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Module Communications Network - Communications Network

Diagnosis and Testing

Principles of Operation

For a detailed description of the Communications Network, refer to the relevant Description and Operation sections in the workshop manual.
REFER to: Communications Network (418-00 Module Communications Network, 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.

 Electronic modules are sensitive to static electrical charges. If exposed to these charges, damage may result.

1. Verify the customer concern

2. Visually inspect for obvious signs of electrical damage and system integrity

Visual Inspection

Electrical
• Fuses (refer to electrical guide) • Wiring harness • Correct engagement of electrical connectors • Loose or corroded connections • Routing of fibre optic harnesses • Correct engagement of optical connectors • Correct placement of optical connectors (ring order) • Correct assembly of optical connectors (backout, etc) • Damage to fibre (chafing, abrasion, kinking, cuts, etc)

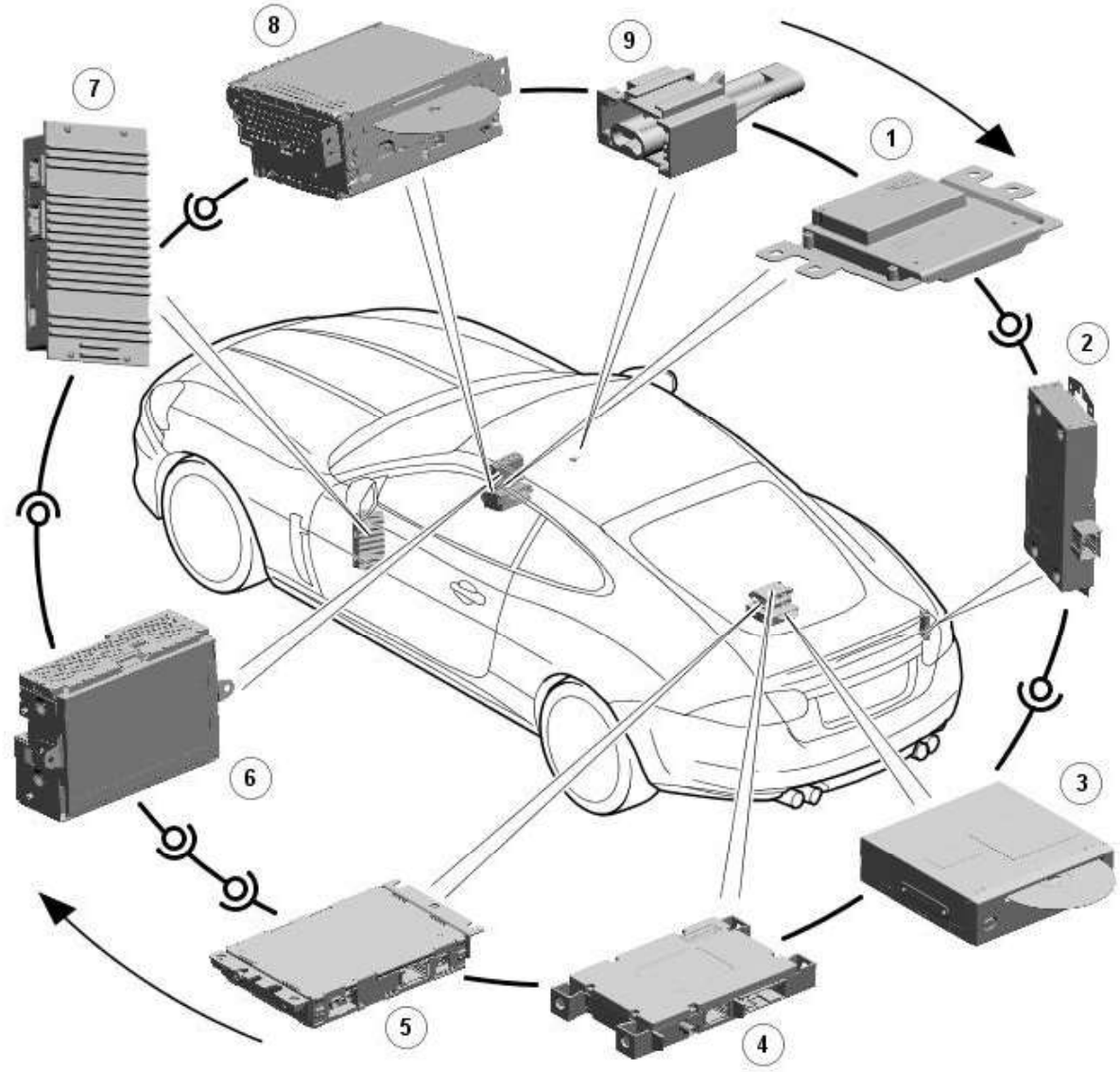
3. If an obvious cause for an observed or reported concern is found, correct the cause (if possible) before proceeding to the next step

