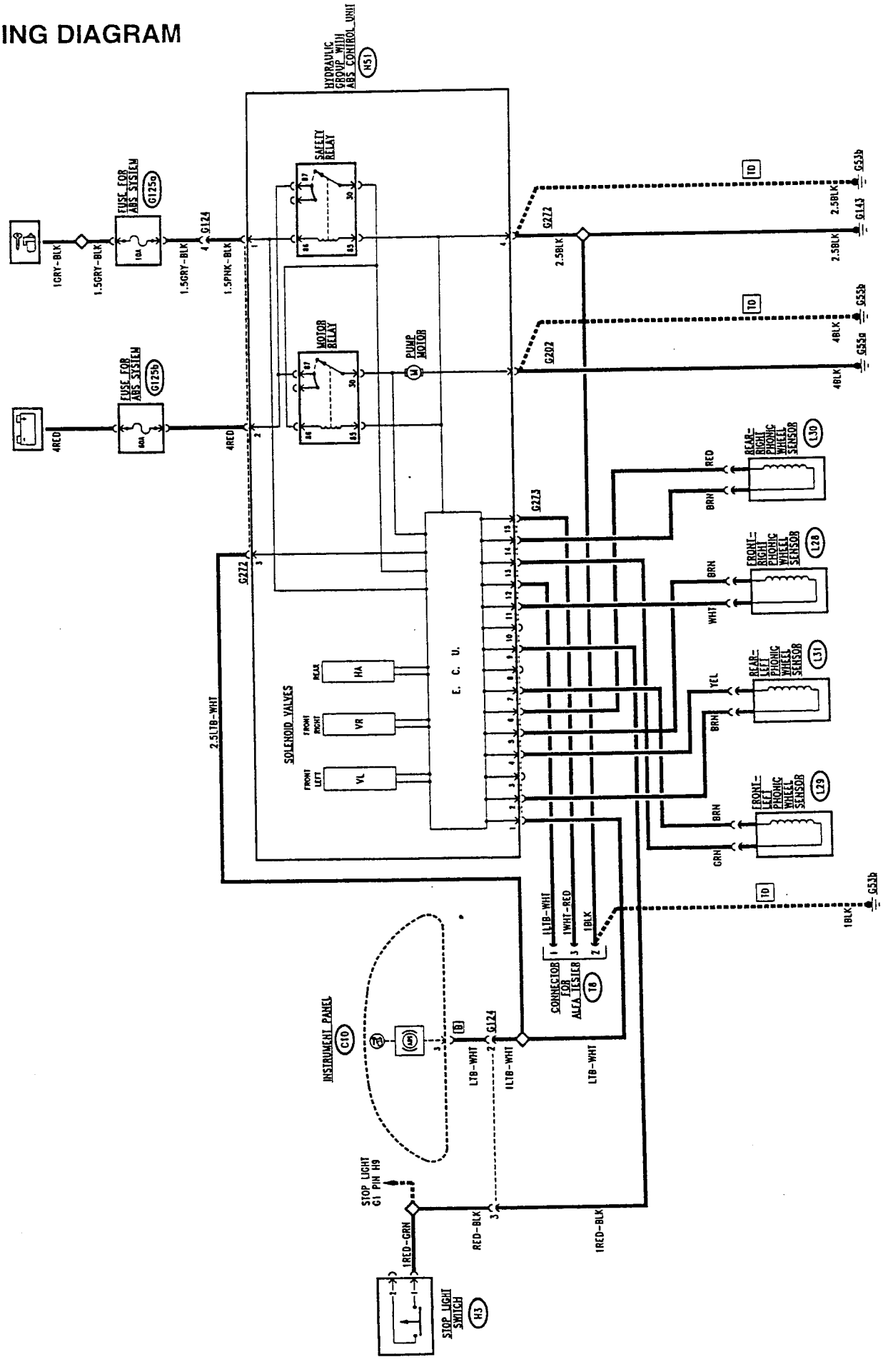
