

# Chapter 12

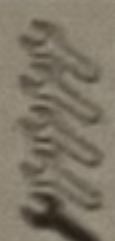
## Body electrical system

### Contents

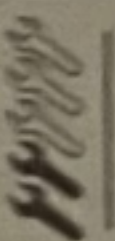
|  | Section number |  | Section number |
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### Degrees of difficulty

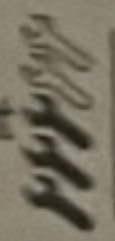
Easy, suitable for novice with little experience



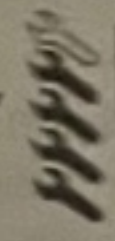
Fairly easy, suitable for beginner with some experience



Fairly difficult, suitable for competent DIY mechanic



Difficult, suitable for experienced DIY mechanic



Very difficult, suitable for expert DIY or professional



### Specifications

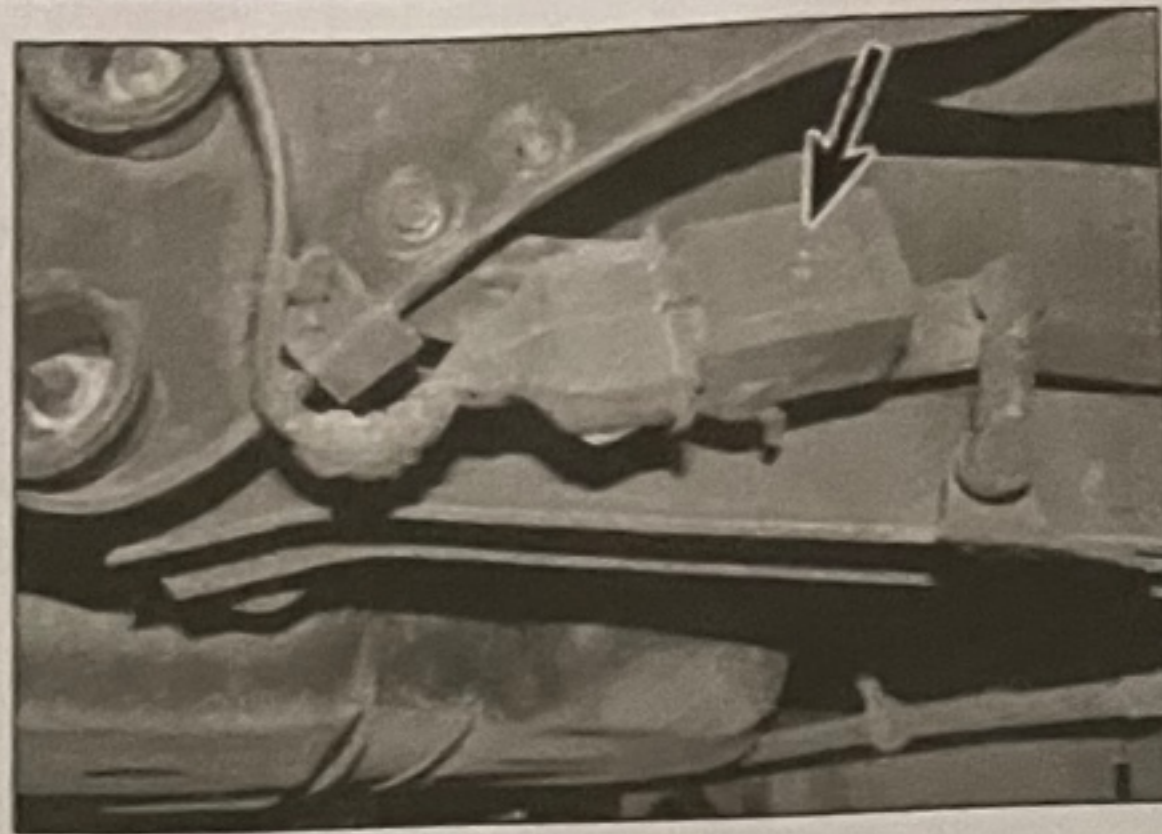
|  |                                |
|--|--------------------------------|
| System voltage   | 12 volt negative earth         |
| Watts  |                                |
| Direction indicators                                       | 24                             |
| Headlight main and dipped                                  | 55                             |
| Headlight  | 55                             |
| Side/rear foglight   | 37                             |
| Interior light, courtesy light, luggage compartment light  | 4                              |
| Number plate light   | 5                              |
| Reversing light  | 1.2 or 2.0                     |
| Seat belt warning, reading light (front), overhead console | 10                             |
| Side repeater light  | 5                              |
| Stop/tail lights   | 4                              |
| Torque wrench setting                                      | 21                             |
| Windscreen wiper motor and linkage                         | 5                              |
|  | 5 (or 2.2 for certain markets) |
|  | 21/5                           |
|  | Nm                             |
|  | 8                              |

lbf ft  
6

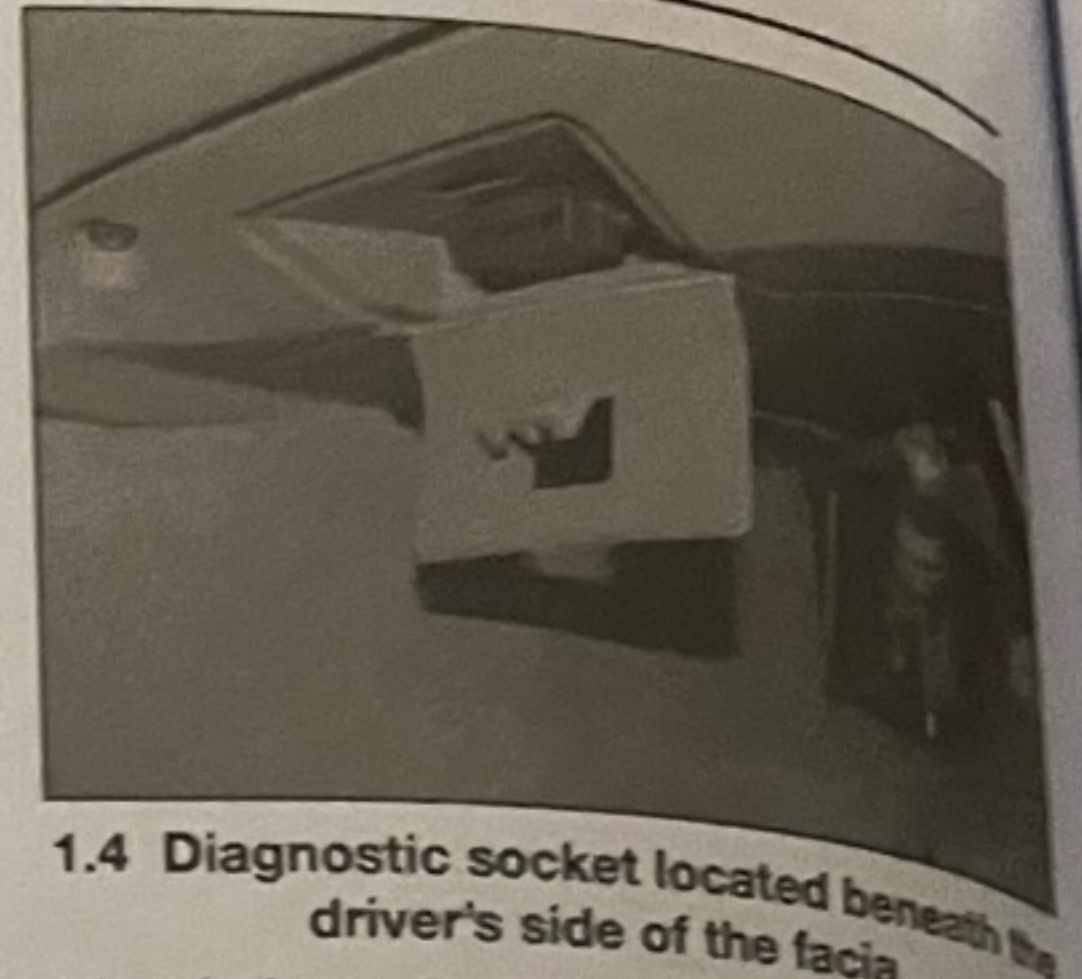




1.3a Xenon load sensor fitted to the front suspension lower arm . . .

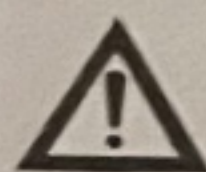


1.3b . . . and rear suspension lower arm



1.4 Diagnostic socket located beneath the driver's side of the fascia

## 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 Chapter 5A.



**Warning:** When working on xenon headlights, always switch off the ignition and turn the key to its **LOCK** position. Never connect voltage to the xenon headlight without its protective cover being fitted. Never attempt to repair the wiring of xenon headlights; faulty wiring must be renewed in its entirety. It is recommended that protective gloves and glasses are worn.

The electrical system is of 12 volt negative earth type and comprises a 12 volt battery, an alternator with integral voltage regulator, a starter motor and related electrical accessories, components and wiring.

All models are fitted with an anti-theft alarm and immobiliser system including door sensors, a boot lid/tailgate sensor, a bonnet sensor and a glass breakage sensor. The system is controlled by a central electronic control module, which operates the warning horn on getting a signal from one of the sensors. A tilt angle sensor (fluid filled) is also fitted to some models to monitor any attempt to jack up the vehicle while the alarm is enabled. Both the glass and tilt sensors can be disabled individually if required, leaving just the main alarm functional. The system antenna is incorporated in the ignition switch, and the transponder for the immobiliser is located in the ignition key fob.

Some models are equipped with xenon dipped headlights that are designed to last the life of the vehicle. To ensure these headlights do not dazzle oncoming traffic, an automatic levelling system is fitted incorporating load sensors on the front and rear suspension arms (see illustrations).

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. Many of the electrical circuits are linked to control units, which can be tested for faults using a purpose-made diagnostic instrument connected to the socket located beneath the driver's side of the fascia (see illustration).

It should be noted that prior to disconnecting wiring from any components in the electrical system, the battery negative terminal should first be disconnected, to prevent the possibility of electrical short circuits and/or fires. Note also that the alarm must be disabled before disconnecting the battery.

## 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 engine management systems, anti-lock braking systems, etc), particularly where an electronic control module (ECM) is used.

### General

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 body. To help pin-point a problem in an electrical circuit, wiring diagrams are included at the end of this Chapter.

Before attempting to diagnose an electrical fault, first study the appropriate wiring diagram, to obtain a complete understanding of the components included in the particular circuit concerned. The possible sources of a fault can be narrowed down by noting if 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.

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 pin-point the trouble spot.

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), an ohmmeter (to measure resistance and check for continuity), 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.

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.

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

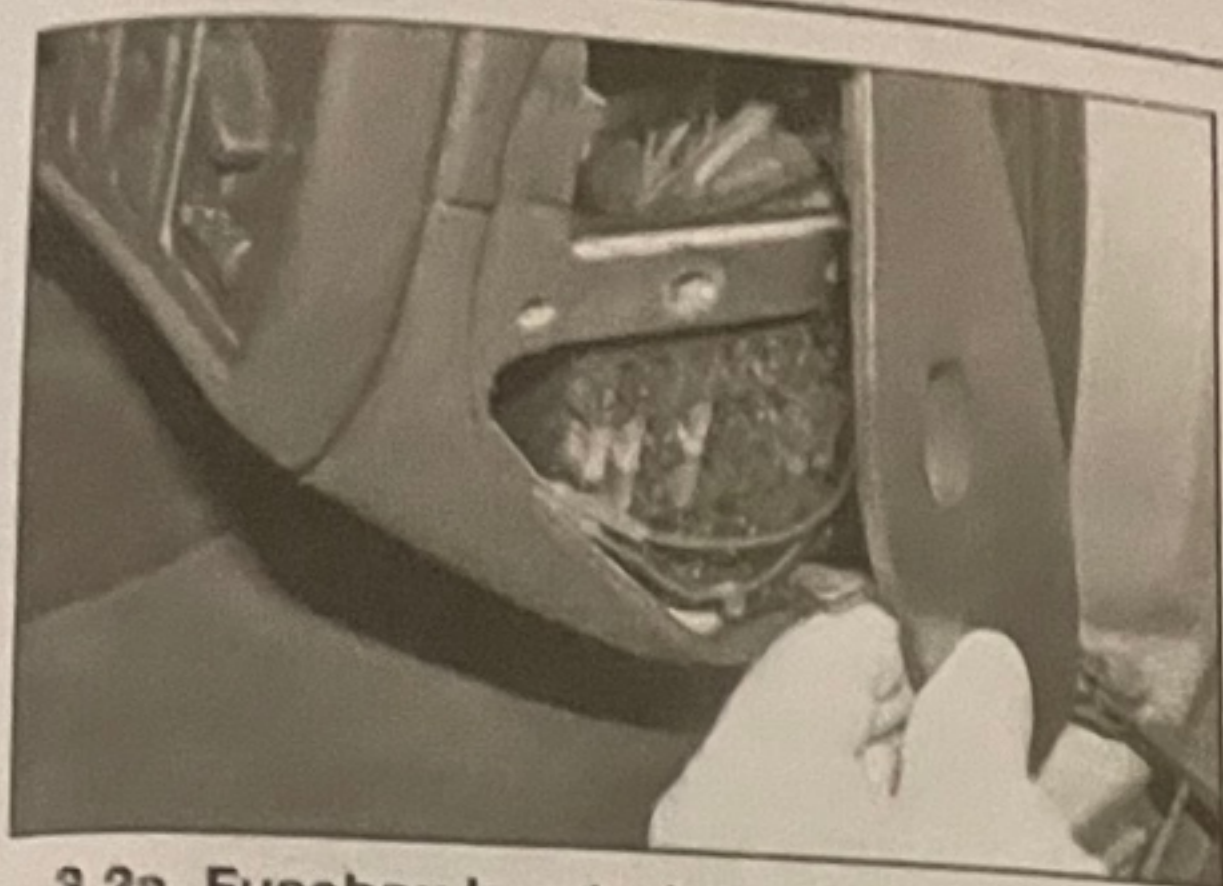
Open circuit faults are caused by a break somewhere in the circuit, which prevents current from flowing. An open circuit fault will prevent a component from working, but will not cause the relevant circuit fuse to blow.

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.

