


GROUP 43

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N.B. Updating of wiring diagrams relating to model  are not available at the time when going to press.

STANDARDS AND PRECAUTIONS FOR OPERATIONS ON ELECTRICAL SYSTEM

The electronic control units installed on the vehicle are built with components capable of withstanding the electrical loads of the system to which they belong. Consequently every system modification may directly damage the control units. For example, the control unit may supply the relay coil, but it

certainly cannot directly supply the electrical loads connected to the relay's contact. Great care must also be taken over the electrical power supply polarities, in that the control unit protection is included in the power supply system and not on the input and output connections. When installing electrical accessories

on the car, it is always advisable to disconnect the electrical control units during installation and to carry out the functional checks on the accessories with the control units disconnected. In any case, it is highly inadvisable to connect from the control units wiring.

The following precautions must therefore be taken:

- Do not connect the control unit output directly to the load.
 - Under no circumstances operate directly on devices with wires connected to "positive" or to "ground", without having previously disconnected the control unit.
 - Do not short-circuit the system sensors, except when this is allowed or specified in the "Workshop Manual".
-


The possible consequences of operating on the systems must always be anticipated to avoid the

risk of damage. Whenever not all the technical data of the components concerned is perfectly known,

operations should be avoided altogether.

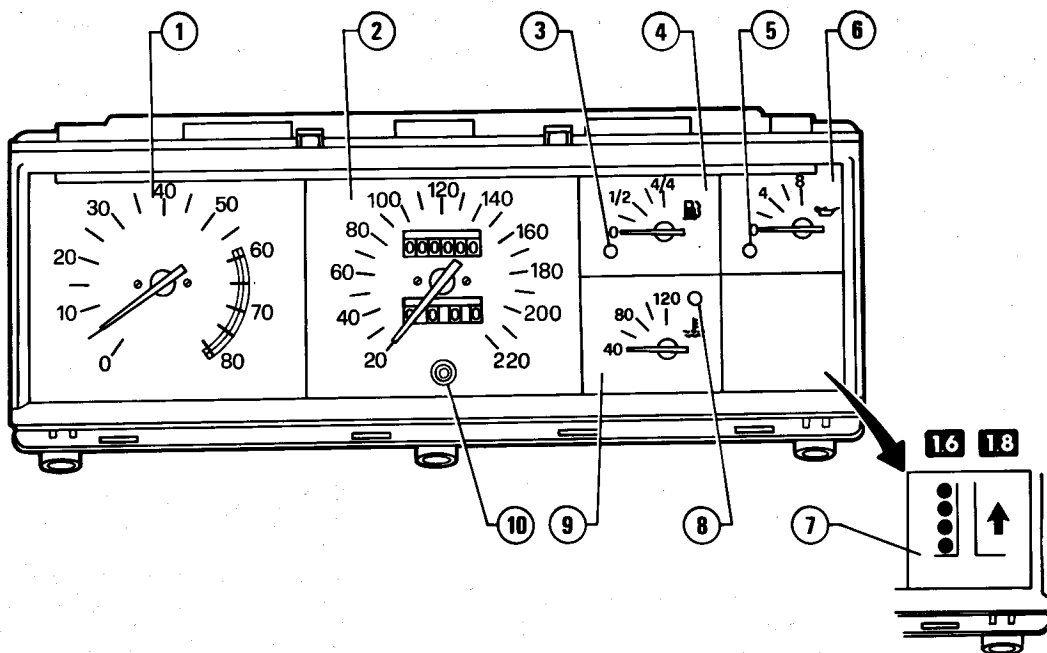
ELECTRONIC DEVICES

SUMMARY TABLE

| Model | 16 161.00 161.01 | 18 161.02 161.03 | 20 161.08 161.09 | 20 <i>turbodiesel</i> 161.04 |  6V iniezione 161.180 161.190 |
|--------------------|-------------------------------|-------------------------------|-------------------------------|--|---|
| TRIP COMPUTER | - | - | X | - | X |
| ALFA ROMEO CONTROL | X | X | X | X | X |
| PERFORMANCE GAUGE | X | X | - | - | - |

