

TIRE PRESSURE MONITOR SYSTEMS

GM - Chevrolet - Impala - 2008-19

DESCRIPTION & OPERATION

NOTE: If a tire pressure sensor or the RCDLR is replaced, or if wheels have been rotated, tire pressure sensor must be relearned. See [**RESET PROCEDURES**](#).

TIRE PRESSURE MONITOR (TPM) SYSTEM

The Tire Pressure Monitor (TPM) system alerts the driver of a large tire pressure change in any of the 4 tires, while the vehicle is being driven. The system will also display individual tire pressures and their locations on the Driver Information Center (DIC).

The TPM system uses the Body Control Module (BCM), Instrument Panel Cluster (IPC), Driver Information Center (DIC), Remote Control Door Lock Receiver (RCDLR), a Radio Frequency (RF) transmitting pressure sensor in each wheel/tire assembly, and the serial data circuit to perform the system functions.

When vehicle is stationary, the sensors go into stationary mode. In this mode, the sensors sample the tire pressure once every 30 seconds and only transmit if the tire pressure changes, to minimize sensor battery consumption. As vehicle speed increases, the sensors go into drive mode, in which they transmit once every 60 seconds. Each sensor takes a pressure measurement sample continuously; if the tire pressure increases or decreases by more than 1.2 psi (8.3 kPa,) the sensor will transmit in re-measure mode in stationary mode or drive mode.

The RCDLR receives and translates the data contained in each sensor transmission, then sends the tire pressure and tire location data to DIC. When TPM system detects a significant loss or gain of tire pressure, a "CHECK TIRE PRESSURE" message will appear on the DIC (if equipped), and the low tire pressure warning indicator is displayed on the IPC.

The RCDLR has the ability to detect malfunctions within the TPM system. Any malfunctions detected will cause the DIC to display a "SERVICE TIRE MONITOR" warning message.

TIRE PRESSURE MONITOR WARNING INDICATORS

When the TPM system detects a significant loss of tire pressure, the "CHECK TIRE PRESSURE" message is displayed on the DIC and the low tire pressure indicator is displayed on the instrument panel. Both the message and indicator can be cleared by adjusting the tires to their recommended pressures and driving the vehicle above 25 mph (40 km/h) for at least 2 minutes. If warning indicators are still on or display shows dashes instead of a value, there is a problem in the TPM system.

The RCDLR has the ability to detect malfunctions within the TPM system. Any malfunctions detected will cause the DIC to display a "SERVICE TIRE MONITOR" warning message. See appropriate manufacturer service information.

TPMS RESET PROCEDURES

NOTE: If a tire pressure sensor or the RCDLR is replaced, or if wheels have been rotated, tire pressure sensor must be relearned.

When the TPM system detects a significant loss of tire pressure, the "CHECK TIRE PRESSURE" message is displayed on the DIC and the low tire pressure indicator is displayed on the instrument panel. Both the message and indicator can be cleared by adjusting the tires to their recommended pressures and driving the vehicle above 25 mph (40 km/h) for at least 2 minutes.

TIRE PRESSURE SENSOR RELEARN

- NOTE:** Once the learn mode has been enabled, each of the sensor's unique identification (ID) codes can be learned into the RCDLR's memory. When a sensor's ID has been learned, the RCDLR sends a serial data message to the BCM to sound a horn chirp. This verifies the sensor has transmitted its ID and the RCDLR has received and learned it. The RCDLR must learn the sensor IDs in the proper order to determine correct sensor location. The first learned ID is assigned to left front, the second to right front, third to right rear and fourth to left rear.
- NOTE:** Each turn signal will illuminate one at a time indicating which location is to be learned next.
- NOTE:** Each sensor takes a pressure measurement sample once every 30 seconds while in stationary mode. If the tire pressure increases or decreases by more than 1.2 psi (8.3 kPa) from the last pressure measurement, another measurement will occur immediately to verify the change in pressure. If a pressure change has indeed occurred, the sensor transmits a learn mode. When the RCDLR receives a learn mode transmission while in sensor learn mode, it will assign that sensor's ID to the location on the vehicle relative to the order in which it was learned.
- NOTE:** The TPM system will cancel the learn mode if more than 2 minutes have passed and no sensors have been learned, or if the ignition switch is turned to the OFF position. If the learn mode is canceled before the first ID is learned, the RCDLR will remember all previously stored IDs and their locations. As soon as the first sensor ID is learned, all other IDs are erased from the RCDLR's memory. If the learn mode is canceled after the first ID is learned, the RCDLR will store the IDs as invalid and the DIC will display dashes instead of tire pressures.
- NOTE:** In the following procedures, a TPM Special Tool (EL-46079 or EL-50448) may be used in place of increasing/decreasing pressures to enable sensor. To use, place activator antenna against the tire sidewall close to the wheel rim at the valve stem location, then press and release the ACTIVATE button.
- NOTE:** If a TPM Sensor Activation Tool is used, and vehicle is having trouble entering relearn mode, check batteries in activation tool. Low batteries may allow some functions to work, but not allow vehicle to perform learn function. When the internal battery is fresh (fully charged), the indicator is "full" or all dark. When the battery is depleted, the indicator shows "empty" or all light.

