ELECTRIC SYSTEM DIAGNOSIS 55

INDEX

An **ALPHABETICAL INDEX,** for rapid identification of a specific subject is given at the back.

(*) See "Spider-Gtv '97"

ALPHABETICAL INDEX

ELECTRIC SYSTEM OF THE CAR - POWER SUPPLY

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ELECTRIC SYSTEM OF THE CAR

FOREWORD

All the electric/electronic systems and installations of the car are supplied by the battery with 12V current.

The lines through which the battery voltage is distributed to the various services are protected by by special wander fuses or fuses in the fusebox which are suitably sized for the foreseen loads.

The fusebox contains a series of relays and fuses and also the lines and control signals from the switches and steering wheel controls (steering column lever unit) converge on it; the supply and control lines for the different services branch off from the fusebox.

PROTECTION AND SAFETY SYSTEMS

The entire electric system for the Spider/GTV has been designed and made taking into consideration the latest directives on the subject of safety and protection, especially against the possibility of fire.

There are two main types of protection:

- **active protection**, to reduce the possible causes of failure "at the source"
- **passive protection**, to minimise the effects of a possible failure.

The first category involves attentive design of the wiring harnesses, accurately positioning and anchoring them, and carefully defining suitably shielded and protected routings.

For this reason, the alternator and starter motor cables have been appropriately modified through the adoption of protection caps, etc.
A "reinforced" sheath has been adopted for certain sections of particularly exposed wiring.

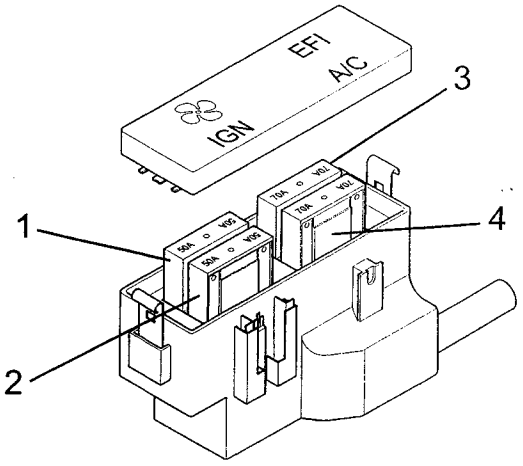
Another form of active protection is the insertion in the original wiring harness of provisions for the more frequently requested optional items (radio, alarm, etc.) to reduce the risk of incorrect work on the cables by unskilled persons.

The passive protections include all the measures, which have always been adopted on vehicles, to reduce high failure currents (overload and short circuit).

All the fuses in the circuit have been sized according to the nominal absorption rating of the loads that can be activated simultaneously and to ensure operation in the event of short circuit.

FUSEBOX

This fusebox with built-in fuses protects all the power lines with the exception of the starter motor wire (battery-starter motor) and the recharge wire (starter motor-alternator): these two wires are protected by a supplementary "shielded" sheath.



b. battery line
1. Fan fuse (50/60A): **VENT**
2. Ignition switch fuse (30A): **IGN**
3. E.i. power fuse (30A): i.e. Code, ecc. **EFI**
4. Climate control power fuse (30A): **A/C**

IGNITION SWITCH

Some circuits are supplied continuously, also when the vehicle is stopped and the key disengaged, as they are connected directly to the battery (N.B. for safety reasons these lines which are "always hot" have been reduced to the minimum indispensable, in both number and the length of the cables involved: they remain only for those functions for which direct supply is expressly needed).

Other circuits are supplied turning the ignition switch **to the various positions**:

- inserrting the key and turning it to the first position "**MAR**" supplies a number of circuits, which are indeed defined as "key-operated";
- the second position - "**AVV**" - supplies the starter motor, disconnecting some of the other circuits (those which absorb a higher amount of power) thereby ensuring the highest flow of current to the starter motor;
- removing the key turning it in the opposite direction (and pressing the special pushbutton) the "PARK" position is engaged which supplies the side lights even when the key is removed.

In the wiring diagrams these different types of supply are shown schematically by the following symbols:


– line always supplied

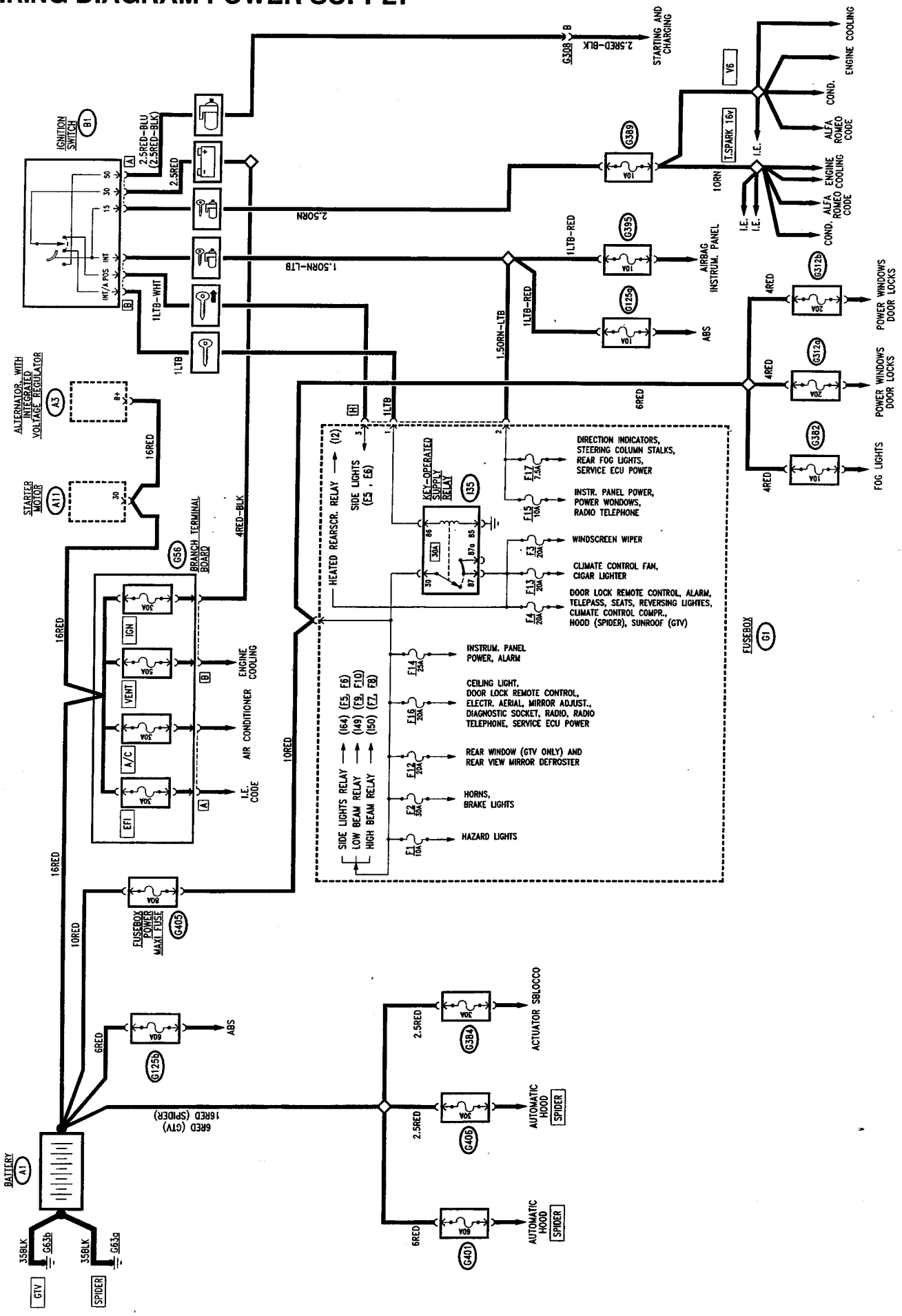

– line supplied with the key in the **"MAR" position**


– line supplied with the key in the **"AVV" position**

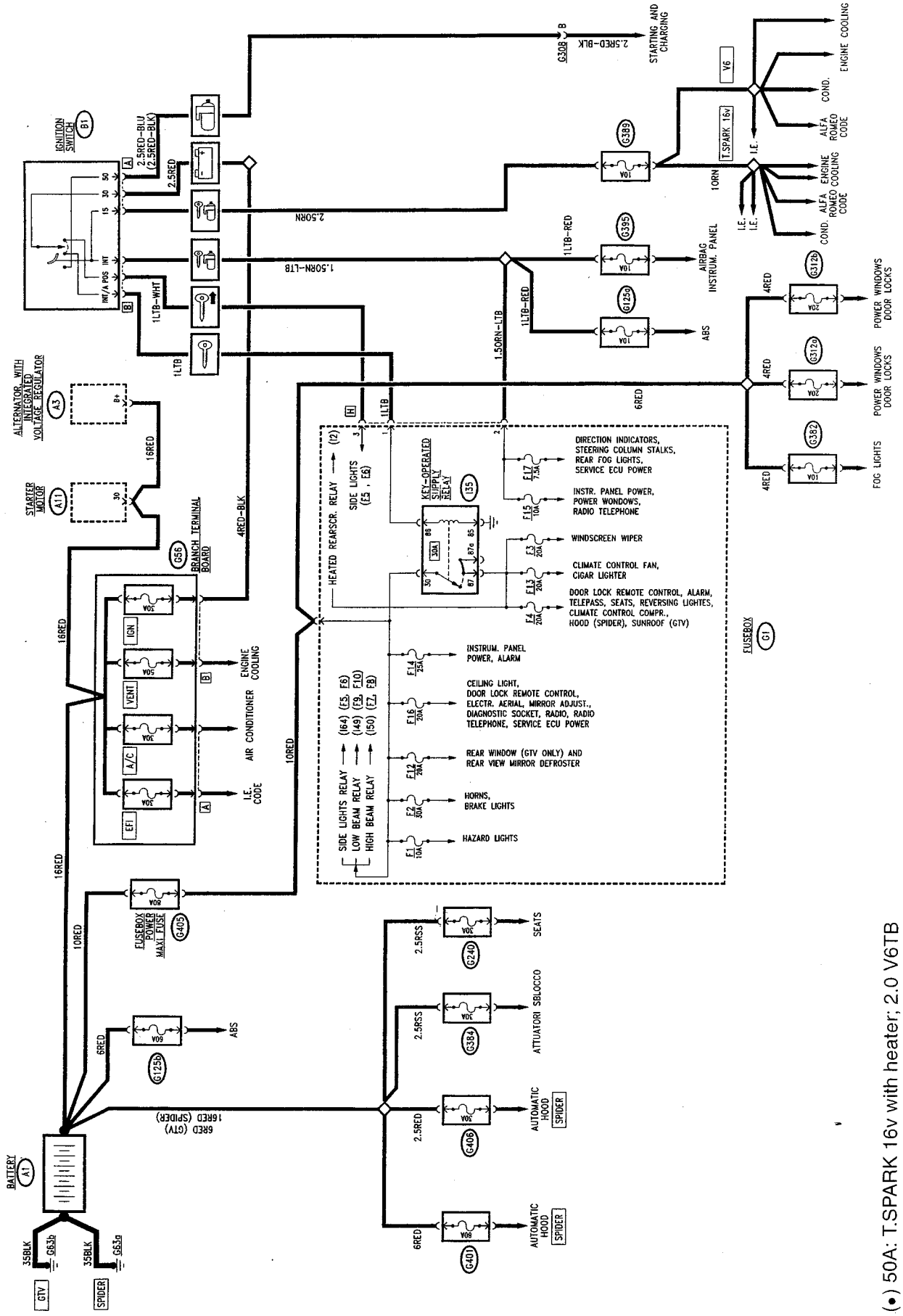

– line supplied with the key engaged in both **of the previous positions**


– line supplied with the key in the **"PARK" position**

WIRING DIAGRAM POWER SUPPLY

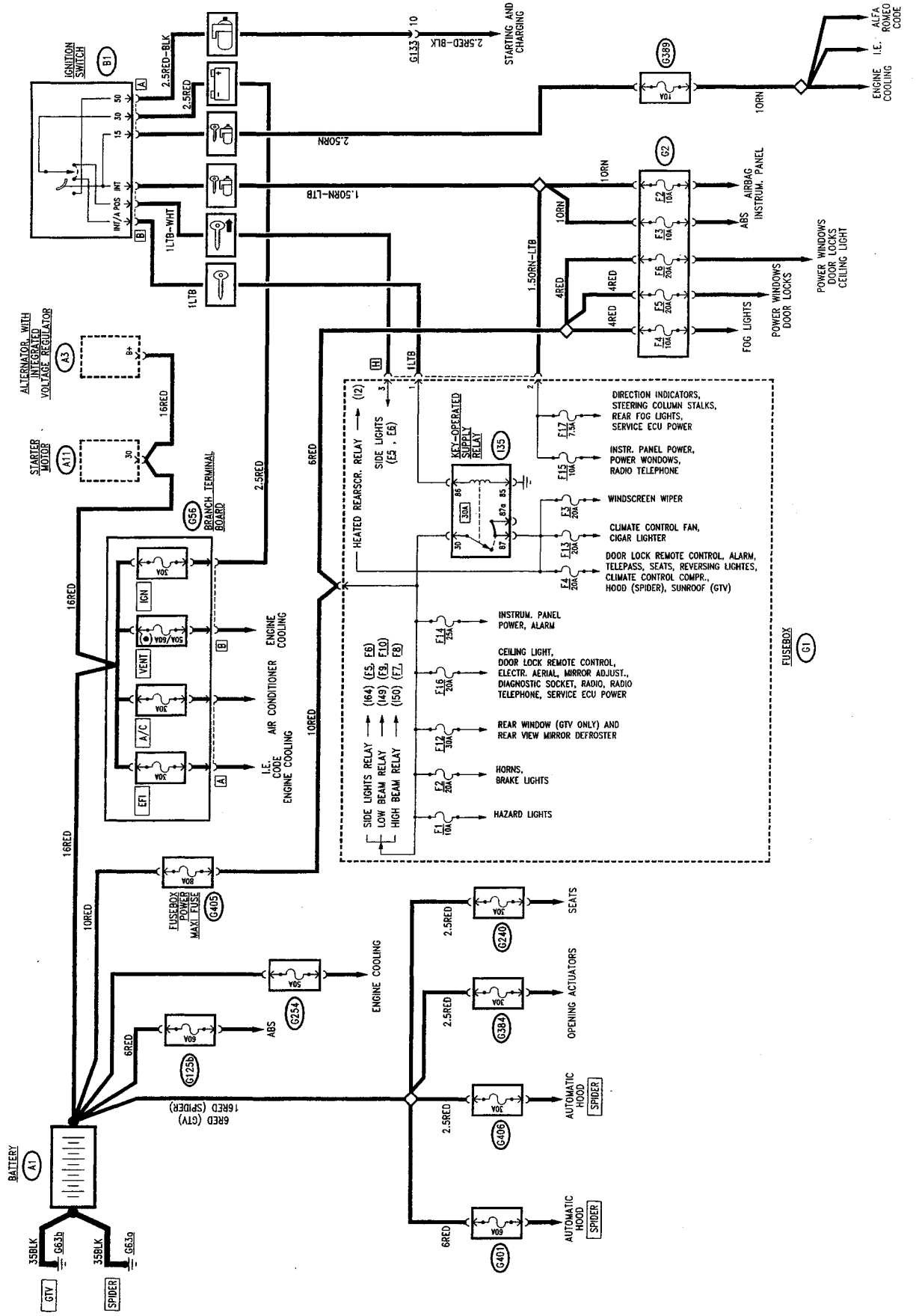


WIRING DIAGRAM POWER SUPPLY (starting from November '99)



(•) 50A: T.SPARK 16v with heater; 2.0 V6TB
(•) 60A: T.SPARK 16v with air conditioning; 3.0 V6; 3.0 V6 24v

WIRING DIAGRAM POWER SUPPLY (starting from October 2000)



(•) 50A: T.SPARK 16v with heater
(•) 60A: T.SPARK 16v with air conditioning, 3.0 V6 24v

FUNCTIONAL DESCRIPTION

Power from battery **A1** is split along several lines branching off from the battery and from fusebox **G56**. Several wires which directly power some systems and the line powering fusebox **G1** (where maxi fuse **G405** (80A) is located) branch off from this fusebox. Inside the fusebox the power is distributed to the various circuits, protected by the corresponding fuses (see the "Fusebox" section); in addition, some supplies for the various systems lead from the supply branch from the fusebox.

The battery recharging line leads from the alternator **A3**, through the starter motor **A11**.

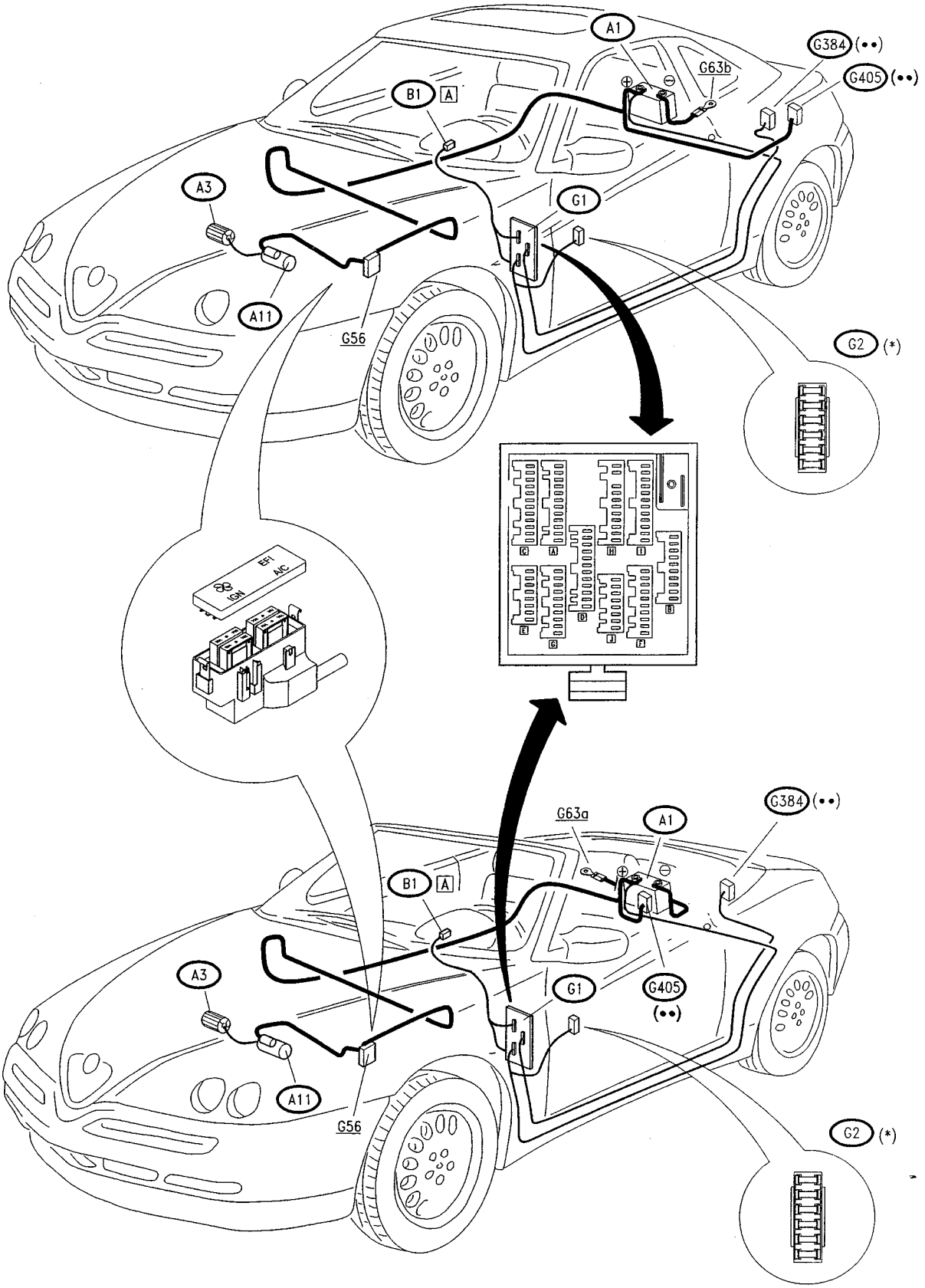
The ignition switch **B1** is also supplied via the terminal board **G56** at pin 30 of connector A.

The line that leaves pin 50 of connector A corresponds to the "STARTING" position and it supplies the starter motor **A11**.

The line leaving pin INT/A of connector B - "RUN" position - via the fusebox **G1**, supplies the "key-operated" circuits, which are however disengaged in the "STARTING" position.
The lines that leave pin INT of connector B and pin 15 of connector A supply, either directly or through the fusebox **G1**, the "key-operated" circuits which also remain engaged in the "STARTING" position.
Lastly, the line that leaves pin POS of connector B corresponds to the "PARKING" position and supplies the sidelights circuit inside the fusebox **G1**.

Starting from October 2000, some of the fuses under the dashboard have been grouped together in an additional fuse box **G2**, containing 6 fuses.

LOCATION OF COMPONENTS



(••) Black fuse holder
(•••) Red fuse holder
(*) Starting from October 2000

LOCATION OF EARTHS

INDEX

GENERAL DESCRIPTION

The following diagrams show the diferent earths present on the vehicle and the connecting cables for each of them; each cable shows the circuit to which it refers and the component earthed through that line.

The earths shown are the following:

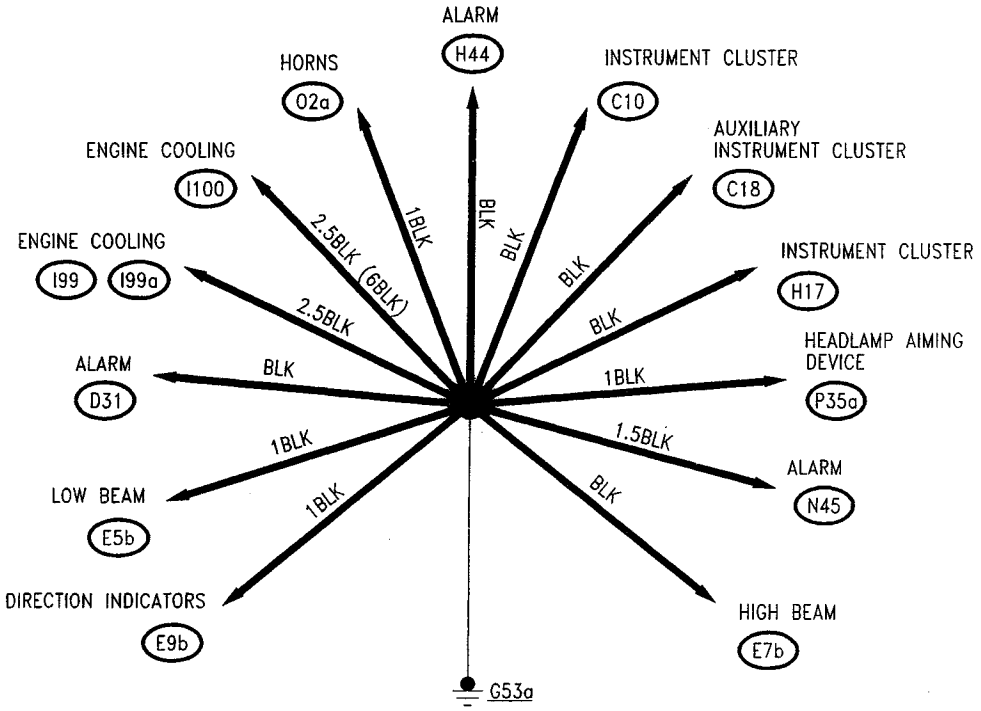
- **G53a** Right-hand engine compartment earth
- **G53b** Left-hand engine compartment earth
- **G55b** Left-hand side panel earth
- **G60** Injection wiring earth (T.Spark 16v engines)
- **G63a** Right-hand rear earth (SPIDER only)
- **G63b** Left-hand rear earth
- **G92** Earth for electric aerial
- **G131** Earth on engine upper cover (3.0 V6 24V engine)
- **G131a/b** Earths on engine upper cover (3.0 V6 and 2.0 V6 TB engines)
- **G148b** Earth under left-hand dashboard
- **G381** Airbag earth

There is also an **earth braid**, which connects the power unit to the body.

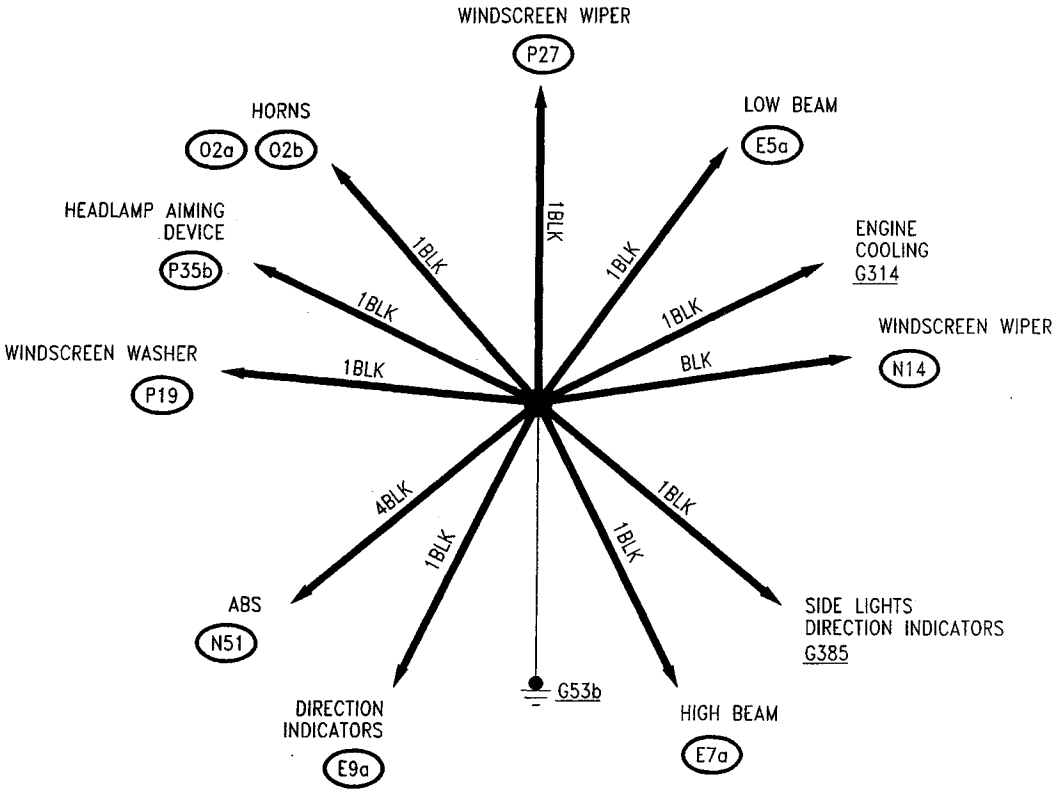
NOTE: Using these diagrams it is easy to locate those circuits which are connected to earth by the same line: this simplifies faultfinding work in the event of problems affecting more than one system: for instance the oxidation of an earth can put several circuits and numerous functions out of order contemporaneously.

