TPMS Lite is based on a new SKIM module called WSSM (Wheel Sensor Signal Management).

**FIGURE 1: SKIM MODULE**

- **TPMS Lite** architecture with FMS gateway and CAN antennas (also apply to On-Screen TPMS version)
  
  Effective with the following vehicles: L-0909, L-6516, L-7684
  
  - FMS Gateway (programmed by vendor)
  - Three CAN network antennas. Three different part numbers, each assigned to a specific location on the vehicle.
  - New wiring harnesses routed from front to rear (CAN network).
FIGURE 2: TPMS LITE ARCHITECTURE

TPMS LITE OPERATION

- Power-up telltale light test
  - When the ignition key is turned to the ON position, the WSSM module is powered up and will activate TPMS telltale for a period of 3 seconds.

- Onboard sensors recognition
  - As the vehicle is moving (speed greater than 6 mph / 10 km/h) and a new sensor is detected by the WSSM module, its ID is temporarily stored and a tracking algorithm begins evaluating whether the sensor belongs to the vehicle or a very close vehicle.
  - The algorithm checks for sensor updates over a 15-minute period and if all conditions are met, the sensor ID will then be stored in non-volatile memory, meaning that at next power-up, it will not have to go through this process again.
  - When a sensor is removed (ex.: tire maintenance), the algorithm keeps the ID in memory for 5 more minutes, looking for updates. After this period if no updates are received, the ID will be deleted.

- On Board Sensors Quantity
  - As the speed gets over 6 mph / 10 km/h, the WSSM begins evaluating if the onboard sensor quantity is sufficient. It takes several minutes after the vehicle starts moving to get the confirmation there is a sufficient number of sensors. After the period has elapsed, the system will keep monitoring sensor quantity until vehicle is stopped.
  - In the event that sensor quantity is below minimum value, system error state is activated and generates the following:
    - TPMS SYSTEM MALFUNCTION popup
    - INFO telltale ON + corresponding audible signal
Following fault code is saved and occurrence is incremented (Ref to Electrical fault in the DID)

- System error state will clear itself 5 minutes after a sufficient number or sensors are detected or if the ignition key is cycled.

- **Tire Pressure monitoring (P)**
  - As soon as a new sensor is confirmed as on board and valid, pressure is monitored. Pressure values are compensated for temperature within each individual wheel.
  - *Low pressure alarm.* In the event where the pressure drops below 40 PSI in a wheel, the *Low Pressure Alarm* state is activated and generates the following:
    - CHECK telltale ON + TPMS telltale ON + warning audible signal
    - Following fault code is saved and occurrence is incremented (SID 55, FMI 1)
  - The *Low Pressure Alarm* will clear itself after the pressure has reached over 42 PSI or if the sensor stops broadcasting (see on board sensor recognition section).

- **Tire Temperature monitoring (T °)**
  - As soon as a new sensor is confirmed as on board and valid, temperature is monitored.
  - *High temperature warning.* In the event where the temperature goes above 90°C in a wheel, the *High Temperature Warning* state is activated and generates the following:
    - CHECK telltale ON + TPMS telltale flashing + warning audible signal
    - Following fault code is saved and occurrence is incremented (SID 106, FMI 0)
  - The *High Temperature Warning* will clear itself after the temperature has dropped below 185°F / 85°C or if the sensor stops broadcasting (see on board sensor recognition section).
  - *High temperature alarm.* In the event where the temperature goes above 212°F / 100°C in a wheel, the *High Temperature Alarm* state is activated and generates the following:
    - STOP telltale ON + TPMS telltale flashing + warning audible signal
    - Following fault code is saved and occurrence is incremented (SID 106, FMI 13)
  - The *High Temperature Alarm* will clear itself after the temperature has dropped below 203°F / 95°C or if sensor stops broadcasting (see on board sensor recognition section).
## DIAGNOSTIC TROUBLESHOOTING CODES (DTC) ON TPMS LITE

