

Tire Pressure Monitoring System

Special Tool(s)

 ST2941-A	Activation Tool, Tire Pressure Monitor 204-363
 ST2869-A	Digital Tire Pressure Gauge 204-354
 ST2834-A	Vehicle Communication Module (VCM) and Integrated Diagnostic System (IDS) software with appropriate hardware, or equivalent scan tool

Principles of Operation

NOTE: The Smart Junction Box (SJB) is also referred to as the Generic Electronic Module (GEM).

The Tire Pressure Monitoring System (TPMS) monitors the air pressure of all 4 road tires. The wheel-mounted tire pressure sensors transmit via radio frequency signals, to the [SJB](#). [TPMS](#) functionality is integral to the [SJB](#). These transmissions are sent approximately every 60 seconds when the vehicle speed exceeds 32 km/h (20 mph). The [TPMS](#) function compares each tire pressure sensor transmission against a low-pressure limit. If it has been determined that the tire pressure has fallen below this limit, the [SJB](#) communicates this on the vehicle communication bus to the instrument cluster. The instrument cluster then illuminates the [TPMS](#) indicator and displays the appropriate message(s) in the message center (if equipped).

For vehicles with different front and rear tire pressures (such as the E-Series and certain F-Series), the tire pressures must be adjusted and the tire pressure sensors must be trained following a tire rotation. Failure to train the sensors will cause the [TPMS](#) indicator to illuminate.

For vehicles with the same tire pressures for front and rear tires, tire rotation will not affect the system.

Ambient Temperature Change and Tire Pressure

 **WARNING:** The tire pressure monitoring system (TPMS) sensor battery may release hazardous chemicals if exposed to extreme mechanical damage. If these chemicals contact the skin or eyes, flush immediately with water for a minimum of 15 minutes and get prompt medical attention. If any part of the battery is swallowed, contact a physician immediately. When disposing of TPMS sensors, follow the correct procedures for hazardous material disposal. Failure to follow these instructions may result in serious

personal injury.

Tire pressures fluctuate with temperature changes. For this reason, tire pressure must be set to specification when tires are at outdoor ambient temperatures. If the vehicle is allowed to warm up to shop temperatures, and the outside temperature is less than shop temperature, the tire inflation pressure must be adjusted accordingly.

If the tires are inflated to specification at shop temperatures, and the vehicle is moved outdoors when the outdoor ambient temperature is significantly lower, the tire pressure may drop enough to be detected by the [TPMS](#) and activate the [TPMS](#) warning lamp.

As the ambient temperature decreases by 6°C (10°F), tire pressure decreases 7 kPa (1 psi). Adjust the tire pressure by 7 kPa (1 psi) for each 6°C (10°F) ambient temperature drop as necessary to keep the tire at the specified Vehicle Certification (VC) label pressure. Refer to the following tables to adjust the tire pressure indoors for colder outside temperatures.

Table 1. Use Table to Adjust Tire Pressure Inside Garage for Colder Outside Temperature¹

**** Do Not Inflate Tire Higher than Maximum Pressure Stamped on Tire Sidewall. ****

Table is based on a Garage Temperature of 70°F. Max Pressure Adjustment is 7 psi.

Outside Temperature (°F)	Tire Placard Pressure (PSI)																	
	30	32	34	35	38	40	41	42	45	50	55	60	65	70	75	80	85	90
70	30	32	34	35	38	40	41	42	45	50	55	60	65	70	75	80	85	90
60	31	33	35	36	39	41	42	43	46	51	56	61	67	72	77	82	87	92
50	32	34	36	37	40	42	43	44	47	53	58	63	68	73	79	84	89	94
40	33	35	37	38	41	43	44	45	49	54	59	64	70	75	80	86	91	96
30	34	36	38	39	42	44	46	47	50	55	61	66	72	77	82	87	92	97
20	35	37	39	40	43	46	47	48	51	57	62	67	72	77	82	87	92	97
10	36	38	40	41	45	47	48	49	52	57	62	67	72	77	82	87	92	97
0	37	39	41	42	45	47	48	49	52	57	62	67	72	77	82	87	92	97
-10	37	39	41	42	45	47	48	49	52	57	62	67	72	77	82	87	92	97
-20	37	39	41	42	45	47	48	49	52	57	62	67	72	77	82	87	92	97
-30	37	39	41	42	45	47	48	49	52	57	62	67	72	77	82	87	92	97
-40	37	39	41	42	45	47	48	49	52	57	62	67	72	77	82	87	92	97

Table 2. Use Table to Adjust Tire Pressure Inside Garage for Colder Outside Temperature (Metric Units)¹

**** Do Not Inflate Tire Higher than Maximum Pressure Stamped on Tire Sidewall. ****

Table is based on a Garage Temperature of 21°C. Max Pressure Adjustment is 50 kPa.