4. If the cause is not visually evident check for diagnostic trouble codes (DTCs) and refer to the DTC Index

Symptom Chart

Symptom	Possible Causes	Action
MOST network fault - Touch screen display displaying flashing logo	• MOST ring broken after the touch screen display • Control module on MOST network power or ground circuit open circuit, high resistance • Control module on MOST network internal failure	• GO to Pinpoint Test B.
MOST network fault - Touch screen display blank	• MOST ring broken between the information and entertainment control module and the touch screen display • Information and entertainment control module or touch screen display power or ground circuit open circuit, high resistance • Wake up signal not received by the information and entertainment control module • Information and entertainment control module or touch screen display internal failure	• GO to Pinpoint Test G.

Media Oriented Systems Transport (MOST)



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NOTE: Items 1, 6, 7, 8 and 9 will always be present. The remaining items are optional and/or market specific.

Item	Description
1	Information and entertainment control module
2	Portable audio interface module
3	Navigation control module
4	Telephone module
5	DAB tuner module
6	Touch screen display
7	Power amplifier
8	Integrated audio module
9	MOST diagnostic connector

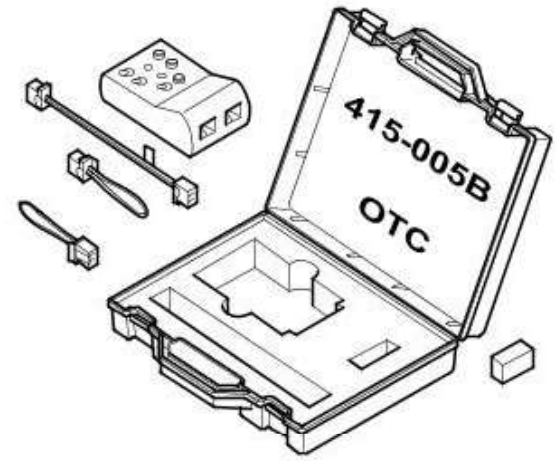
Overview

The basic guidelines are covered in the description and operation section, such as not attempting to repair fibre optic cables, but additional precautions include:

- Do not touch the exposed ends of the optical fibres (grease from skin can contaminate the fibre)
- Whenever the fibre optic cable is disconnected, cover the connectors to prevent dust contamination
- Do not expose the fibre optic cable to heat
- Do not bend the fibre optic cable through less than a 25 mm (one inch) radius
- Do not use laser pens to test the fibre optic cable's ability to pass light

MOST Diagnostic Tools

There are two dedicated tools for testing the MOST system:



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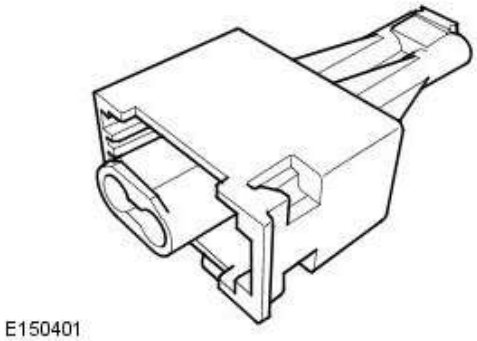
MOST tester. The MOST tester is connected to the MOST network in place of a control module. It will confirm receipt of any existing MOST signal and transmit it to the next control module on the network. Perform the following tests to validate the operation of the MOST tester. GO to Pinpoint Test A.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MOST prism. The MOST prism is connected in the same way as the MOST tester but will simply reflect any existing signal onward to the next control module. Using the MOST prism before or after a long run of harness may cause a ring break as a good signal may be too weak after travelling the extended distance. Also, the MOST prism will pass light in either direction so will not detect reversed MOST terminals elsewhere in the network. For these reasons, the MOST tester is the preferred tool and should be used unless limited access does not permit it

MOST Ring Break Indication

A ring break in the MOST network is indicated by a blank touch screen display if the break is before the touch screen display or a flashing logo of the break is after the touch screen display. Possible causes of ring breaks are listed in the symptom chart

Pinpoint Tests

PINPOINT TEST A : MOST TESTER TESTS	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
A1: MOST TESTER BATTERY TEST	
	1 Set the MOST tester power switch to 'on'
	Is the power LED illuminated? **Yes** Test passed. GO to A2. **No**

	Test failed. Install a new battery into the MOST tester. GO to A1.
A2: 2+0 INPUT/OUTPUT TEST	
NOTE: '2+0' indicates that the loop harness connector consists of 2 fibre optic terminals and 0 electrical terminals.	
NOTE: The MOST tester may continue to emit a tone or illuminate the LED after the test switch is released. This does not indicate a fault.	
	1 Set the MOST tester power switch to 'on'
	2 Set the connector selector switch to '2+0'
	3 Set the indication switch to 'beep' or 'LED'
	4 Remove the covers from the MOST tester 2+0 connector and the 2+0 loop harness connector
	5 Connect the 2+0 loop harness to the MOST tester 2+0 connector
	6 Operate the test switch and check the MOST tester beep/LED
	Did the MOST tester emit a tone or illuminate the LED? **Yes** Test passed. GO to A3. **No** Test failed. MOST tester or 2+0 harness fault
A3: 2+4 INPUT/OUTPUT TEST	
NOTE: '2+4' indicates that the loop harness connector consists of 2 fibre optic terminals and 4 electrical terminals.	
NOTE: The MOST tester may continue to emit a tone or illuminate the LED after the test switch is released. This does not indicate a fault.	
	1 Set the MOST tester power switch to 'on'
	2 Set the connector selector switch to '2+4'
	3 Set the indication switch to 'beep' or 'LED'
	4 Remove the covers from the MOST tester 2+4 connector and the 2+4 loop harness connector
	5 Connect the 2+4 loop harness to the MOST tester 2+4 connector
	6 Operate the test switch and check the MOST tester beep/LED
	Did the MOST tester emit a tone or illuminate the LED? **Yes** Test passed. GO to A4. **No** Test failed. MOST tester or 2+4 harness fault
A4: ADAPTER HARNESS AND PRISM TEST	
NOTE: The MOST tester may continue to emit a tone or illuminate the LED after the test switch is released. This does not indicate a fault.	
	1 Set the MOST tester power switch to 'on'
	2 Set the connector selector switch to '2+0'
	3 Set the indication switch to 'beep' or 'LED'
	4 Remove the covers from the MOST tester 2+0 connector, the prism, and the adapter harness connectors
	5 Connect the adapter harness to the MOST tester 2+0 connector
	6 Connect the prism to the adapter harness
	7 Operate the test switch and check the MOST tester beep/LED
	Did the MOST tester emit a tone or illuminate the LED? **Yes** Test passed **No** Test failed. MOST tester, adapter harness or prism fault

PINPOINT TEST B : MOST NETWORK INITIAL TESTS	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
B1: MOST NETWORK INITIAL TEST 1	
NOTE: When connecting the MOST tester, use the 2+0 or 2+4 socket as appropriate and set the connector selector switch to match the socket in use	
	1 Switch on the audio/video system
	2 Remove the cover from the MOST diagnostic connector
	3 Set the MOST tester power switch to 'on'
	4 Connect the MOST tester to the MOST diagnostic connector
	5 Check the touch screen for indication of a MOST network fault
	Has the MOST network been restored? **Yes** The MOST diagnostic connector cover is causing the MOST network fault. GO to B2. **No** The MOST diagnostic connector cover is not causing the MOST network fault. GO to B3.
B2: MOST NETWORK INITIAL TEST 2	
	1 Disconnect the MOST tester
	2 Install the cover to the MOST diagnostic connector
	Has the MOST network been restored?

