

**155**

**REPAIR MANUAL**

**ELECTRICAL &  
ELECTRONIC DIAGNOSIS**



# ALFA ROMEO 155

## VOLUME 4(ELECTRICAL)

[SMS PART No Z6019]

THIS MANUAL CONTAINS THE FOLLOWING  
UPDATES

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SUPPLEMENT	4655***00001
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# 155

## REPAIR MANUAL

### ELECTRICAL & ELECTRONIC DIAGNOSIS





DIVISION OF  
"REPAIR MANUAL"

Models

The documentation published by the Alfa Romeo Assistance Service for the "155" vehicle is composed of the following publications:

**155** REPAIR MANUAL

- VEHICLE CHARACTERISTICS AND MAINTENANCE

**155** T.SPARK V6 - PA4655A1000000: GROUP 00  
**155** ~~155~~ - PA4655A24x4000: GROUP 00  
**155** TD - PA4655A3TD0000: GROUP 00  
**155** TD 2.5 - PA4655A4TD2500: GROUP 00  
**155** T.SPARK 16V - PA4655A516V000: GROUP 00

**155** REPAIR MANUAL

- ENGINES

- PA4655B1000000: GROUPS 01, 04, 05, 07  
 Engine 1995 cm<sup>3</sup> (code AR 67202)  
 Engine 1773 cm<sup>3</sup> (code AR 67102)  
 Engine 1749 cm<sup>3</sup> (code AR 67103)

- PA4655B2000000: GROUPS 01, 04, 05, 07  
 Engine 2492 cm<sup>3</sup> (code AR 67301)

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- MECHANICAL UNITS
- BODY

- PA4655C1000000: MECHANICAL UNITS  
 - PA4655D1000000: Electrical components, Bodywork, Trim, Heating and Ventilation

**155** REPAIR MANUAL

- ELECTRICAL & ELECTRONIC DIAGNOSIS

- PA4655E1000000: Wiring diagrams and Troubleshooting

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- PA4736B14x4000: GROUPS 01, 04, 05, 07  
 Engine 1995 cm<sup>3</sup> TURBO (code AR 67203)  
 - PA4736C14x4000: MECHANICAL UNITS  
 - PA4736D14x4000: Electrical components, Bodywork, Trim, Heating and Ventilation  
 - PA4736E14x4000: Wiring diagrams and Troubleshooting

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- PA4805B1TD0000: GROUPS 01, 04, 05, 07  
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 - PA4830D1TD2500: Electrical components, Bodywork, Trim, Heating and Ventilation  
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## PRESENTATION

This publication details the electrical system and electronic devices regarding the "155" vehicle for the models listed in the "vehicle identification" tables. The aim of this publication is to provide the Alfa Romeo Service staff with a tool which can be used to rapidly identify any faults and help to render the intervention both precise and efficient.

The manual gives the electrical diagrams and the descriptions of each function, the labels for the connectors and the location of the relative components.

Particular attention has been given to the fault diagnosis procedures which can be found at the end of each section. These combine with the irreplaceable experience of the operator and help to correctly identify and rectify the fault starting from the malfunction which the operator himself has detected and carrying out a series of tests on the system affected by the fault.

More detailed information is given in the chapter "Introduction" which should in any case be carefully read before using the manual.

This manual is supplied together with the "155" Repair Manual" relative to the mechanics of the vehicle and complementary to it.

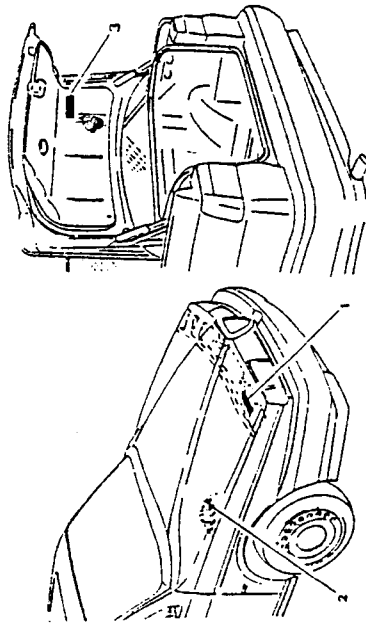
All the information contained in this manual is accurate to the date of publication.

Alfa Romeo reserves the right to carry out any modifications to its products considered necessary without warning, though the technical information and updates regarding this manual will be promptly published.

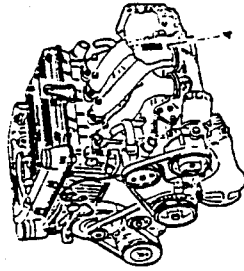
### NOTE:

It should be pointed out that inside this manual the "155" vehicle may also be indicated with the "167" vehicle code.

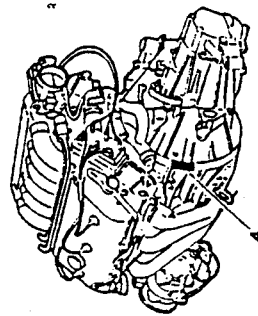
## VEHICLE IDENTIFICATION IDENTIFICATION LABELS



### TWIN SPARK ENGINES



### V6 ENGINE



- 1 Label carrying identification data
2. Body label
3. Body paint identification label
4. Engine label

## MODEL IDENTIFICATION TABLE

Vehicle	155 T.SPARK 1.7	155 T.SPARK 1.7 (I)	155 T.SPARK 1.8 (2)	155 T.SPARK 1.8	155 T.SPARK 2.0	155 V6
Type	4-door sedan					
Drive	LH + RH	LH + RH	LH + RH	LH + RH	LH + RH	LH + RH
Vehicle Type N°	16/AH	16/A4L	16/A4B 16/A4G	16/A4A 16/A4E	16/A2A 16/A2U	16/A1 16/A1C
Progressive chassis N°	167000 00000001	167000 00000001	167000 00000001	167000 00000001	167000 00000001	167000 (00000001)
Type and progressive engine N°	AR 67105 000.001	AR 67105 000.001	AR 67103 000.001	AR 67102 000.001	AR 67202 000.001	AR 67301 000.001

(1) FRANCE only

(2) PORTUGAL only

NOTE: Within this manual the various models have been indicated as follows:

• "T.SPARK 1.7", "T.SPARK 1.8" and "T.SPARK 2.0" models are grouped under "T.SPARK" or (1)

• the "V6" model is indicated by "2.5 6V" or (6 V).

MODEL IDENTIFICATION ('95 Versions)

Vehicle	155					
Model	1.7 T. SPARK		1.8 T. SPARK		V6	
Cylinder displacement	1.749 cm <sup>3</sup>		1.773 cm <sup>3</sup>		2.492 cm <sup>3</sup>	
Trim level	4-door saloon					
Drive	LH + RH		LH + RH		LH + RH	
Car model no.	167A4H	167A4G	167A4L	167A4E	167A4M	167A1E
	on identification label	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Engine type and serial no.	AR 67105	AR 67103	AR 67105	AR 67102	AR 67202	AR 67303
	from (*)	from (*)	from (*)	from (*)	from (*)	from (*)
	167000		167000		167000	
	167000		167000		167000	

(\*) Engine no. not available at time of going to press

(C) Only for certain markets.





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# INTRODUCTION

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Testing Components: . . . . . XI

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## INTRODUCTION

This manual contains all the necessary information regarding the electrical systems and circuits present on this vehicle. Those instruments which are useful in diagnosing faults are given particular attention. Each circuit is dealt with separately in a specific section in which the following can be found:

- wiring diagram;
- operation and description of the circuit;
- illustration showing the various components;
- pin-pointing the affected components;
- table giving the diagnosis of the most frequent faults with relative test procedures and corrective action (troubleshooting)

## GENERAL PRECAUTIONS AND SAFETY MEASURES

Before carrying out any work on the electrical components, the following precautions should be noted and taken

- Remove rings, wrist-watches or other metal objects
- Disconnect one of the terminals of the battery each time an electrical component has to be removed

- If a component needs replacing, only Alfa Romeo spare parts should be used

When operating on the electrical system of the vehicle, never forcibly pull wires or cables as these may then become detached from terminals or connectors. Disconnect all the control units and electronic devices when arc-welding on the vehicle body

## AVOIDING ELECTRICAL ARCHING

Even if the voltage in the electrical system is only 12 V, the power of the battery

can cause high voltage in the event of a short circuit causing sparks or sparks which can cause fires, or present a direct danger to the operator

## HIGH VOLTAGE

The system of electronic ignition operates at a current of over 20,000 volts which could be very dangerous, especially to people suffering from heart problems. Proceed with great care when operating on or near these components.

## AVOIDING FIRES

Do not smoke while working near the battery or components containing fuel or other engine fluids

## HEAT SOURCES

When it is necessary to operate on components which are subject to heating during use, (e.g. halogen bulbs) or inside the engine compartment when the engine is still warm, particular care must be taken to avoid burns or damage to tools or components

### STRUCTURE OF THE MANUAL

This manual is subdivided into sections, each dealing with a single circuit.

All the sections are identical in layout and are composed of five parts:

A wiring diagram;

B general description (description of the circuit and its operation) and functional description (analytical illustration of the wiring system);

C troubleshooting table;

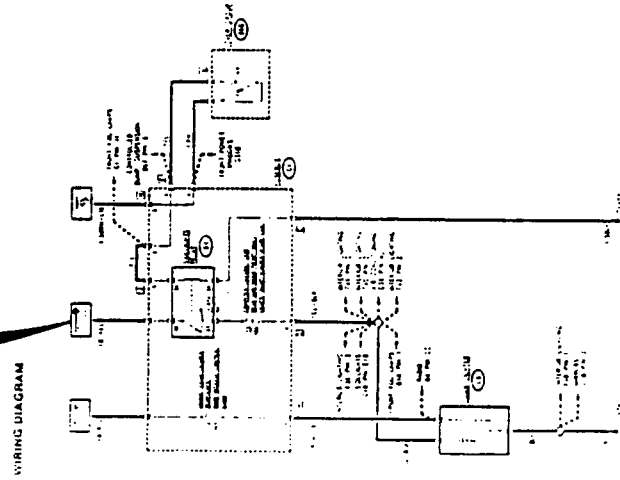
C illustrations showing components and connectors;

D schematic cable diagram (location of the components);

E tests for troubleshooting (see "TROUBLESHOOTING").

### WIRING DIAGRAM

16-2



### GENERAL AND FUNCTIONAL DESCRIPTION

16-3

**GENERAL DESCRIPTION**  
 This section describes the general operation of the circuit and its components. It includes a functional description of the circuit and a troubleshooting table.

**FUNCTIONAL DESCRIPTION**  
 This section describes the functional operation of the circuit and its components. It includes a functional description of the circuit and a troubleshooting table.

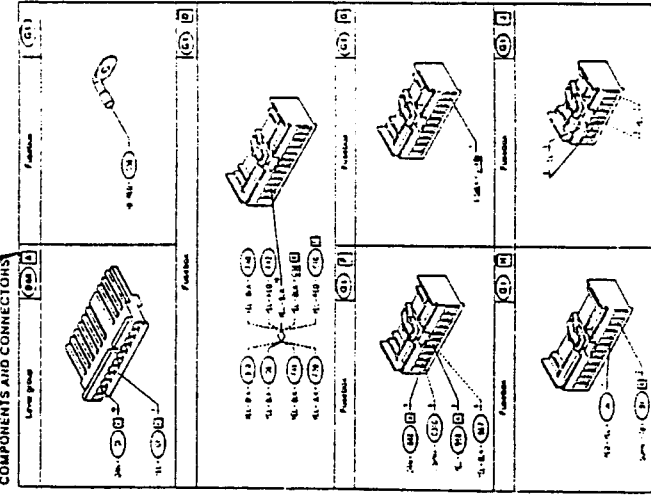
**TROUBLESHOOTING TABLE**

Malfunction	Component	Test
Circuit not working	Relay	A
Lamp not working	Lamp	B

### TROUBLESHOOTING TABLE

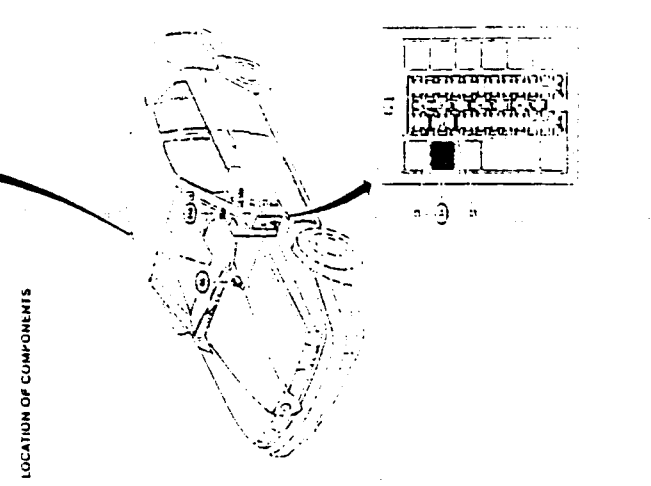
### COMPONENTS AND CONNECTORS

16-4








### LOCATION OF COMPONENTS

16-5



**WIRING DIAGRAMS**

The wiring diagrams are carried out in accordance with the operation of the circuit in order to make it easier to understand and therefore easier and quicker to identify a fault. The layout follows the "flow" of current and signals starting from the power source (always placed higher up or to the left in the more complex double page diagrams) passing the components and reaching ground located lower down. The power supplies given schematically with symbols which vary depending on the position of the key in the ignition:

-  - Line under constant supply directly connected to the battery)
-  - line supplied when the ignition key is in the "RUN" position (first position of the key)
-  - line supplied when the key is in the "STARTING" position (second position of the key which is disengaged when the key is released)
-  - line supplied when the key is in either the "RUN" or the "STARTING" position
-  - line supplied when the key is in the "PARKING" position (key rotated in the opposite direction and withdrawn after the relative button has been pushed)

A special section ("Power supply") deals in detail with the power supply to all the lines, and the functioning of the ignition switch. The fusebox is not represented in its entirety in the single charts and only the components useful to the diagram under examination are given: a complete description of the fusebox is given in the

Arrows indicate references to other relevant diagrams:

- a continuous arrow indicates that the line crosses the indicated component;
- a hatched line indicates that a line starts from that point towards the component indicated; the indications are composed of the name of the chart which is to be referred to, the code pertaining to the components and relative pin to which it refers.

N.B. the lines shown which refer to other diagrams do not affect the circuit under examination, but must however be shown in order to avoid confusion (for example, two wires leaving the same pin), or to follow a signal which crosses other components which have nothing to do with the circuit in question (e.g. to supply or ground them). The ground lines only show the grounding point (located in the lower part of the diagram) and other lines connected to them are not shown. To remedy this, a special section "Location of grounds" gives all the lines converging on a particular grounding point.

**NOTE:** these crossed references between the lines and the grounds make it possible to easily identify the faults in the event of a malfunction in more than one circuit at the same time: for example a faulty ground point will cause an anomaly to all the circuits which converge on it.








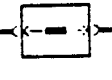
N.B.: the diagrams represent the vehicle in its most complete version (all the optional installed) and unless otherwise stated refer to all models. Where there are differences the charts refer to the 155 V6 version (continuous line) while the dashed line indicates the 155 T.SPARK 2.0, 155 T.SPARK 1.8 and 155 T.SPARK 1.7 versions.

These differences are sometimes indicated by the symbols **(6V)** and **(15)** or by "T.SPARK" and "6V".

**ELECTRICAL COMPONENTS**

The electrical components are represented in the diagrams by the most frequently used and best-known international symbols.

**COMPONENT SYMBOLOGY**

SYMBOL	NAME
	Connector
	Ground point
	Ultra-sonic washing
	Fuse
	Bulb
	Battery
	Branch point
	Subcircuit

**CABLE IDENTIFICATION**

Each cable shown in the diagrams is characterized by a code formed by numbers and letters: the numbers indicate cable cross-section in mm<sup>2</sup> (0.5 where not shown), while the letters indicate the colour according to the table given below.

**CABLE IDENTIFICATION TABLE**

COLOUR	IDENTIFICATION LETTER
Black	BLK
White	WHT
Light blue	LTB
Brown	BRN
Yellow	YEL
Red	RED
Green	GRN
Grey	GRY
Pink	PNK
Orange	ORN
Purple	PPL
Blue	BLU
Hazel brown	HZL

**NOTE:** for combinations the colours are simply coupled

Examples:

COLOUR	IDENTIFICATION LETTER
Light blue-white	LTB-WHT
Green-black	GRN-BLK
Blue-Red	BLU-RED

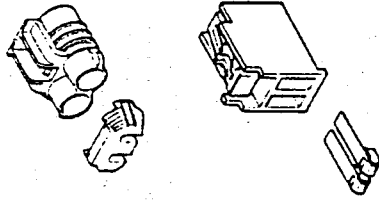
The following table lists these symbols as they are shown in the diagrams.

COMPONENT SYMBOLOLOGY			
SYMBOL	NAME	SYMBOL	NAME
	Instrument panel		Switches/contacts
	Intermittence timer		Sensors/senders
	Electric motor		
	Relays		

Some connectors are equipped with a secondary lock which prevents the terminals of the cables from becoming accidentally separated from the connector itself.

**NOTE:** ensure that the secondary lock is removed before removing the cable from the connector. When it is refitted, after connecting all the cables, replace the secondary lock.

The secondary lock may be one of a variety of different types depending on the connector to which it is fitted as shown in the following examples.



**LOCATION OF COMPONENTS**

A schematic diagram representing the silhouette of the vehicle makes it easy to find the various components of the circuit under examination, and to identify, where necessary, the route taken by the cables fixed to the body of the vehicle itself.

**TROUBLESHOOTING TABLE**

A TROUBLESHOOTING TABLE follows the descriptions. The possible (and most frequent) faults which can affect the circuit are listed in this table. For each of these, the components which may be affected and the test to be carried out from among those given below are indicated.

In the example given below, the fault affecting function X involves compo-

nents 1 and 5 and can be rapidly located by following test A

Multifunction	Component					Test
	1	2	3	4	5	
X	.	.	.	.	.	A
Y	.	.	.	.	.	B

**TROUBLESHOOTING**

**N.B.** All the troubles/troubleshooting procedures given in this publication begin from the hypothetical situation that there is ONLY ONE FAULT in the system at any one time. In the unlikely event of simultaneous faults, it is necessary to undertake more than one procedure. If more than one circuit or system is out of use at the same time there are at least two situations which can be easily recognized: the malfunction affects a fuse protecting the various lines (for this refer to the section "Fusebox") or a defect affecting the ground point where the different lines converge (for this, refer to the section "Location of grounds").

The troubleshooting tests are located at the end of each section. Each test, identified by the type of malfunction is given a code letter. NOTE: the malfunction is indicated and described exactly as the driver of the

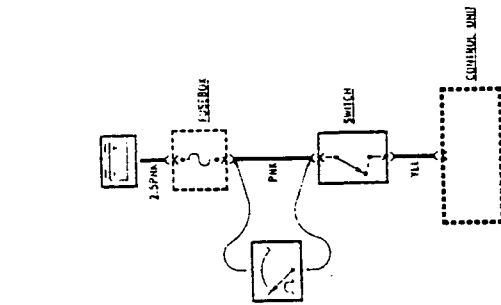
TROUBLESHOOTING		TESTS	
MALFUNCTION		TEST	
CIGAR LIGHTERS			
16-7			
TROUBLESHOOTING			
CIGAR LIGHTER SOCKET NOT WORKING			
TEST PROCEDURE			
1. Connect the positive (+) lead of the voltmeter to the battery (+) terminal and the negative (-) lead to the cigar lighter socket.			
2. Turn the ignition key to the "ON" position.			
3. Observe the voltmeter reading. It should be approximately 12 volts.			
4. If the voltmeter reads 0 volts, the cigar lighter socket is not connected to the battery.			
5. If the voltmeter reads approximately 12 volts, the cigar lighter socket is connected to the battery.			
6. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is not connected to ground.			
7. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to ground.			
8. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the battery.			
9. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the ground.			
10. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the battery.			
11. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the ground.			
12. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the battery.			
13. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the ground.			
14. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the battery.			
15. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the ground.			
16. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the battery.			
17. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the ground.			
18. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the battery.			
19. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the ground.			
20. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the battery.			
21. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the ground.			
22. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the battery.			
23. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the ground.			
24. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the battery.			
25. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the ground.			
26. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the battery.			
27. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the ground.			
28. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the battery.			
29. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the ground.			
30. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the battery.			
31. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the ground.			
32. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the battery.			
33. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the ground.			
34. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the battery.			
35. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the ground.			
36. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the battery.			
37. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the ground.			
38. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the battery.			
39. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the ground.			
40. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the battery.			
41. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the ground.			
42. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the battery.			
43. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the ground.			
44. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the battery.			
45. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the ground.			
46. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the battery.			
47. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the ground.			
48. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the battery.			
49. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the ground.			
50. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the battery.			
51. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the ground.			
52. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the battery.			
53. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the ground.			
54. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the battery.			
55. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the ground.			
56. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the battery.			
57. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the ground.			
58. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the battery.			
59. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the ground.			
60. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the battery.			
61. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the ground.			
62. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the battery.			
63. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the ground.			
64. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the battery.			
65. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the ground.			
66. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the battery.			
67. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the ground.			
68. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the battery.			
69. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the ground.			
70. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the battery.			
71. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the ground.			
72. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the battery.			
73. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the ground.			
74. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the battery.			
75. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the ground.			
76. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the battery.			
77. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the ground.			
78. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the battery.			
79. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the ground.			
80. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the battery.			
81. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the ground.			
82. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the battery.			
83. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the ground.			
84. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the battery.			
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88. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the battery.			
89. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the ground.			
90. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the battery.			
91. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the ground.			
92. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the battery.			
93. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the ground.			
94. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the battery.			
95. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the ground.			
96. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the battery.			
97. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the ground.			
98. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the battery.			
99. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the ground.			
100. If the voltmeter reads approximately 12 volts, but the cigar lighter does not work, the cigar lighter is shorted to the battery.			

1st column: "TEST PROCEDURE": this column indicates the steps to be carried out, numbered in sequence, to check the circuit and to search for the malfunction. If the operation to be carried out is a simple one, or among those indicated in this section (see: "ELEMENTARY CHECKS RELATIVE TO ELECTRICAL LINES AND COMPONENTS") it is only indicated. If the component to be checked or the operation is more complex it will be accurately described and illustrated.

2nd column: "RESULT": this column indicates two possible outcomes of the tests carried out for the step in question: "OK" or "not OK" which indicate the remedy to be followed.

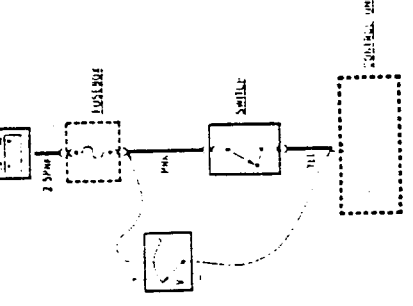
3rd column: "CORRECTIVE ACTION": this column corresponds to the result of the checks carried out and gives the possible remedies which may be used to restore the correct operation of the vehicle, for example, replacing a component etc. Reference may be given to the next step to be carried out

ifies an interruption. For certain components, for example resistances, sensors, electric motors etc., a specific value should be read corresponding to the impedance of the component itself.



**MEASURING VOLTAGE DROP:** NOTE: before any readings are taken, ensure that the relative components or lines are connected to the power supply as indicated in the wiring diagram.

Set the Multimeter to measure volts. Connect the two prods of the voltmeter to the two points where you wish to know the difference in voltage, and, selecting a suitable scale, take a reading. The positive prod should be connected to the part nearest the power source.



**MEASURING VOLTAGE:** NOTE: before any readings are taken ensure that the component or line being examined is connected to the power supply as shown in the wiring diagram.

Set the Multimeter to measure volts. Connect the negative prod of the Multimeter to ground (for example the battery ground). Connect the positive prod to the point where you wish to know the voltage, and selecting the suitable scale, take a reading.

If the exact voltage at various points along a line or circuit is known, the affected part can then be located with rapidity.

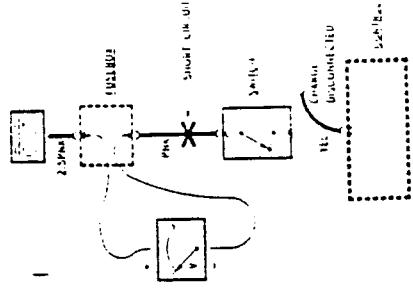
**CHECKING FOR A SHORT CIRCUIT:** with voltmeter.

NOTE: before taking any readings ensure that the component or line being examined is connected to the power supply as indicated in the wiring diagram

Set the Multimeter to measure volts. Remove the fuse of the relevant circuit (which will be burnt out) and disconnect the charge.

Connect the prods of the Multimeter to the terminals of the fuse; the positive prod should be connected to the part nearest to the power source.

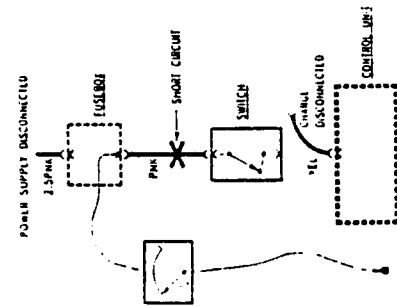
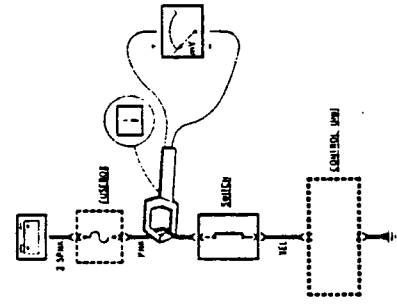
If the voltmeter gives a reading indicating that voltage is present, part of the circuit will be short circuited to ground (fused, worn, pinched wire etc.) by moving the wiring in order to find a point where the reading is 0 V, the affected part can be identified



MEASURING CURRENT

- It will sometimes be necessary to take reading of the current absorption, in which case the Multimeter will not suffice. It is therefore necessary to use another instrument, for example a snap on ammeter, operating as follows:
  - insert the lead of which the current is to be measured into the pincers, suitably connected to the multimeter set to measure volts (mV);
  - NOTE: ensure that the flow of current (from positive towards ground) is the same as indicated on the pincers;
  - take a reading in mV which coincides with the value of the current in A.

**with a multimeter:**  
 NOTE: above all ensure that the component has been disconnected from the power supply.  
 Set the Multimeter to measure ohms and set it so that when the prods are touched together a reading of 0 Ω can be taken  
 Remove the fuse from the affected circuit (which will be burnt out) and disconnect the charge.  
 Connect the prod of the instrument to the terminal of the fuse nearest the charge and the other to a suitable ground point. If the ohmmeter shows a resistance of 0 Ω, or is very low, part of the circuit will have been short circuited to ground (burned, worn, pinched wire etc.). If the resistance is ∞ (infinite), then in that particular stretch the circuit is whole. The affected part can be easily found by moving the wiring to identify in which position the resistance value ceases to be ∞ (infinite).

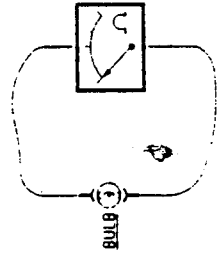


NOTE: measurements taken with a volt meter are more accurate and if both conditions are possible the voltmeter should be chosen

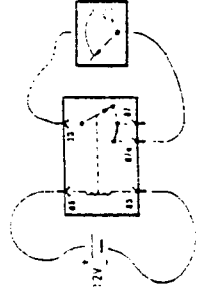
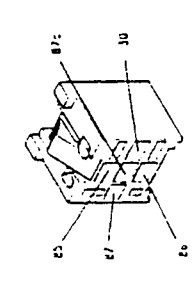
TESTING COMPONENTS:

**BULBS:**  
 NOTE: a bulb is characterized by two values: voltage and wattage rating. The resistance of the bulb is lower as its wattage increases. Example: a headlight bulb (12V-45W) will have a resistance which is much lower than an instrument panel warning light bulb (12V-3W).

To check whether a bulb is damaged or not, remove it and connect the prods of a Multimeter, set to measure ohms, to the terminals of the lamp itself. A finite resistance value (quite large as indicated above) indicates that the bulb is working while a resistance value of ∞ (infinite) signifies that the filament of the bulb is interrupted.



**FUSES:**  
 A fuse is an electrical conductor the cross section of which is such that if the load passing through the cable exceeds a certain value, called fuse amperage, it will blow and interrupt the circuit.  
 If it is not possible to visually see whether the filament is intact or not, it can be checked by connecting the prods of a Multimeter, set to measure ohms, to the terminals of the fuse: a zero value (0 Ω)

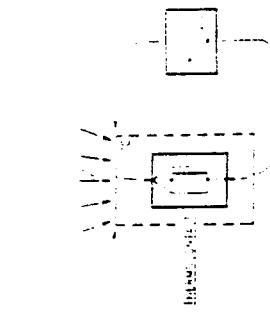


In a relay switch, the check will consist of the passage from continuity to open circuit on one pin and vice-versa on the other  
 One of the most common malfunctions affecting the relays is the "locking" of the contact. This can be immediately identified as the ohm signal does not vary when activating or deactivating the coil (always 0 Ω or always ∞).  
 NOTE: some relays have a built in fuse: this though must be checked separately before checking the relay.  
 In other relays a resistance is placed in parallel to the activated circuit, in others a diode protects the excitation; in these cases the method of checking the operation of the relay does not differ from the method given above.

THERMOCONTACTS:

The thermal contacts change their state (circuit closed or open) when a certain temperature is reached.  
 NOTE: they can be N.C. (normally closed) or N.O. (normally open); in the diagrams they are shown at their rest position.  
 To check a thermocircuit, remove it from the vehicle and connect the terminals to the Multimeter set to measure ohms

Using suitable equipment (thermometer which can be heated and cooled) check that at the setting temperature of each thermocircuit, the Multimeter passes from 0 Ω to ∞ or vice-versa



SENSORS:

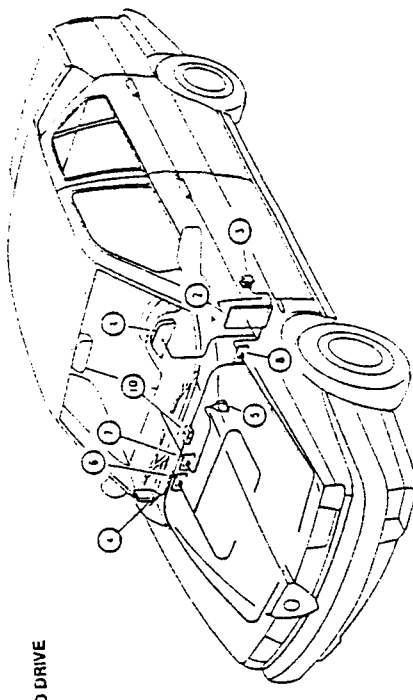
These are components of varying types which are in general similar to contacts (H.O. or N.C.), changing their state when a certain measured physical value varies (e.g. temperature, see thermocircuits, or pressure etc.). For these components, the same rules apply as for checking the thermocircuits  
 Other sensors measure specific values and emit a signal which is proportional to these values, as each occasion arises; these will be indicated in the electrical charge diagram which follows. It makes it possible to identify the correct voltage or resistance values to be checked by the Multimeter.

RHEOSTATS:

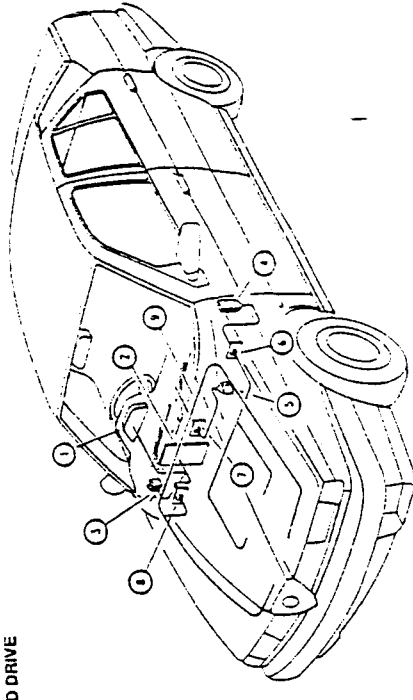
Rheostats are variable resistances: when voltage (12 V) is applied to the main terminals, the output signal from the third terminal is varied by mechanical action (e.g. rotating a resistivity wheel)  
 To check the correct operation, connect one of the prods of a Multimeter set to measure ohms, to one of the main terminals and the other to the third terminal. By acting on the regulation wheel for example, the resistance should vary



The information given above is shown diagrammatically below and highlights the differences in a few components and in the wiring for right-hand drive vehicles.



LEFT-HAND DRIVE



RIGHT-HAND DRIVE

- 1-Instrument panel C10
- 2-Fusibox G1
- 3-Auxiliary bracket for fuse and relay boxes
- 4-Motronic control unit S11
- 5-ABS control unit N51
- 6-Motronic wiring cable runner
- 7-ABS wiring Cable runner
- 8-Dashboard wiring/engine wiring cable runner
- 9-Engine wiring (single) - only RIGHT-HAND DRIVE
- 10-Engine wiring (double) - only for G306) only LEFT-HAND DRIVE

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electrical checks regarding voltage or resistance which can be carried out with a Multimeter.

You are reminded that it is not possible to work on these electrical components internally, therefore if they are found to be faulty they should be replaced.

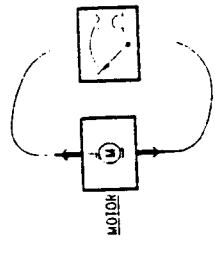
### RIGHT-HAND DRIVE VEHICLES

This Electrical and Electronic Diagnosis manual is based on the LEFT-HAND DRIVE vehicle. The layout of the installations and wiring for RIGHT-HAND DRIVE vehicles is different but:

- the functions of the various systems and electrical installations are clearly the same as indicated in the "General Descriptions" of the various sections
- the operating logic in the layout of the fault diagnosis is therefore identical
- the location of components, connections, control units and wiring is normally mirrored in relation to left-hand drive vehicles (for example the instrument panel and the control switches of the dashboard wiring will be on the right and the right and left-hand door wiring will be inverted etc).
- The arrangement of the components in the engine compartment remains unchanged and only the position of the cable and wiring runners between the passenger and engine compartments is different

N.B. There may also be differences in the connections and joints and in the colour of the wiring which make it important to pay close attention to the various fault diagnosis procedures which will consequently differ, though not drastically.

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NOTE: for these mechanisms it is possible for faults to be caused by mechanical and not electrical problems. In this case other volumes of "REPAIR MANUAL" should be consulted.

#### GROUND POINTS:

A ground point is not correctly connected if oxidation is present, if it is not securely fixed to the body, if the cables reaching it are bared or damaged. To check whether the ground point is really at "zero potential" connect it to the prod of a multimeter set to measure ohms. Connecting the other prod to the negative pole of the battery a resistance value of 0 Ω should be measured. If this is not the case, carefully inspect the ground as it is damaged.

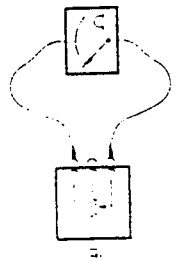
#### SOLDERS:

Numerous solders between wires are present in the wiring of the vehicle. These are carried out using the ultrasound technique which makes them extremely reliable and safe.

If it becomes necessary to check a solder, simply check the continuity between the various wires which converge on it. If this proves unsuccessful suitably restore the wiring.

#### CONTROL UNITS AND GENERAL ELECTRONIC DEVICES:

These components cannot be dealt with in a general context and therefore reference must be made to the single fault diagnosis procedures where the specific checks are given. These are however



#### THE RHEOSTATS/PRESSOSTATS:

These are instruments which emit a signal which is directly proportional to the temperature/pressure which they measure. From a diagrammatic point of view they are rheostats of which the resistance varies with the readings taken. To check these devices therefore, follow the indications given for the rheostats although suitable equipment will be necessary to enable the temperature or pressure to be changed.

#### ELECTRIC MOTORS/SOLENOIDS:

The electric motors and solenoids are mechanisms which are essentially composed of electrical windings and for this reason checking the operation of these components consists of verifying if electrical continuity has reached the windings or not; therefore operate using the Multimeter as indicated above.

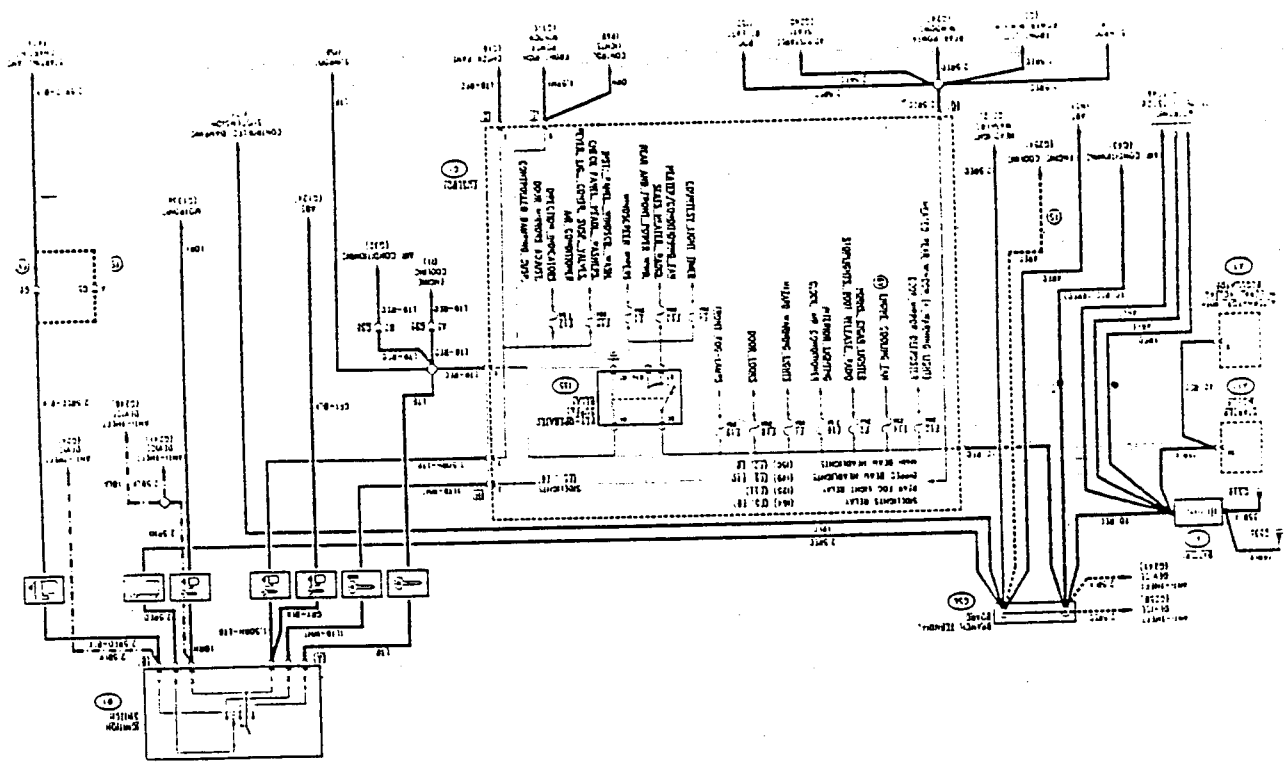
It is also possible to check a component when it is installed in the vehicle; disconnect it and check the rotation (for example the rotation of the motor) by connecting a 12 V power source to the terminals.

N.B. when the polarity (positive and ground) of an electric motor (the direction of rotation of the motor is changed; particular attention must therefore be paid that the two terminals are connected correctly

PA11551 1000102



WIRING DIAGRAM



POWER SUPPLY

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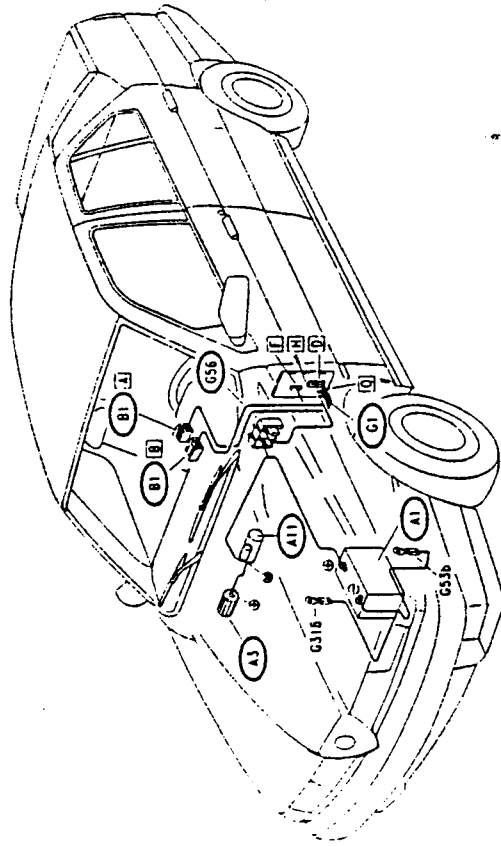
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FUNCTIONAL DESCRIPTION . . . . . 1-3

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LOCATION OF COMPONENTS

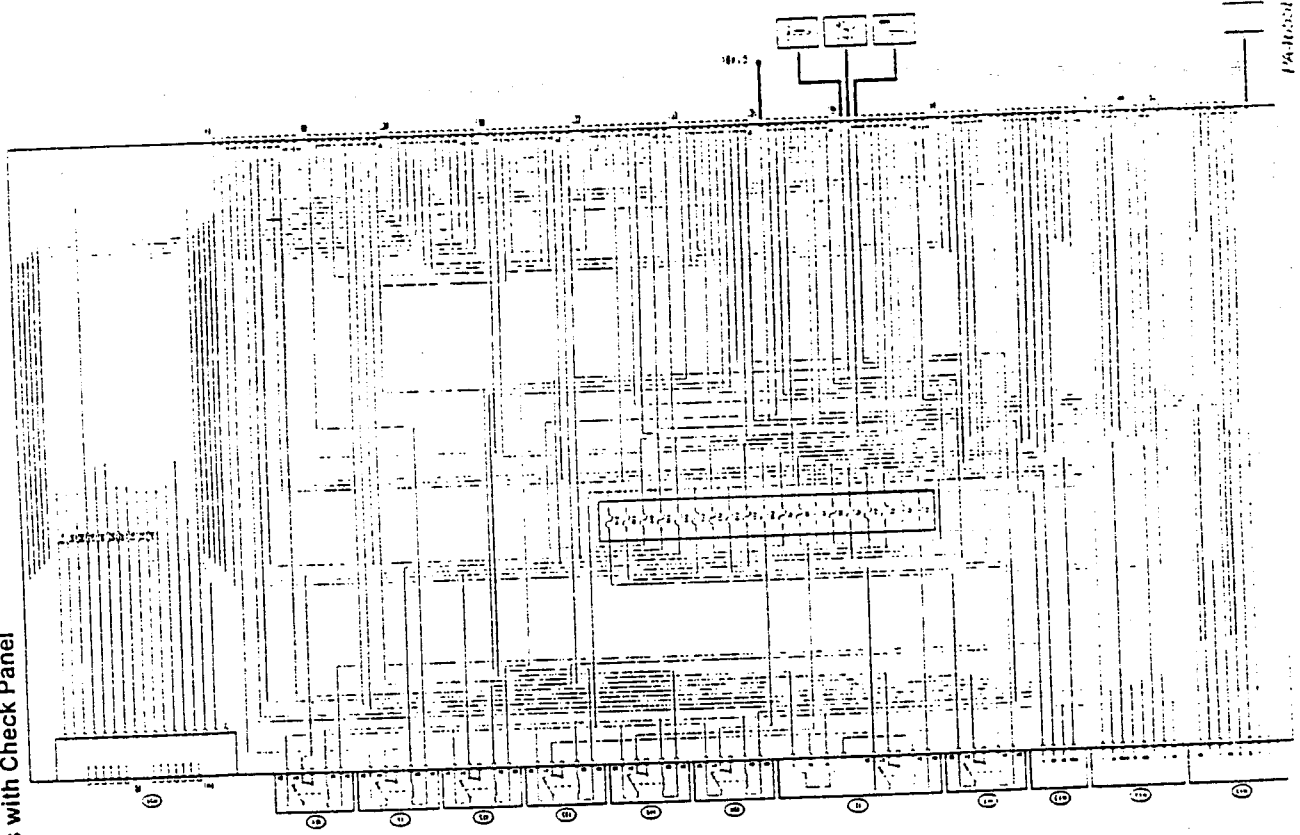


# FUSEBOX

## INDEX

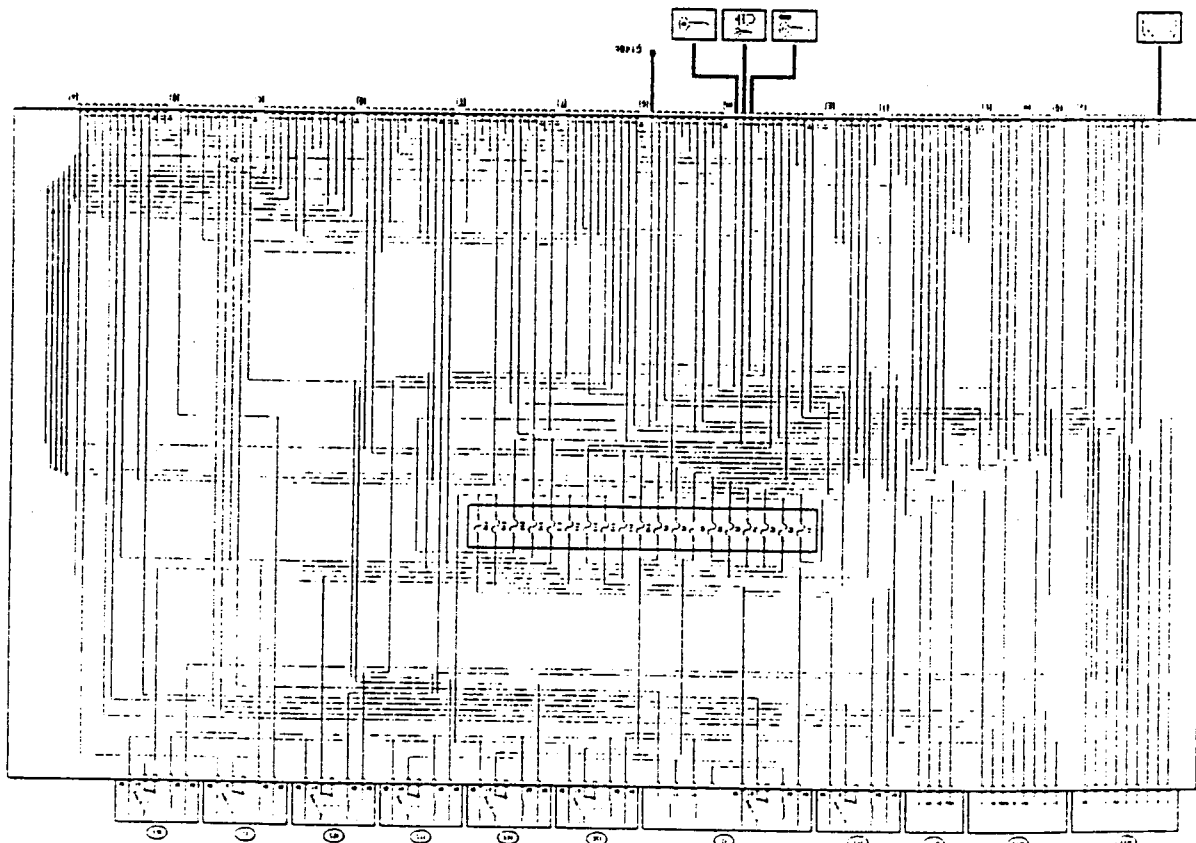
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- WIRING DIAGRAM (Models without Check Panel) . . . . . 2-3
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- FUSES AND RELAYS ON AUXILIARY BRACKET . . . . . 2-13

**WIRING DIAGRAM**  
Models with Check Panel



WIRING DIAGRAM

Models without Check Panel



GENERAL DESCRIPTION

Internal lay-out

This section describes the printed circuit connecting the inner parts of the fusebox G1.

N.B. Two distinct wiring diagrams are given, one for the models equipped with the Check Panel and the other for those without Check Panel.

In the various diagrams relative to the single systems and circuits only the lines relevant to the case under examination

are shown; this chart on the other hand gives an overall view of the entire fusebox G1.

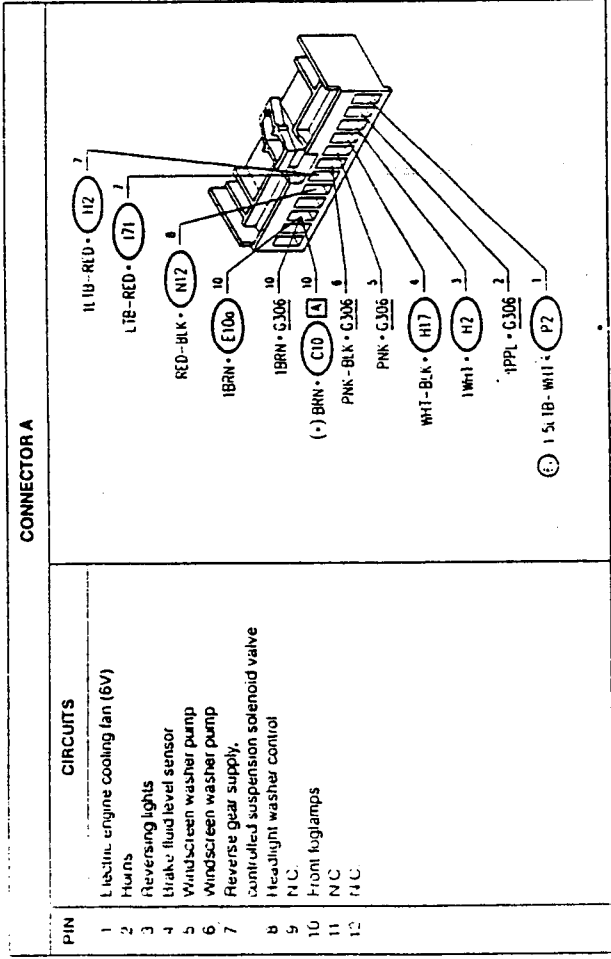
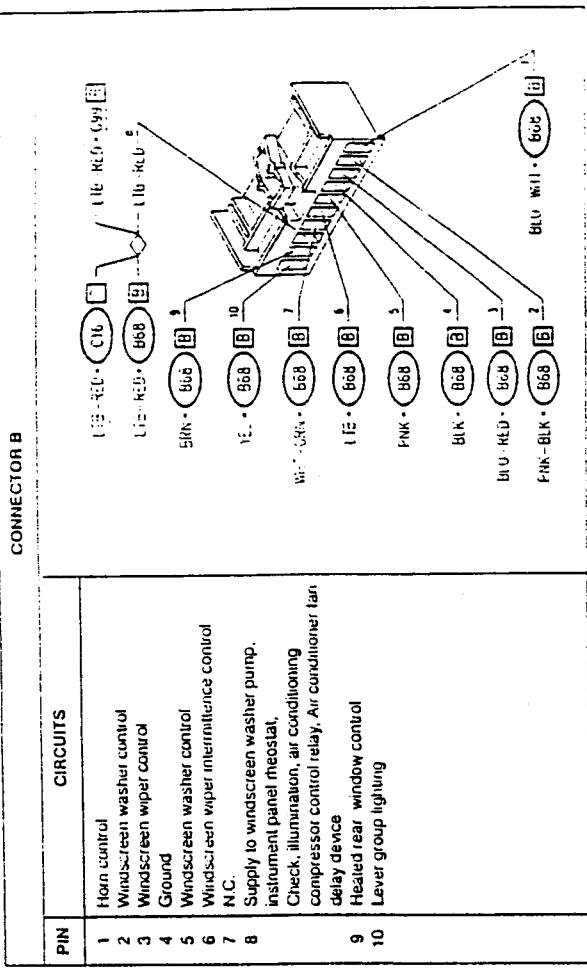
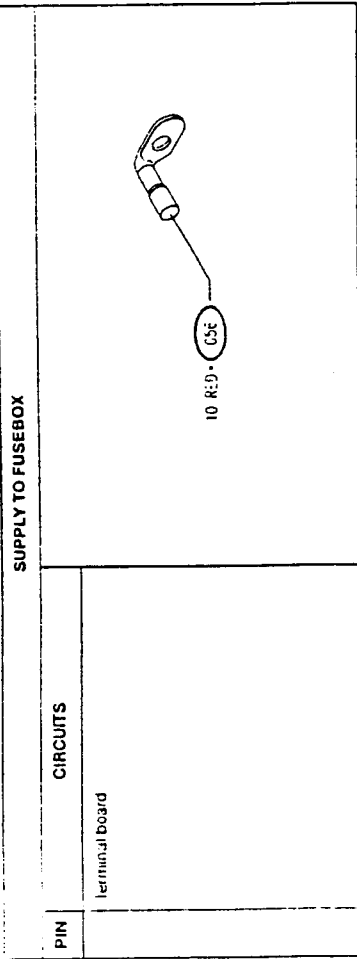
Numerous relays and other devices are housed in the fusebox indicated here with their relative codes, as are fuses (F1, ..., F19).

The Check Panel control unit N59 is installed on the fuse box on models equipped with the Check Panel. On some lines connected to this, shunts have been installed (indicated by S1).

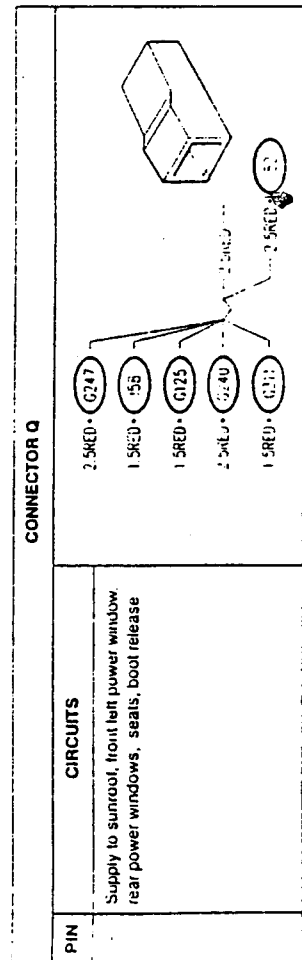
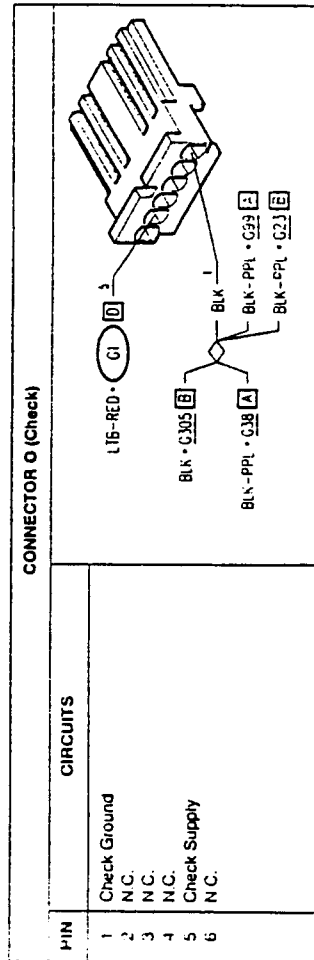
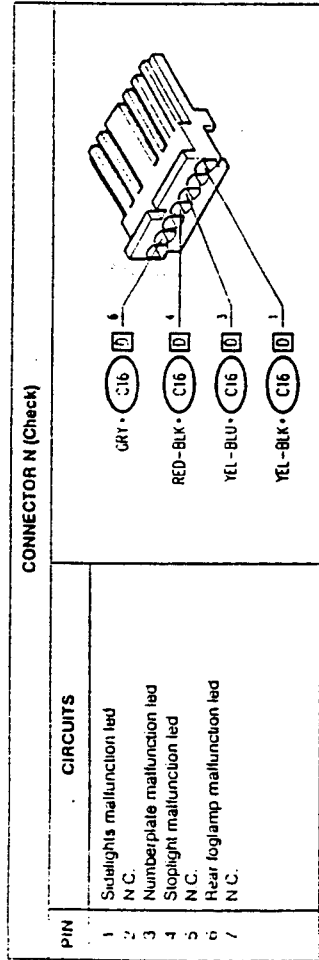
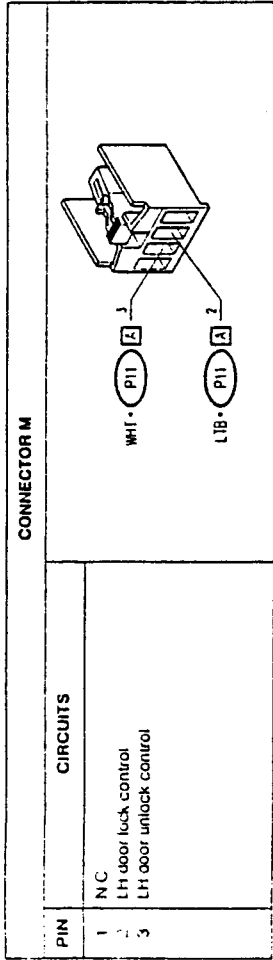
NOTE: Not all the pins in output from the fusebox G1 are connected for all vehicle models: some lines therefore may be found to be redundant although they will be present on the printed circuit.

Alongside the schematic diagram of the connectors a list of output signals from the various pins is given. This makes the job of identifying faults easier to accomplish.

NOTE: The letters N.C. indicate pins connected inside the fusebox but not used for the present versions of the vehicle.