Outside Temperature (°C)	Tire Placard Pressure (kPa)																	
	205	220	235	240	260	275	285	290	310	345	380	415	450	485	515	550	585	620
21	205	220	235	240	260	275	285	290	310	345	380	415	450	485	515	550	585	620
16	215	230	240	250	270	285	290	295	315	350	385	420	460	495	530	565	600	635
10	220	235	250	255	275	290	295	305	325	365	400	435	470	505	545	580	615	650
4	230	240	255	260	285	295	305	310	340	370	405	440	485	515	550	595	625	660
-1	235	250	260	270	290	305	315	325	345	380	420	455	495	530	565	600	635	670
-7	240	255	270	275	295	315	325	330	350	395	425	460	495	530	565	600	635	670
-12	250	260	275	285	310	325	330	340	360	395	425	460	495	530	565	600	635	670
-18	255	270	285	290	310	325	330	340	360	395	425	460	495	530	565	600	635	670
-23	255	270	285	290	310	325	330	340	360	395	425	460	495	530	565	600	635	670
-29	255	270	285	290	310	325	330	340	360	395	425	460	495	530	565	600	635	670
-34	255	270	285	290	310	325	330	340	360	395	425	460	495	530	565	600	635	670
-40	255	270	285	290	310	325	330	340	360	395	425	460	495	530	565	600	635	670

¹When Outside (Ambient) Temperature is greater than 21°C (70°F), Inflate tires to placard pressure.

¹Use the table to adjust tire pressure for P-metric and LT tires only.

¹Do NOT use table for Commercial Truck Tires (i.e. 19.5 inch tires for F450 & F550). See F-Super Duty Service Manual for tire inflation procedure.

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The [TPMS](#) indicator and vehicle message center (if equipped) sometimes displays faults that cannot be resolved by the customer. Treat these messages as [TPMS](#) faults that must be serviced.

Tire Pressure Monitoring System (TPMS) Indicator Illuminates Continuously

NOTE: If the spare tire is in use, the damaged road tire must be repaired and installed on the vehicle to restore complete [TPMS](#) functionality before carrying out any diagnosis.

NOTE: For vehicles with different front and rear tire pressures (such as E-Series and certain F-Series), the tire pressure sensors must be trained following a tire rotation. Failure to train the sensors will result in a false low tire pressure event, which will cause the [TPMS](#) indicator to illuminate.

1. The [TPMS](#) indicator remains on continuously for the following condition:
 - Low Tire Pressure — The [TPMS](#) indicator is illuminated solid and the message center displays LOW TIRE PRESSURE (if equipped). This is displayed when any of the tire pressures are low. When this condition exists, the tire pressure must be adjusted to the recommended cold pressure as indicated on the [VC](#) label.
2. **NOTE:** The [TPMS](#) sensors do not transmit when the vehicle is stationary. If the vehicle has been stationary for more than 30 minutes, it will be necessary to wake up the sensors so they will transmit the latest tire pressure information to the [SJB](#).

If the vehicle has been stationary for more than 30 minutes, carry out the [Tire Pressure Monitoring System \(TPMS\) Sensor Activation](#) procedure in this section.

Tire Pressure Monitoring System (TPMS) Indicator Flashes

The [TPMS](#) indicator flashes for 70 seconds, then remains ON solid when the ignition switch is turned to the ON position, for the following conditions:

1. Tire Pressure Sensor Fault — If equipped, the message center will display TIRE PRESSURE SENSOR FAULT when a tire pressure sensor is malfunctioning. GO to [Symptom Chart](#).
2. No communication with the [SJB](#) ([TPMS](#) is integral to the [SJB](#)) — The [TPMS](#) indicator is illuminated when the Instrument Cluster (IC) has not received any signals from the [SJB](#) for more than 5 seconds. If equipped, the message center displays TIRE PRESSURE MONITOR FAULT. GO to [Symptom Chart](#).
3. Tire Pressure Monitor Fault — If equipped, the message center will display TIRE PRESSURE MONITOR FAULT when the [TPMS](#) is malfunctioning or communication with the [IC](#) has been lost. GO to [Symptom Chart](#).

Inspection and Verification

1. **NOTE:** The tire pressure sensors are not designed to be used with aftermarket wheels.

NOTE: The use of run-flat tires (tires with steel body cord plies in the tire sidewall) where not originally equipped, may cause the [TPMS](#) to malfunction and is therefore not recommended.

Verify the customer concern by inspecting the vehicle and observing the message center (if equipped) and the [TPMS](#) indicator.

2. **NOTE:** The valve-mounted [TPMS](#) sensors and the strap-mounted [TPMS](#) sensors are not compatible.

