ELECTRIC SYSTEM DIAGNOSIS

INDEX

VOLUME III

VOLUME III - SECTION II -

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

ALPHABETICAL INDEX

WARNING!

From chassis no._____ the 145 models are fitted with the "ALFA ROMEO CODE" system as a **standard** item: this is an **innovative electronic anti-theft protection system** which inhibits the operation of the engine management control unit (Petrol versions) or of the engine stop solenoid valve (TD version).

BEFORE PROCEEDING WITH ANY WORK ON THE ELECTRIC SYSTEM OF THE VEHICLE, IN PARTICULAR ON THE ENGINE CONTROL SYSTEMS, CAREFULLY READ THE SPECIAL SECTION: "ALFA ROMEO CODE".

POWER SUPPLY

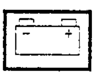
INDEX

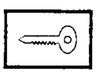
GENERAL DESCRIPTION

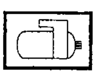
All the electric systems and devices are supplied by the battery **A1** at 12 V.
The lines through which the battery voltage is distributed to the various services are shown in the wiring diagrams corresponding to the various functions and systems.
This general diagram shows all the lines as they branch from the battery and from the branch terminal box **G56**, for further details, reference should be made to the specific diagrams.
Some circuits are supplied continuously, also when the vehicle is stopped and the key disengaged, as they are connected directly to the battery A1.
Other circuits are supplied turning the key in the ignition switch B1 to the different positions:

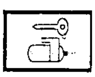
- inserting the key and turning it to the first position the key moves to "DRIVE" and supplies a number of circuits, which are in fact known as "key-operated";
- the second position "START" - supplies the starter motor, while disconnecting some other circuits (those that absorb more power) thereby ensuring the highest flow of current to the motor itself;
- removing the key and turning it in the opposite direction (and pressing the special button) the "PARK" position is engaged which supplies the sidelights also when the key has been removed.

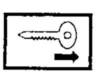
In the wiring diagrams these different types of supply are shown schematically by the following symbols:


– line always supplied


– line supplied with the ignition key at "DRIVE"


– line supplied with the ignition key at "START"


– line supplied with key engaged (in both the previous positions).


– line supplied with the ignition key at "PARK"

NOTE: this general wiring diagram makes it possible to easily locate the circuits supplied by the same line: this simplifies fault-finding in the case of problems involving more than one system.

NOTE: (Boxer and TD version) the terminal branch box G56 has been newly designed and is highly reliable and safe. The procedure for removing and connecting the single connectors in the terminal box is described at the end of this section.

The T.SPARK version has a branch terminal box with incorporated fuses (see following pages).

Protection and safety systems

The entire electric system of the 145 has been designed and made taking account of 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 possible causes of faults "at the source"
- **passive protection**, to minimise the effects of any faults.

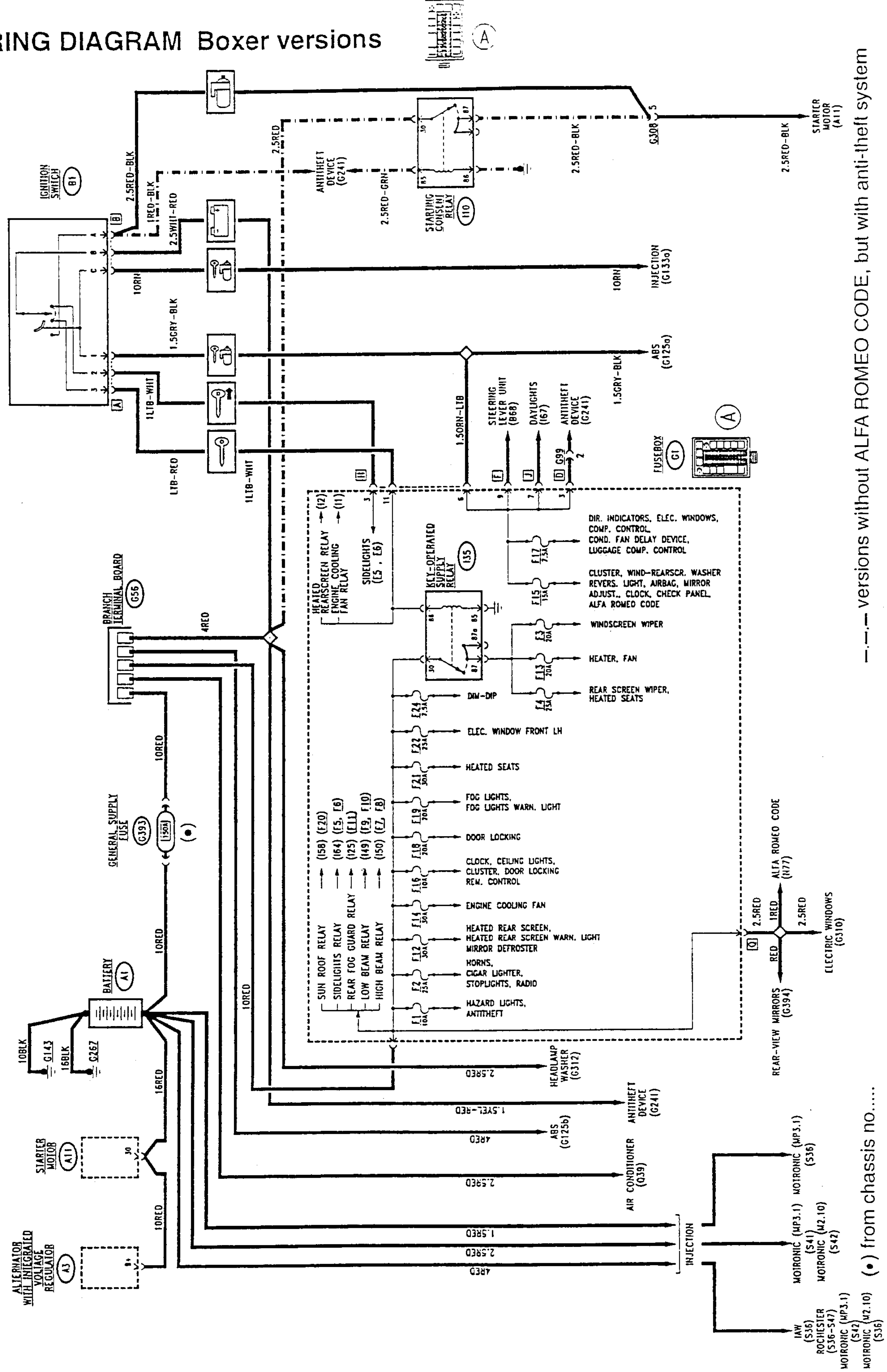
The first category involves attentive design of the wiring harnesses, positioning and fastening them accurately and carefully defining suitably shielded and protected routes.

For this reason the alternator and starter motor cables have been suitably modified, with the adoption of protective caps, etc.

Passive protections include all measures, which have always been adopted on cars, to reduce high fault currents (overload and short circuit).

All the fuses of the system have been sized according to the nominal absorption of the loads that can be operated contemporaneously, and in such a way as to ensure that they cut in in the event of short circuit.

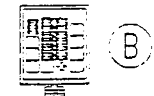
WIRING DIAGRAM Boxer versions

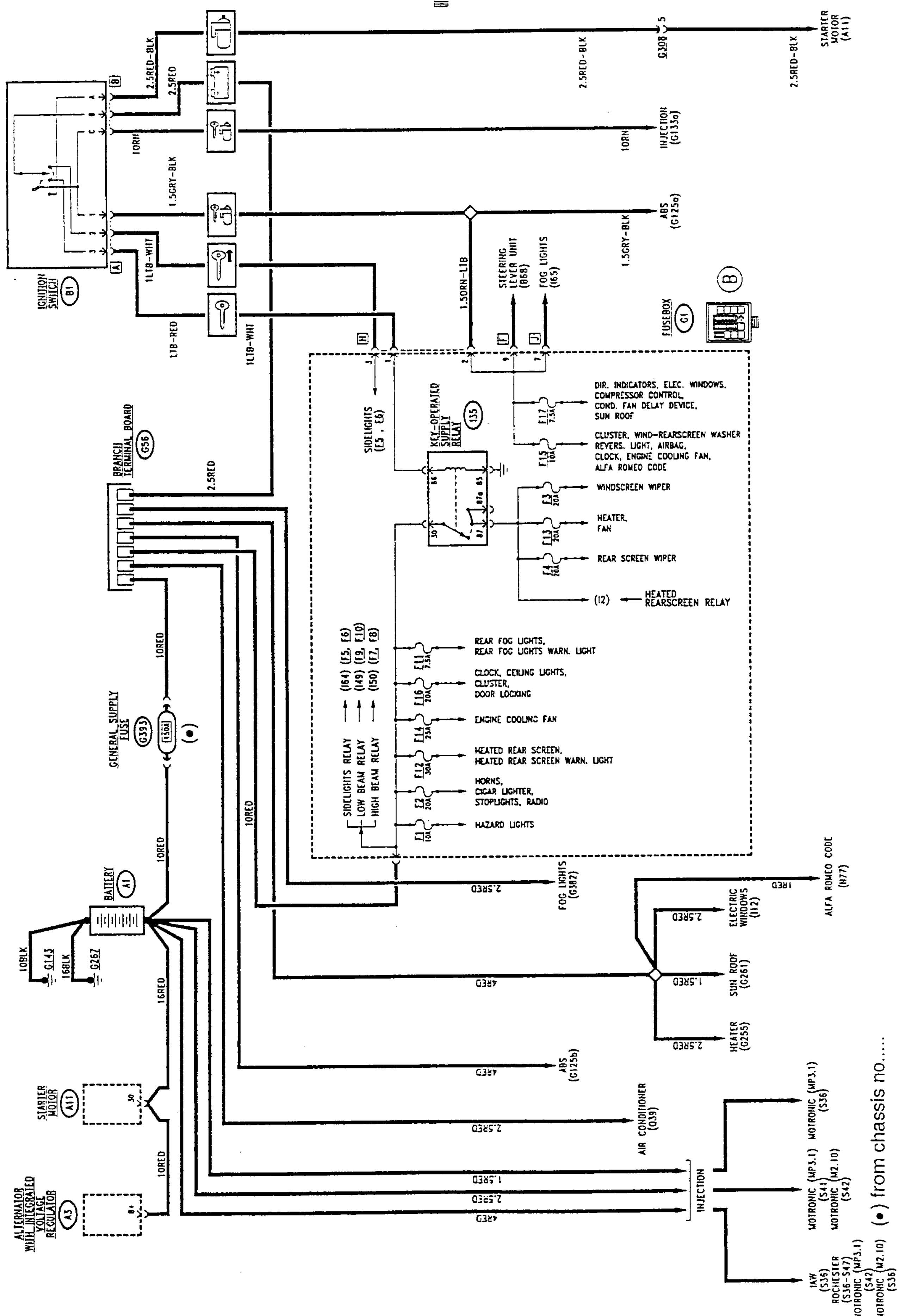


—·—·— versions without ALFA ROMEO CODE, but with anti-theft system

(•) from chassis no.....

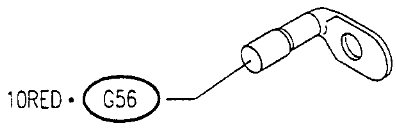
WIRING DIAGRAM Boxer versions



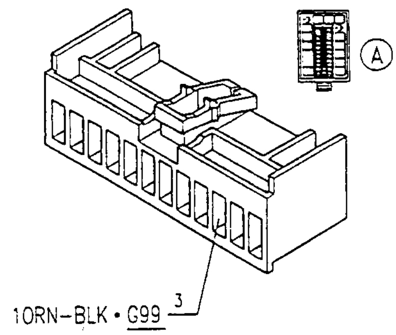


COMPONENTS AND CONNECTORS (cont.d)

