

# Chapter 10 Electrical system

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## Specifications

<b>System type</b> .....	12 volt, negative earth		
<b>Battery type (standard)</b> .....	12 volt 45 Ampere hour at 20 hour rate (special version 55 to 60 Ampere hour)		
<b>Alternator</b>	<b>Bosch</b>	<b>Marelli</b>	<b>Ducellier</b>
Models .....	K1-14V-55A 20	AA 124-14V-42A or AA 125-14V-55 A	514.001 A or 12V 43A
Cut in speed at 12V (25°C) .....	1000 rpm	1000 rpm	1150 rpm (14V)
Speed at $\frac{2}{3}$ max amp output .....	2000 rpm (37 amps)	–	2250 rpm (37 amps)
Speed at maximum amp output .....	6000 rpm	7000 rpm	8000 rpm
Maximum shaft speed .....	12000 rpm	13000 rpm	12500 rpm
Maximum amperage .....	55 amps	44 amps (AA 124)/ 55 amps (AA 125)	43 amps
Direction of rotation .....	Clockwise	Clockwise	Clockwise
Induction coil resistance – ohms .....	–	4.3 + 0.2 ohms at 20°C (68°F)	4 + 0.2 ohms at 20°C (68°F)

<b>Alternator drivebelt tension</b> .....	10 to 15 mm (0.39 to 0.59 in) deflection under a load of 5 kg (11 lbs) on centre of horizontal section of belt	
<b>Starter motor</b>	<b>Bosch</b>	<b>Marelli</b>
Model .....	12V 1.1CV	E 100 1.3/12
Rated output .....	1.1 kW	1.3 kW
Number of poles .....	4	4
<b>Bulbs</b>	<b>UK and Europe</b>	<b>USA</b>
Headlights:		
Main beam .....	55W (halogen)	
Dipped beam .....	55W (halogen)	
Direction indicators:		
Front and rear .....	21W	5/21W
Side repeaters .....	4W	3W
Reversing lights .....	21W	21W
Stoplights .....	21W	21W
Side or parking lights .....	5W	5W
Engine bay light .....	5W	4W
Courtesy light .....	5W	
Boot light .....	4W	4W
Cigar lighter light .....	4W	4W
Number plate lights .....	4W	5W
Fibre optic light for switches .....	3W	
Clock illumination .....	3W	3W
Glovebox light .....	3W	4W
Instrument lights .....	3W or 1.2W	3W
Heating control lights .....	3W or 1.2W	3W
Power window lift switch lights .....	3W or 1.2W	
Warning lights .....	1.2W	3W
Door safety lights .....		4W
Fasten seat belts light .....	Not fitted	3W
EGR renewal light .....	Not fitted	3W
Windscreen wiper switch light .....		1.2W
Hazard flasher switch light .....		1.2W
Warning lights for heated rear window light, side lights, main beam light, indicator light, oil light, engine overheating light, no charge light, fuel reserve light, brakes and brake pad wear limit indicator light, EGR service (Coupe) light, fasten seat belt light (Coupe) .....		1.2W

### Fuses – UK and European models (up to 1979)

Fuse No	Amps	Circuits protected
1	8	Front right side light, right number plate light and rear left side light
2	8	Engine compartment light, boot light, cigarette lighter light, front left side light, instruments lights, side light warning light, rear right side light and left number plate light
3	8	Right dipped beam
4	8	Left dipped beam
5	8	Right main beam
6	8	Left main beam and main beam warning light
7	8	Stop lights, windscreen washer motor and radio (if fitted)
8	16	No. 14 solenoid switch, heating and ventilation booster and windscreen wipers
9	16	No. 12 solenoid switch, turn indicators, ignition coil, handbrake warning light, instruments and warning lights and engine cooling fan solenoid switch
10	8	Courtesy lights, door safety lights, glove locker light and clock light
11	25	Glove locker light, door safety lights, courtesy light, horns, plug in socket, cigarette lighter, rear heated window and clock

### Fuse identification

8 amp .....	Black
16 amp .....	Green
25 amp .....	Hazel
Numbering .....	1 to 11 from left to right

### Fuses – UK and European models (1979 on models)

Fuse No	Amps	Circuits protected
1	8	Left front side light, right rear tail light, number plate light, side light indicator, instruments light, engine bay light, boot light
2	8	Right side light, parking light, front and rear light, clock light, cigar lighter light, foglamps, fog lamp indicator light, fibre optics for switches light, heater controls light, glovebox light
3	8	Left dipped beam
4	8	Right dipped beam
5	8	Left main beam and indicator lamp
6	8	Right main beam
7	8	Rear fog lamp and indicator lamp

8	16	Front fog lights
9	16	Left power window lift
10	16	Right power window lift
11	16 or 25	Reversing lights, solenoid switches for power window lifts, horns, radiator fan, cigar lighter, heated rear window and indicator lamp, clock, fan booster, idling fuel cut-out, instruments cluster
12	16	Wiper motor and relay, windscreen washers, stop lights, direction indicators, handbrake warning light
13	16	Radiator fan (on some models this is a 16 amp in-line fuse between battery + terminal and fan)
14	16	Horns
15	16	Cigar lighter, heated rear window and indicator lamp
16	16	Hazard flasher and warning light, plug-in socket, radio, powered aerial, digital clock (later models), courtesy lights

**Fuse identification**

8 amp .....
16 amp .....
25 amp .....
Numbering .....

**Colour coding**

Black
Green
Hazel
1 to 16 from left to right

**Fuses – USA models**

Fuse No	Amps	Circuits protected
1	8	Front right side light, front right clearance light, rear left side light, rear left clearance light, right number plate light (Saloon), left number plate light (Coupe), boot light (Saloon)
2	8	Lighting: engine compartment, cigarette lighter, instruments cluster, heating and ventilation controls, wipe speed and hazard switches; front left side light, front left clearance light, rear right side light, rear right clearance light, side lights warning light, left number plate light (Saloon), right number plate light (Coupe), boot light (Coupe), clock light (Coupe)
3	8	Right low beam
4	8	Left low beam
5	8	Right main beam, main beams warning light
6	8	Left main beam
7	8	Stop lights, radio (if fitted)
8	16	Reversing lights, engine ignition remote control switch, solenoid switches for electric window lifts (if fitted), rear heated window, cigarette lighter, air conditioner fan motor (if fitted), horns, engine coolant motor-driven fan, emission control system solenoid switches, air conditioning system solenoid switches (if fitted), air ventilation and heating fan, windscreen wiper, windscreen washer motor
9	16	Direction indicators and tell-tales, ignition coil, carburettor fuel idling cut-off device, emission control system solenoid switch, EGR warning light device. Feed for following warning lights: engine oil low pressure, engine overheating, EGR, brake, brake pad, fasten belts, fuel reserve and alternator. Feed for following instruments: oil pressure gauge, voltmeter (Coupe), fuel gauge, coolant temperature gauge and engine rev counter, EGR circuit and driver's seat belts circuit solenoid switches and electric delaying device
10	8	Plug-in socket, front and rear interior lights, open door safety lights, clock and glove locker
11	25	Solenoid switches for: horns, rear heated window, heating and ventilation fan and rear heated window warning light

**Fuse identification**

3 amp .....
8 amp .....
16 amp .....
25 amp .....

**Colour coding**

White
Black
Green
Hazel

**In-line fuses – USA (Saloon models)**

Amps	Circuits protected
16	Engine coolant fan
16	Air conditioner condenser motor-driven fan
25	Air conditioner
8	Fuel lift pump
3	Driver's seat belt unfastened and open door buzzer with ignition key on sited below dashboard right-hand side
16	Hazard signalling system located below dashboard right-hand side
3	EGR warning light system and relative solenoid switch located below dashboard right-hand side
25	Electric window lifts (if fitted)

**Fuse identification**

3 amp .....
8 amp .....
16 amp .....
25 amp .....

**Colour coding**

White
Black
Green
Hazel

**In-line fuses – USA (Coupe models)**

Amps	Circuits protected
16	Engine coolant fan
16	Air conditioner condenser motor-driven fan
25	Air conditioner
16	Electric window lifts (if fitted)
8	Fuel lift pump
3	Driver's seat belt unfastened and open-door buzzer with ignition key on located below dashboard right-hand side

- 16 Hazard signalling sited below dashboard right-hand side  
 3 EGR warning light and relevant solenoid switch located below dashboard right-hand side

**Fuse identification**

3 amp .....	
8 amp .....	
16 amp .....	
25 amp .....	

**Colour coding**

White  
 Black  
 Green  
 Hazel

**Torque wrench settings**

	lbf ft	Nm
Alternator main lower pivot bolt .....	51	69
Alternator adjuster nut and bolt:	32	43
Alternator bracket to engine		
Series A engines .....	38	52
Series B engine 1300/1600 .....	32	43
USA 1800 and 2000 models .....	16	22
Temperature transmitter to cylinder head .....	36	49
Oil pressure switch to support .....	24	32

**1 General description**

1 The electrical systems on the Lancia Beta models reflect the trend towards ever more profusion as is apparent on so many new cars. Following this greater complexity comes the likelihood of failure of those systems, and therefore whereas the mechanics of your car will be more reliable than in years past, the electrical system will most probably demand more attention than any others on the vehicle. Fortunately, more often than not, it will be the electrical lead connections and electrical device mountings that will give trouble, rather than the electrical devices themselves. It is from this factor that the need comes for cleanliness and neatness when dealing with electrical systems.

2 In this Chapter details are given of the maintenance and repair of each system, including any special precautions that may be taken to guard against premature failure of those systems.

3 As mentioned earlier, because you will probably have to deal with electrical faults more than anything else on this car it may be worth while investing in a few items of electrical test equipment. One very useful item of equipment is a voltmeter (0 to 20 volts) or at very often not much more expense, a multi-meter. This last device is really useful, not only for the car but also around the house. A multimeter can measure voltage, current or resistance on a variety of scales.

4 So much for the equipment and rationale. The electrical systems on the Lancias are conventional 12 volt systems with a negative earth. They are powered by a battery and an alternator driven off the engine. A pre-engaged starter is fitted to the front of the engine.

5 The battery provides power for starting, and reserve power should the demand from the systems exceed the output of the alternator. When the alternator is not fully loaded, the voltage regulator ensures that the battery is kept charged.

6 The potential power from the alternator or battery is sufficient to severely damage the electrical wiring, if faults occur which allow that power through the circuits. Therefore most are protected with fuses. Those not protected with fuses are associated with engine systems and include the ignition system and starter motor circuit.

7 When fitting accessories to cars with negative earth systems it is important, if they contain silicon diodes or transistors, that they are connected correctly, otherwise they may be irreparably damaged. Before purchasing any accessory check that the polarity is suitable or can be changed.

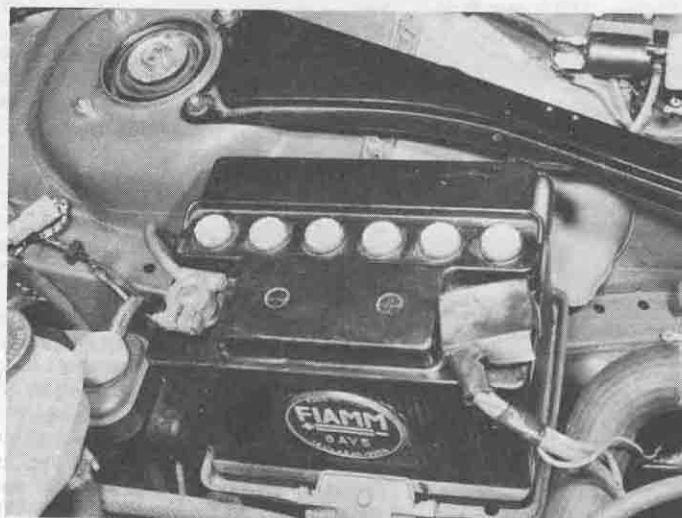
8 Always disconnect the battery leads, if the battery is to be boost charged in situ, or if any welding work is to be carried out using arc-welding equipment.

**2 Battery – removal and refitting**

1 The battery is situated on the left-hand side of the engine compartment, and is held in place by a clamp plate and bolt (photo).

2 To remove the battery begin by disconnecting the negative earth lead from the battery and bodyshell. Then disconnect the positive lead from the battery.

3 Once the leads have been removed, the bolt, which secures the clamp onto the battery base ledge, may be unscrewed so that the battery is free to come out.



2.1 Battery locations and fitting (HPE model shown)

4 Lift the battery from its seating in the bodyshell, taking great care not to spill any of the highly corrosive electrolyte.

5 With the battery out of the car, clean the battery tray and the clamps if they are dirty or corroded. Also clean the battery itself and the posts.

6 Refitting is the reversal of this procedure. Refit the positive lead first and smear the clean terminal posts and lead clamp assembly beforehand with petroleum jelly (Vaseline) in order to prevent corrosion. Do not use ordinary grease.

**3 Battery – maintenance and care**

1 At weekly intervals, the electrolyte level should be checked and topped up if required.

2 One of three types of battery may be encountered. On a battery with a non-removable cover, raise the cover as far as it will go. If the electrolyte level is below the bottom of the filling tubes, top up using distilled water only.

3 On a battery with a removable cover or screw plugs, lift off the cover and inspect the electrolyte level. This should be just above the perforated splash guard. If it is below this, top it up with distilled water.

4 It should be noted that with the non-removable battery cover, distilled water is poured into the trough on top of the cells and will not actually enter them until the cover is partially refitted.

5 On modern cars, the addition of distilled water is required very infrequently. If the need for it becomes excessive, suspect over-charging caused by a fault in the alternator control section.

6 Periodically inspect the battery tray and mounting bolts for corrosion. This will appear as a white deposit and must be neutralised before permanent damage to the metalwork occurs.



- 7 Disconnect the battery leads, release the battery mountings and remove the battery from the car.
- 8 Sponge any deposits with ammonia, dry the surface and protect with anti-corrosive paint such as underseal.
- 9 Refit the battery, clean the terminals and clamps if necessary by careful scraping. Connect the leads, making quite sure that they are fitted to the correct polarity terminals by having the battery the right way round.
- 10 Smear the battery terminals and clamps with petroleum jelly (never grease) and wipe away any moisture or dirt from the top of the battery.
- 11 The foregoing operations are all that should be required to keep a battery in first class condition.

#### 4 Battery – charging

- 1 As a result of the efficiency of the alternator, the battery will be kept in a good state of charge even if only short journeys are undertaken.
- 2 Only in a case where electrical equipment has been left on by mistake, should mains charging be necessary.
- 3 On cars with a battery charge indicator, the battery charge condition will be visually apparent whenever the ignition is on or the engine running.
- 4 On cars without this instrument, the state of charge can be ascertained using a hydrometer. The specific gravity of the electrolyte for fully charged conditions at the electrolyte temperature indicated, is listed in **Table A**. The specific gravity of a fully discharged battery at different temperatures of the electrolyte is given in **Table B**.

##### Type A

*Specific gravity – battery fully charged*

- 1.268 at 100°F or 38°C electrolyte temperature
- 1.272 at 90°F or 32°C electrolyte temperature
- 1.276 at 80°F or 27°C electrolyte temperature
- 1.280 at 70°F or 21°C electrolyte temperature
- 1.284 at 60°F or 16°C electrolyte temperature
- 1.288 at 50°F or 10°C electrolyte temperature
- 1.292 at 40°F or 4°C electrolyte temperature
- 1.296 at 30°F or -1.5°C electrolyte temperature

##### Table B

*Specific gravity – battery fully discharged*

- 1.098 at 100°F or 30°C electrolyte temperature
- 1.102 at 90°F or 32°C electrolyte temperature
- 1.106 at 80°F or 27°C electrolyte temperature
- 1.110 at 70°F or 21°C electrolyte temperature
- 1.114 at 60°F or 16°C electrolyte temperature
- 1.118 at 50°F or 10°C electrolyte temperature
- 1.122 at 40°F or 4°C electrolyte temperature
- 1.126 at 30°F or -1.5°C electrolyte temperature

- 5 When the time comes that regular battery charging from a mains charger is required to give the battery enough life to start the car in the mornings and it is known that the alternator is working correctly and reasonable mileages are being run, then the battery should be checked for failure by your dealer and if found to be at the end of its useful life, renewed.

#### 5 Alternator – general description

The main advance of the alternator lies in its ability to provide a relatively high power output at low revolutions. Driving slowly in traffic with a dynamo fitted invariably means a very small or even no charge at all reaching the battery. In similar conditions even with the wipers, heater, lights and perhaps radio switches on the alternator will still ensure a charge reaches the battery.

The alternator is of the rotating field ventilated design and comprises principally a laminated stator on which is wound a 3 phase output winding and a twelve pole rotor carrying the field windings. Each end of the rotor shaft runs in ball race bearings which are lubricated for life. Aluminium end brackets hold the bearings and incorporate the alternator mounting lugs. The rear bracket supports the silicone diode rectifier pack which converts the AC output to DC for battery charging and output to the voltage regulator.

The rotor is belt driven from the engine through a pulley keyed to

the rotor shaft. A special fan adjacent to the pulley draws air through the alternator. This fan forms an integral part of the alternator specification. It has been designed to provide adequate flow of air with the minimum of noise and to withstand the stresses associated with the high rotational speeds of the rotor. Rotation is clockwise when viewed from the drive end.

The rectifier pack of silicone diodes is mounted on the inside of the rear end casing, the same mounting is used by the brushes which contact the slip rings on the rotor to supply the field current. The slip rings are carried on a small diameter moulded drum attached to the rotor. By keeping the circumference of the slip rings to a minimum, the contact speed and therefore the brush wear is minimised.

Maintenance consists of occasionally wiping away any oil or dirt which may have accumulated on the outside of the unit.

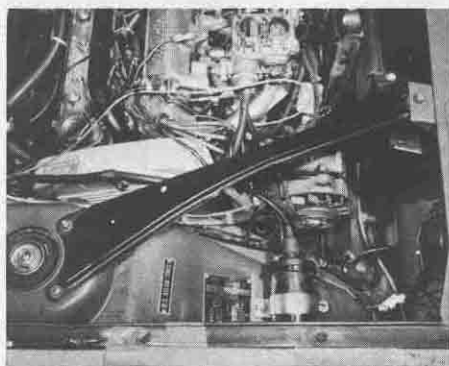
Take extreme care when connecting the battery to ensure that the polarity is correct, and never run the engine with a battery charger connected. Do not stop the engine by disconnecting the battery leads, as this will almost certainly damage the alternator. When jump starting from another battery ensure that the jump leads are connected positive to positive and negative to negative.

#### 6 Alternator – testing and maintenance

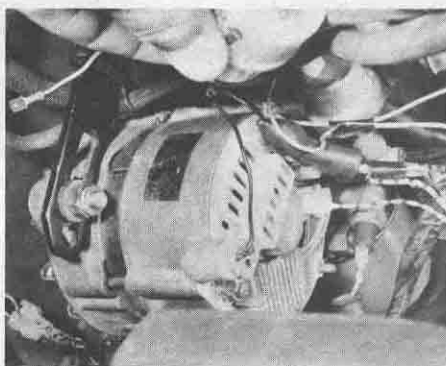
- 1 The alternator has been designed for the minimum amount of attention during service. The only items subject to wear are the brushes and bearings.
- 2 If the ignition warning light on the instrument panel lights up indicating that the battery is no longer being charged, check the continuity of the leads to and from the alternator voltage regulator and battery.
- 3 Ensure all the connections of those leads are clean, and check for breaks in each cable by disconnecting both ends of a cable and reconnecting in series with a small battery and bulb. If the cable is complete the bulb will light up. If once the continuity checks have been completed and nothing found at fault, the alternator may be checked in situ as follows.
- 4 Connect one end of a jumper lead to the large terminal on the alternator, and the other to a 0 to 20 v voltmeter. Connect the other (-ve) terminal on the voltmeter to the bodyshell. Start the engine and monitor the voltmeter reading as the engine speed is increased and decreased.
- 5 If only a few volts registered on the voltmeter, remove the alternator and inspect more closely. If the reading obtained was between 12 and 14½ volts the alternator would seem to be all right. It must be stated however that the diode bridge network which rectifies the output of the stator makes it impossible to be certain that the alternator is serviceable, even if the output volts appear to be between 12 and 14½ volts. Therefore, if the checks detailed in paragraphs 3 and 4 do not reveal a clear fault, take the car to the nearest auto-electrician.

#### 7 Alternator – removal and refitting

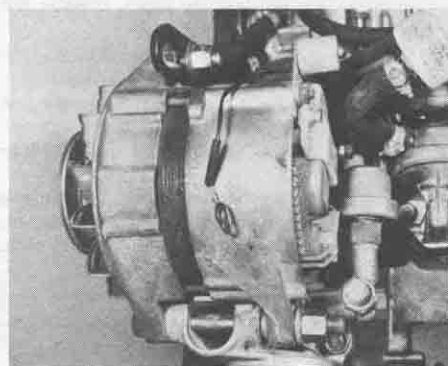
- 1 Disconnect the negative and positive cables from the battery to isolate the electrical system.
- 2 With Saloon models remove the radiator grille, as described in Chapter 12 to get better access to the alternator (Fig. 10.1).
- 3 With Coupe, Spider and HPE models and all USA models the grille cannot easily be removed and therefore the operation has to be carried out from above. However, it may be found to be advantageous if the right-hand body bracer strut is removed first (photo). On all USA models remove the air cleaner (see Chapter 3).
- 4 Either working through the grille opening or from above, disconnect the leads to the alternator. Note which wires fit where (photo).
- 5 Slacken off the adjuster/tensioner nut and bolt, and the lower pivot bolt and nut (photo). Pivot the alternator in towards the engine and slip the drivebelt off the pulley.
- 6 Undo and remove the adjuster/tensioner nut and bolt and the main pivot bolt and nut and lift the alternator away.
- 7 Refitting is basically the reverse procedure to removal, but do not tighten the pivot bolt and nut or the adjuster bolt and nut until the tension of the drive belt has been checked, as described in Section 8.
- 8 Finally tighten the mounting bolts and nuts to their specified torques.



7.3 The alternator is easier to get at if this body bracer is first removed (HPE model shown)



7.4 This is how the wires are connected to the back of the Marelli type alternator (note the radio capacitor fitted to the alternator)



7.5 Alternator adjustment and pivot bolt locations

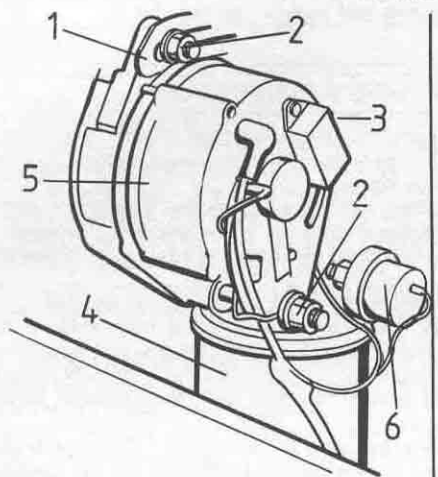


Fig. 10.1 View of alternator with the grille removed (Saloon models) (Sec 7)

- |   |                                  |
|---|----------------------------------|
| 1 Alternator belt adjusting bracket           | 4 Oil filter                     |
| 2 Alternator adjuster nut, bolt and pivot nut | 5 Alternator                     |
| 3 Electronic voltage regulator                | 6 Oil pressure gauge transmitter |

## 8 Alternator drivebelt – checking, adjustment and renewal

1 If the drivebelt is slack then it will slip and the alternator will not produce its correct output. If it is too tight then the alternator and water pump bearings may be ruined.

2 When correctly tensioned, the drivebelt should be able to be depressed 10 to 15 mm (0.39 to 0.59 in) in the centre of its longest run when a force of 5 kg (11 lb) is placed on it. This is equivalent to firm pressure of the forefinger or thumb (Fig. 10.2).

3 If the belt is too slack or needs renewing proceed as follows. Loosen the adjuster/tensioner nut and bolt on the top of the alternator. Push the alternator in so that the old belt can be lifted off, then fit a new one. Pull the alternator away from the engine to tighten the drivebelt. If necessary the lower pivot bolt may have to be slackened slightly as well.

4 When the belt is tensioned correctly lock the adjuster nut and bolt. Recheck the tension (photo).

5 Tighten the lower pivot bolt if it was slackened off.

6 If a new belt has been fitted, the tension should be checked after approximately 150 miles (250 km) of motoring.

## 9 Alternator – brush renewal

### Bosch type

1 With the alternator removed from the car, undo the two screws and remove the voltage regulator from the rear of the alternator. The

voltage regulator will come away complete with brushes and brush holder (Fig. 10.3).

2 Using a piece of pointed nose pliers, relieve the tension of the lead clamps and then using a soldering iron separate the leads from the brushes (Fig. 10.4).

3 Withdraw the brushes and springs.

4 Fit the new brushes and springs and solder the leads to the brushes.

5 Tighten the lead clamps and then refit the regulator and brush assembly to the alternator.

### Marelli type

6 With the alternator removed from the car as described in Section 7, proceed as follows. Disconnect the single spade connector from the brush holder at the rear of the alternator (photo). This wire runs to the rectifier. Disconnect the double connector from the brush holder. This runs to the regulator (photo).

7 Remove the crosshead screw, which holds the brush holder in position and prise the brush holder out of the casing (photo).

8 Lever out the spring clips at the rear end of the brushes and remove the brushes and springs.

9 Fit new brushes and springs, secure them in position and refit the brush holder in the reverse order to removal.

10 Finally refit the alternator to the car as described in Section 7.

## 10 Alternator regulator – renewal

### Bosch type

1 With the alternator removed from the car, withdraw the regulator assembly, as described in the previous Section.

2 The regulator and brush holder are a one-piece assembly and must be renewed as such.

3 Refit the regulator as described in the previous Section.

### Marelli type

4 The electronic regulator is mounted to the rear alternator casing by two screws. Remove the screws, unplug the connector at the brush holder and lift it away (photos).

5 Refit a new regulator in the reverse order.

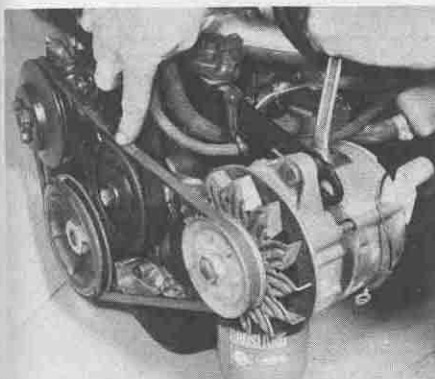
6 Refit the alternator to the car as described in Section 7 and test it in position.

## 11 Starter motor – general description

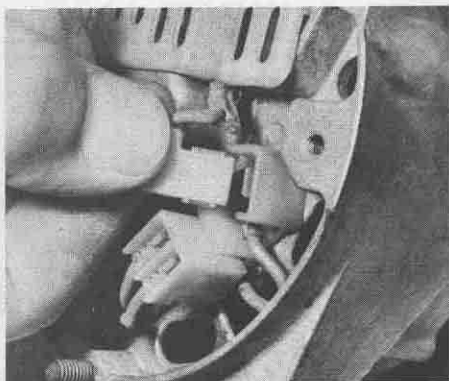
1 The starter motors are of the pre-engaged type, in which the solenoid switch is also employed to physically move the drive pinion along the starter motor shaft, into contact with the ring gear on the flywheel before power is supplied to the motor for turning the engine.

2 There is a spring between the pinion and the actuating lever from the solenoid, so that in the event of an exact abutment of gear teeth as the pinion is impelled to engage with the flywheel ring gear; the solenoid switch will still continue and make power contact. The pinion will fall into engagement as soon as the motor shaft turns.

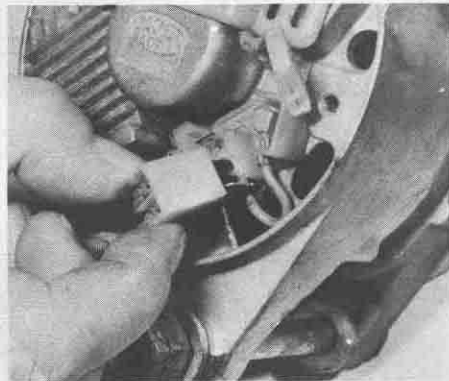
3 The location of the starter motor is as usual on the left-hand side of the engine, and it is bolted to the clutch bellhousing. The



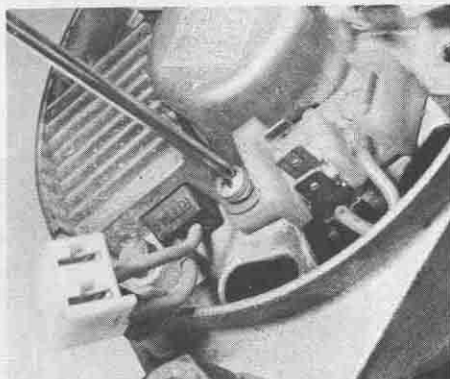
8.4 Check the tension and lock the adjuster nut and bolt



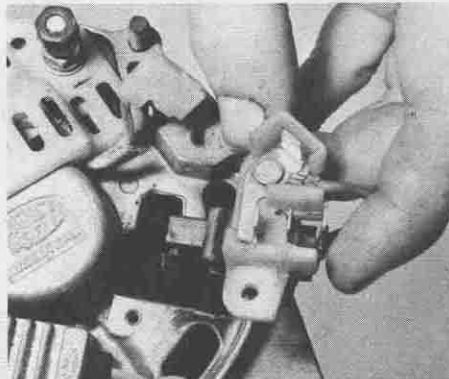
9.6a Disconnect the lead from the rectifier



9.6b Disconnect the lead from the regulator



9.7a Removing the brush holder retaining screw



9.7b The brush holder removed from the casing

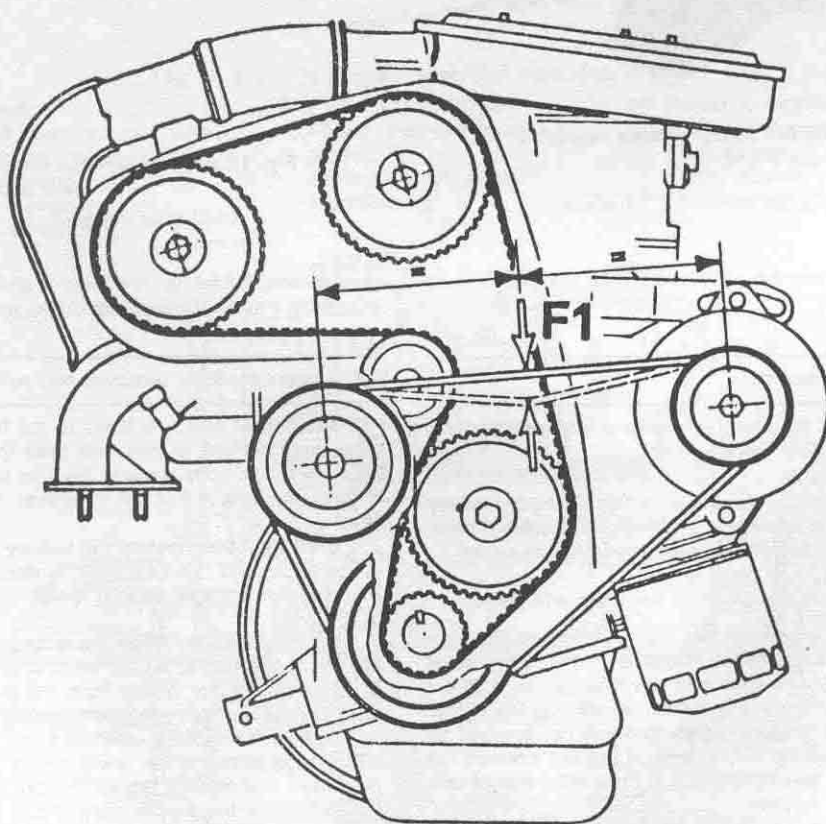
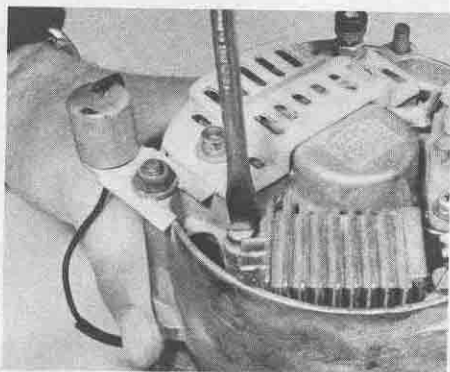


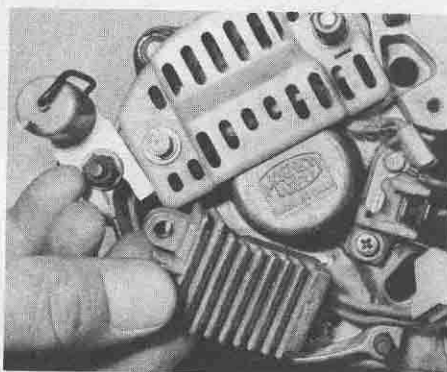
Fig. 10.2 Alternator drivebelt tension (Sec 8)

*F1 deflection = 10 to 15 mm (0.39 to 0.59 in)*

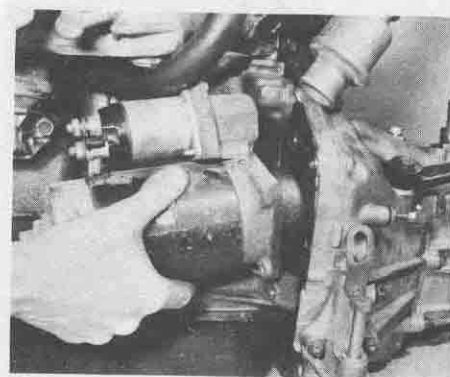




10.4a Removing one of the regulator retaining screws



10.4b Removing the regulator



13.7 Withdrawing the starter motor (engine removed for clarity)

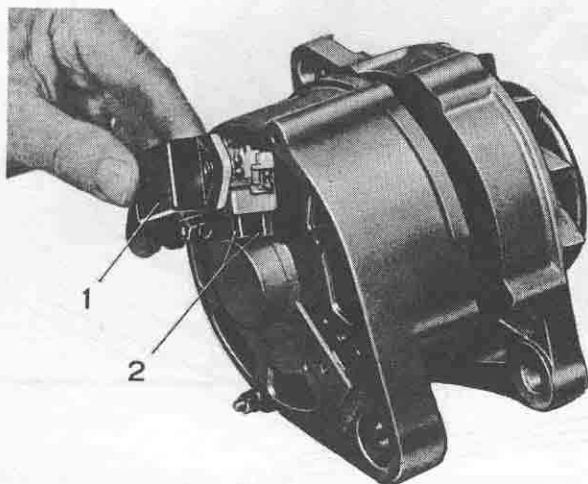


Fig. 10.3 Removing the Bosch voltage regulator (Secs 9 and 10)

1 Voltage regulator 2 Brushes

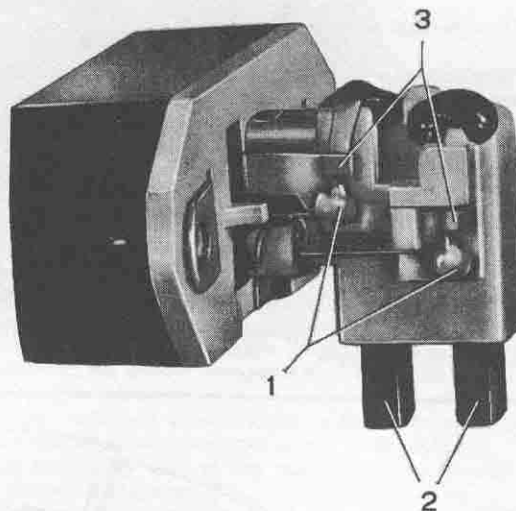


Fig. 10.4 Bosch voltage regulator and brush holder (Secs 9 and 10)

1 Brush lead soldered joints 2 Brushes 3 Lead clamps

motor/pinion shaft projects into the bellhousing near the periphery of the flywheel.

## 12 Starter motor circuit – testing

1 If the starter motor fails to turn the engine when the switch is operated, there are four possible reasons why:

- The battery is no good
- The electrical connections between switch, solenoid, battery and starter motor are somewhere failing to pass the necessary current from the battery through the starter to earth
- The solenoid switch is no good
- The starter motor is either jammed or electrically defective

2 To check the battery, switch on the headlights. If they go dim after a few seconds the battery is definitely suspect. If the lamps glow brightly, next operate the starter switch and see what happens to the lights. If they go dim then you know that power is reaching the starter motor but failing to turn it. Therefore, check that it is not jammed by placing the car in gear and rocking it to and fro. If it is not jammed the starter will have to come out for examination. If the starter should turn very slowly go on to the next check.

3 If, when the starter switch is operated, the lights stay bright, then the power is not reaching the starter. Check all connections from battery to solenoid switch and starter for perfect cleanliness and tightness. With a good battery installed this is the most usual cause of starter motor problems. Check that the earth link cable between the

engine and frame is also intact and cleanly connected. This can sometimes be overlooked when the engine has been taken out.

## 13 Starter motor – removal and refitting

1 The starter motor is fitted to the front of the engine beneath the inlet manifold and is mounted onto the bellhousing. It is secured in place by three bolts through the rear of the bellhousing. Like most of the components in this tightly packed engine bay it is not that easy to reach.

2 Start by disconnecting the battery negative lead and by removing the radiator and fan assembly as described in Chapter 2. It may be found easier if the air cleaner is also removed as described in Chapter 3.

3 With the Saloon model the radiator grille can be removed for easier access to the starter motor, as described in Chapter 12.

4 Disconnect the wiring from the starter motor solenoid and note which wires fit onto which terminals.

5 Unhook the clutch control arm return spring from its bracket, which is attached to the lower starter motor mounting bolt.

6 Undo and remove the three mounting bolts for the starter motor.

7 Withdraw the starter motor from the bellhousing (photo). Pull it out and slightly downwards to clear the other components and then manoeuvre it out of the engine bay through the space created by removing the radiator and fan.

8 If any difficulty is experienced in actually withdrawing the starter motor from the bellhousing on earlier models, because of the lack of



space, it may be found necessary to remove the oil pressure warning switch and oil temperature gauge transmitter assemblies which are located differently on the oil filter mounting block. This will give you sufficient room to withdraw the starter motor.

9 Refit the starter motor in the reverse order to removal. Remember to tighten the various mounting bolts to the specified torques, and don't forget to reconnect the clutch control arm return spring, and refill the cooling system as described in Chapter 2.

#### 14 Starter motor – dismantling, repair and reassembly

1 The starter motor assembly comprises three sub-assemblies; the motor itself, the solenoid switch and the pinion actuator housing. The

actuator housing forms the mechanical link between the motor and the solenoid switch.

2 Such is the inherent reliability and strength of the starter motors fitted that it is very unlikely that a motor will ever need dismantling until it is totally worn out and in need of renewal as a whole.