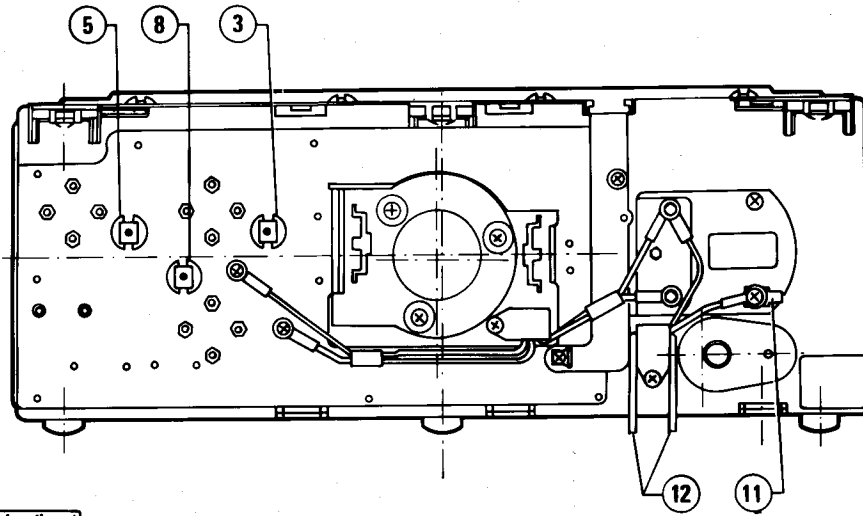
VEGLIA ELECTRONIC CLUSTER

front view - **20** , **20** *turbodiesel* ,  **6V iniezione**

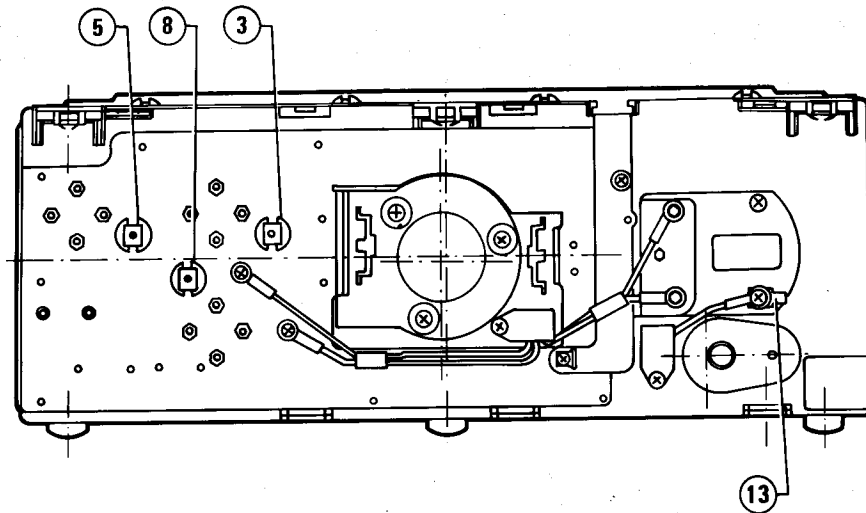


CLUSTER AND ELECTRONIC INSTRUMENTS

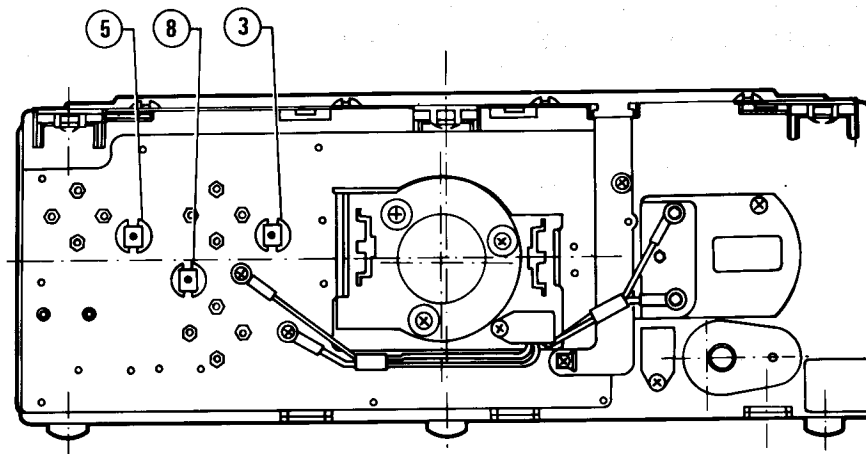
rear view - 1.6 1.8



rear view - 2.0 turbodiesel



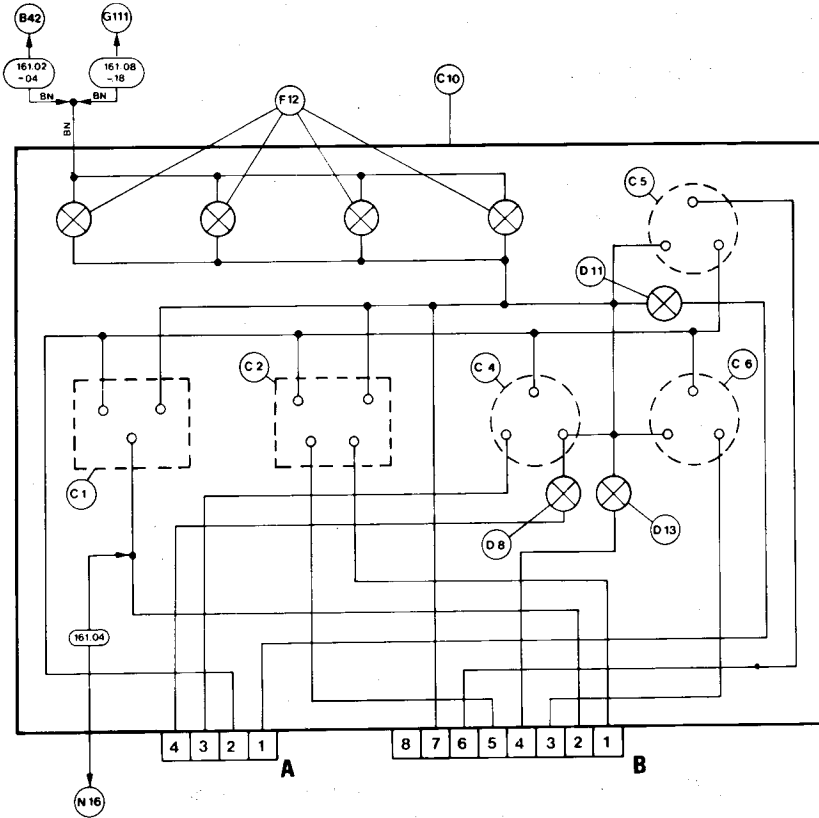
rear view - 2.0 6V iniezione



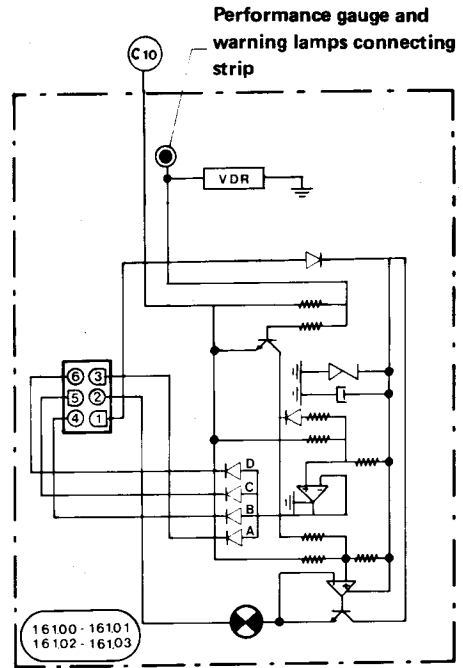
- | | |
|--|---|
| 1 Rev counter | 9 Coolant temperature indicator |
| 2 Speedometer - odometer | 10 Pushbutton for resetting trip odometer |
| 3 Fuel reserve warning lamp | 11 Tongue for connection performance gauge to lights warning lamp |
| 4 Fuel level indicator | 12 Performance gauge cables |
| 5 Min oil pressure warning lamp | 13 Tongue for tachimetric relay |
| 6 Oil pressure indicator | |
| 7 Performance gauge | |
| 8 Max coolant temperature warning lamp | |

WIRING DIAGRAM AND PIN-OUT LOCATION

WIRING DIAGRAM



Performance gauge display

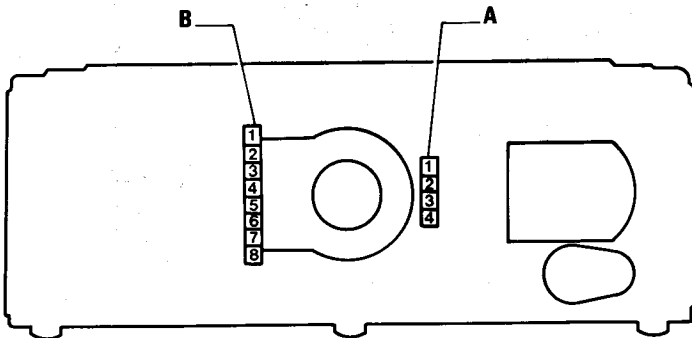


Performance gauge connector

- Pin 1: common +
- Pin 2: Indicator warning lamp
- Pin 3: Led A
- Pin 4: Led B
- Pin 5: Led C
- Pin 6: Led D

PIN-OUT LOCATION

For pin - out location of connectors A and B refer to the following figure (cluster rear view) and to the related tables.



Connector A

- Pin 1: min oil pressure warning lamp
- Pin 2: common +
- Pin 3: Fuel level indicator
- Pin 4: Fuel reserve warning lamp

Connector B

- Pin 1: Odometer signal
- Pin 2: Rev counter signal
- Pin 3: Coolant thermometer
- Pin 4: Max coolant temperature warning lamp
- Pin 5: Pulse generator supply +
- Pin 6: Oil pressure indicator
- Pin 7: Common ground
- Pin 8: Not connected

CLUSTER AND ELECTRONIC INSTRUMENTS

CAUTION:

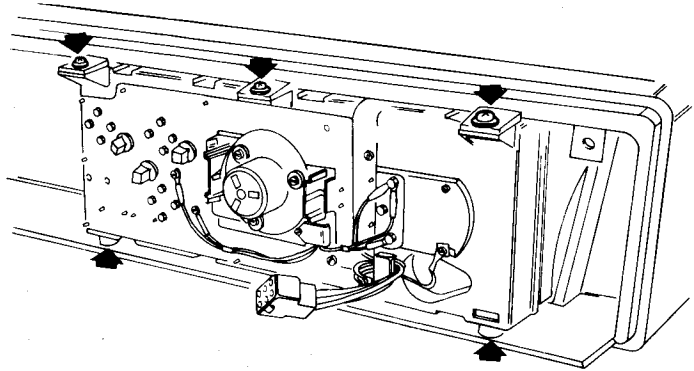
Prior to performing any interventions, ensure the ignition key is in the "ST" position and the battery ground cable is disconnected.

2. Unscrew the five screws indicated in the figure, and remove the cluster.

3. Install by reversing the order of removal.

REMOVAL AND INSTALLATION

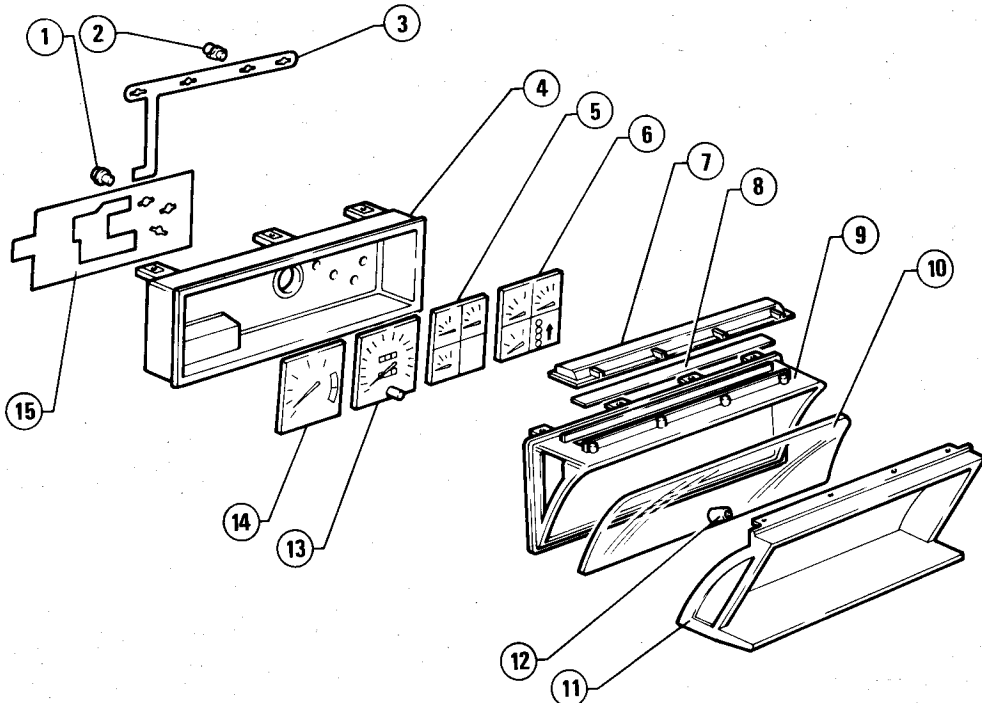
1. Remove the instrument panel dashboard (refer to: Group 66 - Dashboard).



DISASSEMBLY AND REASSEMBLY

CAUTION:

Operate with necessary caution to avoid damaging the printed circuit boards and electronic components.

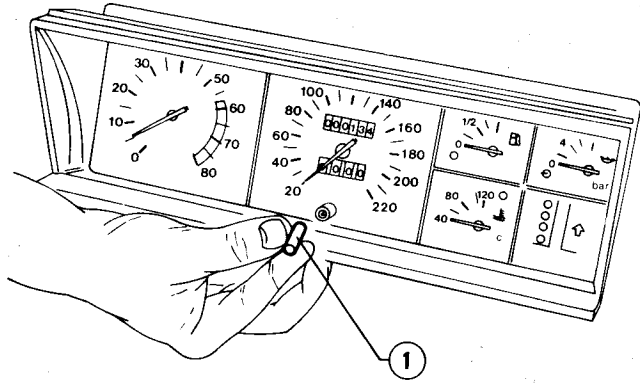


- 1 Indicators warning lamp (complete with lampholder)
- 2 Cluster lighting lamp (complete with lampholder)
- 3 Cluster lighting lamps power circuit board
- 4 Cluster box
- 5 Instrument panel (without performance gauge)
- 6 Instrument panel (with performance gauge)
- 7 Cluster lighting lamps support
- 8 Transparent strip for cluster lighting

- 9 Front support
- 10 Transparent strip
- 11 Outer case
- 12 Trip odometer reset pushbutton
- 13 Speedometer - odometer
- 14 Rev counter
- 15 Instrument power circuit board