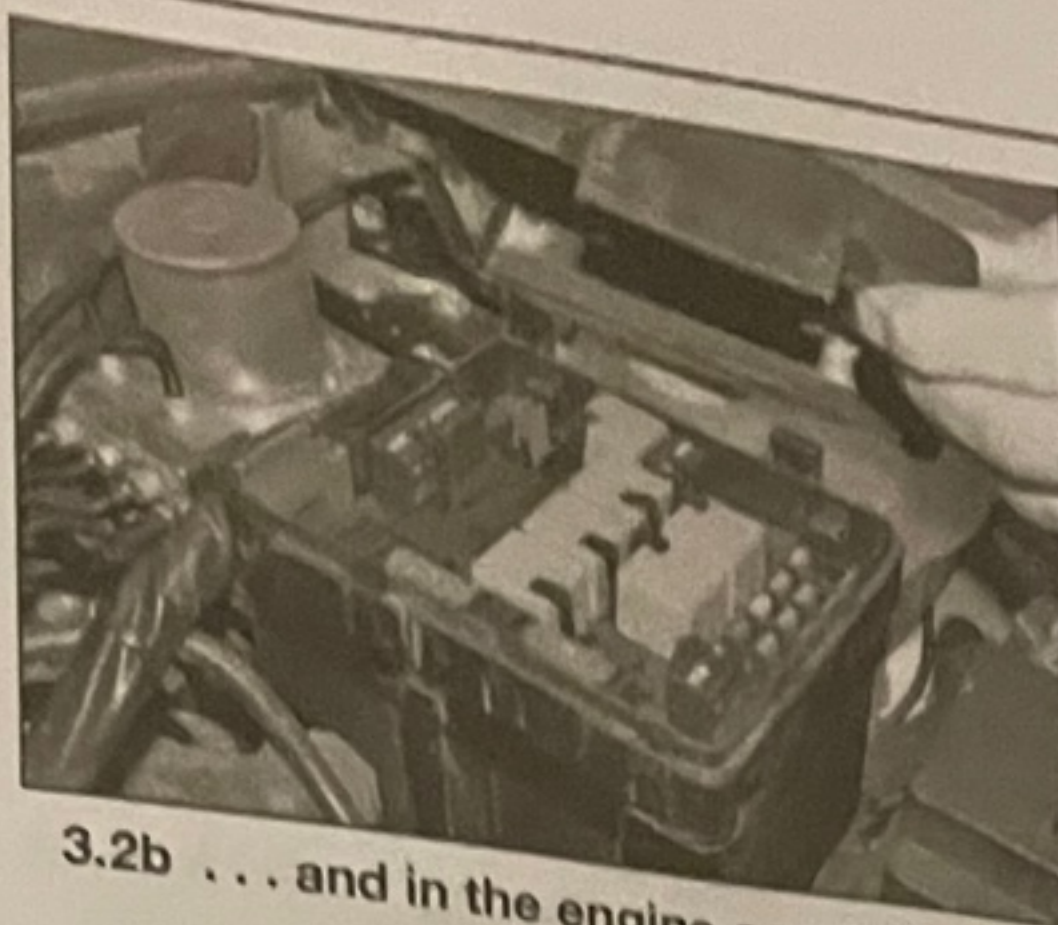
### Finding an open-circuit

To check for an open circuit, connect one lead of a circuit tester or the negative lead

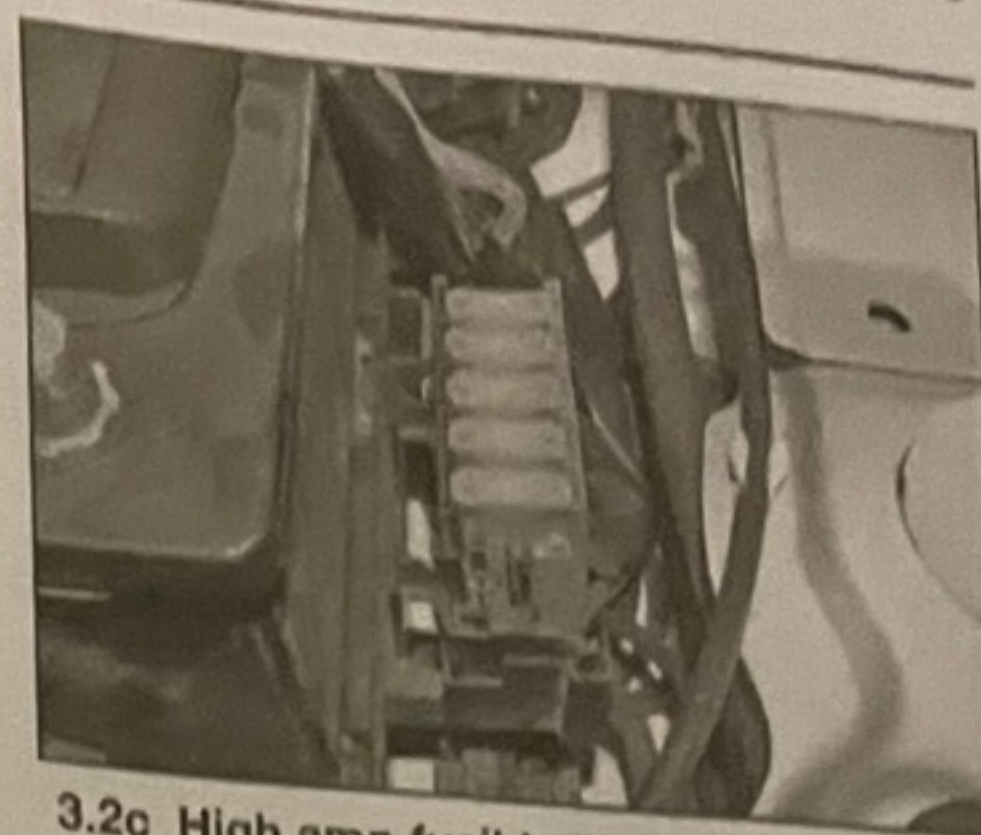




3.2a Fusebox located on the right-hand end of the fascia . . .



3.2b . . . and in the engine compartment



3.2c High amp fusible links on the side of the battery tray

### 3 Fuses and relays – general information

#### Fuses

1 Fuses are designed to break an electrical circuit when a predetermined current limit 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 fuses are located either in the fusebox located on the right-hand end of the fascia, or in the fusebox located in the left-hand rear of the engine compartment (see illustrations). High amp fusible links are also located next to the battery on the left-hand front corner of the engine compartment.

3 Access to the fascia fusebox is gained by opening the driver's door and releasing the plastic cover. The engine compartment fusebox is opened by opening the bonnet and lifting the plastic cover.

4 To remove a fuse, use the plastic tool provided in the fusebox to pull the fuse from its socket (see illustration).

5 Inspect the fuse from the side, through the transparent plastic body – a blown fuse can be recognised by its melted or broken wire.

6 Spare fuses are provided in the blank terminal positions in the fusebox.

7 Before renewing a blown fuse, trace and rectify the cause, and always use a fuse of the

of a voltmeter either to the battery negative terminal or to a known good earth.

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

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

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 component is problem-free.

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

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

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).

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

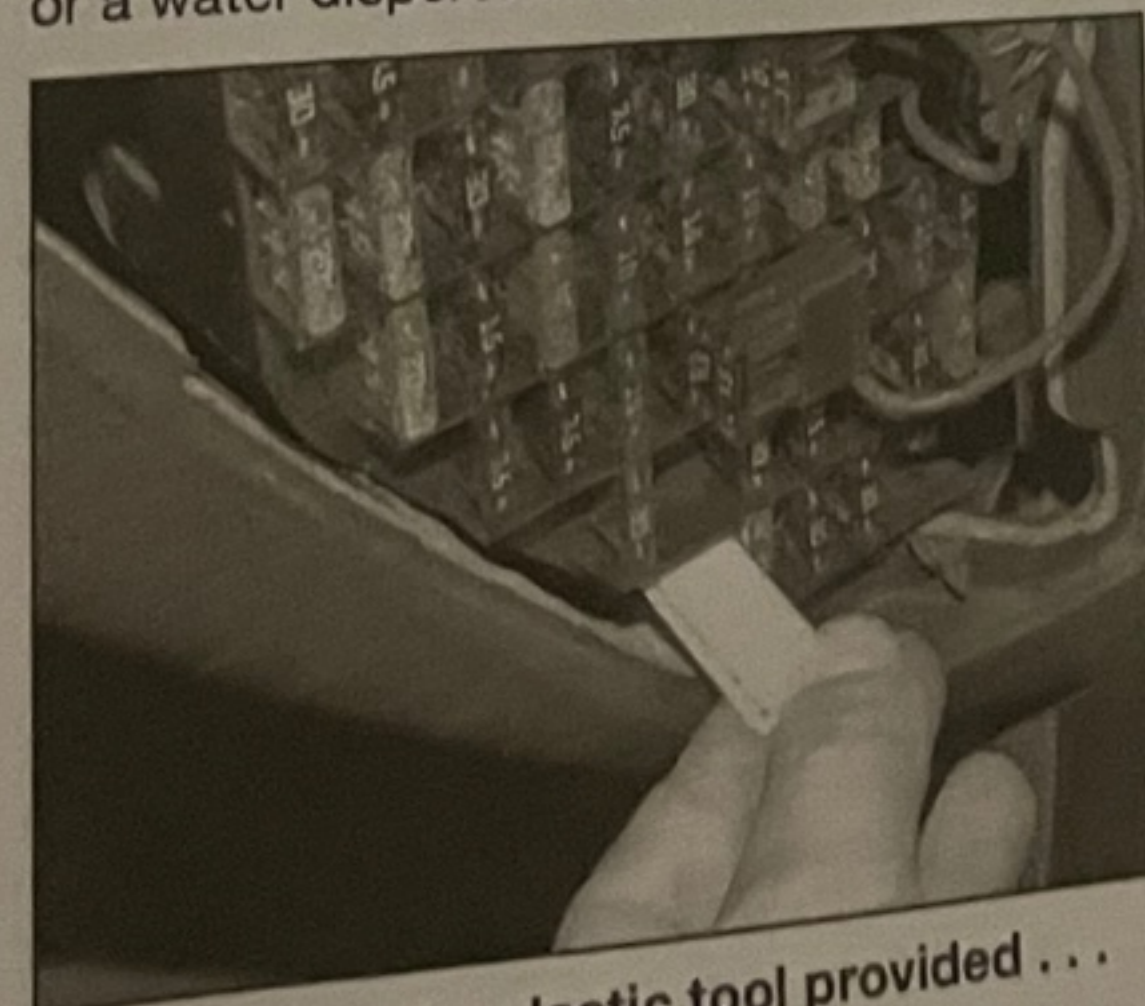
Switch on the circuit, bearing in mind that some circuits are live only when the ignition switch is moved to a particular position.

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.

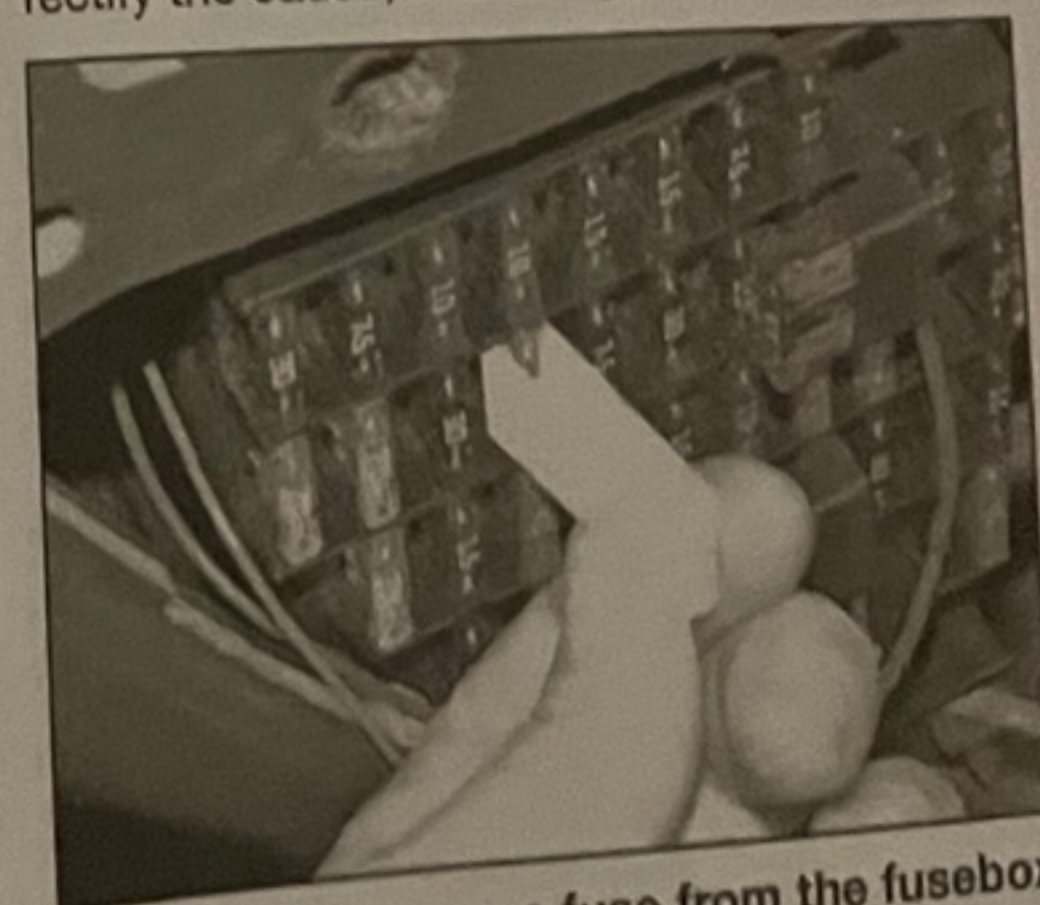
If no voltage is present during this test, but the fuse still blows with the load(s) reconnected, this indicates an internal fault in the load(s).

#### Finding an earth fault

The battery negative terminal is connected to 'earth' – the metal of the engine/transmission unit and the vehicle body – and many 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 failure. In particular,

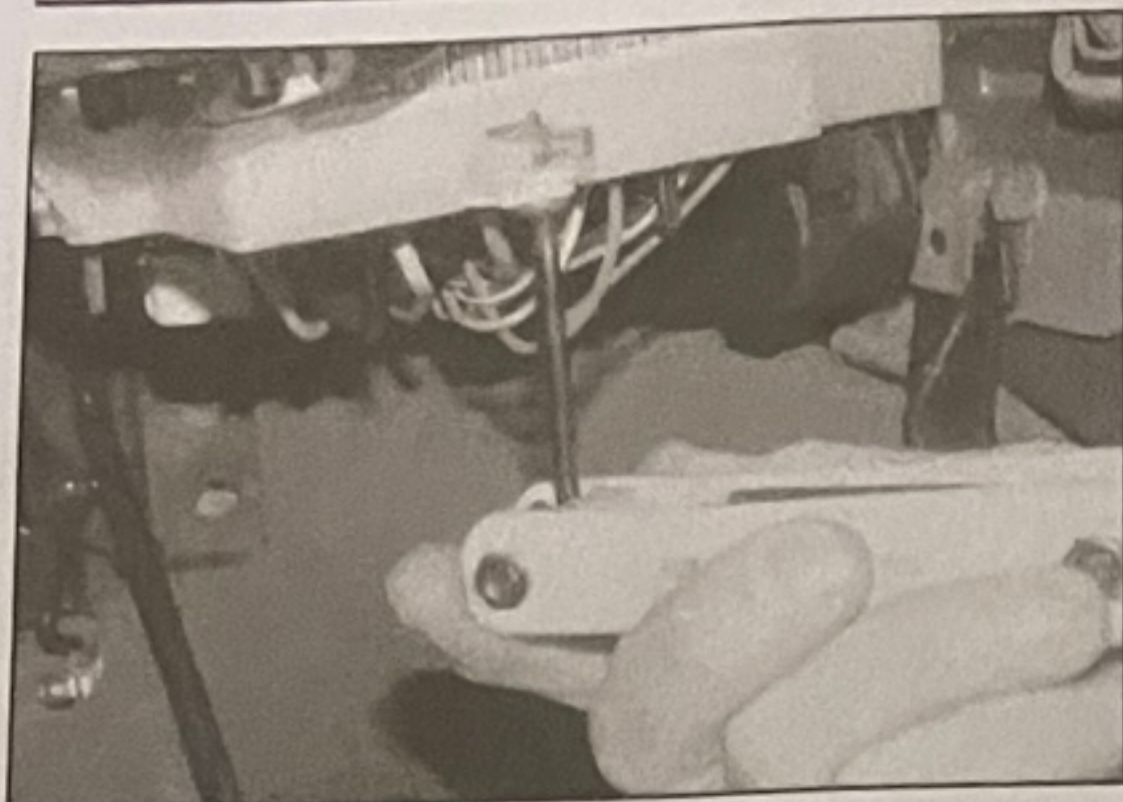


3.4a Use the plastic tool provided . . .



3.4b . . . to remove a fuse from the fusebox





3.8a Undo the screw . . .



