

## Wheels and Tires

### Overview

This section will provide basic information to assist in the diagnosis of tire-related faults.

Tire pressure monitoring systems (TPMS) have been introduced on 2006 my vehicles and this section will also provide information to assist in the diagnosis of the system.

For information on the operation of the systems:

[Wheels and Tires](#)

### TPMS inspection and verification

1 . Verify the customer complaint.

#### NOTE:

Record any messages displayed by the system.

2 . Visually inspect for obvious mechanical or electrical faults.

Mechanical	Electrical
<ul style="list-style-type: none"> <li>• Tire pressures</li> <li>• Tire/Wheel damage</li> <li>• Tire low pressure sensor fitment/damage</li> <li>• Front antenna fitment/damage</li> <li>• Rear antenna fitment/damage</li> <li>• Module antenna fitment/damage</li> </ul>	<ul style="list-style-type: none"> <li>• Fuses</li> <li>• Front antenna fitment/damage</li> <li>• Rear antenna fitment/damage</li> <li>• External antenna fitment/damage</li> <li>• TPMS switch</li> <li>• TPMS module</li> <li>• Connectors/Harnesses</li> </ul>

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 . Use the approved diagnostic system or a scan tool to retrieve any diagnostic trouble codes (DTCs) before moving onto the DTC index.



Make sure that all DTCs are cleared following rectification.

### DTC Index

#### NOTE:

Generic scan tools may not read the codes listed, or may read only 5-digit codes. Match the 5 digits from the scan tool to the first 5 digits of the 7-digit code listed to identify the fault (the last 2 digits give extra information read by the manufacturer-approved diagnostic system).

DTC	Description	Possible causes	Action
C1A0111	Switch LED status	<ul style="list-style-type: none"> <li>• LED circuit: short circuit to ground</li> </ul>	Check the LED and circuits. Refer to the electrical guides.
C1A0112	Switch LED status	<ul style="list-style-type: none"> <li>• LED circuit: short circuit to power</li> </ul>	Check the LED and circuits. Refer to the electrical guides.

C1A0113	Switch LED status	<ul style="list-style-type: none"> <li>LED circuit: high resistance</li> </ul>	Check the LED and circuits. Refer to the electrical guides.
C1A2992	Switch activation too long	<ul style="list-style-type: none"> <li>Switch performance</li> <li>Switch operation</li> </ul>	Check the switch operation.
C1A5512	Ignition switch input circuit	<ul style="list-style-type: none"> <li>Ignition switch input circuit: short circuit to power</li> </ul>	Check for DTCs indicating an ignition switch fault. Check the ignition switch and circuits. Refer to the electrical guides.
C1A5514	Ignition switch input circuit	<ul style="list-style-type: none"> <li>Ignition switch input circuit: short circuit to ground</li> <li>Ignition switch input circuit: high resistance</li> </ul>	Check the ignition switch and circuits. Refer to the electrical guides.
C1A5616	Left hand front tire low pressure sensor	<ul style="list-style-type: none"> <li>Low battery detected</li> </ul>	Install a new tire pressure sensor. <a href="#">Tire Low Pressure Sensor (74.10.05)</a>
C1A5631	Left hand front tire low pressure sensor	<ul style="list-style-type: none"> <li>No signal detected</li> </ul>	Check for antenna faults. If no antenna faults are indicated, install a new tire pressure sensor. <a href="#">Tire Low Pressure Sensor (74.10.05)</a>
C1A5691	Left hand front tire low pressure sensor	<ul style="list-style-type: none"> <li>Data out of range for: pressure, temperature or acceleration</li> </ul>	Install a new tire pressure sensor. <a href="#">Tire Low Pressure Sensor (74.10.05)</a>
C1A5693	Left hand front tire low pressure sensor	<ul style="list-style-type: none"> <li>No sensor can be found at this location</li> </ul>	Check for antenna faults. If no antenna faults are indicated, install a new tire pressure sensor. <a href="#">Tire Low Pressure Sensor (74.10.05)</a>
C1A5711	Left hand front antenna	<ul style="list-style-type: none"> <li>Output circuit: short circuit to ground</li> </ul>	Check the antenna circuits. Refer to the electrical guides.
C1A5712	Left hand front antenna	<ul style="list-style-type: none"> <li>Output circuit: short circuit to power</li> </ul>	Check the antenna circuits. Refer to the electrical guides.
C1A5713	Left hand front antenna	<ul style="list-style-type: none"> <li>Output circuit: high resistance</li> </ul>	Check the antenna circuits. Refer to the electrical guides.
C1A5816	Right hand front tire low pressure sensor	<ul style="list-style-type: none"> <li>Low battery detected</li> </ul>	Install a new tire pressure sensor. <a href="#">Tire Low Pressure Sensor (74.10.05)</a>
C1A5831	Right hand front tire low pressure sensor	<ul style="list-style-type: none"> <li>No signal detected</li> </ul>	Check for antenna faults. If no antenna faults are indicated, install a new tire pressure sensor. <a href="#">Tire Low Pressure Sensor (74.10.05)</a>
C1A5891	Right hand front tire low pressure sensor	<ul style="list-style-type: none"> <li>Data out of range for: pressure, temperature or acceleration</li> </ul>	Install a new tire pressure sensor. <a href="#">Tire Low Pressure Sensor (74.10.05)</a>

