IMPORTANT: This procedure will only relearn the vehicle keys. This procedure will not learn the immobilizer prerelease password or the challenge/response data. Do not use this procedure as a substitute for a 10-minute relearn when replacing or reprogramming a theft deterrent module (TDM) or engine control module (ECM). Doing so will result in a failure to learn the pre-release password and/or the challenge/response data.

This 10-minute learn procedure should be used when all vehicle keys are desired to be replaced or

reprogrammed. This procedure will erase all previously learned vehicle keys from the TDM. Once the 10-minute learn procedure has been completed, any remaining vehicle keys may be programmed using the Adding Keys procedure to ensure their continued functionality.

1. Connect a scan tool to the vehicle in the pass-thru arrangement.
2. Turn ON the ignition, with the engine OFF.
3. Ensure that all power consuming devices are turned OFF on the vehicle.
4. On the Techline Terminal, select Service Programming System and follow the Techline Terminal on-screen instructions, using the Pass-Thru method. Ensure the correct programming selection is chosen based on component being replaced or programmed. For this procedure, go to the V.T.D. Vehicle Theft Deterrent Learn menu and choose the Vehicle Theft Deterrent Learn for Learning Replacement Keys selection.
5. At this point the scan tool must remain connected for the duration of the 10-minute relearn procedure.

IMPORTANT:

- The scan tool will initially display 12 Minutes. The first 2 minutes allow the scan tool to initialize the appropriate control module. The remaining 10 minutes is the relearn timer.
- On some vehicles the security indicator may be illuminated for the duration of the 10-minute relearn procedure.

6. Observe the scan tool, after approximately 10 minutes the scan tool will display "Programming Successful, Turn OFF Ignition". The vehicle is now ready to relearn the key information and/or the passwords on the next ignition switch transition from OFF to CRANK.
7. Turn OFF the ignition and wait 2 minutes.
8. With a master vehicle key, turn the ignition to the RUN position for 15 seconds, then start the vehicle. The TDM has now learned the key transponder information.
9. With a scan tool, clear any DTCs.

30-Minute Vehicle Key Relearn

IMPORTANT: This procedure will only relearn the vehicle keys. This procedure will not learn the immobilizer prerelease password or the challenge/response data. Do not use this procedure as a substitute for a 10-minute relearn when replacing or reprogramming a TDM or ECM. Doing so will result in a failure to learn the prerelease password and/or the challenge/response data.

This 30-minute learn procedure should be used when all vehicle keys are desired to be replaced or reprogrammed. This procedure will erase all previously learned vehicle keys from the TDM. Once the 30-minute learn procedure has been completed, any remaining vehicle keys may be programmed using the Adding Keys procedure to ensure their continued functionality.

1. With an unlearned master vehicle key, turn ON the ignition, with the engine OFF.
2. Observe the security indicator, after approximately 10 minutes the telltale will turn off.
3. Turn OFF the ignition, and wait 5 seconds.

4. Repeat steps 1-3 two more times for a total of 3 cycles or 30 minutes.

IMPORTANT: The TDM learns the key transponder information upon the ignition switch transition from OFF to ON. You must turn the ignition OFF before attempting to start the vehicle.

5. With a master vehicle key, start the vehicle. The vehicle has now learned the key transponder information.
6. If additional keys are required to be learned, refer to **Adding Keys (North America)**.
7. With a scan tool, clear any DTCs.

REPLACING KEYS (CANADA, EUROPE, AND ASIA)

10-Minute Vehicle Key Relearn

IMPORTANT: This procedure will only relearn the vehicle keys. This procedure will not learn the immobilizer prerelease password or the challenge/response data. Do not use this procedure as a substitute for a 10-minute relearn when replacing or reprogramming a theft deterrent module (TDM) or engine control module (ECM). Doing so will result in a failure to learn the pre-release password and/or the challenge/response data.

This 10-minute learn procedure should be used when all vehicle keys are desired to be replaced or reprogrammed. This procedure will erase all previously learned vehicle keys from the TDM. Once the 10-minute learn procedure has been completed, any remaining vehicle keys may be programmed using the Adding Keys procedure to ensure their continued functionality.