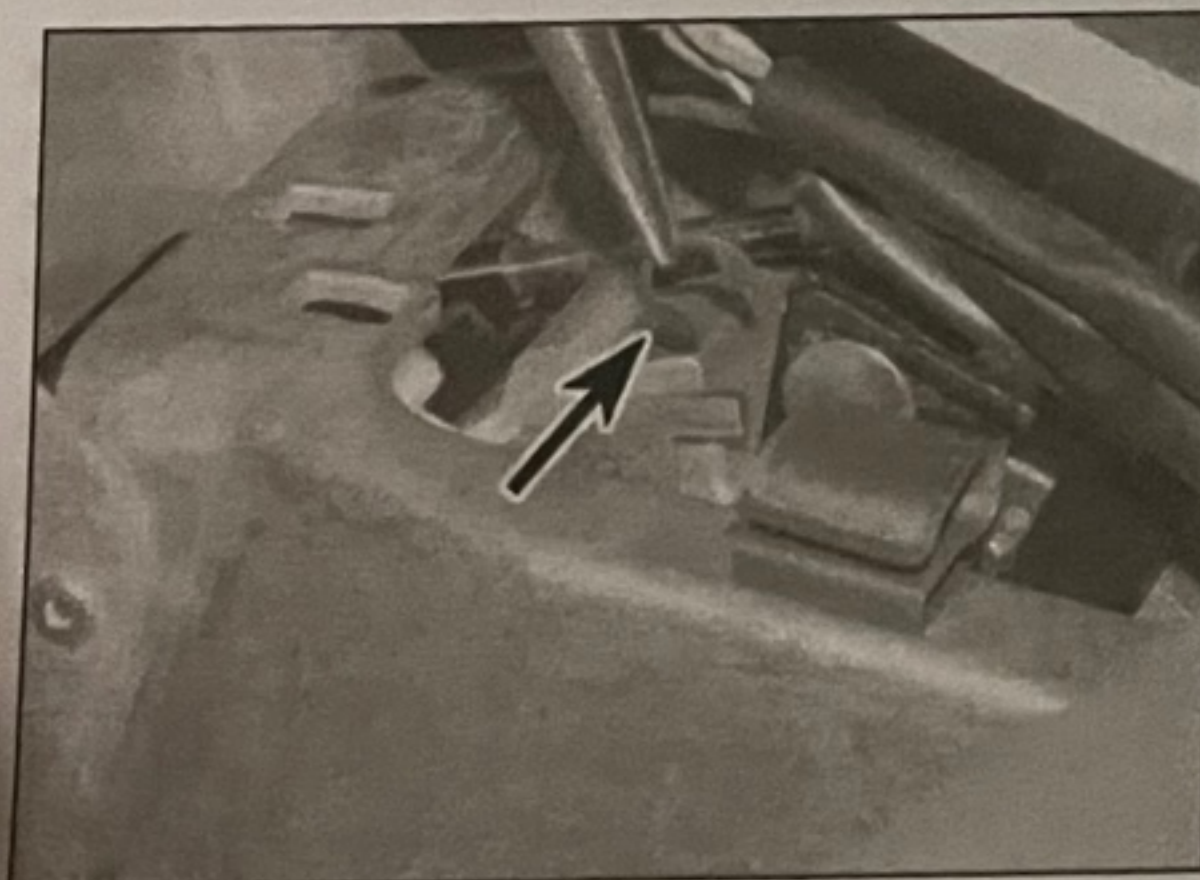
3.8b . . . and lower the relay holder from its housing

correct rating (refer to the wiring diagrams at the end of this Chapter).

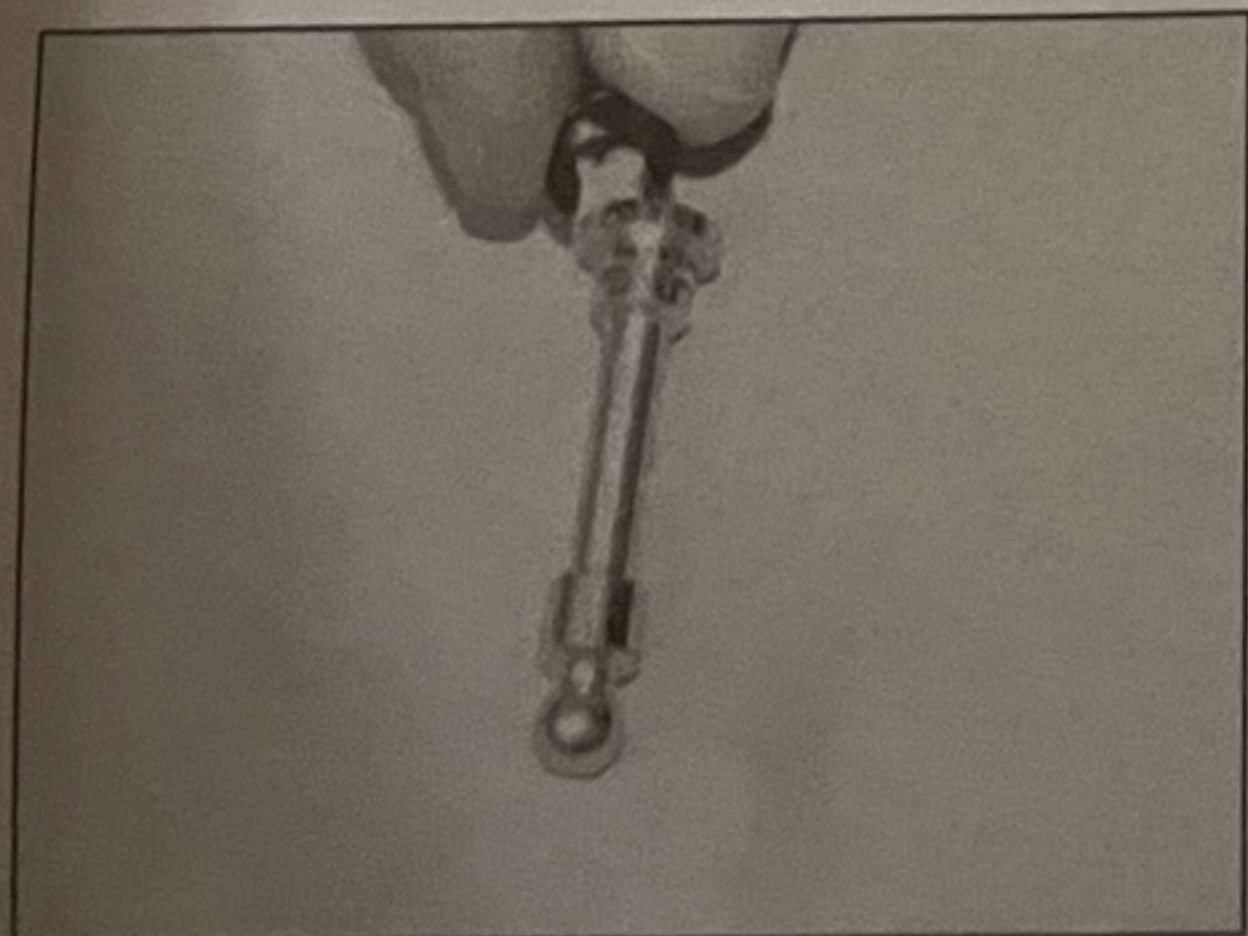
**Caution:** Never substitute a fuse of a higher rating, or make temporary repairs using wire or metal foil; more serious damage, or even a fire, could result.



4.7a Remove the air duct . . .



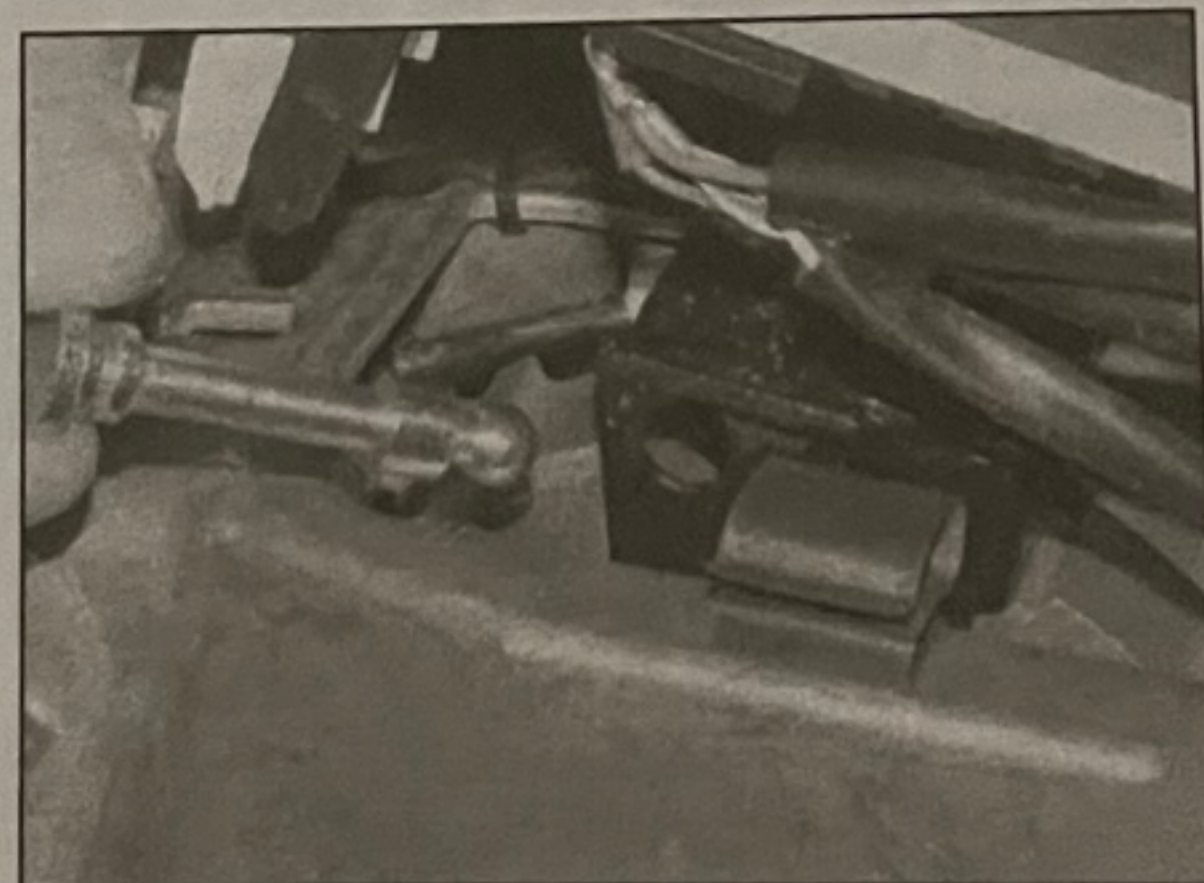
4.7c . . . then extract the circlip . . .



4.7e . . . ball-pin shown removed . . .



4.7b . . . disconnect the wiring connector . . .



4.7d . . . and remove the cable ball-pin . . .



4.7f . . . lift the housing . . .

## Relays

8 Relays are remote electrically-operated switches used in certain circuits. The relays are located under the right-hand side of the fascia, or on the left-hand side of the engine

compartment. Access to the fascia-mounted relays is gained by undoing the screw and lowering the relay holder (see illustrations). 9 If a component controlled by a relay becomes inoperative and the relay is suspected, listen to the relay as the circuit is operated. If the relay is functioning, it should be possible to hear it click as it is energised. If the relay proves satisfactory, 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 switching voltage, or the relay itself is faulty. Do not overlook the relay socket terminals when tracing faults. Testing is by the substitution of a known good unit, but be careful; some relays are identical in appearance and in operation, but perform different functions.

10 To renew a relay first ensure that the ignition switch is off. The relay can then simply be pulled out from the socket and the new relay pressed in.

## 4 Switches and controls - removal and refitting

### Ignition switch cylinder

#### Removal

1 Remove the ignition key antenna unit from around the switch cylinder by turning it slightly clockwise and lifting it up.

2 Turn the ignition key to the OFF position, but leave it inserted.

3 Bend a length of welding rod at right angles and insert it through the rear hole in the switch housing so that the locking catch is released. The lock cylinder can now be withdrawn directly from the housing. Refer to the cylinder removal included in *Ignition switch and lock* removal below for the location to insert the rod.

#### Refitting

4 Refitting is a reversal of removal.

### Ignition switch and lock

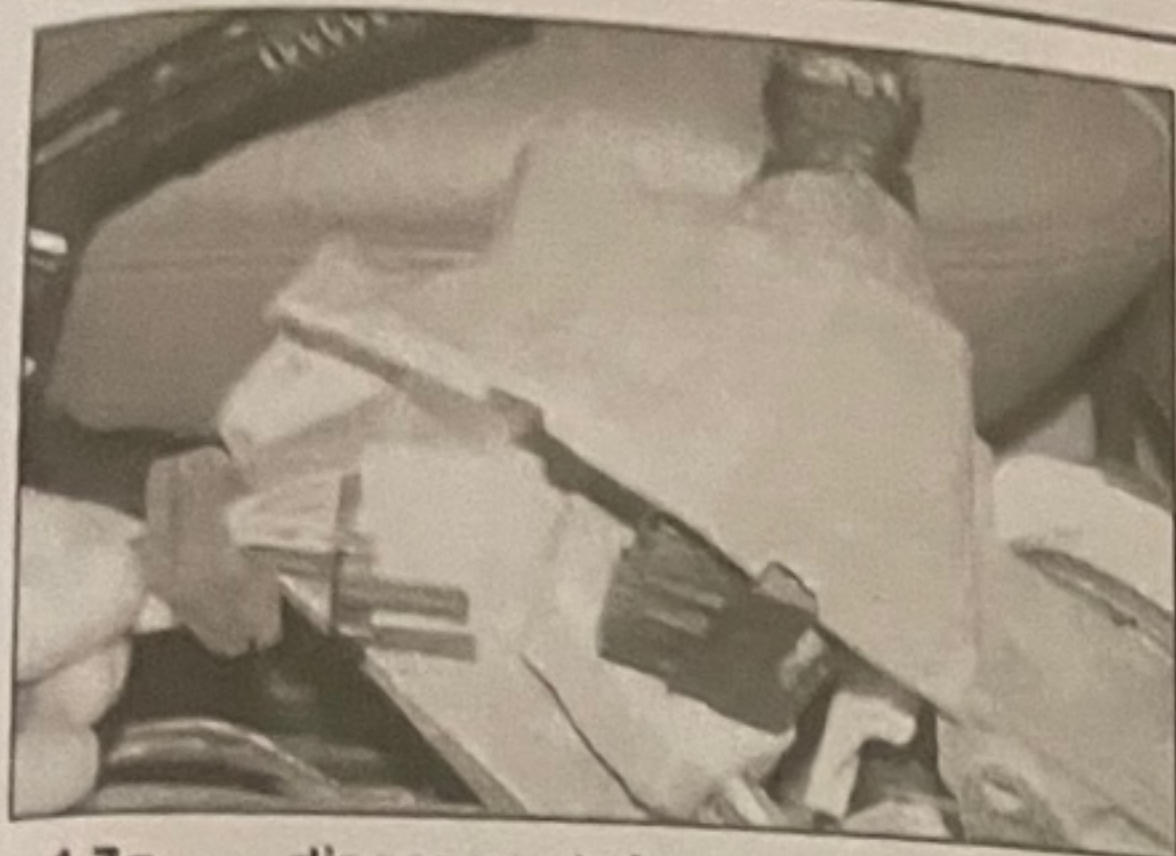
#### Removal

5 The ignition switch and lock is incorporated in the gearchange assembly between the front seats. Remove the centre console as described in Chapter 11; the ignition switch is incorporated in the gearchange housing.

