

2010 ACCESSORIES & EQUIPMENT

Theft Deterrent - Equinox & Terrain

SCHEMATIC AND ROUTING DIAGRAMS

THEFT DETERRENT SYSTEM SCHEMATICS

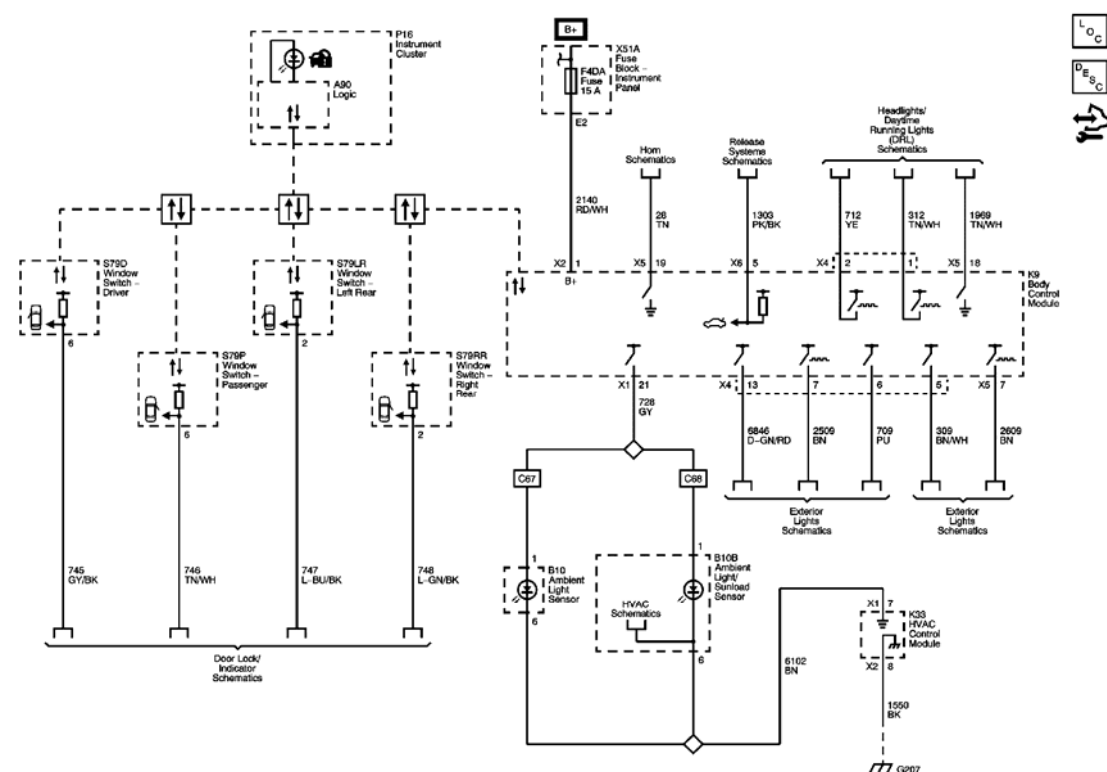


Fig. 1: View Of Theft Deterrent System Schematic  
Courtesy of GENERAL MOTORS CORP.

DIAGNOSTIC INFORMATION AND PROCEDURES

DIAGNOSTIC CODE INDEX

DIAGNOSTIC CODE INDEX

| DTC       | Description                                                                                                                                                                     |
|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| DTC B0685 | B0685 01: Security System Indicator Circuit Short to Battery<br>B0685 02: Security System Indicator Circuit Short to Ground<br>B0685 04: Security System Indicator Circuit Open |

DTC B0685

**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 Descriptors**

**DTC B0685 01**

Security System Indicator Circuit Short to Battery

**DTC B0685 02**

Security System Indicator Circuit Short to Ground

**DTC B0685 04**

Security System Indicator Circuit Open

**Diagnostic Fault Information**

| Circuit              | Short to Ground | Open/High Resistance | Short to Voltage | Signal Performance |
|----------------------|-----------------|----------------------|------------------|--------------------|
| Security LED Control | B0685 02        | B0685 04             | B0685 01         | -                  |
| Ground               | -               | B0685 04             | -                | -                  |

**Circuit/System Description**

The security LED is controlled by the body control module (BCM) based on commands from the content theft deterrent system. The security LED is located in the dash as part of the ambient light sensor and is supplied ground at all times. When the content theft deterrent system requests the LED be commanded ON, the BCM applies voltage to the security indicator control circuit, illuminating the LED.

**Conditions for Running the DTC**

The system voltage is at least 9 V and no more than 16 V.