WIRING DIAGRAMS

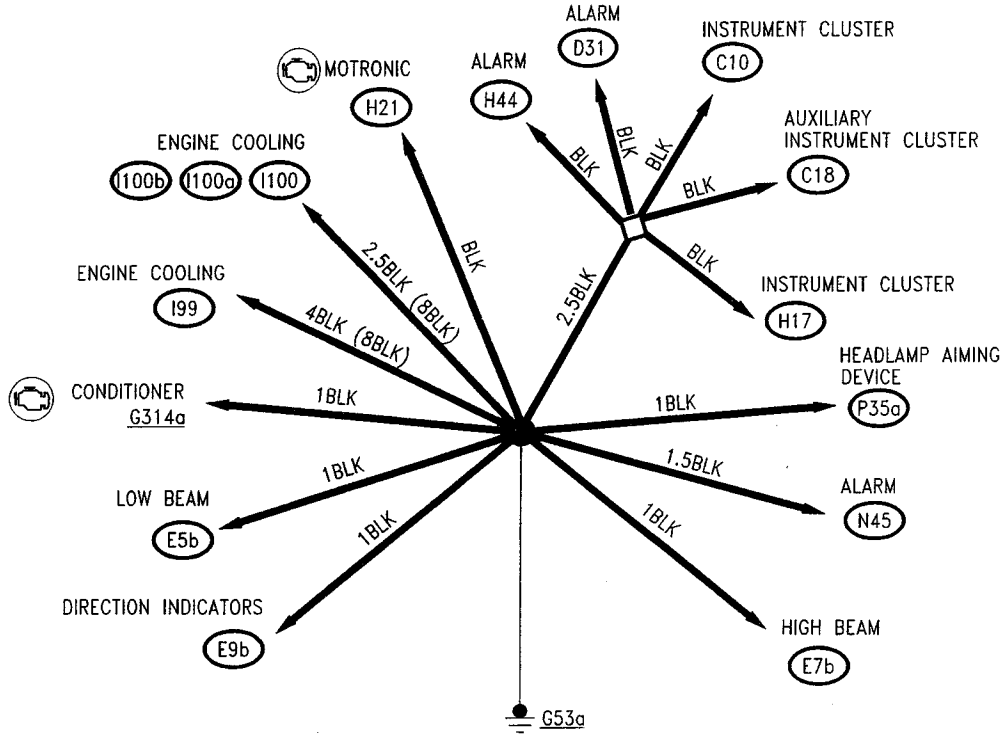
G53a



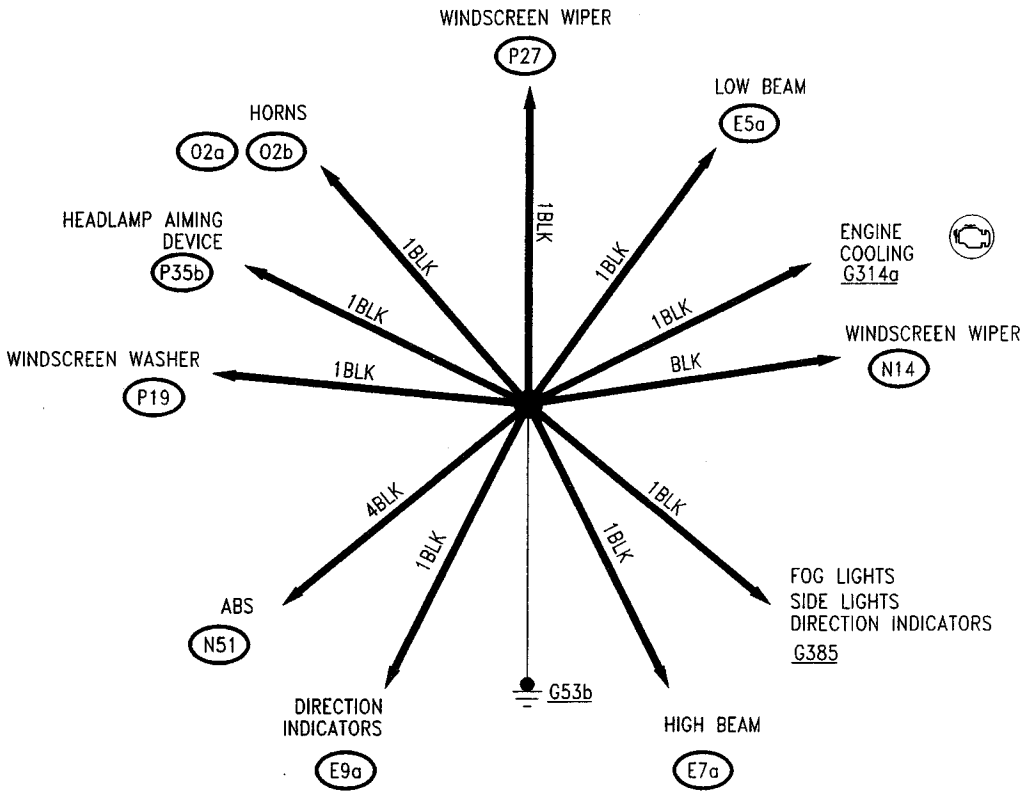
G53b



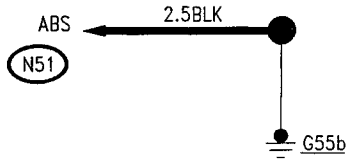
G53a (starting from November '99)



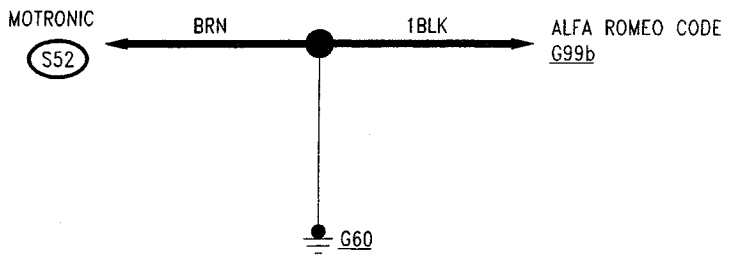
G53b (starting from November '99)

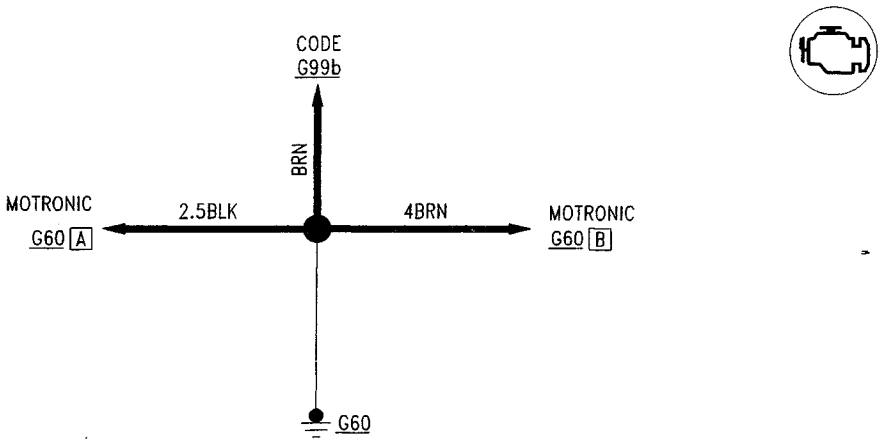


G55b

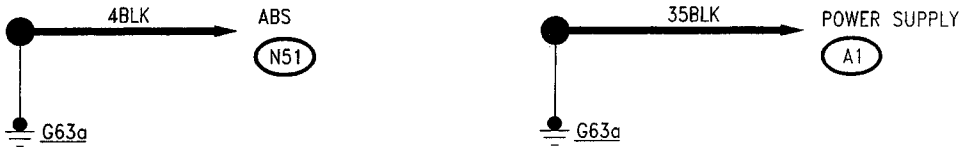


G60 (T.Spark 16v engines)

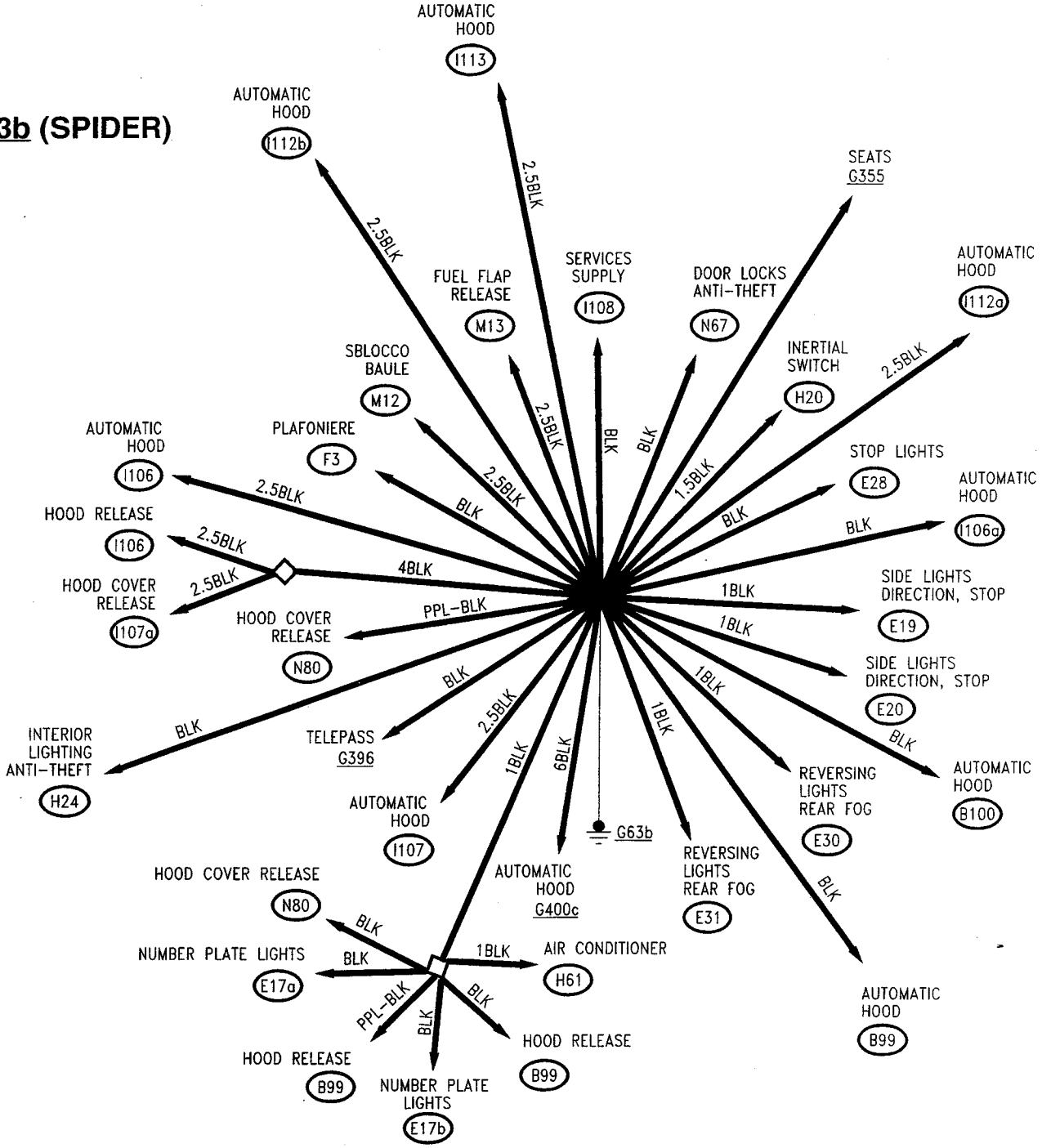




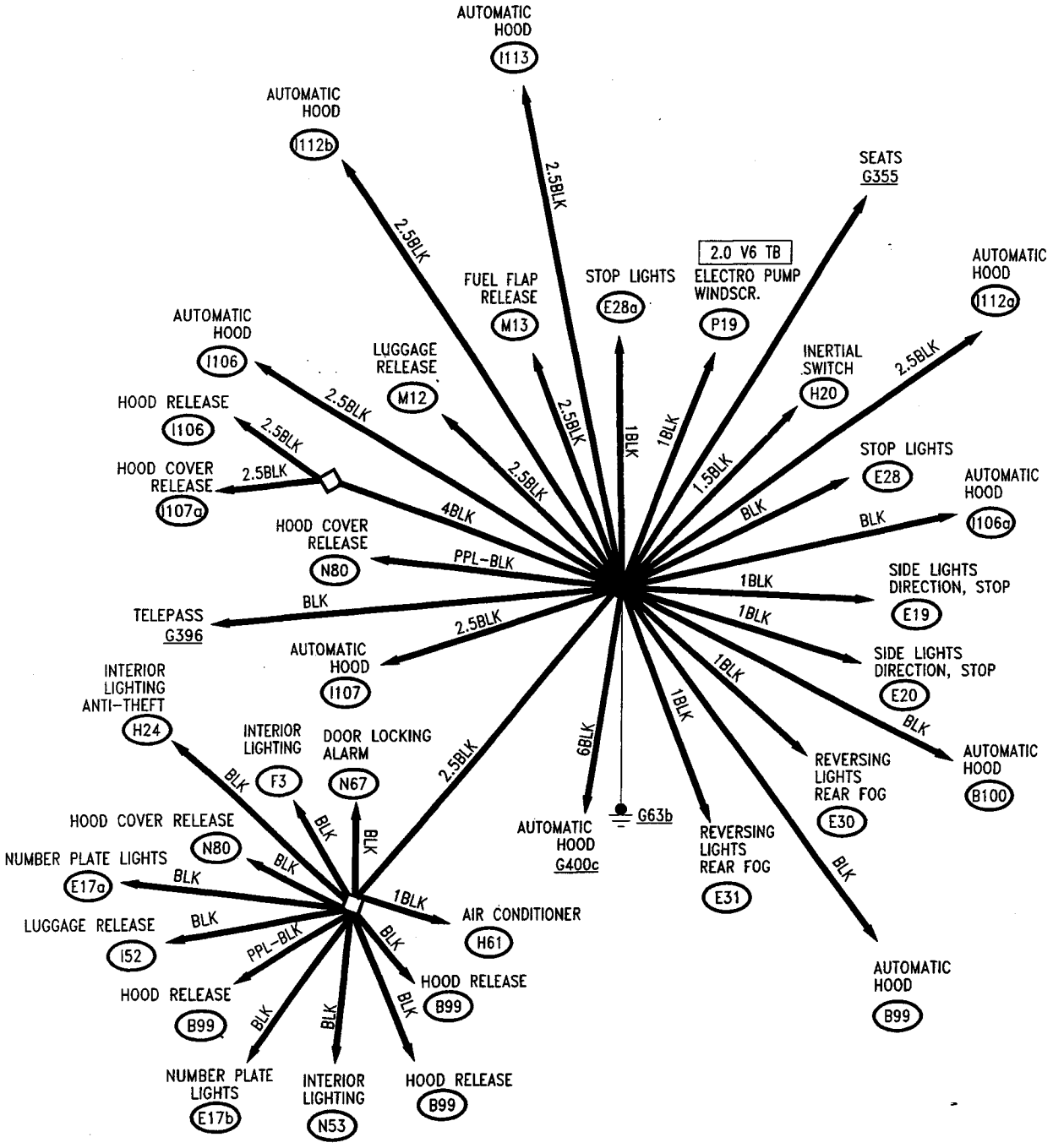
G63a (SPIDER)



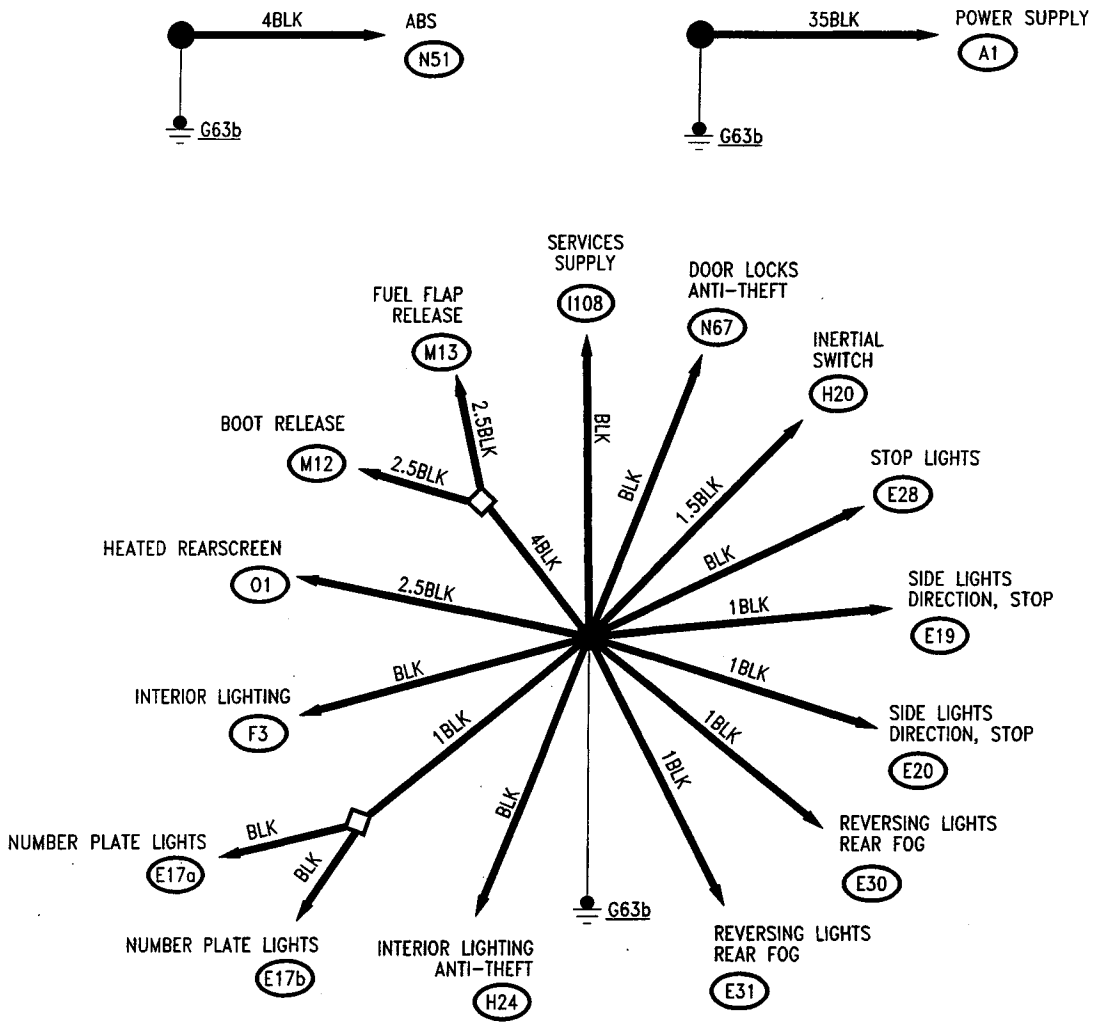
G63b (SPIDER)



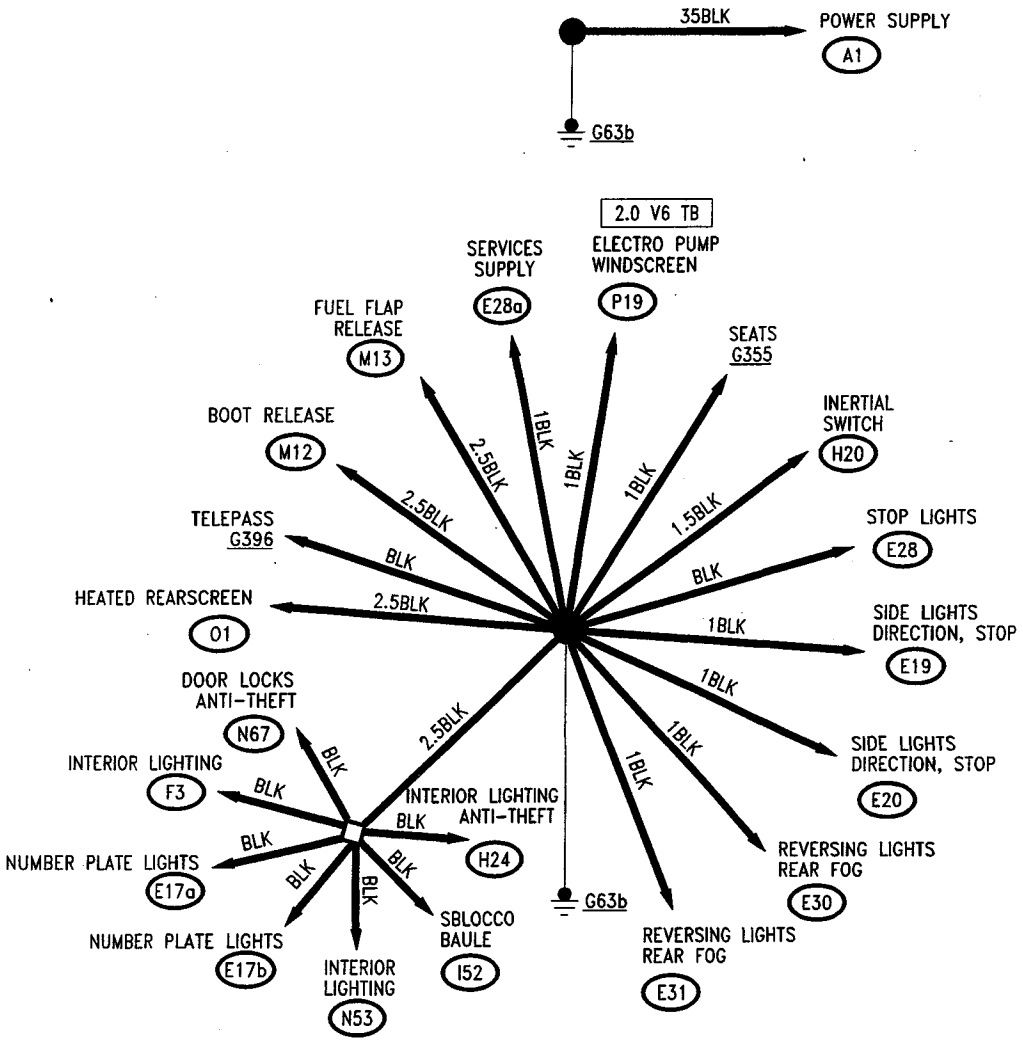
G63b (SPIDER) (starting from November '99)



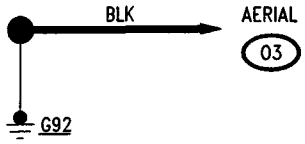
G63b (GTV)


4BLK
ABS
N51
G63b
35BLK
POWER SUPPLY
A1
G63b
SERVICES SUPPLY
I108
DOOR LOCKS ANTI-THEFT
N67
FUEL FLAP RELEASE
M13
INERTIAL SWITCH
H20
BOOT RELEASE
M12
STOP LIGHTS
E28
HEATED REARSCREEN
01
SIDE LIGHTS DIRECTION, STOP
E19
INTERIOR LIGHTING
F3
SIDE LIGHTS DIRECTION, STOP
E20
NUMBER PLATE LIGHTS
E17a
REVERSING LIGHTS REAR FOG
E30
NUMBER PLATE LIGHTS
E17b
INTERIOR LIGHTING ANTI-THEFT
H24
G63b
REVERSING LIGHTS REAR FOG
E31
2.5BLK
BLK
1.5BLK
4BLK
1BLK

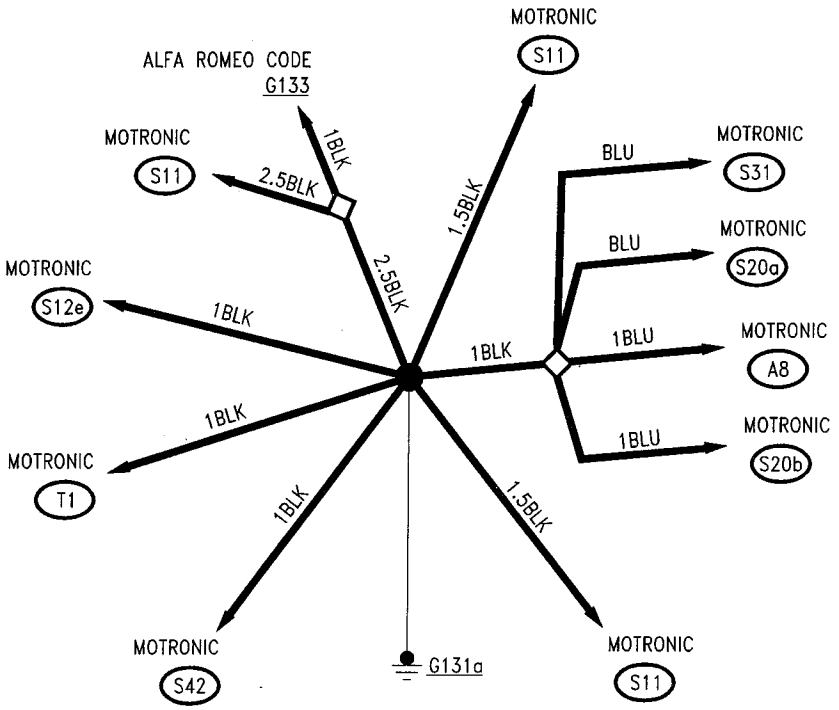
G63b (GTV) (starting from November '99)



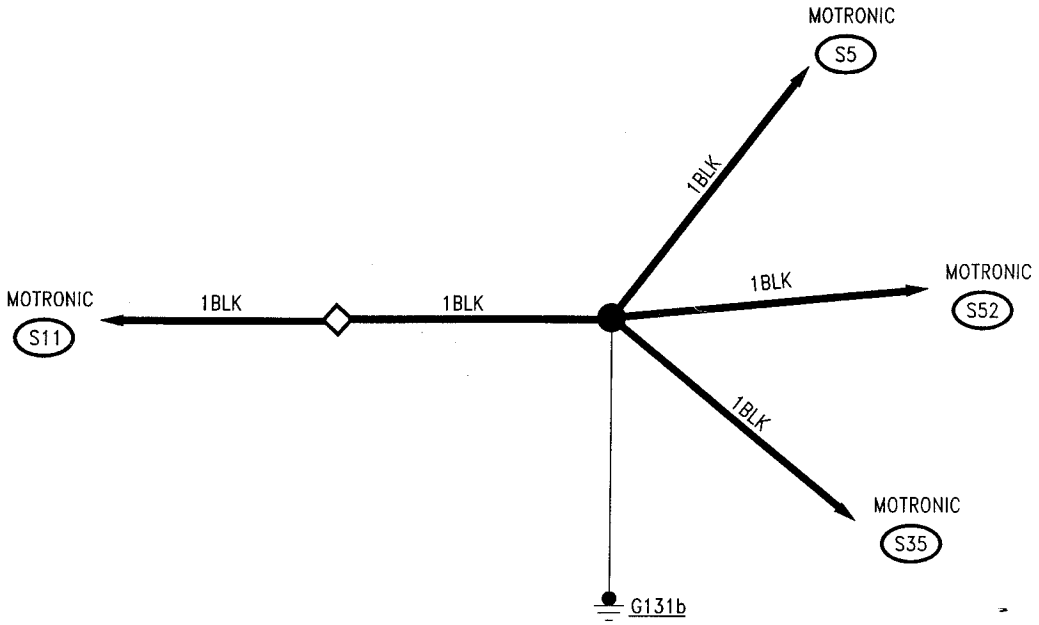
G92



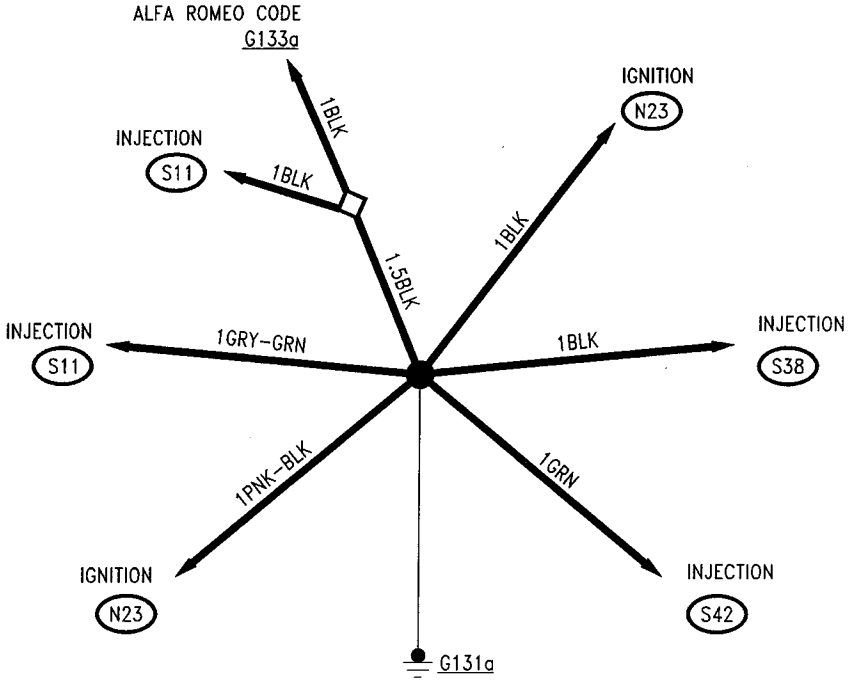
G131a (3.0 V6 engine)



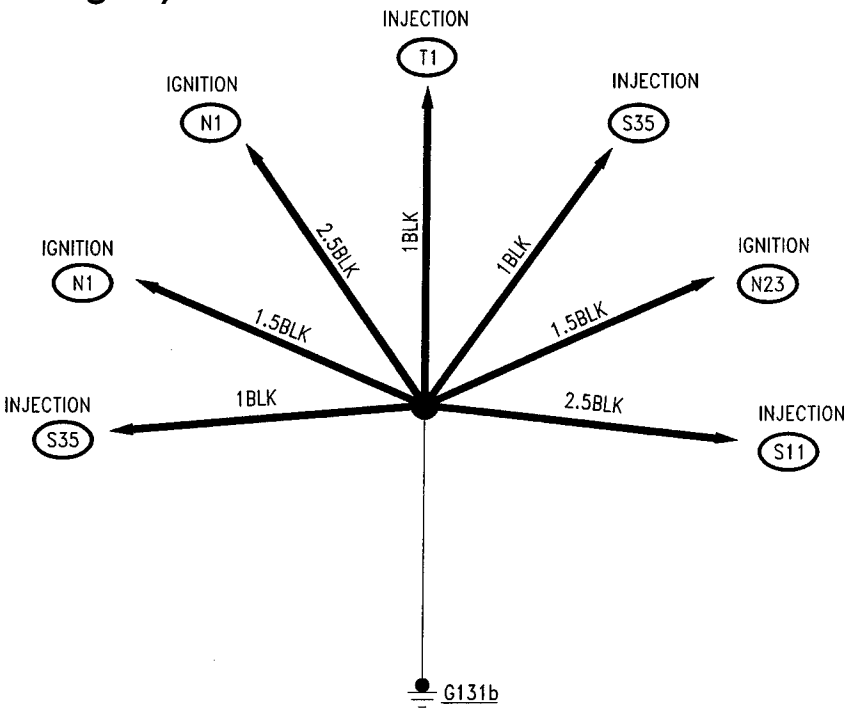
G131b (3.0 V6 engine)



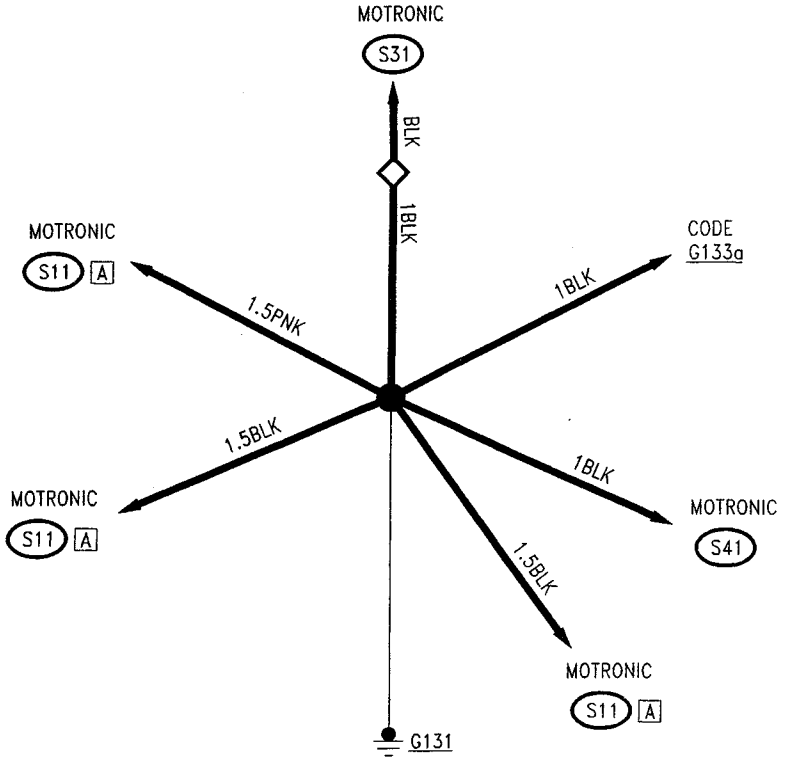
G131a (2.0 V6 TB engine)

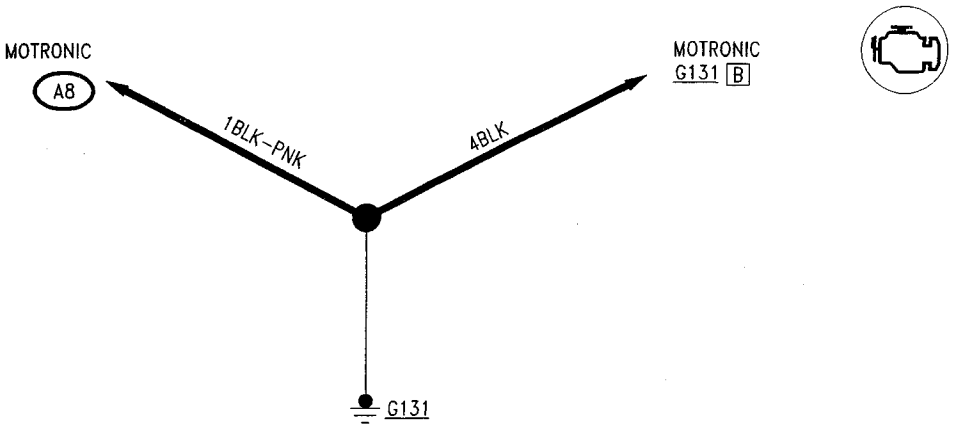


G131b (2.0 V6 TB engine)