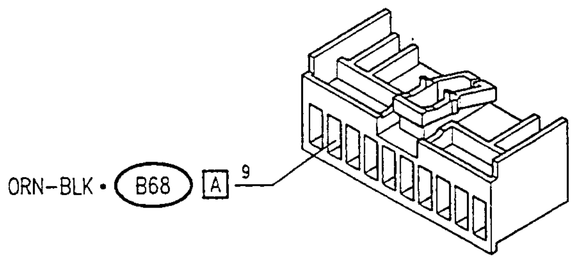
Fusebox G1



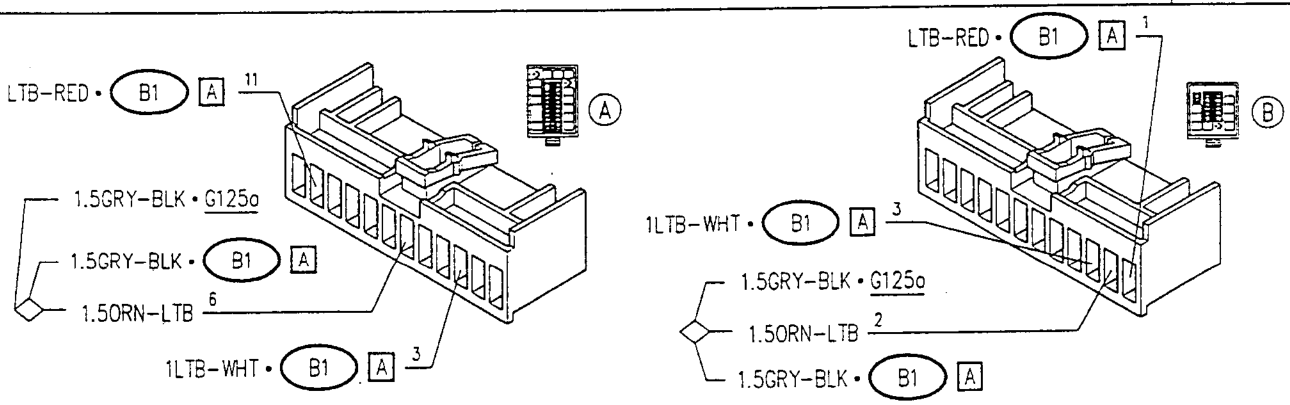
Fusebox G1 D



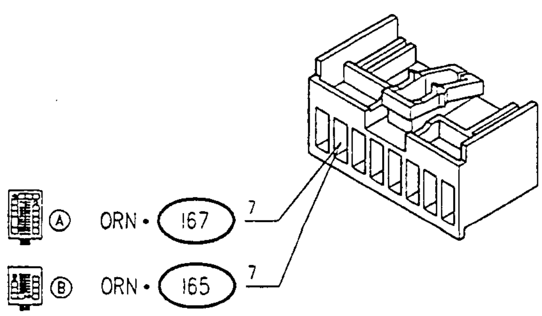
Fusebox G1 F



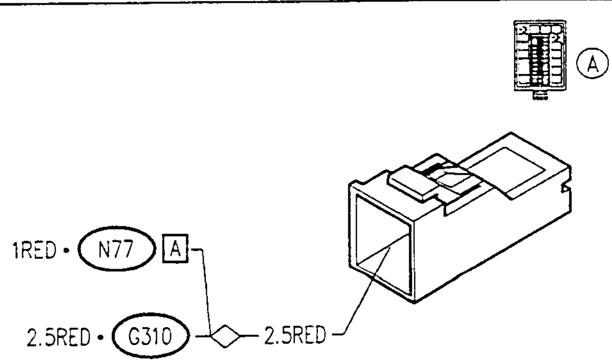
Fusebox G1 H



Fusebox G1 J

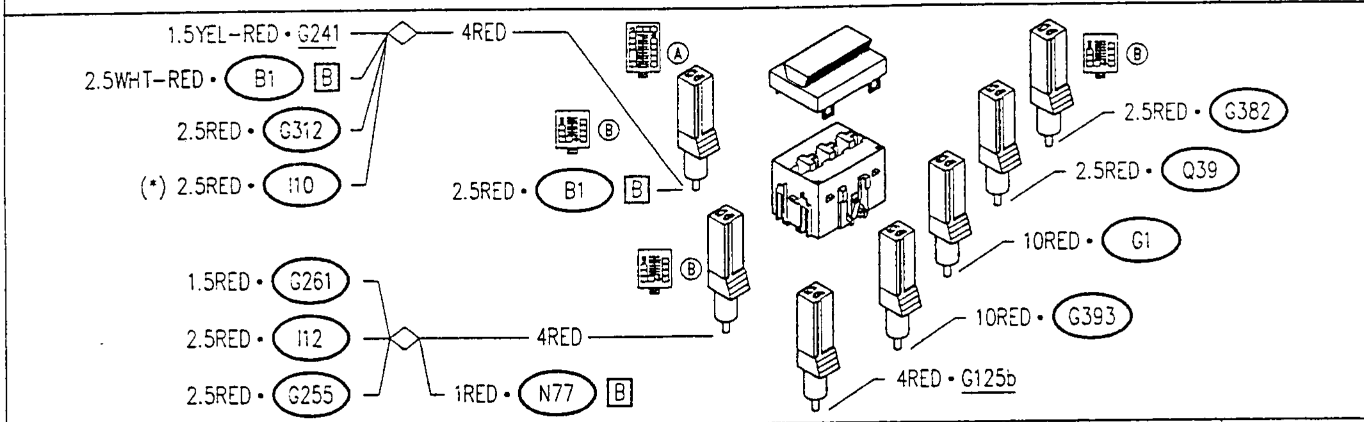


Fusebox G1 Q

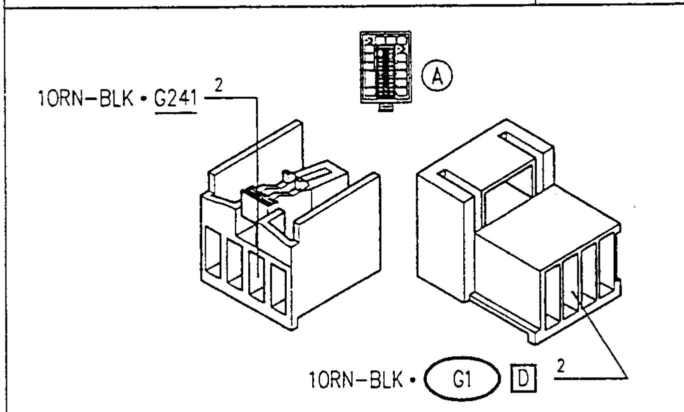


COMPONENTS AND CONNECTORS (cont.d)

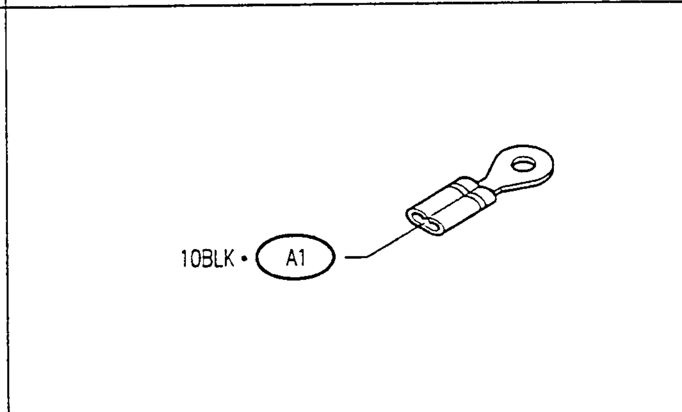
Branch terminal board — G56



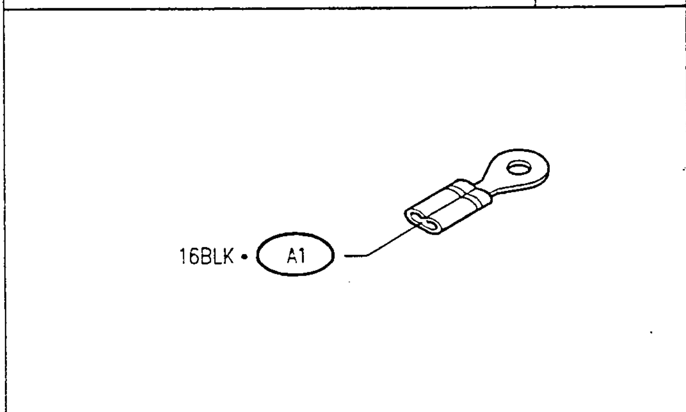
Dashboard/engine wiring connector — G99



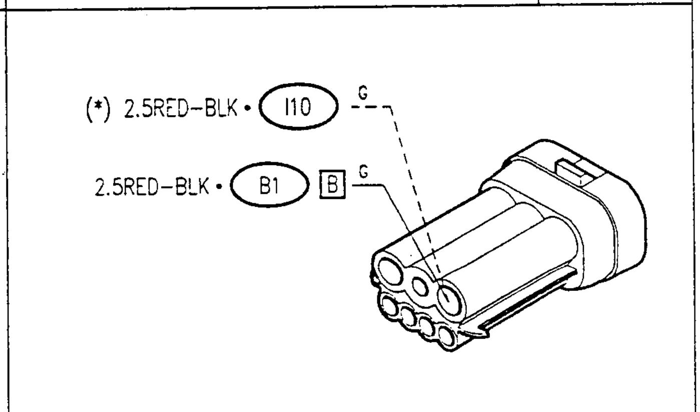
Services tray centre earth — G143



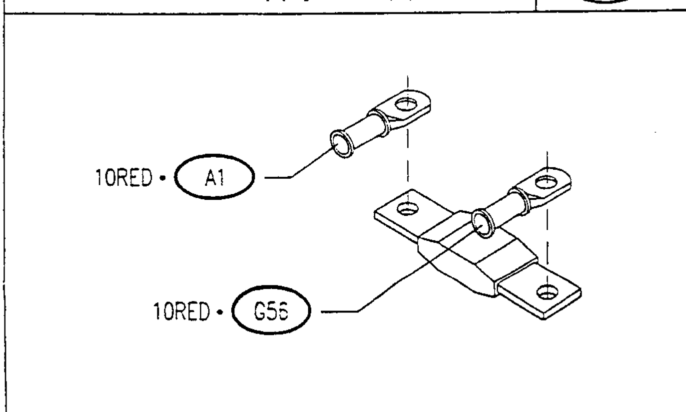
Earth on crankcase — G267



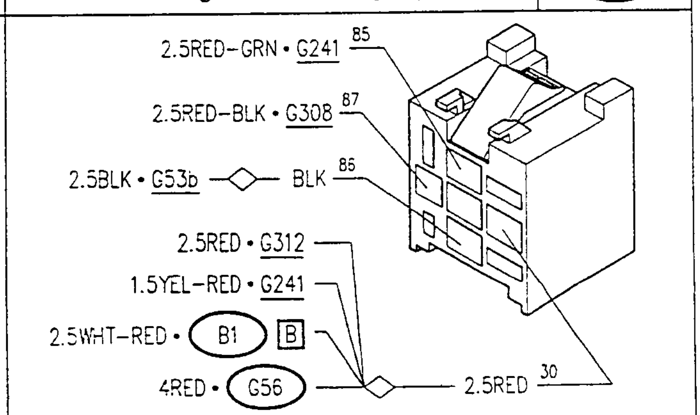
Engine sensors connector — G308



General supply fuse (•) — G393

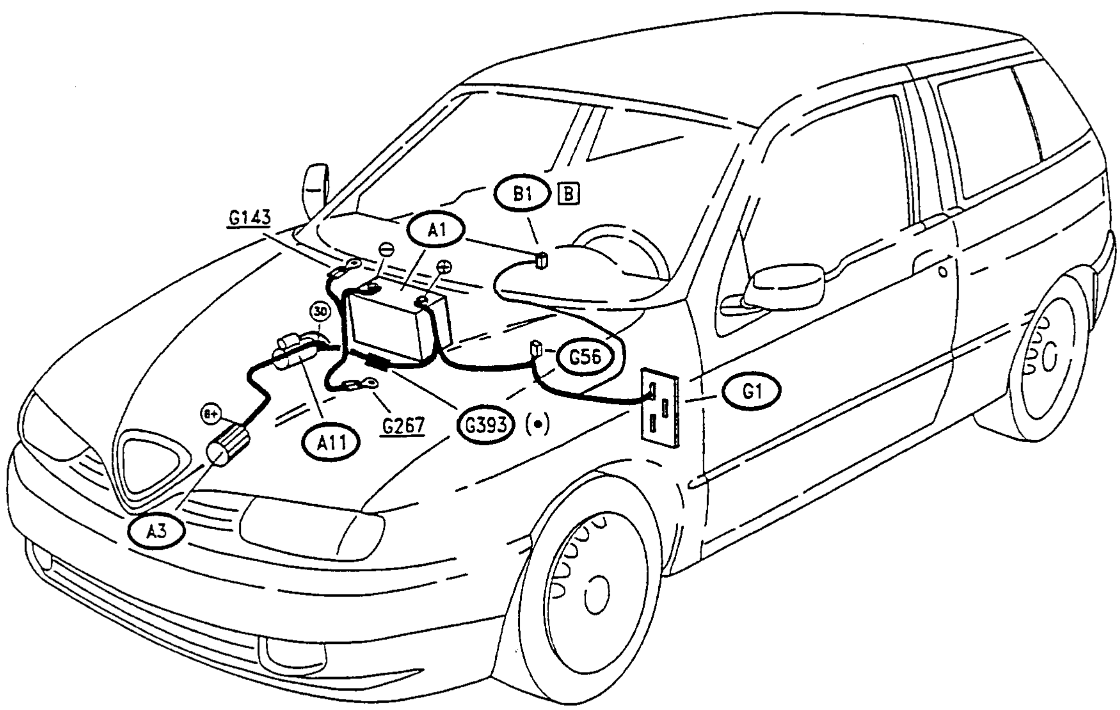


Starting consent relay (*) — I10



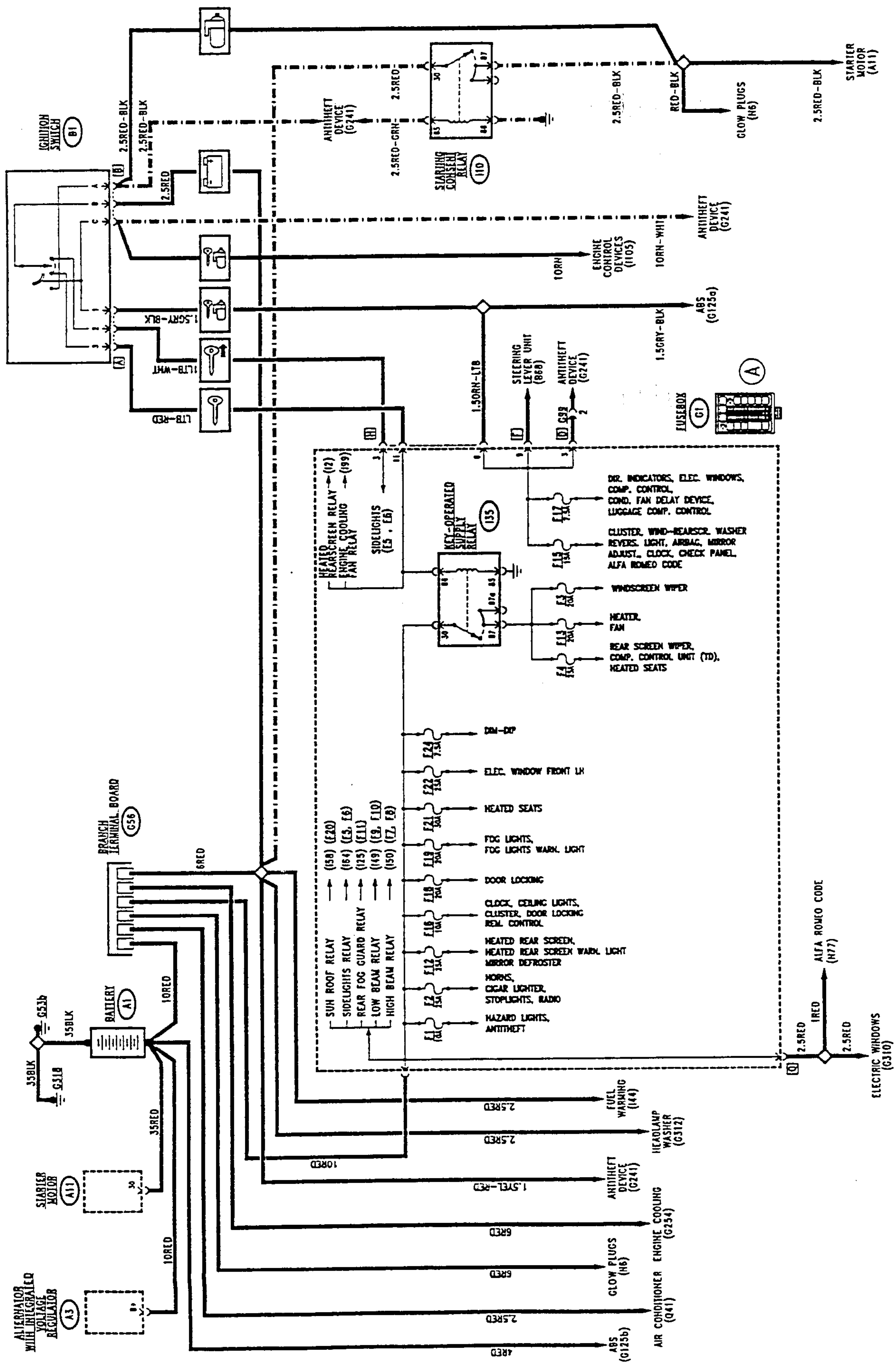
(*) versions without ALFA ROMEO CODE, but with anti-theft system (•) from chassis no.....