**Conditions for Setting the DTC**

**B0685 01**

The BCM detects a short to voltage on the security indicator control circuit.

**B0685 02**

The BCM detects a short to ground on the security indicator control circuit.

## **B0685 04**

The BCM detects an open on the security indicator control circuit.

### **Action Taken When the DTC Sets**

Security LED output is disabled

### **Conditions for Clearing the DTC**

- A current DTC is cleared when the conditions for setting the DTC are no longer present.
- A history DTC will clear after 40 malfunction free ignition cycles.

### **Reference Information**

### **Schematic Reference**

### **Theft Deterrent System Schematics**

### **Connector End View Reference**

### **Component Connector End Views**

### **Description and Operation**

### **Content Theft Deterrent (CTD) 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**

Arm the content theft deterrent system. The security LED should illuminate and/or flash during the arming sequence.

### **Circuit/System Testing**

1. Ignition OFF, disconnect the harness connector at the B10B Light/Sunload Ambient Sensor.
2. Test for less than 10 ohms between the ground circuit terminal 6 and ground.

- If greater than the specified range, test the ground circuit for an open/high resistance.
- 3. Ignition ON, test for less than 1V between the control circuit terminal 1 and ground.
  - If greater than the specified range, test the control circuit for a short to voltage. If the circuit tests normal, replace the K9 BCM.
- 4. Command the security LED ON. Test for B+ between the control circuit terminal 1 and ground.
  - If less than the specified range, test the control circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the K9 BCM.
- 5. If all circuits test normal, replace the B10B Light/Sunload Ambient Sensor.

### Repair Procedures

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

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

### SYMPTOMS - THEFT DETERRENT

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

1. Perform **Diagnostic System Check - Vehicle** 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 link.
2. Review the system operation in order to familiarize yourself with the system functions. Refer to the following **Content Theft Deterrent (CTD) Description and Operation**.

### Visual/Physical Inspection

- Inspect for aftermarket devices which could affect the operation of the Theft Deterrent System. 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 a symptom diagnostic procedure from the following list in order to diagnose the symptom:

- **Content Theft Deterrent Malfunction**
- **Security Indicator Malfunction**

### CONTENT THEFT DETERRENT 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.

## Circuit/System Description

The content theft deterrent system is a software based system in which the body control module (BCM) actively monitors certain inputs to determine if unauthorized vehicle access is being attempted. Based on inputs such as the door ajar switches, the rear compartment ajar switch, and the hood ajar switch, the BCM determines whether a content theft deterrent alarm is warranted. If unauthorized access is being detected, the BCM will pulse the vehicle horn and flash the turn signals as a means of theft deterrence.

## Reference Information

### Schematic Reference

#### **Theft Deterrent System Schematics**

### Connector End View Reference

#### **Component Connector End Views**

## Description and Operation

### **Content Theft Deterrent (CTD) 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. Ignition ON, individually open and close each vehicle door while observing the door ajar indicator/message. The indicator/message should accurately transition between the door ajar and door closed state when each door is opened and closed.
  - If the door ajar indicator/message does not properly transition when each door is opened and closed, refer to **Door Ajar Indicator Malfunction** .

- 2. Completely lower the driver door window and close all vehicle doors.
- 3. Ignition OFF, arm the content theft deterrent system. Verify the scan tool Content Theft Deterrent Alarm Status parameter is Armed.
  - o If not the specified value, refer to **Keyless Entry System Malfunction** .
- 4. Without disarming the system, reach in through the open driver window, unlock and open the driver door. Verify the scan tool Content Theft Deterrent Alarm Status parameter is Alarm.
  - o If not the specified value, replace the K9 body control module.
- 5. With the door open, verify the vehicle horn is pulsing and the exterior lamps are flashing.
  - o If the horn is not pulsing, refer to **Horns Malfunction** .
  - o If the exterior lights are not flashing, refer to **Headlamps Malfunction** .

**Repair Procedures**

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

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

**SECURITY INDICATOR 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.

**DTC Descriptors**

**DTC B0685 01**

Security System Indicator Circuit Short to Battery

**DTC B0685 02**

Security System Indicator Circuit Short to Ground

**DTC B0685 04**

Security System Indicator Circuit Open

**Diagnostic Fault Information**

| Circuit              | Short to Ground | Open/High Resistance | Short to Voltage | Signal Performance |
|----------------------|-----------------|----------------------|------------------|--------------------|
| Security LED Control | B0685 02        | B0685 04             | B0685 01         | -                  |
|                      |                 |                      |                  |                    |

|        |   |          |   |   |
|--------|---|----------|---|---|
| Ground | - | B0685 04 | - | - |
|--------|---|----------|---|---|

## Circuit/System Description

The security LED is controlled by the body control module (BCM) based on commands from the content theft deterrent system. The security LED is located in the dash as part of the ambient light sensor and is supplied ground at all times. When the content theft deterrent system requests the LED be commanded ON, the BCM applies voltage to the security indicator control circuit, illuminating the LED.

