

DUSTER

8 Electrical equipment

88B

MULTIPLEXING

Fault finding – Introduction	88B - 2
Fault finding – List and location of components	88B - 6
Fault finding – Operating diagram	88B - 7
Fault finding – Interpretation of faults	88B - 8
Fault finding – Fault Finding Chart	88B - 12

V1

Edition Anglaise

"The repair procedures given by the manufacturer in this document are based on the technical specifications current when it was prepared.

The procedures may be modified as a result of changes introduced by the manufacturer in the production of the various component units and accessories from which his vehicles are constructed."

All rights reserved by Renault s.a.s.

Copying or translating, in part or in full, of this document or use of the service part reference numbering system is forbidden without the prior written authority of Renault s.a.s.

© Renault s.a.s. 2009

INTRODUCTION

Description of the multiplex network:

The multiplex network consists of a twisted pair of wires connected to several vehicle computers. These two wires are called multiplex line H and multiplex line L.

On this vehicle, there is only one multiplex network. Depending on the vehicle options, it can include the following computers: ABS, ESP, torque distributor – ETC, injection, and DP0.

Data is exchanged by the computers on the **multiplex** network at a communication speed of 500 kbit/s.

In contrast to standard **multiplex** networks that have two **120 Ω** resistors at the two network terminations, this network has just one **60 Ω** resistor. This **60 Ω** line resistor is located in the injection computer.

PURPOSE

- The purpose of the multiplex network test is to determine the various computers present on the vehicle's multiplex network as well as the cause of possible inter-computer communication faults.
- It also serves to determine the functions installed in the vehicle which are often housed in various computers (distributed functions, e.g.: Air conditioning, Security access, etc.).
- The multiplex network test can also run fault finding on computers disconnected from the multiplex network; this provides an overview of the vehicle's electronic layout.

MULTIPLEX NETWORK OPERATIONAL TEST

Vehicle computer power supply for fault finding:

Depending on the type of vehicle equipment, proceed as follows:

Standard key / radio frequency key, switch on the ignition with the key.

To cut off the + after ignition feed, proceed as follows:

Standard key / radio frequency key, switch off the ignition with the key

This step is the essential starting point for any computer fault finding procedure.

It ensures that the network is correctly connected at the terminals of each computer and that the signal is correctly sent to it and received by it. This function also reads the faults present in the computers.

The multiplex network test function is started after the user selects the vehicle then selects the Test computers icon.

After the network check, the other functions become accessible.

MULTIPLEX NETWORK TEST PROCEDURE

- Establish dialogue with the computers storing the vehicle configuration (read identification).
- Read the computers that support fault finding.
- Computer interrogation.
- Physical (electrical) measurements on the multiplex line network.

IMPORTANT

Two fault finding lines are present on this vehicle depending on the equipment:

Multiplex line:

- Injection (depending on the engine)
- Torque distributor - ETC

Line K:

- Airbag
- ABS/ESP
- GEPDA

ACQUISITION AND DISPLAY OF THE RESULTS

The acquisition screen is made up of a bar graph which changes when the various initialisation, acquisition and data analysis stages are updated.

At the end of the test, the tool displays a screen with the test result.

COMPUTERS

- **Valid:** green border, green lettering.
- **Not detected:** red border, red lettering.
- **Cannot support fault finding:** black border, black lettering.
- **Not recognised:** red border, red lettering + exclamation mark.

Interpreting test result charts

On the **Faults** tab, the computers are organised into the following groups:

- **Not detected** if the computer failed to respond to the tool's identification request.
- **Not recognised** if the computer is detected but cannot be identified from its response.

On the **Information** tab, the computers are organised and listed as follows:

- **Cannot support fault finding**, if the computer cannot support fault finding with the tool and therefore was not queried.
- **Valid** if the computer responded correctly to the tool's request.

If the **Proceed** icon in the bottom right-hand corner is selected, a new screen will appear with the following tab:

Under the **Results** tab the computers are organised into the following groups:

- **Faulty** if the computer is known and has a non-zero number of faults.
- **OK** if the computer was detected, recognised and has no faults.
- **Not recognised** if the computer was detected but could not be identified from its response.
- **Not detected** if the computer can support fault finding but failed to respond.

FUNCTION TESTING

The function test can be accessed by clicking on the **List of functions** icon.

- The vehicle function tests screen resembles the multiplex network test screen with a diagram of the network layout if this is known and displayed.
- The **Function** tab displays the different computers involved in the functions whether distributed or not over the various computers.

Examples:

- **Air conditioning:** UCH, INJ, and CLIM.
- **Access - Safety:** UCH and INJ
- **Wiping:** UCH
- **Lighting:** UCH

- The **Info** tab displays the other possible functions found on the vehicle concerned.
- Selecting a function from the list of functions enables computers not involved in this function to be shaded, thus indicating the computers involved in this function.
- The **Fault finding** button runs fault finding on the function selected from the list.

