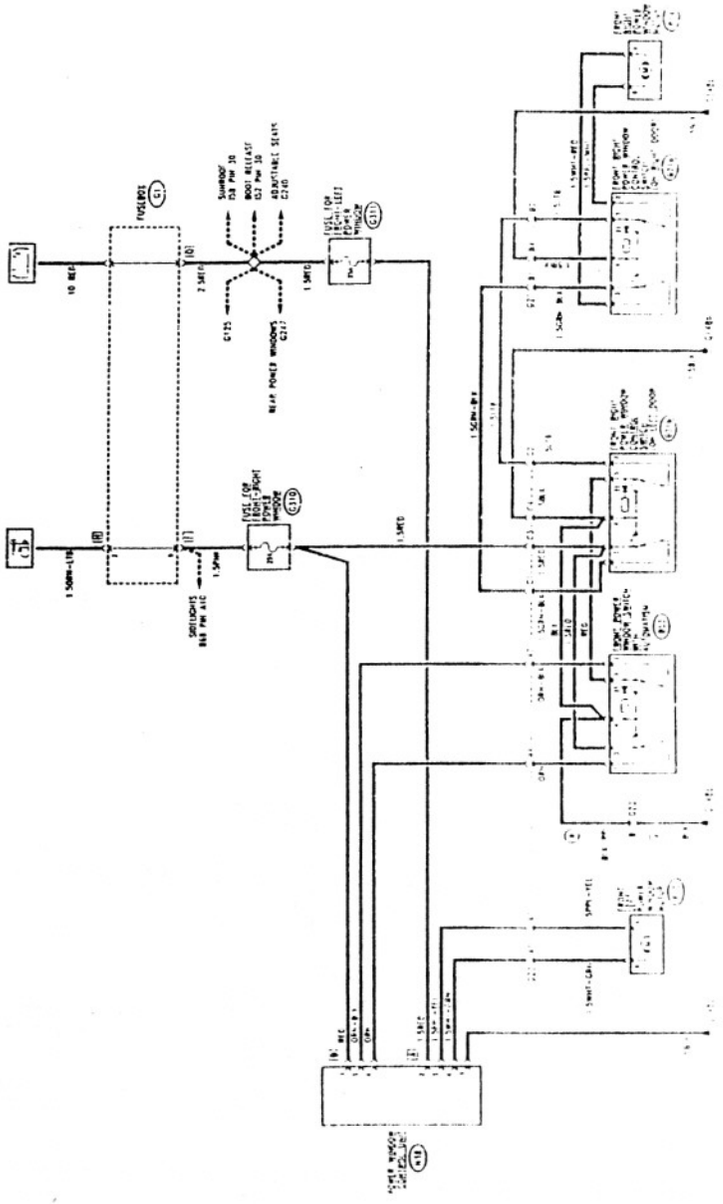
FRONT POWER WINDOWS

(Off-side Window with Automatic Raising Device*)

INDEX

(*) If the off-side window does not have an automatic raising device see successive Section 22A

WIRING DIAGRAM



GENERAL DESCRIPTION

Operation of the left-hand power window (driver's side) is of the automatic type (*), controlled by a control unit which actuates it in accordance with the following logic:

- acting on one of the two buttons and keeping it pressed, the window is raised or lowered normally until the button is released;
- a short impulse (less than 300 ms. approx.) actuates the electric motor which automatically stops when the stop limit is reached (window completely open or closed);
- an even shorter impulse (less than 50 ms. approx.) is considered by the control unit as an accidental shock and no action will result.

All the power windows are turn-key operated.

The electrical mechanism which actuates the front right-hand window is of the traditional type: when the button is pressed the window is raised or lowered; it is equipped with two control switches, one on the right-hand door and one on the left-hand door.

FUNCTIONAL DESCRIPTION

The power window control unit **N38** is supplied at pin 2 of connector A by voltage from the battery via fuse **G311** (25A) protecting the left- hand power window.

The key operated supply reaches pin 1 of connector B via fuse **G310** (25A) which also protects the right-hand power window.

Consensus signals for the raising and lowering of the window reach pins 3 and 4 of connector B from the left-hand window control switch **B53**.

This double switch sends and ground to the control unit and then to the electric motor **P15** on the side where the contact was closed, determining in this way the direction of rotation of the motor.

The actuation signals (raising or lowering) for the left-hand window motor **P15** leave from pins 3 and 4 of connector A of **N38**.

Pin 1 of connector A of **N38** is connected to ground.

The actuation of the right-hand power window is directly controlled by one of the two switches **B21** (**B21a** located on the right-hand door, **B21b** on the left) connected in series.

The key operated supply passes fuse **G310** (25A) and the negative signal from ground **G148b**.