LOCATION OF COMPONENTS (Boxer versions)



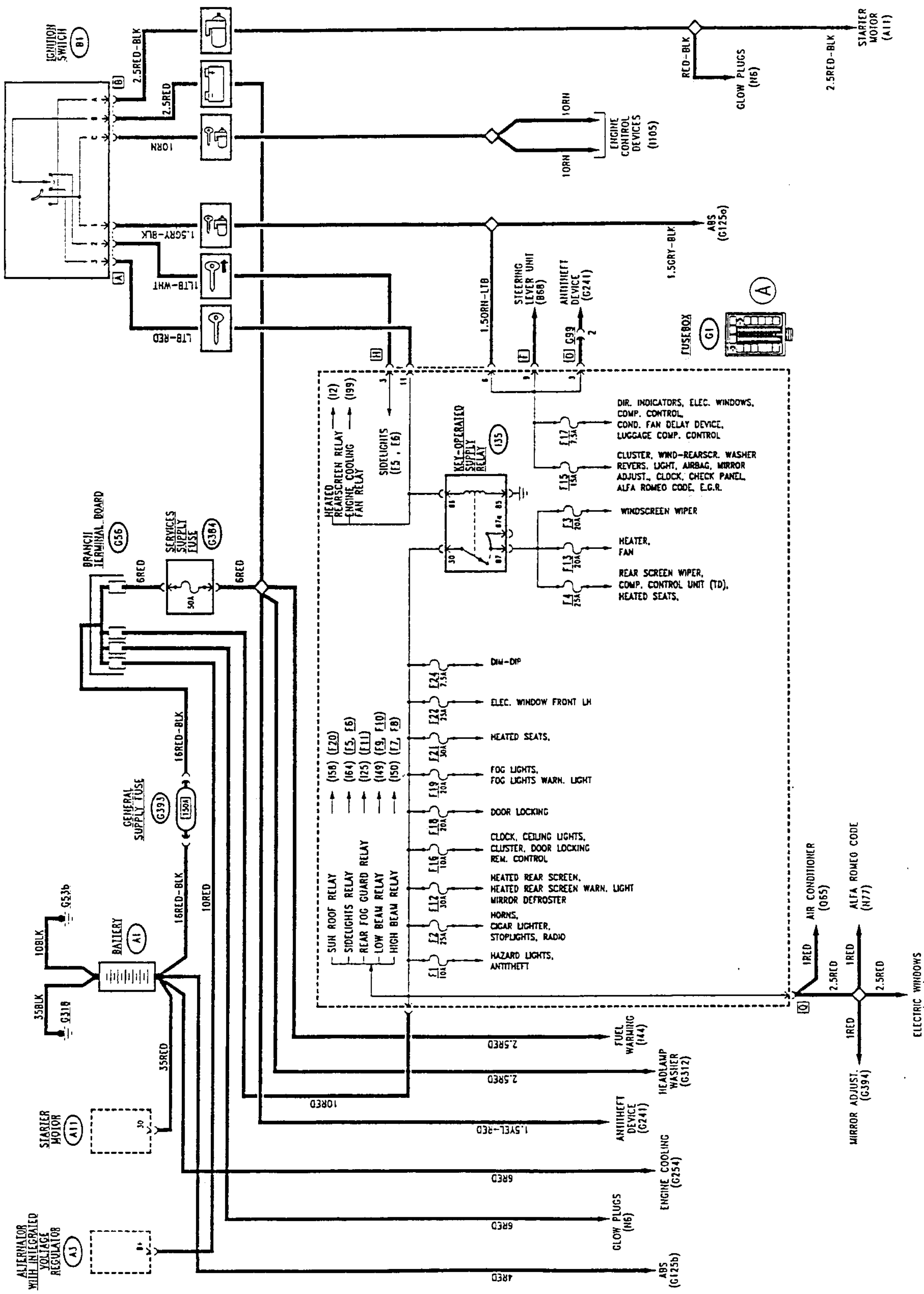
(•) from chassis no.....

WIRING DIAGRAM (TD version - up to chassis no. ....)

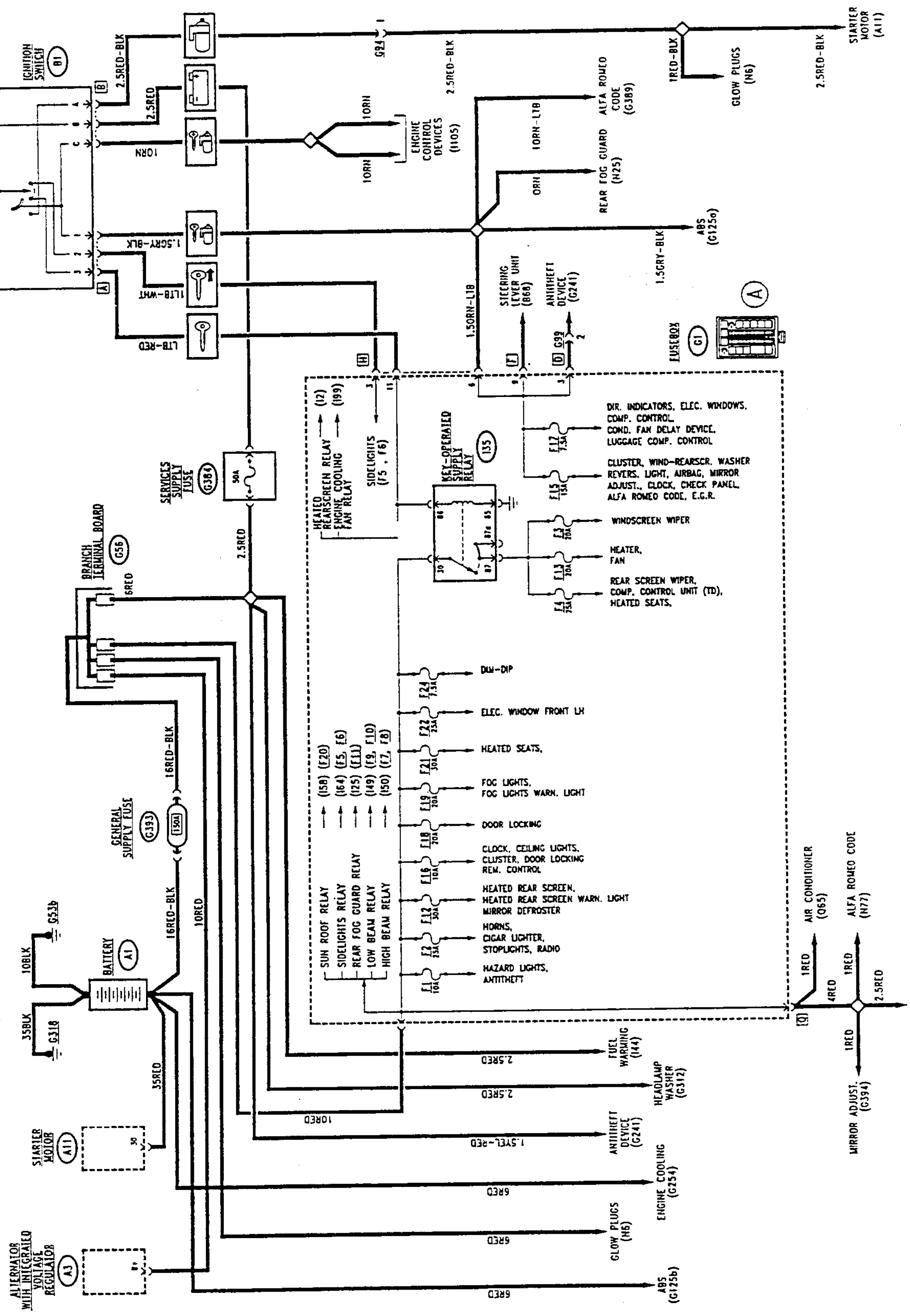


versions without ALFA ROMEO CODE, but w theft alarm

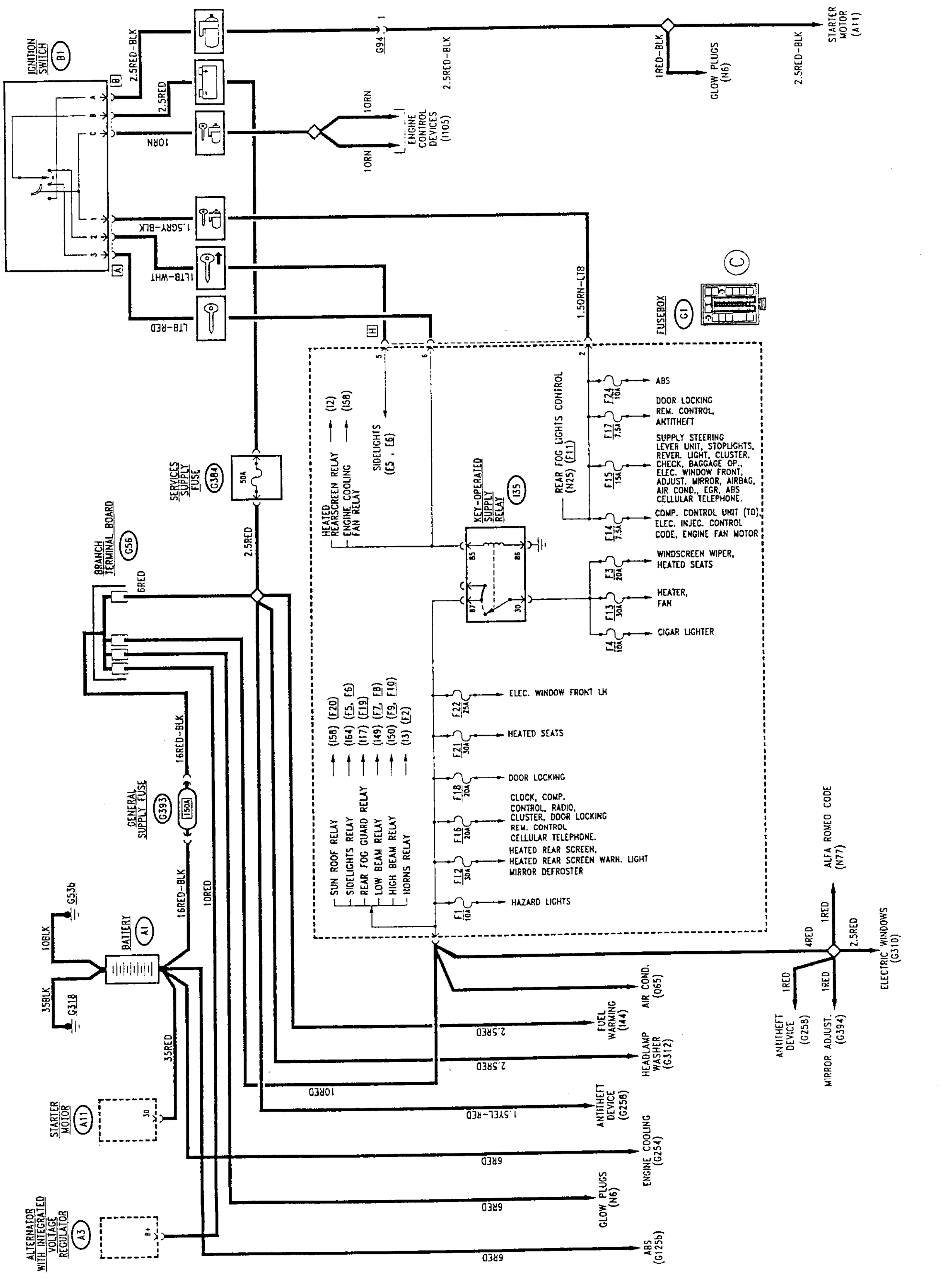
WIRING DIAGRAM (TD version from chassis no. ....)



WIRING DIAGRAM (TD-CAT version)



WIRING DIAGRAM (TD version)



FUNCTIONAL DESCRIPTION (TD, TD-CAT version)

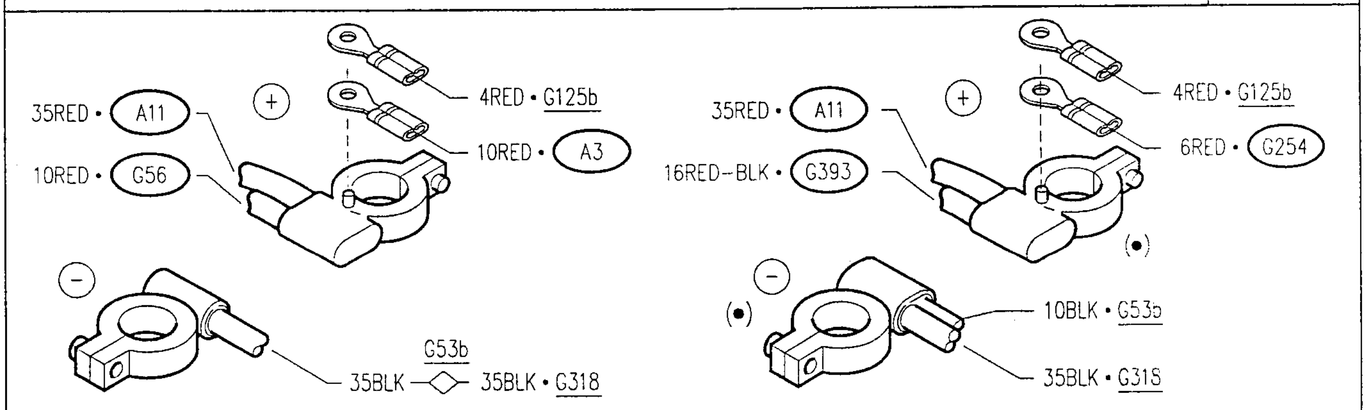
The supply leading from the battery **A1** is subdivided into the various lines in the branch terminal box **G56**, from which the numerous cables that directly supply certain systems (protected by specific "wander" fuses) and the line that supplies the fusebox **G1** lead; inside the fusebox, the supply is sorted to the various circuits, protected by the corresponding fuses (see the "Fusebox" section").
The battery charging line leads directly from the alternator **A3** or (from chassis no. .....) via the branch terminal box **G56.**
The ignition switch **B1** is also supplied through the branch terminal box **G56** at pin B of connector B.
The line leaving pin A of connector B is the one corresponding to the "START" position and directly supplies the starter motor **A11** (only for certain cars without ALFA ROMEO CODE but with theft alarm, through the alarm control unit **N45** and the starting consensus relay **I10**).