The learn mode can be enabled using any one of the following three methods:

- [Using Keyless Entry System](#)
- [Using Scan Tool](#)
- [Using Driver Information Center \(DIC\)](#)

- NOTE:** Before proceeding with the steps below, ensure that no other sensor learn procedure is being performed simultaneously and that no tire pressures are being adjusted on another TPM equipped vehicle within close proximity.

Using Keyless Entry System

1. Turn ignition switch to ACCY position. Apply parking brake.
2. Simultaneously press the keyless entry transmitter's lock and unlock buttons until a double horn chirp sounds, indicating the learn mode has been enabled.

NOTE: The left front turn signal will also illuminate to indicate the learn mode has been enabled.

3. Starting with left front tire, follow either of these 2 procedures:
 - **Increase/Decrease Method:** Increase or decrease tire pressure for 8-10 seconds, then wait for the horn to make a chirp sound. The horn chirp may occur before the 8-10 second pressure increase/decrease time period has been reached, or up to 30 seconds after the 8-10 second pressure increase/decrease time period has been reached
 - **Sensor Activation Tool Method:** Starting with the left front tire, hold the activation tool against the tire wall aiming upward with the antenna. Press the activate button and wait for a horn chirp.
4. After horn chirp has sounded and the right turn signal has illuminated, repeat procedure for the next 3 sensors in the following order: right front, right rear and left rear.
5. After left rear sensor has been learned, a double horn chirp will sound, indicating all 4 sensor IDs have been learned. Turn ignition switch to OFF position. Adjust all tire pressures to specification.

Using Scan Tool

NOTE: Before proceeding with the steps below, ensure that no other sensor learn procedure is being performed simultaneously and that no tire pressures are being adjusted on another TPM equipped vehicle within close proximity.

1. Connect scan tool. Turn ignition switch to RUN position. Apply parking brake.
2. Using scan tool, select "SPECIAL FUNCTIONS".
3. Select "SENSOR LEARN MODE ENABLE", and press ENTER key.
4. Press ON soft key. A double horn chirp will sound, indicating the learn mode has been enabled.

NOTE: The left front turn signal will also illuminate to indicate the learn mode has been enabled.

5. Starting with left front tire, follow either of these 2 procedures:
 - **Increase/Decrease Method:** Increase or decrease tire pressure for 8-10 seconds, then wait for the horn to make a chirp sound. The horn chirp may occur before the 8-10 second pressure increase/decrease time period has been reached, or up to 30 seconds after the 8-10 second pressure increase/decrease time period has been reached
 - **Sensor Activation Tool Method:** Starting with the left front tire, hold the activation tool against the tire wall aiming upward with the antenna. Press the activate button and wait for a horn chirp.
6. After horn chirp has sounded, repeat procedure for the next 3 sensors in the following order: right front, right rear and left rear.
7. After left rear sensor has been learned, a double horn chirp will sound, indicating all 4 sensor IDs have been learned. Turn ignition switch to OFF position. Adjust all tire pressures to specification.

Using Driver Information Center (DIC)

NOTE: Before proceeding with the steps below, ensure that no other sensor learn procedure is being performed simultaneously and that no tire pressures are being adjusted on another TPM equipped vehicle within close proximity.

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1. Turn ignition switch to RUN position. Apply parking brake.
2. Press the "INFO" button on the DIC (located on the instrument panel, to the right of the instrument panel cluster), until the "RELEARN TIRE POSITIONS" message display on the DIC. Then press the "SET/RESET" button on the DIC until a double horn chirp sounds and the DIC displays "TIRE LEARNING ACTIVE". This will indicate the learn mode has been enabled.
3. Proceed to **All Models**, below.

1. Turn the ignition to ON/RUN with the engine off or place the vehicle power mode in ON/RUN/START.
2. Make sure the Tire Pressure info page option is turned on.

NOTE: The info pages on the DIC can be turned on and off through the Settings menu.

3. Use the DIC controls on the right side of the steering wheel to scroll to the Tire Pressure screen under the DIC info page.
4. Press and hold the Set/Reset button (check-mark symbol) located in the center of the DIC controls.
5. The horn sounds twice to signal the receiver is in relearn mode and the TIRE LEARNING ACTIVE message displays on the DIC screen.
6. Proceed to **All Models**, below.

