Chapter 12
Body electrical systems

Contents

Degrees of difficulty

Easy, suitable for novice with little experience

Fairly easy, suitable for beginner with some experience

Fairly difficult, suitable for competent DIY mechanic

Difficult, suitable for experienced DIY mechanic

Very difficult, suitable for expert DIY or professional

Specifications

Note: *The following fuse information is for pre-1998 models. Refer to your handbook for information on later models.*

Main fusebox

Fuse	Amp	Circuit
1	15	Reversing lights, stop lights, direction indicators, instrument panel power supply, check panel power supply, electric mirrors control, radio power supply, remote control power supply
2	10	Radio power supply, internal lighting, glove compartment light, boot light, door lock/unlock remote control power supply, alarm system power supply, clock power supply
3	10	Right side light and left tail light, right number plate light, radio illumination, instrument panel illumination and side/tail lights warning lamp, cigar lighter illumination, switch panel illumination
4	10	Left side light and right tail light, left number plate light, manual climate control/heater controls illumination
5	10	Left dipped beam headlight
6	10	Right dipped beam headlight, headlight alignment control
7	10	Right main beam headlight
8	10	Left main beam headlight, main beam headlight warning light
9	10	Rear foglight
10	10	Hazard lights
11	30	Heated rear window, heated rear window warning light
12	30	Electric climate control motor (manual version)
13	20	Horn
14	20	Windscreen wiper, windscreen washer, rear window wiper, rear window washer, headlamp washers
15	30	Electric heater motor, cigar lighter, manual climate control relay

Fuses above control unit

Fuse	Amp	Circuit
1	20	Electric sunroof, heated seats
2	20	Front foglights
3	20	Door central locking
4	5	Airbag
5	30	Electric windows
6	7.5	Electric mirror defrosting

Fuses behind glovebox

Fuse	Amp	Circuit
1	30	Injection system (1.8 litre engine)
2	15	Fuel pump (1.8 litre engine)

Fuses on left-hand side of engine compartment rear panel

Fuse	Amp	Circuit
1	80	Control unit
2	60	Optional devices
3	40	Ignition switch
4	30	Injection/ignition system
5	60	ABS system

Fuses in front of battery

Fuse	Amp	Circuit
1	20	Headlamp washer
2	5	ABS
3	10	Automatic transmission cooling oil circuit
4	10	Automatic transmission power supply (key)
5	5	Automatic transmission power supply (battery)

Fuses in centre of engine compartment rear panel

Fuse	Amp	Circuit
1	10	1.4 litre engine injection system
2	10	1.4 litre engine fuel pump
3	5	1.6 litre engine injection system
4	25	1.6 litre engine fuel pump

Bulb ratings

	Watts
Headlights (main beam and dipped beam)	55
Front foglight	55
Front sidelight	5
Front direction indicator (orange bulb)	21
Front direction indicator repeater light	5
Rear sidelight	5
Rear direction indicator	21
Rear foglight	21
Stop light	21
High-level stop light	5
Reversing light	21
Rear number plate light	5
Interior light	10
Glovebox light	5
Rear luggage compartment light	5

Torque wrench settings

	Nm	lbf ft
Airbag control unit	8	6
Airbag module to steering wheel	8	6
Passenger airbag module to body	7	5

1 General information and precautions

Warning: Before carrying out any work on the electrical system, read through the precautions given in Safety first! at the beginning of this manual, and in Chapter 5A. Before working on the airbag system, observe the precautions given in Section 21.

The electrical system is of 12-volt negative earth type. Power for the lights and all electrical accessories is supplied by a lead/acid type battery, which is charged by the alternator.

This Chapter covers repair and service procedures for the various electrical components not associated with the engine. Information on the battery, alternator and starter motor can be found in Chapter 5A.

It should be noted that, prior to working on any component in the electrical system the battery negative terminal should first be disconnected, to prevent the possibility of electrical short-circuits and/or fires. When reconnecting the battery on models with a side airbag and presence sensor, ensure there is no one inside the vehicle, as a precaution against accidental activation of the airbag. With the driver's door open, reach inside and turn on the ignition, then check the operation of the airbag warning light.

2 Electrical fault finding - general information

Note: *Refer to the precautions given in Safety first! and in Section 1 of this Chapter before starting work. The following tests relate to testing of the main electrical circuits, and should not be used to test delicate electronic circuits (such as anti-lock braking systems), particularly where an electronic control module (ECU) is used.*

General

1 A typical electrical circuit consists of an electrical component, any switches, relays, motors, fuses, fusible links or circuit breakers related to that component, and the wiring and connectors which link the component to both the battery and the chassis. To help pinpoint a problem in an electrical circuit, wiring diagrams are included at the end of this manual.

2 Before attempting to diagnose an electrical fault, first study the appropriate wiring diagram, to obtain a more complete understanding of the components included in the particular circuit concerned. The possible sources of a fault can be narrowed down by noting whether other components related to the circuit are operating properly. If several components or circuits fail at one time, the problem is likely to be related to a shared fuse or earth connection.

3 Electrical problems usually stem from simple causes, such as loose or corroded connections, a faulty earth connection, a blown fuse, a melted fusible link, or a faulty relay (refer to Section 3 for details of testing relays). Visually inspect the condition of all fuses, wires and connections in a problem circuit before testing the components. Use the wiring diagrams to determine which terminal connections will need to be checked, in order to pinpoint the trouble-spot.

4 The basic tools required for electrical fault-finding include a circuit tester or voltmeter (a 12-volt bulb with a set of test leads can also be used for certain tests), a self-powered test light (sometimes known as a continuity tester), an ohmmeter (to measure resistance), a battery and set of test leads, and a jumper wire, preferably with a circuit breaker or fuse incorporated, which can be used to bypass suspect wires or electrical components. Before attempting to locate a problem with test instruments, use the wiring diagram to determine where to make the connections.

5 To find the source of an intermittent wiring fault (usually due to a poor or dirty connection, or damaged wiring insulation), a 'wiggle' test can be performed on the wiring. This involves wiggling the wiring by hand, to see if the fault occurs as the wiring is moved. It should be possible to narrow down the source of the fault to a particular section of wiring. This method of testing can be used in conjunction with any of the tests described in the following sub-Sections.

6 Apart from problems due to poor connections, two basic types of fault can occur in an electrical circuit - open-circuit, or short-circuit.

7 Open-circuit faults are caused by a break somewhere in the circuit, which prevents current from flowing. An open-circuit fault will prevent a component from working, but will not cause the relevant circuit fuse to blow.

8 Short-circuit faults are caused by a 'short' somewhere in the circuit, which allows the current flowing in the circuit to 'escape' along an alternative route, usually to earth. Short-circuit faults are normally caused by a breakdown in wiring insulation, which allows a feed wire to touch either another wire, or an earthed component such as the bodyshell. A short-circuit fault will normally cause the relevant circuit fuse to blow.

Finding an open-circuit

9 To check for an open-circuit, connect one lead of a circuit tester or voltmeter to either the negative battery terminal or a known good earth.

10 Connect the other lead to a connector in the circuit being tested, preferably nearest to the battery or fuse.

11 Switch on the circuit, bearing in mind that some circuits are live only when the ignition switch is moved to a particular position.

12 If voltage is present (indicated either by the tester bulb lighting or a voltmeter reading, as applicable), this means that the section of the circuit between the relevant connector and the battery is problem-free.

13 Continue to check the remainder of the circuit in the same fashion.

14 When a point is reached at which no voltage is present, the problem must lie between that point and the previous test point with voltage. Most problems can be traced to a broken, corroded or loose connection.

Finding a short-circuit

15 To check for a short-circuit, first disconnect the load(s) from the circuit (loads are the components which draw current from a circuit, such as bulbs, motors, heating elements, etc).

16 Remove the relevant fuse from the circuit, and connect a circuit tester or voltmeter to the fuse connections.

17 Switch on the circuit, bearing in mind that some circuits are live only when the ignition switch is moved to a particular position.

18 If voltage is present (indicated either by the tester bulb lighting or a voltmeter reading, as applicable), this means that there is a short-circuit.

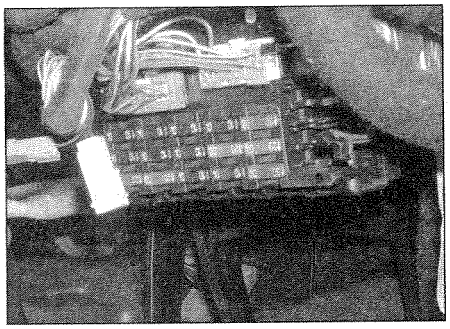
19 If no voltage is present, but the fuse still blows with the load(s) connected, this indicates an internal fault in the load(s).

Finding an earth fault

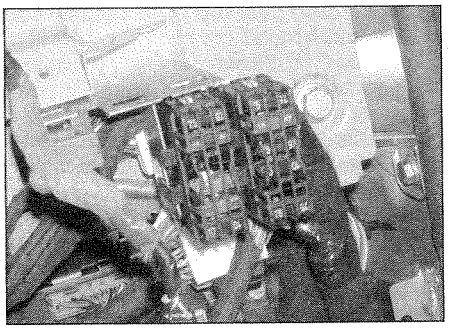
20 The battery negative terminal is connected to 'earth' - the metal of the engine/transmission and the car body - and most systems are wired so that they only receive a positive feed, the current returning via the metal of the car body. This means that the component mounting and the body form part of that circuit. Loose or corroded mountings can therefore cause a range of electrical faults, ranging from total failure of a circuit, to a puzzling partial fault. In particular, lights may shine dimly (especially when another circuit sharing the same earth point is in operation), motors (eg wiper motors or the radiator cooling fan motor) may run slowly, and the operation of one circuit may have an apparently-unrelated effect on another. Note that on many vehicles, earth straps are used between certain components, such as the engine/transmission and the body, usually where there is no metal-to-metal contact between components, due to flexible rubber mountings, etc.

21 To check whether a component is properly earthed, disconnect the battery, and connect one lead of an ohmmeter to a known good earth point. Connect the other lead to the wire or earth connection being tested. The resistance reading should be zero; if not, check the connection as follows.

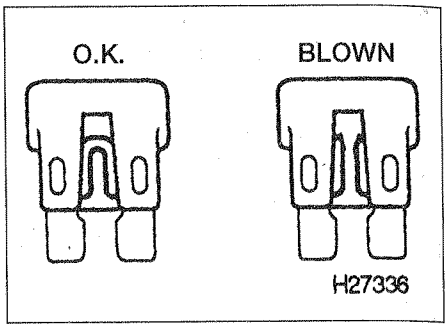
22 If an earth connection is thought to be faulty, dismantle the connection, and clean back to bare metal both the bodyshell and the wire terminal or the component earth



3.2a Main fusebox under the right-hand side of the facia



3.2b Upper fuse block above the main fusebox



3.6 A blown fuse can be recognised from its melted or broken wire

connection mating surface. Be careful to remove all traces of dirt and corrosion, then use a knife to trim away any paint, so that a clean metal-to-metal joint is made. On reassembly, tighten the joint fasteners securely; if a wire terminal is being refitted, use serrated washers between the terminal and the bodyshell, to ensure a clean and secure connection. When the connection is remade, prevent the onset of corrosion in the future by applying a coat of petroleum jelly, or by spraying on a proprietary ignition sealer, or a water-dispersant lubricant.

3 Fuses and relays - general information

Fuses

1 Fuses are designed to break a circuit when a predetermined current is reached, in order to protect the components and wiring which could be damaged by excessive current flow. Any excessive current flow will be due to a fault in the circuit, usually a short-circuit (see Section 2).

2 The main fuses are located in the fusebox on the driver's side of the facia. To gain access to the fuses, undo the three screws and remove the fusebox cover from its retaining tabs. On later models, the fuses are arranged in two blocks, and access to the fuses in the upper block is gained by releasing the plastic cage **(see illustrations)**.

3 Additional fuses are located behind the glovebox, above the control unit under the facia, and in the engine compartment. Access to the fuses behind the glovebox is gained by removing the trim from inside the glovebox, however on later models the complete glovebox must be removed. Access to the fuses above the control unit is gained by removing the footwell side trim panel. In the engine compartment, additional fuses are located in front of the battery and on the engine compartment rear panel.

4 Refer to the Specifications for the location of fuse circuits, as this varies according to model.

5 Fusible links are located on the left-hand side of the engine compartment rear panel, and are accessed by undoing the upper screw and removing the cover. The links are of 30, 40, 50, 60, and 80 amp rating, according to the circuit protected. It is important to fit a fusible link of the correct rating.

6 A blown fuse can be recognised from its melted or broken wire **(see illustration)**.

7 To remove a fuse, first ensure that the relevant circuit is switched off.

8 Pull the fuse from its location, and fit the new fuse. Spare fuses are provided in the main fusebox.

9 Before renewing a blown fuse, trace and rectify the cause, and always use a fuse of the correct rating. Never substitute a fuse of a higher rating, or make temporary repairs using wire or metal foil, as more serious damage, or even fire, could result.

10 Note that the fuses are colour-coded as follows. Refer to the wiring diagrams for details of the fuse ratings used and the circuits protected.

Colour	Rating
Orange	*7.5A*
Red	*10A*
Blue	*15A*
Yellow	*20A*
Green	*30A*

Relays

11 A relay is an electrically-operated switch, which is used for the following reasons:

a) A relay can switch a heavy current remotely from the circuit in which the current is flowing, therefore allowing the use of lighter-gauge wiring and switch contacts.

b) A relay can receive more than one control input, unlike a mechanical switch.

c) A relay can have a timer function - for example, the intermittent wiper relay.

12 The main relays are located together with the fuses behind the facia on the driver's side. The central door locking and sunroof relays are located behind the glovebox. On 1998-on models, additional relays for the air conditioning, headlight washers, and electric cooling fans, are located in front of the battery in the left-hand front corner of the engine compartment.

13 If a circuit or system controlled by a relay develops a fault, and the relay is suspect, operate the system. If the relay is functioning, it should be possible to hear it click as it is energised. If this is the case, the fault lies with the components or wiring of the system. If the relay is not being energised, then either the relay is not receiving a main supply or a switching voltage, or the relay itself is faulty. Testing is by the substitution of a known good unit, but be careful - while some relays are identical in appearance and in operation, others look similar but perform different functions.

14 To renew a relay, first ensure that the relevant circuit is switched off. The relay can then simply be pulled out from the socket, and the new one pushed firmly into position.

4 Bulbs (exterior lights) - renewal

General

1 Whenever a bulb is renewed, note the following points:

a) Ensure that the relevant electrical circuit is isolated before removing a bulb.

b) Remember that, if the light has just been in use, the bulb may be extremely hot.

c) Always check the bulb contacts and holder, ensuring that there is clean metal-to-metal contact. Clean off any corrosion or dirt before fitting a new bulb.

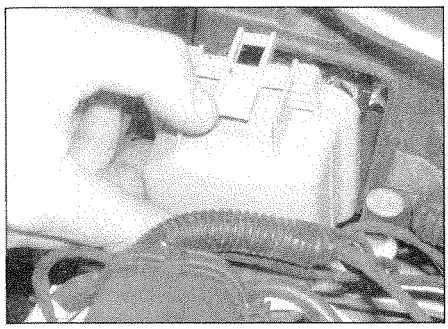
d) Where bayonet-type bulbs are fitted, ensure that the live contacts bear firmly against the bulb contacts.

e) Always ensure that the new bulb is of the correct rating, and that it is completely clean before fitting it.

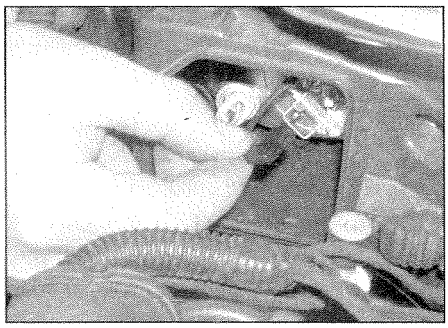
f) Pay attention to the orientation when fitting multi-filament bulbs (e.g. combined tail/brake light bulbs).