The line that leaves pin 3 of connector A - "DRIVE" position - via the fusebox **G1**, supplies the "key-operated" circuits, which are however disengaged in the "START" position.
The lines that leave pin 1 of connector A and pin C of connector B supply the "key-operated" circuits which remain engaged also when the ignition key is turned to "START", either directly or via the fusebox **G1**.
Lastly, the line that leaves pin 2 of connector A corresponds to the "PARK" position and supplies the sidelights circuit inside the fusebox **G1**.

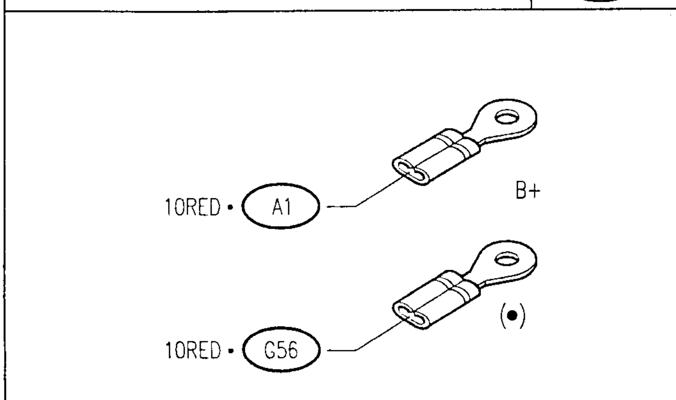
From chassis no....., through the adoption of a special high capacity fuse (150A) **G393**, all the supply lines are protected with the exception of the starter motor cable (battery - starter motor) and the battery charging cable (starter motor - alternator) which are protected by an additional "reinforced" sheath.
A fuse **G384** (50A) has also been added to protect the supply for the ignition switch.

COMPONENTS AND CONNECTORS (TD, TD-CAT version)

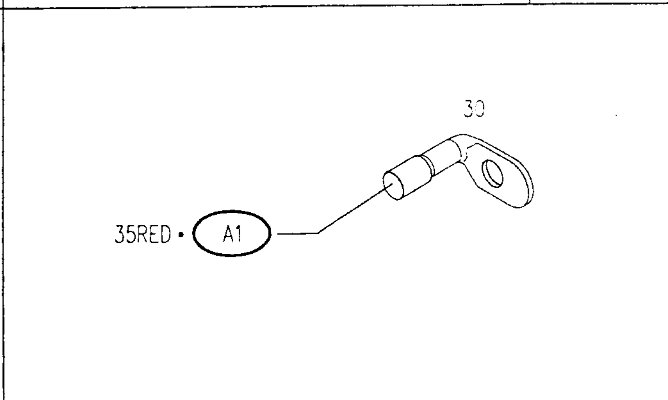
Battery A1



Alternator, with built-in voltage regulator A3



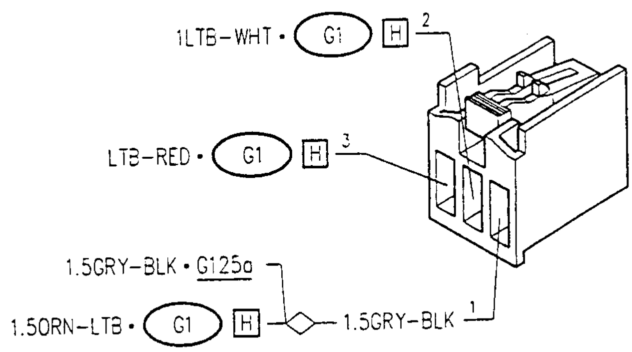
Starter motor A11



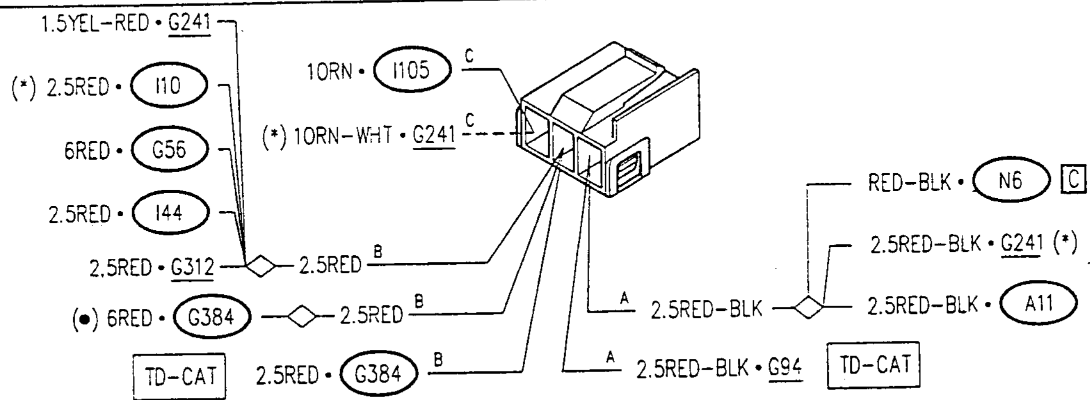
(•) Variant from chassis no....

COMPONENTS AND CONNECTORS (contd.)

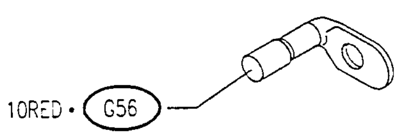
Ignition switch — B1 A



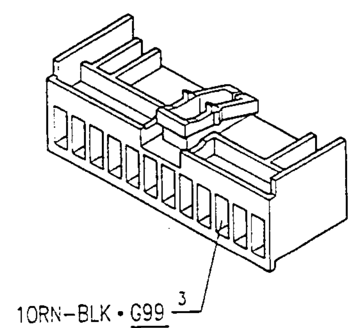
Ignition switch — B1 B



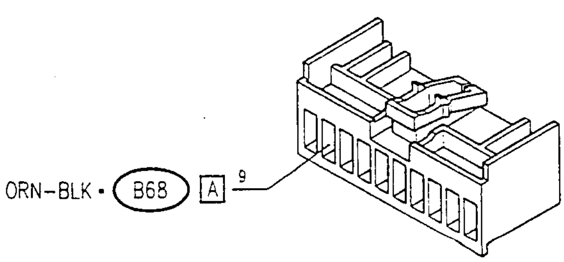
Fusebox — G1



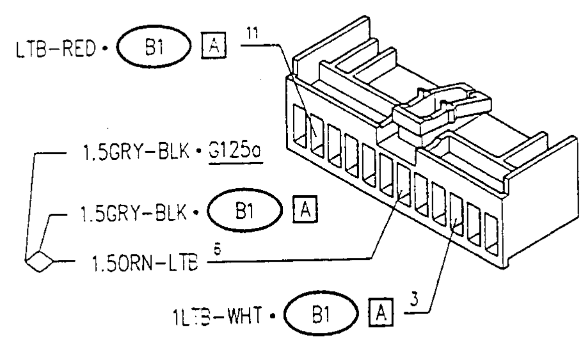
Fusebox — G1 D



Fusebox — G1 F



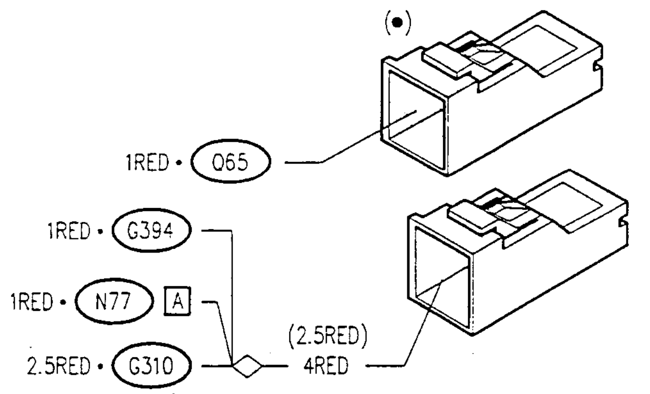
Fusebox — G1 H

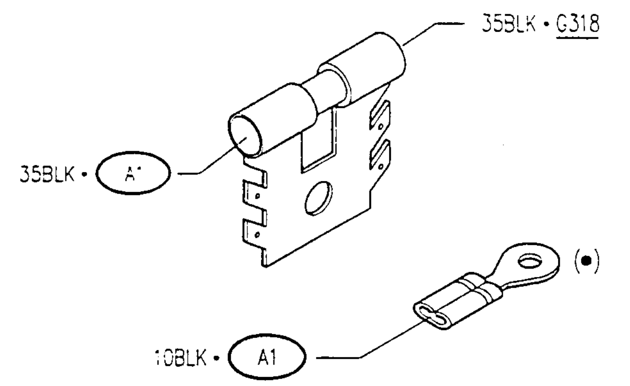


(*) Versions without ALFA ROMEO CODE, but with anti-theft system (•) Variant from chassis no....

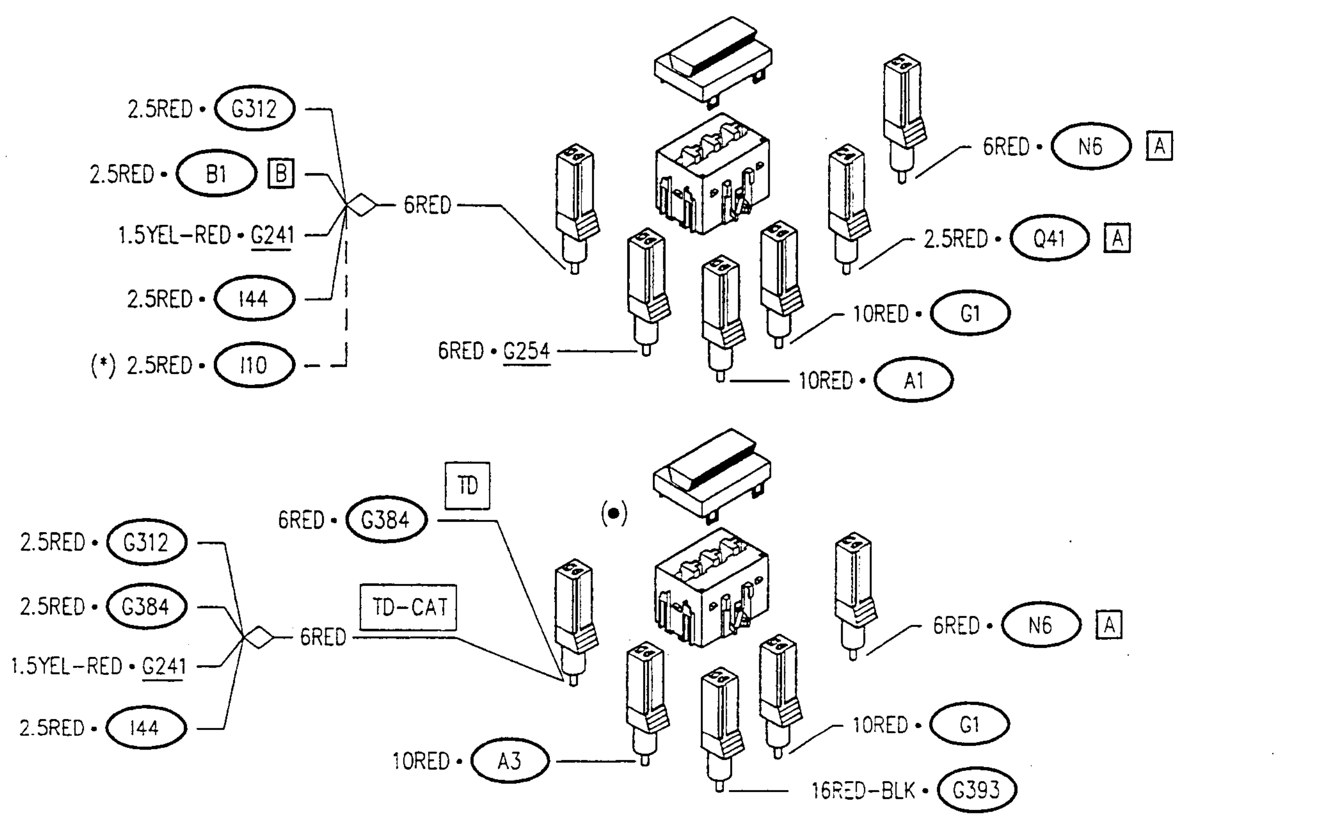
COMPONENTS AND CONNECTORS (contd.)

Fusebox	G1 Q	LH engine compt. earth	G53b

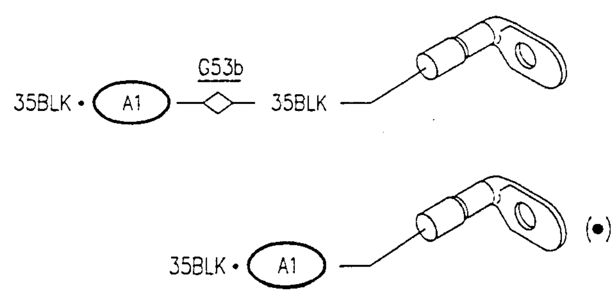




Branch terminal box	G56



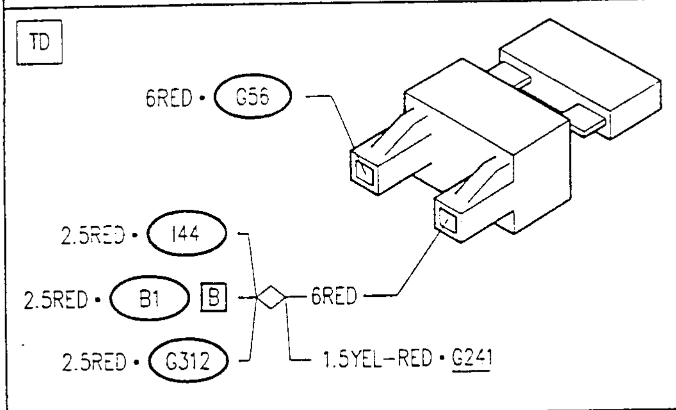
Earth on gearbox	G318

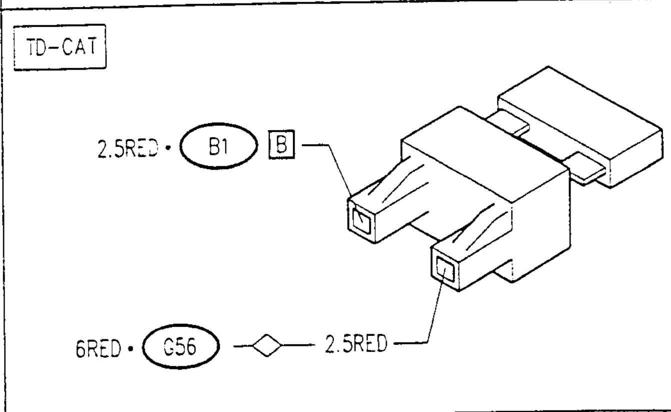


(*) Versions without ALFA ROMEO CODE, but with anti-theft system (•) Variant from chassis no....