3 The solenoid which is usually available individually as a spare is attached to the actuator housing by three nuts on three long bolts passing the length of the solenoid. Undo and remove these three end nuts and lift the solenoid from the starter motor assembly.

4 There is no possibility of repairing the solenoid and therefore if after reconnecting across the battery with two stout leads the unit remains lifeless or the switch part fails to work, the whole solenoid must be renewed.

5 Starter motor brushes: On the forward end of the motor there is a

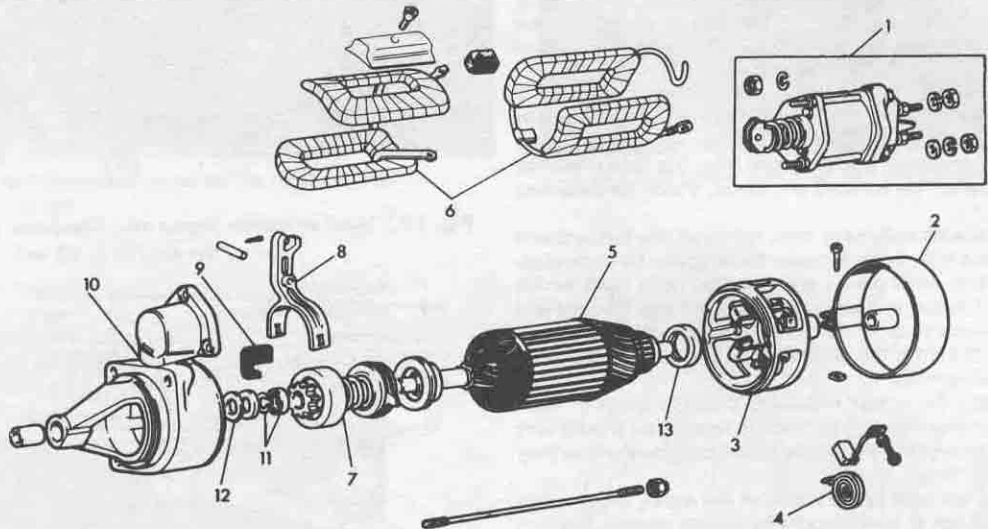


Fig. 10.5 Starter motor – exploded view (Sec 13)

- |                              |  |  |
|------------------------------|--|--|
| 1 Solenoid                   | 7 Pinion and pinion carriage           | 10 Pinion actuator housing                   |
| 2 Brush aperture cover strap | 8 Pinion carriage actuating lever      | 11 Pinion carriage retaining ring and sleeve |
| 3 Brush and terminal cage    | 9 Lever buffer, fitted to motor casing | 12 Thrust washer                             |
| 4 Spiral spring and brushes  |  | 13 Thrust washer front end                   |
| 5 Motor armature             |  |  |
| 6 Field windings             |  |  |

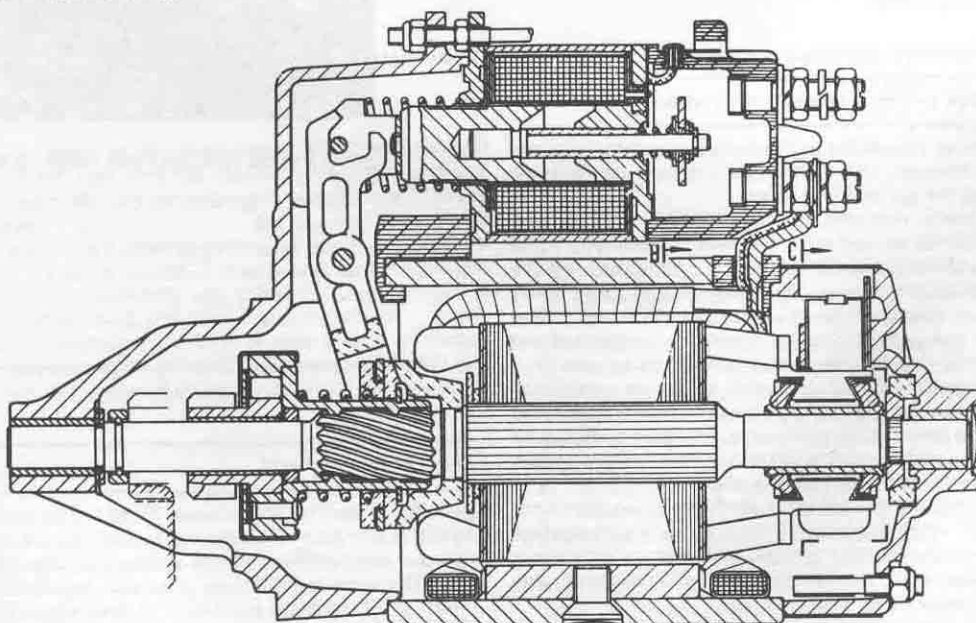


Fig. 10.6 Longitudinal section of the starter motor (Sec 13)

wide strap with a single screw to tighten it in position and it covers the aperture which allows access to the motor brushes.

6 The procedure for inspection and renewal of the brushes is straightforward. With the starter motor removed from the car and on a bench, slacken the single screw which clamps the end strap in position and slip the strap along the motor casing to uncover the brush access apertures.

7 The brushes are retained in their mountings by spiral springs. Move the ends of the spiral springs to allow the carbon brushes to be extracted from their mountings. Undo the small screw which secures the small lead from the brush to its terminal on the forward end fitting and remove the brush from the motor assembly. If the brush was worn to the extent that the spiral spring applies little force, then the brush should be renewed.

8 Motor dismantling: having already removed the solenoid, the front end of the motor is the next unit to be separated from the motor assembly. The motor is held together by tie rods screwed into the actuator housing at the rear end and projecting through the front end fitting to accommodate nuts at the other.

9 Before proceeding to separate the motor sub-assemblies it is necessary to disconnect the electrical connections between them. In particular the forward end cover strap should be removed and the brushes removed. The electrical leads running from the field windings in the motor, to terminals in the forward end cover, should be detached from those terminals.

10 Once the nuts on the tie-rods have been removed, the forward end fitting, motor casing and the pinion actuator housing can be separated. The motor armature and drive pinion are mounted on a shaft which runs in bush bearings housed in the actuator housing and forward end fitting. It will be necessary to drive the pinion actuating pivot pin from the actuator housing to permit the separation of the actuator housing and motor armature assembly.

11 Be careful to retrieve the spacer shims and thrust bearings on each end of the motor shaft when the motor shaft is freed. You should refit the spacers and thrust components exactly in the positions which they occupied before dismantling.

12 The field windings are held to the inside of the motor main casing by special blocks which are in turn secured by screws passing through the casing.

13 The armature and pinion assembly will usually be separated from the motor components in order to gain access to the pinion assembly. Inspection and repair of the pinion assembly is described in Section 15.

14 Reassembly of the starter motor follows the reversal of the dismantling procedure. Fortunately there is little in the way of adjustments to make on the motor, the assemblies usually fit together to their correct relative positions.

### 15 Starter motor drive pinion – inspect and repair

1 Persistent jamming or reluctance to disengage may mean that the starter pinion needs attention. The starter motor should be removed from the car first of all for general inspection.

2 With the starter motor removed, thoroughly clean all the grime and grease off with a petrol soaked rag. Take care to avoid any liquid running into the motor itself. If there is a lot of dirt, particularly on the pinion itself, this could be the trouble. The pinion should move freely along a spiral which is machined on the motor shaft. If the pinion motion is not smooth and easy, the motor should be dismantled and the armature/pinion assembly inspected and cleaned as follows.

3 Having removed armature/pinion assembly the commutator may be cleaned with a petrol dampened rag. The pinion carriage is retained on the motor shaft by a spring ring and sleeve. The sleeve should be driven off the end of the shaft exposing the spring ring which can now be slipped out of its groove seat and off the shaft.

4 Slide the pinion carriage off the rotor shaft and then clean the spiral which is exposed. Wipe the internal spiral in the pinion carriage clean. Do not dismantle the pinion carriage. Individual parts are not available and if the pinion teeth are damaged then the pinion carriage or the whole starter should be renewed.

5 The spiral splines should be lubricated with grease before re-assembly of the carriage onto the shaft. The intermediate disc that forms the thrust bearing between the actuating lever ring and the pinion carriage sleeve, should also be lubricated with grease.

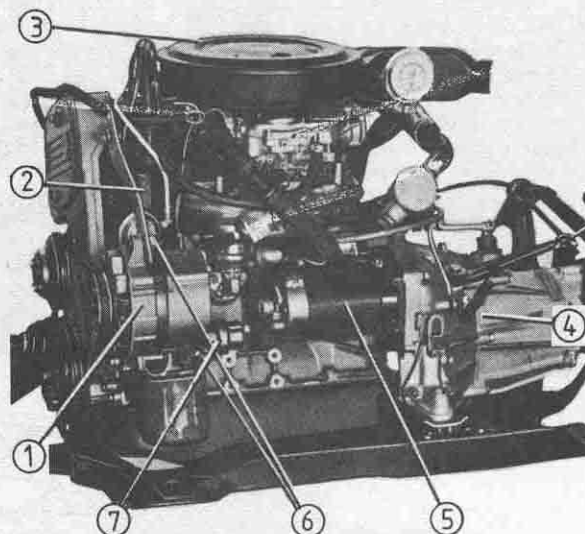


Fig. 10.7 View of starter motor and alternator locations with engine out of the car (Secs 13 and 7)

- |                               |                                    |
|-------------------------------|------------------------------------|
| 1 Alternator                  | 4 Clutch control arm return spring |
| 2 Alternator adjuster bracket | 5 Starter motor                    |
| 3 Air cleaner                 | 6 Alternator mounting bolts        |
|                               | 7 Oil transmitter                  |

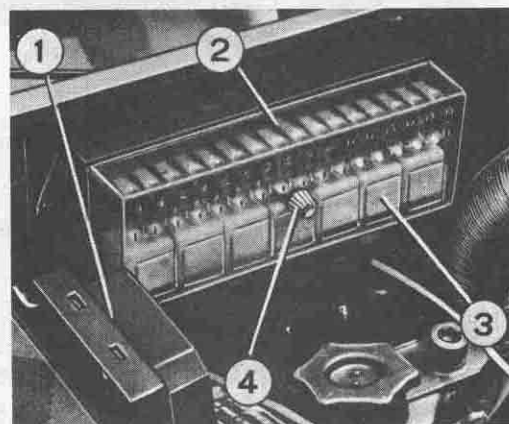


Fig. 10.8 Later type fuse box (with 16 fuses) (Sec 16)

- |                                    |                                  |
|------------------------------------|----------------------------------|
| 1 Electronic ignition control unit | 3 Solenoid switches control unit |
| 2 Fuses 1 to 16 from left to right | 4 Cover retaining knob           |

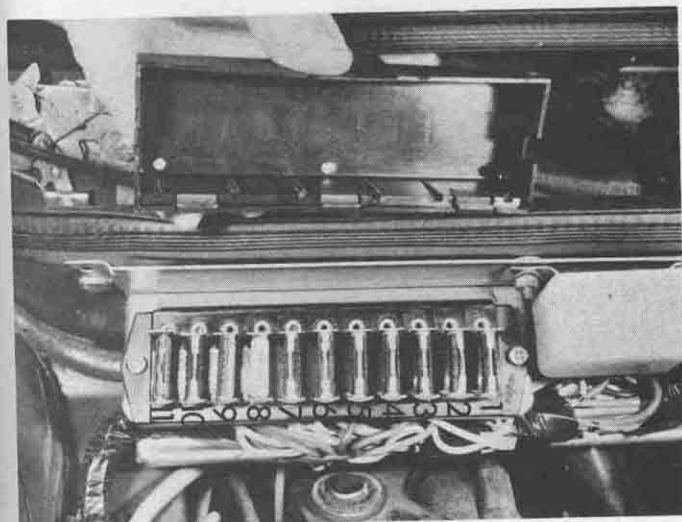
6 Reassembly of the pinion carriage onto the motor shaft follows the reversal of the removal procedure.

### 16 Fuses – general

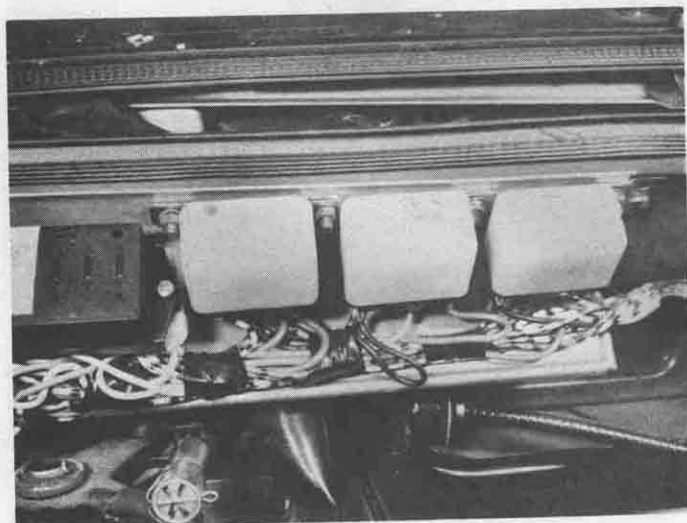
1 There are 11 or 14 fuses fitted in the electrical system in early models and 16 in later ones. They are mounted on a holder mounted on the rear bulkhead of the engine bay (Fig. 10.8 and photo).

2 The symptom of fuse failure is the simultaneous 'failure' of a number of electrical systems. The fuse which has broken can then be identified by which combination of electrical systems does not operate.

3 Some of the fuses are 8 amp, some 16 amp and some 25 amp. All are colour coded.



16.1 Removing the fuse box cover on an earlier model (fuses are numbered from right to left)



17.1 Solenoid (relay) locations on early models

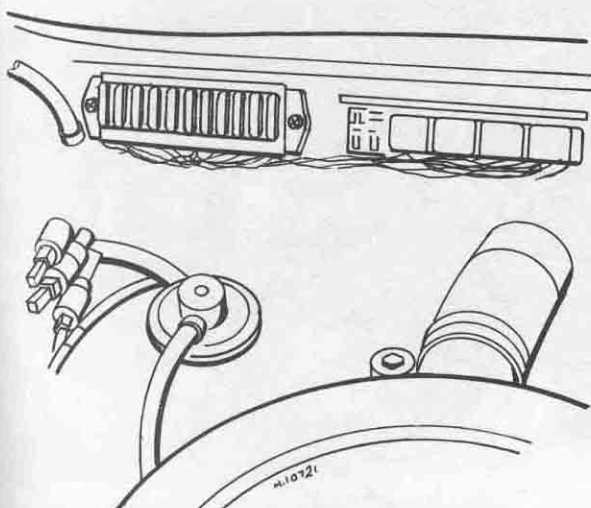


Fig. 10.9 Layout of fuses and solenoids on the USA models (Secs 16 and 17)

4 The Specifications section at the beginning of this Chapter details the identification of each fuse and the circuits protected by them. Ensure that you check the relevant table for your model, or refer to the car's handbook.

5 Never think you can leave fuses out or by-pass them, or substitute a fuse with a piece of tin foil or similar. A fuse blows for a reason and if the fault is not righted immediately, you will do serious damage to the wiring on the circuit involved and even adjacent wiring.

6 The plastic electric insulation material is also a heat insulation material and if excessive currents flow through the wires, they will soon heat up and melt the insulation.

### 17 Solenoids (relays) – general

1 Early models have three solenoids mounted on the rear bulkhead of the engine bay next to the fuse holder (photo). Later models, 1979 onwards, have 7 solenoids, as shown in Fig. 10.8. Models produced for the USA market have 4 solenoids mounted on the bulkhead as shown in Fig. 10.9.

2 They are easily removed by undoing the mounting nuts appropriate to the unit which needs renewing. Disconnect the wires running to the solenoid and it is free. Refitting is a reversal of the removal procedure.

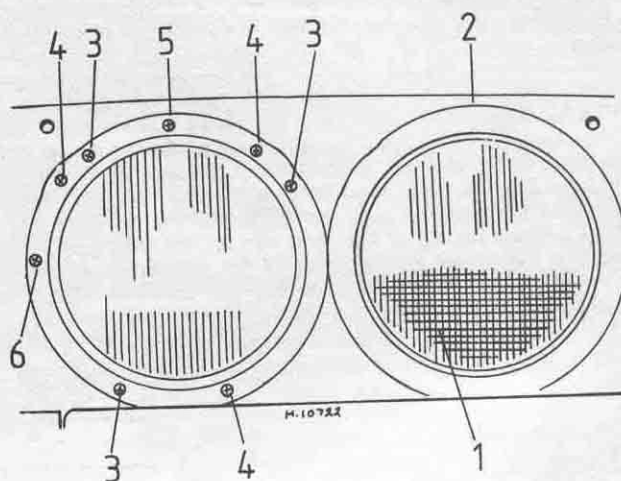


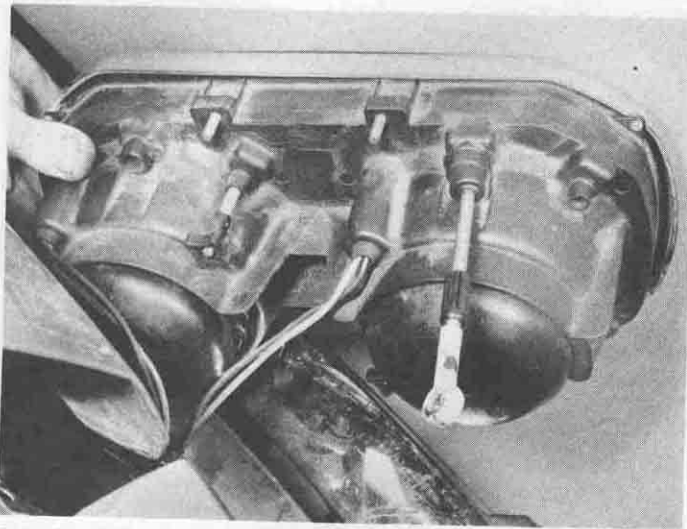
Fig. 10.10 Headlamp mounting layout (1400 Saloon models) (Sec 18)

- |                             |                                       |
|-----------------------------|---------------------------------------|
| 1 Headlamp                  | 4 Headlamp-to-bodywork mounting bolts |
| 2 Water gaurd               | 5 Vertical aiming screw               |
| 3 Lamp unit mounting screws | 6 Horizontal aiming screw             |

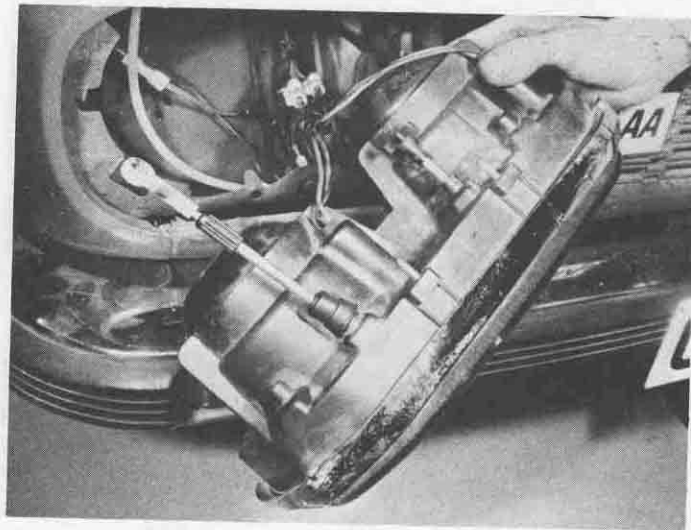
### 18 Headlamp unit (Saloon model) – removal and refitting

- 1 Disconnect the battery negative cable.
- 2 Remove the knurled screws, from inside the engine bay, which hold the headlamps twim panel or rectangular lens cover in place.
- 3 The headlamp units are mounted individually in the front panel of the bodywork, and inner or outer headlamp can be removed separately (Fig. 10.10).
- 4 Disconnect the earth lead from the headlamp to the body.
- 5 Disconnect the snap connector in the power supply cable to the headlamp unit, leaving the bulb in place.
- 6 Remove the bolts which retain the headlamp to the body panel and lift the headlamp away. This is simple for the inner, or main beam lamp, but for the outer, or dipped beam units in models fitted with self-levelling headlamp systems, the self-levelling control tube has to be disconnected before the headlamp can be removed.
- 7 Refit the headlamp units in the reverse order, and check that they operate correctly.





19.2 Headlamp unit removed (Coupe, Spider and HPE models)



19.3 Disconnect the wiring at the rear of the headlamp unit and its free

### 19 Headlamp unit (Coupe, Spider and HPE) – removal and refitting

- 1 Disconnect the battery negative lead.
- 2 The headlamp unit comprises both inner and outer headlamps in one moulded assembly. This assembly has four bolts in it, two at the top and two at the bottom. These are located through holes in the front body panel and secured in place by nuts (photo).
- 3 Remove the four headlamp assembly retaining nuts. Disconnect the self-levelling system linkage and remove the connector covers. Disconnect the power supply cables to the headlamps. Disconnect also the earth wire spade connector. The headlamp assembly is now free to be removed (photo).
- 4 Refit the headlamp assembly in the reverse order, and check that they operate correctly.

### 20 Headlamp self-levelling system – general

- 1 The outer, or dipped, units of the headlamp system are automatically set to the correct level according to load by a simple hydraulic system. The control units are connected to sensors linked to the left-hand side front transverse link of the rear suspension, as described in Chapter 11.
- 2 As the suspension moves up and down under load the sensors alter the fluid pressure and this is transmitted to the two control units mounted one on either wing (photo). These units move back and forth in a horizontal plane thus altering the beam height by pushing the adjustable link rod forwards or, if the load is removed, pulling it back.
- 3 The pipes which connect the sensors to the headlamp units and each other must never be removed, or the fluid will leak out and the pressure will be altered, thus ruining the self-levelling system alignment.
- 4 The adjustable links which connect the headlamp units to the control units are easily removed from the control unit ball arms by carefully levering them off.
- 5 If any major problems occur with the self-levelling headlamp system then it must be repaired by your local Lancia dealer.

### 21 Headlamp – alignment

- 1 It is strongly recommended that the adjustment of the headlamps is only carried out by a Lancia dealer or garage that has special beam setting equipment. This should always be carried out if a new headlamp unit or bulb has been fitted.
- 2 However, if for some reason the headlamp beam has been altered dramatically then it can be roughly aligned using the large plastic knobs on the rear of the headlamp unit (Figs. 10.11 and 10.12).

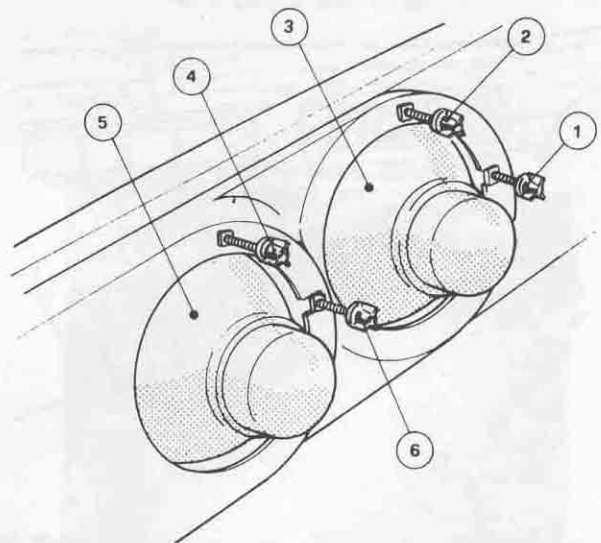


Fig. 10.11 Headlamp aiming knobs (models without self-levelling system) (Sec 21)

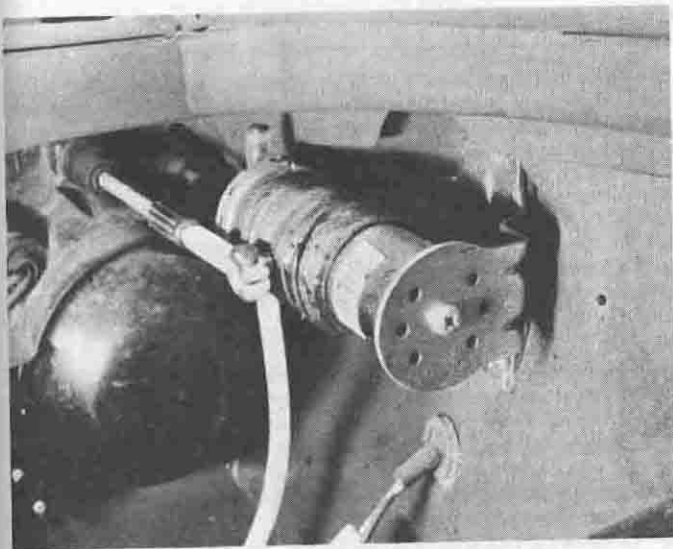
- |                                    |                                      |
|------------------------------------|--------------------------------------|
| 1 Main beam horizontal aiming knob | 4 Dipped beam vertical aiming knob   |
| 2 Main beam vertical aiming knob   | 5 Left-hand dipped beam headlamp     |
| 3 Left-hand main beam headlamp     | 6 Dipped beam horizontal aiming knob |

- 3 On models fitted with the self-levelling system, if the beam appears too high or too low then it can be altered using the plastic screw adjuster in the centre of the control link.
- 4 Any rough adjustment that is made should only be considered as a temporary measure. The car must be taken to a garage and have the headlights set properly as soon as possible.

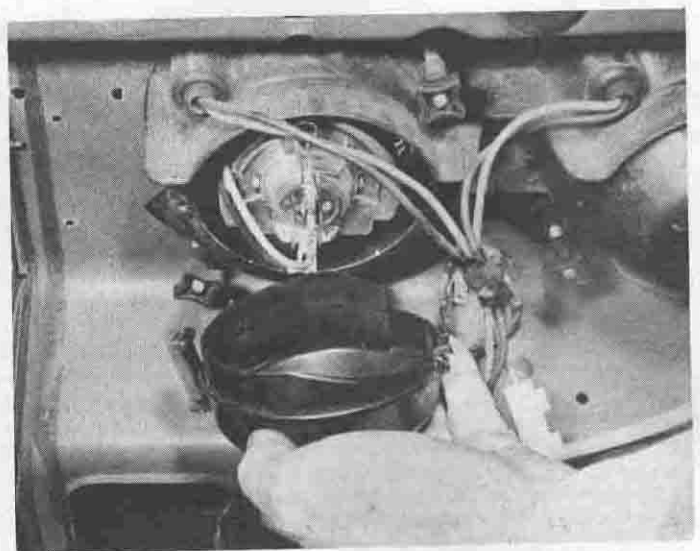
### 22 Headlamp bulbs – renewal

- 1 Disconnect the battery negative cables.
- 2 Remove the rear cap of the appropriate headlamp unit (photo).
- 3 Disconnect the spade connectors from the rear terminals of the bulb.
- 4 Squeeze the retaining clip and withdraw the bulb (photo). Do not touch the glass part if the bulb is to be re-used.

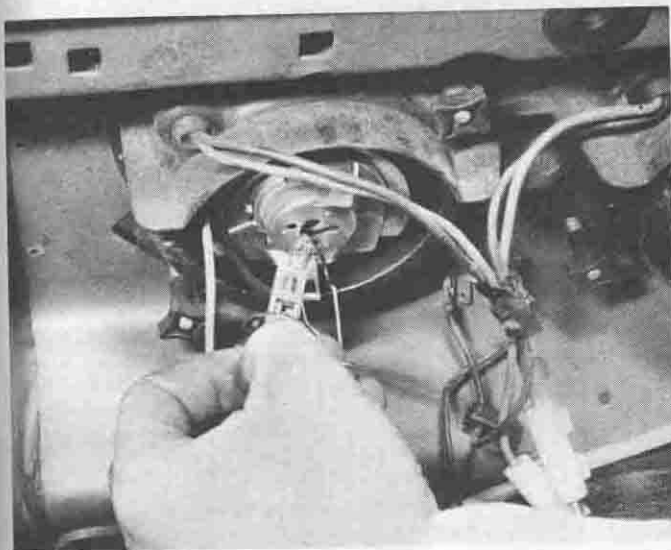




20.2 Headlamp self-levelling unit (HPE model shown)



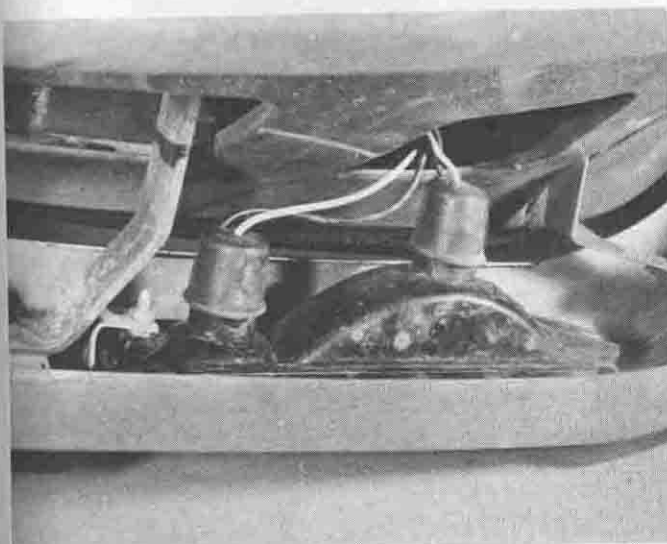
22.2 Removing the right-hand main beam headlamp rear cap (HPE model shown)



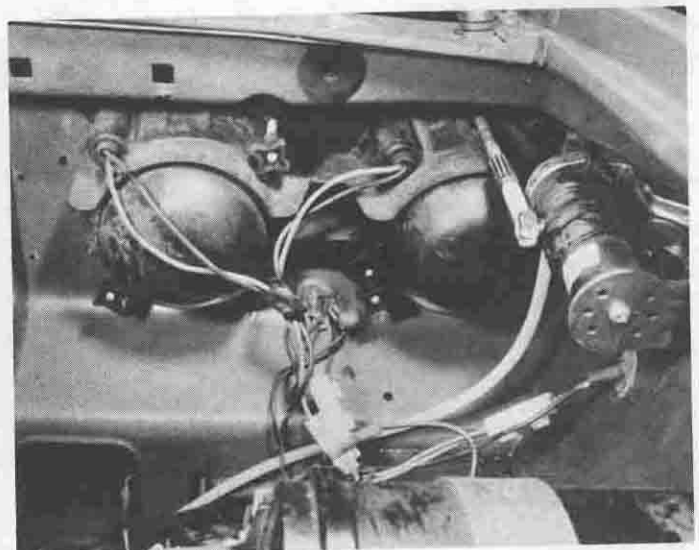
22.4 Removing the bulb



23.1 Removing the front parking and flasher lens



23.2 The lamp holder is held into the front bumper from the rear



24.6 The wiring for the repeater lamp comes through the inner wing

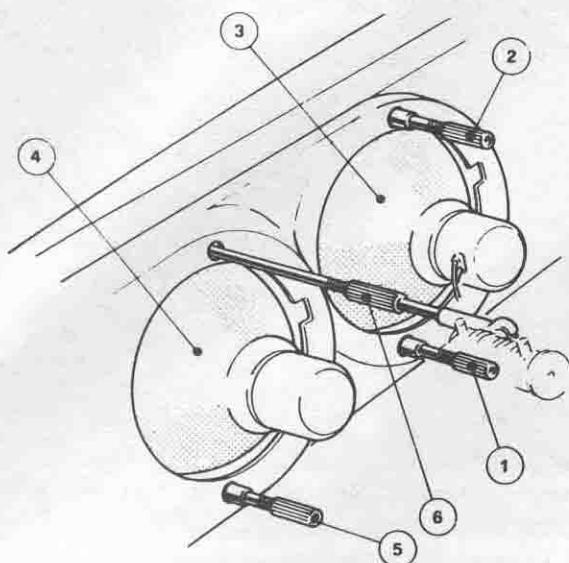


Fig. 10.12 Headlamp aiming knobs (1600, 1800 and 2000 Saloon models) (Sec 21)

- |                                    |   |
|------------------------------------|---|
| 1 Main beam horizontal aiming knob | 4 Left-hand dipped beam headlamp                                      |
| 2 Main beam vertical aiming knob   | 5 Dipped beam horizontal aiming knob                                  |
| 3 Left-hand main beam headlamp     | 6 Dipped beam vertical aiming knob on automatic adjuster control link |

- 5 Fit the bulb ensuring that you do not touch the glass part. If it is accidentally touched then it must be cleaned using methylated spirit and dried with a lint-free cloth. The bulb can only fit one way.
- 6 Refit the retaining spring clip and reconnect the cables, then refit the rear cap.
- 7 Standard British sealed beam headlamp units may be available as a spare for your car.

### 23 Front parking and flasher lamps – removal, refitting and bulb renewal

#### Bulb renewal

- 1 Undo the two retaining screws and lift away the dual lens cover. Either bulb can then be removed. Fit a bulb of the appropriate wattage with a bayonet fitting (photo).

#### Removing and refitting the lamp holder

- 2 The lamp holder or body is secured to the bumper from behind by a nut and bolt and a bolt to a bracket. Remove these and the lamp holder can be withdrawn rearwards (photo).
- 3 Disconnect the electrical connectors and the lamp holder can be removed from the car.
- 4 Refit the unit in the reverse order. Check before refitting the lens that the rubber seal is in good order and correctly fitted.

### 24 Side repeater lamps – removal, refitting and bulb renewal

#### Bulb renewal

- 1 Turn the steering wheel to full lock in order to reach up inside the wing to pull back the rubber boot over the repeater lamp bulb holder (Fig. 10.13).
- 2 Pull the bulb holder out of the socket and then remove the old bulb.
- 3 Fit a bulb of the correct type and wattage and refit the rubber boot, making sure that the boot fits securely.

#### Removing and refitting the lamp assembly

- 4 Disconnect the battery negative cable.

- 5 Lever the flasher repeater light assembly out of the wing using a flat bladed screwdriver. Take great care not to damage the paintwork.
- 6 Remove the plastic connector cover from the power supply wire and disconnect the cables. Also disconnect the earth spade connector from the earth lead point below the headlamps (photo).
- 7 Withdraw the grommet from the inner wing and remove the whole assembly.
- 8 Refit in the reverse order to removal. To secure the repeater lamp in the wing push it firmly home. Ensure before doing so that the lamp base is clean and that the fitting recess in the wing has been cleaned off.

### 25 Rear lamp assembly – removal, refitting and bulb renewal

#### Bulb removal (Saloon and HPE models)

- 1 Unscrew and remove the rear lamp lens retaining screws. The Saloon has four and the HPE three (photo). It is easier if the boot lid or tailgate is opened first.
- 2 Lift away the lens and identify and remove the bulb to be renewed (photo).
- 3 Fit a new bulb of the same wattage (photo).
- 4 Check that the lamp holder rubber seal is in good condition and refit the lens and the retaining screws.

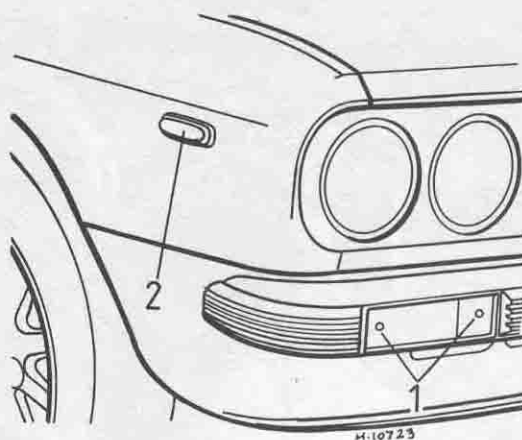


Fig. 10.13 Side flasher and repeater lamp layout (Coupe, Spider and HPE models) (Secs 23 and 24)

- |  |                                       |
|--|---------------------------------------|
| 1 Side light and flasher lens retaining screws | 2 Repeater lamp lens retaining screws |
|--|---------------------------------------|

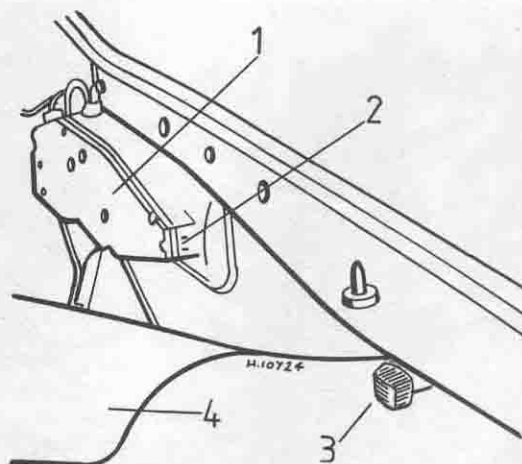


Fig. 10.14 Rear lamp assembly (Coupe and Spider) (Sec 25)

- |              |               |
|--------------|---------------|
| 1 Lamp cover | 3 Boot lamp   |
| 2 Tab        | 4 Boot carpet |

**Bulb removal (Coupe and Spider models)**

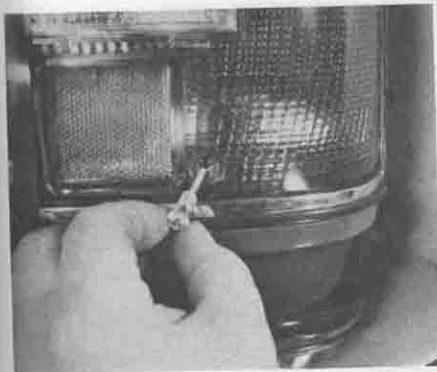
- 5 Open the boot and release the studs to remove the boot lining on the appropriate side to get at the lamp holder (Fig. 10.14). The bulbs are changed from inside the boot.
- 6 Lift up the catch on the outside of the lamp assembly and lift off the cover.
- 7 Identify and change the appropriate bulb. Ensure that the new bulb is of the same fitting and wattage as the original.
- 8 Refit the cover; the inner end slots in first and the outer end is held by the catch, which has to be lifted up so that the outer end can seat properly.

**Removing and refitting the lamp assembly**

- 9 Disconnect the battery negative lead.
- 10 Remove the luggage compartment lining on the left or right side, or the spare wheel on the right (Saloon and HPE models) to reach the rear lamp assembly (photo).
- 11 Disconnect the electrical snap connector or plug-in type, depending on model.
- 12 Remove the lamp to body mounting nuts. There are four on each lamp, and then remove the lamp assembly from the car. Take care that the seal is not damaged.
- 13 With the Saloon, HPE and early Spider models the lamp assembly is withdrawn from the outside of the car (ie the lamp holder is held into the rear body panel). With the Coupe and later Spider models the lamp holder is mounted onto the rear panel from inside the boot.

**26 Luggage compartment light – removal, refitting and bulb renewal****Bulb renewal (Saloon, Coupe and Spider models)**

- 1 Slide the lamp to the right to release it from the guides and the bulb can then be removed.
- 2 Fit a new bulb of the same fitting and wattage and fit the lamp in the guides.