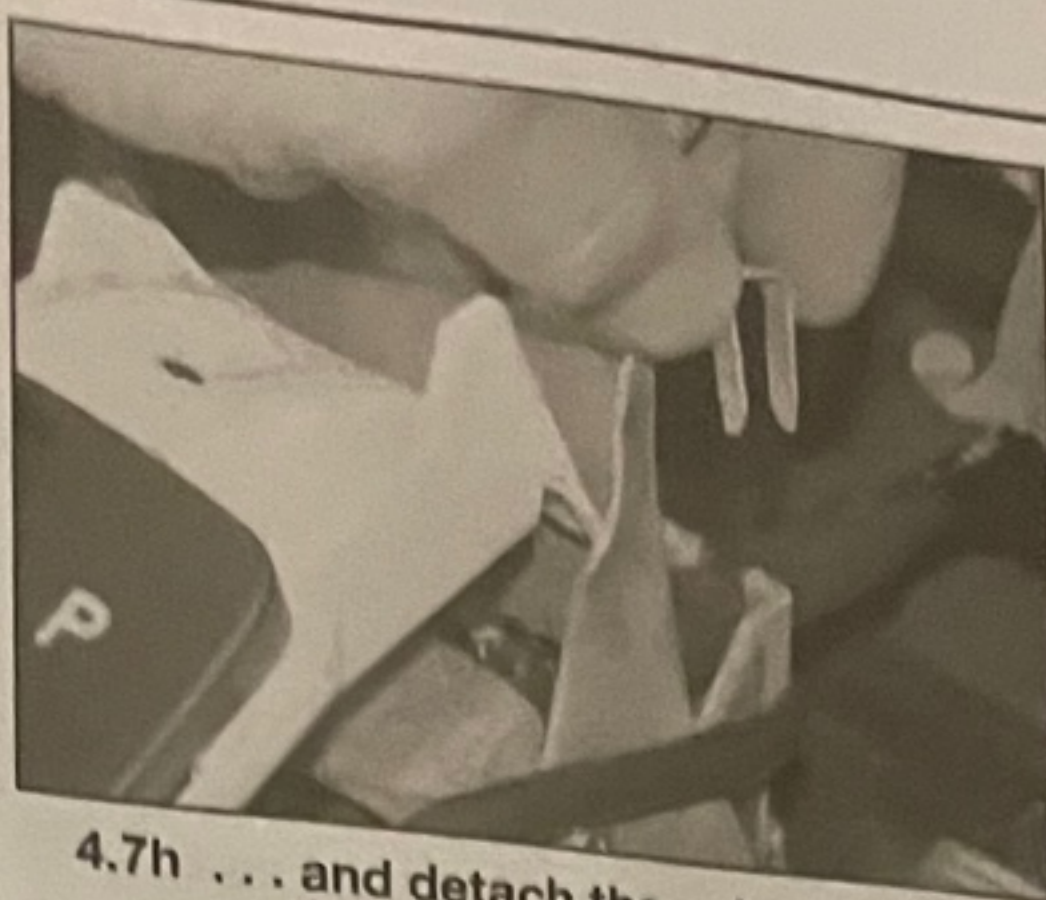
6 To remove the manual transmission gearchange housing, select 4th gear then loosen the clamp at the universal joint. Unscrew the bolts securing the housing to the floor, then lift the housing and disconnect the wiring. Also remove the heater air duct.

7 To remove the automatic transmission selector housing, remove the air duct, disconnect the upper wiring, then extract the circlip and drive out the cable ball-pin while disconnecting the cable end fitting. Unscrew the bolts securing the housing to the floor, then lift the housing and disconnect the wiring and release the cable-ties. Pull out the clip

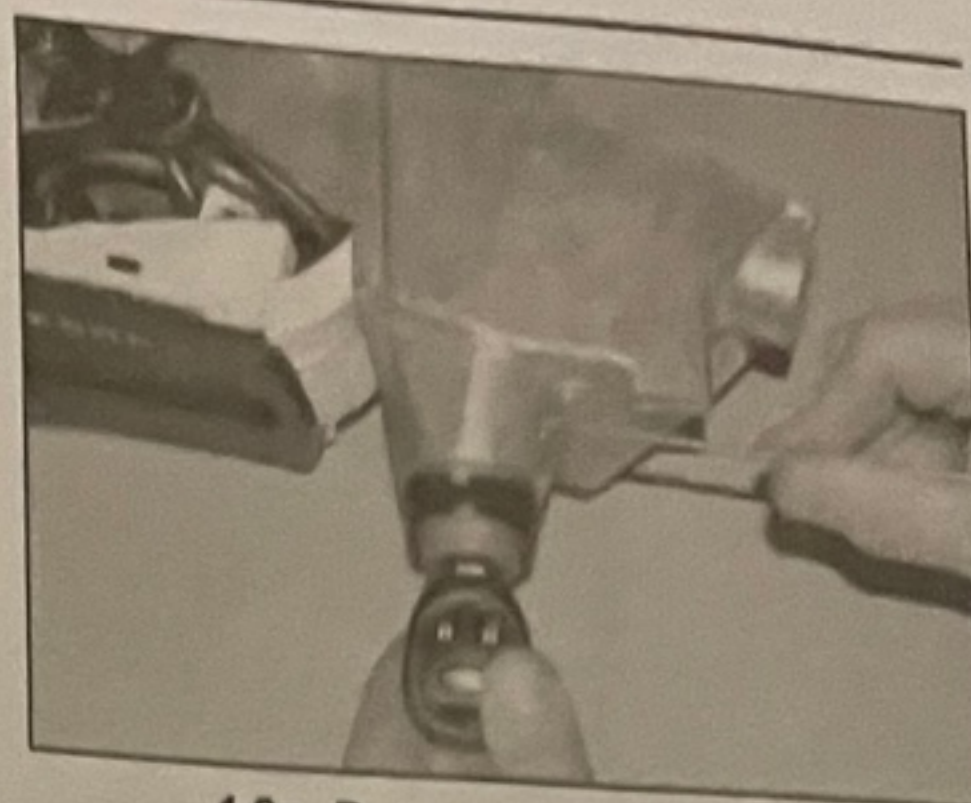




4.7g ... disconnect the lower wiring ...



4.7h ... and detach the selector cable from the housing



4.8a Depress the catch ...

and lift the selector cable from the housing (see illustrations).

8 Remove the ignition switch cylinder as described earlier in this Section, then undo the screws and remove the switch from the housing. Note the location of the spacer (see illustrations).

#### Refitting

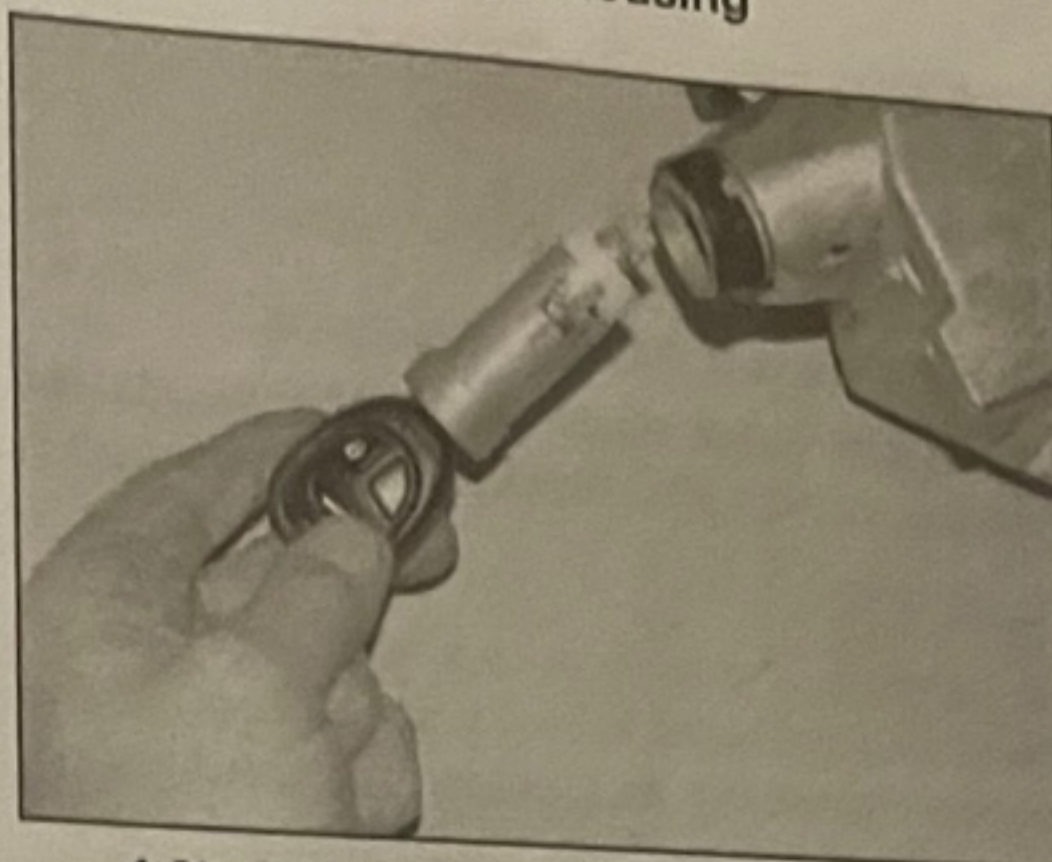
9 Refitting is a reversal of removal.

#### Steering column switch

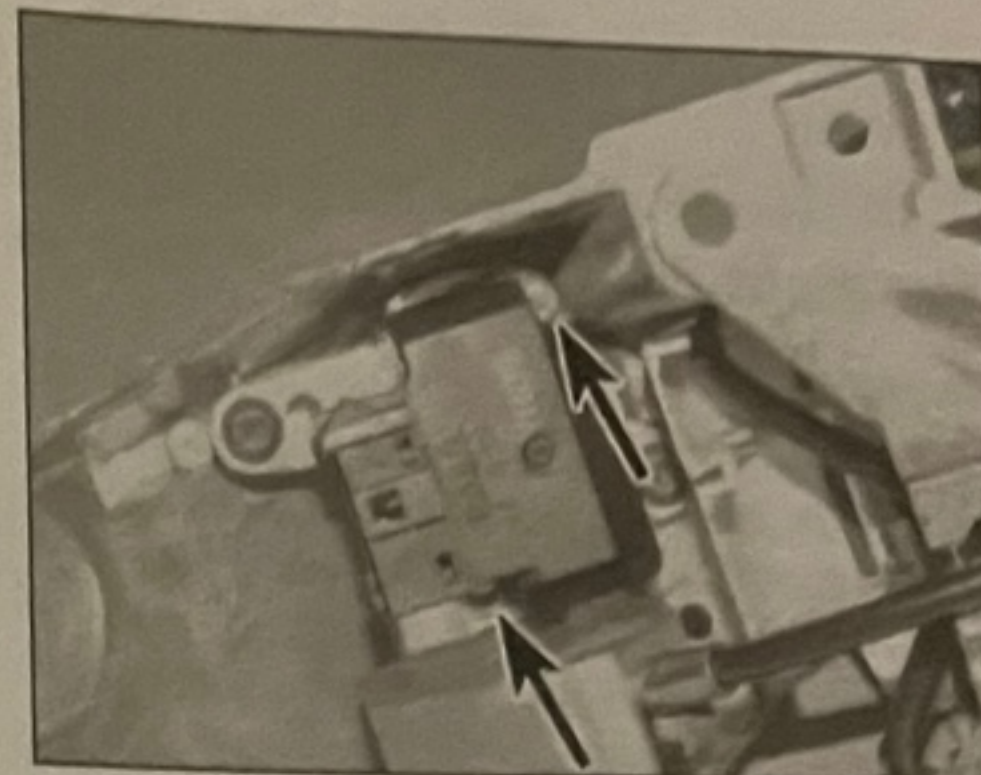
##### Removal

10 Adjust the steering wheel to its lowest and most rearward position, then lock it. To make access easier, remove the steering wheel as described in Chapter 10.

11 Remove the steering column upper and lower shrouds. There are two screws facing forward in the upper shroud, and one screw facing forward beneath the lower shroud.



4.8b ... remove the ignition switch cylinder ...



4.8c ... undo the screws (arrowed) ...

