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2020.0 DEFENDER (LE), 205-02

REAR DRIVE AXLE/DIFFERENTIAL

REAR DRIVE AXLE AND DIFFERENTIAL (G2400933)

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PRINCIPLES OF OPERATION

For additional information, refer to the relevant description and operation section of the workshop manual. REFER to: [Rear Drive Axle and Differential](#) (205-02 Rear Drive Axle/Differential, Description and Operation).

INSPECTION AND VERIFICATION

ⓘ CAUTIONS:

- 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.
- Only serviceable items can be renewed or adjusted. Failure to follow this instruction may result in the warranty of the component being rejected.

⚠ 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. 1. Verify the customer concern by carrying out a road test of the vehicle if safe to do so
2. Visually inspect for obvious signs of mechanical or electrical damage and system integrity

Visual Inspection

MECHANICAL	ELECTRICAL
■ Differential oil leakage ■ Differential oil level ■ Sensor installation ■ Rear right halfshaft ■ Rear left halfshaft	■ Power supply ■ Fuse(s) ■ Wiring harness physical damage or water ingress ■ Loose or corroded electrical connectors ■ CAN circuits

MECHANICAL	ELECTRICAL
■ Mass damper ■ Driveshaft	■ Sensors ■ Rear differential control module ■ Rear differential locking motor

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 DDW 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 MESSAGE	POSSIBLE CAUSE	ACTION
Rumbling noise from the rear of the vehicle varying at different vehicle speed and load	■ N/A	■ Rear differential internal failure ■ Road noise ■ Worn or damaged driveshaft joint ■ Wheel bearing ■ Another component contacting the front/rear drive halfshaft	Using the Jaguar Land Rover approved diagnostic equipment run application Noise, vibration and harshness diagnostic test - Rear differential
Running at reduced capability with fault present	■ N/A	■ Water ingress to wiring harness or connectors ■ Reduced differential capability ■ Differential increased tolerances ■ Internal fault ■ Rear differential control module fault	Check for stored DTCs and refer to the DTC index. Visually inspect the wiring harness and connectors for water ingress
Rear differential overheat	■ Rear Axle Overheat	■ Oil level incorrect ■ Oil level incorrect specification ■ Sensor fault	Check for stored DTCs and refer to the DTC index. Check for correct oil quantity and specifications. Refer to the relevant section of the workshop manual

SYMPTOM	POSSIBLE MESSAGE	POSSIBLE CAUSE	ACTION
		Internal fault	
Excessive steering effort	Rear Axle Fault	Sticking or stuck actuator	Check for stored fault codes and refer to DTC index
Vehicle hop and/or tyre scrub when the vehicle is cornering	N/A	- Rear differential locking motor brake circuit short circuit to ground, short circuit to power, open circuit, high resistance - Rear differential control module connector(s) not correctly connected, disconnected, pins backed out or damaged - Rear differential clutch actuator sticking	- Refer to the electrical circuit diagrams and check the rear differential locking motor brake circuit for short circuit to ground, short circuit to power, open circuit, high resistance. Rectify as necessary - Refer to - Rear Differential Control Module (RDCM) Connector Checks - in this section - Refer to - Rear Differential Control Module (RDCM) Clutch Activation Overheat Condition Checks - in this section

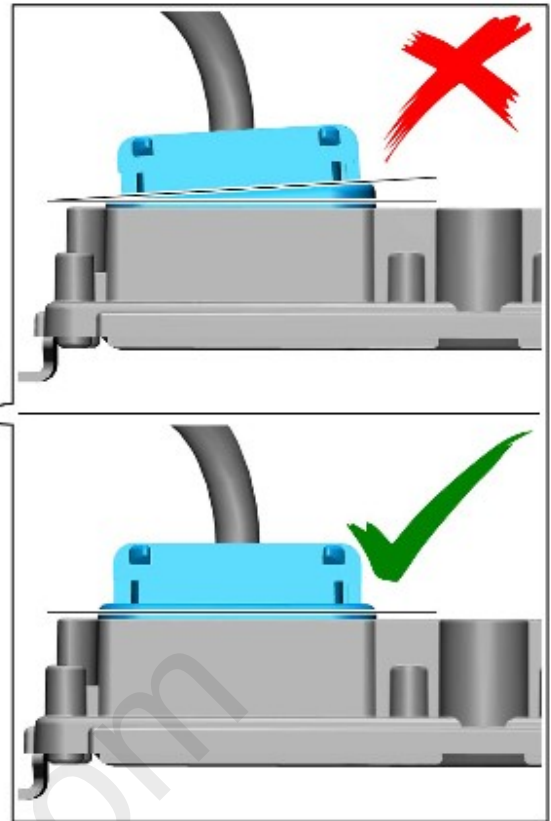
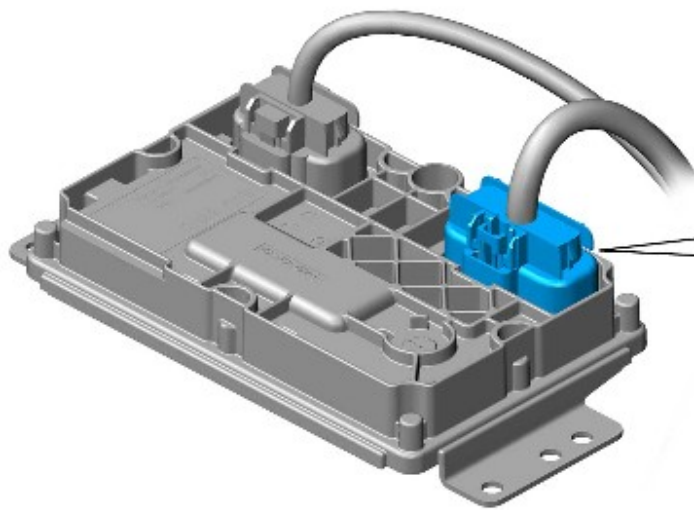
REAR DIFFERENTIAL CONTROL MODULE (RDCM) CONNECTOR CHECKS