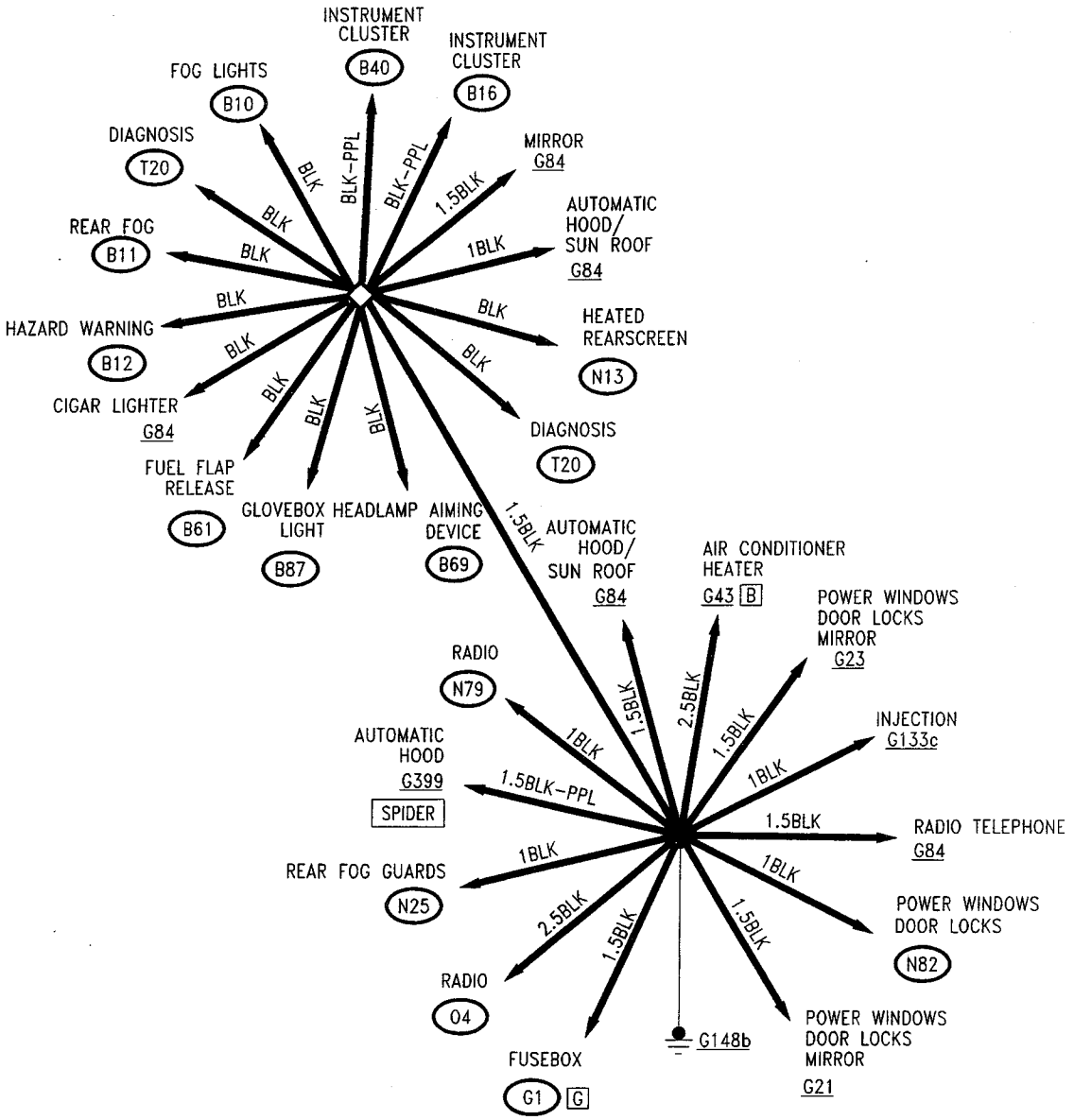


G131 (3.0 V6 24v engine)

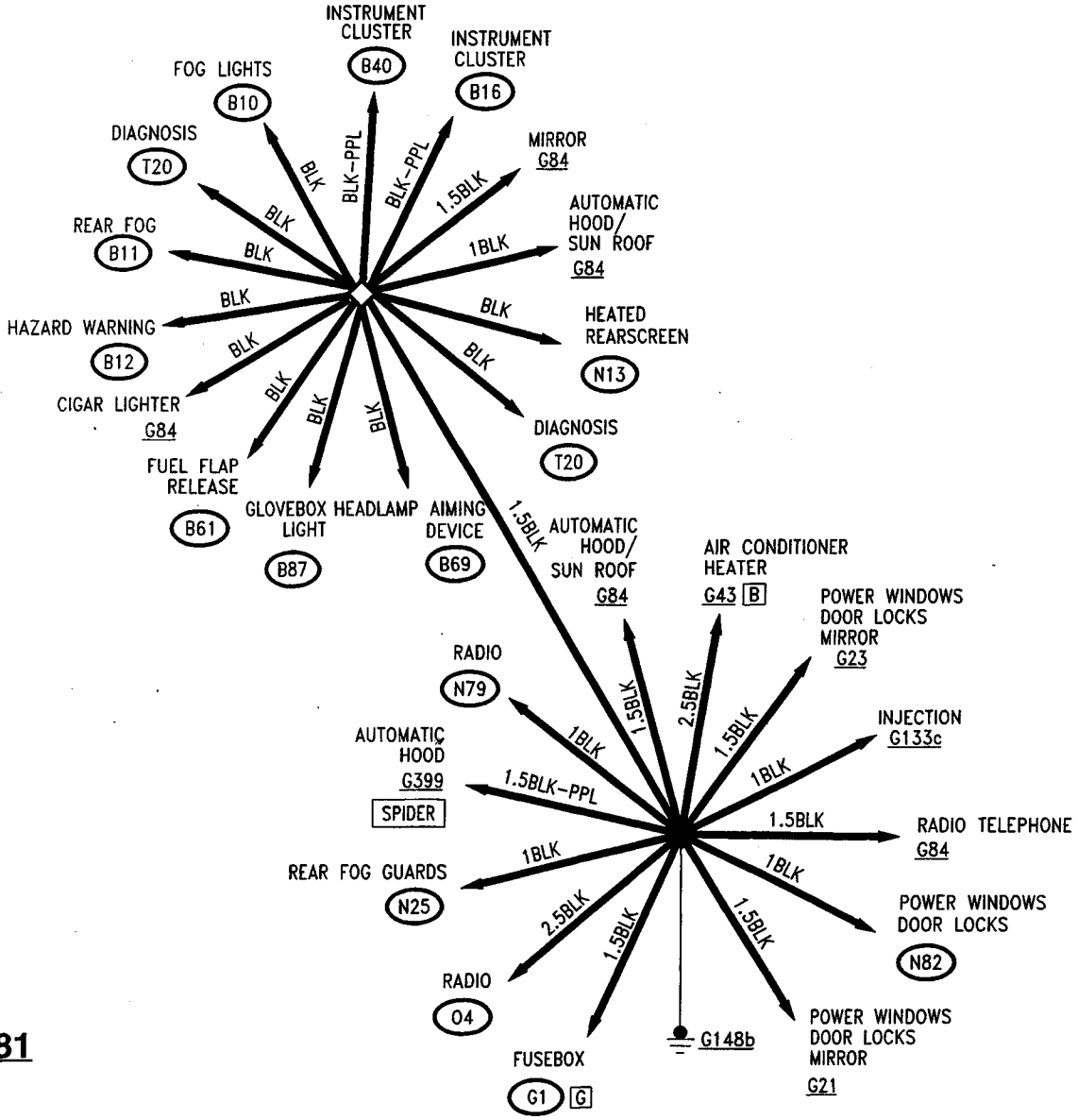




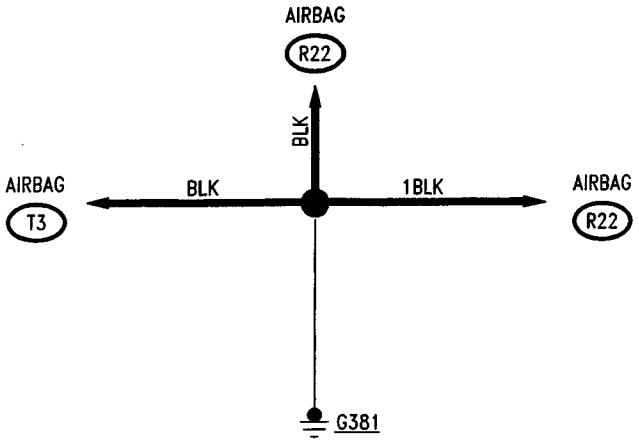
G148b


INSTRUMENT CLUSTER
B40
INSTRUMENT CLUSTER
B16
FOG LIGHTS
B10
DIAGNOSIS
T20
MIRROR
G84
REAR FOG
B11
AUTOMATIC HOOD/ SUN ROOF
G84
HAZARD WARNING
B12
HEATED REARSCREEN
N13
CIGAR LIGHTER
G84
DIAGNOSIS
T20
FUEL FLAP RELEASE
B61
GLOVEBOX LIGHT
B87
HEADLAMP AIMING DEVICE
B69
AUTOMATIC HOOD/ SUN ROOF
G84
AIR CONDITIONER HEATER
G43 B
POWER WINDOWS DOOR LOCKS MIRROR
G23
RADIO
N79
INJECTION
G133c
AUTOMATIC HOOD
G399
SPIDER
RADIO TELEPHONE
G84
REAR FOG GUARDS
N25
POWER WINDOWS DOOR LOCKS
N82
RADIO
04
G148b
POWER WINDOWS DOOR LOCKS MIRROR
G21
FUSEBOX
G1 G
BLK
BLK-PPL
1.5BLK
1BLK
2.5BLK
1.5BLK-PPL

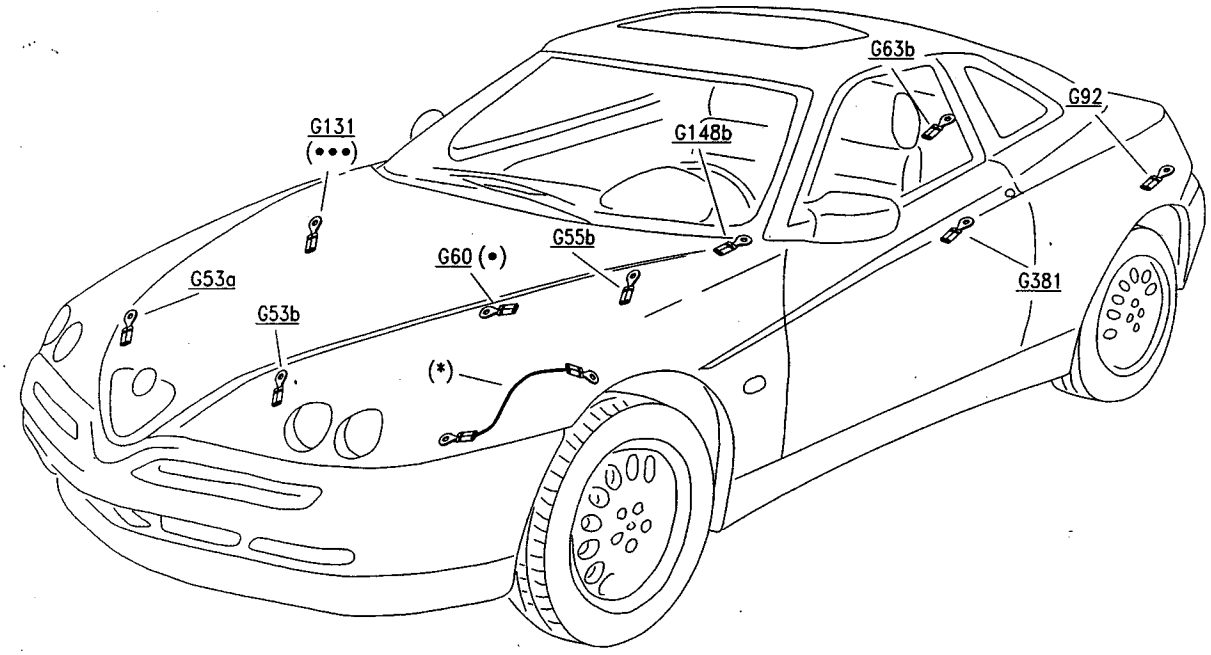
G148b (starting from November '99)

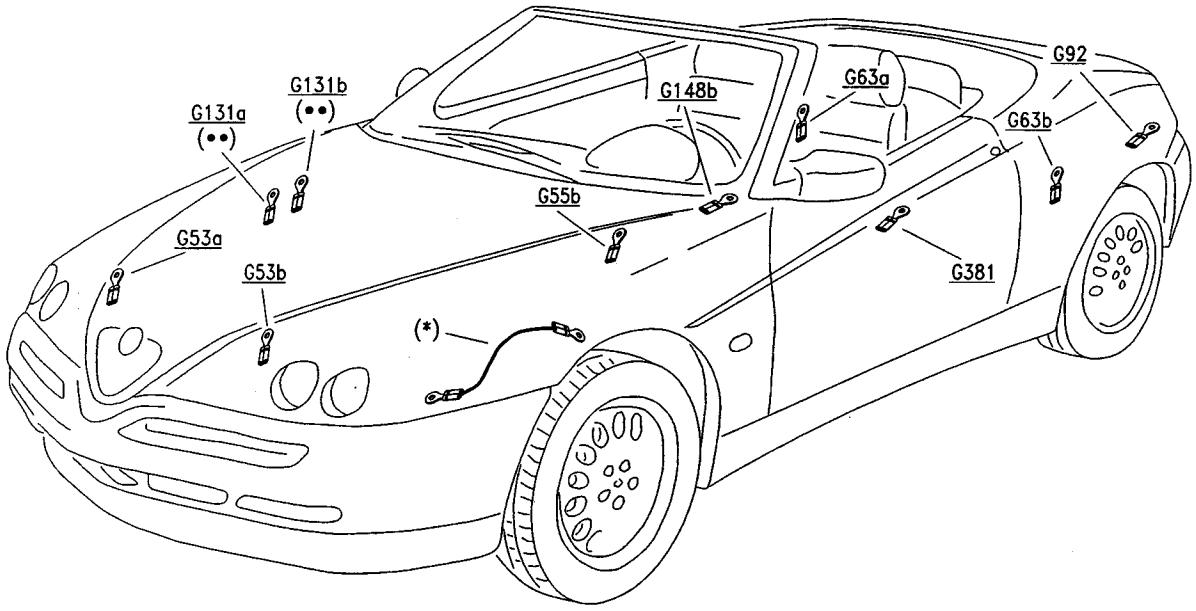


G381



LOCATION OF EARTHS ON THE CAR





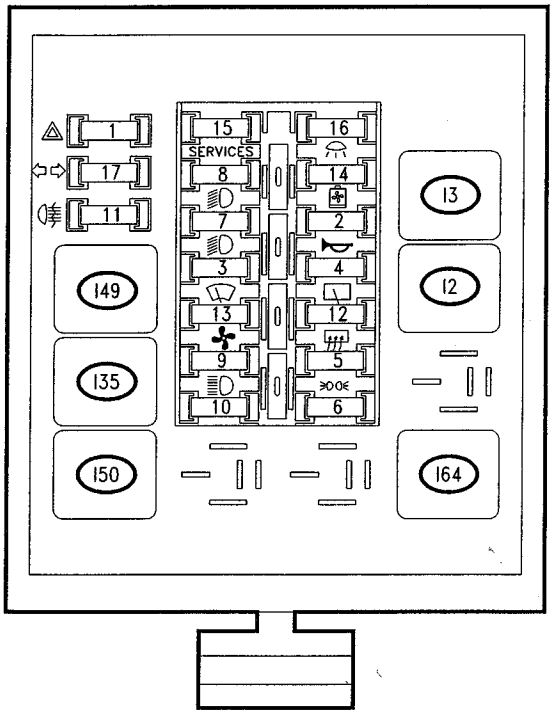
(*) earth braid between gearbox and body

(•) T.SPARK 16v
(••) 3.0 V6, 2.0 V6 TB
(•••) 3.0 V6 24v

FUSEBOX

INDEX

FUSEBOX

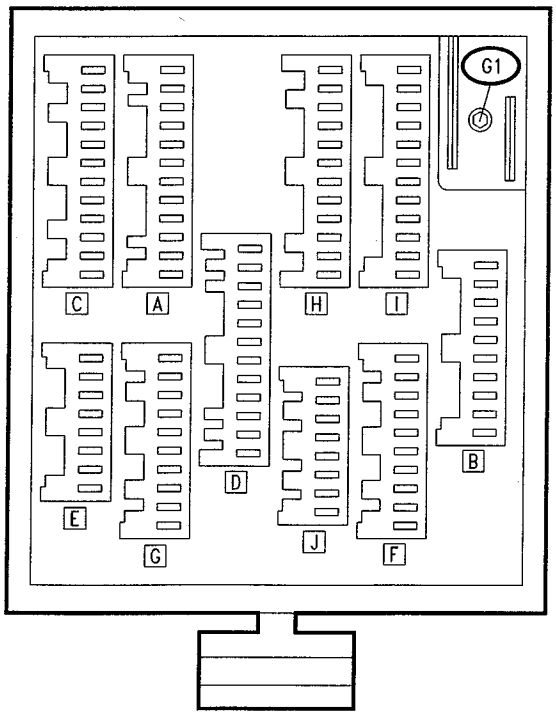


LOCATION OF FUSES AND RELAYS

RELAYS

I2	Heated rearscreen relay
I3	Horns relay
I35	Key-operated supply relay
I49	Low beam headlamp relay
I50	High beam headlamp relay
I64	Side lights relay

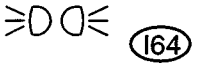
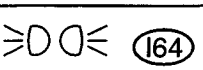
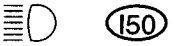
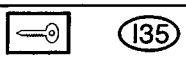
FUSES (see following page)



REAR VIEW, CONNECTOR SIDE

G1:
fusebox supply
Connectors A,I:
Front wiring
Connectors B,C,D,E,F,G,H:
Dashboard wiring
Connector J:
provision bridge required by specific regulations (daylights, fog lights, etc..)

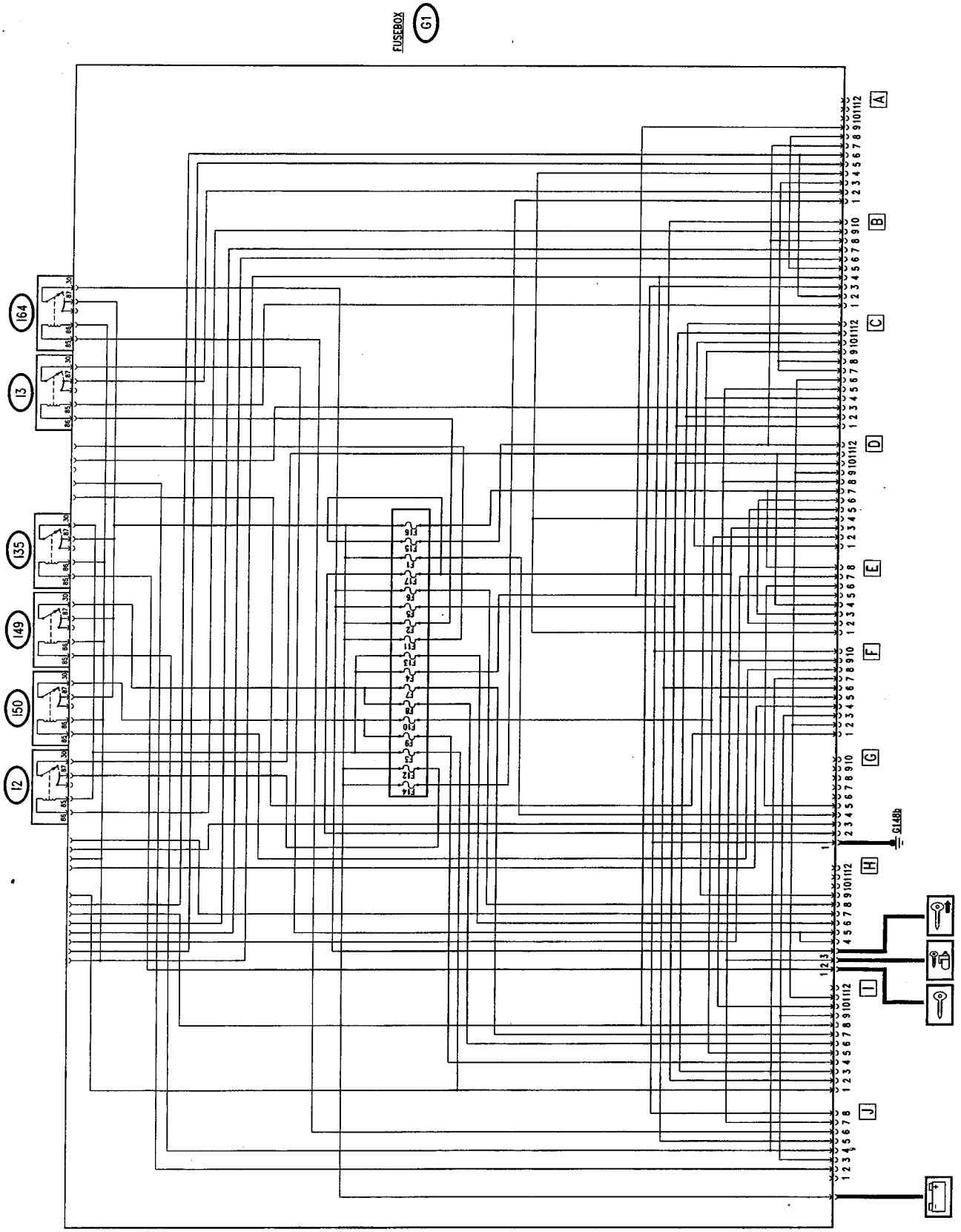
FUSES (up to November '99)

FUSE			SUPPLY	PROTECTED SERVICES
SYMBOL	NO.	AMP.		
	1	10A		Hazard lights, radio telephone
	2	30A		Horns, brake lights
	3	20A		Windscreen wiper
	4	20A		Door lock remote control, alarm, reversing lights, boot and fuel filler flap opening, engine solenoid valve (T.SPARK), climate control compressor (T.SPARK), hood (SPIDER), sunroof (GTV)
	5	10A		Instrument panel, LH taillights, RH number plate light, RH front side light, headlight corrector, ashtray light
	6	10A		Control lights, RH taillights, LH number plate light, LH front side light, glove compartment light
	7	10A		RH dipped beam
	8	10A		LH dipped beam
	9	10A		RH main beam
	10	10A		LH main beam
	11	--	--	SPARE
	12	20A		Rear window (GTV only) and rear view mirror defroster
	13	20A		Climate control fan, cigar lighter
	14	25A		Instrument panel power, alarm
SERVICES	15	10A		Instrument panel power, steering column stalks, rear fog lights, service ECU power
	16	20A		Ceiling light, door lock remote control, electrical aerial, mirror adjustment, diagnostic socket, service ECU power
	17	7.5A		Direction indicators, seats, hood ECU (SPIDER), TELEPASS

FUSES (from November '99)

FUSE			SUPPLY	PROTECTED SERVICES
SYMBOL	N0.	AMP.		
	1	10A		Hazard lights
	2	20A		Horns, brake lights
	3	20A	I35	Windscreen wiper
	4	20A	I35	Central locking remote control, alarm, reversing lights, air conditioning compressor, hood (SPIDER), sun roof (GTV), TELEPASS, seats
	5	10A	I64	Instrument panel, LH taillights, RH number plate light, RH front side light, headlight corrector, ashtray light
	6	10A	I64	Control lights, RH taillights, LH number plate light, LH front side light,
	7	10A	I49	RH dipped beam
	8	10A	I49	LH dipped beam
	9	10A	I50	RH main beam
	10	10A	I50	LH main beam
	11	--	--	SPARE
	12	30A		Rear window (GTV only) and rear view mirror defroster
	13	20A	I35	Climate control fan, cigar lighter
	14	25A		Instrument panel power, alarm
SERVICES	15	10A		Panel supply, radio phone, electric windows
	16	20A		Courtesy lights, electric aerial, mirrors adjustment, diagnostic connector, services control unit supply, radio, radio phone
	17	7.5A		Direction indicators, rear fog lamp, services control unit supply

WIRING DIAGRAM



GENERAL DESCRIPTION

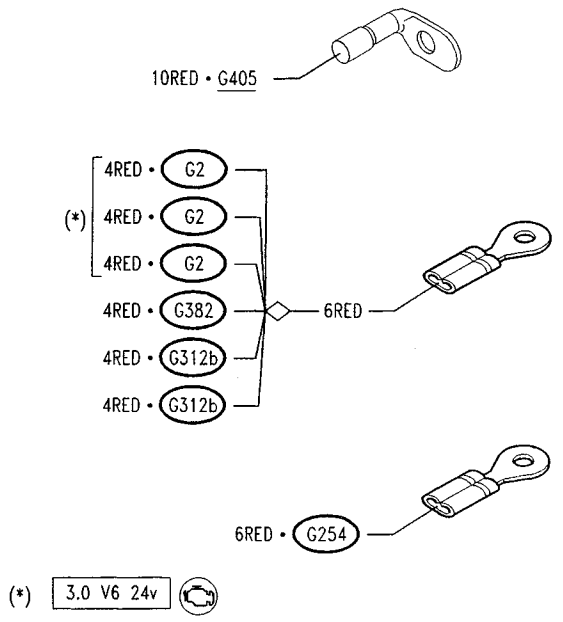
This section describes the complete printed circuit that makes the connections inside the FUSEBOX **G1**.

In the various diagrams referring to the individual systems and circuits only the lines associated with the case under examination are shown: this chart gives a complete, overall view of the entire fusebox **G1**.

The fusebox houses a number of relays and other devices, shown here with the corresponding codes, and the fuses (**F1**,...., **F24**).

NOTE: not all the output pins of the box **G1** are actually connected for all versions of the car: some lines therefore may be found to be redundant though they will be present on the printed circuit.

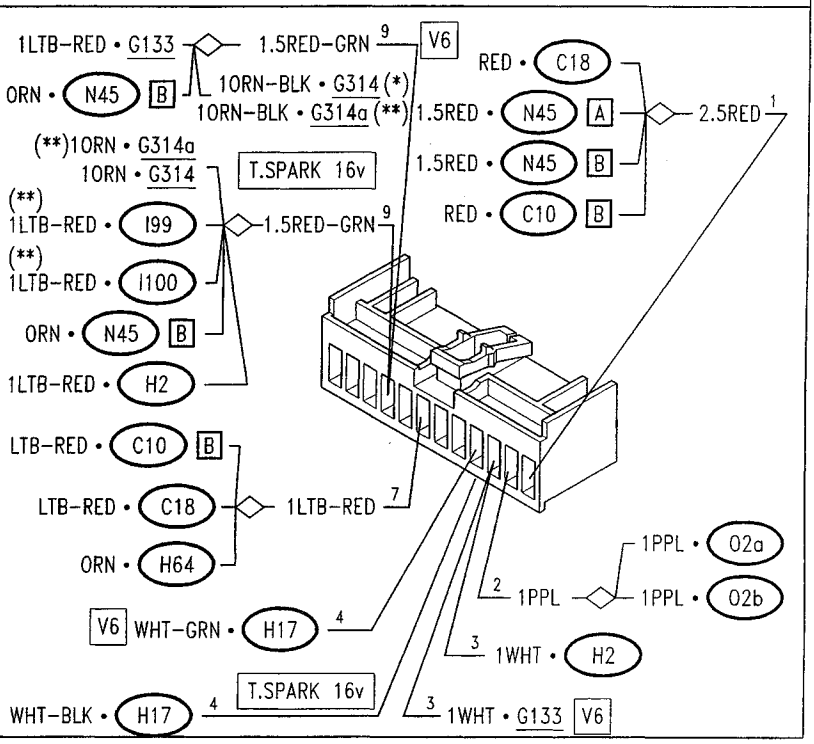
Next to the schematic drawings of the connectors a **list of output signals** from the different pins is given: this simplifies for instance faultfinding work on the different circuits affected. (NOTE: the letters N.C. indicate pins connected inside the fusebox but not used for the present versions of the car).

SUPPLY TO FUSEBOX		
PIN	**CIRCUITS**	
-	Fusebox supply from terminal board	
-	Window winder, door lock, ceiling light, sunroof (Gtv), automatic hood (Spider), fog lights	
-	Engine fan supply (3.0 V6 24V EOBD)	

(*) starting from October 2000

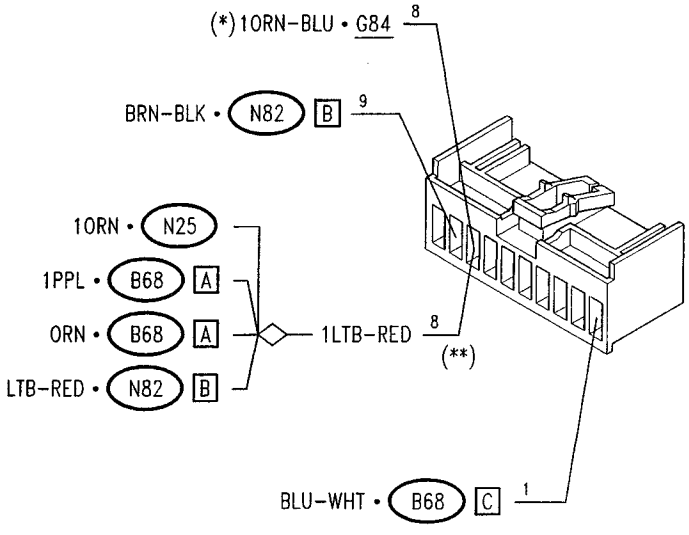
CONNECTOR A

PIN	CIRCUITS
1	Alarm, panel, auxiliary panel power
2	Horns
3	Reversing lights
4	Brake fluid level sensor
5	N.C.
6	N.C.
7	Panel, auxiliary panel (ignition switch powered)
8	N.C.
9	Engine cooling solenoid valve relay, reversing light, alarm, climate control compressor (ignition switch powered)
10	N.C.
11	N.C.
12	N.C.



CONNECTOR B

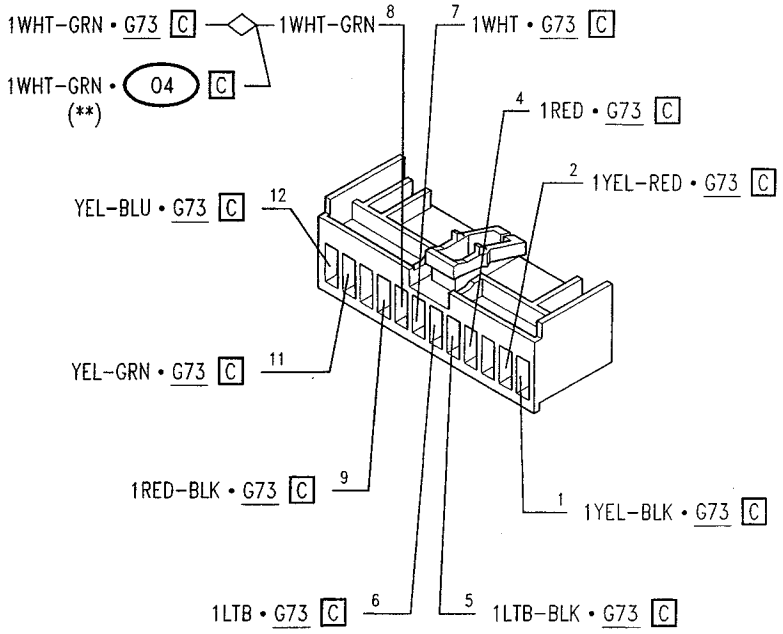
PIN	CIRCUITS
1	Horns control
2	N.C.
3	N.C.
4	N.C.
5	N.C.
6	N.C.
7	N.C.
8	Steering column stalks, service ECU, rear fog light (ignition switch powered)(**) Supply for radio phone (*)
9	Rearscreen heating/door mirror defrosting control
10	N.C.