1. Connect a scan tool to the vehicle in the pass-thru arrangement.
2. Turn ON the ignition, with the engine OFF.
3. Ensure that all power consuming devices are turned OFF on the vehicle.
4. On the Techline Terminal, select Service Programming System and follow the Techline Terminal on-screen instructions. Ensure the correct programming selection is chosen based on component being replaced or programmed. For this procedure, go to the V.T.D. Vehicle Theft Deterrent Learn menu and choose the Vehicle Theft Deterrent Learn for Learning Replacement Keys selection.
5. At this point the scan tool must remain connected for the duration of the 10-minute relearn procedure.

IMPORTANT:

- **The scan tool will initially display 12 Minutes. The first 2 minutes allow the scan tool to initialize the appropriate control module. The remaining 10 minutes is the relearn timer.**
- **On some vehicles the security indicator may be illuminated for the duration of the 10-minute relearn procedure.**

6. Observe the scan tool, after approximately 10 minutes the scan tool will display "Programming Successful, Turn OFF Ignition". The vehicle is now ready to relearn the key information and/or the

passwords on the next ignition switch transition from OFF to CRANK.

7. Turn OFF the ignition and wait 2 minutes.
8. With a master vehicle key, turn the ignition to the RUN position for 15 seconds, then start the vehicle. The TDM has now learned the key transponder information.
9. With a scan tool, clear any DTCs.

DESCRIPTION AND OPERATION

IMMOBILIZER DESCRIPTION AND OPERATION (WITH ATH)

Immobilizer System

The immobilizer system is incorporated into the remote control door lock receiver (RCDLR). The immobilizer is provided in order to prevent the vehicle operation if an incorrect or unprogrammed keyless entry transmitter is used in an attempt to start the vehicle. When the brake is pressed or the ignition control knob is pushed in and rotated, the console passive antenna broadcasts a low frequency (LF) challenge to the transmitter. The transmitter will respond to the RCDLR via radio frequency (RF). If the RCDLR determines a valid transmitter has responded, vehicle starting will be allowed. This is accomplished by the RCDLR sending a fuel enable message to the engine control module (ECM).

The design of the immobilizer system is to prevent vehicle theft by disabling the engine unless the correct transmitter is present when attempting to start the vehicle. The system is similar in concept to conventional immobilizer systems which use a normal vehicle key. The components of the immobilizer system are as follows:

- Ignition mode switch
- Key capture solenoid
- Keyless entry transmitters
- Console passive keyless entry antenna
- Console active antenna
- RCDLR
- Security indicator
- ECM

Ignition Mode Switch

The igniting mode switch is located at the right side of the steering column. The ignition mode switch is used to start the vehicle engine, turn OFF the vehicle, put the vehicle in ACC mode, or put the vehicle in RUN mode.

Key Capture Solenoid

The key capture solenoid allows the ignition control knob to be rotated through its various positions: OFF, ACCY, CRANK and RUN. The key capture solenoid is controlled by the RCDLR. Ground is applied to key capture solenoid through the park switch. If the vehicle is not in park, the solenoid will not be activated and the ignition control knob cannot be turned to the off position.

When the ignition control knob is pushed in or the brake pedal is pressed, the RCDLR looks for a valid transmitter on the interior of the vehicle. If a valid transmitter is detected, the RCDLR applies voltage to the key capture solenoid control circuit, which then allows the ignition control knob to be turned to the RUN position.

Keyless Entry Transmitter

The keyless entry transmitters are not only used to passively or actively lock and unlock the vehicle, they are also used to allow vehicle starting. If the RCDLR does not receive a valid RF response after the transmitter is challenged, the RCDLR will not send a fuel enable message to the ECM. If the RCDLR is unable to establish communication with the transmitter during an attempted engine start, the ELECTRONIC KEY NOT DETECTED message will display on the driver information center (DIC).

When any one of the programmed key fobs are challenged by pushing in the control knob, it will passively send a RF signal to the RCDLR. The RCDLR will then send a serial data message to the ECM to enable engine starting.

Keyless Entry Antenna - Console Passive

The console keyless entry antenna is located in the center console, under the cupholder. The purpose of the console keyless entry antenna is to send a low frequency RF challenge to a programmed transmitter within the interior of the vehicle when authentication is requested (brake pedal pressed or ignition control knob is pushed in). The console keyless entry antenna is controlled by the RCDLR.