12 Release the retaining clips and slide out the combination switch, then disconnect the wiring (see illustrations).

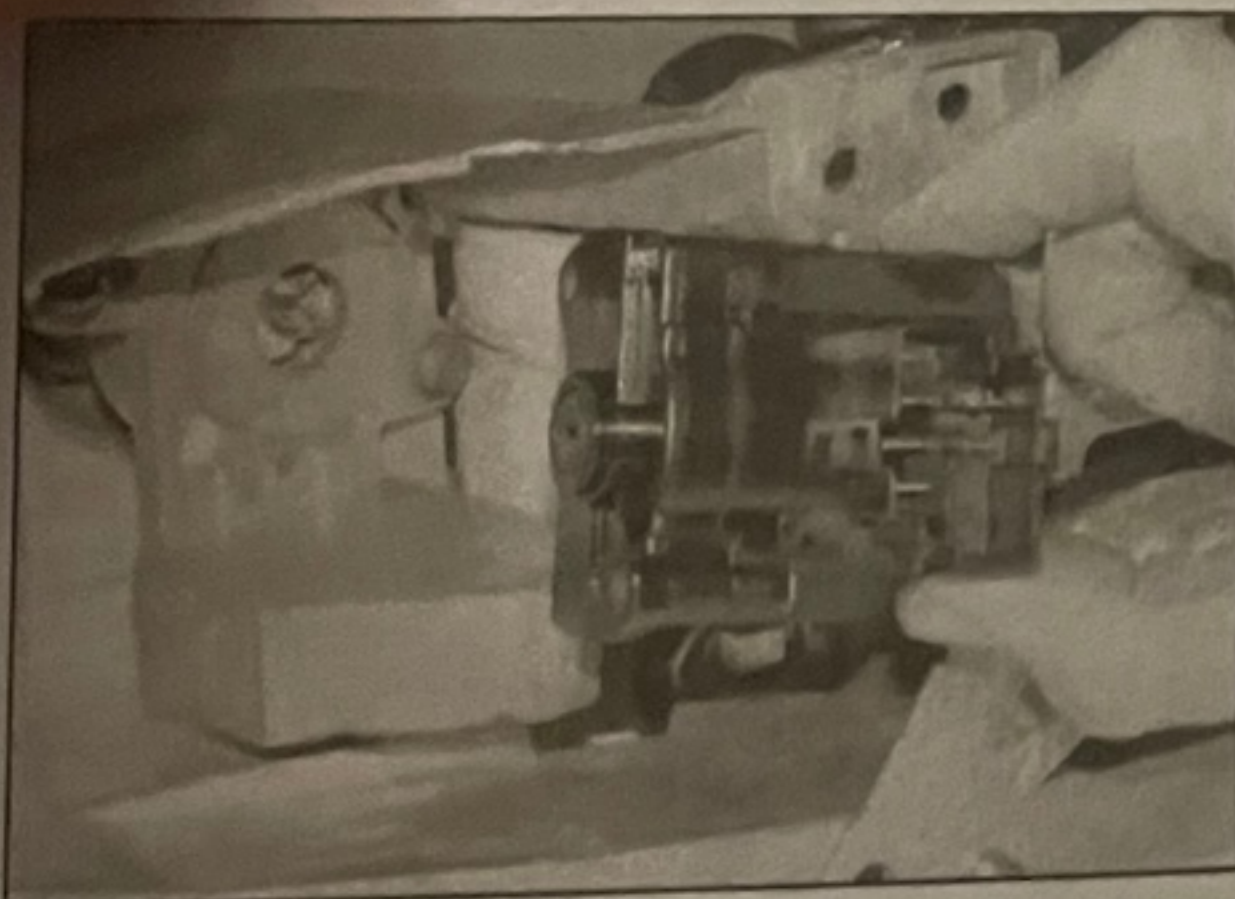
#### Refitting

13 Refitting is a reversal of removal.

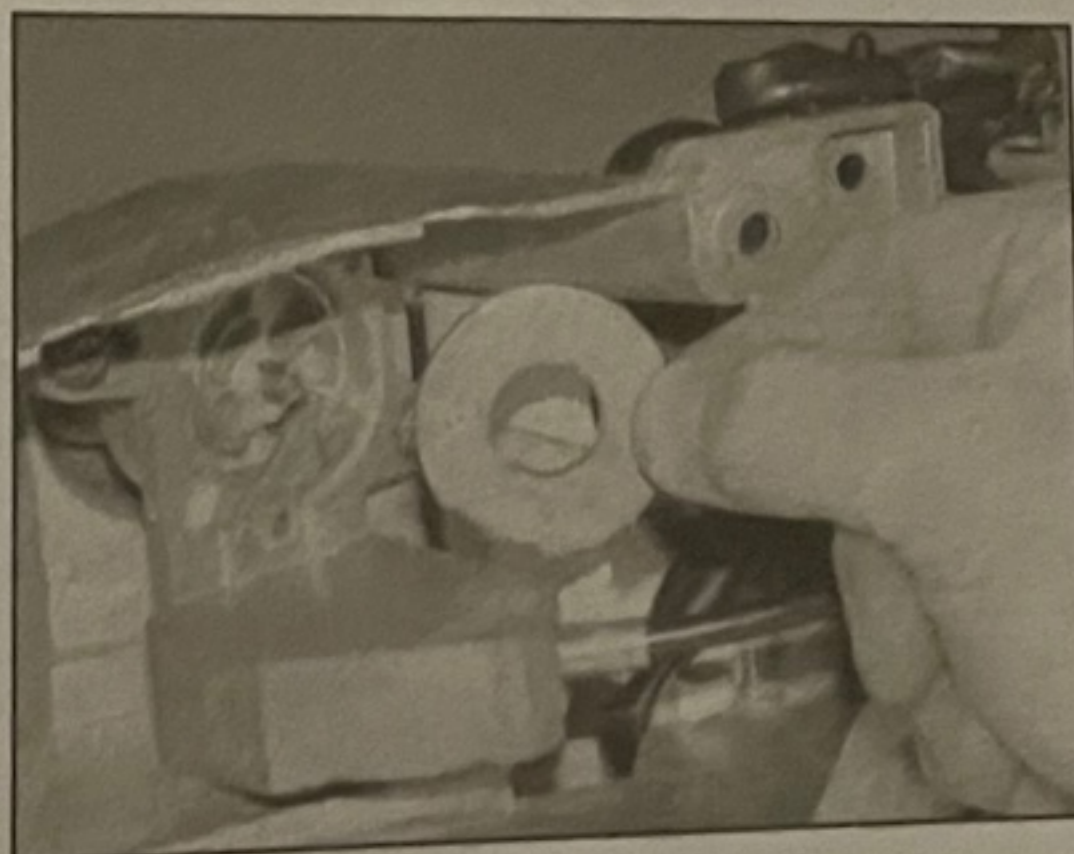
#### Electric window control switch

##### Removal

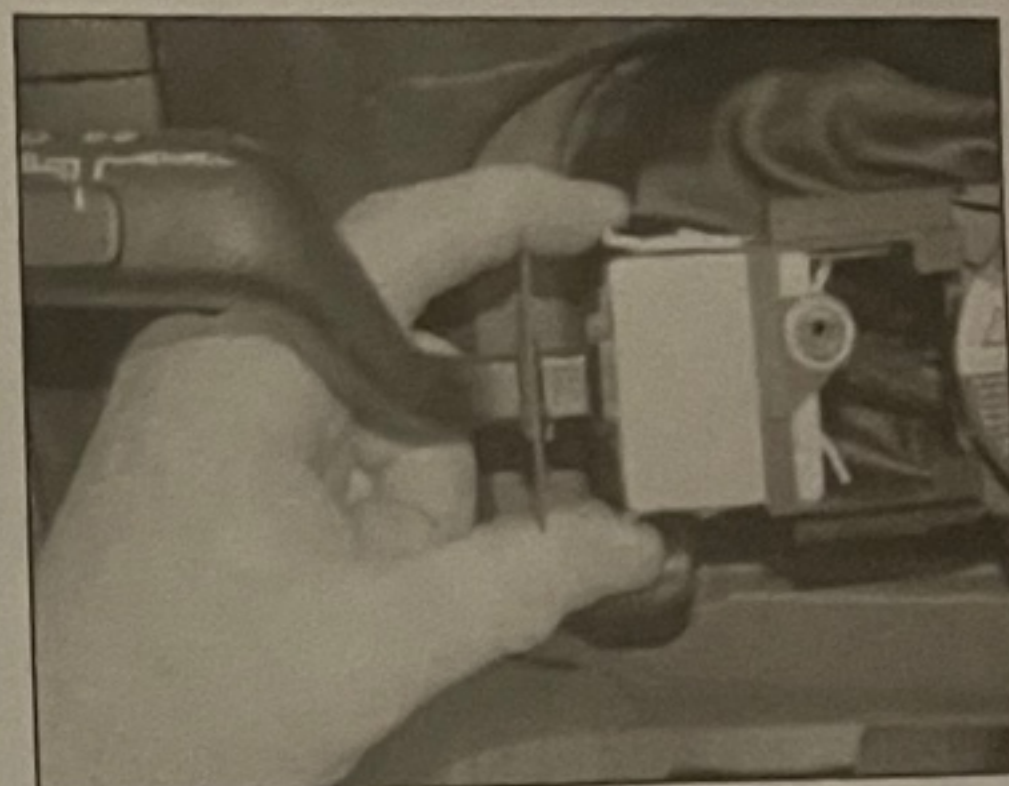
14 Using a screwdriver, carefully prise up the front of the switch from the centre console.



4.8d ... and remove the ignition switch ...



4.8e ... and then the spacer



4.12a Remove the indicator/lighting combination switch ...



4.12b ... and disconnect the wiring

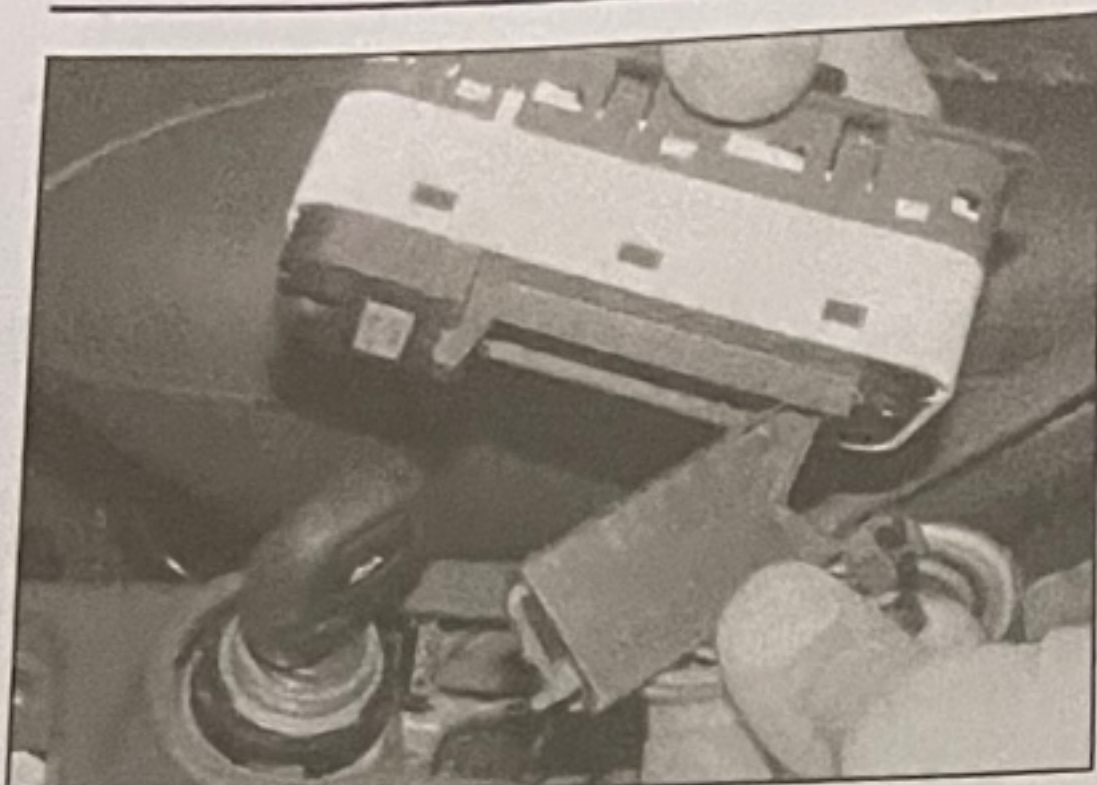


4.12c Remove the wiper/washer combination switch ...



4.12d ... and disconnect the wiring





4.15 Disconnecting the wiring from the electric window control switch

15 Disconnect the wiring (see illustration).

#### Refitting

16 Refitting is a reversal of removal.

#### Headlight height switch

##### Removal

17 Using a screwdriver, carefully prise the switch from the facia panel. If it is tight, remove the lighting switch (see paragraph 23) and press the switch out from behind.

18 Disconnect the wiring.

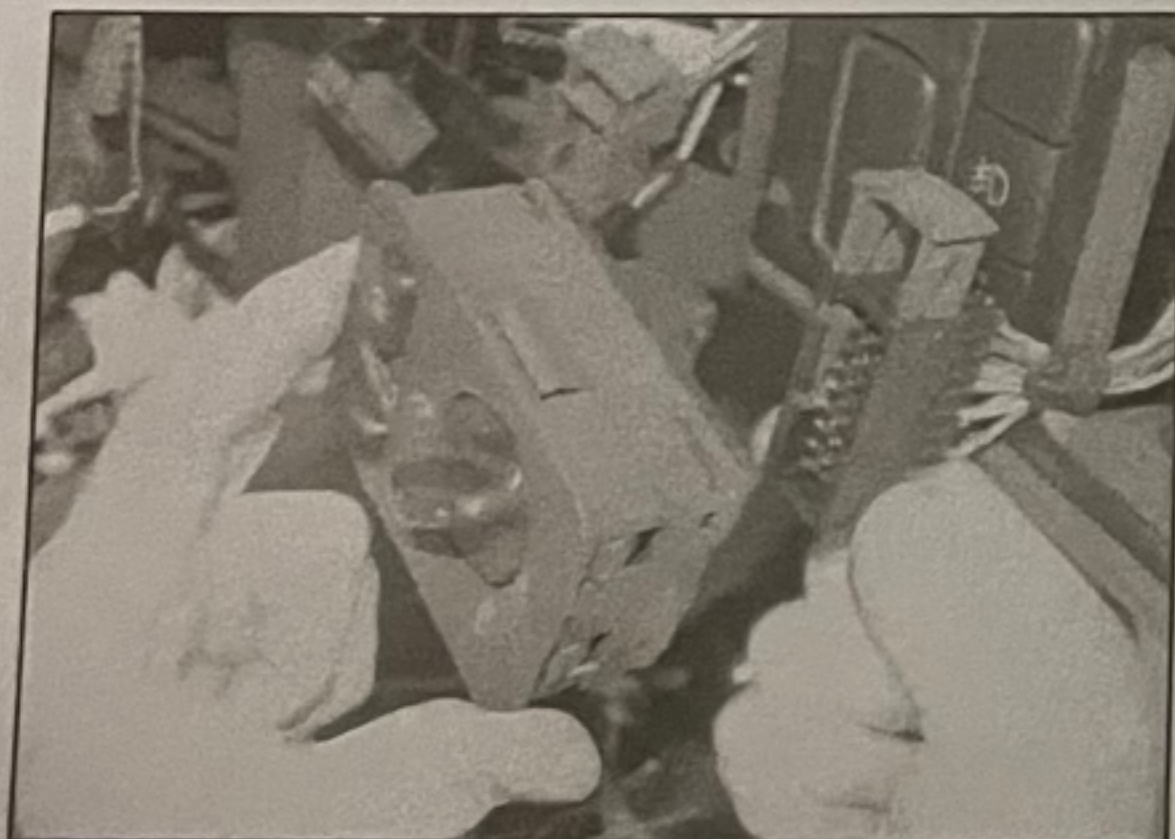
##### Refitting

19 Refitting is a reversal of removal.

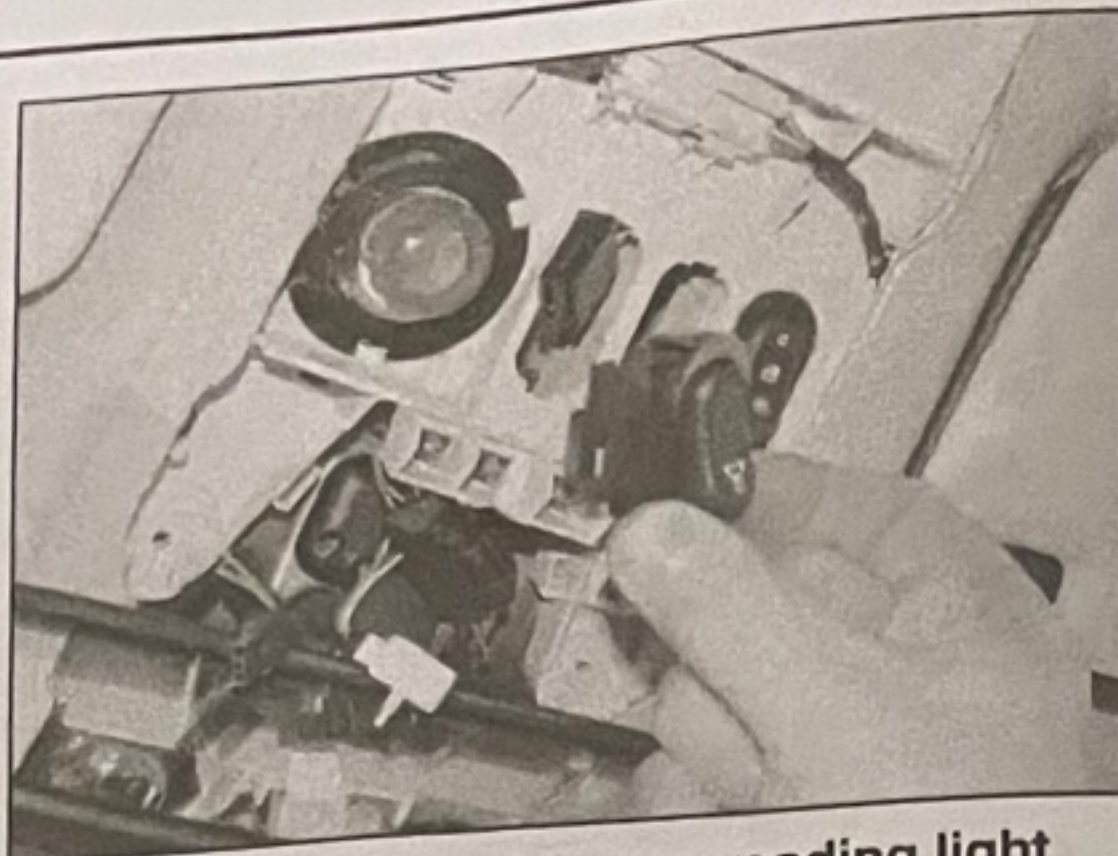
#### Interior lighting control switch

##### Removal

20 Using a screwdriver, carefully prise the switch from the centre console rear section. Access to the lighting switches on the



4.24 ... and disconnect the wiring



4.20 Removing the map reading light switch

headlining console is gained after removing the lens and cover (see illustration).

21 Disconnect the wiring.

##### Refitting

22 Refitting is a reversal of removal.

#### Lighting and rear foglight switch/instrument illumination rheostat

##### Removal

23 Remove the lid from the main fusebox on the end of the facia. Insert a finger through the fusebox opening and press out the lighting switch from behind (see illustration).