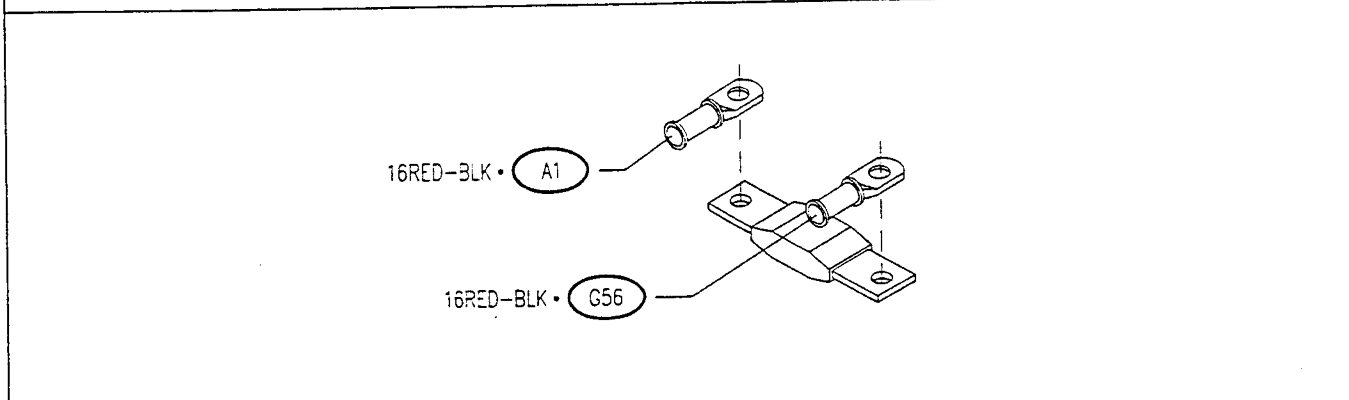
COMPONENTS AND CONNECTORS (contd.)

Services supply fuse (•)	G384	Services supply fuse	G384

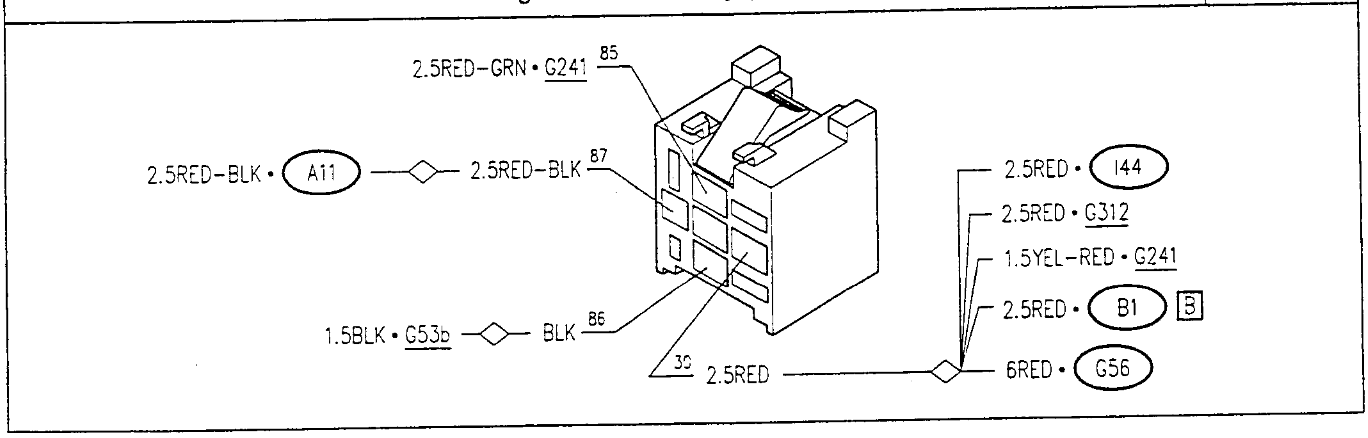




General supply fuse (•)	G393



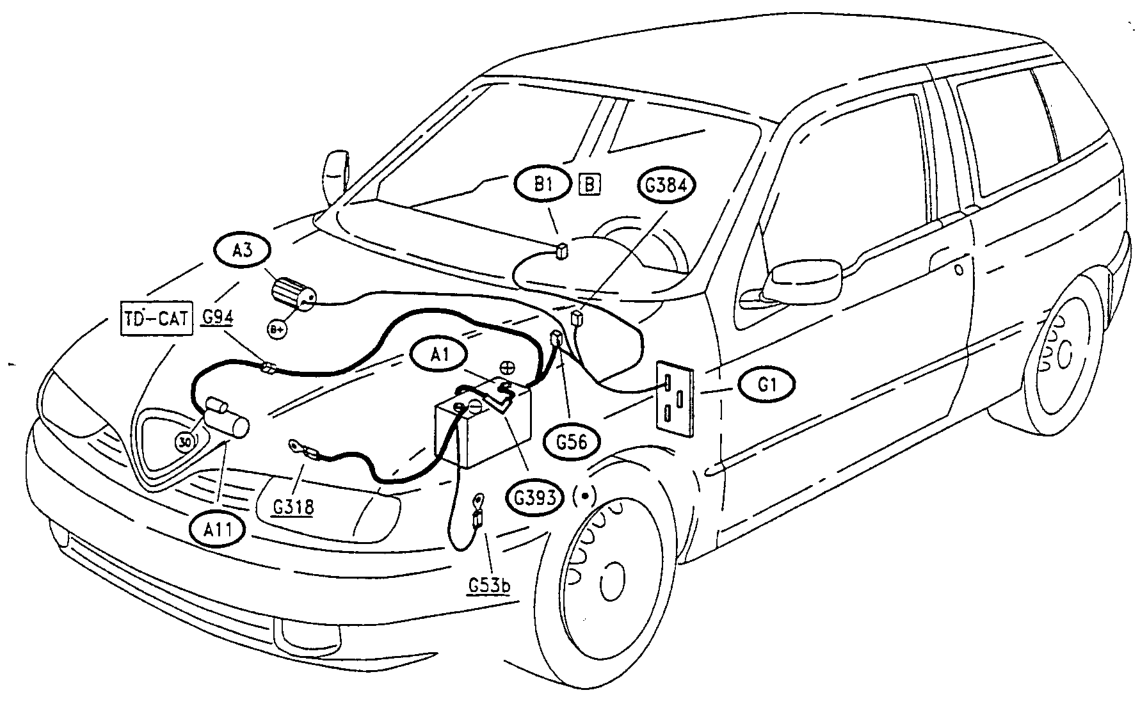
Starting consensus relay (*)	I10



(*) Versions without ALFA ROMEO CODE, but with anti-theft system

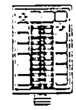
(•) Variant from chassis no....

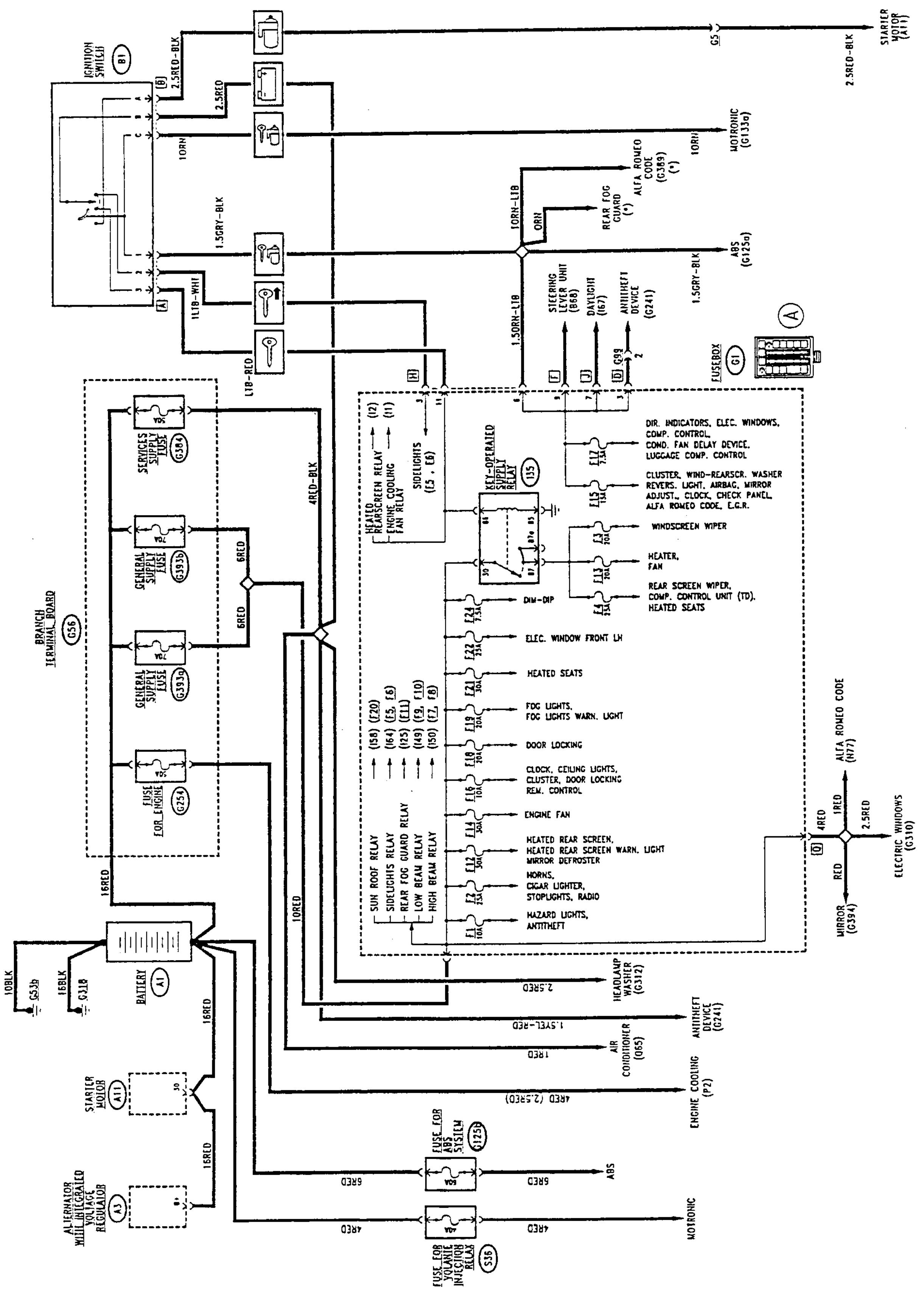
LOCATION OF COMPONENTS (TD, TD-CAT version)



(•) from chassis no.....

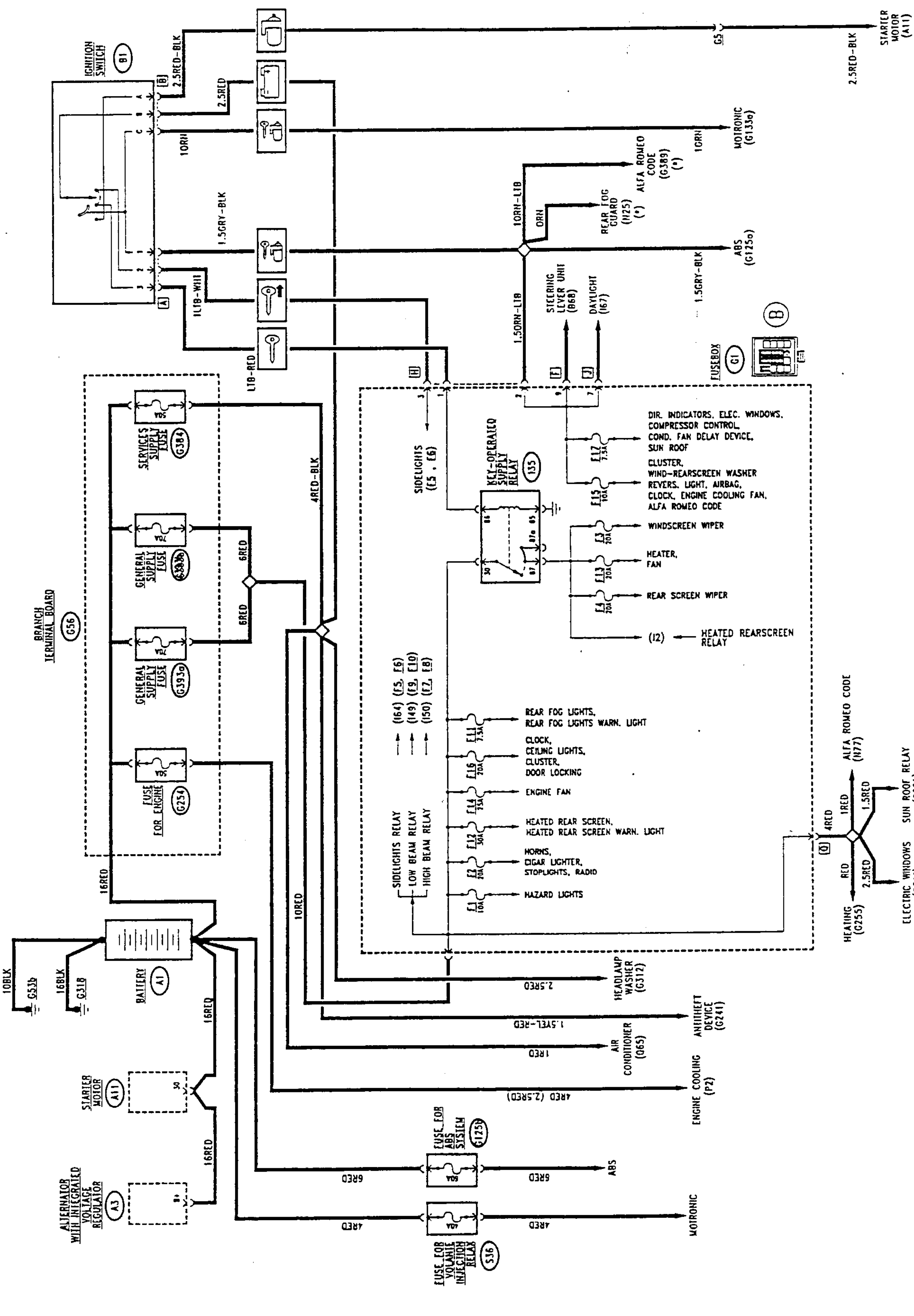
WIRING DIAGRAM (T.SPARK version)