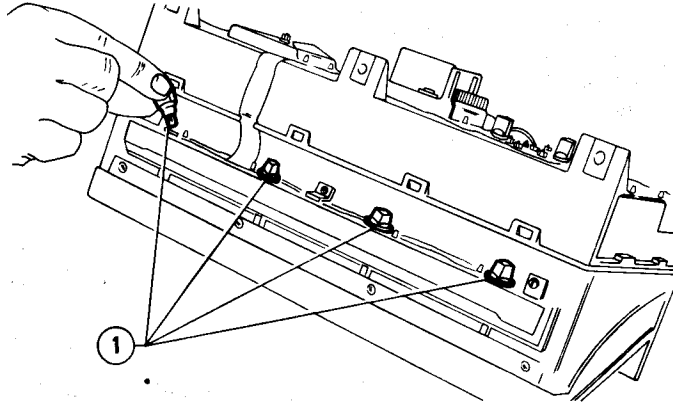
CLUSTER AND ELECTRONIC INSTRUMENTS

1. Remove trip odometer reset pushbutton ①, which has been pushed into cluster.



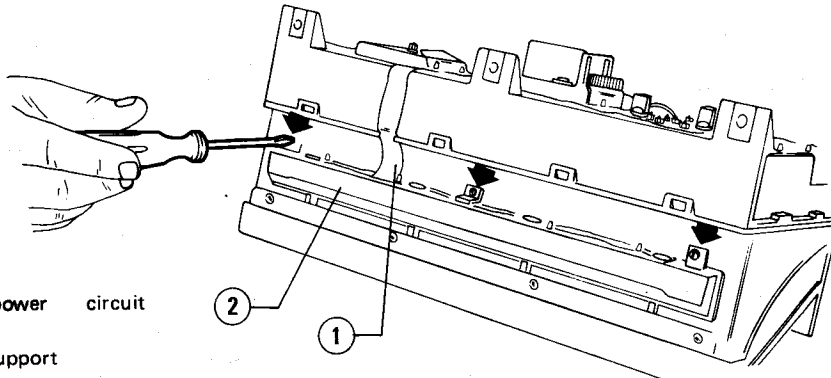
1 Trip odometer reset pushbutton

2. Rotate and withdraw the four lamps lighting cluster ① (complete with the related lampholders).



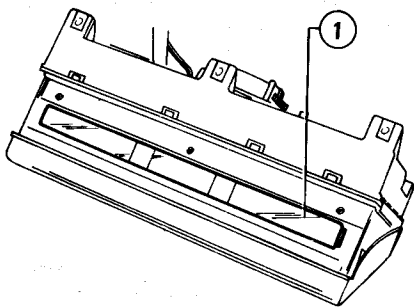
1 Lamps lighting cluster (complete with the lampholder)

3. Unscrew the three screws shown in the figure, carefully move the lighting power circuit board ①, and remove lamp support ②.



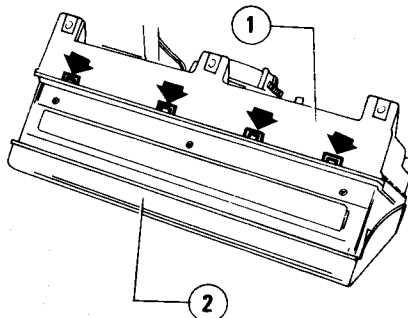
1 Cluster lighting power circuit board
2 Cluster lighting lamps support

4. Remove green transparent strip ①.



1 Cluster lighting transparent strip

cover) from the cluster box:
a. Release the four strips shown in the figure, from their seat on box ① upper part.

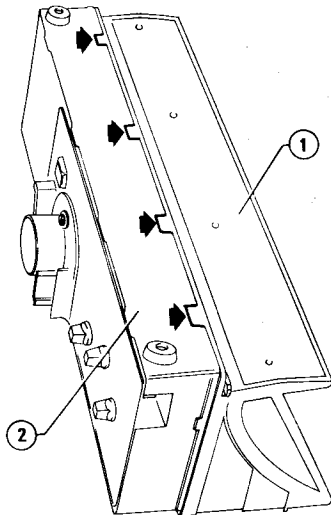


1 Cluster box
2 Front support

b. Lift the four lower clips (shown in the figure) and separate front support ① (complete with transparent strip and cover) from cluster box ②.

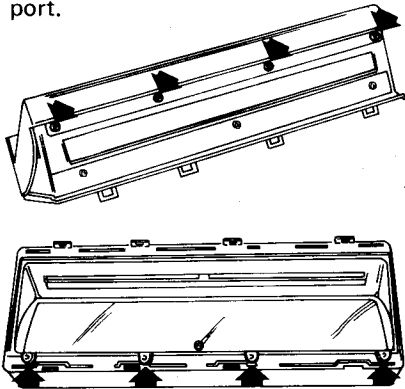
5. Separate the front support (complete with transparent strip and

CLUSTER AND ELECTRONIC INSTRUMENTS

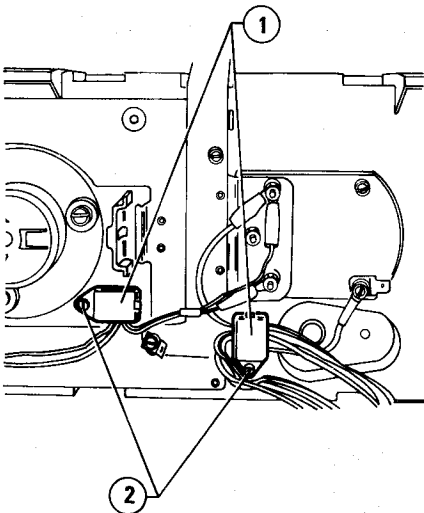


- 1 Front support
- 2 Cluster box

6. If required, unscrew the eight screws shown in the figure; and separate the cover from front support.




7. Unscrew the two screws (2) and remove covers (1).



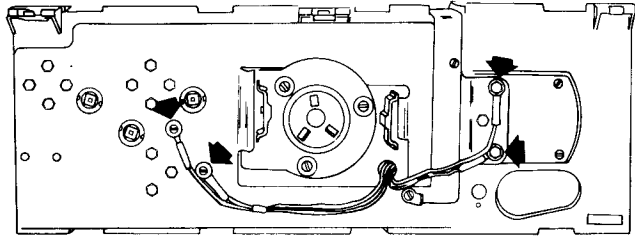
- 1 Covers
- 2 Screws

8. Disconnect the electric leads operating as follows:

20  **6V iniezione**

Unscrew the two screws and the two

nuts indicated in the figure, and disconnect the electric leads.

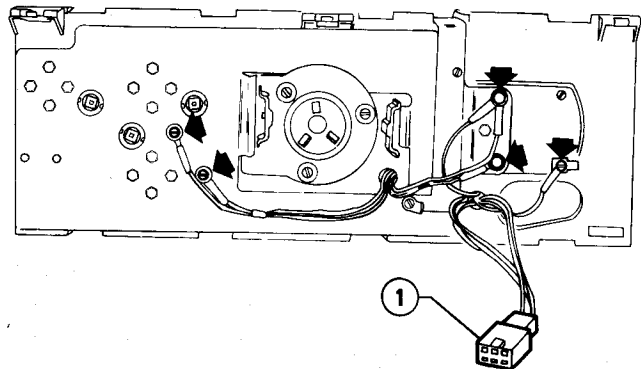


16 **13** **20** **turbodiesel**

- a. Unscrew the three screws and the two nuts indicated in the figure, and disconnect the electric leads.
- b. Extract the terminals of the six leads in the performance gauge from connector (1) (Models **16** **13**).

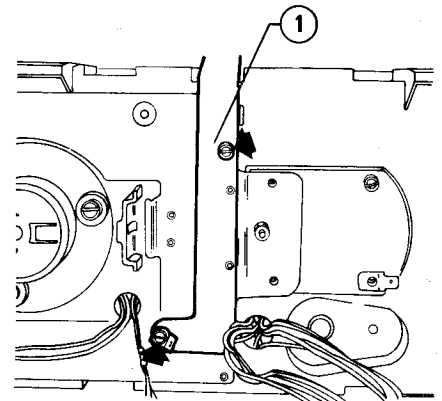
CAUTION:

Note down the connector wires position so as to connect them correctly when reassembling.



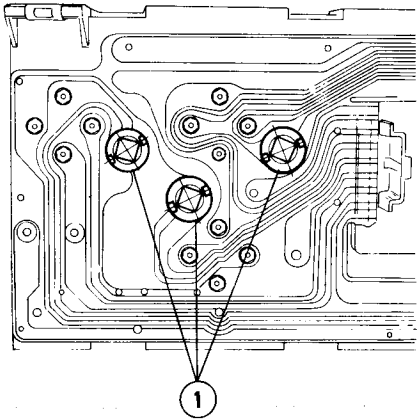
1 Performance gauge connector

9. Unscrew the two screws indicated in the figure and remove the cluster lighting lamps circuit board (1).



1 Cluster lighting printed circuit board

10. Rotate and extract the three lampholders of indicators ① warning lamps (complete with lamp).



1 Indicators warning lamp holder

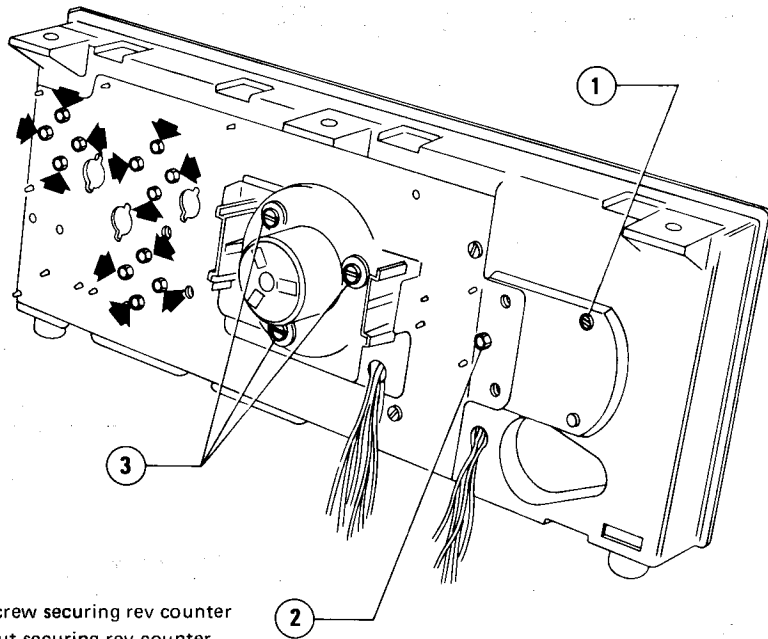
11. Proceed to disassemble the cluster instruments.