Headlight

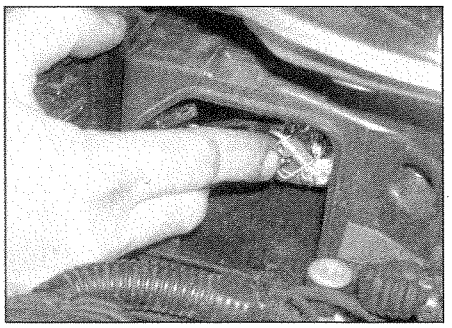
2 Open the bonnet. Press the tab downwards



4.2 Removing the plastic cover from the rear of the headlight



4.3 Disconnect the wire . . .



4.4 . . . release the bulb retaining spring clip . . .

to release the clip, then withdraw the plastic cover from the rear of the headlight **(see illustration)**. Note that the inner headlights are for main beam only, whereas the outer headlights are for dipped beam only.

3 Carefully disconnect the wire from the rear of the bulb **(see illustration)**.

4 Release the bulb retaining spring clip and swivel it from the rear of the bulb **(see illustration)**.

5 Withdraw the bulb from the rear of the headlight **(see illustration)**.

6 When handling the new bulb, use a tissue or clean cloth, to avoid touching the glass with the fingers. Moisture and grease from the skin can cause blackening and rapid failure of this type of bulb. If the glass is accidentally touched, wipe it clean using methylated spirit. Avoid knocking or shaking the bulb as this may weaken the filament.

7 Install the new bulb, using a reversal of the removal procedure, ensuring that its locating tabs are correctly located in the light unit cut-outs.

Sidelight

8 Open the bonnet. The sidelight bulbs are located in the outer headlight units. Press the tab downwards to release the clip, then withdraw the plastic cover from the rear of the headlight.

9 Twist the bulbholder to release it from the rear of the light unit **(see illustration)**.

10 The bulb is a push fit in the bulbholder and is removed by pulling it direct from the bulbholder **(see illustration)**.

11 Fit the new bulb using a reversal of the removal procedure.

Front direction indicator

12 Open the bonnet. The front direction indicator bulbs are located in the rear of the headlight/direction indicator light units.

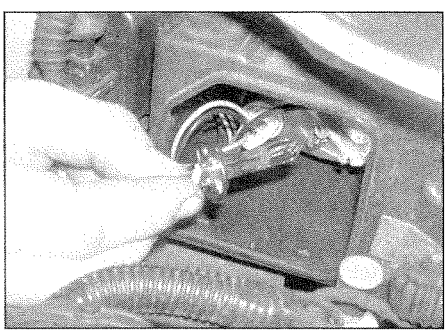
13 Twist the bulbholder anticlockwise through 90° and withdraw it from the rear of the light unit **(see illustration)**.

14 Depress and twist the bulb to remove it from the bulbholder **(see illustration)**.

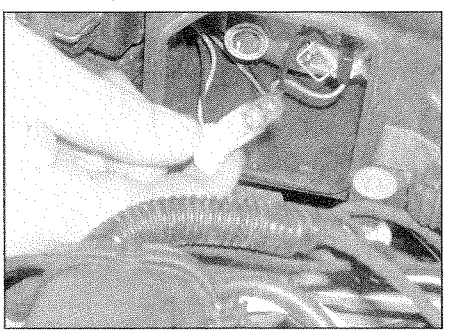
15 Fit the new bulb using a reversal of the removal procedure. Note that an orange coloured bulb must be fitted, not the clear type bulb normally fitted where the lens is coloured orange.

Front direction indicator side repeater

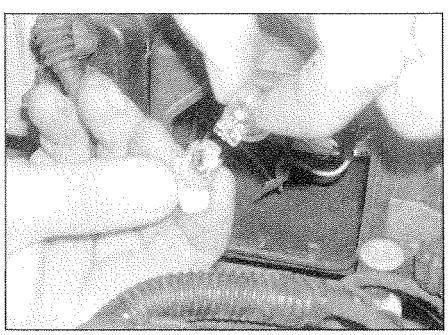
16 The side repeater is held in position by a plastic spring clip on the rear of the light. One method of removing the light without damaging the paintwork is to remove the wheel arch liner first, then reach up behind the wing and depress the clip in order to push out the light from inside. Alternatively, carefully press the side repeater light lens in a rearwards direction, then use a small



4.5 . . . and withdraw the bulb from the rear of the headlight

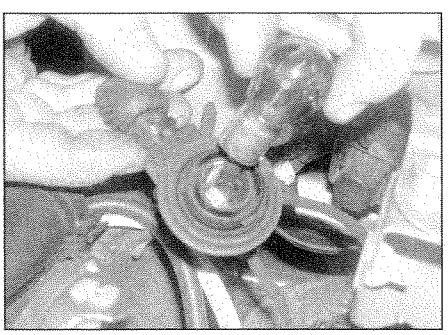


4.9 Remove the bulbholder . . .

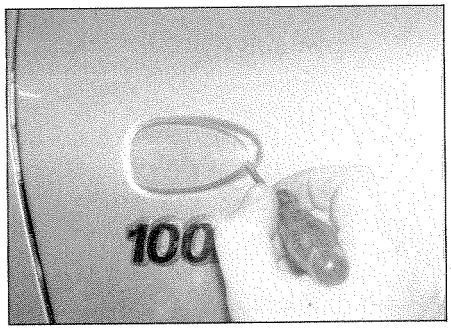


4.10 . . . and pull out the wedge-type bulb

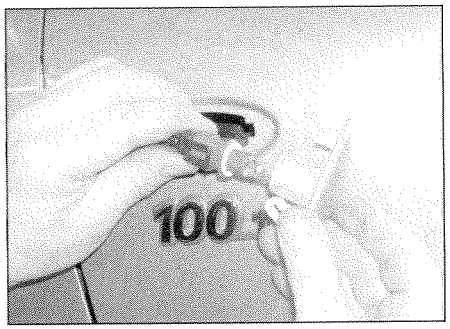
4.13 Twist the front direction indicator anticlockwise and remove it from the rear of the light unit . . .



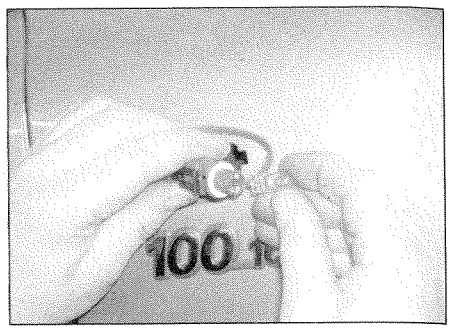
4.14 . . . then depress and twist the bulb to remove it



4.16 Carefully release the side repeater front tab with a screwdriver . . .



4.17 . . . then twist the bulbholder to release it from the light unit . . .



4.18 . . . and pull out the wedge-type bulb

screwdriver to release the front tab from the wing **(see illustration)**.

17 Twist the bulbholder anti-clockwise to release it from the light unit **(see illustration)**.

18 Pull the wedge-type bulb from the bulbholder **(see illustration)**.

19 Fit the new bulb using a reversal of the removal procedure.

Front foglight

20 Unscrew the three screws securing the front foglight to the front bumper. The upper one is located in the light cowl, and the lower two are located on the lower face of the front bumper. With the screws removed, use the screwdriver in the upper screw hole to hook the light unit out from the bumper.

21 Disconnect the wiring from the rear of the foglight, then turn the cover anticlockwise and remove it.

22 Disconnect the flying lead wire from the rear of the bulb.

23 Release the spring clip, and withdraw the bulb from the rear of the light unit.

24 Fit the new bulb using a reversal of the removal procedure, ensuring that the raised areas engage with the grooves in the light unit.

Rear light cluster bulbs

3-door models

25 Open the tailgate. Working inside the loadspace, undo the screw and remove the cover from the rear of the light cluster.

26 Disconnect the wiring from the rear light cluster bulbholder.

27 Unscrew the two retaining knobs and withdraw the bulbholder.

28 Depress and twist the relevant bulb to remove it **(see illustration)**.

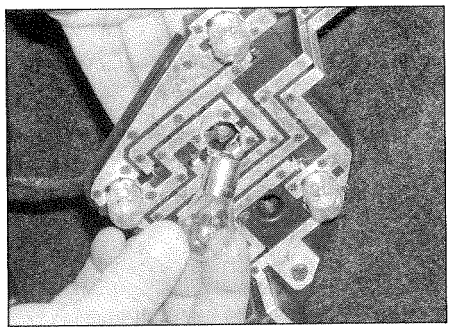
5-door models

29 Open the tailgate. Working inside the loadspace, undo the screw and remove the cover from the rear of the light cluster **(see illustrations)**.

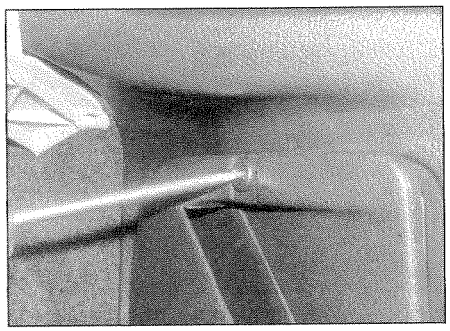
30 Disconnect the wiring from the rear light cluster bulbholder **(see illustration)**.

31 Depress the tabs and withdraw the bulbholder **(see illustration)**.

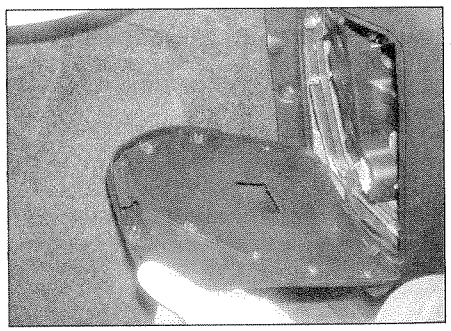
32 Depress and twist the relevant bulb to remove it **(see illustration)**. The top bulb is for the stop light, the middle bulbs are for the direction indicator and reversing light, and the



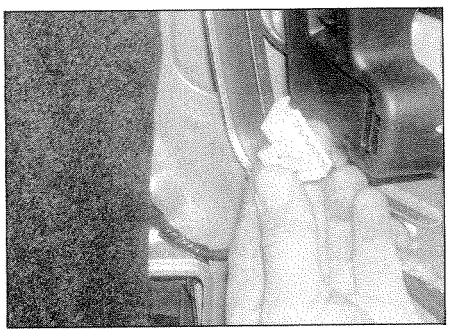
4.28 Removing a rear light cluster bulb



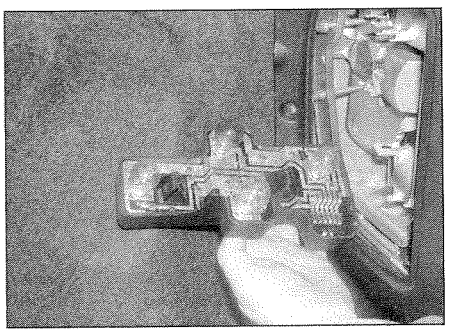
4.29a Undo the screw . . .



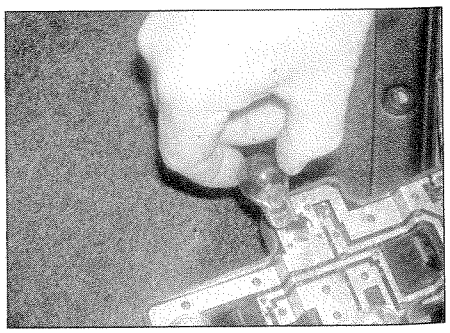
4.29b . . . and remove the cover for access to the rear light cluster bulbs



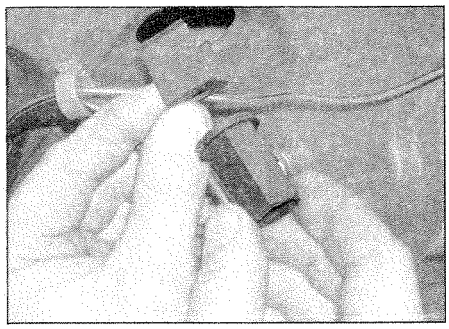
4.30 Disconnecting the wiring from the rear light cluster



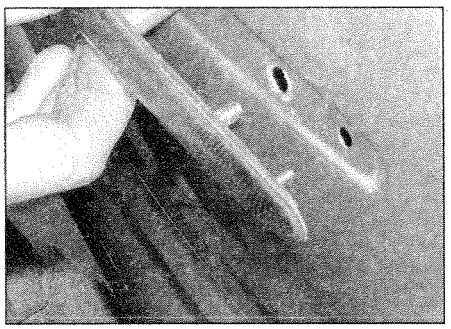
4.31 Withdraw the bulbholder from the rear light cluster



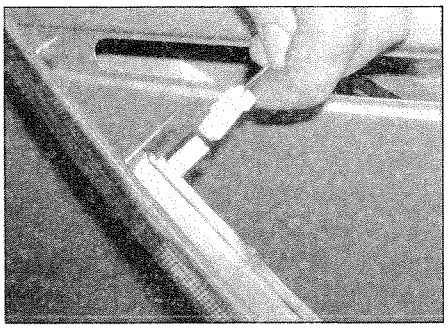
4.32 Removing a bulb from the bulbholder



4.35a Brackets are fitted to the middle mounting nuts



4.35b Withdraw the high-level stop light bulb from the tailgate . . .



4.35c . . . then disconnect the wiring

bottom bulb is of dual filament type for the rear fog light and tail light.

All models

33 Fit the new bulb using a reversal of the removal procedure.

High-level stop light bulb

34 Open the tailgate, then undo the screws securing the trim panel. Note on 5-door models that four of the screws are visible, and four are hidden beneath rubber pads. Prise out the buttons securing the panel to the tailgate lower edge, and withdraw the panel. On 3-door models, use a wide-bladed screwdriver to prise free the clips.

35 Unscrew the plastic nuts inside the tailgate noting that brackets are fitted to the middle nuts. Withdraw the high-level stop light from the tailgate and disconnect the wiring **(see illustrations)**.

36 Undo the screws and separate the lens from the light unit. Note that it is not possible to remove the bulbs individually **(see illustrations)**.

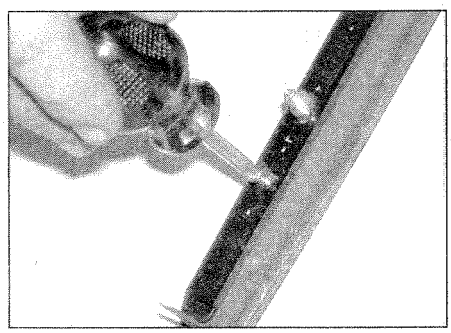
37 Fit the new bulbs using a reversal of the removal procedure. **Do not** overtighten the light mounting nuts.

Rear number plate light

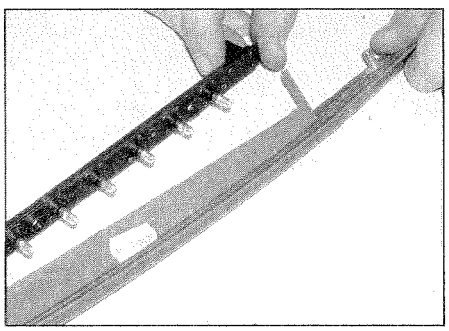
38 Using a screwdriver, depress the plastic retainer and withdraw the light unit from the rear bumper **(see illustration)**.

39 Twist the bulbholder and remove it from the light body, then pull out the wedge-type bulb **(see illustrations)**.

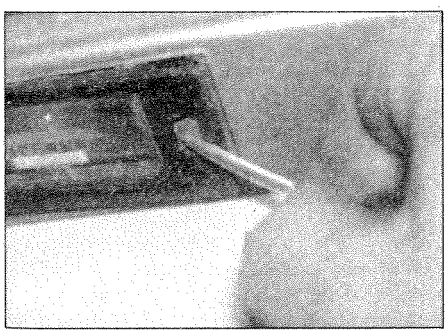
40 Fit the new bulb using a reversal of the removal procedure.