(\*) Not furnished only



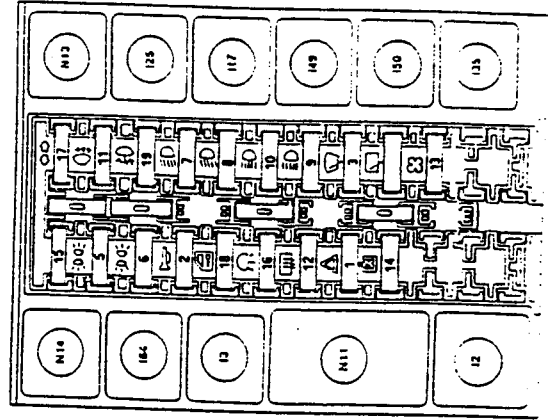
The list of fuses contained in fusebox G1 is also given along with the relative amps and indications regarding the circuits protected

N. FUSIBILE	AMPERAGGIO	CIRCUITS PROTETTI
1	10A	Hazard warning lights
2	20A	Horns, Cigar lighters, Stoplights, Boot release, Radio,
3	20A	Windscreen wipers
4	20A	Roof light timer
5	10A	Control lighting, Rear left and front right sidelights, RH numberplate light
6	10A	Control lighting, Rear right and front left sidelights, LH numberplate light
7	10A	RH dipped beam headlight
8	10A	LH dipped beam headlight
9	10A	RH main beam headlight
10	10A	LH main beam headlight (+ warning lamp)
11	7.5A	Rear foglamp (+ warning lamp)
12	30A	Heated rear window (+ warning lamp), Door mirror defrosters
13	20A	Heating/air conditioning fan, Seat warming, Rear and front power windows, Radio
14	20A	Engine cooling fan (8V)
15	10A	Dashboard, Check Panel, Windscreen washers, Headlight washers, Heating lights, Controlled damping suspension solenoid valves, Air conditioning compressor control, Engine electric fan control
16(*)	7.5A	Interior lights, Clock, Air conditioning control unit
17	7.5A	Direction indicators, Door mirror adjustment, Controlled damping suspension
18(*)	20A	Door locks
19	20A	Front foglamps (+ warning lamp)

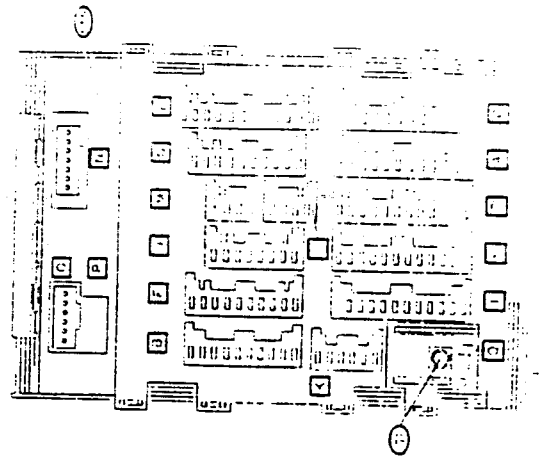
(\*) Fuse to insert in vehicle during pre-consignment phase.

Two schematic diagrams are given below illustrating the location of the fuses, relays and the position of the connectors.

LOCATION OF FUSES AND RELAYS



REAR VIEW, CONNECTORS SIDE





**FUSES AND RELAYS ON AUXILIARY BRACKET**

A series of fuses and relays is located on an auxiliary bracket (not removable) located on the left-hand side of the main fusebox.

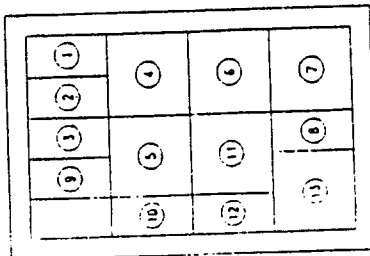
**VEHICLES UP TO CHASSIS N.30.732**

The fuses and relays can be distinguished by the colour of the connectors (fuse or relay holders) which connects them to the wiring, as shown in the table below

COMPONENTS	CODE	COLOUR
Boot lid opening relay (with 30 A fuse)	I52	RED
Sunroof relay (with 30 A fuse)	I58	WHITE
Controlled damping suspension relay (with 20 A fuse)	I71	BROWN
Engine cooling fan relay	I1	GREEN
Timer for headlight washer	N12	BLACK
Fuse for headlight washer (20A)	G312	BLACK
Fuse for front seats (30A)	G240	GREEN
Fuse for rear power windows (25A)	G247	GREEN
Fuse for ABS system (10A) (*)	G125	BLUE
Fuse for front right-hand power window (25A)	G310	RED
Fuse for front left-hand power window (25A)	G311	BROWN
		WHITE

**VEHICLES FROM CHASSIS N.30.733**

The fuses and relays can be identified by a number placed on the connectors (fuse or relay holders), and anyway by their position, as shown in the figure below.



N.	COMPONENTS	CODE
1	Fuse for front left-hand power window (25A)	G311
2	Fuse for front right-hand power window (25A)	G310
3	Fuse for ABS system (10A) (*)	G125
4	Engine cooling fan relay	I1
5	Sunroof relay (with 30 A fuse)	I58
6	Boot lid opening relay (with 30 A fuse)	I52
7	Timer for headlight washer	N12
8	Fuse for headlight washer (20A)	G312
9	Fuse for rear power windows (25A)	G247
10	Fuse for front seats (30A)	G240
11	DIM-DIP engagement relay	I91
12	Fuse for DIM-DIP device (7.5A)	G333
13	Controlled damping suspension relay (with 20A fuse)	I71

(\*) not used in all versions.

GENERAL DESCRIPTION

The following diagrams show the different grounds present on the vehicle and the connecting cables for each. Each cable shows the circuit to which it refers and the component which is grounded by that line.

The grounds shown are:

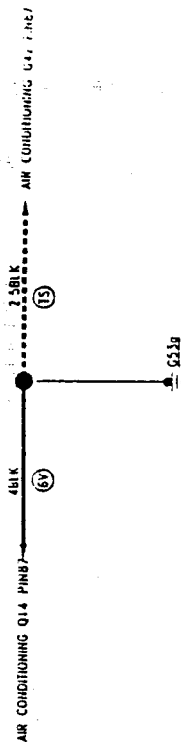
- G53a RH engine compartment ground
- G53b LH engine compartment ground
- G63a RH side rear ground
- G63b LH side rear ground
- G66 Motronic wiring ground
- G148a Ground on RH side under dashboard (No longer present after chassis N)

- G148b Ground on LH side under dashboard
- G318 Ground on gearbox
- G36 Heater-ventilation system ground

NOTE: The use of these diagrams makes it easy to identify those circuits which are connected to ground by the same line; this facilitates troubleshooting in the event of problems affecting more than one system

ELECTRIC DIAGRAMS

G53a



LOCATION OF GROUNDS

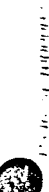
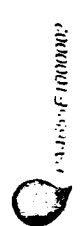
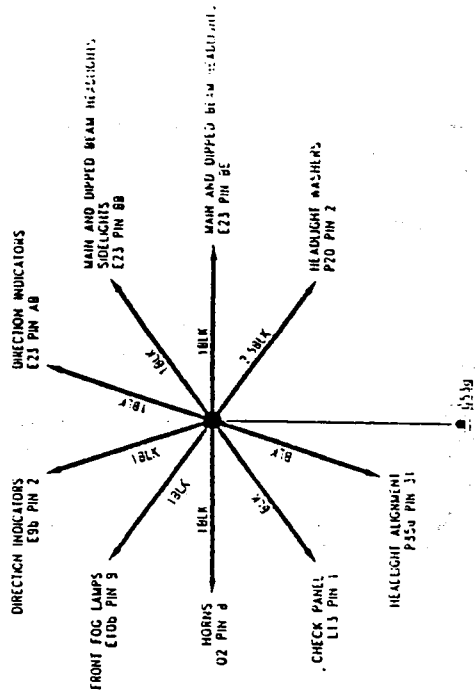
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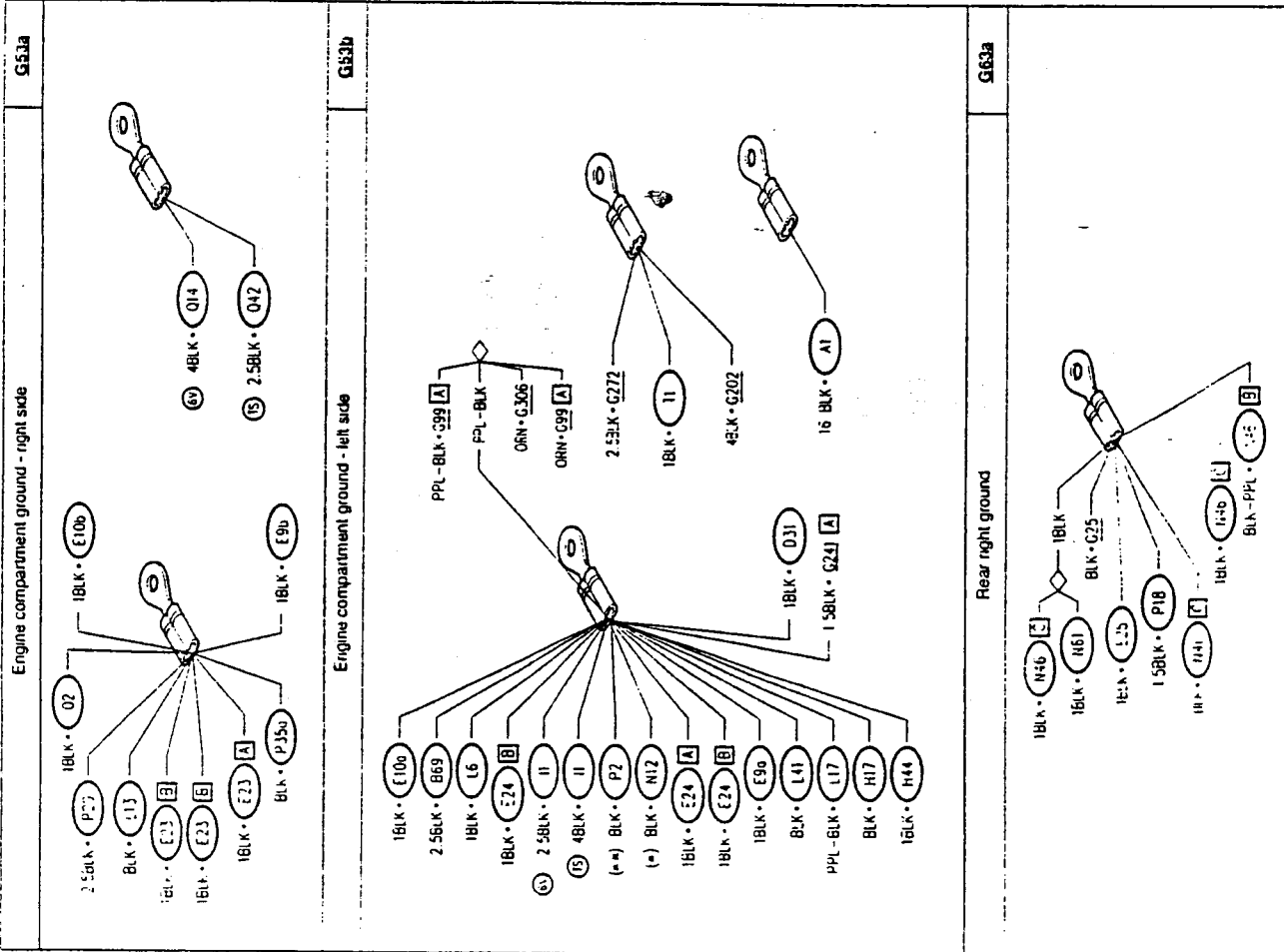




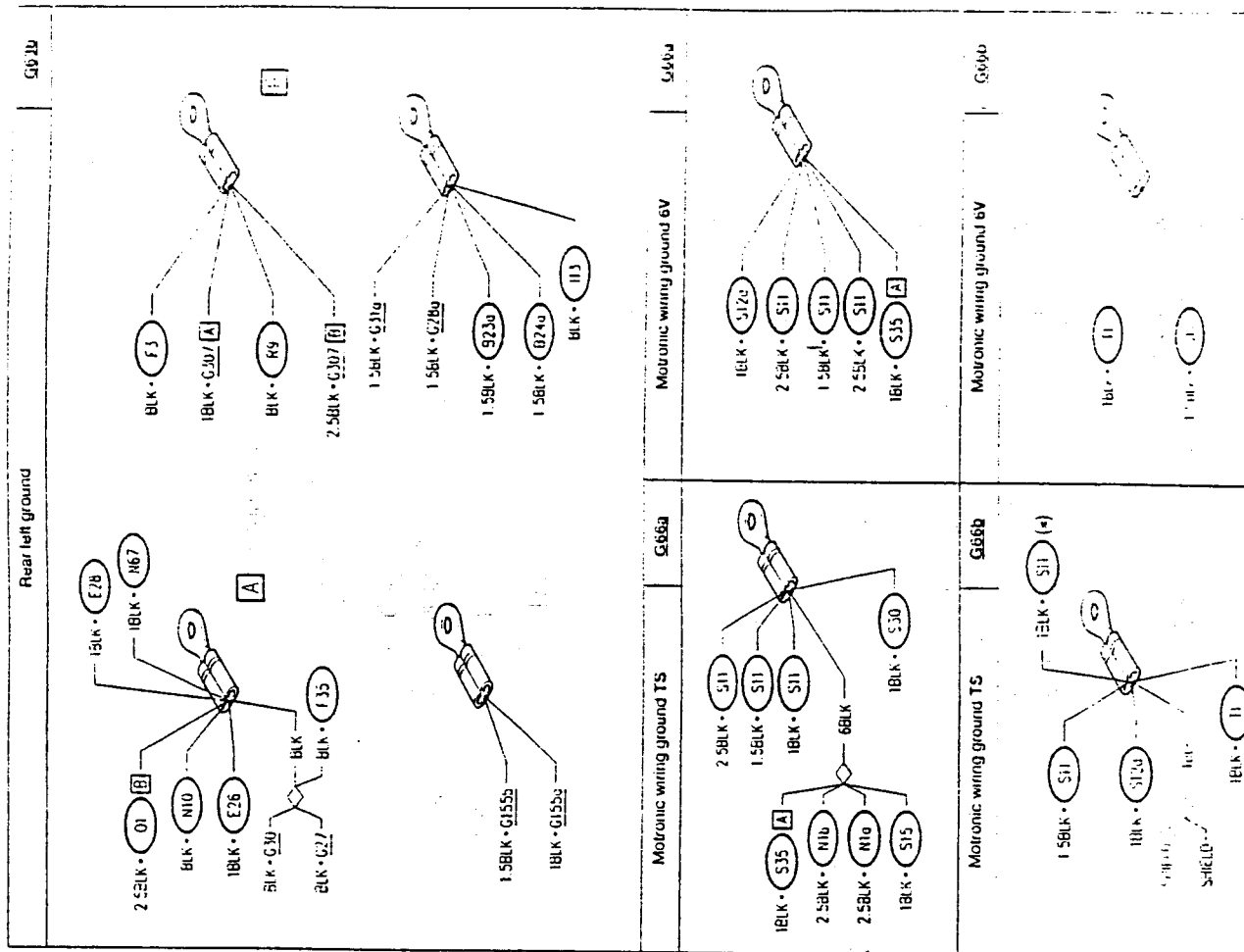




COMPONENTS AND CONNECTORS



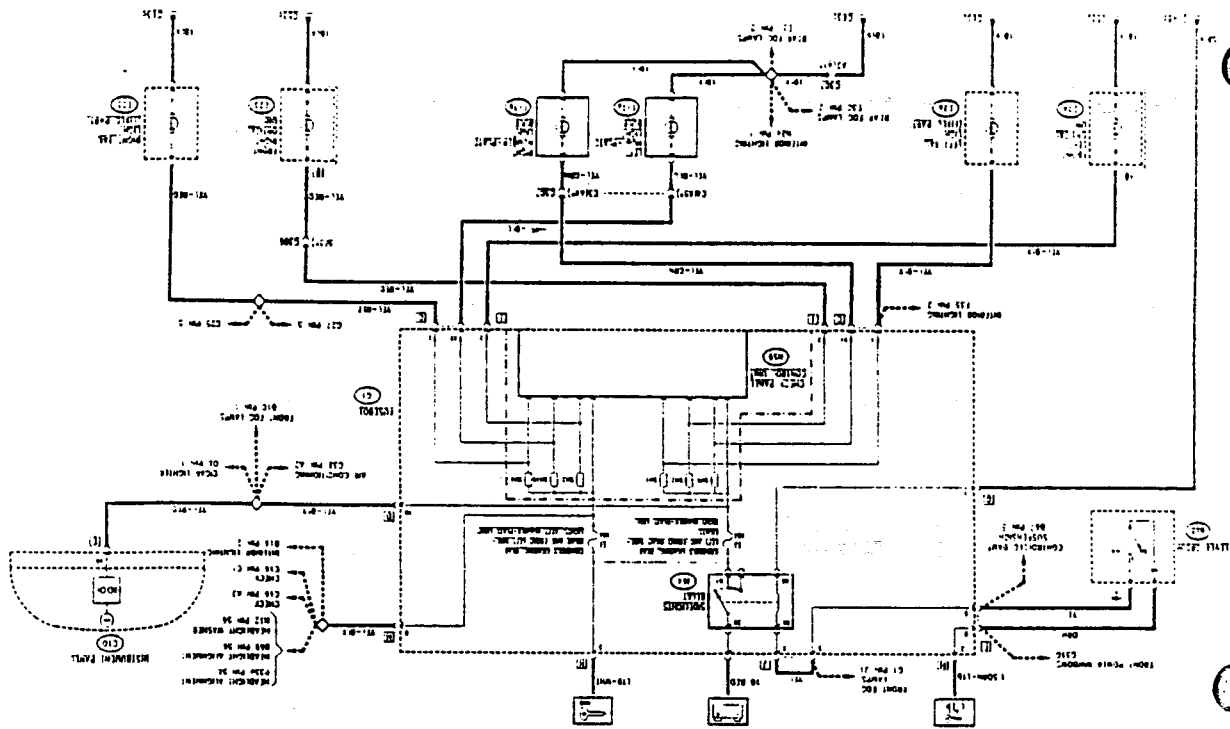
(\*) up to chassis N \_\_\_\_ / (\*\*) from chassis N \_\_\_\_  
 P/A 1635E 1000002 11-1993



(\*) only for version: PARK  
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WIRING DIAGRAM



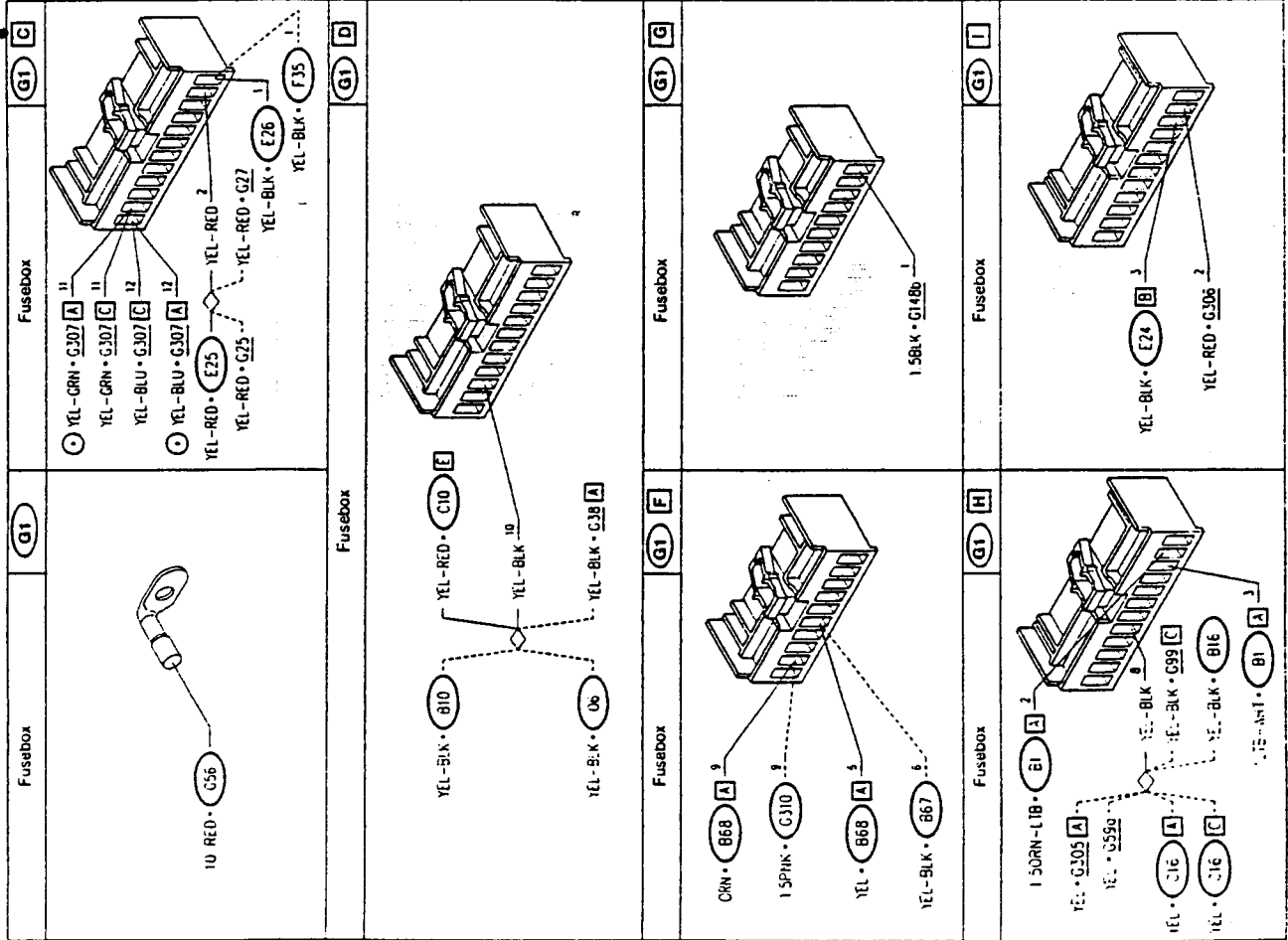
# SIDELIGHTS

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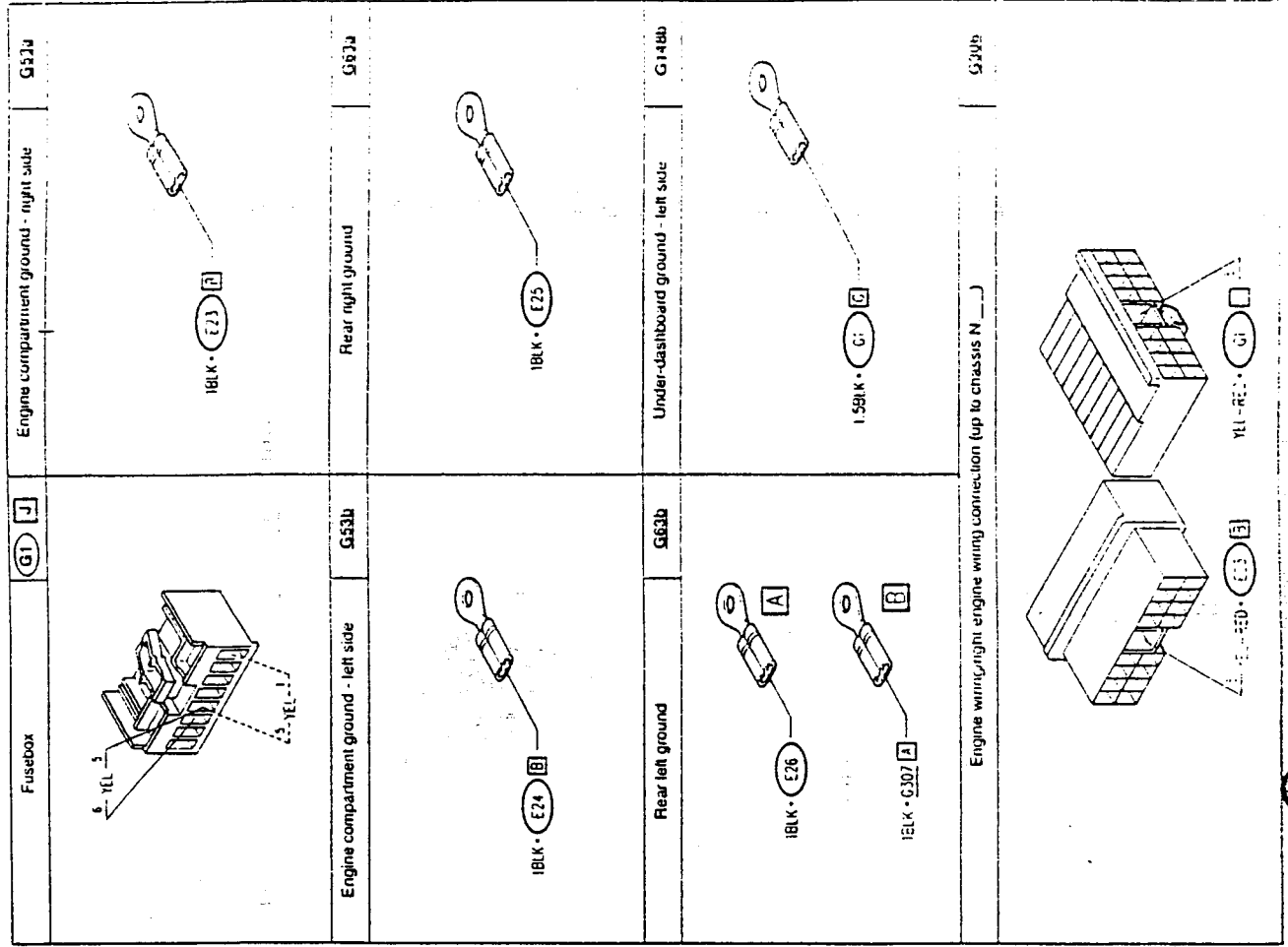
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(\*) from Chassis N  
PA-4655E 1000002





**TROUBLESHOOTING**

**NONE OF SIDELIGHTS WORKING**

**TEST A**

NOTE: for versions equipped with the Check Panel device, refer to section "Check Panel - Numberrplate lights and sidelights check" before carrying out the following tests.

TEST PROCEDURE	RESULT	CORRECTIVE ACTION
<b>A1</b> CHECK VOLTAGE -- Rotate the ignition key in the opposite direction, placing the sidelights in the "PARKING" mode; verify 12V at pin H3 of G1	<input type="radio"/> OK <input checked="" type="radio"/>	Carry out step A2  Restore wiring between pin H3 of G1 and the ignition switch (LTB-WHIT)
<b>A2</b> CHECK RELAY -- Check for correct functioning of sidelights relay I64, located in G1	<input type="radio"/> OK <input checked="" type="radio"/>	Carry out step A3  Replace relay I64
<b>A3</b> CHECK VOLTAGE -- Rotate the key and verify 12V at pin A10 of lever group B68	<input type="radio"/> OK <input checked="" type="radio"/>	Carry out step A4  Restore wiring between pin F9 of G1 and pin A10 of lever group B68 (ORN)
<b>A4</b> CHECK LEVER GROUP -- Check for correct functioning of lever group: • with sidelights on, check continuity between pin A7 and pin A10 of lever group B68	<input type="radio"/> OK <input checked="" type="radio"/>	Carry out step A5  Replace lever group B68, left part
<b>A5</b> CHECK VOLTAGE -- With ignition key rotated and sidelights on, verify 12V at pin F6 of G1	<input type="radio"/> OK <input checked="" type="radio"/>	Carry out step A6  Restore wiring between pin F6 of G1 and pin A7 of lever group B68 (YEL)
<b>A6</b> CHECK VOLTAGE -- With ignition key rotated and sidelights on, verify 12V at pin J6 of G1	<input type="radio"/> OK <input checked="" type="radio"/>	Carry out the successive tests  Restore wiring between pins J6 and J5 of G1 (YEL)

**FRONT RIGHT LIGHTS NOT WORKING**

**TEST B**

TEST PROCEDURE	RESULT	CORRECTIVE ACTION
<b>B1</b> CHECK FUSE -- Check for damage of fuse F5 in fusebox G1	<input type="radio"/> OK <input checked="" type="radio"/>	Carry out step B2  Replace fuse (10A)
<b>B2</b> CHECK VOLTAGE -- With ignition key rotated and lights on, verify 12V between pin BD and BB of right-hand light assembly E23	<input type="radio"/> OK <input checked="" type="radio"/>	Carry out step B3  Carry out step B4
<b>B3</b> CHECK BULB -- Check for damage of sidelights bulb, located in light assembly E23	<input type="radio"/> OK <input checked="" type="radio"/>	Check and if necessary replace the complete light assembly E23  Replace bulb
<b>B4</b> CHECK VOLTAGE -- With ignition key rotated and lights on, verify 12V at pin BD of light assembly E23	<input type="radio"/> OK <input checked="" type="radio"/>	Restore wiring between pin BD of E23 and ground G33a (BLK)  Restore wiring between pin I2 of G1 and pin 5(3*) of G306, and between pin 5(3*) of G306 and pin BD of E23 (YEL, BLK)

(\*): from chassis N....

**FRONT LEFT LIGHTS NOT WORKING**

**TEST C**

TEST PROCEDURE	RESULT	CORRECTIVE ACTION
<b>C1</b> CHECK FUSE -- Check for damage of fuse F6 in fusebox G1	<input type="radio"/> OK <input checked="" type="radio"/>	Carry out step C2  Replace fuse (10A)
<b>C2</b> CHECK VOLTAGE -- With ignition key rotated and lights on, verify 12V between pin BD and BB of left light assembly E24	<input type="radio"/> OK <input checked="" type="radio"/>	Carry out step C3  Carry out step C4
<b>C3</b> CHECK BULB -- Check for damage of sidelights bulb, located in light assembly E24	<input type="radio"/> OK <input checked="" type="radio"/>	Check and if necessary replace the complete light assembly E24  Replace bulb
<b>C4</b> CHECK VOLTAGE -- With ignition key rotated and lights on, verify 12V at pin BD of light assembly E24	<input type="radio"/> OK <input checked="" type="radio"/>	Restore wiring between pin BB of E24 and ground G53b (BLK)  Restore wiring between pin I3 of G1 and pin BB of E24 (YEL-BLK)

REAR RIGHT-HAND LIGHT NOT WORKING TEST D

TEST PROCEDURE	RESULT	CORRECTIVE ACTION
D1   CHECK FUSE - Check for damage of fuse F6 in fusebox G1	OK	Carry out step D2
	OK	Replace fuse (10A)
D2   CHECK VOLTAGE - With ignition key rotated and lights on, verify 12V between pins 2 and 4 of rear right-hand light assembly E25	OK	Carry out step D3
	OK	Carry out step D4
D3   CHECK BULB - Check for damage of sidelights bulb, located in light assembly E25	OK	Check and if necessary replace the complete light assembly E25
	OK	Replace bulb
D4   CHECK VOLTAGE - With ignition key rotated and lights on, verify 12V at pin 2 of light assembly E25	OK	Restore wiring between pin 4 of E25 and ground G63a (BLK)
	OK	Restore wiring between pin C2 of G1 and pin 2 of E25, also across the solder (YEL-RED)

REAR LEFT-HAND LIGHT NOT WORKING TEST E

TEST PROCEDURE	RESULT	CORRECTIVE ACTION
E1   CHECK FUSE - Check for damage of fuse F5 in fusebox G1	OK	Carry out step E2
	OK	Replace fuse (10A)
E2   CHECK VOLTAGE - With ignition key rotated and lights on, verify 12V between pins 3 and 1 of rear left light assembly E26	OK	Carry out step E3
	OK	Carry out step E4
E3   CHECK BULB - Check for damage of sidelights bulb, located in light assembly E26	OK	Check and if necessary replace the complete light assembly E26
	OK	Replace bulb
E4   CHECK VOLTAGE - With ignition key rotated and lights on, verify 12V at pin 3 of light assembly E26	OK	Restore wiring between pin 1 of E26 and ground G62b (BLK)
	OK	Restore wiring between pin C1 of G1 and pin 3 of E26 (YEL-BLK)

RIGHT-HAND NUMBERPLATE LIGHT NOT WORKING TEST F

TEST PROCEDURE	RESULT	CORRECTIVE ACTION
F1   CHECK FUSE - Check for damage of fuse F5 in fusebox G1	OK	Carry out step F2
	OK	Replace fuse (10A)
F2   CHECK VOLTAGE - With ignition key rotated and lights on, verify 12V between pin 1 and 2 of right-hand numberplate light E17b	OK	Carry out step F3
	OK	Carry out step F4
F3   CHECK BULB - Check for damage of numberplate light bulb E17b	OK	Check and if necessary replace the complete numberplate lighting assembly
	OK	Replace bulb
F4   CHECK VOLTAGE - With ignition key rotated and lights on, verify 12V at pin 2 of light E17b	OK	N.B.: In this case the left-hand numberplate will also not be working, see test G. Restore wiring between pin 1 of E17b and ground G63b, across solder and pin A2(A1*) of connector G307 (BLK)
	OK	Restore wiring between pin C11 of G1 and pin 2 of E17b, across pin G3(A4*) of connector G307 (YEL-GHN)

(\*) from chassis N.---

LEFT-HAND NUMBERPLATE LIGHT NOT WORKING TEST G

TEST PROCEDURE	RESULT	CORRECTIVE ACTION
G1 CHECK FUSE - Check for damage of fuse F6 in fusebox G1	OK <del>OK</del>	Carry out step G2 Replace fuse (10A)
G2 CHECK VOLTAGE - With ignition key rotated and lights on, verify 12V between pin 1 and 2 of left-hand numberplate light E17a	OK <del>OK</del>	Carry out step G3 Carry out step G4
G3 CHECK BULB - Check for damage of numberplate light bulb E17a	OK <del>OK</del>	Check and if necessary replace the complete numberplate lighting assembly Replace bulb
G4 CHECK VOLTAGE - With ignition key rotated and lights on, verify 12V at pin 2 of light E17a	OK <del>OK</del>	Restore wiring between pin 1 of E17a and ground G63b, across, solder and pin A2(A1*) of connector G307 (BLK) Restore wiring between pin C12 of G1 and pin 2 of E17a, across pin C4(A5*) of connector G307 (YEL-BLU)

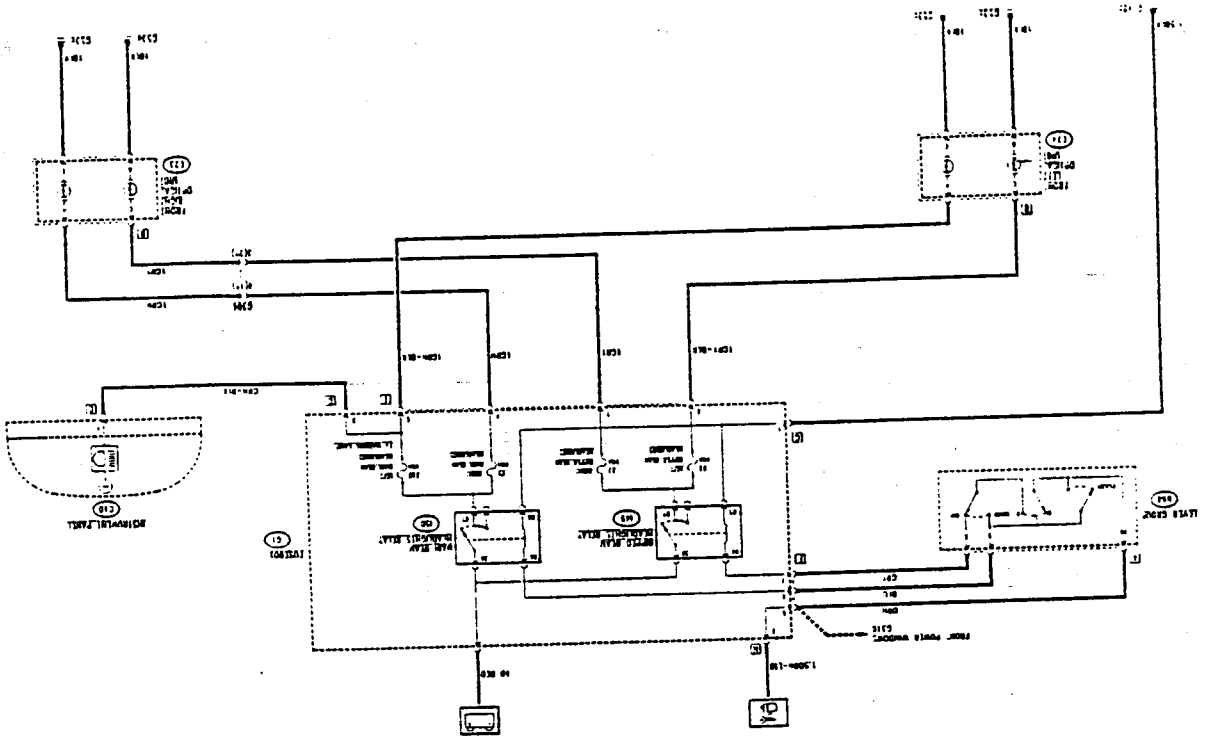
\* Front chassis N

SIDELIGHTS WARNING LAMP ON INSTRUMENT PANEL NOT WORKING TEST H

Note: The sidelights are however, working correctly

TEST PROCEDURE	RESULT	CORRECTIVE ACTION
H1 CHECK VOLTAGE - With ignition key rotated and sidelights on, verify 12V at pin E10 of instrument panel C10	OK <del>OK</del>	Carry out step H2 Restore wiring between pin D10 of G1 and pin E10 of C10, also across the solder (YEL-BLK and YEL-RED)
H2 CHECK WARNING LIGHT BULB - Check for damage of sidelights warning lamp, located on the instrument panel C10	OK <del>OK</del>	Check and if necessary replace the complete instrument panel C10 Replace a warning light bulb

WIRING DIAGRAM



MAIN AND DIPPED BEAM HEADLIGHTS

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**GENERAL DESCRIPTION**

The vehicle is equipped with two lamps for the dipped beam and two for main-beam.

Dipped beam is selected by rotating the switch located on the lever group one position on from the sidelights position. From this position the main-beam can be permanently selected by acting on the main-beam beam switch; lightly pulling the lever activates the main-beam "flashing" function which will continue to flash for as long as the lever is pulled. A warning lamp on the dashboard signals the selection of the main-beam.

For safety reasons each light is protected by two fuses, one for the right-hand lamp and the other for the left.

**NOTE:** some versions are equipped with an electrically operated device which regulates the alignment of the headlights (see "Adjusting headlight alignment") however a manual device permits a rapid and simple adjustment of the beam to the loading conditions of the vehicle.

**FUNCTIONAL DESCRIPTION**

The circuit of the dipped beam headlights is activated by relay 49 located in fusebox G1.

Moving the lever group switch B68 to position II - one position on from the sidelights position - and with the switch at the dipped beam position, the coil of relay 49 is "turn key" supplied closing the circuit supplying the lamps E24 (left)

and E23 (right). Each circuit is protected by a fuse in box G1: F7 (10A) for the right-hand lamp and F10 (10A) for the left.

The main-beam circuit is activated by relay 150 located in fusebox G1.

Moving the switch to the main-beam position, with the switch on the lever group B68 to position II, or by closing the "flashing" contact, the coil of relay 150 is "turn key" supplied and closes the circuit which supplies the lamps E24 (left) and E23 (right). Each circuit is protected by a fuse in fusebox G1: F9 (10A) for the right-hand lamp and F10 (10A) for the left.

The supply line of the left lamp also sends a signal to the instrument panel C10 which illuminates the "main-beam on" warning lamp.

**TROUBLESHOOTING TABLE**

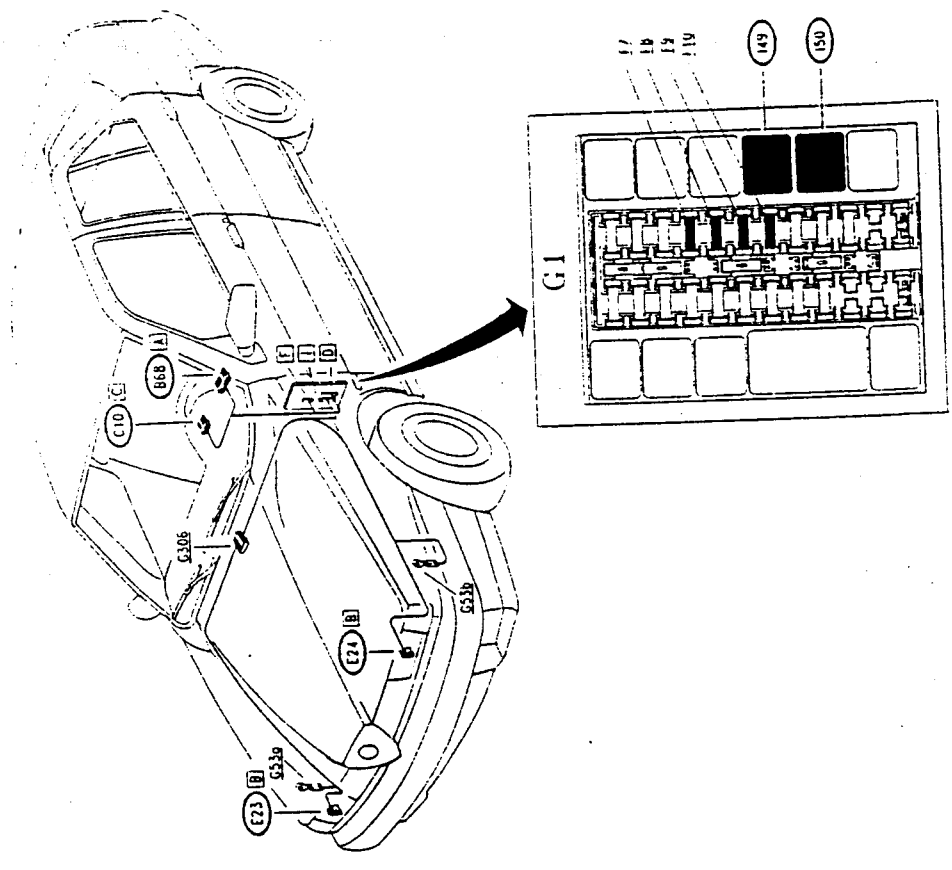
Malfunction	Component							Test
	(149) (150)	E7	E8	E9	F10	(B68) (E23)	(E24) (C10)	
Both dipped beam lamps	•					•		A
Right dipped beam lamp		•					•	B
Left dipped beam lamp			•				•	C
Both main beam lamps		•				•		D
Right main beam lamp			•				•	E
Left main beam lamp				•			•	F
Main beam warning lamp							•	G

**COMPONENTS AND CONNECTORS**

Lever group	Instrument panel
<p>ORN • G1 (E7) BLU • G1 (E8) GRY • G1 (E9)</p>	<p>Instrument panel (C10) (G)</p>
<p>Front right optical unit (E23) (D)</p>	<p>Front left optical unit (E23) (D)</p>
<p>Fusebox (G1)</p>	<p>Fusebox (G1) (D)</p>
<p>Fusebox (G1)</p>	<p>Fusebox (G1) (G)</p>
<p>Fusebox (G1) (F)</p>	<p>Fusebox (G1) (D)</p>



LOCATION OF COMPONENTS



<p>Fusebox</p> <p>1. IGRY • G306 2. IGRY • E24 3. ICRN • E24 4. ICRN • G306</p>	<p>Fusebox</p>
<p>Engine compartment ground-right side</p> <p>G53a</p> <p>1. ICRN • E23 2. ICRN • E24</p>	<p>Engine compartment ground-left side</p> <p>G53b</p> <p>1. ICRN • E23 2. ICRN • E24</p>
<p>Under-dashboard ground-left side</p> <p>G148b</p> <p>1. ICRN • G1</p>	<p>Engine wiring/right engine wiring connection (up to chassis N)</p> <p>G306</p> <p>1. ICRN • E23 2. ICRN • G1 3. IGRY • G1 4. IGRY • E23 5. ICRN • E23 6. ICRN • G1</p>
<p>Engine wiring/right engine wiring connection (from chassis N)</p> <p>1. ICRN • G1 2. ICRN • E23 3. ICRN • E23 4. ICRN • G1</p>	<p>Engine wiring/right engine wiring connection (from chassis N)</p> <p>G306</p> <p>1. ICRN • G1 2. ICRN • E23 3. ICRN • E23 4. ICRN • G1</p>

LEFT-HAND DIPPED BEAM LAMP NOT WORKING

TEST C

TEST PROCEDURE		RESULT	CORRECTIVE ACTION
C1	CHECK FUSE	OK	Carry out step C2
	- Check for damage of fuse F8 in fusebox G1	<del>OK</del>	Replace fuse (10A)
C2	CHECK VOLTAGE	OK	Carry out step C3
	- With ignition key rotated and lights on, verify 12V between pin BC and BB of left-hand headlight assembly E24	<del>OK</del>	Carry out step C4
C3	CHECK BULB	OK	Check and if necessary replace the entire headlight assembly E24
	- Check for damage of left-hand dipped beam lamp, located in headlight assembly E24	<del>OK</del>	Replace bulb
C4	CHECK VOLTAGE	OK	Restore wiring between pin BB of E24 and ground G53b (BLK)
	- With ignition key rotated and lights on, verify 12V at pin BC of headlight assembly E24	<del>OK</del>	Restore wiring between pins of G1 and pin BC of E24 (GRY-BLK)

TEST D

TEST PROCEDURE		RESULT	CORRECTIVE ACTION
D1	CHECK RELAY	OK	Carry out step D2
	- Check correct functioning of main-beam relay I50 located in G1	<del>OK</del>	Replace relay I50
D2	CHECK VOLTAGE	OK	Carry out step D3
	- Rotate the ignition key and verify 12V at pin A10 of lever group B68	<del>OK</del>	Restore wiring between pin F9 of G1 and pin A10 of lever group B68 (DRN)
D3	CHECK LEVER GROUP	OK	Carry out step D4
	- Check correct functioning of lever group • with main beam selected or operating the "flashing" device, check continuity between pin A9 and pin A10 of lever group B68	<del>OK</del>	Replace lever group B68 - left part
D4	CHECK VOLTAGE	OK	Carry out tests E and F
	- With ignition key rotated and main beam selected, verify 12V at pin FB off G1	<del>OK</del>	Restore wiring between pin F9 of G1 and pin FB of E24

RIGHT-HAND DIPPED BEAM LAMP NOT WORKING

TEST A

TEST PROCEDURE		RESULT	CORRECTIVE ACTION
A1	CHECK RELAY	OK	Carry out step A2
	- Check correct functioning of dipped beam relay I49, located in G1	<del>OK</del>	Replace relay I49
A2	CHECK VOLTAGE	OK	Carry out step A3
	- Rotate the ignition key and verify 12V at pin A10 of lever group B68	<del>OK</del>	Restore wiring between pin F9 of G1 and pin A10 of lever group B68 (DRN)
A3	CHECK LEVER GROUP	OK	Carry out step A4
	- Check correct functioning of lever group: • with dipped beam selected, verify continuity between pin AB and pin A10 of lever group B68	<del>OK</del>	Replace lever group B68, left part
A4	CHECK VOLTAGE	OK	Carry out tests B and C
	- With key rotated and dipped beam selected, verify 12V at pin F7 of G1	<del>OK</del>	Restore wiring between pin F7 of G1 and pin AB of lever group B68 (GRY)

TEST B

TEST PROCEDURE		RESULT	CORRECTIVE ACTION
B1	CHECK FUSE	OK	Carry out step B2
	- Check for damage of fuse F7 in fusebox G1	<del>OK</del>	Replace fuse (10A)
B2	CHECK VOLTAGE	OK	Carry out step B3
	- With key rotated and lights on, verify 12V between pin BC and BB of right-hand headlight assembly E23	<del>OK</del>	Carry out step B4
B3	CHECK BULB	OK	Check and if necessary replace the entire headlight assembly E23
	- Check for damage of right-hand dipped beam lamp, located in headlight assembly E23	<del>OK</del>	Replace bulb
B4	CHECK VOLTAGE	OK	Restore wiring between pin BB of E23 and ground G53a (BLK)
	- With ignition key rotated and lights on, verify 12V at pin BC of headlight assembly E23	<del>OK</del>	Restore wiring between pin I7 of G1 and pin J(2') of G306, and between pin J(2') of G306 and pin BC of E23 (GRY)

LEFT-HAND MAIN-BEAM LAMP NOT WORKING TEST F

TEST PROCEDURE	RESULT	CORRECTIVE ACTION
<b>F1</b> CHECK FUSE - Check for damage of fuse F10 in fusebox G1	OK <del>OK</del>	Carry out step F2 Replace fuse (10A)
<b>F2</b> CHECK VOLTAGE - With ignition key rotated and lights on, verify 12V between pin BA and BE of left-hand headlight assembly E24	OK <del>OK</del>	Carry out step F3 Carry out step F4
<b>F3</b> CHECK BULB - Check for damage of left-hand main-beam bulb, located in the headlight assembly E24	OK <del>OK</del>	Check and if necessary replace the complete headlight assembly E24 Replace the bulb
<b>F4</b> CHECK VOLTAGE - With ignition key rotated and lights on, verify 12V at pin BA of headlight assembly E24	OK <del>OK</del>	Restore wiring between pin BE of E24 and ground G53a (BLK) Restore wiring between pin IS of G1 and pin BA of E24 (GHN-BLK)

HEADLIGHTS WARNING LAMP ON INSTRUMENT PANEL NOT WORKING TEST G

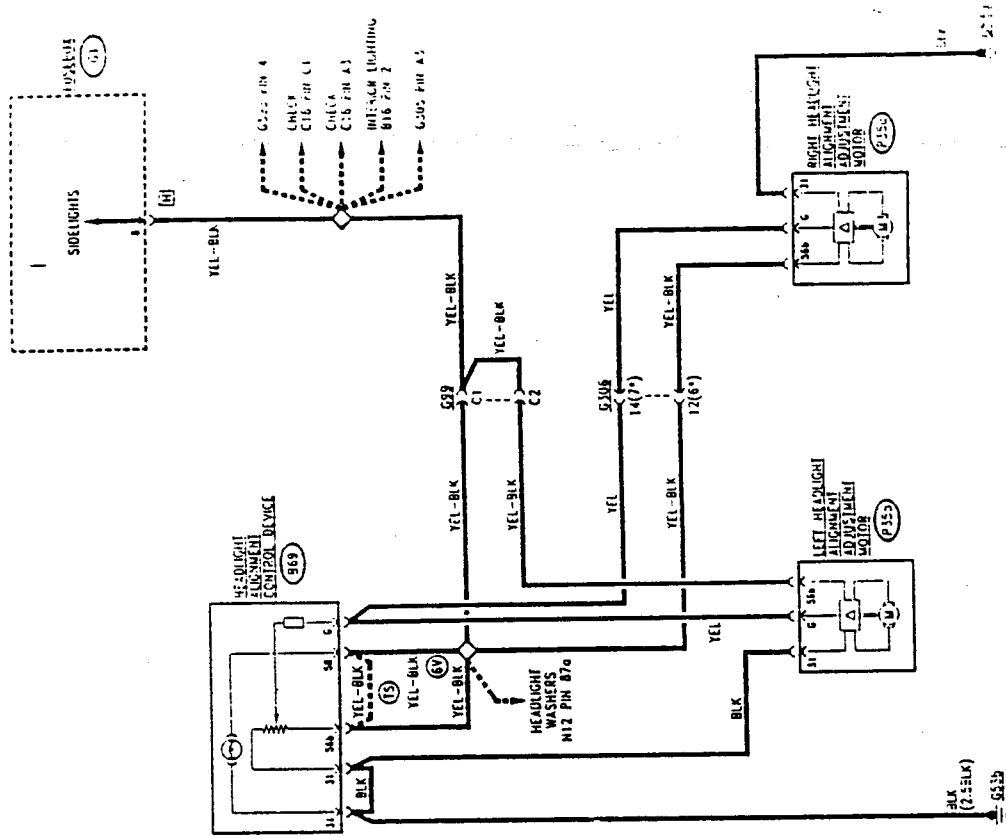
NOTE: the dipped beam headlights however are functioning correctly

TEST PROCEDURE	RESULT	CORRECTIVE ACTION
<b>G1</b> CHECK VOLTAGE - With ignition key rotated and main-beam selected, verify 12V at pin C4 of instrument panel C10	OK <del>OK</del>	Carry out step G2 Restore wiring between pin D2 of G1 and pin C4 of C10 (GHN-BLK)
<b>G2</b> CHECK WARNING LIGHT BULB - Check for damage of main-beam warning lamp, located in the instrument panel C10	OK <del>OK</del>	Check and if necessary replace the complete instrument panel C10 Replace the warning lamp

RIGHT-HAND MAIN-BEAM LAMP NOT WORKING TEST E

TEST PROCEDURE	RESULT	CORRECTIVE ACTION
<b>E1</b> CHECK FUSE - Check for damage of fuse F9 in fusebox G1	OK <del>OK</del>	Carry out step E2 Replace fuse (10A)
<b>E2</b> CHECK VOLTAGE - With ignition key rotated and lights on, verify 12V between pin BA and BE of right-hand headlight assembly E23	OK <del>OK</del>	Carry out step E3 Carry out step E4
<b>E3</b> CHECK BULB - Check for damage of right-hand main-beam bulb, located in headlight assembly E23	OK <del>OK</del>	Check and if necessary replace the complete headlight assembly E23 Replace the bulb
<b>E4</b> CHECK VOLTAGE - With ignition key rotated and lights on, verify 12V at pin BA of headlight assembly E23	OK <del>OK</del>	Restore wiring between pin BE of E23 and ground G53a (BLK) Restore wiring between pin J4 of G1 and pin 4(1*) of G306, and between pin 4(1*) of G306 and pin BA of E23 (GRN)

WIRING DIAGRAM



ADJUSTING HEADLIGHT ALIGNMENT

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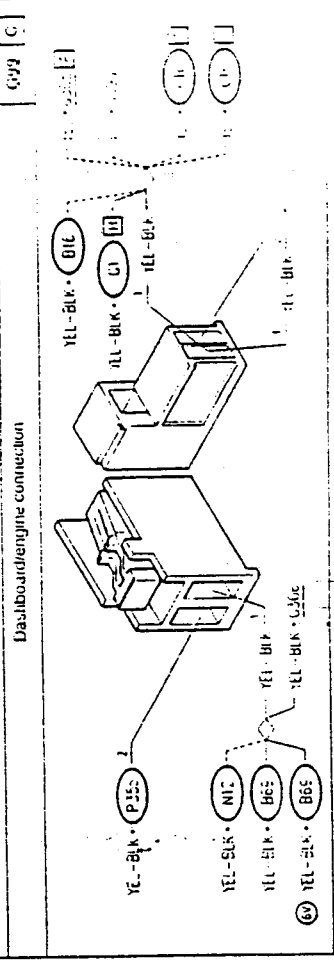
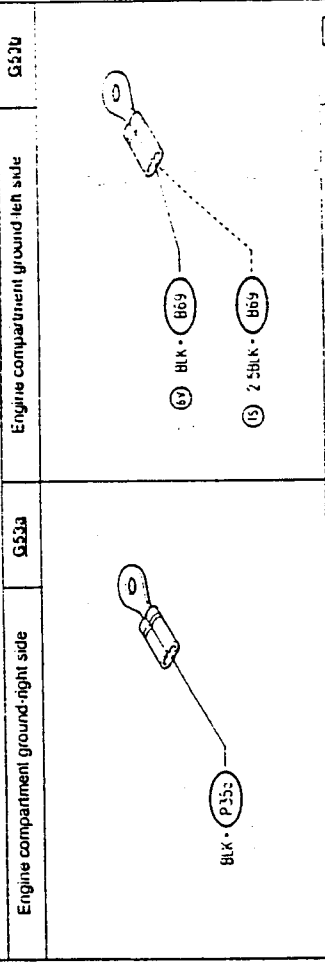
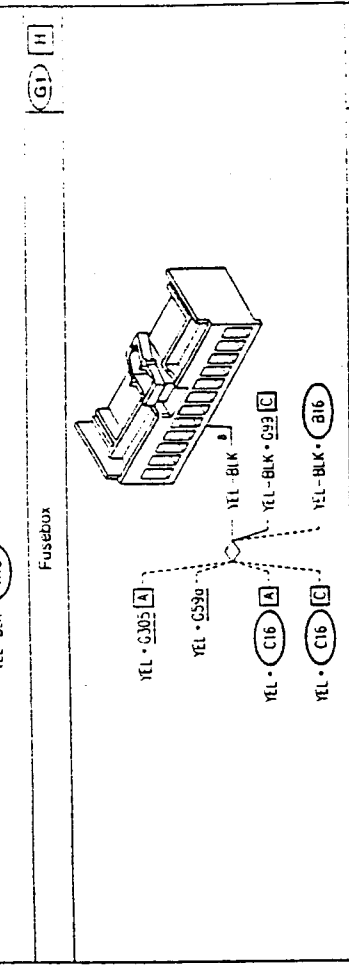
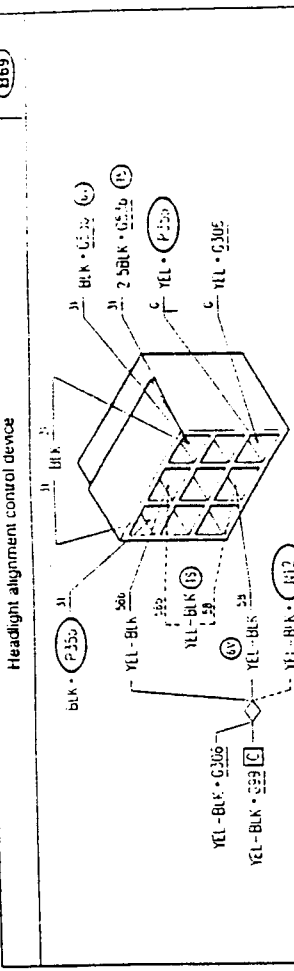
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(\*) from chassis N. . . . .

