

The use of the Diagnostic System Check will identify the correct procedure for diagnosing the system and where the procedure is located.

DTC B2945

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 B2945

Security System Sensor Power Circuit

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Security System Sensor Supply Voltage	B3055	B3055	B2945	-
Security System Sensor Low Reference	-	B3055	B3055	-
Ground	-	B3055	B3055	-

Circuit/System Description

When the ignition is switched to the ON position, the body control module (BCM) supplies 12 volts to the theft deterrent exciter module. The BCM also provides a low reference for the exciter. With the voltage supplied to the exciter, 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 BCM. The BCM then compares this value to a value stored in memory, learned key code. If the value received matches the stored value, the BCM sends the fuel enable password to the engine control module/powertrain control module (ECM/PCM) via serial data.

Conditions for Running the DTC

The ignition is OFF.

Conditions for Setting the DTC

The BCM detects a short to voltage on the security system sensor supply voltage circuit with the ignition OFF.

Action Taken When the DTC Sets

The DTC will set as current only with the ignition OFF. With the ignition ON, the DTC will always set as a history DTC.

Conditions for Clearing the DTC

- A current DTC will clear when the BCM no longer detects a circuit fault.
- A history DTC will clear after 100 fault-free ignition cycles.

Reference Information

Schematic Reference

Immobilizer Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

Immobilizer 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 Testing

1. Ignition OFF, disconnect the harness connector at the theft deterrent exciter.
2. Verify a test lamp does not illuminate between the B+ circuit terminal A and ground.
 - o If the test lamp illuminates, test the B+ circuit for a short to voltage. If the circuit tests normal, replace the BCM.
3. If all circuits test normal, test or replace the theft deterrent exciter.

Repair Procedures

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

Control Module References for BCM replacement, setup, and programming

DTC B2960

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 B2960

Security System Sensor Data Incorrect but Valid

Circuit/System Description

When the ignition is switched to the ON position, the body control module (BCM) supplies 12 volts to the theft deterrent exciter module. The BCM also provides a low reference for the exciter. With the voltage supplied to the exciter, 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

BCM. The BCM then compares this value to a value stored in memory, the learned key code. If the value received matches the stored value, the BCM sends the fuel enable password to the engine control module/powertrain control module (ECM/PCM) via serial data.

Conditions for Running the DTC

Ignition is in the Accessory or Run position.

Conditions for Setting the DTC

The transponder value received by the BCM 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.

Conditions for Clearing the DTC

- A current DTC will be cleared when the BCM detects a valid transponder value from the ignition key.
- 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****Description and Operation****Immobilizer 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**

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.

1. Perform the 10-Minute Vehicle Key Relearn procedure. Refer to **Replacing Keys (North America except**

Canada) or Replacing Keys (Canada).

2. While viewing the scan tool BCM VTD States parameter, turn ON the ignition with each of the available vehicle keys. The parameter should read Valid Key Code with all available keys.
 - o If not the specified value, replace the affected key.

Repair Procedures

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

Replacing Keys (North America except Canada) or Replacing Keys (Canada)**DTC B3031****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**

Security System Controller In Learn Mode

Circuit/System Description

When learning a vehicle key, the body control module (BCM) 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 BCM does not exit learn mode, B3031 will remain current and indicate a fault.

Conditions for Running the DTC

The immobilizer system is in learn mode.

Conditions for Setting the DTC

DTC B3031 will set any time the BCM 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 the successful 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**Description and Operation****Immobilizer Description and Operation****Electrical Information Reference**

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

Scan Tool Reference**Control Module References** for Scan Tool Information**Circuit/System Verification**

IMPORTANT: When performing a 10 Minute 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 vehicle keys not be present at the time of repair.

1. Verify DTC B3055 is not set as current.
 - o If DTC B3055 is set as current, refer to **DTC B3055**.
2. Perform the 10 Minute Vehicle Key Relearn procedure. Refer to **Replacing Keys (North America except Canada)** or **Replacing Keys (Canada)**. The BCM should exit learn mode and DTC B3031 should clear.
 - o If the BCM does not exit learn mode, replace the BCM.

