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BATTERY, MOUNTING AND CABLES

DIAGNOSIS AND TESTING

PRINCIPLES OF OPERATION

For a detailed description of the battery system and operation, refer to the relevant Description and Operation section of the workshop manual REFER to: Battery and Cables (414-01 Battery, Mounting and Cables, 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 checked and/or the donor vehicle.

NOTES:

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

- If DTCs are recorded and, after performing the pinpoint tests, a fault is not present, an intermittent concern may be the cause. Always check for loose connections and corroded terminals.

1. Verify the customer concern

2. Visually inspect for obvious signs of mechanical or electrical damage

Visual Inspection

MECHANICAL	ELECTRICAL
▪ Generator ▪ Drive belt ▪ Drive belt tensioner ▪ Generator pulley ▪ Check the security of the generator fixings	▪ Generator ▪ Battery ▪ Battery connections ▪ Starter motor ▪ Harnesses and connectors ▪ Fuses ▪ Charge warning lamp function

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 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

POWER SUPPLY SERVICE MODE DIAGNOSTIC ROUTINE APPLICATION

NOTE:

The Jaguar Land Rover Approved battery support unit **must** be disconnected whilst the diagnostic routine application runs through its process.

Connect the Jaguar Land Rover Approved Diagnostic Equipment to the vehicle. Locate and run the 'Power supply service mode diagnostic' application by following the onscreen instructions

The diagnostic routine will perform five tests as follows:

1. Check the customer and vehicle system's battery usage. To do this it will interrogate the Battery Monitoring System (BMS) for data, this is only applicable for vehicles with a battery age greater than 30 days, **do not** reset the battery time in service counter prior to running this application. This will give guidance as to the customer and vehicle use of available power and how this has affected the battery e.g. high discharge due to use of the in car entertainment without the engine running

2. Check for known DTC's that will prevent the tests that will follow from being performed, this will show updated help text around these DTCs

3. Set the generator to mid voltage point, this will check that the LIN bus is working correctly and that the generator is able self regulate, this is done by checking the voltage and current at the generator and the battery

4. Switch the generator off, this will check that the LIN bus is working correctly and that the generator is able to self regulate, this is done by checking the voltage and current at the generator and the battery

5. Switch the generator to max charge, this will check that the LIN bus is working correctly and that the generator is able to self regulate, this is done by checking the voltage and current at the generator and the battery

When the routine application is complete, exit the session. Using the Jaguar Land Rover Approved Battery Diagnostic Equipment carry out any further specific battery tests as required

SYMPTOM CHART

SYMPTOM	POSSIBLE CAUSES	ACTION
▪ DTC B11DB-87 logged in Gateway Module	▪ Gateway Module connections insecure ▪ Battery Monitoring System Control Module connections insecure ▪ Battery Monitoring System Control Module fault	▪ GO to Pinpoint Test **A.**

SYMPTOM	POSSIBLE CAUSES	ACTION
▪ Battery power to vehicle interrupted	▪ High resistance between battery terminals and clamps	▪ Refer to the Battery Diagnostics instructions for the Midtronics GRX-3080 / EXP-1080 / GR8-1180 Diagnostic Battery Chargers in this Section

DIAGNOSTIC PROCEDURES FOR DTC B11DB-87 (BATTERY MONITORING MODULE "A" - MISSING MESSAGE)

NOTE:

These diagnostics only apply to vehicles fitted with a Gateway Module.

If a vehicle is presented with DTC B11DB-87 logged, follow the diagnostic routine below BEFORE replacing the Battery Monitoring System Control Module:

PINPOINT TEST A : BATTERY MONITORING SYSTEM CONTROL MODULE - FURTHER DIAGNOSTICS	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
A1: CHECK FOR RELATED DTCS (B1412-87)	
	1 Using the Jaguar Land Rover Approved Diagnostic Equipment, check the Gateway Module for related DTCs
	In addition to DTC B11DB-87, is DTC B1412-87 (Quiescent Current Control Module - Missing Message) also logged? **Yes** Check the continuity of Gateway Module LIN_1 circuit and rectify as required. Then, **GO to A2**. **No** **GO to A3**.
A2: CLEAR DTCS AND RETEST. CHECK GATEWAY MODULE AND QUIESCENT CURRENT CONTROL MODULE	
	1 Using the Jaguar Land Rover Approved Diagnostic Equipment, clear the DTCs and retest the vehicle (vehicle must have the ignition on or engine running for a minimum of 20 seconds before retesting)
	Are the DTCs still logged? **Yes** If ONLY B11DB-87 is logged, **GO to A3**. If ONLY B1412-87 is logged, check the connections and operation of the Quiescent Current Control Module and rectify as required If BOTH the DTCs are still present, check the connections and operation of the Gateway Module and rectify as required **No** No further action
A3: CHECK BATTERY MONITORING SYSTEM CONTROL MODULE INSTALLATION AND CONNECTIONS	

PINPOINT TEST A : BATTERY MONITORING SYSTEM CONTROL MODULE - FURTHER DIAGNOSTICS	
	1 Check that the Battery Monitoring System Control Module is seated correctly on the battery post (the battery post should slightly protrude from the mounting ring). Adjust as required
	2 Check that the Battery Monitoring System Control Module power cable (thin wire from positive terminal) is securely connected to positive terminal and that the wiring is undamaged. Rectify as required
	3 Check the installation of the Battery Monitoring System Control Module connector for security and check the security of the cables into the connector. Rectify as required
	4 Disconnect the Battery Monitoring System Control Module and LIN circuit connectors and visually inspect the pins in both ends for damage. Rectify as required and resecure connectors
	5 NOTE: this step only applies to X250. Ensure that the earth cable fixing at location G4D178 is secure and torqued to 13.5Nm
	6 Using the Jaguar Land Rover Approved Diagnostic Equipment, clear the DTCs and retest the vehicle (vehicle must have the ignition on or engine running for a minimum of 20 seconds before retesting)
	Is DTC B11DB-87 still logged? **Yes** Replace the Battery Monitoring System Control Module **No** No further action

FURTHER BATTERY DIAGNOSTICS

For further guidance in diagnosing battery issues, refer to the battery diagnostics instructions for the Midtronics GRX-3080 / EXP-1080 / GR8-1180 Diagnostic Battery Chargers in this section

DTC INDEX

For a list of Diagnostic Trouble Codes (DTCs) that could be logged on this vehicle, please refer to Section 100-00.