COMPONENTS AND CONNECTORS



GENERAL DESCRIPTION

On some versions it is possible to adjust the orientation of the headlight beam to the weight load directly from the driver's seat.

In this way the problem of incorrect headlight direction is avoided and the delicate task of direct adjustment of the lamps simplified (this is not substituted by the electric mechanism, but only integrated with it). For further details see "REPAIR MANUAL - BODY", Group 40.

The adjustment device consists of a motor mounted on each of the two lamps which tilts them in order to raise the beam when the vehicle is fully loaded and lower it when the load is lightened.

The driver acts directly on the system by rotating a handle located on the dashboard which allows four positions to be chosen ("0" = vehicle unloaded; "3" =

The 31 pins of the device B69 are grounded, while the adjustment signal obtained by acting on the four-position selection wheel originates from pin G. This signal varies the output voltage through a potentiometer (100% voltage at position "0" with voltage decreasing for the successive positions).

Motors P35a and P35b are formed by a motor in the strict sense of the word, controlled by a transducer which establishes the movement on the basis of the voltage of the adjustment signal reaching pins G from the device B69.

The transducers are supplied at pins 56b, by the same line which supplies the device B69; the 31 pins are grounded.

FUNCTIONAL DESCRIPTION

The headlight alignment control device B69 is supplied through pin 56b by a line originating from the sidelights circuit; this line is live only when the lights are on.

The same supply (pin 58) illuminates the lamp located inside the device B69 itself which illuminates the ideogram identifying the function.

TROUBLESHOOTING TABLE

Malfunction	Component		Test
	B69	P35a/P35b	
Adjustment not working	•		A
RT headlight		•	B
LT headlight		•	C



HEADLIGHT ADJUSTMENT NOT WORKING (RIGHT-HAND HEADLIGHT) TEST B

TEST PROCEDURE		RESULT	CORRECTIVE ACTION
B1	CHECK VOLTAGE - With sidelights on, verify 12V between pins 56b and 31 of the right-hand headlight alignment motor P35a	OK	Carry out step B2
		<del>OK</del>	Carry out step B3
B2	CHECK CONTINUITY - Check continuity between pin G of the motor P35a and pin G of the device B69	OK	Replace the motor P35a
		<del>OK</del>	Restore wiring between pin G of B69 and pin 14(7') of G306, and between pin 14(7') of G306 and pin G of P35a (YEL)
B3	CHECK VOLTAGE - With sidelights on, verify 12V at 56b of P35a	OK	Restore wiring between pin 31 of P35a and ground G53a (BLK)
		<del>OK</del>	Restore wiring between pin 56b of B69 and pin 12(6') of G306 across the solder and between pin 12(6') of G306 and pin G of P35a (YEL-BLK)

(\*) from chassis N.

TROUBLESHOOTING HEADLIGHT ADJUSTMENT NOT WORKING (BOTH HEADLIGHTS) TEST A

NOTE: Check that the sidelights are working correctly, if not, refer to section "Sidelights"

TEST PROCEDURE		RESULT	CORRECTIVE ACTION
A1	CHECK VOLTAGE - With sidelights on, verify 12V between pins 56b and 31 of the headlight alignment control device B69	OK	Carry out step A4
		<del>OK</del>	Carry out step A2
A2	CHECK GROUND - Verify 0V at pin 31 of device B69	OK	Carry out step A3
		<del>OK</del>	Restore wiring between pin 31 of B69 and ground G53b (BLK)
A3	CHECK CONTINUITY - Check continuity between pin 56b of B69 and pin 18 of G1	OK	Carry out step A4
		<del>OK</del>	Restore wiring between pin 56b of B69 and pin 18 of G1, across pin C1 of connector G98 and the two solders (YEL-BLK)
A4	CHECK CONTROL DEVICE Check for correct functioning of the headlight alignment control device B69. • With sidelights on, act on the handle and check that the voltage between pin 56b and pin G of B69 varies as a consequence	OK	Carry out tests B and C
		<del>OK</del>	Replace the device B69

HEADLIGHT ADJUSTMENT NOT WORKING (LEFT-HAND HEADLAMP) TEST C

TEST PROCEDURE		RESULT	CORRECTIVE ACTION
C1	CHECK VOLTAGE - With sidelights on, verify 12V between pins 56b and 31 of the left-hand headlight alignment motor P35b	OK	Carry out step C2
		<del>OK</del>	Carry out step C3
C2	CHECK CONTINUITY - Check continuity between pin G of the motor P35b and pin G of the device B69	OK	Replace the motor P35b
		<del>OK</del>	Restore wiring between pin G of B69 and pin 14 of P35b (YEL)
C3	CHECK VOLTAGE - With sidelights on, verify 12V at 56b of P35b	OK	Restore wiring between pin 31 of P35b and ground G53b, across pin 31 of device B69 (BLK)
		<del>OK</del>	Restore wiring between pin 56b of P35b and pin 18 of G1, across pins C2 and C1 of connector G99 and the solder (YEL-BLK)

WIRING DIAGRAM

REAR AND FRONT FOG-LAMPS

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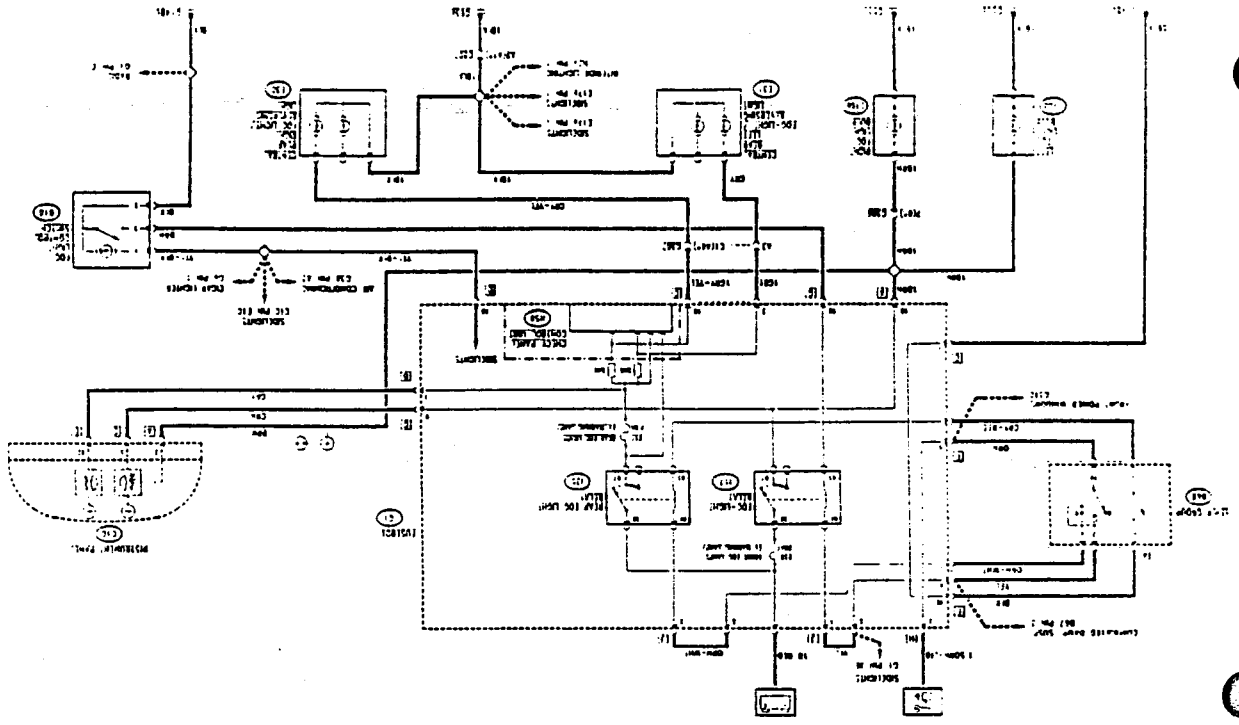
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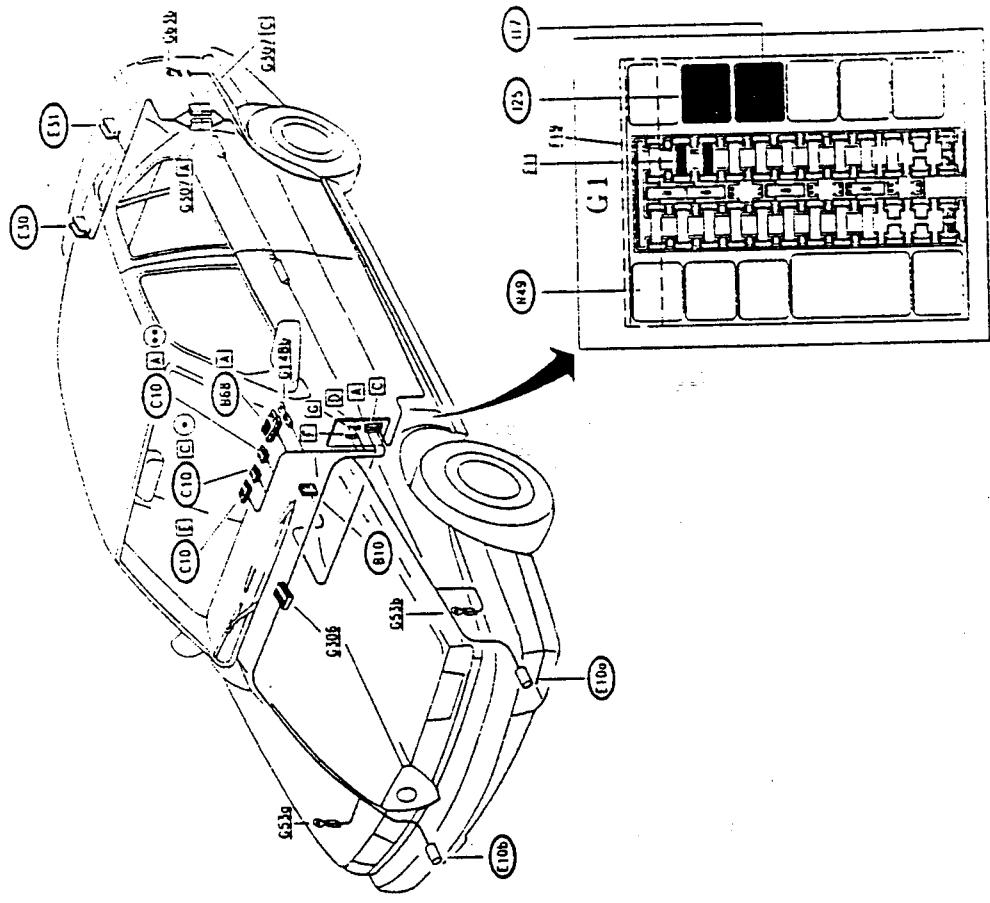






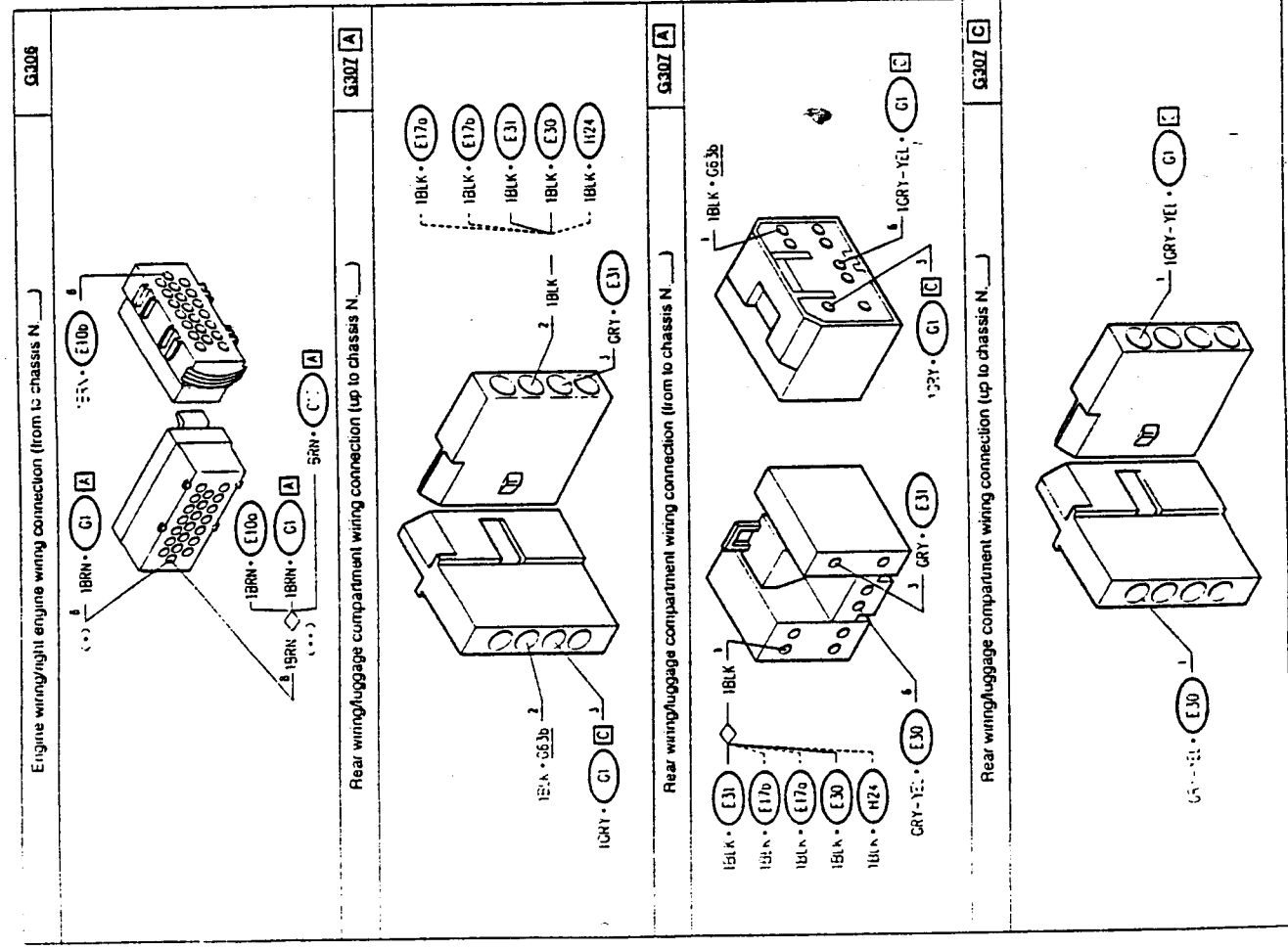


LOCATION OF COMPONENTS



(\*) panel "A" or "C"  
 (••) panel "B"

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(\*) panel "A" or "C"  
 (••) variation for panel "B"

11-1993

TROUBLESHOOTING

NEITHER OF THE REAR FOG-LAMPS WORKING			TEST A
TEST PROCEDURE	RESULT	CORRECTIVE ACTION	
<b>A1</b> CHECK FUSE - Check for damage of fuse F11 in fusebox G1	<input type="radio"/> OK <input checked="" type="radio"/>	Carry out step A2  Replace fuse (7.5A)	
<b>A2</b> CHECK RELAY - Check the correct functioning of the rear fog-lamps relay I25, located in G1	<input type="radio"/> OK <input checked="" type="radio"/>	Carry out step A3  Replace relay I25	
<b>A3</b> CHECK VOLTAGE - Float the ignition key and verify 12V at pin A10 of the lever group B68	<input type="radio"/> OK <input checked="" type="radio"/>	Carry out step A4  Restore wiring between pin F9 of G1 and pin A10 of the lever group B68 (ORN)	
<b>A4</b> CHECK LEVER GROUP - NOTE: The rear fog-lamps can be illuminated only when the sidelight switch is at position "II", dipped beam. Check the correct functioning of the lever group: - with the sidelights switch at the "II" position, check the continuity between pin A4 and pin A10 of the lever group B68 - activating the rear fog-lamps function, check the continuity between pins A2 and A11 of lever group B68	<input type="radio"/> OK <input checked="" type="radio"/>	Carry out step A5  Replace lever group B68, left hand part	
<b>A5</b> CHECK VOLTAGE - With the key turned and the sidelights switch at position "II", verify 12V at pin F3 of G1	<input type="radio"/> OK <input checked="" type="radio"/>	Carry out step A6  Restore wiring between pin F3 of G1 and pin A4 of the lever group B68 (ORN-WHT)	
<b>A6</b> CHECK VOLTAGE - With the ignition key turned and sidelights at position "II", verify 12V at pin J2 of G1	<input type="radio"/> OK <input checked="" type="radio"/>	Carry out step A7  Restore wiring between pin J2 and J3 of G1 (ORN WHT)	

(continues)

NEITHER OF THE REAR FOG-LAMPS WORKING

TEST PROCEDURE	RESULT	CORRECTIVE ACTION	TEST A
<b>A7</b> CHECK GROUND - Verify 0V at pin A11 of B68	<input type="radio"/> OK <input checked="" type="radio"/>	Carry out step A8  Restore wiring between pin F10 of G1 and pin A11 of B68 (BLK)	
<b>A8</b> CHECK GROUND - With rear fog lamps illuminated verify 0V at pin F1 of G1	<input type="radio"/> OK <input checked="" type="radio"/>	Carry out step A9  Restore wiring between pin F1 of G1 and pin A2 of B68 (GRY-RED)	
<b>A9</b> CHECK GROUND - Verify 0V at pin A2 of connector G307	<input type="radio"/> OK <input checked="" type="radio"/>	Carry out tests B and C  Restore wiring between pin A2(A1) of G307 and ground G63b (BLK)	

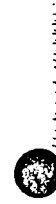
(\*) from chassis N...

RIGHT REAR FOG-LAMP NOT WORKING

TEST PROCEDURE	RESULT	CORRECTIVE ACTION	TEST B
<b>B1</b> CHECK VOLTAGE - With rear fog-lamps illuminated, verify 12V between pin 2 and 1 of the central rear light assembly E30	<input type="radio"/> OK <input checked="" type="radio"/>	Carry out step B2  Carry out step B3	
<b>B2</b> CHECK BULB - Check for damage of rear fog-lamps bulb in light assembly E30 (outer bulb, with red transparency)	<input type="radio"/> OK <input checked="" type="radio"/>	Check and if necessary replace the entire light assembly E30  Replace bulb	
<b>B3</b> CHECK VOLTAGE - With the rear fog-lamps illuminated, verify 12V at pin 1 of E30	<input type="radio"/> OK <input checked="" type="radio"/>	Restore wiring between pin 2 of E30 and pin A2 (A11) of connector G307, across the solder (Bt K)  Restore wiring between pin C10 of G1 and pin 1 of E30 through pin C1(A6) of connector G307 (alt F1 L)	

(\*) from chassis N...

NOTE: In some countries the right-hand rear fog-lamp is not fitted; see "General Description" in this section.



LEFT REAR FOG-LAMP NOT WORKING		TEST C
TEST PROCEDURE	RESULT	CORRECTIVE ACTION
<b>C1</b> CHECK VOLTAGE - With rear fog-lamps on, verify 12V between pin 2 and pin 1 of rear central light assembly E31	OK <del>OK</del>	Carry out step C2 Carry out step C3
<b>C2</b> CHECK BULB - Check for damage of rear fog-lamp bulb in light assembly E31 (outer bulb, with red transparency)	OK <del>OK</del>	Check and if necessary replace the entire light assembly E31 Replace bulb
<b>C3</b> CHECK VOLTAGE - With rear fog-lamps illuminated, verify 12V at pin 1 of E31	OK <del>OK</del>	Restore wiring between pin 2 of E31 and pin A2(A17) of connector G307 across the solder and the solder (BLK) Restore wiring between pin C3 of G1 and pin 1 of E31, through pin A3 of connector G307 (GRY)

(\*) from chassis N

REAR FOG-LAMP WARNING LIGHT ON INSTRUMENT PANEL NOT WORKING TEST D

Note: The rear fog-lamps however are working correctly.

TEST PROCEDURE	RESULT	CORRECTIVE ACTION
<b>D1</b> CHECK VOLTAGE - With the ignition key turned and rear fog-lamps illuminated, verify 12V at pin E12 of the instrument panel C10	OK <del>OK</del>	Carry out step D2 Restore wiring between pin D1 of G1 and pin E12 of C10 (GRY)
<b>D2</b> CHECK WARNING LAMP - Check for damage of rear fog-lamps warning lamp, on the instrument panel C10	OK <del>OK</del>	Check and if necessary replace the entire instrument panel C10 Replace the warning lamp

NEITHER OF THE FRONT FOG-LAMPS WORKING		TEST E
TEST PROCEDURE	RESULT	CORRECTIVE ACTION
<b>E1</b> CHECK FUSE - Check for damage of fuse F19 in fusebox G1	OK <del>OK</del>	Carry out step E2 Replace fuse (20A)
<b>E2</b> CHECK RELAY - Check correct functioning of front fog-lamps relay I17, located in G1	OK <del>OK</del>	Carry out step E3 Replace relay I17
<b>E3</b> CHECK VOLTAGE - Rotate the ignition key and verify 12V at pin 10 of lever group B68.	OK <del>OK</del>	Carry out step E4 Restore wiring between pin F9 of G1 and pin A10 of lever group B68 (ORIN)
<b>E4</b> CHECK LEVER GROUP - NOTE: the front fog-lamps can only be illuminated when the sidelights switch is at position "I". Check correct functioning of the lever group: • with the sidelights switch at "I", check continuity between pin A7 and pin A10 of lever group B68	OK <del>OK</del>	Carry out step E5 Replace lever group B68, left part
<b>E5</b> CHECK VOLTAGE - With the ignition key turned and sidelights switch at "I", verify 12V at pin F6 of G1	OK <del>OK</del>	Carry out step E6 Restore wiring between pin F6 of G1 and pin A7 of lever group B68 (YEL)
<b>E6</b> CHECK VOLTAGE - With the ignition key turned and sidelights switch at "I", verify 12V at pin J1 of G1	OK <del>OK</del>	Carry out step E7 Restore wiring between pin J1 and J5 of G1 (Y11)

(continues)

NEITHER OF THE FRONT FOG-LAMPS WORKING		TEST E
TEST PROCEDURE	RESULT	CORRECTIVE ACTION
<b>E7</b> CHECK GROUND - Verify 0V at pin 2 of front fog-light switch B10.	OK <del>OK</del>	Carry out step E8 Restore wiring between pin 2 of B10 and ground G148b, also across the solder (BLK)
<b>E8</b> CHECK SWITCH - Check the correct functioning of the front fog-lamps switch B10: selecting the front fog-lamp function, check continuity between pin 2 and 3 of B10	OK <del>OK</del>	Carry out step E9 Replace switch B10
<b>E9</b> CHECK GROUND - With front fog-lamps on verify 0V at pin G10 of G1	OK <del>OK</del>	Carry out tests F and G Restore wiring between pin G10 of G1 and pin 3 of B10 (BRN)

RIGHT-HAND FRONT FOG-LAMP NOT WORKING		TEST F
TEST PROCEDURE	RESULT	CORRECTIVE ACTION
<b>F1</b> CHECK VOLTAGE - With front fog-lamps selected, verify 12V between pins A and B of right-hand fog-lamp assembly E10b	OK <del>OK</del>	Carry out step F2 Carry out step F3
<b>F2</b> CHECK BULB - Check for damage of front fog-lamp bulb, located in light assembly E10b	OK <del>OK</del>	Check and if necessary replace complete light assembly E10b Replace bulb
<b>F3</b> CHECK VOLTAGE - With front fog-lamps selected, verify 12V at pin A of E10b	OK <del>OK</del>	Restore wiring between pin B of E10b and ground G53a (BLK) Restore wiring between pin A10 of G1 and pin 7(8*) of G306, and between pin 7(8*) of G306 and pin A of E10b (BRN)

(\*) from chassis N

LEFT-HAND FRONT FOG-LAMP NOT WORKING		TEST G
TEST PROCEDURE	RESULT	CORRECTIVE ACTION
<b>G1</b> CHECK VOLTAGE - With front fog-lamps selected, verify 12V between pin A and B of left front fog-lamp assembly E10a	OK <del>OK</del>	Carry out step G2 Carry out step G3
<b>G2</b> CHECK BULB - Check for damage of front fog-lamps bulb, located in light assembly E10a	OK <del>OK</del>	Check and if necessary replace complete light assembly E10a Replace bulb
<b>G3</b> CHECK VOLTAGE - With front fog-lamps selected, verify 12V at pin A of E10a	OK <del>OK</del>	Restore wiring between pin B of E10a and ground G53b (BLK) Restore wiring between pin A10 of G1 and pin A of E10a (BRN)

REAR FOG-LAMP WARNING LAMP ON INSTRUMENT PANEL NOT WORKING		TEST H
TEST PROCEDURE	RESULT	CORRECTIVE ACTION
<b>H1</b> CHECK VOLTAGE - With the ignition key turned and front fog lamps selected, verify 12V at pin C5 (pin A3 for type "B" panel) of instrument panel C10	OK <del>OK</del>	Carry out step H2 Restore wiring between pin G9 of G1 and pin C5 of C10 (GRN) (between pin A10 of G1 and pin A3 of C10 (54th) for type "B" panel)
<b>H2</b> CHECK WARNING LIGHT BULB - Check for damage of front fog-lamp warning lamp, located on the instrument panel C10	OK <del>OK</del>	Check and if necessary replace complete instrument panel C10 Replace warning lamp

Note: The rear fog-lamps however are working correctly

LIGHT IN FRONT FOG-LAMP SWITCH NOT WORKING TEST I

Note: If the front fog-lamps are not working, first see test E

TEST PROCEDURE	RESULT	CORRECTIVE ACTION
11 CHECK VOLTAGE - With sidelights on, verify 12V at pin D10 of G1	OK <input checked="" type="checkbox"/>	Carry out step 12
12 CHECK VOLTAGE - With sidelights on, verify 12V between pins 1 and 2 of switch B10	OK <input checked="" type="checkbox"/>	Check sidelights circuit (see "Sidelights")
13 CHECK BULB - Check for damage of bulb inside switch B10	OK <input checked="" type="checkbox"/>	Carry out step 13 Carry out step 14
14 CHECK VOLTAGE - With sidelights on, verify 12V at pin 1 of B10	OK <input checked="" type="checkbox"/>	Check and if necessary replace complete switch B10 Replace bulb
	OK <input checked="" type="checkbox"/>	Restore wiring between pin 2 of B10 and ground G148b across solder (BLK)
	OK <input checked="" type="checkbox"/>	Restore wiring between pin 1 of B10 and pin D10 of G1, also across the solder (YEL-BLK)

WIRING DIAGRAM

DIRECTION INDICATORS AND HAZARD WARNING LIGHTS

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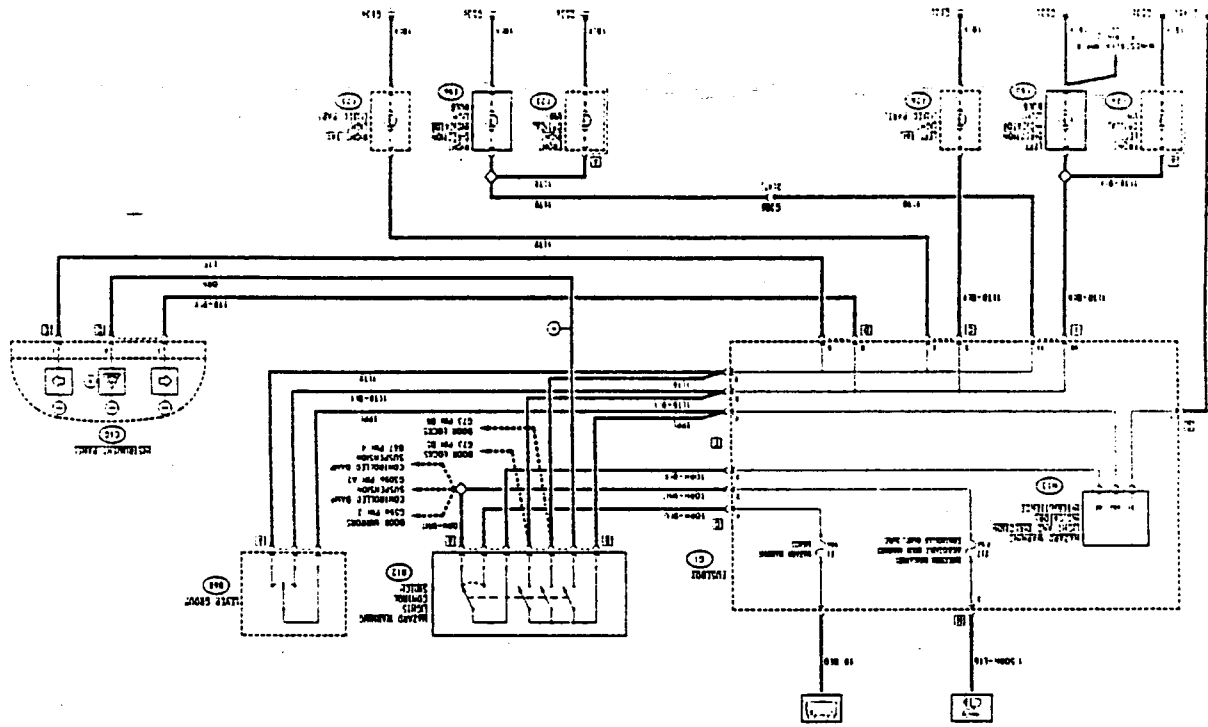
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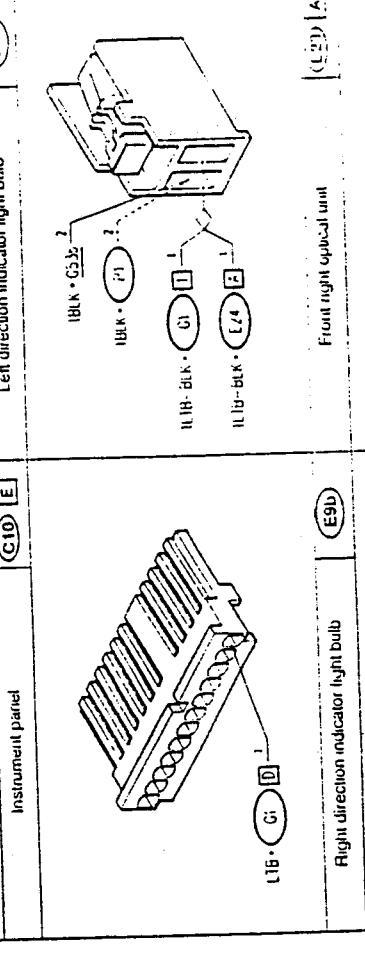
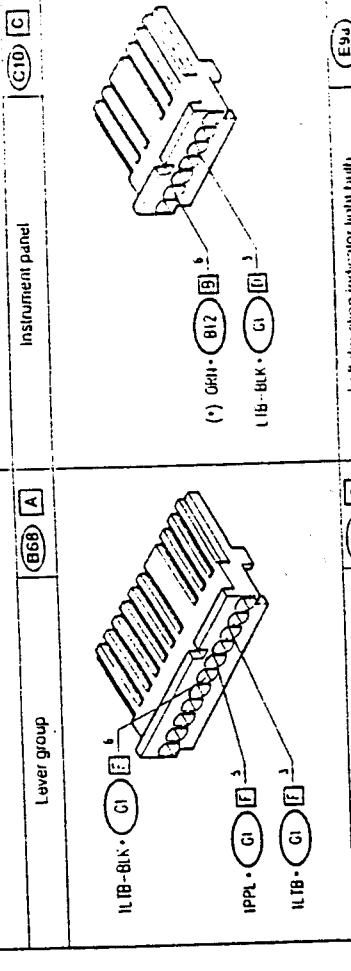
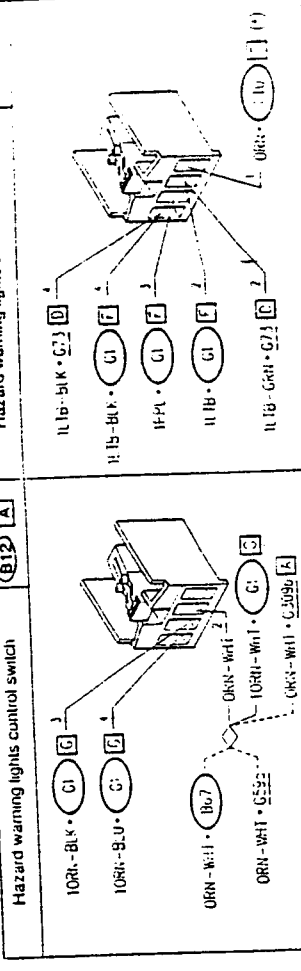
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COMPONENTS AND CONNECTORS



(10 A) in G1. The device N13 generates an intermittent signal which leaves pin 49a and supplies the contacts of switch B12 and the direction indicator switch of lever group B68.

By acting on the specific lever in lever group B68, the right-hand direction indicators (E23, E9b and E25) or the left-hand indicators (E24, E9a and E26) are actuated as is the relative warning lamp on the instrument panel C10.

Pressing switch B12 closes the three contacts which supply the right and left-hand indicators and the hazard warning lamp warning lamp on the instrument panel C10.

N.B. The warning light is not present on vehicles with a type "B" instrument panel - see "Instrument Panel" section.

FUNCTIONAL DESCRIPTION

The hazard warning lights (the warning light is not present on vehicles with a type "B" instrument panel - see "Instrument Panel" section). The circuits of the direction indicators and the hazard warning lights are both protected by their own separate fuses.

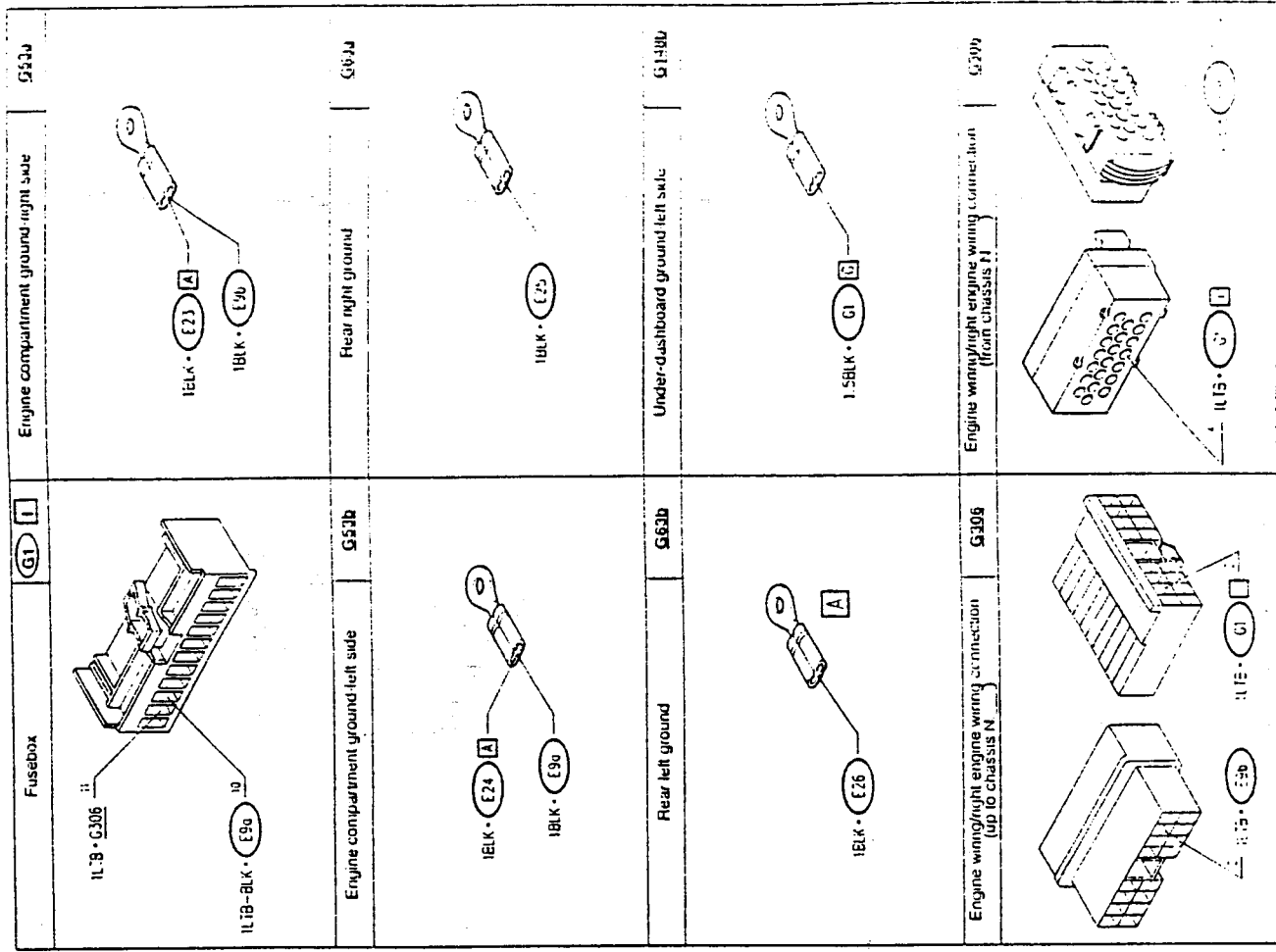
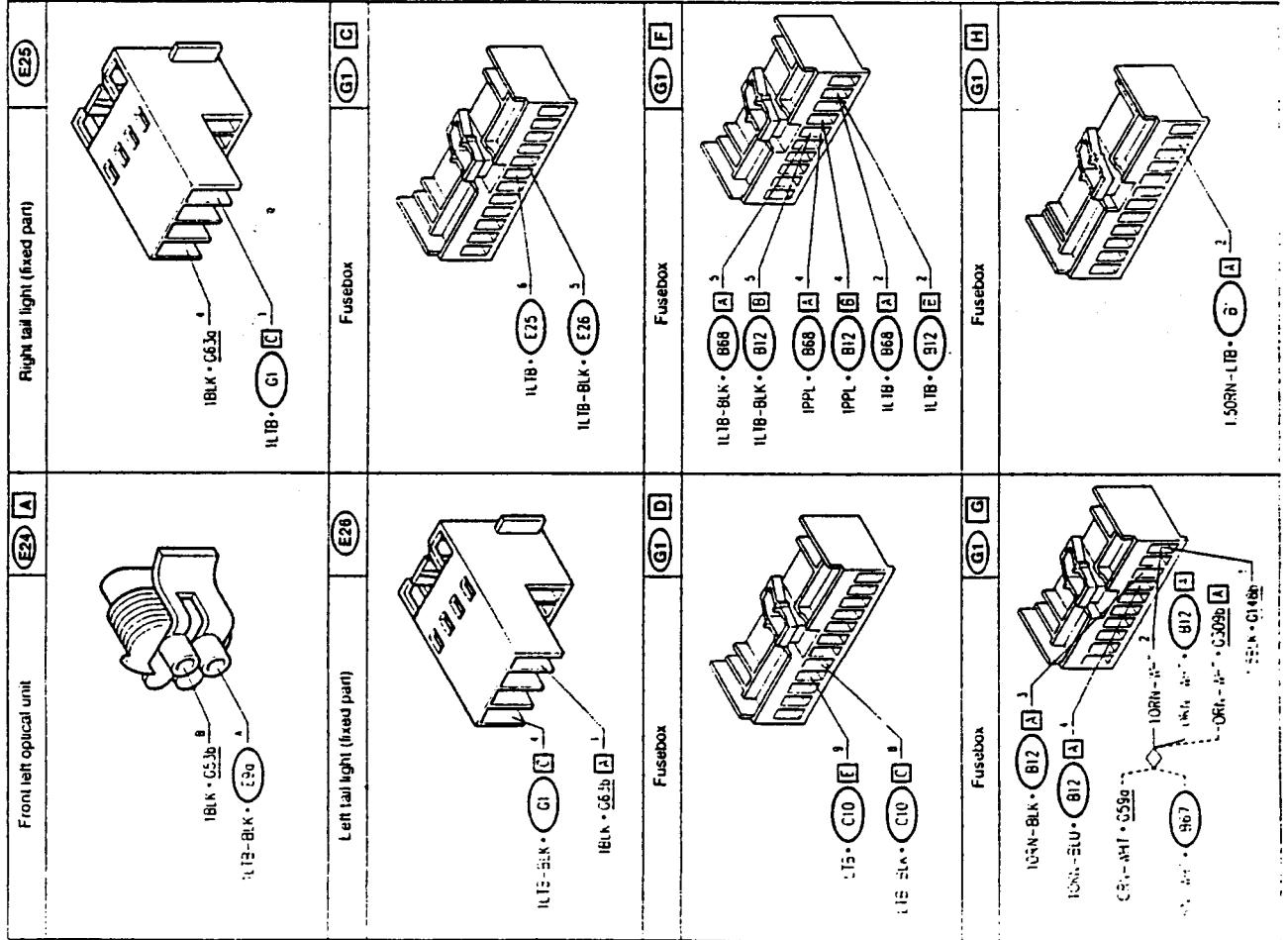
The circuit is controlled by the hazard warning lights and direction indicators interference N13 located in fusebox G1.

The intermittence, grounded, pin 31, receives a supply signal, pin 49, through the hazard warning lights switch B12: when these are not selected, supply is key-operated through fuse F17 (7.5A) of fusebox G1; when the hazard warning lights are selected, the supply comes directly from the battery through fuse F1

TROUBLESHOOTING TABLE

Malfunction	Component												
	F1	E12	N13	B68	B12	E23	E24	E25	E9b	E26	E23	E25	C10
All direction indicators													
Hazard warning lights													
HM direction indicator													
HM direction indicator													
Front right light													
Right side light													
Right rear light													
Front left light													
Left side light													
Left rear light													
HM warning lamp													
HM warning lamp													
HM warning lights warning lamp (*)													

(\*) warning light not present on vehicles with a type "B" panel - see "Instrument Panel" section

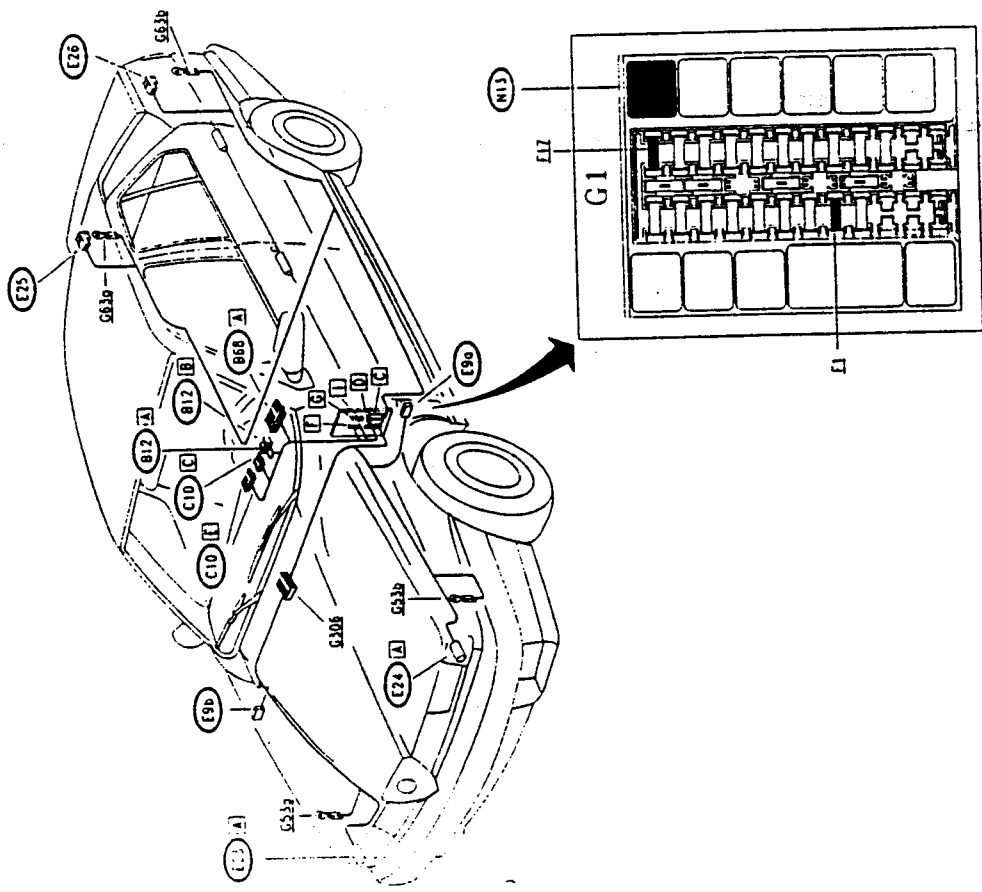


**TROUBLESHOOTING**

**DIRECTION INDICATORS NOT WORKING** TEST A

TEST PROCEDURE		RESULT	CORRECTIVE ACTION
A1	CHECK FUSE	OK	Carry out step A2
	- Check for damage of fuse F17 in fusebox G1	OK	Replace the fuse (7.5A)
A2	CHECK SWITCH	OK	Carry out step A3
	- Check for correct functioning of the hazard warning lights switch with the warning lights off. Check continuity between pin A2 and pin A3 of B12	OK	Replace switch B12 (ORN-BLK)
A3	CHECK VOLTAGE	OK	Carry out step A4
	- Verify 12V at pin A2 of the hazard warning lights switch B12	OK	Restore wiring between pin G2 of G1 and pin A2 of B12, also across the solder (ORN-WHT)
A4	CHECK VOLTAGE	OK	Carry out step A5
	- With ignition key rotated verify 12V at pin G3 of G1	OK	Restore wiring between pin G3 of G1 and pin A3 of B12 (ORN-BLK)
A5	CHECK VOLTAGE	OK	Carry out step A6
	- With ignition key rotated, verify 12V -intermittencies at pin F4 of G1	OK	Replace intermitence N13, located in G1 N.B. In this case the hazard warning lights are also not working.
A6	CHECK VOLTAGE	OK	Check and if necessary replace the lever group B68
	- With ignition key rotated, verify 12V -intermittencies at pin A5 of lever group B68	OK	Restore wiring between pin F4 of G1 and pin A5 of B68 (PPL)

**LOCATION OF COMPONENTS**



HAZARD WARNING LIGHTS NOT WORKING		TEST B
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NOTE: If the direction indicators are also not working, carry out this test together with the preceding test A

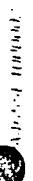
TEST PROCEDURE	RESULT	CORRECTIVE ACTION
<b>B1</b> CHECK FUSE - Check for damage of fuse F1 in fusebox G1	OK <del>OK</del>	Carry out step B2  Replace the fuse (10A) T9
<b>B2</b> CHECK VOLTAGE - Verify 12V at pin A4 of the hazard warning lights switch B12	OK <del>OK</del>	Carry out step B3  Restore wiring between pin G4 of G1 and pin A4 of B12 (ORN-BLU)
<b>B3</b> CHECK HAZARD WARNING LIGHTS SWITCH - Check for correct functioning of the switch B12: - with the hazard warning lights on, check continuity between: - pin A3 and A4 - pin B3 and B1, B2 and B4	OK <del>OK</del>	Carry out step B4  Replace the switch B12
<b>B4</b> CHECK VOLTAGE - With hazard warning lights on verify 12V at pin G3 of G1	OK <del>OK</del>	Carry out step B5  Restore wiring between pin G3 of G1 and pin A3 of B12 (ORN-BLK)
<b>B5</b> CHECK VOLTAGE - With hazard warning lights on, verify 12V - intermitencies - at pin F4 of G1	OK <del>OK</del>	Restore wiring between pin F4 of G1 and pin B3 of B12 (PPL)  Replace intermitence M13, located in G1. N.B. in this case not even the direction indicators are working

NONE OF LIGHTS ON RIGHT SIDE OF VEHICLE WORKING		TEST C
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TEST PROCEDURE	RESULT	CORRECTIVE ACTION
<b>C1</b> CHECK VOLTAGE - With ignition key rotated and the right direction indicators on, verify 12V intermitencies at pin F2 of G1	OK <del>OK</del>	Carry out the successive tests E, F and G  Carry out step C2
<b>C2</b> CHECK LEVER GROUP - Check for correct functioning of lever group: With right-hand direction indicators on, check continuity between pin A5 and A3 of B68	OK <del>OK</del>	Restore wiring between pin A3 of B68 and pin F2 of G1, and between pin B2 of B12 and pin F2 of G1 (t. 1b)  Replace the lever group B68, left part

NONE OF THE LIGHTS ON LEFT SIDE OF VEHICLE WORKING		TEST D
--	--	--------

TEST PROCEDURE	RESULT	CORRECTIVE ACTION
<b>D1</b> CHECK VOLTAGE - With ignition key rotated and left-hand direction indicators on, verify 12V intermitencies at pin F5 of G1	OK <del>OK</del>	Carry out the successive tests H, I and J  Carry out step D2
<b>D2</b> CHECK LEVER GROUP - Check for correct functioning of lever group: with the left-hand direction indicators on, check continuity between pin A5 and A6 of B68	OK <del>OK</del>	Restore wiring between pin A6 of B68 and pin F5 of G1, and between pin B4 of B12 and pin F5 of G1 (t. 1b B1 b)



TEST PROCEDURE		RESULT	CORRECTIVE ACTION
E1	CHECK VOLTAGE	OK	Carry out step E2
	With lights on, verify 12V intermittencies between pin AA and AB of right-hand light assembly E23	OK	Carry out step E3
E2	CHECK BULB	OK	Check and if necessary replace the complete light assembly E23
	Check for damage of direction indicator bulb, located in the light assembly E23	OK	Replace the bulb
E3	CHECK VOLTAGE	OK	Restore wiring between pin AB of E23 and ground G53a (BLK)
	With lights on, verify 12V intermittencies at pin AA of light assembly E23	OK	Restore wiring between pin 111 of G1 and pin 2(4*) of G306, and between pin 2(4*) of G306 and pin AA of E23, through pin 1 of E9b (LTB) In this case the right side light E9b is also not working, see test F.

(\*) from chassis N.

TEST PROCEDURE		RESULT	CORRECTIVE ACTION
F1	CHECK VOLTAGE	OK	Carry out step F2
	With lights on, verify 12V intermittencies between pin 1 and 2 of right-hand side light E9b	OK	Carry out step F3
F2	CHECK BULB	OK	Check and if necessary replace the complete light E9b
	Check for damage of direction indicator bulb, of E9b	OK	Replace the bulb
F3	CHECK VOLTAGE	OK	Restore wiring between pin 2 of E9b and ground G53a (BLK)
	With lights on, verify 12V intermittencies at pin 1 of light E9b	OK	Restore wiring between pin 111 of G1 and pin 2(4*) of G306, and between pin 2(4*) of G306 and pin 1 of E9b (LTB)

(\*) from chassis N.

TEST PROCEDURE		RESULT	CORRECTIVE ACTION
G1	CHECK VOLTAGE	OK	Carry out step G2
	With lights on, verify 12V intermittencies between pin 1 and 4 of rear right light assembly E25	OK	Carry out step G3
G2	CHECK BULB	OK	Check and if necessary replace complete light assembly E25
	Check for damage of direction indicator bulb, located in the light assembly E25	OK	Replace the bulb
G3	CHECK VOLTAGE	OK	Restore wiring between pin 4 of E25 and ground G63a (BLK)
	With lights on, verify 12V intermittencies at pin 1 of E25	OK	Restore wiring between pin C6 of G1 and pin 1 of E25 (LTB)

(\*) from chassis N.

TEST PROCEDURE		RESULT	CORRECTIVE ACTION
H1	CHECK VOLTAGE	OK	Carry out step H2
	With lights on, verify 12V intermittencies between pin AA and AB of left light assembly E24	OK	Carry out step H3
H2	CHECK BULB	OK	Check and if necessary replace the complete light assembly E24
	Check for damage of direction indicator bulb, located in the light assembly E24	OK	Replace the bulb
H3	CHECK VOLTAGE	OK	Restore wiring between pin AB of E24 and ground G53b (BLK)
	With lights on, verify 12V intermittencies at pin AA of light assembly E24	OK	Restore wiring between pin 110 of G1 and pin AA of E24, through pin 1 of E9a (LTB BLK) In this case the left side light E9a is also not working, see test I

LEFT-HAND SIDE LIGHT NOT WORKING		TEST I
TEST PROCEDURE	RESULT	CORRECTIVE ACTION
<b>K1 CHECK VOLTAGE</b> - With lights on, verify 12V intermitencies between pin 1 and 2 of left-hand side light E9a	OK (OK)	Carry out step I2
<b>K2 CHECK BULB</b> - Check for damage of direction indicator bulb, of E9a	(OK) (X)	Carry out step I3
<b>K3 CHECK VOLTAGE</b> - With lights on, verify 12V intermitencies at pin 1 of light E9a	OK (OK) (X)	Check and if necessary replace the complete light assembly E9a Replace the bulb
	OK (OK)	Restore wiring between pin 2 of E9a and ground G53b (BLK)
	(OK) (X)	Restore wiring between pin 110 of G1 and pin 1 of E9a (LTB-BLK)

REAR LEFT-HAND LIGHT NOT WORKING		TEST J
TEST PROCEDURE	RESULT	CORRECTIVE ACTION
<b>J1 CHECK VOLTAGE</b> - With lights on, verify 12V intermitencies between pin 1 and 4 of rear left-hand light assembly E26	OK (OK) (X)	Carry out step J2
<b>J2 CHECK BULB</b> - Check for damage of direction indicator bulb, located in the light assembly E26	OK (OK) (X)	Carry out step J3
<b>J3 CHECK VOLTAGE</b> - With lights on, verify 12V intermitencies at pin 4 of E26	OK (OK) (X)	Check and if necessary replace the complete light assembly E26 Replace the bulb
	OK (OK)	Restore wiring between pin 1 of E26 and ground G63b (BLK)
	(OK) (X)	Restore wiring between pin C5 of G1 and pin 4 of E26 (LTB-BLK)

RIGHT-HAND DIRECTION INDICATOR WARNING LAMP ON INSTRUMENT PANEL NOT WORKING		TEST K
TEST PROCEDURE	RESULT	CORRECTIVE ACTION
<b>K1 CHECK VOLTAGE</b> - With right-hand indicators on, verify 12V intermitencies at pin E1 of instrument panel C10	OK (OK) (X)	Carry out step K2
<b>K2 CHECK WARNING LAMP</b> - Check for damage of right-hand direction indicators warning lamp, located on the instrument panel C10	OK (OK) (X)	Restore wiring between pin F9 of G1 and pin L1 of C10 (LTB) Check and if necessary replace complete instrument panel C10 Replace the warning light bulb

LEFT-HAND DIRECTION INDICATOR WARNING LAMP ON INSTRUMENT PANEL NOT WORKING		TEST L
TEST PROCEDURE	RESULT	CORRECTIVE ACTION
<b>L1 CHECK VOLTAGE</b> - With left-hand direction indicators on, verify 12V intermitencies at pin C3 of instrument panel C10	OK (OK) (X)	Carry out step L2
<b>L2 CHECK WARNING LAMP</b> - Check for damage of left-hand direction indicators warning lamp, located on the instrument panel C10	OK (OK) (X)	Restore wiring between pin D8 of G1 and pin C3 of C10 (LTB-BLK) Check and if necessary replace complete instrument panel C10 Replace the warning light bulb

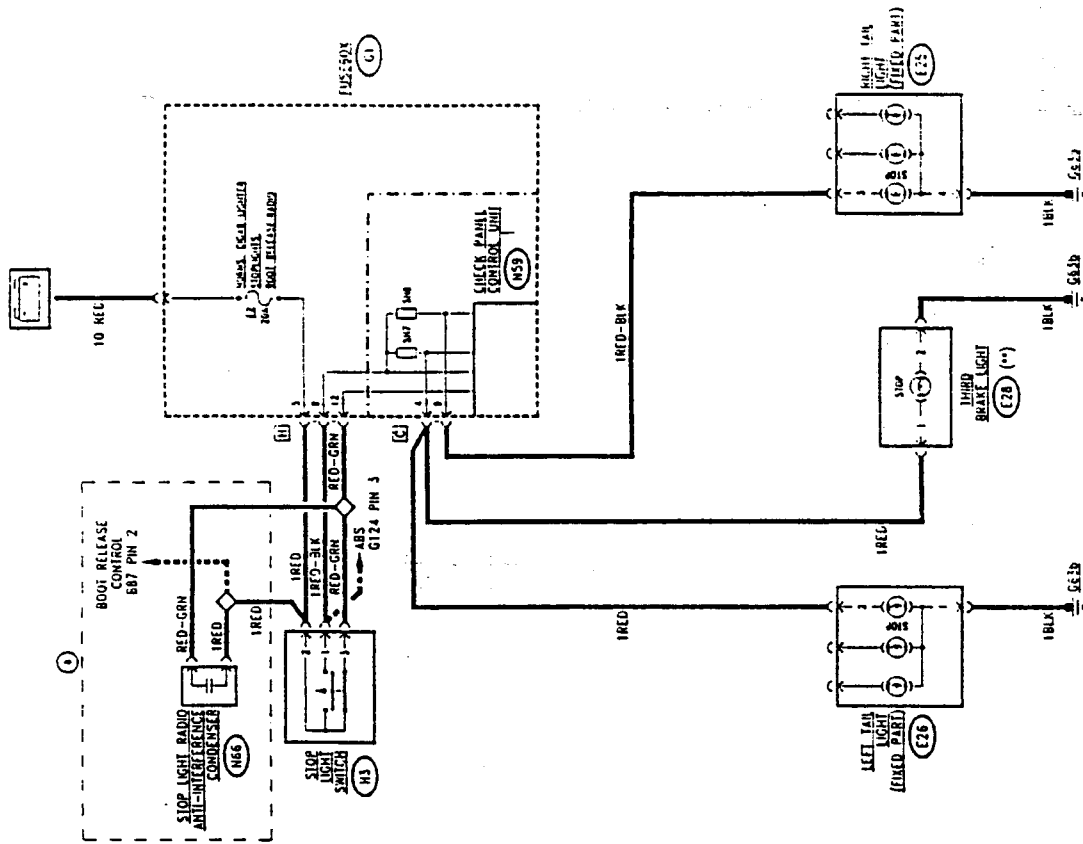
HAZARD WARNING LIGHTS WARNING LAMP ON INSTRUMENT PANEL NOT WORKING (\*) TEST M

Note: the hazard warning lights however, are working correctly

TEST PROCEDURE	RESULT	CORRECTIVE ACTION
<b>M1</b> CHECK VOLTAGE - With hazard warning lights on, verify 12V intermitencies at pin B1 of the switch B12	OK <input type="checkbox"/> OK <input checked="" type="checkbox"/>	Carry out step M2  Replace the switch B12
<b>M2</b> CHECK VOLTAGE - With hazard warning lights on, verify 12V intermitencies at pin C6 of instrument panel C10	OK <input type="checkbox"/> OK <input checked="" type="checkbox"/>	Carry out step M3  Restore wiring between pin B1 of the switch B12 and pin C6 of C10 (ORN)
<b>M3</b> CHECK WARNING LAMP - Check for damage of hazard warning lights warning lamp, located on the instrument panel C10	OK <input type="checkbox"/> OK <input checked="" type="checkbox"/>	Check and if necessary replace the complete instrument panel C10  Replace the warning light bulb

(\*) warning light not present on vehicles with a type "B" panel - see "Instrument Panel" section.

