

# MEGANE

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## 8 Electrical equipment

### 88B MULTIPLEXING

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### 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.

There may be two multiplex networks, depending on the vehicle's equipment.

- the **CAN V** (vehicle: injection, ABS, instrument panel, etc.) is always present,
- **multiplex line M** (multimedia: navigation, radio, hands-free telephone) depending on the vehicle's equipment.

Note:

**The RENAULT tool can only perform fault finding on the multiplex line V multiplex network.**

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

the **multiplex line V** network has two computers, each with an internal resistance of **120  $\Omega$**  (network termination resistances):

- the **injection computer**,
- the **airbag computer**.

### PURPOSE

- The purpose of the multiplex network test is to determine the 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 sometimes housed in various computers (distributed functions).
- The test also checks the condition of multiplex network segments.
- 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.

### MONITORING MULTIPLEX NETWORK OPERATION

**Vehicle computer power supply for fault finding:**

With the vehicle card in the card reader,  
press and hold start button (longer than **5 seconds**) with start-up conditions not fulfilled,  
connect the diagnostic tool and perform the required operations.

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

press the Start button twice briefly (less than 3 seconds),  
Ensure that the + after ignition feed has been cut off by checking that the computer indicator lights on the instrument panel have gone out.

**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 number of faults present in the computers.

**The Test multiplex network function is started after the vehicle is selected, followed by confirming 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).
- Vehicle configuration read in the two computers that store the multiplex network configuration (**UCH and Airbag**).
- List of computers which support fault finding read from the two configuration computers.
- Computer interrogation.
- Physical (electrical) measurements on the multiplex line network.

#### IMPORTANT

**Fault finding is run on all the computers connected to the multiplex network via the CAN V network, except the steering column lock computer and the driving school unit which cannot support fault finding.**

**Fault finding is run by other networks on just two computers that are not connected to the CAN V multiplex network - Proximity sensor by line K.**

- **Central communication unit by the CAN M (multimedia) network.**

If the following error messages appear during a multiplex network test:

- **Communication cannot be established with some computers: check their supply and diagnostic lines before rerunning the test:** network topology is visible. Check to see if there are many computers that have not been configured: update the multiplex network according to the computers on the vehicle (see **Multiplex network configuration**).
- **Incorrect computer configuration which support fault finding: check the configuration before rerunning test:** network topology is not visible, network configuration is requested (see **Multiplex network configuration**).
- **Incorrect configuration: check the computer configuration before rerunning test:** network topology is not visible, network configuration is requested (see **Multiplex network configuration**).

### 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.

#### How to read the topological diagram:

The results display screen consists of three zones:

- the upper zone: fault finding procedure result message,
- the left-hand centre zone: topological diagram (not always available),
- the right-hand centre zone: interpretation of the results from the various vehicle computers and list.

### COMPUTERS

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

### SEGMENTS

- **Valid:** green dash.
- **Faulty:** red dash.
- **Cannot support fault finding:** black dash.

### 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.  
Within the **not detected** category, the computers are subdivided into **Stores multiplex network configuration** and **Does not store multiplex network configuration**.
- **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 recognised 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 various computers involved in the functions whether distributed or not distributed over the various computers.
- 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.

### REPAIR HELP

- **Help with detecting computer or faulty segment:**

If the multiplex network is completely frozen, this command can isolate multiplex network segments and thereby rule out those that respond correctly to the tool. This makes it easier to pinpoint the cause of the fault. The algorithm for help with locating faults is intended for dealing with electrical faults present solely in the multiplex line; it is therefore essential that connectors and computers not attached to the multiplex line V are not taken into consideration.

- **A test for multiplex network faults by using physical measurements:**

When a multiplex network segment has a short circuit, the computers can no longer communicate with each other or with the diagnostic tool. At this point, the network test is not operational.

The CLIP tool can identify several types of faults by taking electrical measurements on the multiplex line H and multiplex line L multiplex network. It can detect a multiplex line L/multiplex line H short circuit, a multiplex line L/+ 12 V short circuit, a multiplex line H/+ 12 V short circuit, and a multiplex line H/earth short circuit. By disconnecting the connectors then the computers, it is possible to determine or indicate the segment causing the fault on the multiplex network.