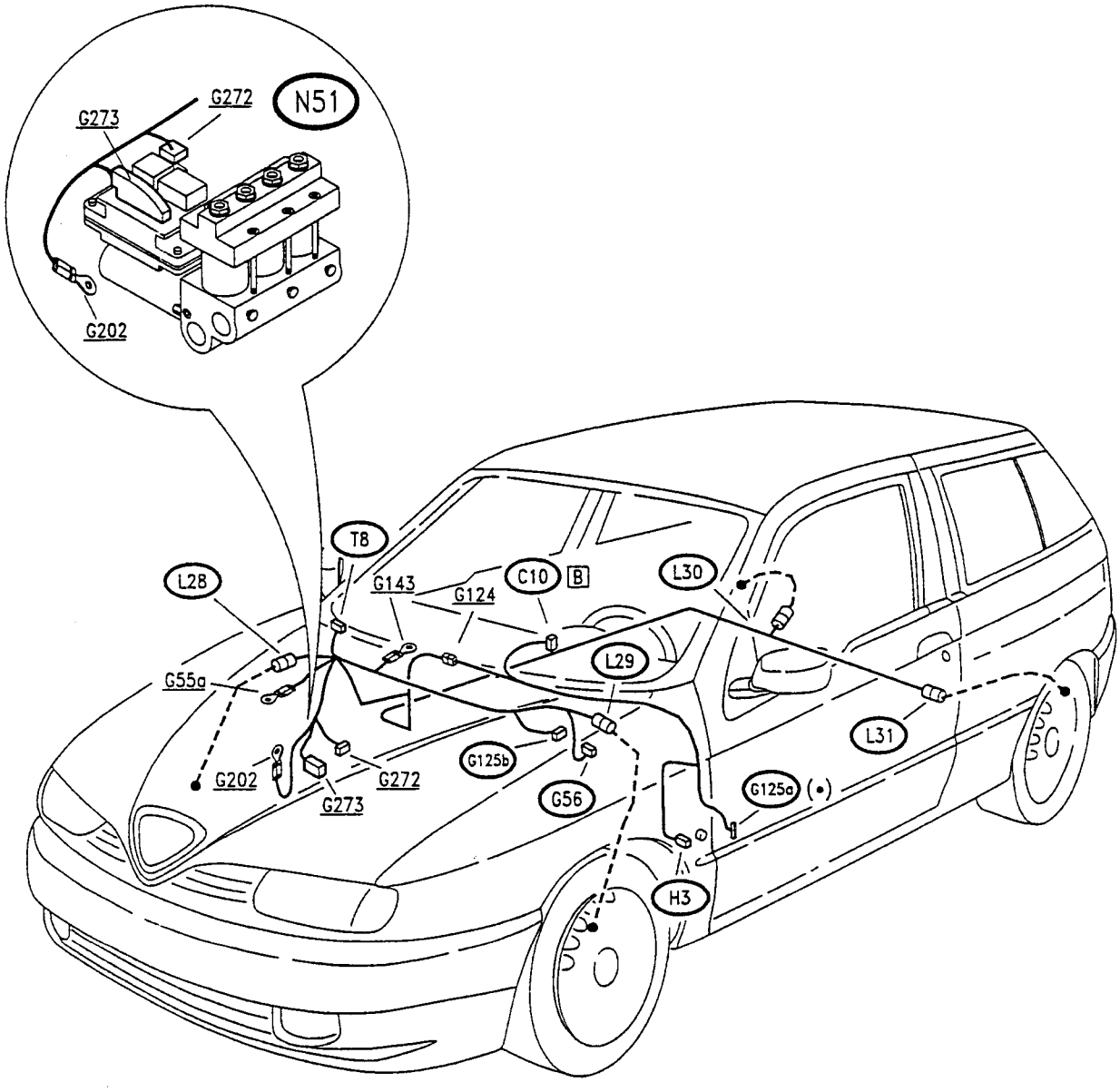
ABS SYSTEM (BOSCH 2E ABS)