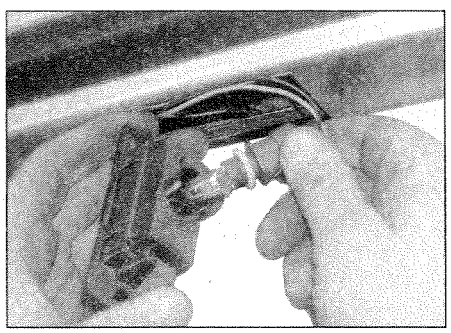
4.36a Undo the screws . . .



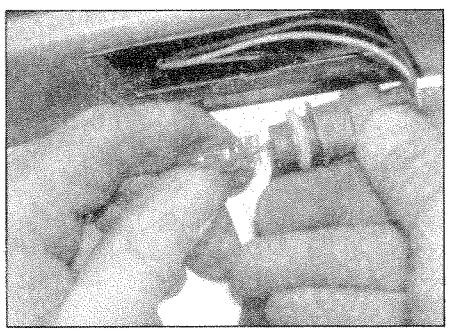
4.36b . . . and separate the lens from the high level light unit



4.38 Use a screwdriver to depress the plastic retainer on the rear number plate light



4.39a Twist the bulbholder from the light unit . . .



4.39b . . . then pull out the wedge-type bulb

5 Bulbs (interior lights) - renewal

General

1 Whenever a bulb is renewed, note the following points:

a) Ensure that the relevant electrical circuit is isolated before removing a bulb.

b) Remember that, if the light has just been in use, the bulb may be extremely hot.

c) Always check the bulb contacts and holder, ensuring that there is clean metal-to-metal contact. Clean off any corrosion or dirt before fitting a new bulb.

d) Where bayonet-type bulbs are fitted, ensure that the live contacts bear firmly against the bulb contacts.

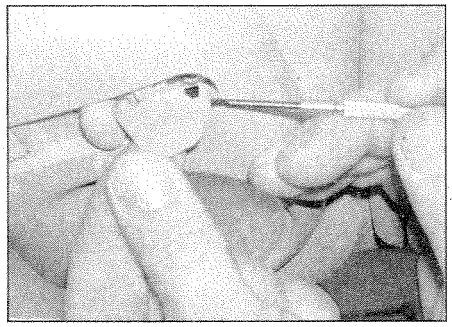
e) Always ensure that the new bulb is of the correct rating, and that it is completely clean before fitting it.

Front courtesy light (models without a sunroof)

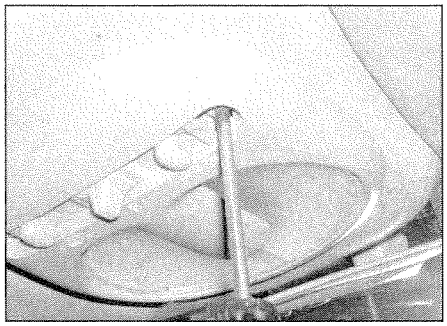
2 Using a screwdriver, carefully prise out the screw head covers from the courtesy light. Undo the screws and slide the light unit down towards the windscreen. Disconnect the wiring and remove the light unit.

3 Remove the lens by carefully depressing the rear edge.

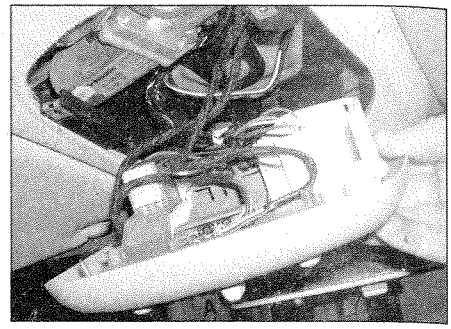
4 Extract the bulb from the spring contacts.



5.6a Prise out the covers . . .

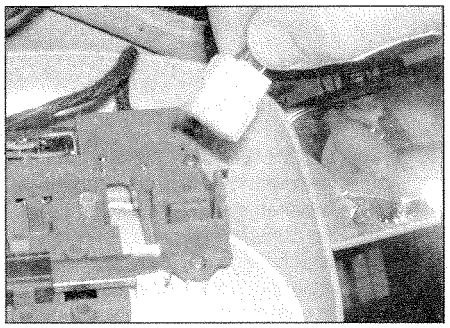


5.6b . . . then undo the screws . . .



5.6c . . . lower the courtesy light . . .

5 Fit the new bulb using a reversal of the removal procedure, but make sure that it is held firmly between the spring contacts. If necessary, bend the contacts.



5.6d . . . and disconnect the wiring

Front courtesy light (models with a sunroof)

6 Using a screwdriver, carefully prise out the screw head covers from the courtesy light. Undo the screws and slide the light unit down towards the windscreen. Disconnect the wiring and remove the light unit **(see illustrations)**.

7 Extract the sunroof key, then push the tab and remove the bulb cover **(see illustration)**.

8 Extract the bulb from the spring contacts **(see illustrations)**.

9 Fit the new bulb using a reversal of the removal procedure, but make sure that it is held firmly between the spring contacts. If necessary, bend the contacts.

Rear courtesy light

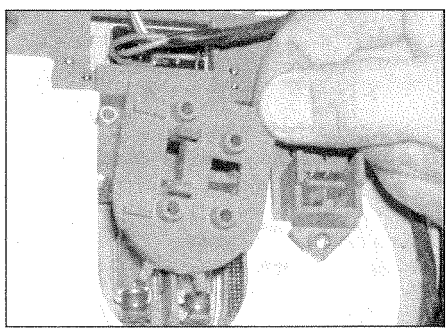
10 Using a screwdriver, carefully prise the light unit from the headlining **(see illustration)**.

11 Extract the bulb from the spring contacts **(see illustration)**.

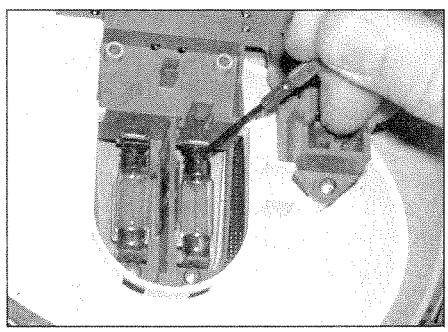
12 Fit the new bulb using a reversal of the removal procedure, but make sure that it is held firmly between the spring contacts. If necessary, bend the contacts.

Luggage compartment light

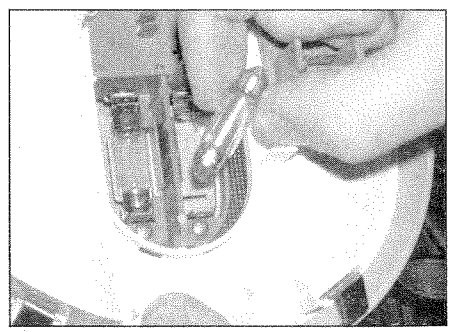
13 Using a screwdriver, carefully prise the light unit from the loadspace side trim and let it hang by the wiring **(see illustration)**.



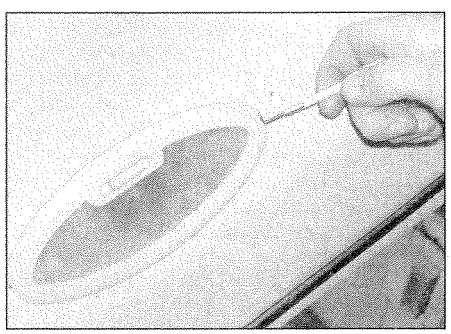
5.7 Remove the bulb cover . . .



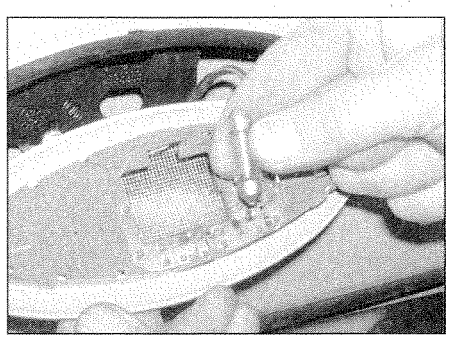
5.8a . . . then use a screwdriver to release the bulb from its contacts . . .



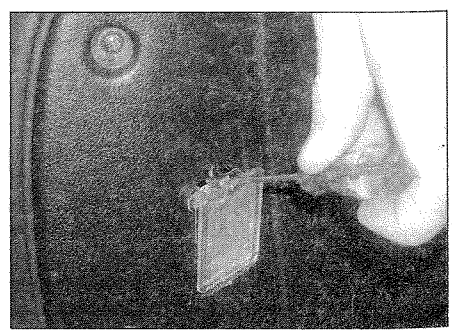
5.8b . . . and withdraw the festoon-type bulb



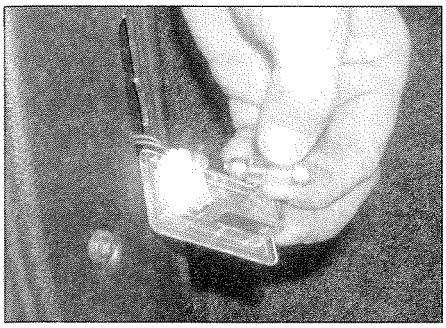
5.10 Prise out the rear courtesy light unit . . .



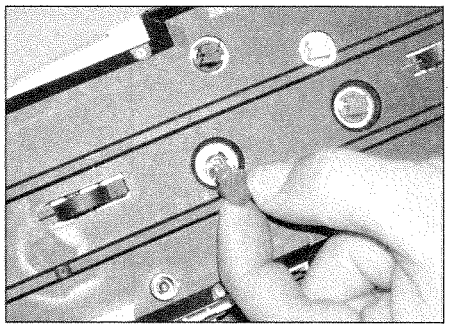
5.11 . . . then extract the festoon-type bulb



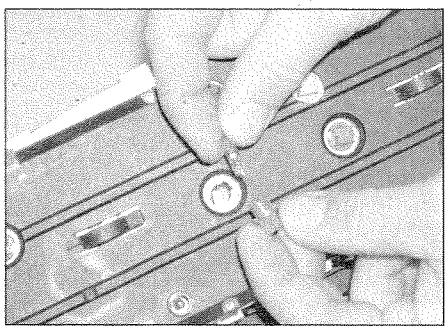
5.13 Prise the light unit from the loadspace side trim panel . . .



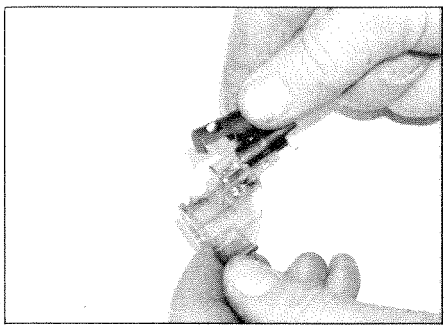
5.14 . . . and extract the festoon-type bulb from the spring contacts



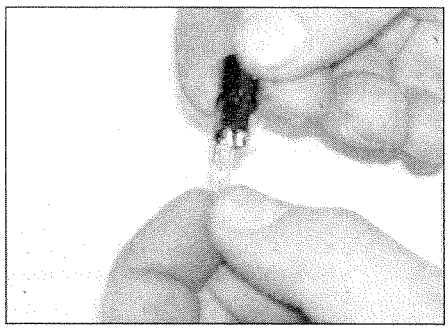
5.21a Turn the bulbholder anticlockwise to remove it . . .



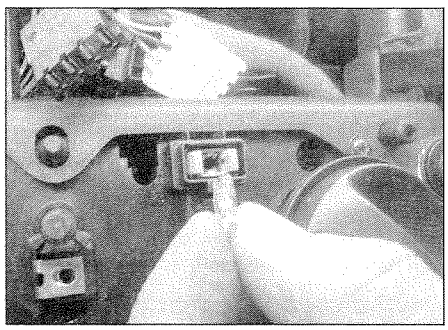
5.21b . . . then pull out the wedge-type bulb



5.24a Remove the bulbholder and cover from the surround . . .



5.24b . . . then withdraw the bulb



5.27 Removing a heater control panel illumination bulb

14 Extract the festoon-type bulb from the spring contacts **(see illustration)**.
15 Fit the new bulb using a reversal of the removal procedure, but make sure that it is held firmly between the spring contacts. If necessary, bend the contacts.

Glovebox light (where fitted)

16 With the glovebox open, prise out the light using a screwdriver.
17 Disconnect the wiring and remove the light unit. Make sure that the wiring remains in the glovebox.
18 Extract the bulb from the spring contacts.
19 Fit the new bulb using a reversal of the removal procedure, but make sure that it is held firmly between the spring contacts. If necessary, bend the contacts.

Instrument panel illumination

20 Remove the instrument panel as described in Section 7.
21 The bulbs/bulbholders are a bayonet fitting in the rear of the instrument panel. Turn the bulbholder anticlockwise to remove it, then pull out the wedge-type bulb **(see illustrations)**.
22 Fit the new bulb using a reversal of the removal procedure.

Cigarette lighter illumination

23 Remove the cigarette lighter as described in Section 15.
24 Remove the bulbholder and cover from the surround, then withdraw the bulb **(see illustrations)**.
25 Fit the new bulb using a reversal of the removal procedure.

Heater control illumination

26 Remove the heater control surround as described in Chapter 3, Section 9.
27 Pull the wedge-type bulb from its location in the heater control panel **(see illustration)**.
28 Fit the new bulb using a reversal of the removal procedure.

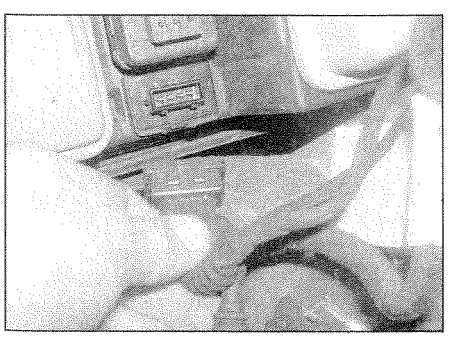
6 Exterior light units - removal and refitting

Caution: Ensure that the relevant electrical circuit is isolated before removing a light unit. If in doubt, disconnect the battery negative lead before starting work.

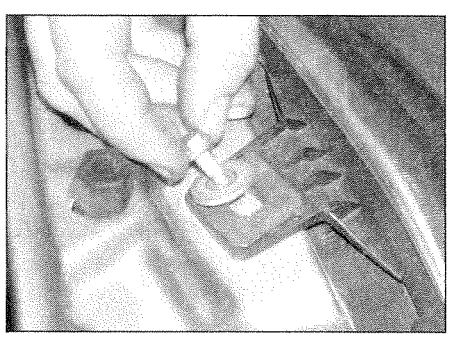
Headlight/front direction indicator light

Removal

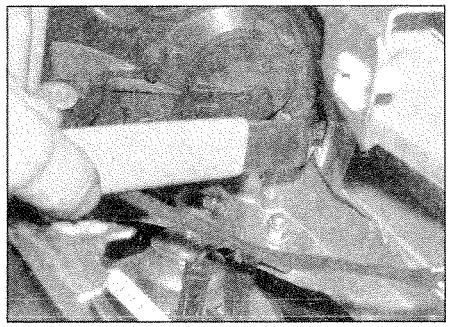
1 With the bonnet open, disconnect the wiring from the rear of the headlight unit **(see illustration)**. There are wiring plugs for the headlights, sidelights, direction indicator light and beam adjuster.
2 Mark the position of the headlight upper mounting bolts located on the crossmember, then unscrew and remove them **(see illustration)**.
3 Carefully withdraw the headlight unit from



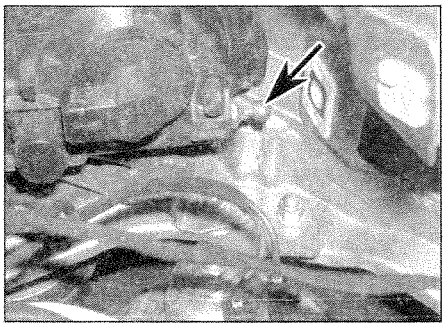
6.1 Disconnecting the wiring from the headlight unit



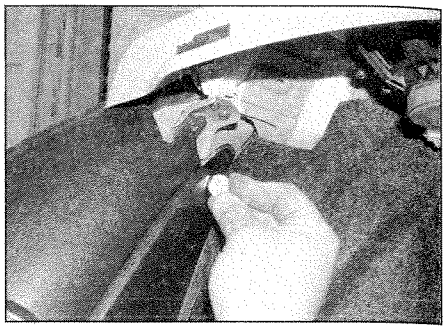
6.2 Removing the headlight upper mounting bolts



6.3a Use a lever . . .