WIRING DIAGRAM



# STOP-LIGHTS

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— Only for versions with Check Panel  
 (\*) variation from chassis N 2521  
 (\*\*) present for some markets only



**GENERAL DESCRIPTION**

The lights, indicating that the vehicle is braking ("stop-lights") are operated each time the brake pedal is depressed; they are located at the rear of the vehicle in the side light assemblies. A third, central brake light is fitted for some markets. The lights are illuminated automatically by a switch located on the brake pedal when the ignition key is disengaged. The circuit is protected by its own fuse.

The correct functioning of the stop-lights is, for some versions, verified by the Check Panel which immediately alerts the driver in the event of a malfunction in the circuit. This is vital to safety. (see "Check Panel").

The braking signal from the switch is also sent to the ABS system control unit which recognizes the situation and as a consequence controls the braking parameters (see "A.B.S. System").

A radio anti-interference condenser has been fitted to vehicles from chassis N252 to prevent disturbances from the brake switch.

**FUNCTIONAL DESCRIPTION**

The stop-light circuit is supplied directly by battery voltage through fuse F2 (20A) in the fusebox G1.

The stop-lights switch H3 is formed by two contacts: the "rest position" contact is closed when the brake pedal is not

depressed and signals the continuity of the circuit to the Check Panel control unit N59.

By depressing the brake pedal the "operating position" contact is closed and the stop lights located in the rear light assemblies E25 (right) and E26 (left) and for markets where applicable in the central brake light E28. From these supply circuits the signals (both direct and by "Sh" shunt) are then sent to the control unit N59 which verifies the line load (see "Check Panel").

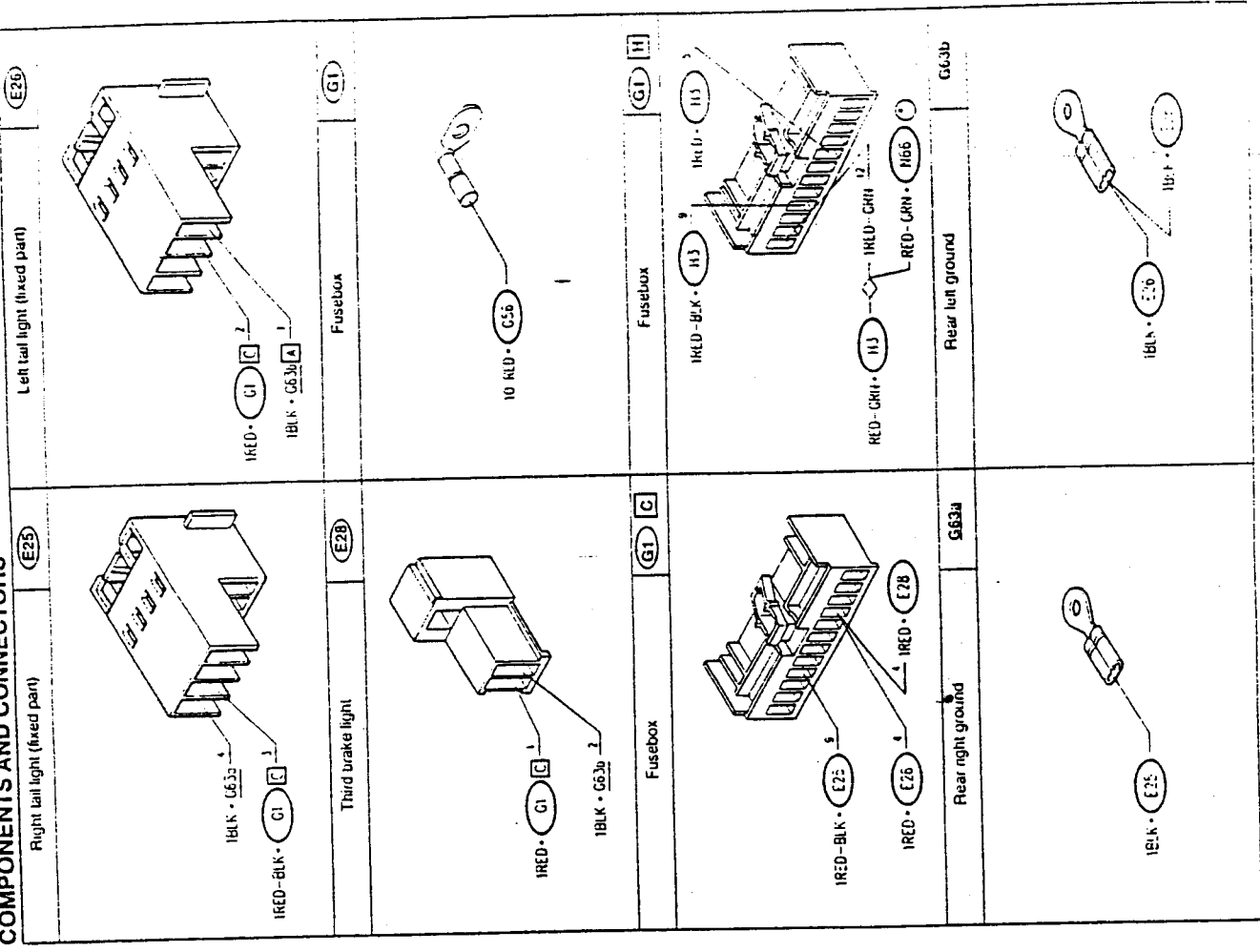
A radio anti-interference condenser N66 is connected in parallel to switch H3.

**TROUBLESHOOTING TABLE**

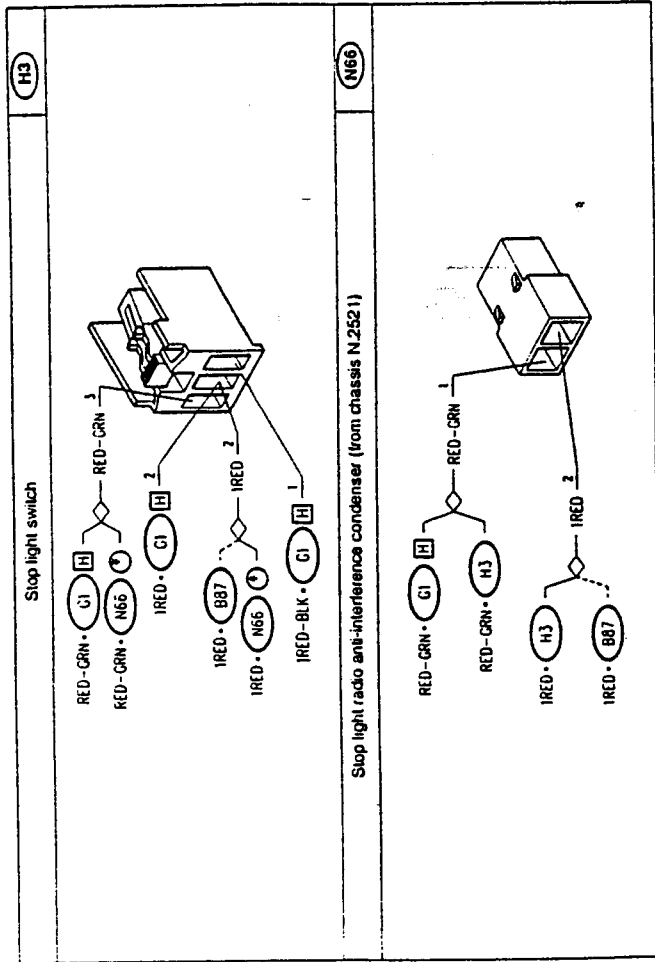
Malfunction	Component				Test
	F2	H3	E25	E26	
All brake lights	•	•			A
RH stop-light			•		B
LH stop-light				•	C
"Third brake light" (*)					D

(\*) Present for some markets only.

**COMPONENTS AND CONNECTORS**

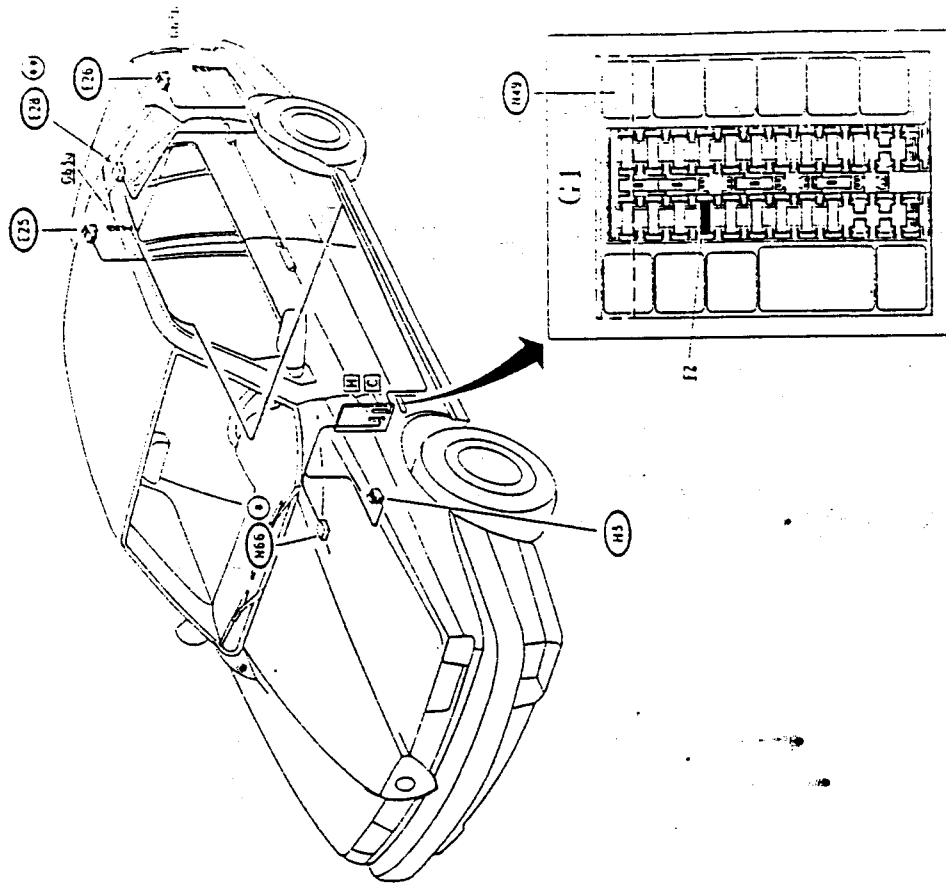


(\*) from chassis N. 2521



(\*) from chassis N. 2521

LOCATION OF COMPONENTS



(\*) from chassis N. 2521  
 (\*\*) present for some markets only

**RIGHT-HAND STOP-LIGHT NOT WORKING**

TEST PROCEDURE		RESULT	CORRECTIVE ACTION
<b>B1</b>	<b>CHECK VOLTAGE</b> - With brake pedal depressed, verify 12V between pin 3 and pin 4 of the light assembly E25	OK	Carry out step B2
		OK	Carry out step B3
<b>B2</b>	<b>CHECK BULB</b> - Check for damage of stop light bulb, located in the rear light assembly E25 (the first towards the centre)	OK	Check and if necessary replace the complete light assembly E25
		OK	Replace the bulb
<b>B3</b>	<b>CHECK VOLTAGE</b> - With brake pedal depressed verify 12V at pin 3 of light assembly E25	OK	Restore wiring between pin 4 of E25 and ground G63J (BLK)
		OK	Restore wiring between pin C9 of G1 and pin J of E25 (RED-BLK)

**TEST B**

**LEFT-HAND STOP-LIGHT NOT WORKING**

TEST PROCEDURE		RESULT	CORRECTIVE ACTION
<b>G1</b>	<b>CHECK VOLTAGE</b> - With the brake pedal depressed, verify 12V between pin 2 and pin 1 of the light assembly E26	OK	Carry out step C2
		OK	Carry out step C3
<b>C2</b>	<b>CHECK BULB</b> - Check for damage of the stop-light bulb, located in the rear light assembly E26 (the first towards the centre)	OK	Check and if necessary replace the complete light assembly E26
		OK	Replace the bulb
<b>C3</b>	<b>CHECK VOLTAGE</b> - With the brake pedal depressed, verify 12V at pin 2 of light assembly E26	OK	Restore wiring between pin 1 of E26 and ground G63J (BLK)
		OK	Restore wiring between pin C4 of G1 and pin 2 of E26 (RED)

**TEST C**

**TROUBLESHOOTING**

**NONE OF STOP-LIGHTS WORKING**

NOTE for versions equipped with the Check Panel device, refer to section: "Check Panel - Stop-lights check" before carrying out the following checks.

TEST PROCEDURE		RESULT	CORRECTIVE ACTION
<b>A1</b>	<b>CHECK FUSE</b> - Check for damage of fuse F2 in fusebox G1	OK	Carry out step A2
		OK	Replace fuse (20A)
<b>A2</b>	<b>CHECK VOLTAGE</b> - Verify 12V at pin 2 of the switch H3	OK	Carry out step A3
		OK	Restore wiring between pin H5 of G1 and pin 2 of the switch H3 (RED)
<b>A3</b>	<b>CHECK SWITCH</b> - Check for correct functioning of the switch: • with brake pedal released verify 12V at pin 3; • with brake pedal depressed verify 12V at pin 1	OK	Carry out step A4
		OK	Replace switch H3
<b>A4</b>	<b>CHECK VOLTAGE</b> - With brake pedal depressed, verify 12V at pin H9 of G1	OK	Carry out step A5
		OK	Restore wiring between pin H9 of G1 and pin 1 of the switch H3 (RED-BLK)
<b>A5</b>	<b>CHECK VOLTAGE</b> - With brake pedal released, verify 12V at pin H12 of G1	OK	See "Check Panel - Stop-lights check".
		OK	Restore wiring between pin H12 of G1 and pin 3 of the switch H3 (RED-GRN) (from chassis N.2521 also across solder)

**TEST A**

"THIRD BRAKE" LIGHT NOT WORKING		TEST D
TEST PROCEDURE	RESULT	CORRECTIVE ACTION
<b>D1   CHECK VOLTAGE</b> - With brake pedal fully depressed check for 12V between pin 2 and pin 1 of light unit E28	OK <del>OK</del>	Carry out step D2 Carry out step D3
<b>D2   CHECK BULB</b> - Check the brake light bulb located in central light unit E28 for damage	OK <del>OK</del>	Check and if necessary replace the complete light assembly E28 Replace the bulb
<b>D3   CHECK VOLTAGE</b> - With the brake pedal pressed check for 12V at pin 1 of light unit E28	OK <del>OK</del>	Restore wiring between pin 2 of E28 and ground G63b (BLK) Restore wiring between pin C4 of G1 and pin 1 of E28 (RED)



**GENERAL DESCRIPTION**

The vehicle is equipped with reversing lights located in the central part of the rear light assembly. When reverse gear is selected, the reversing lights are automatically engaged by way of a switch located on the gearbox.

The circuit is protected by a fuse.

The reversing lights are operated when the ignition key is inserted and are independent from the other lights on the vehicle.

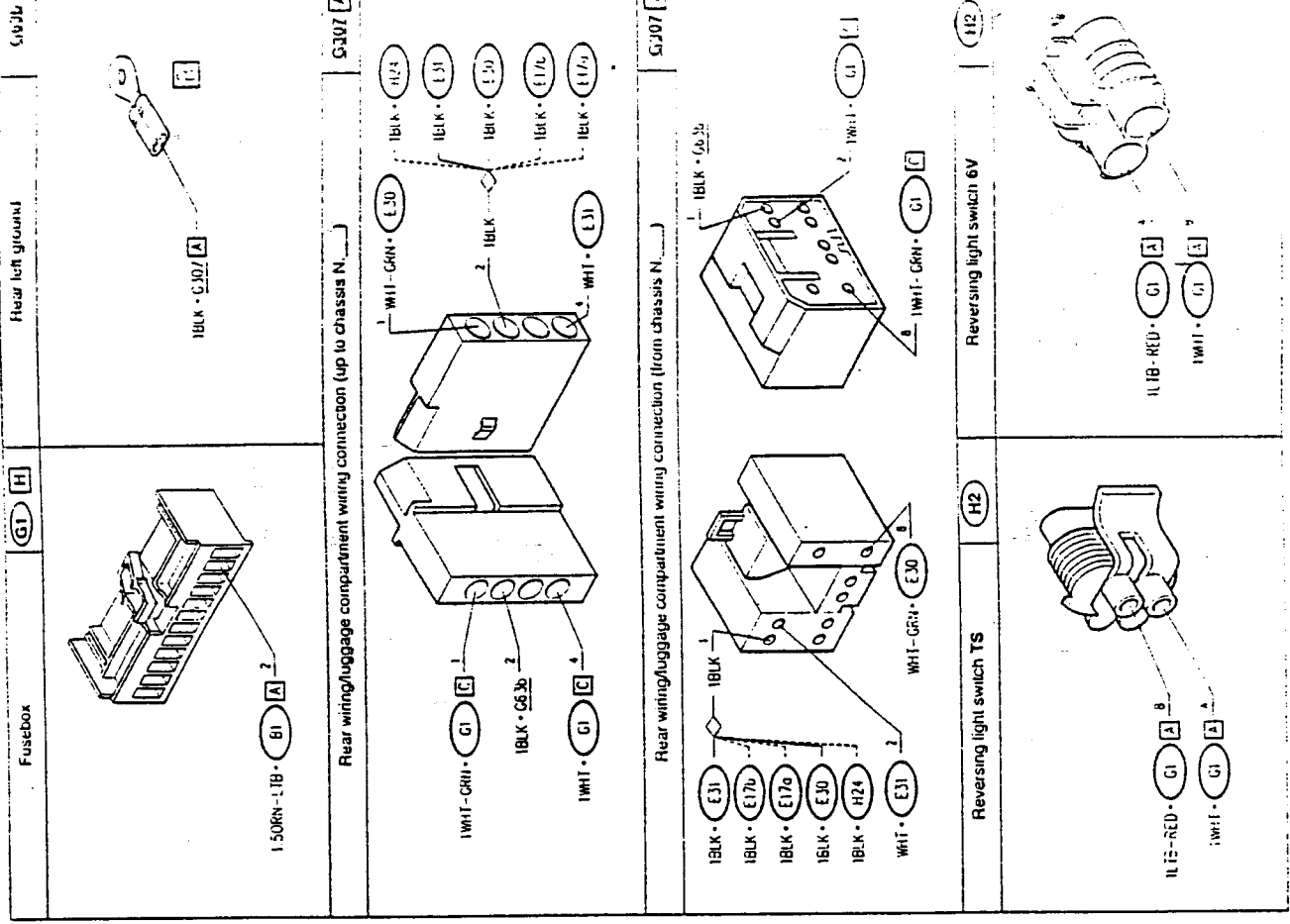
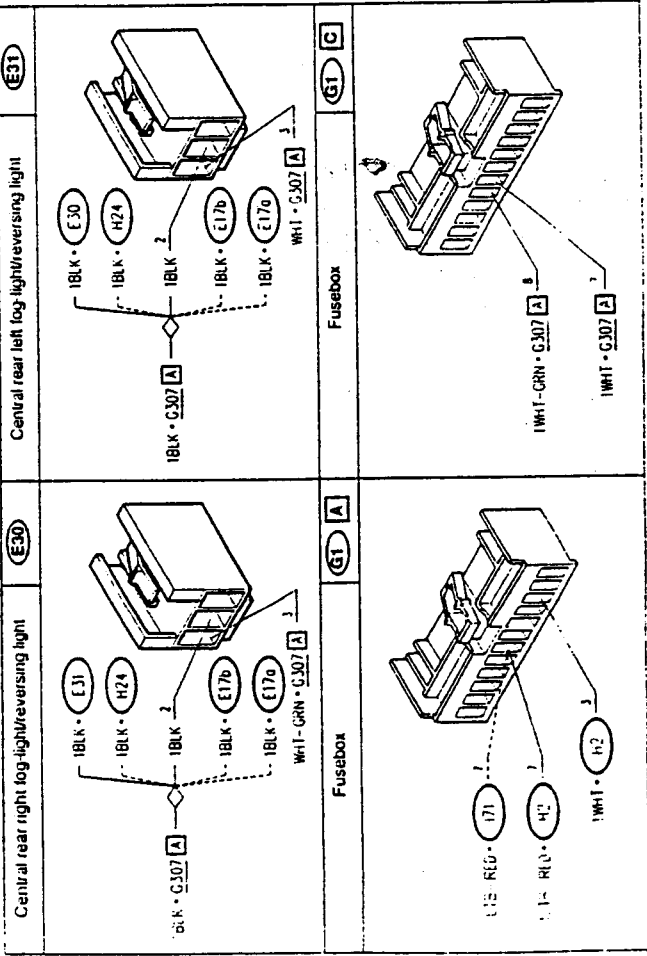
**FUNCTIONAL DESCRIPTION**

The circuit of the reversing lights is under key operated supply and is routed through fuse F15 (10A) in fusebox G1. When reverse gear is engaged, switch H2 supplies the right (E30) and left (E31) reversing lights.

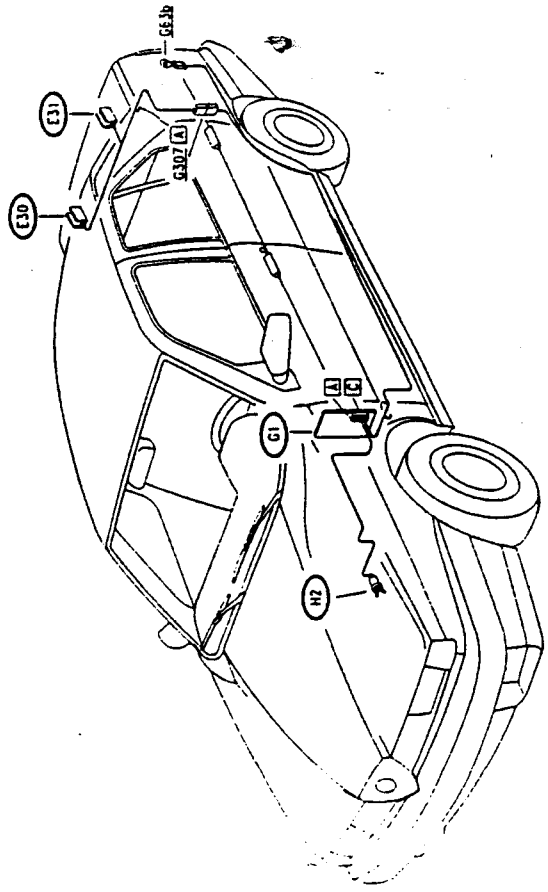
**TROUBLESHOOTING TABLE**

Malfunction	Component			Test
	E15	H2	E30	
Both reversing lights	•	•		A
RH reversing light			•	B
LH reversing light				C

**COMPONENTS AND CONNECTORS**



LOCATION OF COMPONENTS



TROUBLESHOOTING

NEITHER OF REVERSING LIGHTS WORKING

TEST A

TEST PROCEDURE		RESULT	CORRECTIVE ACTION
A1	CHECK FUSE - Check for damage of fuse F15 in fusebox G1	OK	Carry out step A2
		OK	Replace fuse (10A)
A2	CHECK VOLTAGE - Rotate the ignition key and verify 12V at pin A reversing lights switch H2	OK	Carry out step A3
		OK	Restore wiring between pin A7 of G1 and pin A of switch H2 (L.T.B-RED)
A3	CHECK SWITCH - Check for correct functioning of switch H2: • with ignition key rotated and reverse gear engaged, check continuity between pin A and B of H2	OK	Carry out step A4
		OK	Replace switch H2
A4	CHECK VOLTAGE - With ignition key rotated and reverse gear engaged, verify 12V at pin A3 of G1	OK	Carry out step A5
		OK	Restore wiring between pin A3 of G1 and pin B of H2 (WHIT)
A5	CHECK GROUND - Verify 0V at pin A2 of connector G307	OK	Carry out tests B and C
		OK	Restore wiring between pin A2(A1*) of G307 and ground G63b (BLK)

(\*) from chassis N. \_\_\_\_\_

RIGHT-HAND REVERSING LIGHT NOT WORKING		TEST B
TEST PROCEDURE	RESULT	CORRECTIVE ACTION
<b>B1</b> CHECK VOLTAGE -- With reverse gear engaged, verify 12V between pin 2 and 3 of the rear central light assembly E30	(OK) <input type="checkbox"/> (OK) <input checked="" type="checkbox"/>	Carry out step B2  Carry out step B3
<b>B2</b> CHECK BULB - Check for damage of the reversing light bulb in light assembly E30 (inner bulb, with white transparency)	(OK) <input type="checkbox"/> (OK) <input checked="" type="checkbox"/>	Check and if necessary replace the complete light assembly E30 Replace the bulb
<b>B3</b> CHECK VOLTAGE -- With reverse gear engaged, verify 12V at pin 3 of E30	(OK) <input type="checkbox"/> (OK) <input checked="" type="checkbox"/>	Restore wiring between pin 2 of E30 and pin A2(A1*) of connector G307, across the solder (BLK)  Restore wiring between pin C8 of G1 and pin 3 of E30, across pin A1(A8*) of connector G307 (WHT-GRN)

(\*) from chassis N. ....

LEFT-HAND REVERSING LIGHT NOT WORKING		TEST C
TEST PROCEDURE	RESULT	CORRECTIVE ACTION
<b>C1</b> CHECK VOLTAGE -- With reverse gear engaged, verify 12V between pin 2 and 3 of the rear central light assembly E31	(OK) <input type="checkbox"/> (OK) <input checked="" type="checkbox"/>	Carry out step C2  Carry out step C3
<b>C2</b> CHECK BULB - Check for damage of reversing light bulb in light assembly E31 (inner lamp, with white transparency)	(OK) <input type="checkbox"/> (OK) <input checked="" type="checkbox"/>	Check and if necessary replace the complete light assembly E31 Replace bulb
<b>C3</b> CHECK VOLTAGE -- With reverse gear engaged, verify 12V at pin 3 of E31	(OK) <input type="checkbox"/> (OK) <input checked="" type="checkbox"/>	Restore wiring between pin 2 of E31 and pin A2(A1*) of connector G307, across the solder (BLK)  Restore wiring between pin C7 of G1 and pin 3 of E31, across pin A4(A2*) of connector G307 (WHT)

(\*) from chassis N. ....



WIRING DIAGRAM

DAY-LIGHT

INDEX

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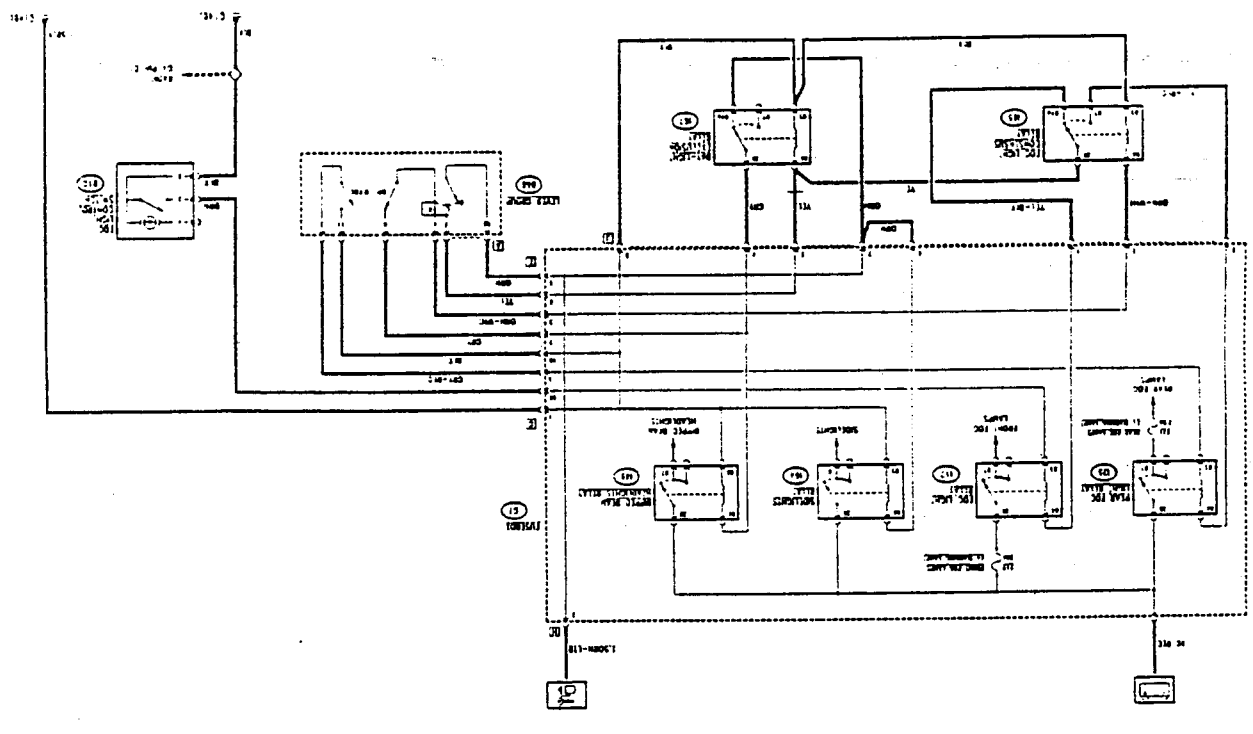
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**GENERAL DESCRIPTION**

Models for some countries may be equipped with a dual or DAY-LIGHT lighting device.  
 This device, in compliance with the laws in force in some countries, switches the sidelights on whenever the ignition key is engaged and regulates, following a specific logic, the selection of dipped beam headlights and the rear and front fog lamps:

- with the ignition key at the "RUN" position: the sidelights and dipped beam headlights are switched on;
- sidelights switch related to the first position ("I"): only the sidelights stay on and the front foglamps can be turned on;
- sidelights switch related to the second position ("II"): the dipped beam is once again switched on and the foglamps are switched off; it is then possible to switch on the rear foglamps;
- the main beam headlights are switched on in the same way as for other models.

This logic is made possible with the intervention of two relays with special wiring connected to connector J in fusebox G1; the day-light exclusion relay 167 switches on the dipped beam headlights when the ignition switch is at the "RUN" position, and is deactivated when the sidelights switch is at position "I"; the front foglamps consensus relay 165 supplies the front foglamps line when the switch is at "I", and the rear foglamps line when the switch is at "II".

Apart from these two components, all else remains unchanged in comparison to the other charts valid for the other versions: in this chart only the part relative to the supply is illustrated, up to the relays which activate the various circuits (164 - sidelights; 149 - dipped beam headlights; 117 - front foglamps; 125 - rear foglamps).  
 It is therefore necessary to refer to the relative sections for greater detail regarding the circuits in question.

**FUNCTIONAL DESCRIPTION**

The sidelights circuit is directly connected to the key-operated supply as pins 6 and 7 of connector J in the

fusebox G1 are bridged in order to excite the sidelight relay 164 (see "Sidelights").

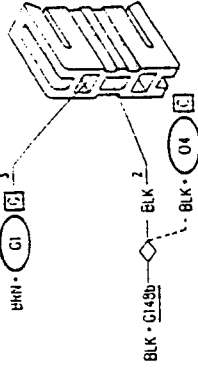
This supply also reaches pin 87a of the day-light exclusion relay 167: when the relay is not excited (lever group switch B68 in the rest position), the key-operated supply excites the relay 149 and supplies the dipped beam headlight circuit (see "Main and Dipped Beam Headlights").

Rotating switch B68 to position "I" - pin A7-, the relay 167, -pin 85- is excited which then excludes the supply to the dipped beam headlights; at the same time the supply crosses the front foglamps consensus relay 165 -pin 87a and 30- and supplies the front foglamps relay 117; in this way the front foglamps switch B10 is activated and it is possible to switch them on (see "Rear and Front Foglamps").

Rotating switch B68 still further to position "II" -pin A4- the relay 165 is excited -pin 85-, which interrupts the supply to the front foglamps circuit -pin 87a- and deviates it towards relay 125 and the rear foglamps circuit -pin 87-, which can then be activated via the switch on the lever group B68 (see "Rear and Front Foglamps").

**COMPONENTS AND CONNECTORS**

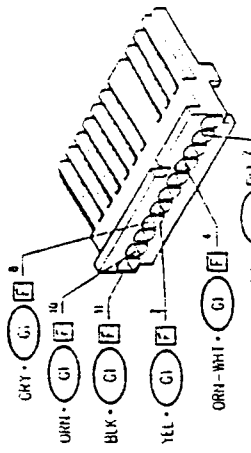
Fog light control switch



Fusebox

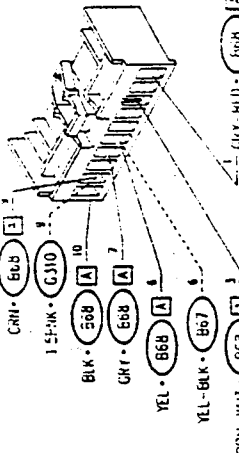
G1

Lever group



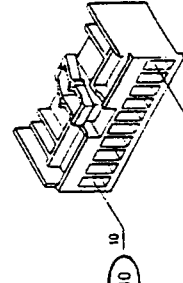
Fusebox

G1



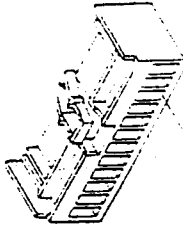
Fusebox

G1



Fusebox

G1

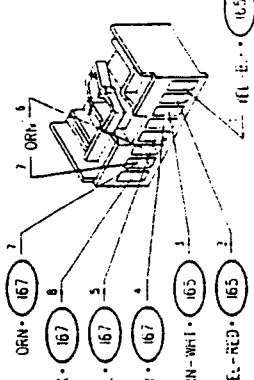


Fusebox

G1

Fusebox

G1



Fusebox

G1

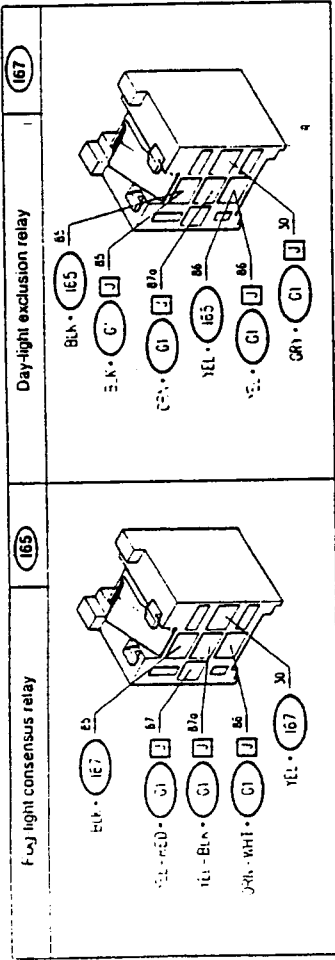
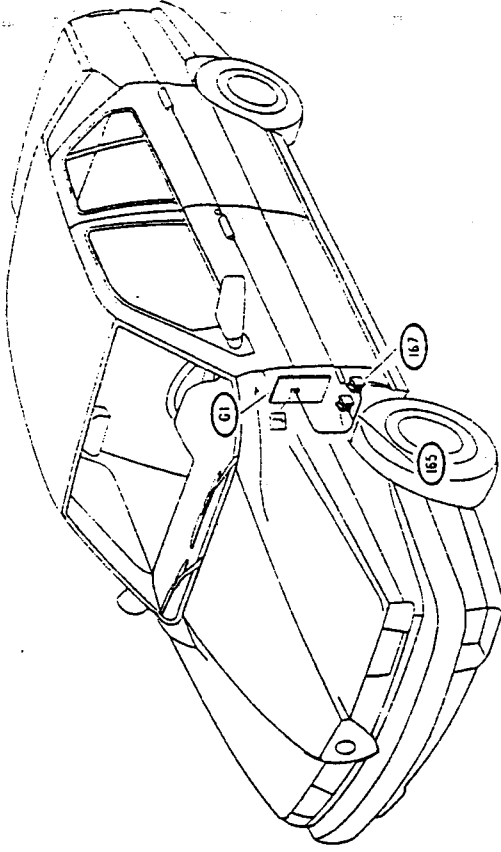
Under-dashboard ground-left side

G148b

**TROUBLESHOOTING TABLE**

Malfunction	Component		Test
	167	165	
With ignition key engaged the sidelights and dipped headlights cannot be engaged	•		A
The front foglamps together with the sidelights cannot be engaged		•	B
The rear foglamps together with the dipped beam headlights cannot be engaged		•	C

LOCATION OF COMPONENTS



THE FRONT FOGLAMPS DO NOT COME ON

TEST B

Note: If only one front foglamp comes on, refer to the relative test in the section "Rear and Front Foglamp".

TEST PROCEDURE	RESULT	CORRECTIVE ACTION
<b>B1</b> CHECK FUSE - Check for damage of fuse <b>§19</b> of fusebox <b>G1</b>	<input type="radio"/> OK <input checked="" type="radio"/>	Carry out step <b>B2</b>  Replace fuse (20A)
<b>B2</b> CHECK RELAY - Check for correct functioning of front foglamps relay <b>I17</b> , located in <b>G1</b>	<input type="radio"/> OK <input checked="" type="radio"/>	Carry out step <b>B3</b>  Replace relay <b>I17</b>
<b>B3</b> CHECK RELAY - Check for correct functioning of front foglamps consensus relay <b>I65</b>	<input type="radio"/> OK <input checked="" type="radio"/>	Carry out step <b>B4</b>  Replace relay <b>I65</b>
<b>B4</b> CHECK VOLTAGE - Rotate the ignition key and verify 12V at pin <b>A10</b> of lever group <b>B68</b>	<input type="radio"/> OK <input checked="" type="radio"/>	Carry out step <b>B5</b>  Restore wiring between pin <b>F9</b> of <b>G1</b> and pin <b>A10</b> of lever group <b>B68</b> (ORN)
<b>B5</b> CHECK VOLTAGE - With ignition key rotated and and lights switched to position "I", verify 12V at pin <b>F6</b> of <b>G1</b>	<input type="radio"/> OK <input checked="" type="radio"/>	Carry out step <b>B6</b>  Restore wiring between pin <b>F6</b> of <b>G1</b> and pin <b>A7</b> of lever group <b>B68</b> (YEL)
<b>B6</b> CHECK VOLTAGE - With ignition key rotated and and lights switched to position "I", verify 12V at pin <b>30</b> of <b>I65</b>	<input type="radio"/> OK <input checked="" type="radio"/>	Carry out step <b>B7</b>  Restore wiring between pin <b>30</b> of <b>I65</b> and pin <b>J5</b> of <b>G1</b> , across pin <b>86</b> of <b>I67</b> (YEL)
<b>B7</b> CHECK VOLTAGE - With ignition key rotated and and lights switched to position "I", verify 12V at pin <b>J1</b> of <b>G1</b>	<input type="radio"/> OK <input checked="" type="radio"/>	Carry out step <b>B8</b>  Restore wiring between pin <b>J1</b> of <b>G1</b> and pin <b>87</b> of <b>I65</b> (YEL-BLK)

TROUBLESHOOTING

WITH IGNITION KEY ENGAGED THE SIDELIGHTS DO NOT COME ON (or the dipped beam headlights do not go out when the light switch is at position "I")

TEST A

NOTE: sidelights and dipped beam headlights function normally when the lever group **B68** is rotated. If this is not the case refer to the troubleshooting of the relative sections "Sidelights" and "Main and Dipped Beam Headlights".

TEST PROCEDURE	RESULT	CORRECTIVE ACTION
<b>A1</b> CHECK RELAY - Check for correct functioning of day-light exclusion relay <b>I67</b>	<input type="radio"/> OK <input checked="" type="radio"/>	Carry out step <b>A2</b>  Replace relay <b>I67</b>
<b>A2</b> CHECK VOLTAGE - Rotate the ignition key and verify 12V at pin <b>J6</b> of <b>G1</b>	<input type="radio"/> OK <input checked="" type="radio"/>	Carry out step <b>A3</b>  Restore wiring between pins <b>J6</b> and <b>J7</b> of <b>G1</b> (ORN)
<b>A3</b> CHECK VOLTAGE - Rotate the ignition key and verify 12V at pin <b>87a</b> of relay <b>I67</b>	<input type="radio"/> OK <input checked="" type="radio"/>	Carry out step <b>A4</b>  Restore wiring between pin <b>J7</b> of <b>G1</b> and pin <b>87a</b> of <b>I67</b> (ORN)
<b>A4</b> CHECK VOLTAGE - Rotate the ignition key and using lever group <b>B68</b> , switch the lights to position "I"; verify 12V at pin <b>86</b> of <b>I67</b>	<input type="radio"/> OK <input checked="" type="radio"/>	Carry out step <b>A5</b>  Restore wiring between pins <b>86</b> of <b>I67</b> and pin <b>J5</b> of <b>G1</b> (YEL)
<b>A5</b> CHECK VOLTAGE - Rotate the ignition key and verify 12V at pin <b>J4</b> of <b>G1</b> ; switching lever group <b>B68</b> to position "I", check that the circuit opens	<input type="radio"/> OK <input checked="" type="radio"/>	Restore wiring between pin <b>85</b> of <b>I67</b> and pin <b>J8</b> of <b>G1</b> (BLK)  Restore wiring between pins <b>30</b> of <b>I67</b> and pin <b>J4</b> of <b>G1</b> (GRY)

THE FRONT FOGLAMPS DO NOT COME ON		TEST B
TEST PROCEDURE	RESULT	CORRECTIVE ACTION
<b>B8</b>   CHECK GROUND - Verify 0V at pin 2 of front foglamps switch B10	OK OK	Carry out step B9 Restore wiring between pin 2 of B10 and ground G148b, also across the solder (BLK)
<b>B9</b>   CHECK SWITCH - Check for correct functioning of front foglamps switch B10 • selecting the front foglamps function, check continuity between pins 2 and 3 of B10	OK OK	Restore wiring between pin G10 of G1 and pin of B68 (BRN) Replace switch B10

REAR FOGLAMPS DO NOT COME ON		TEST C
TEST PROCEDURE	RESULT	CORRECTIVE ACTION
<b>C1</b>   CHECK FUSE - Check for damage of fuse F11 in fusebox G1	OK OK	Carry out step C2 Replace fuse (7.5A)
<b>C2</b>   CHECK RELAY - Check for correct functioning of rear foglamps relay I25, located in G1	OK OK	Carry out step C3 Replace relay I25
<b>C3</b>   CHECK RELAY - Check for correct functioning of foglamps consensus relay, I65	OK OK	Carry out step C4 Replace relay I65
<b>C4</b>   CHECK VOLTAGE - Rotate the ignition key and verify 12V at pin A10 of lever group B68	OK OK	Carry out step C5 Restore wiring between pin F9 of G1 and pin A10 of lever group B68 (ORN)

Note: if only one of the rear foglamps is working, refer to the relative test in the section "Rear and Front Foglamps"

(continues)

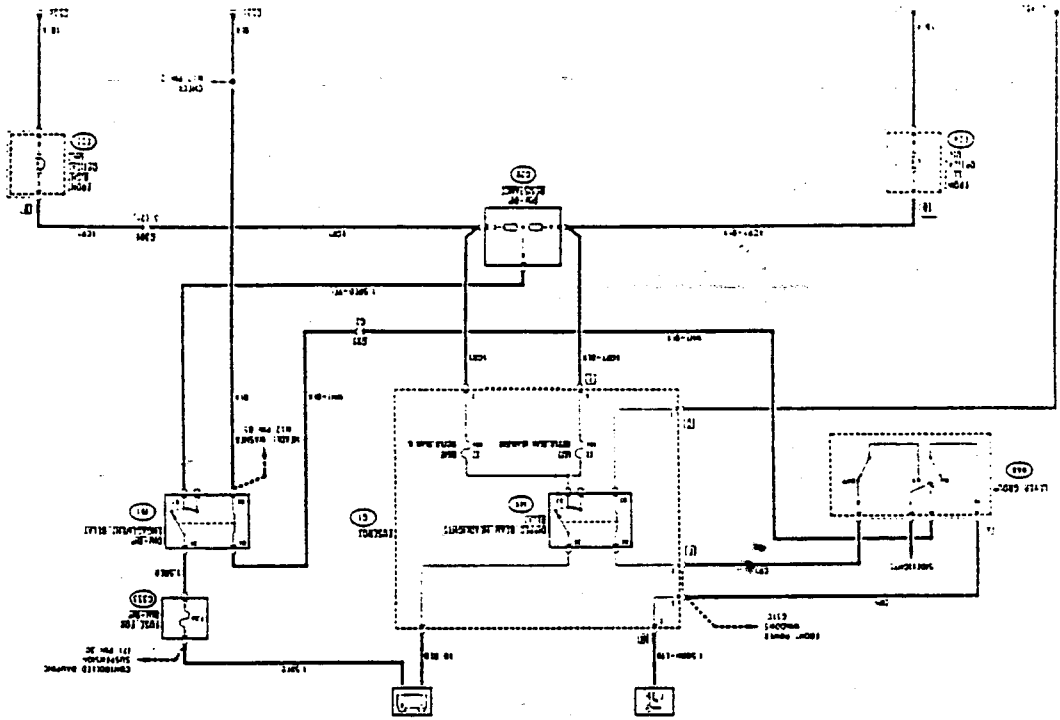
REAR FOGLAMPS DO NOT COME ON		TEST C
TEST PROCEDURE	RESULT	CORRECTIVE ACTION
<b>C5</b>   CHECK VOLTAGE - With ignition key rotated and lights switched to position "II", verify 12V at pin F3 of G1	OK OK	Carry out step C6 Restore wiring between pin F3 of G1 and pin A1 of lever group B68 (ORN-WHT)
<b>C6</b>   CHECK VOLTAGE - With ignition key rotated and lights switched to position "II", verify 12V at pin 86 of I65	OK OK	Carry out step C7 Restore wiring between pin J3 of G1 and pin I6 of I65 (ORN-WHT)
<b>C7</b>   CHECK VOLTAGE - With ignition key rotated and lights switched to position "II", verify 12V at pin 30 of I65	OK OK	Carry out step C8 Restore wiring between pin 30 of I65 and pin J5 of G1, across pin 86 of I67 (YEL)
<b>C8</b>   CHECK VOLTAGE - With ignition key rotated and lights switched to position "II", verify 12V at pin J2 of G1	OK OK	Carry out step C9 Restore wiring between pin J2 of G1 and pin B7 of I65 (YEL-RED)
<b>C9</b>   CHECK LEVER GROUP - Check for correct functioning of lever group: • selecting the rear foglamps function, verify continuity between pin A2 and A11 of lever group B68	OK OK	Carry out step C10 Replace lever group B68, left hand part
<b>C10</b>   CHECK GROUND - With rear foglamps on, verify 0V at pin F1 of G1	OK OK	Restore wiring between pin F10 of G1 and pin A11 of B68 (BLK) Restore wiring between pin F1 of G1 and pin A2 of Bus (GRY-RED)

# "DIM-DIP" DEVICE

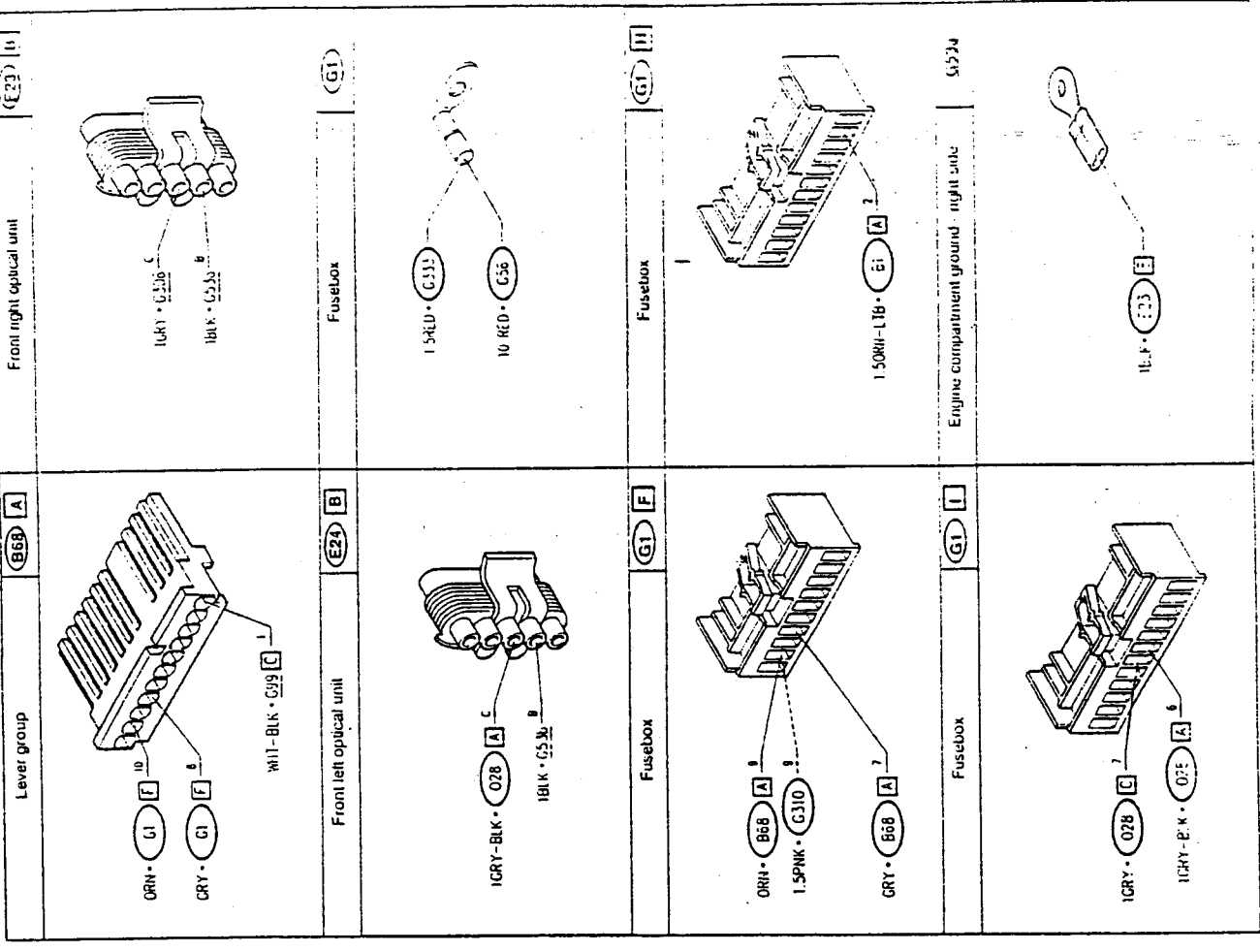
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## WIRING DIAGRAM



COMPONENTS AND CONNECTORS



GENERAL DESCRIPTION

The normal dipped-beam headlights circuit by-passes this device and operates normally as in other versions (see section "Main and dipped beam headlights").

An appropriate fuse protects the power line of the "DIM-DIP" device.

FUNCTIONAL DESCRIPTION

The circuit of the "DIM-DIP" device is regulated by a "DIM-DIP" relay 191. The relay is supplied by battery voltage through "DIM-DIP" wander fuse G333 (7.5A) which protects the entire line.

Moving the switch on the stalk unit B68 to position I - sidelights - the coil of relay 191 is supplied and activated, in this way the line for the dipped-beam headlights (E24 left and E23 right) is supplied through the additional "DIM-DIP" resistance O28; the luminosity of the headlights is in this way reduced.

Moving the switch on the lever group B68 to position II - dipped-beam headlights - the coil of relay 149 in fusebox G1 is supplied, and the current is sent directly to the headlights E24 and E23 by-passing the resistance O28 and obtaining the full luminosity of the headlights.

TROUBLESHOOTING TABLE

Malfunction	Component					Test
	149	B68	EZ	EB	G333	
Dipped-beam headlights	.	.	.	.	.	A
Dipped-beam headlights, low intensity			.	.	.	B
Dipped-beam headlights, high intensity						.
Only one dipped-beam headlight						.

\* See section "Main and dipped beam headlights"





**TROUBLESHOOTING**

**DIPPED-BEAM HEADLIGHTS NOT WORKING, NEITHER AT HIGH NOR LOW INTENSITY** TEST A

(See also "Main and dipped-beam headlights")

TEST PROCEDURE	RESULT	CORRECTIVE ACTION
<b>A1 CHECK RELAY</b> - Check for correct operation of relay I49, located in fusebox G1	OK <del>OK</del>	Carry out step A2 Replace relay I49
<b>A2 CHECK VOLTAGE</b> - Turn the ignition key and check for 12V at pin A10 of lever group B68	OK <del>OK</del>	Carry out step A3 Restore wiring between pin F9 of G1 and pin A10 of lever group B68 (ORN)
<b>A3 CHECK LEVER GROUP</b> - Check for correct operation of lever group: with dipped-beam headlights on, check for continuity between pin A8 and pin A10 of lever group B68	OK <del>OK</del>	Carry out step A4 Replace lever group B68, left-hand part
<b>A4 CHECK VOLTAGE</b> - With ignition key turned and Dipped-beam headlights on, check for 12V at pin F7 of G1	OK <del>OK</del>	Carry out step A5 Restore wiring between pin F7 of G1 and pin A8 of lever group B68 (GRY)
<b>A5 CHECK FUSE</b> - Check for damage of fuses F7 and F8 of G1	OK <del>OK</del>	Carry out step A6 Replace the fuse/s (10A)
<b>A6 CHECK CONTINUITY</b> - Check for continuity between: - pin I6 of G1 and pin BC of light assembly E24 - pin I7 of G1 and pin BC of light assembly E23	OK <del>OK</del>	Carry out the other tests in section "Main and dipped beam headlights" Restore wiring between: - pin I6 of G1 and pin BC of light assembly E24, across pin A of resistance O28 (GRY-BLK) - pin I7 of G1 and pin BC of light assembly E23, across pin C of resistance O28 and pin 3(2') of connector G308 (GRY)

(\*) From chassis N°

**LOW INTENSITY DIPPED-BEAM HEADLIGHTS NOT WORKING** TEST B

TEST PROCEDURE	RESULT	CORRECTIVE ACTION
<b>B1 CHECK FUSE</b> - Check for damage of warden fuse G333	OK <del>OK</del>	Carry out step B2 Replace the fuse (7.5A)
<b>B2 CHECK RELAY</b> - Check for correct operation of DIM-DIP relay I91	OK <del>OK</del>	Carry out step B3 Replace relay I91
<b>B3 CHECK RESISTANCE</b> - Check for correct operation of the additional DIM DIP resistance O28: measuring a value of 1.7 Ω between pins A and B and between pins B and C, and a value of 3.4 Ω between pins A and C	OK <del>OK</del>	Carry out step B4 Replace the resistance O28
<b>B4 CHECK VOLTAGE</b> - With ignition key turned and the sidelights on, check for 12V at pin B6 of relay I91	OK <del>OK</del>	Carry out step B5 Restore wiring between pin B6 of I91 and pin A1 of lever group B68, across pin C2 of connector G99 (W11-BLK)
<b>B5 CHECK VOLTAGE</b> - Check for 12V at pin 30 of relay I91	OK <del>OK</del>	Carry out step B6 Restore wiring between pin 30 of I91 and the terminal terminal board, across the fuse G333 (RED)
<b>B6 CHECK GROUND</b> - Check that pin B5 of I91 is grounded (UV)	OK <del>OK</del>	Restore wiring between pin B5 of I91 and ground G53b, across pin 2 of H17 (BLK)

GENERAL DESCRIPTION

The numerous light sources permit easy identification of the controls and switches and, when necessary, suitable lighting of the passenger compartment and/or specific points.

The wiring diagram relating to interior lighting has been divided into three parts; the first part includes the illumination of the ideograms on the controls and switches activated when the sidelights are switched on. The second includes courtesy lights and light points switched on and off by the timer when the doors are opened or closed.

A third specific diagram is dedicated to the dashboard lighting as this can be regulated using the rheostat.

Illumination of controls and ideograms:

When the sidelights are on, the ideograms located on the stalk unit are lit up; controls of the heater or of the manual conditioner (for the automatic heater and automatic air conditioner) control panel are also illuminated (see "Heating-ventilation control unit: supply and diagnosis").