INDEX

WIRING DIAGRAM

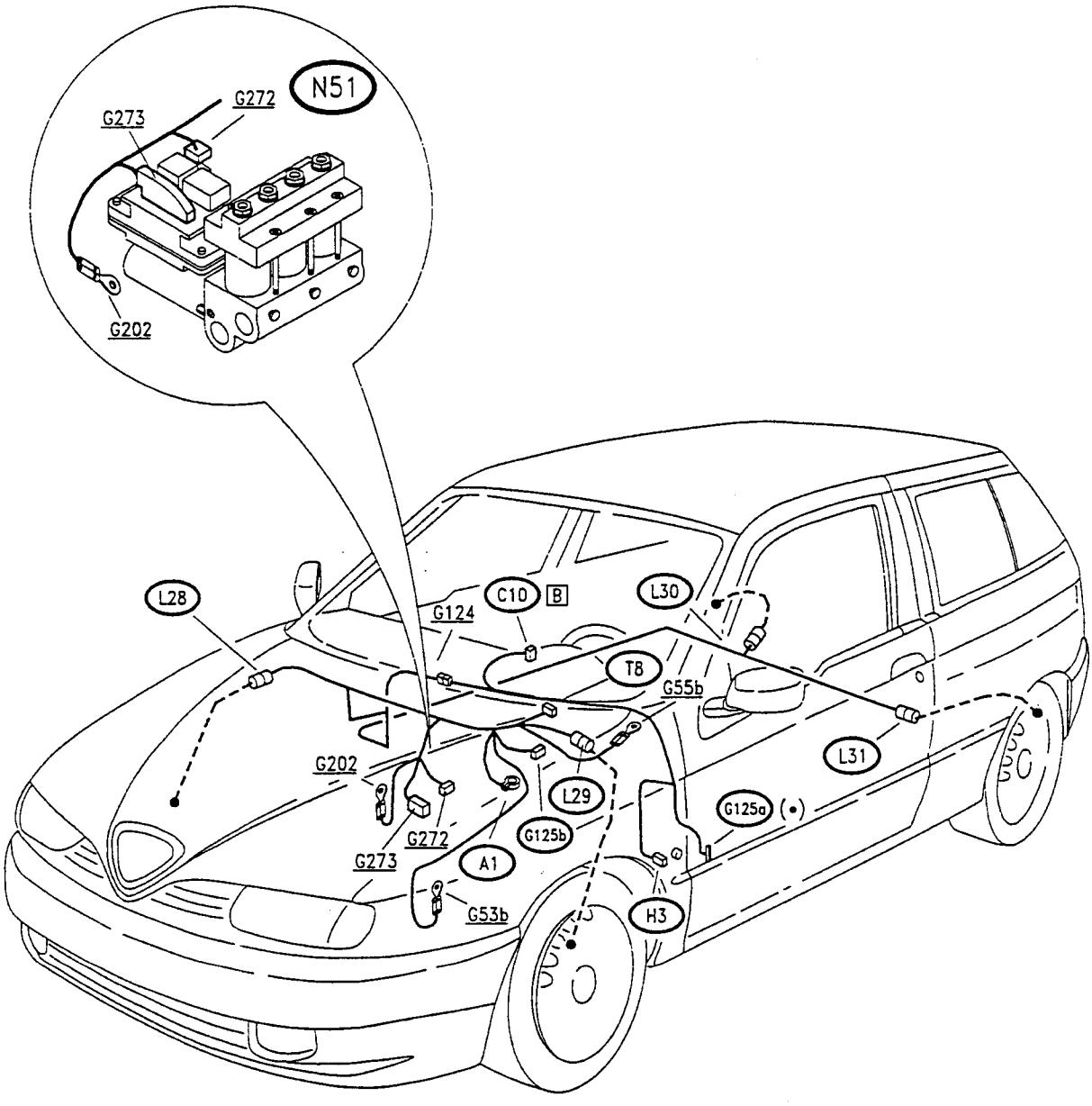


LOCATION OF COMPONENTS (Boxer version)