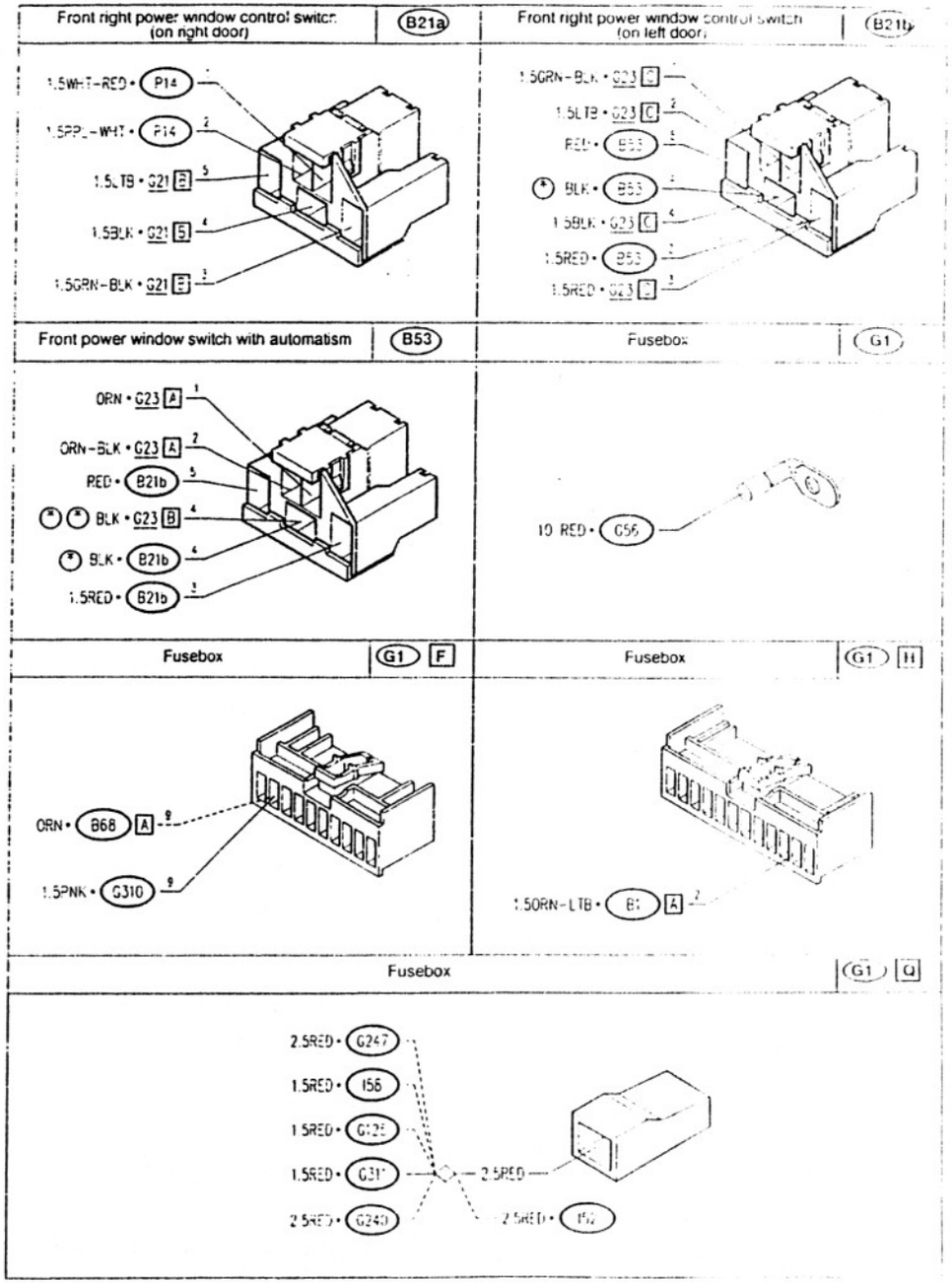
The motor of the right-hand window **P14** is in this way actuated by the double switch **B21** in either one direction or the other depending on the origin of the positive or negative signal.

TROUBLESHOOTING TABLE

Malfunction	Component							Test
	N38	G310	G311	B21	B53	P14	P15	
Front left power window	•	•	•		•		•	A
Front right power window		•		•		•		B

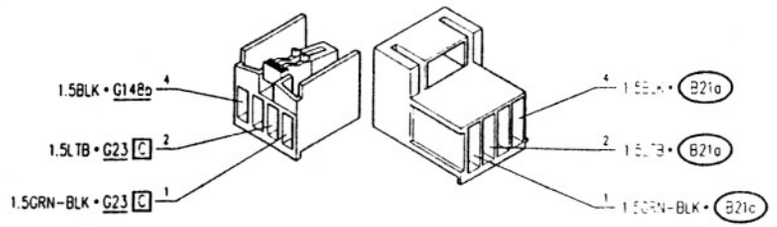
(*) If the off-side window **does not have an automatic raising device** see successive **Section 22A**

