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2014.0 DISCOVERY 4 / LR4 (LA), 204-04

WHEELS AND TIRES

TIRE PRESSURE MONITORING SYSTEM (G1985878)

PRINCIPLES OF OPERATION

For a detailed description of the Tire Pressure Monitoring System, refer to the relevant Description and Operation section in the workshop manual. REFER to: [Wheels and Tires](#) (204-04 Wheels and Tires, Description and Operation).

INSPECTION AND VERIFICATION

ⓘ CAUTION:

Diagnosis by substitution from a donor vehicle is **NOT** acceptable. Substitution of control modules does not guarantee confirmation of a fault, and may also cause additional faults in the vehicle being tested and/or the donor vehicle.

⚠ NOTES:

- If a control module or a component is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual, or determine if any prior approval programme is in operation, prior to the installation of a new module/component.
- When performing voltage or resistance tests, always use a digital multimeter that has the resolution ability to view 3 decimal places. For example, on the 2 volts range can measure 1mV or 2 K Ohm range can measure 1 Ohm. When testing resistance always take the resistance of the digital multimeter leads into account.
- Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.

1. Verify the customer concern
2. Visually inspect for obvious signs of damage and system integrity

Visual Inspection

MECHANICAL	ELECTRICAL
<ul style="list-style-type: none"> ▪ Wheels/tires ▪ Tire pressure sensors 	<ul style="list-style-type: none"> ▪ Fuses ▪ Wiring harnesses and connectors ▪ Central junction box ▪ Tire pressure sensors

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. If the cause is not visually evident, verify the symptom and refer to the Symptom Chart, alternatively check for Diagnostic Trouble Codes (DTCs) and refer to the DTC Index
5. Check JLR claims submission system for open campaigns. Refer to the corresponding bulletins and SSMS which may be valid for the specific customer complaint and carry out the recommendations as required.

SYMPTOM CHART

SYMPTOM	POSSIBLE CAUSES	ACTION
Tire pressure monitoring system warning indicator illuminated continuously	<ul style="list-style-type: none"> ▪ One or more tires punctured / incorrectly inflated 	<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p> NOTE: To extinguish the warning indicator/message, it is essential that the tire pressures are adjusted to the correct pressure with the ignition set to on. It is not necessary to drive the vehicle to extinguish the warning indicator /message; changing the tire pressure causes the tire pressure sensor to transmit new data.</p> </div> <ul style="list-style-type: none"> ▪ Check the tires for punctures. Check the tire pressures and correct as necessary
Tire pressure monitoring system warning indicator flashing for 75 seconds and then illuminated continuously	<ul style="list-style-type: none"> ▪ Tire pressure monitoring system fault 	<ul style="list-style-type: none"> ▪ Using the manufacturer approved diagnostic system, check the central junction box for related DTCs and refer to the relevant DTC index

USE OF PROPRIETARY LF TOOLS FOR DIAGNOSIS OF TPMS SENSOR ISSUES

An LF TPMS test and diagnostic tool may be used to check the operation and status of the TPMS sensors. Such LF tools typically operate by generating a low-frequency (LF) magnetic field to activate the tire pressure sensors and then capturing the information transmitted by the sensor (in the form of UHF radio signals) and displaying the status of the sensor to the technician. Any LF tool capable of supporting the communication protocols of the Continental TG1C sensor may be used.

If TPMS faults are logged with DTCs indicating either "No Signal" (DTC codes ending in 31 - for example, C1A56- **31**) or "No Operation" (DTC codes ending in 93 - for example, C1A56- **93**) from one or more TPMS sensor/transmitter assemblies and if an LF Tool is available, the following procedures may be used to diagnose the specific nature of the fault:

Incorrect TPMS Sensors Fitted

First, complete a visual external inspection to ensure wheel unit sensors are fitted. (e.g. no Winter wheels, space saver, Rubber valves etc) and ask the customer if they have fitted the spare wheel unit before the fault occurred. If no wheel units/incorrect wheel units/rubber valves are fitted:

1. Fit the correct JLR wheel units. Part Numbers for correct wheel units are: FW93 – 1A159 – AB (for Low Pressure Systems) / GX63 – 1A159 – AA (for High Pressure systems)
2. Use the Tire Pressure Sensor Replacement routine available in SDD/Pathfinder to write the new wheel unit ID (s) to the tire pressure monitoring system control module. Then, test drive the vehicle for at least 15 minutes duration with speed >20MPH and retest for TPMS DTCs

Correct TPMS Sensors Fitted

If the correct TPMS sensor/transmitter assemblies are fitted and if an LF Tool is available, the following procedures may be used to diagnose the specific nature of the fault:

3. Use the LF Tool to check the STATUS of all the wheel units. If any of the wheel units are in SHIP (DISABLED Mode), use the LF Tool to activate the units to ON (ENABLED/PARK Mode). Then, test drive the vehicle for at least 15 minutes duration with speed >20MPH and retest for TPMS DTCs
4. If there is no response from one or more of the wheel units, first check the following:
 - Check that only approved JLR parts are fitted
 - Check that the frequency of the wheel units is 433MHz
 - Review potential electrical interference to the tire pressure monitoring system control module e.g. charging units, power adapters, laptop/Nav screens, etc
 - Check to see if after-market Front and/or Rear facing cameras have been fitted. If fitted, reposition them
5. Following the above checks and any remedial action, if faults still persist:
 - Run the Tire Pressure Monitoring Tire Pressure Sensor Test available in SDD/Pathfinder and identify faulty wheel unit/s
 - Replace the faulty wheel units with the correct JLR wheel units. Part Numbers for correct wheel units are: FW93 – 1A159 – AB (for Low Pressure Systems) / GX63 – 1A159 – AA (for High Pressure systems)
 - Use the Tire Pressure Sensor Replacement routine available in SDD/Pathfinder to write the new wheel unit ID(s) to the tire pressure monitoring system control module. Then, test drive the vehicle for at least 15 minutes duration with speed >20MPH and retest for TPMS DTCs

TIRE PRESSURE CHECK AND ADJUSTMENT

NOTE:

Tire pressure adjustments are part of routine owner maintenance. Tire pressure adjustments that are required due to a lack of owner maintenance are not to be claimed under vehicle warranty.

The tire pressures should be checked using a calibrated tire pressure gauge and when the tires are cold (vehicle parked in the ambient temperature for at least one hour, not in a garage with an artificial ambient temperature).

If the tire pressure warning indicator/message does not clear within two minutes of adjusting the tire pressures, it is likely that the gauge is not correctly calibrated or the tires are warm. Perform the following steps until the warning has cleared:

1. Rotate the wheels by 180°
2. Increase the tire pressures by 3psi
3. Wait a further two minutes
4. Reset the tire pressures to the correct pressure

DTC INDEX

For a list of Diagnostic Trouble Codes (DTCs) that could be logged on this vehicle, please refer to Section 100-00. REFER to: [Diagnostic Trouble Code Index - DTC: Central Junction Box \(CJB\)](#) (100-00 General Information, Description and Operation).

PINPOINT TESTS

PINPOINT TEST A : U201F-11 TESTS

A1: U201F-11 TEST 1

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS				
	1 Set the ignition to off				
	2 Disconnect tire pressure monitoring system RF receiver connector C2875S				
	3 Measure the resistance between: <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>C2875S, HARNESS SIDE</th> <th>BATTERY</th> </tr> </thead> <tbody> <tr> <td>Terminal 1</td> <td>Negative terminal</td> </tr> </tbody> </table>	C2875S, HARNESS SIDE	BATTERY	Terminal 1	Negative terminal
C2875S, HARNESS SIDE	BATTERY				
Terminal 1	Negative terminal				
	Is the resistance less than 5 ohms? Yes GO toA2. No GO toA3.				