Swapping wheels from one vehicle to another with the different systems will set a [TPMS](#) fault.

NOTE: Swapping wheels between vehicles with the same [TPMS](#) will cause a [TPMS](#) fault to be set if the sensors are not trained. Refer to [Tire Pressure Monitoring System \(TPMS\) Sensor Training](#) in this section.

NOTE: Non-OEM modifications made to the vehicle may result in false [TPMS](#) warnings.

Inspect to determine if one of the following mechanical or electrical concerns apply:

Visual Inspection Chart

Mechanical	Electrical
<ul style="list-style-type: none">• Low tire pressure• Tire Pressure Monitoring System (TPMS) sensor damaged or missing• Spare tire installed as a road wheel• Incorrect TPMS sensor installed• TPMS sensor installed incorrectly• Sensors not trained after a tire rotation on vehicles with different front and rear tire pressures• Non-OEM wheels installed (aftermarket rims)• Non-OEM equipped run-flat tires installed• Other non-OEM modifications (roll cages, service barriers, part racks, ladder racks)	<ul style="list-style-type: none">• Wiring, terminals or connectors• Smart Junction Box (SJB) damaged• Aftermarket electronic accessories

3. If an obvious cause for an observed or reported concern is found, correct the cause (if possible) before proceeding to the next step.
4. **NOTE:** Make sure to use the latest scan tool software release.

If the cause is not visually evident, connect the scan tool to the Data Link Connector (DLC).

5. **NOTE:** The Vehicle Communication Module (VCM) LED prove out confirms power and ground from the [DLC](#) are provided to the [VCM](#).

If the scan tool does not communicate with the [VCM](#):

- check the [VCM](#) connection to the vehicle.
- check the scan tool connection to the [VCM](#).
- refer to [Section 418-00](#), No Power To The Scan Tool, to diagnose no power to the scan tool.

6. If the scan tool does not communicate with the vehicle:
 - verify the ignition key is in the ON position.
 - verify the scan tool operation with a known good vehicle.
 - refer to [Section 418-00](#) to diagnose no response from the PCM.
7. Carry out the network test.
 - If the scan tool responds with no communication for one or more modules, refer to [Section 418-00](#).
 - If the network test passes, retrieve and record Continuous Memory Diagnostic Trouble Codes (CMDTCs).
8. Clear the continuous DTCs and carry out the self test diagnostics for the [SJB](#) (the [TPMS](#) is part of the [SJB](#)).
9. If the DTCs retrieved are related to the concern, go to the Tire Pressure Monitoring System (TPMS) DTC Chart. For all other DTCs, refer to the Master DTC Chart in [Section 419-10](#).
10. If no DTCs related to the concern are retrieved, GO to [Symptom Chart](#).

DTC Charts

Tire Pressure Monitoring System (TPMS) DTC Chart

DTC	Description	Source	Action
B106A	Pressure Sensor Range Bit Incorrect State	Smart Junction Box (SJB)	GO to Pinpoint Test G .
B106B	Tire Pressure Sensor Low Battery	SJB	DTC B106B can be set during SJB configuration. GO to Pinpoint Test H .
B106D	Tire Pressure Monitoring System (TPMS) Initiators Not Configured	SJB	DTC B106D is only present when a new SJB is installed, the SJB is incorrectly flashed or the SJB is incorrectly configured. Successfully configuring the SJB is the only way to clear this DTC. VERIFY the SJB is correctly configured. If DTC B106D is still present, REFER to Section 418-01 .
B2477	Module Configuration Failure/Mismatch	SJB	DTC B2477 is only present when a new SJB is installed, the SJB is incorrectly flashed or the SJB is incorrectly configured. Successfully configuring the SJB is the only way to clear this DTC. MAKE SURE the SJB is configured correctly. If DTC B2477 is still present, REFER to Section 418-01 .
B2868	LF Tire Pressure Sensor Fault	SJB	DTC B2868 is only present when a new SJB is installed, the SJB is flashed or the SJB is reconfigured. TRAIN the tire pressure sensors. REFER to Tire Pressure Monitoring System (TPMS) Sensor Training in this section.
B2869	RF Tire Pressure Sensor Fault	SJB	DTC B2869 is only present when a new SJB is installed, the SJB is flashed or the SJB is reconfigured. TRAIN the tire pressure sensors. REFER to Tire Pressure Monitoring System (TPMS) Sensor Training in this section.
B2870	RR Tire Pressure Sensor Fault	SJB	DTC B2870 is only present when a new SJB is installed, the SJB is flashed or the SJB is reconfigured. TRAIN the tire pressure sensors. REFER to Tire Pressure Monitoring System (TPMS) Sensor Training in this section.
B2871	LR Tire Pressure Sensor Fault	SJB	DTC B2871 is only present when a new SJB is installed, the SJB is flashed or the SJB is reconfigured. TRAIN the tire pressure sensors. REFER to Tire Pressure Monitoring System (TPMS) Sensor Training in this section.
B2872	Tire Pressure Sensor Fault	SJB	NOTE: If the vehicle has been stationary for more than 30 minutes, the sensors will go into a "sleep mode" to conserve battery power. It will be necessary to wake them up so they will transmit the latest tire pressure information to the SJB . ACTIVATE the TPMS sensors. REFER to Tire Pressure Monitoring System (TPMS) Sensor Activation in this section. GO to Pinpoint Test F .
B287A	Tire Pressure System Fault	SJB	GO to Pinpoint Test F .
C2780	ECU in Manufacturing Mode	SJB	DTC C2780 is only present when a new SJB is installed, the SJB is flashed or the SJB is reconfigured. TRAIN the tire pressure sensors. REFER to Tire Pressure Monitoring System (TPMS) Sensor Training in this section.
U0155	Lost Communication with Instrument Cluster	SJB	REFER to Section 418-00 to diagnose the no communication problem.
All other	—	SJB	REFER to the Master DTC Chart in Section 419-10 .