# MULTIPLEXING

## Fault finding - Configuration

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### MULTIPLEX NETWORK CONFIGURATION

#### NOTES

The configuration is entered with the ignition on; apply the forced + after ignition feed procedure (see Introduction).  
It can be run from the multiplex network test results screens.

The tool displays the **UCH** and **Airbag** configurations.

The **Configuration** screen consists of two tabs for displaying and modifying:

- The first tab: **Multiplex network configuration** on the multiplex network version and the list of computers defined as present on the multiplex network.
- The second tab: **Configuration of computers supporting fault finding** indicates the relevant diagram number, and the list of defined computers which can support fault finding with the RENAULT tool.

#### WARNING

Enter the correct diagram version number,

- **Mégane II phase 1: version 1**
- **Mégane II phase 2: version 2 and above**

The number increases with each change to the multiplex network wiring in the vehicle.

**First repair the computers containing the multiplex network configuration (Airbag and UCH) in order to display the screen with the multiplex network configuration diagram for the vehicle on which fault finding is being run.**

#### IMPORTANT

A computer connected to the multiplex network but not declared as being among the computers containing the multiplex network configuration will not be checked in the multiplex network test.

Correct the configuration by declaring the computer as present if it is absent in the Airbag and UCH computer. Carry out the multiplex network test again after modifying the configurations.

# MULTIPLEXING

## Fault finding - Configuration

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### Configuration screen

Make sure that the information displayed on the tabs is correct.

The same configuration information for the two computers is essential for displaying the network topology.

Computer		Multiplex network configuration	Configuration of computers that can support fault finding
Injection		PRESENT	YES
AS		PRESENT	YES
UCH		PRESENT	YES
Automatic transmission		PRESENT or ABSENT (option)	YES or NO (option)
Instrument panel		PRESENT	YES
Airbag/pretensioners		PRESENT	YES
Steering lock		PRESENT	NO (cannot support fault finding)
Climate control		PRESENT or ABSENT (option)	YES or NO (option)
Proximity sensor		ABSENT	YES or NO (option)
Power assisted steering		PRESENT	YES
UPC (protection and switching unit)		PRESENT	YES
Driving school unit		PRESENT or ABSENT (option)	NO (cannot support fault finding)
Central Communication Unit		ABSENT	YES or NO (option)
Roof control unit		PRESENT or ABSENT (option)	YES or NO (option)
Gas injection		PRESENT or ABSENT (option)	YES or NO (option)
Hands-free kit		ABSENT	NO
IMPORTANT			
Mégane II ph1	Xenon bulb	PRESENT or ABSENT (option)	YES or NO (option)
	Left COSLAD	PRESENT or ABSENT (option)	YES or NO (option)
	Right COSLAD	PRESENT or ABSENT (option)	YES or NO (option)
Mégane II ph2	Lighting (xenon bulb)	PRESENT or ABSENT (option)	YES or NO (option)

**Option:** depending on equipment level

\* Manual climate control is not on the multiplex network and fault finding on it cannot be run with the clip tool.