(•) red fuseholder

LOCATION OF COMPONENTS (TD version)



(•) red fuseholder

FAULT-FINDING

AUTOMATIC CHECK UPON IGNITION: when the car is started the "ABS warning light" on the instrument cluster turns on for appr. 2 secs., then it goes off meaning that the system is working properly. If the warning light stays on, carry out diagnosis using the flashing code, as mentioned previously.

If the warning light does not turn on, carry out **test J.**

Fault-Finding using the Flashing Code

The self-diagnosis system with which this system is fitted, makes it possible to quickly locate a faulty component following the instructions of a **FLASHING CODE**, which is activated as follows:

– earth the line of pin A of connector **T8**

– power the ABS control unit **N51** ("key-operated" supply")

Read the sequence of flashes on the "ABS warning light" on the instrument panel **C10**:

– for three times code "12" appears, meaning correct operation: if this does not occur, carry out **test J**

– the codes of the errors memorised appear (each repeated three times): carry out the test given in the following table

– code "12" appears for another three times, indicating the end of the sequence

NOTE: Resetting the memorised code is obtained by disconnecting the line of pin 1 of **T8** and engaging the ignition switch 20 times (or using the ALFA ROMEO Tester)

Error Codes Table

CODE	FAULT	CARRY OUT TEST
12	Start and end of diagnosis	—
No code (*)	Control unit and self-diagnosis fault	A
16	Faulty LH front solenoid valve (VL)	Check the impedance of the solenoid valve (1.5÷2.5 Ω) and the condition of the connections between the control unit and the solenoid valve; if necessary change the solenoid valve
17	Fault RH front solenoid valve (VR)	Check the impedance of the solenoid valve (1.5÷2.5 Ω) and the condition of the connections between the control unit and the solenoid valve; if necessary change the solenoid valve
18	Faulty rear solenoid valve (HA)	Check the impedance of the solenoid valve (1.5÷2.5 Ω) and the conditions of the connections between the control unit and the solenoid valve; if necessary change the solenoid valve
19	Faulty safety relay	B
25	Incorrect number of phonic wheel teeth	Change the phonic wheel concerned see Group 33 "BRAKES")
35	Faulty pump motor	C
37	Faulty brake switch (H3)	D
39	Faulty LH front sensor (**L29**)	Check the impedance of the sensor (appr.1 kΩ); change it if necessary. Then carry out the next **test E.**
41	LH front sensor (**L29**) not connected	E
42	Faulty RH sensor (L28)	Check the impedance of the sensor (appr. 1kΩ); change it if necessary. Then carry out the next **test F.**
43	RH front sensor (**L28**) not connected	F
44	Faulty LH rear sensor (	Check the impedance of the sensor (appr. 1kΩ); change it if necessary. Then carry out the next **test G.**
45	LH rear sensor (**L31**) not connected	G
46	Faulty RH rear sensor (**L30**)	Check the impedance of the sensor (appr. 1kΩ); change it if necessary. Then carry out the next **test H.**
47	RH rear sensor (**L30**) not connected	H
48	Insufficient supply voltage	I
55	Faulty electronic control unit	Change the control unit, contained in **N51**

(*) if the warning light is not working, see **test J**

Fault-finding using the Alfa Romeo Tester

N.B. Before carrying out diagnosis with the Tester, perform the preliminary check described later (TEST A); if the warning light is not working properly also carry out TEST J.

The connection between the TESTER and the control unit must be made as follows:

1. Supply the TESTER either through the cigar lighter socket or connecting directly to the battery using the special lead.
2. Connect the TESTER socket to the control unit (the socket is near the control unit).

