Component Procedures: Antitheft and Alarm Systems

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Parts and Labor (itype_189)

Labor

Operation	Qualifier Path	Skill	Std Hrs	Wty Hrs
Remove & Replace	Anti-Theft Components > Module, R&R	B	1.1	0.0

Theft Systems (Article 13334)

When armed, the content theft deterrent system is designed to deter vehicle content theft by pulsing the horns and exterior lamps for approximately 30 seconds when an unauthorized vehicle entry is detected. However, the content theft deterrent system does not affect engine starting.

An unauthorized entry can be any of the following with the content theft deterrent system armed:

- Unauthorized entry into the underhood area
- Unauthorized entry into the rear compartment
- When any door is opened without using the UNLOCK command from a keyless entry transmitter
- After a battery reconnect, if the battery was disconnected with the content theft deterrent system armed

The components of the content theft deterrent system are:

- Body Control Module (BCM)
- Remote control door lock receiver
- Door ajar switches
- Rear compartment ajar switch
- Hood ajar switch

Arming the Content Theft Deterrent System

Use the following procedure in order to arm the system:

- Place the shift lever in P (park).
- Turn OFF the ignition.
- Open any door.
- Lock the doors by pressing the LOCK button on the transmitter. The system is in standby mode and will not start the arming timer until all doors are closed.
- The system will begin the arm sequence immediately after the last door is closed. If the keyless entry transmitter is used to arm the system after the vehicle doors are closed, the arm sequence will begin as soon as the LOCK command is received from the transmitter.
- Pressing the LOCK button on the keyless entry transmitter a second time will bypass the delayed arming function and force the system to arm.

Locking the Vehicle Without Arming the Content Theft Deterrent System

Locking the vehicle may be accomplished without arming the content theft deterrent system. Use of the manual door locks will lock the vehicle, but will not arm the content theft deterrent system.

Disarming an Armed System/Silencing an Alarm

If system arming has been requested by the keyless entry transmitter, it must be disarmed.

- To disarm the content theft deterrent system in standby mode, perform one of the following:
- Press the UNLOCK button on the keyless entry transmitter.
- Insert a valid key into the ignition and switch to the ON position.
- To disarm the content theft deterrent system in the armed mode (non-event) or when activated (during an alarm event):
- Insert a valid key into the ignition and switch to the ON position

Content Theft Deterrent Circuit Description

The following is a description of each component used in the content theft deterrent system:

Body Control Module

The content theft deterrent system is an internal function of the BCM which utilizes serial data and various switch inputs information to perform content theft deterrent functions. When the BCM detects an unauthorized entry, it activates the horns and exterior lamps. The BCM has 4 basic modes (disarmed, standby, armed, and alarm) for operating the content theft deterrent system. The different modes are described below.

- The BCM has the content theft deterrent system in a disarmed mode until the following conditions are detected:
- Ignition key turned to the OFF position.
- Doors locked by the LOCK button on the transmitter.
- The BCM enters the standby mode when the above conditions are detected. If a door was already opened when the arm mode was requested, the standby mode does not start the timer until the last door is closed.

- When the last door is closed, a 15 second timer is activated. Once the timer has expired, the BCM enters the armed mode. After this delay, any unauthorized entry will activate the alarm mode.
- When the BCM detects an unauthorized entry, the BCM enters the alarm mode. The BCM activates the horns and exterior lamps for 30 seconds. This is followed by a three minute time-out with the horn no longer active. If no new intrusions are detected after the time-out, the horn is not active. The system must be disarmed or the intrusion condition removed after the time-out for the system to exit alarm mode.

Remote Control Door Lock Receiver

The keyless entry system can arm and disarm the content theft deterrent system. When the remote control door lock receiver receives a door lock or unlock signal from the transmitter, the remote control door lock receiver sends a message to the BCM via serial data to perform the appropriate arm/disarm functions.

Door Ajar Switches

The content theft deterrent system uses the door ajar switches as a status indicator to activate the alarm. The door ajar switches are monitored by the body control module via a discrete input from each door ajar switch. If the BCM receives a signal indicating a door is opened when the content theft deterrent system is armed, the BCM activates the alarm.

Hood Ajar Switch

The content theft deterrent system uses the hood ajar switch as a status indicator to activate the alarm. The BCM monitors the hood ajar switch via a discrete input from the switch. If the BCM receives a signal indicating the hood has been opened when the content theft deterrent system is armed, the BCM activates the alarm.

Rear Compartment Ajar Switch

The content theft deterrent system uses the rear compartment ajar switch as a status indicator to activate the alarm. The BCM monitors the rear compartment ajar switch via a discrete input from the switch. If the BCM receives a signal indicating the rear compartment has been opened when content theft deterrent system is armed, the BCM activates the alarm.