A2: U201F-11 TEST 2

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
	1 Disconnect central junction box connector C0580
	2 Measure the resistance between:

A2: U201F-11 TEST 2

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS	
	C2875S, HARNESS SIDE	BATTERY
	Terminal 1	Negative terminal
	<p>Is the resistance less than 5 ohms?</p> <p>Yes Refer to the electrical circuit diagrams and check the tire pressure monitoring system RF receiver LIN circuit for short circuit to ground. Repair the LIN circuit as necessary</p> <p>No GO toA4.</p>	

A3: U201F-11 TEST 3

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
	1 Reconnect tire pressure monitoring system RF receiver connector C2875S
	2 Using the manufacturer approved diagnostic system, clear the DTCs
	3 Set the ignition to off
	4 Set the ignition to on
	5 Read DTCs
	<p>Is DTC U201F-11 set?</p> <p>Yes Install a new tire pressure monitoring system RF receiver</p> <p>No Investigate possible cause of intermittent failure</p>

A4: U201F-11 TEST 4

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
	1 Reconnect central junction box connector C0580
	2 Reconnect tire pressure monitoring system RF receiver connector C2875S
	3 Using the manufacturer approved diagnostic system, clear the DTCs
	4 Set the ignition to off
	5 Set the ignition to on
	6 Read DTCs
	<p>Is DTC U201F-11 set?</p> <p>Yes Install a new central junction box</p> <p>No Investigate possible cause of intermittent failure</p>

PINPOINT TEST B : U201F-12 TESTS

B1: U201F-12 TEST 1

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS				
	1 Set the ignition to off				
	2 Disconnect tire pressure monitoring system RF receiver connector C2875S				
	3 Measure the resistance between: <table border="1" style="margin: 10px auto; width: 80%;"> <thead> <tr> <th style="background-color: #333; color: white;">C2875S, HARNESS SIDE</th> <th style="background-color: #333; color: white;">BATTERY</th> </tr> </thead> <tbody> <tr> <td>Terminal 1</td> <td>Positive terminal</td> </tr> </tbody> </table>	C2875S, HARNESS SIDE	BATTERY	Terminal 1	Positive terminal
C2875S, HARNESS SIDE	BATTERY				
Terminal 1	Positive terminal				
	Is the resistance less than 5 ohms? Yes GO toB2. No GO toB3.				

B2: U201F-12 TEST 2

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS				
	1 Disconnect central junction box connector C0580				
	2 Measure the resistance between: <table border="1" style="margin: 10px auto; width: 80%;"> <thead> <tr> <th style="background-color: #333; color: white;">C2875S, HARNESS SIDE</th> <th style="background-color: #333; color: white;">BATTERY</th> </tr> </thead> <tbody> <tr> <td>Terminal 1</td> <td>Positive terminal</td> </tr> </tbody> </table>	C2875S, HARNESS SIDE	BATTERY	Terminal 1	Positive terminal
C2875S, HARNESS SIDE	BATTERY				
Terminal 1	Positive terminal				
	Is the resistance less than 5 ohms? Yes Refer to the electrical circuit diagrams and check the tire pressure monitoring system RF receiver LIN circuit for short circuit to power. Repair the LIN circuit as necessary No GO toB4.				

B3: U201F-12 TEST 3

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
	1 Reconnect tire pressure monitoring system RF receiver connector C2875S
	2 Using the manufacturer approved diagnostic system, clear the DTCs
	3 Set the ignition to off
	4 Set the ignition to on
	5 Read DTCs
	Is DTC U201F-12 set? Yes

B3: U201F-12 TEST 3	
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
	Install a new tire pressure monitoring system RF receiver No Investigate possible cause of intermittent failure
B4: U201F-12 TEST 4	
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
	1 Reconnect central junction box connector C0580
	2 Reconnect tire pressure monitoring system RF receiver connector C2875S
	3 Using the manufacturer approved diagnostic system, clear the DTCs
	4 Set the ignition to off
	5 Set the ignition to on
	6 Read DTCs
	Is DTC U201F-12 set? Yes Install a new central junction box No Investigate possible cause of intermittent failure