24 Disconnect the wiring (see illustration).

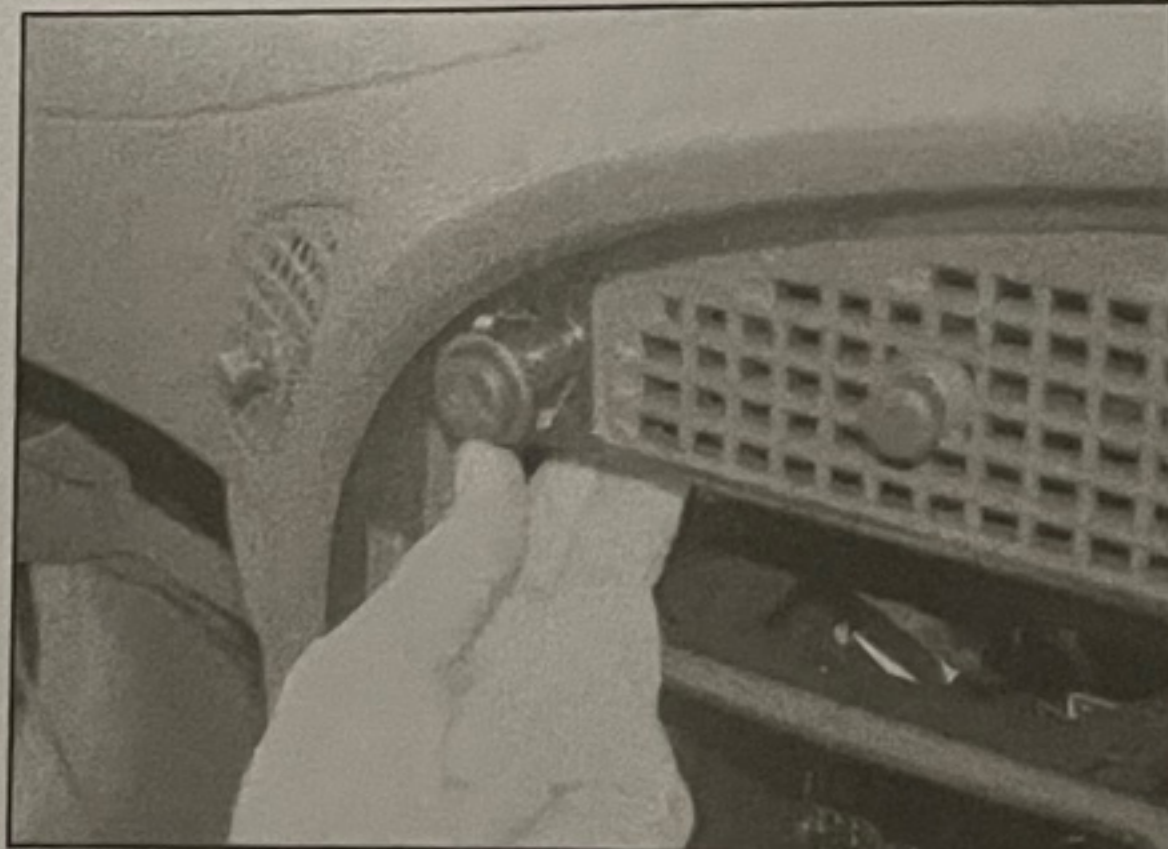
##### Refitting

25 Refitting is a reversal of removal.

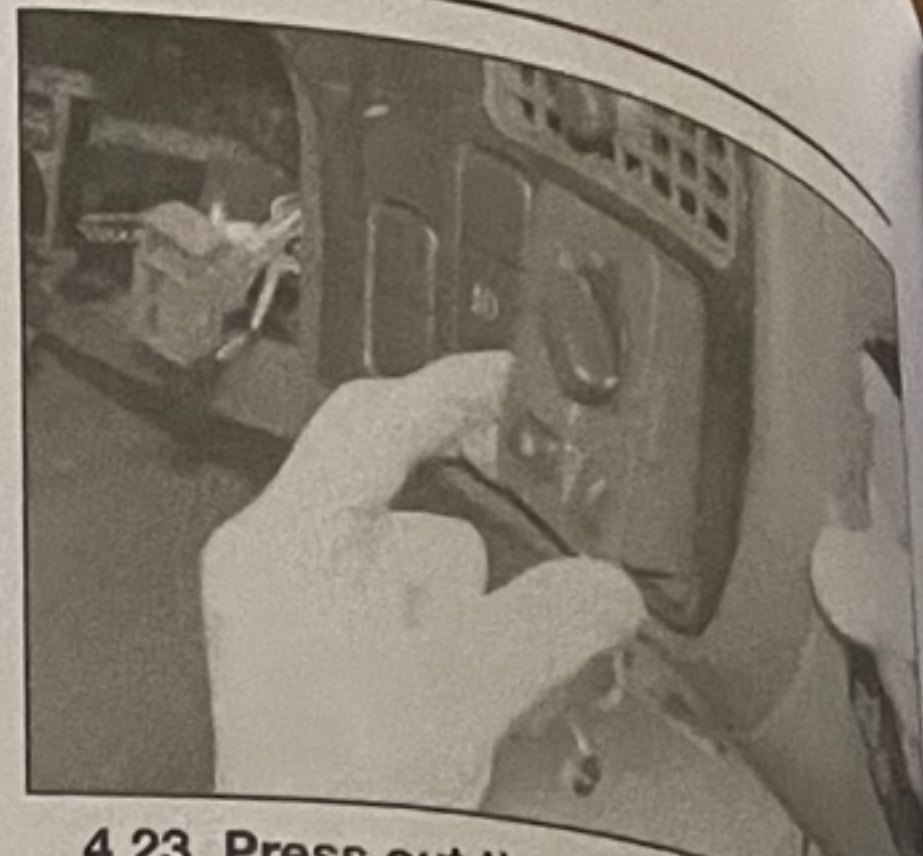
#### Stop-light switch

##### Removal

26 To remove the switch, first remove the



4.30 Removing the hazard warning light switch



4.23 Press out the lighting switch from behind ...

lower trim panel from the facia with reference to Chapter 11.

27 Twist the switch anti-clockwise 90° and withdraw it from the mounting bracket.

28 Disconnect the wiring from the switch.

##### Refitting

29 Refitting is a reversal of removal.

#### Hazard warning light switch

##### Removal

30 The switch is held in position by two tensioned plastic tabs which have both fitting and removal ramps. Carefully prise the switch from the facia using a screwdriver, or alternatively press out the switch from behind after removing the SID module or radio/CD player, depending on model (see illustration).

31 Disconnect the wiring.

##### Refitting

32 Refitting is a reversal of removal.

#### Electric door mirror switch

##### Removal

33 Carefully prise the switch from the triangular cover on the front door.

34 Disconnect the wiring.

##### Refitting

35 Refitting is a reversal of removal.

#### Courtesy light switch

##### Removal

36 Open the door then undo the screw securing the courtesy light switch to the B- or C-pillar (see illustration).

37 Remove the switch and disconnect the wiring. Tape the wire to the pillar to prevent it dropping inside.

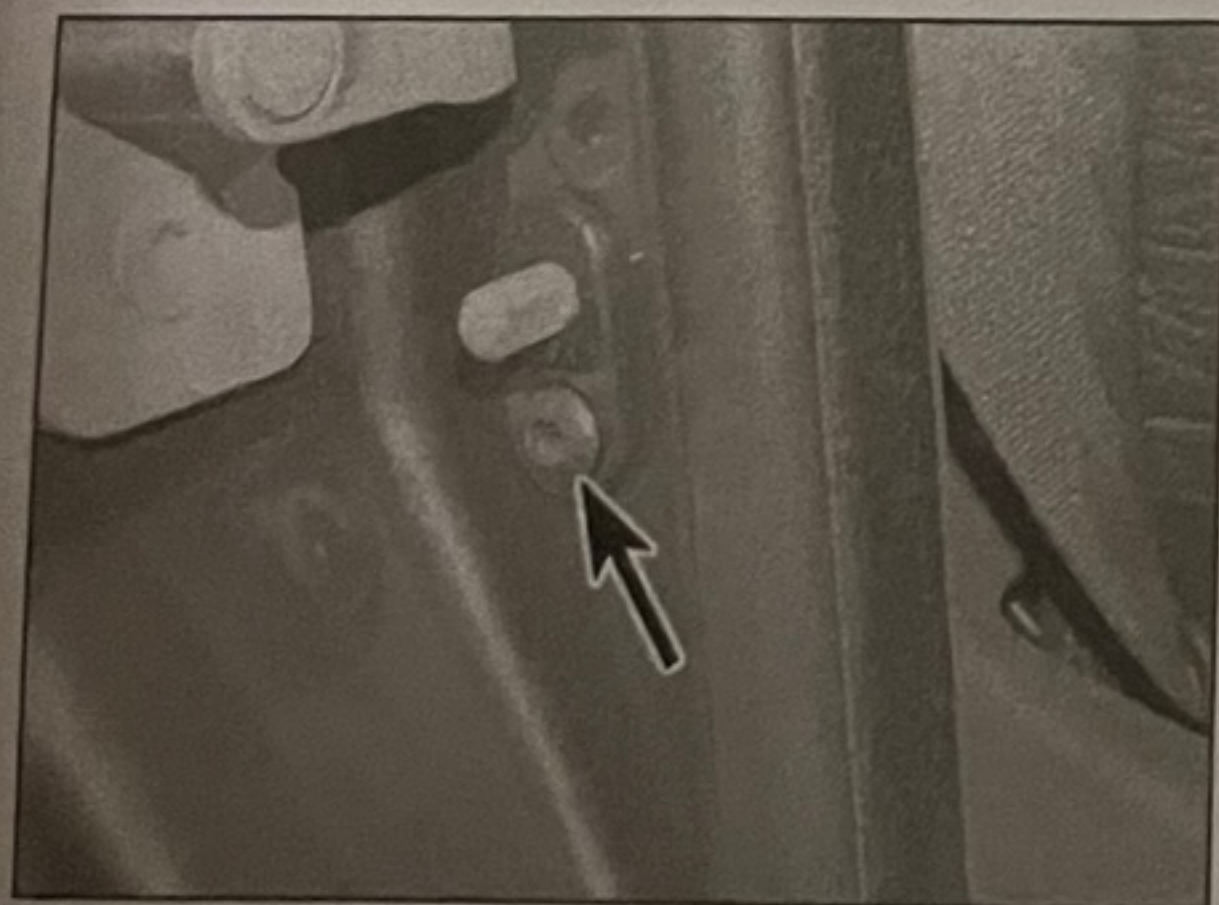
##### Refitting

38 Refitting is a reversal of removal.

#### TCS switch

##### Removal

39 Using a screwdriver, carefully prise out the switch from the facia. On earlier models, remove the radio/CD player unit and press out the switch from behind (see illustration). On later models, remove the lighting switch (see paragraph 23) and press the switch out from behind.