CAUTION:

Disassemble the indicators in the following order: cluster, level indicators (with performance gauge if present), rev counter and speedometer-odometer. This order must be followed due to the fact that the cover edges overlap.

- a. Unscrew the twelve nuts in the figure, and remove the level indicators panel.
- b. Unscrew nut ②, and screw ① (two screws ① for 20 and 6V iniezione) and remove rev counter.
- c. Unscrew the three screws ③ and remove the speedometer-odometer.

12. Reassemble by reversing the order of removal.



- 1 Screw securing rev counter
- 2 Nut securing rev counter
- 3 Screw securing speedometer odometer

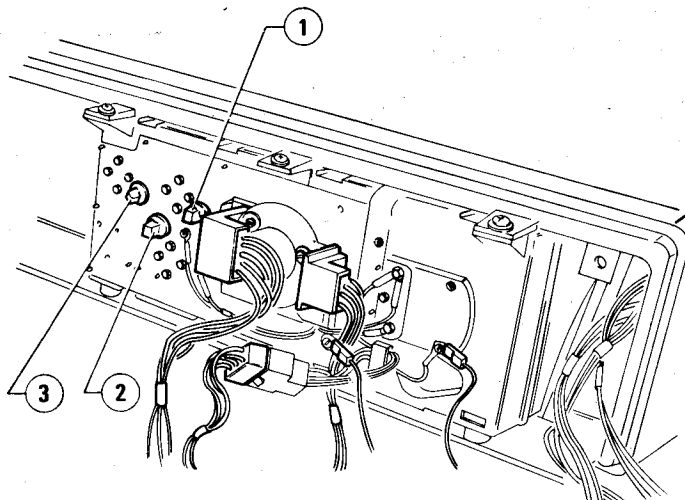
REPLACEMENT OF WARNING AND LIGHTING LAMPS

- 1. Remove the instrument panel dashboard without disconnecting wiring (refer to: Group 66 - Dashboard - Removal and Installation).
 - a. Remove the front cigar lighter finisher.
 - b. Remove the instrument panel without disconnecting wiring.
 - c. Remove the glove box.
 - d. Remove the switch finishers on cluster left-hand side, and disconnect wiring.
 - e. Unscrew the two screws and remove the frame on cluster left-hand side.

- f. Disconnect the instrument panel dashboard complete with cluster without disconnect wiring.
- 2. Rotate and extract the lampholder, then withdraw the bulb from it.
- 3. Replace the bulb with another of the same type, and refit by reversing the order of removal.

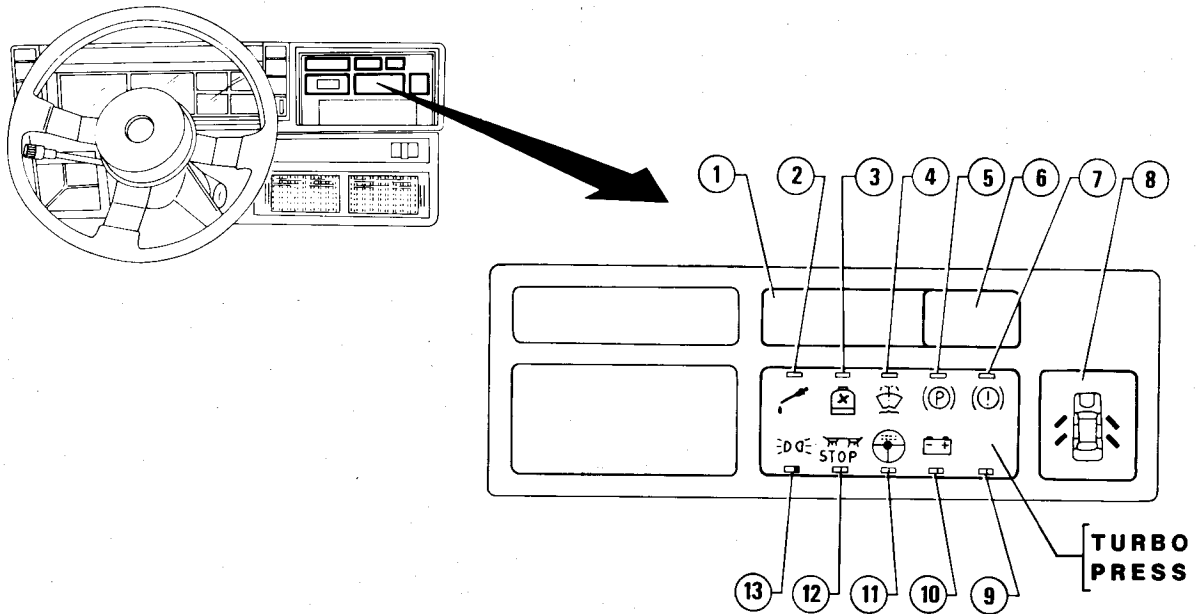
CAUTION:

Use only original lamps supplied by ALFA ROMEO.



- 1 Fuel reserve warning lamp
- 2 Coolant temperature warning lamp
- 3 Engine oil pressure warning lamp

ALFA ROMEO CONTROL (AR.C.)



- 1 Red alarm warning lamp disabling key
- 2 Engine oil level warning lamp
- 3 Coolant liquid level warning lamp
- 4 Windscreen washer liquid level warning lamp
- 5 Handbrake efficiency warning lamp
- 6 Red general alarm warning lamp (Check)
- 7 Brake oil and pad wear oil level warning lamp

- 8 Door closing efficiency warning lamp
- 9 Turbocharger max pressure warning (2.0 turbodiesel)
- 10 Generator efficiency warning lamp
- 11 Cluster warning lamps efficiency warning lamp
- 12 Stop lights efficiency warning lamp
- 13 Side/rear fog lights efficiency warning lamp

THEORY OF OPERATION

Refer to: **Alfa 90**

INSPECTION OF AR.C. ON VEHICLE

Refer to: **Alfa 90**

ALFA ROMEO CONTROL (AR.C.) WIRING DIAGRAM

As regards the wiring diagrams of model 161.00, refer to model 161.02 unless other specific indication.