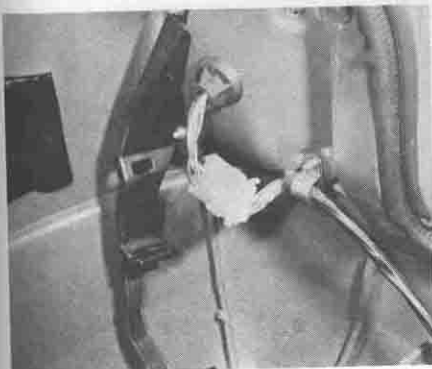
25.1 Removing the rear lamp lens retaining screws



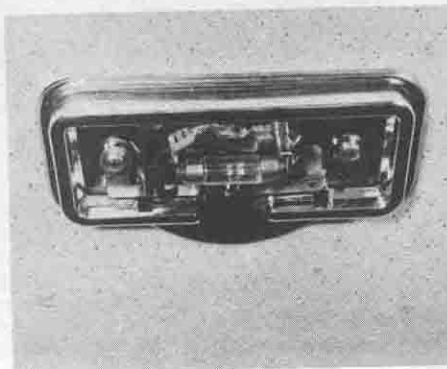
25.2 Removing the lens



25.3 Fitting a new tail lamp bulb



25.10 The rear lamp assembly is fitted like this on the right-hand side



26.3 The HPE has a rear courtesy lamp over the luggage area



27.1 Removing the courtesy lamp lens to change a bulb

**Bulb renewal (HPE models)**

- 3 The HPE model is fitted with a lamp, similar to the interior courtesy lamp, over the luggage area (photo). Refer to Section 27 for the removal, refitting and bulb renewal procedure.

**Removing and refitting the lamp assembly**

- 4 Slide the lamp out of its guides, disconnect the wiring plugs and remove it.
- 5 Refit it in the reverse order to removal.

**27 Interior courtesy lamp – removal, refitting and bulb renewal****Bulb renewal**

- 1 Squeeze the two long sides of the lamp lens together if the lamp is of the type with a protruding lens cover, or if it is a flush fitting lens cover then prise it out using a small electrical screwdriver (photo).
- 2 With the lens removed the festoon bulb can be removed.
- 3 Refitting is the reverse procedure. The flush fitting type of lens cover needs only to be pressed home.

**Removing and refitting the lamp assembly**

- 4 Disconnect the battery negative lead.
- 5 Remove the lens cover and bulb.
- 6 Disconnect the two wires to the lamp holder. On some models the wires to the lamp holder are connected from the rear, and cannot be disconnected until the lamp holder has been released from the roof panel. The HPE rear lamp over the luggage area has only one wire.
- 7 Unscrew and remove the two crosshead screws and remove the lamp holder assembly.
- 8 Refitting is a reversal of the removal procedure.

**28 Under bonnet lamp – removal, refitting and bulb renewal****Bulb renewal**

- 1 Open the bonnet and support it.



- 2 Push in and twist to remove the bulb. Fit a new one of the same type and wattage.

### *Removing and refitting the lamp assembly*

- 3 The under bonnet lamp is mounted to the rear bulkhead of the engine compartment by a single mounting. Undo the nut and disconnect the electrical plug and remove the unit (photo).
- 4 Refitting is the reverse of the removal procedure.

- 2 Push the bulb and socket back into the fitting (photo).

### *Removing and refitting the lamp assembly*

- 3 Undo the retaining screw next to the switch button.
- 4 Disconnect the connector from the rear of the bulb socket.
- 5 Pull the assembly forward through the mounting bracket and disconnect the black wire from the switch.
- 6 Refitting is a reversal of the removal procedure.

## 29 Number plate lamps – removal, fitting and bulb renewal

### *Bulb renewal*

- 1 All models have two rear number plate lamps. On the Saloon models they are fitted in the boot lid itself, and on the Coupe, Spider and HPE they are fitted into the upper surface of the bumpers.
- 2 To remove a bulb and socket simple pull it out of the lamp holder (photo).
- 3 Remove the bulb from the socket and fit a new one of the same wattage and fitting.
- 4 Push the new bulb and socket firmly home into the holder.

### *Removing and refitting the lamp assemblies*

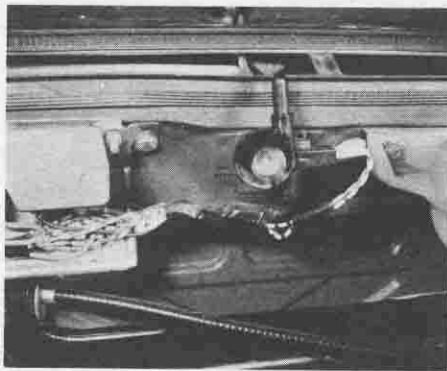
- 5 Remove the bulb and socket.
- 6 Squeeze the retaining lugs inwards to release the lamp holder and lens unit from the boot lid or bumper.
- 7 Refitting is simply a matter of pressing the lamp holder into the top edge of the bumper or the boot lid opening. Make sure that the seal is in good condition first.

## 31 Auxiliary switches, illumination and warning lights (Coupe, Spider and HPE models up to 1979)

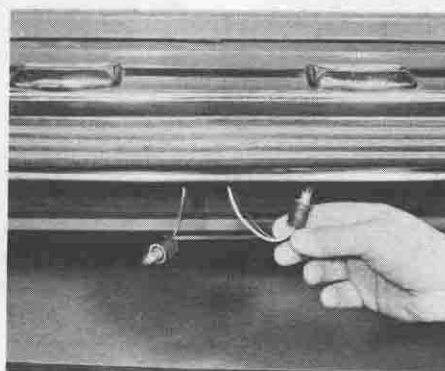
- 1 In the Coupe, HPE and Spider models the auxiliary switches are all mounted in a wood veneer panel in the centre of the dashboard. This is held in place by four knurled screws in the corners. Remove these and the panel can be carefully eased forward but disconnect the battery negative lead first of all (photo).
- 2 To renew a bulb in the cigar lighter or hazard flasher, heated rear window switch or rear fog warning lamp (as fitted) is a simple operation. Pull the bulb and socket out of the rear of the switch. Refit the bulb and socket in the reverse procedure to removal.
- 3 To remove a switch first remove the centre panel. Remove the switch knob by unscrewing it. Remove the knurled ring on the outside of the panel and clear plastic or metal collar behind it. Withdraw the switch complete and disconnect the wiring, noting which wire fits where.
- 4 Refit the switch to the panel and secure it with the knurled collar. Refit the wiring and the knob. Refit the panel.

## 32 Auxiliary switches and indicator lamps (Coupe, Spider and HPE models, 1979 onwards) – removal and refitting

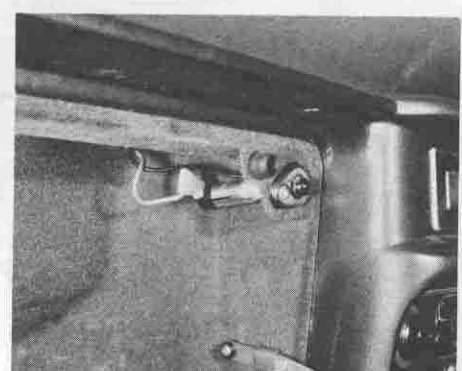
- 1 In later models the old type of centre panel was discontinued, but the new auxiliary switches, of the rocker type, are still fitted in the centre of the dashboard, although the indicator or warning lamps are



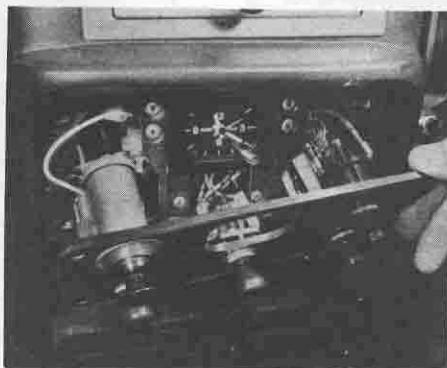
28.3 The under-bonnet light has an integral switch



29.2 Removing the second rear number plate lamp



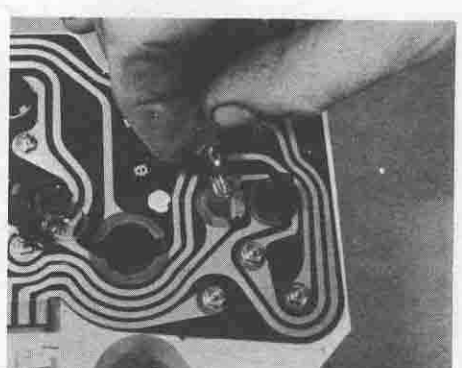
30.2 The integral light and switch for the glovebox



31.1 Easing the auxiliary switch panel forward to reach the switches and bulbs



34.2 With the panel pulled out the bulbs can be reached



34.3 Twist and pull out the bulb and holder



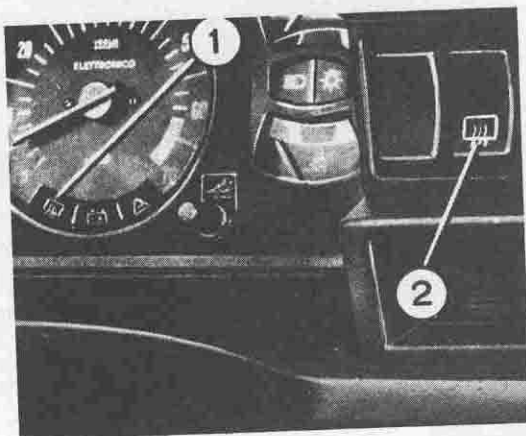


Fig. 10.15 The heated rear window switch and warning lamp (later models) Sec 32)

- 1 Warning or indicator lamp      2 Heated rear window switch

now incorporated in the instrument panel itself (Fig. 10.15).

2 The heated rear window and hazard flasher switches are mounted in the upper centre section of the dashboard on either side of the heater controls, while the fog lamps switches and cigar lighter are mounted in the lower panel in the centre console forward of the gear lever (Fig. 10.16).

3 To change an indicator or warning bulb for either of the switches

refer to Section 34, which covers the instrument illumination and panel warning lights.

4 To change any of the rocker switches, prise the appropriate switch out of the dashboard panel, disconnect the wiring from the rear and fit it to the new switch. Insert the switch in the panel and push it home.

5 To renew the cigar lighter, remove the knob, undo the securing collar and withdraw the unit through the panel. Disconnect the wiring and fit it to a new unit. Fit the new cigar lighter in the reverse sequence to removal.

### 33 Auxiliary switches and indicator lamps (Saloon models) – removal and refitting

1 On the Saloon models the auxiliary switches for the heated rear window, rear fog warning lights and hazard flasher are mounted on an auxiliary panel under the dashboard to the right of the steering wheel.

2 The indicator lamps for these switches are incorporated in the instrument panel layout. To change a bulb in one of these indicator lamps, refer to Section 34, which deals with instrument illumination and panel warning lights.

### Switch removal and refitting

3 Identify the switch that needs replacing and remove the knob. Undo the knurled ring which secures it to the auxiliary switch panel and withdraw it from the rear.

4 Disconnect the wiring to the switch and note which wire fits where. Alternatively take the new switch and refit each wire in turn as it is removed so that there can be no mistake.

5 Fit the new switch to the panel and secure it in place with the knurled collar. Then refit the knob.

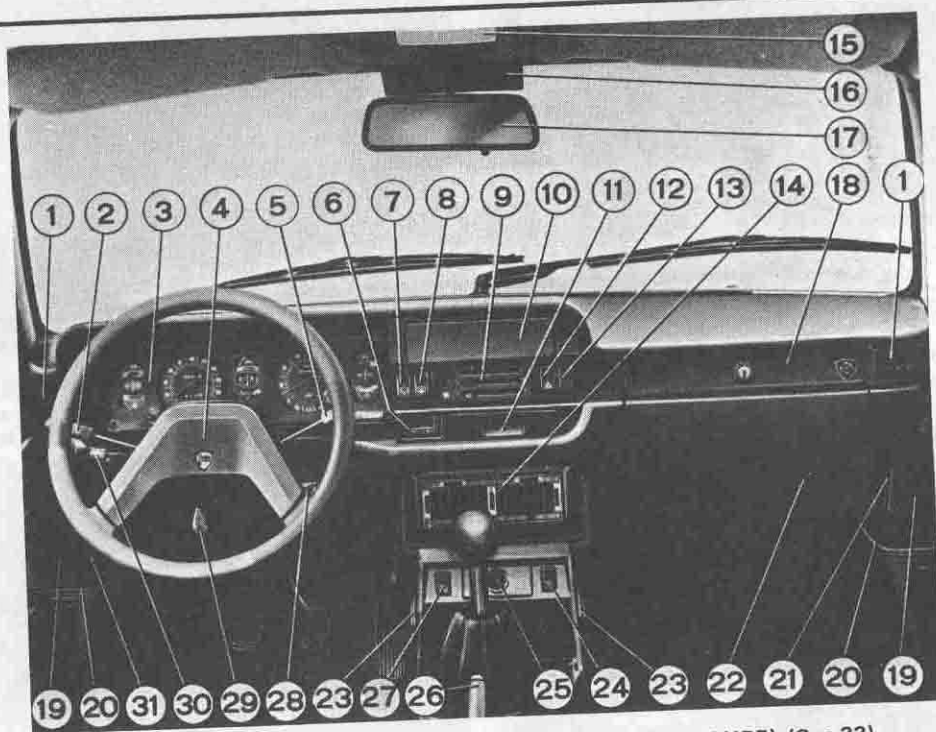


Fig. 10.16 Layout of later model controls (Coupe, Spider and HPE) (Sec 32)

- |   |   |   |  |
|---|---|---|--|
| 1 Heating and ventilation directional outlets | 9 Ventilation and heating controls              | 16 Licence and insurance tag holder (Italian market only) | 24 Rear fog lamp (if fitted) switch      |
| 2 Outside lights switch                       | 10 Radio blank                                  | 17 Rear view mirror                                       | 25 Cigarette lighter                     |
| 3 Instruments panel                           | 11 Ash-tray                                     | 18 Glove box  | 26 Handbrake lever                       |
| 4 Horn switch                                 | 12 Hazard signalling switch                     | 19 Speakers   | 27 Fog lamps (if fitted) switch          |
| 5 Windscreen wiper and control                | 13 Spare switch                                 | 20 Bins   | 28 Ignition key switch                   |
| 6 Digital clock                               | 14 Heating and ventilation outlets and controls | 21 Bonnet emergency release lever                         | 29 Steering wheel position setting lever |
| 7 Extra switch                                | 15 Inside light                                 | 22 Plug-in socket   | 30 Turn indicators control               |
| 8 Rear heated window switch                   |   | 23 Front seat footwell outlets                            | 31 Bonnet release lever                  |

6 The cigar lighter, which is mounted in the panel next to the ashtray is replaced in a similar fashion.

### 34 Instrument panel warning indicator lights – bulb renewal

1 Remove the instrument panel as described in Section 35 or 36 but it is not absolutely necessary to withdraw it completely or disconnect the multi-plug connectors. Most of the bulbs can be reached quite easily (photo).

3 Having identified the bulb concerned, twist and remove the bulb holder and bulb (photo). Fit a new bulb of the correct type and wattage. As can be seen from the photo, there are different sizes.

4 All these small panel light bulbs are of the pull-out and push-in variety. The bigger bulbs are for the instrument panel illumination, and the smaller ones are for the warning and indicator lamps.

5 Refitting is a reversal of removal.

### 35 Instrument panel (Saloon models) – removal and refitting

1 Disconnect the battery negative cable.

2 Disconnect the speedometer drive cable from the gearbox/differential housing.

3 On early models unscrew the four screws which retain the instrument panel in position; these project from the panel itself. On later models 2 screws in the bottom corners hold the cowling in position and another two behind hold the panel in place.

4 Pull the panel away from the dashboard so that the multi-plug connectors can be detached from the instrument panel. There are 3 plugs and it is very important to note which fits where. Fully lower the steering wheel where necessary.

5 Disconnect the speedometer cable from the back of the speedometer and the oil level pressure pipe from the rear of the panel (if it is fitted).

6 The instrument panel, which is of the printed circuit type, can then be removed carefully.

7 Refitting the panel is the reverse procedure to removal. Make sure that the multi-plug connectors are fitted to the correct terminal positions. They can be interchanged without realising it as the terminals and plugs are in some cases similar.

### 36 Instrument panel (Coupe, Spider and HPE) – removal and refitting

1 Disconnect the battery negative cable.

2 Disconnect the speedometer cable at the gearbox/differential housing. Remove the dipstick.

3 Unlock the steering column and lower the steering wheel as far as it will go.

4 Undo the 4 retaining screws and lift off the steering column upper and lower casings (photo).

5 Undo the knurled rings from the three knobs in the lower section of the instrument panel and then unscrew and remove the 2 screws in the top front of the instrument panel. These retain the cowling, which can then be removed (photo). In later models (from 1979 onwards) there are four screws (one in each corner), which have to be removed first, as the instrument panel is a single assembly. There is no separate cowling.

6 Beneath the cowling (where fitted) there are two screws in the bottom edge of the instrument panel which hold the panel itself in position. Remove these and ease the panel away from the dashboard (photo).

7 Disconnect the multi-plug connectors from the instrument panel and note which fits onto which terminal. If in doubt refer to the wiring diagram in your handbook.

8 Also disconnect the speedometer cable and oil level pressure pipe from the rear of the instrument panel.

9 The instrument panel, which is of the printed circuit type, can now be manoeuvred out of its housing and can be placed to one side.

10 Refitting the instrument panel is the reverse process to removal. Remember to ensure that the multi-plug connectors are fitted to the correct terminals. Do not forget to reconnect the speedometer cable to the gearbox housing.

### 37 Auxiliary switch panel (Coupe, Spider and HPE) – removal and refitting

1 The centrally mounted auxiliary switch panel with a wood veneer finished is fitted on these models up to early 1979 when the fascia design was altered.

2 Depending on the model and year there may be two, four or five switches fitted to the panel.

3 To remove the panel first unscrew and remove the four knurled screws (one in each corner). The panel can then be eased forward. This may take a bit of fiddling as it is a tight fit when five units/switches are fitted.

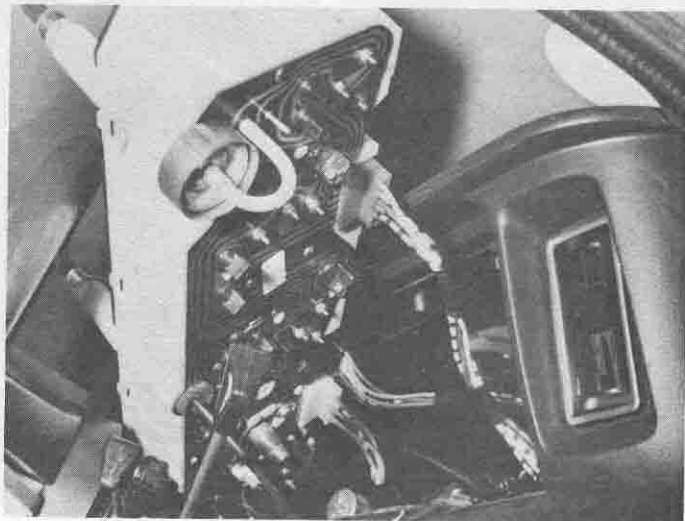
4 With the panel pulled forward it is easy to change any one switch by disconnecting the leads and removing the knob and knurled collar from the front of the panel.

5 When the panel is removed the clock is left behind as can be seen in the photo. To remove the clock first remove the ashtray and the speaker and speaker grille in the top of the dashboard. Undo the 2 nuts which hold the clock onto the bracket which runs behind it. With the nuts removed the clock can be pushed out into the car from behind. The switch panel has to be removed to carry out this operation.

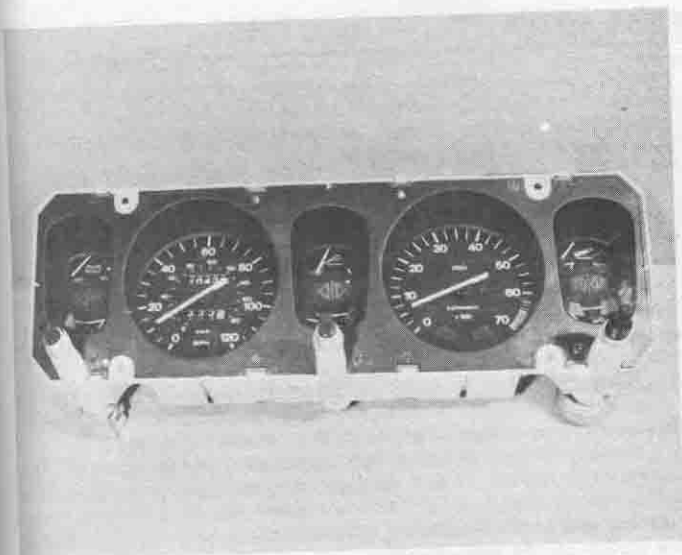
6 Refitting both the clock and switch panel is the reverse procedure to removal.



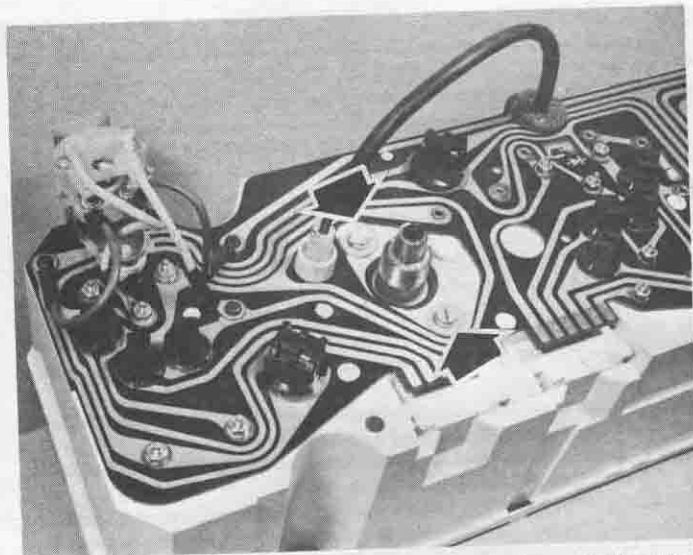
36.4 Removing the steering column lower casing



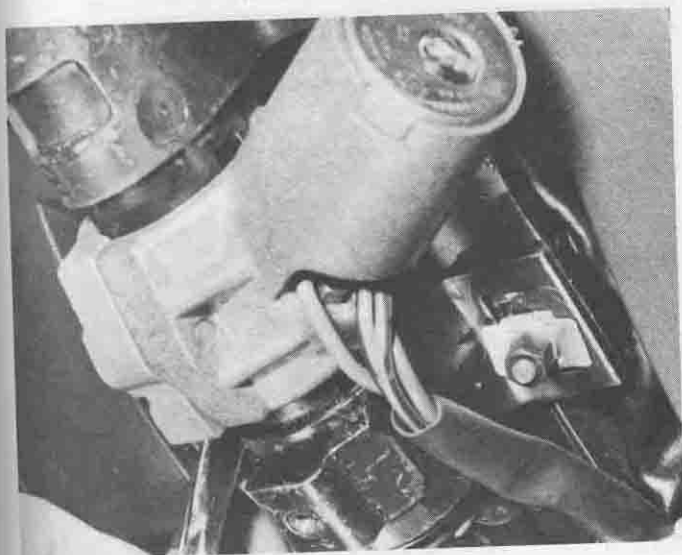
36.6 Removing the instrument panel



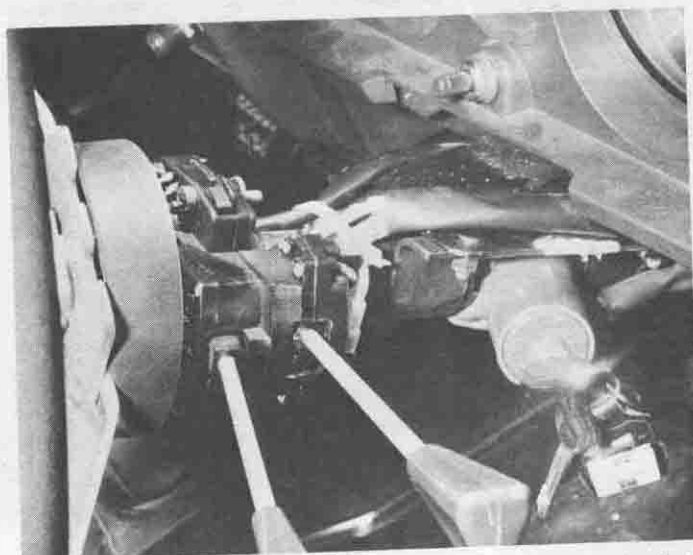
38.2 Remove the front panel from the main assembly



38.3 The instrument mounting nuts and screws can be easily identified (speedometer screws arrowed)



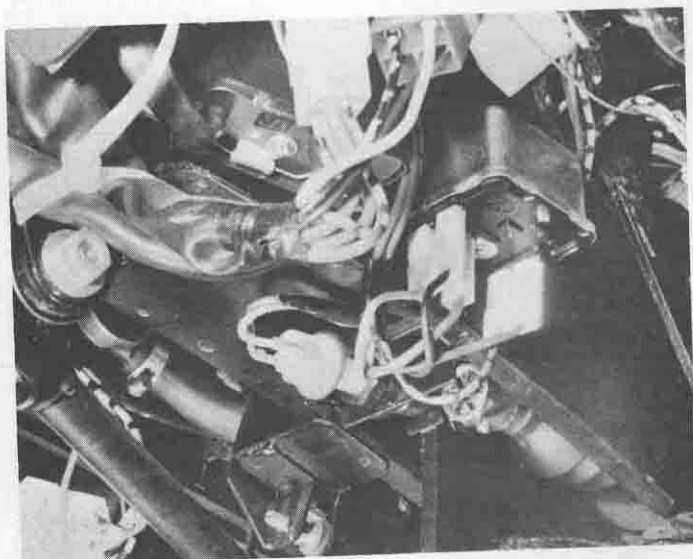
39.3 The ignition switch with casings removed



40.1 The lighting, direction indicators and wiper/washer control switch assembly is a one piece unit



41.2 The front left-hand door courtesy light switch



42.1 The brake stop light switch is fitted to the pedal box



**38 Instruments – removal and refitting**

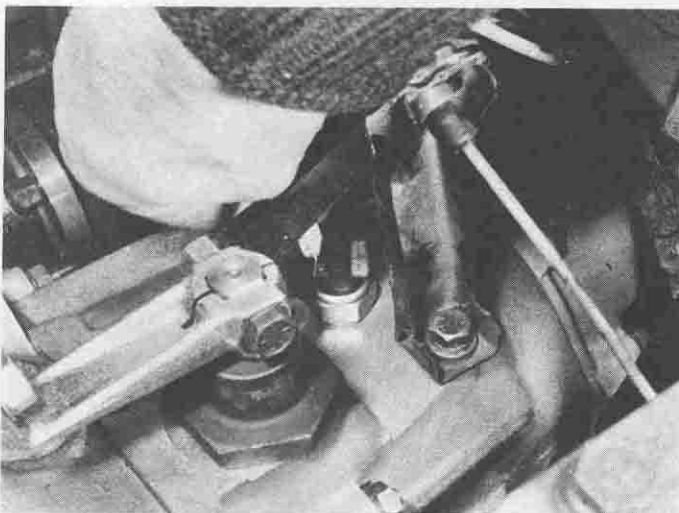
- 1 Remove the instrument panel as described in Sections 35 and 36.
- 2 Working on the bench remove the panel glass sheet and front black panel (photo).
- 3 Identify the instrument which needs to be removed. The small ones are held in place with nuts and the large instruments (speedometer and tachometer) are retained by screws (photo).
- 4 With the screws removed or nuts undone the instrument can then be withdrawn from the panel, for further stripping or renewal.
- 5 Refit the instrument in the reverse order to removal and refit the panel to the dashboard as described in Sections 35 to 36.

**39 Ignition switch – removal and refitting**

- 1 Disconnect the battery negative lead.
- 2 Remove the steering column casings; there are two, split horizontally and retained by screws through the lower section.
- 3 It is easier to remove the upper casing with the steering column fully lowered (photo).
- 4 Undo the cable ties and trace the wires from the ignition switch back as far as the multi-plug connectors. Disconnect them.
- 5 Undo and remove the bolt which secures the ignition switch to the anti-theft locking device. Insert the key into the ignition lock, turn it to the GAR position and remove it. The complete ignition switch can be removed by depressing the locking spring pin with a pointed instrument and sliding it out.
- 6 Refitting is the reverse procedure to removal.

**40 Lighting, direction indicators and wiper/washer control switch assembly – removal and refitting**

- 1 The lights, direction indicators and wiper/washer controls are all mounted on the steering column. The assembly is a one piece unit and if one section goes wrong, then the whole assembly has to be renewed (photo).
- 2 Disconnect the battery negative lead.
- 3 Remove the steering column upper and lower casings. They are retained by screws underneath.
- 4 Remove the steering wheel as described in Chapter 11.
- 5 Undo the cable ties which keep the harness in place.
- 6 Trace the various harnesses back to their multi-plug connectors and separate them.
- 7 Undo the control switch assembly retaining screws and lift the whole switch combination off the steering column.
- 8 Fit a new switch assembly to the steering column in the reverse order to removal. Before refitting the steering wheel check that all the



43.1 The reversing light switch is really well hidden

controls function correctly. The indicator cancellation mechanism cannot of course be checked until the steering wheel has been refitted, and provided that the 'straight ahead' position has been maintained then there should be no problem.

**41 Courtesy light switches – removal and refitting**

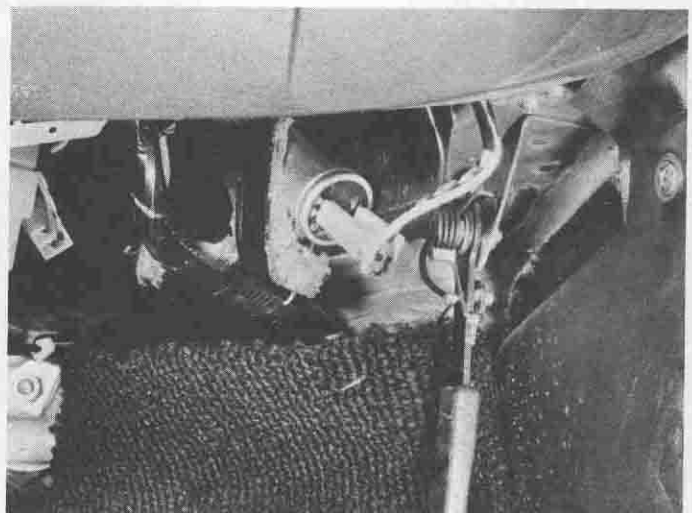
- 1 The courtesy lights are operated when any door is opened, or in the case of the HPE when the tailgate is opened.
- 2 The courtesy light switches are mounted in the front door pillars of each door (photo).
- 3 To remove one of these switches first remove the trim panel covering the inside of the pillar. Unscrew the retaining collar, remove the washer and retrieve the switch from inside the pillar.
- 4 These switches tend to suffer a great deal as they grow old. The commonest problem is that they get clogged up and won't release, which means that the light will not come on. By a little judicious cleaning and gentle lubrication using a product such as WD 40 spray the switch can be resuscitated.
- 5 Fit the switch in the reverse order and then check it for operation.

**42 Brake stoplight switch – removal and refitting**

- 1 The switch is located on the pedal carrier to the rear of the brake pedal (photo).
- 2 Disconnect the battery negative cable before commencing work.
- 3 Undo the retaining nut on the front of the mounting plate, remove the washer and withdraw the switch.
- 4 Disconnect the two spade connectors.
- 5 Refit the switch in the reverse sequence to removal. Reconnect the battery.
- 6 Set the switch, using the nut at the rear of the bracket to adjust it, so that the lights come on when the pedal pad has moved 12 mm (0.47 in) forward from its rest position, or if measured at the switch, the pedal arm should move only 2 to 3 mm (0.079 to 0.118 in) before the lights come on. When it is correctly set tighten the nuts.

**43 Reversing light switch – removal and refitting**

- 1 The reversing light switch is mounted on top of the gearbox beneath the clutch control cable bracket (photo).
- 2 To remove it first disconnect and remove the battery and battery tray and the large windscreen washer reservoir in later models. Remove the bolts which secure the clutch cable bracket to the gearbox. Release the clutch control arm. Lift the assembly to one side.



44.2 The round flasher unit is for the direction indicators

- 3 Disconnect the cables from the switch and then remove the switch from the casing.
- 4 Refit the switch in the reverse order to removal. Do not forget to check the clutch cable adjustment when the cable and bracket have been refitted. This is covered in Chapter 5.

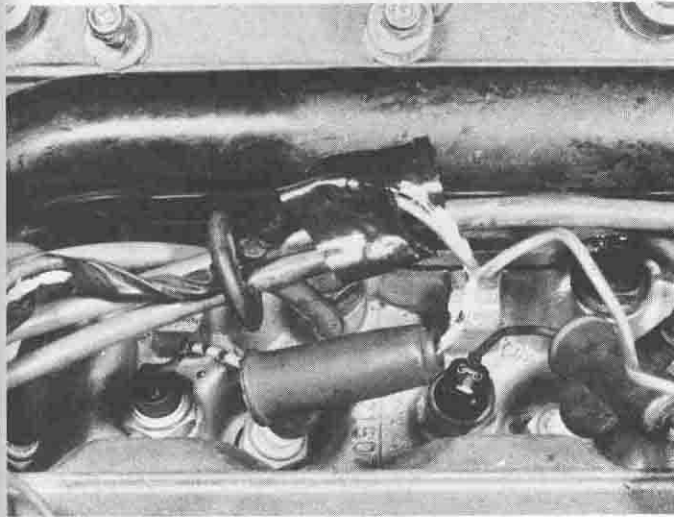
#### 44 Flasher units – removal and refitting

- 1 There are two flasher units fitted to the Lancia Beta Series. Both are located under the dashboard, on the drivers side. Disconnect the battery negative cable.
- 2 The small round one is the flasher unit for the indicators (photo). Pull it out of its position and remove the connectors.
- 3 The hazard flasher unit is a square metal cased unit mounted on the outside of the pedal box. This can clearly be seen in photo 42.1.
- 4 Undo the two mounting nuts and remove the unit. Disconnect the five leads to it.
- 5 Refitting is the reverse procedure to removal.

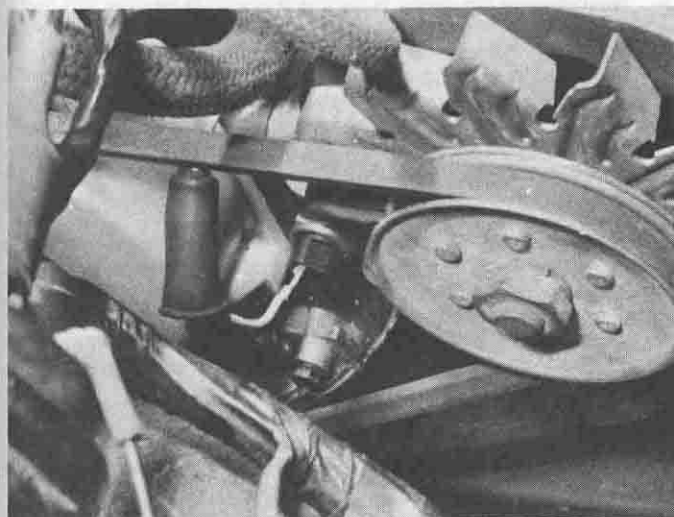
#### 45 Sender units – removal and refitting

##### *Temperature gauge sender unit*

- 1 Mounted in the top of the cylinder between the sparking plugs are



45.1 There are two sender units mounted in the cylinder head



45.11 The oil temperature switch is mounted in the front of the oil filter mounting block

two sender units. The one nearest the front of the engine is the temperature gauge transmitter (photo).

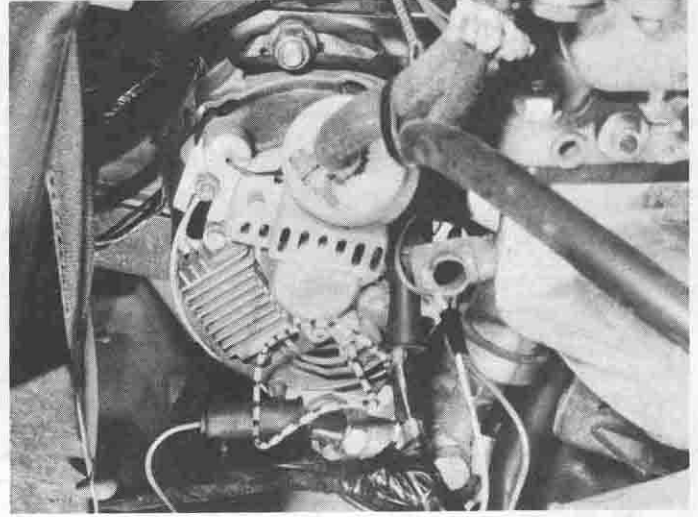
- 2 Disconnect the lead to it having first pulled back the protective rubber boot.
- 3 Using a socket remove the transmitter.
- 4 Immediately fit the new unit and screw it in. Tighten it to the specified torque, refit the lead and slide the boot over it. Check and if necessary top up the cooling system (see Chapter 2).

##### *Engine overheating warning light switch*

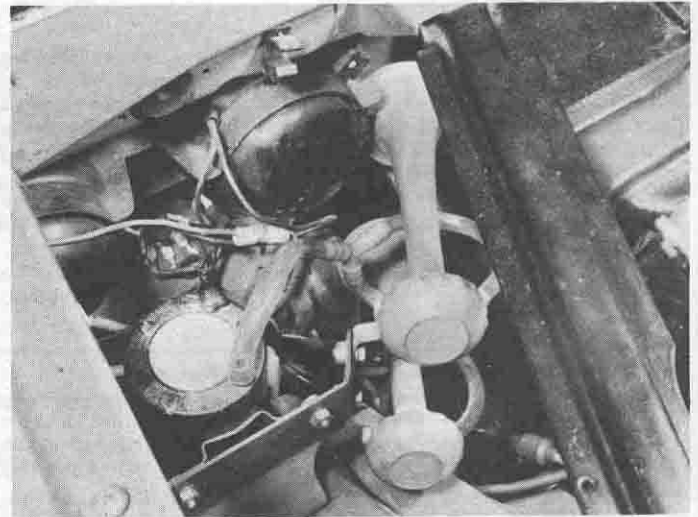
- 5 The other sender unit in the cylinder head, between Nos 3 and 2 cylinders, is the switch for the engine overheating warning light.
- 6 The procedure for removal and refitting is exactly the same as for the temperature gauge transmitter.