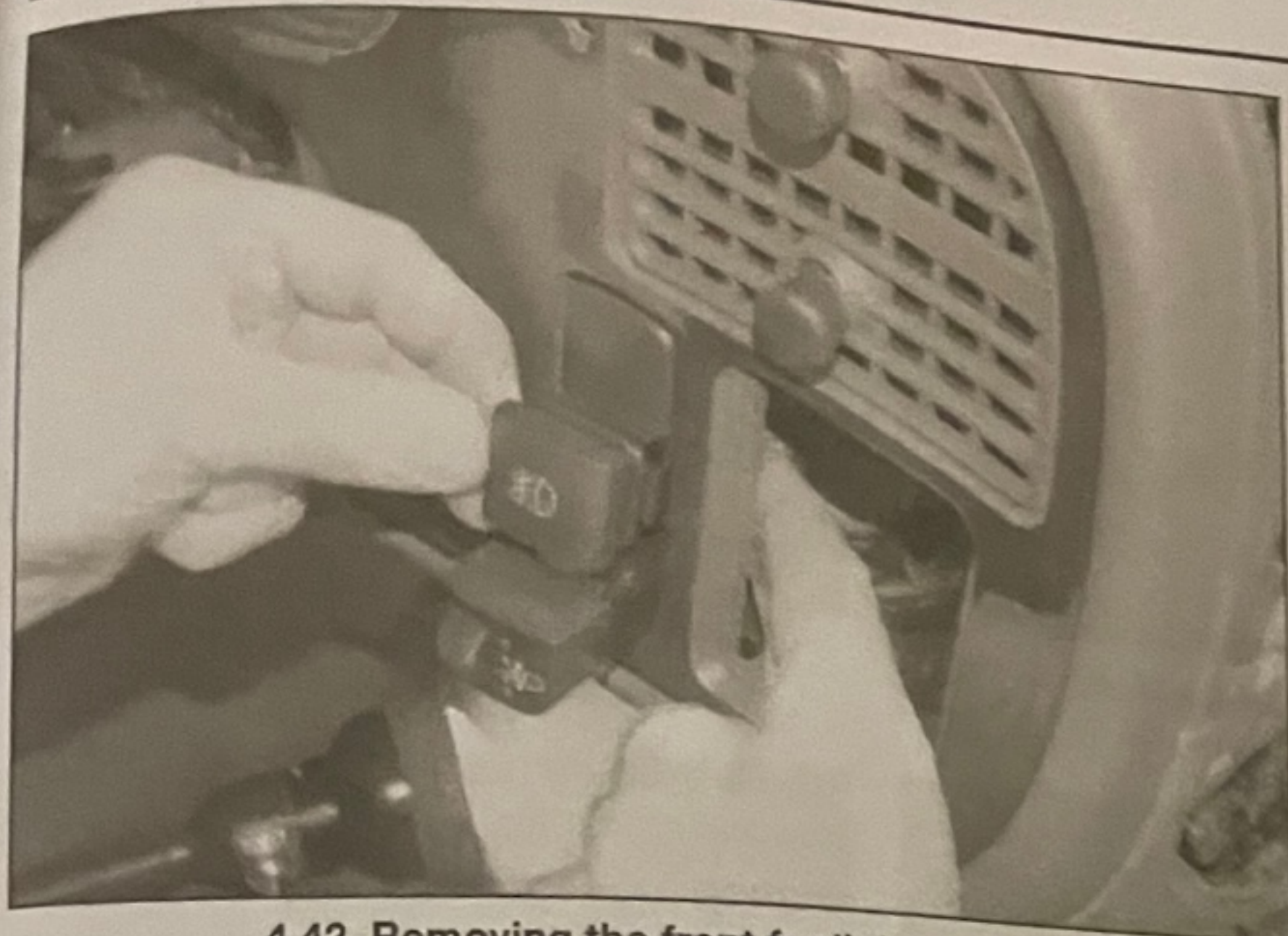


4.36 Courtesy light switch retaining screw



4.39 Removing the TCS switch (early models)





4.42 Removing the front foglight switch

40 Disconnect the wiring.

#### Refitting

41 Refitting is a reversal of removal.

### Front foglight switch

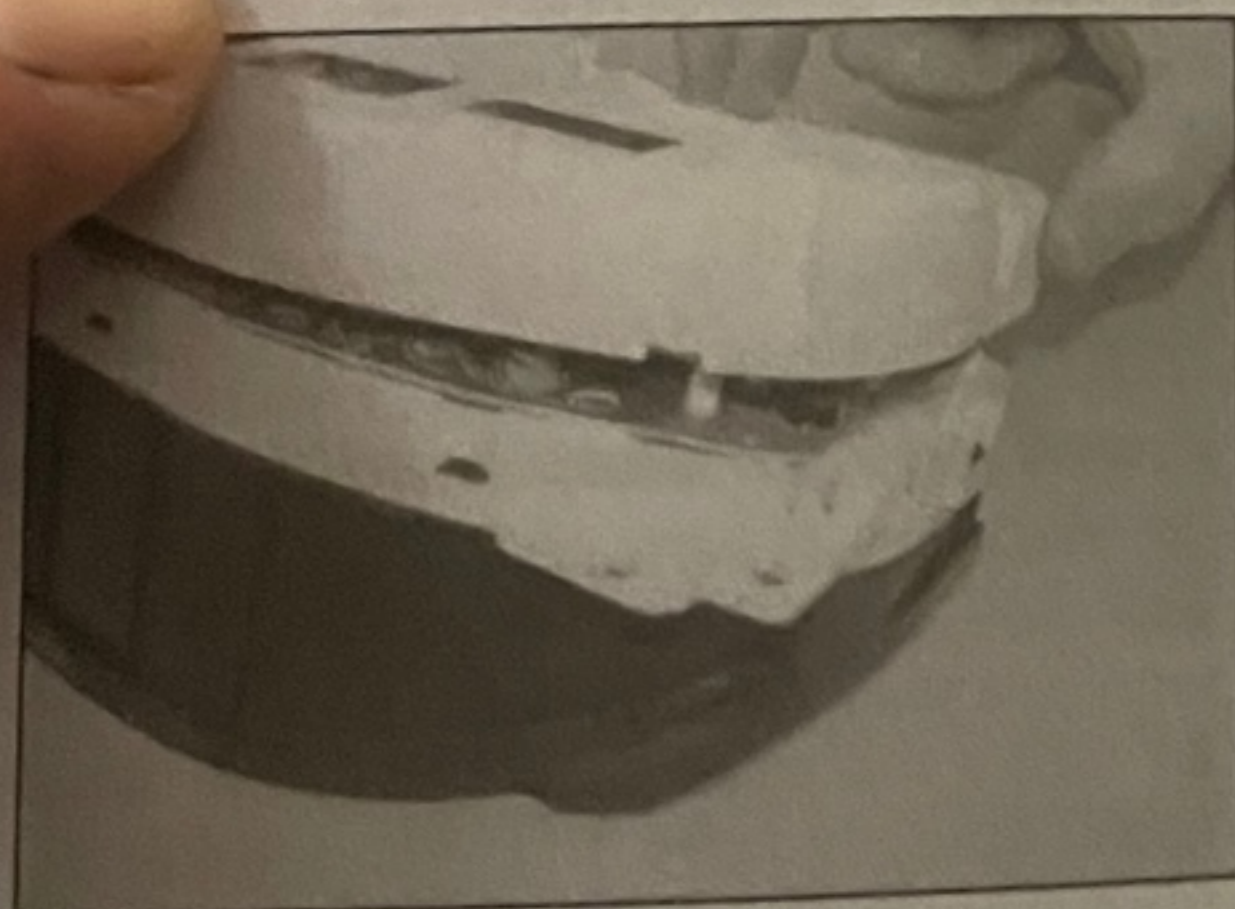
#### Removal

42 Carefully prise out the switch from the fascia, or alternatively remove the lighting switch and press out the switch from behind (see illustration).

43 Disconnect the wiring.

#### Refitting

Refitting is a reversal of removal.



5.3 ... release the clips, and withdraw the back panel

### 5 Interior light bulbs - renewal

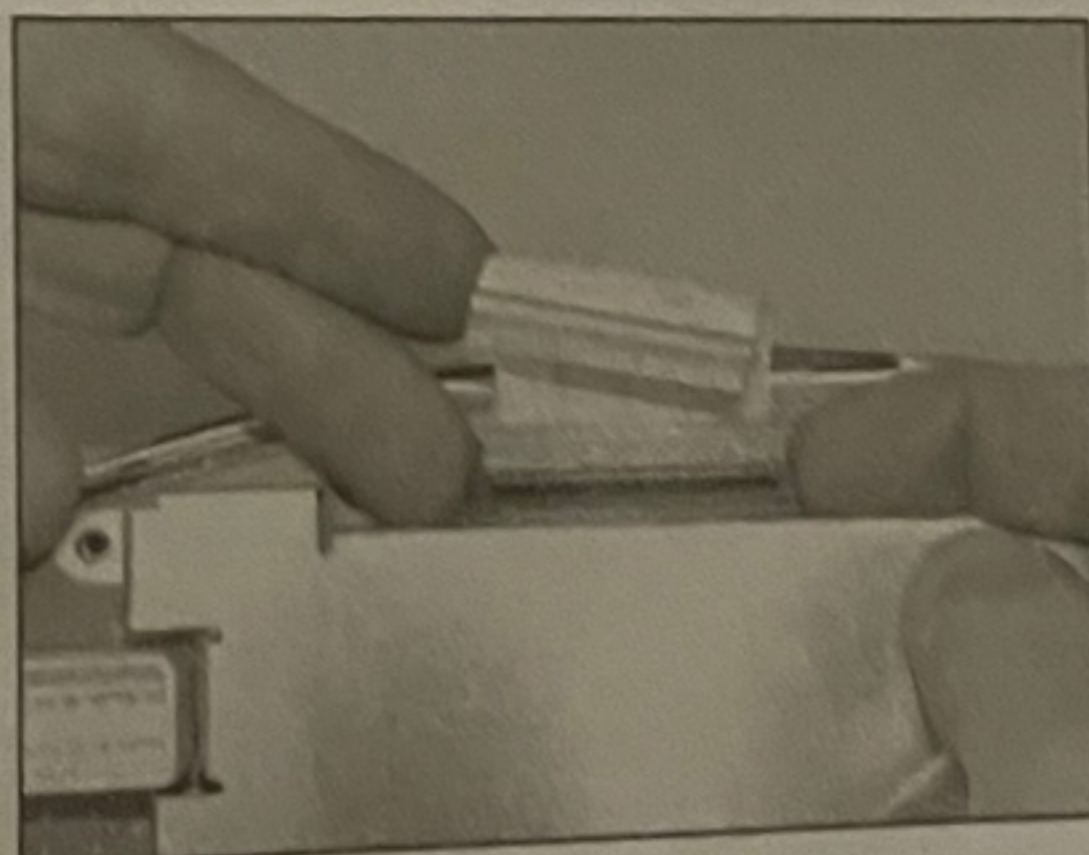
#### Instrument panel

1 Remove the instrument panel as described in Section 9.

2 Undo and remove the 8 screws securing the back panel to the module (see illustration).

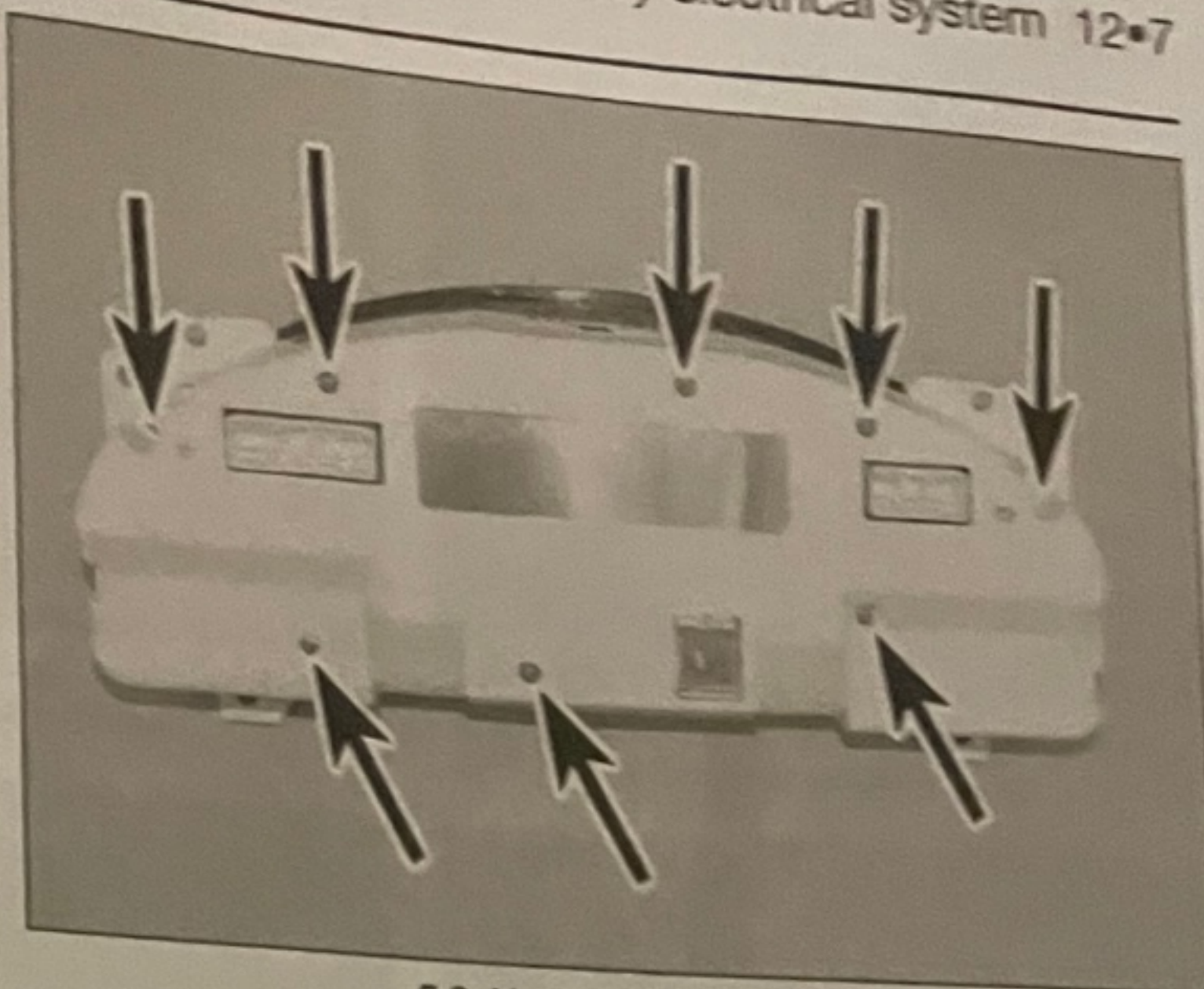
**Note:** Four of the screws are short and four are long, so record their positions.

3 Release the 2 side clips and withdraw the back panel (see illustration).



5.4a Disconnect the wiring plugs ...

5.2 Undo the screws ...



4 Disconnect the wiring plugs and remove the printed circuit boards (see illustrations).

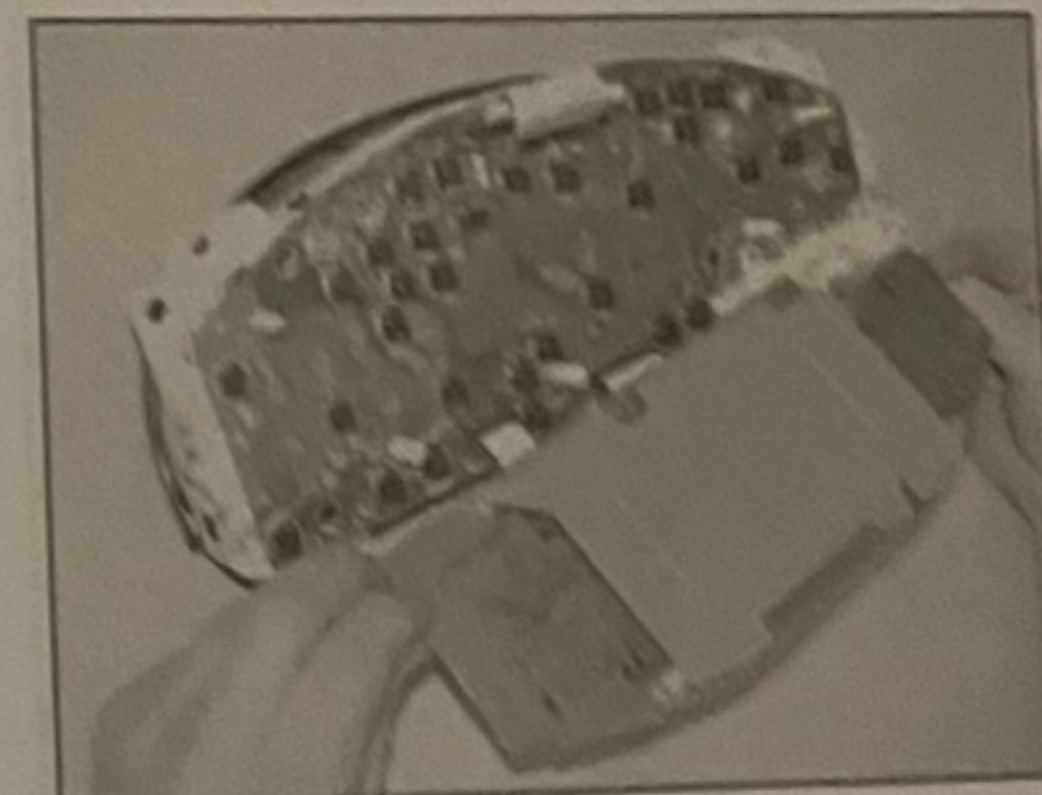
5 Twist the relevant bulbholder and remove it from the instrument panel; the bulbholder positions are marked on the printed circuit board (see illustrations).