The challenge from the console antenna can reach almost all areas inside the vehicle, with the exception of the rear package shelf. If the transmitter cannot be located inside the vehicle via the console antenna, the console active antenna is used.

If the RCDLR does not receive a valid response from a programmed transmitter, it will not allow the ignition control knob to rotate, and the DIC will display the message "ELECTRONIC KEY NOT DETECTED." See **Electronic Key Not Detected**

Keyless Entry Antenna - Console Active

The console active antenna is located in the center console. It has a small pocket next to it where the transmitter can be inserted if the transmitter battery is dead, weak, or the RF signal is being interrupted.

The purpose of the console active antenna is to detect a transmitter in the center console pocket when the transmitter cannot be detected inside the vehicle via the console antenna. It is only activated if the authentication sequence for starting has been attempted by the console passive antenna, but a transmitter has not been found. It is also used for programming transmitters. The console active antenna is controlled by the RCDLR.

If the RCDLR does not receive a valid response from a programmed transmitter, it will not allow the ignition control knob to rotate, and the DIC will display the message "ELECTRONIC KEY NOT DETECTED." See **Electronic Key Not Detected**

Remote Control Door Lock Receiver (RCDLR)

The RCDLR controls the console passive antenna and the console active antenna. The RCDLR also controls

three other low frequency antennas used for passive vehicle entry, but not for immobilizer operations. The RCDLR will send an AC voltage signal and provide ground to the console active antenna when the ignition button is pressed and a transmitter is not found with the console passive antenna. This will enable the console active antenna to send out a low frequency broadcast challenge to a transmitter. The RCDLR also has an internal radio frequency (RF) antenna that receives the transmitter's responses. The RCDLR is responsible for sending the fuel enable message to the ECM if all the requirements are met.

Security Indicator

The security indicator appears on the instrument panel cluster (IPC). If the security indicator flashes or is illuminated continuously during vehicle operation, a malfunction exists within the immobilizer system. The security indicator is a dual purpose indicator. With the ignition OFF, the indicator is controlled by the body control module (BCM) as a status indicator for the content theft deterrent system. With the ignition ON, it is controlled by the immobilizer system as a fault indicator.

The RCDLR will turn on the indicator when any of the following conditions exist:

- DTC B3122 is active
- DTC B1000 is active
- A fuel disable response is received from the ECM.
- The RCDLR loses communication with the BCM.

The RCDLR will flash the indicator when any of the following conditions exist:

- The VIN matching between the RCDLR and the other modules on the bus is not correct (export vehicles only)
- The power mode has become RUN without the RCDLR authenticating a valid transmitter.

Engine Control Module (ECM)

The ECM communicates with the RCDLR over the serial data line. If the RCDLR receives a valid transmitter RF response, the RCDLR allows the ignition to rotate to the RUN position and will send the fuel enable message to the ECM to enable the starting system. If the RCDLR does not receive a valid response from the transmitter, the ignition control knob will not rotate. Additionally, if the fuel enable password received by the ECM does not match the stored password, vehicle starting will be disabled and the RCDLR will illuminate the security indicator.

IMMOBILIZER DESCRIPTION AND OPERATION (WITHOUT ATH)

The immobilizer system functions are provided by the theft deterrent module (TDM) and the engine control module (ECM). When an ignition key is inserted into the ignition lock cylinder and the ignition is switched ON, the transponder embedded in the head of the key is energized by the exciter coil surrounding the ignition lock cylinder. This exciter coil is part of the TDM. The energized transponder transmits a signal that contains its unique value, which is received by the TDM. The TDM then compares this value to a value stored in memory. If the values match, the TDM will send the prerelease password via the serial data circuit to the ECM. If the transponder's unique value is incorrect, the TDM will send the fuel disable password to the ECM.

When the ECM receives the TDM prerelease password, the ECM will challenge the password. The ECM sends this challenge back to the TDM via the serial data circuit. Both the ECM and TDM perform a calculation on this challenge. If the calculated response from the TDM equals the calculation performed by the ECM, the ECM will allow vehicle starting.