The different components of the vehicle are listed below:

118	ABS computer	502	GEPDA computer
119	Automatic transmission computer	645	UCH
120	Injection computer	756	Airbag / pretensioners computer
225	Diagnostic socket	1016	Passenger compartment fuse box
247	Instrument panel	1094	ESP computer
261	Radio	2017	Torque distributor - ETC computer
419	Air conditioning		

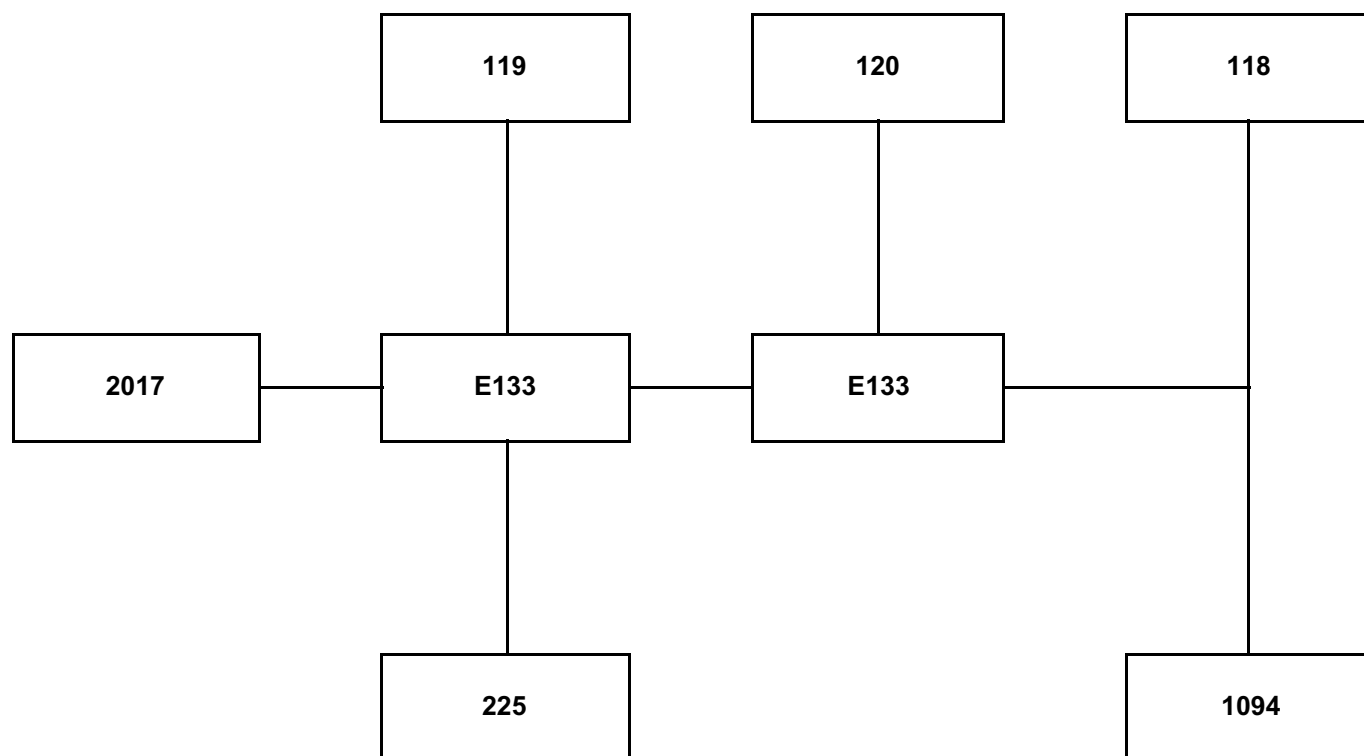
The location of the components is available under Visu-Schéma.

MULTIPLEXING

Fault finding – Operating diagram

88B

The multiplex network diagram may be similar to the following:



Number	Description
118	ABS computer
119	Automatic transmission computer
120	Injection computer
225	Diagnostic socket
1094	ESP computer
2017	Torque distributor - ETC computer
E133	Splice

WARNING

The CLIP tool does not display this network on the screen. Only a list of the computers is displayed. This list is essential in order to have all the important information about the computers (computer not recognised, not present, faulty, etc.).

FAULTY COMPUTER

NOTES

Make sure that the computers installed in the vehicle are the correct type and are compatible with the vehicle.
Check that the computers are correctly supplied (earth, + battery, + accessories or + after ignition).

Make sure that the computer **wake-up mode** is in full working order on the vehicle and is properly assimilated by the computers.