 (A)



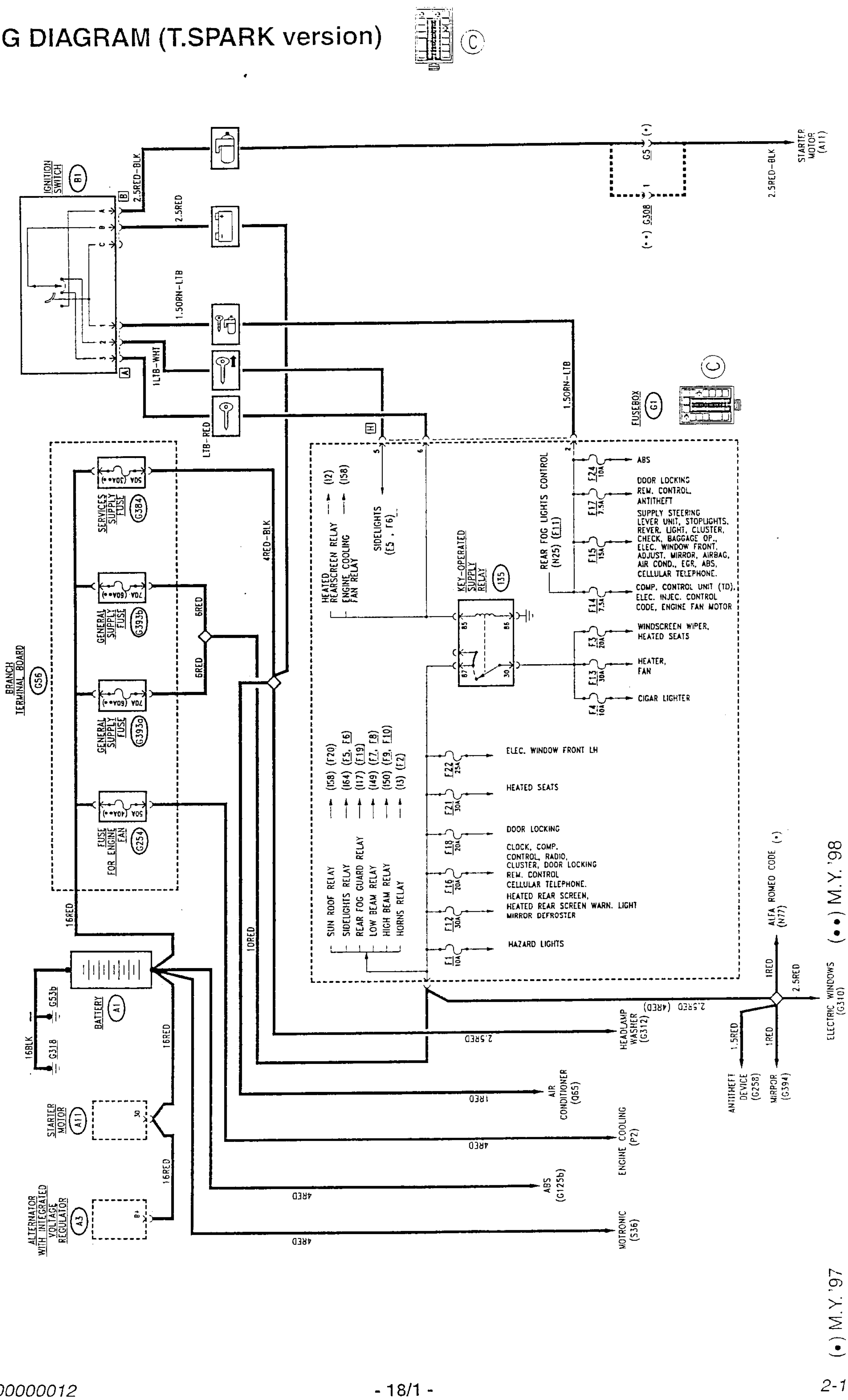
(*) only from M.Y. '97

WIRING DIAGRAM (T.SPARK version)



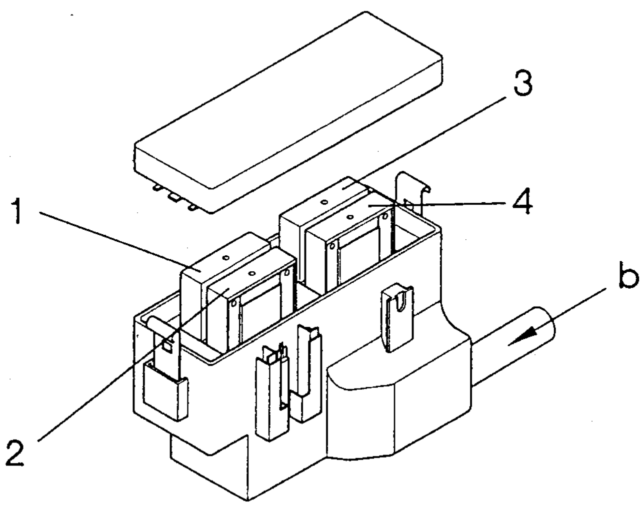
(*) only from M.Y. '97

WIRING DIAGRAM (T.SPARK version)



FUNCTIONAL DESCRIPTION (T.SPARK version)

The supply leading from the battery **A1** is subdivided into various lines in the branch terminal box **G56**. This is a branch terminal box with built-in fuses, which makes it possible to protect all the supply lines except the starter motor cable (battery-starter motor) and the battery charging cable (starter motor-alternator): these cables are however protected by an additional "reinforced" sheath.



b. line (16 mm cable) from the battery

Up to Model Year '97

1. Fan fuse (50A): **G254**
2. Services supply fuse (50A): **G384**
3. General supply fuse (70A): **G393a**
4. General supply fuse (70A): **G393b**

From Model Year '98

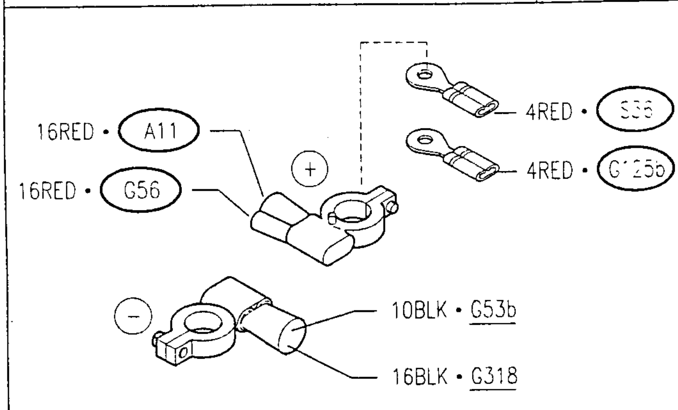
1. Fan fuse (40A): **G254**
2. Services supply fuse (30A): **G384**
3. General supply fuse (60A): **G393a**
4. General supply fuse (60A): **G393b**

From this, lead the cables which directly supply certain systems and the line that supplies the fusebox **G1**; inside the fusebox the supply is branched to the various circuits, protected by the corresponding fuses (see "Fusebox" section).
The battery charging line leads from the alternator **A3**, via the starter motor **A11.**
The ignition switch **B1** is also supplied via the branch terminal box **G56** and the specific fuse **G384** at pin B of connector B.
The line that leaves pin A of connector B is the one corresponding to the "START" position and directly supplies the starter motor **A11.**

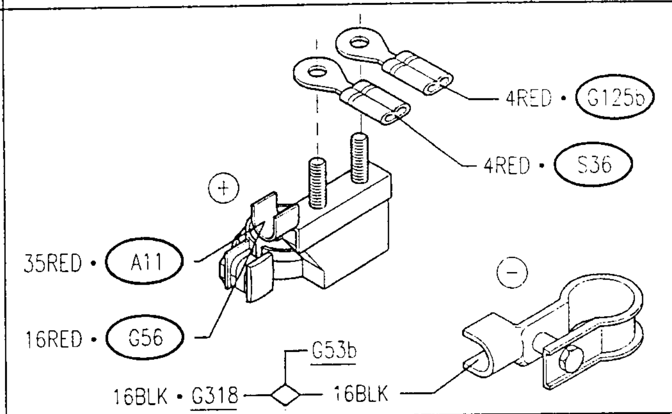
The line that leaves pin 3 of connector A - "DRIVE" position - supplies, via the fusebox **G1**, the "key-operated" circuits which are disengaged in the "START" position.
The lines that leave pin 1 of connector A and pin C of connector B supply, either directly or via the fusebox **G1**, the "key- operated" circuits which also remain engaged in the "START" position.
For fusebox **G1** "C"" pin C of connector B is not connected.
Lastly the line leaving pin 2 of connector A corresponds to the "PARK" position and supplies the sidelights circuit inside the fusebox **G1**.

COMPONENTS AND CONNECTORS (T.SPARK version)

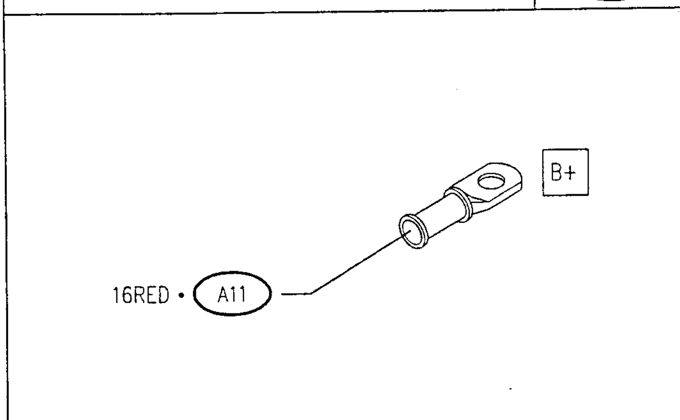
Battery A1



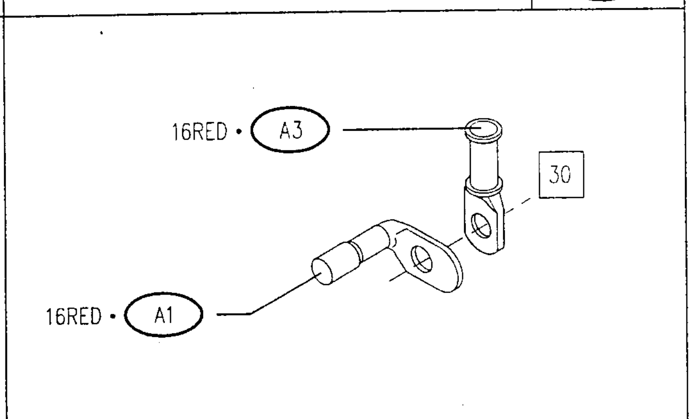
Battery (•) A1



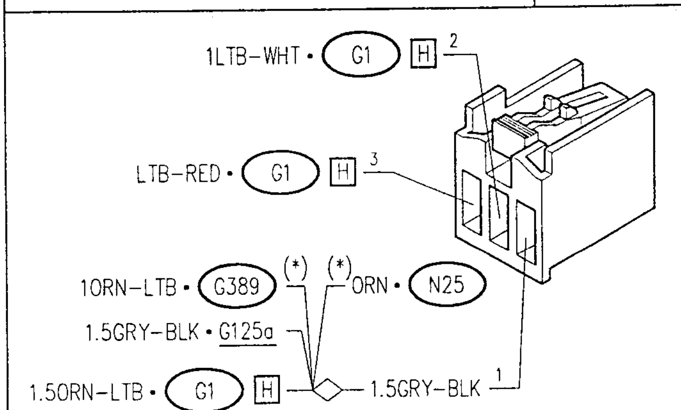
Alternator, with built-in voltage regulator A3