COMPONENTS AND CONNECTORS

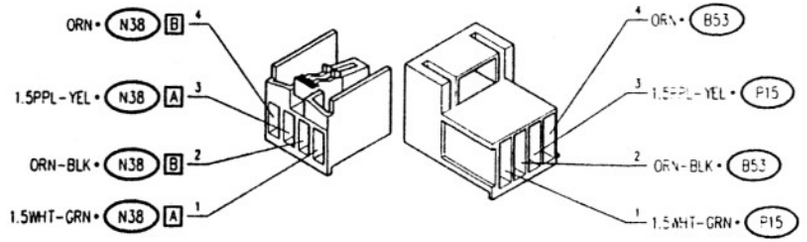


(*) Up to chassis N.2520 (**) from chassis N.2521

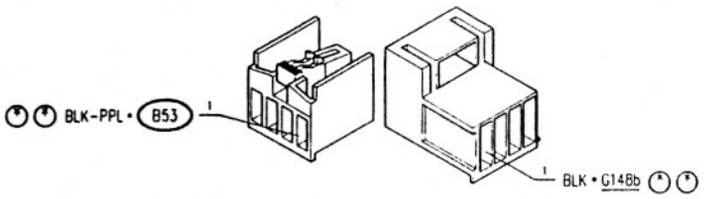
Connector for front right door wiring — G21 B



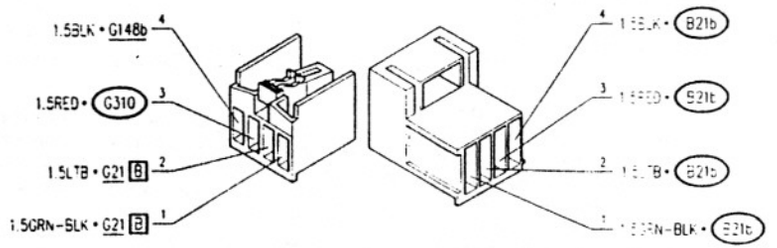
Connector for front left door wiring — G23 A



Connector for front left door wiring — G23 B

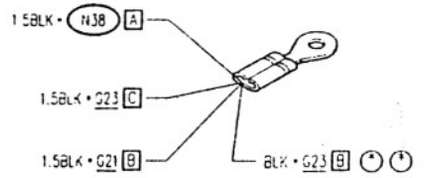


Connector for front left door wiring — G23 C

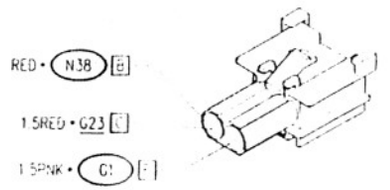


(*) from chassis N.2521

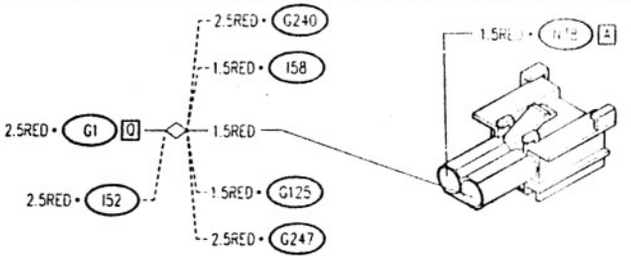
Under-dashboard ground - left side — G148b



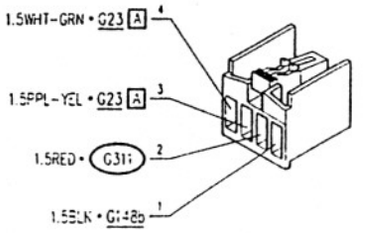
Fuse for front right power window — G310