C1A5893	Right hand front tire low pressure sensor	NO SENSOR can be found at this location	Check for antenna faults. If no antenna faults are indicated, install a new tire pressure sensor. <a href="#">Tire Low Pressure Sensor (74.10.05)</a>
C1A5911	Right hand front antenna	<ul style="list-style-type: none"> <li>Output circuit: short circuit to ground</li> </ul>	Check the antenna circuits. Refer to the electrical guides.
C1A5912	Right hand front antenna	<ul style="list-style-type: none"> <li>Output circuit: short circuit to power</li> </ul>	Check the antenna circuits. Refer to the electrical guides.
C1A5913	Right hand front antenna	<ul style="list-style-type: none"> <li>Output circuit: high resistance</li> </ul>	Check the antenna circuits. Refer to the electrical guides.
C1A6016	Left hand rear tire low pressure sensor	<ul style="list-style-type: none"> <li>Low battery detected</li> </ul>	Install a new tire pressure sensor. <a href="#">Tire Low Pressure Sensor (74.10.05)</a>
C1A6031	Left hand rear tire low pressure sensor	<ul style="list-style-type: none"> <li>No signal</li> </ul>	Check for antenna faults. If no antenna faults are indicated, install a new tire pressure sensor. <a href="#">Tire Low Pressure Sensor (74.10.05)</a>
C1A6091	Left hand rear tire low pressure sensor	<ul style="list-style-type: none"> <li>Data out of range for: pressure, temperature or acceleration</li> </ul>	Install a new tire pressure sensor. <a href="#">Tire Low Pressure Sensor (74.10.05)</a>
C1A6093	Left hand rear tire low pressure sensor	<ul style="list-style-type: none"> <li>No sensor can be found at this location</li> </ul>	Check for antenna faults. If no antenna faults are indicated, install a new tire pressure sensor. <a href="#">Tire Low Pressure Sensor (74.10.05)</a>
C1A6111	Left hand rear antenna	<ul style="list-style-type: none"> <li>Output circuit: short circuit to ground</li> </ul>	Check the antenna circuits. Refer to the electrical guides.
C1A6112	Left hand rear antenna	<ul style="list-style-type: none"> <li>Output circuit: short circuit to power</li> </ul>	Check the antenna circuits. Refer to the electrical guides.
C1A6113	Left hand rear antenna	<ul style="list-style-type: none"> <li>Output circuit: high resistance</li> </ul>	Check the antenna circuits. Refer to the electrical guides.
C1A6216	Right hand rear tire low pressure sensor	<ul style="list-style-type: none"> <li>Low battery detected</li> </ul>	Install a new tire pressure sensor. <a href="#">Tire Low Pressure Sensor (74.10.05)</a>
C1A6231	Right hand rear tire low pressure sensor	<ul style="list-style-type: none"> <li>No signal</li> </ul>	Check for antenna faults. If no antenna faults are indicated, install a new tire pressure sensor. <a href="#">Tire Low Pressure Sensor (74.10.05)</a>
C1A6291	Right hand rear tire low pressure sensor	<ul style="list-style-type: none"> <li>Data out of range for: pressure, temperature or acceleration</li> </ul>	Install a new tire pressure sensor. <a href="#">Tire Low Pressure Sensor (74.10.05)</a>
C1A6293	Right hand rear tire low pressure sensor	<ul style="list-style-type: none"> <li>No sensor can be found at this location</li> </ul>	Check for antenna faults. If no antenna faults are indicated, install a new tire pressure sensor. <a href="#">Tire Low Pressure Sensor (74.10.05)</a>
C1A6311	Right hand rear antenna	<ul style="list-style-type: none"> <li>Output circuit: short circuit to ground</li> </ul>	Check the antenna circuits. Refer to the electrical guides.