## Fault finding - Interpretation of faults

### MULTIPLEX NETWORK NOT OPERATIONAL

<p><b>NOTES</b></p>	<p>First check that the computer at the end of the faulty segment is properly powered (earth, + battery, + accessories or + after ignition). Always check the computer conformity.</p> <p><b>IMPORTANT</b> Switch off the ignition or remove the RENAULT card from the card reader, check that the side lights are off and wait for <b>1 minute</b>.</p>
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<p><b>Finding the fault type</b></p>	<p><b>NOTES</b></p>	<p>Obtain a copy of the multiplex network diagram for the vehicle. (Diagnostic socket diagram).</p>
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<p>Measure the resistance between <b>tracks 6 and 14</b> of the diagnostic socket. What is <b>the resistance</b>?</p>
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<p><b>0 <math>\Omega</math></b></p>	<p>The two lines are in short circuit (see <b>Introduction - Repair advice</b>).</p>
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<p><b>60 <math>\Omega \pm 10 \Omega</math></b></p>	<p>Check that there is <b>earth, + battery feed, + accessories feed or + after ignition feed at the airbag computer and UCH terminals</b>.</p>
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<p><b>Between 70 <math>\Omega</math> and 110 <math>\Omega</math></b></p>	<p>Check that there is no interference resistance on <b>tracks 6 and 14</b>, and then check that there is no short circuit to earth or + battery feed.</p>
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<p><b>120 <math>\Omega \pm 10 \Omega</math></b></p>	<p>Open circuit on one or two lines. Disconnect the airbag and check the multiplex connection between the diagnostic socket and the airbag. Is the multiplex connection correct?</p>
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<p><b>YES</b></p>	<p>Check that the resistance is approximately <b>120 <math>\Omega</math></b> between the two network tracks on the airbag computer:</p> <ul style="list-style-type: none"> <li>– If the resistance is not approximately <b>120 <math>\Omega</math></b>, <b>contact Techline</b>.</li> <li>– If the resistance is <b>120 <math>\Omega</math></b>, check the continuity and absence of interference resistance on the multiplex connection between the diagnostic socket and the UCH.</li> </ul> <p>If there is a repair procedure (See <b>Technical Note 6015A, Electrical wiring repair, Wiring: Precautions for repair</b>), repair the wiring, otherwise replace it.</p> <p>Check that the resistance is approximately <b>120 <math>\Omega</math></b> between the two network tracks on the UCH computer:</p> <ul style="list-style-type: none"> <li>– If the resistance is not approximately <b>120 <math>\Omega</math></b>, <b>contact Techline</b>.</li> </ul>
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<p><b>NO</b></p>	<p>If there is a repair procedure (see Technical Note <b>6015A, Electrical wiring repair, Multiplex network: Repair</b>) repair the multiplex connection between the diagnostic socket and the airbag, if not, replace the multiplex connection. If the fault is still present, <b>contact your Techline</b>.</p>
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<p><b>AFTER REPAIR</b></p>	<p>Run the multiplex network test again using the diagnostic tool. Clear the stored faults on all the computers connected to the network. Deal with any other faults.</p>
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FAULTY SEGMENT ON THE MULTIPLEX NETWORK

NOTES	<p>First check that the computer at the end of the faulty segment is properly powered (earth, + battery, + accessories or + after ignition). Always check the computer conformity.</p> <p>If the Protection and Switching Unit computer is not detected, apply the appropriate fault finding procedure (see <b>87G, Engine compartment connection unit, ALP 1</b>).</p> <p><b>IMPORTANT</b></p> <p>It may be that the tool cannot exactly determine which segment(s) are faulty. It will then suggest several segments that could be faulty. In this event, repair the segment closest to the diagnostic socket.</p>
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<p>Isolate the faulty segment by disconnecting both ends of the segment. Check the condition of the connectors. Check the continuity and insulation of the multiplex line H and multiplex line L lines between the two connectors on the isolated segment.</p> <p>Refer to the vehicle's multiplex network diagrams for the allocation of tracks on the computers and connections. Perform the necessary operations to check the continuity of the two lines (for example, replacing the wiring). Make sure that the computer present in the vehicle is compatible and that the data it is producing is correct.</p>
<p>Reconnect the segment.</p> <p>Carry out the multiplex network test again using the diagnostic tool.</p> <p><b>Is the segment still declared faulty?</b></p>

NO	End of fault finding.
YES	Are there other faulty segments?
NO	Repeat the multiplex network tests to check the continuity and insulation of the multiplex line H and multiplex line L lines between the end of the faulty segment and the diagnostic socket.
YES	Apply the same procedure to each segment.