##### *Oil pressure gauge transmitter and low oil level warning light switch*

- 7 The oil pressure gauge transmitter is mounted onto the rear of the oil filter mounting block. On early models it is mounted horizontally and on later models it is mounted vertically on a right angled banjo union with the oil level warning light switch (photo).
- 8 Remove the wiring connector and apply a spanner to the mounting nut on the base of the transmitter. To reach the unit will involve the removal of the air cleaner assembly. On Saloon models, where the grille can be removed, the task is much simpler.



45.7 The oil pressure transmitter and oil low level warning light switch are mounted behind the alternator on the oil filter block



47.2 The horns and air compressor are mounted on a bracket behind the left-hand headlamps

9 To remove the low oil level switch, where it is fitted, pull back the rubber boot and disconnect the lead to the switch. Apply a spanner and remove the switch.

10 Refitting is the reverse procedure to removal but ensure all the units are tightened to the correct torques.

#### Oil temperature switch

11 The oil temperature switch is mounted in the front end of the oil filter mounting block (photo).

12 Disconnect the lead to it, having pulled back the rubber boot and remove the transmitter.

13 Fit a new switch in the reverse order to removal.

#### Fuel tank gauge transmitter

14 The removal and refitting procedure for the fuel tank transmitter unit is fully covered in Chapter 3.

### 46 Horns (Saloon models) – removal and refitting

- 1 Disconnect the battery negative cable.
- 2 Disconnect the electric leads from the horns.
- 3 Undo the mounting nuts and bolts and remove first the upper horn and then the lower horn.
- 4 Refit the horns in the reverse order to removal and then check their operation.

### 47 Horns and compressor (Coupe, Spider and HPE models) – removal and refitting

- 1 Disconnect the battery negative cable.
- 2 Disconnect the clear plastic tube from the horns and compressor unit (photo).
- 3 Disconnect the wiring from the compressor unit.
- 4 Undo the mounting nut and bolt for the upper air horn and remove it. Then carry out the same procedure for the lower horn.
- 5 The compressor is mounted to the same bracket by two nuts and bolts. Remove these and lift the unit away.
- 6 Refitting is the reverse procedure; remember to check the correct operation of the horns on reassembly.
- 7 Lubricate the compressor regularly as detailed in the maintenance Section, at the beginning of the manual.

### 48 Horn operating switch – removal and refitting

- 1 The horns of all models are actuated by pushing in the centre section of the steering wheel. However, the type of horn push varies considerably as does its fixing method.
- 2 With all Saloon models the horn push is retained by screws through the steering wheel spokes from behind. These screws hold the horn push against the spring.
- 3 To remove the horn push, first disconnect the battery negative lead then remove the screws and remove the horn push and spring.
- 4 With the Coupe, Spider and HPE models that have a small inverted T-shape horn push this is held in position by lugs. Release the lugs from the rear of the steering wheel and the horn push and spring can then be withdrawn.
- 5 Later (1979 onwards) versions of the Coupe and HPE have inverted V-shape horn pushes that are retained by screws, as in the Saloon models.
- 6 To refit the horn push, place the spring in position and refit the horn push and secure it. Then check the horns for correct operation.

### 49 Windscreen washer pump – removal and refitting

- 1 Various types of windscreen washer reservoir and pump system have been fitted. In very early models the water is housed in the traditional water bag and the pump is an integral part of the bag assembly.
- 2 Later models have the bag separate from the pump which is mounted on the left inner wing.
- 3 New Coupe, Spider and HPE models from 1979 onwards have a

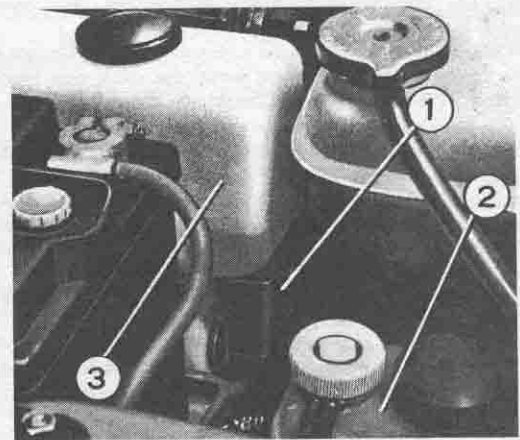


Fig. 10.17 Latest type of washer reservoir and pump (Sec 49)

- |                           |                               |
|---------------------------|-------------------------------|
| 1 Windscreen washer motor | 3 Windscreen washer reservoir |
| 2 Brake fluid reservoir   |                               |

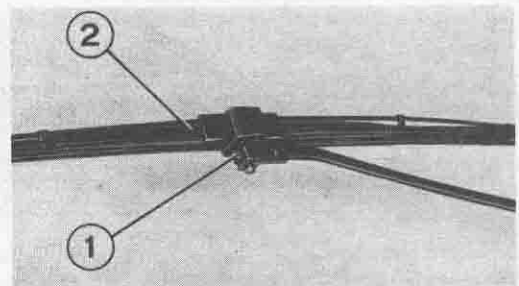


Fig. 10.18 Removing the wiper blade from the arm (Sec 50)

- |                  |         |
|------------------|---------|
| 1 Blade retainer | 2 Blade |
|------------------|---------|

modern type system with a large rectangular plastic water container with a built-in pump. This is mounted inboard of the battery and has a much greater capacity than the old type of bag (Fig. 10.17).

4 To remove the pump disconnect the wiring having first removed the battery negative cable.

5 Then remove the inlet and outlet plastic pipes from the pump, and note which is which for refitting purposes.

6 Next remove the pump. How this is done depends on the type of system fitted. In early models the bag and pump are simple lifted out when the wiring and pipes have been disconnected.

7 In later models the mounting screws, which retain the pump to the inner wing, have to be removed; then the pump can be withdrawn.

8 In the newest models the complete reservoir assembly has to be removed from the vehicle. Then the reservoir has to be emptied in order to reach the washer pump mounting nuts, which are inside the reservoir. With the nuts removed, the pump unit can be removed complete with its seal.

7 All models are fitted with a sealed pump and motor unit. If the motor malfunctions, it has to be renewed, as it cannot be repaired, unless of course it is suffering from a simple blockage in the pump. This can be cleaned out either by air pressure or a thin piece of wire.

6 Refit the unit in the reverse order to that in which it was removed. Finally check the washers for correct operation.

### 50 Windscreen wiper arms and blades – removal and refitting

#### Wiper blade

- 1 Lift the wiper arm away from the windscreen.
- 2 Release the blade connector from the arm. This is either by pulling the connector up to release it from the stud on the arm and then



withdrawing it (photo), or if it is the alternative fitting which is to be found on later models, by lifting the retainer and pulling the blade upwards (Fig. 10.18).

3 Refitting is the reverse procedure to removal.

#### Wiper arm

4 The wiper arm is retained on the splined shaft of the wiper spindle by a clip which locates under the lower edge of the splined boss (photo) or a nut.

5 Lift the arm away from the windscreen and use a flat bladed screwdriver to release the clip or unscrew the nut. Pull the wiper arm off the splined boss.

6 To refit the wiper arm position the arm in relation to the windscreen so that it is in the 'parked' position. Then slide the arm onto the splined boss until the clip locks it in place or until the nut can be refitted.

7 Finally check the operation of the wipers to ensure that the splines are correctly located and that the wiper returns to its correct park position. If it doesn't remove the arm again and reposition it as necessary on the splines.

#### 51 Windscreen wiper motor and mechanism – removal and refitting

1 There are minor differences between the Saloon models and the others in the range in the fitting of the windscreen wiper mechanism, although the basic procedure is the same.

2 Start by disconnecting the battery negative cable.

3 In the Saloon version begin by dismantling the washer jet supporting bracket, which is secured to the front of the section which houses the wiper motor under the bonnet, then remove the motor protective cover. If necessary disconnect the speedometer drive cable from the gearbox for access.

4 Disconnect the windscreen wiper motor multi-plug connector. On the Coupe, Spider and HPE models this is located beside the motor. The cable clamp to the right will also need undoing (photo).

5 On the Saloon models the multi-plug is located behind the instrument panel. This can be reached without removing the panel and the end can be pushed through the hole in the bulkhead, once the grommet has been removed. If difficulty is experienced in reaching or

identifying the wiper motor multi-plug connector then remove the instrument panel.

6 Remove the wiper arms complete with blades, as described in the previous Section, and then undo and remove the spindle retaining nuts, washers and seals.

7 Remove the two wiper mounting plate retaining nuts, which support the mounting plate on rubber pads.

8 The whole assembly is now free and can be manoeuvred out of the car (Fig. 10.19).

9 With the assembly on the bench the motor can be removed from its mounting plate. Undo the drive arm retaining nut and lift off the arm. Unscrew the two motor retaining screws and the motor is free.

10 Refitting is the reverse procedure to removal, but make sure that the motor is in the automatic 'park' position before fitting the linkage to it. The linkage should be fitted with the drive arm and link bar in a straight line (Fig. 10.19).

11 Finally check, after refitting the whole assembly to the car, that the wipers operate correctly.

#### 52 Windscreen wiper motor and mechanism – dismantling and reassembly

1 Remove the wiper motor and mechanism as described in Section 51.

2 If the motor is known to be faulty, there is no point in trying to effect a repair, a new motor/gearbox assembly should be purchased.

3 If the problem was one of sloppy operation with a great deal of slack in the operating mechanism, the bearing bushes at each end of both link rods should be closely inspected. The bearings are not renewable individually and it will be a matter of renewing the appropriate link rods. It should be remembered that if the bearings are worn, then the pins on which the bearings run could also be worn.

4 Still with the investigation into sloppy operation, it is worth removing the top of the gearbox so that the condition of the worm driven gear wheel can be inspected. This main gear wheel is listed as available as spare and may be renewed, if found to be worn.

5 The wiper spindles are not renewable individually and if the spindles are a shaky fit in their housings, it will be necessary to renew the whole main framework. This framework comprises both spindles, the housings and spacing member and finally the motor mounting.

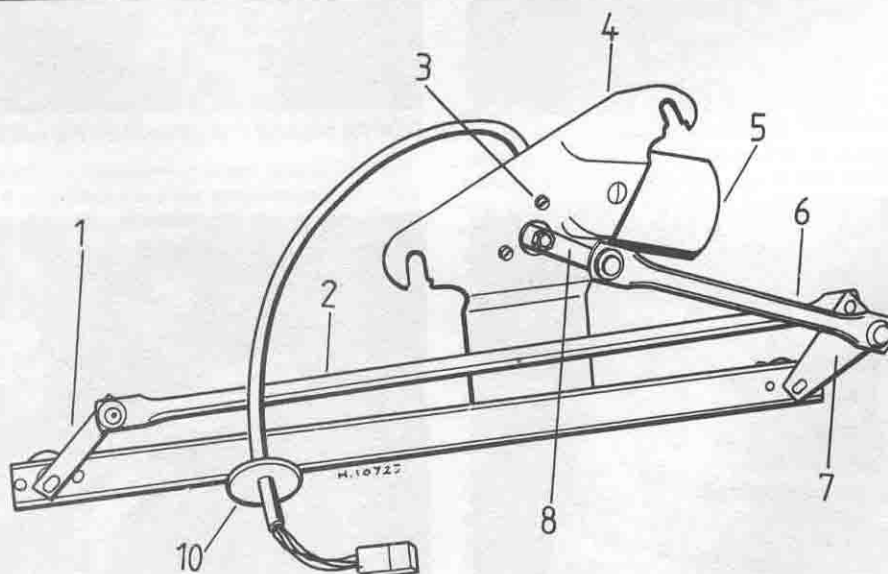


Fig. 10.19 Windscreen wiper motor and mechanism (Sec 51)

1 Lever  
2 Link

3 Motor-to-support bracket  
mounting bolts  
4 Motor support bracket

5 Motor  
6 Motor-to-lever link  
7 Dual lever

8 Drive arm  
9 Multiplug  
10 Grommet

**53 Tailgate wiper assembly (HPE models) – removal and refitting**

- 1 The tailgate wiper motor may be either of Ducellier or Lucas manufacture. The fitting is slightly different.
- 2 Disconnect the battery negative lead, and remove the wiper blade and arm as described in Section 50.
- 3 Undo the wiper spindle retaining nut and remove the washer, any spacers and seal.
- 4 Open the tailgate and remove the interior trim panel. Also remove the slotted grille and blind assembly.
- 5 With the Ducellier type motor, undo the cable clips and unplug the electric leads to the wiper motor (Fig. 10.20).
- 6 Remove the motor mounting bracket retaining screw and then the motor mounting screws. The bracket can now be withdrawn.
- 7 Remove the motor from the tailgate.
- 8 With the Lucas type motor, remove the two screws at either end of the long mounting plate (photo).
- 9 Disconnect the mechanism by moving it back.
- 10 Disconnect the electric leads to the motor and lift it away.
- 11 Refitting is the reverse procedure to removal.

**54 Radios and tape players – fitting (general)**

A radio or tape player is an expensive item to buy and will only

give its best performance if fitted properly. If you do not wish to do the fitting yourself there are many in-line vehicle entertainment specialists who can do the fitting for you.

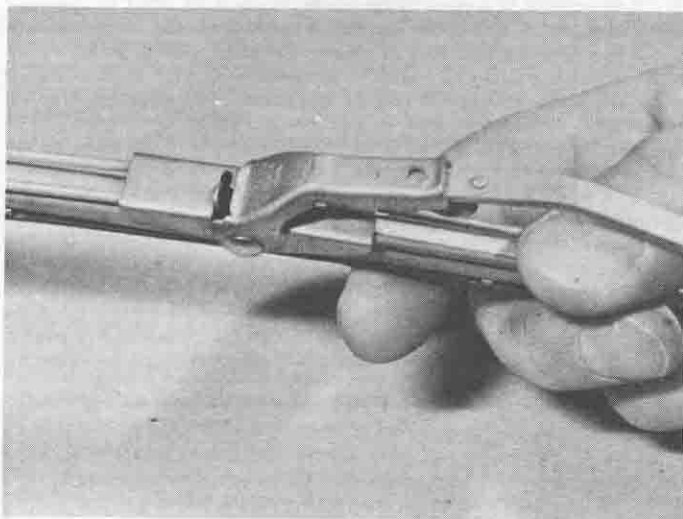
Make sure the unit purchased is of the same polarity as the car and ensure that units with adjustable polarity are correctly set before commencing installation.

It is difficult to give specific information with regard to fitting, as final positioning of the radio/tape player, speakers and aerial is entirely a matter of personal preference. However, the following paragraphs give guidelines, which are relevant to all installations.

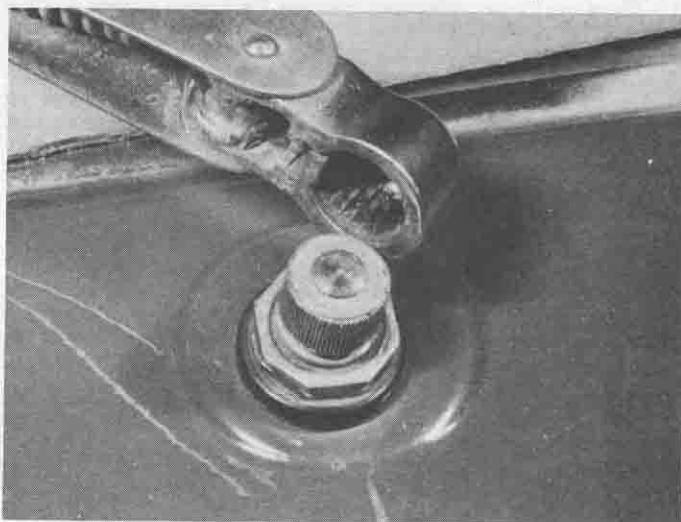
**Radios**

Most radios are a standardised 7 in wide by 2 inches deep – this ensures that they will fit into the radio aperture provided in most cars. If your car does not have such an aperture, the radio must be fitted in a suitable position either in, or beneath, the dashpanel. Alternatively, a special console can be purchased which will fit between the dashpanel and the floor, or on the transmission tunnel. These consoles can also be used for additional switches and instrumentation if required. Where no radio aperture is provided, the following points should be borne in mind before deciding where to fit the unit:

- (a) *The unit must be within easy reach of the driver wearing a seat belt*
- (b) *The unit must not be mounted in close proximity to an electric tachometer, the ignition switch and its wiring, or the flasher*



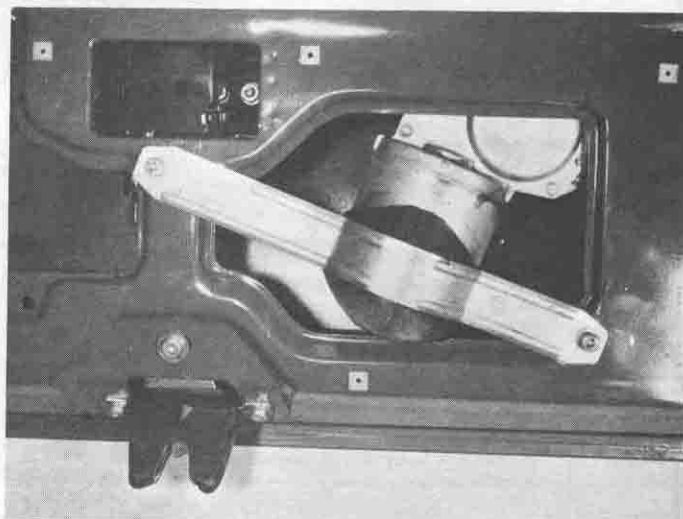
50.2 Removing the wiper blade from the arm



50.4 The wiper arm is mounted on the splined boss



51.4 The wiper motor is mounted in the channel section between the scuttle and engine bay



53.8 The Lucas type motor is held in place by the plate and two screws

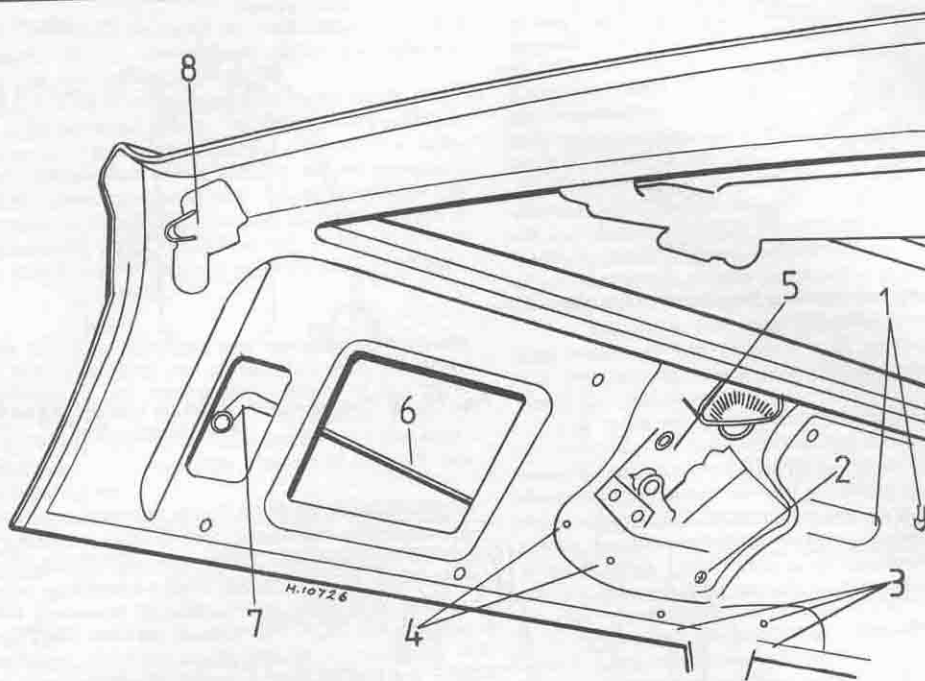


Fig. 10.20 Layout of the tailgate with the Ducellier wiper motor (Sec 53)

- |                                |                         |                    |                          |
|--------------------------------|-------------------------|--------------------|--------------------------|
| 1 Electric cables clips        | 3 Latch mounting screws | 5 Wiper motor      | 7 Tailgate control lever |
| 2 Motor bracket mounting screw | 4 Motor mounting screws | 6 Tailgate control | 8 Side pad               |

unit and associated wiring

- (c) The unit must be mounted within reach of the aerial lead and in such a place that the aerial lead will not have to be routed near the component detailed in preceding paragraph 'b'
- (d) The unit should not be positioned where it might cause injury to the car occupants in an accident; for instance, under the dashpanel above the driver's or passenger's legs
- (e) The unit must be fitted really securely

Some radios will have mounting brackets provided, together with instructions: others will need to be fitted using drilled and slotted metal strips, bent to form mounting brackets. These strips are available from most accessory shops. The unit must be properly earthed by fitting a separate earthing lead between the casing of the radio and the vehicle frame.

Use the radio manufacturer's instructions when wiring into the vehicle's electrical system. If no instructions are available, refer to the relevant wiring diagram to find the location of the radio 'feed' connection in the vehicle's wiring circuit. A 1–2 amp 'in-line' fuse must be fitted in the radio's 'feed' wire; a choke may also be necessary (see next Section).

The type of aerial used and its fitted position, is a matter of personal preference. In general, the taller the aerial, the better the reception. It is best to fit a fully retractable aerial – especially, if a mechanical car-wash is used or if you live where cars tend to be vandalised. In this respect, electrical aerials which are raised and lowered automatically when switching the radio on or off are convenient, but are more likely to give trouble than the manual type.

When choosing a site for the aerial, the following points should be considered:

- (a) The aerial lead should be as short as possible – this means that the aerial should be mounted at the front of the car
- (b) The aerial must be mounted as far away from the distributor and HT leads as possible
- (c) The part of the aerial which protrudes beneath the mounting point must not foul the roadwheels, or anything else
- (d) If possible, the aerial should be positioned so that the coaxial lead does not have to be routed through the engine compartment
- (e) The plane to the panel on which the aerial is mounted should not be so steeply angled that the aerial cannot be mounted

vertically (in relation to the 'end-on' aspect of the car). Most aerials have a small amount of adjustment available

Having decided on a mounting position, a relatively large hole will have to be made in the panel. The exact size of the hole will depend upon the aerial being fitted, although, generally, the hole required is of  $\frac{3}{4}$  inch (19 mm) diameter. On metal body cars, a 'tank-cutter' of the relevant diameter is the best tool to use for making the hole. This tool needs a small diameter pilot hole drilled through the panel, through which the tool clamping bolt is inserted. On GRP body cars a 'hole-saw' is the best tool to use. Again, this tool will require the drilling of a small pilot hole. When the hole has been made the raw edges should be de-burred with a file and then painted, to prevent corrosion.

Fit the aerial according to the manufacturer's instructions. If the aerial is very tall, or if it protrudes beneath the mounting panel for a considerable distance, it is a good idea to fit a stay between the aerial and the vehicle frame. This can be manufactured from the slotted and drilled metal strips previously mentioned. The stay should be securely screwed or bolted in place. For best reception it is advisable to fit an earth lead between the aerial body and the vehicle frame – this is essential for GRP bodied cars.

It will probably be necessary to drill one or two holes through bodywork panels in order to feed the aerial lead into the interior of the car. Where this is the case ensure that the holes are fitted with rubber grommets to protect the cable, and to stop possible entry of water.

Positioning and fitting of the speaker depends mainly on the type. Generally, the speaker is designed to fit directly into the aperture already provided in the car (usually in the shelf behind the rear seats, or in the top of the dashpanel). Where this is the case, fitting the speaker is just a matter of removing the protective grille from the aperture and screwing or bolting the speaker in place. Take care not to damage the speaker diaphragm whilst doing this. It is a good idea to fit a 'gasket' between the speaker frame and the mounting panel, in order to prevent vibration – some speakers will already have such a gasket fitted.

If a 'pod' type speaker was supplied with the radio, the best acoustic results will normally be obtained by mounting it on the shelf behind the rear seat. The pod can be secured to the panel with self-tapping screws.

When connecting a rear mounted speaker to the radio, the wires should be routed through the vehicle beneath the carpets, or floor



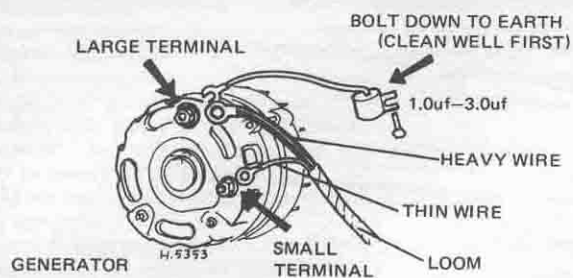


Fig. 10.21 The correct way to connect a capacitor to the alternator (Sec 55)

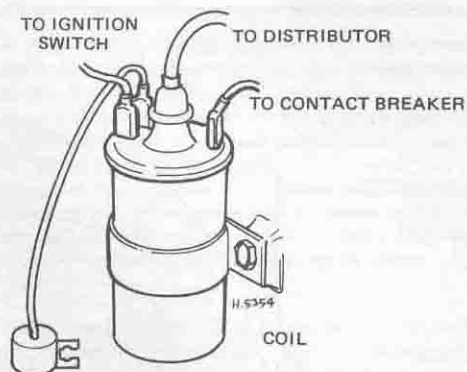


Fig. 10.22 The capacitor must be connected to the ignition side of the coil (Sec 55)

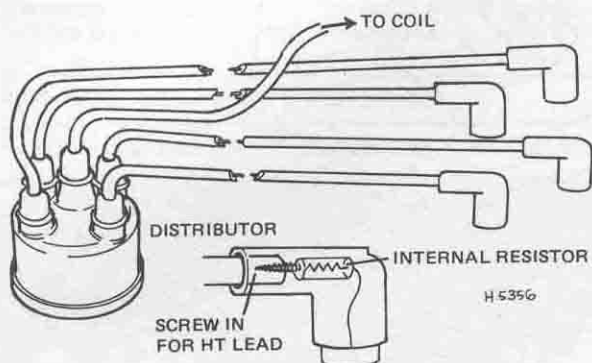


Fig. 10.23 Ignition HT lead suppressors (Sec 55)

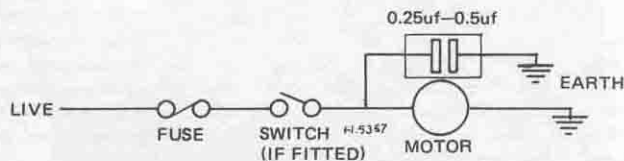
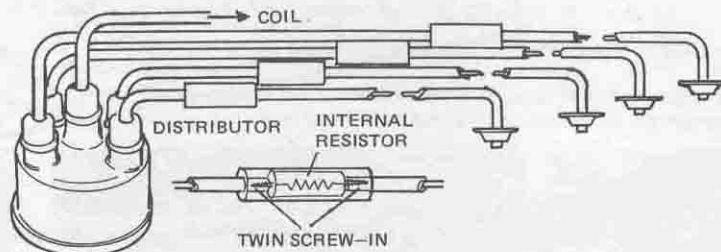


Fig. 10.24 Correct method of suppressing electric motors (Sec 55)

Fig. 10.25 Method of suppressing gauges and their control units (Sec 55)

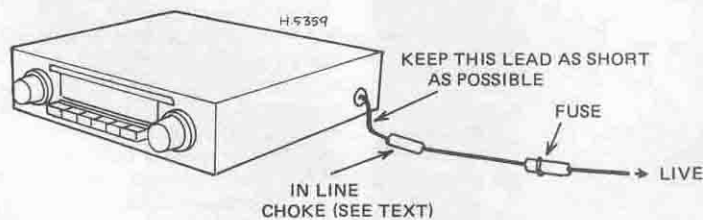
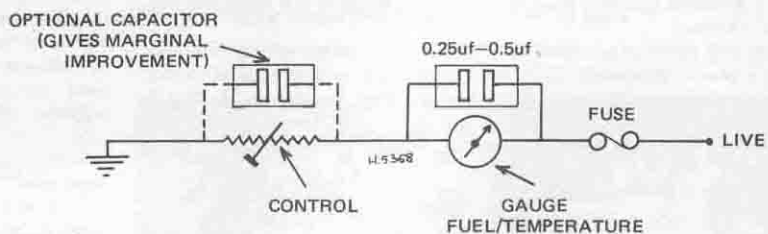


Fig. 10.26 An 'in-line' choke should be fitted with the line supply lead as close to the unit as possible (Sec 55)

mats – preferably the middle, or along the side of the floorpan, where they will not be trodden on by passengers. Make the relevant connections as directed by the radio manufacturer.

Ensure that all the electrical connections have been made properly, so that there is a good electrical contact and that all the wiring is installed neatly and secured to the car with wiring clips, or PVC tape.

After completing the installation of the radio, it will be necessary to trim the radio to suit the aerial. If specific instructions on this are not given by the manufacturer of the radio, proceed as follows. Find a medium waveband station with a low signal strength and turn the trim screw on the radio in or out until the signal is received at maximum strength.

### Tape players

Fitting instructions for both cartridge and cassette stereo tape players are the same and in general the same rules apply as when fitting a radio. Tape players are not usually prone to electrical interference like radios – although it can occur – so positioning is not so critical. If possible the player should be mounted on an 'even keel'. Also, it must be possible for a driver wearing a seat belt to reach the unit to change or turn over tapes.

For the best results from speakers designed to be recessed into a panel, mount them so that the back of the speaker protrudes into an enclosed chamber within the car (eg door interiors or the boot cavity).

To fit recessed type speakers in the front doors, first check that there is sufficient room to mount the speakers in each door without fouling the latch or window winding mechanism. Hold the speaker against the skin of the door, and draw a line around the periphery of the speaker. With the speaker removed draw a second 'cutting' line, within the first, to allow enough room for the entry of the speaker back, but at the same time, providing a broad seat for the speaker flange. When you are sure that the 'cutting-line' is correct, drill a series of holes around its periphery. Pass a hacksaw blade through one of the holes and cut through the metal between the holes until the centre section of the panel falls out.

De-burr the edges of the hole and paint the raw metal to prevent corrosion. Cut a corresponding hole in the door trim panel – ensuring that it will be completely covered by the speaker grille. Now drill a hole in the door edge and a corresponding hole in the door surround. These holes are to feed the speaker leads through – so fit grommets. Pass the speaker leads through the door trim, door skin and out through the holes in the side of the door and door surround. Refit the door trim panel and then secure the speaker to the door using self-tapping screws.

**Note:** If the speaker is fitted with a shield to prevent water dripping on it, ensure that this shield is at the top.

Pod type speakers can be fastened to the shelf behind the rear seat, or anywhere else offering a corresponding mounting point. If the pod speakers are mounted on each side of the shelf behind the rear seat, it is a good idea to drill several large diameter holes through to the boot cavity beneath each speaker; this will improve the sound reproduction. Pod speakers sometimes offer a better reproduction quality if they face the rear window – which then acts as a reflector – so it is worthwhile to do a little experimenting before finally fixing the speaker.

### 55 Radios and tape players – suppression of interference (general)

To eliminate buzzes and other unwanted noises costs very little and is not as difficult as sometimes thought. With a modicum of common sense and patience, and following the instructions in the following paragraphs, interference can be virtually eliminated.

The first cause for concern is the generator. The noise this makes over the radio is like an electric mixer and the noise speeds up when the engine is revved. (To prove the point, remove the drivebelt and try it). The remedy for this is to simply, connect a 1.0 to 3.0 mfd capacitor between earth (probably the bolt that holds down the generator base) and the positive (+) terminal on the alternator. This is most important for if it is connected to the small terminal, the generator will probably be damaged permanently.

A second common cause of electrical interference is the ignition system. Here a 1.0 mfd capacitor must be connected between earth and the SW or + terminal on the coil. This may stop the tick-tick sound that comes over the speaker. Next comes the spark itself.

There are several ways of curing interference from the ignition HT

system. One is the use of carbon-cored HT leads. Where copper cable is used then resistive spark plug caps must be used. These should be of about 10 000 to 15 000 ohm resistance. If due to lack of room these cannot be used an alternative is to use 'in-line' suppressors. If the interference is not too bad, it may be possible to get away with only one suppressor in the coil to distributor line. If the interference does continue (a 'clacking' noise), then modify all HT leads.

At this stage it is advisable to check that the radio is well earthed also the aerial and to see that the aerial plug is pushed well into the set and that the radio is properly trimmed (see preceding Section). In addition, check that the wire which supplied the power to the set is as short as possible. At this stage it is a good idea to check that the fuse is of the correct rating. For most sets this will be about 1 to 2 amps.

At this point, the more usual causes of interference have been suppressed. If the problem still exists, a look at the cause of interference may help to pinpoint the component generating the stray electrical discharges.

The radio picks up electromagnetic waves in the air. Some are made by regular broadcasters and some, which we do not want, are made by the car itself. The home made signals are produced by stray electrical discharges floating around in the car. Common producers of these signals are electrical motors, ie the windscreen wipers, electric screen washers, electric window winders, heater fan or an electric aerial if fitted. Other sources of interference are flashing turn signals and instruments. The remedy for these cases is shown in Fig. 10.24 for an electric motor whose interference is not too bad and Fig. 10.25 for instrument suppression. Turn signals are not normally suppressed. In recent years, radio manufacturers have included in the live line of the radio, in addition to the fuse, an 'in-line' choke. If your circuit lacks one of these, put one in as shown in Fig. 10.26.

All the foregoing components are available from radio stores or accessory stores. If you have an electric clock fitted, this should be suppressed by connecting a 0.5 mfd capacitor directly across it as shown for a motor in Fig. 10.24.

If after all this you are still experiencing radio interference, first assess how bad it is, for the human ear can filter out unobtrusive unwanted noises quite easily. But if you are still adamant about eradicating the noise, then continue.

As a first step, a few 'experts' seem to favour a screen between the radio and the engine. This is OK as far as it goes, literally! The whole set is screened anyway and if interference can get past that then a small piece of aluminium is not going to stop it.

A more sensible way of screening is to discover if interference is coming down the wires. First, take the live lead; interference can get between the set and the choke (hence the reason for keeping the wires short). One remedy here is to screen the wire and this is done by buying screened wire and fitting that. The loudspeaker lead could be screened also to prevent 'pick-up' getting back to the radio, although this is unlikely.

Without doubt, the worst source of radio interference comes from the ignition HT leads, even if they have been suppressed. The ideal way of suppressing these is to slide screening tubes over the leads themselves. As this is impractical, we can place an aluminium shield over the majority of the lead areas. In a vee or twin-cam engine this is relatively easy but for a straight engine, the results are not particularly good.

Now for the really impossible cases, here are a few tips to try out. Where metal comes into contact with metal, an electrical disturbance is caused which is why good clean connections are essential. To remove interference due to overlapping or butting panels you must bridge the join with a wide braided earth strap (like that from the frame to the engine/transmission). The most common moving parts that could create noise and should be strapped are, in order of importance:

- (a) Silencer to frame
- (b) Exhaust pipe to engine block and frame
- (c) Air cleaner to frame
- (d) Front and rear bumpers to frame
- (e) Steering column to frame
- (f) Bonnet and boot lids to frame
- (g) Hood frame to bodyframe on soft tops

These faults are most pronounced when the engine is idling or labouring under load. Although the moving parts are already connected with nuts, bolts etc, these do tend to rust and corrode, thus creating a high resistance interference source.

If you have a ragged sounding pulse when mobile, this could be

wheel or tyre static. This can be cured by buying some anti-static powder and sprinkling it liberally inside the tyre.

If the interference takes the shape of a high pitched screeching noise that changes its note when the vehicle is in motion and only comes now and then, this could be related to the aerial, especially if it is of the telescopic or whip type. This source can be cured quite simply by pushing a small rubber ball on top of the aerial as this breaks the electric field before it can form; but it would be much better to buy yourself a new aerial of a reputable brand. If, on the other hand, you are getting a loud rushing sound every time you brake, this is brake static. This effect is most prominent on hot dry days and is cured only by fitting a special kit, which is quite expensive.

In conclusion, it is pointed out that it is relatively easy, therefore

cheap, to eliminate 95 per cent of all noise, but to eliminate the final 5 per cent is time and money consuming. It is up to the individual to decide if it is worth it. Please remember also, that you cannot get a concert hall performance out of a cheap radio.

Finally, tape players and eight track players are not usually affected by vehicle noise, but in a very bad case, the best remedy is the first suggestion, plus using a 3 to 5 amp choke in the live line, and in incurable cases, screening the live and speaker wires.