All Models

1. Starting with left front tire, follow either of these 2 procedures:
 - **Increase/Decrease Method:** Increase or decrease tire pressure for 8-10 seconds, then wait for the horn to make a chirp sound. The horn chirp may occur before the 8-10 second pressure increase/decrease time period has been reached, or up to 30 seconds after the 8-10 second pressure increase/decrease time period has been reached
 - **Sensor Activation Tool Method:** Starting with the left front tire, hold the activation tool against the tire wall aiming upward with the antenna. Press the activate button and wait for a horn chirp.
2. After horn chirp has sounded and the right turn signal has illuminated, repeat procedure for the next 3 sensors in the following order: right front, right rear and left rear.
3. After left rear sensor has been learned, a double horn chirp will sound, indicating all 4 sensor IDs have been learned. Turn ignition switch to OFF position. Adjust all tire pressures to specification.

DISMOUNTING/MOUNTING PROCEDURES

CAUTION: The tire should be dismounted from the wheel using the tire changer manufacturer's instructions. Use the following information to avoid damage during the dismounting/mounting procedures.

NOTE: If vehicle's tires are replaced with those not having a TPC Spec number, the TPM system may give an inaccurate low pressure warning. Non-TPC Spec tires may give a low pressure warning that is higher or lower than the proper warning level achieved by TPC Spec numbered tires.

NOTE: If a tire pressure sensor or the RCDLR is replaced, or if wheels have been rotated, tire pressure sensor must be relearned. See **RESET PROCEDURES**.

TIRE PRESSURE SENSOR

CAUTION: DO NOT inject any tire liquid or aerosol tire sealant into tires, as this may cause a malfunction of the tire pressure sensors. If any tire sealant is noted upon tire dismounting, replace the sensor. Also remove all residual liquid sealant from the inside of the tire and wheel surfaces.

Removal

1. Raise vehicle on a suitable support. Remove tire/wheel assembly from vehicle.
2. Dismount tire from wheel following tire changer manufacturer's instructions while paying special attention to the following to avoid damaging tire pressure sensor:

- Place the sensor's cap and valve on a dry, clean surface after removal. The cap is aluminum and the valve is nickel-plated to prevent corrosion. DO NOT substitute a cap or valve made of any other material.
 - Position the bead breaking fixture 90 degrees from valve stem when separating tire bead from wheel.
 - Position the mounting/dismounting head so tire iron (or pry bar) can be inserted slightly clockwise of sensor body when prying tire bead up and over the mounting/dismounting head.
 - Using tire machine, rotate tire/wheel assembly clockwise when transferring the tire bead to the outside of the wheel rim.
 - Repeat items for inner bead.
3. Remove TORX screw from the tire pressure sensor. See [Fig. 1](#).
 4. Pull screw and tire pressure sensor from the tire pressure valve stem.
 5. Remove the tire pressure valve stem from rim.

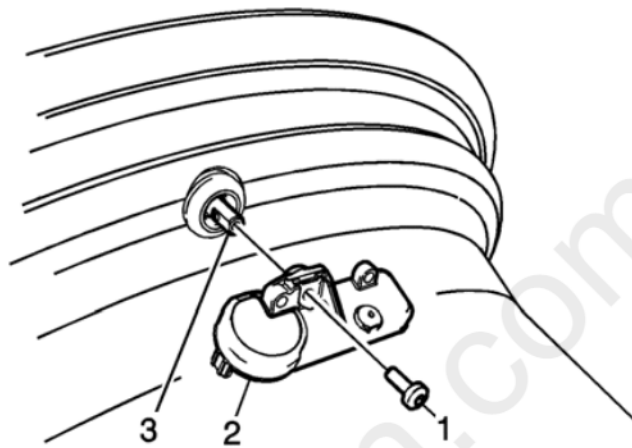


Fig. 1: Exploded View Of Tire Pressure Sensor
Courtesy of GENERAL MOTORS CORP.

Installation

1. Clean any dirt or debris. Assemble the tire pressure sensor to the new tire pressure valve stem. Install new TORX screw. Tighten the screw to 11.5 INCH lbs. (1.3 N.m)
2. Apply tire soap to the tire pressure valve stem.
3. Use tire valve stem mounting tool, and pull the valve stem through the wheel hole in a parallel direction.
4. Before installing tire on the wheel, note the following items to avoid tire pressure sensor damage upon tire mounting:
 - Position the mounting/dismounting head 180 degrees from valve stem.
 - Position the bead transition area 45 degrees counterclockwise of valve stem.
 - Using tire machine, rotate tire/wheel assembly clockwise when transferring tire bead to the inside of the wheel rim.
 - Repeat items for outer bead.
5. Install tire on wheel. Install tire/wheel assembly on vehicle. learn tire pressure sensor. See [RESET PROCEDURES](#).

TORQUE SPECIFICATIONS

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Component	Ft. Lbs. (N.m)
Wheel Nut (2008-12)	100 (140)
Wheel Nut (2014-)	111 (150)
INCH Lbs. (N.m)	
Clamp-In Style Nut	62 (7)

Component	Ft. Lbs. (N.m)
Snap-In Style TORX Screw	89 (10)

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