

2007 Cadillac Escalade

2007 SUSPENSION Tire Pressure Monitoring - Avalanche, Escalade, Suburban, Tahoe & Yukon

2007 SUSPENSION

Tire Pressure Monitoring - Avalanche, Escalade, Suburban, Tahoe & Yukon

SPECIFICATIONS

FASTENER TIGHTENING SPECIFICATIONS

Fastener Tightening Specifications

Application	Specification	
	Metric	English
Tire Pressure Sensor Screw	1.3 N.m	11.5 lb in

DIAGNOSTIC INFORMATION AND PROCEDURES

DIAGNOSTIC CODE INDEX

DIAGNOSTIC CODE INDEX

DTC	Description
<u>DTC C0750, C0755, C0760, or C0765</u>	DTC C0750 Left Front Low Tire Pressure Sensor DTC C0755 Right Front Low Tire Pressure Sensor DTC C0760 Left Rear Low Tire Pressure Sensor DTC C0765 Right Rear Low Tire Pressure Sensor
<u>DTC C0775</u>	Low Tire Pressure System Sensors Not Programmed/Learned

DIAGNOSTIC STARTING POINT - TIRE PRESSURE MONITORING

System Familiarization

Review the tire pressure monitor (TPM) system operation in order to familiarize yourself with the correct system functions and operations. Refer to **Tire Pressure Monitor Description and Operation**.

Visual/Physical Inspection

- Inspect for aftermarket devices, such as tires, wheels, or radio frequency transmitting devices which could affect the operation of the tire pressure monitor (TPM) system. Refer to **Checking Aftermarket Accessories** in Wiring Systems
- Inspect the easily accessible or visible system components for obvious damage which could cause the condition.
- Inspect the tires for the proper inflation pressures.

System Diagnosis

After incorrect system operation has been verified and that aftermarket devices are not the cause, begin the system diagnosis with the diagnostic system check. the diagnostic system check will provide the following

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information:

1. The identification of the control modules that control the TPM system.
2. The ability of those control modules to communicate via the serial data circuit.
3. The presence of any stored diagnostic trouble codes (DTCs) in those control modules and there status.

The use of the diagnostic system check will identify the correct procedure for diagnosing the system and where the procedure is located. Refer to **Diagnostic System Check - Vehicle** in Vehicle DTC Information.

DIAGNOSTIC SYSTEM CHECK - TIRE PRESSURE MONITORING

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

Review the systems description and operation in order to familiarize yourself with the system functions. Refer to **Tire Pressure Monitor Description and Operation**.

1. Inspect for aftermarket devices which could affect the operation of the Tire Pressure Monitoring (TPM) system to verify that none are installed. Refer to **Checking Aftermarket Accessories** .
 - If such devices are installed, remove/disable them and retest.
2. Inspect the easily accessible or visible system components for obvious damage or conditions which could cause the symptom.
 - If damage or such conditions are found, repair as required.
3. Verify that the scan tool Selected Front and Rear Tire Pressure parameters are correct compared to the tires actual pressure ratings.
 - If Tire Pressure parameters are not correct, use scan tool special functions to adjust setting.
4. Using **J-46079** Tire Pressure Monitor Diagnostic Tool, verify that the scan tool pressure sensor ID parameters match the actual on-vehicle locations. See **Special Tools**.
 - If actual pressure sensor locations do not match scan tool readings, refer to **Tire Pressure Sensor Learn**.
5. Verify that the scan tool TPM System Enabled parameter is YES.
 - If the TPM System Enabled parameter is NO, use scan tool special functions to adjust setting.
6. Verify that tires are inflated to the correct pressure.

SCAN TOOL OUTPUT CONTROLS

Scan Tool Output Controls

Scan Tool Output Control	Additional Menu Selections	Description
Tire Pressure Monitor (TPM) Option	TPM Option Enable	After replacing the Remote Control Door Lock Receiver (RCDLR) assembly, the SPS reprogramming must be used to enable the TPM option, refer to <u>Control Module Setup</u> .
Module Setup	Tire Type/Pressure	After replacing the RCDLR assembly, the scan tool must be used to select the correct tire type and the front and rear tire

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	Selection	pressures for the vehicle being serviced. Refer to Control Module Setup .
Module Setup	TPM Learn Mode	The sensor learn procedure must be performed after every tire rotation, RCDLR replacement, or sensor replacement. Once the TPM learn mode has been enabled, each of the sensors unique identification (ID) codes can be learned in to the RCDLR's memory. Refer to Tire Pressure Sensor Learn .

SCAN TOOL DATA LIST

Scan Tool Data List

Scan Tool Parameter	Data List	Units Displayed	Typical Data Value
Operating Conditions: Ignition ON/Engine OFF/Vehicle Stationary for at Least 60 Minutes/Tire Pressures Adjusted to Recommended kPa/psi.			
LF Pressure Status	Data Display	Unknown/Normal/Low/Flat/High	Normal
LF Pressure Sensor Mode	Data Display	Learn/Re-measure/Rolling/Entering Off/Exiting Off/Remeasure	Learn
LF Tire Pressure	Data Display	kPa/psi	35 psi
LF Tire Pressure Sensor Battery Status	Data Display	OK/Low	OK
LF Tire Pressure, Sensor Status	Data Display	Normal/Failed	Normal
LR Pressure Status	Data Display	Unknown/Normal/Low/Flat/High	Normal
LR Pressure Sensor Mode	Data Display	Learn/Re-measure/Rolling/Entering Off/Exiting Off/Remeasure	Learn
LR Tire Pressure	Data Display	kPa/psi	35 psi
LR Tire Pressure Sensor Battery Status	Data Display	OK/Low	OK
LR Tire Pressure, Sensor Status	Data Display	Normal/Failed	Normal
RF Pressure Status	Data Display	Unknown/Normal/Low/Flat/High	Normal
RF Pressure Sensor Mode	Data Display	Learn/Re-measure/Rolling/Entering Off/Exiting Off/Remeasure	Learn
RF Tire Pressure	Data Display	kPa/psi	35 psi
RF Tire Pressure Sensor Battery Status	Data Display	OK/Low	OK
RF Tire Pressure, Sensor Status	Data Display	Normal/Failed	Normal/Failed
RR Pressure Status	Data Display	Unknown/Normal/Low/Flat/High	Normal
RR Pressure Sensor Mode	Data Display	Learn/Re-measure/Rolling/Entering Off/Exiting Off/Remeasure	Learn
RR Tire Pressure	Data Display	kPa/psi	35 psi
RR Tire Pressure Sensor Battery	Data Display	OK/Low	OK