	Yes No further action required **No** Install a new MOST diagnostic connector cover

B3: MOST NETWORK INITIAL TEST 3	
	1 Check the MOST tester beep/LED
	Did the MOST tester emit a tone or illuminate the LED? **Yes** MOST signal received. The MOST network fault is located downstream of the MOST tester. GO to Pinpoint Test E. **No** MOST signal not received. The MOST network fault is located upstream of the MOST tester. Disconnect the MOST harness connector from the MOST tester and reconnect it to the control module. GO to Pinpoint Test C.

PINPOINT TEST C : MOST NETWORK UPSTREAM TESTS	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
C1: MOST NETWORK UPSTREAM TEST 1	
	1 Refer to the electrical circuit diagrams and identify the preceding control module on the MOST network
	Is this control module the touch screen display? **Yes** GO to Pinpoint Test F. **No** GO to C2.
C2: MOST NETWORK UPSTREAM TEST 2	
	1 Disconnect the MOST harness connector from the control module
	2 Direct the MOST harness connector at a suitable surface and check for the presence of red light
	Is red light present? **Yes** The MOST network fault is in the control module or the MOST harness to the succeeding control module. GO to C3. **No** The MOST network fault is located upstream of the disconnected control module. Reconnect the MOST harness connector to the control module. GO to C1.
C3: MOST NETWORK UPSTREAM TEST 3	
NOTE: When connecting the MOST tester, use the 2+0 or 2+4 socket as appropriate and set the connector selector switch to match the socket in use	
	1 Connect the MOST harness connector to the MOST tester
	2 Check the touch screen display for indication of a MOST network fault
	Has the MOST network been restored? **Yes** The disconnected control module is causing the MOST network fault. GO to Pinpoint Test D. **No** The fault is in the MOST harness between the MOST tester and the succeeding control module. Install a new MOST harness as necessary

PINPOINT TEST D : CONTROL MODULE TESTS	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
D1: CONTROL MODULE TEST 1	
NOTE: When connecting the MOST tester, use the 2+0 or 2+4 socket as appropriate and set the connector selector switch to match the socket in use	
NOTE: The MOST tester may continue to emit a tone or illuminate the LED after the test switch is released. This does not indicate a fault.	
	1 Connect the MOST tester to the relevant control module using the adapter harness
	2 Operate the test switch and check the MOST tester beep/LED
	Did the MOST tester emit a tone or illuminate the LED? **Yes** MOST signal received. Tests inconclusive. Reconnect the MOST harness connector to the control module and confirm that the MOST network fault is still present. Repeat the tests from the beginning. GO to Pinpoint Test B. **No** GO to D2.
D2: CONTROL MODULE TEST 2	
	1 Refer to the electrical circuit diagrams and test the relevant control module power and ground circuits for open circuit, high resistance
	Are the power and ground circuits within specification? **Yes** GO to D3.