6.3b . . . to lever the headlight location ball from its socket



6.12a Using a coin, undo the screw . . .

the front of the car and release the outer location ball from its socket with a suitable lever **(see illustrations)**.

Refitting

4 Refitting is a reversal of removal, but align the upper mounting bolts with the previously-made marks before tightening them. Finally, have the headlight beam alignment checked with reference to Section 8.

Front direction indicator side repeater light

5 The procedure is described as part of the bulb renewal procedure in Section 4.

Front foglight

6 Unscrew the three screws securing the front foglight to the front bumper. The upper one is located in the light cowl, and the lower two are located on the lower face of the front bumper. With the screws removed, use a screwdriver in the upper screw hole to hook the light unit out from the bumper.

7 Disconnect the wiring from the rear of the foglight.

8 To separate the foglight from the mounting bracket/cowl, undo the three crosshead screws.

9 Refitting is a reversal of removal.

10 On completion, check the foglight beam alignment. If necessary, the beam may be altered using the adjustment screw accessible through the hole on the bottom face of the front bumper.

Rear light cluster

3-door models

11 Open the tailgate. Working inside the loadspace, undo the screws and prise out the buttons, then remove the trim panel from the rear valance, using a wide-bladed screwdriver to release the clips.

12 Undo the screw and remove the corner trim panel for access to the rear of the rear light cluster **(see illustrations)**.

13 Disconnect the wiring from the rear light cluster bulbholder. If necessary, remove the bulbholder complete by unscrewing the retaining knobs **(see illustration)**.

14 Support the light cluster from the outside, then unscrew the mounting nuts and withdraw the light unit from the body. If necessary, remove the sealing gasket **(see illustrations)**.

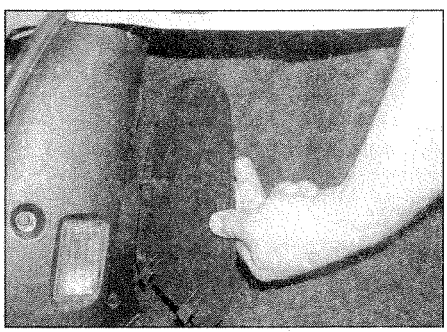
5-door models

15 Open the tailgate. Working inside the loadspace, undo the screws and prise out the buttons, then remove the trim panel from the rear valance.

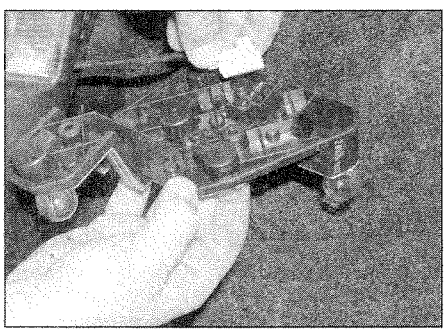
16 Undo the screw and remove the fastener, then remove the complete corner trim panel for access to the rear of the rear light cluster **(see illustration)**.

17 Disconnect the wiring from the rear light cluster bulbholder. If necessary, remove the bulbholder complete.

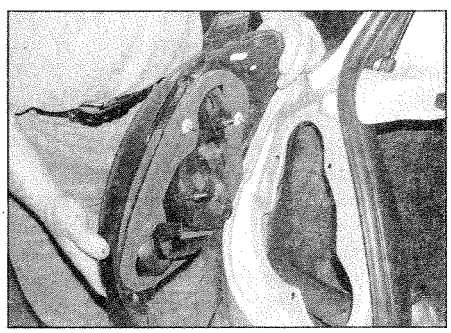
18 The light cluster is mounted on a bracket bolted to the inside of the loadspace.



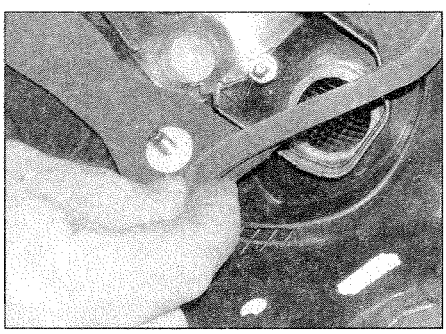
6.12b . . . and remove the corner trim panel



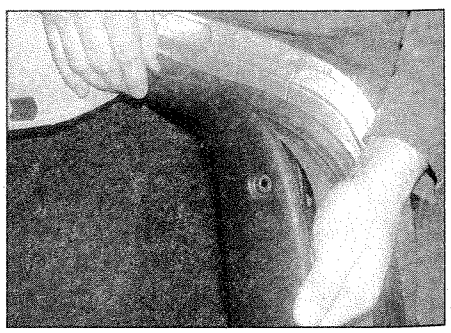
6.13 Disconnecting the wiring from the rear light cluster bulbholder



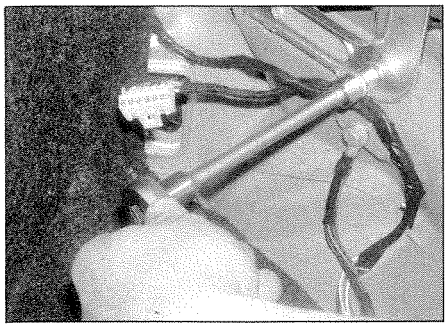
6.14a Removing the rear light cluster



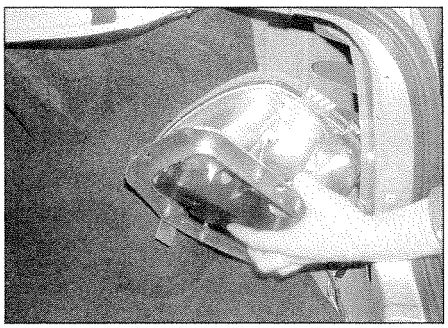
6.14b Removing the sealing gasket



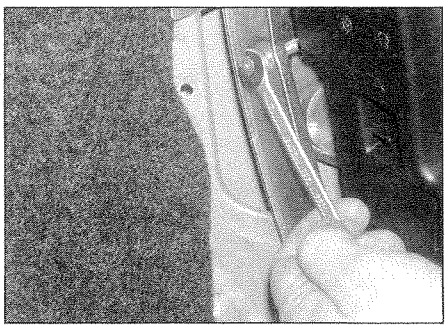
6.16 Removing the corner trim panel



6.18a Unscrew the mounting bolts . . .



6.18b . . . then withdraw the rear light cluster from inside the loadspace



6.19 Adjusting the rear light cluster on its mounting plate

Unscrew the bolts and withdraw the cluster from inside the loadspace **(see illustrations)**.

All models

19 Refitting is a reversal of removal, however, on 5-door models check that the cluster lens is a snug fit on the outer body panel. If necessary, turn the 4 adjustment bolts on the mounting plate to position the lens correctly **(see illustration)**.

High-level stop light bulbs

20 The procedure is described as part of the bulb renewal procedure in Section 4.

Rear number plate light

21 The procedure is described as part of the bulb renewal procedure in Section 4.

7 Instrument panel - removal and refitting

Right-hand drive models

Removal

1 Disconnect the battery negative (earth) lead (see *Disconnecting the battery*).

2 Undo the screws and remove the lower shroud from the steering column.

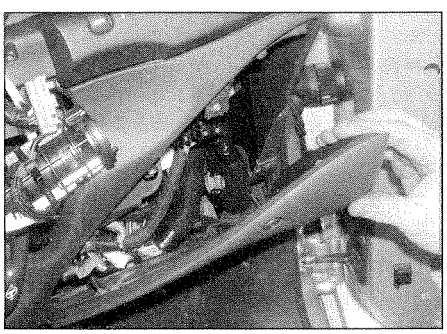
3 Undo the screws and remove the upper shroud from the steering column.

4 Undo the screws and remove the cover from the fuses/relays located on the driver's side of the instrument panel **(see illustration)**.

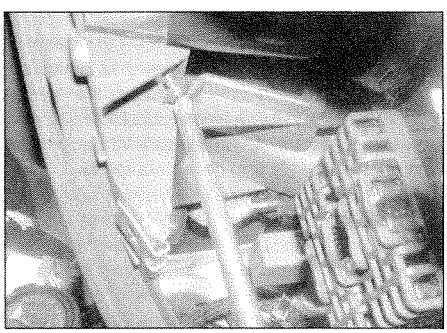
5 Working through the fuse/relay cover hole, undo the screw securing the outer end of the instrument panel surround to the facia **(see illustration)**.

6 Undo the 3 upper and 2 lower screws and withdraw the surround from the facia. Disconnect the wiring from the headlight adjustment and panel lighting rheostats, and place the surround to one side **(see illustrations)**.

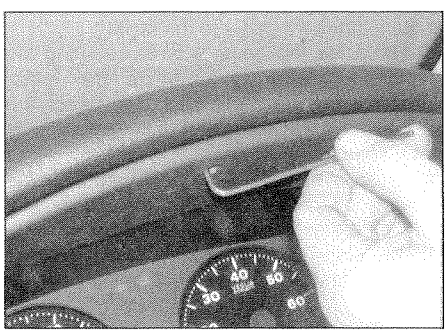
7 Undo the four screws and withdraw the instrument panel from the facia, then



7.4 Removing the cover from the fuses/relays

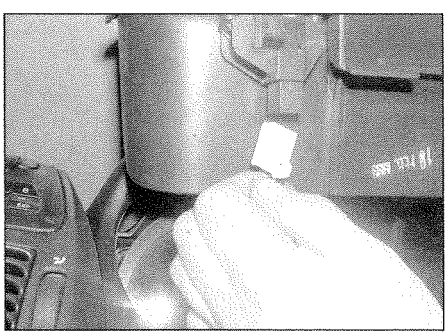


7.5 Removing the instrument panel surround outer screw

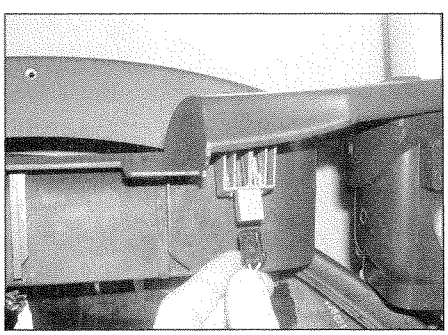


7.6a Unscrew the three upper . . .

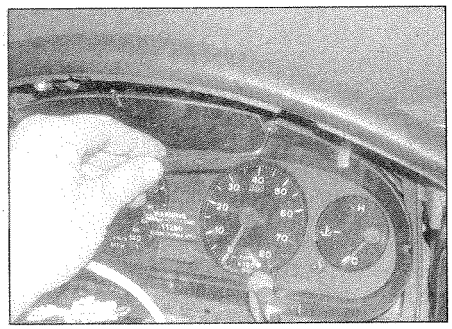
7.6b . . . and two lower screws . . .



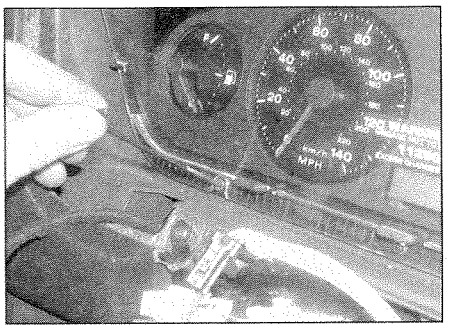
7.6c . . . then disconnect the wiring from the panel lighting rheostat . . .



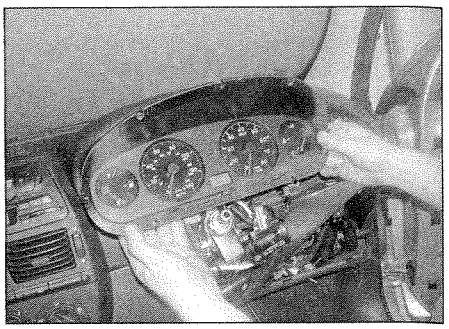
7.6d . . . and headlight adjustment switch



7.7a Undo the upper screws . . .



7.7b . . . and lower screws . . .



7.7c . . . withdraw the instrument panel from the facia . . .

disconnect the wiring plugs from the rear of the panel **(see illustrations)**.

8 The individual gauges and warning lights are illuminated by bulbs. These are a bayonet fit in the rear of the instrument panel and can be removed individually by rotating them through a quarter turn.

Refitting

9 Refitting is a reversal of removal.

Left-hand drive models

Removal

10 Disconnect the battery negative (earth) lead (see *Disconnecting the battery*).

11 Undo the screws and remove the cover from the fuses/relays located on the driver's side of the instrument panel.

12 Working through the fuse/relay cover hole, undo the screw securing the outer end of the instrument panel to the facia.

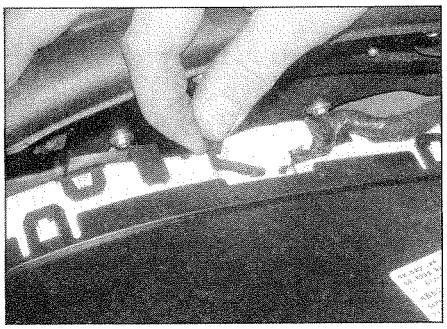
13 Undo the remaining screws securing the instrument panel surround to the facia. Withdraw the surround and disconnect the wiring from the headlight adjustment and panel lighting rheostats.

14 Undo the four screws and withdraw the instrument panel from the facia, then disconnect the wiring plugs from the rear of the panel.

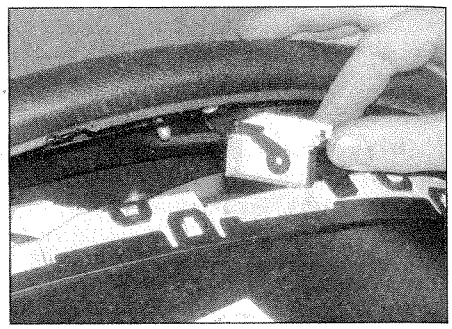
15 The individual gauges and warning lights are illuminated by bulbs. These are a bayonet fit in the rear of the instrument panel and can be removed individually by rotating them through a quarter turn.

Refitting

16 Refitting is a reversal of removal.



7.7d . . . then lift the clip . . .



7.7e . . . and disconnect the wiring

8 Headlight beam alignment - general information

Accurate adjustment of the headlight beam is only possible using optical beam-setting equipment, and this work should therefore be carried out by a FIAT dealer or suitably-equipped workshop. Incorrectly adjusted headlamps can dazzle other drivers and cause accidents.

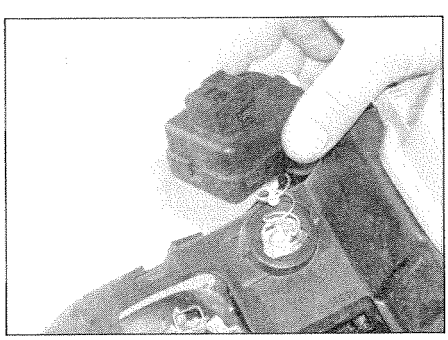
All models are equipped with a headlight aim adjustment switch, located on the facia, which allows the aim of the headlights to be adjusted to compensate for the varying loads carried in the vehicle. The switch should be positioned according to the load being carried in the vehicle. Position 0 is for the driver only or driver and one front passenger. Position 1 is for all seats occupied (5 persons). Position 2 is for all seats occupied plus some luggage in the rear compartment. Position 3 is for all seats occupied plus the maximum luggage in the rear compartment.

If the headlight beam adjuster is faulty, it may be renewed by twisting it anticlockwise from the rear of the headlight unit **(see illustration)**.