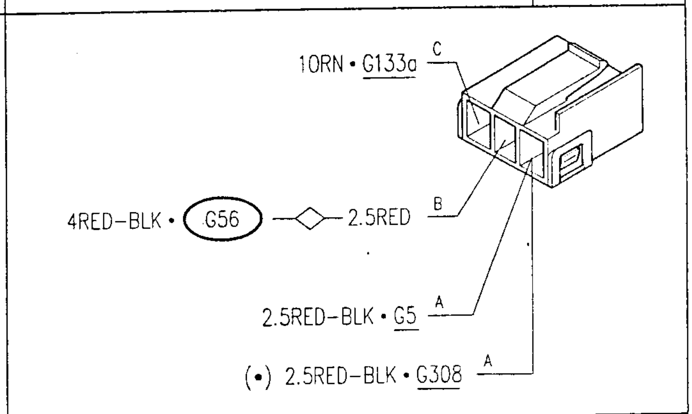
Starter motor A11



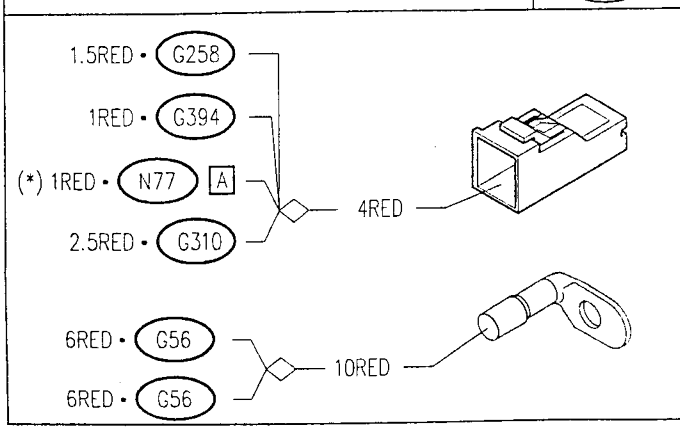
Ignition switch B1 A



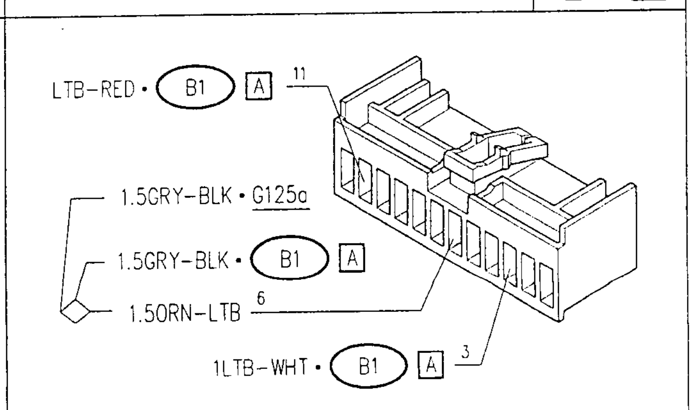
Ignition switch B1 B



Fusebox G1



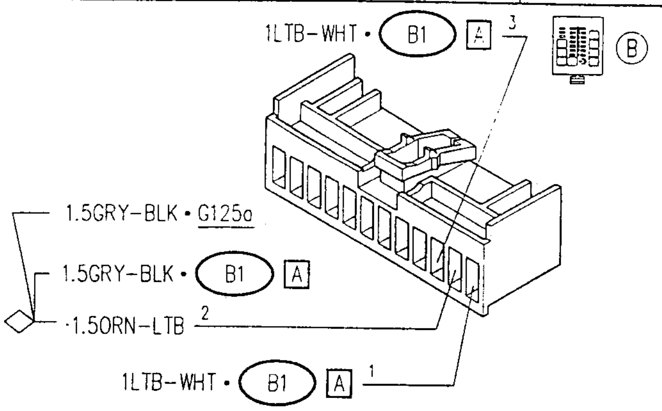
Fusebox G1 H

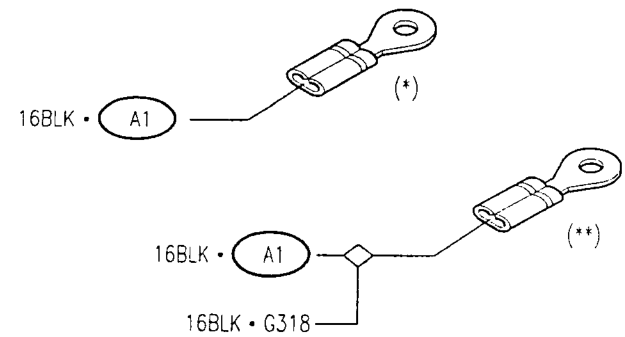


(*) from M.Y. '97

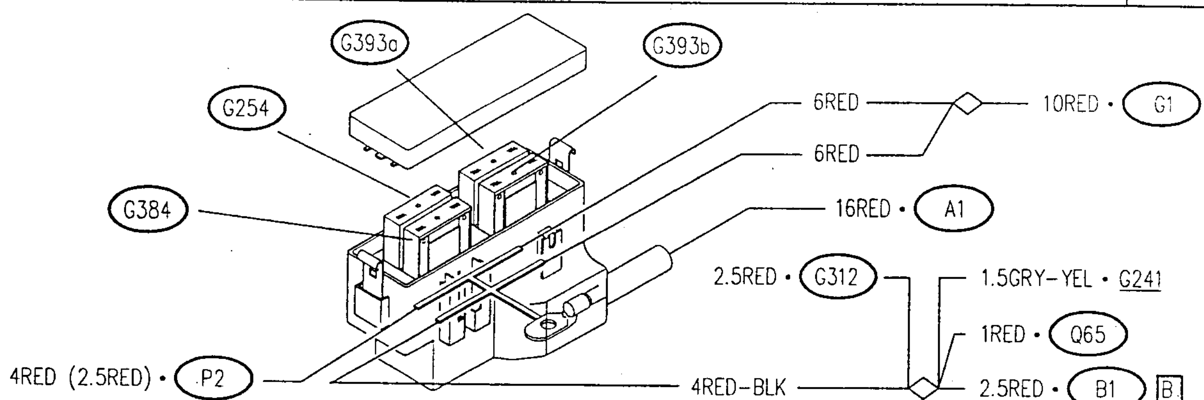
COMPONENTS AND CONNECTORS (contd.)

Fusebox	G1 H	LH engine compt. earth	G53b

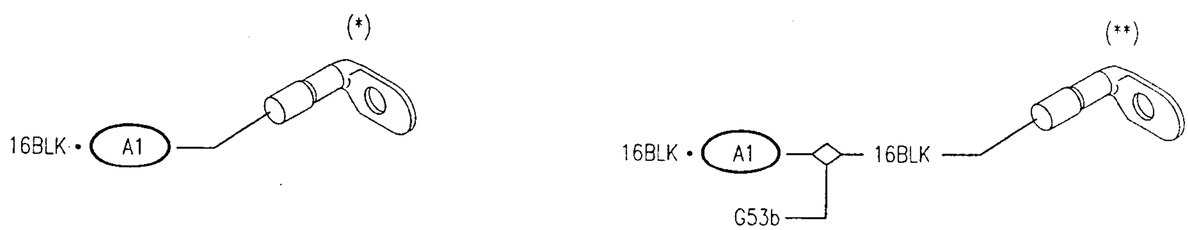




Branch terminal box	G56

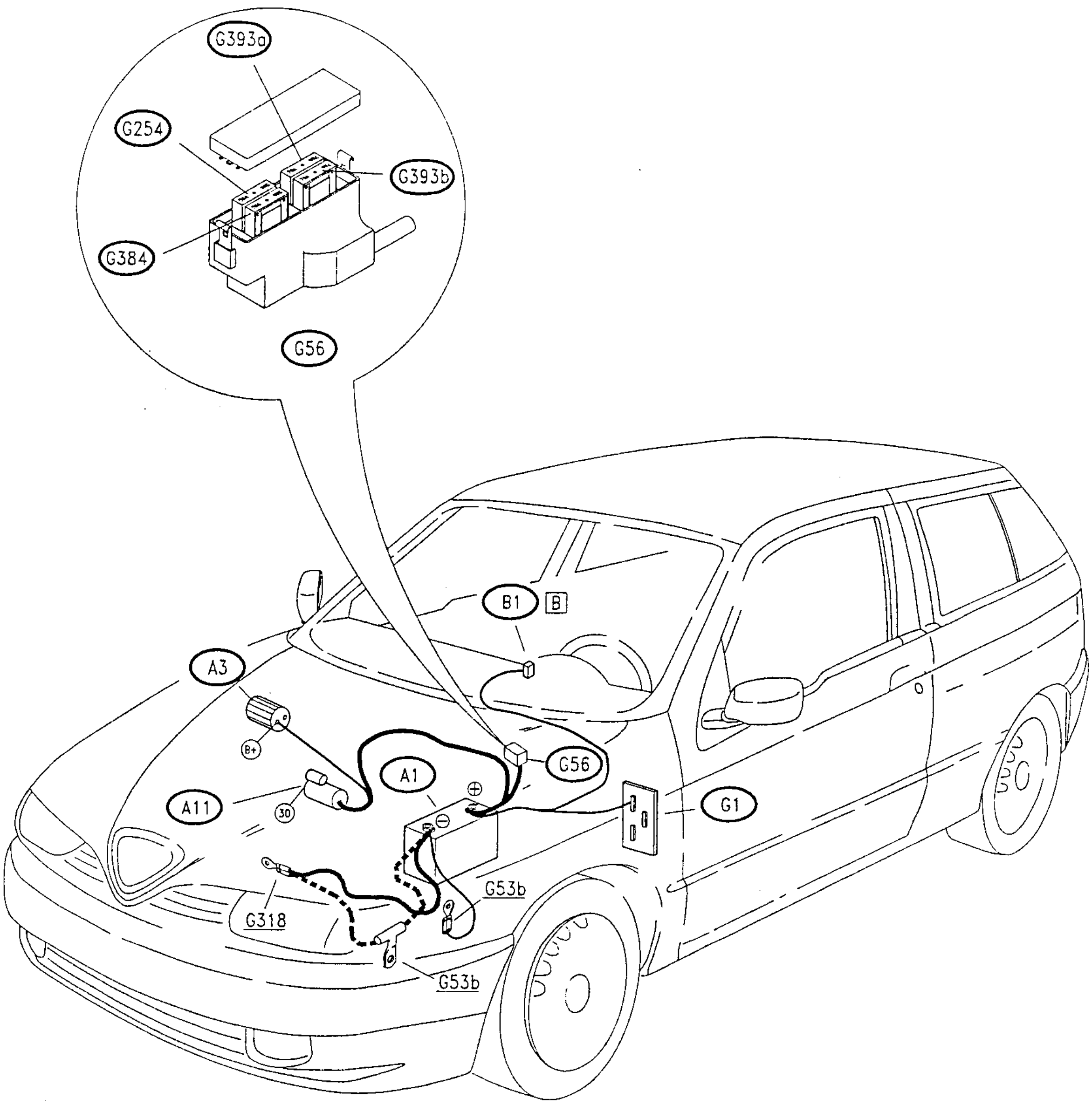


Earth on gearbox	G318



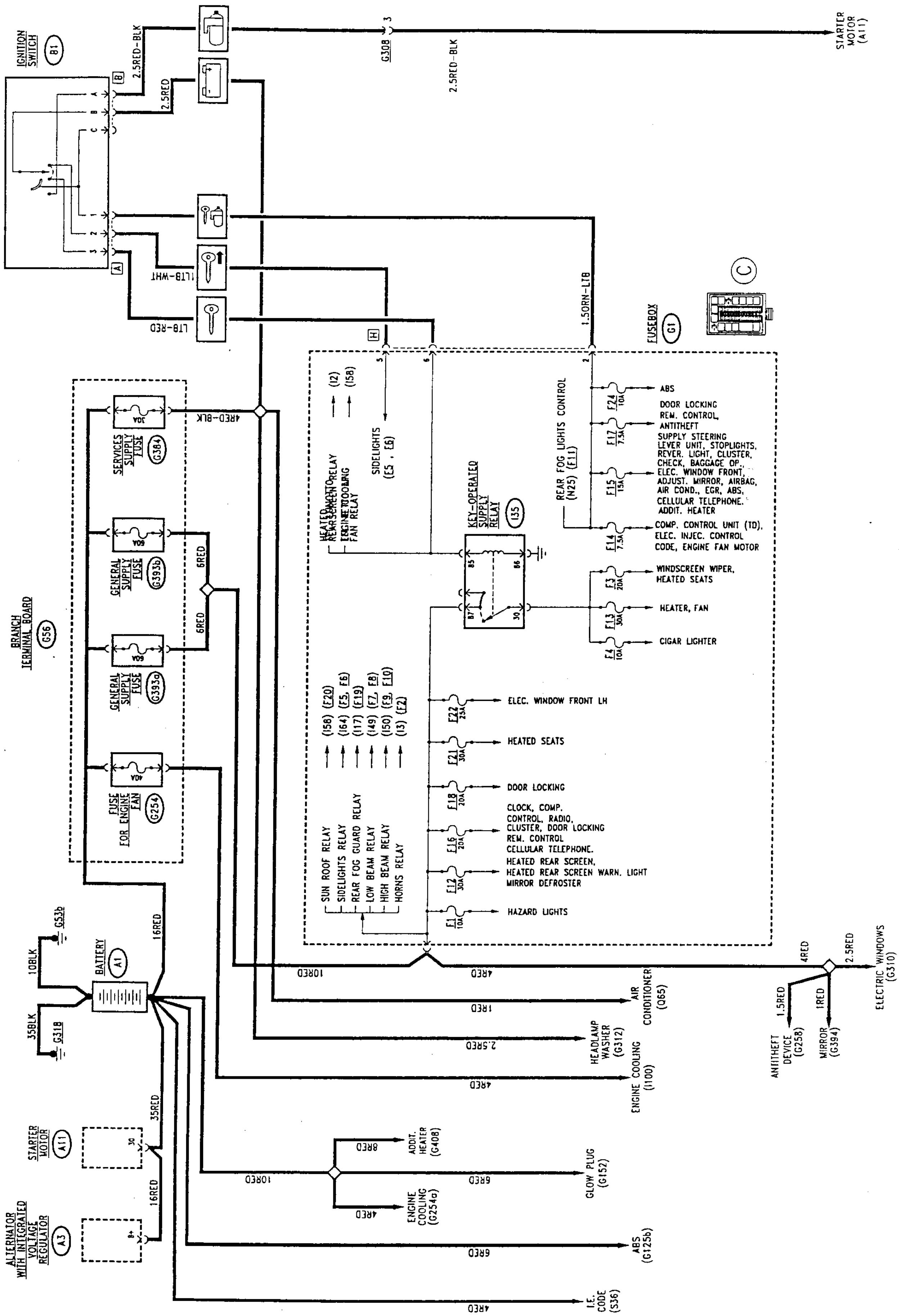
(*) from M.Y.' 97
(**) from M.Y. '98

LOCATION OF COMPONENTS (T.SPARK version)



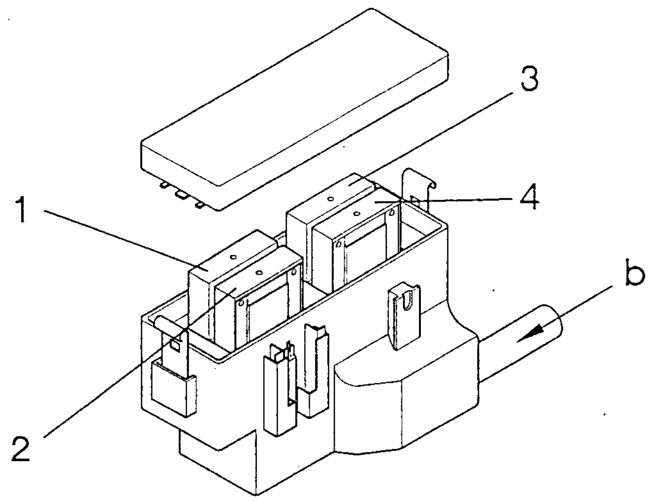
— — — From Model Year '98

WIRING DIAGRAM (JTD version)



FUNCTIONAL DESCRIPTION (JTD version)

The supply leading from the battery **A1** is subdivided into various lines in the branch terminal box **G56**. This is a branch terminal box with built-in fuses, which makes it possible to protect all the supply lines except the starter motor cable (battery-starter motor) and the battery charging cable (starter motor-alternator): these cables are however protected by an additional "reinforced" sheath.