The components of the theft system are as follows:

- TDM
- ECM
- Ignition key (Transponder)
- Security indicator

Theft Deterrent Module (TDM)

Vehicles with steering column mounted ignition switches have the exciter integral with the theft deterrent module (TDM), which is located within the steering column. The TDM can learn up to 10 keys (transponder values).

The TDM uses the following inputs: battery voltage, ignition switched voltage and ground circuit. The theft deterrent control module uses the following outputs: password exchange and challenge/response with the engine control module (ECM).

When an ignition key is inserted into the ignition lock cylinder and the ignition is switched ON, the transponder embedded in the head of the key is energized by the exciter coils surrounding the ignition lock cylinder. The energized transponder transmits a signal that contains its unique value, which is received by the TDM. The TDM then compares this value to the learned key code stored in memory. The TDM then performs one of the following functions:

- If the transponder value matches the values stored in the TDM memory, the TDM will send the prerelease password to the ECM via the serial data circuit.
- If the transponder's unique value does not match the value stored in the TDM, the TDM will send the fuel disable message to the ECM via the serial data circuit.
- If the TDM is unable to measure the ignition key transponder value, the TDM will not send any messages to the ECM.

Engine Control Module (ECM)

When the engine control module (ECM) receives the theft deterrent module (TDM) prerelease password, the ECM will challenge the password. The ECM sends this challenge back to the TDM via the serial data circuit. Both the ECM and TDM perform a calculation on this challenge. If the calculated response from the TDM equals the calculation performed by the ECM, the ECM will allow vehicle starting.

The ECM will disable vehicle starting if any of the following conditions occur:

- The prerelease password is invalid.
- The fuel disable password is sent by the TDM.

- No passwords are received-There is no communication with the TDM.
- The TDM calculated response to the challenge does not equal the calculation performed by the ECM.

The Ignition Key (Transponder)

The ignition key for Passkey III+ (PK3+) equipped vehicles is a standard ignition key with a transponder located in the plastic head of the key. The transponder value is fixed and unable to be changed. The immobilizer system uses the ignition key transponder value to determine if a valid ignition key is being used to start the vehicle. There are approximately 3 trillion possible transponder values. There are no visible electrical contacts. The keys are identified by + symbol in a circle stamped into the steel shank of the key. The immobilizer system use the following types of ignition keys:

Master Keys

Master keys have a black plastic head for full access operation of the vehicle. Master keys may perform the following functions:

- Start the vehicle.
- Lock/unlock all of the door locks and rear compartment.
- Lock/unlock all of the storage compartments.

Valet Keys

IMPORTANT: Valet keys are NOT standard equipment on all GM vehicle lines.

Valet keys have a gray plastic head and are for restricted operation of the vehicle. Valet keys may perform the following functions:

- Start the vehicle.
- Lock/unlock all of the door locks.

Fleet Keys

IMPORTANT: Fleet keys are NOT standard equipment on all GM vehicle lines.

Fleets keys allow full access to the vehicle just as a master key would. However, unlike a master key which may only learn 10 keys to a particular vehicle, an unlimited number of fleet keys may be learned to the vehicle. Fleet keys are only used in vehicles configured for fleet use with RPO 6E2 or 6E8.

- Start the vehicle.
- Lock/unlock all of the door locks and rear compartment.
- Lock/unlock all of the storage compartments.

Security Indicator

The theft deterrent module (TDM) can command the instrument panel cluster (IPC) to illuminate the security indicator only when the ignition key is in the ON position. The TDM will command the security indicator be illuminated any time a fault is noted in the immobilizer system and when the engine starting is disabled.

REMOTE VEHICLE SPEED LIMITING DESCRIPTION AND OPERATION

Certain vehicles equipped with OnStar® now have an additional feature that allows for remote limiting of the vehicle's speed. This OnStar® feature is called Stolen Vehicle Slow-Down and is now part of the OnStar® Stolen Vehicle Assistance service. This feature, when used in conjunction with local law enforcement and strict guidelines at the OnStar® Call Center, will slow the vehicle by interacting with the engine control system.

When the engine control system receives a valid request from the OnStar® telematics communications interface module, it will enter into a reduced engine power/vehicle speed limiting mode, which will decelerate the vehicle. Once the request is active the engine control module begins reducing engine torque to match requested vehicle speed and a REDUCED ENGINE POWER indication is displayed. No DTCs will be set during this process.