Inputs

The BCM monitors the following inputs for content theft deterrent:

- Keyless entry transmitter LOCK/UNLOCK buttons; a message from the remote control door lock receiver
- Immobilizer status—The BCM uses the immobilizer status for disarming the system or silencing an alarm when the correct vehicle key is used to start the vehicle

Outputs

The BCM controls the following for content theft deterrent:

- Horn relay
- Exterior lamps

Immobilizer (Article 13174)

The immobilizer system functions are provided by the body control module (BCM) and the engine control module (ECM), as well as any modules which store and report the environment identifier.

When an ignition key is inserted into the ignition lock cylinder and the ignition is switched ON, the transponder in the key is energized by the immobilizer coil surrounding the ignition lock cylinder. This immobilizer coil is part of the immobilizer antenna . The transponder transmits a signal that contains its unique value, which is received by the BCM through the immobilizer coil. The BCM then compares this value to a value stored in memory. The BCM also monitors various modules to determine if the stored environment identifiers match.

If both the environment identifier and the value received from the transponder match, the BCM will send the prerelease password via serial data to the ECM. If the encrypted code's unique value is incorrect or the environment identifier does not match, the BCM will send the fuel disable message to the ECM.

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

The components of the theft system are as follows:

- BCM
- ECM
- Immobilizer antenna
- Ignition key
- Security indicator
- Various modules which store and report the environment identifier

Body Control Module (BCM)

The immobilizer system is an integral part of the BCM and is controlled internally within the BCM. The BCM can

learn up to 8 keys (transponder values).
The BCM uses the following inputs:
- Environment identifier exchange with various modules
- Encrypted code from the vehicle key, received by the immobilizer antenna
The BCM uses the following outputs:
- Prerelease password communication with ECM
- Challenge/response with ECM
When an ignition key is inserted into the ignition lock cylinder and the ignition is switched ON, the encrypted code in the key is energized by the immobilizer antenna 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 the learned key code stored in memory. The BCM then performs one of the following functions:
- If the encrypted code value matches the values stored in the BCM memory, the BCM will send the prerelease password to the ECM via serial data.
- If the encrypted code unique value does not match the value stored in the BCM, the BCM will send the start disable message to the ECM via serial data.
- If the BCM is unable to measure the ignition key encrypted code value, the BCM will not send any messages to the ECM.

Engine Control Module (ECM)

When the ECM receives the BCM prerelease password, the ECM will challenge the password. The ECM sends this challenge to the BCM via the serial data circuit. Both the ECM and BCM perform a calculation on this challenge. If the calculated response from the BCM equals the calculation performed by the ECM, the ECM will allow vehicle starting.
The ECM will disable vehicle starting if any of the following immobilization conditions occur:
- The prerelease password is invalid.
- The start disable password is sent by the BCM.
- No passwords are received. There is no communication with the BCM.
- The BCM calculated response to the challenge does not equal the calculation performed by the ECM.

Immobilizer Antenna

The immobilizer antenna contains an immobilizer coil which surrounds the ignition cylinder. The coil passively powers the transponder located in the ignition key when the key is in the ignition. When powered, the key transmits its unique value to the immobilizer antenna, which is then relayed to the BCM via a LIN serial data circuit. The immobilizer antenna also receives B+ and ground from the BCM.
The immobilizer antenna is used to:
- Learn keys
- To start vehicle

Ignition Key

Each ignition key contains a transponder with a unique encrypted value. The transponder's encrypted 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.

Environment Identifier

Various modules throughout the vehicle learn a specific environment identifier during the module programming process. The environment identifier is learned by each individual module and matches the environment identifier stored in the BCM. Prior to starting after a battery disconnect, each of the modules which store a environment identifier will compare their identifier to that of the identifier stored in the BCM. If all the identifiers match, the engine starting process will continue. If the environment identifiers do not match, engine starting will be disabled.

Security Indicator

The BCM will command the instrument panel cluster to illuminate the security indicator when the ignition key is in the ON position to indicate a fault has occurred within the immobilizer system and when the engine starting is disabled.

Remote Vehicle Speed Limiting (Article 13175)

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.