**Note:** *If your car is fitted with electronic ignition, then it is not recommended that either the spark plug resistors or the ignition coil capacitor be fitted as these may damage the system. Most electronic ignition units have built in suppression and should, therefore, not cause interference.*

## 56 Fault diagnosis – electrical system

Symptom	Reason(s)
Starter motor fails to turn engine	Battery discharged Battery defective internally Battery terminal leads loose or earth lead not securely attached to body Loose or broken connections in starter motor circuit Starter motor switch or solenoid faulty Starter brushes badly worn, sticking, or brush wires loose Commutator dirty, worn or burnt Starter motor armature faulty Field coils earthed
Starter motor turns engine very slowly	Battery in discharged condition Starter brushes badly worn, sticking, or brush wires loose Loose wires in starter motor circuit
Starter motor turns without turning engine	Pinion or flywheel gear teeth broken or worn
Starter motor noisy or excessively rough engagement	Pinion or flywheel gear teeth broken or worn Starter motor retaining bolts loose
Battery will not hold charge for more than a few days	Battery defective internally Electrolyte level too low or electrolyte too weak due to leakage Plate separators no longer fully effective Battery plates severely sulphated Alternator belt slipping Battery terminal connections loose or corroded Alternator not charging properly* Short in lighting circuit causing continual battery drain Regulator unit not working correctly
Ignition light fails to go out, battery runs flat in a few days	Drivebelt loose and slipping or broken Brushes worn, sticking, broken or dirty Brush springs weak or broken Alternator faulty*
* If all appears to be well but the alternator is still not charging, take the car to an automobile electrician to check the alternator	
Failure of individual electrical equipment to function correctly is dealt with alphabetically below. In cases of electrical failure it is always worth checking the obvious, such as blown fuses (particularly if associated equipment has also failed) and loose or broken wires.	
Fuel gauge gives no reading	Fuel tank empty! Electric cable between tank sender unit and gauge earthed or loose Fuel gauge case not earthed Fuel gauge supply cable interrupted Fuel gauge unit broken
Fuel gauge registers full all the time	Electric cable between tank unit and gauge broken or disconnected
Horn operates all the time	Horn push either earthed or stuck down Horn cable to horn push earthed
Horn fails to operate	Blown fuse Cable or cable connection loose, broken or disconnected Horn has an internal fault
Horn emits intermittent or unsatisfactory noise	Cable connections loose Horn incorrectly adjusted



Lights do not come on	Blown fuse If engine not running, battery discharged Light bulb filament burnt out or bulbs broken Wire connections loose, disconnected or broken Light switch shorting or otherwise faulty
Lights come on but fade out	If engine not running battery discharged
Lights give very poor illumination	Lamp glasses dirty Reflector tarnished or dirty Lamps badly out of adjustment Incorrect bulb with too low wattage fitted Existing bulbs old and badly discoloured Electrical wiring too thin not allowing full current to pass
Lights work erratically – flashing on and off, especially over bumps	Battery terminals or earth connections loose Lights not earthing properly Contacts in light switch faulty
Wiper motor fails to work	Blown fuse Wire connections loose, disconnected or broken Brushes badly worn Armature worn or faulty Field coils faulty
Wiper motor works very slowly and takes excessive current	Commutator dirty, greasy or burnt Drive to spindles bent or unlubricated Drive spindle binding or damaged Armature bearings dry or unaligned Armature badly worn or faulty
Wiper motor works slowly and takes little current	Brushes badly worn Commutator dirty, greasy or burnt Armature badly worn or faulty
Wiper motor works but wiper blades remain static	Linkage disengaged or faulty Drive spindles damaged or worn Wiper motor gearbox parts badly worn

See overleaf for Wiring Diagrams

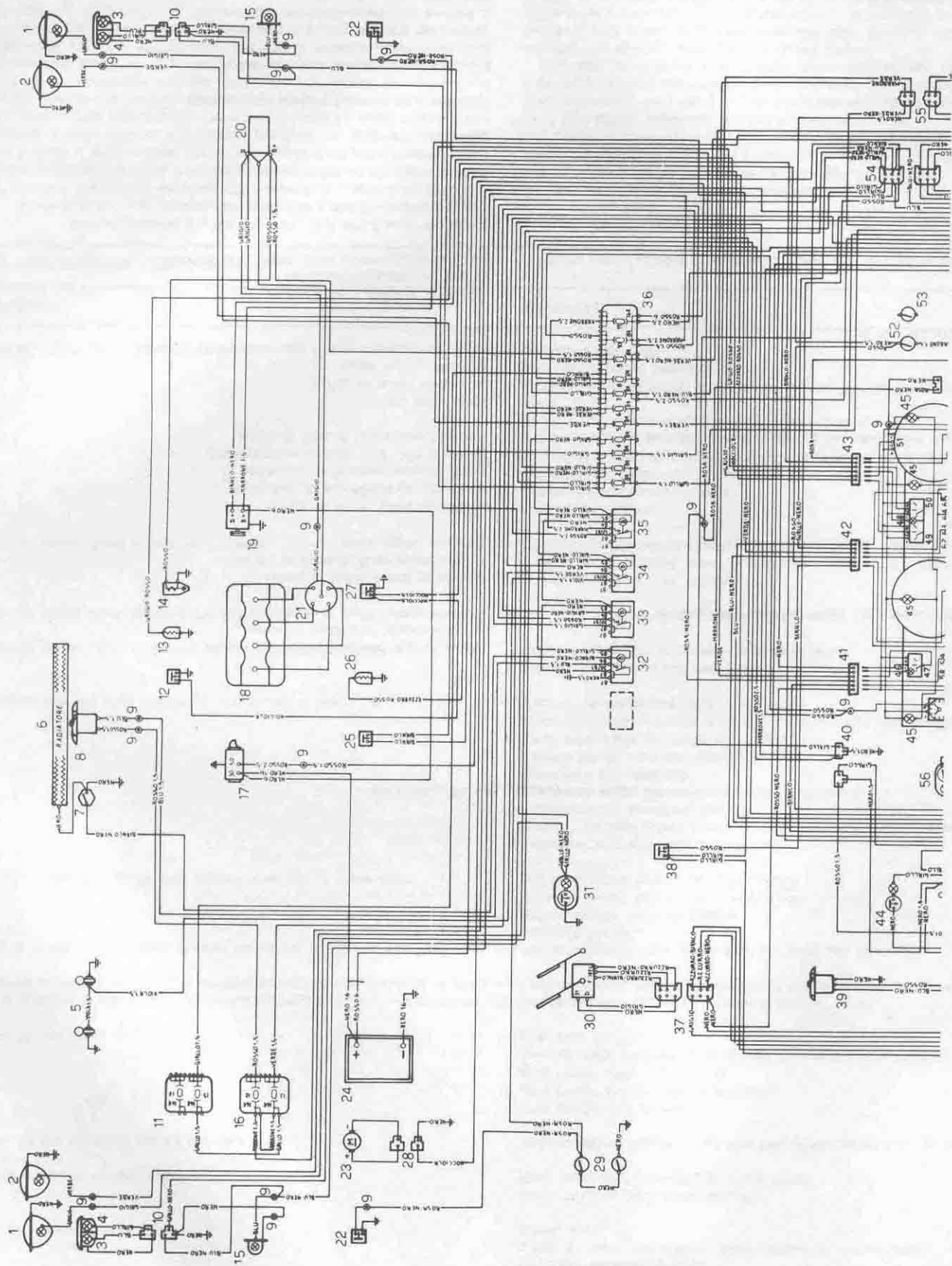


Fig. 10.27 Wiring diagram for right-hand drive 1300 Saloon models (typical). For key see page 188

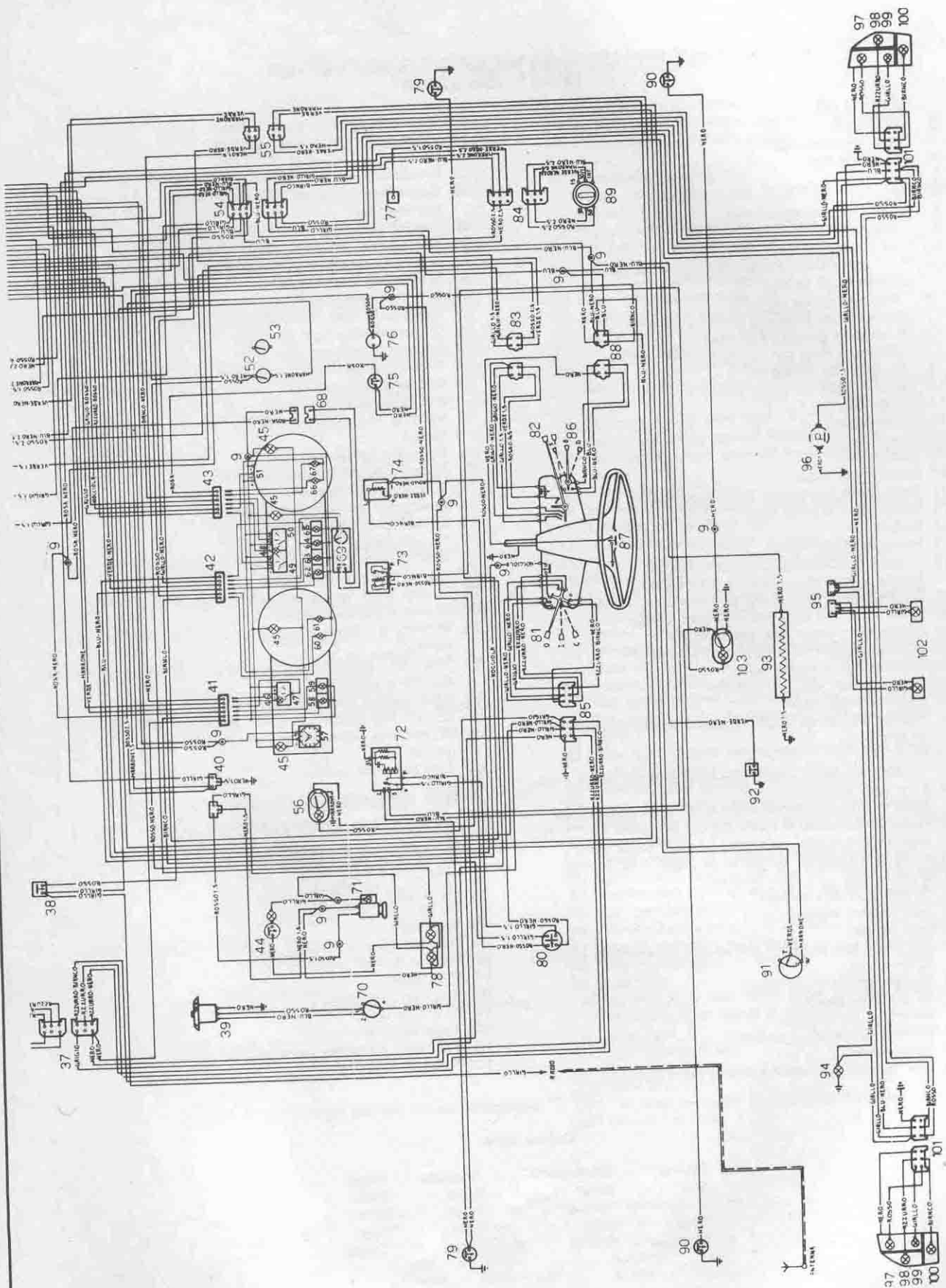


Fig. 10.27 (cont'd) Wiring diagram for right-hand drive 1300 Saloon models (typical). For key see page 188



**Fig. 10.27 Key to Wiring Diagram for right-hand drive 1300  
Saloon models (typical)**

- |  |   |
|--|---|
| 1 Dipped beam  | 55 Rear harness four-outlet junction block (white)  |
| 2 Main beam  | 56 Front interior light with switch   |
| 3 Front turn indicator   | 57 Clock  |
| 4 Front side light   | 58 Handbrake warning light  |
| 5 Horn   | 59 Brake fluid low level and front friction pad wear limit warning light                    |
| 6 Radiator   | 60 Hazard signalling system warning light   |
| 7 Radiator fan thermoswitch  | 61 Heated rear window warning light   |
| 8 Radiator fan   | 62 Left-hand turn indicator warning light   |
| 9 Plug-in junction   | 63 Main beam warning light  |
| 10 Front turn indicator and front side light three-outlet junction block (white) | 64 Side light warning light   |
| 11 Twin-fuse box for item 72   | 65 Right-hand turn indicator warning light  |
| 12 Engine oil low pressure warning light switch                                  | 66 Choke warning light (if fitted)  |
| 13 Oil pressure gauge transmitter  | 67 Alternator warning light   |
| 14 Carburettor slow-running fuel cut-off device                                  | 68 Two-outlet junction block (white) for item 69  |
| 15 Turn indicator repeater   | 69 Instrument cluster light switch with intensity adjuster and push-button to check item 59 |
| 16 Twin-fuse box for items 5 and 7   | 70 Heating and ventilation system fan motor change-over switch                              |
| 17 Starter motor   | 71 Cigarette lighter with light   |
| 18 Spark plugs   | 72 Hazard signalling system flasher   |
| 19 Alternator  | 73 Turn indicator flasher   |
| 20 Ignition coil   | 74 Handbrake warning light flasher  |
| 21 Ignition distributor  | 75 Choke warning light switch   |
| 22 Front brake pads wear limit warning light                                     | 76 Plug-in socket   |
| 23 Windscreen washer motor   | 77 Fuel lift pump one-outlet junction block (white)   |
| 24 Battery   | 78 Heater controls twin-lights  |
| 25 Reversing light switch  | 79 Interior front light press-switch on front door pillar                                   |
| 26 Coolant temperature gauge transmitter   | 80 Hazard signalling system switch  |
| 27 Engine overheating warning light switch                                       | 81 Windscreen wiper two-speed motor and washer motor control                                |
| 28 Washer motor two-outlet junction block (white)                                | 82 Side light, dipped beam, main beam and dipped beam signalling control                    |
| 29 Brake fluid low level warning light switch                                    | 83 Light control four-outlet junction block (white)   |
| 30 Windscreen wiper two speed motor  | 84 Ignition key switch six-outlet junction block (black)                                    |
| 31 Engine compartment light with switch  | 85 Windscreen wiper control six-outlet junction block (white)                               |
| 32 Radiator fan solenoid switch  | 86 Turn indicator control   |
| 33 Dipped beam solenoid switch   | 87 Horn   |
| 34 Horn solenoid switch  | 88 Light control four-outlet junction block (red)   |
| 35 Heated rear window and cigarette lighter solenoid switch                      | 89 Ignition and accessories key switch with anti-theft device                               |
| 36 Fuse box  | 90 Interior rear light press-switch on rear door pillar                                     |
| 37 Windscreen wiper motor six-outlet junction block (red)                        | 91 Fuel gauge transmitter   |
| 38 Stop light switch   | 92 Handbrake warning light switch   |
| 39 Heating and ventilation system fan two-speed motor                            | 93 Heated rear window filament  |
| 40 Three-outlet junction block (white) for items 44-71-78                        | 94 Boot light   |
| 42 Instruments cluster six-outlet junction block (red)                           | 95 Number plate light three-outlet junction block (white)                                   |
| 43 Instruments cluster six-outlet junction block (black)                         | 96 Electric fuel lift pump (if fitted)  |
| 44 Glove locker light with switch  | 97 Stop light   |
| 45 Instruments cluster light   | 98 Rear turn indicator  |
| 46 Fuel reserve warning light  | 99 Rear side light  |
| 47 Fuel gauge  | 100 Reversing light   |
| 48 Engine oil low pressure and engine overheating warning light                  | 101 Tail lamp six-outlet junction block (white)   |
| 49 Coolant temperature gauge   | 102 Number plate light  |
| 50 Oil pressure gauge  |   |
| 51 Electronic rev counter  |   |
| 52 Heated rear window switch   |   |
| 53 Spare switch  |   |
| 54 Rear harness six-outlet junction block (white)                                |   |

**Colour code**

Bianco	White	Nocciola	Hazel
Blu	Blue	Nero	Black
Giallo	Yellow	Rosa	Pink
Grigio	Grey	Rossa	Red
Marrone	Brown	Verde	Green

Fig. 10.28 Key to wiring diagram for right-hand drive 1600, 1800 and 2000 Saloon models (typical)

- |  |   |
|--|---|
| 1 Dipped beam  | 56 Rear harness six-outlet junction block (white)   |
| 2 Main beam  | 57 Rear harness four-outlet junction block (white)  |
| 3 Dipped beam and main beam three-outlet junction block (white)                  | 58 Front interior light with switch   |
| 4 Front turn indicator   | 59 Clock  |
| 5 Front side light   | 60 Handbrake warning light  |
| 6 Horn   | 61 Brake fluid low level and front friction pad wear limit warning light                    |
| 7 Radiator   | 62 Hazard signalling system warning light   |
| 8 Radiator fan thermoswitch  | 63 Heated rear window warning light   |
| 9 Plug-in junction   | 64 Left-hand turn indicator warning light   |
| 10 Radiator fan  | 65 Main beam warning light  |
| 11 Front turn indicator and front side light three-outlet junction block (white) | 66 Side light warning light   |
| 12 Twin-fuse box for item 73   | 67 Right-hand indicator warning light   |
| 13 Engine oil low pressure warning light switch                                  | 68 Choke warning light (if fitted)  |
| 14 Oil pressure gauge transmitter  | 69 Alternator warning light   |
| 15 Carburettor slow-running fuel cut-off device                                  | 70 Two-outlet junction block (white) for item 76  |
| 16 Turn indicator repeater   | 71 Heating and ventilation system fan motor change-over switch                              |
| 17 Twin-fuse box for items 6 and 8   | 72 Cigarette lighter with light   |
| 18 Starter motor   | 73 Hazard signalling system flasher   |
| 19 Spark plugs   | 74 Windscreen wiper solenoid switch with intermittence device                               |
| 20 Alternator  | 75 Turn indicator flasher   |
| 21 Ignition coil   | 76 Instrument cluster light switch with intensity adjuster and push-button to check item 61 |
| 22 Front brake pads wear limit warning light                                     | 77 Handbrake warning light flasher  |
| 23 Windscreen washer motor   | 78 Choke warning light switch (if fitted)   |
| 24 Washer motor two-outlet junction block (white)                                | 79 Plug-in socket   |
| 25 Battery   | 80 Fuel lift pump one-outlet junction block (white)   |
| 26 Reversing light switch  | 81 Interior front light press-switch on front door pillar                                   |
| 27 Coolant temperature gauge transmitter   | 82 Heater controls twin-lights  |
| 28 Ignition distributor  | 83 Windscreen wiper solenoid switch four-outlet junction block (white)                      |
| 29 Engine overheating warning light switch                                       | 84 Hazard signalling system switch  |
| 30 Brake fluid low level warning light switch                                    | 85 Windscreen wiper control six-outlet junction block (white)                               |
| 31 Windscreen wiper two-speed motor  | 86 Windscreen wiper two-speed motor and washer motor control                                |
| 32 Engine compartment light with switch  | 87 Side light, dipped beam, main beam and dipped beam signalling control                    |
| 33 Windscreen wiper motor six-outlet junction block (red)                        | 88 Turn indicator control   |
| 34 Stop light switch   | 89 Lights control four-outlet junction block (white)  |
| 35 Radiator fan solenoid switch  | 90 Ignition key switch six-outlet junction block (black)                                    |
| 36 Dipped beam solenoid switch   | 91 Horn control   |
| 37 Horn solenoid switch  | 92 Lights control four-outlet junction block (red)  |
| 38 Heated rear window and cigarette lighter solenoid switch                      | 93 Ignition and accessories key switch with anti-theft device                               |
| 39 Fuse box  | 94 Interior rear light press-switch on rear door pillar                                     |
| 40 Heating and ventilation system fan two-speed motor                            | 95 Fuel gauge transmitter   |
| 41 Three-outlet junction block (white) for items 45, 72, 82                      | 96 Handbrake warning light switch   |
| 42 Instrument cluster six-outlet junction block (white)                          | 97 Interior rear light with switch  |
| 43 Instrument cluster six-outlet junction block (red)                            | 98 Heated rear window filament  |
| 44 Instrument cluster six-outlet junction block (black)                          | 99 Boot light   |
| 45 Glove locker light with switch  | 100 Number plate light three-outlet junction block (white)                                  |
| 46 Instrument cluster light  | 101 Electric fuel lift pump (if fitted)   |
| 47 Fuel reserve warning light  | 102 Stop light  |
| 48 Fuel gauge  | 103 Rear turn indicator   |
| 49 Coolant temperature gauge   | 104 Rear side light   |
| 50 Engine oil low pressure and engine overheating warning light                  | 105 Reversing light   |
| 51 Oil pressure gauge  | 106 Tail lamp six-outlet junction block (white)   |
| 52 Electronic rev counter  | 107 Number plate light  |
| 53 Heated rear window switch   |   |
| 54 Extra switch  |   |
| 55 Windscreen wiper motor high and low speed changeover switch                   |   |

#### Colour code

Bianco	White	Nocciola	Hazel
Blu	Blue	Nero	Black
Giallo	Yellow	Rosa	Pink
Grigio	Grey	Rosso	Red
Marrone	Brown	Verde	Green

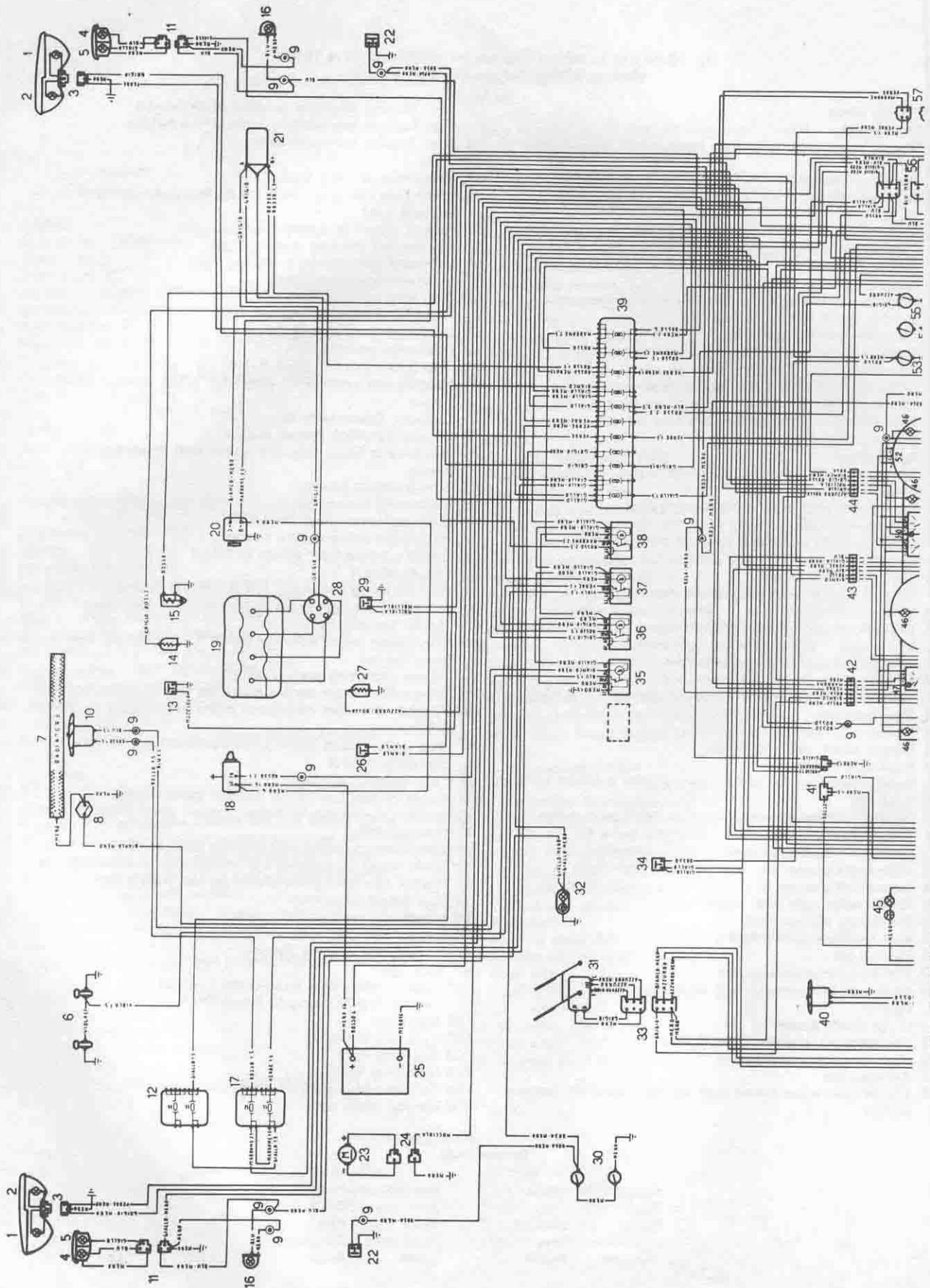


Fig. 10.28 Wiring diagram for right-hand drive 1600, 1800 and 2000 Saloon models (typical). For key see page 189



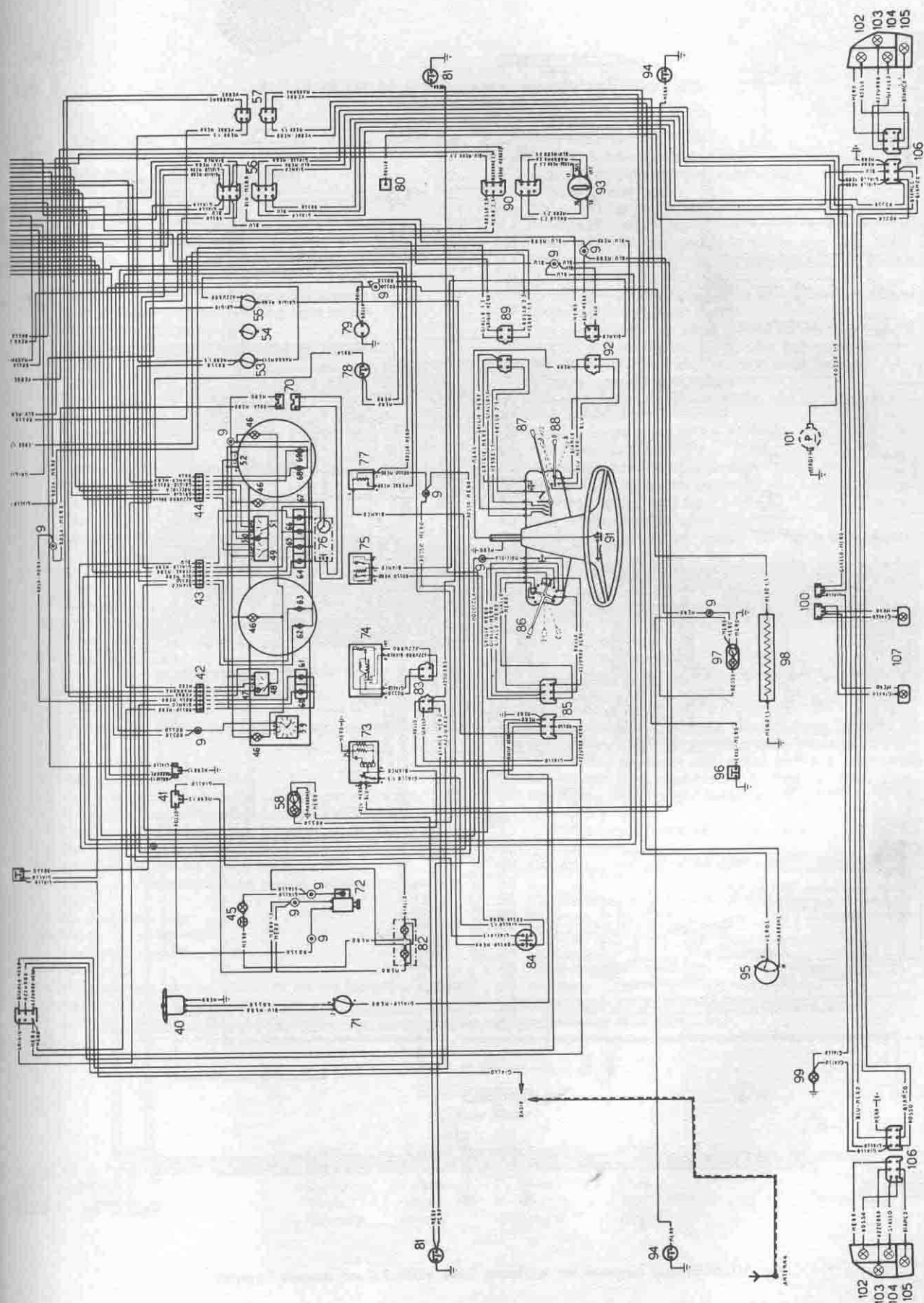


Fig. 10.28 (cont'd) Wiring diagram for right-hand drive 1600, 1800 and 2000 Saloon models (typical). For key see page 189

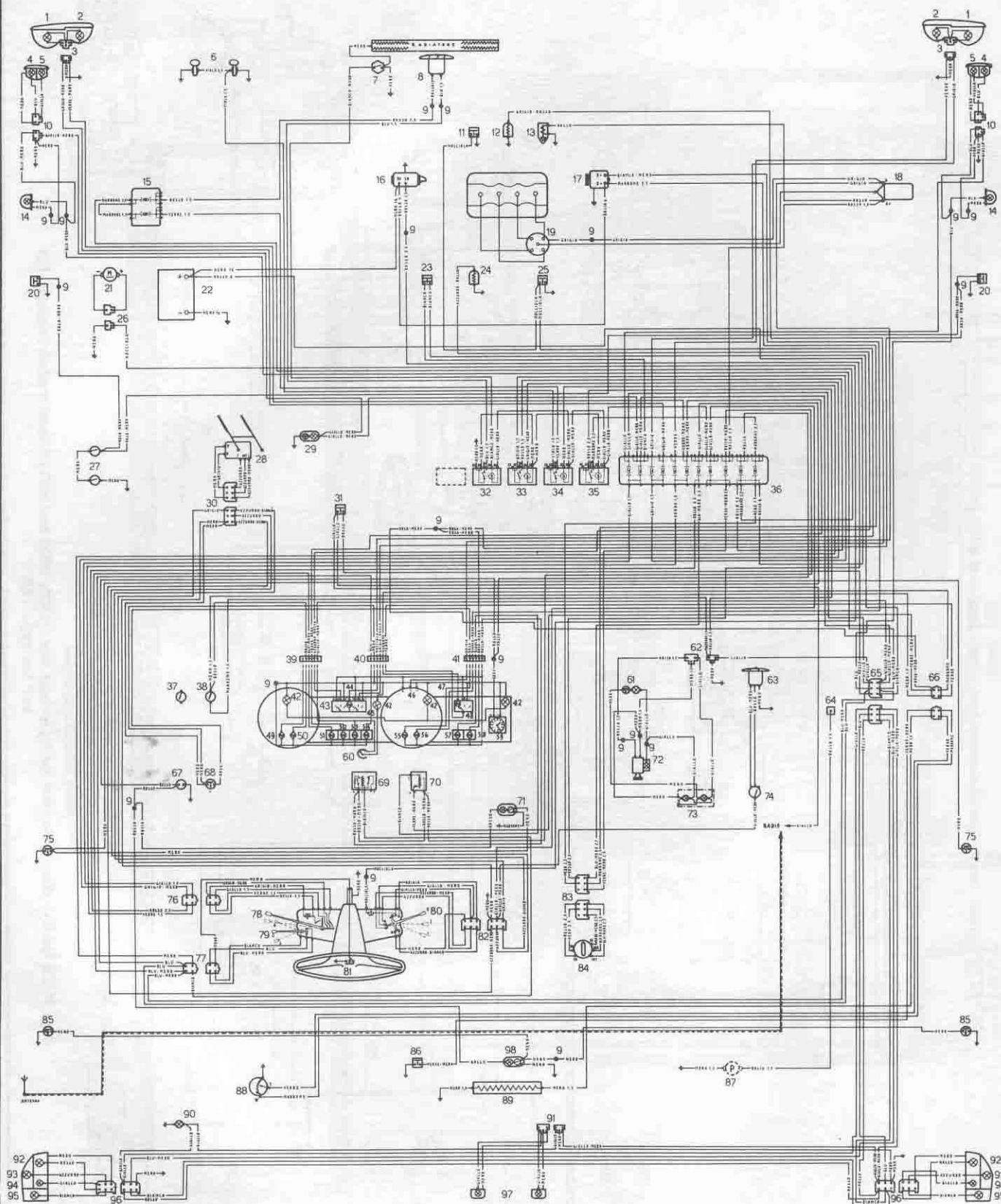


Fig. 10.29 Wiring diagram for left-hand drive 1300 Saloon models (typical)

Fig. 10.29 Key to wiring diagram for left-hand drive 1300  
Saloon models (typical)

- |    |  |    |   |
|----|--|----|---|
| 1  | Dipped beam  | 52 | Main beam warning light   |
| 2  | Main beam  | 53 | Side light warning light  |
| 3  | Three-outlet junction block (white)                          | 54 | Right-hand turn indicator warning light                               |
| 4  | Front turn indicator   | 55 | Choke warning light   |
| 5  | Front side light   | 56 | Alternator warning light  |
| 6  | Horn   | 57 | Handbrake warning light   |
| 7  | Radiator fan thermoswitch                                    | 58 | Brake fluid low level and front friction pad wear limit warning light |
| 8  | Radiator fan   | 59 | Clock   |
| 9  | Plug-in junction   | 60 | Instruments cluster light switch with intensity adjuster              |
| 10 | Front lamp three-outlet junction block (white)               | 61 | Glove locker light with switch  |
| 11 | Engine oil low pressure warning light switch                 | 62 | Three-outlet junction block (white) for items 61-72-73                |
| 12 | Oil pressure gauge transmitter                               | 63 | Heating and ventilation system fan two-speed motor                    |
| 13 | Carburettor slow-running fuel cut-off device                 | 64 | Fuel lift pump one-outlet junction block (white)                      |
| 14 | Turn indicator repeater                                      | 65 | Six-outlet junction block (white)                                     |
| 15 | Twin-fuse box  | 66 | Four-outlet junction block (white)                                    |
| 16 | Starter motor  | 67 | Plug-in socket  |
| 17 | Alternator   | 68 | Choke warning light switch (if fitted)                                |
| 18 | Ignition coil  | 69 | Turn indicator flasher  |
| 19 | Ignition distributor   | 70 | Handbrake warning light flasher                                       |
| 20 | Front brake pads wear limit warning light switch             | 71 | Interior front light with switch                                      |
| 21 | Windscreen washer motor                                      | 72 | Cigarette lighter with light  |
| 22 | Battery  | 73 | Two heater controls lights  |
| 23 | Reversing light switch                                       | 74 | Heating and ventilation system fan motor changeover switch            |
| 24 | Coolant temperature gauge transmitter                        | 75 | Interior front light press-switch in front door pillar                |
| 25 | Engine overheating warning light switch                      | 76 | Lights control four-outlet junction block (white)                     |
| 26 | Windscreen washer motor two-outlet junction block (white)    | 77 | Lights control four-outlet junction block (red)                       |
| 27 | Brake fluid low level warning light switch                   | 78 | Side light main beam, dipped beam and dipped beam signalling control  |
| 28 | Windscreen wiper motor                                       | 79 | Turn indicator control  |
| 29 | Engine compartment light with switch                         | 80 | Windscreen wiper two-speed motor and washer motor control             |
| 30 | Windscreen wiper motor six-outlet junction block (red)       | 81 | Horn control  |
| 31 | Stop light switch  | 82 | Windscreen wiper six-outlet junction block (white)                    |
| 32 | Radiator fan solenoid switch                                 | 83 | Ignition key switch six-outlet junction block (black)                 |
| 33 | Dipped beam solenoid switch                                  | 84 | Ignition and accessory key switch with anti-theft device              |
| 34 | Horn solenoid switch   | 85 | Interior rear light press-switch on rear door pillar                  |
| 35 | Heated rear window and cigarette lighter solenoid switch     | 86 | Handbrake warning light switch and to check warning light item 58     |
| 36 | Fuse box   | 87 | Fuel lift pump (on special versions only)                             |
| 37 | Spare switch   | 88 | Fuel gauge transmitter  |
| 38 | Heated rear window switch                                    | 89 | Heated rear window filament   |
| 39 | Instrument cluster six-outlet junction block (white)         | 90 | Boot light  |
| 40 | Instrument cluster six-outlet junction block (red)           | 91 | Number plate light three-outlet junction block (white)                |
| 41 | Instrument cluster six-outlet junction block (black)         | 92 | Stop light  |
| 42 | Instrument cluster light                                     | 93 | Rear turn indicator   |
| 43 | Coolant temperature gauge                                    | 94 | Rear side light   |
| 44 | Engine oil low pressure and engine overheating warning light | 95 | Reversing light   |
| 45 | Oil pressure gauge   | 96 | Tail lamp six-outlet junction block (white)                           |
| 46 | Electronic rev counter                                       | 97 | Number plate light  |
| 47 | Fuel reserve warning light                                   | 98 | Interior rear light with switch                                       |
| 48 | Fuel gauge   |    |   |
| 49 | Extra warning light (available for hazard signalling system) |    |   |
| 50 | Heated rear window warning light                             |    |   |
| 51 | Left-hand turn indicator warning light                       |    |   |

#### Colour code

Bianco	White	Nocciola	Hazel
Blu	Blue	Nero	Black
Giallo	Yellow	Rosa	Pink
Grigio	Grey	Rosso	Red
Marrone	Brown	Verde	Green



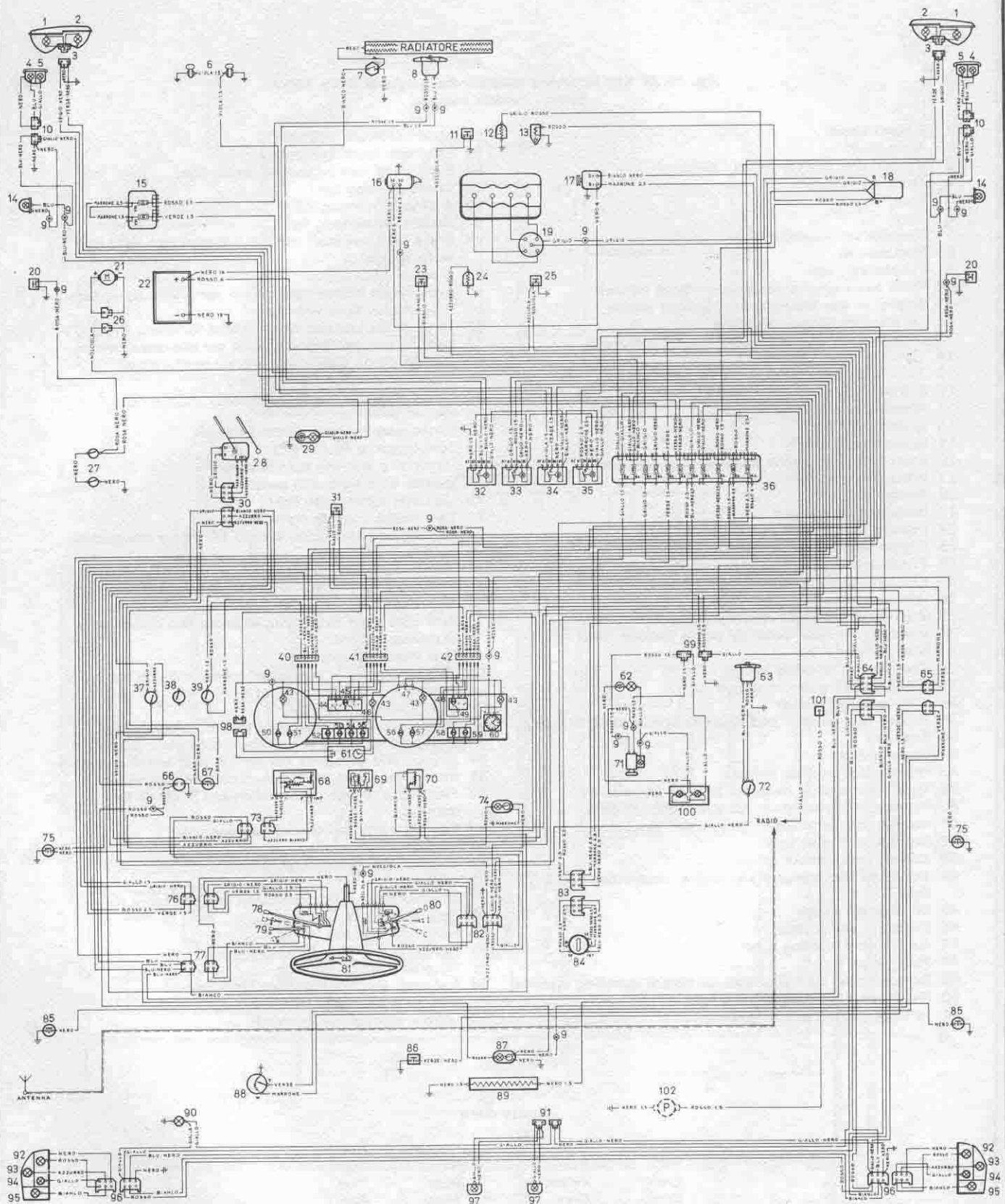


Fig. 10.30 Wiring diagram for left-hand drive 1600, 1800 and 2000 Saloon models (typical)