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Status			
RR Tire Pressure, Sensor Status	Data Display	Normal/Failed	Normal
Learn in Progress	Data Display	Yes/No	No
Tire Pressure Indicator Requested	Data Display	Yes/No	No
TPM System Enabled	Data Display	Yes/No	Yes
Vehicle Speed Signal	Data Display	km/h/mph	0

SCAN TOOL DATA DEFINITIONS

LF Pressure Status

The scan tool displays the overall condition of the tire. The conditions that display are Unknown, Normal, Low, Flat and High.

LF Pressure Sensor Mode

This data parameter indicates the mode contained in the last transmission received from the left front tire pressure sensor. The scan tool displays Entering Off, Exiting Off, Rolling, Re-measure, Learn. Entering Off indicates the sensors internal roll switch is opened and the sensor has made its stationary transmission which only occurs once every 60 minutes from the last stationary transmission. Exiting Off indicates the sensor has transition to Rolling mode. In this mode the sensor has detected an initial roll switch closure. Rolling indicates the sensors internal roll switch has been closed for at least 10 seconds. In this mode the sensor is transmitting once every 60 seconds. Re-measure indicates the sensor has detected a 8 KPa (1.2 psi) change in tire pressure. This mode occurs to keep the system updated as to any changes in tire pressure. Learn indicates the sensor has been activated by a low frequency (LF) signal. Low Bat indicates the sensor's internal battery charge level is low. N/A indicates the sensor is in a mode not supported by the scan tool.

LF Tire Pressure

The scan tool displays 0-703 kPa (0-102 psi). The actual pressure of the left front tire.

LR Pressure Status

The scan tool displays the overall condition of the tire. The conditions that display are Unknown, Normal, Low, Flat and High.

LR Pressure Sensor Mode

This data parameter indicates the mode contained in the last transmission received from the left rear tire pressure sensor. The scan tool displays Entering Off, Exiting Off, Rolling, Re-measure, Learn. Entering Off indicates the sensors internal roll switch is opened and the sensor has made its stationary transmission which only occurs once every 60 minutes from the last stationary transmission. Exiting Off indicates the sensor has transition to Rolling mode. In this mode the sensor has detected an initial roll switch closure. Rolling indicates vehicle speed is greater than 32 km/h (20 mph). In this mode the sensors internal roll switch has been closed for at least 10 seconds and the sensor is transmitting once every 60 seconds. Re-

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measure indicates the sensor has detected a 8 KPa (1.2 psi) change in tire pressure. This mode occurs to decrease the time between when the pressure change occurred and the RCDLR has received it. Learn indicates the sensor has been activated by a LF signal. Low Bat indicates the sensors internal battery charge level is low. N/A indicates the sensor is in a mode not supported by the scan tool.

LR Tire Pressure

The scan tool displays 0-703 kPa (0-102 psi). The actual pressure of the left rear tire.

RF Pressure Status

The scan tool displays the overall condition of the tire. The conditions that display are Unknown, Normal, Low, Flat and High.

RF Pressure Sensor Mode

This data parameter indicates the mode contained in the last transmission received from the right front tire pressure sensor. The scan tool displays Entering Off, Exiting Off, Rolling, Re-measure, Learn. Entering Off indicates the sensors internal roll switch is opened and the sensor has made its stationary transmission which only occurs once every 60 minutes from the last stationary transmission. Exiting Off indicates the sensor has transition to Rolling mode. In this mode the sensor has detected an initial roll switch closure. Rolling indicates vehicle speed is greater than 32 km/h (20 mph). In this mode the sensors internal roll switch has been closed for at least 10 seconds and the sensor is transmitting once every 60 seconds. Re-measure indicates the sensor has detected a 8 KPa (1.2 psi) change in tire pressure. This mode occurs to decrease the time between when the pressure change occurred and the RCDLR has received it. Learn indicates the sensor has been activated by a LF signal. Low Bat indicates the sensors internal battery charge level is low. N/A indicates the sensor is in a mode not supported by the scan tool.

RF Tire Pressure

The scan tool displays 0-703 kPa (0-102 psi). The actual pressure of the right front tire.

RR Pressure Status

The scan tool displays the overall condition of the tire. The conditions that display are Unknown, Normal, Low, Flat and High.

RR Pressure Sensor Mode

This data parameter indicates the mode contained in the last transmission received from the right rear tire pressure sensor. The scan tool displays Entering Off, Exiting Off, Rolling, Re-measure, Learn. Entering Off indicates the sensors internal roll switch is opened and the sensor has made its stationary transmission which only occurs once every 60 minutes from the last stationary transmission. Exiting Off indicates the sensor has transition to Rolling mode. In this mode the sensor has detected an initial roll switch closure. Rolling indicates vehicle speed is greater than 32 km/h (20 mph). In this mode the sensors internal roll switch has been closed for at least 10 seconds and the sensor is transmitting once every 60 seconds. Re-measure indicates the sensor has detected a 8 KPa (1.2 psi) change in tire pressure. This mode occurs to

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decrease the time between when the pressure change occurred and the RCDLR has received it. Learn indicates the sensor has been activated by a LF signal. Low Bat indicates the sensors internal battery charge level is low. N/A indicates the sensor is in a mode not supported by the scan tool.