SJB DTCs			
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Symptom Chart

Symptom Chart

NOTE: For vehicles with different front and rear tire pressure (such as E-Series and certain F-Series), the tire pressures must be adjusted and the tire pressure sensors must be trained following a tire rotation. Failure to train the sensors will result in a false low tire pressure event, which will cause the Tire Pressure Monitoring System (TPMS) indicator to illuminate.

For vehicles with the same tire pressure for front and rear tires, tire rotation will not affect the system.

Failure of a [TPMS](#) component may not cause the message center to display a fault message or a DTC to be stored. The Symptom Chart is a starting point to begin diagnosis of these concerns.

Condition	Possible Sources	Action
<ul style="list-style-type: none"> • Tire Pressure Monitoring System (TPMS) indicator ON solid and message center (if equipped) displays LOW TIRE PRESSURE 	<ul style="list-style-type: none"> • Spare tire currently in use • Air pressure not set to specifications listed on the Vehicle Certification (VC) label • Sensors not trained following tire rotation 	<ul style="list-style-type: none"> • INSTALL the repaired road wheel/tire in place of the spare tire. • GO to Pinpoint Test D . • ADVISE customer that on vehicles with different front and rear tire pressure, the sensors must be trained as directed in their Owner's Literature.
<ul style="list-style-type: none"> • Smart Junction Box (SJB) will not enter sensor training mode when using the TPMS sensor training procedure 	<ul style="list-style-type: none"> • Brake ON/OFF switch • Ignition switch • Vehicle communication bus • SJB 	<ul style="list-style-type: none"> • GO to Pinpoint Test E .
<ul style="list-style-type: none"> • TPMS indicator FLASHES for 70 seconds and then remains ON solid when the ignition key is turned to the ON position, the message center (if equipped) displays TIRE PRESSURE SENSOR FAULT and DTC B2872 is present 	<ul style="list-style-type: none"> • TPMS sensor(s) • TPMS sensor(s) not trained to the SJB • SJB 	<ul style="list-style-type: none"> • NOTE: If the vehicle has been stationary for more than 30 minutes, the sensors will go into a "sleep mode" to conserve battery power. It will be necessary to wake them up so they will transmit the latest tire pressure information to the SJB . <p>ACTIVATE the TPMS sensors. REFER to Tire Pressure Monitoring System (TPMS)</p>