(*) from November '99
(**) up to November '99
(***) starting from October 2000

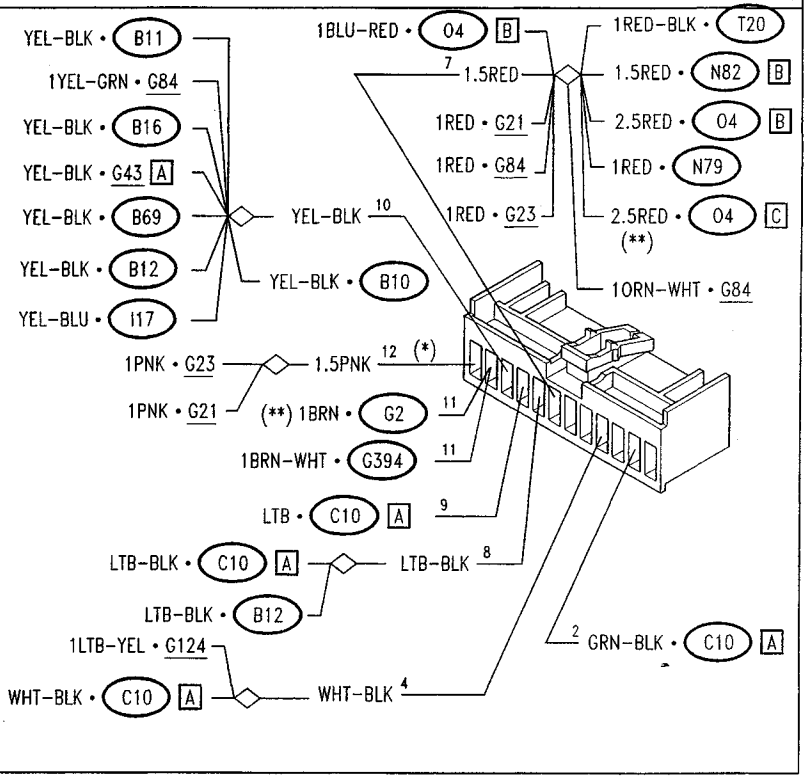
CONNECTOR C

PIN	CIRCUITS
1	Rear LH sidelights, controls lighting and front roof lamp
2	Rear RH sidelights, seat controls light
3	N.C.
4	LH brake lights
5	LH rear sidelights
6	RH rear sidelights
7	LH reversing light
8	RH reversing light
9	RH brake light and 3rd stop light
10	N.C.
11	RH number plate light
12	LH number plate light



CONNECTOR D

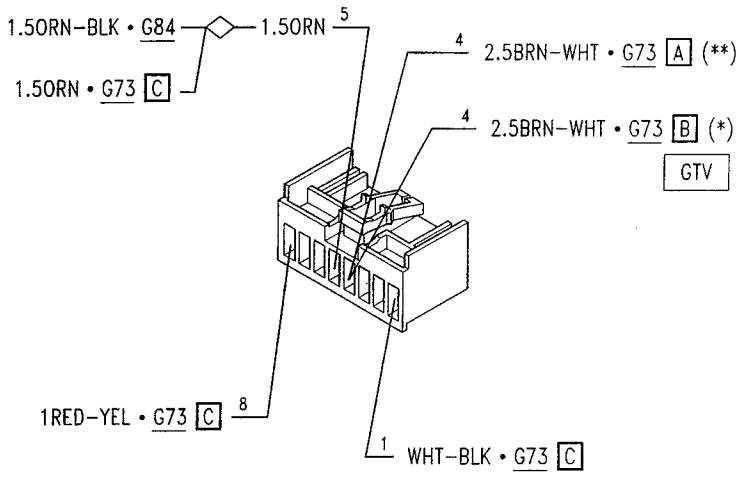
PIN	CIRCUITS
1	N.C.
2	Headlamps warning light
3	N.C.
4	Handbrake warning light brake fluid level
5	N.C.
6	Fuel level gauge
7	Service ECU, radio, mirror control (direct power)
8	LH direction indicator warning light, hazard warning lights control lighting
9	RH direction indicator warning light
10	Various controls lighting (with sidelights on), fog lamp enable, headlamp aming enable
11	Defrosting warning light
12	Supply for electric window controls (*)



(*) from November '99
(**) starting from October 2000

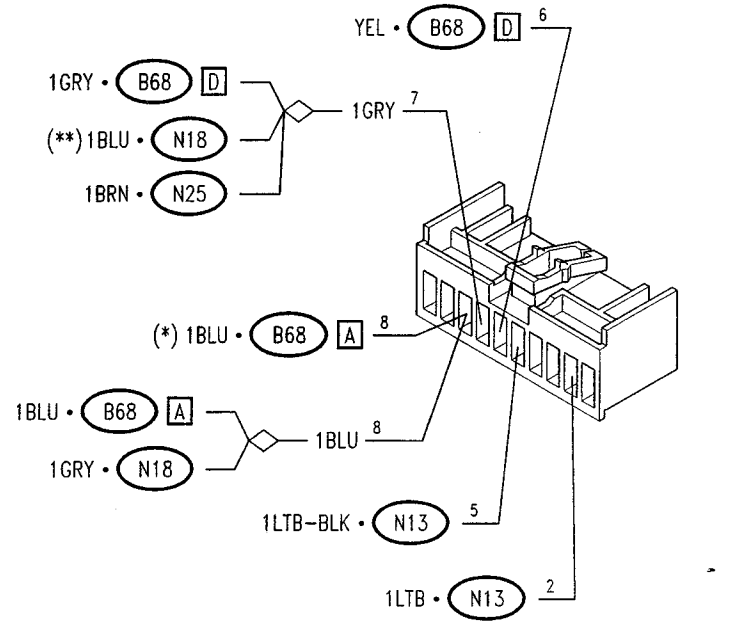
CONNECTOR E

PIN	CIRCUITS
1	Handbrake switch
2	N.C.
3	N.C.
4	Heated rearscreen
5	Remote control, boot and fuel filler flap opening, sunroof, ceiling light, steering column stalk, hood release, automatic hood relays and ECU (SPIDER) (ignition switch powered) (**)
	Supply for remote control, sun roof (GTV), seats, telepass, automatic hood control unit (Spider) (*)
6	N.C.
7	N.C.
8	Supply for front roof lamp, electric aerial, door lock remote control (direct)



CONNECTOR F

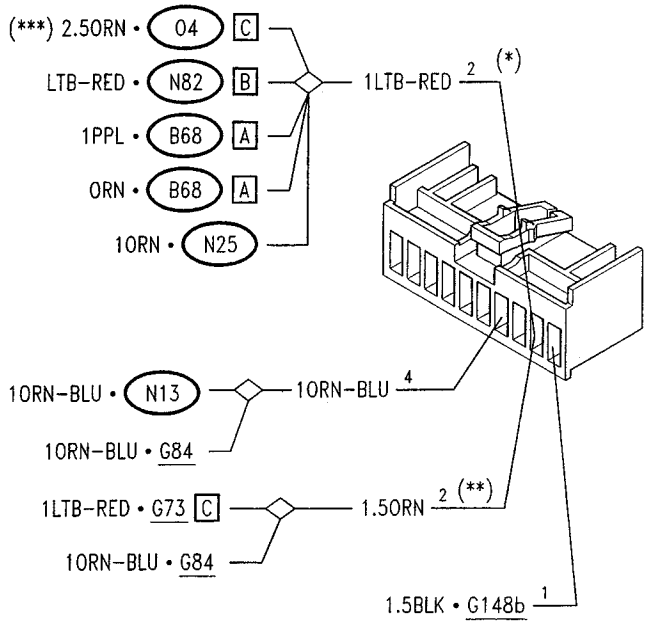
PIN	CIRCUITS
1	N.C.
2	RH direction indicator control
3	N.C.
4	N.C.
5	LH direction indicator control
6	Sidelights control
7	Low beam control
8	High beam control
9	N.C.
10	N.C.



(*) from November '99
(**) up to November '99

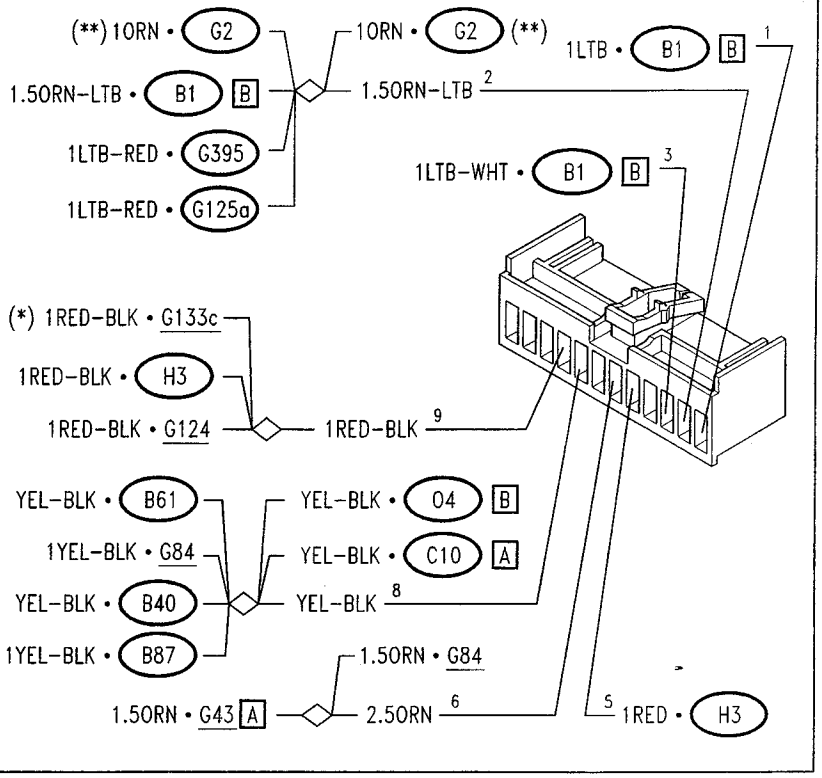
CONNECTOR G

PIN	CIRCUITS
1	FUSEBOX EARTH
2	Automatic hood ECU (SPIDER), TELEPASS (ignition switch powered) (**) Supply for services control unit, steering column switch unit, radio, rear fog lamp (*)
3	N.C.
4	Hazard lights, radio telephone (direct power)
5	N.C.
6	N.C.
7	N.C.
8	N.C.
9	N.C.
10	N.C.



CONNECTOR H

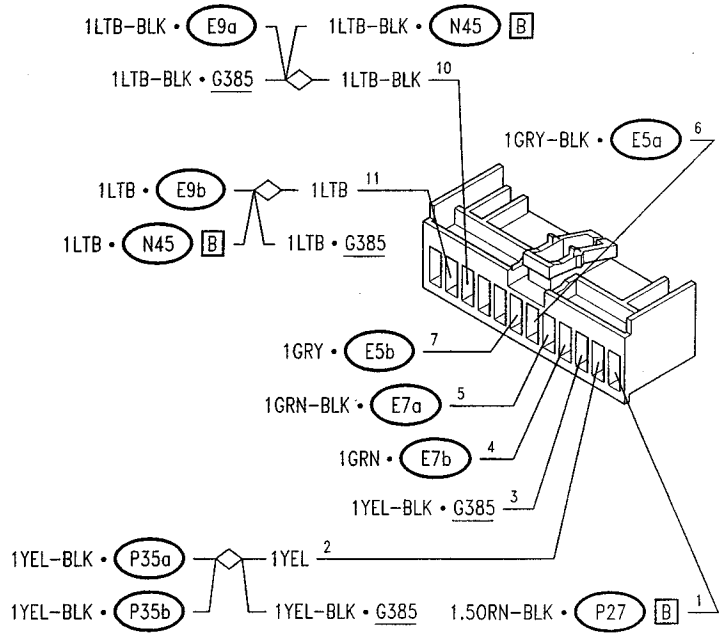
PIN	CIRCUITS
1	"KEY-OPERATED supply (cut-of when Starting)
2	"KEY-OPERATED" supply
3	"KEY-OPERATED" supply (Park)
4	N.C.
5	Stop lights supply
6	Heater/climate control fan, cigar lighter (ignition switch powered)
7	N.C.
8	Sidelights warning light, various controls lighting, glovebox light (with sidelights on)
9	Brake lights control
10	N.C.
11	N.C.
12	N.C.



(*) from November '99
(**) up to November '99
(***) starting from October 2000

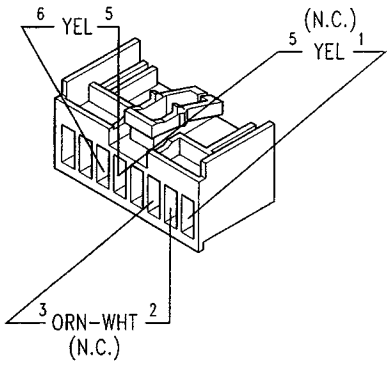
CONNECTOR I

PIN	CIRCUITS
1	Windscreen wiper supply
2	RH front sidelight, headlamp aiming device
3	LH front sidelight
4	RH high beam
5	LH high beam
6	LH low beam
7	RH low beam
8	N.C.
9	N.C.
10	LH front direction indicator
11	RH front direction indicator
12	N.C.



CONNECTOR J

PIN	CIRCUITS
1	(*)
2	(*)
3	(*)
4	N.C.
5	Side lights control
6	Sidelights relay consent
7	N.C.
8	N.C.
	(*) not used

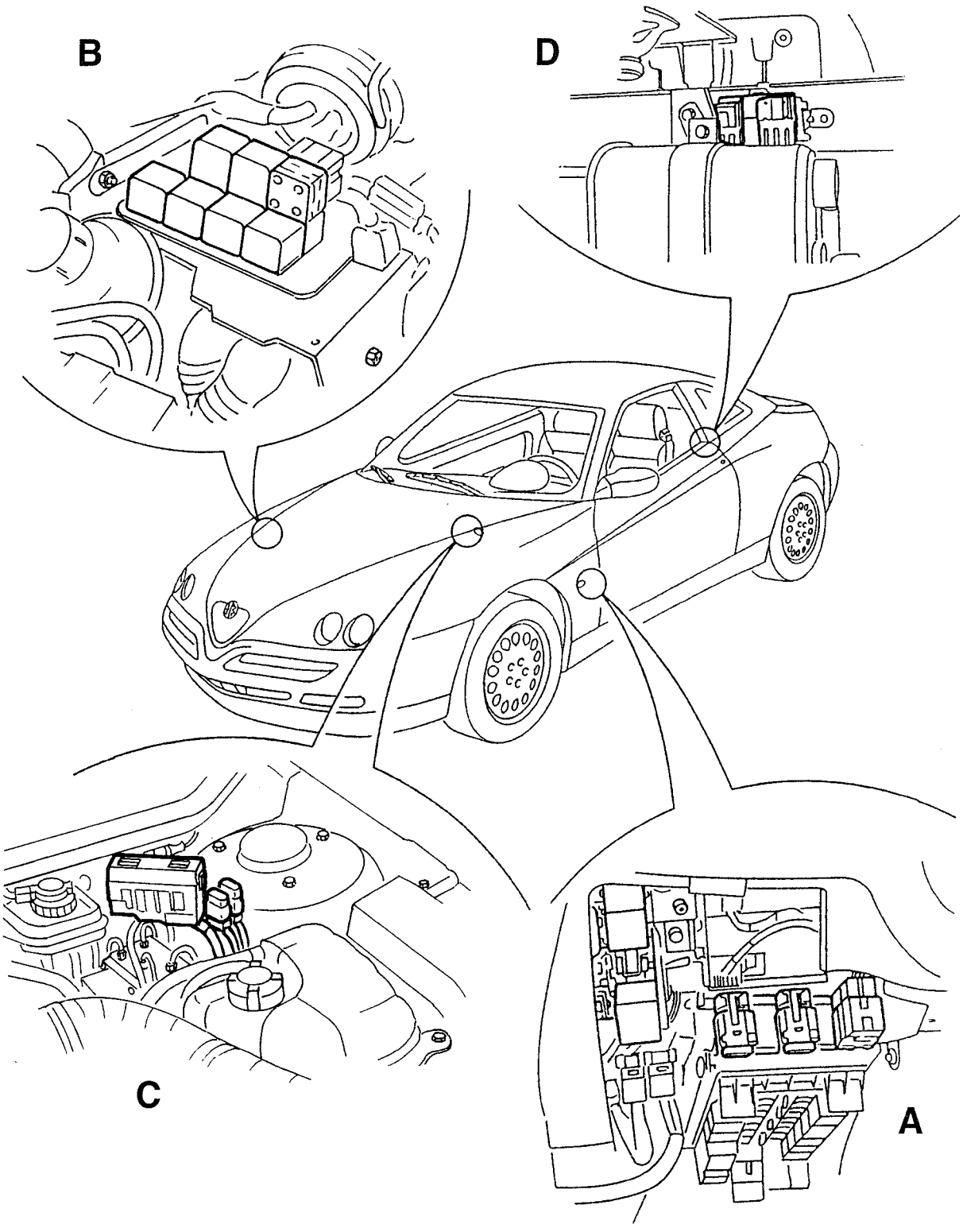


LOCATION OF FUSES AND RELAYS

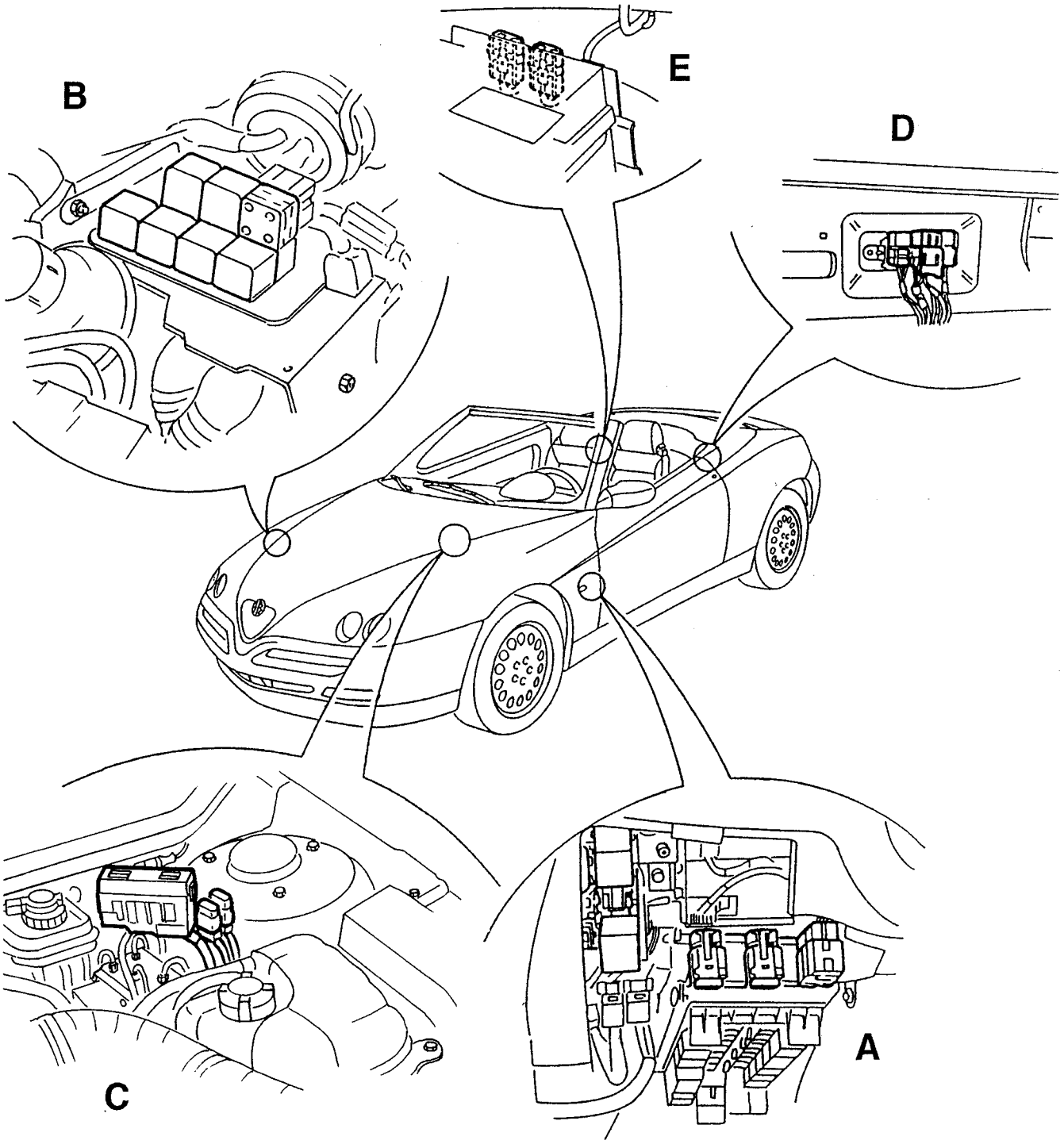
This section shows the locations in the car of all the fuses and switches that are not to be found in the fusebox.

The fuses and relays are distinguished by the colour of the base (fuse holder or relay carrier) which connects them to the wiring harness, as described later.
In addition to the colour of the base, it is always wise to check the exact location of a relay or fuse by the colour of the wires that converge on it (for these - see the wiring diagram concerned).

GTV



Spider



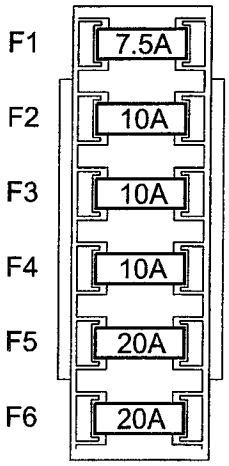
FUSES AND RELAYS ON AUXILIARY BRACKET (see fig. position A)

A set of fuses and relays is positioned on an auxiliary bracket (not removable) on the left-hand side of the main fusebox; next to this there is also the integrated services control unit **N82**, the electronic key control unit **N77** and the electronic windscreen wiper device **N14**.

COMPONENT	AMP.	SYMBOL	COLOUR OF BASE
Fog lamp relay	20A	**I17**	Black
Hazard warning light & direction indicator intermittent device	-	**N13**	Black
Rear fog guard device	-	**N25**	White
Engine cooling fan 2nd speed relay	50A	**I100 a/b**	Black
Engine cooling fan 1st speed relay	30A	**I99**	Yellow
ABS fuse	10A	**G125a (*)**	Red
Power window fuse, door locking device	25A	**G312a (*)**	Yellow
Power window fuse, door locking device	25A	**G312b (*)**	Yellow
Air Bag fuse	10A	**G395 (*)**	Red
Fog light fuse	10A	**G382 (*)**	Red
Rear view defroster fuse	7.5A	**G394 (*)**	Brown

(*) The fuses marked with an (*) are incorporated, starting from October 2000, in the additional fuse box **G2** described below.

N.	COMPONENT	AMP.
F1	Rear view defroster fuse	7.5A
F2	Air Bag fuse	10A
F3	ABS fuse	10A
F4	Fog light fuse	10A
F5	Power window fuse, door locking device	20A
F6	Power window fuse, door locking device	20A



FUSES AND RELAYS IN ENGINE COMPARTMENT (see fig. position B)

One set of fuses and relays located in the engine compartment, on right-hand side.

COMPONENT	AMP.	SYMBOL	COLOUR OF BASE
Engine fan fuse (*)	50A	**G254**	Black
Conditioner fan delay device (•)	-	**Q42**	White
Compressor electromagnetic coupling relay	15A	**Q22**	Black
3.0 V6 Engine			
Main relay	30A	**S41**	Grey
Secondary relay	30A	**S42**	Black
Motronic fuel pump relay	30A	**S12a**	Black
Air flow meter relay	30A	**S12e**	Black
Motronic supply fuse	7.5A	**S46**	Brown
Fuel pump fuse	10A	**S47**	Red
T.Spark Engine (up to September 2000)			
Main relay	30A	**S41**	Black
Motronic fuel pump relay	30A	**S12a**	Black
Motronic supply fuse	15A	**S46**	Blue
Lambda probe fuse	15A	**S45**	Blue
2.0 V6 TB Engine (up to September 2000)			
Motronic fuel pump relay	30A	**S12a**	Black
Main relay	30A	**S41**	Grey
Secondary relay	30A	**S42**	White
Fuel pump fuse	15A	**S47**	Blue
Air conditioner system fuse	50A	**Q39**	Black
3.0 V6 24v and T.SPARK 16V - EOBD Engine			
Main relay	30A	**S41**	Red
Motronic fuel pump relay	30A	**S12a**	Black
Lambda probe fuse	15A	**S45**	Blue
Motronic supply fuse	15A	**S46**	Blue

(•) only for 3.0 V6 and 2.0 V6 TB
(*) up to September 2000

FUSES NEXT TO THE FUSEBOX (see fig. position C)

COMPONENT	AMP.	SYMBOL	COLOUR OF BASE
Fuse for ALFA ROMEO CODE unit	7.5A	**G389**	Brown
Injection ECU power fuse (*)	7.5A	**S58**	Brown
Engine fan fuse (**)	50A	**G254**	Black

(*) T.SPARK only up to September 2000
(**) 3.0 V6 24v - EOBD

FUSES AND RELAYS ON REAR BRACKET (see fig. position D)

A set of fuses and relays is located in the luggage compartment on a special bracket.

COMPONENT	AMP.	SYMBOL	COLOUR OF BASE
Hood release relay (*)	20A	**I106**	Black
Hood cover release relay (*)	20A	**I107a**	Red
Hood cover release relay (*)	20A	**I107b**	Brown
Luggage compartment opening relay	20A	**I52**	Black
Fuel flap opening relay	20A	**I53**	Black
key-operated supply cut-off relay (•)	20A	**I108**	Black
Hood cover release timer (*)	27A	**N80**	Black
Services supply fuse	30A	**G384**	Green
ABS supply wander fuse (**)	60A	**G125b**	Black
Hood release relay (***)	20A	**I106**	Brown
Hood cover release relay (***)	20A	**I107**	Brown
RH hood closing relay (***)	20A	**I112a**	Brown
LH hood closing relay (***)	20A	**I112b**	Brown
Hood cover closing relay (***)	20A	**I113**	Brown
Automatic hood emergency relay (***)	20A	**I106a**	Brown
Automatic hood electric pump relay (***)	20A	**I117**	Black
Hood control unit fuse (***)	7.5A	**G402**	Brown
Seat fuse	40A	**G240**	Black
Fusebox power MAXI FUSE (**)	80A	**G405**	Black

(•) No longer present from November '99
(*) Spider only
(**) GTV only
(***) Spider with automatic hood

FUSES ON BRACKET IN REAR TRAY (Spider only) (see fig. position E)

In the Spider two wander fuses are to be found near the battery, in the rear tray.