INDIVIDUAL FUNCTIONS

Refer to: **Alfa 90**

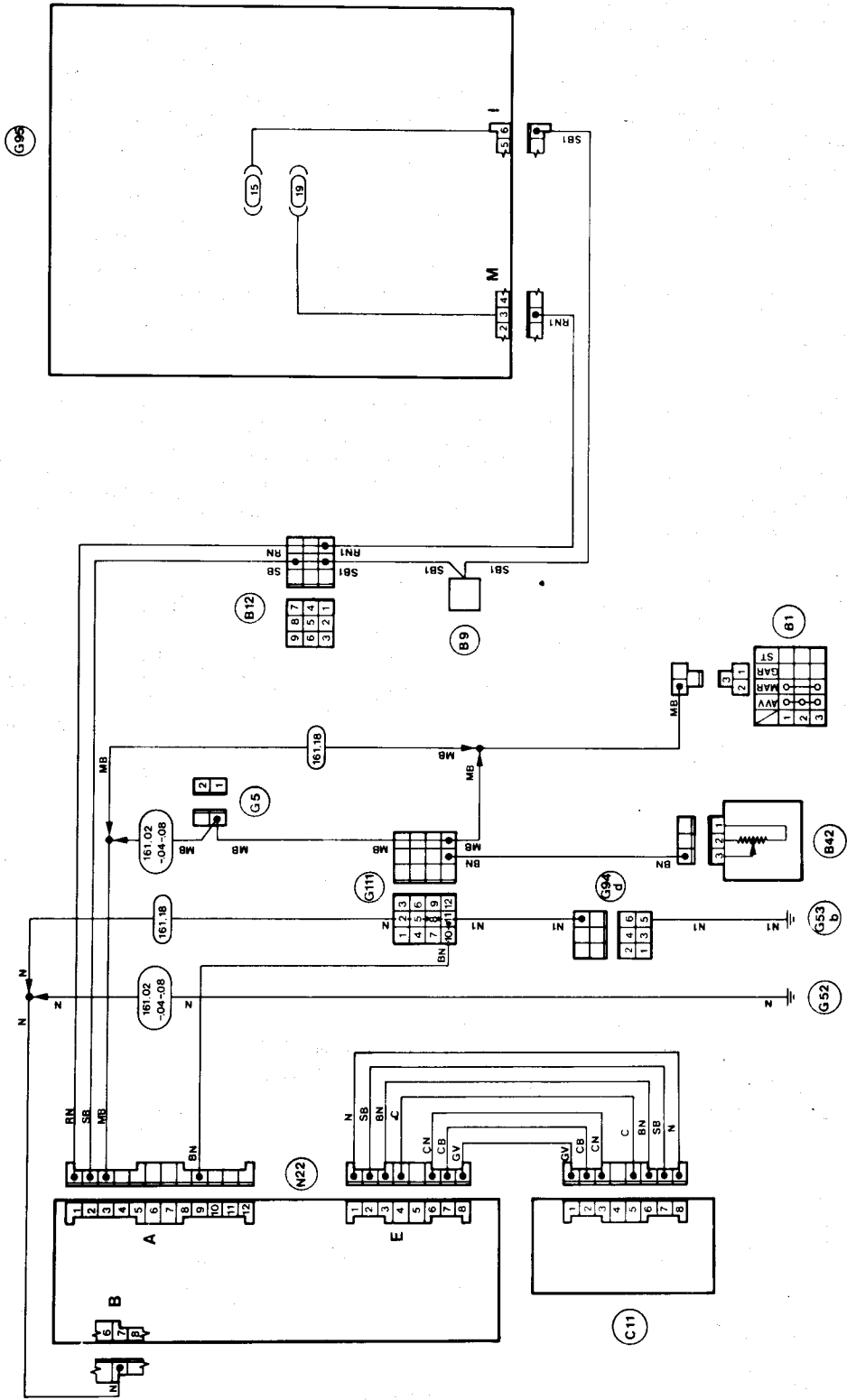
TROUBLE DIAGNOSIS AND CORRECTIONS

Refer to: **Alfa 90**

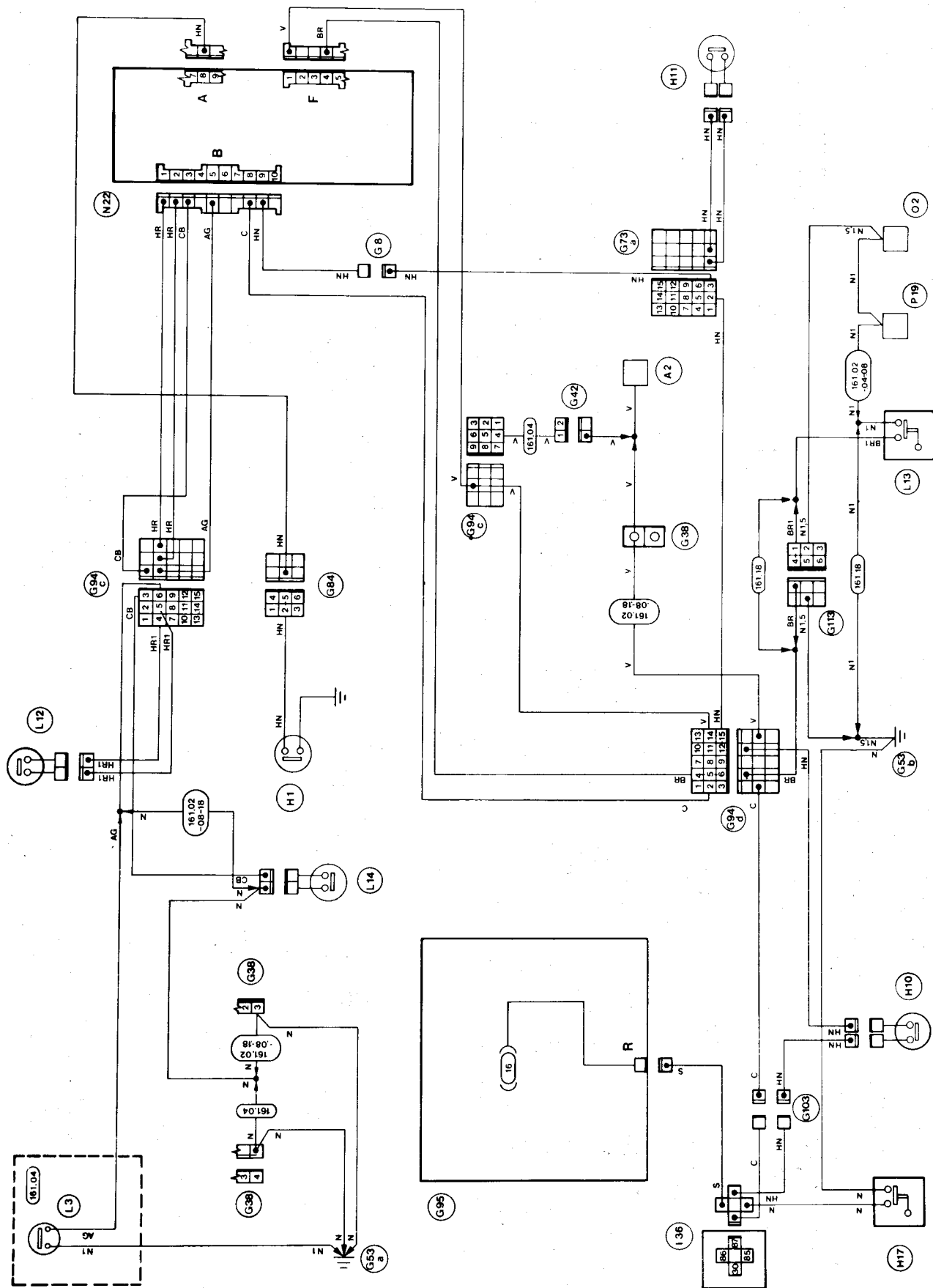
ALFA ROMEO CONTROL (AR.C.) PIN OUT

Refer to: **Alfa 90**

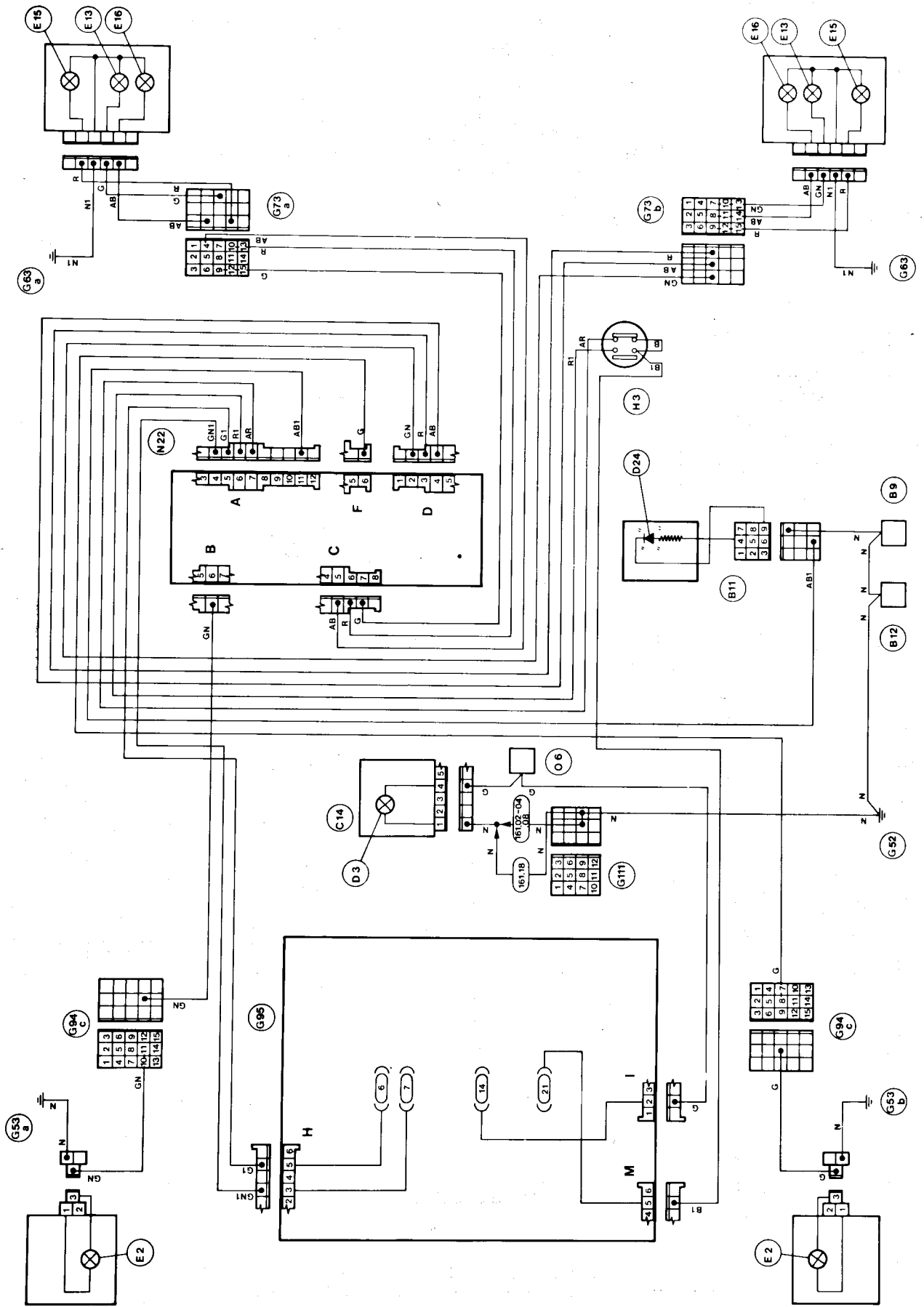
POWER SUPPLIES AND DISPLAY



SENSORS

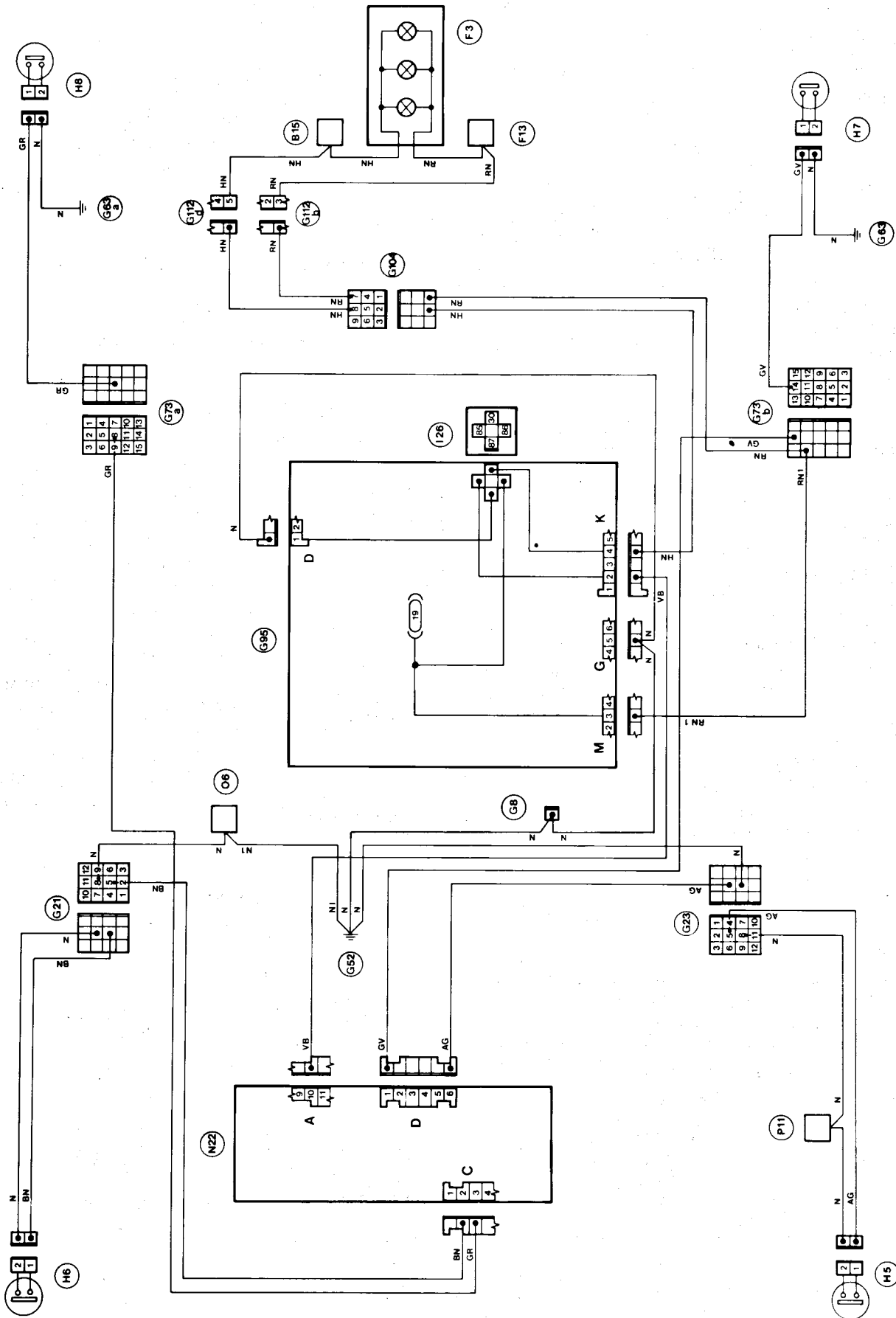


SIDE, STOP AND REAR FOG LIGHTS



CLUSTER AND ELECTRONIC INSTRUMENTS

DOOR CLOSING PUSHBUTTONS AND ROOF LIGHTS TIMING



TRIP COMPUTER

INTRODUCTION

The BOSCH TRIP COMPUTER is a computer-clock that supplies data on the vehicle running conditions, which enables the driver to drive his vehicle economically.

It has been built using integrated circuits technology, and has a liquid crystal display.

The electronics consist of a computer that receives data regarding speed, fuel consumption and fuel in tank, which it elaborates and displays in various forms that can be selected by means of a pushbutton situated on the TRIP COMPUTER panel. The data calculated while running is stored in a "volatile" - type memory which implies a continuous power supply even when the vehicle is idle. If the battery or the TRIP COMPUTER itself is detached, the running data must be recalculated from SCRATCH. As has been previously mentioned, the micro-computer receives signals from external sensors, but since these differ from vehicle to vehicle, adjustments must be made on each vehicle to obtain correct information. For this reason, in addition to the main programme, the TRIP COMPUTER also contains various subprogrammes that can be selected via the four code pins (pins 7-11-12-13) to be found on the rear connector. Each selection corresponds to a certain type of vehicle and consequently to different ways of handling the input data. The main programme and the various subprogrammes reside in the "non volatile" memories, and are pre-established by the TRIP COMPUTER manufacturer. Consequently they cannot be subsequently modified, or lost by disconnecting the power supply.

TRIP COMPUTER functions are:

- **CLOCK**
Hours and minutes
- **IMMEDIATE CONSUMPTION**
For speeds lower than 20 km/h (12.4 mph) data is expressed in l/h (gall/h for GB.)
For speeds higher than 20 km/h (12.4 mph) data is expressed in l/100 km (gall/100 km for GB.)
- **AVERAGE CONSUMPTION**
Data expressed in l/100 km (gall/100 km for GB.)
- **AVERAGE SPEED**
Data expressed in km/h
- **ENDURANCE**
Data expressed in km
- **CHRONOMETER**
Up to 10 minutes = min. - sec. sec. - 1/10 sec
Up to 60 minutes = min. min. - sec. sec.
Up to 100 hours = hours hours - min. min.
More than 100 hours = hours hours hours hours
- **EXTERNAL TEMPERATURE**
Data is expressed in degrees centigrade (°C) (Fahrenheit for GB.) (°F), positive and negative according to temperature measured. The selection and zeroing pushbuttons are active only with ignition key in the "MAR" position.

DISPLAY LIGHTING

There is a display illumination lamp behind the TRIP COMPUTER, and the brightness of the display depends on the intensity of this lamp. When the side lights are lit, the brightness diminishes to avoid distracting the driver during night driving.

CLOCK

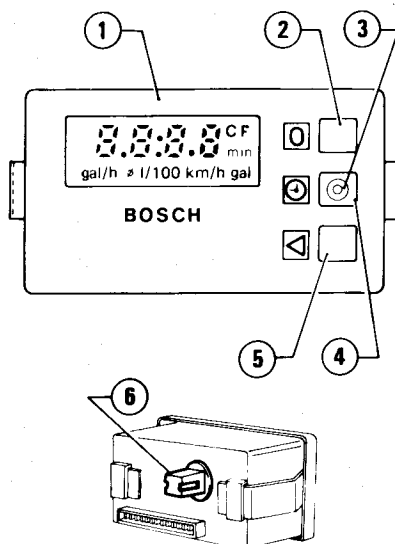
The time indication goes from 00:00 to 23:59.

The clock function can be returned to at any moment by pressing pushbutton ①.

To set the clock to the right time, pushbutton ② must be pressed once, which will cause the minute figures to disappear. Repeatedly press pushbutton ③ to advance the hours one by one, and keep the same pushbutton pressed to advance more rapidly.