AFTER REPAIR	<p>Run the multiplex network test again 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>
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### FAULTY COMPUTER

<b>NOTES</b>	<p>Make sure that the computers installed in the vehicle are the correct type and are compatible with the vehicle.</p> <p>Check the power supply to the computers (earth, + battery, + accessories or + after ignition).</p>
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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:

- **Timed power supply:** UCH, instrument panel.
  - **+ accessories feed:** air conditioning, Protection and Switching Unit, central communication unit.
  - **+ after ignition feed:** Injection, Airbag/Pretensioners, AS/ESP, Automatic Transmission, Xenon bulbs, Electric Power-Assisted Steering, Steering column lock, UCT, Proximity Sensor.
- In **+ accessories feed** these computers will not appear.

### IMPORTANT

To establish dialogue with the xenon bulbs of the Mégane II Phase 1 model, the dipped headlights and + after ignition feed must be activated.

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

Attempt to establish dialogue with computers.

- No dialogue from computers to diagnostic tool: see ALP 1

**No dialogue with the computer** or computers not communicating with the diagnostic tool.

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

If there is a repair procedure (See **Technical Note 6015A, Electrical wiring repair, Wiring: Precautions for repair**), repair the wiring, otherwise replace it.

- 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.

If no faults or open or short circuits have been detected after these checks, contact Techline.

<b>AFTER REPAIR</b>	<p>Run the multiplex network test again 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>
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# MULTIPLEXING

## Fault finding - Interpretation of faults

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### UNRECOGNISED COMPUTERS ON THE NETWORK

#### 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.

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

Attempt to establish dialogue with computers.

- No dialogue between computers and diagnostic tool: see ALP 1.

**No dialogue with the computers** or computers not communicating with the diagnostic tool.

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

If there is a repair procedure (See **Technical Note 6015A, Electrical wiring repair, Wiring: Precautions for repair**), repair the wiring, otherwise replace it.

- If there is communication with computers:

Make sure that the computer identification information is correct and matches the vehicle in fault finding.

- Check that the following computer information is correct:

- Vdiag:

- Program No.: (injection computer)

If no faults or open or short circuits have been detected after these tests, contact Techline.

#### AFTER REPAIR

Run the multiplex network test again using the diagnostic tool.

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

Deal with any other faults.

# MULTIPLEXING

## Fault finding - Customer complaints

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NO DIALOGUE WITH THE COMPUTERS

ALP 1

NO TOPOLOGY DIAGRAM OR CONFIGURATION TABLE DISPLAY AT THE END OF THE MULTIPLEX NETWORK TEST

ALP 2

CONFIGURATION TABLE DISPLAY AT THE END OF THE MULTIPLEX NETWORK TEST

ALP 3

# MULTIPLEXING

## Fault finding - Fault finding chart

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ALP 1	No dialogue with computers
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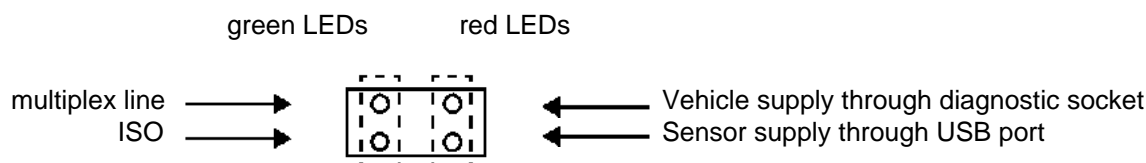
NOTES	<b>Vehicle computer power supply for fault finding:</b> Engine stopped, ignition on. Connect the diagnostic tool and perform the required operations.
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Try the diagnostic tool on another vehicle.  
 Check that the tool version is **CD V60** or a more recent version.

Check:

- the connection between the diagnostic tool and the diagnostic socket (connection and cable in good condition),
- the computers' power supply,
- the engine and passenger compartment fuses.

Check that the **CLIP** sensor is supplied by **tracks 16 (+ 12 V), 4 and 5 (earth)** of the diagnostic socket, which can be seen by the two red diodes on the sensor lighting up.  
 Check that the **CLIP** sensor is supplied by the computer's USB port (red diode).  
 Make sure that the **CLIP** sensor is communicating properly with the vehicle's computers; this can be seen by the two green diodes on the sensor lighting up.