Repair Procedures

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

Control Module References for BCM replacement, setup, and programming**DTC B3055****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**

No Transponder Modulation or No Transponder

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance

2008 Buick LaCrosse CXL

2008 ACCESSORIES & EQUIPMENT Immobilizer - LaCrosse

Security System Sensor Supply Voltage	B3055	B3055	B2945	-
Security System Sensor Low Reference	-	B3055	B3055	-
Ground	-	B3055	B3055	-

Circuit/System Description

When the ignition is switched to the ON position, the body control module (BCM) supplies 12 volts to the theft deterrent exciter module. The BCM also provides a low reference for the exciter. With the voltage supplied to the exciter, 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 BCM. The BCM then compares this value to a value stored in memory, the learned key code. If the value received matches the stored value, the BCM sends the fuel enable password to the engine control module/powertrain control module (ECM/PCM) via serial data.

Conditions for Running the DTC

Ignition is in the Accessory or Run position.

Conditions for Setting the DTC

The BCM 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 BCM detects a valid transponder value from the ignition key.
- 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

Description and Operation

Immobilizer 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

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.

1. Inspect all available vehicle keys that they are correct vehicle keys.
 - o 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.
 - o If only one key results in the parameter reading Not Present, replace the affected key.
 - o If all available keys result in the parameter reading Not Present, refer to Exciter Circuit Malfunction.

Circuit/System Testing

Exciter Circuit Malfunction

1. Ignition OFF, disconnect the harness connector at the theft deterrent exciter.
2. Ignition OFF, test for less than 10 ohms of resistance between the low reference circuit terminal C and ground.
 - o If greater than the specified range test the low reference circuit for an open/high resistance. If the circuit tests normal, replace the BCM.
3. Test for less than 10 ohms of resistance between the ground circuit terminal B and ground.
 - o If greater than the specified range test the ground circuit for an open/high resistance.
4. Ignition ON, test for B+ between the B+ circuit terminal A and ground.
 - o If not the specified value, test the B+ circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the BCM.
5. If all circuits test normal, replace the theft deterrent exciter.

Repair Procedures

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

- **Replacing Keys (North America except Canada)** or **Replacing Keys (Canada)**
- **Control Module References** for BCM replacement, setup, and programming

DTC P1626

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 P1626

Theft Deterrent Fuel Enable Signal Not Received

Circuit/System Description

The body control module (BCM) sends the fuel enable password to the powertrain control module (PCM) via the serial data circuit. The PCM compares this password to the learn password. If the learned password matches the password received from the BCM, the PCM will allow vehicle starting.

Conditions for Running the DTC

- Ignition is in the ACCESSORY or RUN position.
- The PCM is not in learn mode.

Conditions for Setting the DTC

The PCM receives does not receive the fuel enable password from the BCM within the required amount of time.

Action Taken When the DTC Sets

The security indicator will illuminate.

Conditions for Clearing the DTC

- A current DTC will be cleared when a 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.

Diagnostic Aids

DTC P1629 is an indicator that the fuel enable password was not received within the required time. This does not necessarily indicate a fault is present with the BCM or PCM. Factors such as a long engine crank, a delay in the serial data communication, or B-codes set in the BCM will cause DTC P1629 to set. This DTC should not be used as a fault indicator, but rather as a symptom to assist in the diagnosis of these other systems.

Reference Information**Schematic Reference****Immobilizer Schematics****Connector End View Reference****Component Connector End Views****Description and Operation****Immobilizer 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**

DTC P1630**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 body control module (BCM), the engine control module/powertrain control (ECM/PCM) must learn the new fuel enable password from the replacement BCM. If the ECM/PCM is replaced with a service replacement part, it is in a functional state to automatically learn the vehicle fuel continue password. If the BCM is replaced, the ECM must be placed in learn mode so it can learn the new BCM password. This DTC indicates the ECM/PCM is in a functional state to learn the BCM fuel enable password.

Conditions for Running the DTC

The ECM/PCM is in learn mode.

Conditions for Setting the DTC

DTC P1630 will set any time the ECM/PCM 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****Description and Operation****Immobilizer 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

IMPORTANT: Because of normal system communications between the BCM and ECM/PCM, 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 (Canada) or Immobilizer System Component Programming (North America except Canada). The ECM/PCM should successfully complete the password learn and the vehicle should start.

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

Repair Procedures

Perform the Diagnostic Repair Verification after completing the diagnostic procedure.

Control Module References for ECM/PCM replacement, setup, and programming

DTC P1631

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 body control module (BCM) sends the fuel enable password to the engine control module/powertrain control module (ECM/PCM) via the serial data circuit. The ECM/PCM compares this password to the learn password. If the learned password matches the password received from the BCM, the ECM/PCM will allow vehicle starting.