The specific diagrams also illustrate the illumination of the ideograms on the check panel display, and illumination of the ashtray, seat adjustment, fog-light switch and controls for the controlled suspension.

A specific light comes on when the glovebox is opened (see "Boot release control").

N.B. Refer to the various sections for

greater detail and to the fault diagnosis if the ideograms do not light up

Courtesy lights:

A timing device M10 turns the front central courtesy light F35, the rear courtesy light F3 and, where applicable, the lights on the ignition block on or off when the doors are opened or closed. This device operates as follows:

- When any door is opened the lights come on and remain on for between 100 and 200 seconds or until the door is closed;

- when the doors have been closed the lights remain on for approximately 15 seconds and then switch themselves off.

The two courtesy lights can obviously be turned on manually by acting on the switch.

On the front courtesy light there is also a spot-light, powered directly by the battery, which enables a passenger, for example, to read without disturbing the driver.

A special courtesy light F5 illuminates the luggage compartment and comes on when the boot lid is opened.

Instrument panel lighting:

The instrument panel C10 is illuminated by way of a rheostat B16, which permits the lighting intensity to be regulated.

ILLUMINATION OF CONTROLS AND IDEOGRAMS

Functional Description

The lever group ideograms B68 are illuminated when the sidelights are switched on; those on the left are activated directly by the light switch itself, while those on the right by a relay returning from the fusebox G1

The controls of the heater F8 on the two lights F8a and F8b of manual air conditioner are supplied by the sidelight relay I64 and fuse F5 (10A) of G1 (see for the automatic conditioner "Heating ventilation control unit: supply and diagnosis").

INTERIOR LIGHTING

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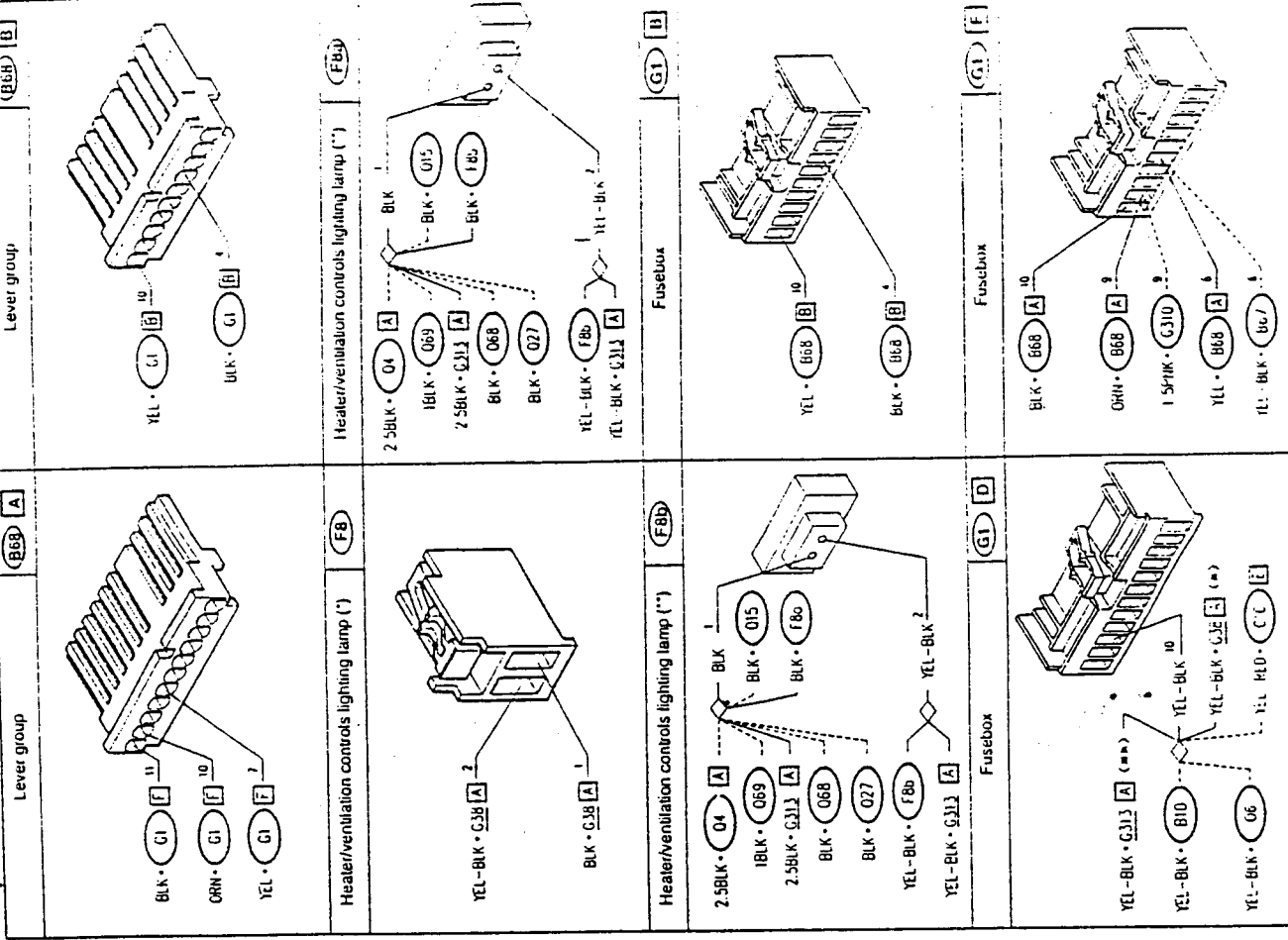
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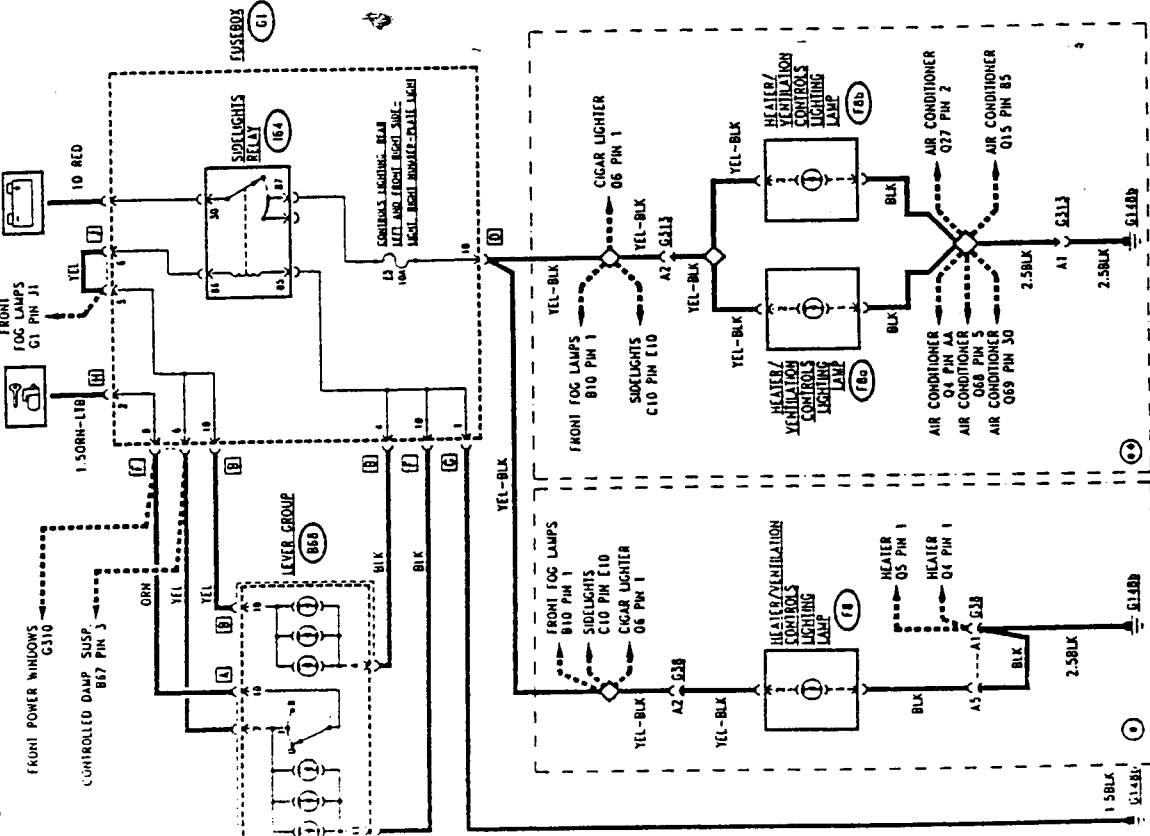
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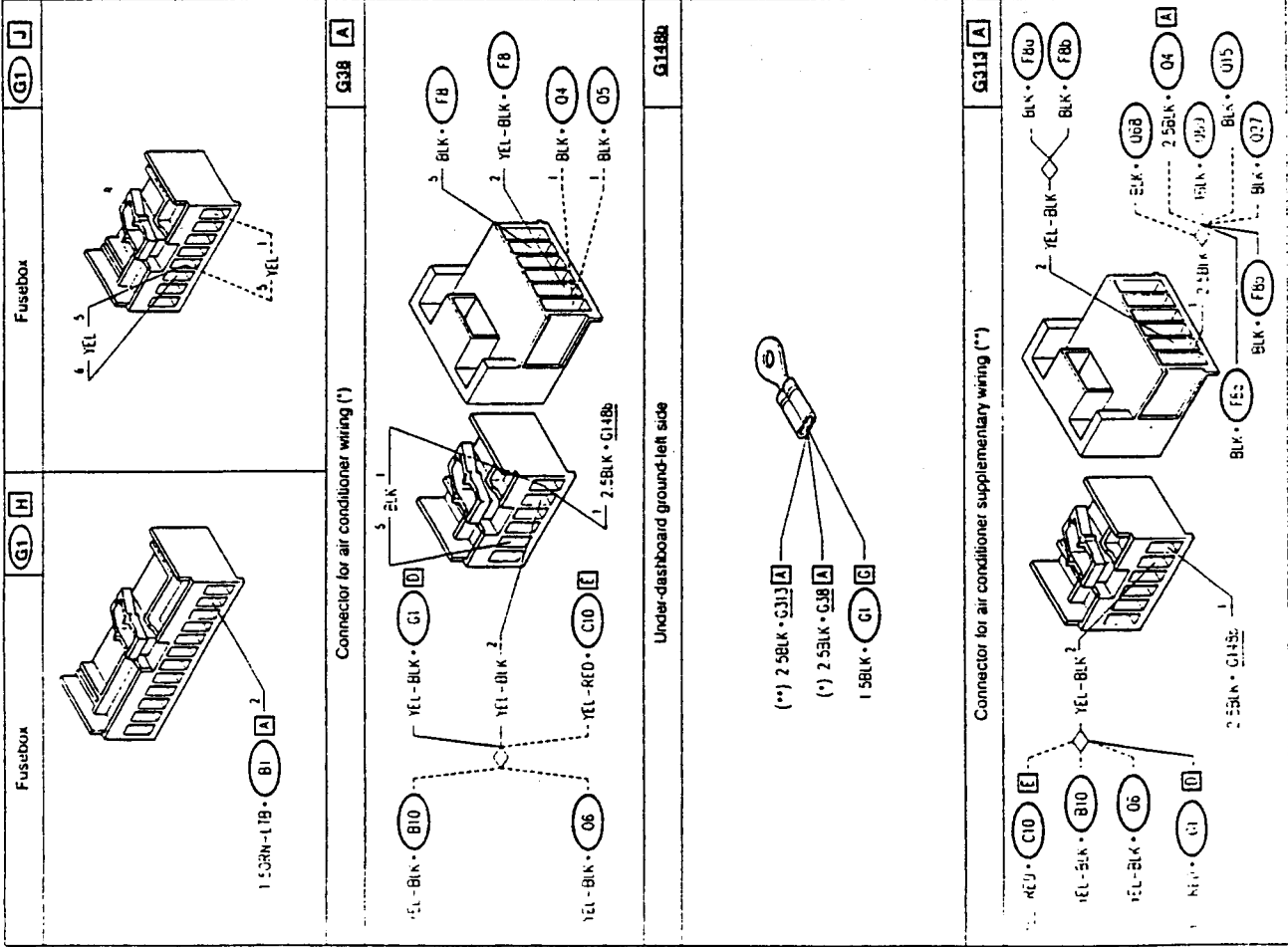
Components and Connectors



Wiring Diagram

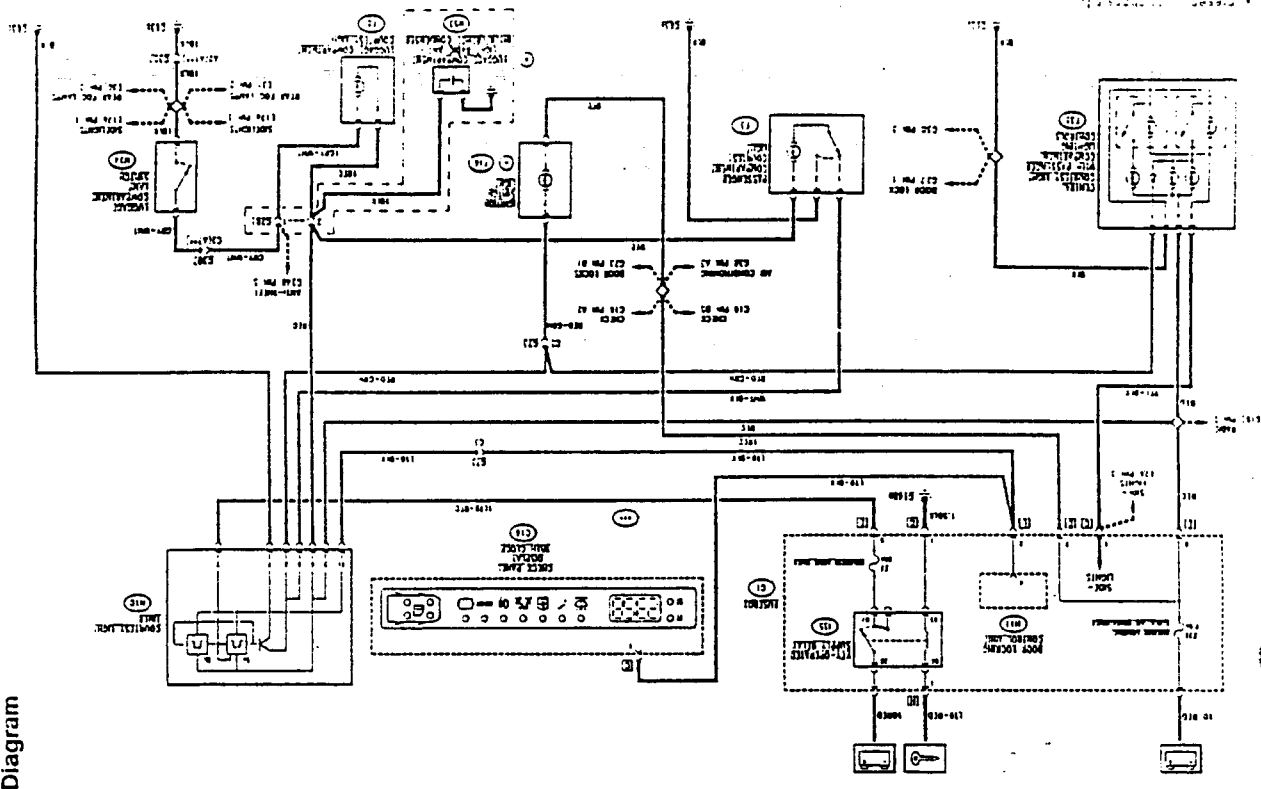


(\*) Manual heater  
 (\*\*) Manual conditioner



(\*) Manual Header Manual Conditioner 1655E 100002

COURTESY LIGHTS Wiring Diagram



**Functional Description**

**Passenger compartment courtesy light**

The courtesy light with passenger compartment lighting controls (reading light) F35 is supplied directly by the battery. Current through fuse F16 (7.5A) of the fusebox G1 this permits the reading light of courtesy light to be illuminated by acting on the relevant switch.

When the sidelights are on, F35 receives another supply which lights up the diagrams on the controls.

The passenger compartment courtesy light F3 also receives supply direct from the battery and once again is routed through fuse F16 (7.5A)

**Timer controlled courtesy light:**

The courtesy light electronic timer device N10 controls illumination of the courtesy lights F35 and F3 and of the lamp illuminating the ignition switch F16; where applicable

Battery voltage is supplied through fuse F16 (7.5A) in the fusebox G1 to the Ta and Tb devices of N10. Pin 11 of the device receives the "door open" signal from the Check Panel C16 when any door is opened (this signal is the same as that which prevents locking/unlocking of the doors - see "Door locking system").

The Ta timer sends a ground signal through pins 8 and 9, to the timer controlled lamps F3, F36 and F16 (supplied by battery voltage by the fuse line F16) and illuminates them for 100 to 200 seconds from the moment the door is opened. When the "door open" signal is interrupted, the Tb timer sends the same negative signal and illuminates the lights for a further 10-20 seconds approximately.

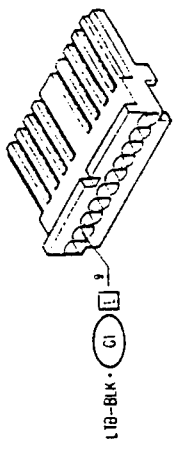
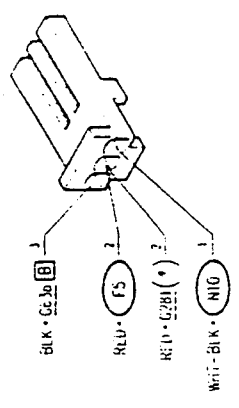
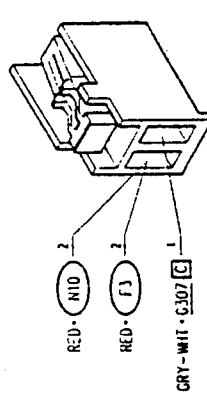
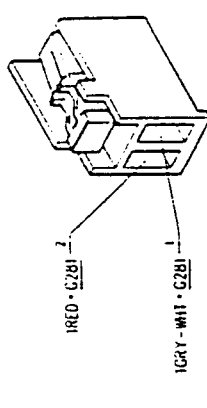
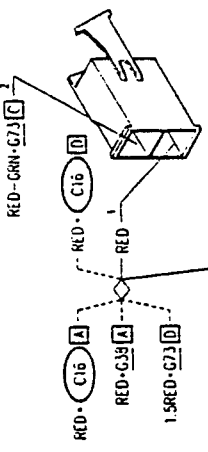
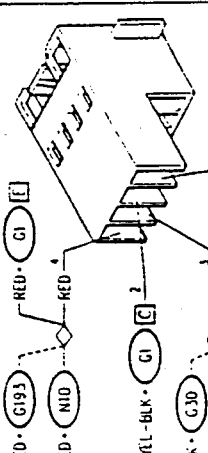

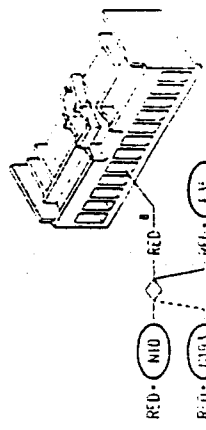
From chassis N... the timer has been modified: the key operated power supply signal which interrupts the timing when the ignition key is engaged reaches pin 2.

**Luggage compartment lighting:**

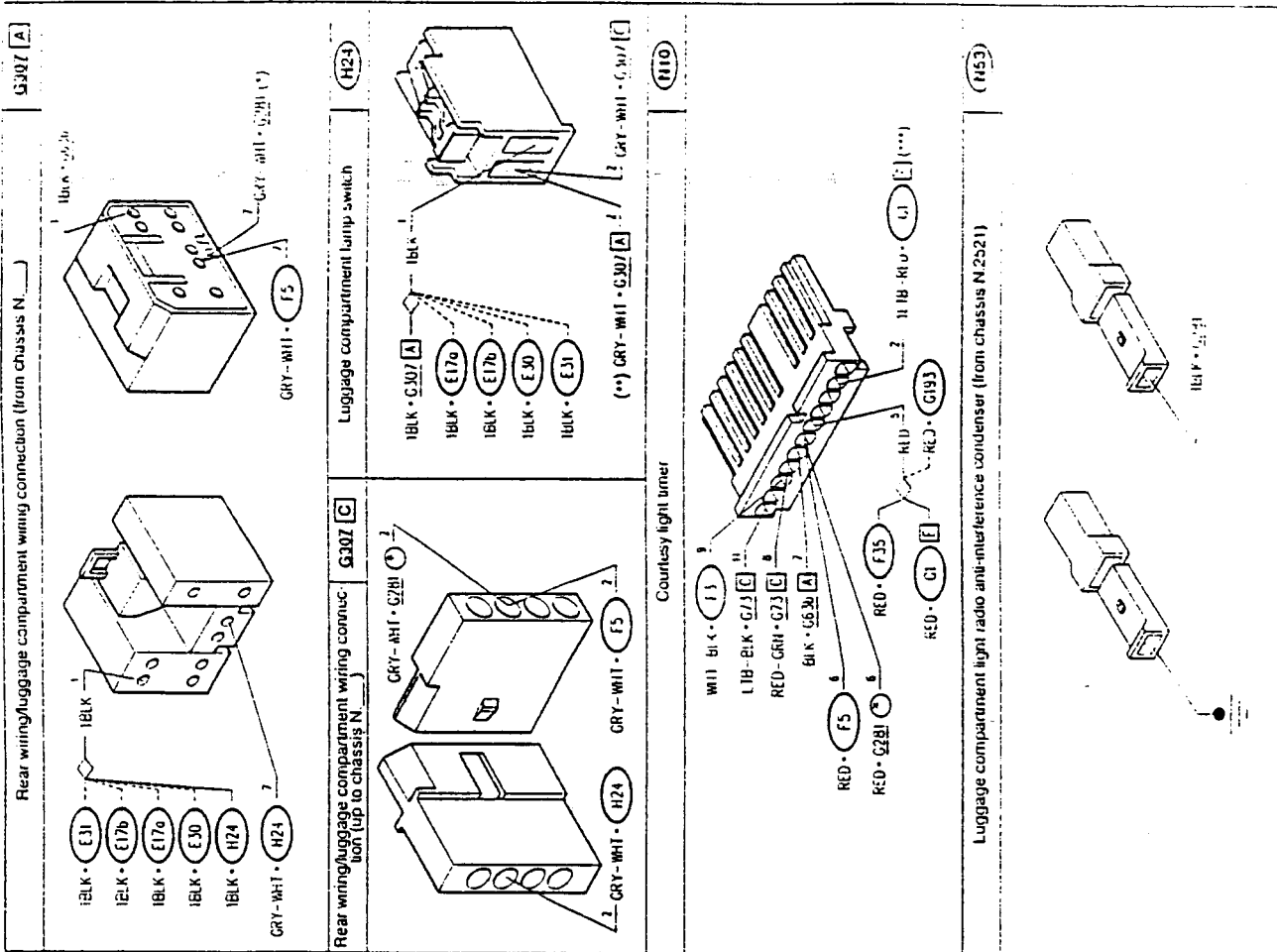
The luggage compartment courtesy light F5 is also illuminated by battery voltage routed through the line protected by fuse F16 (7.5A); it comes on when the boot lid is opened and switch H24 sends a ground signal

From chassis N.2521 a radio anti-interference condenser N53 is installed to prevent disturbances from the roof light F5.

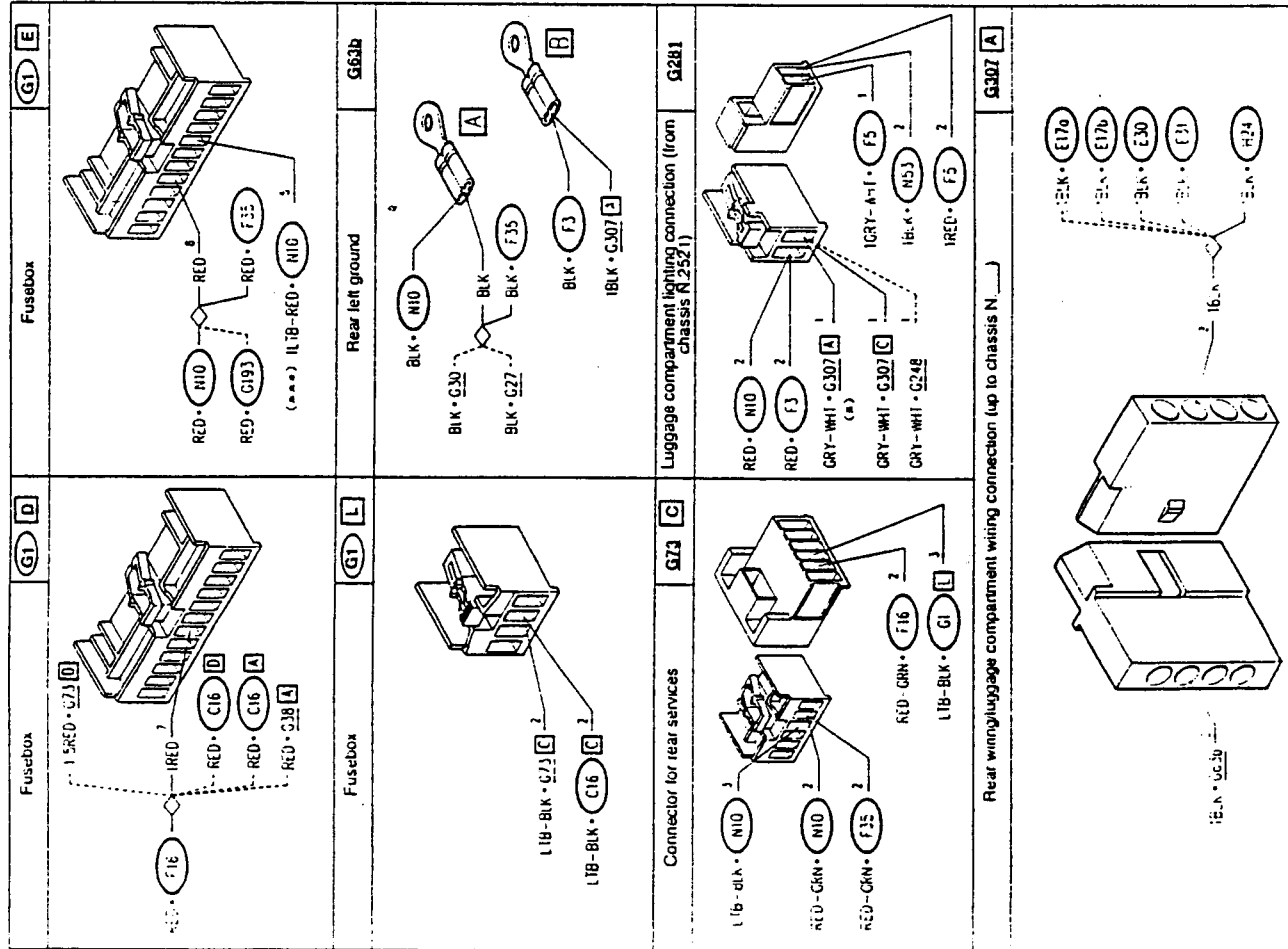
**Components and Connectors**

<p>Check panel display with clock</p>  <p>110-Blk - G1 E 2 3</p>	<p>Passenger compartment courtesy light</p>  <p>Blk - G1, 2a B 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200 201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300 301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400 401 402 403 404 405 406 407 408 409 410 411 412 413 414 415 416 417 418 419 420 421 422 423 424 425 426 427 428 429 430 431 432 433 434 435 436 437 438 439 440 441 442 443 444 445 446 447 448 449 450 451 452 453 454 455 456 457 458 459 460 461 462 463 464 465 466 467 468 469 470 471 472 473 474 475 476 477 478 479 480 481 482 483 484 485 486 487 488 489 490 491 492 493 494 495 496 497 498 499 500 501 502 503 504 505 506 507 508 509 510 511 512 513 514 515 516 517 518 519 520 521 522 523 524 525 526 527 528 529 530 531 532 533 534 535 536 537 538 539 540 541 542 543 544 545 546 547 548 549 550 551 552 553 554 555 556 557 558 559 560 561 562 563 564 565 566 567 568 569 570 571 572 573 574 575 576 577 578 579 580 581 582 583 584 585 586 587 588 589 590 591 592 593 594 595 596 597 598 599 600 601 602 603 604 605 606 607 608 609 610 611 612 613 614 615 616 617 618 619 620 621 622 623 624 625 626 627 628 629 630 631 632 633 634 635 636 637 638 639 640 641 642 643 644 645 646 647 648 649 650 651 652 653 654 655 656 657 658 659 660 661 662 663 664 665 666 667 668 669 670 671 672 673 674 675 676 677 678 679 680 681 682 683 684 685 686 687 688 689 690 691 692 693 694 695 696 697 698 699 700 701 702 703 704 705 706 707 708 709 710 711 712 713 714 715 716 717 718 719 720 721 722 723 724 725 726 727 728 729 730 731 732 733 734 735 736 737 738 739 740 741 742 743 744 745 746 747 748 749 750 751 752 753 754 755 756 757 758 759 760 761 762 763 764 765 766 767 768 769 770 771 772 773 774 775 776 777 778 779 780 781 782 783 784 785 786 787 788 789 790 791 792 793 794 795 796 797 798 799 800 801 802 803 804 805 806 807 808 809 810 811 812 813 814 815 816 817 818 819 820 821 822 823 824 825 826 827 828 829 830 831 832 833 834 835 836 837 838 839 840 841 842 843 844 845 846 847 848 849 850 851 852 853 854 855 856 857 858 859 860 861 862 863 864 865 866 867 868 869 870 871 872 873 874 875 876 877 878 879 880 881 882 883 884 885 886 887 888 889 890 891 892 893 894 895 896 897 898 899 900 901 902 903 904 905 906 907 908 909 910 911 912 913 914 915 916 917 918 919 920 921 922 923 924 925 926 927 928 929 930 931 932 933 934 935 936 937 938 939 940 941 942 943 944 945 946 947 948 949 950 951 952 953 954 955 956 957 958 959 960 961 962 963 964 965 966 967 968 969 970 971 972 973 974 975 976 977 978 979 980 981 982 983 984 985 986 987 988 989 990 991 992 993 994 995 996 997 998 999 1000</p>
<p>Luggage compartment courtesy light (up to chassis N.2520)</p>  <p>RED - N10 2 RED - F3 2 GRY - WHT - G307 C 1</p>	<p>Luggage compartment courtesy light (from chassis N.2521)</p>  <p>1RED - G2B1 2 1GRY - WHT - G2B1 1</p>
<p>Ignition switch light (present to chassis N...)</p>  <p>RED - GRN - G73 C 2 RED - G16 A RED - G39 A 1.5RED - G73 D RED - G1 D</p>	<p>Central courtesy light with passenger compartment lighting controls</p>  <p>RED - G193 RED - N10 RED - G1 C 2 RED - G1 E RED - G27 RED - G6 RED - G6A A BLK - G30 BLK - GRN - G73 C RED - N10 - GRN - G73 C</p>
<p>Fusebox</p>  <p>10 RED - G56</p>	<p>Fusebox</p>  <p>RED - N10 RED - F35 RED - F5</p>

(\*) from chassis N°2521

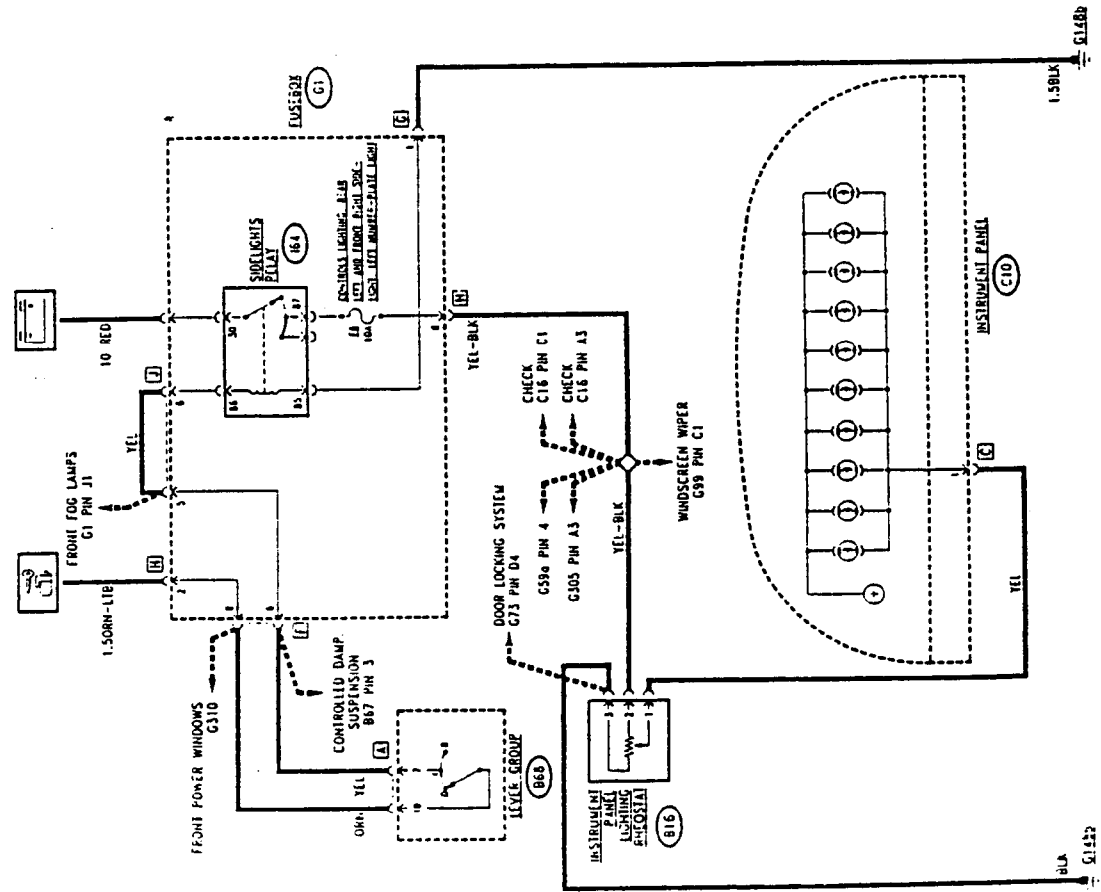


(\*) from chassis N.2521 (\*\*) from chassis N.      / (\*\*\*) from chassis N.     



(\*) from chassis N.      / (\*\*\*) from chassis N.

### INSTRUMENT PANEL LIGHTING Wiring Diagram

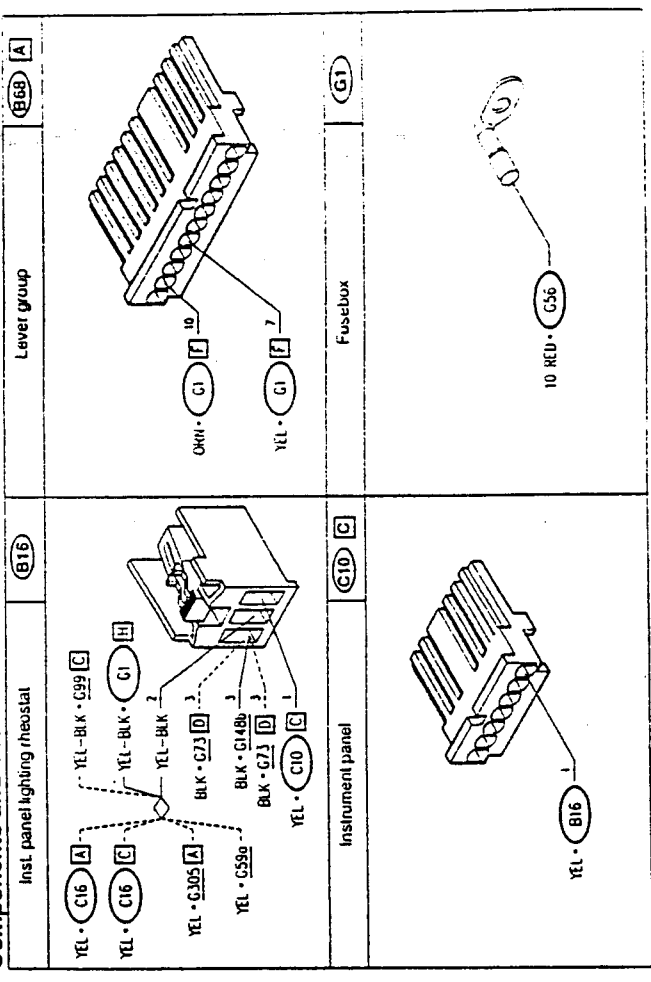


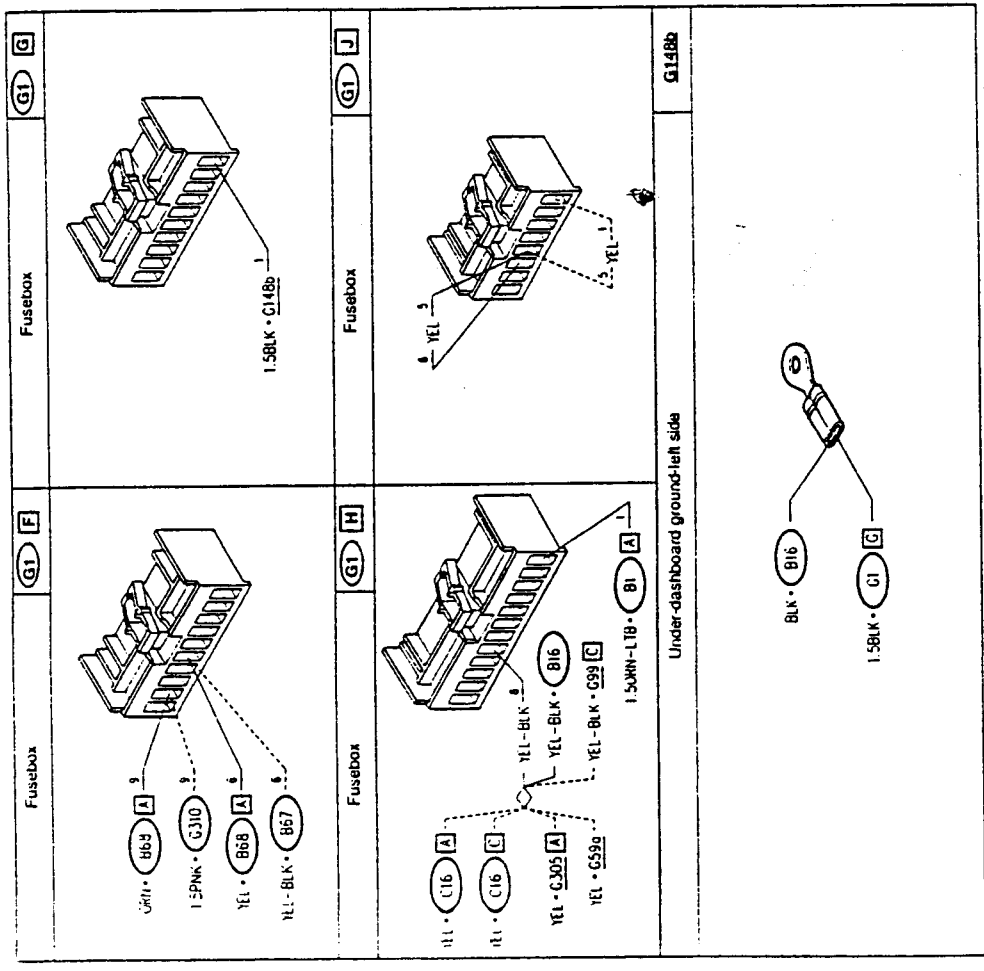
**Functional Description**

The rheostat B16 is powered by battery voltage, through relay I64 and fuse F6 (10A) of the fusebox G1, when the side lights are switched on using the switch on the lever group B68.

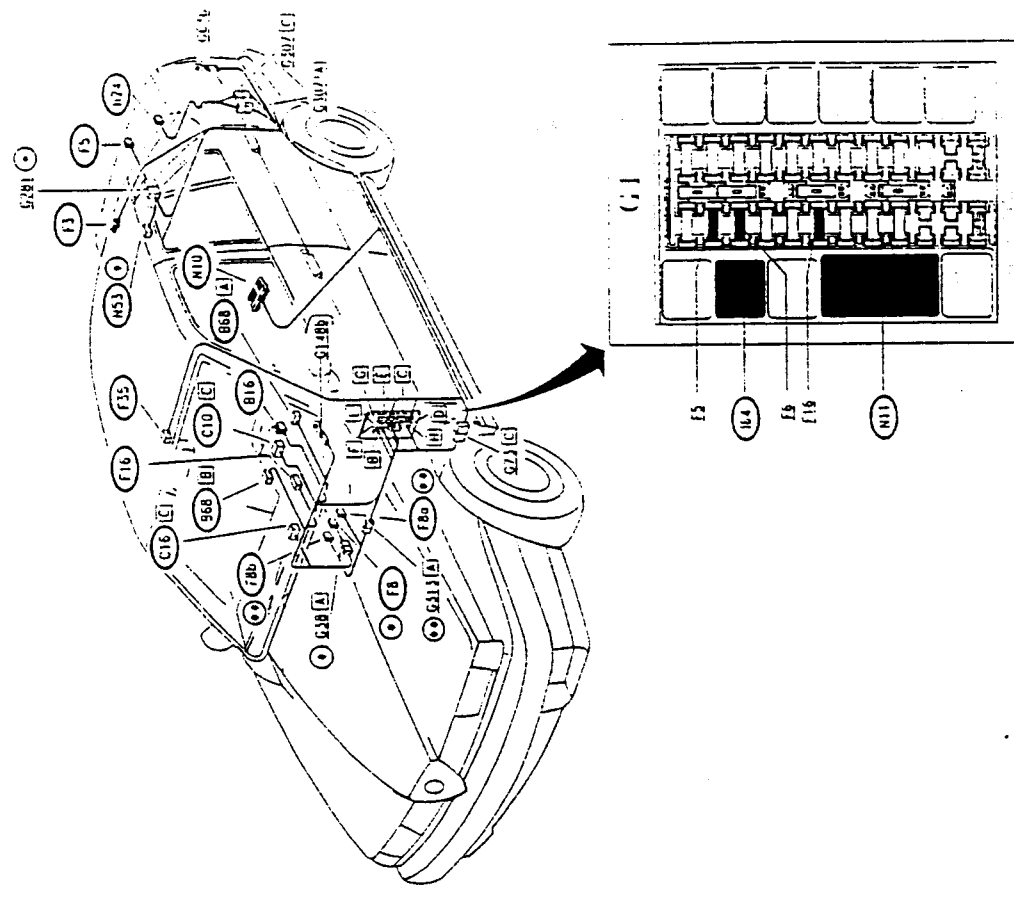
Intensity is regulated by the negative signal which reaches the "key operated" supply instrument panel lamps.

### Components and Connectors





LOCATION OF COMPONENTS



(\*) from chassis N.2521  
 (\*\*) Manual heater  
 (\*\*\*) Manual combustion



TROUBLESHOOTING

TROUBLESHOOTING TABLE

Malfunction	Component											Test		
	(F8)	(F8a)	(F8b)	(B66)	E16	E1	(N10)	(F35)	(F3)	(F16)	(F5)		(H23)	(C10)
Manual air conditioner lights	.													
Heater lights	.													
Level group lights				.										
All inner controlled courtesy lights				.	.	.	.	.	.	.	.	.	.	.
Central courtesy light				.	.	.	.	.	.	.	.	.	.	.
Passenger compartment courtesy light				.	.	.	.	.	.	.	.	.	.	.
Ignition switch light (*)				.	.	.	.	.	.	.	.	.	.	.
Luggage compartment light				.	.	.	.	.	.	.	.	.	.	.
Inst panel illumination				.	.	.	.	.	.	.	.	.	.	.
Inst panel lighting intensity regulation				.	.	.	.	.	.	.	.	.	.	.

(\*) present up to chassis N. \_\_\_\_\_

THE AIR CONDITIONING CONTROL PANEL LIGHTING DOES NOT COME ON (MANUAL AIR CONDITIONER) TEST A

TEST PROCEDURE	RESULT	CORRECTIVE ACTION
<b>A1</b> CHECK VOLTAGE - With ignition key engaged and the sidelights on, check for 12 V between pin 1 and 2 of bulbs F8a and F8b	OK	Substitute bulbs F8a or F8b
	OK	Proceed to step A2
<b>A2</b> CHECK VOLTAGE - With ignition key engaged and sidelights on, check for 12 V at pin 2 of F8a and of F8b	OK	Restore wiring between pins 1 of F8a and F8b and earth G148b, across the solder and pin A1 of connector G313 (BLK)
	OK	Restore wiring between pins 2 of F8a and F8b and pin D10 of fusebox G1, across pin A2 of connector G313 and solder (YEL-BLK)

LIGHTING OF HEATER/VENTILATION SYSTEM CONTROLS NOT WORKING (HEATER) TEST B

**NOTE:**  
Carry out test only for vehicles equipped with manually controlled heater; for vehicles equipped with automatically controlled heater or heating/ventilation system refer to the section "Air conditioning - Control unit: supply and diagnosis".

TEST PROCEDURE	RESULT	CORRECTIVE ACTION
<b>B1</b> CHECK VOLTAGE - With the ignition switch turned and the sidelights switched on, verify 12V between pin 1 and 2 of the bulb F8	OK	Replace the bulb contained in F8
	OK	Carry out step B2
<b>B2</b> CHECK VOLTAGE - With the ignition switch turned and the sidelights switched on, verify 12V at pin 2 of F8	OK	Restore wiring between pin 1 of F8 and ground G148b, across pins A5 and A1 of the connector G38 (BLK)
	OK	Restore wiring between pin 2 of F8 and pin D10 of G1, across pin A2 of the connector G38 and the solder (YEL-BLK)

LEVER GROUP CONTROL ILLUMINATION NOT WORKING		TEST C
--	--	--------

NOTE:  
If the sidelight also do not work, first refer to section: "Sidelights".  
If some of the lever group controls do not work, first refer to the relative sections.

TEST PROCEDURE	RESULT	CORRECTIVE ACTION
<b>C1 CHECK VOLTAGE</b> - With the ignition switch turned and the sidelights switched on, verify 12V between pins A7 and A11 of the lever group B68	OK	Carry out step C2
<b>C2 CHECK BULB</b> - Check lever group bulbs B68 for damage	OK	Carry out step C3
<b>C3 CHECK CONTINUITY</b> - Check continuity between pin A11 of B68 and pin F10 of G1	OK	Carry out step C4
<b>C4 CHECK VOLTAGE</b> - With the ignition switch turned and the sidelights switched on, verify 12V between pin B4 and B10 of the lever group B68	OK	Replaces faulty bulbs
<b>C5 CHECK VOLTAGE</b> - With the ignition switch turned and the sidelights switched on, verify 12V at pin B10 of lever group B68	OK	See section "Sidelights"
	OK	Restore wiring between pin A8 of B68 and pin F10 of G1 (BLK)
	OK	Replace faulty bulbs
	OK	Carry out step C5
	OK	Restore wiring between pin B4 of B68 and pin B4 of G1 (BLK)
	OK	Restore wiring between pin B10 of B68 and pin B10 of G1 (YEL)

NONE OF THE TIMER CONTROLLED LIGHTS WORKING (*)		TEST D
---	--	--------

TEST PROCEDURE	RESULT	CORRECTIVE ACTION
<b>D1 CHECK FUSE</b> - Check that fuse F16 in fusebox G1 is not damaged	OK	Carry out step D2
<b>D2 CHECK VOLTAGE</b> - Verify 12V at pin 5 of the timer for courtesy light N10	OK	Replace the fuse (7.5A)
<b>D3 CHECK GROUND</b> - Verify 0V at pin 7 of the courtesy light timer N10	OK	Carry out step D3
<b>D4 CHECK SIGNAL</b> - Verify ground signal (0V) at pin 11 of the courtesy light timer N10 when one of the doors is opened (and that this signal disappears when all the doors are closed correctly)	OK	Restore wiring between pin E8 of G1 and pin 5 of N10, and across the solder (RED)
	OK	Carry out step D4
	OK	Restore wiring between pin / of N10 and ground G63b (BLK)
	OK	Replace the courtesy light timer N10
	OK	Restore wiring between pin 11 of N10 and pin 12 of G1, across pin C3 of connector G73 (LTB BLK). Check correct functioning of door open signalling device (refer to "Check Panel")

(\*) If the timer is not interrupted when the ignition key is engaged check continuity of the wiring between pin E5 of G1 and pin 2 of N10 (LTB-RED)

PASSENGER COMPARTMENT COURTESY LIGHT NOT WORKING TEST F

TEST PROCEDURE		RESULT	CORRECTIVE ACTION
F1	CHECK FUSE - Check for damage of the fuse F16 in fusebox G1	OK	Carry out step F2
		OK	Replace fuse (7.5A)
F2	CHECK VOLTAGE - Verify 12V between pin 3 and 2 of courtesy light F3	OK	Carry out step F3
		OK	Carry out step F4
F3	CHECK BULB - check for damage of the courtesy light bulb F3	OK	Check and if necessary replace the complete courtesy light F3
		OK	Replace the bulb
F4	CHECK VOLTAGE - Verify 12V at pin 2 of F3	OK	Carry out step F5
		OK	Restore wiring between pin 6 of timer N10 and pin 2 of F3, across courtesy light F5 (RED). If the luggage compartment light also does not work: refer to the successive test H.
F5	CHECK GROUND - Verify 0V at pin 3 of F3	OK	Carry out step F6
		OK	Restore wiring between pin 3 of F3 and ground G63b (BLK)
F6	CHECK GROUND - Open a door, and immediately, verify 0V at pin 1 of F3	OK	Replace the complete courtesy light F3
		OK	Restore wiring between pin 1 of F3 and pin 9 of timer N10 (WHT-BLK). If necessary, check for correct functioning of the timer N10 (refer to the preceding test D)

CENTRAL COURTESY LIGHT NOT WORKING TEST E

NOTE: If the controls of the central courtesy light are not illuminated when the sidelights are on, check the continuity between between pin 2 of F35 and pin C1 of the fusebox G1 (YEL-BLK), and check the sidelights circuitry (refer to "Sidelights")

TEST PROCEDURE		RESULT	CORRECTIVE ACTION
E1	CHECK FUSE - Check that fuse F16 of the fusebox G1 is not outaged	OK	Carry out step E2
		OK	Replace the fuse (7.5A)
E2	CHECK VOLTAGE - Verify 12V between pin 3 and 4 of courtesy light F35	OK	Carry out step E3
		OK	Carry out step E4
E3	CHECK BULBS - Check for damage of the courtesy light bulbs F35: spot light bulb, two bulbs of the courtesy light, two bulbs lighting the controls.	OK	Check and replace the entire group F35 if necessary
		OK	Replace faulty bulbs
E4	CHECK VOLTAGE - Check 12V at pin 4 of F35	OK	Carry out step E5
		OK	Restore wiring between pin E8 of G1 and pin 4 of F35, and across the solder (RED)
E5	CHECK GROUND - Verify 0V at pin 3 of F35	OK	Carry out step E6
		OK	Restore wiring between pin 3 of F35 and ground G63b, and across the solder (BLK)
E6	CHECK GROUND - Open a door, and immediately verify 0V at pin 1 of F35	OK	Replace the complete courtesy light F35
		OK	Restore wiring between pin 1 of F35 and pin 8 of the timer N10, across pin C2 of connector G73 (RED-GRN). If necessary, also check the correct functioning of timer N10. (refer to the preceding test D)

LIGHT ILLUMINATING IGNITION SWITCH NOT WORKING (*)		TEST G
TEST PROCEDURE	RESULT	CORRECTIVE ACTION
G1   CHECK FUSE - Check for damage of fuse F16 in fusebox G1	OK <input type="checkbox"/> <del>OK</del> <input type="checkbox"/>	Carry out step G2  Replace fuse (7.5A)
G2   CHECK VOLTAGE - Open a door, and immediately, verify 12V between pin 1 and 2 of light F16	OK <input type="checkbox"/> <del>OK</del> <input type="checkbox"/>	Carry out step G3  Carry out step G4
G3   CHECK BULB - Check for damage of the bulb of light F16	OK <input type="checkbox"/> <del>OK</del> <input type="checkbox"/>	Check and if necessary replace the complete courtesy light F16  Replace the bulb
G4   CHECK GROUND - Open a door, and immediately, verify 0V at pin 2 of F16	OK <input type="checkbox"/> <del>OK</del> <input type="checkbox"/>	Restore wiring between pin 1 of F16 and connector D of G1, and across the solder (RED)  Restore wiring between pin 2 of F16 and pin 8 of timer N10, across pins C2 of connector G73 (RED- GRN).

(\*) present up to chassis N. \_\_\_\_\_

LUGGAGE COMPARTMENT COURTESY LIGHT NOT WORKING		TEST H
TEST PROCEDURE	RESULT	CORRECTIVE ACTION
H1   CHECK FUSE - Check for damage of fuse F16 in fusebox G1	OK <input type="checkbox"/> <del>OK</del> <input type="checkbox"/>	Carry out step H2  Replace fuse (7.5A)
H2   CHECK VOLTAGE - With boot open, verify 12V between pin 1 and 2 of luggage compartment courtesy light F5	OK <input type="checkbox"/> <del>OK</del> <input type="checkbox"/>	Carry out step H3  Carry out step H4
H3   CHECK BULB - Check for damage of the courtesy light bulb F5	OK <input type="checkbox"/> <del>OK</del> <input type="checkbox"/>	Check and if necessary replace the complete courtesy light F5  Replace the bulb
H4   CHECK VOLTAGE - Verify 12V at pin 2 of F5	OK <input type="checkbox"/> <del>OK</del> <input type="checkbox"/>	Carry out step H5  Restore wiring between pin 6 of timer N10 and pin 2 of F5 across pin 2 of connector G281 (where applicable) (RED)
H5   CHECK GROUND - Verify 0V at pin 1 of switch H24	OK <input type="checkbox"/> <del>OK</del> <input type="checkbox"/>	Carry out step H6  Restore wiring between pin 1 of H24 and ground G63B, across the solder and pin A2(A1**) of connector G307 (BLK)
H6   CHECK GROUND - With boot open, verify 0V at pin 2 of H24	OK <input type="checkbox"/> <del>OK</del> <input type="checkbox"/>	Restore wiring between pin 2 of H24 and pin 1 of F5, across pin C2(A7**) of G307 and pin 1 of connector G281 (where applicable) (GRY-WHT)  Replace switch H24

(\*\*) from chassis N. \_\_\_\_\_

**INSTRUMENT PANEL NOT ILLUMINATED** **TEST I**

NOTE: if none of the indicators and warning lamps on the instrument panel are working, check for correct supply; refer to "Instrument panel: supply and ground"  
If the occasional lamp works, immediately carry out step L2.

TEST PROCEDURE	RESULT	CORRECTIVE ACTION
I1 CHECK GROUND - Verify, with key rotated and rheostat B16 in the position of maximum illumination, 0V at pin C1 of the instrument panel C10	OK <del>OK</del>	Carry out step I2  Restore wiring between pin C1 of C10 and pin 1 of rheostat B16 (YEL), and between pin 3 of B16 and ground G1-48b (BLK)
I2 CHECK BULBS - Check for damage of the ten lamps on the instrument panel C10	OK <del>OK</del>	Check and if necessary replace the complete instrument panel C10  Replace faulty bulbs

**INSTRUMENT PANEL ILLUMINATION REGULATION DEVICE NOT WORKING** **TEST J**

NOTE: before carrying out the following test, check that the sidelights are working correctly (refer to section "Sidelights")

TEST PROCEDURE	RESULT	CORRECTIVE ACTION
J1 CHECK VOLTAGE - With the ignition switch turned and the sidelights switched on, verify 12V between pin 2 and 3 of rheostat B16	OK <del>OK</del>	Replace rheostat B16  Carry out step J2
J2 CHECK RHEOSTAT - With the ignition switch turned and the sidelights switched on, check that the resistance between pins 3 and 1 of B16 varies when the adjustment wheel is rotated	OK <del>OK</del>	Restore wiring between pin H8 of G1 and pin 2 of B16, and across the solder (YEL-BLK)  Replace rheostat B16

FOREWORD

Different instrument clusters are installed on the 155 depending on the version: in addition to the "base" cluster A, the only one installed on the first cars (up to chassis no. ...), cluster B is supplied with more shooting features and instruments with "depth effect".

On other versions (1.7 and 1.8 T.S.) the simplified cluster C is installed, in which the warning lights and indicators are reduced to the essential.

From the '95 version (from chassis no. ...), instead of B, a new cluster D, with "depth effect" instruments is installed.

N.B. for the 1.7 T.S. version the simplified version (type C) remains, with the addition of the "ALFA ROMEO CODE" warning light.

The various types of clusters have a different internal electronic board (see "inner circuitry") therefore the connection of certain warning lights is also different.

INSTRUMENT PANEL

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BRAKING SYSTEM WARNING LAMPS . . . . . 13-8
ENGINE OIL GAUGES . . . . . 13-11
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TROUBLESHOOTING . . . . . 13-26

GENERAL DESCRIPTION

The instrument panel supplies information and indications relative to the state of the vehicle which are indispensable for safe and relaxed driving.

The instrument is of the analog type with two large indicators for the speedometer and the rev counter, and other indicators for engine oil pressure and temperature, fuel level and engine coolant temperature.

Numerous, evident warning lamps contribute the information available to the driver.

N.B. The instrument panel is manufactured as a single component, all the internal connections are carried on a printed circuit which unites the instrument controls and the various warning lamps. It is not therefore possible to carry out repairs apart from the simple operation of replacing the warning light bulbs.