Pressing pushbutton ④ a second time, the minute figures will reappear and the hours disappear. The minutes can be adjusted with the above-mentioned procedure.

The clock will be reenabled either by pressing pushbutton ⑤ for a third time, which will display the hour and minute figures, or by pressing ⑥, which will display the last preselected function, or by removing the ignition key.



- 1 Positive contrast display
- 2 Function selection pushbutton
- 3 Clock selection pushbutton
- 4 Tank capacity regulation cover
- 5 Pushbutton for function resetting and selection, hour-minute regulation
- 6 Display illumination lamp

SELECTING INDIVIDUAL FUNCTIONS

Lightly pressing pushbutton ◁ repeatedly with the ignition on, will display the various functions in the following order.

- Immediate consumption
- Average consumption
- Average speed
- Endurance
- Chronometer
- External temperature

Keeping pushbutton ◁ pressed, the displaying of the functions will be continuously rotated. When one of these functions is changed to the clock function, and then back again by pressing pushbutton ◁, the last selected function will be displayed.

In all other cases, pressing pushbutton ◁ will display the "IMMEDIATE CONSUMPTION" function.

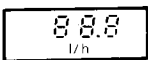
RESETTING

Pushbutton ○ is not only used for setting the right time, but also for zeroing the average speed, and immediately up-dating the endurance function after filling up with fuel, when these functions have been selected.

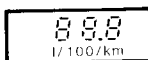
To clarify the last-mentioned function, it should be noted that the TRIP COMPUTER takes about 10 minutes to calculate rapid changes in the fuel level.

This means that the endurance value is not immediately updated after refilling, and the low fuel level indication remains.

IMMEDIATE CONSUMPTION FUNCTION



Speeds lower than 20 km/h (12.4 mph)



Speeds above 20 km/h (12.4 mph)

Maximum indication is 40 litres (8.79 Imp. gall.).

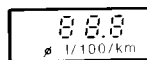
Value is updated every second. To prevent indication fluctuating. The TRIP COMPUTER calculates the new data with the following formula:

$$\text{New data} = \frac{3 \times \text{pre-vious data} + \text{new data}}{4}$$

This system reduces fluctuations (considerably), and the immediate consumption data will be stable within a few seconds of changes in running conditions occurring.

Finally, it should be pointed out that on injection operated engines, the immediate consumption indication is affected by the battery voltage. Consequently, the TRIP COMPUTER automatically introduces correction factors to indicate the real values.

AVERAGE CONSUMPTION FUNCTION



Maximum indication is 40 litres (8.79 Imp. gall.).

The average consumption value does not take into account the consumption at speeds less than 20 km/h (12.4 mph) and therefore, when the vehicle stops with the engine running, the data supplied will be lower than the real average consumption. If changes in the running conditions occur, the average consumption value tends to stabilize within about 3 minutes of the change taking place. When driving conditions are constant, the average consumption is equivalent to the immediate consumption.

The TRIP COMPUTER calculates with the following formula:

$$\text{Average consumption} = \frac{255 \times \text{pre-vious data} + \text{immediate consumption}}{256}$$

If the power supply is detached and reattached (electrical interruption or battery detached) the data will be recalculated from scratch. There is no resetting command for this function.

AVERAGE SPEED FUNCTION



Data is constantly updated according to the momentary vehicle speed, but only if the engine is running.