Conditions for Running the DTC

Ignition is in the ACCESSORY or RUN position.

Conditions for Setting the DTC

The ECM/PCM receives an incorrect fuel enable password from the BCM.

Action Taken When the DTC Sets

- The security indicator will illuminate.

- Vehicle starting will be disabled.

Conditions for Clearing the DTC

- A current DTC will be cleared when a correct fuel enable password is received.
- A history DTC will be cleared after 40 malfunction-free ignition cycles.

Reference Information**Schematic Reference****Immobilizer Schematics****Connector End View Reference****Component Connector End Views****Description and Operation****Immobilizer 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**

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 (Canada)** or **Immobilizer System Component Programming (North America except Canada)**. The ECM/PCM should successfully complete the password learn and the vehicle should start.

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

Repair Procedures

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

Control Module References for ECM/PCM 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 **Keyless Entry System Description and Operation**.

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 **Hood Ajar Indicator/Message Malfunction** in order to diagnose the symptom.

HOOD AJAR INDICATOR/MESSAGE MALFUNCTION

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.

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Hood Ajar Switch Signal	1	1	1	-
Ground	-	1	1	-
1. Hood ajar indicator/message malfunction; Remote vehicle start inoperative				

Circuit/System Description

The hood ajar switch is part of the hood latch and uses two resistors to determine the state of the hood. The body control module (BCM) apply a reference voltage on the hood ajar switch signal circuit. With the hood closed, the hood ajar switch opens and the hood ajar switch signal circuit is grounded through a 750 ohm and a 6K ohms resistor in series. When the hood is opened, the hood ajar switch closes and the hood ajar switch signal circuit is from ground through only the 750 ohm resistor. The BCM then sends a serial data message indicating the status of the hood to the instrument panel cluster (IPC), which will illuminate or displays the hood ajar indicator indicator/message as appropriate.

Reference Information

Schematic Reference

Immobilizer Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

Keyless Entry System 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

1. Hood closed, verify the scan tool BCM Hood Ajar Switch parameter is Closed.
2. Hood open, verify the scan tool BCM Hood Ajar Switch parameter is Open.

Circuit/System Testing

1. Ignition OFF, disconnect the harness connector at the hood ajar switch.
2. Test for less than 10 ohms of resistance between the ground circuit terminal B and ground.
 - If greater than the specified range, test the ground circuit for an open/high resistance.
3. Connect the harness connector at the hood ajar switch. Disconnect the X1 harness connector at the BCM.
4. Ignition ON, verify a test lamp does not illuminate between the signal circuit terminal 26 and ground.
 - If the test lamp illuminates, test the signal circuit for a short to voltage.
5. Ignition OFF, hood closed, test for 700-800 ohms of resistance between the signal circuit terminal 26 and ground.
 - If not within the specified range, test the signal circuit for a short to ground or an open/high resistance.
 - If the circuit tests normal, test or replace the hood ajar switch.
6. Hood open, test for 6K-8K ohms of resistance between the signal circuit terminal 26 and ground.
 - If not within the specified range, test or replace the hood ajar switch.
7. If all circuits test normal, replace the BCM.

Repair Procedures

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

- **Hood Primary and Secondary Latch Replacement**
- **Control Module References** for BCM replacement, setup, and programming