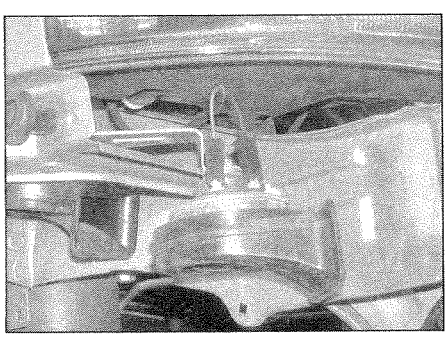
9 Horn - removal and refitting

Removal

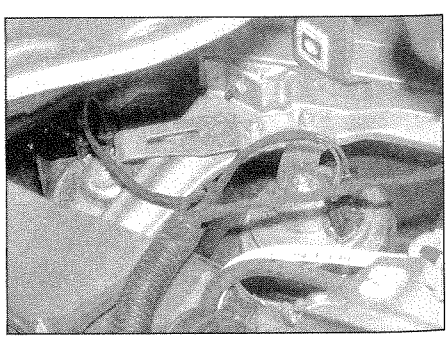
1 The horn is mounted beneath the right-hand end of the front bumper. To gain access to the horn, either remove the right-hand headlight unit (see Section 6) or remove the front bumper (see Chapter 11) **(see illustrations)**.



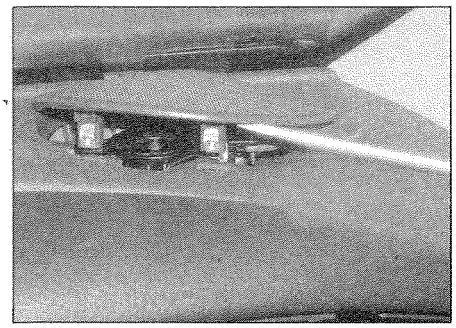
8.3 Removing the headlight beam adjuster from the headlight unit



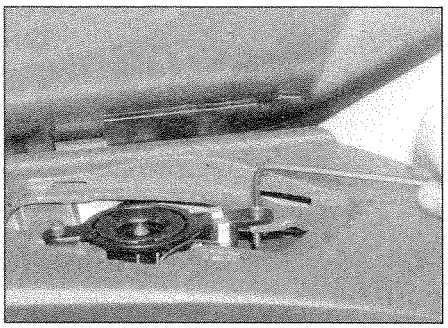
9.1a The horns viewed with the front bumper removed



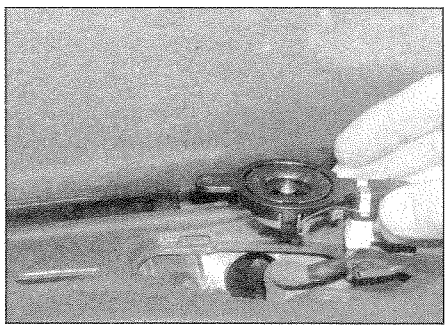
9.1b The horns viewed with the right-hand headlight unit removed



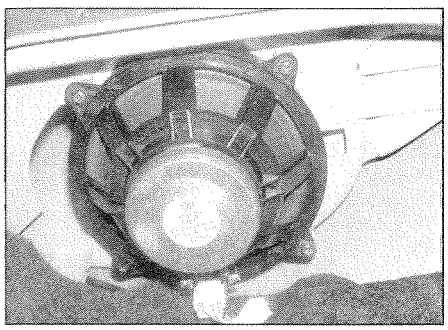
10.2 Prise the speaker grille from the top of the facia . . .



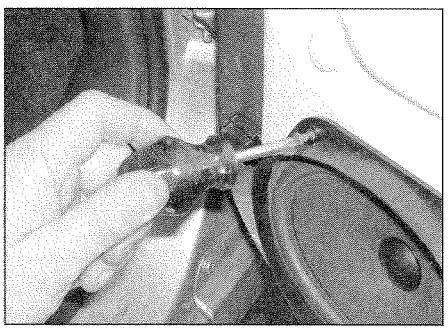
10.3a Undo the speaker mounting screws . . .



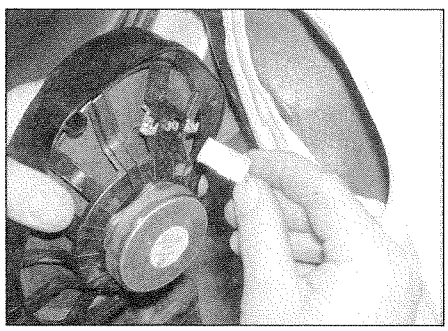
10.3b . . . then withdraw the speaker and disconnect the wiring



10.4 The rear loudspeaker viewed from the luggage compartment



10.6a Undo the screws and remove the loudspeaker from the door . . .



10.6b . . . then disconnect the wiring

2 Disconnect the wiring from the horns.
3 Unscrew the mounting bolts and remove the horns and bracket. Unbolt the horns from the bracket.

Refitting

4 Refitting is a reversal of removal.

10 Loudspeakers - removal and refitting

Removal

1 Ensure that the radio/cassette unit is switched off.

Facia mounted front speaker

2 Carefully prise out the speaker grille from the top of the facia **(see illustration)**.
3 In the grille aperture, undo the speaker mounting screws, withdraw the speaker, and disconnect the wiring **(see illustrations)**.

Rear parcel shelf speakers

4 Working underneath the relevant parcel shelf support bracket, pull back the carpet/trim then undo the securing screws and lower the loudspeaker from the support bracket **(see illustration)**. Unplug the wiring at the connector.

Door-mounted speakers

5 Remove the door inner trim panel as described in Chapter 11.
6 Undo the screws and withdraw the speaker from the door panel, then disconnect the wiring **(see illustrations)**.
7 If necessary, separate the protective grille by releasing the retaining tabs.

Refitting

8 Refitting is a reversal of removal.

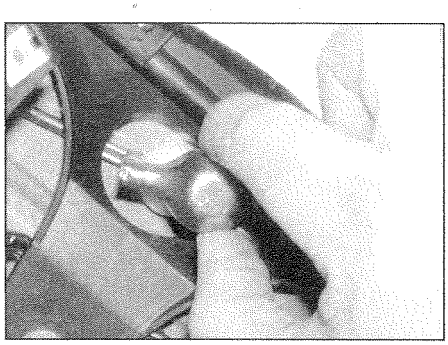
11 Radio aerial - removal and refitting

Removal

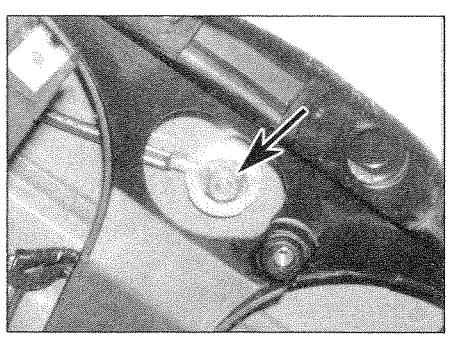
1 Access to the aerial is gained by removing the interior light/roof switch housing. Carefully prise out the end covers, then undo the two screws and lower the housing from the headlining.
2 Undo the sunroof motor screws and disengage the gear from the two cables. Lower the motor from the roof.
3 With the motor removed, prise off the metal cover using a screwdriver, then disconnect the aerial lead **(see illustration)**.
4 Unscrew the mounting nut and withdraw the aerial from the roof **(see illustration)**.
5 Removal of the aerial lead requires removal of the radio/cassette player as described in Section 12, then removal of the interior trim as necessary.

Refitting

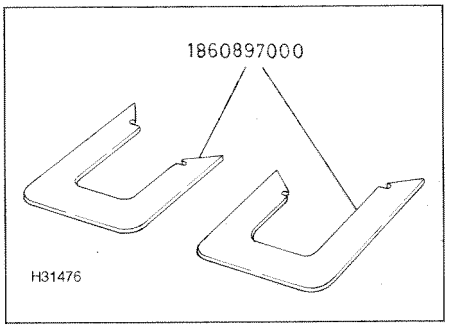
6 Refitting is a reversal of removal, but ensure that seal between the aerial housing and the roof panel is in good condition.



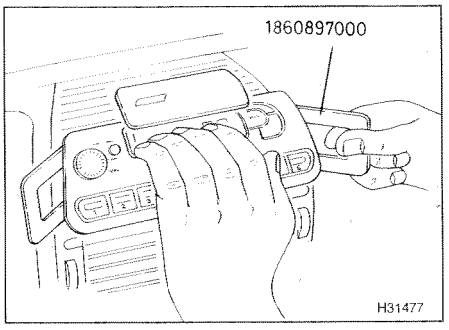
11.3 Prise off the metal cover and disconnect the aerial lead . . .



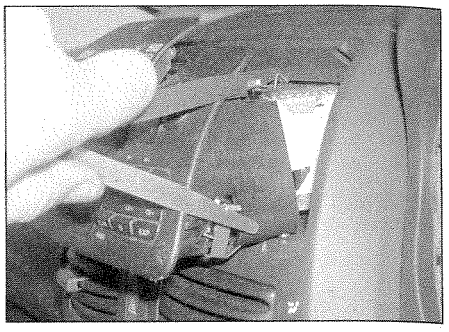
11.4 . . . then unscrew the aerial mounting nut



12.2a Fiat radio/cassette removal tools



12.2b Using the Fiat tools to remove the radio/cassette



12.2c Using feeler blades to remove the radio/cassette

12 Radio/cassette player - removal and refitting

Caution: If the radio/cassette player fitted has an anti-theft facility, make sure you have the security code before disconnecting the battery.

Removal

1 Disconnect the battery negative (earth) lead (see *Disconnecting the battery*).

2 The radio/cassette player is retained by 4 clips (2 on each side). FIAT technicians use two special tools which are inserted between the sides of the unit and the facia surround, and the tools effectively press the upper clips down, and the lower clips up. These tools may be supplied with the vehicle tool kit. An alternative method to using the special tools is to insert two feeler blades on each sides shown **(see illustrations)**, and to press down the upper blade and press up the lower blade. This will release the unit from the surround, one side at a time.

3 Lift the cassette flap, then pull the unit out from the facia **(see illustration)**.

4 Disconnect the wiring plugs and the aerial lead from the rear of the unit **(see illustrations)**.

Refitting

5 Refitting is a reversal of removal.

13 Speedometer sender unit - removal and refitting

Removal

1 The speedometer sender unit is mounted on the top of the transmission, above the final drive position. First remove the battery and battery tray as described in Chapter 5A for access to the sender. Move the relay holder box to one side after removing the cover and unscrewing the mounting bolts. Also unbolt and remove the battery mounting bracket.

2 Disconnect the wiring from the sender unit.

3 On early models, the sender may be removed from the pinion by unscrewing the large nut. On later models, however, the sender unit is manufactured as a single unit.

4 On manual transmission models, use an Allen key to unscrew the lockbolt from the rear of the transmission casing.

5 On automatic transmission models, unscrew the bolt securing the unit to the top of the transmission casing.

6 Carefully, lift the sender unit and pinion from the casing. Make sure that the pinion remains in the sender unit while it is being removed otherwise it may fall into the transmission.

7 Remove the O-ring seal from the groove in the body of the sender unit. Obtain a new O-ring seal.

Refitting

8 Refitting is a reversal of removal, but fit a new O-ring seal, and make sure that the pinion remains in the body of the sender unit as it is being inserted. The top of the pinion has a square drive which engages a dog inside the unit, and it may be necessary to turn the unit slightly to ensure the dog enters the drive. On manual transmission models it will be necessary to align the hole in the sender body with the lockbolt hole; apply suitable sealant to the threads of the lockbolt before inserting it.

14 Switches - removal and refitting

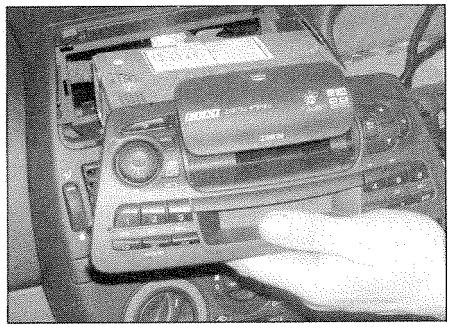
Steering column combination switch

Removal

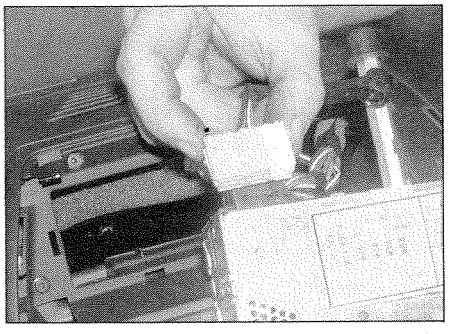
1 Disconnect the battery negative (earth) lead (see *Disconnecting the battery*). Wait approximately 10 minutes before proceeding as a precaution against accidental activation of the airbag (see Section 21). Turn the steering wheel so that the roadwheels are pointing in the straight-ahead position.

2 Remove the steering wheel as described in Chapter 10.

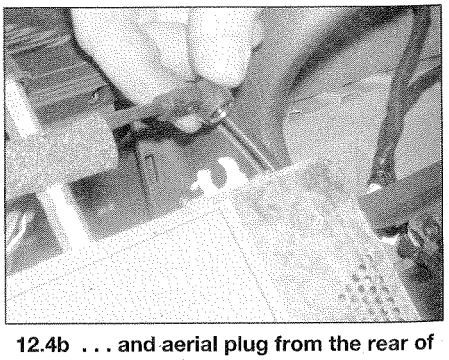
3 Remove the airbag clockspring unit from the column with reference to Section 22 of this Chapter. **Note:** *The clockspring*



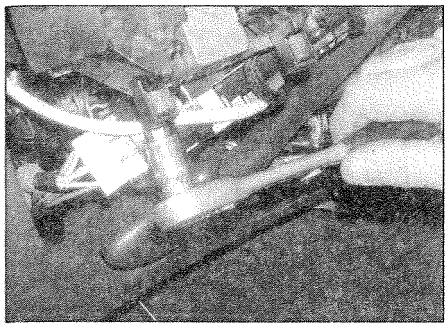
12.3 Removing the radio/cassette from the facia



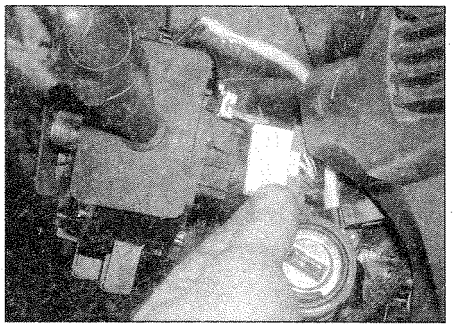
12.4a Disconnecting the wiring plugs . . .



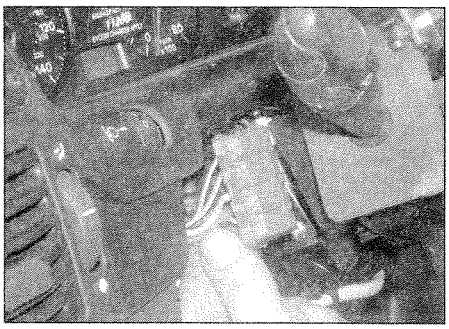
12.4b . . . and aerial plug from the rear of the radio/cassette



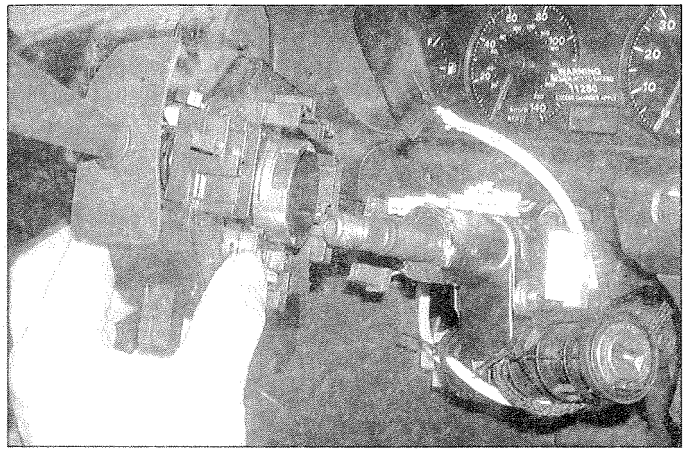
14.4a Using an Allen key, undo the collar retaining screw from the bottom of the switch . . .