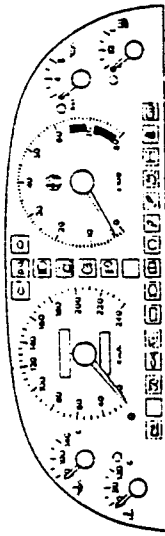
Note: The wiring diagram has been divided into 6 parts

The first five charts describe some of the specific functions which are not given elsewhere and which are connected only to the indications on the instrument panel. Other functions, particularly the warning lamps, are given in the system or installation diagrams, to which they refer. For example, the dipped beam headlight warning lamp is given in the diagram "Main and dipped beam headlights", etc.

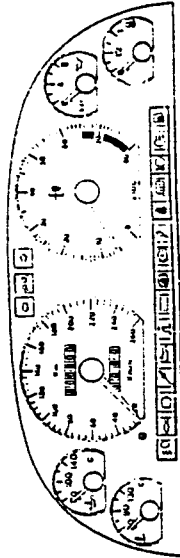
The sixth chart gives all the internal connections on the printed circuit.

N.B.: The first chart illustrates the connections which supply power (+) and ground (-), at the successive points, these lines are not given even though at least one of them is implied, i.e. and ground signal reaching a warning lamp implies that the warning lamp is connected to the power supply inside the instrument and this connection is indicated with the symbol (+) or (-) and can easily be located in the internal chart.

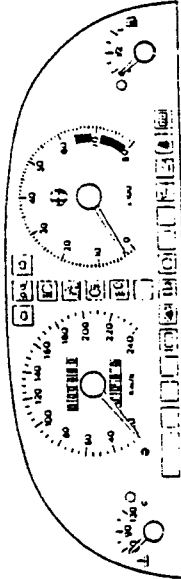
The instrument panel lighting is supplied when the sidelights are switched on and is regulated by a rheostat (R) for the "depth effect" (see also the "depth effect" lights).



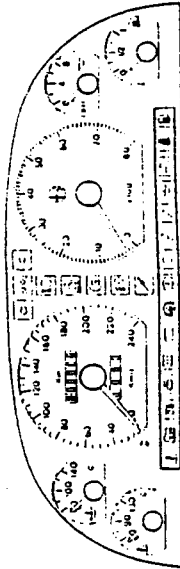
"Basic" INSTRUMENT PANEL A



Sports type INSTRUMENT PANEL B



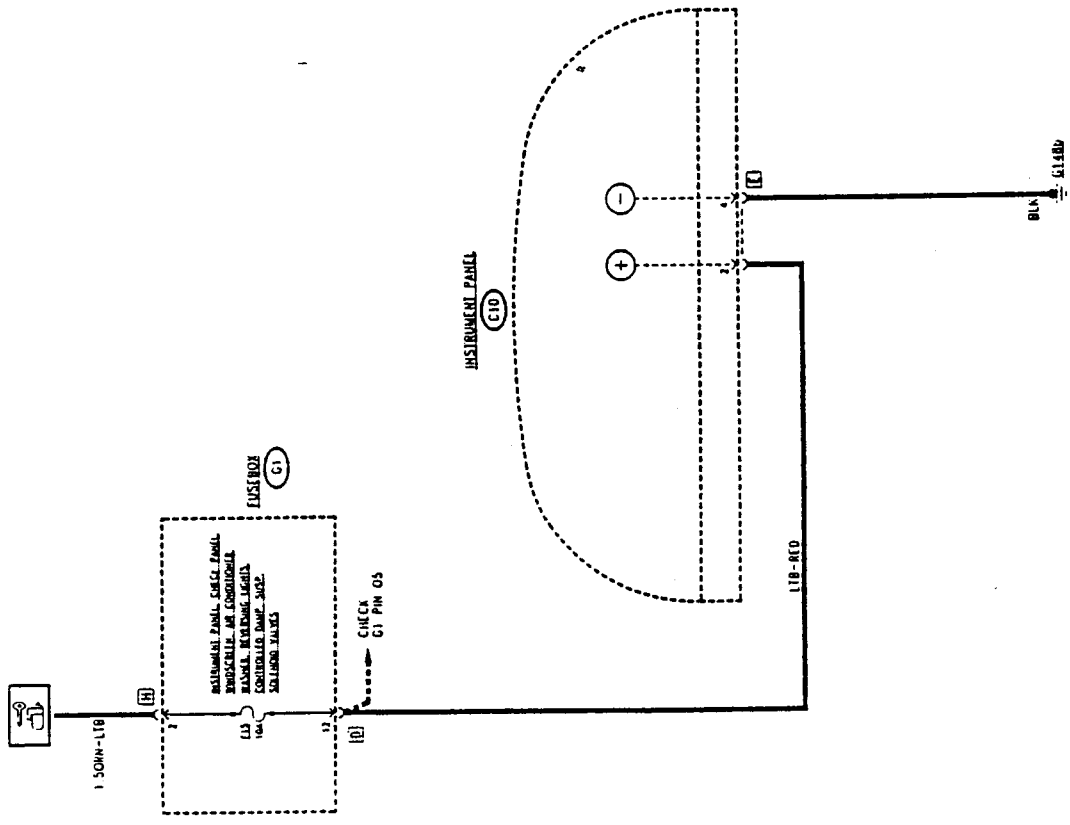
Simplified INSTRUMENT PANEL C



'95 Version INSTRUMENT PANEL D

### SUPPLY AND GROUND

#### Wiring diagram



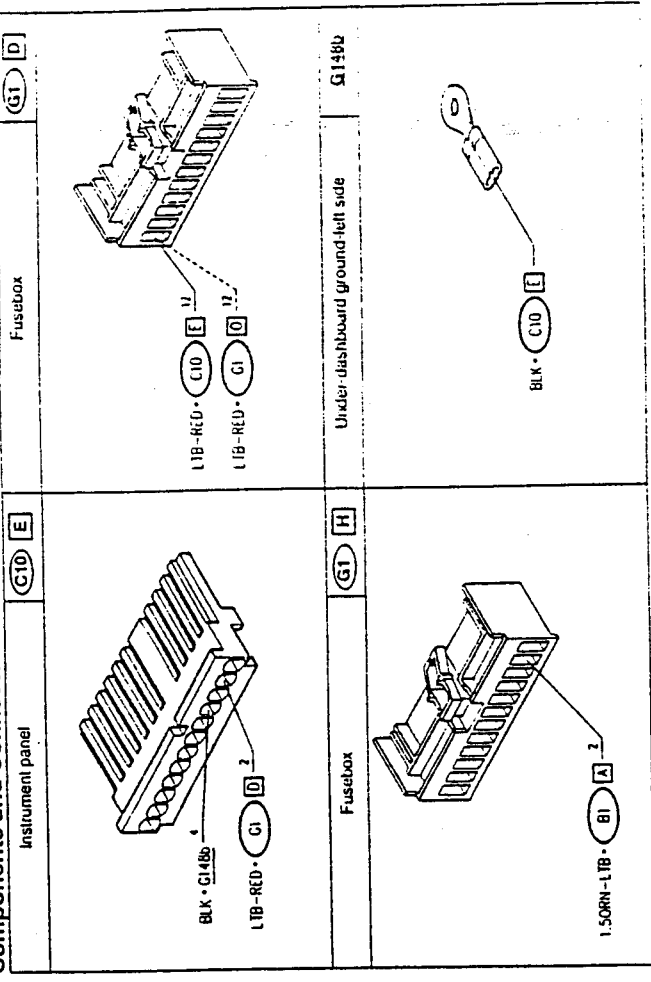
### Functional description

The instrument panel is supplied by battery voltage through fuse F15 (10A) in

fusebox G1. The connection is made at pin 2 of connector E of the instrument panel C10. Instrument panel C10 is grounded via

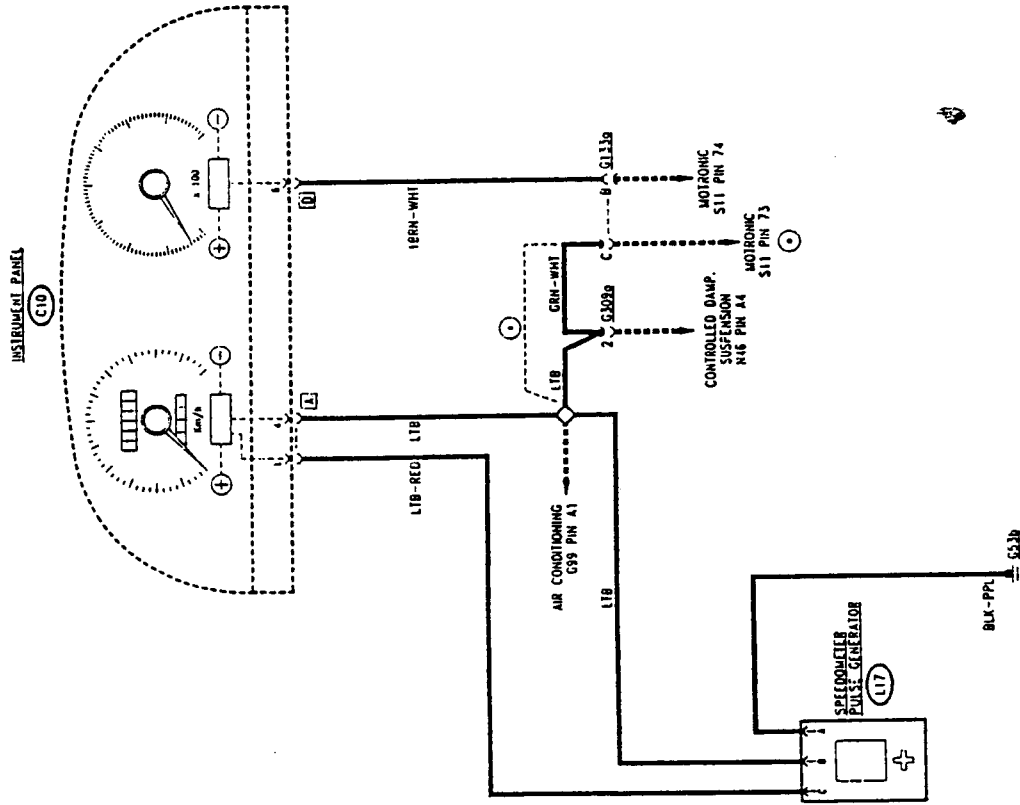
the cable coming out of pin 4 of connector E towards ground G148b

### Components and Connectors



### REV COUNTER AND SPEEDOMETER

#### Wiring diagram



of a Hall effect probe, generates and processes a signal which is proportional to the speed of the drive shaft exiting the gearbox, and therefore of the wheels.

Sensor L17 is supplied at pin C with the same power supply as the instrument panel (from Pin 1 of connector A of C10); pin A is connected to the battery through the wire while the speedometer signal leaves pin B (proportional to the speed of the vehicle), which is sent to instrument panel C10 at pin 4 of connector A, and here to the electronic device which actualises the speedometer and the two odometers (total and partial).

The same signal is also sent to some of the systems which require information regarding the speed of the vehicle:

- through connector G89 to the controlled damping system and in particular to the control unit Q21a which controls the operation of the tachator electric fan when the vehicle is at rest (see "Automatic heating/ventilation system with air conditioner");
- through connector G309a to the control unit M46 of the suspension control, which regulates the rigidity of the suspension system on the basis of the speed of the vehicle (see "controlled damping suspension");
- across the connector G133a to the Motronic control unit S11 (only from chassis N ...)

The rev counter signal is supplied to the instrument panel by the Motronic control unit S11 which receives a signal proportional to the number of the revolutions of the engine detected by the sensor S23; (see "Motronic ignition and injection system").

The signal reaches instrument panel C10 at pin 6 of connector D arriving from Motronic which connects to connection G133a which connects to Motronic with the other circuits: inside the instrument panel it reaches the electronic device which actualises the rev counter.

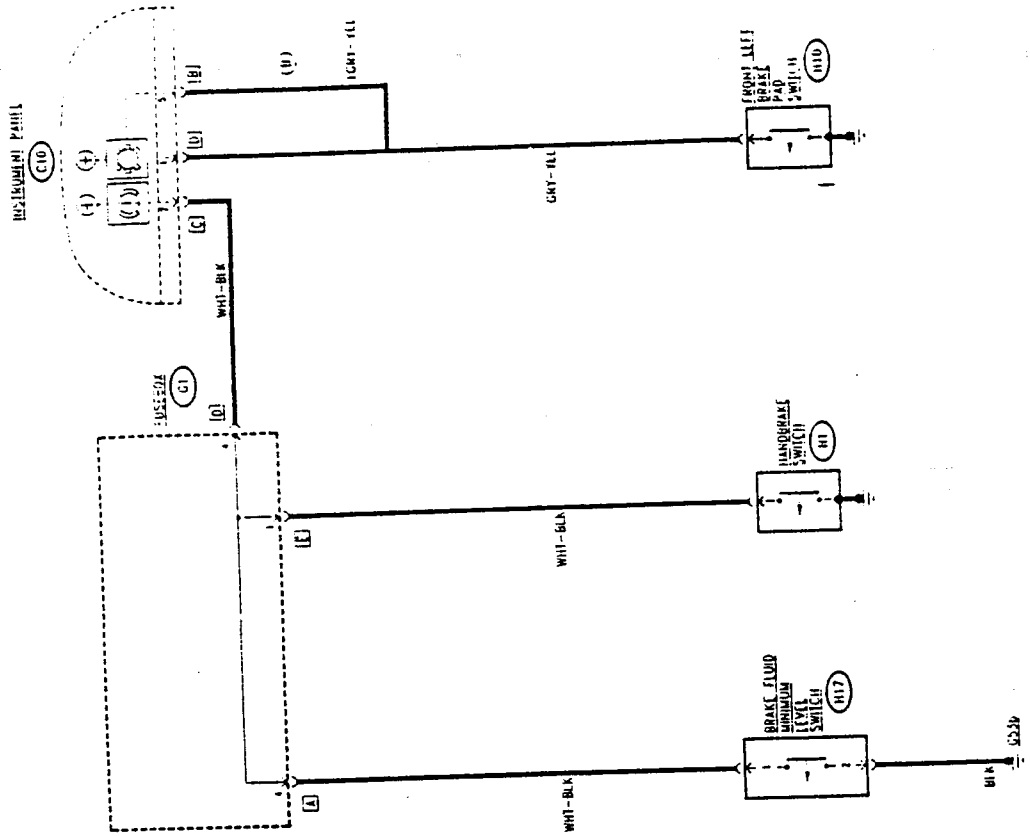
The speedometer signal is supplied by the speedometer sensor L17; this, installed on the gearbox, detects the speed of the vehicle at all times. It is an impulse generator which, by way

(\*) from chassis N  
 (\*) variation for versions without controlled damping suspension



BRAKING SYSTEM WARNING LAMPS

Wiring diagram



(D) Only for sports type panel

Components and Connectors

<p>Instrument panel</p>	<p>Instrument panel</p>
<p>Engine compartment ground-left side</p>	<p>Electronic ignition-injection wiring A</p>
<p>Controlled damping suspension A</p>	<p>Speedometer pulse generator</p>

(\*) variation for versions without controlled damping suspension

**Functional description**

Three warning lamps alert the driver in case of problems in the braking system. The brake pad switch H10, which is turned by a microswitch located on the pads, is grounded when the pad becomes too thin and as a result sends a signal to the instrument panel C10 at pin 1 of connector D (pin 5 of connector B for the sports-type instrument panel B) and lights the relative "brake pad wear" warning lamp.

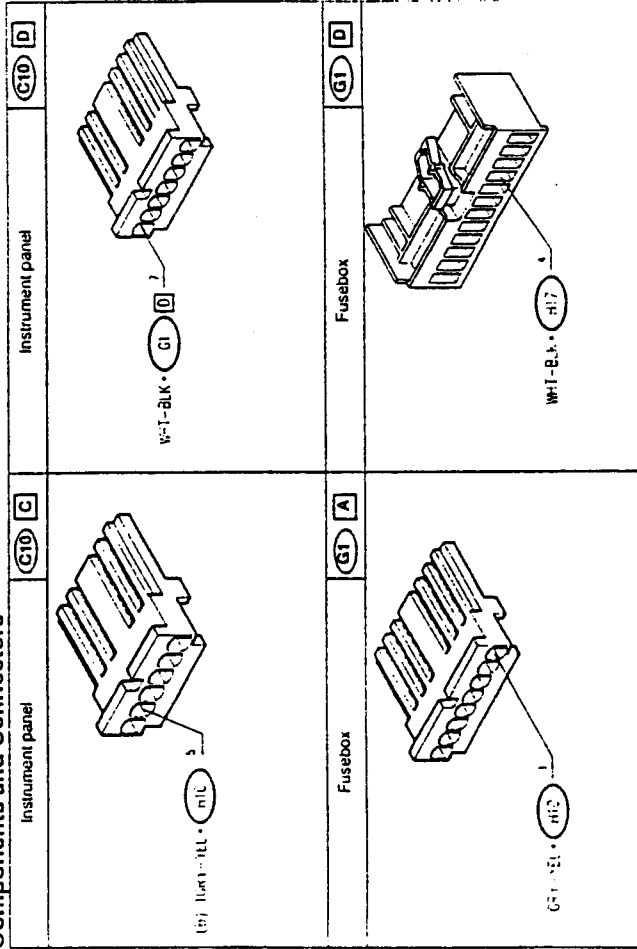
The handbrake switch H1 and the brake fluid minimum level check switch H17 (these also are two microswitches which send a ground signal) supply the signal to the instrument panel C10 at pin 7 of connector C; both react by lighting the "handbrake on or low brake fluid level" warning lamp.

The first closes when the handbrake lever is raised and the second when the level of fluid in the braking system falls below a certain level in the reservoir.

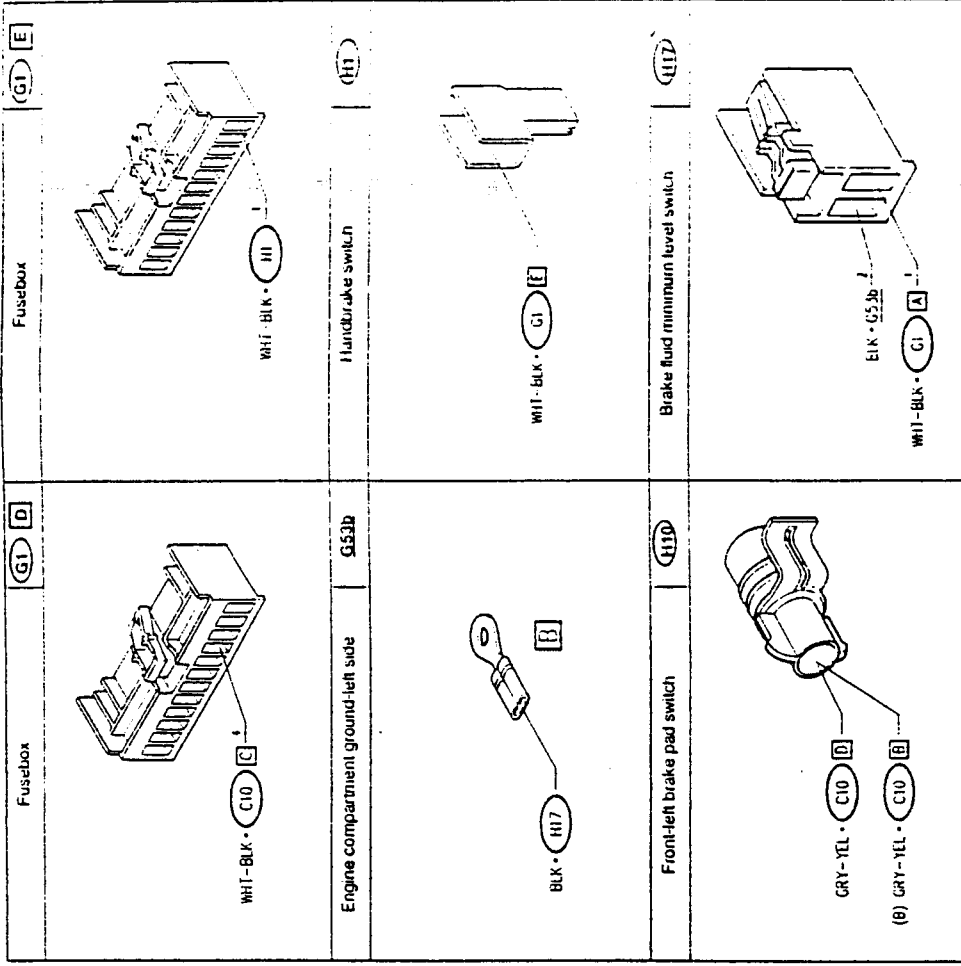
The third warning lamp relative to the

braking system is that of the "ABS system malfunction" which is described in that section (see "ABS system").

**Components and Connectors**

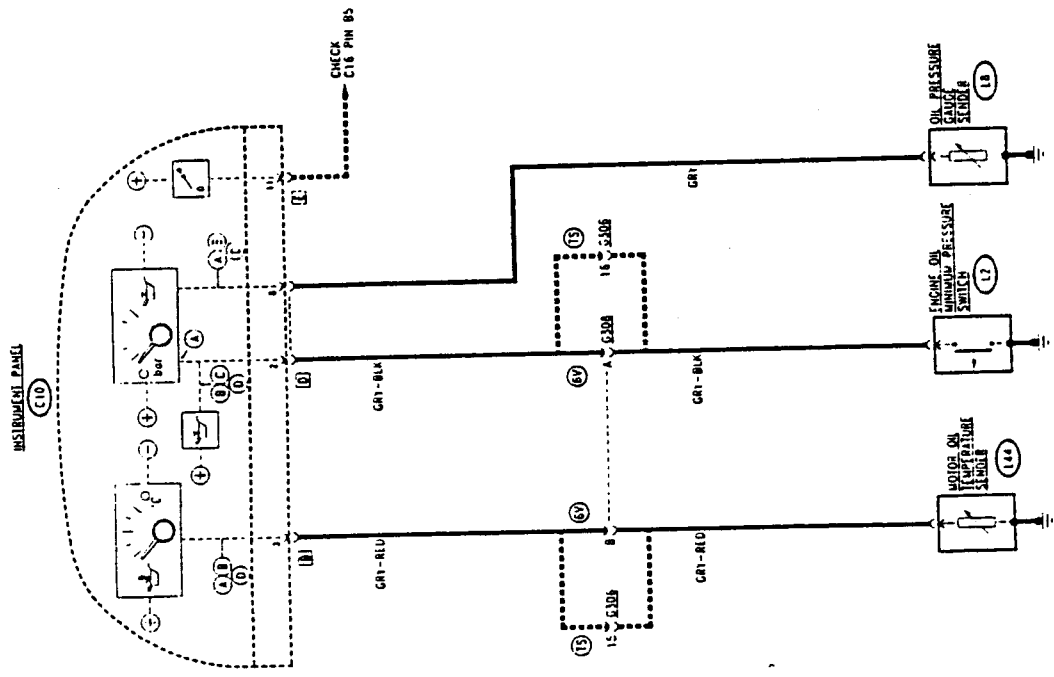


(B) Only for sports-type panel



(B) Only for sports-type panel

### ENGINE OIL GAUGES Wiring diagram



(A) Basic instrument panel  
 (B) Sports type panel  
 (C) Simplified panel  
 (D) '95 version instrument panel

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sends an analog ground signal to the instrument panel at pin 3 of connector B for the analog oil temperature gauge. A thermostat is in contact with the engine oil and detects the temperature.

In addition the minimum oil pressure pressure switch L2, also installed on the engine block, closes when the pressure falls below 0.2-0.5 bar (engine 2.5 6V) or 0.15-0.45 bar (engine T Spark), sending a ground signal to the instrument panel C10 at pin 2 of connector D and lighting the "engine oil minimum press-

**Functional Description**

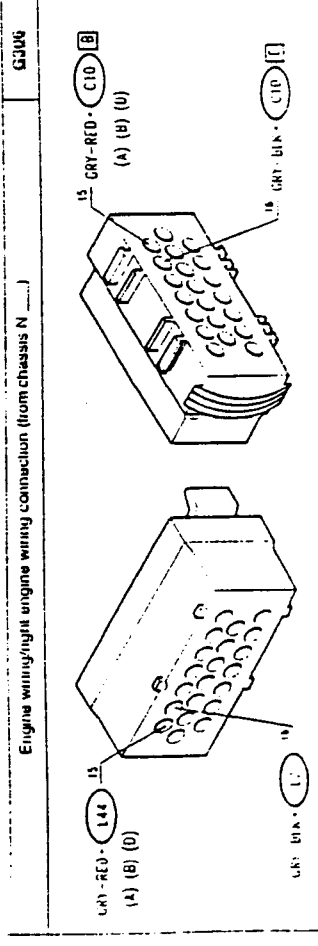
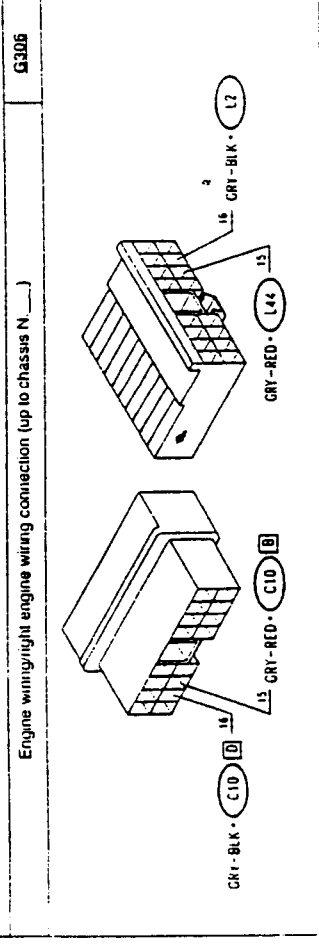
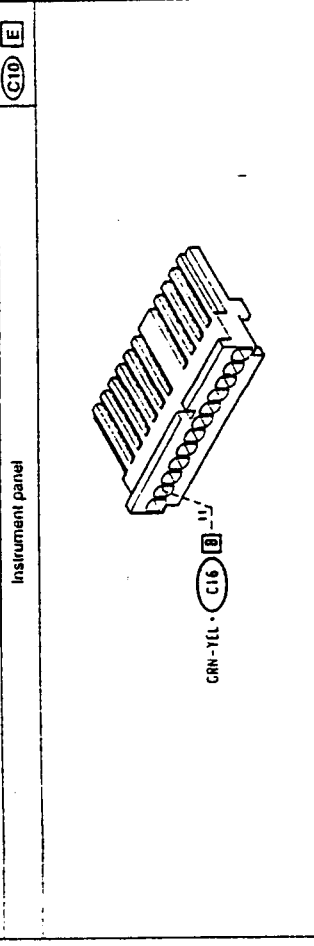
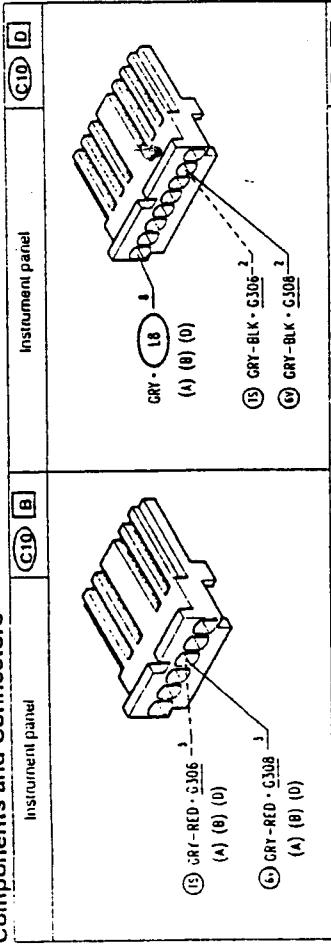
The oil pressure gauge sender L8 (not present in the simplified C version) sends a ground signal to pin 8 of connector C of the instrument panel C10 for the analog oil pressure gauge. This is a pressure switch which, located in the correct position on the engine block, generates a signal which is proportional to the engine oil pressure.

The oil temperature sender L44 (not present in the simplified C version)

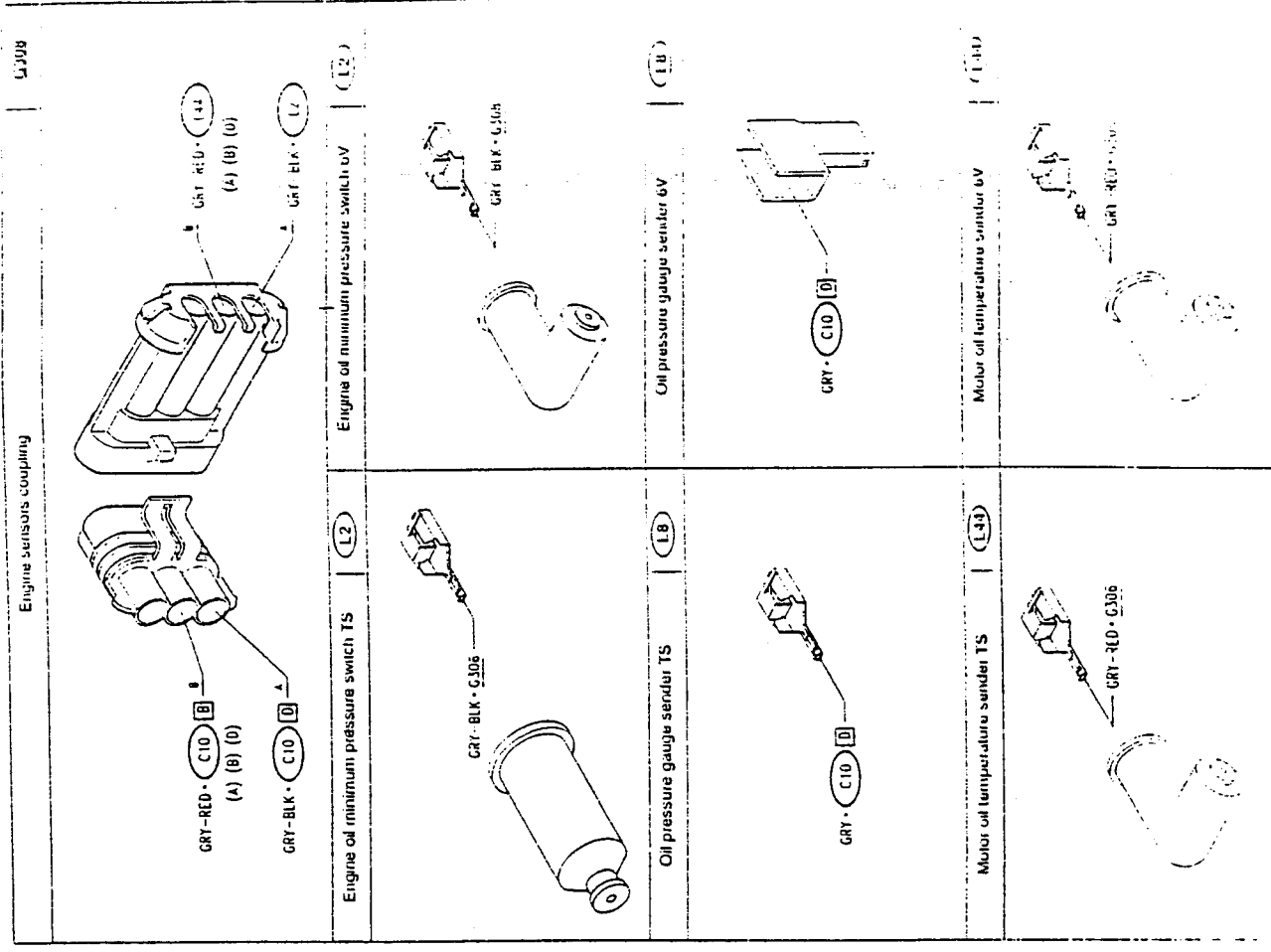
ure" warning lamp. This warning light can be found inside the gauge but the basic A version whereas it is separate in the other versions.

The "engine oil minimum level" warning lamp is connected to the Check Panel C16 (see "Check Panel") which, if the oil in the sump falls below a certain level lights the relative Led and sends a signal to instrument panel C10 at pin 11 of connector E.

Components and Connectors



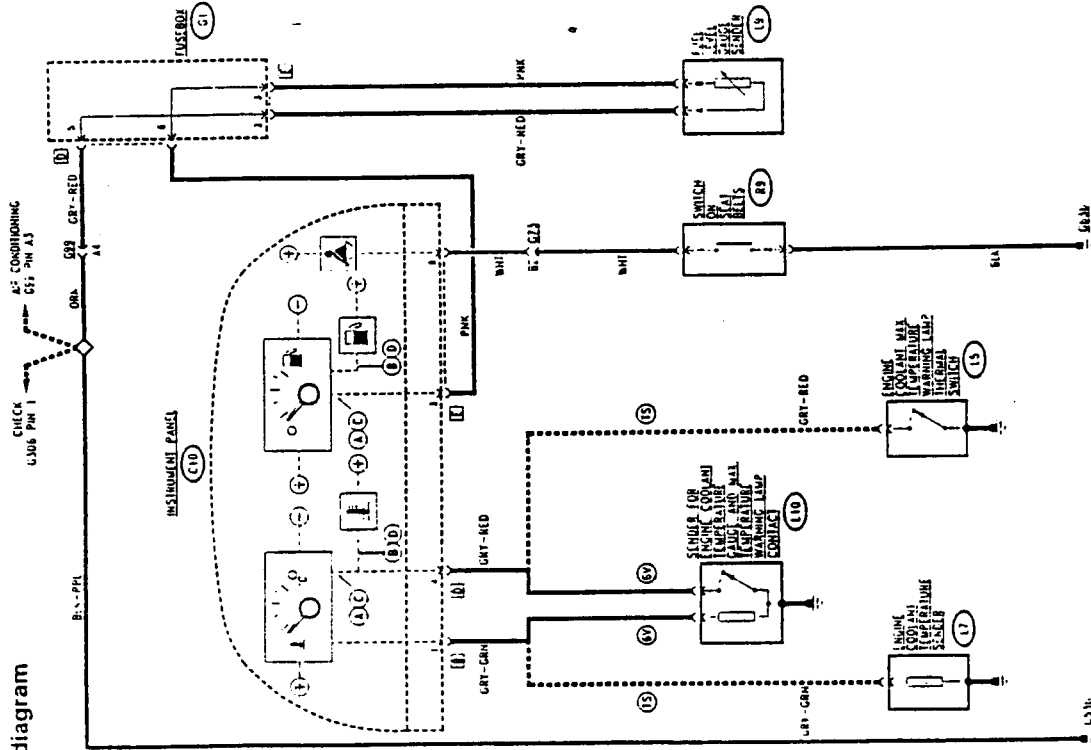
(A) basic instrument panel (B) sports type panel (C) simplified panel (D) '95 version instrument panel



(A) basic instrument panel (B) sports type panel (C) simplified panel (D) '95 version instrument panel

VARIOUS INDICATIONS

Wiring diagram



(A) Basic instrument panel  
 (B) Sporty type panel  
 (C) Simplified panel  
 (D) 95 version instrument panel

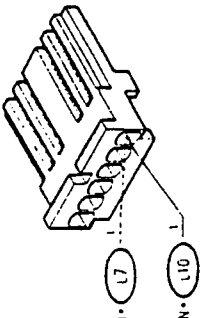
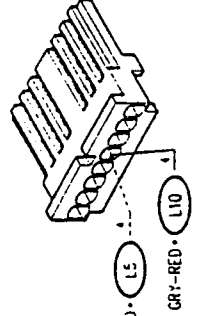
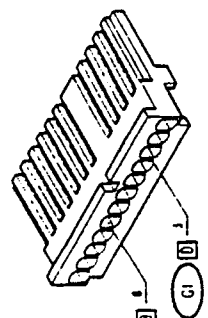
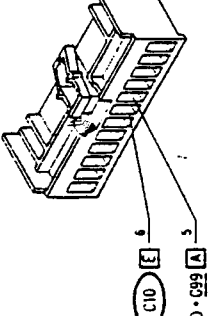
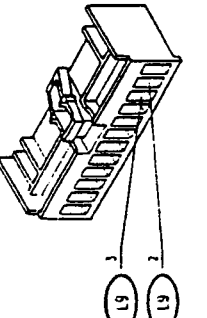
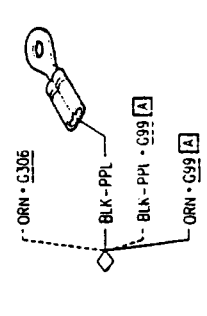
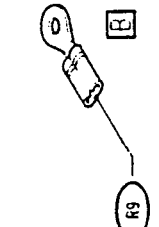
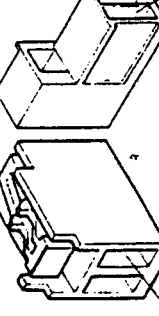
Functional description

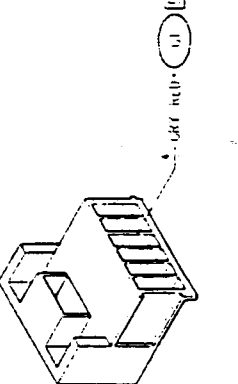
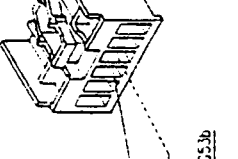
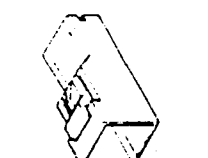
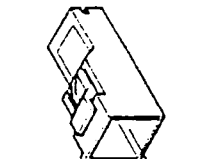
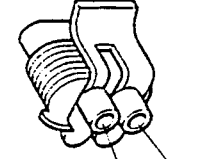

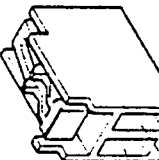
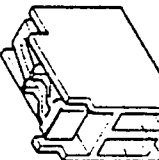
The temperature of the engine coolant is displayed continuously by the analog indicator, while excessively high levels are signalled by the "engine coolant maximum temperature" warning lamp. This warning light can be found inside the gauge for the Basic A versions and the simplified C version of the instrument panel while it is separate for the sports-type B version, and the '95 version (D). The engine coolant temperature sender and maximum temperature warning lamp contact L10 (for engine 2.5 6V) installed on the engine head comprise a thermistor which generates a signal in proportion to the temperature of the engine coolant and a contact which closes when the fluid reaches 115°C. The list is sent to instrument panel C10 to pin 1 of connector B, while the second

goes to the pin 4 of connector D. For the T, Spark engines the sender L7 and the thermal switch L5 are separate but carry out the same function (in this case the contact closes at 118°C), and the electrical connection is the same. The fuel level sender L9 is a sensor which is immersed in the fuel tank and the resistance varies depending on the level in the tank itself (from 0.7 Ohm with a full tank to 290-310 Ohm when the tank is empty). A ground signal reaches pin A of L9, while a signal proportional to the level is sent by pin B through the fuse box to the instrument panel C10 at pin 3 of connector E. Inside the fuel level gauge an electronic device selects the signal corresponding to the reserve (262 Ohm, corresponding to about 7 litres) and lights the

relative warning lamp. This warning light can be found inside the gauge for the Basic A version and the simplified C version of the instrument panel while it is separate for the sports-type B version, and the '95 version (D). The seat belt switch H9 is located on the fastening mechanism of the driver's seat belt when the belt is correctly fastened a contact is opened and the ground signal towards the instrument panel C10 (pin 8 of connector E) interrupted which puts out the "seat belt not fastened" warning lamp. The other warning lamps not described in this section are included in the installations or systems charts to which they refer.

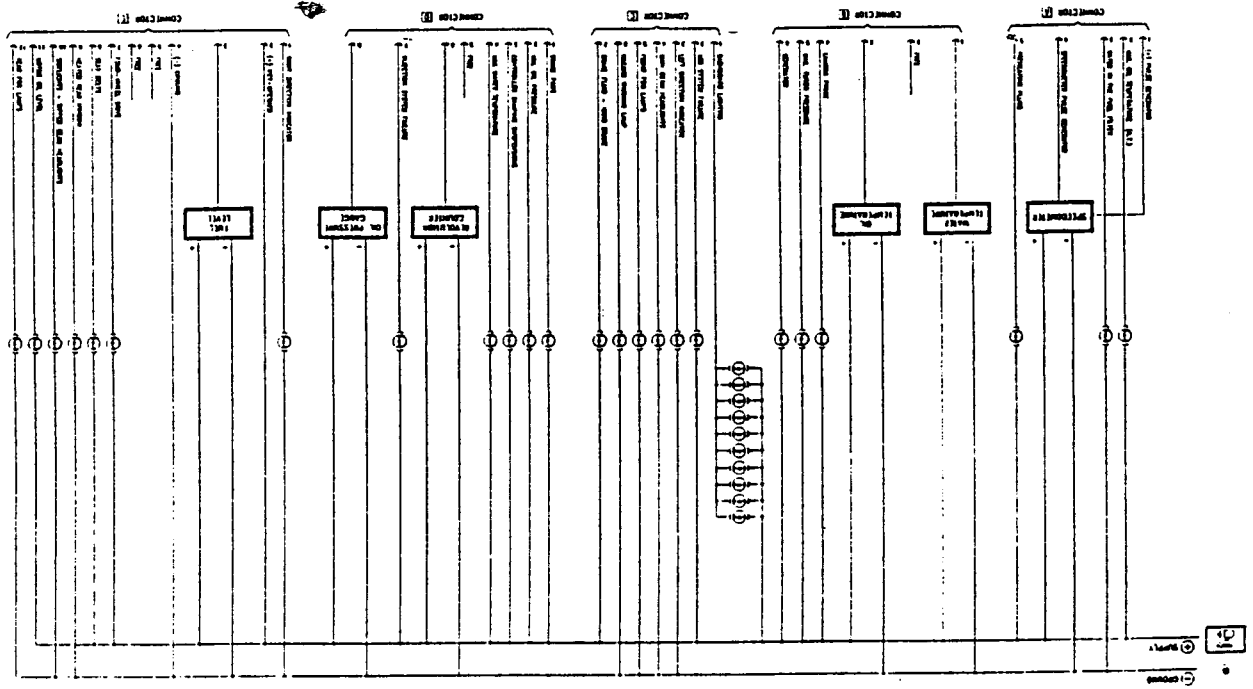
Components and Connectors

<p>Instrument panel</p>  <p>⑬ WHI - GRN • L7 ⑭ GRN - GRN • L10 ⑮ GRN - RED • L5 ⑯ GRN - RED • L10</p>	<p>Instrument panel</p>  <p>⑰ GRN - RED • L5 ⑱ GRN - RED • L10</p>
<p>Instrument panel</p>  <p>⑰ WHI • C13 ⑱ GRN • C1</p>	<p>Fusebox</p>  <p>⑰ GRN - RED • C99 ⑱ GRN - RED • C99 ⑲ GRN - RED • C99</p>
<p>Fusebox</p>  <p>⑲ GRN - RED • L9 ⑳ GRN - RED • L9 ㉑ GRN - RED • L9</p>	<p>Engine compartment ground-left side</p>  <p>⑰ GRN • C306 ⑱ GRN • C306 ⑲ GRN • C306</p>
<p>Rear left ground</p>  <p>⑲ GRN • C19</p>	<p>Connector for rear services</p>  <p>⑰ WHI • C10 ⑱ GRN • C10 ⑲ WHI • C10</p>

<p>Dash/hood/engine connection</p>  <p>⑰ GRN • C306 ⑱ GRN • C306 ⑲ GRN • C306 ㉑ GRN • C306 ㉒ GRN • C306</p>	<p>Engine coolant max. temperature warning lamp thermal switch</p>  <p>⑰ GRN - RED • C10</p>
<p>Engine coolant temperature sender</p>  <p>⑰ GRN - GRN • C10</p>	<p>Engine coolant max. temperature warning lamp</p>  <p>⑰ GRN - RED • C10</p>
<p>Fuel level gauge sender</p>  <p>⑰ GRN • C10 ⑱ GRN • C10 ㉑ GRN • C10</p>	<p>Sender for engine coolant temperature gauge and max. temperature warning lamp contact</p>  <p>⑰ GRN - RED • C10 ⑱ GRN • C10 ㉑ GRN • C10</p>
<p>Switch on seat belts</p>  <p>⑰ WHI • C13 ⑱ GRN • C13 ㉑ WHI • C13</p>	<p>Switch on seat belts</p>  <p>⑰ WHI • C13 ⑱ GRN • C13 ㉑ WHI • C13</p>

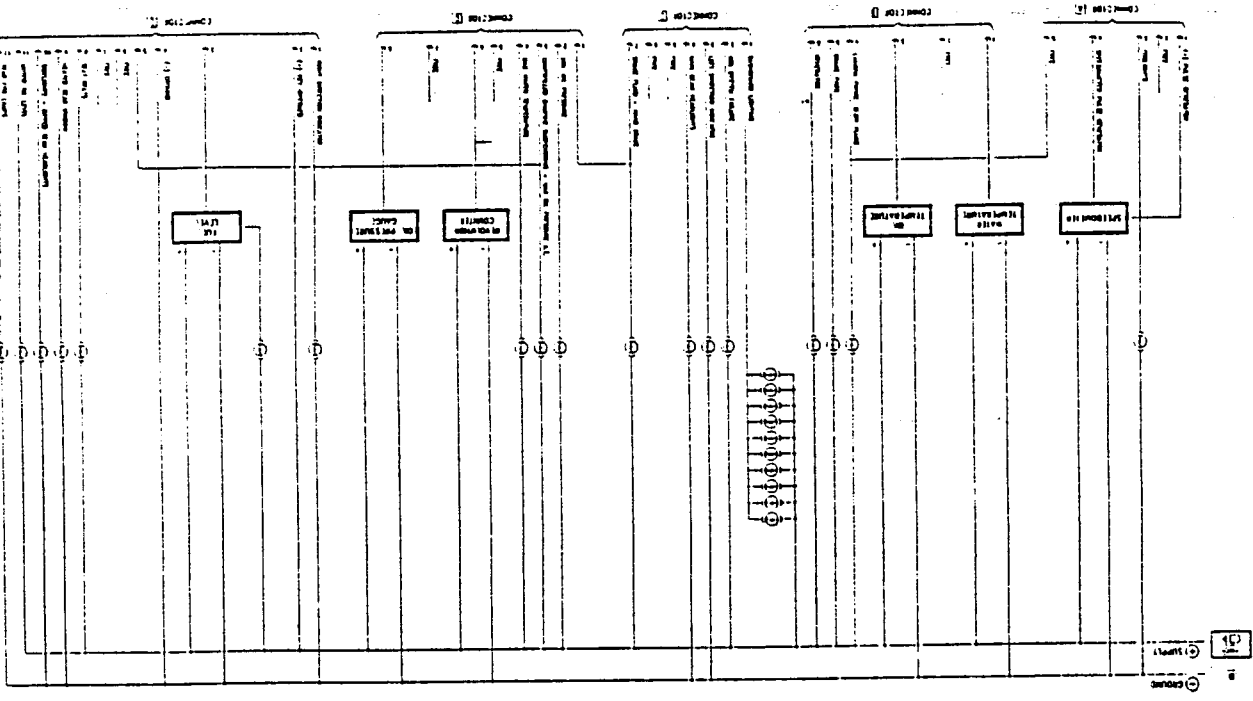
INTERNAL CHART

Wiring Diagram, basic A version



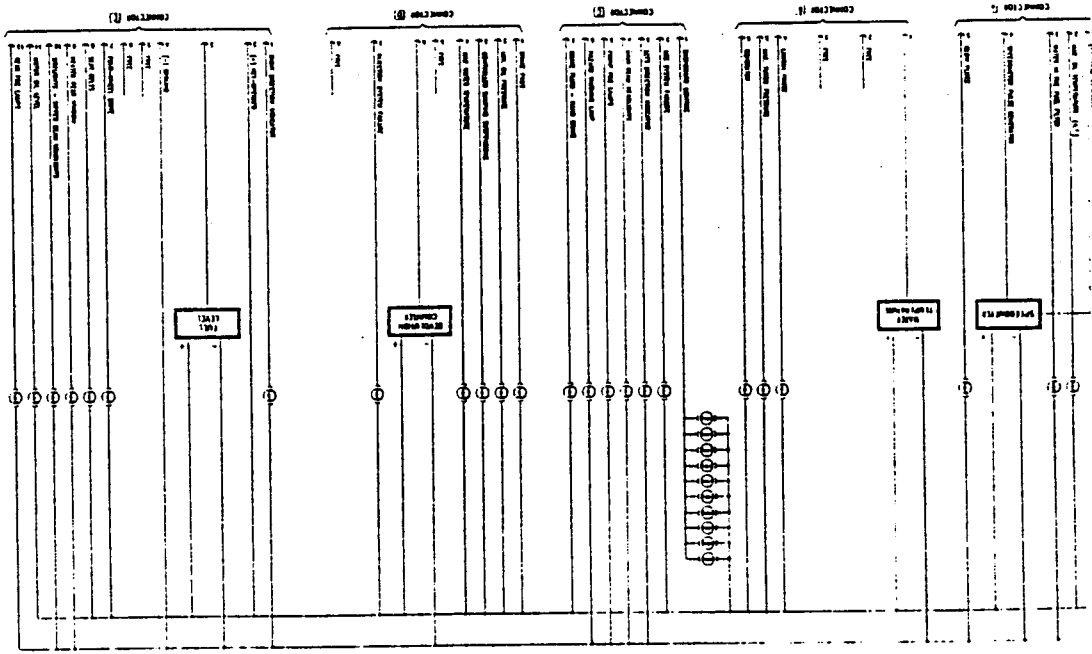
INTERNAL CHART

Wiring Diagram, sports type B version



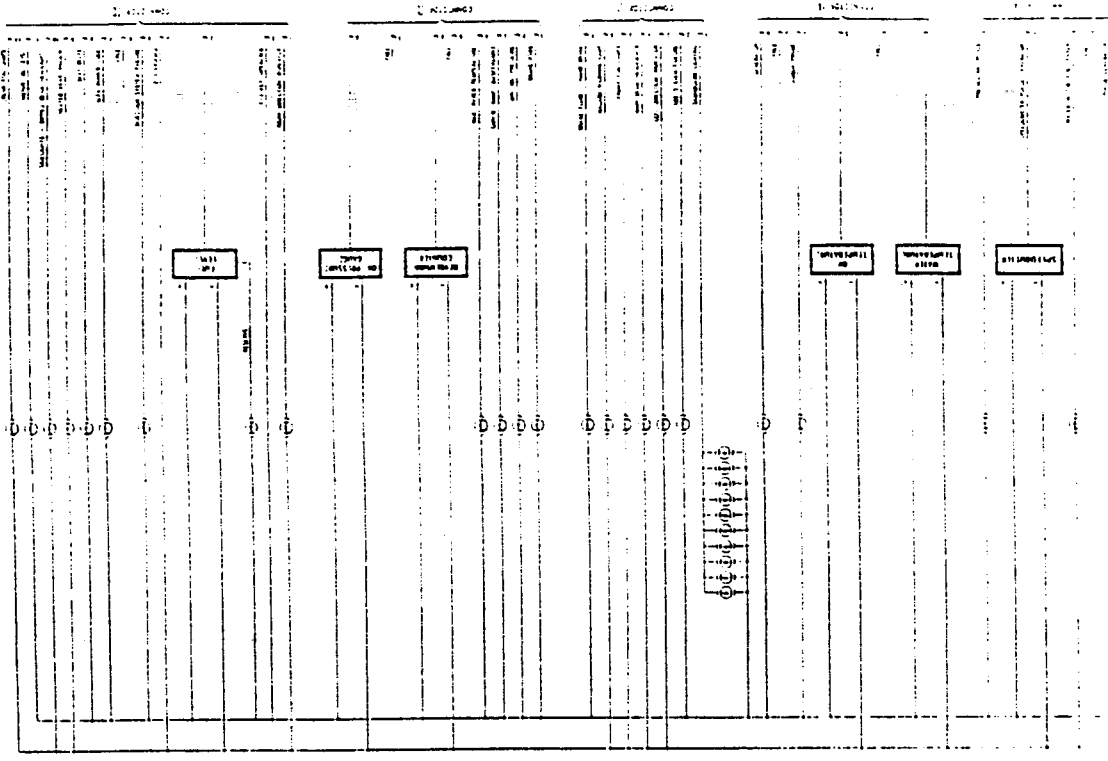
INTERNAL CHART

Wiring Diagram, simplified C version



INTERNAL CHART

Wiring Diagram, '95 D version





### Functional Description

This electrical chart represents the printed circuit and the connections within the instrument panel C10. This chart differs therefore with regards the different types of panel as described in the "Foreword" of this section in the other charts relative to the external

connections of the instrument panel (or in those of the single circuits which are connected to warning lamps in the instrument panel) only the relevant lines are represented while this chart makes it possible to have an overall picture of the instrument panel C10.

**NOTE:** not all the output pins are connected for all versions of the vehicle: in this chart lines which are not in use may be found (for example warning lamps not connected) but present in the printed circuit.



TROUBLESHOOTING TABLE

Malfunction	Component												
	E15	(C10)	(L17)	(LB)	(L44)	(L2)	(L10)	(L9)	(FB)	(H17)	(H1)	(H10)	Test
All lights on instrument panel die out	•												A
Speedometer	•												B
Rev counter	•												C
Oil press gauge**	•		•										D
Oil temp. gauge**	•			•									E
Water temp. gauge	•					•							F
Fuel gauge	•						•						G
Handbrake warning lamp	•								•				H
Brake pad warning lamp	•									•			I
Min oil press warning lamp	•						•						J
Max water temp. warning lamp	•							•					K
Seat belt warning lamp	•										•		L

\* (L15) L5 e L7

\*\* not present in the simplified cluster C

The malfunctions of warning lamps not indicated in this section should be sought in the section relative to the system to which they refer, e.g. for the dipped beam warning lamp refer to the section "Main and dipped beam headlights".

NOTE:  
The malfunctions described below, for example the "warning lamp not working", are a grouping of all the cases in which the behaviour of the warning lamp does not correspond to the correct operation: e.g. the warning lamp comes on to signal an anomaly which does not exist or vice-versa, a function is selected and the warning lamp does not show it, etc.