PINPOINT TEST C : U201F-87 TESTS					
C1: U201F-87 TEST 1					
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS				
	1 Using a multimeter, measure and record the battery voltage (reference voltage)				
	2 Connect the multimeter to tire pressure monitoring system RF receiver connector C2875S terminals 3 and 2				
	Is the measured voltage less than battery voltage? Yes Repair the tire pressure monitoring system RF receiver power/ground circuit as necessary No GO toC2.				
C2: U201F-87 TEST 2					
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS				
	1 Disconnect tire pressure monitoring system RF receiver connector C2875S				
	2 Disconnect central junction box connector C0580				
	3 Measure the resistance between: <table border="1"> <thead> <tr> <th>C2875S, HARNESS SIDE</th> <th>C0580, HARNESS SIDE</th> </tr> </thead> <tbody> <tr> <td>Terminal 1</td> <td>Terminal 25</td> </tr> </tbody> </table>	C2875S, HARNESS SIDE	C0580, HARNESS SIDE	Terminal 1	Terminal 25
C2875S, HARNESS SIDE	C0580, HARNESS SIDE				
Terminal 1	Terminal 25				

C2: U201F-87 TEST 2	
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
	<p>Is the resistance less than 5 ohms?</p> <p>Yes GO toC3.</p> <p>No Refer to the electrical circuit diagrams and check the tire pressure monitoring system RF receiver LIN circuit for open circuit, high resistance. Repair the LIN circuit as necessary</p>
C3: U201F-87 TEST 3	
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
	1 Reconnect central junction box connector C0580
	2 Reconnect tire pressure monitoring system RF receiver connector C2875S
	3 Using the manufacturer approved diagnostic system, clear the DTCs
	4 Set the ignition to off
	5 Set the ignition to on
	6 Read DTCs
	<p>Is DTC U201F-87 set?</p> <p>Yes Install a new tire pressure monitoring system RF receiver. GO toC4.</p> <p>No Investigate possible cause of intermittent failure</p>
C4: U201F-87 TEST 4	
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
	1 Using the manufacturer approved diagnostic system, clear the DTCs
	2 Set the ignition to off
	3 Set the ignition to on
	4 Read DTCs
	<p>Is DTC U201F-87 set?</p> <p>Yes Install a new central junction box</p> <p>No Test is complete. No further action is required</p>

PINPOINT TEST D : C1D18-00 TESTS	
D1: C1D18-00 TEST 1	
TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
	<p>1 Establish the locations of the tire pressure sensor localization failures: Using the manufacturer approved diagnostic system, check datalogger signals:</p> <ul style="list-style-type: none"> ▪ Wheel Position Triggering Statistic, Identifier 1, Unsuccessful triggering (0x4149) ▪ Wheel Position Triggering Statistic, Identifier 2, Unsuccessful triggering (0x4149)

PINPOINT TEST D : C1D18-00 TESTS

D1: C1D18-00 TEST 1

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
	<ul style="list-style-type: none"> ■ Wheel Position Triggering Statistic, Identifier 3, Unsuccessful triggering (0x4149) ■ Wheel Position Triggering Statistic, Identifier 4, Unsuccessful triggering (0x4149)
	<p>Have the locations of the tire pressure sensor localization failures been identified?</p> <p>Yes GO toD2.</p> <p>No Investigate possible cause of intermittent failure</p>

D2: C1D18-00 TEST 2

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
	<p>1 Using the manufacturer approved diagnostic system, check the central junction box for tire pressure sensor related DTCs</p>
	<p>Are any tire pressure sensor related DTCs set?</p> <p>Yes Refer to the relevant DTC index and perform the relevant corrective actions</p> <p>No GO toD3.</p>

D3: C1D18-00 TEST 3

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
	<p>1 Using the manufacturer approved diagnostic system, check the central junction box for initiator related DTCs</p>
	<p>Are any initiator related DTCs set?</p> <p>Yes Refer to the relevant DTC index and perform the relevant corrective actions</p> <p>No GO toD4.</p>