		<p>Sensor Activation in this section. GO to Pinpoint Test E.</p>
<ul style="list-style-type: none"> • Tire Pressure Monitoring System (TPMS) indicator FLASHES for 70 seconds and then remains ON solid when the ignition key is turned to the ON position, the message center (if equipped) displays TIRE PRESSURE MONITOR FAULT and DTC B287A is present 	<ul style="list-style-type: none"> • All TPMS sensors not trained to the SJB or all TPMS sensors are not installed 	<ul style="list-style-type: none"> • NOTE: If the vehicle has been stationary for more than 30 minutes, the sensors will go into a "sleep mode" to conserve battery power. It will be necessary to wake them up so they will transmit the latest tire pressure information to the SJB. <p>ACTIVATE the TPMS sensors. REFER to Tire Pressure Monitoring System (TPMS) Sensor Activation in this section. GO to Pinpoint Test E.</p>
<ul style="list-style-type: none"> • TPMS indicator FLASHES for 70 seconds and then remains ON solid when the ignition key is turned to the ON position, the message center (if equipped) displays TIRE PRESSURE MONITOR FAULT and there are no DTCs present 	<ul style="list-style-type: none"> • Vehicle communication issue between the SJB and the Instrument Cluster (IC) • SJB 	<ul style="list-style-type: none"> • REFER to Section 418-00 to diagnose the no communication concern. • REFER to Section 419-10 to diagnose the SJB.
<ul style="list-style-type: none"> • One or more sensors will not train 	<ul style="list-style-type: none"> • TPMS sensor(s) • Vehicle communication issue • SJB 	<ul style="list-style-type: none"> • RETRIEVE and RECORD DTCs. REFER to Tire Pressure Monitoring System (TPMS) DTC Chart.
<ul style="list-style-type: none"> • One or more sensors will not train and no DTCs are present 	<ul style="list-style-type: none"> • TPMS sensor(s) 	<ul style="list-style-type: none"> • TRAIN all 4 tire pressure sensors. REFER to Tire Pressure Monitoring System (TPMS) Sensor Training in this section. • For any sensor(s) that did not train, ATTEMPT to activate the same sensor with the activation tool. If the sensor still does not respond, MOVE the vehicle to rotate the wheels at least one-fourth turn and ATTEMPT to activate the same sensor again. • If the sensor(s) fail to train a second time, INSTALL a new sensor(s). REFER to Tire Pressure Monitoring System (TPMS) Sensor in this section.

Pinpoint Tests

Pinpoint Test D: Tire Pressure Monitoring System (TPMS) Indicator ON Solid and Message Center (if equipped) Displays LOW TIRE PRESSURE

Normal Operation

The Tire Pressure Monitoring System (TPMS) monitors the air pressure of all 4 road tires. The wheel-mounted tire pressure sensors transmit via radio frequency signals, to the Smart Junction Box (SJB). [TPMS](#) functionality is integral to the [SJB](#). These transmissions are sent approximately every 60 seconds when the vehicle speed exceeds 32 km/h (20 mph). The [TPMS](#) function (integral to the [SJB](#)) compares each tire pressure sensor transmission against a low-pressure limit. If it has been determined that the tire pressure has fallen below this limit, the [SJB](#) communicates this on the vehicle communication bus to the Instrument Cluster (IC). The [IC](#) then illuminates the [TPMS](#) indicator and displays the appropriate message(s) in the message center (if equipped).

This symptom can also be caused by a spare tire currently being used in place of a road tire. Make sure that the spare tire is not currently in use. On vehicles with different front and rear tire pressures, if the sensors are not trained following a tire rotation, this symptom will also be present. Advise the customer that on vehicles with different front and rear tire pressures, the sensors must be trained as directed in the Owner's Literature.

This pinpoint test is intended to diagnose the following:

- Low air pressure in tire(s)
- Tire pressure sensor(s)

PINPOINT TEST D: [TPMS](#) INDICATOR ON SOLID AND MESSAGE CENTER (IF EQUIPPED) DISPLAYS LOW TIRE PRESSURE

NOTE: Use only the Digital Tire Pressure Gauge any time tire pressures are measured to be sure that accurate values are obtained.

NOTE: If a warranty case is opened for an actual [TPMS](#) fault, document and include the actual tire pressure data in all warranty communications.

Test Step	Result / Action to Take
<p>D1 CHECK THE TIRE PRESSURE</p> <ul style="list-style-type: none"> ● Measure and record the air pressure in all 4 road tires. ● Adjust the air pressure for those found to be below the specification listed on the Vehicle Certification (VC) label. ● NOTE: If the vehicle has been stationary for more than 30 minutes, activate each TPMS sensor. Refer to Tire Pressure Monitoring System (TPMS) Sensor Activation in this section. The TPMS sensor does not transmit when the vehicle is stationary. ● Verify system operation. ● Have the TPMS indicator and the message center (if equipped) warnings gone out? 	<p>Yes The system is functioning normally, diagnosis is complete. INFORM the customer of correct tire pressure maintenance as instructed in the scheduled maintenance guide and the Owner's Literature.</p> <p>No GO to D2.</p>
<p>D2 CHECK THE SYSTEM COMPONENTS</p> <ul style="list-style-type: none"> ● Train all 4 tire pressure sensors. Refer to Tire Pressure Monitoring System (TPMS) Sensor Training in this section. ● Connect the scan tool. ● Ignition ON. ● Enter the following diagnostic mode on the scan tool: DataLogger SJB. 	<p>Yes The system is functioning normally, diagnosis complete.</p> <p>No Before installing a new sensor(s): If a sensor(s) does not respond to the Tire Pressure Monitor</p>

- Read and record the following PIDs:
 - Left Front Tire Pressure (LF_PRES)
 - Right Front Tire Pressure (RF_PRES)
 - Left Rear Outer Tire Pressure (LRO_PRES)
 - Right Rear Outer Tire Pressure (RRO_PRES)
- Compare the air pressure readings recorded from the function test to those recorded in D1.
- **Do the compared tire pressure values match within ± 5 psi, and have the **TPMS** indicator and the message center (if equipped) warnings gone out?**

Activation Tool, ATTEMPT to activate the same sensor(s) with the Tire Pressure Monitor Activation Tool. If the sensor(s) still does not respond, MOVE the vehicle to rotate the wheels at least one-fourth turn and ATTEMPT to activate the same sensor(s) again.