## Conditions for Running the DTC

The system voltage is at least 9 V and no more than 16 V.

## Conditions for Setting the DTC

### B0685 01

The BCM detects a short to voltage on the security indicator control circuit.

### B0685 02

The BCM detects a short to ground on the security indicator control circuit.

### B0685 04

The BCM detects an open on the security indicator control circuit.

## Action Taken When the DTC Sets

Security LED output is disabled

## Conditions for Clearing the DTC

- A current DTC is cleared when the conditions for setting the DTC are no longer present.
- A history DTC will clear after 40 malfunction free ignition cycles.

## Reference Information

## Schematic Reference

## Theft Deterrent System Schematics

## Connector End View Reference

## Component Connector End Views

## Description and Operation

## **Content Theft Deterrent (CTD) 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**

Arm the content theft deterrent system. The security LED should illuminate and/or flash during the arming sequence.

### **Circuit/System Testing**

1. Ignition OFF, disconnect the harness connector at the B10B Light/Sunload Ambient Sensor.
2. Test for less than 10 ohms between the ground circuit terminal 6 and ground.
  - If greater than the specified range, test the ground circuit for an open/high resistance.
3. Ignition ON, test for less than 1V between the control circuit terminal 1 and ground.
  - If greater than the specified range, test the control circuit for a short to voltage. If the circuit tests normal, replace the K9 BCM.
4. Command the security LED ON. Test for B+ between the control circuit terminal 1 and ground.
  - If less than the specified range, test the control circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the K9 BCM.
5. If all circuits test normal, replace the B10B Light/Sunload Ambient Sensor.

### **Repair Procedures**

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

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

## **DESCRIPTION AND OPERATION**

### **CONTENT THEFT DETERRENT (CTD) DESCRIPTION AND OPERATION**

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 function receiver module/Remote control door lock receiver
- Security Indicator
- 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:

1. Place the shift lever in P (park).
2. Turn OFF the ignition.
3. Open any door.

**NOTE:**        **The system is not armed if the doors are locked manually; the power door lock switch or remote keyless entry transmitter must be used to arm the content theft deterrent system.**

4. Lock the doors with the power door lock switch or the LOCK button on the transmitter. The system is in standby mode and will not start the arming timer until all doors are closed.
5. The system will begin the arm sequence immediately after the last door is closed. If the keyless entry transmitter is used the arm the system after the vehicle doors are closed, the arm sequence will begin as soon as the LOCK command is received by the transmitter.
6. Double clicking the LOCK command on the keyless entry transmitter will bypass the delayed arming function and force the system to arm.
7. If the vehicle is equipped with passive locks, the vehicle will start the arming sequence when a keyless entry transmitter is no longer detected.

### **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 or using the key to lock the doors 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 power door lock switch or the keyless entry transmitter, it must be disarmed.

**NOTE:**        **Disconnecting the battery or pulling fuses does not disable the arm mode, since the BCM stores the content theft deterrent mode status in memory.**

- To disarm the content theft deterrent system in standby mode, perform one of the following:
  - Press either power door unlock switch.
  - 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):
  - Press the UNLOCK button on the keyless entry transmitter.
  - 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.

1. 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 either the power door lock switch or the LOCK button on the transmitter.
2. 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.
3. 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 forced entry activates the alarm mode.
4. When the BCM detects a forced 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 Function Receiver Module/Remote Control Door Lock Receiver

The keyless entry system can arm and disarm the content theft deterrent system. When the keyless entry module receives a door lock or unlock signal from the transmitter, the keyless entry module sends a message to the

BCM via serial data to perform the appropriate arm/disarm functions.

### **Security Indicator**

The security LED is illuminated on the upper I/P by the BCM. The content theft deterrent system uses the security LED to inform the driver of system status prior to arming.

### **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:

- The door ajar switches
- The keyless entry transmitter LOCK/UNLOCK buttons; a message from the Remote function receiver module/Remote control door lock receiver
- The 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
- The rear compartment ajar switch
- The hood ajar switch

### **Outputs**

The BCM controls the following for content theft deterrent:

- The horn relay
- The exterior lamps