D4: C1D18-00 TEST 4

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
	<p>1 Check for correct installation of the initiator(s) in the location(s) identified</p>
	<p>Are the initiator(s) correctly installed?</p> <p>Yes GO toD5.</p> <p>No Install the initiators correctly</p>

D5: C1D18-00 TEST 5

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS
	<p>1 Set the ignition to off</p>
	<p>2 Disconnect central junction box connector C0584 (front initiators)</p>
	<p>3 Disconnect central junction box connector C0586 (rear initiators)</p>

D5: C1D18-00 TEST 5

TEST CONDITIONS	DETAILS/RESULTS/ACTIONS				
	<p>4 Measure the resistance of the front right initiator circuit</p> <table border="1"> <thead> <tr> <th>C0584, HARNESS SIDE</th> <th>C0584, HARNESS SIDE</th> </tr> </thead> <tbody> <tr> <td>Terminal 1</td> <td>Terminal 2</td> </tr> </tbody> </table>	C0584, HARNESS SIDE	C0584, HARNESS SIDE	Terminal 1	Terminal 2
C0584, HARNESS SIDE	C0584, HARNESS SIDE				
Terminal 1	Terminal 2				
	<p>5 Measure the resistance of the front left initiator circuit</p> <table border="1"> <thead> <tr> <th>C0584, HARNESS SIDE</th> <th>C0584, HARNESS SIDE</th> </tr> </thead> <tbody> <tr> <td>Terminal 14</td> <td>Terminal 15</td> </tr> </tbody> </table>	C0584, HARNESS SIDE	C0584, HARNESS SIDE	Terminal 14	Terminal 15
C0584, HARNESS SIDE	C0584, HARNESS SIDE				
Terminal 14	Terminal 15				
	<p>6 Measure the resistance of the rear right initiator circuit</p> <table border="1"> <thead> <tr> <th>C0586, HARNESS SIDE</th> <th>C0586, HARNESS SIDE</th> </tr> </thead> <tbody> <tr> <td>Terminal 30</td> <td>Terminal 31</td> </tr> </tbody> </table>	C0586, HARNESS SIDE	C0586, HARNESS SIDE	Terminal 30	Terminal 31
C0586, HARNESS SIDE	C0586, HARNESS SIDE				
Terminal 30	Terminal 31				
	<p>7 Measure the resistance of the rear left initiator circuit</p> <table border="1"> <thead> <tr> <th>C0586, HARNESS SIDE</th> <th>C0586, HARNESS SIDE</th> </tr> </thead> <tbody> <tr> <td>Terminal 18</td> <td>Terminal 19</td> </tr> </tbody> </table>	C0586, HARNESS SIDE	C0586, HARNESS SIDE	Terminal 18	Terminal 19
C0586, HARNESS SIDE	C0586, HARNESS SIDE				
Terminal 18	Terminal 19				
	<p>Are any of the initiator resistance measurements less than 1 Ohm?</p> <p>Yes Repair the short circuit as necessary</p> <p>No Install new tire pressure sensor(s) in the locations identified</p>				

COMPONENT TESTS

Wheels and Tires

For wheel and tire specification information (pressures, torques, etc). REFER to: [Specifications](#) (204-04 Wheels and Tires, Specifications).

When replacing wheels or tires, local legislation regarding health and safety must be complied with.

If the vehicle has a Tire Pressure Monitoring System installed, only manufacturer approved wheels and tires should be used. If the wheel and tire size is changed (for example from R18 to R20) the Tire Pressure Monitoring System

module should be updated with the correct pressure information appropriate to the new wheel and tire set. Update the Tire Pressure Monitoring System module using the manufacturer 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. REFER to: [Specifications](#) (204-04 Wheels and Tires, Specifications).
- Legal tire tread depth
- Cuts/Bulges in tire sidewall(s)
- Tire ply separation
- Embedded objects
- Wheel rim damage
- Correct tire installation (specification, direction of rotation, etc)
- Any obvious distortion of the tire (flat/high spots)
- Worn/Damaged steering or suspension components

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.

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