REPAIR INSTRUCTIONS

THEFT DETERRENT MODULE REPLACEMENT

Removal Procedure

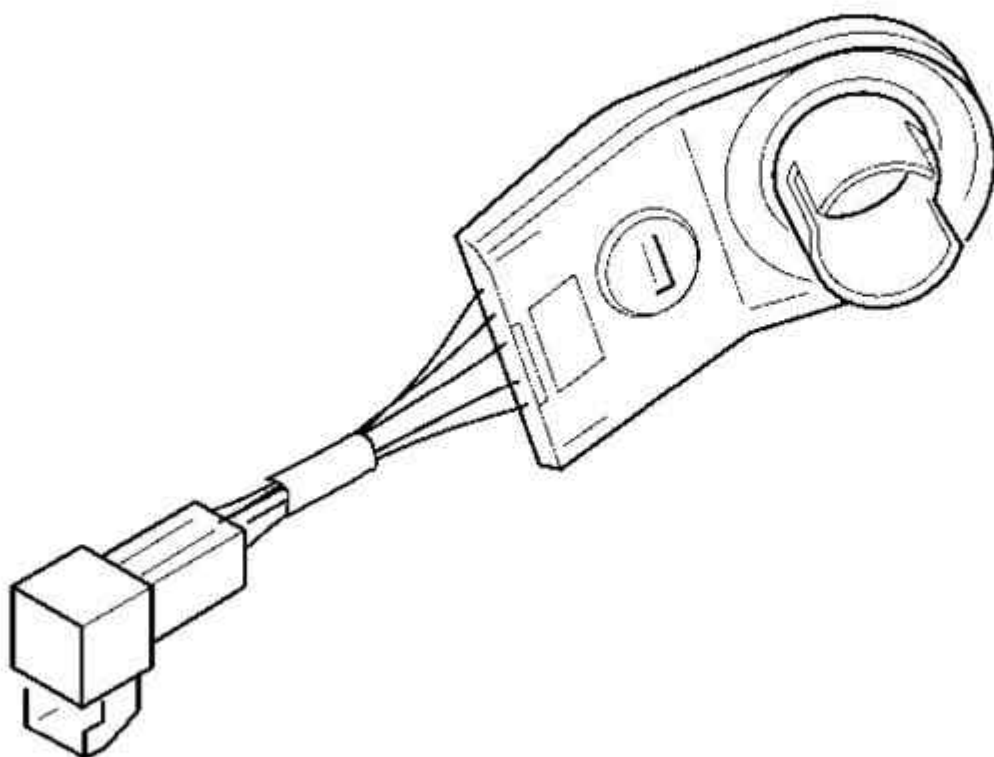


Fig. 2: Identifying Theft Deterrent Control Module
Courtesy of GENERAL MOTORS CORP.

CAUTION: Refer to SIR Caution .

1. Disable the inflatable restraint steering wheel module. Refer to SIR Disabling and Enabling .
2. Remove the upper and lower trim covers. Refer to Steering Column Trim Covers Replacement .
3. Remove the lock cylinder. Refer to Ignition Lock Cylinder Replacement .
4. Disconnect the connector from the theft deterrent module.
5. If necessary, disconnect the connector from the ignition lock cylinder case.
6. Remove the theft deterrent module from ignition lock cylinder case assembly.

Installation Procedure

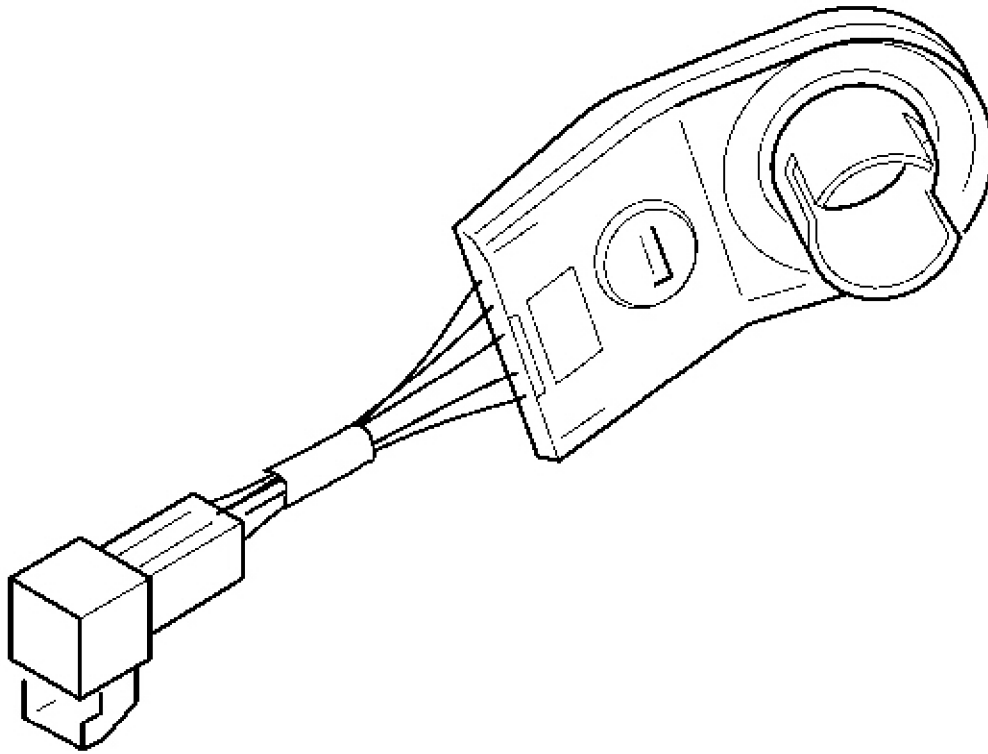


Fig. 3: Identifying Theft Deterrent Control Module
Courtesy of GENERAL MOTORS CORP.