This function can be reset, for example at the beginning of a journey, by pressing pushbutton ○ for more than 1 second. After resetting, four dashes (----) will appear for about 1 second on the display followed by the immediate speed.

ENDURANCE FUNCTION



The letter "H" appearing before the endurance indication indicates a quantity of fuel greater than 40 litres (8.79 Imp. gall.).



The display indicates vehicle endurance for the quantity of fuel between 7 and 40 litres (1.54 and 8.79 Imp. gall.).



Blinking display
The letter "A" preceding the endurance indication indicates a quantity of fuel between 7 and 3 litres (1.54 and 0.659 Imp. gall.).



The four flashing "A A A A" indicate a quantity of fuel less than **3 litres (0.659 Imp. gall.)**.

The purpose of this function is to inform the driver of the vehicle's endurance level on the basis of the quantity of fuel in the tank, and to provide a warning indication if the fuel drops below the pre-established level of **7 litres (1.54 Imp. gall.)**. In the last-mentioned case; the TRIP COMPUTER will switch to this function automatically so as to indicate that fuel is low, both when switching on and while running. This condition is also indicated by the blinking of the display. If, when the vehicle is running and there is a warning indication, another function is selected, this function is displayed, but it is not possible to automatically switch to the endurance function while the first warning indication persists (**7 to 3 litres (1.54 to 0.659 Imp. gall.)**) or when the second fuel warning level is reached (**< 3 litres (< 0.659 Imp. gall.)**).


For a fuel level higher than **40 litres (8.79 Imp. gall.)**, endurance is expressed in km of endurance corresponding to **40 litres (8.79 Imp. gall.)** of fuel and to the average consumption of the last **30 minutes** running.

WARNING:
This average consumption may be different from that indicated by the "AVERAGE CONSUMPTION" function since it is calculated over a longer period of time.

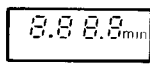
The above is also valid for the fuel level between **7 and 40 litres (1.54 and 8.79 Imp. gall.)** except that the quantity of fuel used in the calculation is the actual amount measured by the *Televel*.

In the same way, as regards the fuel level between **7 and 3 litres (1.54 and 0.659 Imp. gall.)** the remaining vehicle endurance is indicated preceded by the letter "A". This condition of fuel reserve is emphasized by the blinking of the display. For a fuel level lower than **3 litres (0.659 Imp. gall.)** there is no endurance

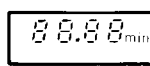
value but four flashing "A A A A" appear to indicate the alarm condition.

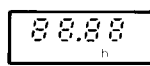
After filling with fuel, great care must be taken with the endurance indication since the TRIP COMPUTER, in order to avoid incorrect endurance indications when going round bends, uphill or downhill, takes approx. **10 minutes** to calculate the actual amount of fuel contained in the tank. Consequently it is possible that, after filling the tank, the display indicates a fuel reserve condition or the previous endurance indication. To obtain the new data immediately, press pushbutton  for more than **1 second** with the endurance function selected. Four dashes (— — — —) will appear followed immediately by the endurance level corresponding to the new quantity of fuel.

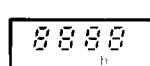
CHRONOMETER FUNCTION


 up to **10 minutes**
min. sec. sec.

1/10 sec.

 from **10 to 60 minutes**
min. min. sec. sec.

 from **60 minutes to 100 hours**
hour hour min. min.

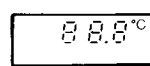
 more than **100 hours**
hour hour hour hour

When this function is selected, by pressing pushbutton  it is possible to perform the following operations in the given order.

- chronometer reset
- chronometer start
- chronometer stop

When moving on to another function, the chronometer remains active. When the ignition key is removed the count is interrupted but will continue from the same value when the ignition key is returned to the "MAR" position.

EXTERNAL TEMPERATURE FUNCTION

 The TRIP COMPUTER gives the temperature value measured with an external probe positioned near one front wheel.

This indication is extremely useful in winter to establish whether there is the possibility of ice forming on the road surface.

WARNING:
The road surface can be icy even when the temperature is a few degrees above zero. When the temperature drops below zero, the minus sign (—) will appear on the display in front of the temperature indication.

INITIALIZATION, TESTS, SETTING


INITIALIZATION

If the power supply fails, the TRIP COMPUTER loses all the data contained in its "volatile" memory and calculations must start from scratch. If, when the power supply is restored, the figures on the display are incomplete, the power supply must be removed again, and after a wait of a few minutes reconnected. The data that is lost is:

- Time
- Average consumption
- Average speed
- Average consumption of the last **30 minutes** used for calculating vehicle endurance.


In addition, it takes approximately **10 minutes** for the exact quantity of fuel in the tank to be calculated (tank contents are calculated only when ignition key is in "MAR" position).

In fact, when power is restored, it is this characteristic that causes a warning indication, four flashing "A A A A" of the endurance function, to be displayed regardless of the tank contents.

To reinitialize the TRIP COMPUTER with the four "A A A A" flashing, pushbutton  must be first of all pressed for more than **1 second**. In this way the quantity of fuel in the tank will be immediately calculated and the endurance indication that appears on the display will refer to this quantity and an average consumption corresponding to an initial value of **10 litres (2.2 Imp. gall.) per 100 km (62.1 mi.)**. In fact,

since no real consumption value has been stored in the TRIP COMPUTER memory, this data is used as a base, and progressively updated as the vehicle travels along.

Once this resetting has been carried out, select the clock function and regulate it as described in the relevant chapter.





The average speed can also be reset, but this operation is left for the driver to decide whether it should be done at initialization or when setting off. In both cases, when the average speed function has been selected, and pushbutton  pressed for more than 1 second, the immediate speed will appear on the display.

The average consumption function cannot be reset, and therefore it is necessary to run for at least 3 minutes until the data, that starts from scratch after a power failure, has reached a significant value.

TEST

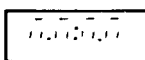
Tests can be performed with the ignition key in the "MAR" position to check whether the TRIP COMPUTER has been correctly attached to the vehicle wiring.

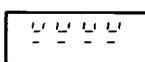
Press the three keys of the TRIP COMPUTER once and simultaneously. The display will indicate the numbers corresponding to the vehicle engine type.

| | |
|--|-----------|
|  | I.h. 7.56 |
|  | r.h. 8.56 |
|  | I.h. 7.64 |
|  | r.h. 8.64 |



If the indication does not correspond to the engine, look for the cause of the failure.

Press the three keys simultaneously once again, and the display test will be carried out lighting up the following sections alternatively.

 1st blinking

 2nd blinking

Press the three keys simultaneously for a third time, and the power voltage measured on the TRIP COMPUTER input connector will be indicated.


Press pushbutton  or  to exit this Test cycle.



SETTING

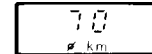
The only setting that need be made is the alignment between the fuel in the tank and the amount read by the TRIP COMPUTER.


This value is already set by the manufacturer and corresponds to 7 litres (1.54 Imp. gall.) of fuel which must correspond to the *Televel* electrical resistance of 264 Ohm ± 4 Ohm. These values can alter if the tank is deformed or if there are other defects, making it necessary to realign the setting.

To do this, completely drain the tank, start the engine and wait for the engine to stop due to lack of fuel. Then fill the tank with exactly 7 litres (1.54 Imp. gall.) of fuel.

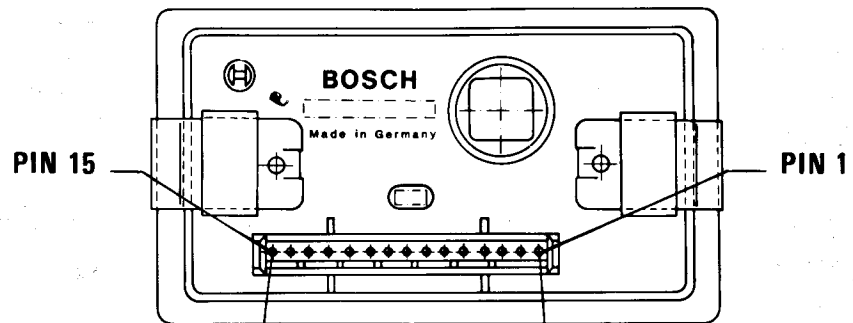
Remove the rubber cap on pushbutton  on the TRIP COMPUTER.



Turn the ignition key to the "MAR" position. Press pushbutton  and  simultaneously and check the indication on the display. If the instrument is correctly set the following indication will be displayed.



If not, insert a very fine screwdriver, at least 40 mm (1.57 in) long, in the hole of pushbutton , and adjust the trimmer inside until the correct indication is obtained.