COMPONENT	AMP.	SYMBOL	COLOUR OF BASE
ABS supply wander fuse	60A	**G125b**	Black
Fusebox power MAXI FUSE	80A	**G405**	Black
Automatic hood system fuse (***)	40 A	**G401**	Black

(***) Spider with automatic hood

STARTING AND CHARGING

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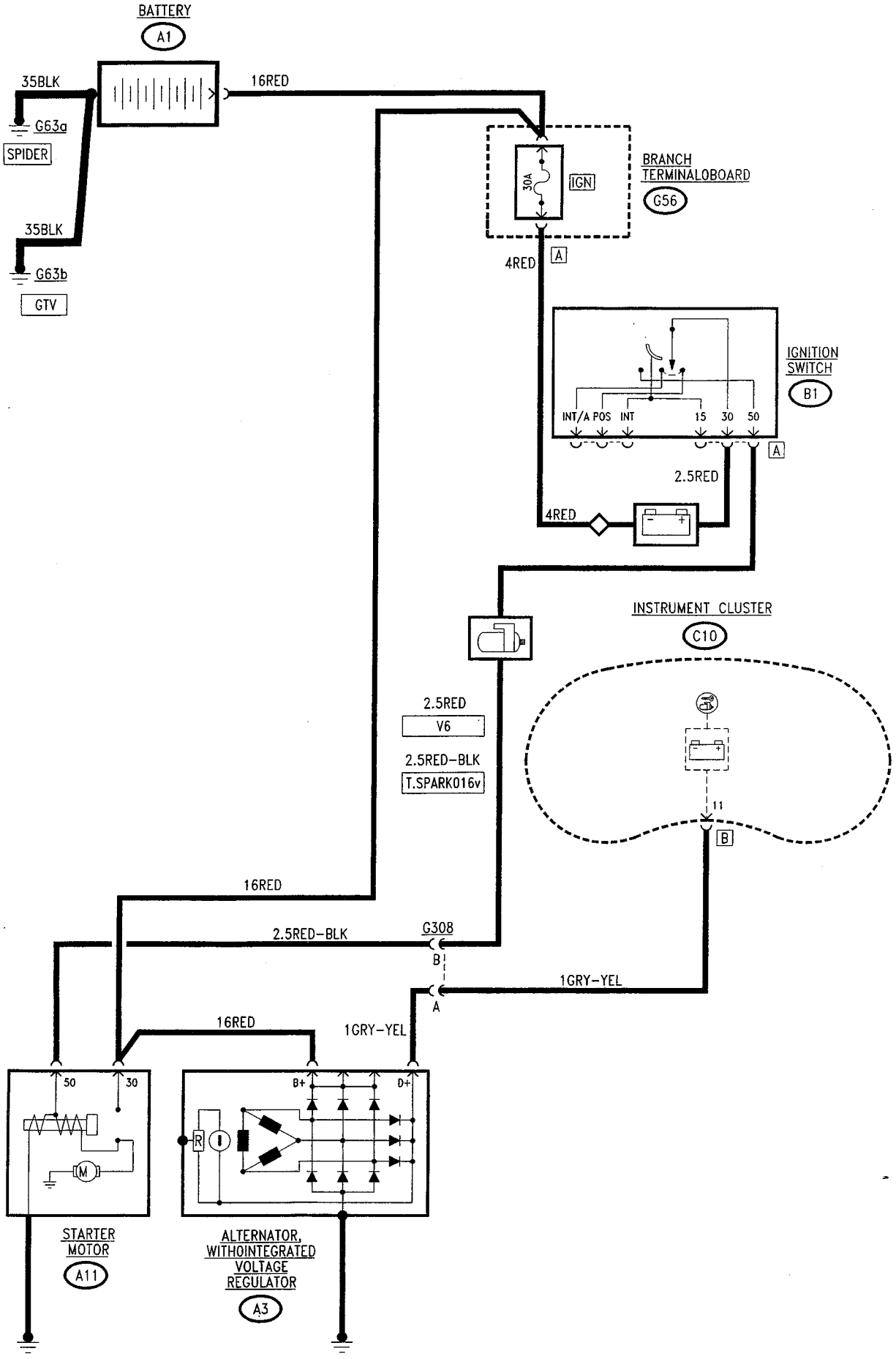
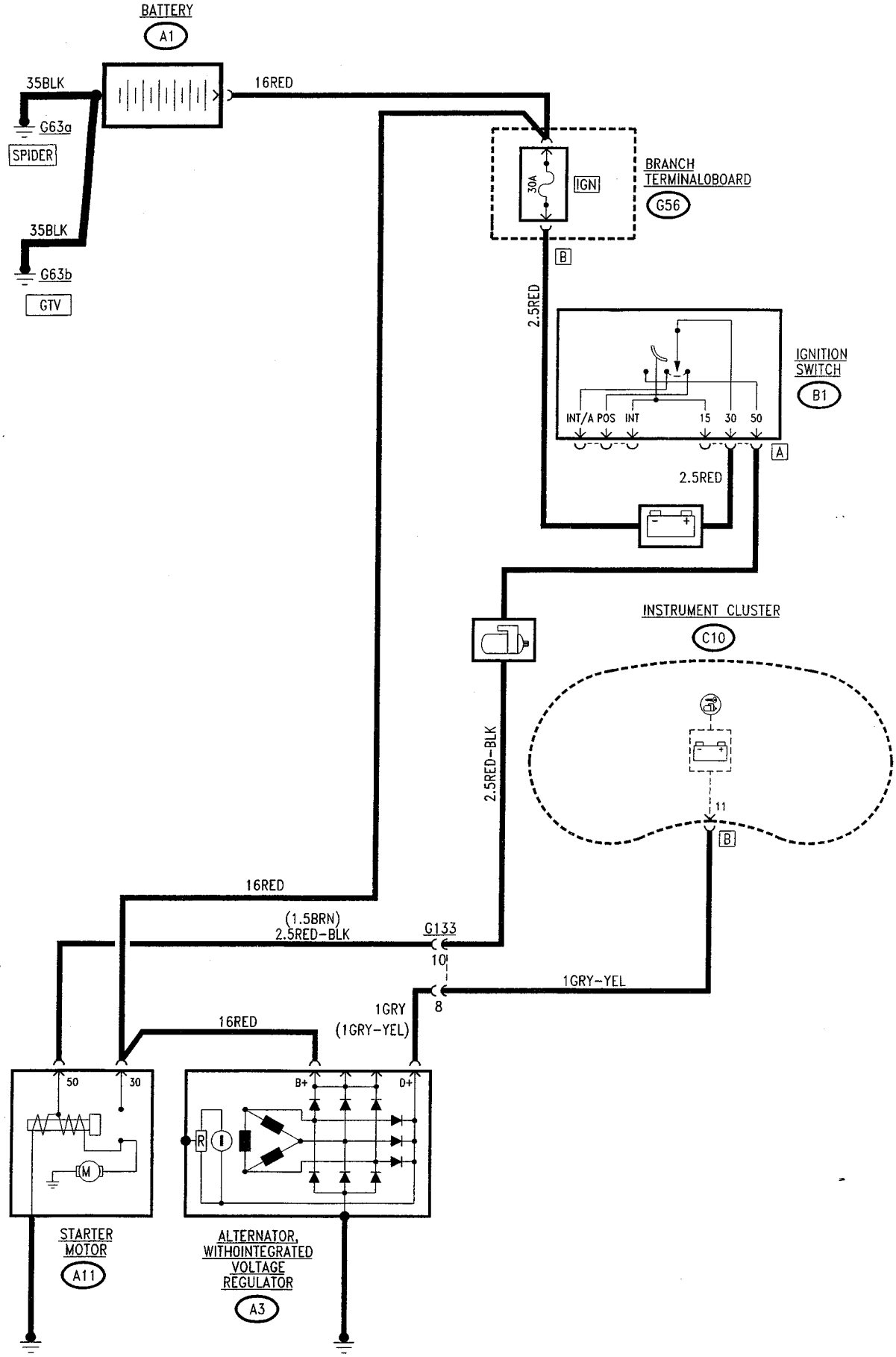
WIRING DIAGRAM (up to September 2000)



WIRING DIAGRAM (starting from October 2000)



GENERAL DESCRIPTION

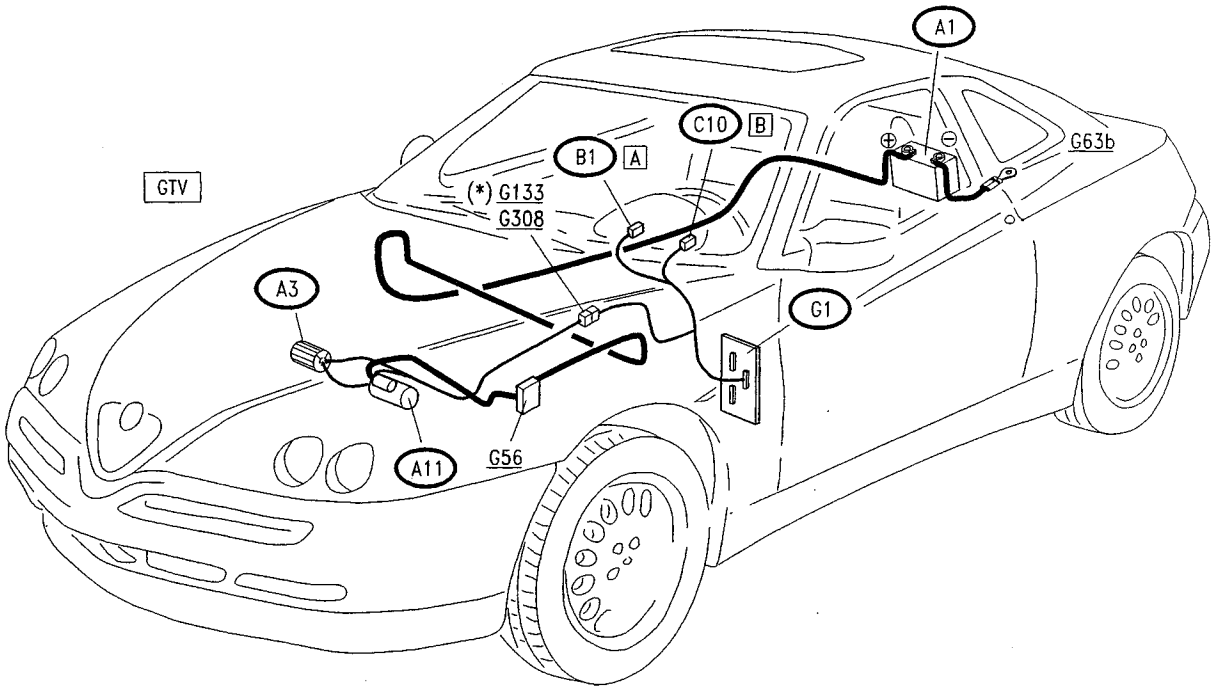
The starting and charging circuit comprises the battery, starter motor and the alternator.
The **battery** (12V) is sealed and maintenance-free.
The **starter motor** comprises a direct current motor supplied by the battery and a control and engagement solenoid.
By turning the ignition key, the voltage leading from the battery supplies the windings of the motor, generating the electromagnetic forces which turn the pinion of the motor itself: simultaneously, the solenoid is energized which operates the mechanism engaging the pinion in the flywheel ring gear, thereby setting the crankshaft into rotation.
The **alternator** recharges the battery during the normal rotation of the engine: the alternator shaft (rotor) turned directly by the crankshaft through a belt is supplied with the excitation current and generates a magnetic field which induces an alternate current on the fixed winding (stator); this is transformed into direct current by a rectifier bridge with diodes and sent to recharge the battery.
A voltage regulator built into the alternator makes it possible to maintain a constant voltage supply (appr. 12 V) for all the fields of load changes and engine speed.

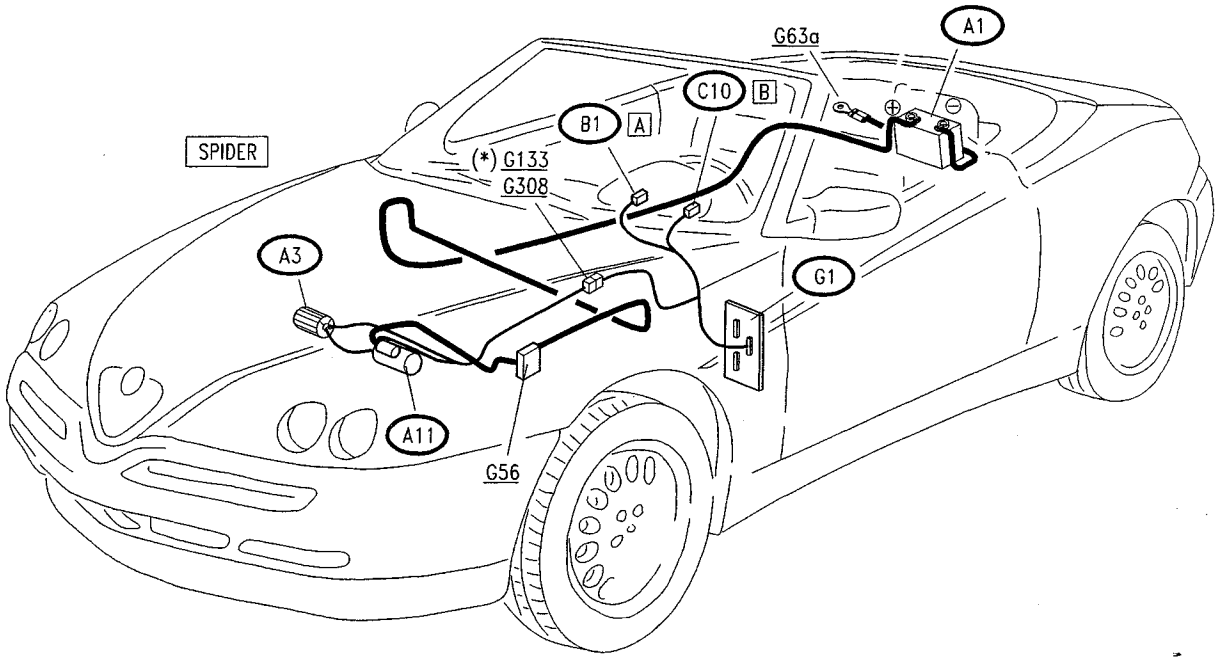
FUNCTIONAL DESCRIPTION

When the ignition key is turned in the ignition switch **B1** right round to the "STARTING" position, the windings of the solenoid (pin 50) of the starter motor **A11** are energized and the actual motor is supplied (pin 30) with the voltage leading from the battery **A1** via MAXI FUSE "IGN" in **G56** (pin 30) in this way cranking the engine.

When the engine is running, the direct current generated by the alternator **A3** (pin B+) is sent via the starter motor **A11** and the terminal block **G56,** to recharge the battery **A1**.
All the lines for supplying the various electric systems of the car branch from the terminal board **G56** (see "Power Supply").
When the alternator is not turning and therefore not charging the battery, an earth signal is sent from pin D+ to the instrument cluster **C10** to turn on the corresponding warning light; once the engine has started this signal becomes 12 V and the warning light goes off.

LOCATION OF COMPONENTS





(*) starting from October 2000

FAULT-FINDING TABLE

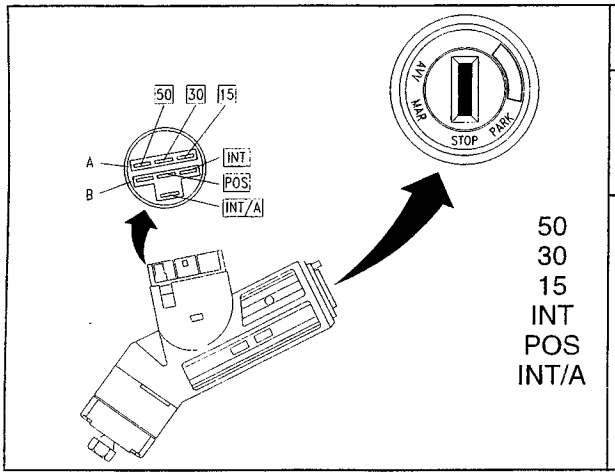
Fault	Component to be checked					
	A1	B1	A11	A3	G56	C10 (1)
Engine starting	•	•	•		•	
Engine recharging	•			•	•	
Charging warning light				•		•

(1) The instrument cluster **C10** cannot be overhauled. Therefore in the event of a failure individual warning lights cannot be replaced and a new complete cluster must be fitted.

CHECKING COMPONENTS

Ignition switch (B1)

Check the internal connections as shown below:



	POSITION OF KEY			
	PARKING key removable	STOP key removable	RUN key not removable	STARTING key not removable
50	———		———	———
30				———
15			———	———
INT	———			
POS				———
INT/A			———	

Starter motor (A11)

If necessary, see the specifications and overhauling of the motor in the section "ELECTRIC SYSTEM-ENGINE STARTING"

Alternator (A3)

If necessary, see the specifications and overhauling of the alternator in the section "ELECTRIC SYSTEM-CURRENT GENERATION SYSTEM"

Battery (A1)

If necessary, see the battery specifications in the section "ELECTRIC SYSTEM-CURRENT GENERATION SYSTEM"

SIDE LIGHTS

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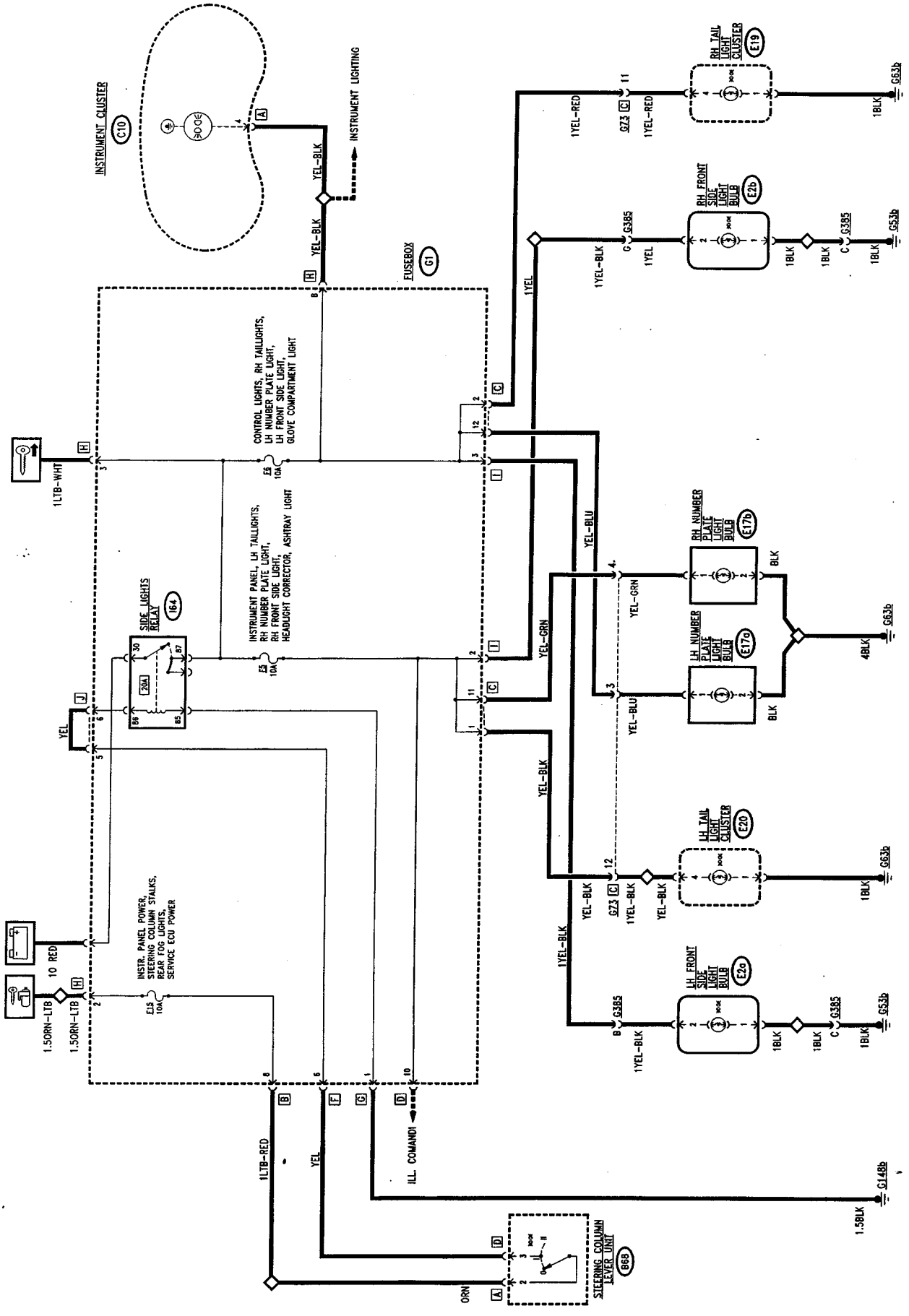
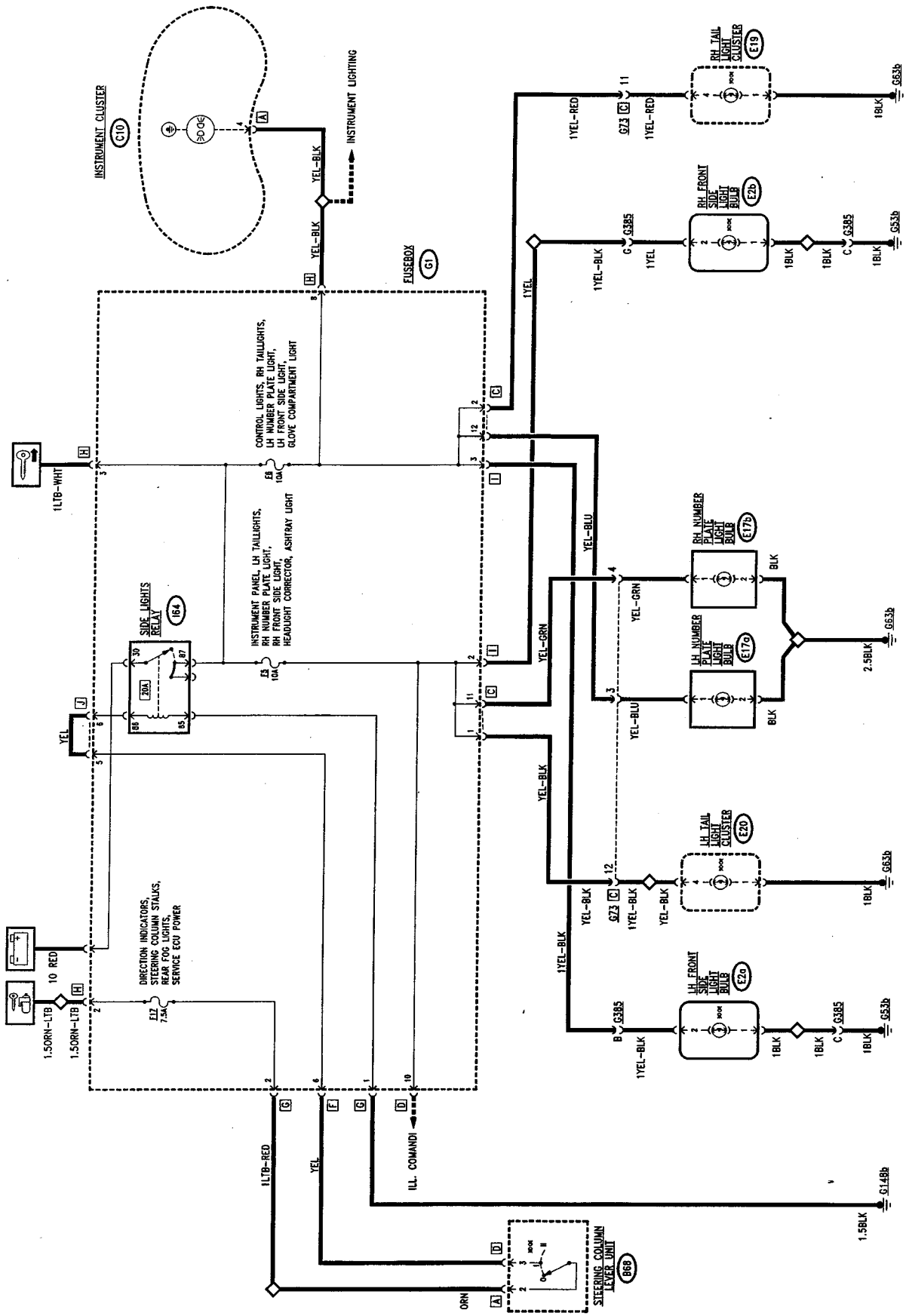
WIRING DIAGRAM



WIRING DIAGRAM (from November '99)



GENERAL DESCRIPTION

The side lights are turned on when the switch on the lever unit is turned to the first position and only when the ignition key is engaged: this prevents the battery from discharging if the lights are inadvertently left on when leaving the car.
N.B.: They can also be turned on by withdrawing the ignition key and turning it in the opposite direction holding down the special button: key in the "PARKING" position (see also "Power supply").
When the side lights are turned on, the number plate lights and numerous interior lights for lighting the passenger compartment, instruments and controls are also turned on with "consent" signals (eg. circuits which operate only with the sidelights on): for these functions see the wiring diagrams of the componnets concerned: eg. instrument cluster lighting: see "Instrument Cluster".
A warning light on the instrument panel indicates that the side lights are on.
For safety reasons the circuit is protected by two "crossed" fuses: one for the right front and left rear lights etc., the other for the left front and right rear lights, etc..

FUNCTIONAL DESCRIPTION

The side lights circuit is activated by the corresponding relay switch **I64** located in fusebox **G1**.
Moving the switch on the lever unit **B68** to position "I" when the ignition key is engaged the coil of relay switch **I64** is supplied thereby closing the circuit that supplies the side lights; this circuit is protected by two fuses in fusebox **G1: F5** for the right front and left rear lights, **F6** for the left front and right rear lights. In this way the front side lights **E2b** (right) and **E2a** (left), the rear lights **E19** (right) and **E20** (left) and the number plate lights **E17a** and **E17b** are supplied.
The line supplying fuse **F6** also sends a signal to the instrument cluster **C10** to turn on the corresponding warning light.
When the ignition key is at the "PARKING" position all the side lights are turned on as a direct supply is sent to fuses **F5** and **F6** in fusebox **G1**, "by-passing" relay switch **I64**.

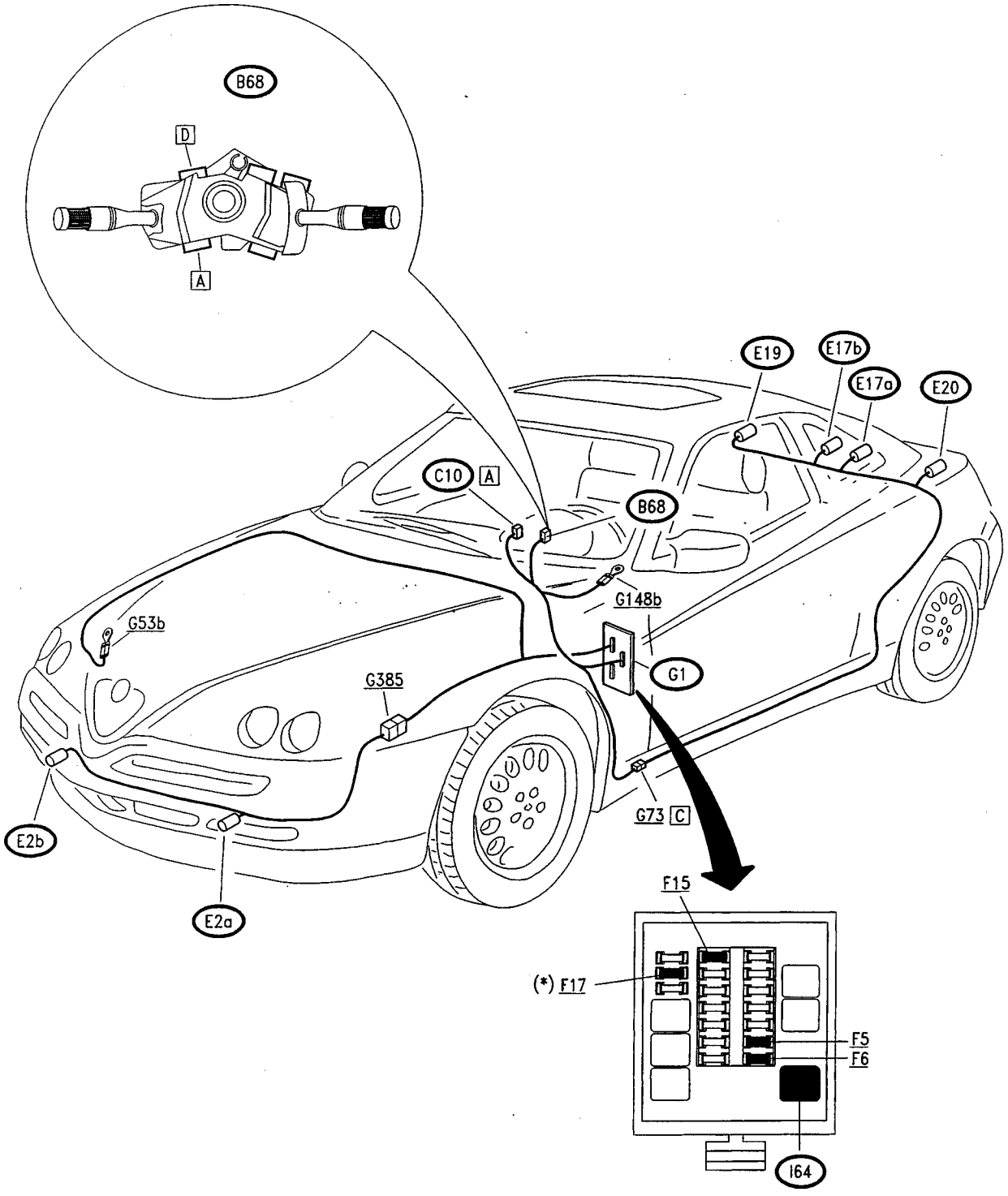
FAULTFINDING TABLE

Failure	Component to be checked												
	F15	F17 (*)	F5	F6	E2b	E2a	E19	E20	E17a	E17b	I64	B68	C10 (1)
All the side lights	•	•									•	•	
Front right			•		•								
Front left				•		•							
Right rear				•			•						
Left rear			•					•					
Right number plate			•							•			
Left number plate				•					•				
Side lights warning light			•										•

(1) The instrument cluster **C10** cannot be repaired. Therefore, in the event of a failure it is not possible to change the single warning light and a new complete cluster must be fitted.