RR Tire Pressure

The scan tool displays 0-703 kPa (0-102 psi). The actual pressure of the right rear tire.

Sensor Learn Mode

The scan tool displays Active, or Inactive. Active indicates the Tire Pressure Monitor (TPM) systems tire pressure sensor learn mode is active and able to learn all 4 sensor Id codes. Inactive indicates the TPM system is not able to learn the sensor Id codes.

Tire Pressure Indicator Request

The scan tool displays Yes or No.

Tire Pressure Sensor Battery Status

The scan tool displays OK or Low. The Low Battery indicates the sensors internal batter charge level is low.

TPM System Enabled

The scan tool displays Yes, or No. Yes indicates the TPM System has been enabled in the RCDLR. No indicates the TPM System has not been enabled in the RCDLR.

Vehicle Speed

The scan tool displays 0-255 km/h (0-159 mph). The actual speed of the vehicle.

DTC C0750, C0755, C0760, OR C0765

Circuit Description

The tire pressure monitor (TPM) system has 4 radio frequency (RF) transmitting pressure sensors inside each wheel/tire assembly. As vehicle speed increases to at least 32 km/h (20 mph) the sensor's internal roll switch closes which puts the sensors into drive mode. The sensors begin to transmit once every 60 seconds to the remote control door lock receiver (RCDLR). The data within the sensors RF transmission is translated by the RCDLR into sensor presence, sensor mode, and tire pressure. If a sensor did not go into drive mode, or is not transmitting at all, the RCDLR will set the appropriate DTC.

DTC Descriptors

This diagnostic procedure supports the following DTCs:

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- DTC C0750 Left Front Low Tire Pressure Sensor
- DTC C0755 Right Front Low Tire Pressure Sensor
- DTC C0760 Left Rear Low Tire Pressure Sensor
- DTC C0765 Right Rear Low Tire Pressure Sensor

Conditions for Running the DTC

Vehicle speed is 40 km/h (25 mph), or greater for 2 minutes.

Conditions for Setting the DTC

Any given sensor stops transmitting for 5 minutes.

Action Taken When the DTC Sets

- A DTC is stored in memory.
- The driver information center (DIC) displays the SERVICE TIRE MONITOR warning message.

Conditions for Clearing the DTC

- A current DTC will clear when the malfunction is no longer present.
- A history DTC will clear after 100 consecutive malfunction free ignition cycles.
- Using a scan tool

Diagnostic Aids

- Occasionally sensors can become mislocated due to previous tire rotations where the sensor learn procedure was not performed. Always learn the sensors to ensure the DTC set is for that actual physical corner of the vehicle. Refer to **Tire Pressure Sensor Learn**.
- Occasionally sensor transmissions are not received by the RCDLR due to vehicle level RF interference.

Test Description

The numbers below refer to the step numbers on the diagnostic table.

- 2:** This step tests if the sensors internal battery level is low.
- 3:** This step tests if the malfunction was system, or vehicle condition related.
- 5:** This step tests if the sensors internal roll switch is functioning properly.
- 6:** This step tests if the malfunction was corrected by sensor replacement or if the malfunction still exists in the RCDLR.

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Step	Action	Yes	No
	Did you perform the Diagnostic System Check -		Go to Diagnostic

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1	Vehicle?	Go to Step 2	<u>System Check - Vehicle</u>
2	1. Install a scan tool. 2. Turn ON the ignition, with the engine OFF. 3. With a scan tool, observe the Suspect Pressure Sensor Mode Data parameter in Data Display. Does the scan tool indicate that the suspect Pressure Sensor Mode is Low Bat?	Go to Step 6	Go to Step 3
3	Since some occurrences of this DTC are caused by certain vehicle conditions. Review the tire pressure monitor (TPM) system with the customer to verify the conditions under which the DTC set. Did vehicle conditions cause this DTC to set?	Go to Diagnostic Aids	Go to Step 4
4	Learn the tire pressure sensors. Refer to <u>Tire Pressure Sensor Learn</u>. Did a horn chirp sound when learning the suspect sensor?	Go to Step 5	Go to Step 6
5	1. Test drive the vehicle above 32 km/h (20 mph) for 10 seconds. 2. With the scan tool observe the Suspect Pressure Sensor Mode Data parameter. Does the Suspect Pressure Sensor Mode data parameter change from Wake to Drive above 32 km/h (20 mph)?	System OK	Go to Step 6
6	Replace the suspect tire pressure sensor. Refer to <u>Tire Pressure Sensor Replacement (Snap In Style)</u> or <u>Tire Pressure Sensor Replacement (Clamp In Style)</u>. Did a horn chirp sound when learning the suspect sensor?	Go to Step 8	Go to Step 7
7	Replace the remote control door lock receiver (RCDLR) module assembly. Refer to <u>Control Module References</u> for replacement, setup, and programming. Did you complete the replacement?	Go to Step 8	-
8	1. Use the scan tool in order to clear the DTCs. 2. Operate the vehicle within the conditions for running the DTC. Does the DTC reset?	Go to Step 2	System OK

DTC C0775

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Circuit Description

The remote control door lock receiver (RCDLR) receives a radio frequency (RF) transmission from each tire pressure sensor. Each sensor has its own unique identification code contained within its RF transmission. These ID codes must be learned into the RCDLR memory to eliminate all other random RF transmissions from being received by the RCDLR.