The wake-up mode is:

- **+ accessories feed:** ABS, ESP, torque distributor - ETC computer
- **+ after ignition feed:** Injection (the injection will not appear in **+ accessories feed**)

- Switch to **computer fault finding** mode.

Attempt to establish dialogue with computers.

- No dialogue between computers and the diagnostic tool: see ALP 1 **No dialogue with the computer** for computer(s) on which there is no dialogue with the diagnostic tool.

Check the connections to the computers and that there are no open circuits.

Repair if necessary.

- Computers are not displaying all the information on their identifications:

Check in the Workshop Repair Manual or the World Vehicle Database that the computer is compatible with the vehicle.

Check that the CLIP diagnostic tool update is recent enough to be able to deal with faults on the vehicle.

AFTER REPAIR

Carry out a new test using the diagnostic tool.
Clear the stored faults on all the computers connected to the network.
Deal with any other faults.

FAULTY COMPUTER (CONTINUED 1)

Measure the resistance of component **225** between the following connections:

- Connection code **133B**
- Connection code **133C**

What **is the value obtained?**

0 Ω

The two lines are in short circuit (see **Introduction - Repair advice**).

60 Ω ± 10 Ω

Check that each of the computers present on the network is correctly supplied.

For the ABS:

Check for earth on connections **MAH** and for the supply on connections **AP5**, **BP14**, and **BP88** of component **118**.

For the ABS / ESP:

Check for earth on connections **MAH** and for the supply on connections **AP5**, **BP14**, and **BP88** of component **1094**.

For the torque distributor - ETC:

Check for earth on connections **NC** and for the supply on connections **AP4**, **BP1U**, **LPD**, and **LPG** of component **2017**.

For the injections:

Check for earth on connections **NH** and for the supply on connections **AP29** or **AP29/ BP17** or **BP38/3FB/3FBA** of component **120**.

AFTER REPAIR

Carry out a new test using the diagnostic tool.

Clear the stored faults on all the computers connected to the network.

Deal with any other faults.

FAULTY COMPUTER (CONTINUED 2)

> 70 Ω

For each of connections 133B and 133C, check that there is no interference resistance and then check that there is no short circuit to earth or to the + battery feed.

Open circuit on one or two lines.

For the ABS:

Disconnect component **118** and check multiplex connections **133B** and **133C** between components **225** and **118**. Repair if necessary.

For the ABS / ESP:

Disconnect component **1094** and check multiplex connections **133B** and **133C** between components **225** and **1094**. Repair if necessary.

For the torque distributor - ETC:

Disconnect component **2017** and check multiplex connections **133B** and **133C** between components **225** and **2017**. Repair if necessary.

For the injections:

Disconnect component **120** and check multiplex connections **133B** and **133C** between components **225** and **120**. Repair if necessary.

If the fault is still present, contact the Techline.

AFTER REPAIR

Carry out a new test using the diagnostic tool.
Clear the stored faults on all the computers connected to the network.
Deal with any other faults.

COMPUTERS NOT RECOGNISED

NOTES	Check computer compatibility with the vehicle.
Check that the CLIP diagnostic tool update is recent enough to be able to deal with faults on the vehicle.	
<p>Switch to computer fault finding mode.</p> <p>Attempt to establish dialogue with computers.</p> <ul style="list-style-type: none"> – No dialogue between computers and the diagnostic tool: see ALP 1 No dialogue with the computers for computer(s) on which there is no dialogue with the diagnostic tool. Check the connections to the computers and that there are no open circuits. Repair if necessary. – If there is communication with computers: Make sure that the computer identification information is correct and matches the vehicle in fault finding. 	
<p>Check that the following computer information is correct:</p> <ul style="list-style-type: none"> – Vdiag – Program no. for the injection computers 	
If no faults or open or short circuits have been detected after these tests, contact Techline.	

AFTER REPAIR	<p>Carry out a new test using the diagnostic tool.</p> <p>Clear the stored faults on all the computers connected to the network.</p> <p>Deal with any other faults.</p>
---------------------	---

ALP 1	No dialogue with computers
--------------	-----------------------------------

NOTES	Vehicle computer power supply for fault finding: Engine stopped, ignition on. Connect the diagnostic tool and perform the required operations.
--------------	--

Try the **diagnostic tool** on another vehicle.
 Check that the tool has been updated with the latest version.