C1A6312	Right hand rear antenna	<ul style="list-style-type: none"> <li>Output circuit: short circuit to power</li> </ul>	Check the antenna circuits. Refer to the electrical guides.
C1A6313	Right hand rear antenna	<ul style="list-style-type: none"> <li>Right hand rear antenna circuit: high resistance</li> </ul>	Check the antenna circuits. Refer to the electrical guides.
C1A6416	Spare wheel tire low pressure sensor	<ul style="list-style-type: none"> <li>Low battery detected</li> </ul>	Install a new tire pressure sensor. <a href="#">Tire Low Pressure Sensor (74.10.05)</a>
C1A6491	Spare wheel tire low pressure sensor	<ul style="list-style-type: none"> <li>No signal</li> </ul>	Install a new tire pressure sensor. <a href="#">Tire Low Pressure Sensor (74.10.05)</a>
C1A6493	Spare wheel tire low pressure sensor	<ul style="list-style-type: none"> <li>No sensor can be found at this location</li> </ul>	If the vehicle is fitted with a temporary spare wheel and tire take no action. Check for antenna faults. If no antenna faults are indicated, install a new tire pressure sensor. <a href="#">Tire Low Pressure Sensor (74.10.05)</a>
C1D1911	Module receiver	<ul style="list-style-type: none"> <li>Receiver data circuit: short circuit to ground</li> </ul>	Check the receiver circuits. Refer to the electrical guides.
C1D1912	Module receiver	<ul style="list-style-type: none"> <li>Receiver data circuit: short circuit to power</li> </ul>	Check the receiver circuits. Refer to the electrical guides.
C1D1987	Module receiver	<ul style="list-style-type: none"> <li>Receiver data circuit: missing message</li> </ul>	Check the receiver circuits. Refer to the electrical guides.
U007388	Control module communication bus A	<ul style="list-style-type: none"> <li>CAN bus off</li> </ul>	<a href="#">Communications Network</a>
U014087	Lost communication with body processor module	<ul style="list-style-type: none"> <li>Missing message</li> </ul>	<a href="#">Communications Network</a>
U015587	Lost communication with instrument cluster module	<ul style="list-style-type: none"> <li>Missing message</li> </ul>	<a href="#">Communications Network</a>
U016487	Lost communication with heating ventilation and air conditioning module	<ul style="list-style-type: none"> <li>Missing message</li> </ul>	<a href="#">Communications Network</a>
U030055	Internal control module incompatibility	<ul style="list-style-type: none"> <li>Not configured</li> </ul>	Configure the module using the approved diagnostic system.
U041600	Invalid data received	<ul style="list-style-type: none"> <li>Invalid data received from vehicle dynamics control module</li> </ul>	<a href="#">Communications Network</a>
U1A1449	CAN initialization failure	<ul style="list-style-type: none"> <li>Internal electronic failure</li> </ul>	<a href="#">Communications Network</a>

## Wheels and tires inspection and verification

For basic information on the wheels and tires available for this model year.

[Wheels and Tires](#)

For specifications for the wheels and tires (pressures, torques, etc).

[Specifications](#)

When replacing wheels or tires you must comply with local legislation regarding health and safety and correct fitment.

If the vehicle is fitted with TPMS, only approved wheels and tires should be used. If the wheel and tire size is changed (for example from R18 to R20) the TPMS module should be updated with the correct pressure information appropriate to the new wheel and tire set. Update the TPMS module using the approved diagnostic system.

As a general guideline, only replace tires in pairs or as a set, and only with tires of equivalent size and specification.

Confirm the symptoms of the customer complaint.

As much information as possible should be gathered from the driver to assist in diagnosing the cause(s).

1 . Before a road test, carry out a basic inspection to make sure the vehicle is safe and legal to drive.

### Basic inspection

- Correct tire inflation.
- [Specifications](#)
- Legal tire tread depth.
- Cuts/Bulges in tire sidewall(s).
- Tire ply separation.
- Embedded objects.
- Wheel rim damage.
- Correct tire fitment (specification, direction of rotation, etc).
- Any obvious distortion of the tire (flat/high spots).
- Worn/Damaged steering or suspension components.

[Front Suspension](#)

[Rear Suspension](#)

### Road test

If the results of the basic inspection are acceptable, carry out a road test to confirm the symptoms.

To reproduce the symptoms, test the vehicle on similar roads to those on which the fault occurs and at similar speeds (provided it is legal to do so).

If the vibration or noise can be reproduced, note the speed at which it occurs and see if it is possible to drive through the symptom, meaning, is it possible to alter the fault by driving faster or slower than the speed at which it occurs?

If it is possible, it is likely that the fault is caused by an imbalance in the wheel or tire.

If the vibration or noise gets worse as the vehicle speed increases, it is likely that the fault is caused by distortion in the wheel or tire, or worn or damaged components.

### Distortion checks

Check for distortion by raising the vehicle so that the wheels are free and placing an axle stand or similar fixed object next to each wheel in turn.

If the stand is placed at the tread of the tire, the tire can be checked for ovality by turning the wheel by hand and checking for high or low spots where the gap between the tread and the stand increases or reduces.

If the stand is placed next to the wheel rim or tire sidewall, the wheel and tire can be checked for run-out in a similar way.