	No Repair the power and/or ground circuit
D3: CONTROL MODULE TEST 3	
	1 Reconnect the MOST harness to the control module
	2 Check the touch screen display for indication of a MOST network fault
	Has the MOST network been restored? **Yes** Tests inconclusive. Repeat the tests from the beginning. GO to Pinpoint Test B. **No** Install a new control module

PINPOINT TEST E : MOST NETWORK FINAL DOWNSTREAM TEST	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
E1: MOST NETWORK FINAL DOWNSTREAM TEST 1	
NOTE: When connecting the MOST tester, use the 2+0 or 2+4 socket as appropriate and set the connector selector switch to match the socket in use	
NOTE: The MOST tester may continue to emit a tone or illuminate the LED after the test switch is released. This does not indicate a fault.	
	1 Disconnect the MOST tester from the MOST diagnostic connector
	2 Install the cover to the MOST diagnostic connector
	3 Disconnect the MOST harness connector from the information and entertainment control module
	4 Connect the MOST harness connector to the MOST tester
	5 Operate the test switch and check the MOST tester beep/LED
	Did the MOST tester emit a tone or illuminate the LED? **Yes** GO to E2. **No** The fault is in the harness between the information and entertainment control module and the preceeding control module. Install a new MOST harness as necessary
E2: MOST NETWORK FINAL DOWNSTREAM TEST 2	
	1 Disconnect the MOST harness connector from the MOST tester
	2 Reconnect the MOST harness connector to the information and entertainment control module
	3 Check the touch screen display for indication of a MOST network fault
	Has the MOST network been restored? **Yes** Tests inconclusive. Repeat the tests from the beginning. GO to Pinpoint Test B. **No** Install a new information and entertainment control module

PINPOINT TEST F : MOST NETWORK FINAL UPSTREAM TESTS	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
F1: MOST NETWORK FINAL UPSTREAM TEST 1	
NOTE: The MOST tester may continue to emit a tone or illuminate the LED after the test switch is released. This does not indicate a fault.	
	1 Disconnect the MOST harness connector from the touch screen display
	2 Connect the MOST tester to the touch screen display using the adapter harness
	3 Operate the test switch and check the MOST tester beep/LED
	Did the MOST tester emit a tone or illuminate the LED? **Yes** The fault is in the MOST harness between the touch screen display and the succeeding control module. Install a new MOST harness as necessary **No** GO to F2.
F2: MOST NETWORK FINAL UPSTREAM TEST 2	
	1 Reconnect the MOST harness to the touch screen display
	2 Check the touch screen display for indication of a MOST network fault
	Has the MOST network been restored? **Yes** Tests inconclusive. Repeat the tests from beginning. GO to Pinpoint Test B. **No** Install a new touch screen display

PINPOINT TEST G : BLANK SCREEN TESTS	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
G1: BLANK SCREEN TEST 1	
	1 Disconnect the MOST harness connector from the touch screen display

	1
	2 Direct the MOST harness connector at a suitable surface and check for the presence of red light
	Is red light present? **Yes** GO to Pinpoint Test I. **No** GO to G2.
G2: BLANK SCREEN TEST 2	
	1 Refer to the electrical circuit diagrams and identify the preceding control module on the MOST network
	Is this control module the information and entertainment control module? **Yes** GO to G5. **No** GO to G3.
G3: BLANK SCREEN TEST 3	
	1 Disconnect the MOST harness connector from the control module
	2 Direct the MOST harness connector at a suitable surface and check for the presence of red light
	Is red light present? **Yes** The MOST network fault is in the control module or the MOST harness to the succeeding control module. GO to G4. **No** The MOST network fault is located upstream of the disconnected control module. Reconnect the MOST harness connector to the control module. GO to G2.
G4: BLANK SCREEN TEST 4	
NOTE: When connecting the MOST tester, use the 2+0 or 2+4 socket as appropriate and set the connector selector switch to match the socket in use	
	1 Connect the MOST harness connector to the MOST tester
	2 Check the touch screen display for indication of a MOST network fault
	Has the MOST network been restored? **Yes** The disconnected control module is causing the MOST network fault. GO to Pinpoint Test D. **No** The fault is in the MOST harness between the MOST tester and the succeeding control module. Install a new MOST harness as necessary
G5: BLANK SCREEN TEST 5	
	1 Disconnect the MOST harness connector from the information and entertainment control module
	2 Direct the information and entertainment control module at a suitable surface and check for the presence of red light
	Is red light present? **Yes** Install a new MOST harness between the information and entertainment control module and the succeeding control module **No** GO to Pinpoint Test H.