INSTALL new tire pressure sensors for those with discrepancies or those that fail to activate. REFER to [Tire Pressure Monitoring System \(TPMS\) Sensor](#) in this section.

Pinpoint Test E: **SJB** Will Not Enter Sensor Training Mode When Using the **TPMS** Sensor Training Procedure

Normal Operation

For the Smart Junction Box (SJB) to enter Tire Pressure Monitoring System (TPMS) sensor training mode, the **SJB** must receive valid inputs from the Brake Pedal Position (BPP) switch (OFF-ON-OFF) and ignition switch (both OFF and RUN), and it must receive valid vehicle speed sensor input (0 km/h [0 mph]). Refer to [Tire Pressure Monitoring System \(TPMS\) Sensor Training](#) in this section for the complete sensor training procedure.

This pinpoint test is intended to diagnose the following:

- Wiring, terminals or connectors
- Brake ON/OFF switch
- Ignition switch
- **SJB**

PINPOINT TEST E: **SJB** WILL NOT ENTER SENSOR TRAINING MODE WHEN USING THE **TPMS** SENSOR TRAINING PROCEDURE

Test Step	Result / Action to Take
E1 CHECK THE SJB BRAKE ON/OFF (GEM_BOO) PID <ul style="list-style-type: none"> • Connect the scan tool. • Ignition ON. • Enter the following diagnostic mode on the scan tool: DataLogger SJB. • Monitor the GEM_BOO PID (SJB reads the brake switch directly). • Press and release the brake pedal while monitoring the PID. • Do the brake pedal PID values match the brake pedal positions? 	Yes GO to E2 . No REFER to Section 417-01 to continue diagnosis of the stoplamp switch.
E2 CHECK THE SJB IGNITION SWITCH PIDs <ul style="list-style-type: none"> • Monitor the following ignition switch PIDs: <ul style="list-style-type: none"> ▪ Ignition Switch Off (IGN_O_ECU) ▪ Ignition Switch RUN (IGN_R_ECU) • Cycle the ignition switch to the RUN and OFF position while monitoring the PIDs (SJB reads the ignition switch directly). • Do the ignition switch status PID values match the ignition switch positions? 	Yes GO to E3 . No REFER to Section 211-05 to continue diagnosis of the ignition switch.

E3 CHECK THE <u>SJB</u> VEHICLE SPEED (VSS_GEM) PID	
<ul style="list-style-type: none"> • Monitor the VSS_GEM PID (<u>SJB</u> receives vehicle speed from the Instrument Cluster (IC)). • Does the vehicle speed PID value match the speed of the vehicle? 	<p>Yes GO to E4.</p> <p>No REFER to Section 413-01 to diagnosis of the IC/vehicle speed concern.</p>
E4 CHECK FOR CORRECT <u>SJB</u> OPERATION	
<ul style="list-style-type: none"> • Disconnect all the <u>SJB</u> connectors. • Check the connectors for: <ul style="list-style-type: none"> ▪ corrosion. ▪ pushed-out pins. ▪ spread terminals. • Connect all the <u>SJB</u> connectors and make sure that they are seated correctly. • Operate the system and verify the concern is still present. • Is the concern still present? 	<p>Yes INSTALL a new <u>SJB</u>. REFER to Section 419-10. CLEAR the DTCs. REPEAT the self-test.</p> <p>No The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the self-test.</p>

Pinpoint Test F: TPMS Indicator FLASHES for 70 Seconds and Then Remains ON Solid When the Ignition Key is Turned to the ON Position, the Message Center (if equipped) Displays TIRE PRESSURE SENSOR or MONITOR FAULT and DTC B2872 or B287A is Present

Normal Operation

If there is a fault with 1, 2 or 3 of the Tire Pressure Monitoring System (TPMS) sensors, DTC B2872 will be set, the TPMS warning indicator will flash for 70 seconds and then remain ON solid when the ignition switch is turned to the ON position and the message center (if equipped) will display TIRE PRESSURE SENSOR FAULT.