The instrument can give the following information:

– parameter display;

– error display;

– active diagnosis.

ERROR STORAGE:

The control unit self-diagnosis system checks a series of components, checking the operating parameters and logging any faults permanently in the control unit; in this situation the control unit de-activates the system and turns on the warning light on the instrument panel.

N.B. the control unit can memorise up to three errors contemporaneously: if a failure is present when three more are memorised, the last one supersedes the "oldest" of the three previous ones.

ERROR CLEARING:

Stored errors may only be cleared SOLELY using the ALFA ROMEO TESTER.

ACTIVATING DIAGNOSIS:

Diagnosis begins with the engine stopped and the ignition key turned to MARCIA.

During diagnosis it will also be requested to set the car in motion.

WARNING: During connection with the Tester the A.B.S. system is disabled and the warning light on the instrument cluster stays on; therefore, the control unit is unable to memorise new errors. Great care is also necessary because in the event of emergency braking, the ABS system is not operational and only the conventional braking system is available.

N.B.:
The system is disabled when the supply voltage falls below 8.6 V, when the solenoid valves are not energized or 9.4 V, when the solenoid valves are energized.

PRELIMINARY SYSTEM CHECK — TEST A

TEST PROCEDURE	RESULT	CORRECTIVE ACTION
A1 CHECK FUSES – Check the intactness of wander fuses **G125a** and **G125b**	OK ▶	Carry out **step A2**
	~~OK~~ ▶	Change fuses - **G125a** (10A) - **G125b** (60A)
A2 CHECK RELAYS – Check the two relays in unit **N51**	OK ▶	Carry out **step A3**
	~~OK~~ ▶	Change the relays if faulty
A3 CHECK VOLTAGE – Check for 12 V at pin 2 of **G272**	OK ▶	Carry out **step A4**
	~~OK~~ ▶	Restore the wiring between pin 2 of **G272** and branch terminal board **G56**
A4 CHECK VOLTAGE – Turn the key and check for 12 V at pin 1 of **G272**	OK ▶	Carry out **step A5**
	~~OK~~ ▶	Restore the wiring between pin 1 of **G272** and the ignition block **B1**
A5 CHECK EARTH – Check that **G202** is earthed	OK ▶	Carry out **step A6**
	~~OK~~ ▶	Restore the wiring between **G202** and earth **G55a** (Boxer) or **G55b** (TD)
A6 CHECK EARTH – Check that pin 4 of **G272** is earthed	OK ▶	CONTINUE DIAGNOSIS USING THE ALFA ROMEO TESTER OR USING THE FLASHING CODE
	~~OK~~ ▶	Restore the wiring between pin 4 of **G272** and earth **G143** (Boxer) or **G53b** (TD)

FAULTY SAFETY RELAY — TEST B

TEST PROCEDURE	RESULT	CORRECTIVE ACTION
B1 CHECK RELAY – Check that the safety relay is working properly (in group **N51**)	OK ▶	Carry out **step B2**
	~~OK~~ ▶	Change the relay
B2 CHECK VOLTAGE – Check for 12 V at pin 87 of the safety relay	OK ▶	Carry out **step B3**
	~~OK~~ ▶	In this case breaks of the connection between **G272** and the safety relay are likely. Change group **N51**
B3 CHECK VOLTAGE – Turn the key and check for 12 V at pin 86 of the safety relay	OK ▶	Carry out **step B4**
	~~OK~~ ▶	In this case breaks of the connection between **G272** and the safety relay are likely. Change group **N51**
B4 CHECK VOLTAGE – Turn the key and check for 12V at pin 86 of the motor relay	OK ▶	Change the motor relay (also see **test C**)
	~~OK~~ ▶	Change group **N51**