PINPOINT TEST H : INFORMATION AND ENTERTAINMENT CONTROL MODULE TESTS	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
H1: INFORMATION AND ENTERTAINMENT CONTROL MODULE TEST 1	
	1 Using the manufacturer approved diagnostic system, check the information and entertainment control module for related DTCs
	Is communication possible between the manufacturer approved diagnostic system and the information and entertainment control module? **Yes** Refer to the relevant DTC index **No** GO to H2.
H2: INFORMATION AND ENTERTAINMENT CONTROL MODULE TEST 2	
	1 Refer to the electrical circuit diagrams and test the information and entertainment control module power and ground circuits for open circuit, high resistance
	Are the power and ground circuits within specification? **Yes** GO to H3. **No** Repair the power and/or ground circuit
H3: INFORMATION AND ENTERTAINMENT CONTROL MODULE TEST 3	
	1 Using the manufacturer approved diagnostic system, perform a CAN network integrity test. Refer to the electrical circuit diagrams and test the medium speed CAN bus circuit for short circuit to ground, short circuit to power, open circuit, high resistance
	Is the medium speed CAN bus within specification?

	Yes Install a new information and entertainment control module **No** Repair the medium speed CAN bus circuit

PINPOINT TEST I : TOUCH SCREEN DISPLAY TESTS	
TEST CONDITIONS	**DETAILS/RESULTS/ACTIONS**
I1: TOUCH SCREEN DISPLAY TEST 1	
	1 Refer to the electrical circuit diagrams and test the touch screen display power and ground circuits for open circuit, high resistance
	Are the power and ground circuits within specification? **Yes** GO to I2. **No** Repair the power and/or ground circuit
I2: TOUCH SCREEN DISPLAY TEST 2	
	1 Reconnect the MOST harness to the touch screen display
	2 Check the touch screen display for indication of a MOST network fault
	Has the MOST network been restored? **Yes** Tests inconclusive. Repeat the tests from beginning. GO to Pinpoint Test B. **No** Install a new touch screen display

DTC Index

CAUTION: When probing connectors to take measurements in the course of the pinpoint tests, use the adaptor kit, part number 3548-1358-00.

NOTE: If the control module is suspect and the vehicle remains under manufacturer warranty, refer to the Warranty Policy and Procedures manual (section B1.2), or determine if any prior approval programme is in operation, prior to the installation of a new module.

NOTE: 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).

NOTE: When performing electrical voltage or resistance tests, always use a digital multimeter (DMM) accurate to three decimal places, and with an up-to-date calibration certificate. When testing resistance, always take the resistance of the DMM leads into account.

NOTE: Check and rectify basic faults before beginning diagnostic routines involving pinpoint tests.

NOTE: Inspect connectors for signs of water ingress, and pins for damage and/or corrosion.

NOTE: 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.

Rear Junction Box (RJB)

DTC	Description	Possible Cause	Action
B100A51	Fuel pump authorisation target ID not stored	• RJB fault • Low speed CAN fault • Instrument cluster fault	Check power and ground supplies to RJB. Check CAN communications between RJB and instrument cluster. Check power and ground supplies to instrument cluster
B100A62	Fuel pump authorisation signal compare failure	• Low speed CAN fault • RJB fault • Instrument cluster fault • Incorrect module installed (RJB/Instrument cluster) • Write target SID synchronisation error following re-programming • Noise/EMC related error	Check CAN communications between RJB and instrument cluster. Check power and ground supplies to RJB and instrument cluster. Confirm correct module installed. Re-synchronise ID by re-configuring the RJB as a new module. Check CAN network for interference/EMC related issues
B100A63	Fuel Pump Authorisation Time Out	• RJB fault • Low speed CAN fault • Instrument cluster fault • Low battery voltage <9V	Check power and ground supplies to RJB and instrument cluster. Check CAN communications between RJB and instrument cluster. Check battery is in fully charged and serviceable condition, refer to the battery care manual