Fig. 10.30 Key to wiring diagram for left-hand drive 1600, 1800 and 2000 Saloon models (typical)

- |    |  |     |   |
|----|--|-----|---|
| 1  | Dipped beam  | 54  | Side light warning light  |
| 2  | Main beam  | 55  | Right-hand turn indicator warning light   |
| 3  | Three-outlet junction block (white)                          | 56  | Choke warning light (if fitted)   |
| 4  | Front turn indicator   | 57  | Alternator warning light  |
| 5  | Front side light   | 58  | Handbrake warning light   |
| 6  | Horn   | 59  | Brake fluid low level and front friction pad wear limit warning light                                     |
| 7  | Radiator fan thermoswitch                                    | 60  | Clock   |
| 8  | Radiator fan   | 61  | Instruments cluster light switch with intensity adjuster and push-button to check warning light (item 59) |
| 9  | Plug-in junction   | 62  | Glove locker light with switch  |
| 10 | Front lamp three-outlet junction block (white)               | 63  | Heating and ventilation system fan two-speed motor  |
| 11 | Engine oil low pressure warning light switch                 | 64  | Four-outlet junction block (white)  |
| 12 | Oil pressure gauge transmitter                               | 65  | Four-outlet junction block (white)  |
| 13 | Carburettor slow-running fuel cut-off device                 | 66  | Plug-in socket  |
| 14 | Turn indicator repeater                                      | 67  | Choke warning light switch (if fitted)  |
| 15 | Twin-fuse box  | 68  | Windscreen wiper solenoid switch with intermittent device   |
| 16 | Starter motor  | 69  | Turn indicator flasher  |
| 17 | Alternator   | 70  | Handbrake warning light flasher   |
| 18 | Ignition coil  | 71  | Cigarette lighter with light  |
| 19 | Ignition distributor   | 72  | Heating and ventilation system fan motor change-over switch   |
| 20 | Front brake pads wear limit warning light switch             | 73  | Windscreen wiper solenoid switch four-outlet junction block (white)                                       |
| 21 | Windscreen washer motor                                      | 74  | Interior front light with switch  |
| 22 | Battery  | 75  | Interior front light press-switch on front door pillar  |
| 23 | Reversing light switch                                       | 76  | Lights control four-outlet junction block (white)   |
| 24 | Coolant temperature gauge transmitter                        | 77  | Lights control four-outlet junction block (red)   |
| 25 | Engine overheating warning light switch                      | 78  | Side light, main beam, dipped beam and dipped beam signalling control                                     |
| 26 | Windscreen washer motor two-outlet junction block (white)    | 79  | Turn indicator control  |
| 27 | Brake fluid low level warning light switch                   | 80  | Windscreen wiper two-speed motor and washer motor control   |
| 28 | Windscreen wiper two-speed motor                             | 81  | Horn control  |
| 29 | Engine compartment light with switch                         | 82  | Windscreen wiper six-outlet junction block (white)  |
| 30 | Windscreen wiper motor six-outlet junction block (red)       | 83  | Ignition key switch six-outlet junction block (black)   |
| 31 | Stop light switch  | 84  | Ignition and accessories key switch with anti-theft device  |
| 32 | Radiator fan solenoid switch                                 | 85  | Interior rear light press-switch on rear door pillar  |
| 33 | Dipped beam solenoid switch                                  | 86  | Handbrake warning light switch  |
| 34 | Horn solenoid switch   | 87  | Interior rear light with switch   |
| 35 | Heated rear window and cigarette lighter solenoid switch     | 88  | Fuel gauge transmitter  |
| 36 | Fuse box   | 89  | Heated rear window filament   |
| 37 | Windscreen wiper motor high and low speed changeover switch  | 90  | Boot lid  |
| 38 | Spare switch   | 91  | Number plate light three-outlet junction block (white)  |
| 39 | Heated rear window switch                                    | 92  | Stop light  |
| 40 | Instrument cluster six-outlet junction block (white)         | 93  | Rear turn indicator   |
| 41 | Instrument cluster six-outlet junction block (red)           | 94  | Rear side light   |
| 42 | Instrument cluster six-outlet junction block (black)         | 95  | Reversing light   |
| 43 | Instrument cluster light                                     | 96  | Tail lamp six-outlet junction block (white)   |
| 44 | Coolant temperature gauge                                    | 97  | Number plate light  |
| 45 | Engine oil low pressure and engine overheating warning light | 98  | Two-outlet junction block (white) for item 61   |
| 46 | Oil pressure gauge   | 99  | Three-outlet junction block (white) for items 62-71-100   |
| 47 | Electronic rev counter                                       | 100 | Two heater controls lights  |
| 48 | Fuel reserve warning light                                   | 101 | Fuel lift pump one-outlet junction block (white)  |
| 49 | Fuel gauge   | 102 | Fuel lift pump (on special versions only)   |
| 50 | Extra warning light (available for hazard signalling system) |     |   |
| 51 | Heated rear window warning light                             |     |   |
| 52 | Left-hand turn indicator warning light                       |     |   |
| 53 | Main beam warning light                                      |     |   |

#### Colour code

Bianco	White	Nocciola	Hazel
Blu	Blue	Nero	Black
Giallo	Yellow	Rosa	Pink
Grigio	Grey	Rosso	Red
Marrone	Brown	Verde	Green

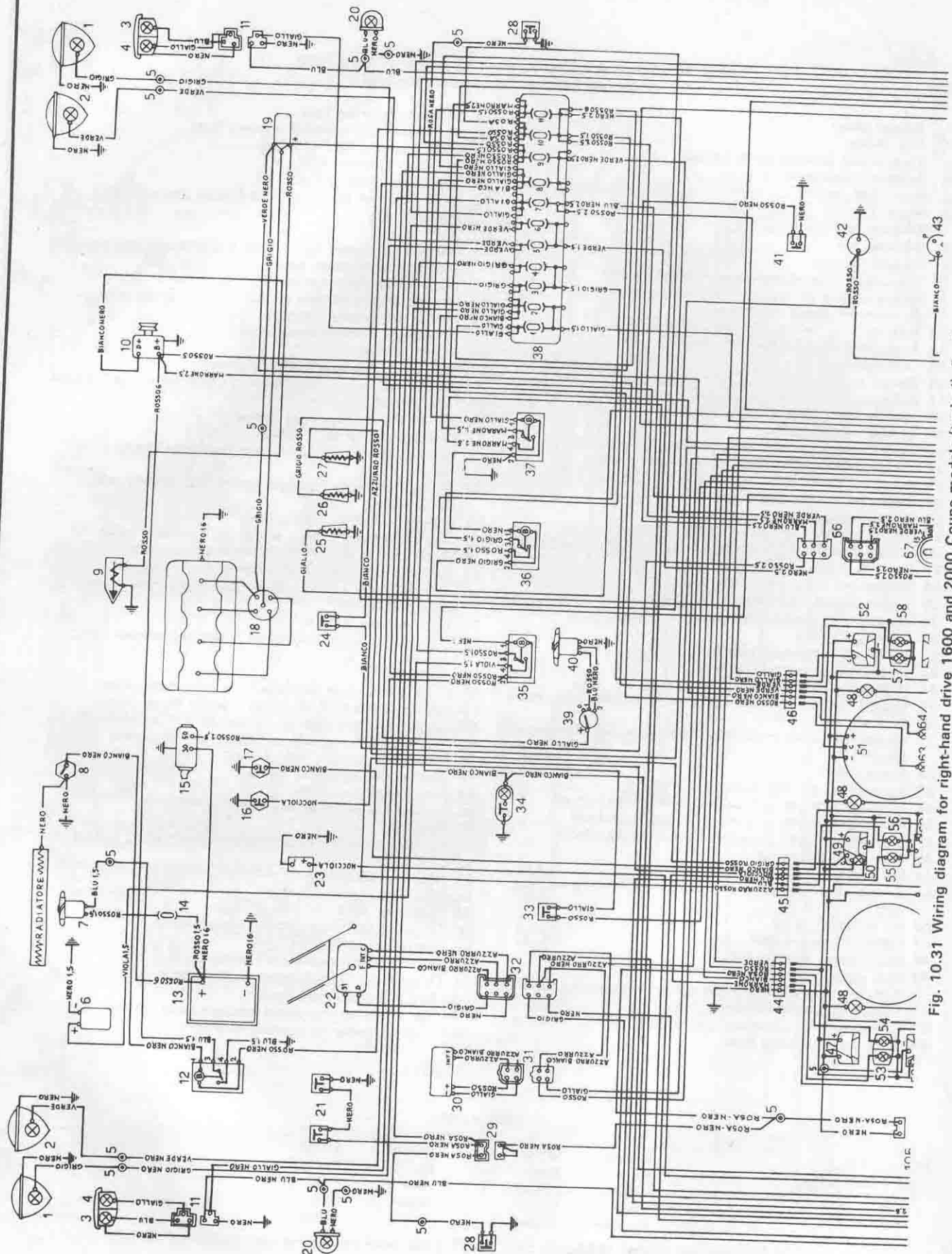


Fig. 10.31 Wiring diagram for right-hand drive 1600 and 2000 Coupe models (typical). For key see page 198



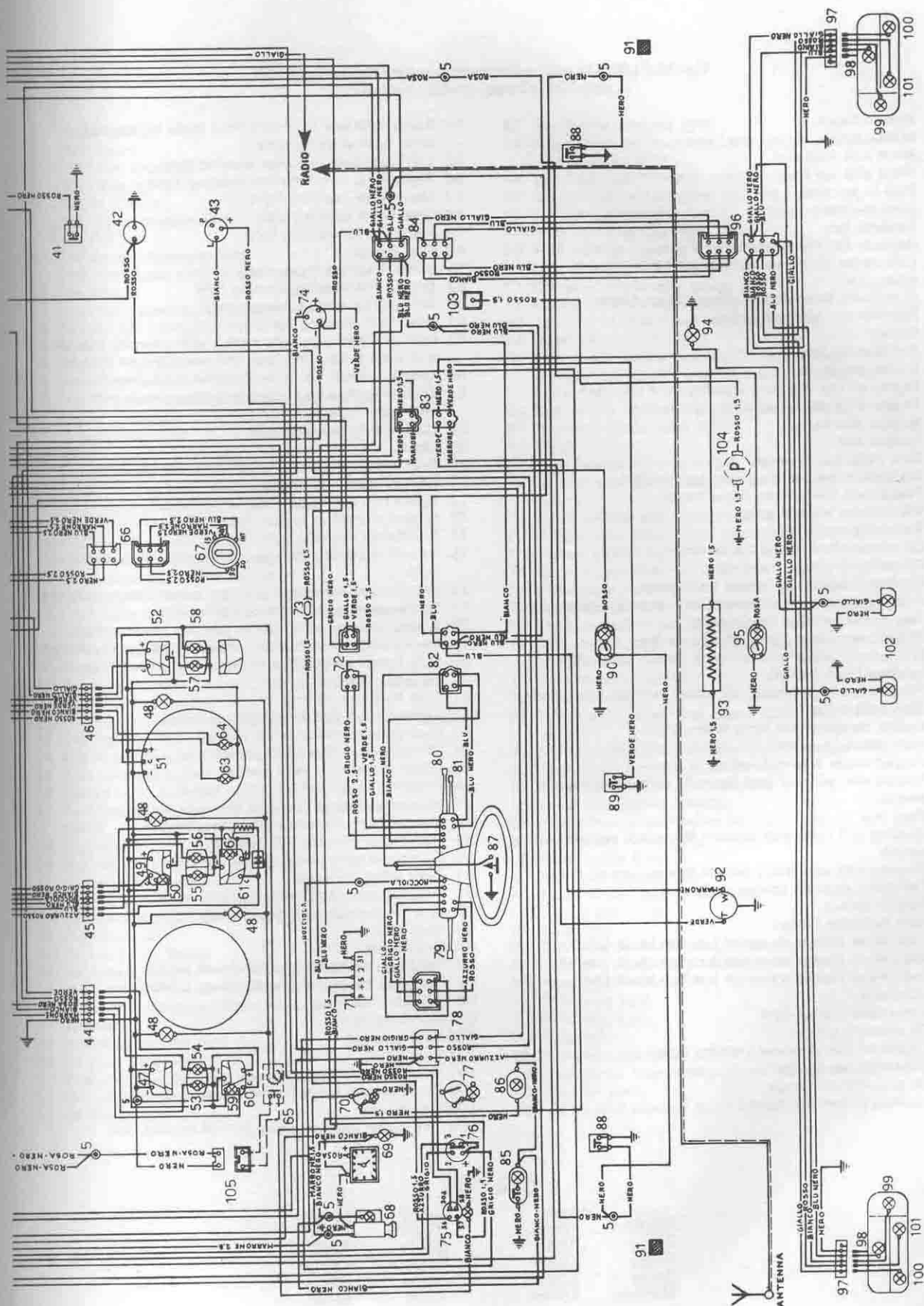


Fig. 10.31 (cont'd) Wiring diagram for right-hand drive 1600 and 2000 Coupe models (typical). For key see page 198

**Fig. 10.31 Key to wiring diagrams for right-hand drive 1600 and 2000 Coupe models (typical)**

- |   |   |
|---|---|
| 1 Dipped beam   | 54 Brake fluid low level and front brake friction pad wear limit warning light                                |
| 2 Main beam   | 55 Left-hand turn indicator warning light   |
| 3 Front turn indicator  | 56 Right-hand turn indicator warning light  |
| 4 Front side light  | 57 Main beam warning light  |
| 5 Plug-in junction  | 58 Side lights warning light  |
| 6 Horn electrocompressor  | 59 Fuel reserve warning light   |
| 7 Radiator fan  | 60 Fuel gauge   |
| 8 Radiator fan thermoswitch   | 61 Coolant temperature gauge  |
| 9 Carburettor slow-running fuel cut-off device                              | 62 Engine overheating warning light   |
| 10 Alternator   | 63 Tell-tale on special version only  |
| 11 Front lamp three-outlet junction block (white)                           | 64 Alternator warning light   |
| 12 Radiator fan solenoid switch   | 65 Instrument cluster light switch with intensity adjuster and push-button to check the warning light item 54 |
| 13 Battery  | 66 Ignition switch six-outlet junction block (black)  |
| 14 Radiator fan fuse  | 67 Engine ignition and accessories key switch with anti-theft device  |
| 15 Starter motor  | 68 Cigarette lighter with light   |
| 16 Engine oil low pressure warning light switch                             | 69 Clock  |
| 17 Engine overheating warning light switch                                  | 70 Rear heated window switch with warning light   |
| 18 Ignition distributor   | 71 Hazard signalling flasher  |
| 19 Ignition coil  | 72 Lights four-outlet junction block (white)  |
| 20 Turn indicator repeater  | 73 Hazard signalling system fuse (16 A)   |
| 21 Brake fluid low level warning light switch                               | 74 Handbrake warning light flasher  |
| 22 Two-speed windscreen wiper motor   | 75 Hazard signalling change-over switch with warning light  |
| 23 Windscreen washer motor  | 76 Windscreen wiper high and low speed change-over switch   |
| 24 Reversing light switch   | 77 Spare switch with warning light  |
| 25 Oil temperature gauge transmitter  | 78 Windscreen wiper six-outlet junction block (white)   |
| 26 Oil pressure gauge transmitter   | 79 Two-speed windscreen wipers and washer motors control  |
| 27 Coolant temperature gauge transmitter                                    | 80 Side lights, dipped beams, main beams and dipped beam signalling control                                   |
| 28 Front brake friction pad wear limit warning light switch                 | 81 Turn indicator control   |
| 29 Two-outlet junction block (white)  | 82 Lights four-outlet junction block (red)  |
| 30 Windscreen wiper intermittence device                                    | 83 Four-outlet junction block (white)   |
| 31 Windscreen wiper intermittence device four-outlet junction block (white) | 84 Six-outlet junction block (white)  |
| 32 Windscreen wiper motor six-outlet junction block (red)                   | 85 Glove locker light with switch   |
| 33 Stop light switch  | 86 Heater controls light  |
| 34 Engine compartment lamp with switch                                      | 87 Air horns control  |
| 35 Horn solenoid switch   | 88 Interior lamp door-operated press-switch   |
| 36 Dipped beam solenoid switch  | 89 Handbrake warning light switch   |
| 37 Heated rear window and cigarette lighter solenoid switch                 | 90 Front interior lamp  |
| 38 Fuse box   | 91 Door safety reflector  |
| 39 Heating and ventilation system fan motor change-over switch              | 92 Fuel gauge transmitter   |
| 40 Heating and ventilation system fan two-speed motor                       | 93 Rear heated window filament  |
| 41 Tell-tale switch on special version only                                 | 94 Boot light   |
| 42 Plug-in socket   | 95 Rear interior lamp   |
| 43 Turn indicator flasher   | 96 Tail lamp six-outlet junction block (white)  |
| 44 Instrument cluster six-outlet junction block (black)                     | 97 Tail lamp six-outlet junction block (white)  |
| 45 Instrument cluster six-outlet junction block (white)                     | 98 Rear turn indicator  |
| 46 Instrument cluster six-outlet junction block (red)                       | 99 Reversing light  |
| 47 Voltmeter  | 100 Rear side light   |
| 48 Instrument cluster light   | 101 Stop light  |
| 49 Oil pressure gauge   | 102 Number plate light  |
| 50 Engine oil low pressure warning light                                    | 103 Fuel pump one-outlet junction block (white)   |
| 51 Electronic rev counter   | 104 Fuel pump   |
| 52 Oil temperature gauge  | 105 Two-outlet junction block (white) for item 65   |
| 53 Handbrake warning light  |   |

**Colour code**

Bianco	White	Nocciola	Hazel
Blu	Blue	Nero	Black
Giallo	Yellow	Rosa	Pink
Grigio	Grey	Rosso	Red
Marrone	Brown	Verde	Green

Fig. 10.32 Key to wiring diagram for left-hand drive 1600,  
1800 and 2000 Coupe models (typical)

- |   |   |
|---|---|
| 1 Dipped beam   | 53 Handbrake warning light  |
| 2 Main beam   | 54 Brake fluid low level and front friction pad wear limit warning light                                    |
| 3 Front turn indicator  | 55 Left-hand turn indicator warning light   |
| 4 Front side light  | 56 Right-hand turn indicator warning light  |
| 5 Plug-in junction  | 57 Main beam warning light  |
| 6 Horn electrocompressor  | 58 Side light warning light   |
| 7 Radiator fan  | 59 Fuel reserve warning light   |
| 8 Radiator fan thermostatswitch   | 60 Fuel gauge   |
| 9 Carburettor slow-running fuel cut-off device                              | 61 Coolant temperature gauge  |
| 10 Alternator   | 62 Engine overheating warning light   |
| 11 Front lamp three-outlet junction block (white)                           | 63 Tell-tale on special versions only   |
| 12 Radiator fan solenoid switch   | 64 Alternator warning light   |
| 13 Battery  | 65 Instrument cluster light switch with intensity adjuster and push-button to check warning light (item 54) |
| 14 Radiator fan fuse  | 66 Key switch six-outlet junction block (black)   |
| 15 Starter motor  | 67 Cigarette lighter with light   |
| 16 Engine oil low pressure warning light switch                             | 68 Clock  |
| 17 Engine overheating warning light switch                                  | 69 Rear heated window switch with warning light   |
| 18 Ignition distributor   | 70 Ignition and accessories key switch with anti-theft device   |
| 19 Ignition coil  | 71 Spare switch with warning light  |
| 20 Turn indicator repeater  | 72 Windscreen wiper motor change-over switch  |
| 21 Brake fluid low level warning light switch                               | 73 Heater control light   |
| 22 Two-speed windscreen wiper motor   | 74 Glove locker light with switch   |
| 23 Windscreen washer motor  | 75 Handbrake warning light flasher  |
| 24 Reversing light switch   | 76 Light control four-outlet junction block (white)   |
| 25 Oil temperature gauge transmitter  | 77 Light control four-outlet junction block (red)   |
| 26 Oil pressure gauge transmitter   | 78 Main beam, dipped beam, light signalling and side light control  |
| 27 Coolant temperature gauge transmitter                                    | 79 Turn indicator control   |
| 28 Front brake friction pad wear limit warning light switch                 | 80 Horn control   |
| 29 Two-outlet junction block (white)  | 81 Windscreen wiper two-speed motor and washer motor control  |
| 30 Windscreen wiper intermittence device                                    | 82 Windscreen wiper six-outlet junction block (white)   |
| 31 Windscreen wiper intermittence device four-outlet junction block (white) | 83 Four-outlet junction block (white)   |
| 32 Windscreen wiper motor six outlet junction block (red)                   | 84 Six-outlet junction block (white)  |
| 33 Stop light switch  | 85 Open door safety reflector   |
| 34 Engine compartment light with switch                                     | 86 Inside lamp press-switch on door pillar  |
| 35 Horn solenoid switch   | 87 Handbrake warning light switch   |
| 36 Dipped beam solenoid switch  | 88 Front inside lamp  |
| 37 Rear heated window and cigarette lighter solenoid switch                 | 89 Fuel gauge transmitter   |
| 38 Fuse box   | 90 Rear heated window filament  |
| 39 Heating and ventilation system fan motor change-over switch              | 91 Rear inside lamp   |
| 40 Heating and ventilation system fan two-speed motor                       | 92 Boot light   |
| 41 Tell-tale switch on special versions only                                | 93 Tail lamp six-outlet junction block (white)  |
| 42 Plug-in socket   | 94 Tail lamp six-outlet junction block (white)  |
| 43 Turn indicator flasher   | 95 Rear turn indicator  |
| 44 Instrument cluster six-outlet junction block (black)                     | 96 Reversing light  |
| 45 Instrument cluster six-outlet junction block (white)                     | 97 Rear side light  |
| 46 Instrument cluster six-outlet junction block (red)                       | 98 Stop light   |
| 47 Voltmeter  | 99 Number plate light   |
| 48 Instrument cluster light   | 100 Fuel pump one-outlet junction block (white)   |
| 49 Oil pressure gauge   | 101 Fuel lift pump  |
| 50 Engine oil low pressure warning light                                    | 102 Two-outlet junction block (white) for item 85   |
| 51 Electronic rev counter   |   |
| 52 Oil temperature gauge  |   |

#### Colour code

Bianco	White	Nocciola	Hazel
Blu	Blue	Nero	Black
Giallo	Yellow	Rosa	Pink
Grigio	Grey	Rosso	Red
Marrone	Brown	Verde	Green



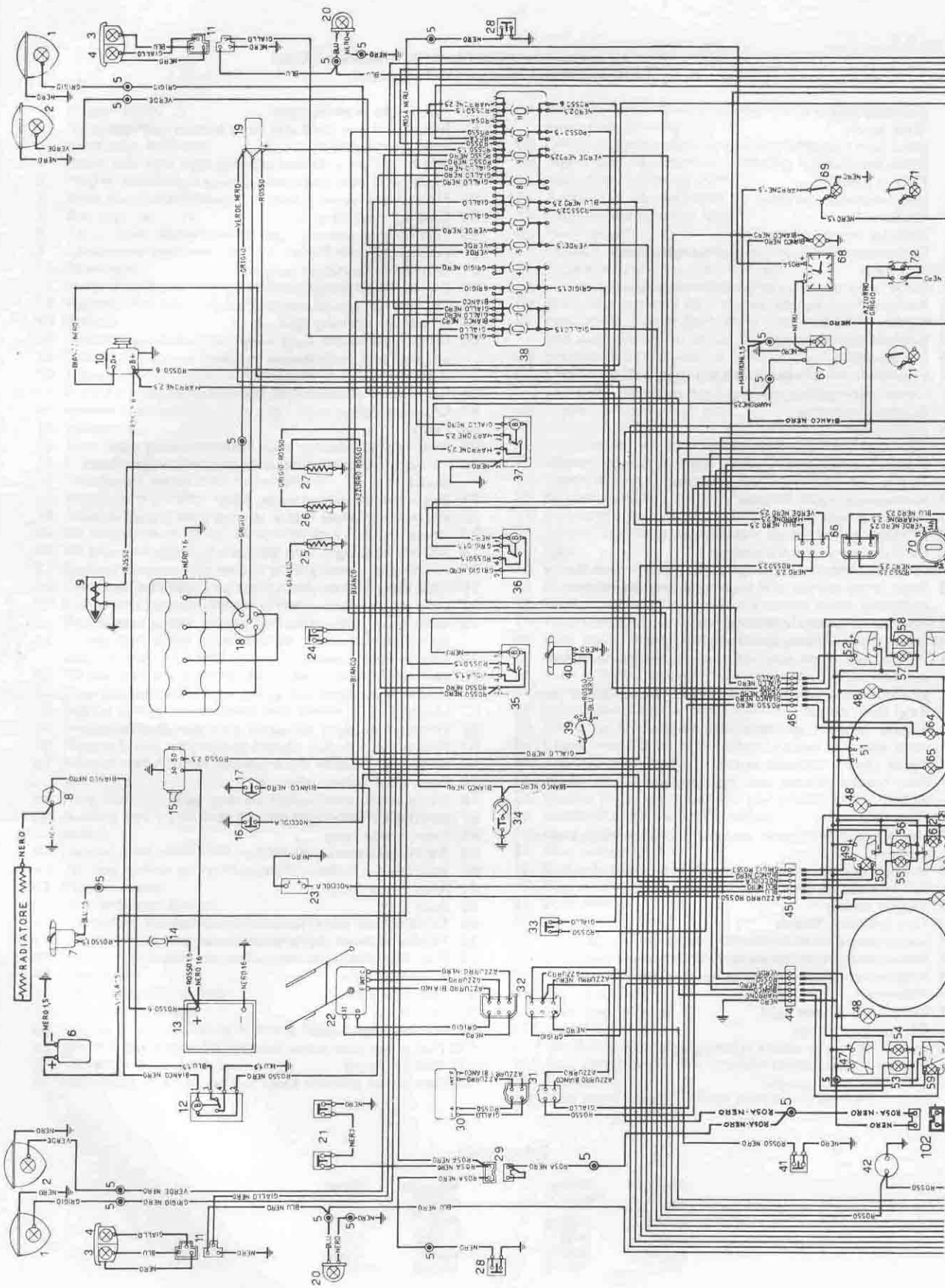
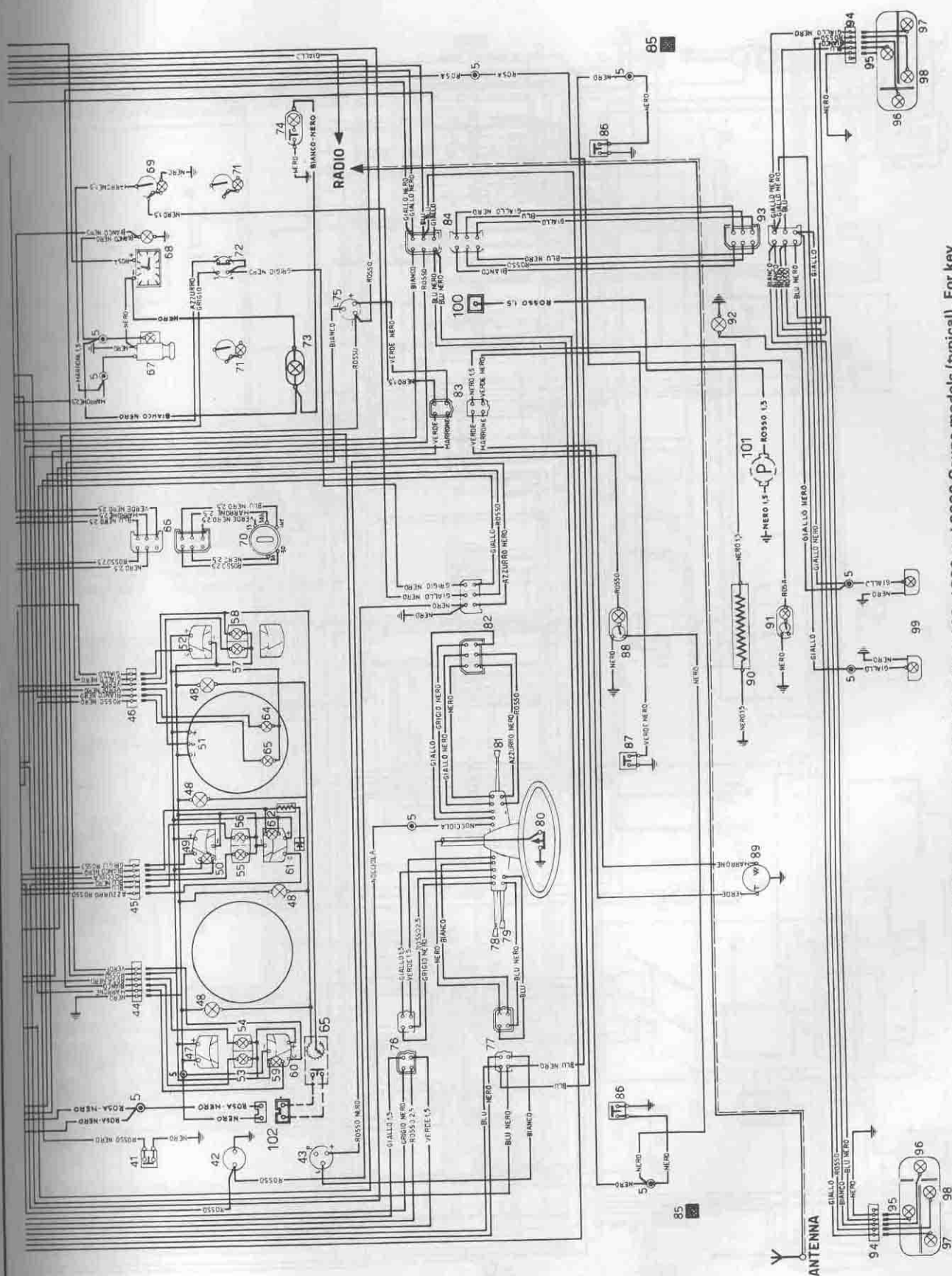


Fig. 10.32 Wiring diagram for left-hand drive 1600, 1800 and 2000 Coupe models (typical). For key see page 199



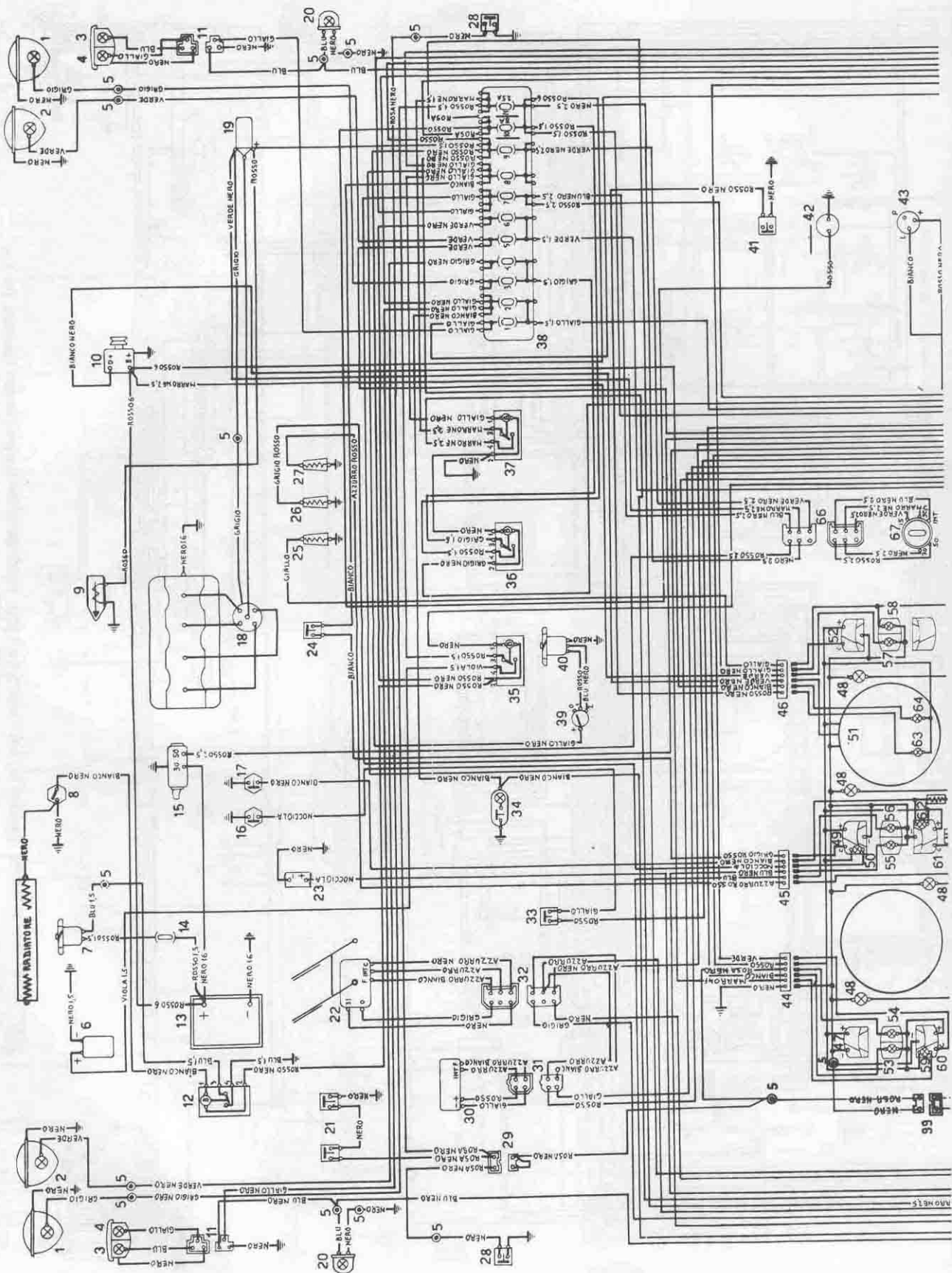


Fig. 10.33 Wiring diagram for right-hand drive 1600 and 2000 Spider models (typical). For key see page 204

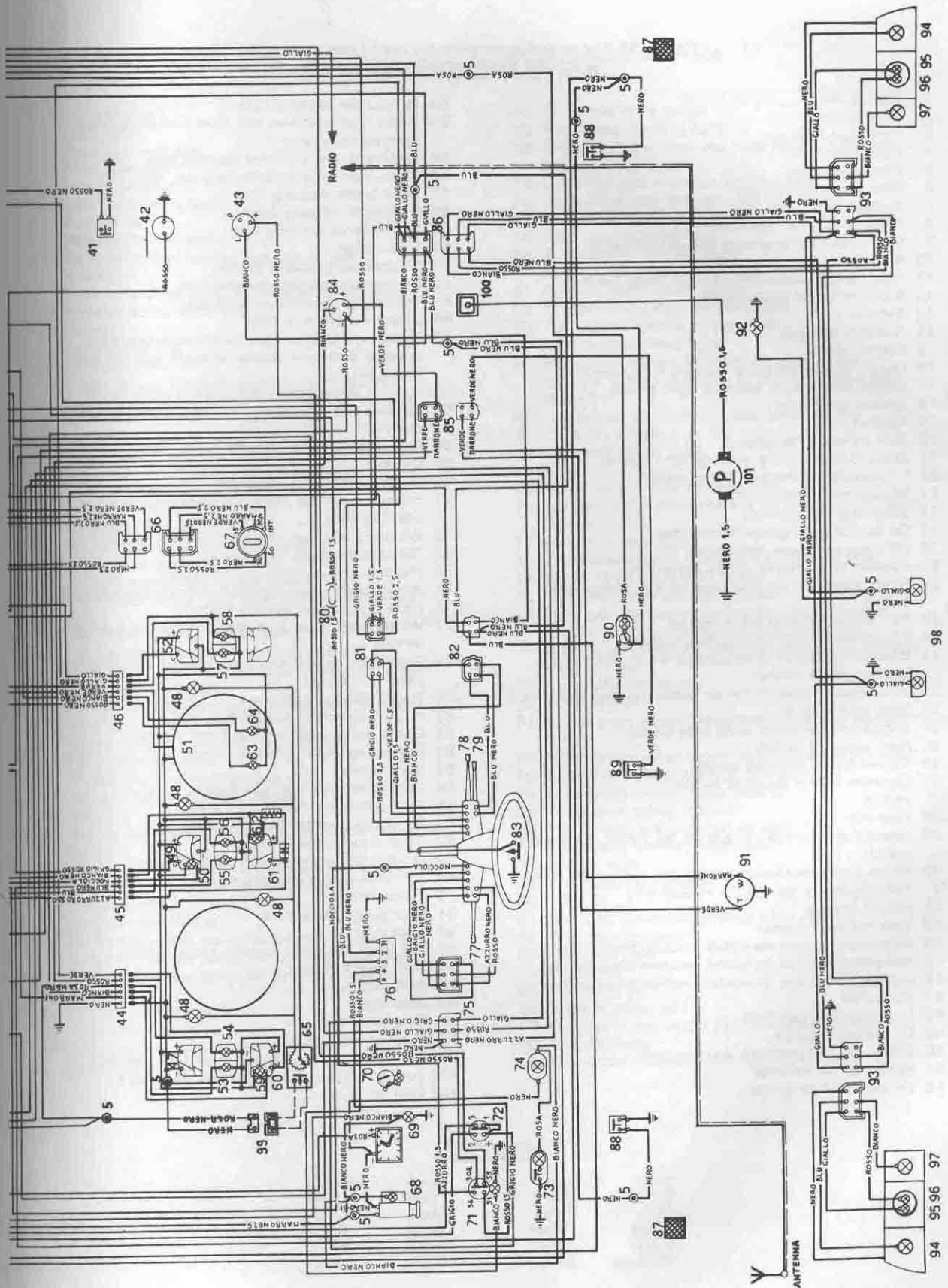


Fig. 10.33 (cont'd) Wiring diagram for right-hand drive 1600 and 2000 Spider models (typical). For key see page 204