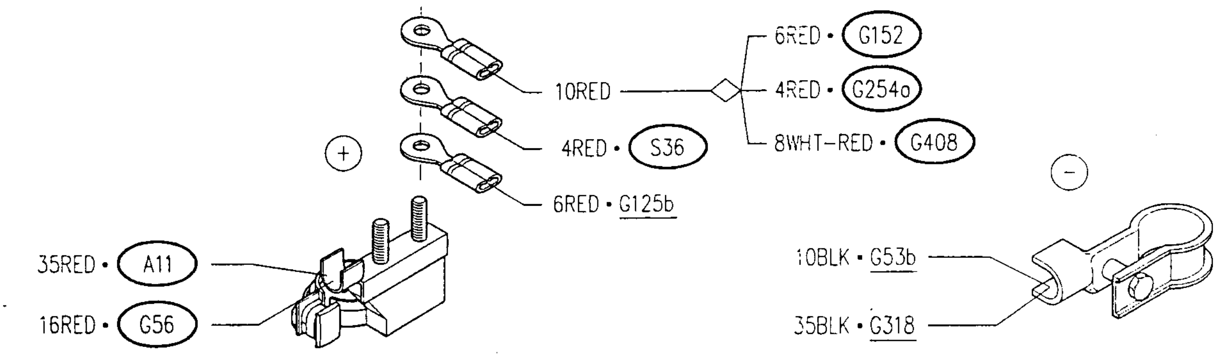
b. line (16 mm cable) from the battery
1. Fan fuse (50A): **G254**
2. Services supply fuse (30A): **G384**
3. General supply fuse (60A): **G393a**
4. General supply fuse (60A): **G393b**

From this, lead the cables which directly supply certain systems and the line that supplies the fusebox **G1**; inside the fusebox the supply is branched to the various circuits, protected by the corresponding fuses (see "Fusebox" section).
The battery charging line leads from the alternator **A3**, via the starter motor **A11.**
The ignition switch **B1** is also supplied via the branch terminal box **G56** and the specific fuse **G384** at pin B of connector B.
The line that leaves pin A of connector B is the one corresponding to the "START" position and directly supplies the starter motor **A11.**

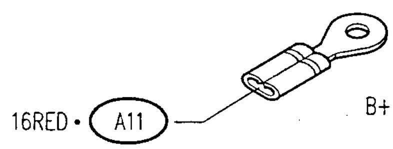
The line that leaves pin 3 of connector A - "DRIVE" position - supplies, via the fusebox **G1**, the "key-operated" circuits which are disengaged in the "START" position.
The lines that leave pin 1 of connector A and pin C of connector B supply, either directly or via the fusebox **G1**, the "key- operated" circuits which also remain engaged in the "START" position.
Pin C of connector B is not connected.
Lastly the line leaving pin 2 of connector A corresponds to the "PARK" position and supplies the sidelights circuit inside the fusebox **G1**.

COMPONENTS AND CONNECTORS (JTD version)

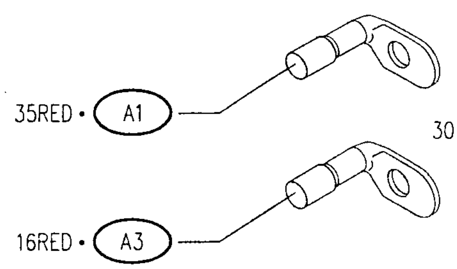
Battery A1



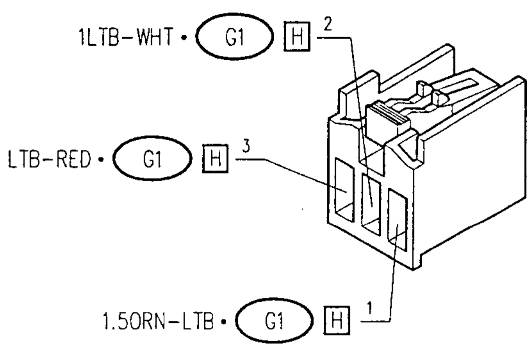
Alternator, with built-in voltage regulator A3



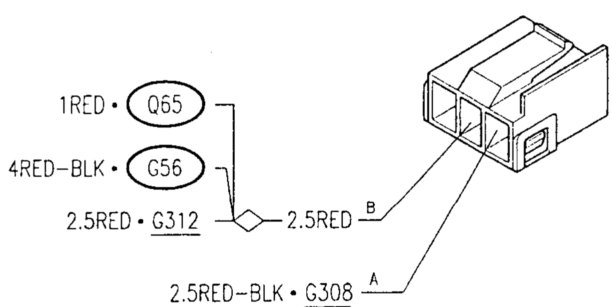
Starter motor A11



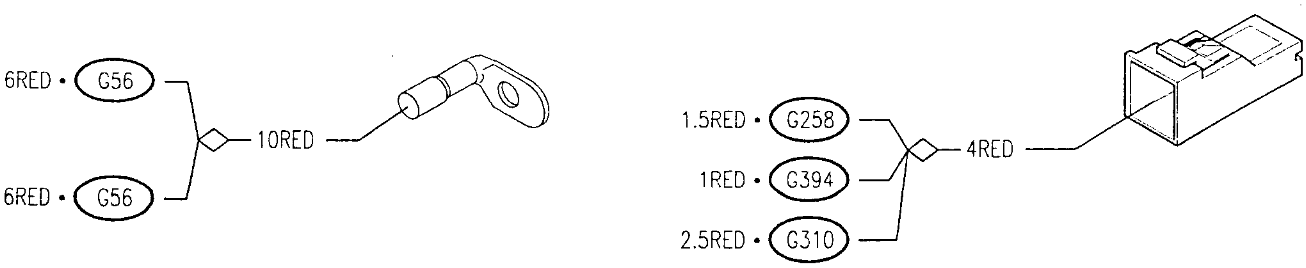
Ignition switch B1 A



Ignition switch B1 B

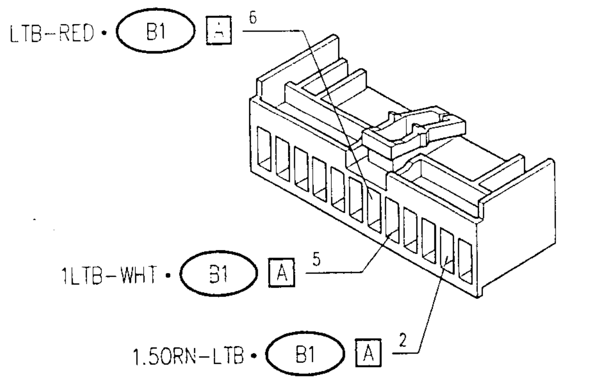


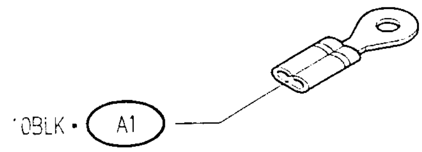
Fusebox G1



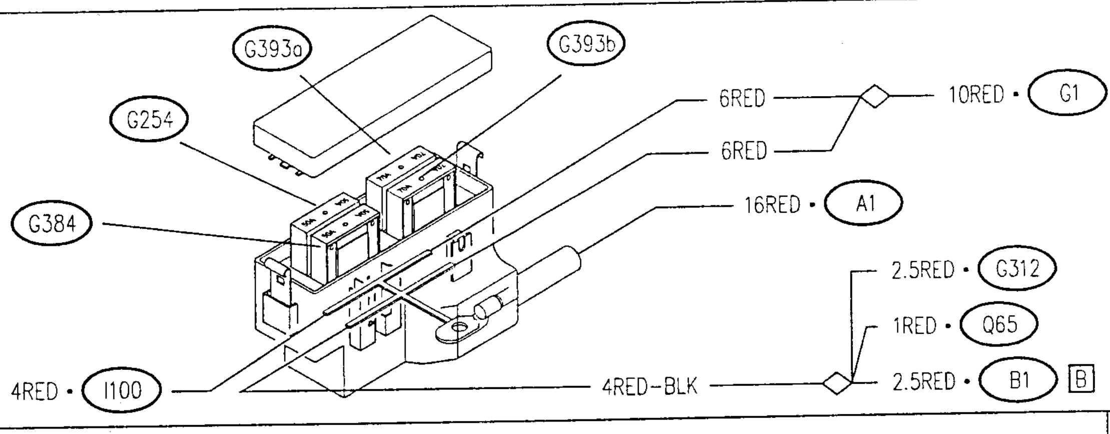
COMPONENTS AND CONNECTORS (contd.)

Fusebox	G1 H	LH engine compt. earth	G53b

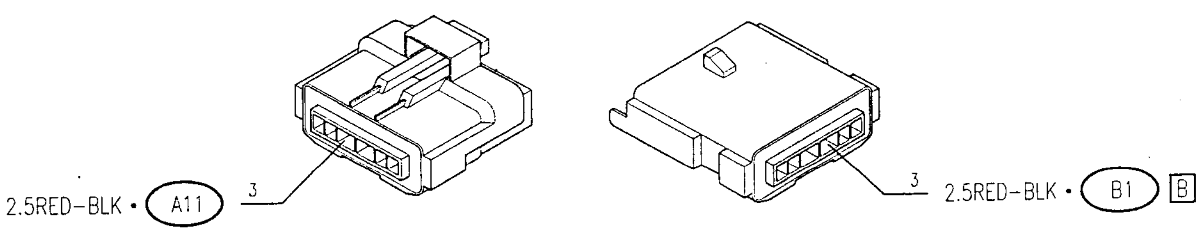




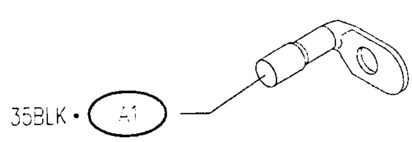
Branch terminal box	G56



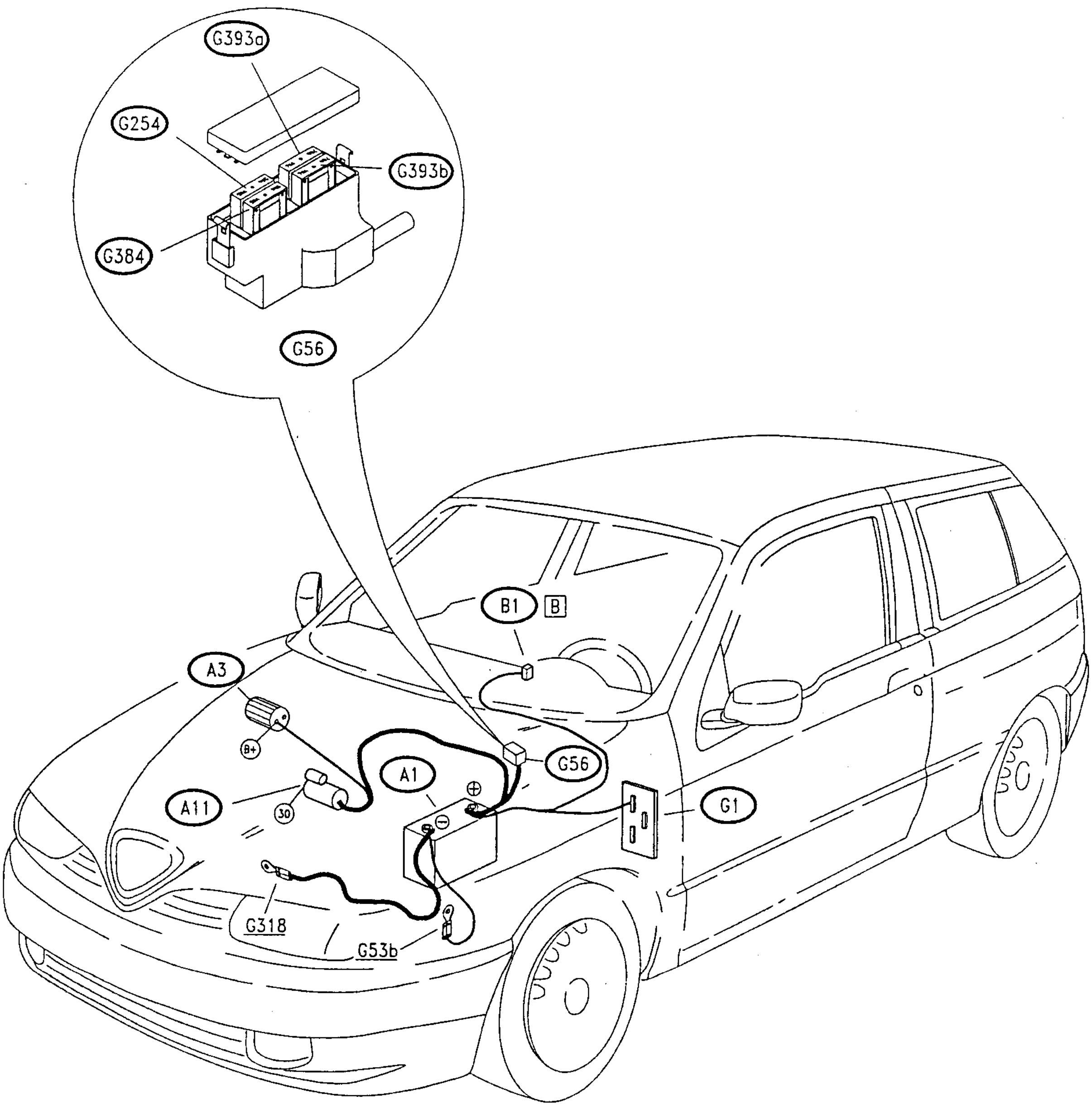
Connector for engine sensors	G308



Earth on gearbox	G318

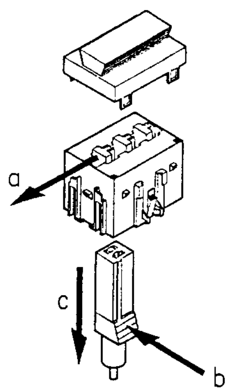


LOCATION OF COMPONENTS (JTD version)



CHECKING COMPONENTS

Branch terminal box (G56) (except T.SPARK and JTD)

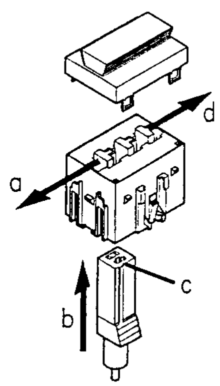


Removing a connector

a - move the "secondary-lock" to the left

b - press the release catch of the connector to be removed

c - remove the connector pulling downwards



Inserting a connector

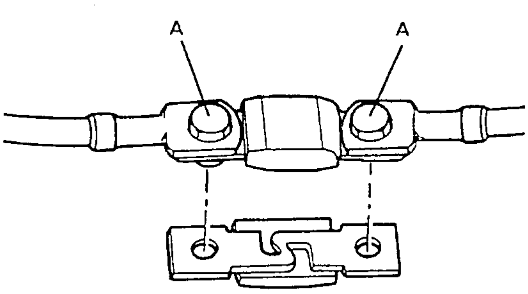
a - position the "secondary-lock" at the left

b - insert the connector

c - press the connector until it catches in the tooth

d - move the "secondary-lock" to the right

General supply fuse (G393) (except T.SPARK and JTD)



"MEGA" general supply protection fuse: (150A).

In the event of replacement tighten the two fastening screws **(A)**, proceeding with care, to a torque of appr. 25 Nm, without forcing the fuse excessively to avoid damaging the copper element.