Check the following tracks on the diagnostic socket:

**Track 1** → **+ after ignition**  
**Track 16** → **+ battery feed**  
**Tracks 4 and 5** → **Earth**

If there is a repair procedure (See **Technical Note 6015A, Electrical wiring repair, Wiring: Precautions for repair**), repair the wiring, otherwise replace it.

### Computer connected to multiplex line V

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

**multiplex line H (diagnostic socket track 6)**  
**multiplex line L (diagnostic socket track 14)**

With a multimeter, make sure that the voltages at the diagnostic socket terminals are:

- **2.5 V** across **CAN H (track 6)** and earth (**tracks 4 and 5**) (average values)
- **2.5 V** across **CAN L (track 14)** and earth (**tracks 4 and 5**) (average values)

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

# MULTIPLEXING

## Fault finding - Fault finding chart

**88B****ALP 2****No topology diagram or configuration table display at the end of the multiplex network test.**

The topology cannot be displayed under the following conditions:

- 1 The two computers storing the multiplex network configuration have failed to respond.
- 2 The multiplex network is not operational; therefore dialogue is impossible.
- 3 The two computers storing the multiplex network configuration do not have the same configurations.
- 4 On the **Multiplex network** tab on the configuration screen, an incorrect **Diagram version** number has been entered into one of the two computers that store the network configuration.
- 5 No **diagram version** has been entered into the two computers that store the network configuration.

**1 – The two computers storing the multiplex network configuration have failed to respond.**

Check first that the computers storing the configuration (Airbag and UCH) are correctly supplied (earth, + battery, + accessories or + after ignition).

Check the condition of the multiplex network and the continuity and insulation of the multiplex line H and multiplex line L lines between the computers storing the configuration.

**2 – The multiplex network is not operational, therefore dialogue is impossible**  
(see fault **Multiplex network not operational**).

**3 – The two computers storing the multiplex network configuration do not have the same configurations**  
(see the **Multiplex network configurations** configuration).

**4 – On the multiplex network tab of the configuration screen, an incorrect diagram version number has been entered on one of the two computers storing the network configuration**  
(see the **Network configuration** configuration).

**5 – No diagram version has been entered on the two computers storing the configuration.**  
(see the **Network configuration** configuration).

# MULTIPLEXING

## Fault finding - Fault finding chart

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ALP 3	Configuration table display at the end of the multiplex network test
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NOTES	<p>ALP to use if the tool loads the configuration screen at the end of the multiplex network test.</p> <p>The configuration chart is always accessible through the <b>Configuration</b> icon.</p> <p>Update the vehicle configuration then run the multiplex network test again.</p> <p>Check that the two tabs are consistent before running the test again.</p>
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The RENAULT diagnostic tool loads the configuration screen directly under the following conditions:

- **MULTIPLEX NETWORK** tab

- Inconsistent **diagram version** numbers entered into the two computers that store the multiplex network configuration. If the numbers are inconsistent, the following error message is displayed when the multiplex network test is being run: Inconsistent configuration of computers supporting fault finding: check configuration before rerunning test.
- Inconsistent list of computers entered into the computers that store the multiplex network configuration.
- The **diagram version** number is incorrect for at least one of the two computers that store the multiplex network configuration (see the **network configuration** configuration). In this instance, the following message is displayed when the multiplex network test is being run: Unknown vehicle configuration: check tool update.
- One of the two computers that store the network version is blank (case of replaced airbag or UCH computer).

- **COMPUTERS SUPPORTING FAULT FINDING** tab

- Inconsistent **Diagram numbers** entered into the two computers that store the configuration.
- The list of computers that can support fault finding entered into the two computers that store the list of computers that can support fault finding is inconsistent.
- Inconsistency between the list of computers entered and the computers actually detected on the vehicle. Some computers are entered as absent in the computer that stores the network configuration even though they are present on the vehicle (see the **Multiplex network configuration** configuration). In this instance, the following error message is displayed when the multiplex network test is being run: Some computers respond to the diagnostic tool even if they are not listed in the computer configuration.