If the Smart Junction Box (SJB) does not get a response from all 4 of the TPMS sensors, DTC B287A will be set and the message center (if equipped) will display TIRE PRESSURE MONITOR FAULT.

- DTC B2872 (Tire Pressure Sensor Fault) — When 1, 2 or 3 of the tire pressure sensors are faulted or not responding, the SJB will set DTC B2872.
- DTC B287A (Tire Pressure Monitor Fault) — When **all** 4 of the tire pressure sensors are faulted, not responding or not heard by the SJB, the SJB will set DTC B287A.

This pinpoint test is intended to diagnose the following:

- TPMS sensor(s) missing
- TPMS sensor(s) not trained to the vehicle
- TPMS sensor(s) swapped due to wheel swap
- TPMS sensor(s) damaged
- Vehicle communication issue
- SJB

PINPOINT TEST F: TPMS INDICATOR FLASHES FOR 70 SECONDS AND THEN REMAINS ON SOLID WHEN THE IGNITION KEY IS TURNED TO THE ON POSITION, THE MESSAGE CENTER (IF EQUIPPED) DISPLAYS TIRE PRESSURE SENSOR OR MONITOR FAULT AND DTC B2872 OR B287A IS PRESENT

NOTE: If a warranty case is opened for an actual TPMS fault, document and include the actual tire pressure data in all warranty communications.

Test Step	Result / Action to Take
F1 CHECK THE SENSOR IDENTIFIERS AND SYSTEM STATUS PIDs	
<ul style="list-style-type: none"> ● Connect the scan tool. ● Ignition ON. ● Enter the following diagnostic mode on the scan tool: DataLogger SJB. ● Read and record the following PIDs: <ul style="list-style-type: none"> ■ Left Front Tire Transmitter Identifier (LF_ID) ■ Right Front Tire Transmitter Identifier (RF_ID) ■ Left Rear Tire Transmitter Identifier (LR_ID) ■ Right Rear Tire Transmitter Identifier (RR_ID) ● Monitor the TPMS system status (TP_STAT) PID. ● Does the TP_STAT PID display SENSOR FAULT? 	<p>Yes GO to F2.</p> <p>No If the TP_STAT PID displays SYSTEM FAULT, GO to F3.</p>
F2 CARRY OUT THE SENSOR TRAINING PROCEDURE	
<ul style="list-style-type: none"> ● Train all 4 tire pressure sensors. Refer to Tire Pressure Monitoring System (TPMS) Sensor Training in this section. ● Did all of the tire pressure sensors transmit correctly and did the horn sound when each tire pressure sensor transmitted to the SJB ? 	<p>Yes Using the scan tool, LOCATE the updated TPMS sensor identifiers trained to the SJB module.</p> <p>COMPARE these values to those recorded prior to the TPMS sensor training procedure. Disregarding sensor position, any sensor identifiers that do not match those retrieved from the module were changed, but not retrained. The sensors are now trained to the vehicle, diagnosis is complete.</p> <p>DOCUMENT all TPMS sensor identifiers on the applicable warranty claim.</p> <p>VERIFY system operation.</p> <p>No Before installing a new sensor(s) : If a sensor(s) does not respond to the Tire Pressure Monitor Activation Tool, ATTEMPT to activate the same sensor(s) with the Tire Pressure Monitor Activation Tool. If the sensor(s) still does not respond, MOVE the vehicle to rotate the wheels at least one-fourth of a turn and ATTEMPT to activate the same sensor(s) again.</p> <p>If the sensor(s) fails to train a second time, INSTALL a new tire pressure sensor(s). REFER to Tire Pressure Monitoring System (TPMS) Sensor in this section.</p>
F3 TP_STAT PID EQUALS SYSTEM FAULT WITH DTC B287A PRESENT	
<ul style="list-style-type: none"> ● Train all 4 tire pressure sensors. Refer to Tire Pressure Monitoring System (TPMS) Sensor Training in this section. ● Did all of the tire pressure sensors transmit correctly and did the horn sound when each tire pressure sensor transmitted to the SJB ? 	<p>Yes Using the scan tool, LOCATE the updated TPMS sensor identifiers trained to the SJB module.</p> <p>COMPARE these values to those recorded prior to the TPMS sensor training procedure. Disregarding sensor position, any sensor identifiers that do not match those retrieved from the module were changed, but not retrained. The sensors are now trained to the vehicle, diagnosis is complete.</p>