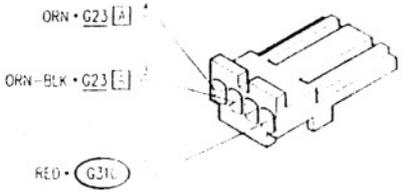
Fuse for front-left power window — G311



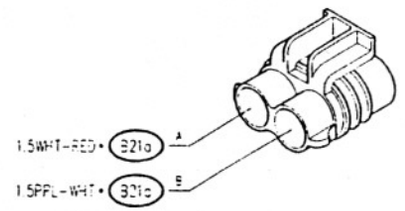
Power window control unit — N38 A



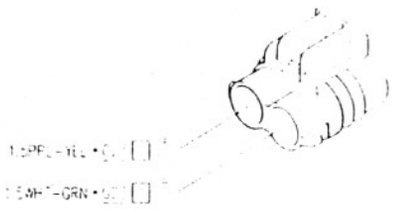
Power window control unit — N38 B



Front-right power window motor — P14

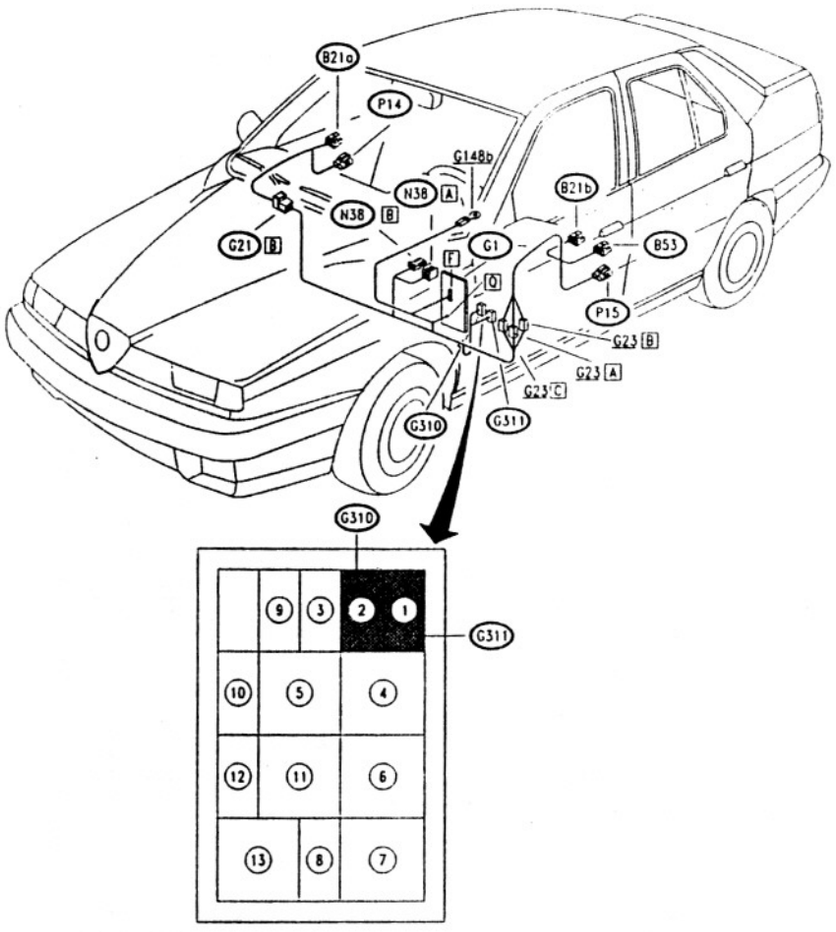


Front-left power window motor — P15



(**) from chassis N.2521

LOCATION OF COMPONENTS



From chassis N.30.733

Up to chassis N.30.732
G311 = WHITE fuse holder
G310 = BRAWN fuse holder

TROUBLESHOOTING

FRONT LEFT-HAND POWER WINDOW NOT WORKING	TEST A

TEST PROCEDURE	RESULT	CORRECTIVE ACTION
A1 CHECK FUSE – Check for damage of wander fuse **G311**	OK ▶	Carry out **step A2**
	NO ▶	Replace fuse (25A)
A2 CHECK FUSE – Check for damage of wander fuse **G310**	OK ▶	Carry out **step A3**
	NO ▶	Replace fuse (25A) **N.B.** in this case the front right hand power window will also not be working (see successive **test B**)
A3 CHECK VOLTAGE – Verify 12V between pins A2 and A1 of power windows control unit **N38**	OK ▶	Carry out **step A5**
	NO ▶	Carry out **step A4**
A4 CHECK VOLTAGE – Verify 12 V at pin A2 of control unit **N38**	OK ▶	Restore wiring between pin A1 of N38 and ground **G148b** (BLK)
	NO ▶	Restore wiring between pin A2 of **N38** and pin Q of **G1**, across wander fuse **G311** and the solder (RED)
A5 CHECK VOLTAGE – With ignition key engaged, verify 12 V at pin B1 of control unit **N38**	OK ▶	Carry out **step A6**
	NO ▶	Restore wiring between pin B1 of **N38** and pin F of **G1**, across wander fuse **G310** (RED and PNK)
A6 CHECK VOLTAGE – With ignition key engaged and activating switch **B53** in one of the two directions, verify 12 V between pins B3 and B4 of control unit **N38**	OK ▶	Carry out **step A10**
	NO ▶	Carry out **step A7**

(Continued)

FRONT LEFT-HAND POWER WINDOW NOT WORKING — TEST A

TEST PROCEDURE	RESULT	CORRECTIVE ACTION
A7 CHECK VOLTAGE – With ignition key engaged and activating switch **B53** in one of the two directions, verify 12 V between pins 1 and 2 of switch **B53**	OK ▶	Restore wiring between: • pin 1 of **B53** and pin B4 of **N38**, across pin A4 of connector **G23** (ORN) • pin 2 of **B53** and pin B3 of **N38**, across pin A2 of connector **G23** (ORN-BLK)
	~~OK~~ ▶	Carry out **step A8**
A8 CHECK GROUND – Check that pin 4 of **B53** is grounded (0V)	OK ▶	Carry out **step A9**
	~~OK~~ ▶	Restore wiring between pin 4 of B53 and ground **G148b** (*) across pin 4 of connector G306 (BLK) (**) across pin B1 of connector **G23** (BLK-PPL and BLK)
A9 CHECK VOLTAGE – With ignition key engaged,verify 12 V at pins 3 and 5 of **B53**	OK ▶	Replace switch **B53**
	~~OK~~ ▶	Restore wiring between: • pin 3 of **B53** and fuse **G310**, across pin 3 of **B21b** and pin C3 of connector **G23** (RED) • pin 5 of **B53** and pin 5 of **B21b** (RED)
A10 CHECK VOLTAGE – With ignition key engaged and activating switch **B53** in one of the two directions, verify 12 V between pins A4 and A3 of control unit **N38**	OK ▶	Carry out step **A11**
	~~OK~~ ▶	Replace control unit **N38**
A11 CHECK MOTOR – With ignition key engaged and activating switch **B53** in one of the two directions, verify 12 V between pins A and B of motor **P15**	OK ▶	Replace motor **P15**
	~~OK~~ ▶	Restore wiring between: • pin A4 of **N38** and pin B of **P15**, across pin A1 of connector **G23** (WHT-GRN) • pin A3 of **N38** and pin A of **P15**, across pin A3 of connector **G23** (PPL-YEL)