1. Install the theft deterrent module onto the ignition lock cylinder case assembly.

CAUTION: Refer to SIR Inflator Module Coil Caution.

2. Connect the connector to the theft deterrent module.
3. If necessary, connect the connector to the ignition lock cylinder case.
4. Install the lock cylinder. Refer to **Ignition Lock Cylinder Replacement**.
5. Install the upper and lower trim covers. Refer to **Steering Column Trim Covers Replacement**.
6. Enable the inflatable restraint steering wheel module. Refer to **SIR Disabling and Enabling**.

IMMOBILIZER SYSTEM COMPONENT PROGRAMMING (CANADA)

10-Minute Immobilizer Relearn

This 10-minute relearn procedure will relearn the fuel enable password between the body control module (BCM) and the engine control module/powertrain control module (ECM/PCM).

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 Legacy 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 Powertrain System selection.

- 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.**

- 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 password on the next ignition switch transition from OFF to CRANK.
- Turn OFF the ignition and wait 2 minutes.
- With a master vehicle key, turn the ignition to the RUN position for 15 seconds, then start the vehicle. The ECM/PCM has now relearned the fuel enable password.
- With a scan tool, clear any DTCs.

IMMOBILIZER SYSTEM COMPONENT PROGRAMMING (NORTH AMERICA EXCEPT CANADA)**10-Minute Immobilizer Relearn**

This 10-minute relearn procedure will relearn the fuel enable password between the body control module (BCM) and the engine control module/powertrain control module (ECM/PCM).

- Connect a scan tool between the vehicle and the Techline Terminal for the pass-thru programming method.
- Turn ON the ignition, with the engine OFF.
- Ensure that all power consuming devices are turned OFF on the vehicle.
- On the Techline Terminal, select pass-thru programming, build the vehicle, and follow the 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 Powertrain System selection.
- 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.**

- 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 password on the next ignition switch transition from OFF to CRANK.
- Turn OFF the ignition and wait 2 minutes.
- With a master vehicle key, turn the ignition to the RUN position for 15 seconds, then start the vehicle. The ECM/PCM has now relearned the fuel enable password.
- With a scan tool, clear any DTCs.

30-Minute Immobilizer Relearn

This 30-minute relearn procedure will relearn the fuel enable password between the body control module (BCM)

and the engine control module/powertrain control module (ECM/PCM).

1. With a 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 vehicle learns the fuel enable passwords on the ignition switch transition from OFF to RUN. 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 ECM/PCM has now learned the fuel enable password.
6. If additional keys are required to be learned, refer to Adding Keys (North America except Canada) or Adding Keys (Canada).
7. With a scan tool, clear any DTCs.

ADDING KEYS (NORTH AMERICA EXCEPT CANADA)

- 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 insert the key to be learned. Turn ON the ignition with the engine OFF. The vehicle has now learned the new key.

ADDING KEYS (CANADA)

- 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.

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 body control module (BCM). Doing so will result in a failure to learn the fuel enable password.

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 BCM. 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 Legacy 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 PASSKEY III System 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 password 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 ECM/PCM has now relearned the fuel enable password.
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 body control module (BCM). Doing so will result in a failure to learn the fuel enable password.

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 BCM. 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 BCM learns the key transponder information upon the ignition switch transition from OFF to CRANK. 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 except Canada)** or **Adding Keys (Canada)**.
7. With a scan tool, clear any DTCs.

REPLACING KEYS (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 body control module (BCM). Doing so will result in a failure to learn the fuel enable password.

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 BCM. 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 Legacy 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 PASSKEY III System 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 password 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 ECM/PCM has now relearned the fuel enable password.
9. With a scan tool, clear any DTCs.