Check:

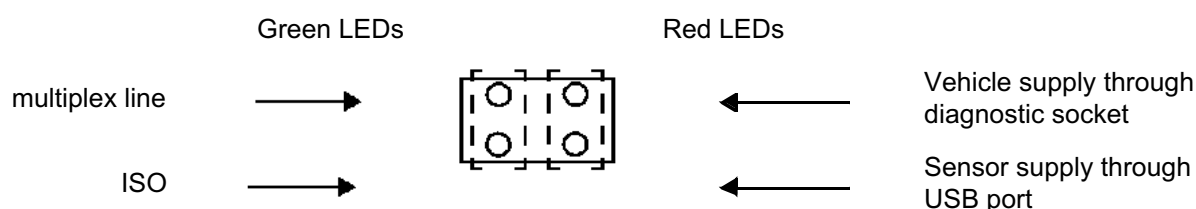
- the connection between the **diagnostic tool** and the diagnostic socket (**component 225**) (connection and cable in good condition),
- the supplies of the computers,
- the engine and passenger compartment fuses.

Check for the supply and earth on the diagnostic socket (component **225**) through the following connections: **BP56 (+12 V)**, **MAN** and **NC** (earths). If the checks are correct then move on to the next step, depending on the type of sensor used:

1. Renault fault finding sensor (with wire connection only):

Check that the CLIP sensor is supplied via the computer's USB port and the diagnostic socket by checking that the red diodes illuminate. If this is not the case, try again with another cable or sensor or even another clip sensor in order to determine the faulty component.

Check that the CLIP sensor is communicating correctly with the vehicle computers; this can be confirmed by the illumination of the two green diodes on the sensor. If it is not, check that the test conditions have been met (+ after ignition feed, vehicle selection etc.) otherwise apply the electrical checks below.



2. Alliance fault finding sensor (with wireless connection possible):





Deal with the fault finding for each warning light in the following order of priority: from warning light 1 to warning light 3.

MULTIPLEXING

Fault finding – Fault Finding Chart

88B





ALP 1 CONTINUED 1	
------------------------------	--

Description of warning lights displayed on the sensor from left to right	 Warning light 1 shows the supply status	 Warning light 2 shows the type and status of the connection	 Warning light 3 shows the level of communication with the vehicle	 Reserved for the Nissan tool
Off	Sensor not connected to the vehicle or connection fault	No connection to clip or connection fault	No dialogue with the computers	-
Green	Sensor supplied	Wireless connection	Green flashing: communication in progress	-
Orange	-	Connection with USB port	-	-
Red	Initialisation fault	-	Communication error	-

MULTIPLEXING

Fault finding – Fault Finding Chart

88B

ALP 1 CONTINUED 2				
Description of warning lights displayed on the sensor from left to right	 Warning light 1 shows the supply status	 Warning light 2 shows the type and status of the connection	 Warning light 3 shows the level of communication with the vehicle	 Reserved for the Nissan tool
To be checked	If red or off: <ul style="list-style-type: none"> – Initialisation or connection fault. Disconnect and reconnect the sensor several times. If the result is not conclusive, try with another sensor. 	If off: <ul style="list-style-type: none"> – Wireless connection: Try connecting with a USB cable. If the warning light illuminates orange, then check the configuration of the wireless connection. If it is not correct, call the Techline. – With a wired connection: Try with another USB cable, another clip or another sensor in order to determine the defective component. 	If warning light 3 is off or red and warning light 2 is illuminated: <ul style="list-style-type: none"> – in this case, during the multiplex network test check that the green warning light flashes and that the test conditions have been met (+ after ignition feed, vehicle selection, etc.) otherwise apply the electrical checks below. 	If the warning light is on: Contact the Techline.

ALP 1 CONTINUED 3

Check the following connections on the diagnostic socket:

BP 56 → **+ Battery**

MAN and NC → **Earth**

If the connection or connections are faulty and there is a repair procedure (see **Technical Note 6015A, Electrical wiring repair, Wiring: Precautions for repair**), repair the wiring, otherwise replace the wiring.

Computer connected to multiplex line V

If the fault is still present, check the **continuity** and the **insulation** of the following connections:

Multiplex line H (133B of component 225).

Multiplex line L (133C of component 225).

Use a multimeter to check that the voltages at the terminals of component **225** are approximately:

- **2.5 V** between **CAN H (133B)** and earth (**MAN and NC**) (Average values)
- **2.5 V** between **CAN L (133C)** and earth (**MAN and NC**) (Average values).

Refer to the **Introduction - Repair advice** to detect a short circuit on the vehicle's multiplex network.

MULTIPLEXING

Fault finding – Fault Finding Chart

88B

ALP 2	Communication fault between computers
NOTES	Vehicle computer power supply for fault finding: Engine stopped, ignition on. Connect the diagnostic tool and perform the required operations.
Computer connected to multiplex line V Check the continuity and insulation of the following connections: 133B between the faulty components, 133C between the faulty components, Important: Several computers can be present on the line.	
If the fault is still present, refer to the repair procedure of ALP1 "Faulty computers".	