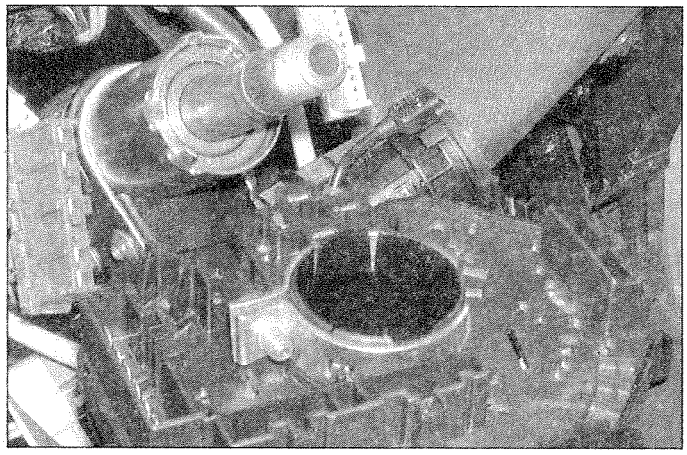
14.4b . . . then disconnect the wiper switch wiring . . .



14.4c . . . and the indicator switch wiring . . .



14.4d . . . and slide the combination switch assembly from the top of the steering column



14.4e The collar on the rear of the combination switch assembly

incorporates spring tensioned clips which prevent the upper and lower sections of the unit from turning in relation to each other when removed from the column.

4 Using an Allen key, undo the collar retaining screw from the bottom of the switch, then disconnect the wiring plugs and slide the combination switch assembly from the top of the steering column **(see illustrations).** It is not possible to separate each stalk unit and switch.

Refitting

5 Refitting is a reversal of removal, but note that the groove at the top of the switch must be aligned with the raised tab on the steering column. As a precaution against accidental activation of the airbag, ensure no one is inside the vehicle when reconnecting the battery. With the driver's door open, reach inside and turn on the ignition, then check the operation of the airbag warning light.

Headlamp beam adjustment switch

Removal

6 The headlamp beam adjustment switch is located on the instrument panel surround. First, undo the screws and remove the lower shroud from the steering column.

7 Undo the screws and remove the upper shroud from the steering column.

8 Undo the screws and remove the cover from the fuses/relays located on the driver's side of the instrument panel.

9 Working through the fuse/relay cover hole, undo the screw securing the outer end of the instrument panel surround to the facia.

10 Undo the 3 upper and 2 lower screws and withdraw the surround from the facia. Disconnect the wiring from the headlight adjustment and panel lighting rheostat.

11 With the surround on the bench, undo the screws and remove the switch.

Refitting

12 Refitting is a reversal of removal.

Brake stop-light switch

Removal and refitting

13 Refer to Chapter 9.

Electric exterior rear view mirror switch (where fitted)

Removal

14 Prise the electric rear view mirror switch panel from the centre console, and disconnect the wiring.

Refitting

15 Refitting is a reversal of removal.

Courtesy light switch

Removal

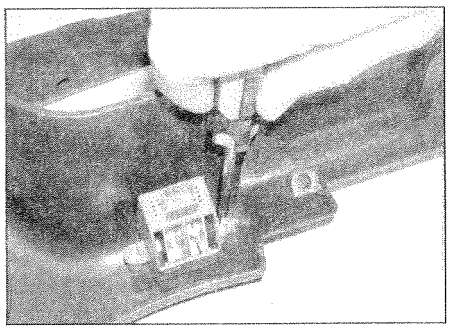
16 A separate courtesy light switch is only fitted to early models - the function is incorporated in the central locking switch on later models. Where fitted, open the door to expose the switch in the door B-pillar.

17 Remove the securing screw, then remove the rubber gaiter (where applicable) and withdraw the switch from the door pillar. Disconnect the wiring connector as it becomes accessible.

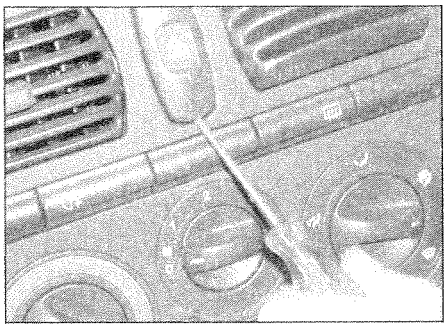
> **HAYNES HiNT** *Tape the wiring to the door pillar, or tie a length of string to the wiring, to retrieve it if it falls back into the door pillar.*

Refitting

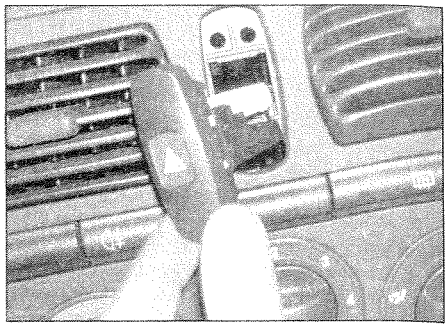
18 Refitting is a reversal of removal, but ensure that the rubber gaiter is securely seated over the switch.



14.27 Removing the instrument panel illumination rheostat from the surround



14.33a Use a screwdriver to prise the hazard warning switch . . .



14.33b . . . from the heater control surround panel . . .

Electric window switches

Removal

19 Use a screwdriver to carefully prise the electric window switch panel from the door trim panel. Use a piece of card or cloth to protect the panel while levering on it.

20 Disconnect the wiring and remove the switch.

Refitting

21 Refitting is a reversal of removal.

Instrument illumination rheostat

Removal

22 The instrument illumination rheostat is located on the instrument panel surround. First, undo the screws and remove the lower shroud from the steering column.

23 Undo the screws and remove the upper shroud from the steering column.

24 Undo the screws and remove the cover from the fuses/relays located on the driver's side of the instrument panel.

25 Working through the fuse/relay cover hole, undo the screw securing the outer end of the instrument panel surround to the facia.

26 Undo the 3 upper and 2 lower screws and withdraw the surround from the facia. Disconnect the wiring from the headlight adjustment and panel lighting rheostat.

27 With the surround on the bench, undo the screws and remove the switch **(see illustration)**.

Refitting

28 Refitting is a reversal of removal.

Facia switches

Removal

29 The facia switches are located in the centre of the facia, above the heater control knobs. Using a small screwdriver, carefully prise out the small covers from each end of the switch position, and the cover at the centre of the switches.

30 Undo the screws and withdraw the switch panel from the front of the facia.

31 Disconnect the wiring and remove the switches from the facia.

Refitting

32 Refitting is a reversal of removal.

Hazard warning switch

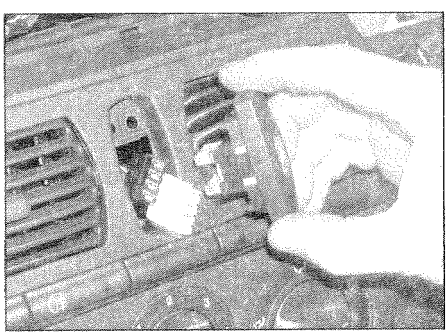
Removal

33 Using a screwdriver, carefully prise the hazard warning switch from the heater control surround panel **(see illustrations)**.

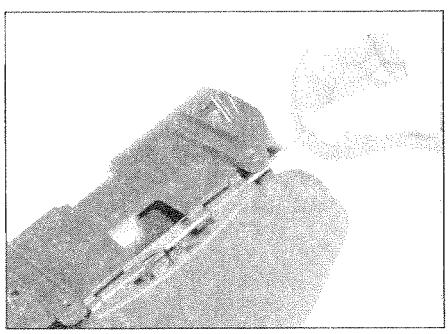
34 Disconnect the wiring and remove the switch **(see illustration)**.

35 Refitting is a reversal of removal.

15 Cigarette lighter - removal and refitting



14.34 . . . then disconnect the wiring



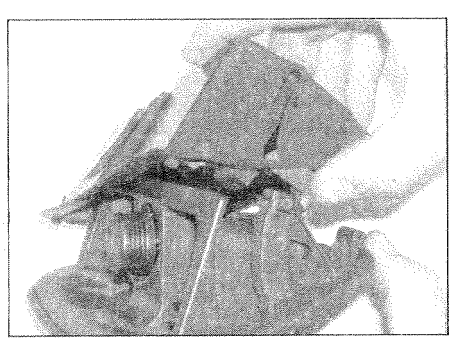
15.2a Remove the pivot pin . . .

Removal

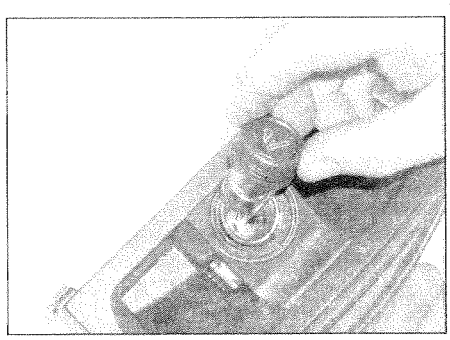
1 With the ashtray closed, undo the lower mounting screws, then open the ashtray lid and unscrew the upper mounting screws. Withdraw the ashtray from the facia and disconnect the wiring from the cigar lighter.

2 With the ashtray on the bench, use a small drift to drive out the pivot pin, then separate the ashtray lid from the base **(see illustrations)**.

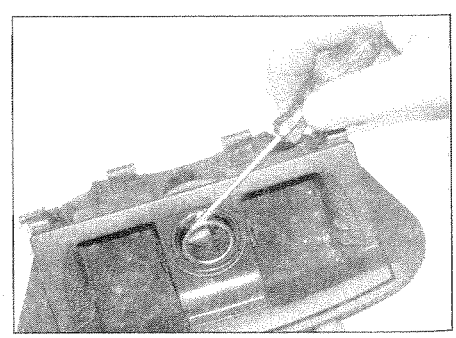
3 Remove the element, then using a small screwdriver, carefully prise the inner metal cylinder from the green plastic outer surround **(see illustrations)**. Press the



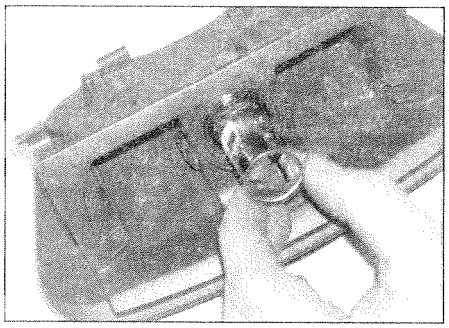
15.2b . . . and separate the ashtray lid from the base



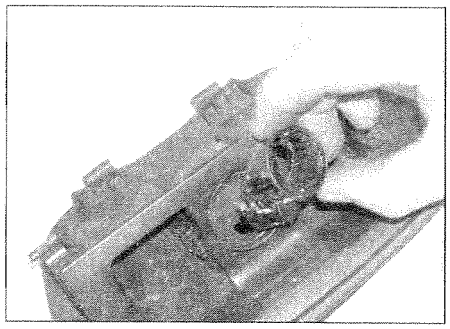
15.3a Remove the element . . .



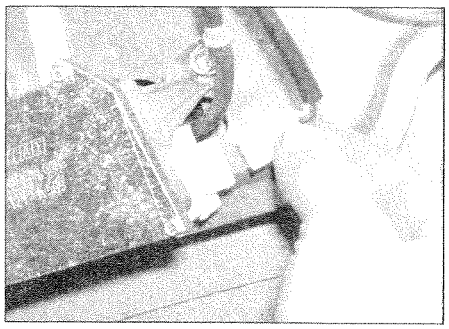
15.3b . . . then use a screwdriver to prise up . . .



15.3c . . . and remove the inner metal cylinder



15.4 Removing the cigarette lighter surround and bulbholder



16.4a Disconnecting the wiring from the tailgate wiper motor . . .

terminal end of the metal cylinder to assist its removal.

4 Align the raised tooth with the cut-out in the body and remove the surround together with the bulbholder **(see illustration)**.

Refitting

5 Refitting is a reversal of removal.

16 Tailgate wiper motor - removal and refitting

Removal

1 Make sure that the ignition is switched off.

2 Remove the tailgate wiper arm as described in Section 19.

3 With the tailgate open, undo the screws and prise out the retaining studs, then remove the inner trim panel. On 3-door models, use a wide-bladed screwdriver to prise free the clips.

4 Disconnect the wiring from the tailgate wiper motor. Also disconnect the washer tube from the jet adapter located on the spindle housing **(see illustrations)**.

5 Using an Allen key, unscrew the mounting bolts, then withdraw the wiper motor while guiding the jet adapter through the rubber grommet **(see illustrations)**.

Refitting

6 Refitting is a reversal of removal. Refit the wiper arm with reference to Section 19.

17 Windscreen/tailgate/headlight washer system components - removal and refitting

Washer fluid reservoir

Removal

1 The washer fluid reservoir is located on the right-hand side (RHD models) or left-hand side (LHD models) of the engine compartment, next to the coolant reservoir. First syphon out all of the fluid using a pipette.

2 Unscrew the mounting bolts and move the coolant reservoir to one side, away from the coolant reservoir.

3 Disconnect the wiring from the washer pump.

4 Disconnect the washer tubing from the pump, noting where each tube is fitted for correct refitting. Also release the tubing from the support clip.

5 Unscrew the mounting bolts and remove the reservoir from the engine compartment. If necessary, remove the inlet neck from the top of the reservoir.

Refitting

6 Refitting is a reversal of removal.

Washer pump

Removal

7 Unscrew the mounting bolts and move the coolant reservoir to one side, away from the coolant reservoir.

8 Disconnect the wiring from the washer pump.

9 Disconnect the washer tubing from the pump, noting where each tube is fitted for correct refitting.

10 Pull the pump upwards from the rubber grommet, and withdraw from the reservoir. If necessary, extract the rubber grommet.

Refitting

11 Refitting is a reversal of removal.

Windscreen washer nozzle

Removal

12 Open the bonnet, then prise out the fasteners and release the padding in the area beneath the washer nozzles.

13 Release the securing tabs using a suitable screwdriver, then push the nozzle from the bonnet. Disconnect the fluid hose, and withdraw the nozzle.

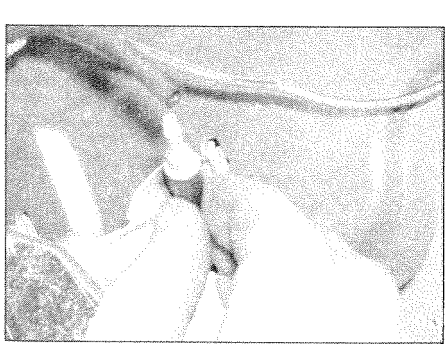
Refitting

14 Refitting is a reversal of removal, but if necessary adjust the nozzle so that the jets are aimed at a point approximately 250 mm from the upper edge of the windscreen. To do this, insert a thin screwdriver in the adjustment holes on the sides of the nozzles.

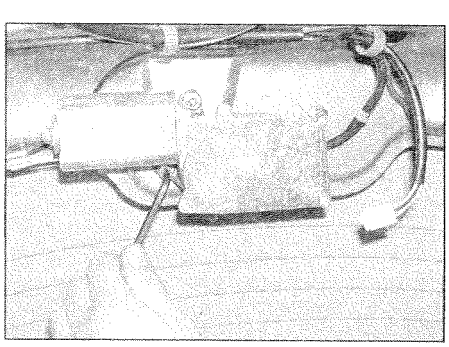
Tailgate washer nozzle

Removal

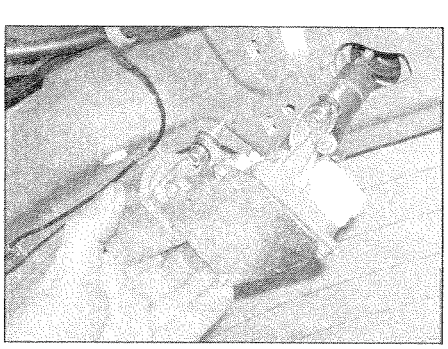
15 The tailgate washer nozzle is located on the tailgate wiper spindle housing. To remove it, first remove the wiper motor as described in Section 16.