**Fig. 10.33 Key to wiring diagram for right-hand drive 1600 and 2000 Spider models (typical)**

- |    |  |     |  |
|----|--|-----|--|
| 1  | Dipped beam  | 53  | Handbrake warning light  |
| 2  | Main beam  | 54  | Brake fluid low level and front friction pad wear limit warning light                                    |
| 3  | Front turn indicator   | 55  | Left-hand turn indicator warning light   |
| 4  | Front side light   | 56  | Right-hand turn indicator warning light  |
| 5  | Plug-in junction   | 57  | Main beam warning light  |
| 6  | Horn electrocompressor   | 58  | Side light warning light   |
| 7  | Radiator fan   | 59  | Fuel reserve warning light   |
| 8  | Radiator fan thermoswitch  | 60  | Fuel gauge   |
| 9  | Carburettor slow-running fuel cut-off device                             | 61  | Coolant temperature gauge  |
| 10 | Alternator   | 62  | Engine overheating warning light   |
| 11 | Front lamp three-outlet junction block (white)                           | 63  | Tell-tale on special versions only   |
| 12 | Radiator fan solenoid switch   | 64  | Alternator warning light   |
| 13 | Battery  | 65  | Instrument cluster light switch with intensity adjuster and push-button to check warning light (item 54) |
| 14 | Radiator fan fuse  | 66  | Ignition switch six-outlet junction block (black)  |
| 15 | Starter motor  | 67  | Ignition and accessories key switch and anti-theft device  |
| 16 | Engine oil low pressure warning light switch                             | 68  | Cigarette lighter with light   |
| 17 | Engine overheating warning light switch                                  | 69  | Clock  |
| 18 | Ignition distributor   | 70  | Switch with warning light  |
| 19 | Ignition coil  | 71  | Hazard signalling system change-over switch with warning light   |
| 20 | Turn indicator repeater  | 72  | Windscreen wiper motor change-over switch  |
| 21 | Brake fluid low level warning light switch                               | 73  | Glove locker light with switch   |
| 22 | Two-speed windscreen wiper motor   | 74  | Heating and ventilation control light  |
| 23 | Windscreen washer motor  | 75  | Windscreen wiper six-outlet junction block (white)   |
| 24 | Reversing light switch   | 76  | Hazard signalling system flasher   |
| 25 | Oil temperature gauge transmitter  | 77  | Windscreen wiper two-speed motor and washer motor control  |
| 26 | Oil pressure gauge transmitter   | 78  | Side light, dipped beam, main beam and headlamp flashing control   |
| 27 | Coolant temperature gauge transmitter                                    | 79  | Turn indicator control   |
| 28 | Front brake friction pad wear limit warning light switch                 | 80  | Hazard signalling system fuse (16 A)   |
| 29 | Two-outlet junction block (white)  | 81  | Lights four-outlet junction block (white)  |
| 30 | Windscreen wiper intermittence device                                    | 82  | Lights four-outlet junction block (red)  |
| 31 | Windscreen wiper intermittence device four-outlet junction block (white) | 83  | Horn control   |
| 32 | Windscreen wiper motor six outlet junction block (red)                   | 84  | Handbrake warning light flasher  |
| 33 | Stop light switch  | 85  | Four-outlet junction block (white)   |
| 34 | Engine compartment lamp with switch                                      | 86  | Six-outlet junction block (white)  |
| 35 | Horn solenoid switch   | 87  | Open door safety reflector   |
| 36 | Dipped beam solenoid switch  | 88  | Inside lamp press-switch on door pillar  |
| 37 | Cigarette lighter solenoid switch  | 89  | Handbrake warning light switch   |
| 38 | Fuse box   | 90  | Inside lamp  |
| 39 | Heating and ventilation system fan motor change-over switch              | 91  | Fuel gauge transmitter   |
| 40 | Heating and ventilation system fan two-speed motor                       | 92  | Boot light   |
| 41 | Tell-tale switch on special version only                                 | 93  | Tail lamp six-outlet junction block (white)  |
| 42 | Plug-in socket   | 94  | Rear turn indicator  |
| 43 | Turn indicator flasher   | 95  | Rear side light  |
| 44 | Instrument cluster six-outlet junction block (black)                     | 96  | Stop light   |
| 45 | Instrument cluster six-outlet junction block (white)                     | 97  | Reversing light  |
| 46 | Instrument cluster six-outlet junction block (red)                       | 98  | Number plate light   |
| 47 | Voltmeter  | 99  | Two outlet junction block (white) for item 65  |
| 48 | Instrument cluster light   | 100 | Fuel pump one-outlet junction block (white)  |
| 49 | Oil pressure gauge   | 101 | Fuel lift pump   |
| 50 | Engine oil low pressure warning light                                    |     |  |
| 51 | Electronic rev counter   |     |  |
| 52 | Oil temperature gauge  |     |  |

**Colour code**

Bianco	White	Nocciola	Hazel
Blu	Blue	Nero	Black
Giallo	Yellow	Rosa	Pink
Grigio	Grey	Rosso	Red
Marrone	Brown	Verde	Green

Fig. 10.34 Key to wiring diagram for left-hand drive 1600 and 2000 spider models (typical)

- |    |  |    |  |
|----|--|----|--|
| 1  | Dipped beam  | 52 | Oil temperature gauge  |
| 2  | Main beam  | 53 | Handbrake warning light  |
| 3  | Front turn indicator   | 54 | Brake fluid low level and front friction pad wear limit warning light                                    |
| 4  | Front side light   | 55 | Left-hand turn indicator warning light   |
| 5  | Plug-in junction   | 56 | Right-hand turn indicator warning light  |
| 6  | Horn electrocompressor   | 57 | Main beam warning light  |
| 7  | Radiator fan   | 58 | Side light warning light   |
| 8  | Radiator fan thermostswitch  | 59 | Fuel reserve warning light   |
| 9  | Carburettor slow-running fuel cut-off device                             | 60 | Fuel gauge   |
| 10 | Alternator   | 61 | Coolant temperature gauge  |
| 11 | Front lamp three-outlet junction block (white)                           | 62 | Engine overheating warning light   |
| 12 | Radiator fan solenoid switch   | 63 | Tell-tale on special version only  |
| 13 | Battery  | 64 | Alternator warning light   |
| 14 | Radiator fan fuse  | 65 | Instrument cluster light switch with intensity adjuster and push-button to check warning light (item 54) |
| 15 | Starter motor  | 66 | Key switch six-outlet junction block (black)   |
| 16 | Engine oil low pressure warning light switch                             | 67 | Cigarette lighter  |
| 17 | Engine overheating warning light switch                                  | 68 | Cigarette lighter light  |
| 18 | Ignition distributor   | 69 | Clock  |
| 19 | Ignition coil  | 70 | Spare switch with warning light  |
| 20 | Turn indicator repeater  | 71 | Ignition and accessories key switch with anti-theft device   |
| 21 | Brake fluid low level warning light switch                               | 72 | Heater control light   |
| 22 | Two-speed windscreen wiper motor   | 73 | Windscreen wiper motor change-over switch  |
| 23 | Windscreen washer motor  | 74 | Glove locker light with switch   |
| 24 | Reversing light switch   | 75 | Handbrake warning light flasher  |
| 25 | Oil temperature gauge transmitter  | 76 | Light control four-outlet junction block (white)   |
| 26 | Oil pressure gauge transmitter   | 77 | Light control four-outlet junction block (red)   |
| 27 | Coolant temperature gauge transmitter                                    | 78 | Main beam, dipped beam, light signalling and side light control  |
| 28 | Front brake friction pad wear limit warning light switch                 | 79 | Turn indicator control   |
| 29 | Two-outlet junction block (white)  | 80 | Horn control   |
| 30 | Windscreen wiper intermittence device                                    | 81 | Windscreen wiper two-speed motor and washer motor control  |
| 31 | Windscreen wiper intermittence device four-outlet junction block (white) | 82 | Windscreen wiper six-outlet junction block (white)   |
| 32 | Windscreen wiper motor six outlet junction block (red)                   | 83 | Four-outlet junction block (white)   |
| 33 | Stop light switch  | 84 | Six-outlet junction block (white)  |
| 34 | Engine compartment lamp with switch                                      | 85 | Open door safety reflector   |
| 35 | Horn solenoid switch   | 86 | Inside lamp press-switch on door pillar  |
| 36 | Dipped beam solenoid switch  | 87 | Handbrake warning light switch   |
| 37 | Cigarette lighter solenoid switch  | 88 | Interior light   |
| 38 | Fuse box   | 89 | Fuel gauge transmitter   |
| 39 | Heating and ventilation system fan motor change-over switch              | 90 | Boot lid   |
| 40 | Heating and ventilation system fan two-speed motor                       | 91 | Tail lamp six-outlet junction block (white)  |
| 41 | Tell-tale switch on special version only                                 | 92 | Rear turn indicator  |
| 42 | Plug-in socket   | 93 | Rear side light  |
| 43 | Turn indicator flasher   | 94 | Stop light   |
| 44 | Instrument cluster six-outlet junction block (black)                     | 95 | Reversing light  |
| 45 | Instrument cluster six-outlet junction block (white)                     | 96 | Number plate light   |
| 46 | Instrument cluster six-outlet junction block (red)                       | 97 | Fuel pump one-outlet junction block (white)  |
| 47 | Voltmeter  | 98 | Fuel lift pump   |
| 48 | Instrument cluster light   | 99 | Two-outlet junction block (white) for item 65  |
| 49 | Oil pressure gauge   |    |  |
| 50 | Engine oil low pressure warning light                                    |    |  |
| 51 | Electronic rev counter   |    |  |

#### Colour code

Bianco	White	Nocciola	Hazel
Blu	Blue	Nero	Black
Giallo	Yellow	Rosa	Pink
Grigio	Grey	Rosso	Red
Marrone	Brown	Verde	Green

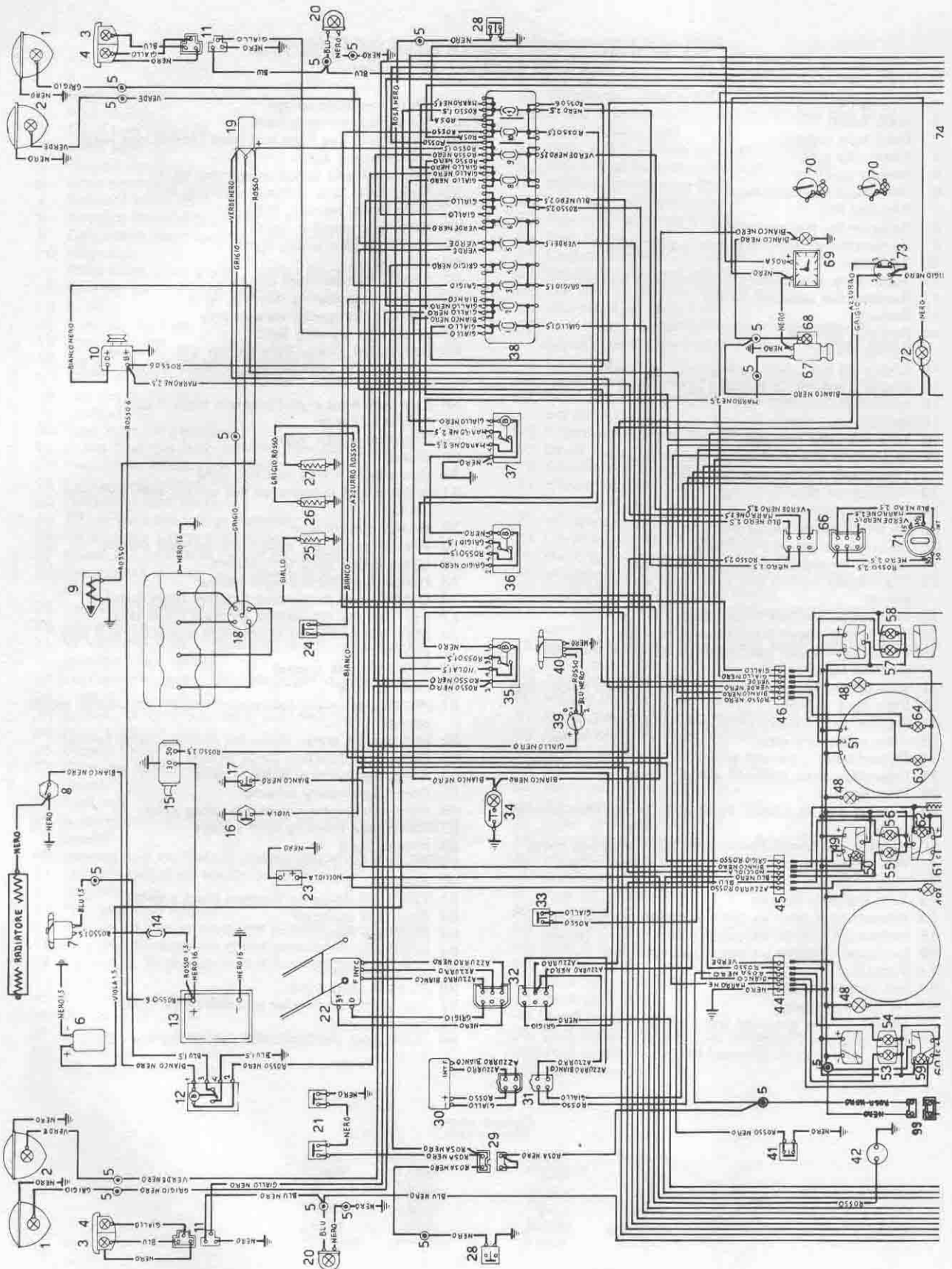


Fig. 10.34 Wiring diagram for left-hand drive 1600 and 2000 Spider models (typical). For key see page 205

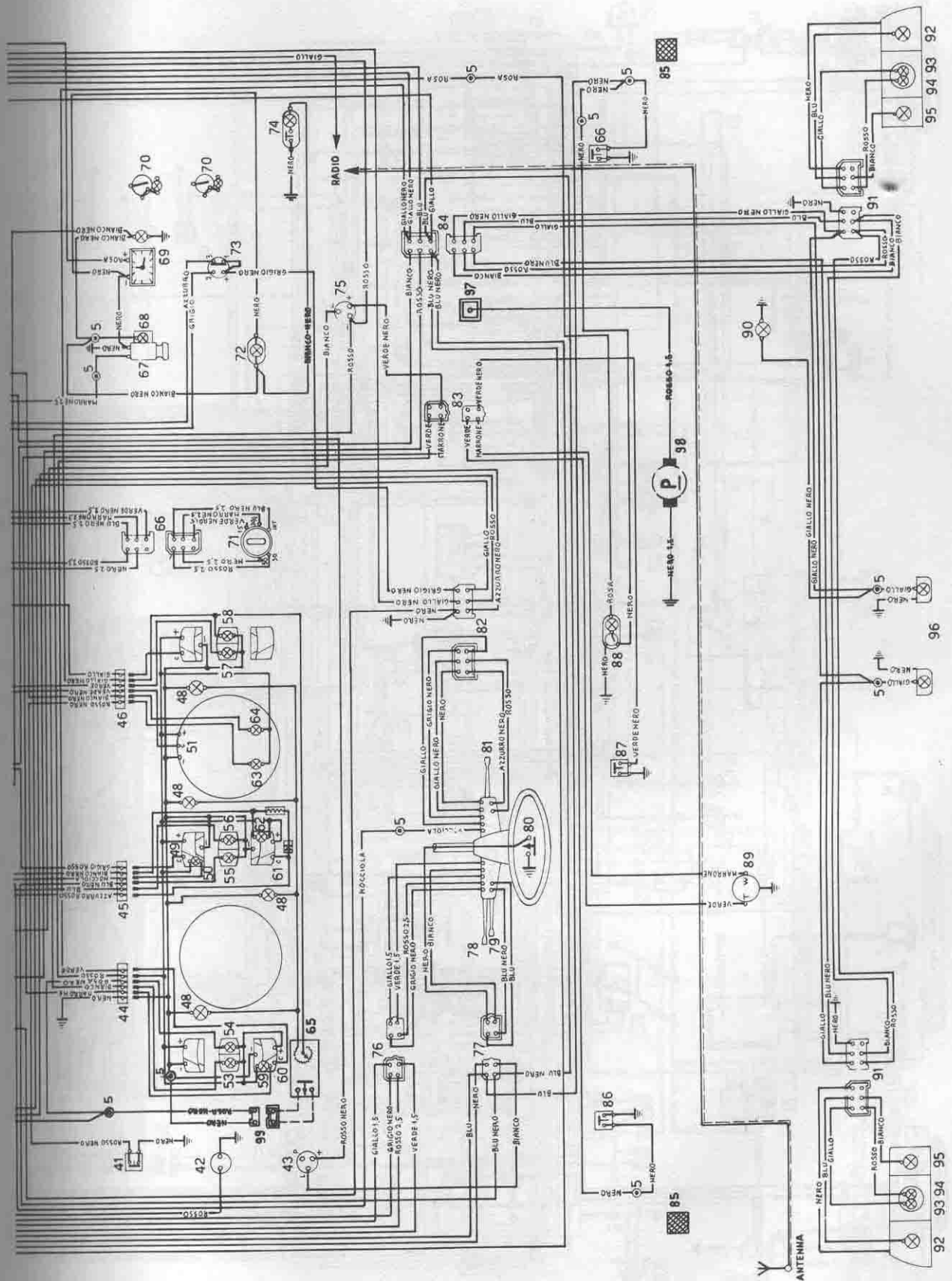


Fig. 10.34 (cont'd) Wiring diagram for left-hand drive 1600 and 2000 Spider models (typical). For key see page 205



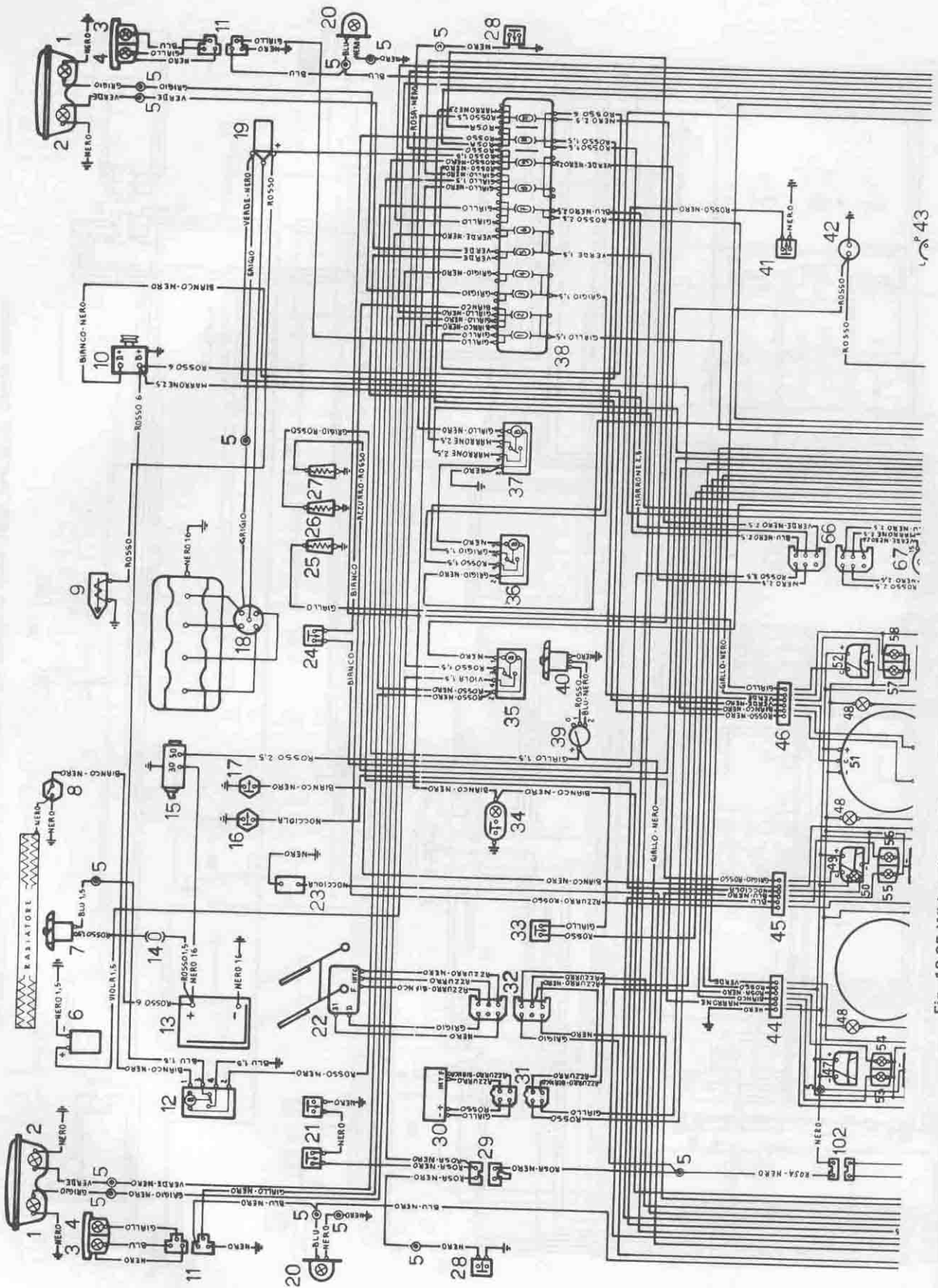


Fig. 10.35 Wiring diagram for right-hand drive HPE models (typical). For key see page 210

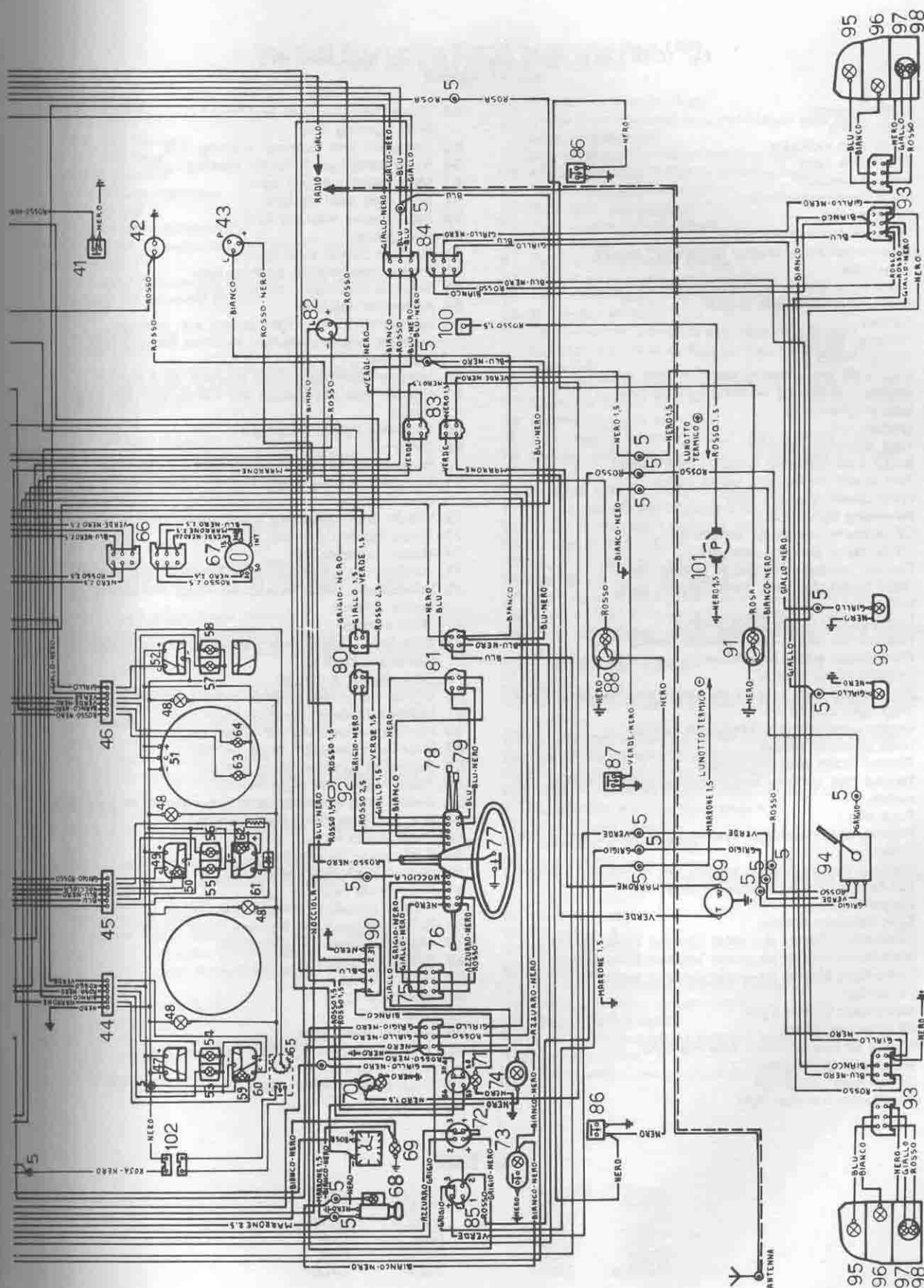


Fig. 10.35 (cont'd) Wiring diagram for right-hand drive HPE models (typical). For key see page 210

Fig. 10.35 Key to wiring diagram for right-hand drive HPE models (typical)

- |   |   |
|---|---|
| 1 Dipped beam   | 54 Brake fluid low level and front brake pad wear limit warning light                                       |
| 2 Main beam   | 55 Left-hand turn indicator warning light   |
| 3 Front turn indicator  | 56 Right-hand turn indicator warning light  |
| 4 Front side light  | 57 Main beam warning light  |
| 5 Plug-in junction  | 58 Side light warning light   |
| 6 Horn electrocompressor  | 59 Fuel reserve warning light   |
| 7 Radiator fan  | 60 Fuel gauge   |
| 8 Radiator fan thermoswitch   | 61 Coolant temperature gauge  |
| 9 Carburettor slow-running fuel cut-off device                              | 62 Engine overheating warning light   |
| 10 Alternator   | 63 Tell-tale on special versions only   |
| 11 Front lamp three-outlet junction block (white)                           | 64 Alternator tell-tale   |
| 12 Radiator fan solenoid switch   | 65 Instrument cluster light switch with intensity adjuster and push-button to check warning light (item 54) |
| 13 Battery  | 66 Ignition switch six-outlet junction block (black)  |
| 14 Radiator fan fuse  | 67 Ignition and accessories key switch with anti-theft device   |
| 15 Starter motor  | 68 Cigarette lighter with light   |
| 16 Engine oil low pressure warning light switch                             | 69 Clock  |
| 17 Engine overheating warning light switch                                  | 70 Heated rear window switch with warning light   |
| 18 Ignition distributor   | 71 Hazard signalling system change-over switch with warning light   |
| 19 Ignition coil  | 72 Windscreen wiper two-speed motor change-over switch  |
| 20 Turn indicator repeater  | 73 Glove locker light with switch   |
| 21 Brake fluid low level warning light switch                               | 74 Heater controls light  |
| 22 Two-speed windscreen wiper motor   | 75 Windscreen wiper six-outlet junction block (white)   |
| 23 Windscreen washer motor  | 76 Windscreen wiper two-speed motor and washer motor control  |
| 24 Reversing light switch   | 77 Horn control   |
| 25 Oil temperature gauge transmitter  | 78 Side light, dipped beam, main beam and headlamp flashing control   |
| 26 Oil pressure gauge transmitter   | 79 Turn indicator control   |
| 27 Coolant temperature gauge transmitter                                    | 80 Lights four-outlet junction block (white)  |
| 28 Front brake pad wear limit warning light switch                          | 81 Lights four-outlet junction block (red)  |
| 29 Two-outlet junction block (white)  | 82 Handbrake warning light flasher  |
| 30 Windscreen wiper intermittence device                                    | 83 Four-outlet junction block (white)   |
| 31 Windscreen wiper intermittence device four-outlet junction block (white) | 84 Six-outlet junction block (white)  |
| 32 Windscreen wiper motor six outlet junction block (red)                   | 85 Tailgate window wiper switch   |
| 33 Stop light switch  | 86 Inside lamp and door lamp press-switch on door pillar  |
| 34 Engine compartment lamp with switch                                      | 87 Handbrake warning light switch   |
| 35 Horn solenoid switch   | 88 Front inside lamp  |
| 36 Dipped beam solenoid switch  | 89 Fuel gauge transmitter   |
| 37 Heated rear window and cigarette lighter solenoid switch                 | 90 Hazard signalling system flasher   |
| 38 Fuse box   | 91 Rear inside lamp   |
| 39 Heating and ventilation system fan motor change-over switch              | 92 Hazard signalling system fuse (16 A)   |
| 40 Heating and ventilation system fan two-speed motor                       | 93 Tail lamp six-outlet junction block (white)  |
| 41 Tell-tale switch on special versions only                                | 94 Tailgate window wiper motor  |
| 42 Plug-in socket   | 95 Rear turn indicator  |
| 43 Turn indicator flasher   | 96 Reversing light  |
| 44 Instrument cluster six-outlet junction block (black)                     | 97 Rear side light  |
| 45 Instrument cluster six-outlet junction block (white)                     | 98 Stop light   |
| 46 Instrument cluster six-outlet junction block (red)                       | 99 Number plate light   |
| 47 Voltmeter  | 100 Fuel lift pump single junction block (white)  |
| 48 Instrument cluster light   | 101 Fuel lift pump  |
| 49 Oil pressure gauge   | 102 Two-outlet junction block (white) for item 65   |
| 50 Engine oil low pressure warning light                                    |   |
| 51 Electronic rev counter   |   |
| 52 Oil temperature gauge  |   |
| 53 Handbrake warning light  |   |

#### Colour code

Bianco	White	Nocciola	Hazel
Blu	Blue	Nero	Black
Giallo	Yellow	Rosa	Pink
Grigio	Grey	Rosso	Red
Marrone	Brown	Verde	Green

Fig. 10.36 Key to wiring diagram for left-hand drive 1600, 1800 and 2000 HPE models (typical)

- |    |  |     |  |
|----|--|-----|--|
| 1  | Dipped beam  | 53  | Handbrake warning light  |
| 2  | Main beam  | 54  | Brake fluid low level and front brake pad wear limit warning light                                       |
| 3  | Front turn indicator   | 55  | Left-hand turn indicator warning light   |
| 4  | Front side light   | 56  | Right-hand turn indicator warning light  |
| 5  | Plug-in junction   | 57  | Main beam warning light  |
| 6  | Horn electrocompressor   | 58  | Side light warning light   |
| 7  | Radiator fan   | 59  | Fuel reserve warning light   |
| 8  | Radiator fan thermoswitch  | 60  | Fuel gauge   |
| 9  | Carburettor slow-running fuel cut-off device                             | 61  | Coolant temperature gauge  |
| 10 | Alternator   | 62  | Engine overheating warning light   |
| 11 | Front lamp three-outlet junction block (white)                           | 63  | Tell-tale on special versions only   |
| 12 | Radiator fan solenoid switch   | 64  | Alternator warning light   |
| 13 | Battery  | 65  | Instrument cluster light switch with intensity adjuster and push-button to check warning light (item 54) |
| 14 | Radiator fan fuse  | 66  | Key switch six-outlet junction block (black)   |
| 15 | Starter motor  | 67  | Cigarette lighter with light   |
| 16 | Engine oil low pressure warning light switch                             | 68  | Electronic clock with light  |
| 17 | Engine overheating warning light switch                                  | 69  | Rear heated window switch with warning light   |
| 18 | Ignition distributor   | 70  | Ignition and accessories key switch with anti-theft device   |
| 19 | Ignition coil  | 71  | Tailgate window wiper pull-switch  |
| 20 | Turn indicator repeater  | 72  | Windscreen wiper change-over switch  |
| 21 | Brake fluid low level warning light switch                               | 73  | Spare switch with warning light  |
| 22 | Two-speed windscreen wiper motor   | 74  | Heater controls light  |
| 23 | Windscreen washer motor  | 75  | Glove locker light with switch   |
| 24 | Reversing light switch   | 76  | Handbrake warning flasher  |
| 25 | Oil temperature gauge transmitter  | 77  | Light control four-outlet junction block (white)   |
| 26 | Oil pressure gauge transmitter   | 78  | Light control four-outlet junction block (red)   |
| 27 | Coolant temperature gauge transmitter                                    | 79  | Side light, dipped beam, main beam and light signalling control  |
| 28 | Front brake friction pad wear limit warning light switch                 | 80  | Turn indicator control   |
| 29 | Two-outlet junction block (white)  | 81  | Horn control   |
| 30 | Windscreen wiper intermittence device                                    | 82  | Windscreen wiper two-speed motor and washer motor control  |
| 31 | Windscreen wiper intermittence device four-outlet junction block (white) | 83  | Windscreen wiper six-outlet junction block (white)   |
| 32 | Windscreen wiper motor six outlet junction block (red)                   | 84  | Four-outlet junction block (white)   |
| 33 | Stop light switch  | 85  | Six-outlet junction block (white)  |
| 34 | Engine compartment lamp with switch                                      | 86  | Front inside lamp press-switch on door pillar  |
| 35 | Horn solenoid switch   | 87  | Handbrake warning light switch   |
| 36 | Dipped beam solenoid switch  | 88  | Front inside lamp  |
| 37 | Heated rear window and cigarette lighter solenoid switch                 | 89  | Fuel gauge transmitter   |
| 38 | Fuse box   | 90  | Rear inside lamp   |
| 39 | Heating and ventilation system fan motor change-over switch              | 91  | Tailgate window wiper motor and heated rear window plug-in junction                                      |
| 40 | Heating and ventilation system fan two-speed motor                       | 92  | Rear turn indicator  |
| 41 | Tell-tale switch on special versions only                                | 93  | Reversing light  |
| 42 | Plug-in socket   | 94  | Rear side light  |
| 43 | Turn indicator flasher   | 95  | Stop light   |
| 44 | Instrument cluster six-outlet junction block (black)                     | 96  | Tail lamp six-outlet junction block  |
| 45 | Instrument cluster six-outlet junction block (white)                     | 97  | Tailgate window wiper motor  |
| 46 | Instrument cluster six-outlet junction block (red)                       | 98  | Number plate light   |
| 47 | Voltmeter  | 99  | Fuel pump one-outlet junction block (white)  |
| 48 | Instrument cluster light   | 100 | Fuel lift pump   |
| 49 | Oil pressure gauge   | 101 | Two-outlet junction block (white) for item 65  |
| 50 | Engine oil low pressure warning light                                    |     |  |
| 51 | Electronic rev counter   |     |  |
| 52 | Oil temperature gauge  |     |  |

#### Colour code

Bianco	White	Nocciola	Hazel
Blu	Blue	Nero	Black
Giallo	Yellow	Rosa	Pink
Grigio	Grey	Rosso	Red
Marrone	Brown	Verde	Green



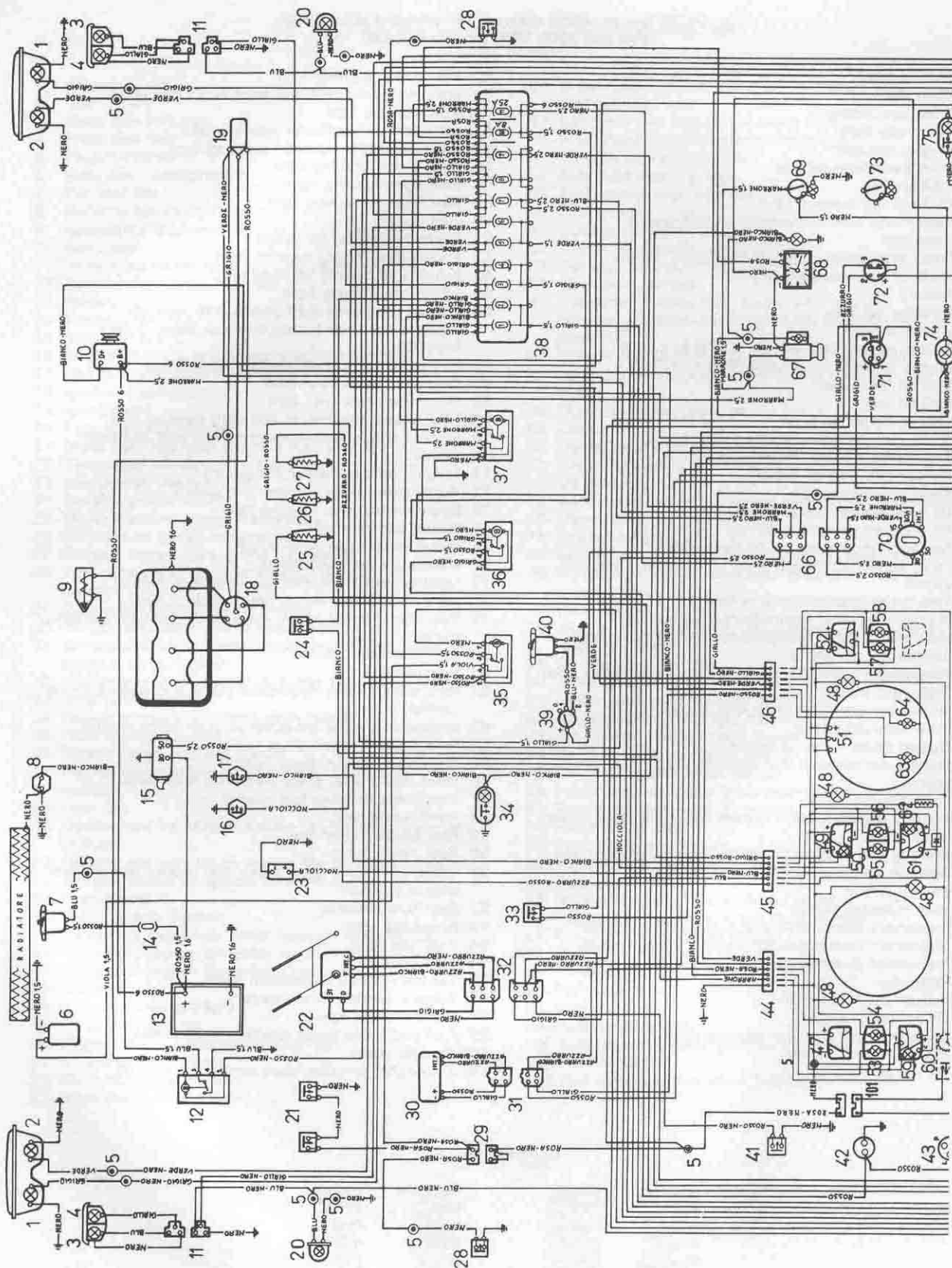
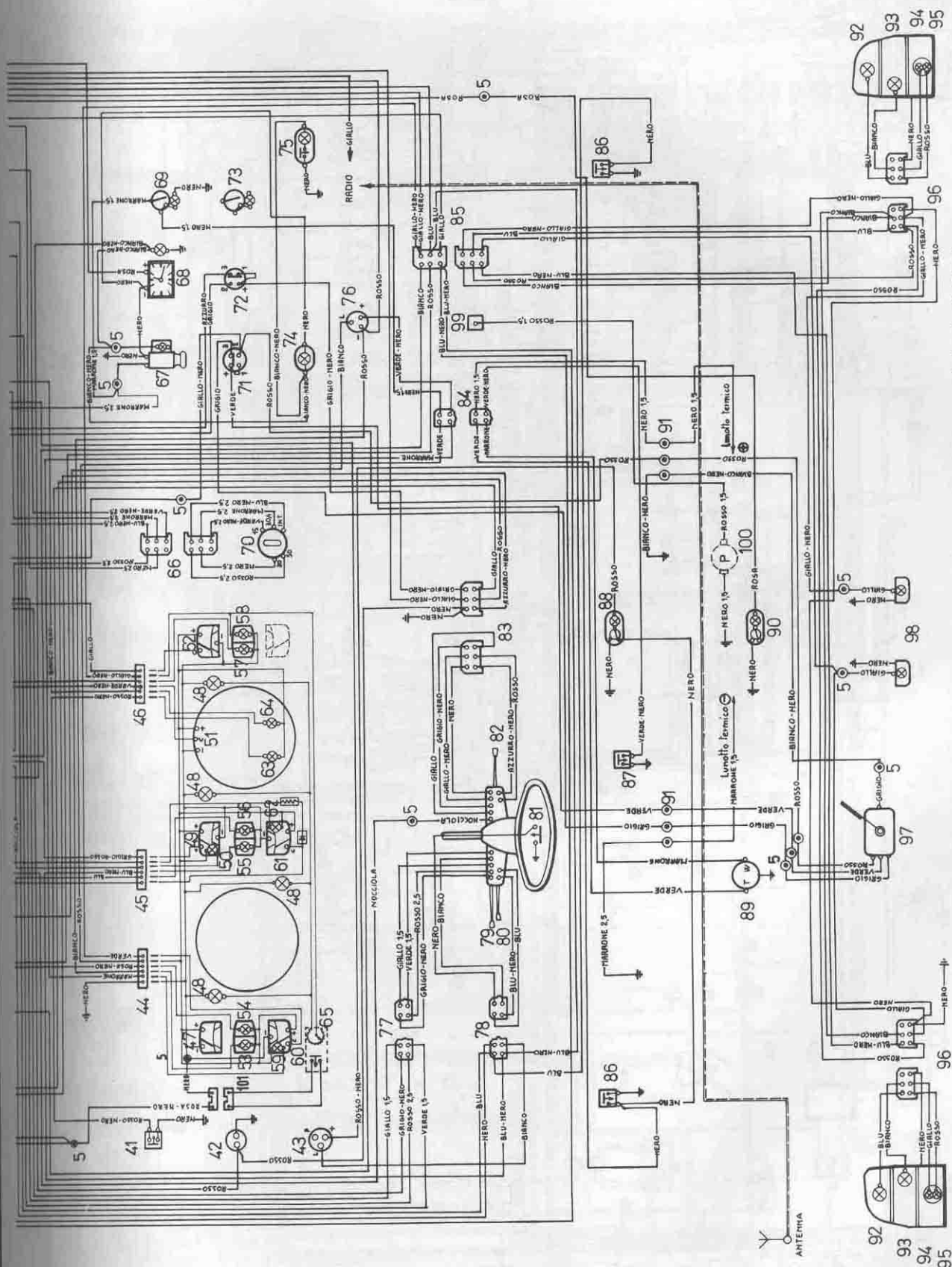