Fault codes displayed on MID 188 ELECTRICAL SYSTEM

<table>
<thead>
<tr>
<th>SID</th>
<th>FMI</th>
<th>Fault message /Description</th>
<th>Troubleshooting Instruction</th>
</tr>
</thead>
<tbody>
<tr>
<td>55</td>
<td>1</td>
<td>Tire Pressure too low</td>
<td>Visually check low pressure tire</td>
</tr>
<tr>
<td>106</td>
<td>0</td>
<td>Tire temperature too high</td>
<td>Feel temperature on each tire</td>
</tr>
<tr>
<td>106</td>
<td>13</td>
<td>Tire temperature critically High</td>
<td>Feel temperature on each tire</td>
</tr>
<tr>
<td>107</td>
<td>2</td>
<td>Tire sensor not responding</td>
<td>Always associated with SID faults 110 to 115. Troubleshoot 2\textsuperscript{nd} fault</td>
</tr>
<tr>
<td>110</td>
<td>4</td>
<td>Sensor Low Batt</td>
<td>Connect Cantrak and perform sensor learn ID</td>
</tr>
<tr>
<td>111</td>
<td>2</td>
<td>LIN/CAN Bus Power fault</td>
<td>Trouble shoot CAN/LIN communication error</td>
</tr>
<tr>
<td>112</td>
<td>2</td>
<td>Front Antenna Fault</td>
<td>Check Front Antenna</td>
</tr>
<tr>
<td>113</td>
<td>2</td>
<td>Rear Left Antenna Fault</td>
<td>Check Rear Left Antenna</td>
</tr>
<tr>
<td>114</td>
<td>2</td>
<td>Rear Right Antenna Fault</td>
<td>Check Rear Right Antenna</td>
</tr>
<tr>
<td>115</td>
<td>1</td>
<td>Low sensor counts</td>
<td>Connect Cantrak and perform sensor learn ID</td>
</tr>
</tbody>
</table>

### CONNECTING A CANTRAK MODULE AS A DIAGNOSTIC TOOL TO IDENTIFY FAULTY SENSOR

**FIGURE 3: DIAGNOSTIC TOOL USING CANTRAK MODULE**

**SETTINGS MENU**

<table>
<thead>
<tr>
<th>SET WHEEL ID</th>
<th>LEARN WHEEL ID</th>
<th>SET TARGET PRESSURES</th>
<th>ALARM SETTINGS</th>
<th>DISPLAY SETTINGS</th>
<th>EXIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>START LEARNING</td>
<td>START LEARNING</td>
<td>START LEARNING</td>
<td>START LEARNING</td>
<td>START LEARNING</td>
<td>START LEARNING</td>
</tr>
</tbody>
</table>

**Learn Wheel ID**

<table>
<thead>
<tr>
<th>CHOOSE AXLE &amp; WHEEL 1:1</th>
<th>CHOOSE AXLE &amp; WHEEL 1:1</th>
<th>WATING PRESSURE CHANGE ...</th>
</tr>
</thead>
<tbody>
<tr>
<td>START LEARNING</td>
<td>EXIT</td>
<td>START LEARNING</td>
</tr>
</tbody>
</table>
Select *Learn wheel ID*. Select 1:1, and then start learning. Lower air pressure in Front LH Tire until display automatically move to 1:2. Repeat the same on front R.H. tire. Follow learning sequence. Replace sensor(s) that cannot be detected or shows low battery.

Note: With TPMS Lite, the backup alarm beep is disabled when learning wheel ID operation. Look at the screen to acknowledge tire identification.

**Building the Cantrak Interface harness**

Build this wiring harness interface if you want to connect the Cantrak to front junction box connector C222.

*FIGURE 4: CANTRAK INTERFACE HARNESS DESIGN*
EXAMPLES OF POP UP MESSAGE AND DIAGNOSTIC TROUBLESHOOTING CODE

First example

![Image of a dashboard with TPMS malfunction]

Second example

CHECK telltale:

![CHECK icon]

TPMS telltale flashing:

![TPMS malfunction icon]

Diagnostic troubleshooting code:
PARTS / WASTE DISPOSAL

Discard according to applicable environmental regulations (Municipal/State[Prov.]/ Federal)

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