TROUBLESHOOTING

THE INSTRUMENT PANEL IS COMPLETELY OUT

TEST A

NOTE: if the indicators and warning lights are working normally but the instrument panel does not light up, refer to "Indicator lighting" test M

TEST PROCEDURE	RESULT	CORRECTIVE ACTION
A1 CHECK FUSE - Check for damage of fuse F15 in fusebox G1	OK	Carry out step A2
	OK	Replace the fuse (10A)
A2 CHECK VOLTAGE - With ignition key engaged, verify 12V between pins E2 and E4 of instrument panel C10	OK	Replace the instrument panel C10
	OK	Carry out step A3
A3 CHECK VOLTAGE - With ignition key engaged, verify 12V at pin E2 of C10	OK	Restore wiring between pin E4 of C10 and ground G148b (BLK)
	OK	Restore wiring between pin D12 of G1 and pin E2 of C10 (LTB-RED)

SPEEDOMETER NOT WORKING		TEST B
TEST PROCEDURE	RESULT	CORRECTIVE ACTION
<b>B1</b> CHECK VOLTAGE - With ignition key engaged, verify 12V between pins A and C of speedometer sensor L17	OK <input checked="" type="checkbox"/>	Carry out step B3
	OK <input checked="" type="checkbox"/>	Carry out step B2
<b>B2</b> CHECK VOLTAGE - With ignition key engaged, verify 12V at pin C of L17	OK <input checked="" type="checkbox"/>	Restore wiring between pin A of L17 and ground G53b (BLK-PPL)
	OK <input checked="" type="checkbox"/>	Restore wiring between pin C of L17 and pin A1 of instrument panel C10 (LTB-RED)
<b>B3</b> CHECK SENSOR - Check for correct functioning of the speedometer sensor operating as follows: • connect pins C and A respectively to 12V and ground • insert the shaft of an electric motor in the sensor • vary the speed of the motor, check that that the frequency of the signal also varies (between 1 and 7.5 V) in output from pin B (speedometer signal)	OK <input checked="" type="checkbox"/>	Carry out step B4
	OK <input checked="" type="checkbox"/>	Replace sensor L17
<b>B4</b> CHECK SIGNAL - Operating as for the preceding step, check that that the speedometer signal reaches pin A4 of instrument panel C10	OK <input checked="" type="checkbox"/>	Replace the instrument panel C10
	OK <input checked="" type="checkbox"/>	Restore wiring between pin B of L17 and pin A4 of C10, also across the solder (LTB)

REV COUNTER NOT WORKING		TEST C
TEST PROCEDURE	RESULT	CORRECTIVE ACTION
<b>C1</b> CHECK SIGNAL - Check the correct functioning and connection of the rpm and timing sensor S31 (refer to the section "Motronic ignition and injection system"). Check that, varying the engine rpm, the output signal from pin 74 of the Motronic control unit S11 varies in frequency	OK <input checked="" type="checkbox"/>	Carry out step C2
	OK <input checked="" type="checkbox"/>	Replace the Motronic control unit S11 (or the rpm and timing sensor S31)
<b>C2</b> CHECK SIGNAL - Operating as for the previous step, check that the rev counter signal reaches pin D6 of instrument panel C10	OK <input checked="" type="checkbox"/>	Replace instrument panel C10
	OK <input checked="" type="checkbox"/>	Restore wiring between pin 74 of control unit S11 and pin D6 of C10, across pin B of connector G133a (BRN-WHT)

OIL PRESSURE INDICATOR NOT WORKING		TEST D
TEST PROCEDURE	RESULT	CORRECTIVE ACTION
<b>D1</b> CHECK SENDER - Check for correct functioning of oil pressure indicator sensor L8: • varying the pressure of the engine oil (e.g. accelerating the engine) the resistance signal in output from pin L8 should vary as a consequence, in accordance with the following table:	OK <input checked="" type="checkbox"/>	Carry out step D2
	OK <input checked="" type="checkbox"/>	Replace sender L8
	OK <input checked="" type="checkbox"/>	Replace the instrument panel C10
<b>D2</b> CHECK SIGNAL - Operating as for the previous step, check that the signal proportional to the pressure reaches pin D8 of instrument panel C10	OK <input checked="" type="checkbox"/>	Restore wiring between L8 and pin D8 of C10 (L47)
	OK <input checked="" type="checkbox"/>	

OIL TEMPERATURE INDICATOR NOT WORKING		TEST E
TEST PROCEDURE	RESULT	CORRECTIVE ACTION
<b>E1</b> CHECK SENDER - Check for correct functioning of oil temperature indicator sender L44: • varying the temperature of the engine oil (e.g. "heating" the engine) the resistance signal in output from pin L44 should vary as a consequence in accordance with the following table:	OK <input checked="" type="checkbox"/>	Carry out step E2
	OK <input checked="" type="checkbox"/>	Replace sender L44
	OK <input checked="" type="checkbox"/>	Replace instrument panel C10
	OK <input checked="" type="checkbox"/>	Restore wiring between: • (TS) L44 and pin B3 of C10 across pin B3 of connector G306 (L47) • (EV) L44 into pin B3 of C10, across pin B3 of connector G308 (HY-RED)

FUEL LEVEL INDICATOR NOT WORKING TEST G

TEST PROCEDURE		RESULT	CORRECTIVE ACTION
G1	<p><b>CHECK SENDER</b></p> <p>Check for correct functioning of fuel level indicator sender L9:</p> <ul style="list-style-type: none"> <li>remove the sender L9 and submerge it in a container of fuel; varying the level of the fuel, check that the resistance at the two pins of L9 vary as a consequence between a value of 0.7 Ω at maximum level and a value of 290-320 Ω when the container is empty</li> </ul>	<p>OK</p> <p><del>OK</del></p>	<p>Carry out step G2</p> <p>Replace sender L9</p>
G2	<p><b>CHECK SIGNAL</b></p> <p>Operating as at the previous step but connecting the sender to the vehicle, check that a signal proportional to the level of fuel in the container reaches pin E3 of instrument panel C10</p>	<p>OK</p> <p><del>OK</del></p>	<p>Replace the instrument panel C10</p> <p>Carry out step G3</p>
G3	<p><b>CHECK EARTH</b></p> <p>Check that pin A of sender L9 is grounded (0V)</p>	<p>OK</p> <p><del>OK</del></p>	<p>Restore wiring between:</p> <ul style="list-style-type: none"> <li>pin B of L9 and pin E3 of G1 (PNK)</li> <li>pin D6 of G1 and pin E3 of instrument panel C10 (PNK)</li> </ul> <p>Restore wiring between:</p> <ul style="list-style-type: none"> <li>pin A of L9 and pin E2 of G1 (GRY-HEI)</li> <li>pin D5 of G1 and ground G53b, across pin A4 of connector G99 and the solder (GRY-HEU and BLK P11)</li> </ul>

WATER TEMPERATURE INDICATOR NOT WORKING TEST F

TEST PROCEDURE		RESULT	CORRECTIVE ACTION										
F1	<p><b>CHECK SENDER</b></p> <p>Check for correct functioning of engine coolant liquid temperature indicator sender L7(TS), L10(6V):</p> <ul style="list-style-type: none"> <li>varying the temperature of the engine coolant (e.g. "heating" the engine from cold) the resistance signal in output from sender L10 (L7) (pin with GRY-GRN cable) should vary as a consequence in accordance with the following table:</li> </ul> <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>Water temperature °C</th> <th>Resistance Ω</th> </tr> </thead> <tbody> <tr> <td>40</td> <td>900-1400</td> </tr> <tr> <td>60</td> <td>470-600</td> </tr> <tr> <td>80</td> <td>235-300</td> </tr> <tr> <td>90</td> <td>174-215</td> </tr> </tbody> </table>	Water temperature °C	Resistance Ω	40	900-1400	60	470-600	80	235-300	90	174-215	<p>OK</p> <p><del>OK</del></p>	<p>Carry out step F2</p> <p>Replace sender L10 (L7)</p>
Water temperature °C	Resistance Ω												
40	900-1400												
60	470-600												
80	235-300												
90	174-215												
F2	<p><b>CHECK SIGNAL</b></p> <p>Operating as for the previous step, check that the signal proportional to the temperature reaches pin B1 of instrument panel C10</p>	<p>OK</p> <p><del>OK</del></p>	<p>Replace the instrument panel C10</p> <p>Restore wiring between L10 (L7) and pin B1 of C10 (GRY-GRN)</p>										

HANDBRAKE AND BRAKE FLUID LEVEL WARNING LIGHT NOT WORKING TEST H

TEST PROCEDURE		RESULT	CORRECTIVE ACTION
H1	<p><b>CHECK SWITCH</b></p> <p>Check for correct functioning of the handbrake switch H1:</p> <ul style="list-style-type: none"> <li>with handbrake engaged (lever raised) check for ground at the output pin of switch H1 (wire WHT-BLK)</li> </ul>	<p>OK</p> <p><del>OK</del></p>	<p>Carry out step H2</p> <p>Check that switch H1 is correctly secured, if not</p>
H2	<p><b>CHECK SWITCH</b></p> <p>Check for correct functioning of the brake fluid minimum level switch H17:</p> <ul style="list-style-type: none"> <li>with the reservoir at the minimum level, check for ground at pin 1 of switch H17</li> </ul>	<p>OK</p> <p><del>OK</del></p>	<p>Carry out step H4</p> <p>Carry out step H3</p>

HANDBRAKE AND BRAKE FLUID LEVEL WARNING LIGHT NOT WORKING		TEST H
TEST PROCEDURE		
H3	CHECK EARTH - Check that pin 2 of H17 is grounded	RESULT OK
		CORRECTIVE ACTION Replace switch H17 Restore wiring between pin 2 of H17 and ground G53b (BLK)
H4	CHECK EARTH - With handbrake on, check that pin C7 of instrument panel C10 is grounded	RESULT OK
		CORRECTIVE ACTION Replace the relative warning lamp on the instrument panel C10 Restore wiring between: • switch H1 and pin E1 of G1 (WHT-BLK) • pin 1 of switch H17 and pin A4 of G1 (WHT-BLK) • pin D4 of G1 and pin C7 of instrument panel C10 (WHT-BLK)

BRAKE PAD WEAR WARNING LAMP NOT WORKING		TEST I
TEST PROCEDURE		
I1	CHECK BRAKE PADS - Check the degree of wear of the brake pads (particularly those of the front left wheel)	RESULT OK
		CORRECTIVE ACTION Carry out step I2 Replace brake pads
I2	CHECK SWITCH - Check for correct functioning of the front left brake pad switch H10: • remove the pad and check that the output pin of switch H10 is grounded (wire GRY-YEL)	RESULT OK
		CORRECTIVE ACTION Carry out step I3 Check that switch H10 is correctly secured, if not replace it
I3	CHECK CONTINUITY - Check continuity between switch H10 and pin D1 (B5 for sports-type B panel) of instrument panel C10	RESULT OK
		CORRECTIVE ACTION Replace the relative warning lamp on the instrument panel C10 Restore wiring between switch H10 and pin D1 of instrument panel C10 (GRY-YEL). Only for sports-type B panel: between H10 and pin B5 of instrument panel C10 (GRY-YEL)

MINIMUM OIL PRESSURE WARNING LAMP NOT WORKING		TEST J
TEST PROCEDURE		
J1	CHECK PRESSURE SWITCH - Check for correct functioning of minimum oil pressure pressure switch L2: • starting the engine, when the pressure of the oil exceeds 0.5 bars approx., the ground signal at the output pin of switch L2 should be interrupted (wire GRY-BLK)	RESULT OK
		CORRECTIVE ACTION Carry out step J2 Check that the pressure switch L2 is correctly secured, if not replace it
J2	CHECK CONTINUITY - Check continuity between pressure switch L2 and pin D2 of instrument panel C10	RESULT OK
		CORRECTIVE ACTION Replace the relative warning lamp on the instrument panel C10 Restore wiring between: - (TS) pressure switch L2 and pin D2 of instrument panel C10, across pin 16 of connector G308 (GRY-BLK) - (BV) pressure switch L2 and pin D2 of instrument panel C10, across pin A of connector G308 (GRY-BLK)

MAX. TEMPERATURE WARNING LAMP NOT WORKING		TEST K
TEST PROCEDURE		
K1	CHECK THERMAL SWITCH - Check for correct functioning of engine coolant max. temp. thermal switch L5(TS), L10 (6V): • remove the thermal switch and with a suitable instrument and check that the contact closes at 115°C (6V) - 118 °C (TS)	RESULT OK
		CORRECTIVE ACTION Carry out step K2 Replace thermal switch L10 (L5)
K2	CHECK CONTINUITY - Check continuity between thermal switch L10 (L5) and pin D4 of instrument panel C10	RESULT OK
		CORRECTIVE ACTION Replace the relative warning light bulb on the instrument panel C10 Restore wiring between L10 (L5) and pin D4 of C10 (GRY-RED)

SEAT BELT WARNING LIGHT NOT WORKING		TEST L
TEST PROCEDURE	RESULT	CORRECTIVE ACTION
<p>L1   CHECK SWITCH</p> <p>- Check for correct functioning of the seat belt switch R9. • with the seat belt not fastened, check for a ground signal at pin 1 of switch R9</p>	<p>OK</p> <p><del>OK</del></p>	<p>Carry out step L3</p> <p>Carry out step L2</p>
<p>L2   CHECK EARTH</p> <p>- Check that pin 2 of R9 is grounded</p>	<p>OK</p> <p><del>OK</del></p>	<p>Check that switch R9 is correctly secured, otherwise replace it</p> <p>Restore wiring between pin 2 of R9 and ground G63b (BLK)</p>
<p>L3   CHECK EARTH</p> <p>- With the seat belt not fastened, check that pin E8 of instrument panel C10 is grounded</p>	<p>OK</p> <p><del>OK</del></p>	<p>Replace the relative warning lamp on the instrument panel C10</p> <p>Restore wiring between pin 1 of switch R9 and pin E8 of instrument panel C10, across pin B2 of connector G73 (WHT)</p>

GENERAL DESCRIPTION

The vehicle efficiency check device, the "Check Panel", continually verifies the correct operation of the most important electrical systems, particularly those connected with safety.

A display immediately alerts the driver if a malfunction or anomaly is detected in one of the controlled systems and the relative warning light then comes on. When the ignition key is engaged an initial check of the controlled systems is carried out.

OPERATING LOGIC

The Check Panel device is formed by:

- a display C18, located in the centre of the dashboard;
- an electronic control unit N59, located in the fusebox G1;

- a series of sensors which measure the controlled values.

The operations are based on the capability of determining certain conditions of certain electrical functions:

- inappropriate electrical charge
- anomalous opening or closing of a circuit.

These functions are carried out, for a few of the controlled systems, by the electronic control unit N59, while the other signals reach the display C18 straight from the sensors.

The controlled systems are the following:

- insufficient windshield washer fluid indicator;
- insufficient engine oil level indicator;
- insufficient engine coolant indicator;

- stop light malfunction indicator;
- rear fog light malfunction indicator;
- sidelights malfunction indicator;
- number plate light malfunction indicator;
- door open indicator

A digital clock with relative buttons for adjustment and setting are also incorporated in the display.

N.B. Models not equipped with the complete Check Panel device are however fitted with a display with clock and the leds signalling "door open". For these models only the diagrams relative to

- power supply and clock
  - door open indicator
- should be considered

CHECK PANEL

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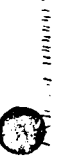
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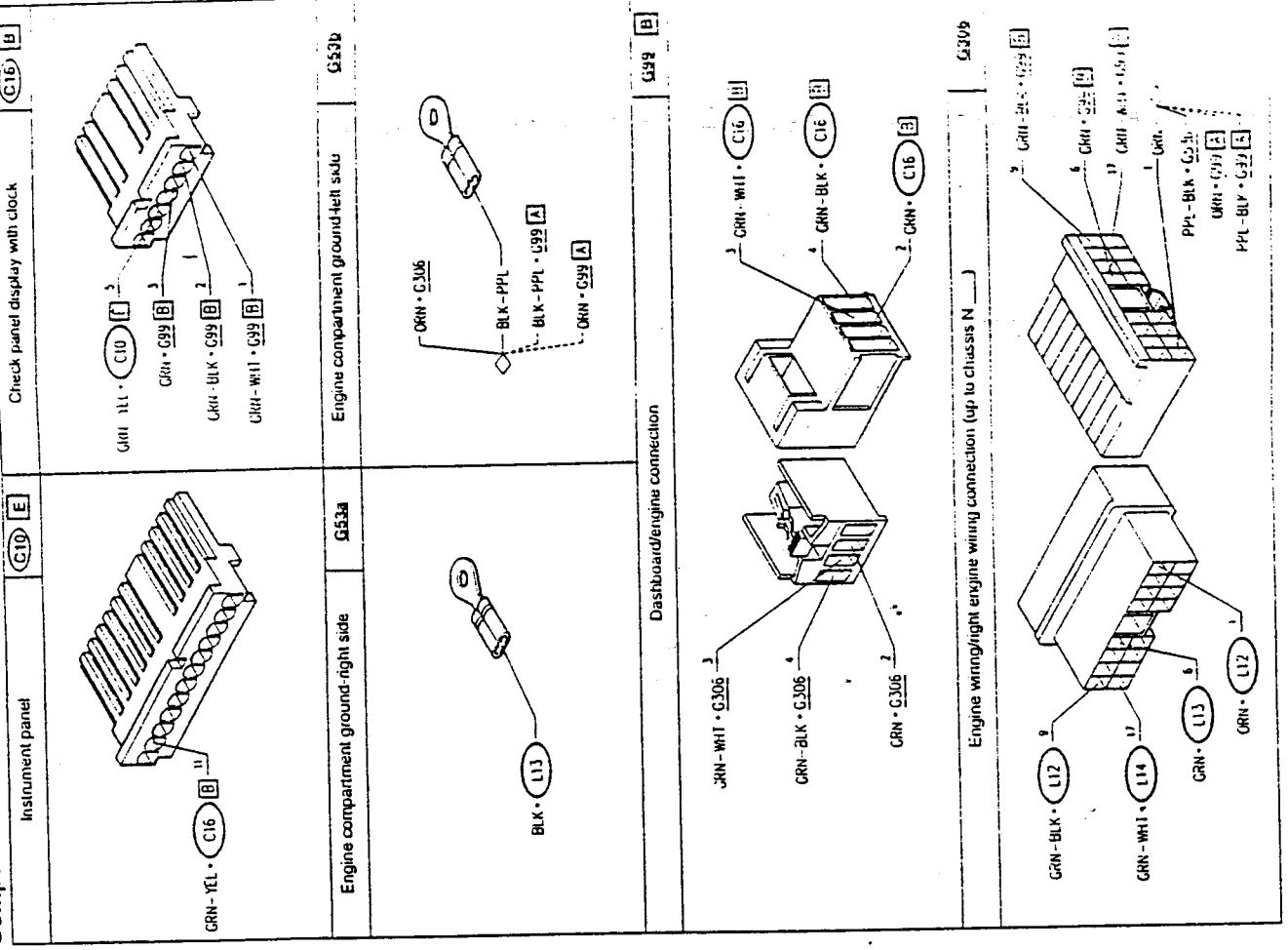








Components and Connectors



Functional Description

Three special sensors, with a ground signal sent directly to display C16, alert the driver that the level of some of the fluids is insufficient.

The engine coolant level sensor L14 is located in the relative reservoir. It is monitored by a float which, when the level of the liquid falls, closes a contact of a hermetically sealed switch and sends a ground signal to display C16, at pin 1 of connector B.

The windshield washer liquid sensor L13, also located in the relative reservoir, the sensor L14, is composed of a contact which is closed by a float and

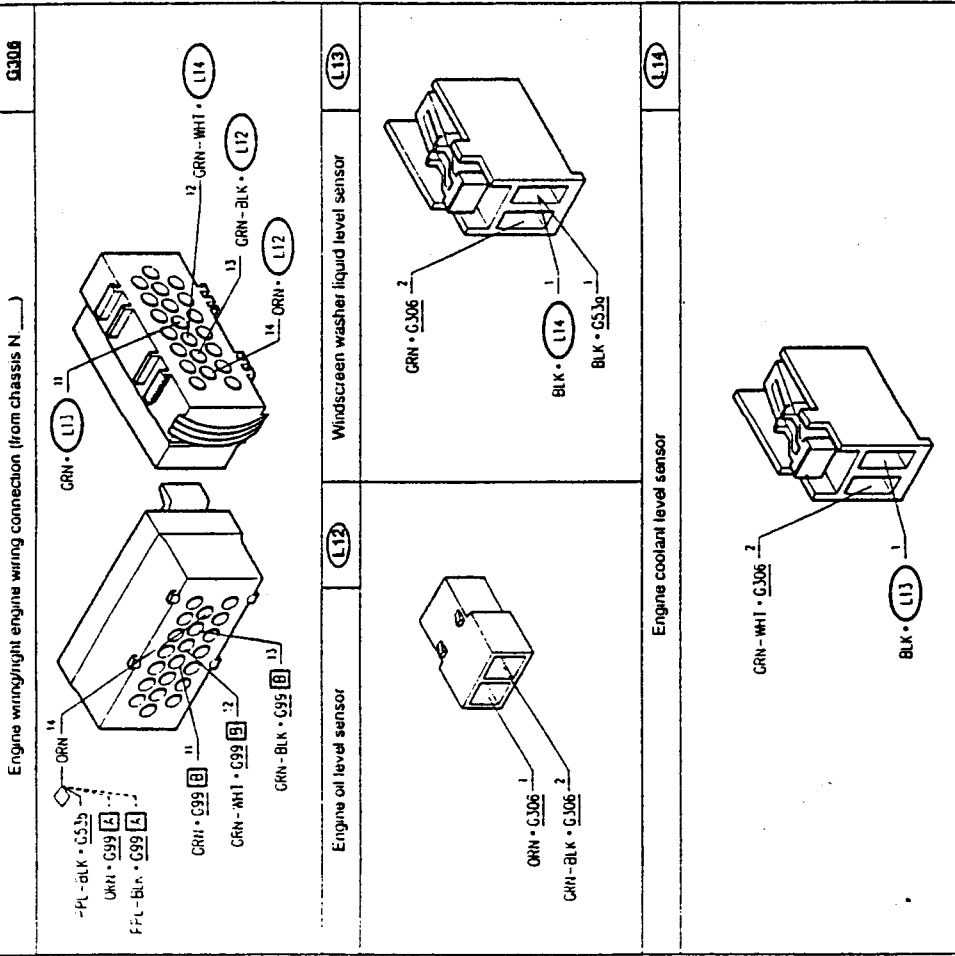
The same signal is sent to pin 5 to pin 11 of connector E of the instrument panel C10 to light up the "Engine oil minimum level" warning lamp (in the basic A version or in the simplified C version of the instrument panel this warning lamp is a simple amber light and has no ideograms).

**NOTE:** The intervention logic ensures that even a brief signal is sent to the instrument panel to switch on the warning lamp, while the led on the Check Panel stays on continuously only when the signal persists.

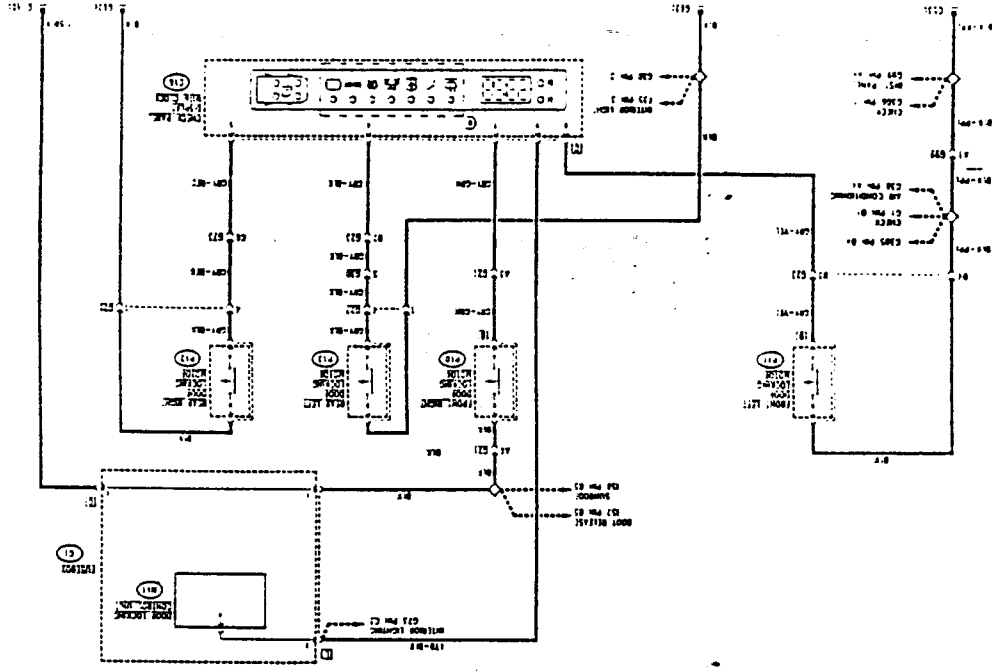
sends a ground signal to pin 3 of connector B of display C16.

The engine oil level sensor L12 is located at the tip of a rod immersed in the sump oil. It is composed of a pair of contacts located at the ends of a bimetal strip which is heated by a resistance. The heat generated is normally dissipated by the oil and the contacts stay closed; when the oil level falls the heat causes the circuit to open and interrupts the signal sent to pin 2 of connector B of display C16.

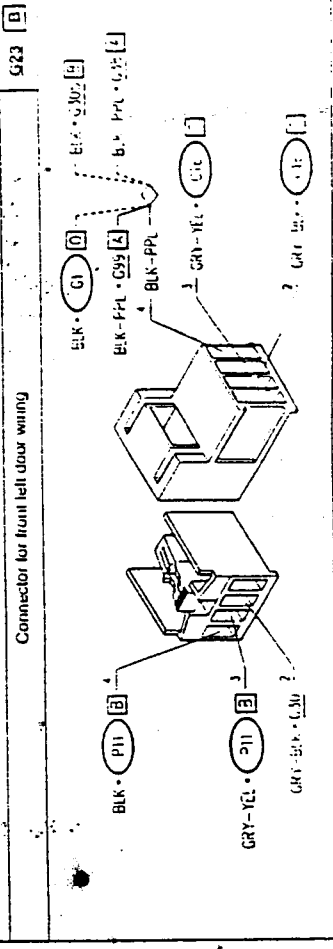
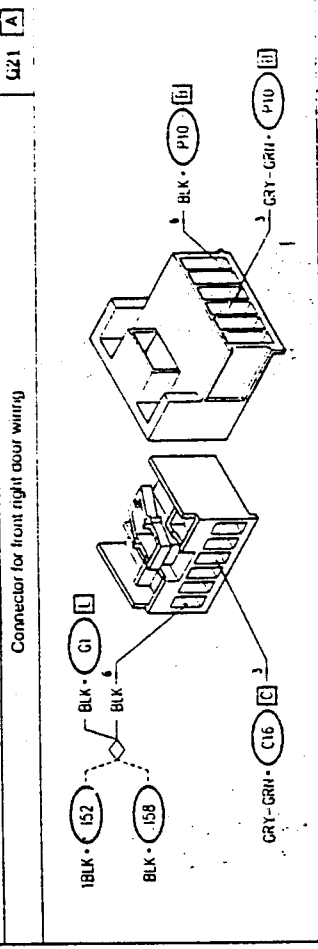
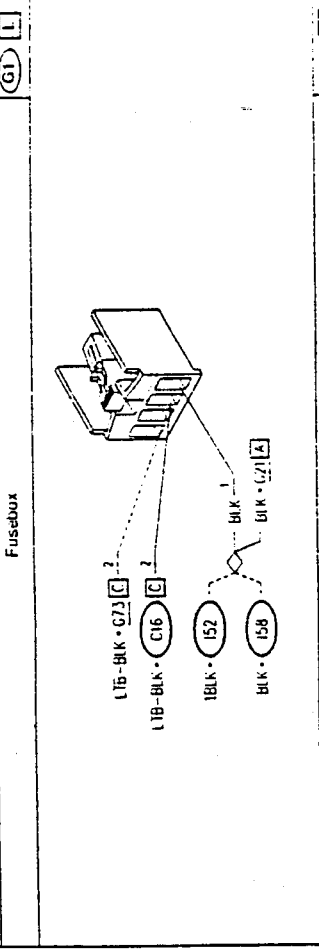
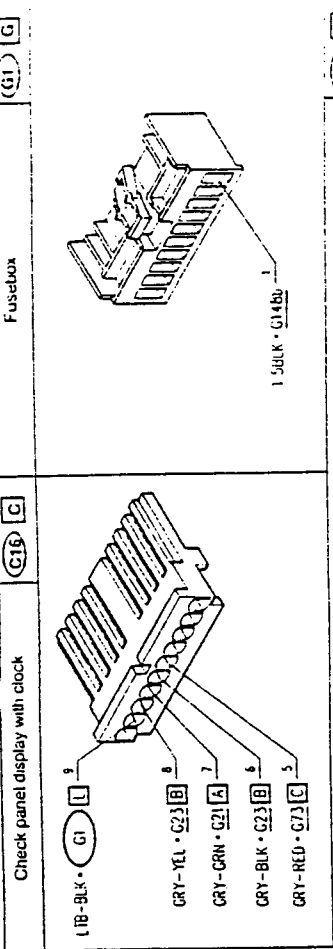
**NOTE:** The signal is analyzed by the Check Panel device only when the engine is started



DOOR OPEN INDICATOR  
Wiring Diagram



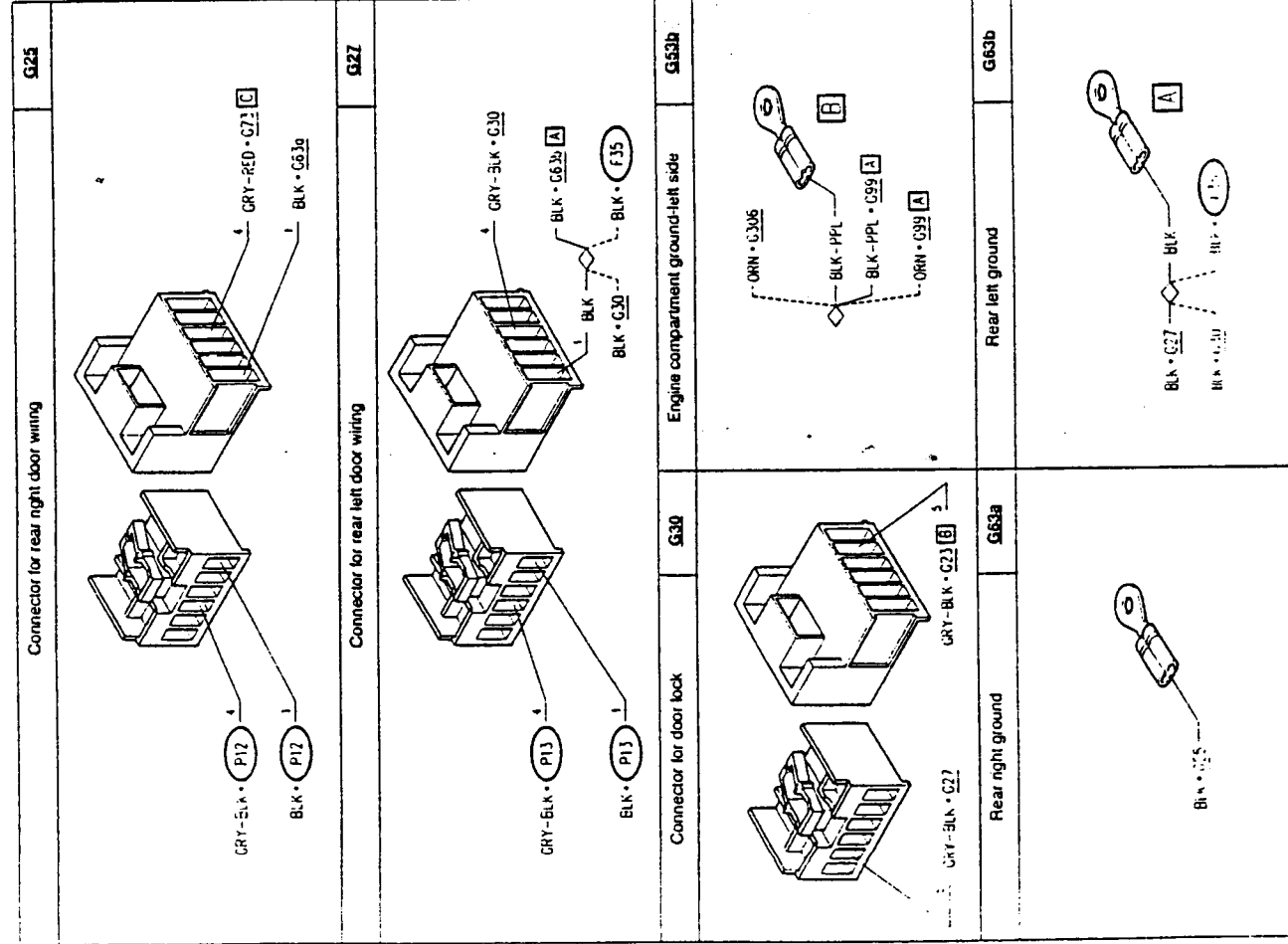
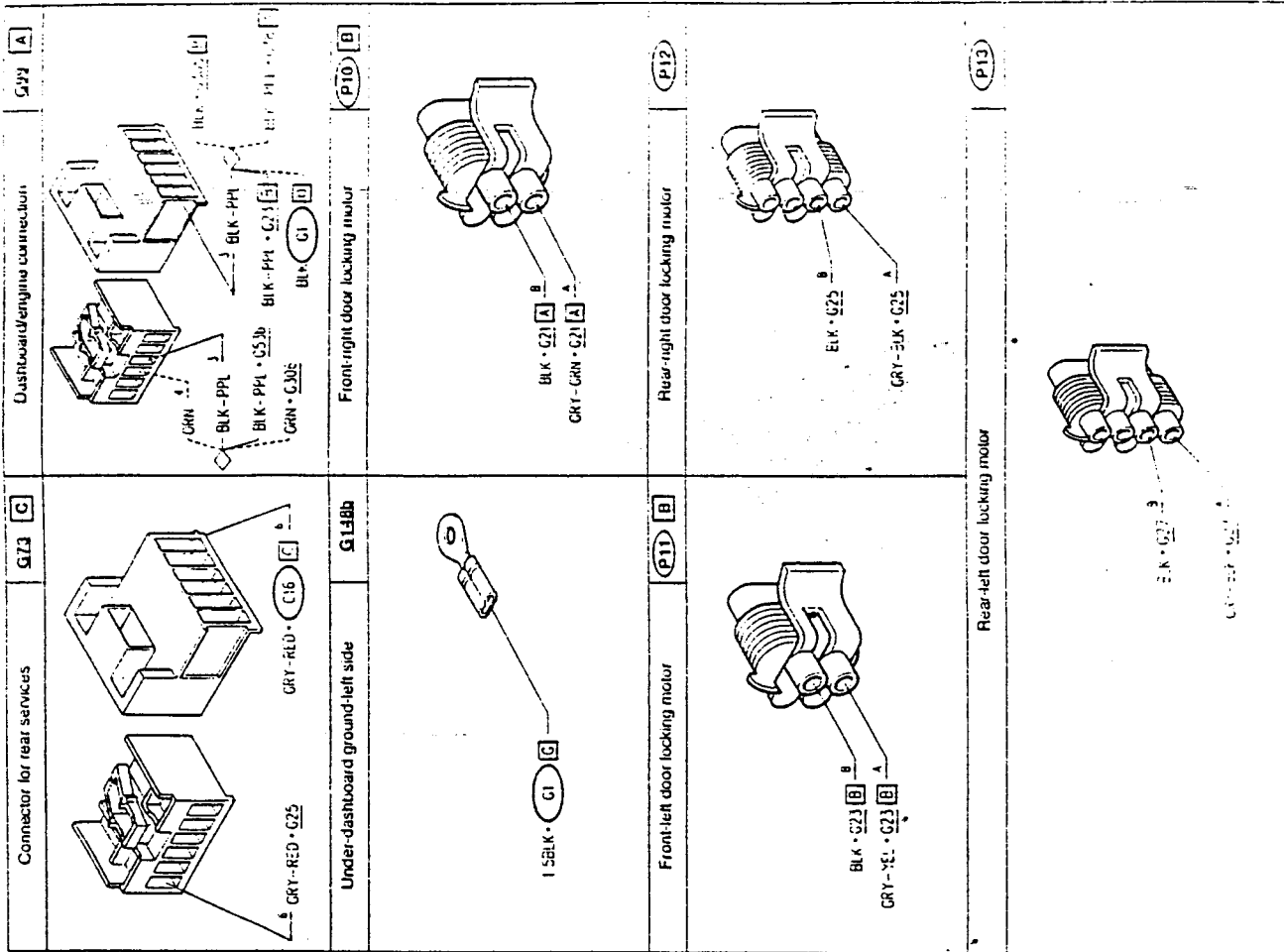
Components and Connectors



Functional Description

The door locking device - P10, P11, P12, P13 located on each door near the lock, also contains a microswitch which closes when the door itself is open, and sends a ground signal to the display C16 at pins 5, 6, 7 and 8 of connector C.

Pin 9 is connected to the door lock control unit N11 and to the Check Panel control unit M59, located inside fusebox G1, in order to signal the incorrect door locking system).



relative circuit, and the correct operation of the "working" contacts (H1) of switch H3 (see "Stop Lights").

the second (continuous operation) controls the supply to the circuit (fuse F2 of fusebox G1) and the correct operation of the contacts "at rest" (N.C.) of switch H3 (see "Stop Lights").

In both cases, if an anomaly is discovered, the control unit sends a signal to pin 4 of connector D of G16 to light up the relative warning lamp.

carrying the signals to be checked by the control unit N59.

In the following three charts the control unit N59 connections are illustrated along with the various controlled functions:

**Stop light check**  
The control unit N59 is connected to the two contacts of the stop light switch H3 via pins 9 and 12 of connector H in G1.

The control unit carries out two distinct checks through this signal:

- the first (only carried out when the brake pedal is depressed) checks for a possible anomaly in a single bulb or

Functional Description

Check Panel control unit

The Check Panel N59 processes the various signals and sends them to the display G16 through the lines that exit pins 1, 3, 4 and 6 of connector N of the fusebox G1 where the control unit N59 is located.

The control unit is turn-key supplied via fuse F15 (10A) to pin 5 of connector O of G1, while a ground reaches the control unit from pin 1 of the connector.

The control unit checks the electrical charge in the controlled circuits by way of a shunt ("SH1", "SH2"...), inserted in the circuits of fusebox G1 on the lines

carrying the signals to be checked by the control unit N59.

In the following three charts the control unit N59 connections are illustrated along with the various controlled functions:

**Stop light check**  
The control unit N59 is connected to the two contacts of the stop light switch H3 via pins 9 and 12 of connector H in G1.

The control unit carries out two distinct checks through this signal:

- the first (only carried out when the brake pedal is depressed) checks for a possible anomaly in a single bulb or

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- the first (only carried out when the brake pedal is depressed) checks for a possible anomaly in a single bulb or

carrying the signals to be checked by the control unit N59.

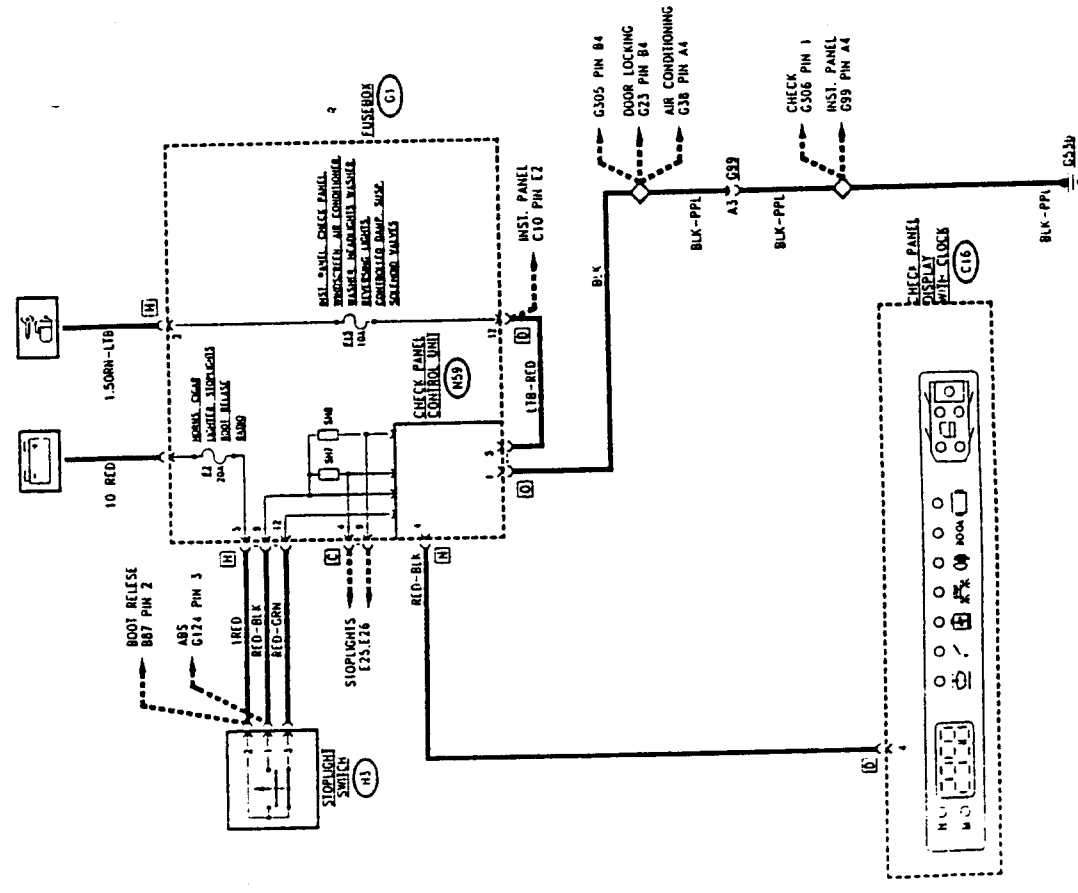
In the following three charts the control unit N59 connections are illustrated along with the various controlled functions:

**Stop light check**  
The control unit N59 is connected to the two contacts of the stop light switch H3 via pins 9 and 12 of connector H in G1.

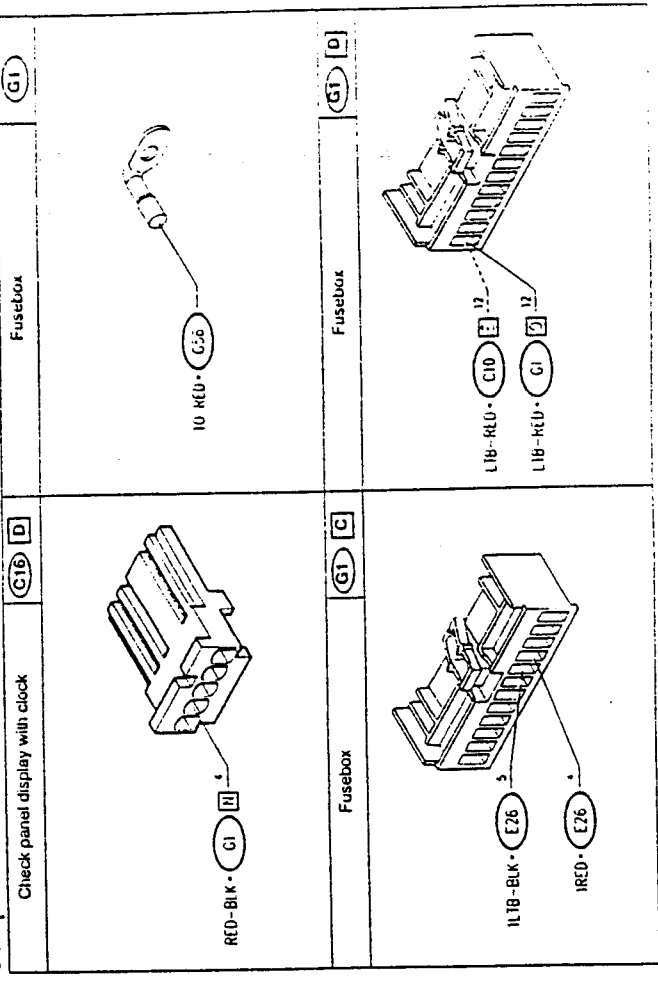
The control unit carries out two distinct checks through this signal:

- the first (only carried out when the brake pedal is depressed) checks for a possible anomaly in a single bulb or

STOP LIGHTS CHECK  
Wiring Diagram



Components and Connectors







**Functional Description**

**Control Unit**

See "Stop lights check".

**Rear fog lights check**

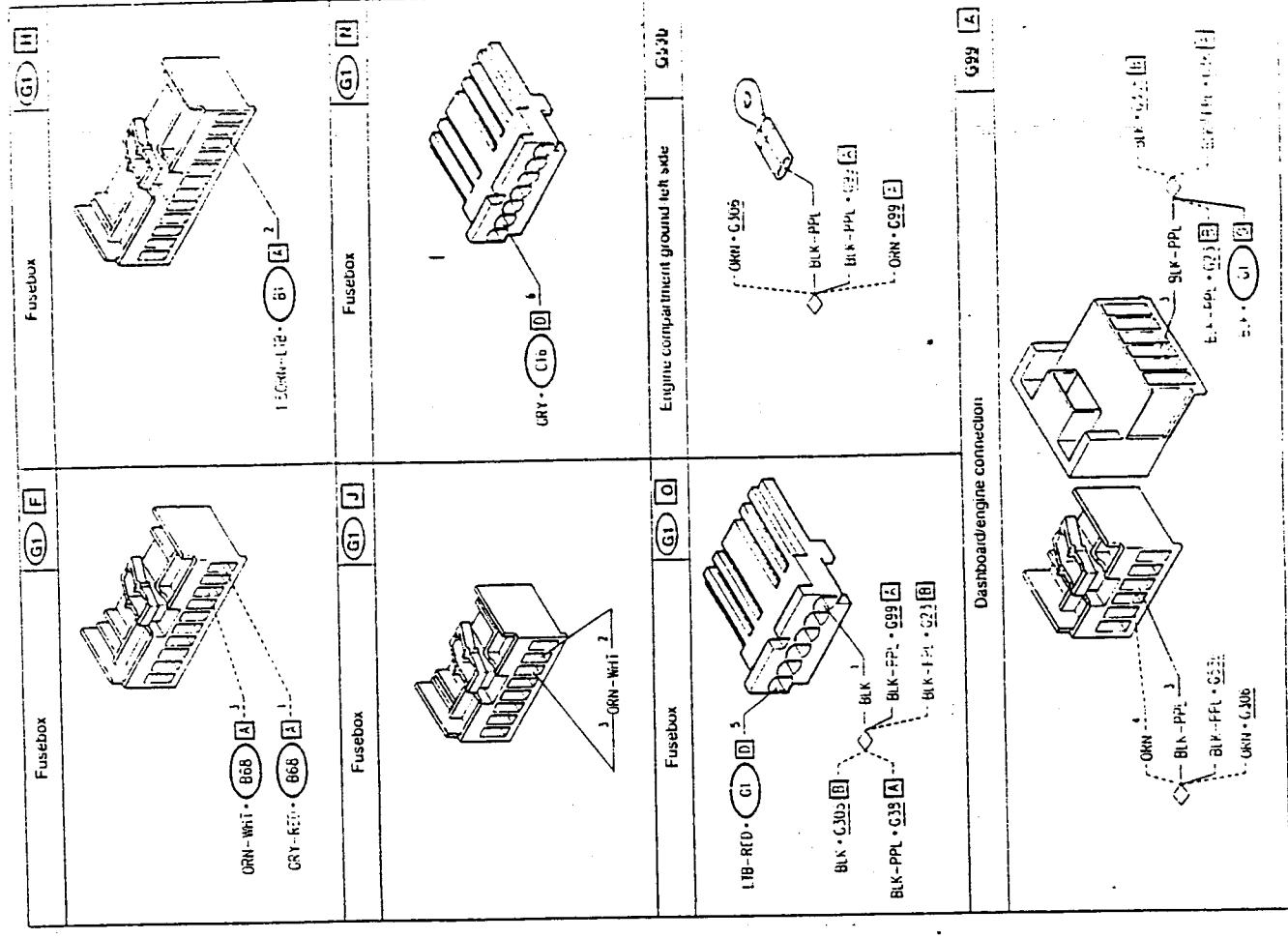
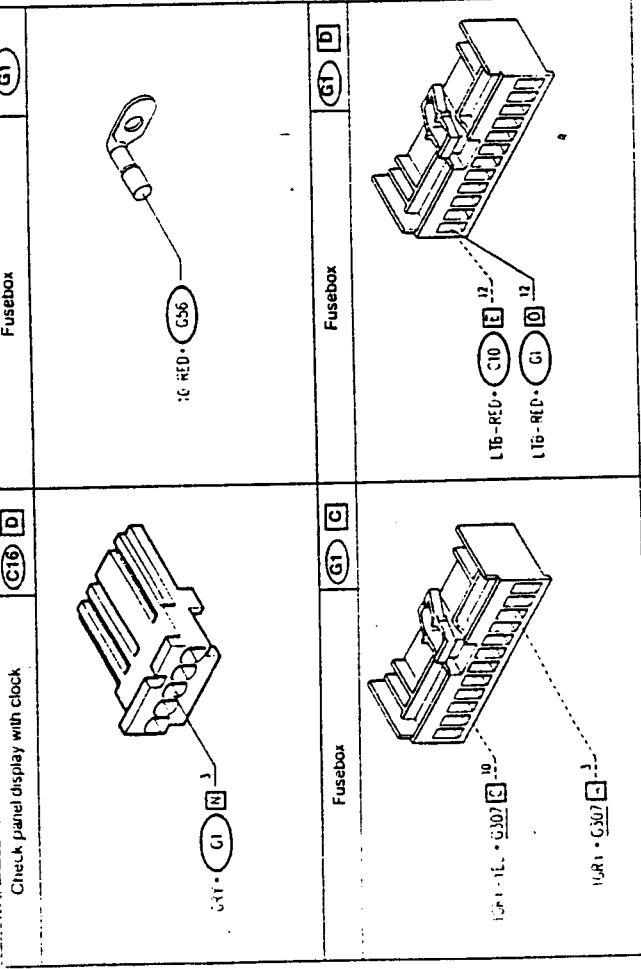
Control unit N59 is connected to the rear fog light power supply - fuse F11. If an anomaly is

detected, the control unit sends a signal to pin 3 of connector D of C16 and lights up the relative warning lamp.  
 "Rear and Front Foglamps".

Through these signals the control unit checks for a possible malfunction of a single bulb or a failure in the power supply to fuse F11. If an anomaly is

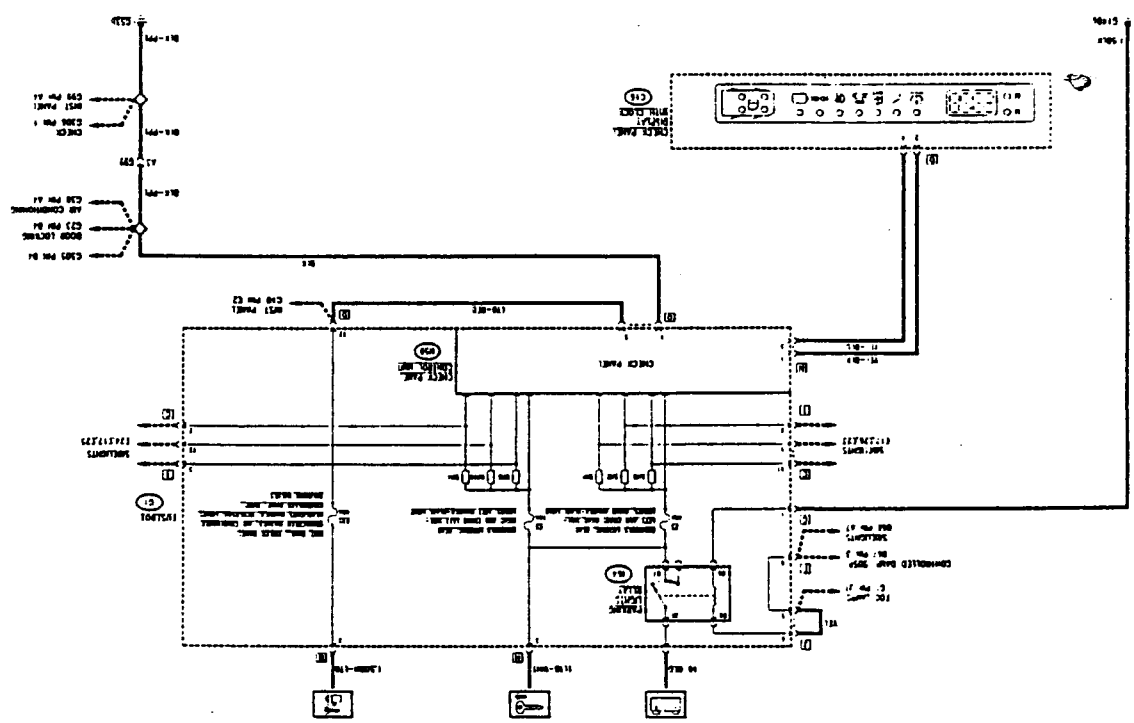
detected, the control unit sends a signal to pin 3 of connector D of C16 and lights up the relative warning lamp.

**Components and Connectors**



### NUMBERPLATE LIGHTS AND SIDELIGHTS CHECK

#### Wiring Diagram



### Functional Description

#### Check Panel control unit

See "Stop lights check".

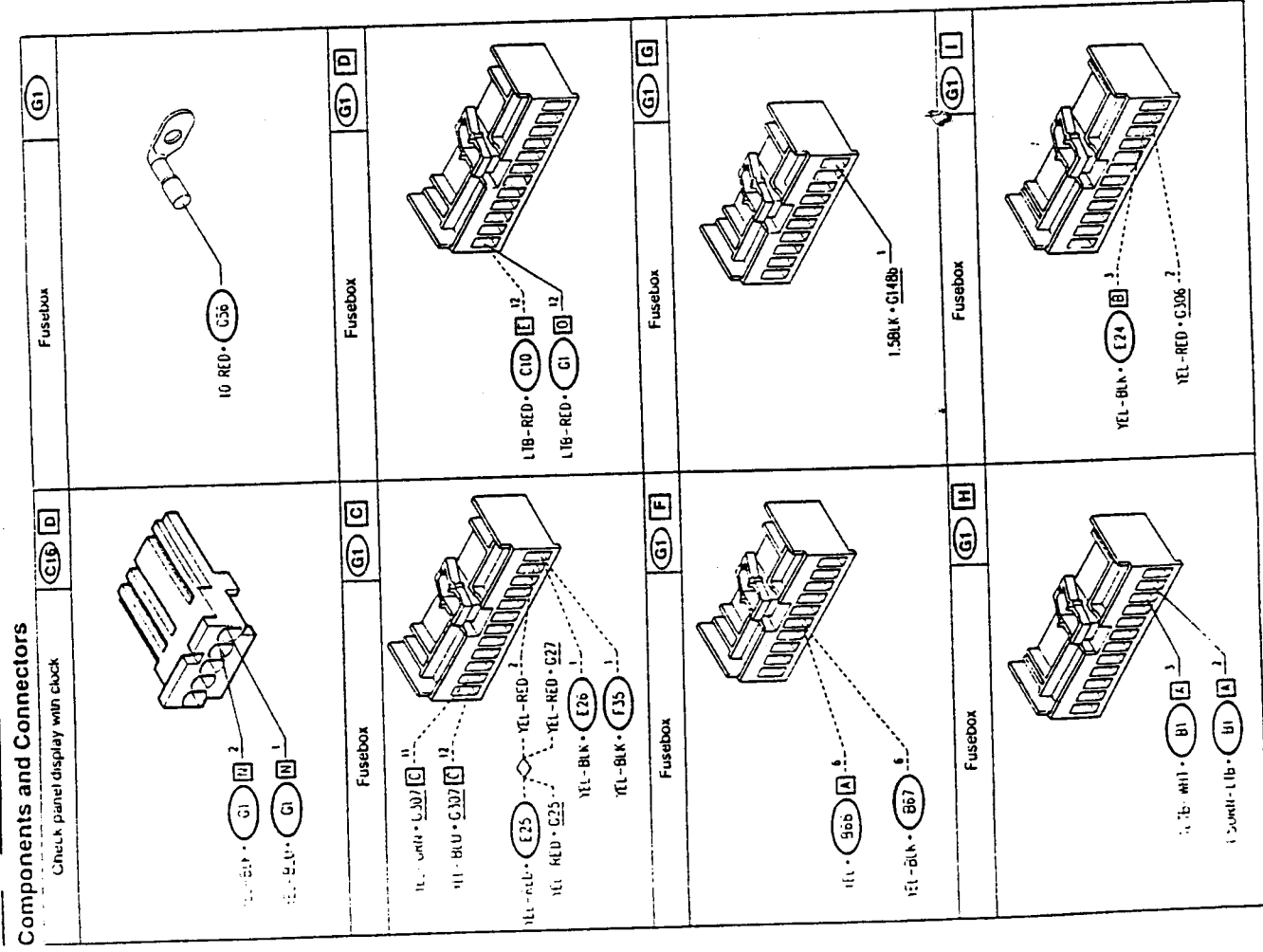
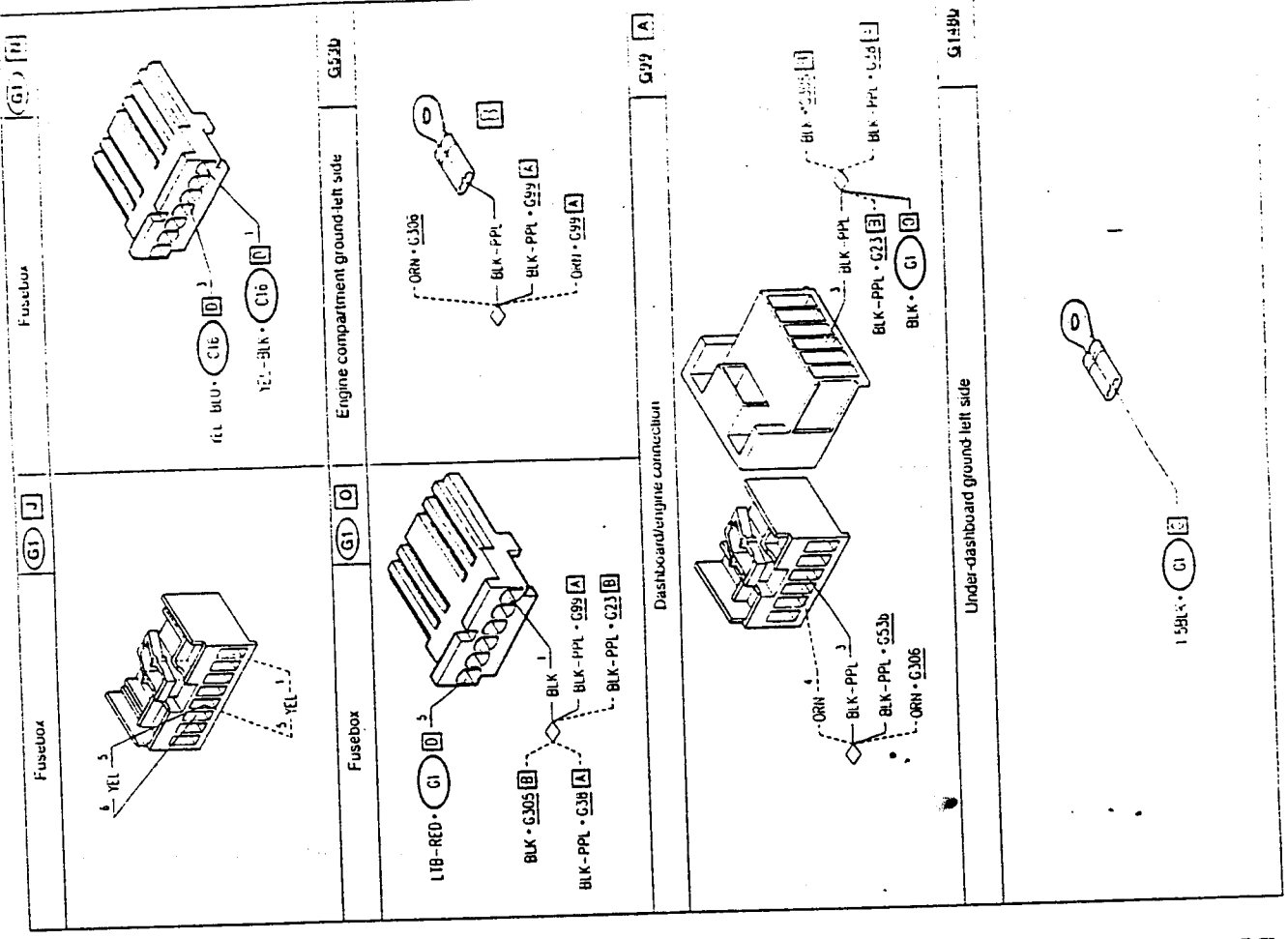
#### Numberplate lights and sidelights check

Control unit N59 is connected to the sidelights power supply - fuses F5 and F6 and relay 164 located in fusebox G1 and also to the sidelights bulbs both

front and rear via pins 2 and 3 of connector I of G1 and pins 1 and 2 of connector C of G1, and to the numberplate lights through pin 11 and 12 of connector C of G1 (see "Sidelights").