DTC Descriptor

This diagnostic procedure supports the following DTC:

DTC C0775 Low Tire Pressure System Sensors Not Programmed/Learned

Conditions for Running the DTC

The ignition is ON.

Conditions for Setting the DTC

No tire pressure sensor ID codes have been learned into the RCDLRs memory.

Action Taken When the DTC Sets

- DTC C0775 is stored in memory.
- The driver information center (DIC) displays the SERVICE TIRE MONITOR warning message.

Conditions for Clearing the DTC

- A current DTC will clear when the sensor ID codes have been learned into the RCDLRs memory.
- A history DTC will clear after 100 consecutive malfunction free ignition cycles from when the sensor ID codes have been learned into the RCDLRs memory.
- Using a scan tool.

Diagnostic Aids

A newly replaced RCDLR will set DTC C0775 on its initial ignition ON cycle.

DTC C0775

Step	Action	Yes	No
1	Did you perform the Diagnostic System Check - Vehicle?	Go to Step 2	Go to <u>Diagnostic System Check - Vehicle</u>
2	Learn the tire pressure sensors. Refer to <u>Tire Pressure Sensor Learn</u> . Did you complete the procedure?	Go to Step 3	-
	1. Use the scan tool in order to clear the DTCs.		

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3	2. Operate the vehicle within the Conditions for Running the DTC. Does the DTC reset?	Go to Step 2	System OK
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SYMPTOMS - TIRE PRESSURE MONITORING

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:

- **Low Tire Pressure Indicator Always On**
- **Low Tire Pressure Indicator Inoperative**

LOW TIRE PRESSURE INDICATOR ALWAYS ON

Low Tire Pressure Indicator Always On

Step	Action	Yes	No
1	Did you perform the Diagnostic System Check - Vehicle?	Go to Step 2	Go to <u>Diagnostic System Check - Vehicle</u>
2	1. Turn OFF the ignition. 2. Turn ON the ignition, with the engine OFF. 3. Observe the low tire pressure indicator on the instrument panel cluster (IPC) during bulb check. Does the indicator illuminate during bulb check and then turn OFF?	Go to <u>Testing for Intermittent Conditions and Poor Connections</u>	Go to Step 3
3	Inspect the tires for proper inflation pressure and inflate as needed. Refer to <u>Label - Vehicle Certification, Tire Place Card, Anti-Theft and Service Parts ID</u> . Did you find and correct the condition?	Go to Step 5	Go to Step 4
4	Replace the IPC. Refer to <u>Control Module References</u> for replacement, setup, and programming. Did you complete the replacement?	Go to Step 5	-
5	Operate the system in order to verify the repair. Did you correct the condition?	System OK	Go to Step 2

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LOW TIRE PRESSURE INDICATOR INOPERATIVE

Low Tire Pressure Indicator Inoperative

Step	Action	Yes	No
1	Did you perform the Diagnostic System Check - Vehicle?	Go to Step 2	Go to <u>Diagnostic System Check - Vehicle</u>
2	1. Turn OFF the ignition. 2. Turn ON the ignition, with the engine OFF. 3. Observe the low tire pressure indicator on the instrument panel cluster (IPC) during bulb check. Does the indicator illuminate during bulb check and then turn OFF?	Go to <u>Testing for Intermittent Conditions and Poor Connections</u>	Go to Step 3
3	Replace the IPC. Refer to <u>Control Module References</u> for replacement, setup, and programming. Did you complete the replacement?	Go to Step 4	-
4	Operate the system in order to verify the repair. Did you correct the condition?	System OK	Go to Step 2

REPAIR INSTRUCTIONS

CONTROL MODULE SETUP

Remote Control Door Lock Receiver (RCDLR) Setup

After remote control door lock receiver assembly replacement, the following procedures must be performed in the order that they appear for the tire pressure monitor (TPM) System to function properly. The RCDLR also requires keyless entry transmitter programming after replacement. Refer to **Transmitter Programming**.

Tire Type/Pressure Selection

Since there are different tire types and pressure combinations for different vehicles, it is necessary to select the correct tire type and tire pressures for the vehicle being serviced.

1. Install a scan tool.
2. Turn ON the ignition, with the engine OFF.
3. With the scan tool select Vehicle Control System.
4. Select Module Setups.
5. Select Remote Control Door Lock Receiver.
6. Select Tire Type/Pressure Selection.
7. Select P-Metric Standard.

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8. Select the front tire pressure as noted on the vehicle drivers door placard sticker.
9. Select the rear tire pressure as noted on the vehicle drivers door placard sticker.
10. Verify the selections made are correct and press the enter key. The scan tool will flash Procedure in Progress, then display Procedure Complete.
11. Press the exit key to escape.

Tire Pressure Sensor Learn

After RCDLR assembly replacement, each of the tire pressure sensors unique identification codes must be learned into the RCDLR memory. Refer to **Tire Pressure Sensor Learn**.

TIRE PRESSURE SENSOR REPLACEMENT (SNAP IN STYLE)

Removal Procedure

1. Raise the vehicle on a suitable support. Refer to **Lifting and Jacking the Vehicle** .
2. Remove the tire/wheel assembly from the vehicle. Refer to **Tire and Wheel Removal and Installation** .
3. Dismount the tire from the rim. Refer to **Tire Mounting and Dismounting** .

IMPORTANT: When servicing the tire pressure sensor always use a new Schrader® tire pressure monitor (TPM) and a new TORX screw during installation.