(*) Starting from November '99

LOCATION OF COMPONENTS



(*) starting from November '99

HIGH AND LOW BEAM HEADLAMPS

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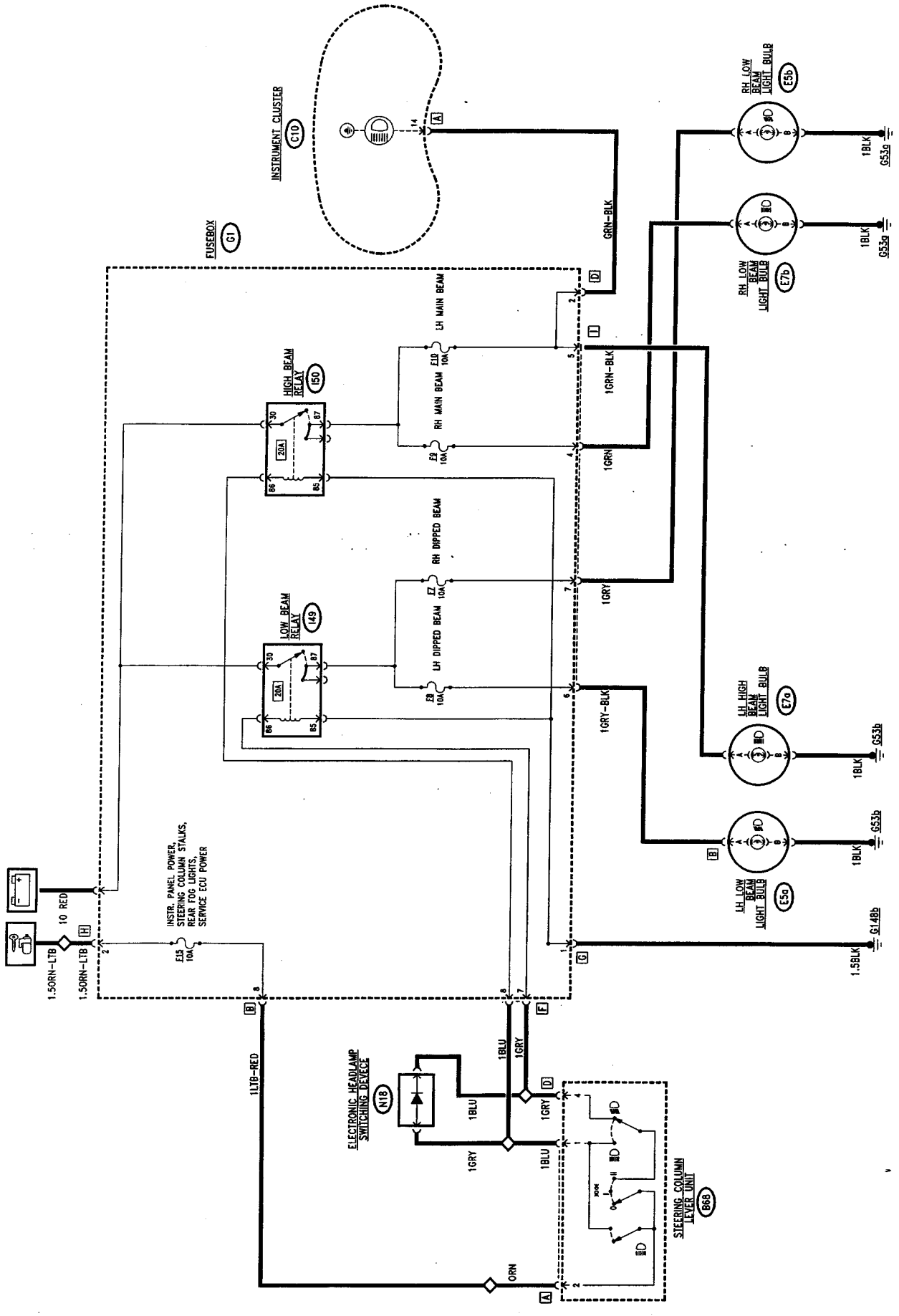
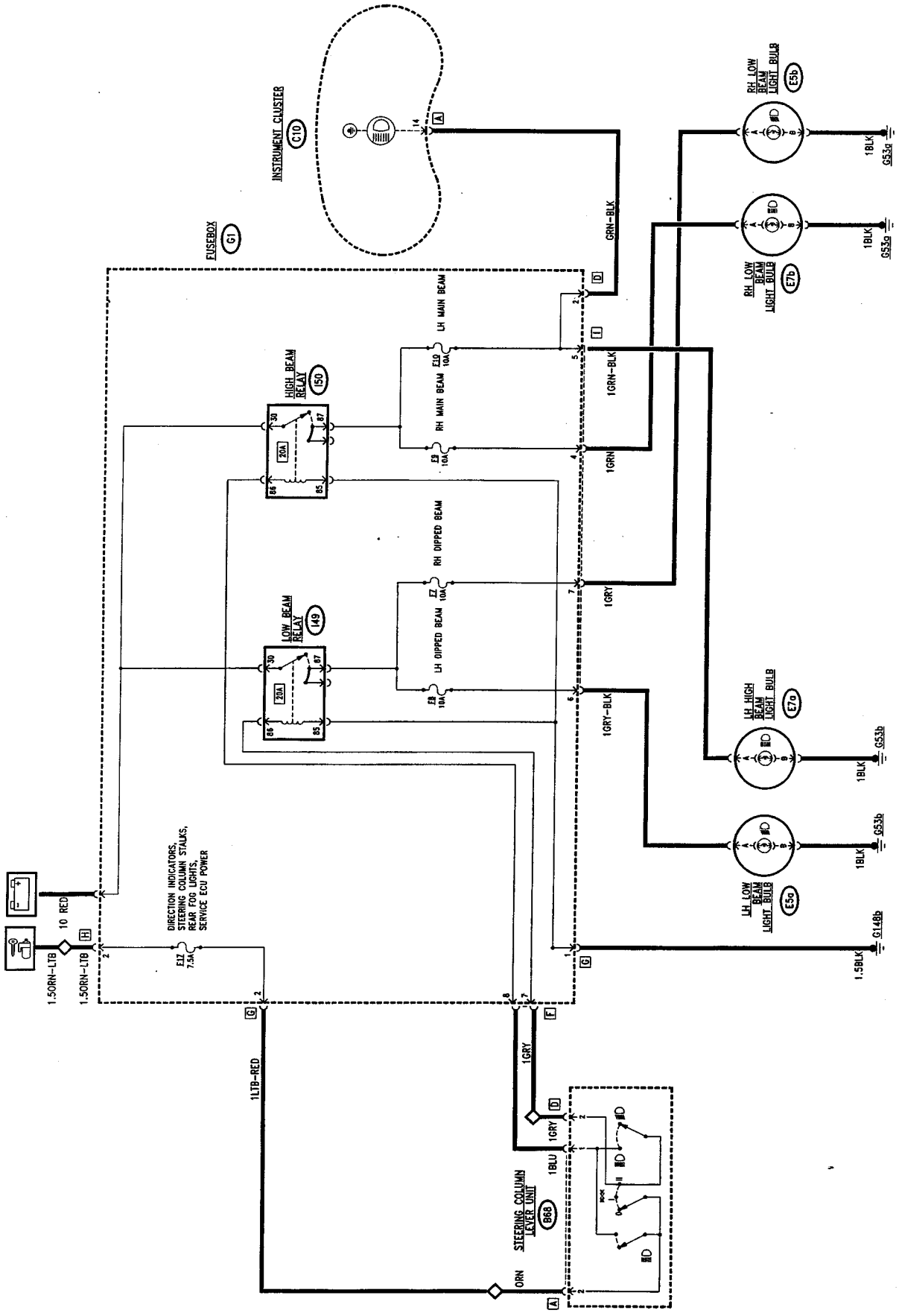
WIRING DIAGRAM



WIRING DIAGRAM (from November '99)



GENERAL DESCRIPTION

The car is fitted with two separate lamps for the low beams and two for the high beams.

The low beams are turned on by the switch on the steering column lever unit one position on from the sidelights; from this position the high beam can be permanently selected operating the high/low beam switch; lightly pulling the lever towards the steering wheel activates the high beam "flashing" function for as long as the lever is pulled.

A warning light on the dashboard indicates when the high beams are on.

For safety reasons each single high and low beam lamp is protected by a fuse.

NOTE: some versions are equipped with an electrically- operated headlamp aiming device (see "Headlamp aiming device"); however a manual device enables quick and simple adjustment of the beam to the loading conditions of the vehicle.

FUNCTIONAL DESCRIPTION

The circuit of the low beam headlamps is operated by relay switch **I49** located in fusebox **G1**.
Moving the lever unit switch **B68** to position II ≡D and with the switch in the low beam position the coil of relay switch **I49** is "turn key" supplied thereby closing the circuit supplying the left headlamp **E5a** and the right headlamp **E5b**.
Each circuit is protected by a fuse in fusebox **G1: F7** for the right headlamp and **F8** for the left one.
The high beam circuit is operated by relay switch **I50** located in fuse box **G1**.
Moving the switch to the high beam position ≡D with the lever unit switch **B68** on position II, or closing the "flashing" contact, the coil of relay switch **I50** is "turn key" supplied thereby closing the circuit that supplies the left headlamp **E7a** and the right one **E7b**. Each circuit is protected by a fuse in fusebox **G1**: **F9** for the right headlamp and **F10** for the left one.

The left high beam headlamp supply line also sends a signal to the instrument panel **C10** to turn on the high beam on warning light.

Only up to November '99
As the arrangement of the internal contacts of the steering column lever switch **B68** does not maintain the supply to the low beam lights when the high beams are switched on a suitable diode **N18** has been added which supplies the low beam lamps when the high beam lamps are on.

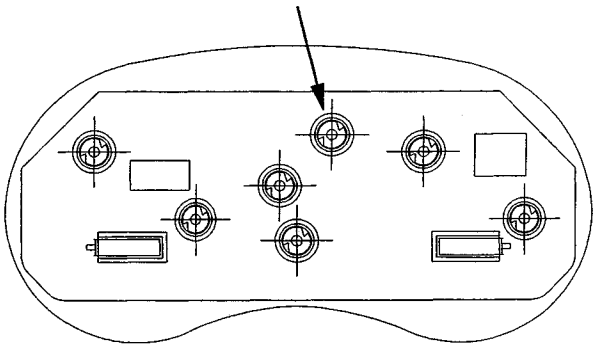
FAULTFINDING TABLE

Failure	Component to be checked														
	F15	F17 (*)	F7	F8	F9	F10	E5b	E5a	E7b	E7s	I49	I50	B68	C10 (1)	N18
Both low beam lamps	•	•									•		•		
RH low beam lamp			•				•								
LH low beam lamp				•				•							
Both high beam lamps	•	•										•	•		
RH high beam lamp					•				•						
LH high beam lamp						•				•					
High beam warning light						•								•	
Low beam lamps turn off when high beams are turned on (**)															•

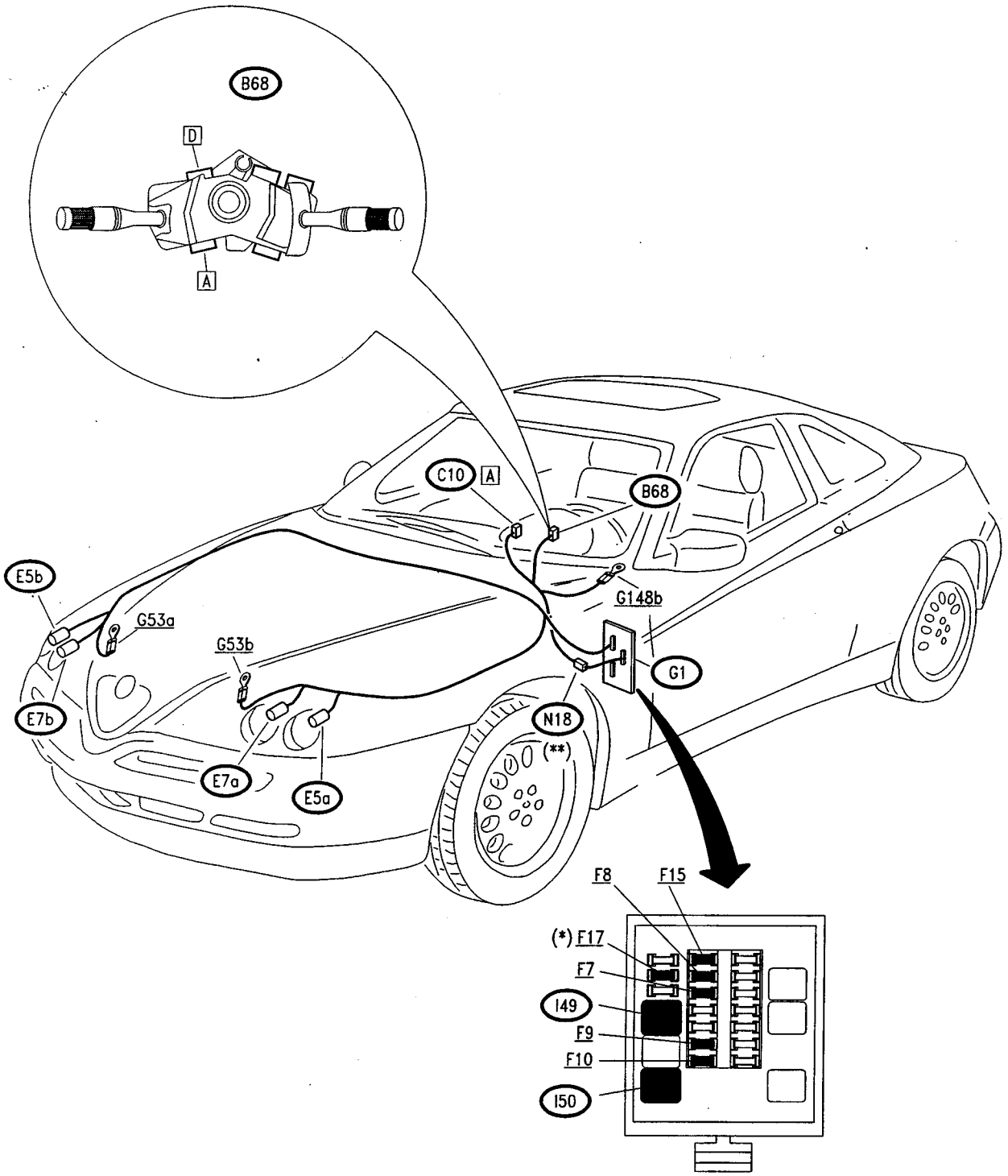
(1) **WARNING:**
The high beam warning light of the instrument cluster **C10**, shown by the arrow, can be replaced

(*) from November '99

(**) only up to November '99



LOCATION OF COMPONENTS



(*) starting from November '99
(**) only up to November '99

FOG LIGHTS AND REAR FOG GUARDS

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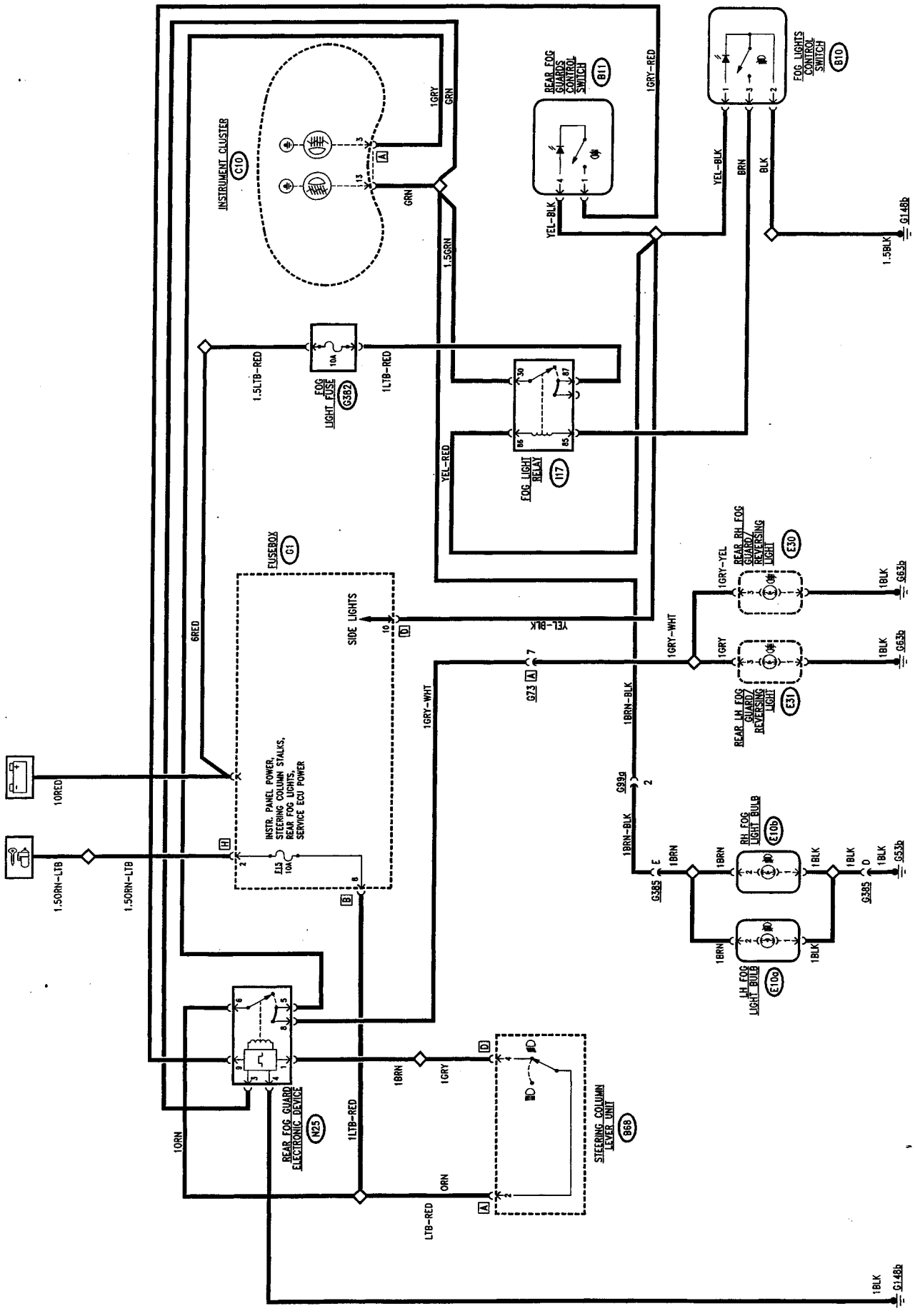
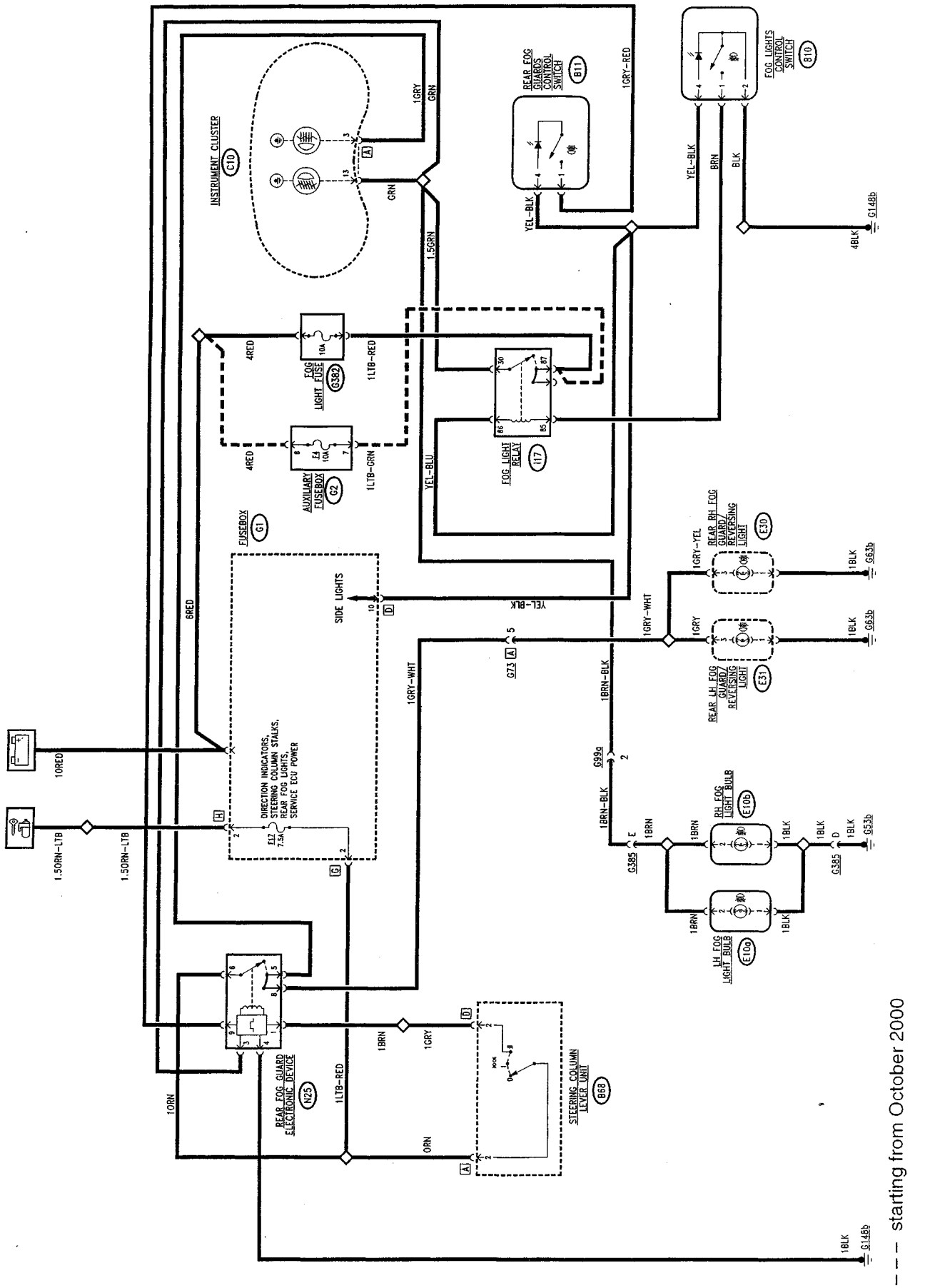
WIRING DIAGRAM



WIRING DIAGRAM (from November '99)



GENERAL DESCRIPTION

Upon request the car is fitted with special halogen fog lights, while the high luminosity rear fog guard, needed in all cases of poor visibility, is a standard item. Thus the entire system ensures the best possible active and passive visibility under all circumstances.

The front and rear fog lights are operated by means of the specific switches located in the centre of the dashboard.

The fog lights can be turned on when the side lights are on, while the rear fog guard can be turned on only with the low beam headlights or fog lights on (N.B. they turn off when the ignition key is moved to STOP and must be turned on again afterwards).
A warning light on the instrument panel indicates that the fog lights are on and another one indicates that the rear fog guards are turned on.

FUNCTIONAL DESCRIPTION

Fog lights

The fog lamp circuit is controlled by the corresponding relay **I17** located on the bracket outside fusebox **G1**.
By operating the switch **B10** , with the side lights on an earth and supply are sent which energize the coil of relay switch **I17** thereby closing the circuit, protected by individual fuse **G382**, (starting from October 2000, by fuse **F4** of the additional fuse box **G2**) which sends a supply to the two fog lights **E10a** and **E10b** which sends the supply to the two fog lights **E10a** and **E10b**.

The switch in **B10** is lit by a led when the side lights are on.
The energising circuit of the relay is protected by fuse **F16** of **G1**.
The supply line also sends a signal to the instrument cluster **C10** to turn on the corresponding warning light.

Rear fog guard

The circuit of the rear fog guards is controlled by the corresponding electronic device **N25** located near fusebox **G1**.

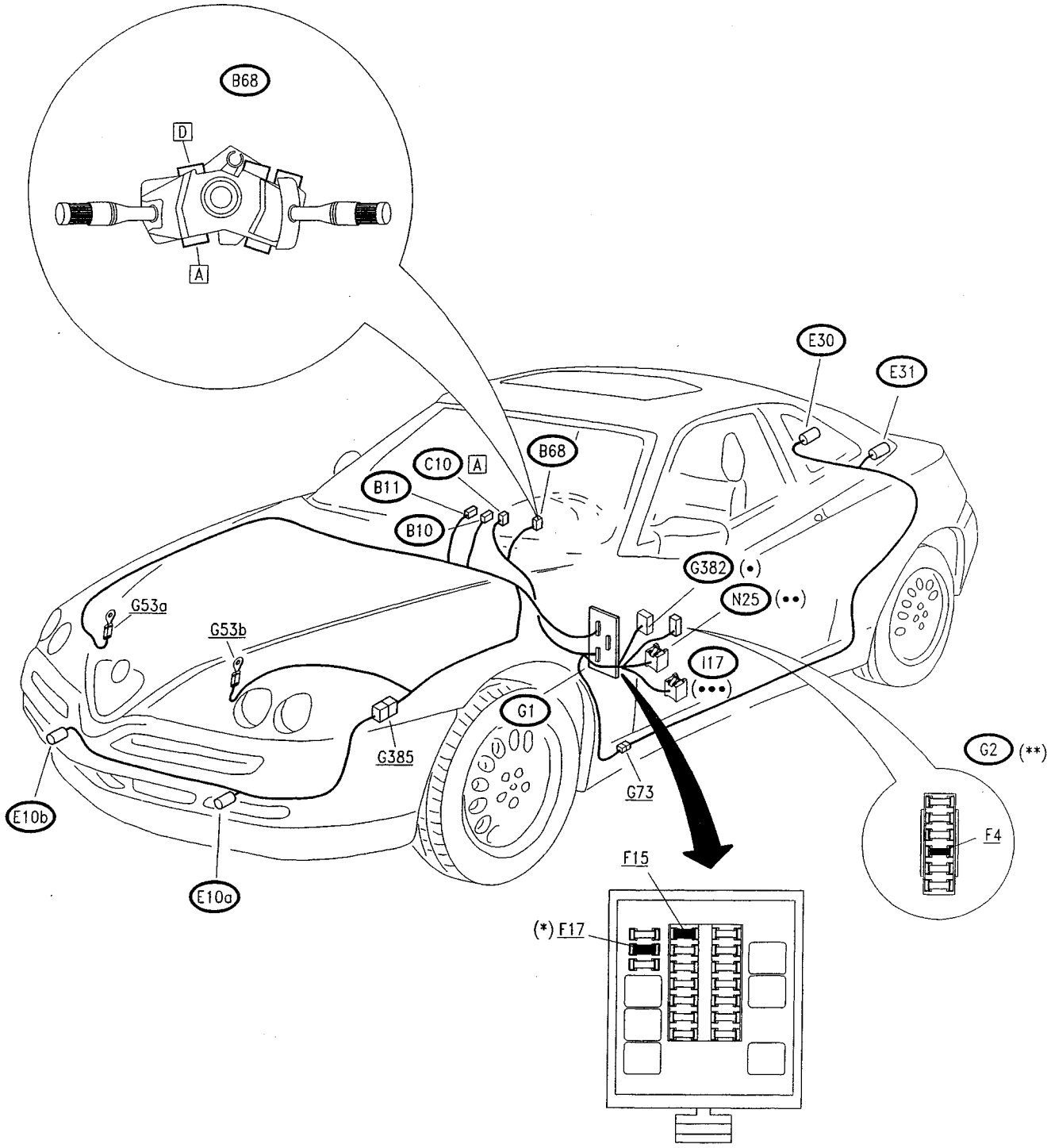
Device **N25** (pin 6) is ignition switch powered via individual fuse **F15** (**F17** from November '99) in fusebox **G1**; pin 4 is earthed, while pins 9, 3 and 1 receive the control and consensus signals, which are respectively: request to turn on the lamps (from switch **B11**); fog lamps on (same signal as for the fog lamp warning light) and low beam lights on (from lever switch **B68**): when the request for turning on is accompanied by one of the two consensus signals, device **N25** closes the circuit on pin 8 which powers the rear fog guards located in the tail lights **E30** (RH) and **E31** (LH).

N.B. The device turns off the lights if it "loses" the "key-operated" signal: when the key is turned to RUN again, the rear fog guards are only turned on by pressing switch **B11**.

The supply line also sends a signal - from pin 5 of **N25** - to the instrument panel **C10** to turn on the corresponding warning light.

Switch **B11** is illuminated by a led when the sidelights are on.

LOCATION OF COMPONENTS



(*) from November '99
(**) starting from October 2000

(•) Red fuseholder
(••) White base
(•••) Black base

FAULTFINDING TABLE

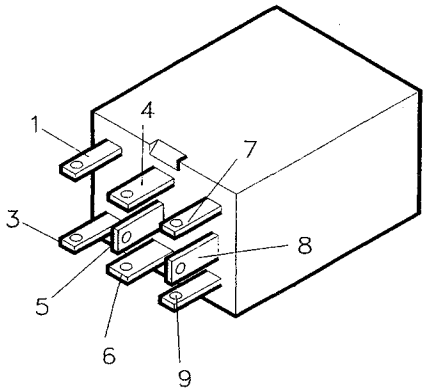
Failure	Component to be checked												
	F15	F17 (*)	E30	E31	G382 G2	E10a	E10b	I17	N25	B68	B11	B10	C10 (1)
Both rear fog guards	•	•							•	•	•		
RH fog light			•										
LH fog light				•									
Rear fog guards warning light									•				•
Both rear fog guards					•			•		•		•	
RH fog ligh							•						
LH fog light						•							
Fog lights warning light					•								•
Lighting fog light switch (with side lights on)												•	
Rear fog guard switch lighting (with sidelights on)											•		

(1) The instrument cluster **C10** cannot be overhauled. Therefore, in the event of a failure it is not possible to change the single warning light and a new complete cluster must be fitted.

(*) from November '99

CHECKING COMPONENTS

Rear fog guard electronic device (N25)



Check device: see **TEST A**

CHECK REAR FOG GUARD DEVICE (N25)	TEST A

TEST PROCEDURE	RESULT	CORRECTIVE ACTION
A1 CHECK VOLTAGE – Disconnect device **N25** and on the base check for "key- operated" 12V at pin 6 of **N25**	OK ▶	Carry out **step A2**
	OK ▶	Check fuse **F15** or **F17** in **G1**. If required, restore the wiring between **N25** and **G1**
A2 CHECK EARTH – Check for 0V at pin 4 of **N25**	OK ▶	Carry out **step A3**
	OK ▶	Restore the wiring between **N25** and earth **G148b**
A3 CHECK CONSENSUS/CONTROL SIGNALS – Check for the following signals on the pins of **N25**: • 0V at pin 9, engaging switch **B11**, • 12V at pin 3, engaging the fog lamps, • 12V at pin 1, engaging the low beams	OK ▶	Insert device **N25** on its base and continue with **step A4**
	OK ▶	Check the connection between **N25** and **B11**, connector G of **G1** and lever unit **B68**
A4 CHECK VOLTAGE – Switch on the rear fog lights with the low beams on or with the fog lights on, and check for 12V at pins 8 and 5 of **N25**	OK ▶	DEVICE **N25** IS WORKING PROPERLY. Check the connections with the other components
	OK ▶	CHANGE DEVICE **N25**

COURTESY LIGHTS AND TIMED LIGHTS

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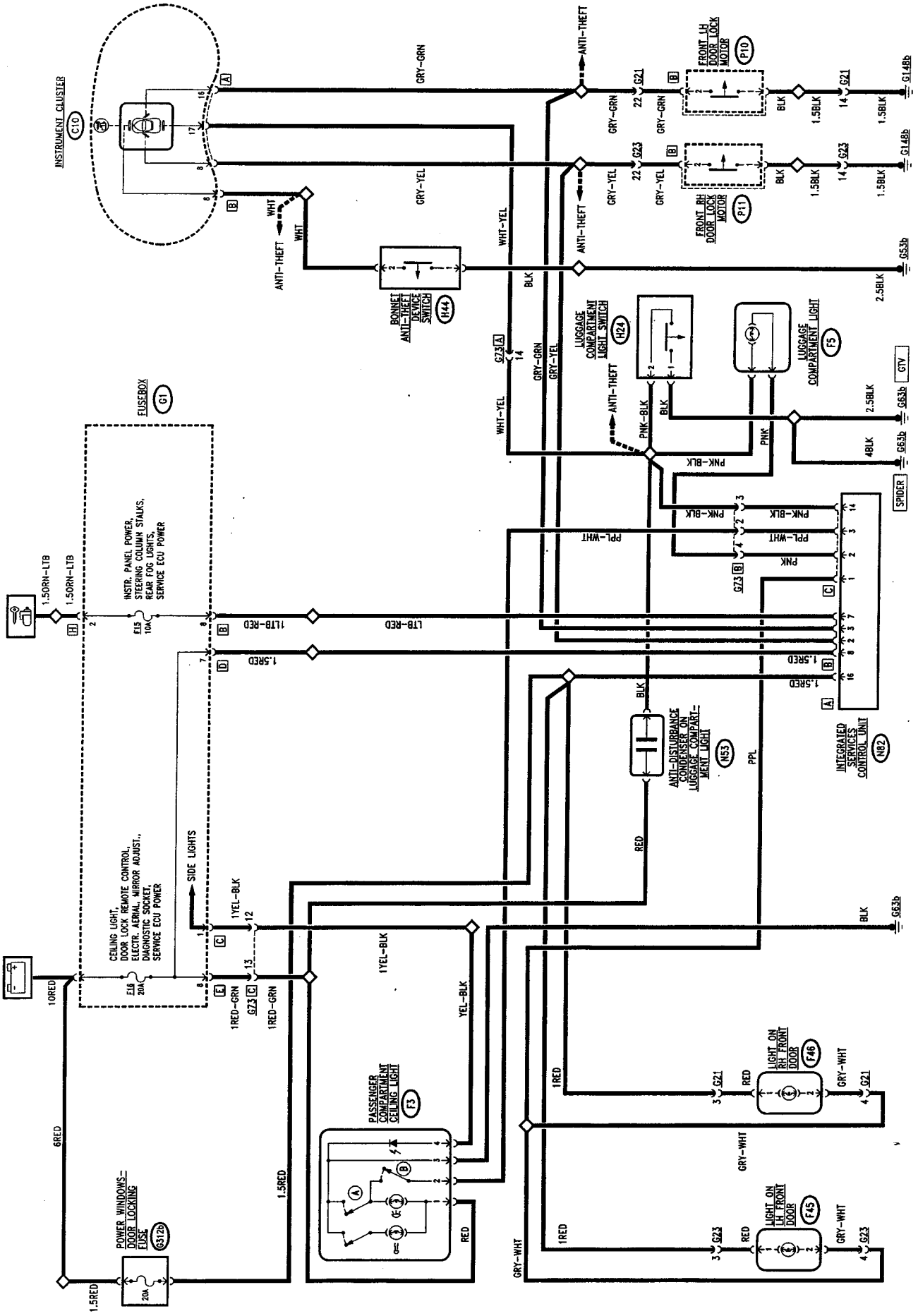
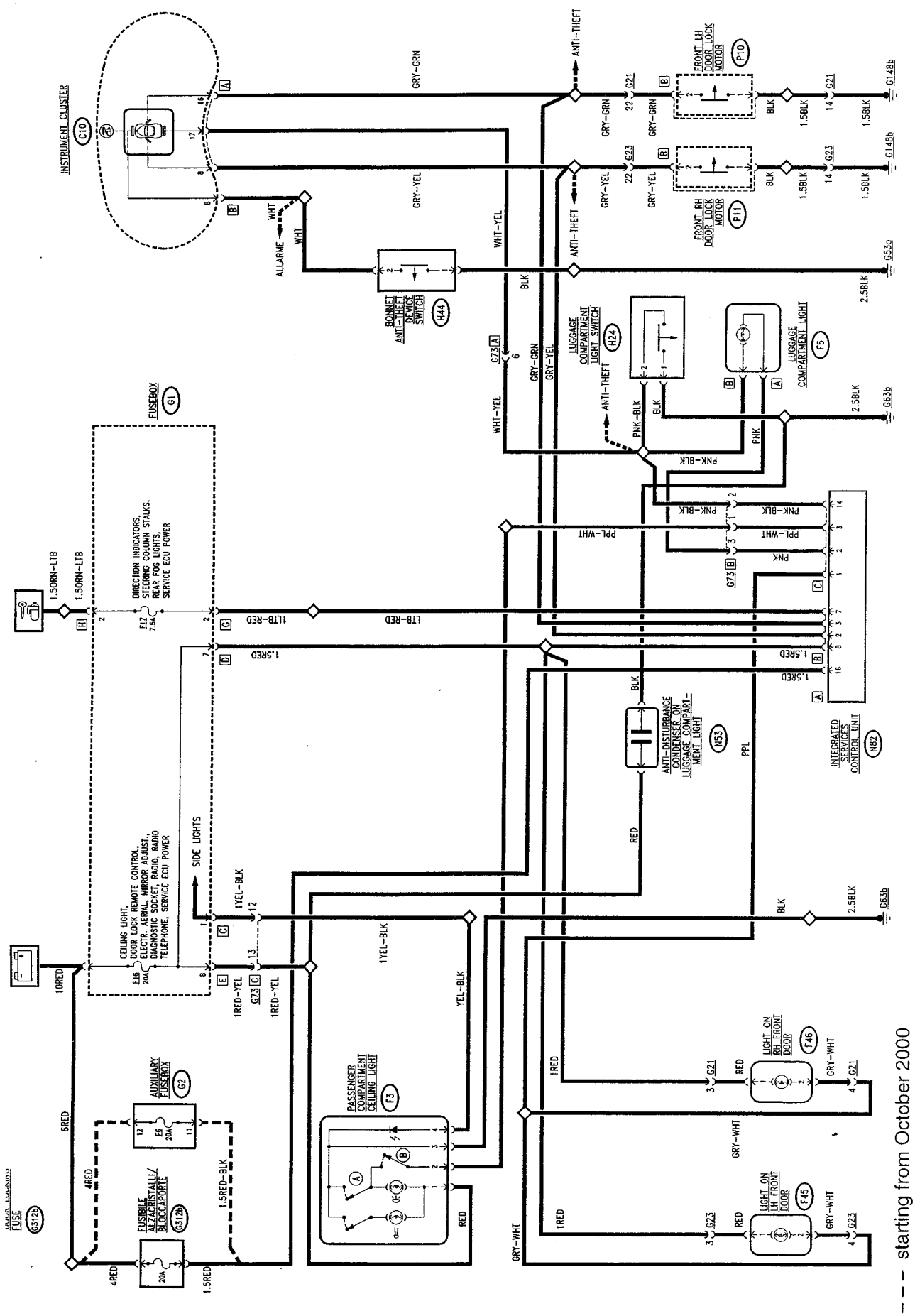
WIRING DIAGRAM



WIRING DIAGRAM (from November '99)



GENERAL DESCRIPTION

Roof lights and timed lights

The numerous lighting points provided offer good lighting in the passenger compartment and/or other specific points under all conditions.
The front roof lamp **F3** in the centre above the windscreen, and lights **F45** and **F46** in the lower part of the doors, are timed: they are turned on when one of the two doors is opened, and when the doors are closed again they turn off after and few moments, according to a logic determined by the integrated services electronic control unit **N82**.