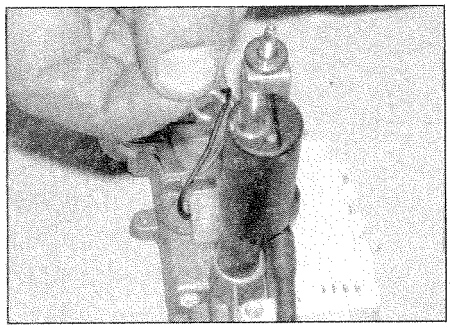
16.4b . . . and the washer tube from the tailgate washer jet adapter



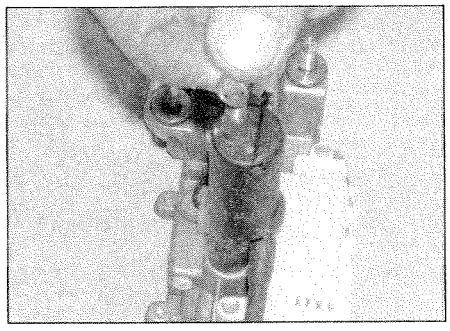
16.5a Unscrew the mounting bolts . . .



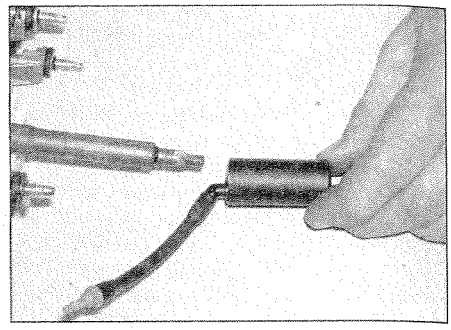
16.5b . . . and withdraw the wiper motor from the tailgate



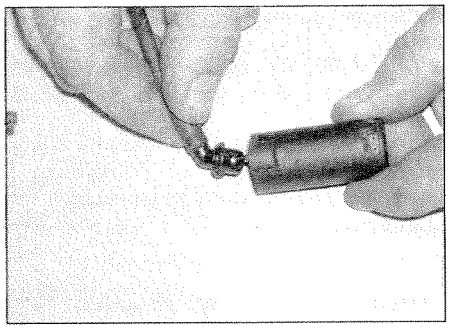
17.16a Extract the circlip . . .



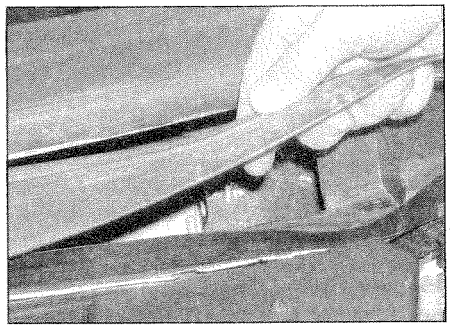
17.16b . . . and washer . . .



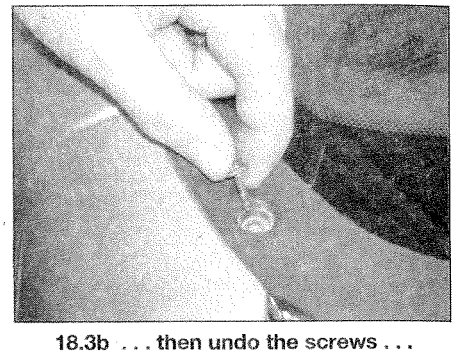
17.16c . . . and pull the nozzle/adapter from the wiper spindle housing



17.16d Removing the washer tube from the nozzle/adapter



18.3a Pull up the weatherstrips . . .



18.3b . . . then undo the screws . . .

16 Extract the circlip and washer, then pull the nozzle/adapter from the wiper spindle housing. If necessary, remove the tube. **(see illustrations)**.

Refitting

17 Refitting is a reversal of removal, but on completion adjust the washer jet using a small screwdriver through the hole in the nozzle/adapter. The jet should be directed towards the upper area of the tailgate wiper wiped area.

Headlight washer nozzle

Removal

18 The headlight washer nozzles are located in the front bumper. First remove the front bumper as described in Chapter 11.

19 Disconnect the tube and adapter from the bottom of the headlight nozzle.

20 Unscrew the nut and withdraw the nozzle from the front bumper.

Refitting

21 Refitting is a reversal of removal.

18 Windscreen wiper motor - removal and refitting

Removal

1 Make sure that the windscreen wiper motor is in its 'parked' position by briefly switching it on and off. Make sure that the ignition is switched off.

2 Refer to Section 19 and remove both wiper arms.

3 With the bonnet open, pull up the weatherstrips and undo the screws, then unclip and remove the cowl panel from in front of the windscreen. Note that the two rear screws are accessed by prising out the two covers **(see illustrations)**.

4 Remove the protective cover from the windscreen wiper motor.

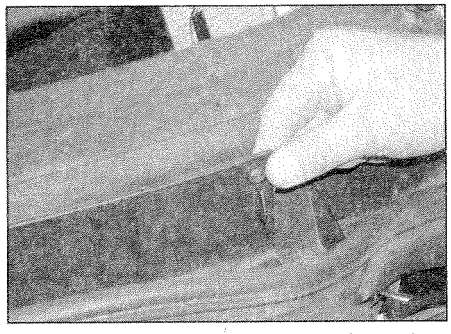
5 Disconnect the wiring plug from the motor **(see illustration)**.

6 Unscrew and remove the three mounting bolts, and withdraw the wiper motor assembly from the bulkhead **(see illustrations)**.

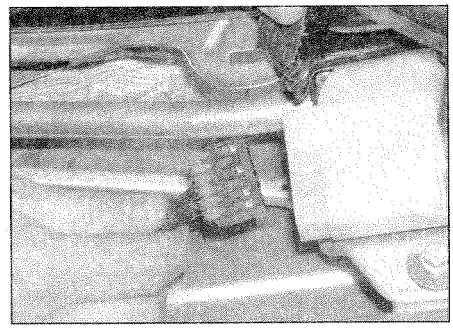
7 Unscrew the crank retaining nut, and the three mounting bolts, then separate the wiper motor from the linkage.

Refitting

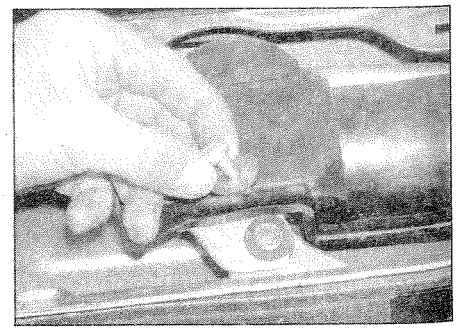
8 Refitting is a reversal of removal, but ensure that the motor drive is in the 'parked' position before reconnecting the crank arm.



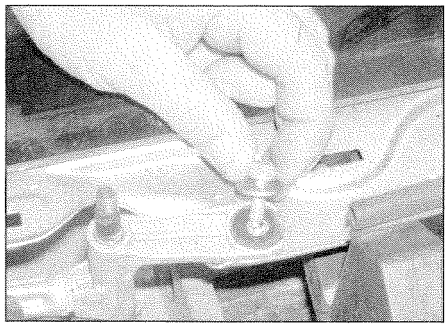
18.3c . . . and remove the cowl panel



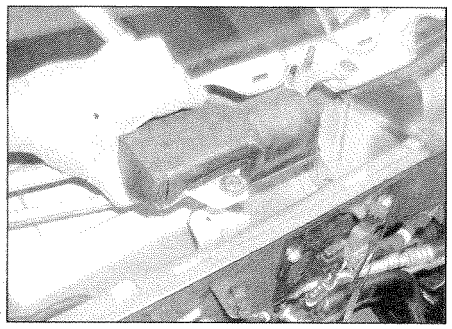
18.5 Disconnect the wiring from the wiper motor



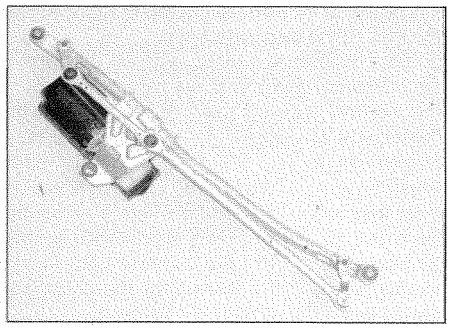
18.6a Wiper mounting bolt located by the motor



18.6b Wiper mounting bolt located on the linkage frame



18.6c Removing the wiper motor assembly from the bulkhead



18.6d Wiper motor and linkage removed from the bulkhead

19 Wiper arm - removal and refitting

Removal

1 Operate the wiper motor, then switch it off so that the wiper arm returns to its 'parked' position.

2 Stick masking tape on the glass, to use as an alignment aid for the rest position of the wiper blade. Note, however, that there is a mark on the tailgate window glass for locating the blade in its 'rest' position **(see illustrations)**.

3 Prise out the wiper arm spindle nut cover, then unscrew and remove the spindle nut. Recover the washer **(see illustrations)**.

4 Lift the blade off the glass, and ease the wiper arm off its spindle, using a rocking action **(see illustrations)**. If both windscreen wiper arms are being removed, note both locations, as different arms are fitted to each side.

Refitting

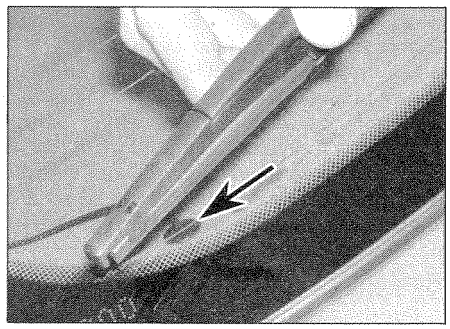
5 Refitting is a reversal of removal, but ensure that the wiper arm and spindle splines are clean and dry and align the blade with the tape before tightening the spindle nut securely.

20 Anti-theft alarm/engine immobiliser system - general information

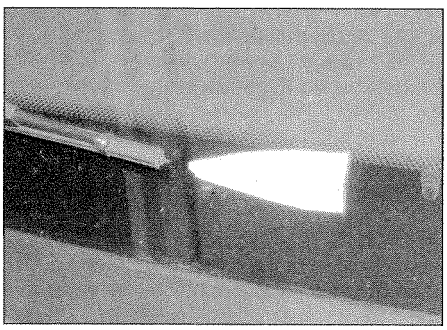
Note: *This information is applicable only to the anti-theft alarm system fitted by FIAT as standard equipment.*

1 All models are fitted with a FIAT CODE engine immobiliser system as standard equipment. The immobiliser is automatically activated when the ignition key is turned to PARK or STOP, and will also be activated when the key is removed completely from the switch. The ignition key has an integral device which transmits a coded signal to the FIAT CODE unit on the ignition switch, and the unit will only allow the engine to be started if it recognises the signal.

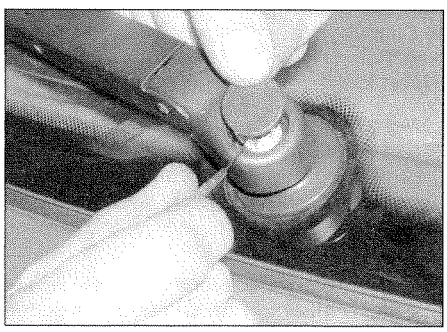
2 Each new car is provided with one master key (burgundy) and two duplicate keys (blue) for normal use. The duplicate keys incorporate a battery on models with remote central locking and an alarm system. The master key should be kept in a safe place, as



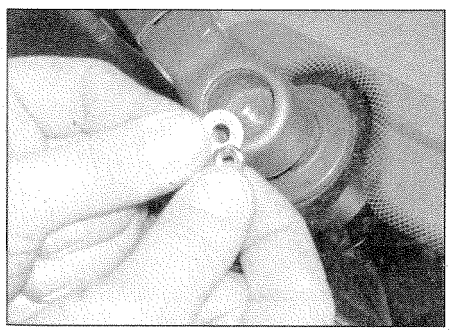
19.2a The 'rest' position mark on the tailgate window glass



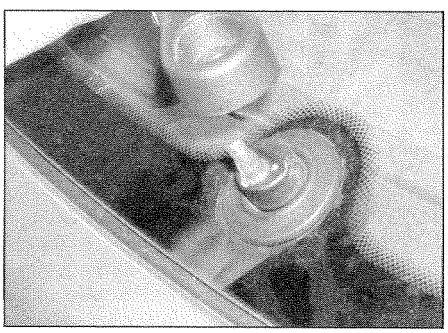
19.2b Stick masking tape on the windscreen to indicate the 'rest' position of the wiper blade



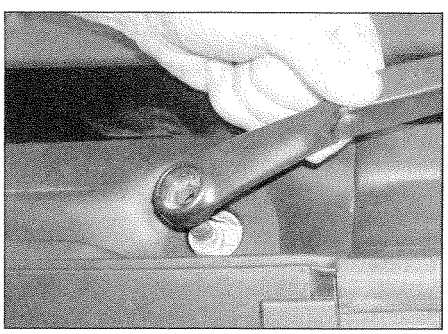
19.3a Prise out the wiper arm spindle nut cover . . .



19.3b . . . remove the nut and washer . . .



19.4a . . . and remove the tailgate wiper arm from the spindle



19.4b Removing the windscreen wiper arm from its spindle

it is required for making copies in the event of the loss of the duplicate keys.

3 Most models are fitted with an electronic alarm system which enables remote control of the central locking system, together with monitoring of door/tailgate/bonnet opening, movement inside the car, and any hard knocks to the car body. The system is activated when the ignition key is removed from the STOP or PARK positions on the ignition switch. An LED warning light in the middle of the facia flashes for the complete period when the system is activated.

4 The alarm system performs a self-test whenever it is switched on. Should a fault be detected, a second short beep will be heard after the main beep. If this occurs, check that the doors/tailgate/bonnet are closed correctly.

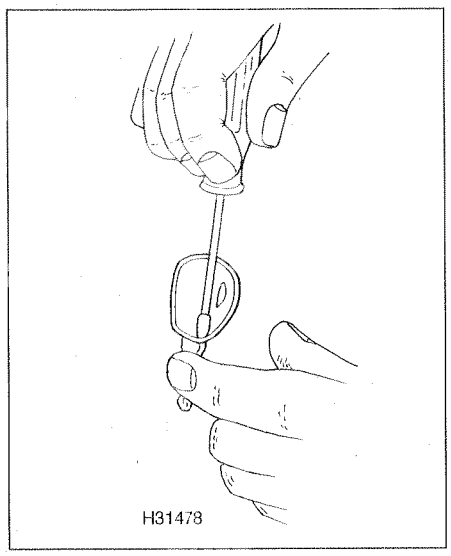
5 When the system is switched on, a single beep will be heard and the direction indicators will light up for approximately three seconds. When the system is switched off, two beeps will be heard and the direction indicators will flash twice.

6 Should the alarm system become faulty, the vehicle should be taken to a FIAT dealer for examination.

7 If a new key is obtained, it will be necessary to transfer the transponder from the old key to the new one. To do this, prise open the old key fob using a small screwdriver. **Note:** *Carry this out over a table, otherwise the transponder may be lost.*

8 Note its location, then use a screwdriver to carefully prise the transponder from the old key **(see illustration)**.

9 Carefully locate the transponder in the new key, then refit the fob halves, pressing the two halves together until they are engaged.



20.8 Removing the transponder from the ignition key fob

21 Airbag system - precautions and general information

Warning: Note that the airbag must not be subjected to temperatures in excess of 100° C. When the airbag is removed, ensure that it is stored the correct way up to prevent possible inflation. Do not allow any solvents or cleaning agents to contact the airbag assembly. It must be cleaned using only a damp cloth. The airbag and control unit are both sensitive to impact. If either is dropped from a height of 50 cm or more or are damaged they should be renewed. Before working on the airbag components, disconnect the battery and wait approximately 10 minutes. Also remove the airbag fuse from the fusebox.