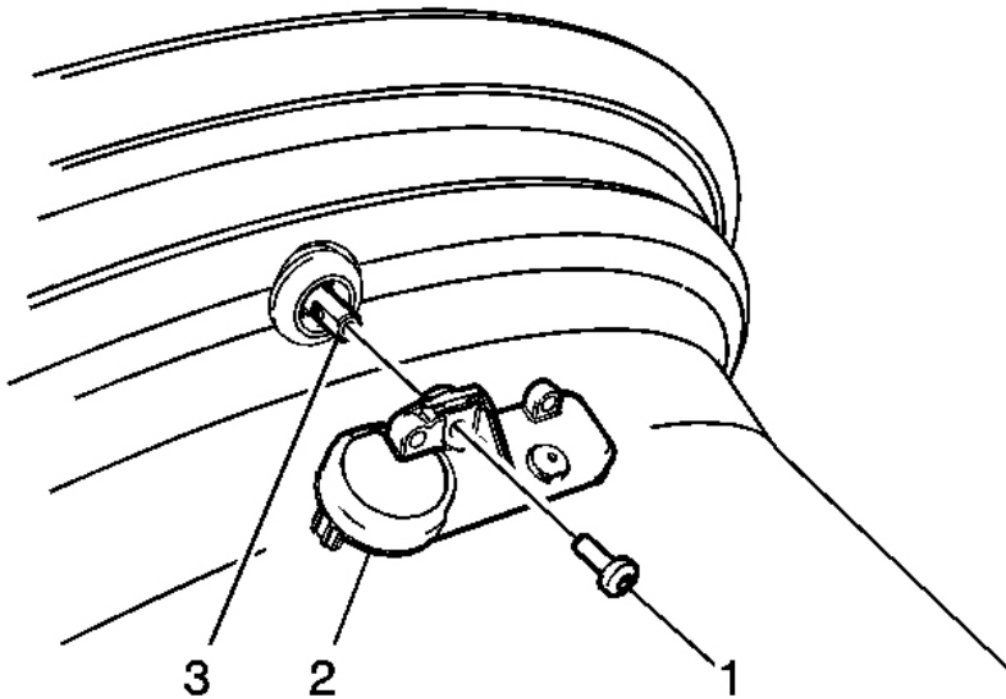


Fig. 1: View Of Tire Pressure Indicator Sensor, Valve Stem & Screws
Courtesy of GENERAL MOTORS CORP.

4. Remove the TORX screw (1) from the tire pressure sensor (2) and pull it straight off the tire pressure valve stem (3).

NOTE: Do not scratch or damage the clear coating on aluminum wheels with the tire changing equipment. Scratching the clear coating could cause the aluminum wheel to corrode and the clear coating to peel from the wheel.

5. Remove the tire pressure valve stem by pulling it through the rim.

Installation Procedure

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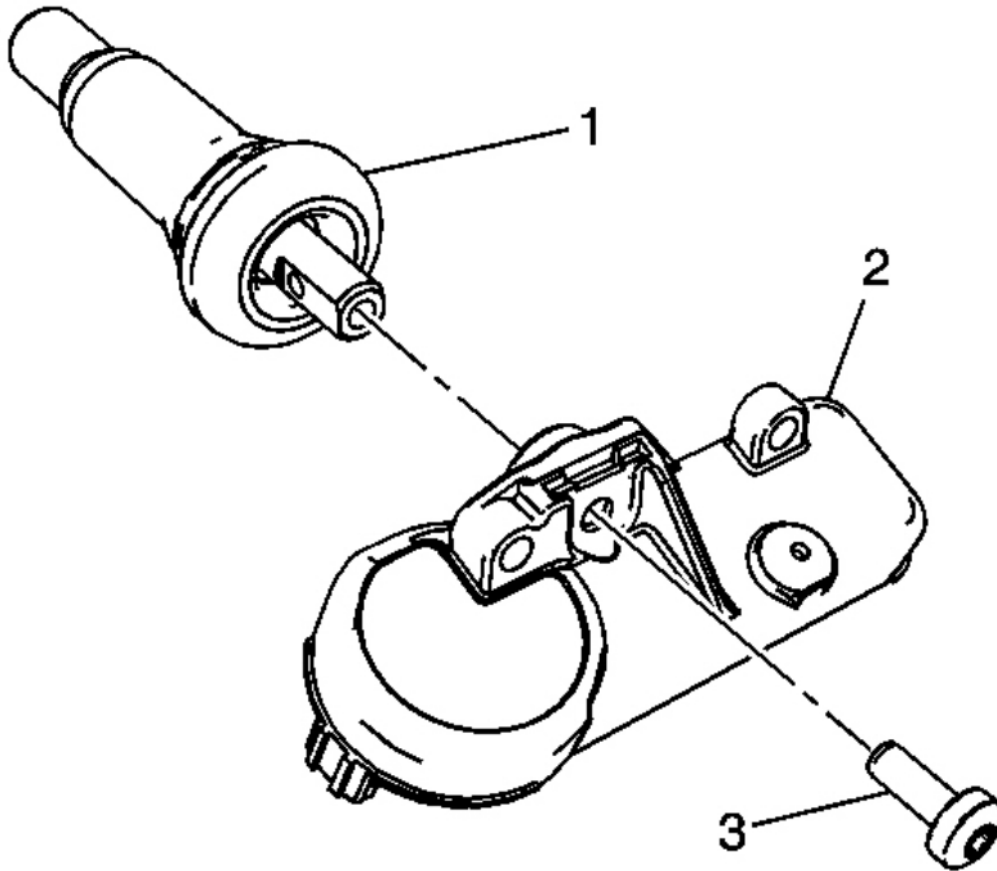


Fig. 2: View Of Tire Pressure Indicator Sensor, Valve Stem & Screws
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to Fastener Notice .

IMPORTANT:

- Ensure the flat of the valve, lines up with the flats of the snap in the enclosure.
- TPM valves and TORX screws are one-time use only.