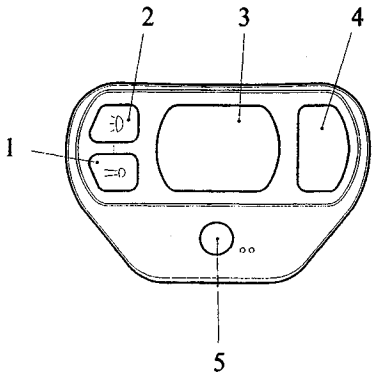
Roof lamp timing logic

When the doors are opened all the lights are operated and timed according to the following logic:

- timing for 10 SECONDS from when the door is closed again; at all events, timing is stopped when the key is turned to MAR: this makes it possible to get into the car and engage the key;
- timing for 2 MINUTES if the door stays open: this avoids draining the battery if the door is left open.

The front roof lamp may also be turned on by hand using the switch.
There is also a spot light incorporated in the front roof lamp unit which can be used for example for reading without disturbing the driver.

NOTE: The roof lamp unit is different for versions with alarm system. However, there are no changes as far as this description is concerned.



1 - spot light switch
2 - roof lamp switch
3 - roof lamp
4 - spot light
5 - alarm I.R. receiver (See "Alarm system")

Boot light

When the boot is opened, the boot light is operated with 20 MINUTE timing: timing is however cut out when the boot is closed.

Doors open warning light

A display on the instrument cluster indicates the opening of the doors, bonnet and boot.

FUNCTIONAL DESCRIPTION

Roof lamps and timed lights

The passenger compartment light and spot light **F3** receive a direct supply through fuse **F16** of fusebox **G1**: this makes it possible to turn on the reading light or the roof lamp using switch **A**; with switch **B** closed, the roof lamp is turned on automatically when the doors are opened: the timing signal is generated by the integrated services electronic control unit **N82** - pin C3.
Ceiling lights **F45** and **F46** are directly powered via individual fuse **G312b** (from November '99 from fuse **F16** of **G1**) and they are only turned on by the timing signal of the control unit **N82** - pin C1.
The boot light **F5** is supplied by **N82** - from pin C2 - at 12V and it is turned on when the boot is opened and switch **H24** sends an earth signal, pin C14.
Next to the roof light **F5** there is a radio anti-disturbance condenser **N53** (for further details see "Radio system").

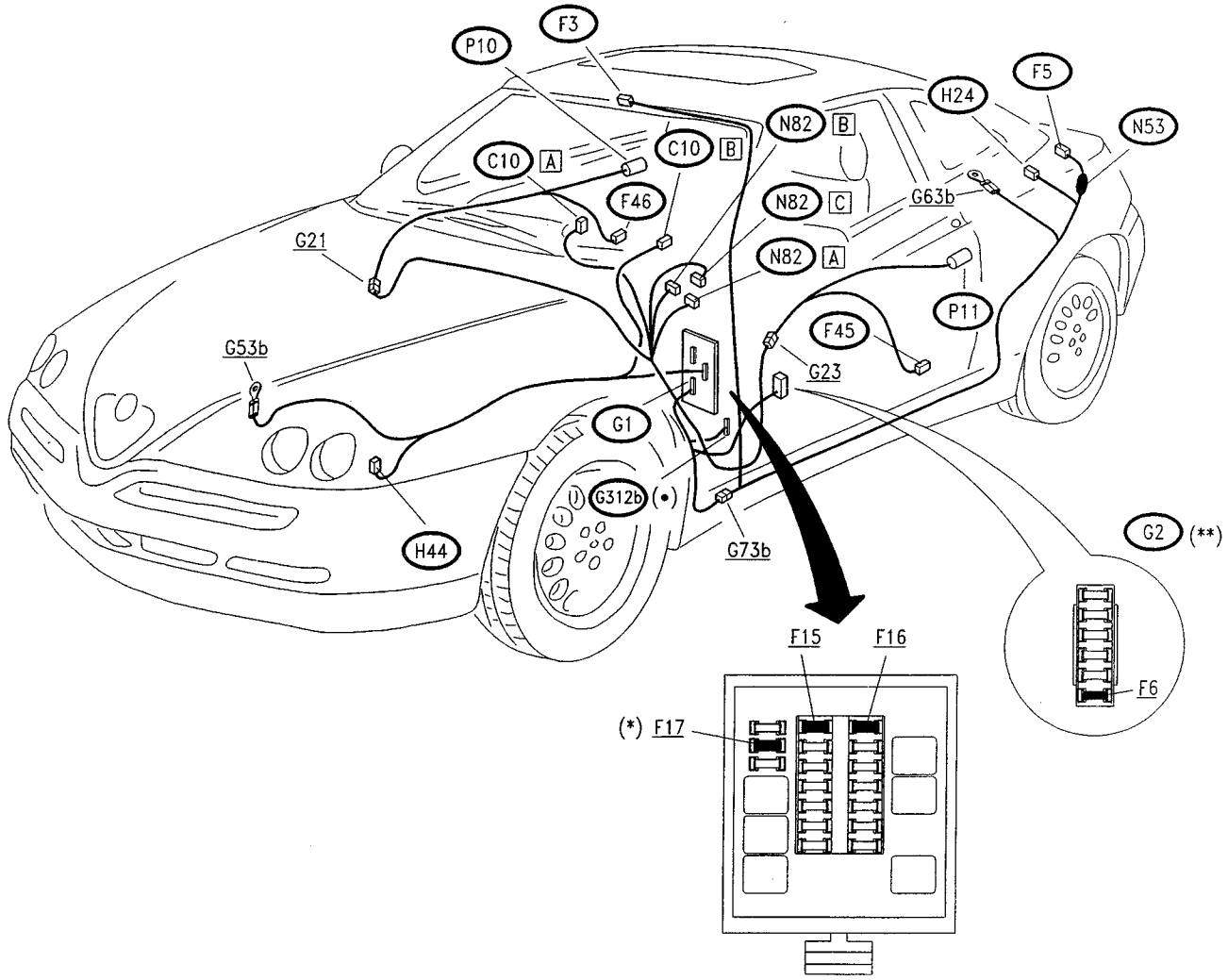
Doors open warning light

The door locking devices **P10** and **P11**, on each door in correspondence with the lock, also contain a microswitch which closes when the door is opened, thereby sending an earth signal to the instrument cluster **C10**, turning on the corresponding led.

Similarly, switch **H24** (on the telescopic boot prop) closes when the boot is open, sending an earth signal to the instrument cluster **C10**, turning on the corresponding led.

Lastly, switch **H44** also sends an earth signal when the bonnet is open turning on the led on the cluster **C10**.

LOCATION OF COMPONENTS



(*) from November '99
(**) from October 2000
(•) Yellow fuse holder

FAULT-FINDING TABLE

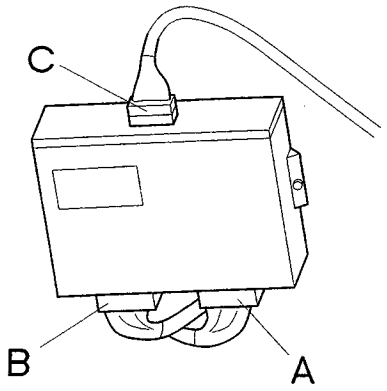
Fault	Component to be checked													
	F15	F17 (*)	F16	F3	G312b G2	F45	F46	F5	H24	N82	C10 (1)	H44	P10	P11
Passenger compartment roof lamp, under all circumstances			•	•										
Passenger compartment light, timed	•	•			•					•				
RH door light			•				•							
LH door light			•			•								
Boot light			•					•	•					
All timed lights			•		•					•				
RH door open indicator led											•		•	
LH door open indicator led											•			•
Bonnet open indicator led											•	•		
Boot open indicator led									•		•			

(1) The instrument cluster **C10** cannot be overhauled. Therefore, in the event of a fault, single leds or the electronic timing device cannot be replaced and a new complete cluster must be installed.

(*) from November '99

CHECK COMPONENTS

Integrated services control unit (N82)



Check timing **test A**

CHECK SERVICES CONTROL UNIT (N82) - LIGHTS TIMING FUNCTION	TEST A

TEST PROCEDURE	RESULT	CORRECTIVE ACTION
A1 CHECK VOLTAGE – Check for 12V at pin A16 and B8 of **N82**	OK ▶	Carry out **step A2**
	~~OK~~ ▶	Check individual fuse **G312b** and fuse **F16** in **G1**
A2 CHECK VOLTAGE – With the key at MARCIA, check for 12V at pin B7 of **N82**	OK ▶	Carry out **step A3**
	~~OK~~ ▶	Check fuse **F15** or **F17** of **G1**
A3 CHECK ROOF LAMP TIMING SIGNAL – Open a door and for 15 seconds check for an earth signal from pins C1 and C3 of **N82**	OK ▶	Carry out **step A4**
	~~OK~~ ▶	Carry out **step A5**
A4 CHECK BOOT TIMING SIGNAL – Open the boot and check for a 12V signal from pin C2 of **N82** until the boot is closed	OK ▶	The control unit **N82** is working normally. Check the connections with other components
	~~OK~~ ▶	Restore the wiring between **N82** and lamp **F5** and switch **H24**
A5 CHECK DOOR OPEN SIGNAL – Open a door and check for an earth signal at pin B2 or B3 of **N82**	OK ▶	Replace the control unit **N82**
	~~OK~~ ▶	Restore the wiring between **N82** and the switches on the doors **P10** and **P11**

DIRECTION INDICATORS AND HAZARD WARNING LIGHTS

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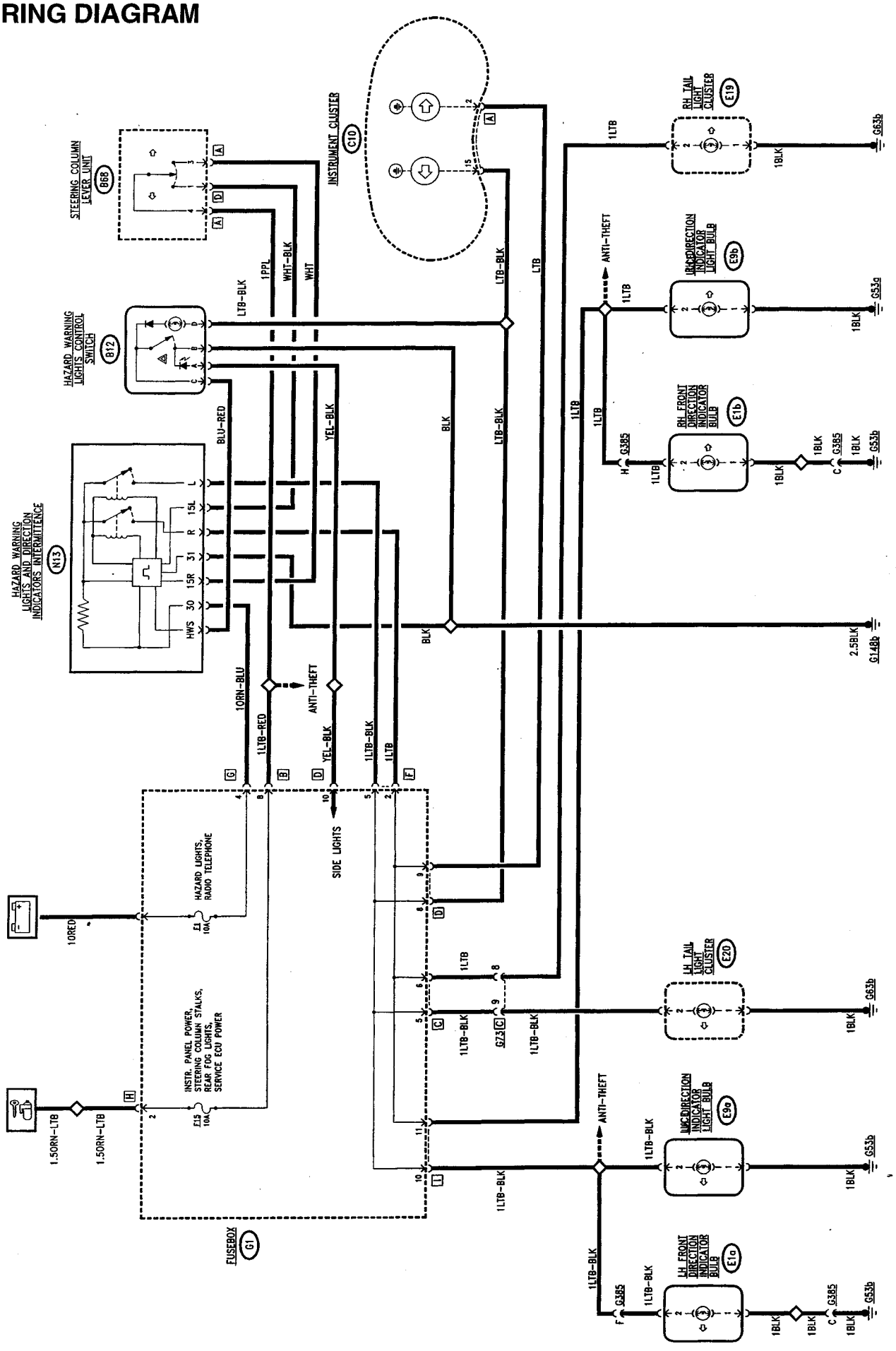
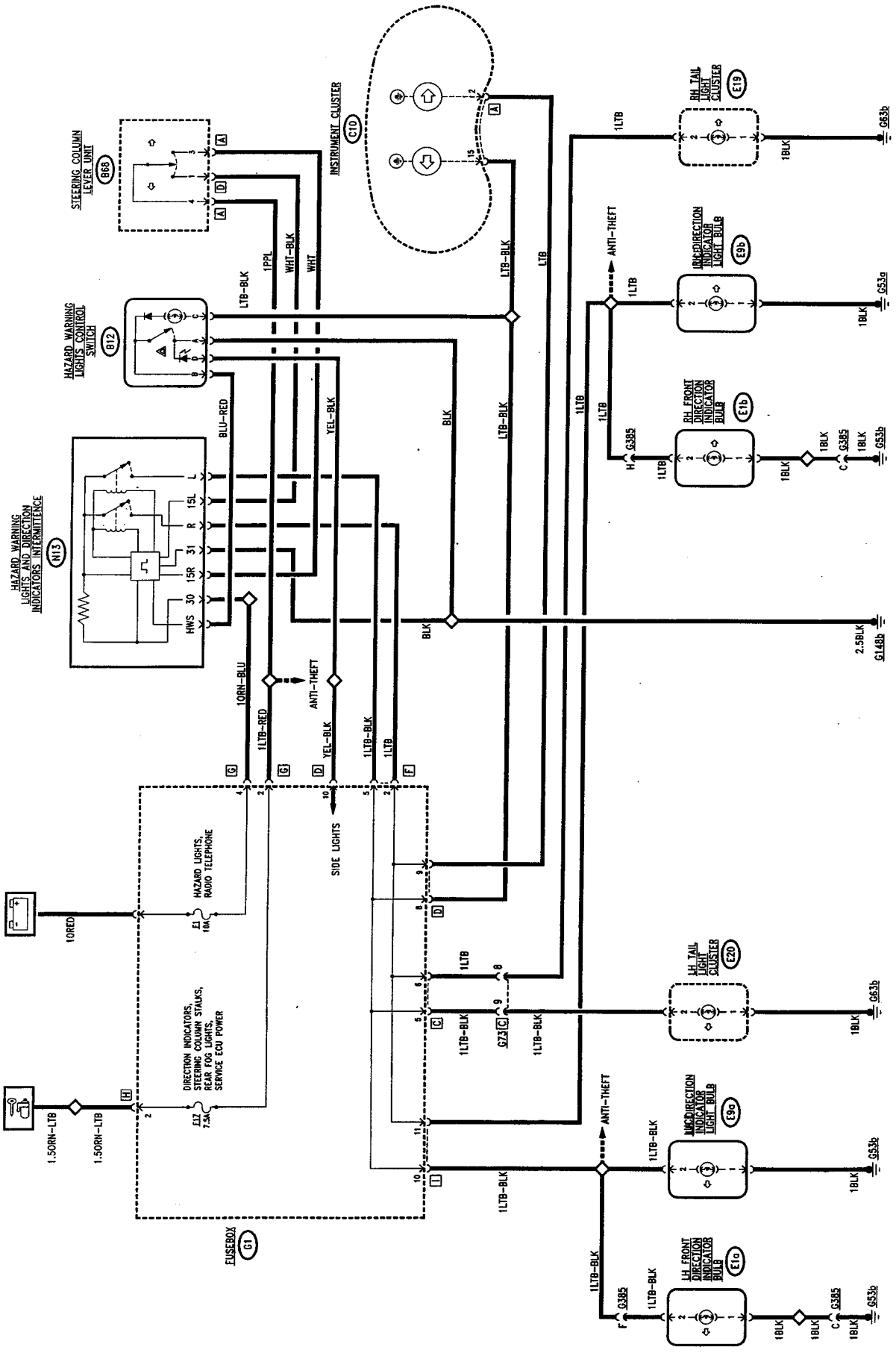
WIRING DIAGRAM



WIRING DIAGRAM (from November '99)



GENERAL DESCRIPTION

The intermittent direction indicators and hazard warning lights delineate the vehicle clearance.

The right or left direction indicators are turned on raising or lowering the lever on the steering column lever unit; the hazard warning lights (right and left indicators activated simultaneously) are switched on from the switch on the centre console.
The direction indicators operate when the ignition key is engaged, for the obvious safety reasons, they are supplied directly by the battery.
Two intermittent warning lights on the instrument cluster flash while the right and left indicators are operating. The hazard warning light switch indicates that these are operating by illuminating when they are turned on.

The circuit of the direction indicators is protected by a special fuse of fusebox **G1** while another fuse protects the circuit for the hazard warning lights.

FUNCTIONAL DESCRIPTION

The circuit is controlled by the hazard warning light and direction indicator flasher **N13** to be found next to the fusebox.

The flasher, earthed at pin 31, is supplied at pin 30 directly from the battery via the line of fuse **F1** of fusebox **G1**.
Pins 15R and 15L receive the signals (12V) from the lever unit **B68** when the line protected by fuse **F15** (**F17** from November '99) of **G1** is "key-operated" for turning on the right indicator (pin 15R) and the left indicator (pin 15L).

Pin HWS receives a signal (earth) when the hazard warning light switch **C16** is pressed.

Pins R and L send the intermittent supply signals for all the indicators: from pin R for those on the right, from pin L for those on the left, according to the following logic:

– only pin R (RH) if the signal reaches pin 15R

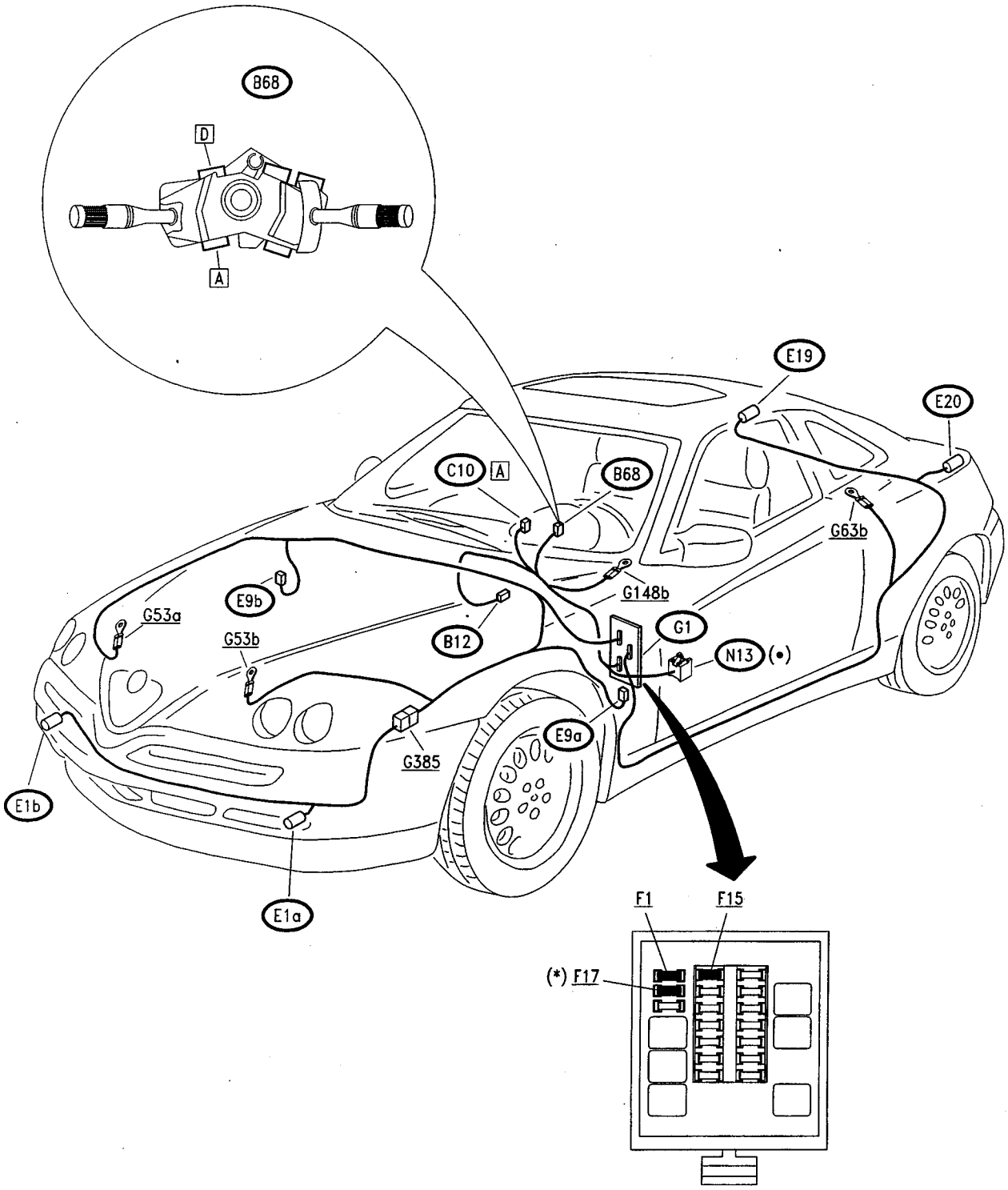
– only pin L (LH) if the signal reaches pin 15L

– both pins R and L if the signal reaches pin HWS.

This way operating the stalk of the lever unit **B68** turns on the righthand indicators (**E1b, E9b** and **E19**) or the left ones (**E1a, E9a** and **E20**) and simultaneously the corresponding warning light on the instrument cluster **C10** is turned on.

When switch **B12** is pressed, the right and left direction indicators are supplied contemporaneously; also the special light is supplied which lights up when the hazard warning lights are switched on. A led illuminates the ideogram of the switch when the side lights are on.

LOCATION OF COMPONENTS



(*) from November '99
(•) Black base

FAULTFINDING TABLE

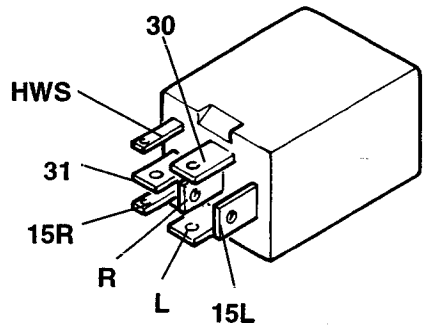
Failure	Component to be checked												
	F1	F15	F17 (*)	E1b	E1a	E9a	E9b	E19	E20	N13	B68	B12	C10 (1)
All the direction indicators	•	•	•							•	•		
Hazard warning lights	•									•		•	
All the RH direction indicators										•	•		
All the LH direction indicators										•	•		
RH front light				•									
RH side light							•						
RH rear light								•					
LH front light					•								
LH side light						•							
LH rear light									•				
RH indicator warning light													•
LH indicator warning light													•
Hazard warning light switch not illuminated with lights on												•	

(1) The instrument cluster **C10** cannot be repaired. Therefore in the event of a failure it is not possible to change the single warning light and a new complete cluster must be fitted.