1 A driver's airbag is fitted as standard on all models, and a passenger airbag is available as an option. Side airbags, fitted in the front seat backrests, are also available on certain models to protect the front seat occupants in the event of a side impact of medium to high level.

2 Where passenger and/or side airbags are fitted, the front passenger seat is fitted with a sensor to detect the presence of a person. If the sensor does not detect a person within approximately 30 seconds, the passenger airbag(s) are deactivated.

3 The airbag system consists of the airbag units complete with gas generators, the control unit with integral deceleration sensor, and a warning light on the instrument panel.

4 The airbag system is triggered in the event of a heavy frontal impact above a predetermined force, depending on the point of impact. The airbag is inflated within milliseconds and forms a safety cushion between the driver and steering wheel and, where fitted, between the passenger and facia. This prevents contact between the upper body and wheel/facia and therefore greatly reduces the risk of injury. The airbag then deflates almost immediately. Note that the front seat belt reels incorporate pretensioners which operate entirely separate to the airbag system and are not connected electrically to the system. The pretensioners are activated by an internal deceleration mechanism.

5 Every time the ignition is switched on, the airbag control unit performs a self-test. The self-test takes approximately 4 seconds and during this time the airbag warning light in the instrument panel is illuminated. After the self-test has been completed the warning light should go out. If the warning light fails to come on, check the bulb first before assuming the system is faulty. If it remains illuminated after 4 seconds or comes on at any time when the vehicle is being driven, there is a fault in the airbag system. The vehicle should be taken to a FIAT dealer for examination at the earliest possible opportunity.

22 Airbag system components - removal and refitting

Note: *Refer to the warnings given in Section 21 before carrying out the following operations.*

Driver's airbag

Removal

1 Disconnect the battery negative (earth) lead (see *Disconnecting the battery*). Also remove the airbag fuse from the fusebox. Wait approximately 10 minutes before proceeding, then insert the ignition key and turn it to release the steering lock.

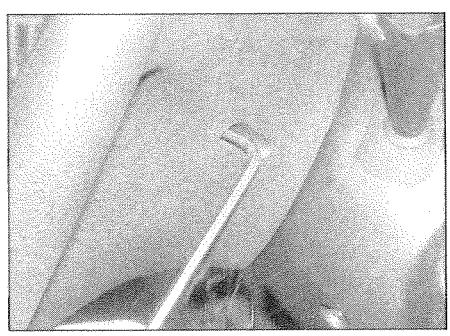
2 Unscrew and remove the two airbag retaining screws from the rear of the steering wheel, rotating the wheel as necessary to gain access to the screws **(see illustration)**.

3 Return the steering wheel to the straight-ahead position then carefully lift the airbag assembly away from the steering wheel. Disconnect the yellow wiring from the rear of the airbag **(see illustrations)**. Note that the airbag must not be knocked or dropped and should be stored the correct way up with its padded surface uppermost.

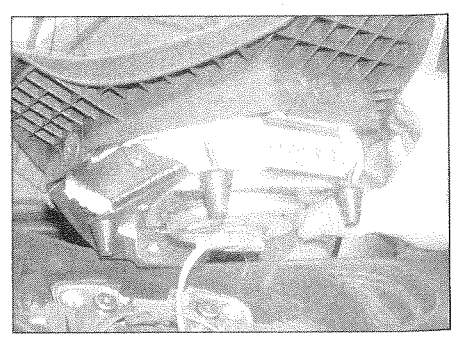
Refitting

4 Reconnect the wiring to the rear of the airbag and to the horn terminal.

5 Seat the airbag unit centrally in the steering



22.2 Unscrew and remove the two airbag retaining screws from the rear of the steering wheel



22.3a Carefully lift the airbag assembly away from the steering wheel

22.3b Disconnect the yellow wiring from the rear of the airbag

wheel, making sure the wires do not become trapped. Fit the retaining screws and tighten them to the specified torque setting.

6 Refit the airbag fuse, then reconnect the battery, but as a precaution against accidental activation of the airbag, ensure no one is inside the vehicle. With the driver's door open, reach inside and turn on the ignition, then check the operation of the airbag warning light.

Passenger airbag

Removal

7 Disconnect the battery negative (earth) lead (see *Disconnecting the battery*). Also remove the airbag fuse from the fusebox. Wait approximately 10 minutes before proceeding.

8 Open the glovebox lid, then undo the two knobs and remove the upper trim from inside the glovebox. Unscrew the mounting bolts and withdraw the glovebox from the facia.

9 Working through the glovebox aperture, unscrew and remove the four bolts securing the airbag to the body.

10 Disconnect the wiring and withdraw the airbag from inside the car. Note that the airbag must not be knocked or dropped and should be stored the correct way up with its padded surface uppermost.

11 Note that the complete facia must be removed in order to remove the passenger airbag module cover. Refer to Chapter 11 and remove the facia, then undo the screws and drill out the rivets.

Refitting

12 If removed, refit the module cover and secure with the screws and new rivets.

13 Reconnect the wiring and make sure that the wire is correctly located in the support grommet.

14 Lift the airbag into position and align the holes in the mounting bracket with those in the body. Insert the bolts and tighten to the specified torque.

15 Refit the glovebox and trim.

16 Refit the airbag fuse, then reconnect the battery, but as a precaution against accidental activation of the airbag, ensure no one is inside the vehicle. With the driver's door open, reach inside and turn on the ignition, then check the operation of the airbag warning light.

Front seat side airbag

Removal

17 Remove the front seat as described in Chapter 11.

18 Using a screwdriver, prise the cap from the seat tilt adjustment knob, then pull off the knob.

19 Undo the screws and remove the outer plastic side cover from the seat.

20 On the inside of the seat, undo the screw securing the inner plastic side cover.

21 Using a screwdriver, carefully prise out the rear of the inner plastic cover from the side of the seat taking care not to damage the cover. As it is being removed, the spring washer will be released from the peg on the seat. With the cover removed, press out the spring washer and outer cap.

22 Release and unhook the bottom of the rear cover from the seat rail, disconnect the tensioning rods, and partly pull the upholstery upwards for access to the side airbag mounting nuts.

23 Unscrew the mounting nuts, and carefully withdraw the airbag module from the side of the seat. Carefully disconnect the wiring from the airbag. Note that the airbag must not be knocked or dropped and should be stored with its padded surface uppermost.

Refitting

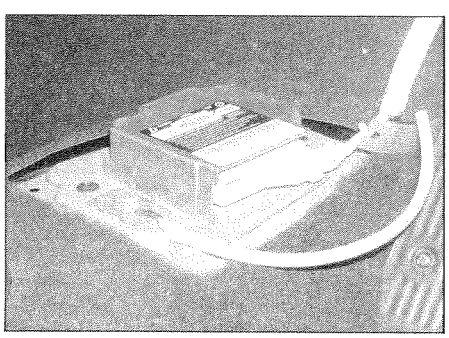
24 Reconnect the wiring and locate the airbag in the side of the seat. Tighten the mounting nuts to the specified torque.

25 Refit the upholstery and side covers to the seat using a reversal of the removal procedure.

26 Refit the front seat to the car with reference to Chapter 11. When reconnecting the battery, ensure no one is inside the vehicle as a precaution against accidental activation of the airbag. With the driver's door open, reach inside and turn on the ignition, then check the operation of the airbag warning light.

Airbag control unit

Note: *The airbag control unit must always be renewed after a crash which activates an airbag.*



22.28 The airbag control unit is located under the centre of the facia

Removal

27 Disconnect the battery negative (earth) lead (see *Disconnecting the battery*). Also remove the airbag fuse from the fusebox. Wait approximately 10 minutes before proceeding.

28 The airbag control unit is located under the centre of the facia, in front of the centre console **(see illustration)**. Undo the screws and release the fasteners in order to remove the trim panel from the inside of the driver's footwell. Push the centre locking pins of the fasteners in order to release them.

29 Undo the mounting screws then disconnect the wiring and withdraw the control unit.

Refitting

30 Locate the control unit beneath the facia, making sure that the arrow on top of the unit is pointing forwards, then reconnect the wiring and insert the mounting screws. Tighten the screws securely.

31 Make sure that the fasteners are correctly located in the trim panel, with the centre locking pins in their raised position. Refit the trim panel and secure the fasteners by pressing in the centre locking pins until flush. Insert and tighten the screws.

32 Refit the airbag fuse, then reconnect the battery, but as a precaution against accidental activation of the airbag, ensure no one is inside the vehicle. With the driver's door open, reach inside and turn on the ignition, then check the operation of the airbag warning light.

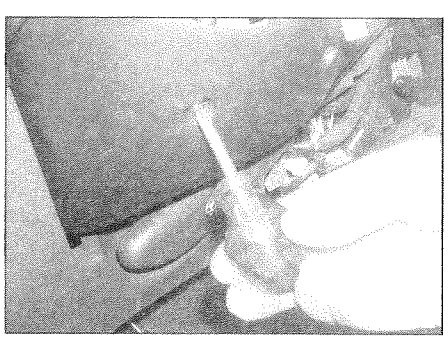
Airbag clock spring

Removal

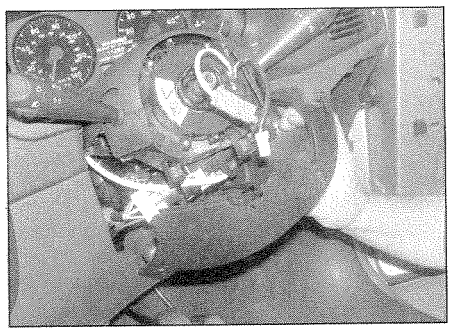
33 Disconnect the battery negative (earth) lead (see *Disconnecting the battery*). Also remove the airbag fuse from the fusebox. Wait approximately 10 minutes before proceeding.

34 Remove the steering wheel as described in Chapter 10. This procedure includes removal of the driver's airbag described in paragraphs 1 to 3 of this Section. **Note:** *Before removing the steering wheel, make sure it is in its central position with the front wheels pointing straight-ahead.*

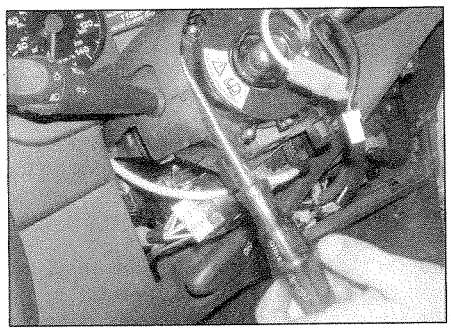
35 Undo the screws and remove the lower shroud from the steering column, then undo the screws and remove the upper shroud **(see illustrations)**.



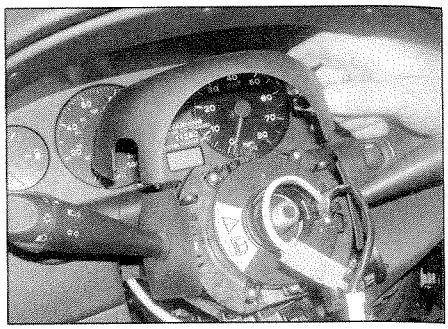
22.35a Undo the screws . . .



22.35b . . . and remove the lower shroud . . .



22.35c . . . then undo the screws . . .



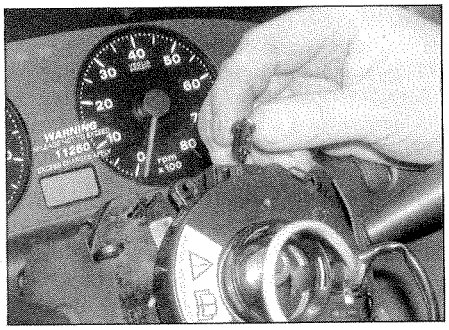
22.35d . . . and remove the upper shroud from the steering column

36 Next to the ignition switch, disconnect the clock spring wiring, and also disconnect the wiring from the airbag control unit **(see illustration)**.

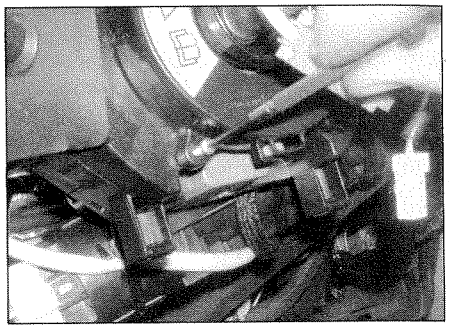
37 Undo the screws (noting their locations) and remove the clock spring from the combination switch **(see illustration)**. **Note:** *The clockspring incorporates spring tensioned clips which prevent the upper and lower sections of the unit from turning in relation to each other when removed from the column.*

Refitting

38 Make sure the front wheels are pointing in the straight-ahead direction. Refit the clockspring to the combination switch and tighten the screws. Note that there are four holes for the retaining screws, however, only three screws are fitted, to prevent distortion of the clockspring housing. **Note:** *If a new clockspring is being fitted, remove the temporary locking key before locating it on the combination switch.*



22.36 Disconnecting the clockspring wiring



22.37 Removing the clockspring retaining screws

39 Reconnect the wiring, and refit the steering column shrouds.

40 Refit the steering wheel and airbag with reference to Chapter 10 and paragraphs 4 to 6 of this Section.

41 Refit the airbag fuse, then reconnect the battery, but as a precaution against accidental activation of the airbag, ensure no one is inside the vehicle. With the driver's door open, reach inside and turn on the ignition, then check the operation of the airbag warning light.

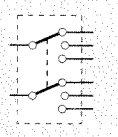
Fiat Brava/Bravo wiring diagrams 1995 to 1999

Key to symbols

20 — Item number

Bulb

Switch



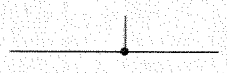
Multiple contact switch (ganged)

Fuse/ fusible link

Solenoid actuator

Resistor

Variable resistor



Internal connection in a component

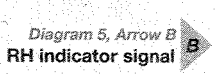
Block conection, detachable

Wire connection, fixed

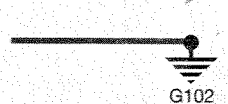
Wire colour (green wire with yellow tracer)

Interconnecting line (thin line)

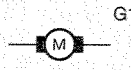
Denotes alternative wiring variation



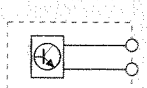
Connections to other circuits



Earth point with location code



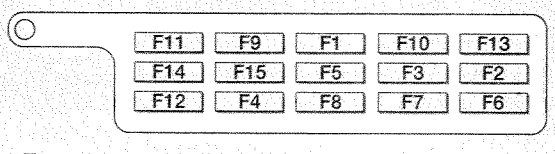
Pump/motor



Dashed outline denotes part of a larger item, containing in this case an electronic or solid state device

Gauge/meter

H31692



Fuse holder

Fuse allocation

1	15A	Exterior lights - Reversing, stop, direction indicators electric windows, air bag, ABS
2	10A	Front RH side light, rear LH light, RH number plate light, radio lighting, instrument panel lighting, switch panel lighting
3	10A	Front LH side light, heater/air conditioner controls lighting, rear RH light, LH number plate light
4	10A	LH dipped beam
5	10A	RH dipped beam, headlamp adjusters
6	10A	RH main beam
7	10A	LH main beam, main beam warning light
8	10A	Rear fog lamps
9	10A	Hazard warning lights
10	15A	Courtesy light, luggage compartment light, clock, radio, glove compartment light
11	20A	Heated rear window and warning light, heated mirrors
12	-	-
13	20A	Horns
14	20A	Front and rear screen wash/wipe, headlight washer
15	20A	Interior ventilation fan, radiator fan, cigar lighter

Index to diagrams

Earth locations

E1	Battery earth on bodyshell
E2	Left front earth
E3	Left dashboard earth
E4	Right front earth
E5	Left rear earth
E6	Right rear earth
E7	Right dashboard earth
E8	Earth for electronic injection
E9	Earth for electronic ignition