1. Assemble the tire pressure sensor (2) to the valve stem and install the new TORX screw (3).

Tighten: Tighten the TORX screw to 1.3 N.m (11.5 lb in).

IMPORTANT: Use and approved tire mounting lubricant. **DO NOT** use silicon or

corrosive base compounds to lubricate the tire bead and the wheel rim. A corrosive type compound can cause tire or rim deterioration.

2. Apply tire soap to the rubber portion of the valve stem (1).

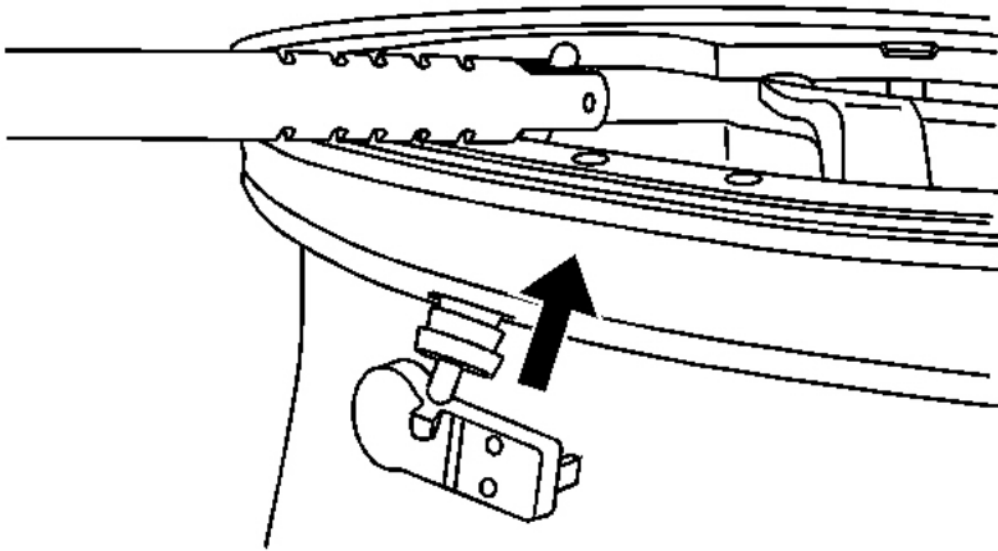


Fig. 3: View Of Tire Valve Stem Mounting Tool
Courtesy of GENERAL MOTORS CORP.

3. Using a tire valve stem mounting tool, pull the valve stem through in a direction parallel to the valve hole on the rim.
4. Mount the tire to the rim. Refer to **Tire Mounting and Dismounting** .
5. Install the tire/wheel assembly on the vehicle. Refer to **Tire and Wheel Removal and Installation** .
6. Lower the vehicle.
7. Learn the tire pressure sensors. Refer to **Tire Pressure Sensor Learn**.

TIRE PRESSURE SENSOR REPLACEMENT (CLAMP IN STYLE)

Removal Procedure

1. Raise the vehicle on a suitable support. Refer to **Lifting and Jacking the Vehicle** in General Information.
2. Remove the tire/wheel assembly from the vehicle. Refer to **Tire and Wheel Removal and Installation** in Tires and Wheels.

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IMPORTANT: Before the tire is removed from the wheel, note the following items to avoid tire pressure sensor damage upon tire dismounting.

- Place the sensors cap and valve on a dry clean surface after removal, the cap is aluminum and the valve is nickel plated to prevent corrosion and are not to be substituted with a cap or valve made of any other material.
- When separating the tire bead from the wheel, position the bead breaking fixture 90 degrees from the valve stem.
- Position the mounting/dismounting head so the tire iron, or pry bar can be inserted slightly clockwise of the sensor body when prying the tire bead up and over the mounting/dismounting head.
- Using the tire machine, rotate the tire/wheel assembly clockwise when transferring the tire bead to the out side of the wheel rim.
- Repeat items for inner bead.