(*) up to chassis N.2520
(**) from chassis N.2521

FRONT RIGHT-HAND POWER WINDOW NOT WORKING — TEST B

TEST PROCEDURE	RESULT	CORRECTIVE ACTION
B1 CHECK FUSE – Check for damage of wander fuse **G310**	OK ▶	Carry out step B2
	~~OK~~ ▶	Replace fuse (25A)
B2 CHECK VOLTAGE – With ignition key engaged and activating switch **B21a** in one of the two directions, verify 12 V between pins 1 and 2 of switch **B21a**	OK ▶	Carry out step B3
	~~OK~~ ▶	Carry out step B4
B3 CHECK MOTOR – With ignition key engaged and activating switch **B21a** in one of the two directions, verify 12 V between pins A and B of motor **P14**	OK ▶	Replace motor P14
	~~OK~~ ▶	Restore wiring between: • pin 1 of B21a and pin A of P14 (WHT-RED) • pin 2 of B21a and pin B of P14 (PPL-WHT)
B4 CHECK VOLTAGE – With ignition key engaged, verify 12 V between pin 3 and 4 of switch **B21a**, and between pin 5 and 4 of the same switch	OK ▶	Replace switch B21a
	~~OK~~ ▶	Carry out step B5
B5 CHECK GROUND – Check that pin 4 of **B21a** is grounded (0V)	OK ▶	Carry out step B6
	~~OK~~ ▶	Restore wiring between pin 4 of B21a and ground **G148b**, across pin B4 of connector G21 (BLK)
B6 CHECK VOLTAGE – With ignition key engaged and activating switch **B21b** in one of the two directions, verify 12 V between pins 1 and 2 of switch **B21b**	OK ▶	Restore wiring between: • pin 1 of B21b and pin 3 of B21a across pin C3 of connector G23 and pin B1 of connector G21 (ORN-BLK) • pin 2 of B21b and pin 5 of B21a across pin C2 of connector G23 and pin B2 of connector G21 (RED)
	~~OK~~ ▶	Carry out step B7
B7 CHECK VOLTAGE – With ignition key engaged, verify 12 V between pin 3 and 4 of switch **B21b**, and between pin 5 and 4 of the same switch	OK ▶	Replace switch B21b
	~~OK~~ ▶	Carry out step B8
B8 CHECK GROUND – Check that pin 4 of **B21b** is grounded (0V)	OK ▶	Restore wiring between: • pin 3 of B21b and fuse G310, across pin C3 of connector G23 (RED)
	~~OK~~ ▶	Restore wiring between pin 4 of B21b and ground **G148b**, across pin C4 of connector G23 (BLU)

FRONT POWER WINDOWS

(Operation without Automatic Raising Device*)

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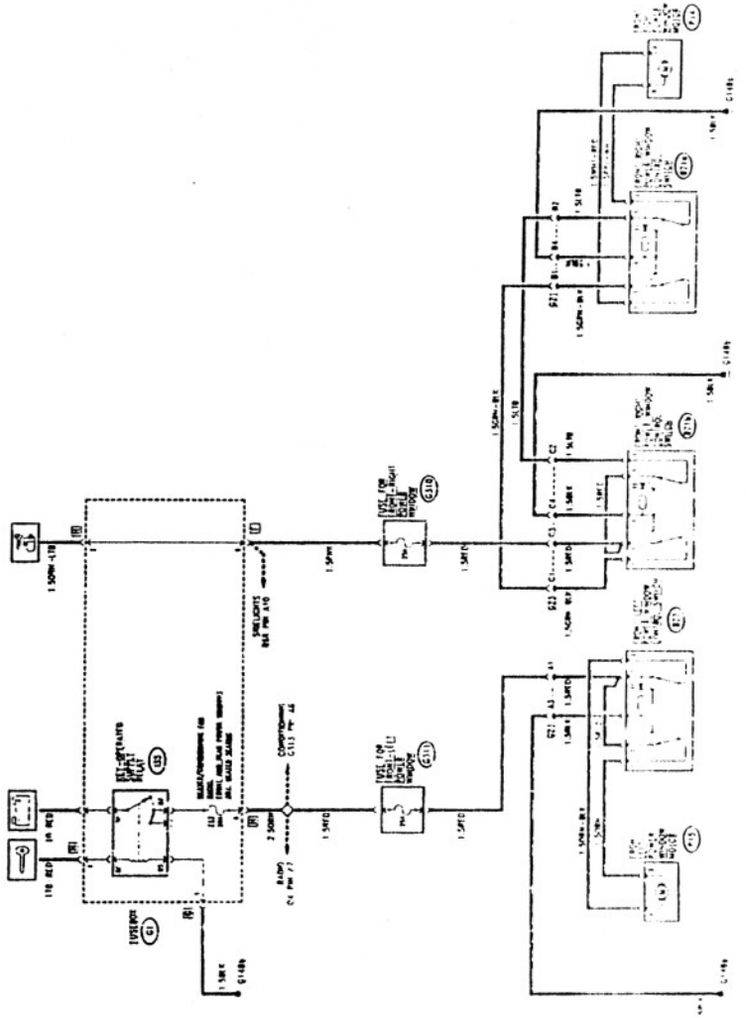
(*) If the off-side window is equipped with an automatic raising device see preceeding Section 22

WIRING DIAGRAM



GENERAL DESCRIPTION

An electrical mechanism permits operation of the front windows when the buttons located on the relative doors are pressed.