DESCRIPTION AND OPERATION

IMMOBILIZER DESCRIPTION AND OPERATION

The immobilizer system functions are provided by the body control module (BCM). When an ignition key is inserted into the ignition lock cylinder and the ignition is switched ON, the BCM supplies battery voltage to the theft deterrent exciter module. The transponder embedded in the head of the key is energized by the theft deterrent exciter module which is surrounding the ignition lock cylinder. The energized transponder transmits a signal that contains its unique value, which is received by the theft deterrent exciter module. The BCM monitors the theft deterrent exciter module for the transponder value. The BCM then compares this value to a value stored in memory, the learned key code. If the value is correct, the BCM sends the fuel enable password via serial data to the engine control module/powertrain control module (ECM/PCM). If the transponders value is incorrect the BCM will send the fuel disable password to the ECM/PCM via the serial data circuit. The components of the immobilizer system are as follows:

- BCM
- Theft deterrent exciter module
- ECM/PCM
- Ignition key (Transponder)
- Security indicator

Body Control Module (BCM)

IMPORTANT: On some vehicles, if the immobilizer system is unable to read the ignition key transponder value after the vehicle has started, the immobilizer system will consider itself malfunctioning. The immobilizer system will enter a fail enable state. When the immobilizer system is in a fail enable state, the vehicle will NOT stall or stop running. If the immobilizer system is in a fail enable state when the ignition is switched OFF, the immobilizer system will remain fail enable until it is able to read a learned ignition key transponder value. When the immobilizer system is in a fail enable state the immobilizer system is NOT active and the vehicle will start. This feature is NOT available on all GM vehicle lines.

When an ignition key is inserted into the ignition lock cylinder and the ignition is switched ON, the body control module (BCM) supplies battery voltage to the theft deterrent exciter module. The transponder embedded in the head of the key is energized by the theft deterrent exciter module which is surrounding the ignition lock cylinder. The energized transponder transmits a signal that contains its unique value, which is received by the theft deterrent exciter module. The BCM monitors the theft deterrent exciter module for the transponder value. The BCM then compares this value to a value stored in memory, learned key code. The BCM then performs one of the following functions:

- If the transponder value is correct, the BCM will send the fuel enable password to the ECM/PCM via serial data.
- If the transponders value is incorrect, the BCM will send the fuel disable password to the ECM/PCM via serial data.
- If the BCM is unable to measure the ignition key transponder value for one second due to a damaged or

missing transponder or a damaged theft deterrent exciter module, the BCM will send the fuel disable password to the ECM/PCM via serial data.

Theft Deterrent Exciter Module

When an ignition key is inserted into the ignition lock cylinder and the ignition is switched ON, the body control module (BCM) supplies battery voltage to the theft deterrent exciter module. The transponder embedded in the head of the key is energized by the theft deterrent exciter module which is surrounding the ignition lock cylinder. The energized transponder transmits a signal that contains its unique value, which is received by the theft deterrent exciter module. The BCM monitors the theft deterrent exciter module for the transponder value. The BCM then compares this value to a value stored in memory, learned key code. The BCM then performs one of the following functions:

Engine Control Module/Powertrain Control Module (ECM/PCM)

IMPORTANT: On some vehicles, if the ECM/PCM is unable to communicate with the immobilizer system after the vehicle has started, the ECM/PCM will consider the immobilizer system to be malfunctioning. The ECM/PCM will enter a fail enable state. When the ECM/PCM is in a fail enable state the vehicle will NOT stall or stop running. If the ECM/PCM is in a fail enable state when the ignition is switched OFF, the ECM/PCM will remain fail enable until communications with the immobilizer system has been restored. When the ECM/PCM is in a fail enable state the immobilizer system is NOT active and the vehicle will start. This feature is NOT available on all GM vehicle lines.

The ECM/PCM verifies that the password received from the body control module (BCM) via the serial data circuit is correct. The PCM can learn only one fuel continue password. If the fuel continue password is correct, the PCM enables the starting and fuel delivery systems.

The ECM/PCM disables the starting and fuel delivery systems if any of the following conditions occur:

- The fuel enable password is incorrect.
- The fuel disable password is sent by the BCM.
- No passwords are received-There is no communication with the BCM.

The Ignition Key (Transponder)

The ignition key is a typical looking 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 three trillion possible transponder values. There are no visible electrical contacts. The keys may be identified by the letters PK3 stamped into the steel shank of the key. The immobilizer system uses 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.
- 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.

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