3. Remove the tire from the wheel. Refer to **Tire Mounting and Dismounting** in Tires and Wheels.

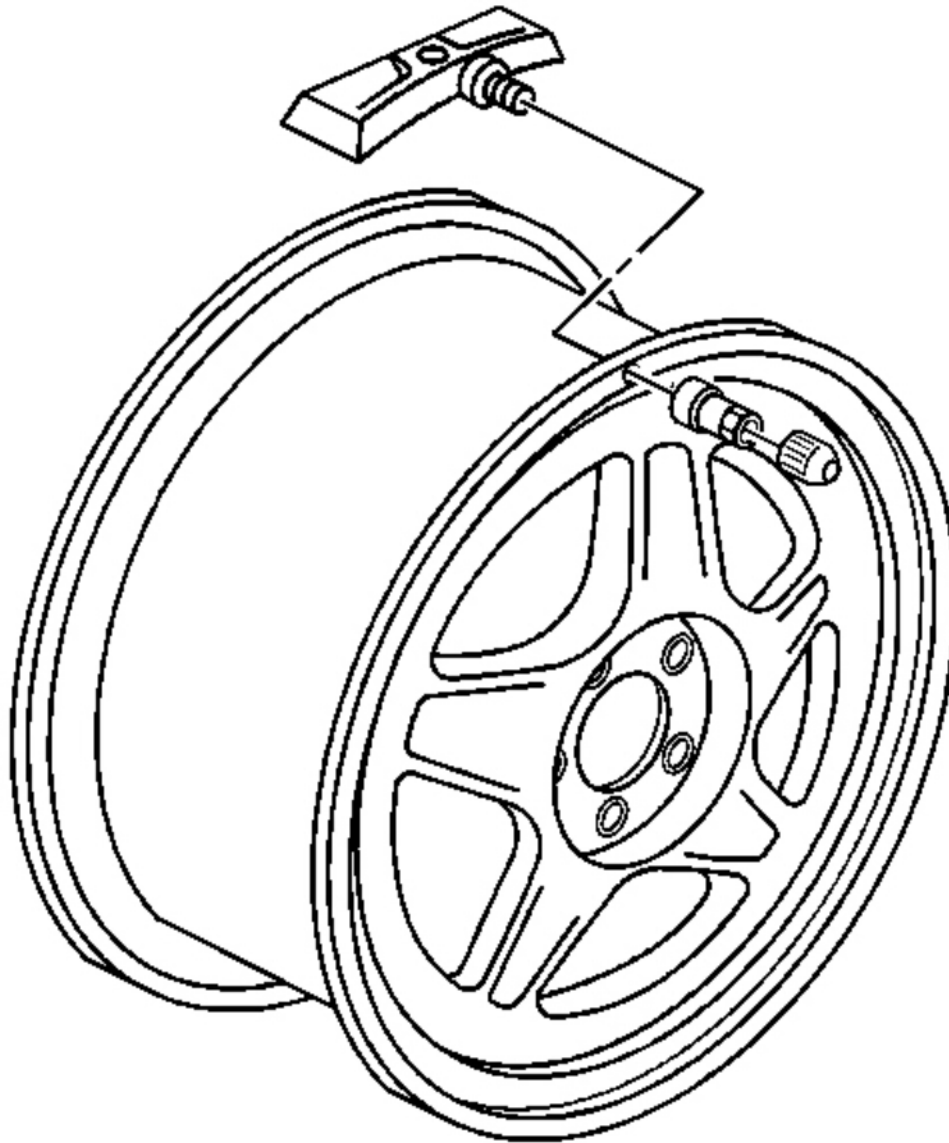


Fig. 4: View Of Tire Pressure Sensor
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: If any tire sealant is noted upon tire dismounting, remove all residual liquid sealant from the inside of the tire and wheel surfaces.

5. Remove the tire pressure sensor.

Installation Procedure

1. Clean any dirt or debris from the grommet sealing area.

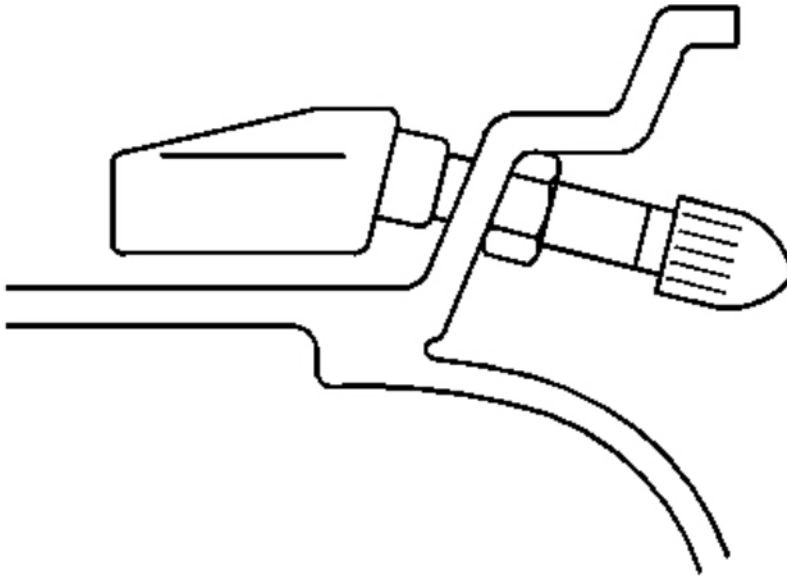


Fig. 5: View Of Tire Pressure Monitor Sensor & Nut
Courtesy of GENERAL MOTORS CORP.

2. Insert the sensor in the wheel hole with the air passage facing away from the wheel.

NOTE: Refer to Fastener Notice in Cautions and Notices.

3. Install the sensor nut and position the sensor body parallel to the inside wheel surface while torquing.

Tighten: Tighten the sensor nut to 7 N.m (62 lb in).

IMPORTANT: Before reinstalling the 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 the valve stem.

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- Position the bead transition area 45 degrees counter clockwise of the valve stem.
 - Using the tire machine, rotate the tire/wheel assembly clockwise when transferring the tire bead to the inside of the wheel rim.
 - Repeat items for outer bead.
4. Install the tire on the wheel. Refer to **Tire Mounting and Dismounting** in Tires and Wheels.

IMPORTANT: A service replacement tire pressure sensor is shipped in OFF mode. In this mode the sensor's unique identification code cannot be learned into the passenger door modules (PDMs) memory. The sensor must be taken out of OFF mode by spinning the tire/wheel assembly above 32 km/h (20 mph) in order to close the sensors internal roll switch for at least 10 seconds.

5. Install the tire/wheel assembly on the vehicle. Refer to **Tire and Wheel Removal and Installation** in Tires and Wheels.
6. Lower the vehicle.
7. Learn the tire pressure sensors. Refer to **Tire Pressure Sensor Learn**.

TIRE PRESSURE SENSOR LEARN

Tools Required

J-46079 Tire Pressure Monitor Diagnostic Tool. See **Special Tools**.

TPM Learn Mode Description

The tire pressure monitor (TPM) system uses the remote control door lock receiver (RCDLR), exterior lamp switch, 4 RF transmitting pressure sensors and the serial data circuit to perform the TPM learn mode functions. The sensor learn procedure must be performed after every tire rotation, RCDLR replacement, or sensor replacement. Once the TPM learn mode has been enabled, each of the sensor's unique identification (ID) codes can be learned in to the RCDLR's memory. When a sensor 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 the left front location, the second to right front, the third to right rear and the fourth to left rear.