Immobilizer (Article 13212)

Non Standards
- Immobilizer Schematics (13213)

Theft Deterrent (Article 13344)

Non Standards
- Theft Deterrent System Schematics (13345)

Anti-Theft - Forced Entry Circuit (Article 10874)

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Anti-Theft - Pass-Key Circuit (Article 10847)

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Immobilizer (Article 13205)

Non Standards
- Replacing Keys (13206)

Immobilizer - Fastener Specifications (Article 13214)

Application Specification
Metric English
Theft Deterrent Module Bolt/Screw 2 Nm 18 lb in

All New Technical Service Bulletins (itype_432)

Tsbs
- Diagnostic Tip - Unable to Learn RKE Transmitters (PIT4945H, 2019/02/19)
- Diagnostic Tip - Security Light on Intermittently / No Crank/No Start or Start Stall / Keyless Access Vehicles May Display No Remote/Fob Detected / Poor or No RKE Range / Service TPM (PIC5650M, 2025/08/06)

All Technical Service Bulletins (itype_100)

Tsbs
- Normal Characteristic - Heated Seat Operation After Performing A Remote Vehicle Start (RVS) (PIC5322D, 2015/05/29)
- Key & Transmitter Programming (PIC6401, 2020/02/03)
- Diagnostic Tip - Unable to Learn RKE Transmitters (PIT4945H, 2019/02/19)
- Information on Using MyBuick, MyCadillac, MyChevrolet, and MyGMC Phone Applications to Control GM Accessory Remote Start Kits (16-NA-355, 2018/10/22)
- Information for Fleet Vehicles - Ignition Key, Fob and Key Rings Configuration (14-00-89-004D, 2017/10/23)
- Tire Monitor System - TPMS Lamp On, No Tire Pressures Displayed (PI1241, 2014/05/16)
- Intermittent Remote Keyless Entry Inoperative (PIT5119F, 2017/11/20)
- Information on How to Prevent Inadvertent Vehicle Starting from Key Fob or OnStar Mobile Application (17-NA-244, 2017/07/25)
- Diagnostic Tip - Security Light on Intermittently / No Crank/No Start or Start Stall / Keyless Access Vehicles May Display No Remote/Fob Detected / Poor or No RKE Range / Service TPM (PIC5650M, 2025/08/06)
- Keyless Start Transmitter - Poor Appearence After Blade Removal (15-09-83-001A, 2015/07/20)
- Information on Poor, Limited, Reduced Remote Keyless Entry (RKE) or Remote Vehicle Start (RVS) Range (PI1018A, 2015/02/05)

Customer Interest Bulletins (itype_109)

Tsbs
- Keyless Start Transmitter - Poor Appearence After Blade Removal (15-09-83-001A, 2015/07/20)

Repair Tips (itype_110)

Tsbs

- Tire Monitor System - TPMS Lamp On, No Tire Pressures Displayed (PI1241, 2014/05/16)

Immobilizer (Article 13202)

Non Standards
- Immobilizer System Component Programming (13203)
- Transmitter Programming (13209)
- Programming Additional Keys (13204)

Theft Deterrent (Article 13335)

Non Standards
- Theft Deterrent Alarm Malfunction (w/ UTP) (13339)
- Symptoms - Theft Deterrent (13343)
- Content Theft Deterrent Malfunction (w/ UTP) (13336)
- Content Theft Deterrent Malfunction (w/o UTP) (13337)
- Security Indicator Malfunction (13340)

Immobilizer (Article 13199)

Non Standards
- Symptoms - Immobilizer (13201)
- OnStar Stolen Vehicle Slowdown Active (13200)

Erratic Operation (itype_132)

Tsbs
- Diagnostic Tip - Unable to Learn RKE Transmitters (PIT4945H, 2019/02/19)
- Keyless Start Transmitter - Poor Appearence After Blade Removal (15-09-83-001A, 2015/07/20)

Inoperative (itype_148)

Tsbs
- Intermittent Remote Keyless Entry Inoperative (PIT5119F, 2017/11/20)

Poor performance (itype_162)

Tsbs
- Information on Poor, Limited, Reduced Remote Keyless Entry (RKE) or Remote Vehicle Start (RVS) Range (PI1018A, 2015/02/05)

Miscellaneous Information (itype_111)

Tsbs
- Normal Characteristic - Heated Seat Operation After Performing A Remote Vehicle Start (RVS) (PIC5322D, 2015/05/29)
- Information on Using MyBuick, MyCadillac, MyChevrolet, and MyGMC Phone Applications to Control GM Accessory Remote Start Kits (16-NA-355, 2018/10/22)
- Information for Fleet Vehicles - Ignition Key, Fob and Key Rings Configuration (14-00-89-004D, 2017/10/23)
- Information on How to Prevent Inadvertent Vehicle Starting from Key Fob or OnStar Mobile Application (17-NA-244, 2017/07/25)

OEM Policies and Procedures (itype_120)

Tsbs
- Key & Transmitter Programming (PIC6401, 2020/02/03)