The door on the driver's side is also fitted with a button which operates the window on the passenger's side.

N.B. The power windows are "key-activated" and cannot be opened if the ignition key is not engaged.

FUNCTIONAL DESCRIPTION

The operation of the left-hand power window is controlled by switch **B22**.

The key-activated power supply is delivered through fuse **G311** (25A) and the negative earth signal through **G148b**.

The double switch delivers power and earth to the motor **P15** according to the part in which the contact was closed thus determining the direction of rotation of the motor itself and raising or lowering the window.

The operation of the right-hand power window is controlled by one of two switches **B21** (**B21a** located on the right-hand door, **B21b** on the left) which are connected in series.

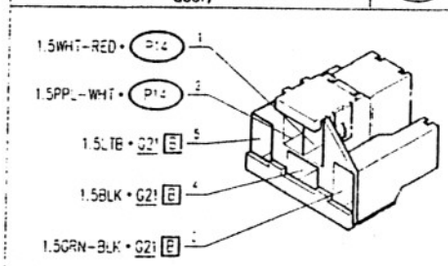
The "Key activated" power supply is delivered via fuse **G310** (25A) and the negative earth signal from earth **G148b**. The motor of the right- hand window **P14** is thus activated by a double switch **B21** in one direction or another depending on the closing of the contact.

FAULT DIAGNOSIS TABLE

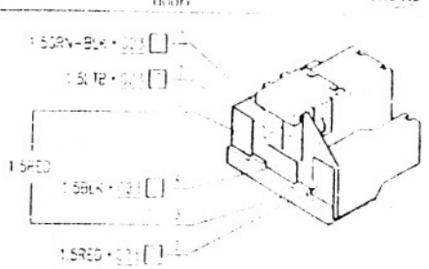
Malfunction	Component							Test
	F13	G310	G311	B21	B22	P14	P15	
Front LH power window	•		•		•		•	A
Front RH power window		•		•		•		B

COMPONENTS AND CONNECTORS

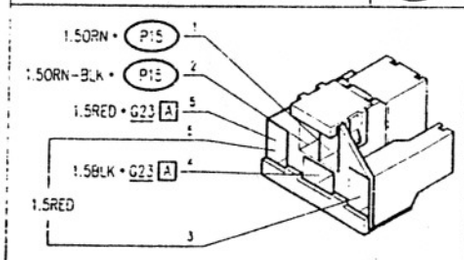
Front right power window control switch (on right door) B21a



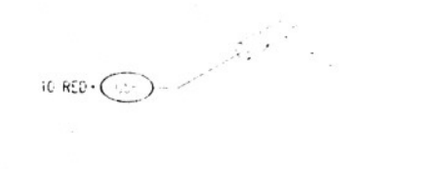
Front right power window control switch (on left door) B21b



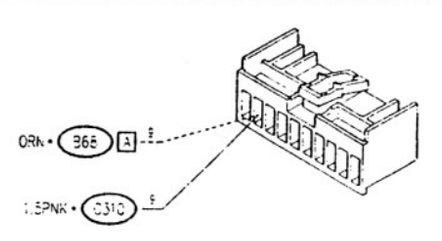
Front left power window control switch B22