TRIP COMPUTER CONNECTOR



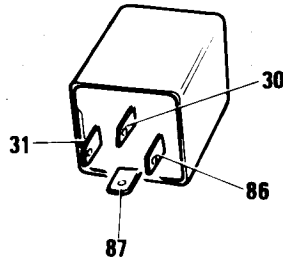
| | |
|---|--|
| PIN 1 = GROUND (terminal 31) | PIN 9 = External temperature transducer |
| PIN 2 = + 12 V direct (terminal 30) | PIN 10 = Side lights (terminal 58) |
| PIN 3 = Pulses proportion to the speed | Code pins. The combination of the pins connected to ground or left free indicates the engine type on which the TRIP COMPUTER is fitted |
| PIN 4 = Consumption transducer (injection time  (Fuel flow ) | |
| PIN 5 = Not connected | |
| PIN 6 = + 12 V with key turned on | PIN 14 = Fuel level with <i>Televel</i> supplied with 12 V |
| PIN 7 = Code pin | PIN 15 = Connected with PIN 4 for flow gauge additional resistor |
| PIN 8 = External temperature transducer | |

PULSE CONVERTER



Technical data

Nominal voltage 12 V
Operational voltage. . . . 9 ÷ 16 V



PIN 30 : Distance covered signal input
PIN 31 : Ground
PIN 86 : +
PIN 87 : Distance covered signal output

CODE

The following table gives the features and code included in the TRIP COMPUTER programme.





| Vehicle | 20 | | 6V iniezione | |
|---|---|------|--|------|
| | LHD | RHD | LHD | RHD |
| N° of cylinders | 4 | | 6 | |
| Fuel pressure kpa (bar; kg/cm ² ; p.s.i.) | - | | 300 (3.0; 3.06; 43.5) | |
| Speed transducer pulses/km (pulses/mii) | 14215 (22876) | | 11225 (18072) | |
| Televel voltage | 12 | | 12 | |
| Code read on Trip Computer by pressing the three pushbuttons simultaneously | 7.56 | 8.56 | 7.64 | 8.64 |
| PIN 7 TRIP PIN 11 TRIP PIN 12 TRIP PIN 13 TRIP PIN 15 | ground not connected ground ground connected to pin 4 | | ground not connected not connected not connected not connected | |

TROUBLE DIAGNOSIS AND CORRECTIONS

Trouble diagnosis refers to the detection of defects in the vehicle's electrical system. It is taken for granted that the TRIP COMPUTER is operating correctly.

| Condition | Probable cause | Fault verification and corrective action |
|-------------------------------|---|--|
| Display fails to light up | Illumination lamp bulb blown | Replace illumination lamp bulb located at the back of the TRIP COMPUTER |
| Display indication incomplete | <ul style="list-style-type: none"> Failure or considerable drop in power supply Display defective | <p>With ignition key remove disconnect the positive battery terminal, wait approximately 120 seconds and then reconnect it. If the defect is repeated and the battery is in good condition check the TRIP COMPUTER power supply connections (pins 1 and 2)</p> <p>Perform the display test as described in the <i>Tests</i> chapter</p> |

CLUSTER AND ELECTRONIC INSTRUMENTS

| Condition | Probable cause | Fault verification and corrective action |
|--|---|--|
| Running data false | <ul style="list-style-type: none"> • Incorrect coding on TRIP COMPUTER connector | Perform the test described in the <i>Tests</i> chapter and check that the "CODE" data corresponds to the vehicle engine type |
| "AVERAGE SPEED" incorrect (different from speedometer indication) | <ul style="list-style-type: none"> • Cluster defective | Run the vehicle at constant speed Reset "AVERAGE SPEED km/h". Wait for the indication to appear on the display, and if this is different from that indicated on the speedometer, look for the fault in the speedometer. |
| "AVERAGE SPEED" function fails to operate | <ul style="list-style-type: none"> • Pulse converter faulty • Break in wiring • Tachymetric pulse generator faulty | Replace pulse converter Check continuity of connection between pin 3 of TRIP COMPUTER and tachymetric pulse generator Replace tachymetric pulse generator |
| Consumption indicator fails to operate - Only l/h is displayed - Consumption indication is not displayed - or is displayed but incorrect | <ul style="list-style-type: none"> • Speedometer pulses relating to speed are not received • Signal from flow gauge (20) is not received • Flow gauge faulty (20) • Signal relating to injection time not received from injection control unit ( 6V iniezione) • Injection control unit faulty ( 6V iniezione) | Carry out operations described for "average speed function fails to operate" Check electrical continuity between pin 4 of TRIP COMPUTER and flow gauge. Verify electrical continuity of connection of TRIP COMPUTER pin 5 . Replace the flow gauge Verify electrical continuity between pin 4 of TRIP COMPUTER and electronic control unit Replace the injection control unit. |
| Endurance value false | <ul style="list-style-type: none"> • Interruption <i>Televel</i> circuit | Press pushbuttons  and  simultaneously for more than 1 second . The display should show the quantity of fuel, in litres, contained in the tank multiplied by 10. |

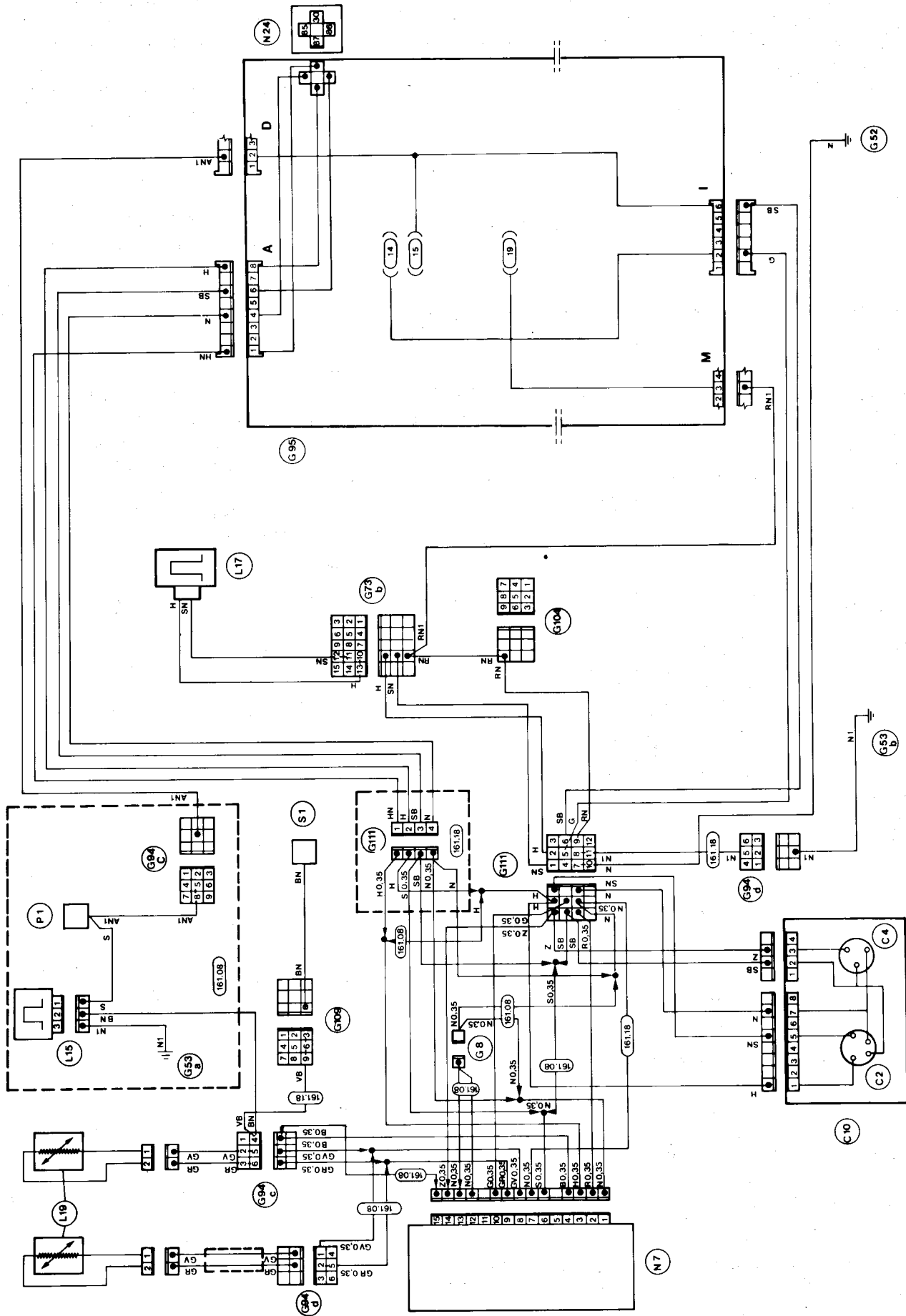
CLUSTER AND ELECTRONIC INSTRUMENTS

| Condition | Probable cause | Fault verification and corrective action |
|--|--|---|
| Endurance value false (Continued) | <ul style="list-style-type: none"> • Interruption <i>Televel</i> circuit (continued) • TRIP COMPUTER out of setting | If there is a big difference, remove the <i>Televel</i> connections and check the electrical resistance at the <i>Televel</i> potentiometer terminals 7l (1.54 Imp. gall.) = 264 Ohm 1/2 = 118 Ohm ± 10 Ohm 4/4 = 0 to 7 Ohm Align TRIP COMPUTER with tank as indicated in paragraph " <i>Initialization, Tests, setting</i> " |
| External temperature indication incorrect - Indication unreliable - Display indicates - 47.5°C | <ul style="list-style-type: none"> • Temperature probe defective • Interruption on probe wiring | Disconnect the TRIP COMPUTER connector. Connect a tester on pins 8 and 9 of the disconnected connector taking care not to damage the pins. Check the sensor electrical resistance which must relate to the temperature as follows: 0°C (32°F) ≅ 16 k Ohm 10°C (50°F) ≅ 10 k Ohm 15°C (59°F) ≅ 7.8 k Ohm 20°C (68°F) ≅ 6.2 k Ohm 25°C (77°F) ≅ 5 k Ohm 30°C (86°F) ≅ 4 k Ohm Verify the connection continuity between pins 8 and 9 of TRIP COMPUTER and temperature probe |

TECHNICAL DATA

| | |
|---|---|
| - Power supply voltage | 9 V to 16 V |
| - Minimum voltage for data retention | 6 V |
| - Absorption with key removed | ≤ 10 m A. |
| - Absorption with key turned on | ≤ 260 m A. |
| - Clock accuracy | < 30 sec/month with 13 V - voltage at 25°C (77°F) |
| - External temperature measuring accuracy | ± 2°C (± 3.6°F) from - 30°C (- 22°F) to + 50°C (122°F); ± 0.5°C (0.9°F) at 0°C (32°F) |

TRIP COMPUTER WIRING DIAGRAM



PERFORMANCE GAUGE

Refer to **Alfa 90** - Carburettors models

PERFORMANCE GAUGE WIRING DIAGRAM