Through this signal the control unit checks for a possible malfunction of a single bulb or an interruption in the power supply to fuses F5 and F6. If an anomaly is detected, the control unit sends two signals to connector D of

C16 (pin 1 for numberplate lights and pin 2 for the sidelights) to illuminate the relative warning lamps  
**NOTE:** the simultaneous interruption of both fuse F5 and fuse F6 is not signalled; in this event though, as the sidelights are completely out, the relative "sidelights on" warning lamp on the instrument panel C10 will be out.

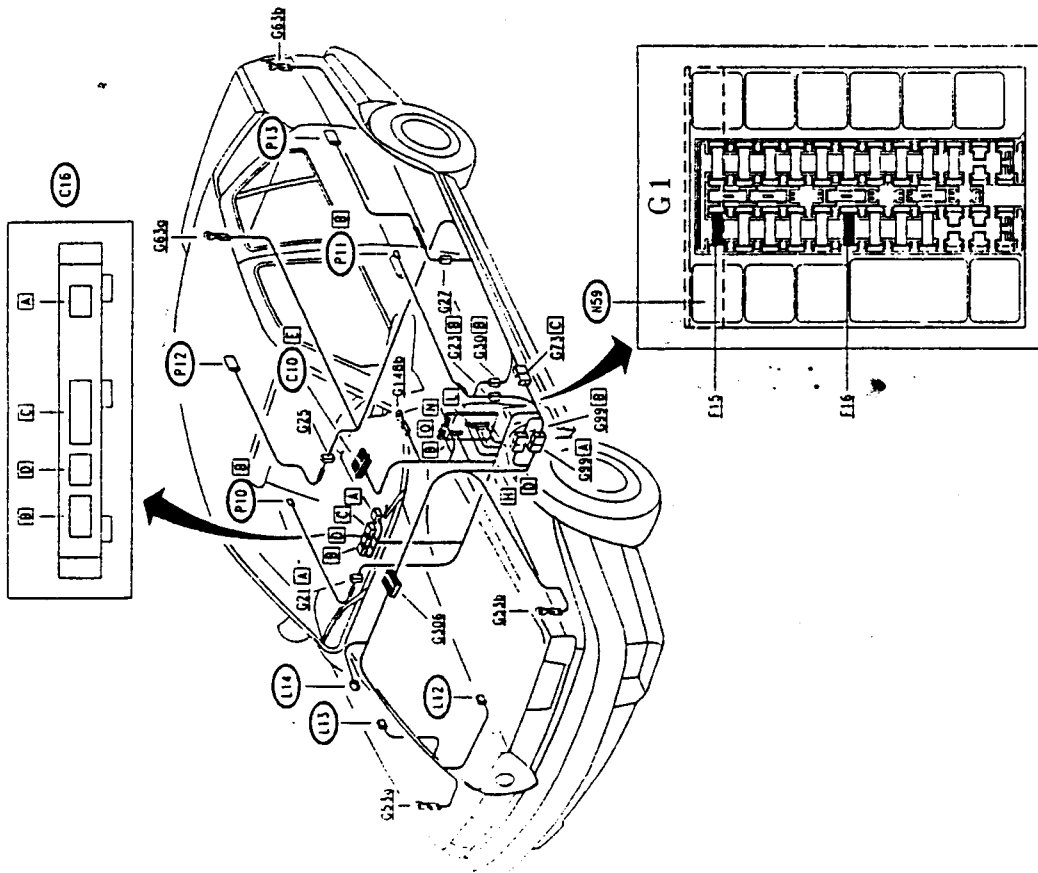


TROUBLESHOOTING TABLE

Malfunction	Component													Test			
	E15	C16	N59	P10	P11	P12	P13	L13	L12	L11	L10	L09	L08				
Display out	•																A
Clock																	B
Display not lit up.																	C
Front RH door open					•												D
Front LH door open						•											E
Rear RH door open							•										F
Rear LH door open								•									G
Water level																	H
Oil level																	I
Windscreen washer fluid level																	J
Stop lights check																	K
Rear fog lamps check																	L
Numberplate lights and side-lights check																	M

NOTE: The tests from A to G are valid for all models. The tests from H to M are only valid for models fitted with the complete Check Panel.

LOCATION OF COMPONENTS



CLOCK NOT WORKING

TEST PROCEDURE		RESULT	CORRECTIVE ACTION
B1	CHECK FUSE	OK	Carry out step B2
	- Check for damage of fuse F16 in fusebox G1	OK	Replace the fuse (7.5 A)
B2	CHECK VOLTAGE	OK	Carry out step B3
	- Verify 12V at pin A2 of display C16	OK	Restore wiring between pin D7 of G1 and pin A2 of display C16, across the solder (RED)
B3	CHECK VOLTAGE	OK	Carry out step B4
	- With ignition key engaged, verify 12V at pin A1 of display C16	OK	Restore wiring between pin D3 of G1 and pin A1 of display C16 (LTB-RED)
B4	CHECK GROUND	OK	Replace display C16
	- Check that pin A1 of display C16 is grounded (0V)	OK	Restore wiring between pin A1 of display C16 and ground G148b (BLK).

CHECK PANEL DISPLAY DOES NOT LIGHT UP

TEST PROCEDURE		RESULT	CORRECTIVE ACTION
C1	CHECK VOLTAGE	OK	Carry out step C3
	- With sidelights on, verify 12V at pin C1 of display C16	OK	Carry out step C2
C2	CHECK VOLTAGE	OK	Restore wiring between pin H8 of G1 and pin C1 of display C16, across the solder (RED-BLK and YEL)
	- With sidelights on, verify 12V at pin H8 of G1	OK	Check the sidelights circuit (see section "Sidelights")
C3	CHECK VOLTAGE	OK	Replace the display C16
	- With sidelights on, verify 12V at pin A3 of display C16	OK	Restore wiring between pin H8 of G1 and pin A3 of display C16, across the solder (YEL, BLK and YEL)

TROUBLESHOOTING

TEST PROCEDURE		RESULT	CORRECTIVE ACTION
A1	CHECK FUSE	OK	Carry out step A2
	- Check for damage of fuse F15 in fusebox G1	OK	Replace the fuse (10A)
A2	CHECK FUSE	OK	Carry out step A3
	- Check for damage of fuse F16 in fusebox G1	OK	Replace the fuse (7.5 A)
A3	CHECK VOLTAGE	OK	Carry out step A4
	- Verify 12V at pin D5 of display C16	OK	Restore wiring between pin D7 of G1 and pin D5 of display C16, across the solder (RED)
A4	CHECK VOLTAGE	OK	Carry out step A5
	- With ignition key engaged, verify 12V at pin C2 of display C16	OK	Restore wiring between pin B8 of G1 and pin C2 of display C16, across the solder (LTB-RED)
A5	CHECK GROUND	OK	Replace the display C16
	- Check that pins C10 and C3 of display C16 are grounded (0V)	OK	Restore wiring between pin C10 and pin C3 of display C16 and ground G148b, across the solder (BLK)



ENGINE OIL LEVEL LED NOT WORKING TEST I

NOTE: "the led not working", means that it lights up to indicate and insufficient level while in reality the level is correct, or vice versa it does not light up when the level is too low

TEST PROCEDURE		RESULT	CORRECTIVE ACTION
11	CHECK SENSOR - Check for correct functioning of engine oil level sensor L12 • removing the sensor from the engine block but without disconnecting the relative wiring, the contact must open between pins 1 and 2 of sensor L12 itself	OK <del>OK</del>	Carry out step 12  Replace the sensor L12
12	CHECK GROUND - Check that pin 1 of sensor L12 is grounded (0V)	OK <del>OK</del>	Carry out step 13  Restore wiring between pin 1 of L12 and ground G53b, across pin 1(14*) of connector G306 and the solder (GRN and BK P11)
13	CHECK SIGNAL - Removing the sensor from the engine block without disconnecting the relative wiring check that the signal at pin B2 of Check Panel display C16 (*) is interrupted	OK <del>OK</del>	Replace the Check Panel display C16  Restore wiring between pin 2 of L12 and pin B2 of C16, across pin 9(13*) of connector G306 and pin B4 of connector G99 (GRN BLK)

(\*) NOTE: warning lamp on instrument panel: removing the sensor from the engine block, also check for a ground signal at pin E11 of instrument panel C10; otherwise replace the relative lamp in the instrument panel C10, or restore the wiring between pin B5 of C16 and pin E11 of C10 (GRN-YEL)

(\*) from chassis N \_\_\_\_\_

WATER LEVEL LED NOT WORKING TEST H

NOTE: "the led not working", means that it lights up to indicate and insufficient level while in reality the level is correct, or vice-versa it does not light up when the level is too low

TEST PROCEDURE		RESULT	CORRECTIVE ACTION
H1	CHECK SENSOR - Check for correct functioning of engine coolant level sensor L14: • removing the sensor from the reservoir, there must be continuity between pins 1 and 2 of sensor L14 itself	OK <del>OK</del>	Carry out step H2  Replace the sensor L14
H2	CHECK GROUND - Check that pin 1 of sensor L14 is grounded (0V)	OK <del>OK</del>	Carry out step H3  Restore wiring between pin 1 of L14 and ground G53a, across pin 1 of sensor L13 (BLK)
H3	CHECK SIGNAL - With the sensor removed from the reservoir but still connected to the relative wiring, check for a ground signal (0V) at pin B1 of Check Panel display C16	OK <del>OK</del>	Replace the Check Panel display C16  Restore wiring between pin 2 of L14 and pin B1 of C16, across pin 17(12*) of connector G306 and pin B3 of connector G99 (GRN-WHT)

(\*) from chassis N \_\_\_\_\_

WINDSCREEN WIPER LIQUID LEVEL LED NOT WORKING

TEST J

NOTE: "The led not working" means that it lights up to indicate and insufficient level while in reality the level is correct, or vice-versa it does not light up when the level is too low

TEST PROCEDURE	RESULT	CORRECTIVE ACTION
<p>J1 CHECK SENSOR</p> <p>— Check for correct functioning of the windshield wiper liquid level sensor L13.</p> <ul style="list-style-type: none"> <li>• on removing the sensor from the reservoir, there should be continuity between pins 1 and 2 of sensor L13 itself</li> </ul>	<p>OK</p> <p><del>OK</del></p>	<p>Carry out step J2</p> <p>Replace the sensor L13</p>
<p>J2 CHECK GROUND</p> <p>— Check that pin 1 of sensor L13 is grounded (0V)</p>	<p>OK</p> <p><del>OK</del></p>	<p>Carry out step J3</p> <p>Restore wiring between pin 1 of L13 and ground G53a (BLK)</p>
<p>J3 CHECK SIGNAL</p> <p>— With the sensor removed from the reservoir but still connected to the relative wiring, check that a ground signal (0V) reaches pin B3 of Check Panel display C16</p>	<p>OK</p> <p><del>OK</del></p>	<p>Replace the Check Panel display C16</p> <p>Restore wiring between pin 2 of L13 and pin B3 of C16, across pin 6(11*) of connector G306 and pin B2 of connector G99 (GRN)</p>

(\* ) from chassis N\_\_\_\_\_

STOP LIGHT CHECK LED NOT WORKING

TEST K

N.B: The malfunction described as "led not working" can be grouped into three categories:

1. the led lights up normally when there is a malfunction in the stop light system. In this case proceed to the tests indicated in the section "Stop-lights".
2. the led lights up but no malfunction is discovered in the stop light system (the tests indicated in the section "Stop-lights" have been carried out without a positive outcome). In this case carry out test K.
3. the led does not light up, but a malfunction in the stop light system has been discovered. In this case, first carry out the tests indicated in the section "Stop lights" to restore the correct functioning of the circuit, and then carry out test K

TEST PROCEDURE	RESULT	CORRECTIVE ACTION
<p>K1 CHECK FUSE</p> <p>— Check for damage of fuse F15 in fusebox G1</p>	<p>OK</p> <p><del>OK</del></p>	<p>Carry out step K2</p> <p>Replace the fuse (10A)</p>
<p>K2 CHECK CONTROL UNIT</p> <p>— Disconnect switch H3 for example, or a bulb and, with the ignition key engaged, check for an output signal at pin N4 of G1 (Check Panel control unit N59)</p>	<p>OK</p> <p><del>OK</del></p>	<p>Carry out step K5</p> <p>Carry out step K3</p>
<p>K3 CHECK VOLTAGE</p> <p>— With ignition key engaged, verify 12 V at pin U5 of G1 (Check Panel control unit N59)</p>	<p>OK</p> <p><del>OK</del></p>	<p>Carry out step K4</p> <p>Restore wiring between pin D12 and pin U5 of G1 (L1B RED)</p>
<p>K4 CHECK GROUND</p> <p>— Verify 0V at pin O1 of G1 (Check Panel control unit N59)</p>	<p>OK</p> <p><del>OK</del></p>	<p>Replace the control unit N49</p> <p>Restore wiring between pin O1 of G1 and ground G55b, across the solders and pin A3 of connector G99 (BLK and BLK-PPL)</p>
<p>K5 CHECK DISPLAY</p> <p>— Disconnect switch H3 for example, or a bulb and, with the ignition key engaged, check for an output signal at pin D4 of display C16</p>	<p>OK</p> <p><del>OK</del></p>	<p>Replace the display C16</p> <p>Restore wiring between pin PH of G1 (Check Panel control unit N59) and pin D4 of display C16 (RED BLK N)</p>



**SIDELIGHTS AND NUMBERPLATE LIGHTS CHECK LED NOT WORKING**

TEST M

N.B: The malfunction described as "led not working" can be grouped into three categories:

1. the led lights up normally when there is a malfunction in the sidelights or numberplate lights system. In this case proceed to the tests indicated in the section "Sidelights".
2. the led lights up but no malfunction is discovered in the sidelights or numberplate lights system (the tests indicated in the section "Sidelights" have been carried out without a positive outcome). In this case carry out test M.
3. the led does not light up, but a malfunction in the sidelights or numberplate lights system has been discovered. In this case, first carry out the tests indicated in the section "Sidelights" to restore the correct functioning of the circuit, and then carry out test M.

TEST PROCEDURE		RESULT	CORRECTIVE ACTION
M1	CHECK FUSE - Check for damage of fuse F15 in fusebox G1	OK	Carry out step M2
		<del>OK</del>	Replace the fuse (10A)
M2	CHECK CONTROL UNIT - Sidelights led: Disconnect relay 164 for example, or a bulb from the sidelights and, with the ignition key engaged, check for an output signal at pin N1 of G1 (Check Panel control unit N59) Numberplate lights led: Disconnect a bulb from the numberplate light for example, and with the ignition key engaged, check for an output signal at pin N3 of G1 (Check Panel control unit N59).	OK	Carry out step M5
		<del>OK</del>	Carry out step M3
M3	CHECK VOLTAGE - With ignition key engaged, verify 12 V at pin O5 of G1 (Check Panel control unit N59)	OK	Carry out step M4
		<del>OK</del>	Restore wiring between pin D12 and pin O5 of G1 (LTB-RED)
M4	CHECK GROUND - Verify 0V at pin O1 of G1 (Check Panel control unit N59)	OK	Replace the control unit N49
		<del>OK</del>	Restore wiring between pin O1 of G1 and ground G53b, across the solders and pin A3 of connector G99 (BLK and BLK-PPL)
M5	CHECK DISPLAY - Sidelights led: disconnect relay 164 for example or a bulb from the sidelights and, with the ignition key engaged, check for a signal at pin D2 of display C16 Numberplate lights led: disconnect a bulb from the numberplate light for example, and with the ignition key engaged, check for a signal at pin D1 of display C16	OK	Replace the display C16
		<del>OK</del>	Restore wiring between: • sidelights led: pin N1 of G1 (Check Panel control unit N59) and pin D2 of display C16 (YEL-BLK) • numberplate lights led: pin N3 of G1 (Check Panel control unit N59) and pin D1 of display C16 (YEL-BLU)

**REAR FOG LIGHTS CHECK LED NOT WORKING**

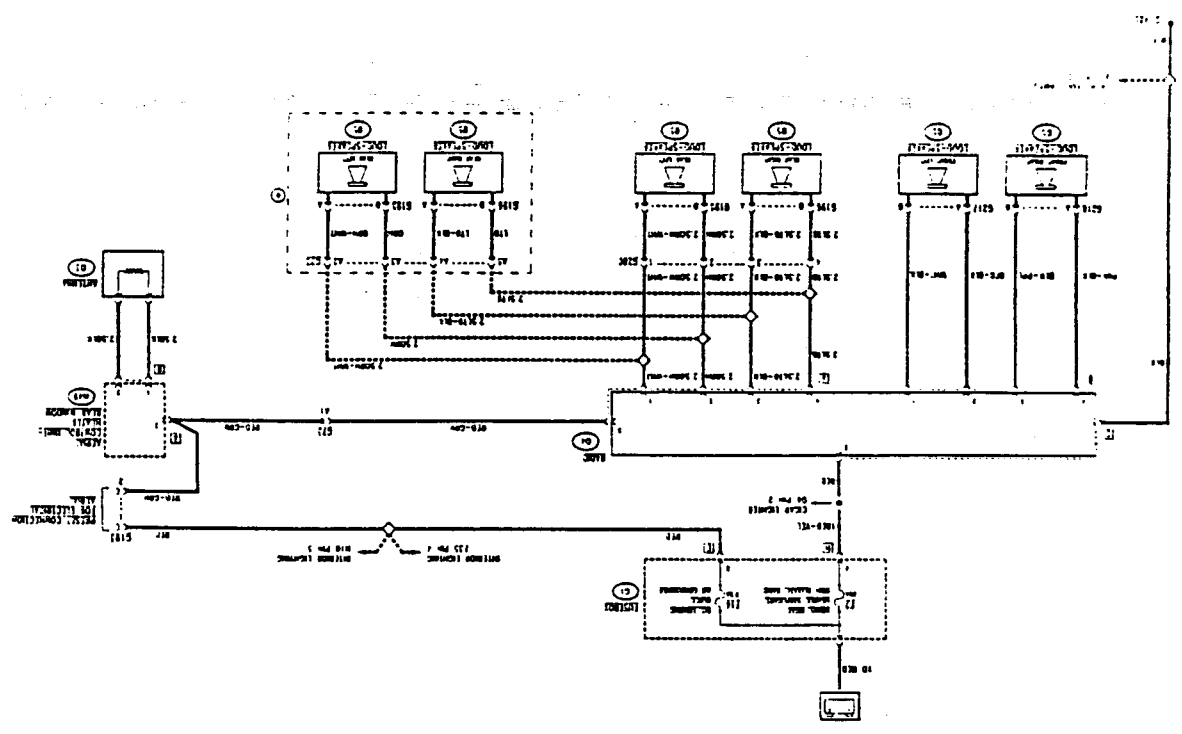
TEST L

N.B: The malfunction described as "led not working" can be grouped into three categories:

1. the led lights up normally when there is a malfunction in the rear fog light system. In this case proceed to the tests indicated in the section "Rear and front fog lights".
2. the led lights up but no malfunction is discovered in the rear fog light system (the tests indicated in the section "Rear and front fog lights" have been carried out without a positive outcome). In this case carry out test L.
3. the led does not light up, but a malfunction in the rear fog light system has been discovered. In this case, first carry out the tests indicated in the section "Rear and front fog lights" to restore the correct functioning of the circuit, and then carry out test L.

TEST PROCEDURE		RESULT	CORRECTIVE ACTION
L1	CHECK FUSE - Check for damage of fuse F15 in fusebox G1	OK	Carry out step L2
		<del>OK</del>	Replace the fuse (10A)
L2	CHECK CONTROL UNIT - Disconnect relay 125 for example, or a bulb and, with the ignition key engaged, check for an output signal at pin N6 of G1 (Check Panel control unit N59)	OK	Carry out step L5
		<del>OK</del>	Carry out step L3
L3	CHECK VOLTAGE - With ignition key engaged, verify 12 V at pin O5 of G1 (Check Panel control unit N59)	OK	Carry out step L4
		<del>OK</del>	Restore wiring between pin D12 and pin O5 of G1 (LTB-RED)
L4	CHECK GROUND - Verify 0V at pin O1 of G1 (Check Panel control unit N59)	OK	Replace the control unit N49
		<del>OK</del>	Restore wiring between pin O1 of G1 and ground G53b, across the solders and pin A3 of connector G99 (BLK and BLK-PPL)
L5	CHECK DISPLAY - Disconnect relay 125 for example, or a bulb and, with the ignition key engaged, check for an output signal at pin D3 of display C16	OK	Replace the display C16
		<del>OK</del>	Restore wiring between pin N6 of G1 (Check Panel control unit N59) and pin D3 of display C16 (GRY)

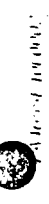
WIRING DIAGRAM



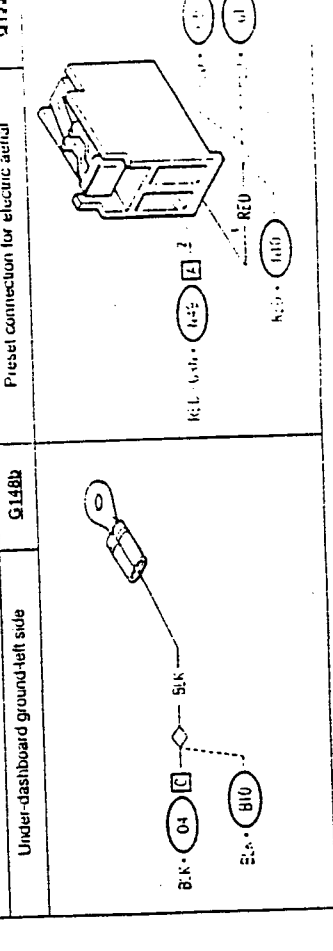
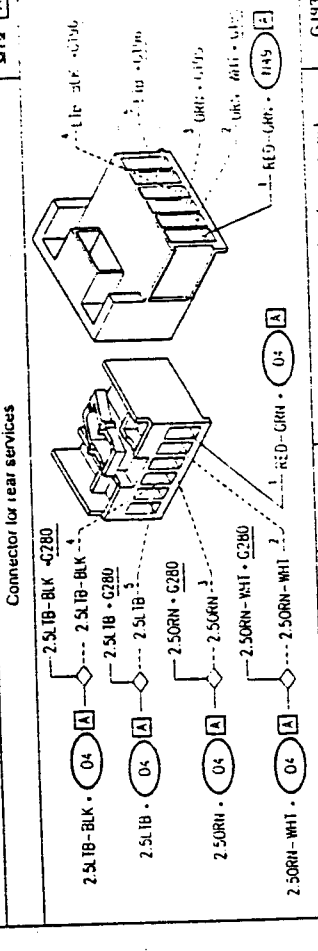
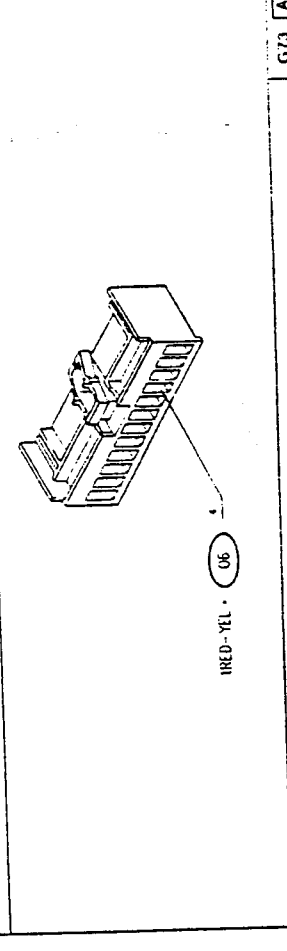
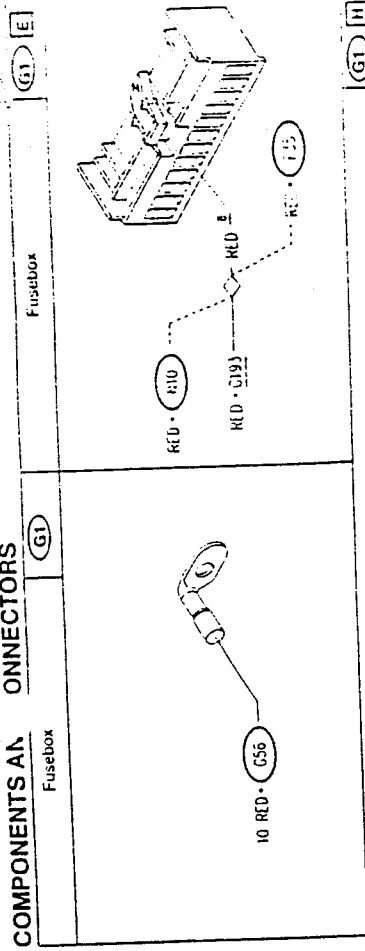
# PROVISION FOR RADIO (\*)

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(\*) valid up to chassis N.2520; from chassis N.2521 see "Radio System"



COMPONENTS AND CONNECTORS



GENERAL DESCRIPTION

The vehicle is preset for the installation of a car radio and four speakers.

The front loudspeakers are located to the side on the upper part of the dashboard, while the rear loudspeakers are located on the shell below the rear wind-screens.

The housings equipped with the relative connector for the speakers are already present in the vehicle as is the radio housing and relative connectors.

The aerial is integrated in the heated rear window device, connected by a coaxial cable to the radio itself. The vehicle is also preset for the installation of an external electric aerial, automatically operated when the radio is switched on. The radio circuit is constantly powered

(right) and G217 (left). The signals towards the rear loudspeakers O5, connected by the preset connectors G196 (right) and G195 (left) are emitted from connector A.

NOTE: The routing of the wires differs depending on the version. Pin 5 of connector A is connected to the control unit N49, which permits the device integrated with the heated rear window to be used as an aerial O3, or the electric aerial to be used through the preset connector G193.

This arrangement permits the motor of the electric aerial to be supplied with battery voltage through fuse F16 (7.5A).

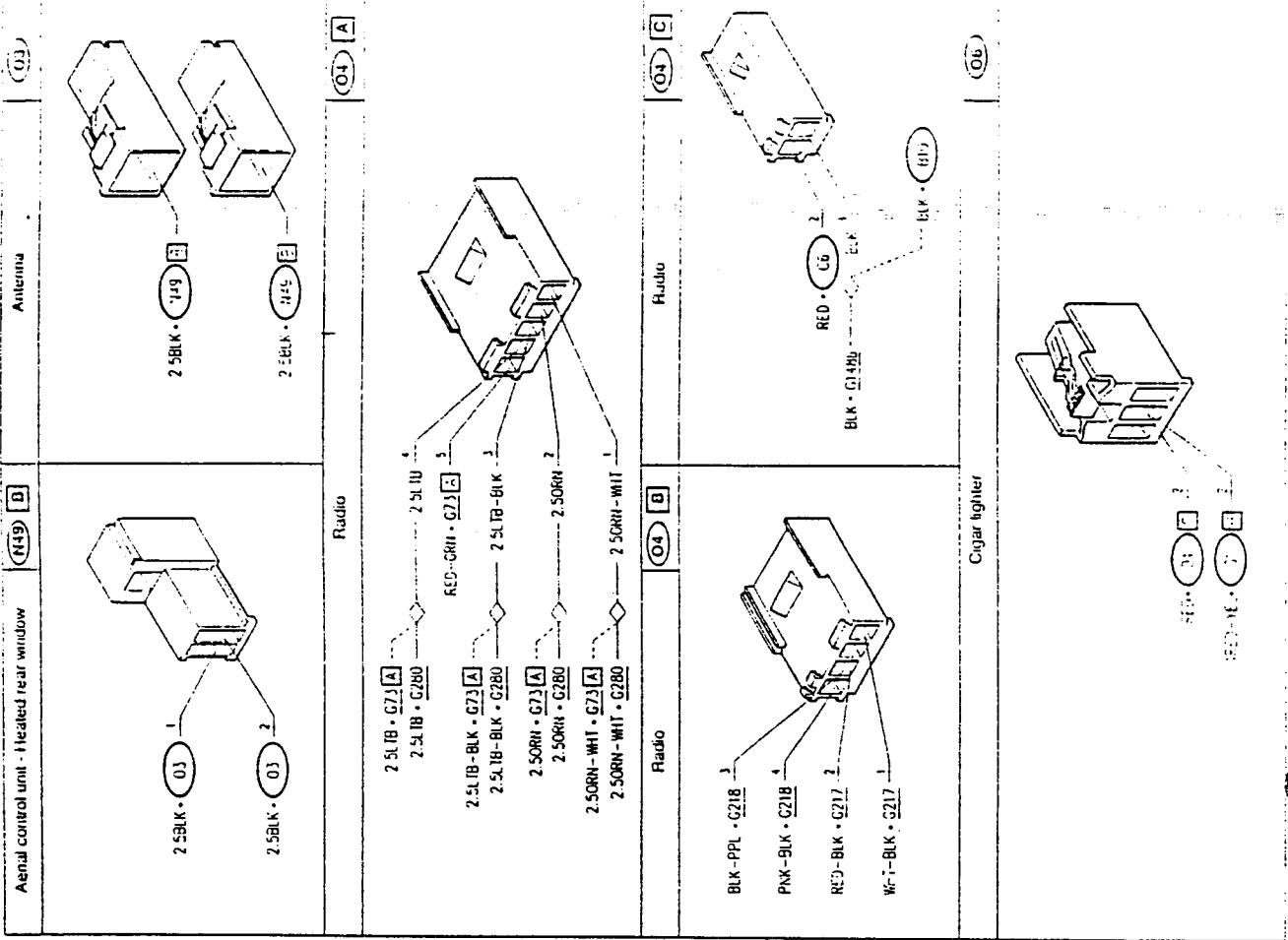
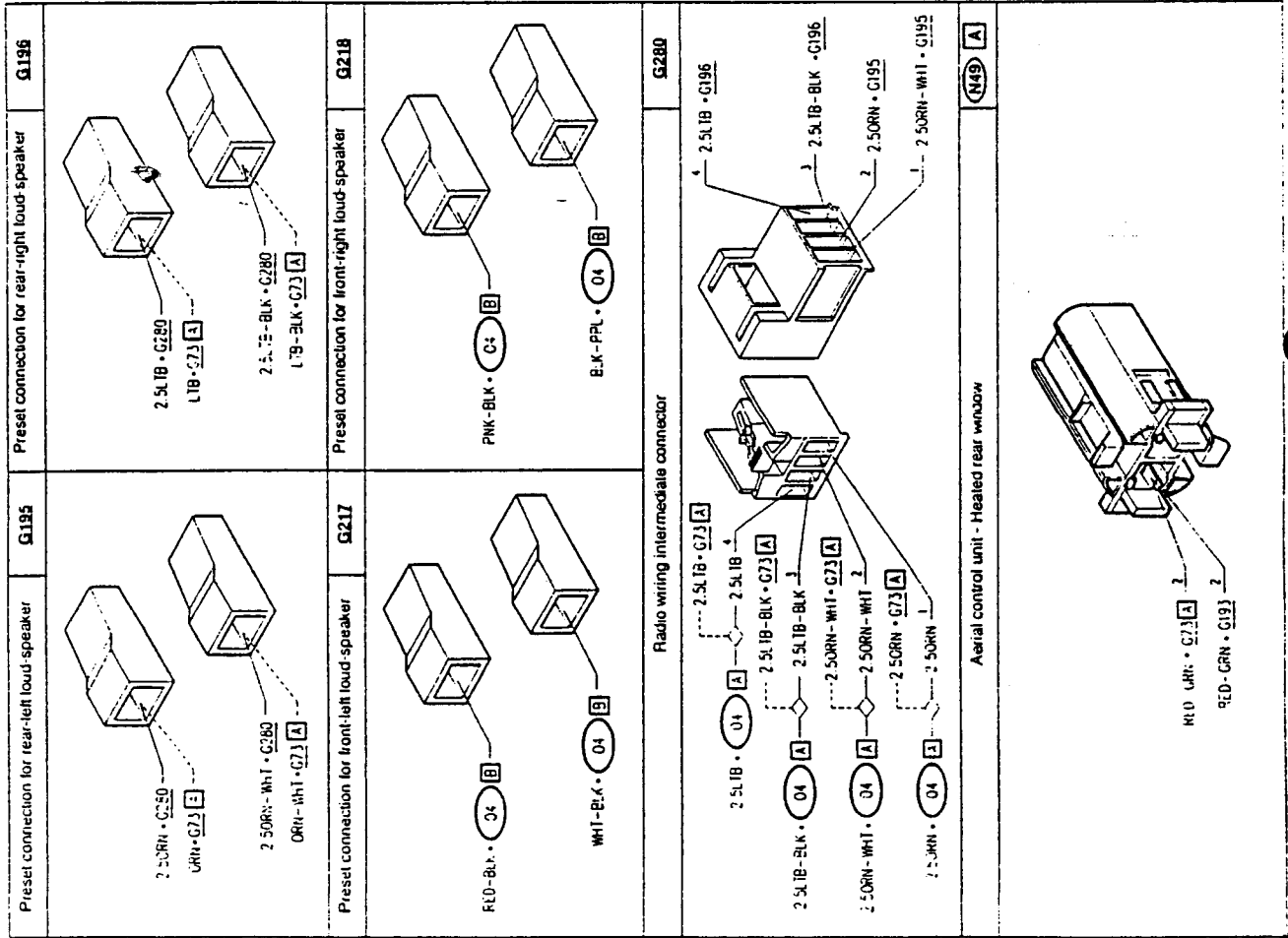
FUNCTIONAL DESCRIPTION

The radio O4 is powered directly by the voltage from the battery through fuse F2 (20A) in fusebox G1, to pin 2 of connector C; Pin 1 is grounded.

The signals are emitted from connector B towards the front loudspeakers O5, connected by preset connectors G218

TROUBLESHOOTING TABLE

Malfunction	Component			Test
	F2	O4	O5 (N49)	
Radio	•	•		A
Bad reception		•	•	B
RH front speaker			•	C
LH front speaker			•	D
RH rear speaker			•	E
LH rear speaker			•	F





REAR RIGHT LOUDSPEAKER NOT WORKING TEST E

TEST PROCEDURE		RESULT	CORRECTIVE ACTION
E1	CHECK LOUDSPEAKER - Check for correct functioning of loudspeaker	OK	Carry out step E2
		<del>OK</del>	Replace faulty loudspeaker
E2	CHECK CONTINUITY - Check the continuity between: - pin A4 of the radio O4 and pin B of connector G196 - pin A3 of the radio O4 and pin A of connector G196	OK	Check and if necessary replace the radio O4
		<del>OK</del>	Restore wiring between: - versions with controlled damping suspension (*): - pin A4 of O4 and pin 4 of connector G280, and pin 4 of G280 and pin B of G196 (LTB) - pin A3 of O4 and pin 3 of connector G280, and pin 3 of G280 and pin A of G196 (LTB-BLK) - versions without controlled damping suspension: - pin A4 of O4 and pin A5 of connector G73, and pin A5 of G73 and pin B of G196 (LTB) - pin A3 of O4 and pin A4 of connector G73, and pin A4 of G73 and pin A of G196 (LTB-BLK)

(\* ) Note: if there is a hissing noise or other signs of malfunctioning of the rear loudspeakers, check that the condenser of the controlled damping suspension system control unit N61 is correctly connected (see "Controlled damping suspension")

REAR LEFT LOUDSPEAKER NOT WORKING TEST F

TEST PROCEDURE		RESULT	CORRECTIVE ACTION
F1	CHECK LOUDSPEAKER - Check for correct functioning of loudspeaker	OK	Carry out step F2
		<del>OK</del>	Replace faulty loudspeaker
F2	CHECK CONTINUITY - Check the continuity between: - pin A2 of the radio O4 and pin B of connector G195 - pin A1 of the radio O4 and pin A of connector G195	OK	Check and if necessary replace the radio O4
		<del>OK</del>	Restore wiring between: - versions with controlled damping suspension(*): - pin A2 of O4 and pin 2 of connector G280, and pin 2 of G280 and pin B of G195 (OHN) - pin A1 of O4 and pin 1 of connector G280, and pin 1 of G280 and pin A of G195 (OHN-WHT) - versions without controlled damping suspension: - pin A2 of O4 and pin A3 of connector G73, and pin A3 of G73 and pin B of G195 (OHN) - pin A1 of O4 and pin A2 of connector G73, and pin A2 of G73 and pin A of G195 (OHN-WHT)

(\* ) Note: if there is a hissing noise or other signs of malfunctioning of the rear loudspeakers, check that the condenser of the controlled damping suspension system control unit N61 is correctly connected (see "Controlled damping suspension")

FRONT RIGHT LOUDSPEAKER NOT WORKING TEST C

TEST PROCEDURE		RESULT	CORRECTIVE ACTION
C1	CHECK LOUDSPEAKER - Check for correct functioning of loudspeaker	OK	Carry out step C2
		<del>OK</del>	Replace faulty loudspeaker
C2	CHECK CONTINUITY - Check the continuity between: - pin B4 of the radio O4 and pin A of connector G218 - pin B3 of the radio O4 and pin B of connector G218	OK	Check and if necessary replace the radio O4
		<del>OK</del>	Restore wiring between: - pin B4 of O4 and pin A of G218 (PNK-BLK) - pin B3 of O4 and pin B of G218 (BLK-PPL)

FRONT LEFT LOUDSPEAKER NOT WORKING TEST D

TEST PROCEDURE		RESULT	CORRECTIVE ACTION
D1	CHECK LOUDSPEAKER - Check for correct functioning of the loudspeaker	OK	Carry out step D2
		<del>OK</del>	Replace faulty loudspeaker
D2	CHECK CONTINUITY - Check the continuity between: - pin B2 of the radio O4 and pin A of connector G217 - pin B1 of the radio O4 and pin B of connector G217	OK	Check and if necessary replace the radio O4
		<del>OK</del>	Restore wiring between: - pin B2 of O4 and pin A of G217 (RED-BLK) - pin B1 of O4 and pin B of G217 (WHT-BLK)

WIRING DIAGRAM

RADIO SYSTEM

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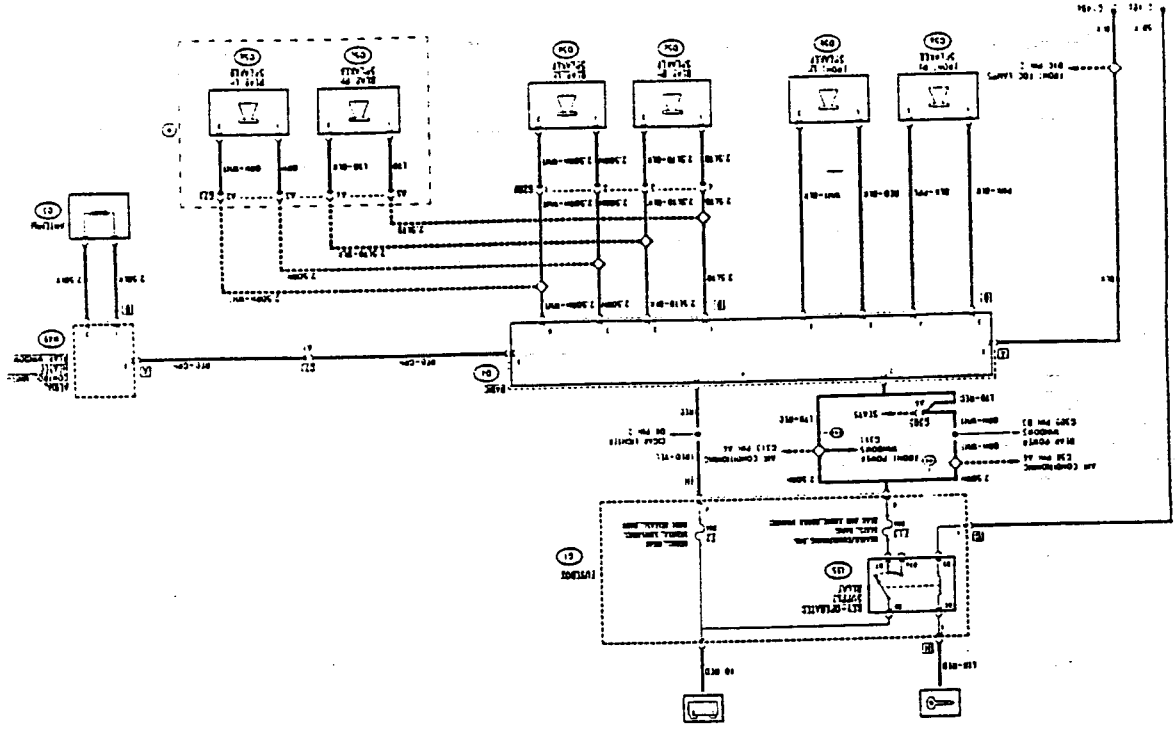
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TROUBLESHOOTING . . . . . 15A-9



15A-4 TROUBLESHOOTING TABLE

Malfunction	Component										Test	
	E2	E13	Q1	(053)	(053)	(05b)	(05c)	(053)	(N49)	(N53)		(N61)
No supply to radio *	•	•	•									
Bad reception									•			
The front RH speaker does not work												
The front LH speaker does not work									•			
The rear RH speaker does not work												
The rear LH speaker does not work												
Disturbance from other electrical devices												•

\* **RADIO PHILIPS DC731:** In the event of a malfunction affecting some specific functions or devices of the radio consult the INSTRUCTIONS FOR USE supplied with the radio. The following should only be heeded if the radio is completely dead.

\*\* Flipping or other sign of malfunction coming from the speakers when other electrical devices are used (e.g. brake lights, electric boot release, luggage compartment light etc.) check that the wiring is correctly connected and that the anti-disturbance condensers N53, N61 and N66 are working correctly (see the section "controlled damping suspension", "brake lights", "boot release" and "internal lighting")  
Also check that the ground braids are correctly fixed to the boot and bonnet hinges.

given in the OWNER'S MANUAL supplied with the radio.

The wiring diagram, wiring connections with the antenna etc. **ARE UNCHANGED** in relation to the indications given above which apply to both types of radio.

**FUNCTIONAL DESCRIPTION**

The radio O4 is supplied directly with battery voltage for the station memorization etc., through fuse F2 (20A) in fusebox G1 to pin 4 of connector A. Pin 8 is grounded. It is also powered with a key-activated supply (operation of the equipment) at pin 7 of connector A through the "key-activated" relay I35 and fuse F13 (20A) in the fusebox G1.

The cables carrying the signals to the four speakers O5 leave from connector B (the route differs depending on the versions). Pin 5 of the connector A is connected to the control unit N49 in case an electrically operated antenna is added.

silence" of all the electrical device which could interfere with the radio circuits:

- Brake lights (condenser N66)
- Luggage compartment light (condenser N53)
- Controlled damping suspension (condenser N61);

refer to the relative sections for more detailed information.

To ground braids have been fitted to the hinges of the bonnet and boot in order to further shield the radio system.

Starting from chassis N... a fixed radio, installed during production can be fitted to the vehicle as an optional.

This is a PHILIPS DC 731 radio with RDS decoder and cassette player. The radio is equipped with a front panel which can be removed to protect the radio against theft, and an internal security code to further decrease the risk of theft.

All the details regarding the characteristics and operation of the radio are

**GENERAL DESCRIPTION**

Starting from chassis N 2521, the vehicle has provision as standard for the installation of a radio with four speakers. The radio is of the pull-out type available in various models - installed in the vehicle by the Service Network. The vehicle is fitted with 20W front speakers with a diameter of 100 mm and separate tweeter. The 30W rear speakers are 165 mm in diameter and two way.

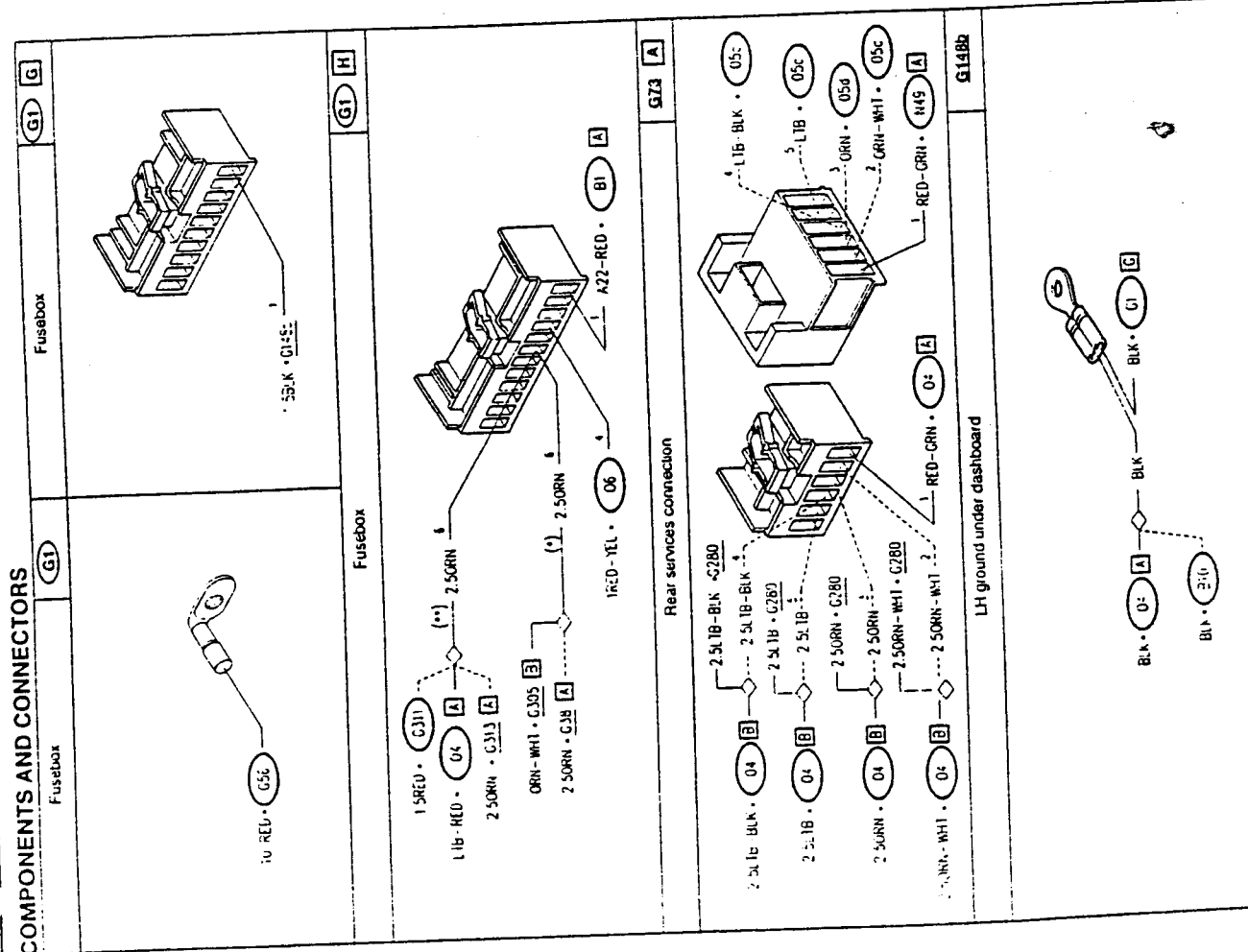
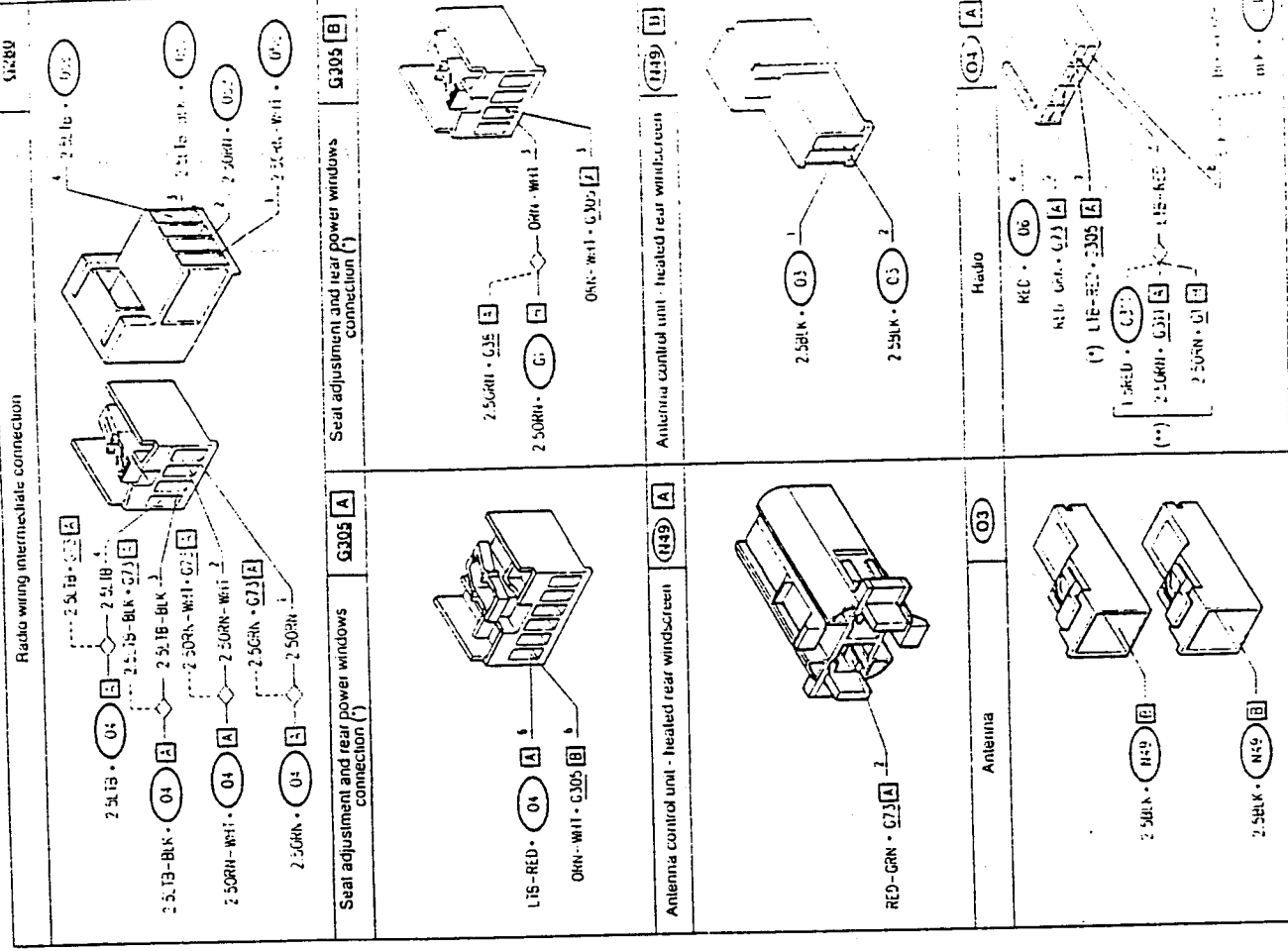
The front speakers are located on the upper part of the dashboard while the rear speakers are located on the rear halfshell.

The antenna is built into the heated rear windshield device connected by a coaxial cable with the radio itself. This ensures a high level of control over the signals without external drilling.

The radio circuit is powered with a key-activated supply and direct battery voltage makes it possible to memorize the frequencies, safety codes etc. in the radio apparatus.

Numerous anti-disturbance condensers have been installed on the wiring in order to guarantee the "electronic





(\*) Automatic air conditioner  
(\*\*) Manual air conditioner  
11-1993



RECEPTION IS BAD

TEST B

NOTE: anomalies and defects affecting the antenna/heated rear windshield control unit may also be connected with a malfunction affecting the heated rear windshield (see "Heated rear windshield and adjustable heated door mirrors").

TEST PROCEDURE	RESULT	CORRECTIVE ACTION
<b>B1</b> CHECK COAXIAL CABLE - Check for damage to and connection of the coaxial cable which connects the radio O4 to device N49	OK	Carry out step B2
	OK	Replace the coaxial cable
<b>B2</b> CHECK CONTINUITY - Check for continuity of cable connecting the control unit N49 to the antenna (heated rear windshield) O3	OK	Check and if necessary replace the control unit N49 or check the radio O4
	OK	Restore wiring between connector B of N49 and O3 (BLK)

THE FRONT RIGHT-HAND LOUDSPEAKER DOES NOT WORK

TEST C

TEST PROCEDURE	RESULT	CORRECTIVE ACTION
<b>C1</b> CHECK LOUDSPEAKER - Check for correct operation of speaker O5a	OK	Carry out step C2
	OK	Replace speaker O5a
<b>C2</b> CHECK CONTINUITY - Check for continuity between: - pin B3 of radio O4 and pin 1 of O5a - pin B4 of radio O4 and pin 2 of O5a	OK	Check and if necessary replace the connector of the radio O4 which does not send the correct signal to the speaker
	OK	Restore wiring between: - pin B3 of O4 and pin 1 of O5a (PJK-BLK) - pin B4 of O4 and pin 2 of O5a (LJK-PY)

TROUBLESHOOTING

THE RADIO DOES NOT WORK (NO POWER SUPPLY)

TEST A

NOTE: if the following circuits are also not working - windshield wipers, interior fan, heated rear windshield and door mirrors, seat warming and adjustment etc. - check and if necessary replace the key-activated supply relay I35.

TEST PROCEDURE	RESULT	CORRECTIVE ACTION
<b>A1</b> CHECK FUSE - Check for damage of fuse F2 in fusebox G1 (*)	OK	Carry out step A2
	OK	Replace fuse (20A)
<b>A2</b> CHECK FUSE - Check for damage of fuse F13 in fusebox G1 (*)	OK	Carry out step A3
	OK	Replace fuse (20A)
<b>A3</b> CHECK VOLTAGE - Check for 12V at pin A4 of O4	OK	Carry out step A4
	OK	Restore wiring between pin H4 of G1 and pin A4 of O4, also across pin 2 of O6 (RED-YEL and RED)
<b>A4</b> CHECK VOLTAGE - Check, with ignition key engaged, 12V at pin A7 of O4	OK	Carry out step A5
	OK	Restore wiring between pin H6 of G1 and pin A7 of O4, across connector G305 (only for automatic air conditioner) and solder (ORN, ORN-WHT and LTB-RED)
<b>A5</b> CHECK EARTH - Check that pin A8 of O4 is grounded (0V)	OK	The radio O4 is correctly powered. Check and if necessary replace the radio itself
	OK	Restore wiring between pins A8 of O4 ground G148b, also across solder (BLK)

(\*) Where PHILIPS DC731 fixed radio is installed also check for damage of the supplementary fuse (I0A) located behind the radio itself. Replace it if necessary.

THE FRONT LEFT-HAND LOUDSPEAKER DOES NOT WORK TEST D

TEST PROCEDURE	RESULT	CORRECTIVE ACTION
<b>D1 CHECK LOUDSPEAKER</b> - Check for correct operation of speaker O5b	OK <del>OK</del>	Carry out step D2 Replace speaker O5b
<b>D2 CHECK CONTINUITY</b> - Check for continuity between: - pin B5 of radio O4 and pin 1 of O5b - pin B6 of radio O4 and pin 2 of O5b	OK <del>OK</del>	Check and if necessary replace radio O4 which does not send the correct signal to the speaker  Restore wiring between: - pin B5 of O4 and pin 1 of O5b (RED-BLK) - pin B6 of O4 and pin 2 of O5b (WHT-BLK)

THE REAR RIGHT-HAND SPEAKER DOES NOT WORK TEST E

TEST PROCEDURE	RESULT	CORRECTIVE ACTION
<b>E1 CHECK LOUDSPEAKER</b> - Check for correct operation of speaker O5c	OK <del>OK</del>	Carry out step E2 Replace speaker O5c
<b>E2 CHECK CONTINUITY</b> - Check continuity between: - pin B1 of radio O4 and pin 1 of O5c - pin B2 of radio O4 and pin 2 of O5c	OK <del>OK</del>	Check and if necessary replace radio O4 which sends the correct signal to the speaker  Restore wiring between: - versions with controlled damping suspension: - pin B1 of O4 and pin 4 of connector G280, and pin 4 of G280 and pin 1 of O5c (L1B) - pin B2 of O4 and pin 3 of connector G280, and pin 3 of G280 and pin 2 of O5c (LTB-BLK) - versions without controlled damping suspension: - pin B1 O4 and pin A5 of connector G73, and pin A5 of G73 and pin 1 of O5c (LTB) - pin B2 of O4 and pin A4 of connector G73, and pin A4 of G73 and pin 2 of O5c (LTB-BLK)

THE REAR LEFT-HAND SPEAKER DOES NOT WORK TEST F

TEST PROCEDURE	RESULT	CORRECTIVE ACTION
<b>F1 CHECK LOUDSPEAKER</b> - Check for correct operation of speaker O5d	OK <del>OK</del>	Carry out step F2 Replace speaker O5d
<b>F2 CHECK CONTINUITY</b> - Check for continuity between: - pin B7 of radio O4 and pin 1 of O5d - pin B8 of radio O4 and pin 2 of O5d	OK <del>OK</del>	Check and if necessary replace the radio O4 which does not send the correct signal to the speaker  Restore wiring between: - versions with controlled damping suspension: - pin B7 of O4 and pin 2 of connector G280, and pin 2 of G280 and pin 1 of O5d (OHT) - pin B8 of O4 and pin 1 of connector G280, and pin 1 of G280 and pin 2 of O5d (OHT WHI) - versions without controlled damping suspension: - pin B7 of O4 and pin A3 of connector G73, and pin A3 of G73 and pin 1 of O5d (OHT) - pin B8 of O4 and pin A2 of connector G73, and pin A2 of G73 and pin 2 of O5d (OHT WHI)