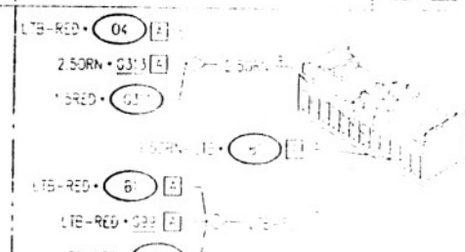
Fusebox G1



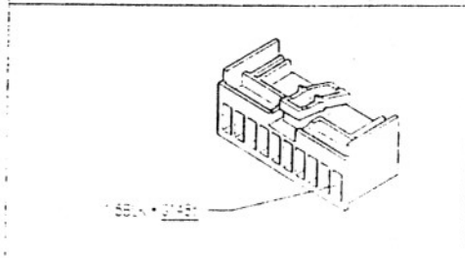
Fusebox G1 F



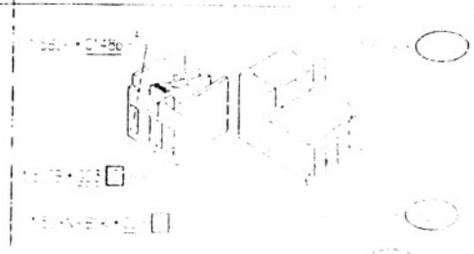
Fusebox G1 H



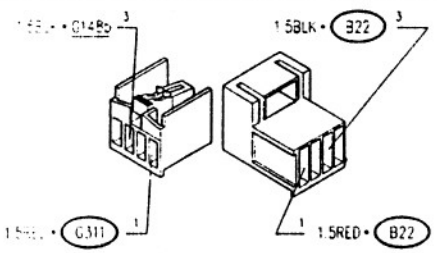
Fusebox G1 G



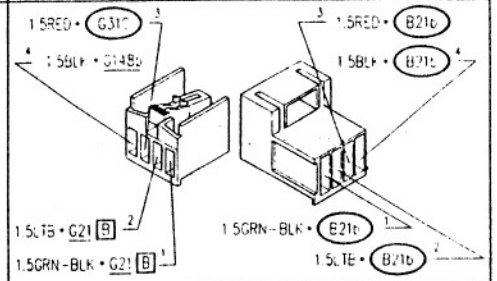
Connector for front right door wiring G21 B



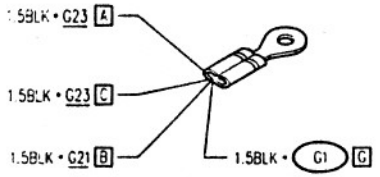
Connector for front left door winng	G23 A



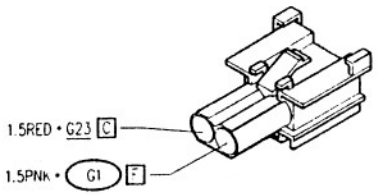
Connector for front left door winng	G23 C



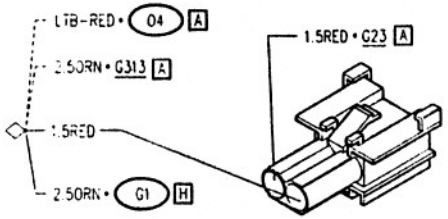
Under-dashboard ground - left side	G148b