Fig. 10.36 Wiring diagram for left-hand drive 1600, 1800 and 2000 HPE models (typical). For key see page 211



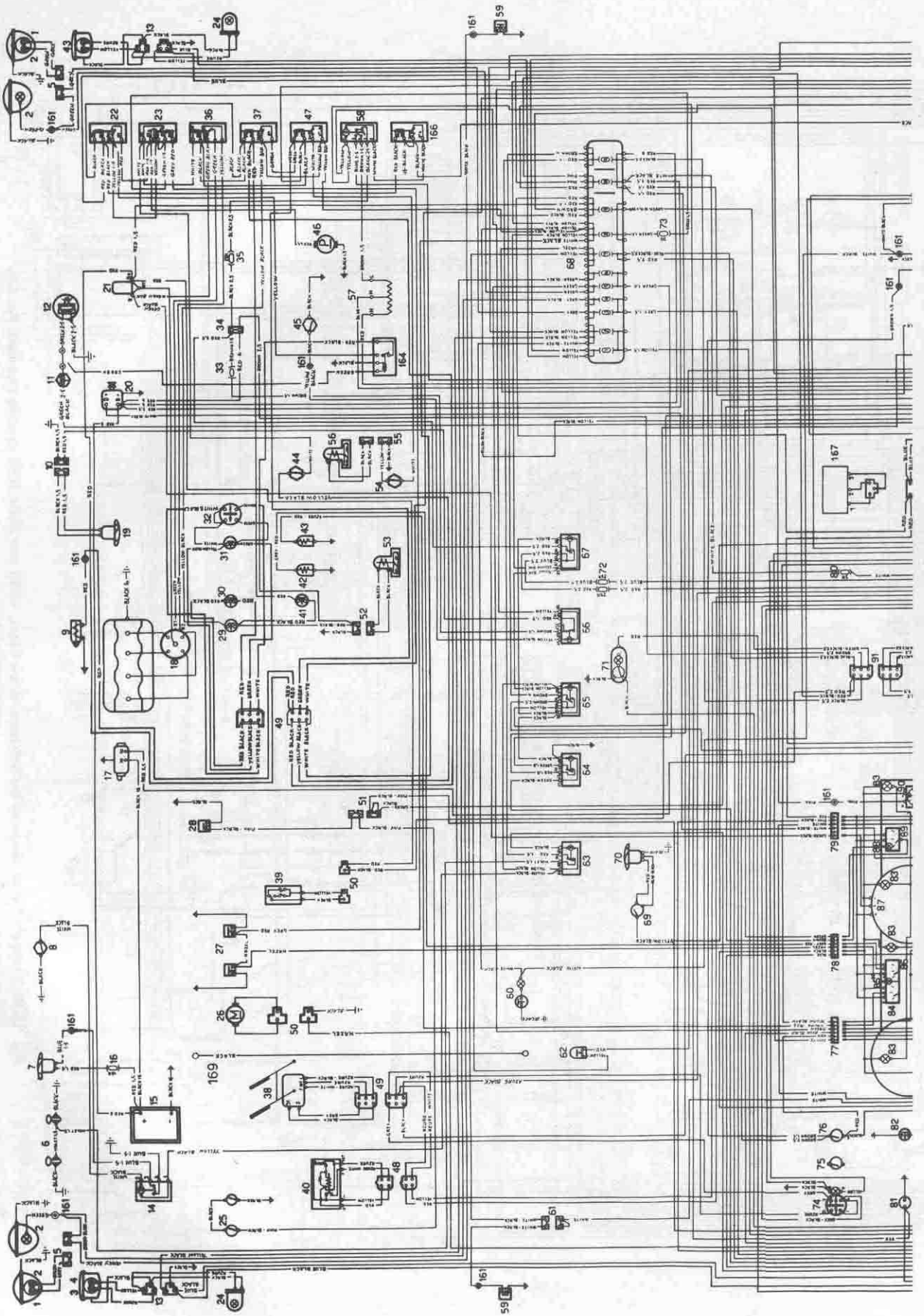


Fig. 10.37 Wiring diagram for North American Saloon models with emission control (typical). For key see page 216

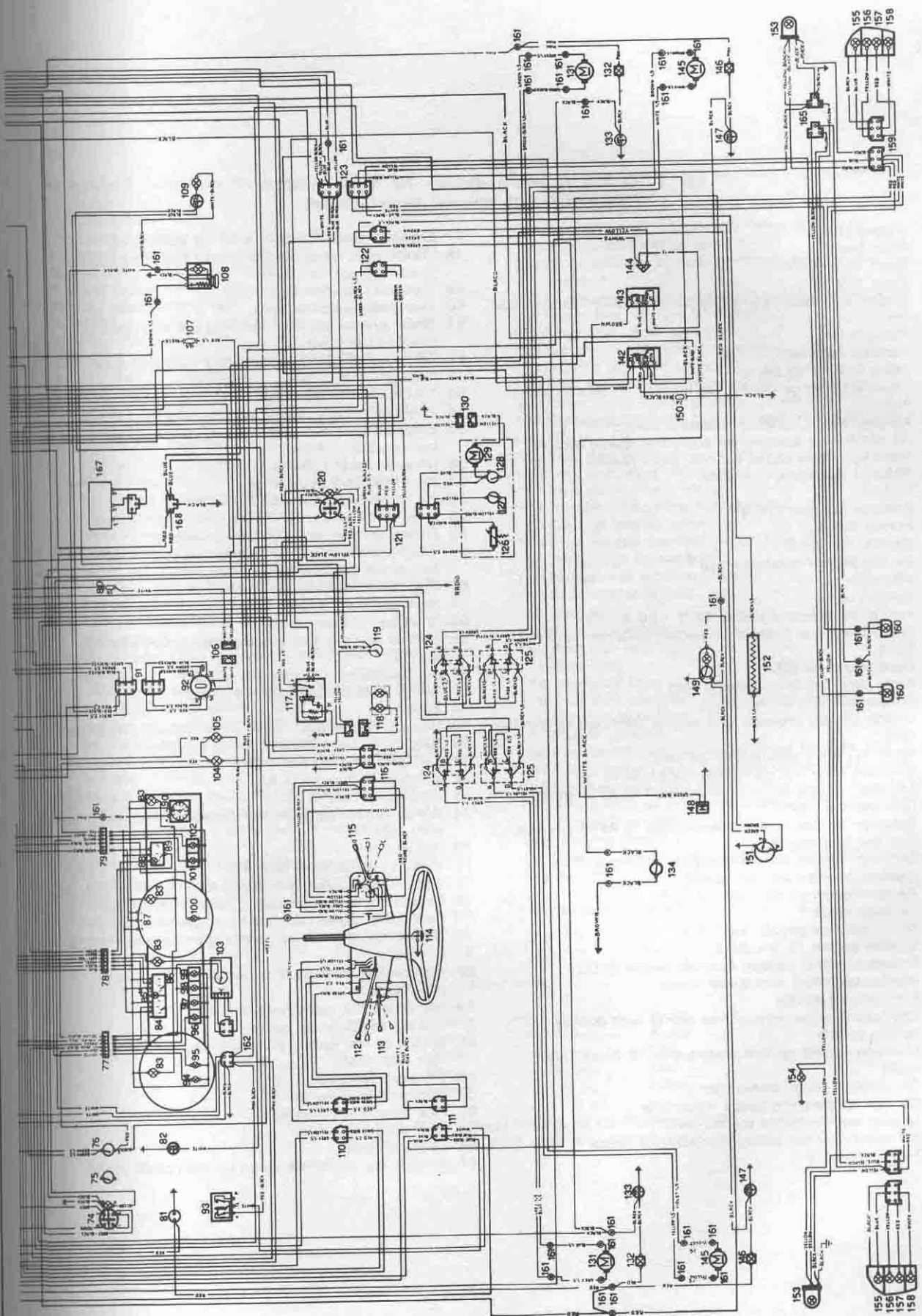


Fig. 10.37 (cont'd) Wiring diagram for North American Saloon models with emission control (typical). For key see page 216



Fig. 10.37 Key to wiring diagram for North American  
Saloon models with emission control (typical)

- 1 Dipped beam
- 2 Main beam
- 3 Front turn indicator
- 4 Front side light
- 5 Dipped and main beams two-outlet junction block (white)
- 6 Horn
- 7 Radiator fan
- 8 Radiator fan thermostatic switch
- 9 Idling fuel cut-off device
- 10 Air conditioner condenser fan two-outlet junction block (white)\*
- 11 Air conditioner minimum pressure switch\*
- 12 Air conditioner compressor electro-magnetic coupling \*
- 13 Front light three-outlet junction block (white)
- 14 Radiator fan solenoid switch
- 15 Battery
- 16 Radiator fan fuse (16 A)
- 17 Starter motor
- 18 Ignition distributor
- 19 Air conditioner condenser fan \*
- 20 Alternator
- 21 Ignition coil
- 22 Fuel pump solenoid switch 12 V – 20 A (NO)
- 23 Ignition and fuel pump change-over switches 12 V – 20 A
- 24 Front clearance light
- 25 Brake fluid low level warning light
- 26 Windscreen washer motor
- 27 Engine oil low pressure and engine overheating warning light
- 28 Brake system pressure drop tell-tale
- 29 Emission control system press-switch (5 A)
- 30 Emission control system press-switch (5 A) on gearbox (3rd and 4th speed)
- 31 Emission control system press-switch (5 A) on gearbox (1st and 2nd speed)
- 32 Emission control system change-over switch (5 A) on gearbox (reverse and 5th speed)
- 33 Air conditioner motor fuse (16 A) \*
- 34 Junction block \*
- 35 Air conditioner circuit fuse (25 A) \*
- 36 Ignition switch 12 V – 20 A
- 37 Emission control system solenoid switch (N.O.)
- 38 Windscreen wiper two-speed motor
- 39 EGR tell-tale device
- 40 Windscreen wiper intermittent device with remote control switch
- 41 Emission control system press-switch (5 A) on clutch pedal
- 42 Oil pressure gauge transmitter
- 43 Coolant temperature gauge transmitter
- 44 Ignition switch control thermo-switch
- 45 Air conditioner fan control temperature sensor \*
- 46 Fuel pump 12 V
- 47 Emission control system solenoid switch (NC)
- 48 Windscreen wiper remote control switch four-outlet junction block (white)
- 49 Six-outlet junction block (red)
- 50 Two-outlet junction block
- 51 Brake system pressure drop tell-tale two-outlet junction block (white)
- 52 Emission control system electro-valve two-outlet junction block (white)
- 53 Fast idling control electro-valve (12 V)
- 54 Emission control system electro-valve thermo-switch
- 55 Emission control system electro-valve two-outlet junction block (white)
- 56 Diverter control electro-valve (12 V)
- 57 Air conditioner system resistor \*
- 58 Air conditioner unit solenoid switch \*
- 59 Front brake pad wear limit warning light contact
- 60 Engine compartment light with switch
- 61 Front brake pad wear limit warning light contact two-outlet junction block (white)
- 62 Stop light switch
- 63 Horn solenoid switch
- 64 Main beam solenoid switch
- 65 Heated rear window and cigarette lighter solenoid switch
- 66 Air conditioner fan solenoid switch \*
- 67 Window lift control solenoid switch \*
- 68 Fuse box
- 69 Heating and ventilation fan motor change-over switch
- 70 Heating and ventilation fan two-speed motor
- 71 Car front interior lamp with switch
- 72 Window lift fuses (25 A) \*
- 73 Fuel pump fuse (3 A)
- 74 Windscreen wiper high and low speed change-over switch with light
- 75 Extra switch
- 76 Heated rear window switch
- 77 Instrument cluster six-outlet junction block (white)
- 78 Instrument cluster six-outlet junction block (red)
- 79 Instrument cluster six-outlet junction block (black)
- 80 Unfastened driver's belt warning buzzer loose fuse (3 A)
- 81 Socket
- 82 Ignition key inserted, front left door pillar fitted press-switch
- 83 No. 4 light for instrument cluster
- 84 Coolant temperature gauge
- 85 Engine oil low pressure and engine overheating warning light with diode
- 86 Oil pressure gauge
- 87 Electronic rev. counter
- 88 Fuel reserve warning light
- 89 Fuel gauge
- 90 Electronic clock
- 91 Ignition key switch six-outlet junction block (black)

- 92 Ignition and accessory key switch with anti-theft device
- 93 Turn indicator flasher
- 94 Hazard signalling system warning light
- 95 Heated rear window warning light
- 96 Left turn indicator warning light
- 97 Main beams warning light
- 98 Side lights warning light
- 99 Right turn indicator warning light
- 100 Alternator warning light
- 101 BRAKE tell-tale (brake system pressure drop, brake fluid level and handbrake)
- 102 BRAKE-PAD tell-tale (front brake pads wear)
- 103 Instruments light intensity adjuster with push-button to check BRAKE PAD - BRAKE - EGR tell-tale.
- 104 Driver's belt FASTEN-BELTS warning light
- 105 EGR tell-tale (scheduled maintenance)
- 106 Buzzer circuit two-inlet junction block (white)
- 107 Hazrd signalling system fuse (16 A)
- 108 Cigarette lighter with light
- 109 Glove locker light with switch
- 110 Lights four-outlet junction block (white)
- 111 Lights four-outlet junction block (red)
- 112 Side light, dipped beam, main beam and headlamp flashing control
- 113 Turn indicator control
- 114 Horn control
- 115 Windscreen wiper two-speed motor and washer motor control
- 116 Windscreen wiper six-outlet junction block (white)
- 117 Hazard signalling system flasher
- 118 Heating and ventilation controls light with two-outlet junction block (white)
- 119 Heating and ventilation controls light switch with intensity adjuster
- 120 Hazard signalling system lights switch with tell-tale
- 121 Air conditioner six-outlet junction block (white) \*
- 122 Four-outlet junction block (white) for items 148 - 151 - 152
- 123 Six outlet junction block (white) for exterior lights
- 124 Front door window lifts switches fitted to centre console rear section \*
- 125 Rear door window lifts switches fitted to centre console rear section \*
- 126 Air conditioner thermostat \*
- 127 Air conditioner limit switch (fitted to the recirculation control lever) \*
- 128 Air conditioner booster fan motor change-over switch \*
- 129 Air conditioner two-outlet junction block (white) \*
- 131 Front door window lift motor \*
- 132 Front open door safety lamp
- 133 Front door pillar press-switch
- 134 Driver's seat belt switch
- 142 EGR system solenoid switch (NC)
- 143 Driver's belt circuit solenoid switch (NO)
- 144 Unfastened driver's belt and ignition key fitted buzzer (12 V)
- 145 Rear door window lift motor \*
- 146 Rear open door safety lamp
- 147 Rear door pillar press-switch
- 148 Handbrake warning light contact
- 149 Car rear interior lamp
- 150 EGR tell-tale solenoid switch fuse (3 A)
- 151 Fuel gauge transmitter
- 152 Heated rear window filament
- 153 Rear clearance light
- 154 Boot light
- 155 Rear turn indicator
- 156 Rear side light
- 157 Stop light
- 158 Reversing light
- 159 Rear light six-outlet junction block (white)
- 160 Number plate light
- 161 Plug-in junction
- 162 Four outlet junction block (white) for item 103
- 164 Safety system relay six-outlet junction block (red)
- 165 Number plate light three-outlet junction block (white)
- 166 Air conditioner cut-out solenoid switch (NC) when starting the engine
- 167 Delaying device
- 168 Delaying device three-outlet junction block (white)
- 169 Steering shaft ground

\* Fitted as an optional extra

#### Colour code

Bianco	White	Nocciola	Hazel
Blu	Blue	Nero	Black
Giallo	Yellow	Rosa	Pink
Grigio	Grey	Rosso	Red
Marrone	Brown	Verde	Green

Please note that, at the time of writing, wiring diagrams for the HPE and Zagato models with emission control were not available

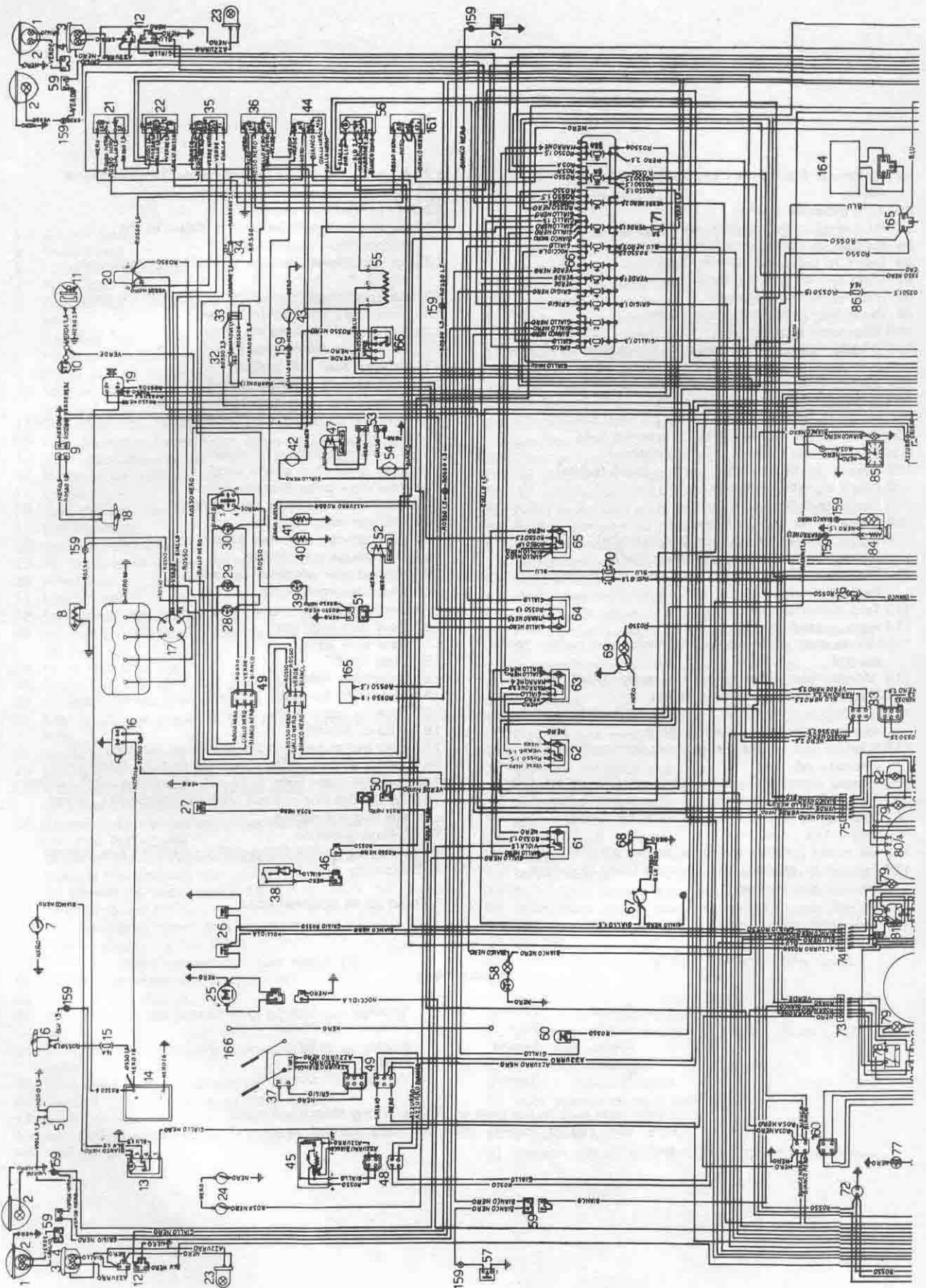
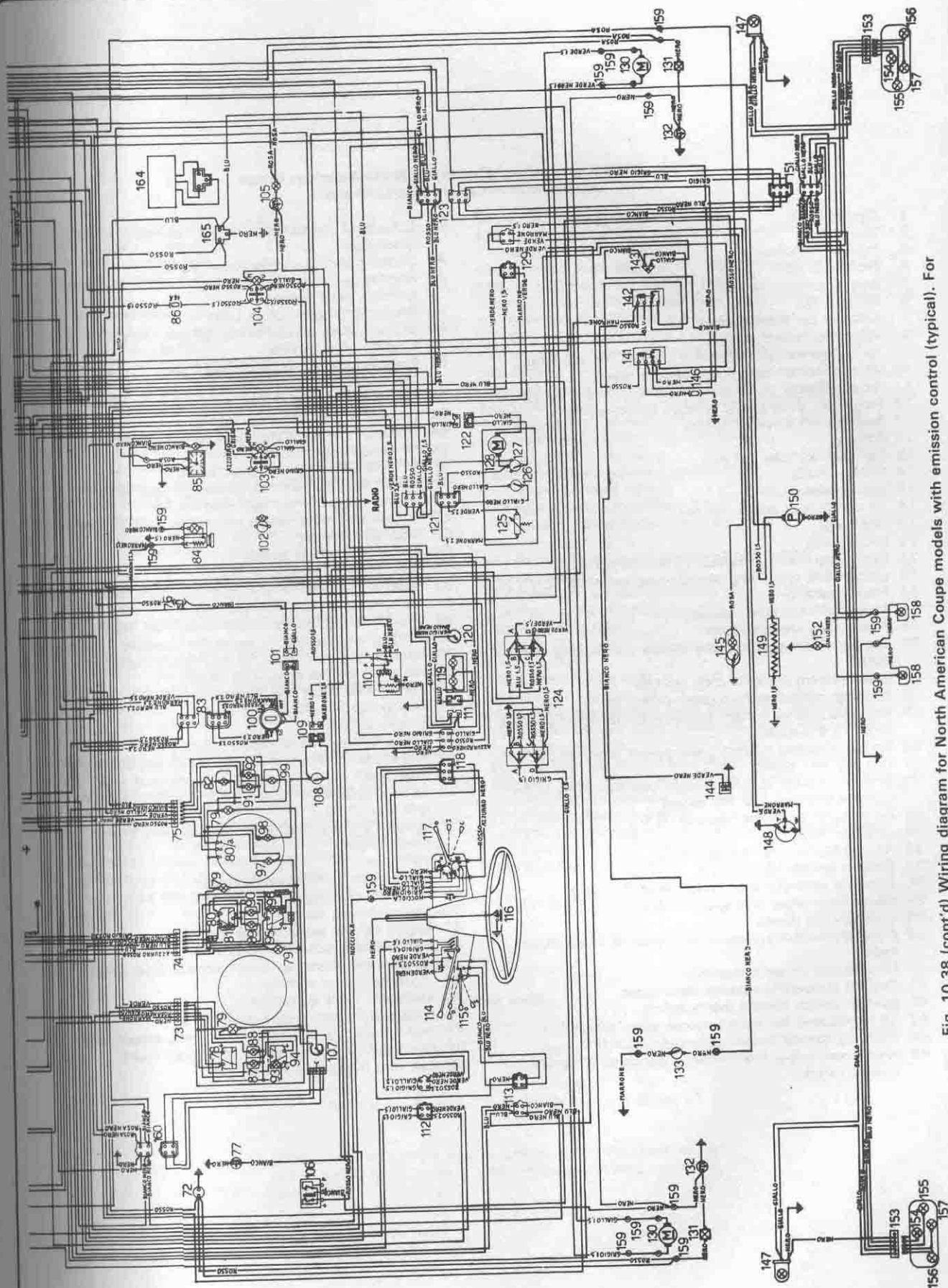


Fig. 10.38 Wiring diagram for North American Coupe models with emission control (typical). For key see page 220





**Fig. 10.38 Key to wiring diagram for North American Coupe models with emission control (typical)**

- 1 Dipped beam
- 2 Main beam
- 3 Front turn indicator
- 4 Front side light
- 5 Horn electro-compressor
- 6 Radiator fan
- 7 Radiator fan thermostatic switch
- 8 Idling fuel cut-off device
- 9 Air condenser fan two-outlet junction block (white)
- 10 Air conditioned minimum pressure switch
- 11 Air conditioner compressor electro-magnetic coupling \*
- 12 Front light three-outlet junction block (white) \*
- 13 Radiator fan solenoid switch
- 14 Battery
- 15 Radiator fan fuse (16 A)
- 16 Starter motor
- 17 Ignition distributor
- 18 Air conditioner condenser fan \*
- 19 Alternator
- 20 Ignition coil
- 21 Fuel pump solenoid switch 12 V - 20 A (NO)
- 22 Ignition and fuel pump change-over switches 12 V - 20 A
- 23 Front clearance light
- 24 Brake fluid low level warning light
- 25 Windscreen washer motor
- 26 Engine oil low pressure and engine overheating warning light
- 27 Brake system pressure drop tell-tale
- 28 Emission control system press-switch (5 A)
- 29 Emission control system press-switch (5 A) on gearbox (3rd and 4th speed)
- 30 Emission control system press-switch (5 A) on gearbox (1st and 2nd speed)
- 31 Emission control system change-over switch (5 A) on gearbox (Reverse and 5th speed)
- 32 Air conditioner motor fuse (16 A) \*
- 33 Junction block \*
- 34 Air conditioner circuit fuse (25 A)
- 35 Ignition switch 12 V - 20 A
- 36 Emission control system solenoid switch (N.O.)
- 37 Windscreen wiper two-speed motor
- 38 EGR tell-tale device
- 39 Emission control system press-switch (5 A) on clutch pedal
- 40 Oil pressure gauge transmitter
- 41 Coolant temperature gauge transmitter
- 42 Ignition switch control therm-switch
- 43 Air conditioner fan control temperature sensor \*
- 44 Emission control system solenoid switch (PC)
- 45 Windscreen wiper intermittence device with remote control switch
- 46 Scheduled maintenance device two-outlet junction block (red)
- 47 Diverter control electro-valve (12 V)
- 48 Windscreen wiper remote control switch four-outlet junction block (white)
- 49 Six-outlet junction block (red)
- 50 Brake system pressure drop tell-tale two-outlet junction block (white)
- 51 Emission control system electro-valve item 52 two-outlet junction block (white)
- 52 Fast idling control electro-valve (12 V)
- 53 Two-outlet junction block (white)
- 54 Emission control system electro-valve thermo-switch
- 55 Air conditioner system resistor \*
- 56 Air conditioner unit solenoid switch \*
- 57 Front brake pad wear limit warning light contact
- 58 Engine compartment light with switch
- 59 Dipped and main beams two-outlet junction block (white)
- 60 Stop light switch
- 61 Air-horns solenoid switch
- 62 Main beams solenoid switch
- 63 Heated rear window and cigarette lighter solenoid switch
- 64 Air conditioner fan solenoid switch \*
- 65 Window lift control solenoid switch \*66 Fuse box
- 67 Heating and ventilation fan motor change-over switch
- 68 Heating and ventilation fan two-speed motor
- 69 Car front interior lamp with switch
- 70 Window lift fuses (16 A)
- 71 Fuel pump fuse (3 A)
- 72 Plug-in socket
- 73 Instrument cluster six-outlet junction block (black)
- 74 Instrument cluster six-outlet junction block (white)
- 75 Instrument cluster six-outlet junction block (red)
- 76 Seat belts and start-block 12 V electronic control unit fuse (3 A)
- 77 Ignition key inserted, front left door pillar fitted press-switch
- 78 Voltmeter
- 79 No 4 lights for instrument cluster
- 80 Oil pressure gauge
- 80a Electronic rev. counter
- 81 Engine oil low pressure warning light
- 82 EGR tell-tale (scheduled maintenance)
- 83 Ignition key switch six-outlet junction block (black)
- 84 Cigarette lighter with light
- 85 Electronic clock with light
- 86 Hazard signalling system fuse (16 A)
- 87 BRAKE tell-tale (handbrake and brake system failure)
- 88 BRAKE-PAD tell-tale (front brake pads wear)
- 89 Left turn indicator warning light

- 90 Right turn indicator warning light
- 91 Main beams warning light
- 92 Side lights warning light
- 93 Fuel reserve warning light
- 94 Fuel gauge
- 95 Coolant temperature gauge
- 96 Engine overheating warning light
- 97 Alternator warning light
- 98 Heated rear window warning light
- 99 Driver's seat belts FASTEN-BELTS tell-tale
- 100 Ignition and accessory key switch with anti-theft device
- 101 Seat belts circuit two-outlet junction block (white)
- 102 Extra switch with warning light
- 103 Windscreen wiper high and low speed change-over switch
- 104 Hazard signalling system switch with warning light
- 105 Glove locker light with switch
- 106 Turn indicator flasher
- 107 Instrument light intensity adjuster with push-button to check BRAKE PAD - BRAKE - EGR tell-tale
- 108 Heated rear window switch
- 109 Heated rear window two-outlet junction block (white)
- 110 Hazard signalling system flasher
- 111 Heating and ventilation controls light two-outlet junction block
- 112 Lights four-outlet junction block (white)
- 113 Lights four-outlet junction block (red)
- 114 Side light, dipped beam, main beam and headlamp flashing control
- 115 Turn indicator control
- 116 Air-horns control
- 117 Windscreen wiper two-speed motor and washer motor control
- 118 Windscreen wiper six-outlet junction block (white)
- 119 Heating and ventilation controls light
- 120 Control switches light intensity adjuster switch
- 121 Air conditioner six-outlet junction block (white) \*
- 122 Seat belt two-outlet junction block (white)
- 123 Exterior lights six-outlet junction block (white)
- 124 Door window lifts switches fitted to centre console rear section \*
- 125 Air conditioner thermostat \*
- 126 Air conditioner limit switch (fitted to the recirculation control lever) \*
- 127 Air conditioner booster fan motor change-over switch \*
- 128 Air conditioner booster fan motor \*
- 129 Four-outlet junction block (white) for items 144-148-149
- 130 Door window lift motor \*
- 131 Open door safety lamp
- 132 Interior light door pillar press-switch
- 133 Driver's seat belts switch
- 141 EGR system solenoid switch (NC)
- 142 Driver's seat belts circuit, solenoid switch (NO)
- 143 Ignition on and seat belt unfastened 12 V buzzer
- 144 Handbrake warning light contact
- 145 Car rear interior lamp
- 146 EGR tell-tale solenoid switch fuse
- 147 Rear clearance light
- 148 Fuel gauge transmitter
- 149 Heated rear window filament
- 150 Fuel pump 12 V
- 151 Rear light six-outlet junction block (white)
- 152 Boot light
- 153 Rear light six-outlet junction block (white)
- 154 Rear turn indicator
- 155 Reversing light
- 156 Rear side light
- 157 Stop light
- 158 Number plate light
- 159 Plug-in junction
- 160 Four-outlet junction block (white) for item 107
- 161 Air conditioner cut-out solenoid switch (NC) when starting engine
- 162 Fuel electric pump feed system mercury switch
- 163 Fast idling control solenoid switch when engaging the electro-magnetic coupling item 11
- 164 Electric delaying device
- 165 Electric delaying device three-outlet junction block (white)
- 166 Steering column earth

\* Fitted as an optional extra

#### Colour code

Bianco	White	Nocciola	Hazel
Blu	Blue	Nero	Black
Giallo	Yellow	Rosa	Pink
Grigio	Grey	Rosso	Red
Marrone	Brown	Verde	Green

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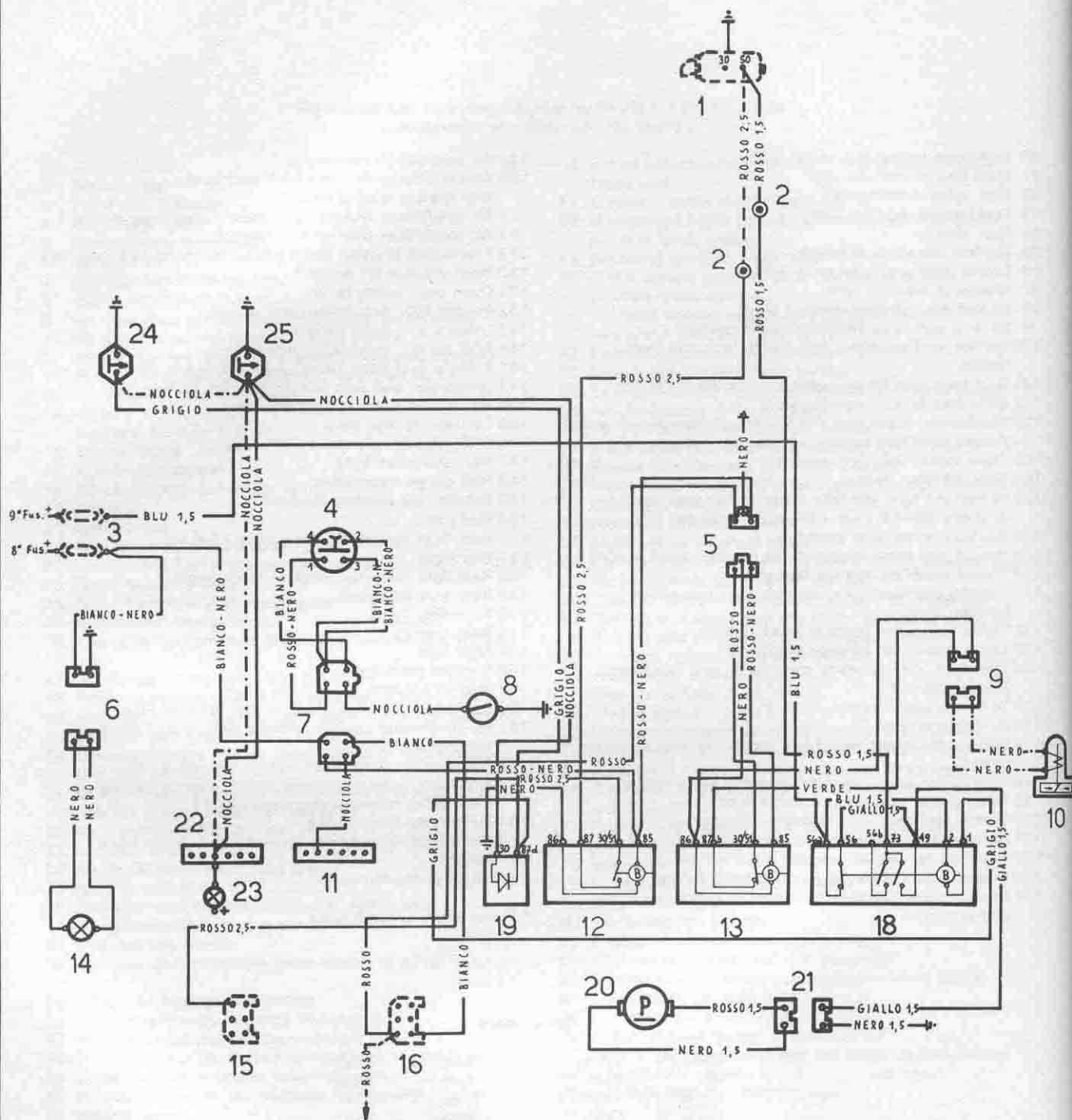


Fig. 10.39 Wiring diagram variations for cars fitted with automatic transmission

## Key to Fig. 10.39

- |   |  |
|---|--|
| 1 Starter motor   | 14 Gear selection light                                  |
| 2 Plug-in junction  | 15 Ignition switch six-outlet junction block (black)     |
| 3 Fuse  | 16 Tail light cluster six-outlet junction block (white)  |
| 4 Neutral and reverse tell-tale switch  | 17 To stop light switch (connection already fitted)      |
| 5 Three-outlet junction block (white) for item 13   | 18 Fuel pump solenoid switch                             |
| 6 Two outlet junction block (white) for item 14   | 19 Diode to disconnect items 24 and 25                   |
| 7 Four-outlet junction block (white) for items 4 and 8  | 20 Fuel pump   |
| 8 Transmission fluid overheating thermoswitch   | 21 Item 20 two-outlet junction block (white)             |
| 9 Two-outlet junction block (white) for item 10   | 22 Instruments six-outlet junction block (white)         |
| 10 Carburettor fast-idling electrovalve   | 23 Engine oil low pressure and overheating warning light |
| 11 Instrument cluster six-outlet junction block (black)   | 24 Engine oil low pressure warning light switch          |
| 12 Starter motor block solenoid switch (N.O.) operating if gear selected                                    | 25 Engine overheating warning light switch               |
| 13 Solenoid switch (N.C.) operating the carburettor fast-idling electrovalve when braking with gear engaged |  |

## Colour code

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