(*) From November '99

CHECKING COMPONENTS

Hazard warning light and indicator flasher (N13)



Checking the device: see **TEST A**

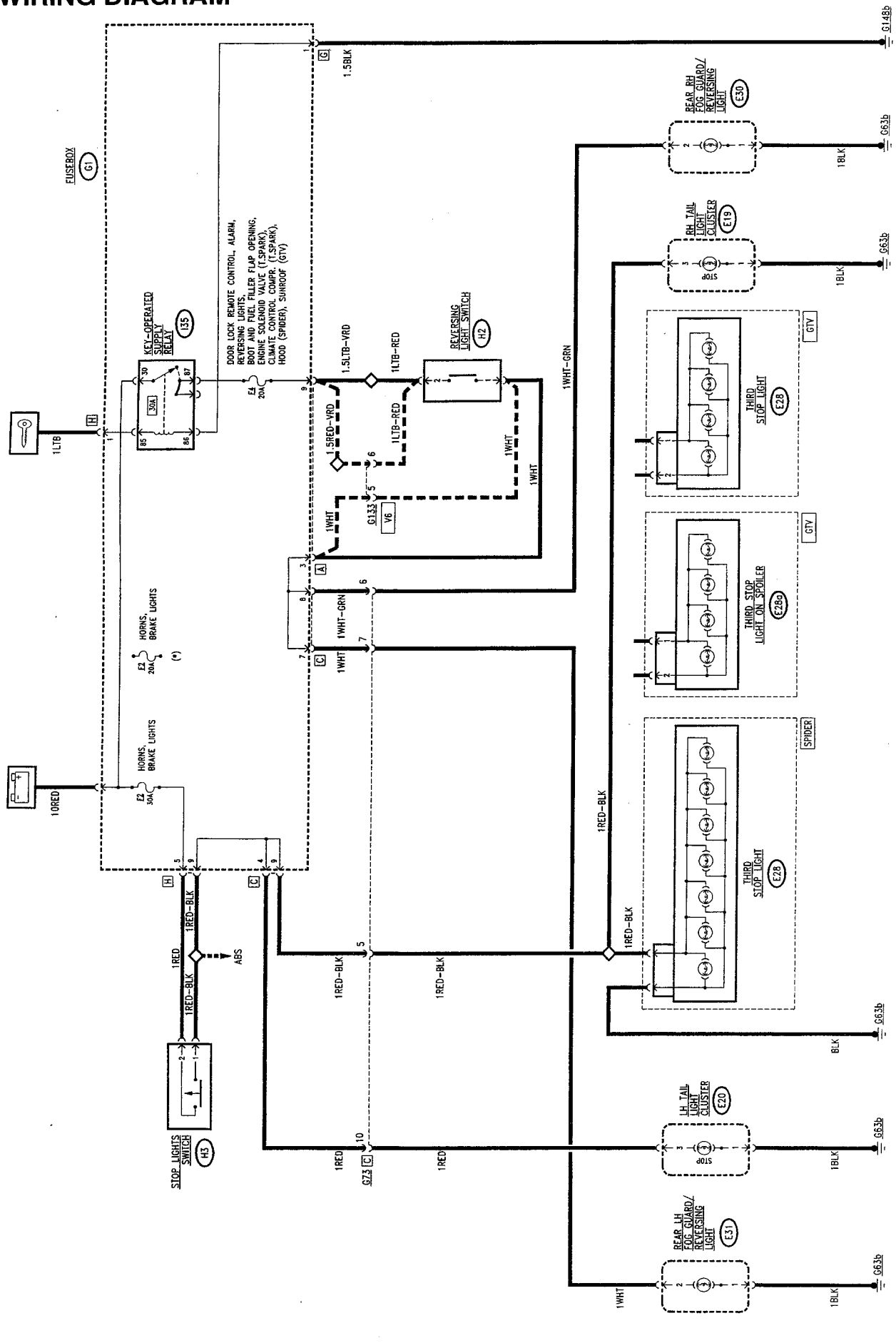
HAZARD WARNING LIGHT AND INDICATOR FLASHER (N13)	TEST A

TEST PROCEDURE	RESULT	CORRECTIVE ACTION
A1 CHECK VOLTAGE – Disconnect the flasher **N13** and on the base check for 12V at pin 30 of **N13**	OK ▶	Carry out **step A2**
	NO ▶	Check fuse **F1** from fusebox **G1**. If necessary replace connection between **N13** and **G1**
A2 CHECK EARTH – Check for 0 V at pin 31 of **N13**	OK ▶	Carry out **step A3**
	NO ▶	Restore the wiring between **N13** and earth **G148b**
A3 CHECK INTERMITTENT VOLTAGE – With the ignition key turned, operate the RH indicator and check for 12 V at pin 15R of **N13**; operate the LH indicator in the same way, check pin 15L of **N13**	OK ▶	Carry out **step A4**
	NO ▶	Restore the wiring between **N13** and lever unit **B68**, or replace the latter
A4 CHECK EARTH – Operate the hazard warning light switch and check for 0V at pin HWS of **N13**	OK ▶	Insert device **N13** on its base and continue with **step A5**
	NO ▶	Restore the wiring between **N13** and switch **B12**, or change the latter
A5 CHECK INTERMITTENT VOLTAGE – Operate the RH indicator and check for **intermittent** 12V at pin R of **N13**; do the same operating the LH indicator at pin L and operating the hazard warning lights at both pin R and pin L	OK ▶	DEVICE **N13** IS WORKING PROPERLY. Check the connections with the other components
	NO ▶	CHANGE DEVICE **N13**

STOP LIGHTS AND REVERSING LIGHTS

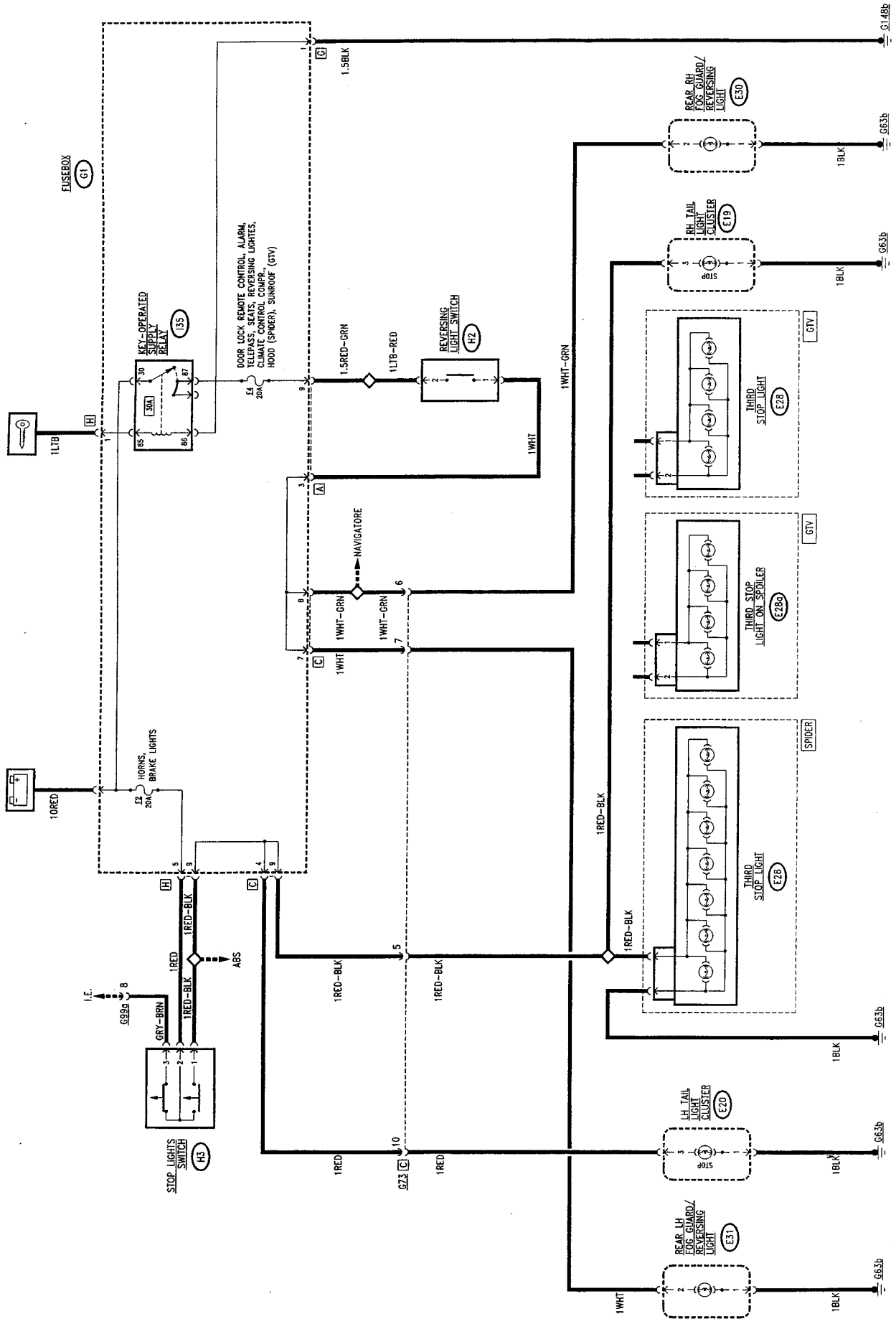
INDEX

WIRING DIAGRAM



— — — variance for all V6
(*) From November '99

WIRING DIAGRAM (starting from October 2000)



GENERAL DESCRIPTION

Stop lights

The car stop lights are operated each time the brake pedal is pressed; two of them are located at the rear in the side lights, one is located in the centre (the so-called "third stop" light.

IMPORTANT GTV ONLY: the third brake light is integrated in the rear spoiler (where fitted).

The lights are turned on automatically through the switch on the brake pedal: it is operated under all conditions, even with the ignition key off.
The circuit is protected by a special fuse.
The braking signal from the switch is also sent to the ABS system control unit which "recognizes" the situation and controls braking accordingly (see "ABS").
The "pedal relesed signal" is sent to engine central unit (EURO 3 versions only).

Reversing lights

The car is fitted with two reversing lights located in the right and left tail lights.
When reversing gear is selected, they are turned on automatically through a special switch on the gearbox.
The circuit is protected by a special fuse.
The reversing light is operated with the ignition key engaged, regardless of the other lights.

FUNCTIONAL DESCRIPTION

Stop lights

The stop lights circuit is supplied directly by the battery through fuse **F2** of fusebox **G1**.
The stop lights switch **H3** comprises a contact which closes when the brake pedal is pressed, through which the stop lights are supplied in the rear side lights **E19** (right), **E20** (left) and centre **E28**; this is different in shape for the Spider and GTV.

GTV only: with rear spoiler, connector **E28** located under the rear window shelf is not used. Connector **E28a** is connected to the light built into the spoiler.

Reversing lights

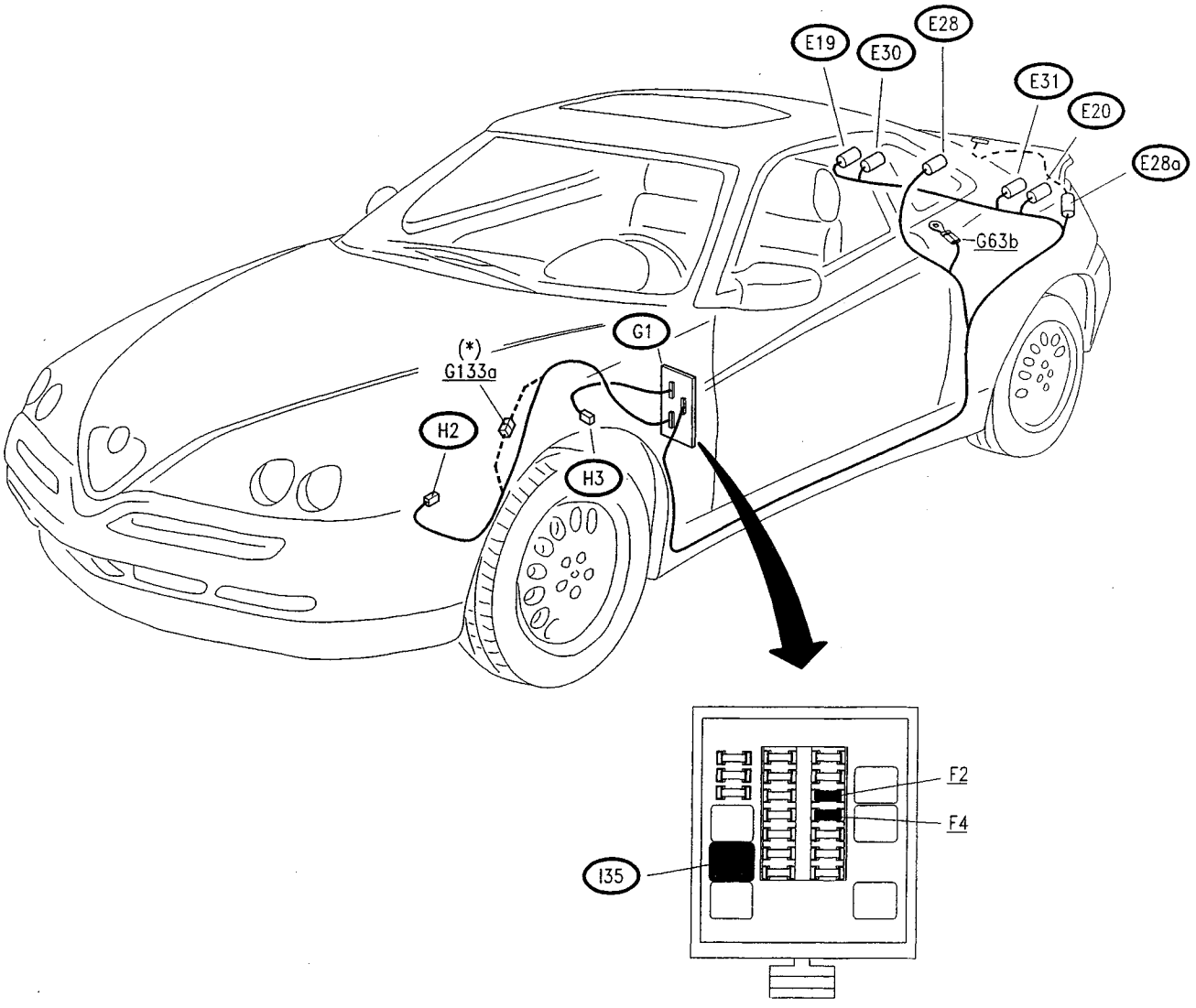
The reversing light circuit is ignition switch powered via relay **I35** and fuse **F4** in fusebox **G1**.

When reverse gear is engaged switch **H2** supplies the right reversing light **E30** and the left one **E31**.

FAULTFINDING TABLE

Failure	Component to be checked									
	F2	E20	E19	E28	E28a	H3	F4	E30	E31	H2
All the stop lights	•					•				
RH stop light			•							
LH stop light		•								
Third stop light				•						
Both reversing lights							•			•
RH reversing light								•		
LH reversing light									•	

LOCATION OF COMPONENTS



(*) up to September 2000 variant for all V6 versions
— — variant for GTV with rear spoiler

HORNS, CIGAR LIGHTER/ CURRENT SOCKET

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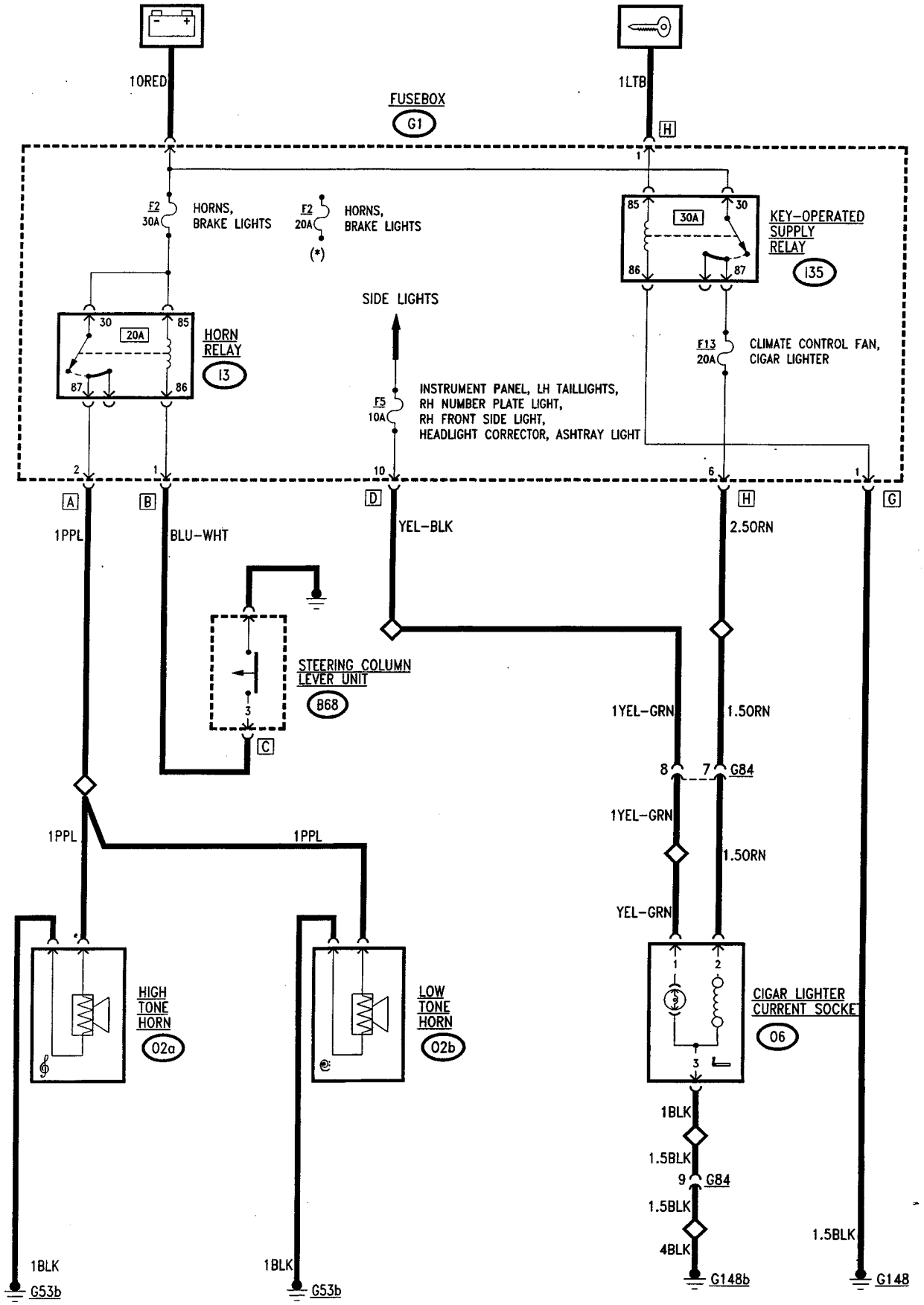
WIRING DIAGRAM



(*) from November '99

GENERAL DESCRIPTION

Horns

The car horn system is formed of two horns with different tones: one high tone and the other low tone: they are both activated simultaneously.

The horns are operated pressing one of the two switches on the spokes at the sides of the Air Bag cushion.

For the obvious safety reasons the horns can be activated at all times even if the ignition key is not engaged.

Cigar lighter/current socket

The car offers the occupants an ashtray in the centre console; next to it there is the "cigar lighter" resistance, which is turned on pressing it into its socket: after a few seconds it pops out automatically, ready for use. This standard socket may also be used for connecting other instruments or devices (provided that they work at 12V).

N.B.: The socket is provided with a thermal protection device: in the event of connections with devices that absorb a high amount of energy, this connection may "trip".

The socket is ignition switch powered to prevent accidentally forgotten loads from deploying the battery.

FUNCTIONAL DESCRIPTION

Horns

The horns relay switch **I3**, located in fusebox **G1**, is supplied by the battery through fuse **F2**, also in **G1**.

The coil of relay switch **I3** is energized with an earth signal leading from the horn control switch which is connected to the lever unit **B68**. This connection is made in a special way due to the presence of the Air Bag: see "Checking Components" in this section).

This way the supply is sent by the relay switch to the horns **O2**, which are already connected to earth.

Cigar lighter/current socket

The cigar light resistance socket **O6** is ignition switch powered via relay **I35** in fusebox **G1** which powers the cigar lighter **O6** via the line protected by fuse **F13**.

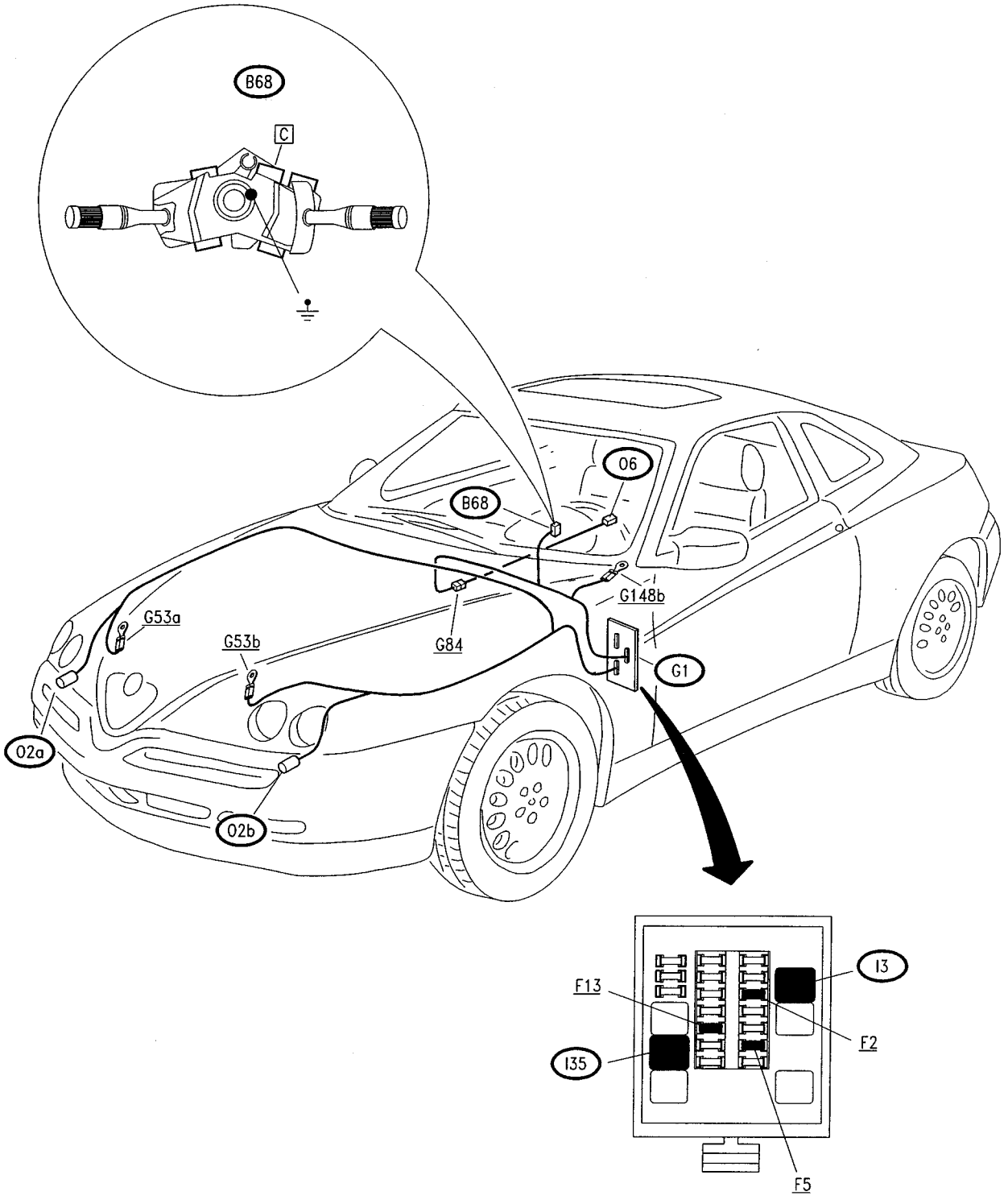
The cigar lighter light **O6** is switched on with the side/taillights (fuse **F5** line).

FAULTFINDING TABLE

Failure	Component to be checked					
	F13	F2	O2	I3	B68	O6 (1)
Cigar lighter - current socket						•
Cigar lighter light						•
Horns failing to work		•	•	•	•	
Horns working badly (out of tune)			•			

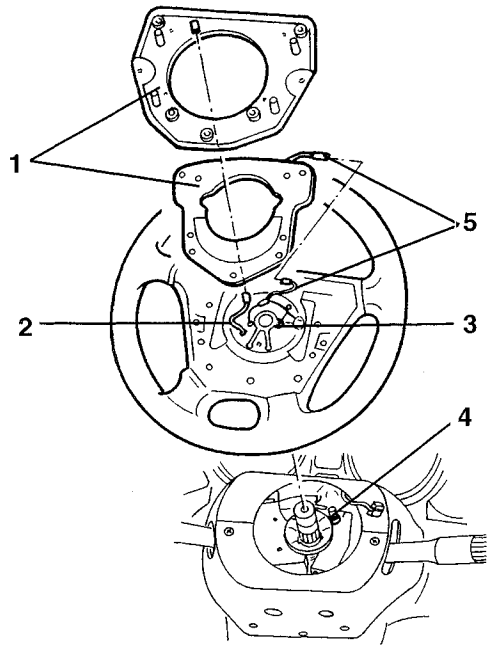
(1) In the event of the cutting in of the current socket **thermal protection device,** this can be replaced at least 5 times without the need to change the complete socket

LOCATION OF COMPONENTS



CHECKING COMPONENTS

Horns control (in B68)

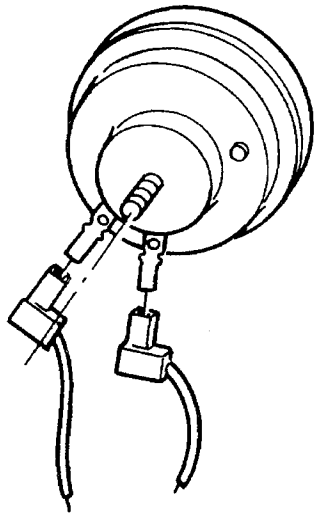


The horn control device comprises two plates (separated by springs: pressing the buttons at the sides of the airbag cushion closes the electrical contact between the plates: the upper plate is connected by the BRN cable (2) and the contact of the clock spring cable (3) with the pushbutton (4) of the steering column lever unit.

The lower plate is connected to earth on the steering column via BLK cable (5).

WARNING: When working on the steering wheel fitted with Air Bag, particularly for removing the clock spring, carefully adhere to the instructions given in the corresponding section.

Horns O2



SPECIFICATIONS	
Nominal voltage rating	12V
Current absorbed	<10A (the pair)
Total horn sound level	106 ÷ 118 dB a 2m
Sound level in band 1800 ÷ 3550 Hz	≥ 105 dB a 2m
Horn sound level L-H	≥ 108 dB a 2m
Fundamental frequency type H	480 ÷ 530 Hz
Fundamental frequency type L	380 ÷ 430 Hz

WINDSCREEN WIPER/WASHER

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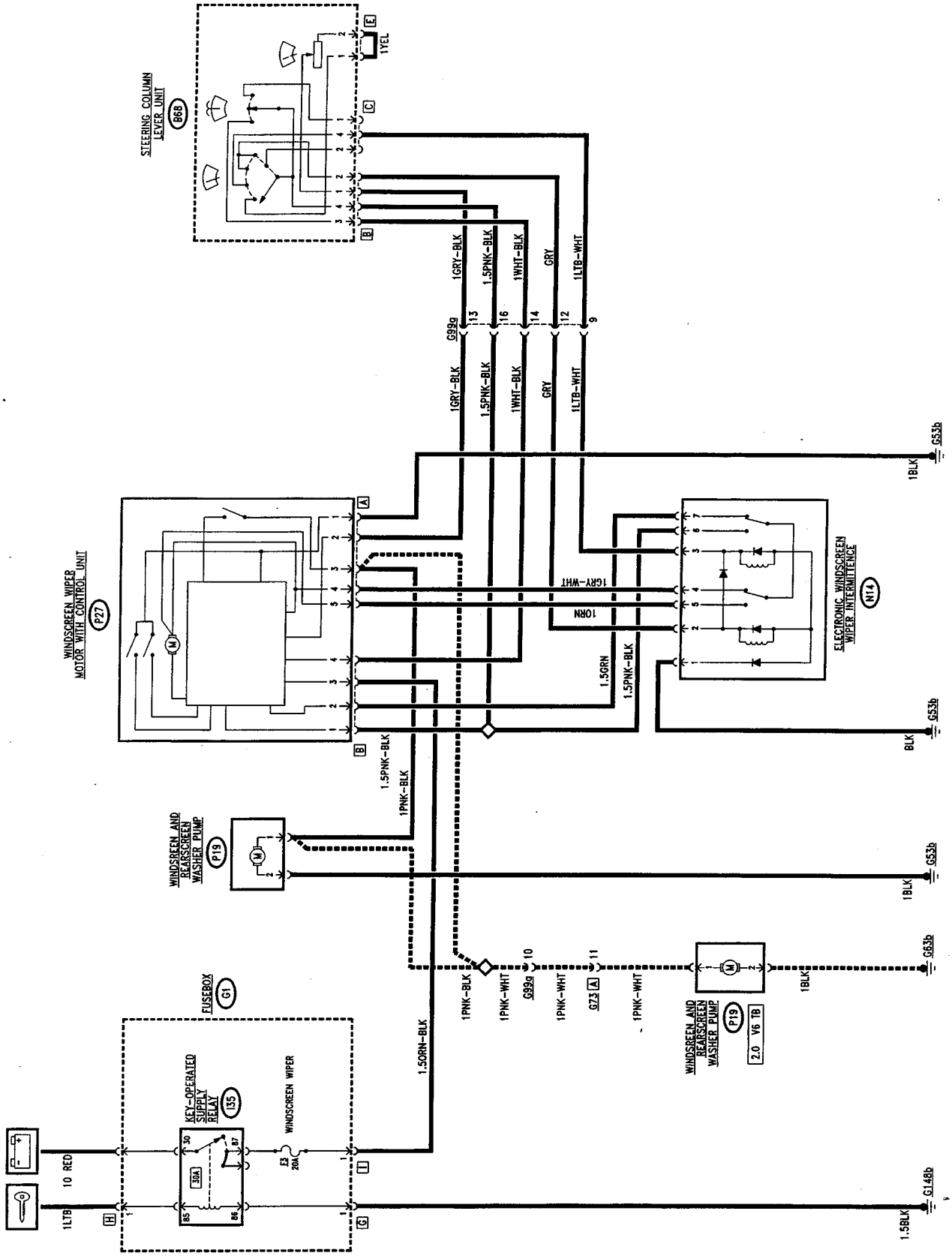
WIRING DIAGRAM



GENERAL DESCRIPTION

With the lever on the righthand side of the steering wheel it is possible to engage the different functions of the windscreen washer/wiper system.
The windscreen wiper device can work continuously and intermittently at different speeds: moving the lever downwards firstly operates intermittent operation, then continuous operation from the first speed, then at the second speed: these functions remain operation until the lever is pushed upwards again.
With the lever in the intermittent position, through the special ring switch it is possible to select the different lengths of the intermittent functions.
The windscreen washer is engaged slightly pulling the lever towards the steering wheel: this way the windscreen washer pump is operated for a few seconds or until the lever is released.

NOTE: operating the windscreen washer without detergent fluid in the reservoir can damage the pump.

The entire system is regulated by an electronic windscreen wiper device integrated in the wiper motor, with the help of another electronic device to be found near the fusebox; this controls the windscreen wiper motor and the windscreen washer pump.

FUNCTIONAL DESCRIPTION

The control unit in the windscreen wiper motor **P27** is supplied at pin B3 by key-operated voltage via fuse **F3** and relay **I35** of fusebox **G1**.
Pin A1 of **P27** is connected to earth.

The supply for operating the windscreen wiper with lever switch **B68** leads from **P27**, pin 81 and reaches pin 4 of connector B od **B68**; the same supply also reaches device **N14**, pin 6, while pin 1 of the same device is connected to earth.

The operating logic of the different functions is as follows:

- windscreen wiper at first speed: the contact at pin 4 of connector C of **B68** closes which sends the supply to pin 3 of **N14**; this "relays" the control from pin 4 to pin A4 of **P27** which operates the motor at first speed.
- windscreen wiper at second speed: the contact at pin 2 of connector B of **B68** closes which sends the supply to pin 2 of **N14**; this "relays" the control from pin 5 to pin A5 of **P27** which operates the second speed motor;
- intermittent wiping operation: the contact at pin 1 of connector B closes also through bridge E of **B68**: this signal differs depending on the position of the potentiometer, and determines the different intermittent speeds: this way the supply is sent to pin A2 of **P27** which operates the windscreen wiper intermittently;
- "end of stroke": the signal from pin B2 of **P27** at pin 7 of **N14** is the "motor stop" command: i.e. it informs that the motor has stopped, which is then activated for another moment to park the blades;
- windscreen washer: the contact closes at pin 3 of connector 8 of **B68** which sends a command to pin B4 of **P27**, which "relays" the supply for the motor **P19**, as well as briefly operating the windscreen wiper.

NOTE: The P19 motor is located in the luggage compartment for the 2.0 V6 TB version.

FAULTFINDING TABLE

Failure	Component to be checked				
	F3	P27	P19	N14	B68
Windscreen wiper (cont. speed)	•	•		•	•
Windscreen wiper (intermitt.speed)	•	•			•
Windscreen/rearscreen washer	•		•		•