FAULTY PUMP MOTOR	TEST C

TEST PROCEDURE	RESULT	CORRECTIVE ACTION
C1 CHECK RELAY – Check the correct operation of the motor relay (in group **N51**)	OK ▶ ~~OK~~ ▶	Carry out **step C2** Change the relay, contained in **N51**
C2 CHECK VOLTAGE – Check for 12 V at pin 87 of the motor relay	OK ▶ ~~OK~~ ▶	Carry out **step C3** In this case breaks are likely in the connection between **G272** and the motor relay. Change group **N51**
C3 CHECK VOLTAGE – Turn the key and check for 12 V at pin 86 of the motor relay	OK ▶ ~~OK~~ ▶	Carry out **step C4** Check the safety relay (see **test B**). If not, breaks are likely in the connection between the safety relay and the motor relay. Change group **N51**
C4 CHECK EARTH – Check for 0 V at pin (-) of the pump motor	OK ▶ ~~OK~~ ▶	Carry out **step C5** In this case breaks are likely in the connection between pin (-) of the pump motor and **G202**. Change group **N51**
C5 CHECK PUMP – Bridge pins 30 and 87 of the motor relay. Check that the pump motor is working properly	OK ▶ ~~OK~~ ▶	If necessary, check the brake hydraulic circuit. (see Group 33 "BRAKES") Change group **N51**, complete with pump motor

FAULTY BRAKE SWITCH — TEST D

TEST PROCEDURE	RESULT	CORRECTIVE ACTION
D1 CHECK STOP LIGHTS – Check that the stop lights are working properly	OK ▶	Carry out **step D2**
	~~OK~~ ▶	Change the stop lights switch **H3**, or proceed as described in the "STOP LIGHTS" section
D2 CHECK VOLTAGE – With the pedal pressed, check for 12 V at pin 9 of **G273**	OK ▶	Check and if necessary change the electronic control unit contained in **N51**
	~~OK~~ ▶	Restore the wiring between pin 9 of **G273** and **H3**

LH FRONT SENSOR NOT CONNECTED — TEST E

TEST PROCEDURE	RESULT	CORRECTIVE ACTION
E1 CHECK OPEN CIRCUIT – Turn the key and check for an open circuit between pins 7 and 13 of **G273**	OK ▶	Carry out **step E2**
	~~OK~~ ▶	Carry out **step E3**
E2 CHECK CONTINUITY – Disconnect the sensor **L29** and check for continuity between the sensor and pin 7 of **G273** , and between the sensor and pin 13 of **G273**	OK ▶	Check and if necessary change the sensor **L29**.
	~~OK~~ ▶	Restore the wiring between **L29** and **G273**
E3 CHECK OPEN CIRCUIT – Disconnect the sensor **L29** and check for an open circuit between pins 7 and 13 of **G273** (wiring side)	OK ▶	Check and if necessary change sensor **L29**.
	~~OK~~ ▶	Restore the wiring eliminating the short circuit between the cables connecting **L29** with **G273**

RH FRONT SENSOR NOT CONNECTED — TEST F

TEST PROCEDURE	RESULT	CORRECTIVE ACTION
F1 CHECK OPEN CIRCUIT – Turn the key and check for an open circuit between pins 5 and 11 of **G273**	OK ▶	Carry out **step F2**
	NO ▶	Carry out **step F3**
F2 CHECK CONTINUITY – Disconnect the sensor **L28** check for continuity between the sensor and pin 5 of **G273**, and between the sensor and pin 11 of **G273**	OK ▶	Check and if necessary change the sensor **L28.**
	NO ▶	Restore the wiring between **L28** and **G273**
F3 CHECK OPEN CIRCUIT – Disconnect the sensor **L28** and check for an open circuit between pins 5 and 11 of **G273** (wiring side)	OK ▶	Check and if necessary change the sensor **L28.**
	NO ▶	Restore the wiring eliminating the short circuit between the cables connecting **L28** with **G273**