NOTE:

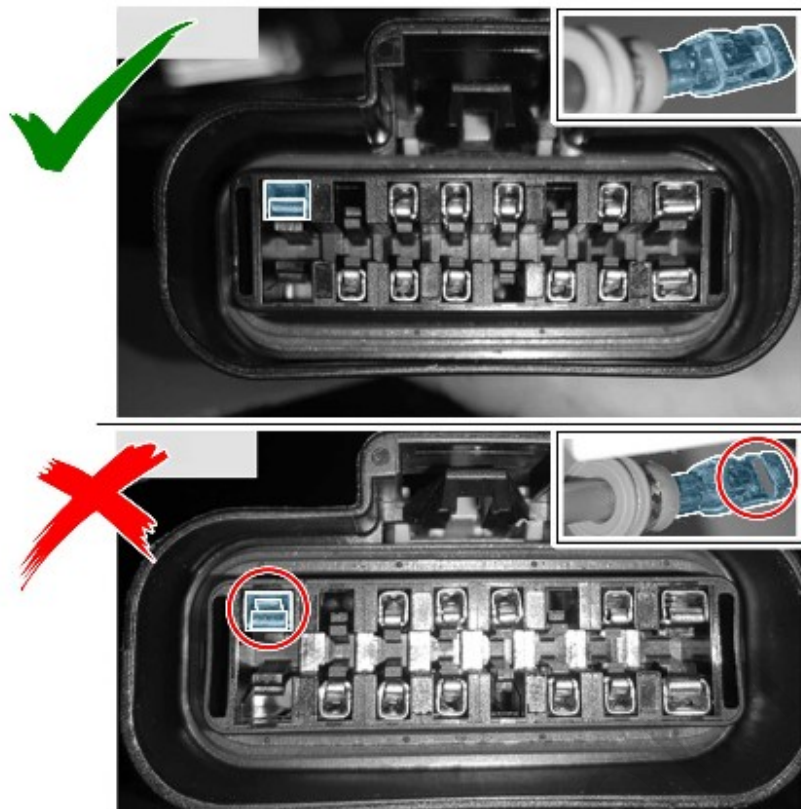
On vehicles with an Electronic Torque Manager (ETM) rear differential, it is possible for the wiring harness connectors to be incorrectly connected or be insecure when connected to the RDCM. Using the Jaguar Land Rover approved diagnostic equipment check for any RDCM related DTCs. Refer to the procedure below to check the connectors are securely located in the RDCM.

1. Inspect the RDCM wiring harness connector(s) for correct and secure connection. Check whether the connector (s) are secure and flush with the RDCM. See the image below of a correctly and incorrectly located connector



E223387

2. 2. If a connector is not flush with the RDCM, remove the connector and check the condition of the terminals within the connector. Have the pins been pulled out or damaged resulting in poor connectivity? See the image below



E223388

3. If the pins or connectors are damaged, or have poor connectivity, repair or replace the wiring harness as necessary and retest

REAR DIFFERENTIAL CONTROL MODULE (RDCM) CLUTCH ACTUATOR OVERHEAT CONDITION CHECK

⚠ CAUTION:

This procedure requires Pathfinder version 113 loaded or a later version.

STEP	ACTION
1.	Connect the Jaguar Land Rover Approved battery support unit
2.	Connect the Jaguar Land Rover Approved Diagnostic Equipment to the vehicle and begin a new diagnostic session. The Jaguar Land Rover Approved Diagnostic Equipment will read the correct VIN for the current vehicle and automatically take the vehicle out of 'Transportation mode' if required
3.	Using the Jaguar Land Rover Approved Diagnostic Equipment Select 'ECU Diagnostics'
4.	Select 'Rear Differential Control Module (RDCM)'
5.	Select 'Clear DTCs'

6.	Follow all the on-screen instructions to complete this task
7.	Start the engine
8.	Select 'Live Data'
9.	Select 'Operational Zero Position (D903)' and make a note of the value
10.	Select 'ECU Functions'
11.	Select 'Demand self test - module calibration'
12.	Follow all the on-screen instructions to complete this task
13.	Select 'Live Data'
14.	Select 'Operational Zero Position (D903)' and make a note of the value
15.	If required, reset the vehicle to 'Transportation mode' when the task is completed, exit the current session
16.	Disconnect the Jaguar Land Rover Approved Diagnostic Equipment and the Jaguar Land Rover Approved battery support unit
17.	If either 'Operational Zero Position (D903)' values are outside the range of 20 to 220, then replace the rear differential unit

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: Rear Differential Control Module \(RDCM\)](#) (100-00 General Information, Description and Operation).