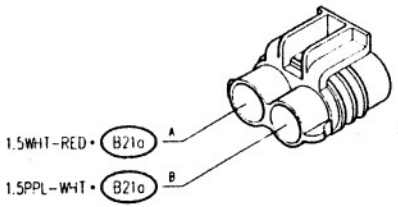
Fuse for front-right power window	G310



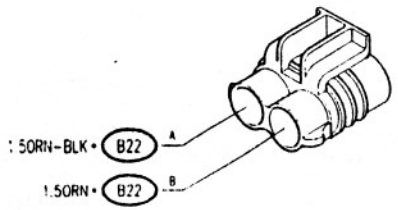
Fuse for front-left power window	G311



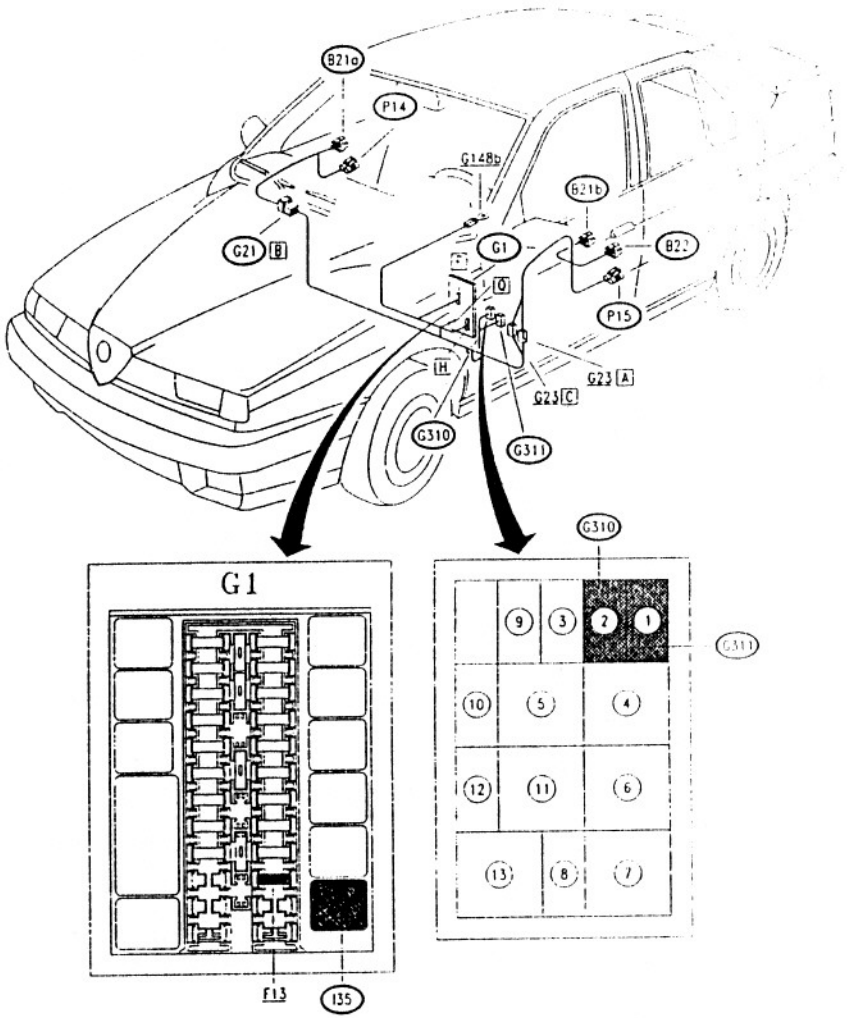
Front-right power window motor	P14



Front-left power window motor	P15



LOCATION OF COMPONENTS



TROUBLESHOOTING

FRONT LEFT-HAND POWER WINDOW NOT WORKING	TEST A

TEST PROCEDURE	RESULT	CORRECTIVE ACTION
A1 CHECK FUSE – Check for damage of wander fuse **G311**	OK ▶	Carry out **step A2**
	OK ▶	Replace fuse (25A)
A2 CHECK VOLTAGE – With ignition key engaged check for 12V on fuse **G311**	OK ▶	Carry out **step A3**
	OK ▶	Restore wiring between fuse **G311** and fusebox **G1**, pin H6 across solder (RED and ORN). Also check fuse **F13** and relay I35 of fusebox **G1**
A3 CHECK VOLTAGE – With ignition key engaged and activating switch **B22** in one of the two directions, verify 12 V between pins 1 and 2 of switch itself	OK ▶	Carry out **step A4**
	OK ▶	Carry out **step A5**
A4 CHECK MOTOR – With ignition key engaged and activating switch **B22** in one of the two directions, verify 12 V between pins A and B of motor **P15**	OK ▶	Replace motor **P15**
	OK ▶	Restore wiring between: • pin 1 of **B22** and pin B of **P15** (ORN) • pin 2 of **B21b** and pin A of **P15** (ORN-BLK)
A5 CHECK VOLTAGE – With ignition key engaged, verify 12 V between pin 3 and 4 of switch **B22**, and between pin 5 and 4 of the same switch	OK ▶	Replace switch **B22**
	OK ▶	Carry out **step A6**
A6 CHECK GROUND – Check that pin 4 of **B22** is grounded (0V)	OK ▶	Restore wiring between: • pin 5 of **B22** and fuse **G311**, across pin A1 of connector **G23** (RED) • pin 3 of **B22** and pin 5 of **B22** (RED)
	OK ▶	Restore wiring between pin 4 of **B22** and ground **G148b**, across pin A3 of connector **G23** (BLK)

FRONT RIGHT-HAND POWER WINDOW NOT WORKING	TEST B

TEST PROCEDURE	RESULT	CORRECTIVE ACTION
B1 CHECK FUSE – Check for damage of wander fuse **G310**	OK ▶	Carry out **step B2**
	OK ▶	Replace fuse (25A)
B2 CHECK VOLTAGE – With ignition key engaged and activating switch **B21a** in one of the two directions, verify 12 V between pins 1 and 2 of switch **B21a**	OK ▶	Carry out **step B3**
	OK ▶	Carry out **step B4**
B3 CHECK MOTOR – With ignition key engaged and activating switch **B21a** in one of the two directions, verify 12 V between pins A and B of motor **P14**	OK ▶	Replace motor P14
	OK ▶	Restore wiring between: • pin 1 of **B21a** and pin A of **P14** (WHT-RED) • pin 2 of **B21a** and pin B of **P14** (PPL-WHT)
B4 CHECK VOLTAGE – With ignition key engaged, verify 12 V between pin 3 and 4 of switch **B21a**, and between pin 5 and 4 of the same switch	OK ▶	Replace switch B21a
	OK ▶	Carry out **step B5**
B5 CHECK GROUND – Check that pin 4 of **B21a** is grounded (0V)	OK ▶	Carry out **step B6**
	OK ▶	Restore wiring between pin 4 of B21a and ground **G148b**, across pin B4 of connector G21 (BLK)
B6 CHECK VOLTAGE – With ignition key engaged and activating switch **B21b** in one of the two directions, verify 12 V between pins 1 and 2 of switch **B21b**	OK ▶	Restore wiring between: • pin 1 of **B21b** and pin 3 of B21a, across pin C1 of connector **G23** and pin B1 of connector G21 (GRN-BLK) • pin 2 of **B21b** and pin 5 of B21a, across pin C2 of connector **G23** and pin B2 of connector G21 (BLK)
	OK ▶	Carry out **step B7**
B7 CHECK VOLTAGE – With ignition key engaged, verify 12 V between pin 3 and 4 of switch **B21b**, and between pin 5 and 4 of the same switch	OK ▶	Replace switch B21b
	OK ▶	Carry out **step B8**
B8 CHECK GROUND – Check that pin 4 of **B21b** is grounded (0V)	OK ▶	Restore wiring between: • pin 3 of **B21b** and fuse G310, across pin C1 of connector **G23** (RED) • pin 5 of **B21b** and pin 3 of B21b (RED)
	OK ▶	Restore wiring between pin 4 of B21b and ground **G148b**, across pin C4 of connector G23 (BLK)