LH REAR SENSOR NOT CONNECTED — TEST G

TEST PROCEDURE	RESULT	CORRECTIVE ACTION
G1 CHECK OPEN CIRCUIT – Turn the key and check for an open circuit between pins 4 and 2 of **G273**	OK ▶	Carry out **step G2**
	NO ▶	Carry out **step G3**
G2 CHECK CONTINUITY – Disconnect the sensor **L31** and check for continuity between the sensor and pin 4 of **G273**, and between the sensor and pin 2 of **G273**	OK ▶	Check and if necessary change the sensor **L31.**
	NO ▶	Restore the wiring between **L31** and **G273**
G3 CHECK OPEN CIRCUIT – Disconnect the sensor **L31** and check for an open circuit between pins 4 and 2 of **G273** (wiring side)	OK ▶	Check and if necessary change the sensor **L31.**
	NO ▶	Restore the wiring eliminating the short circuit between the cables connecting **L31** with **G273**

RH REAR SENSOR NOT CONNECTED — TEST H

TEST PROCEDURE	RESULT	CORRECTIVE ACTION
H1 CHECK OPEN CIRCUIT – Turn the key and check for an open circuit between pins 6 and 14 of **G273**	OK ▶	Carry out **step H2**
	~~OK~~ ▶	Carry out **step H3**
H2 CHECK CONTINUITY – Disconnect the sensor **L30** and check for continuity between the sensor and pin 6 of **G273** , and between the sensor and pin 14 of **G273**	OK ▶	Check and if necessary change the sensor **L30.**
	~~OK~~ ▶	Restore the wiring between **L30** and **G273**
H3 CHECK OPEN CIRCUIT – Disconnect the sensor **L28** and check for an open circuit between pins 6 and 14 of **G273** (wiring side)	OK ▶	Check and if necessary change the sensor **L30.**
	~~OK~~ ▶	Restore the wiring eliminating the short circuit between the cables connecting **L30** with **G273**

INSUFFICIENT SUPPLY VOLTAGE — TEST I

TEST PROCEDURE	RESULT	CORRECTIVE ACTION
I1 CHECK VOLTAGE – Check that the battery voltage is 12V	OK ▶	Carry out **step I2**
	~~OK~~ ▶	Restore the correct voltage recharging or changing the battery **A1**
I2 CHECK VOLTAGE – Check for a voltage of 12 V at pin 2 of **G272**	OK ▶	Carry out **step I3**
	~~OK~~ ▶	Restore the wiring between pin 2 of **G272** and the battery **A1** (TD) or the branch terminal board **G56** (Boxer), through fuse **G125b**
I3 CHECK VOLTAGE – With the key turned, check for a voltage of 12 V at pin 1 of **G272**	OK ▶	CONTINUE DIAGNOSIS USING THE ALFA ROMEO TESTER
	~~OK~~ ▶	Restore the wiring between pin 1 of **G272** and the ignition switch **B1** through fuse **G125a**

"ABS" WARNING LIGHT NOT WORKING (fails to turn on for faults)	TEST J

TEST PROCEDURE	RESULT	AZIIONE CORRETTIVA
J1 CHECK CONTINUITY – Check the continuity between pin 12 of **G273** and pin 1 of connector **T8** and between pin 15 of **G273** and pin 3 of **T8**	OK ▶ ~~OK~~ ▶	Carry out **step J2** Restore the wiring between **G273** and connector **T8**
J2 CHECK EARTH SIGNAL – Turn the key and check for, 0V for a few seconds 0V at pin B3 of the instrument cluster **C10**	OK ▶ ~~OK~~ ▶	Change the instrument cluster **C10** Carry out **step J3**
J3 CHECK EARTH SIGNAL – Turn the key and check for, 0V for a few seconds 0V at pin 1 of **G273**	OK ▶ ~~OK~~ ▶	Restore the wiring between **G273** and **C10** Also check the wiring between pin 3 of **G272** and **C10** Change the control unit contained in **N51**