Sensor Functions using pressure increase/decrease method

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 from the last transmitted pressure, another measurement will occur immediately to verify the change in pressure. If a pressure change has indeed occurred, the sensor transmits in re-measure mode. When the RCDLR receives a re-measure mode transmission while in TPM learn mode, it will assign that sensor's ID to the location on the vehicle relative to the order in which it was learned.

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Sensor functions using J-46079

Each sensor has an internal low frequency (LF) coil. When the J-46079 is used in activate mode it produces an LF transmission that activates the sensor. The sensor responds to a LF activation by transmitting in learn mode. When the RCDLR receives a learn mode transmission while in TPM learn mode, it will assign that sensor's ID to the location on the vehicle relative to the order in which it was learned.

TPM Learn Mode Cancellation

The learn mode will cancel if more than 2 minutes have passed and no sensor have been learned, or if more than 5 minutes has passed for the entire procedure. If the learn mode is canceled before any IDs are learned, the RCDLR will remember all previously stored IDs and their locations. As soon as the RCDLR learns the first ID, all other IDs are erased from the RCDLR's memory.

IMPORTANT: Before proceeding with the steps below, ensure that no other sensor learn procedure is being performed simultaneously, or that tire pressures are not being adjusted on a TPM equipped vehicle within close proximity.

1. Turn ON the ignition, with the engine OFF.
2. Apply the parking brake.

IMPORTANT: If the learn mode cannot be enabled, ensure the TPM system is enabled in the RCDLR. Refer to Control Module Setup.

3. Using the driver information center (DIC), press the vehicle information button until the RELEARN TIRE POSITIONS message displays. If your vehicle does not have the DIC buttons, press the trip odometer reset stem located on the instrument panel cluster until the RELEARN TIRE POSITIONS message displays. If your vehicle has the DIC buttons, press the set/reset button. The horn will sound twice to indicate the TPMs receiver is ready, and the TIRE LEARNING ACTIVE message will display. If your vehicle does not have the DIC buttons, press and hold the trip odometer reset stem until the horn chirps twice and the TIRE LEARNING ACTIVE message is displayed.

Alternate method: Simultaneously press the keyless entry transmitters lock and unlock buttons until a horn chirp sounds or use the scan tool and select Special Functions/Sensor Learn Mode Enable/Enable soft key. A horn chirp will sound indication the mode has been enabled.

CAUTION: Over inflating tires may cause personal injury or damage to the tires and wheels. When increasing tire pressure do not exceed the maximum inflation pressure as noted on the tire sidewall.

4. Starting with the left front tire, hold the antenna of the **J-46079** against the tire sidewall close to the wheel rim at the valve stem location then press and release the activate button and wait for a horn chirp, or increase/decrease the tire pressure for 8-10 seconds then wait for a horn chirp. See Special Tools. 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.
5. After the horn chirp has sounded, proceed as in step 4 for the next 3 sensors in the following order:

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- Right front
 - Right rear
 - Left rear
6. After the LR sensor has been learned, turn OFF the ignition to exit the learn mode.
 7. After the learn mode has been exited, adjust all tire pressures to the recommended PSI. Refer to **Label - Vehicle Certification, Tire Place Card, Anti-Theft and Service Parts ID**.

DESCRIPTION AND OPERATION

TIRE PRESSURE MONITOR DESCRIPTION AND OPERATION

The tire pressure monitor (TPM) system warns the driver when a significant loss of tire pressure occurs in any of the 4 tires, and allows the driver to display the individual tire pressures, and their locations on the driver information center (DIC).

The system uses the powertrain control module (PCM), instrument panel cluster (IPC), 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 the vehicle is stationary the sensor's internal accelerometer is inactive, which puts the sensors into a stationary state. In this state the sensors sample tire pressure once every 30 seconds and do not transmit at all if the tire pressures do not change. As vehicle speed increases, centrifugal force activates the sensor's internal accelerometer causing the sensors to go into rolling mode. In this mode the sensors sample pressure once every 30 second and transmit in rolling mode once every 60 seconds. The RCDLR receives and translates the data contained in each sensor's RF transmission into sensor presence, sensor mode, and tire pressure. The RCDLR sends the tire pressure and tire location data to the DIC via the serial data circuit where they are displayed as follows:

- LF TIRE XX PSI
- RF TIRE XX PSI
- RR TIRE XX PSI
- LR TIRE XX PSI

The sensors continuously compare their last transmitted pressure to their current pressure sample and will transmit in re-measure mode if a 8 kPa (1.2 psi) change in tire pressure has been detected in either a stationary, or rolling state. 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 IPC. Both the message and indicator can be cleared by adjusting the tire pressures to the recommended kPa/psi. The sensor's pressure range is 0-102 psi. The sensors pressure accuracy from -10 to +70 degrees C is +/- 13.7 kPa (2 psi). Refer to **Label - Vehicle Certification, Tire Place Card, Anti-Theft and Service Parts ID**.

The RCDLR has the ability to detect malfunctions within the TPM system. Any malfunction detected will cause the DIC to display the SERVICE TIRE MONITOR message. For more information on other functions of the RCDLR, refer to Keyless Entry System description and Operation.

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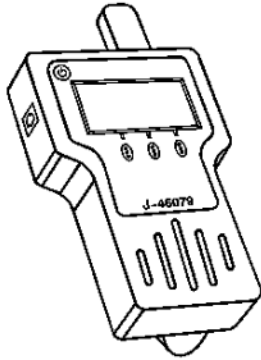
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- Keyless Entry System Description and Operation
- Power Door Locks Description and Operation

SPECIAL TOOLS AND EQUIPMENT

SPECIAL TOOLS

Special Tools

Illustration	Tool Number/ Description
	J-46079 Tire Pressure Monitor Diagnostic Tool