	<p>DOCUMENT all TPMS sensor identifiers on the applicable warranty claim.</p> <p>VERIFY system operation.</p> <p>No Before diagnosing the SJB : If the sensors do not respond to the Tire Pressure Monitor Activation Tool, ATTEMPT to activate the same sensors with the Tire Pressure Monitor Activation Tool a second time. If the sensors still do not respond, MOVE the vehicle to rotate the wheels at least one-fourth of a turn and ATTEMPT to activate the same sensors again.</p> <p>If the sensors fail to train a second time, GO to F4 .</p>
<p>F4 CHECK FOR CORRECT SJB OPERATION</p>	<p>Yes NOTE: The sensors may not be present. DISMOUNT the tire. REFER to Wheel and Tire in this section. VERIFY that the sensors are present and mounted to the wheels. If missing, INSTALL new sensors.</p> <p>If the sensors are present, INSTALL a new SJB module. REFER to Section 419-10 . CLEAR the DTCs. REPEAT the self-test.</p> <p>No The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the self-test.</p>
<ul style="list-style-type: none"> ● Disconnect all the SJB electrical connectors. ● Check the connectors for: <ul style="list-style-type: none"> ■ corrosion. ■ pushed-out pins. ■ spread terminals. ● Connect all the SJB connectors and make sure that they are seated correctly. ● Operate the system and verify the concern is still present. ● Is the concern still present? 	

Pinpoint Test G: DTC B106A

Normal Operation

This DTC may be encountered if a sensor designed for a different application is installed. Low pressure applications utilize a black- or blue-colored sensor, while heavy duty applications utilize a green-colored sensor. The Smart Junction Box (SJB) will only allow one type of sensor to be trained using the Tire Pressure Monitoring System (TPMS) sensor training procedure. Make sure the correct sensors are used to avoid compatibility issues.

- DTC B106A (Pressure Sensor Range Bit Incorrect State) — When an attempt has been made to train a non-compatible sensor, the [SJB](#) will set DTC B106A.

This pinpoint test is intended to diagnose the following:

- Incorrect tire pressure sensor(s) installed

PINPOINT TEST G: DTC B106A

Test Step	Result / Action to Take
<p>G1 DETERMINE IF THE VEHICLE IS EQUIPPED WITH AN INCORRECT SENSOR</p>	<p>Yes CLEAR the DTCs. REPEAT the self test. VERIFY system operation.</p>
<ul style="list-style-type: none"> ● Train all 4 tire pressure sensors. Refer to Tire Pressure Monitoring 	

[System \(TPMS\) Sensor Training](#)

in this section.

- **Did all of the tire pressure sensors transmit correctly and did the horn sound when each tire pressure sensor transmitted to the [SJB](#) ?**

No

Before installing a new sensor(s) : If a sensor(s) does not respond to the Tire Pressure Monitor Activation Tool, ATTEMPT to activate the same sensor(s) with the Tire Pressure Monitor Activation Tool. If the sensor(s) still does not respond, MOVE the vehicle to rotate the wheels at least one-fourth of a turn and ATTEMPT to activate the same sensor(s) again.

If the sensor(s) fails to train a second time, INSTALL a new tire pressure sensor(s). REFER to [Tire Pressure Monitoring System \(TPMS\) Sensor](#) in this section.

Pinpoint Test H: DTC B106B

Normal Operation

If there is a fault in the Tire Pressure Monitoring System (TPMS), such as a damaged or missing sensor(s), damaged module or a communication issue within the vehicle, DTCs are set in the Smart Junction Box (SJB), the [TPMS](#) warning indicator will flash for 70 seconds and then remain ON solid when the ignition switch is turned to the ON position and the message center (if equipped) will display TIRE PRESSURE SENSOR FAULT.

The tire pressure sensor is battery powered.

This DTC may be set when attempting to train a tire pressure sensor(s) with a low battery.

This pinpoint test is intended to diagnose the following:

- Tire pressure sensor battery
- Tire pressure sensor(s)

PINPOINT TEST H: DTC B106B

Test Step	Result / Action to Take
H1 DETERMINE WHICH SENSOR HAS A LOW BATTERY	
<ul style="list-style-type: none">• Train all 4 tire pressure sensors. Refer to Tire Pressure Monitoring System (TPMS) Sensor Training in this section.• Did all of the tire pressure sensors transmit correctly and did the horn sound when each tire pressure sensor transmitted to the SJB ?	<p>Yes CLEAR the DTCs. REPEAT the self test. VERIFY system operation.</p> <p>No Before installing a new sensor(s) : If a sensor(s) does not respond to the Tire Pressure Monitor Activation Tool, ATTEMPT to activate the same sensor(s) with the Tire Pressure Monitor Activation Tool. If the sensor(s) still does not respond, MOVE the vehicle to rotate the wheels at least one-fourth of a turn and ATTEMPT to activate the same sensor(s) again.</p> <p>If the sensor(s) fails to train a second time, INSTALL a new tire pressure sensor(s). REFER to Tire Pressure Monitoring System (TPMS) Sensor in this section.</p>