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

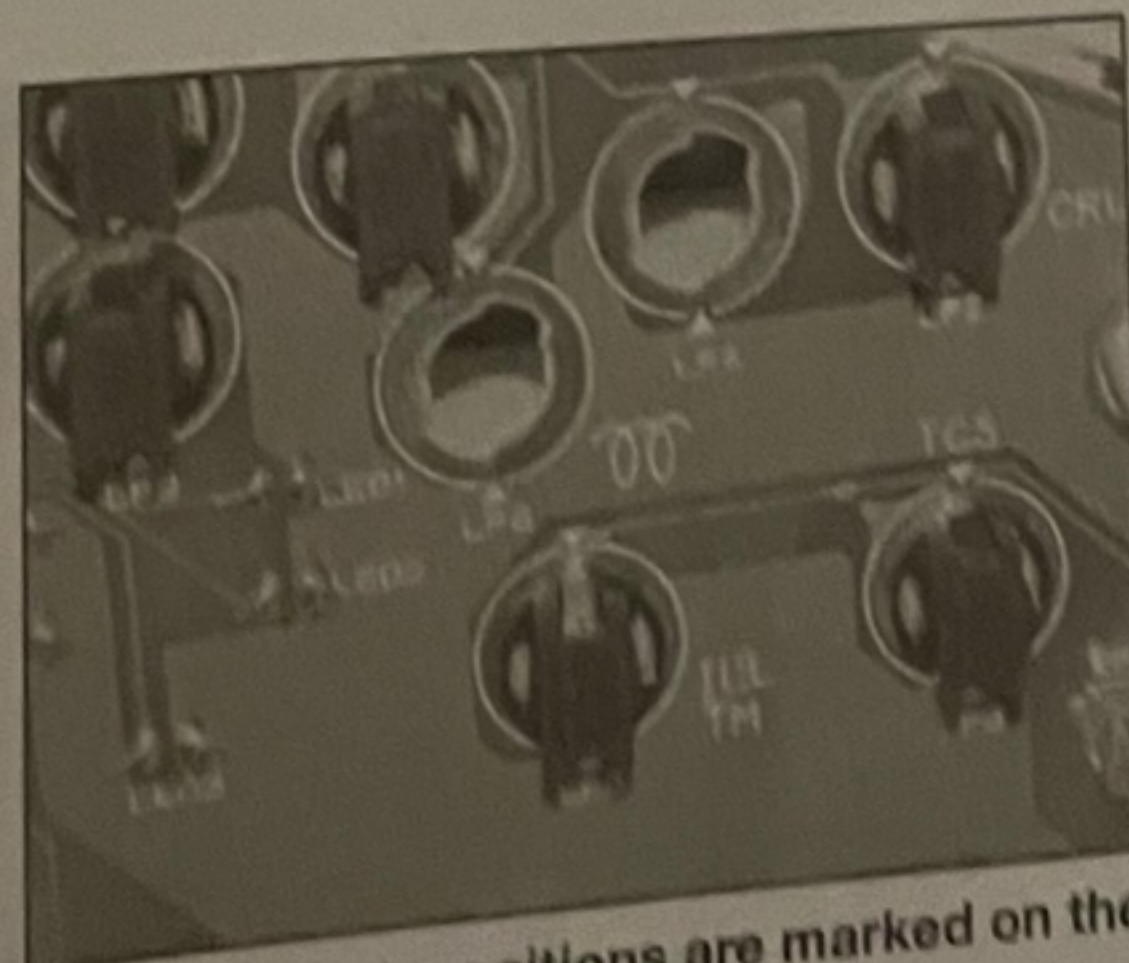
#### Rear interior lights

#### Passenger compartment

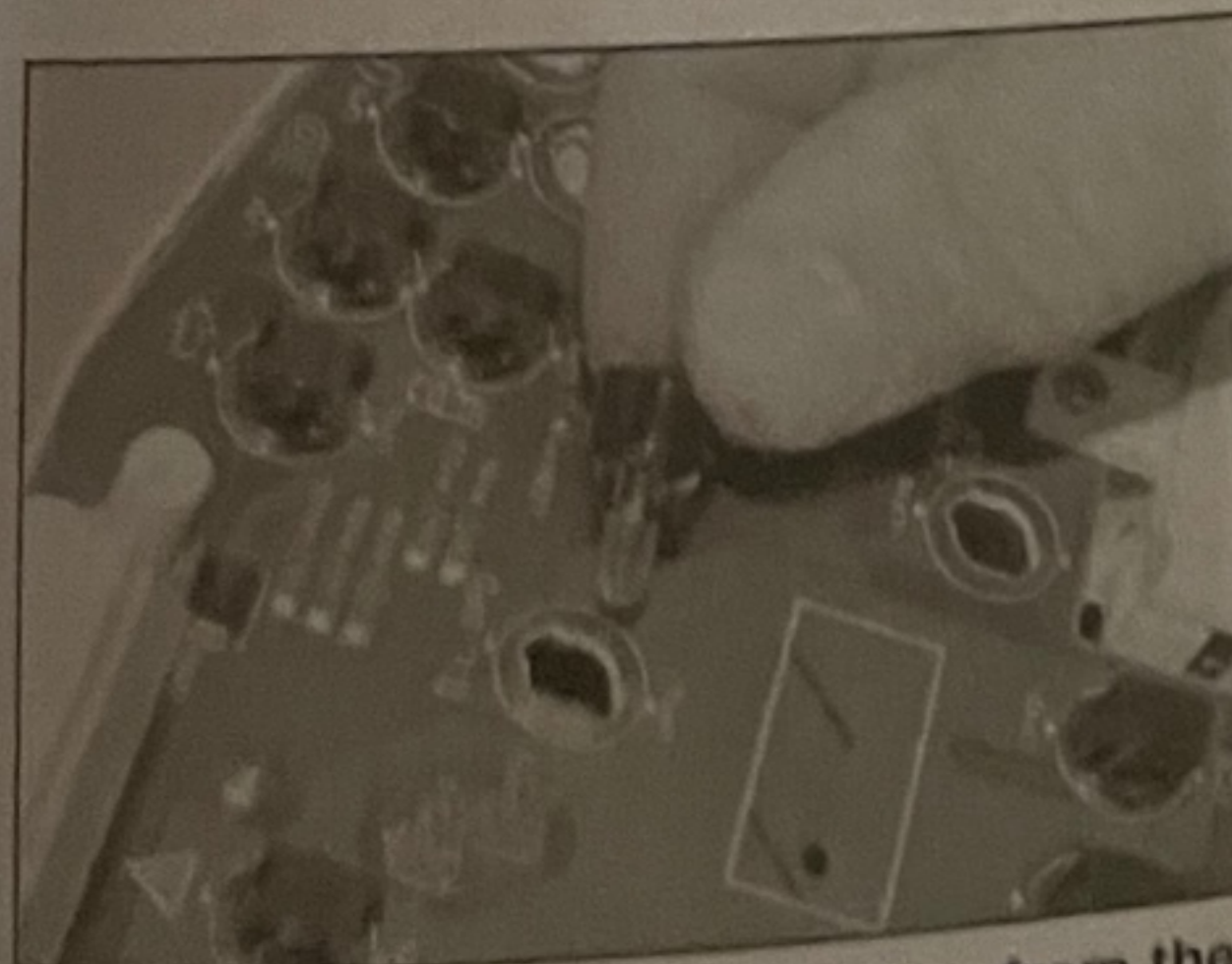
7 Using a screwdriver, carefully prise down the interior light lens (see illustration). Note that the glass breakage sensor is located in the light cover.



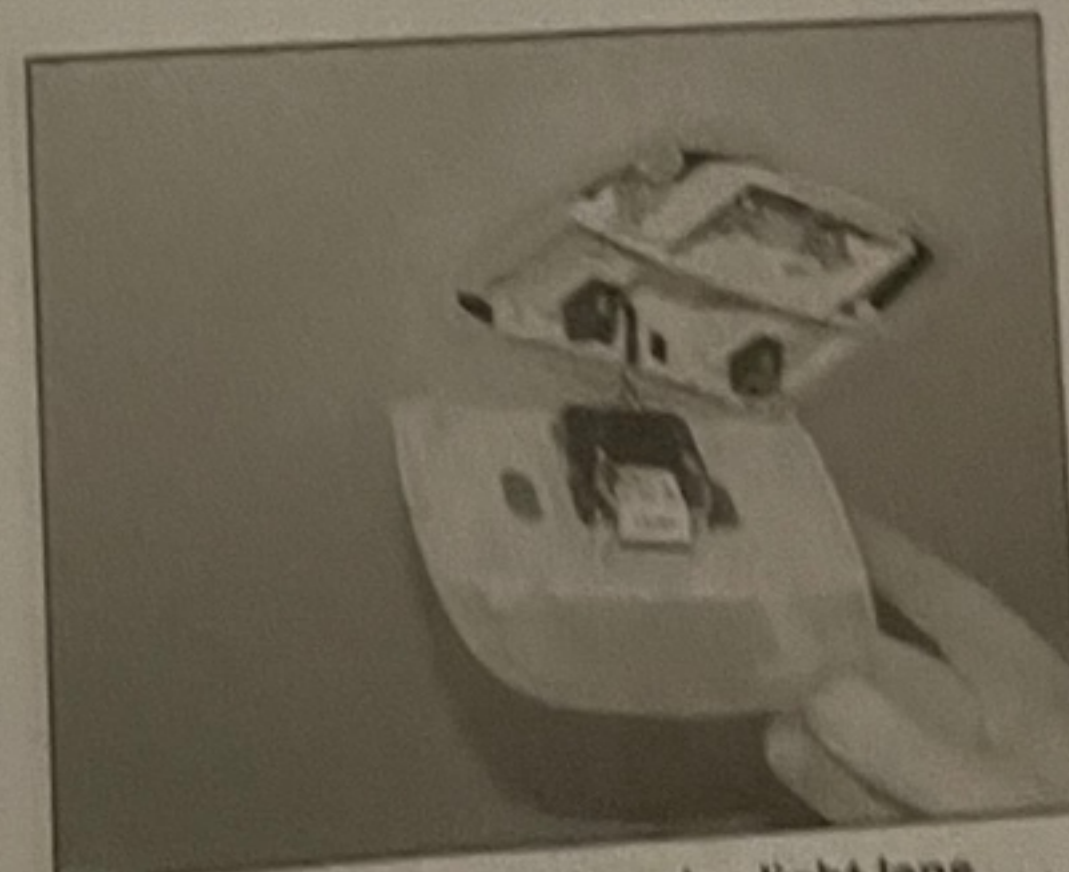
5.4b ... and remove the printed circuit boards



5.5b The bulb positions are marked on the printed circuit

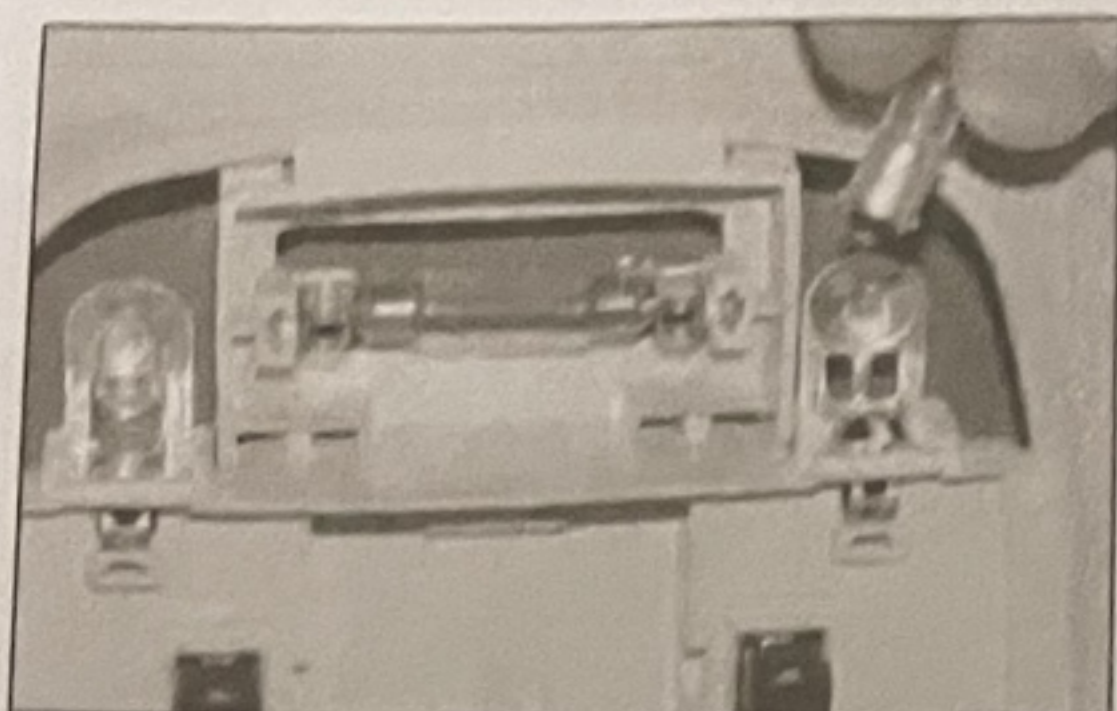


5.5a Removing a bulb/bulbholder from the printed circuit board

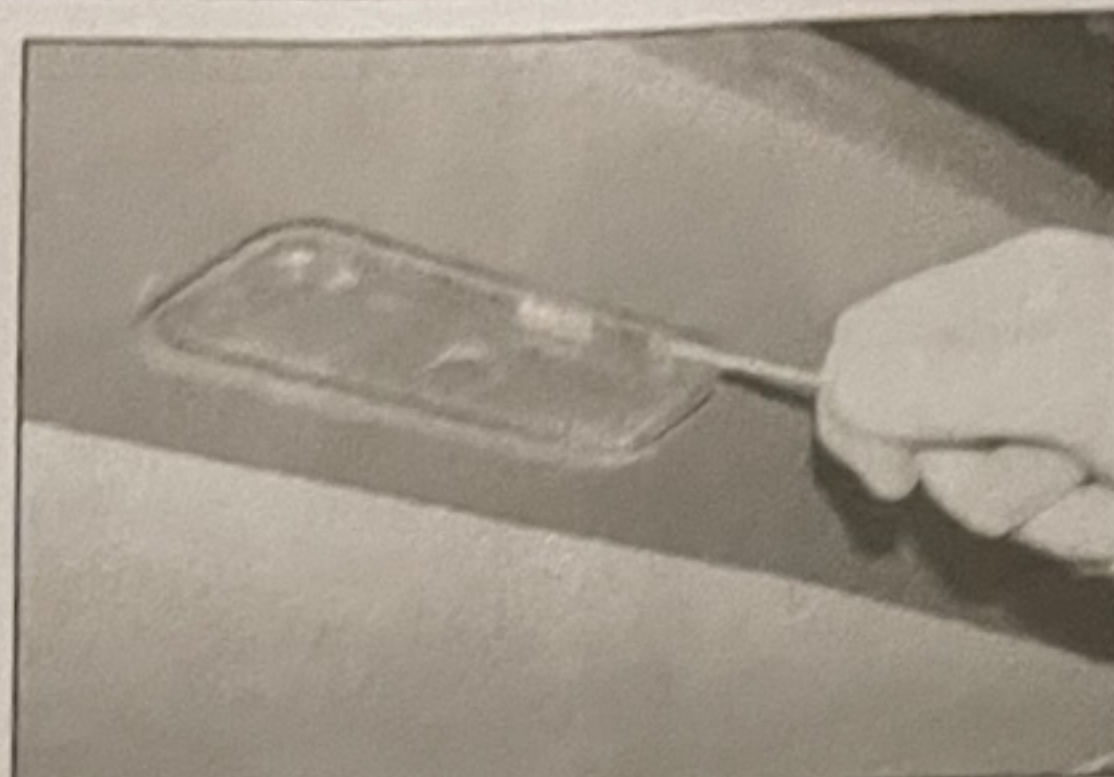


5.7 Prise down the interior light lens ...

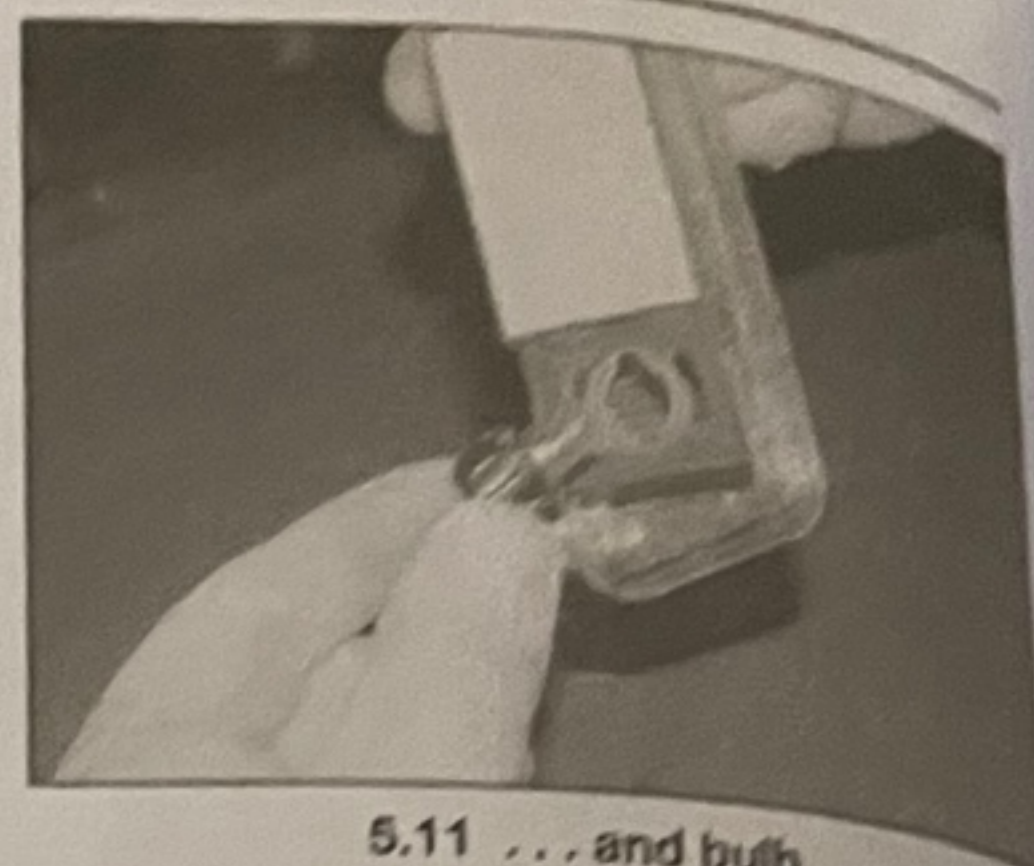




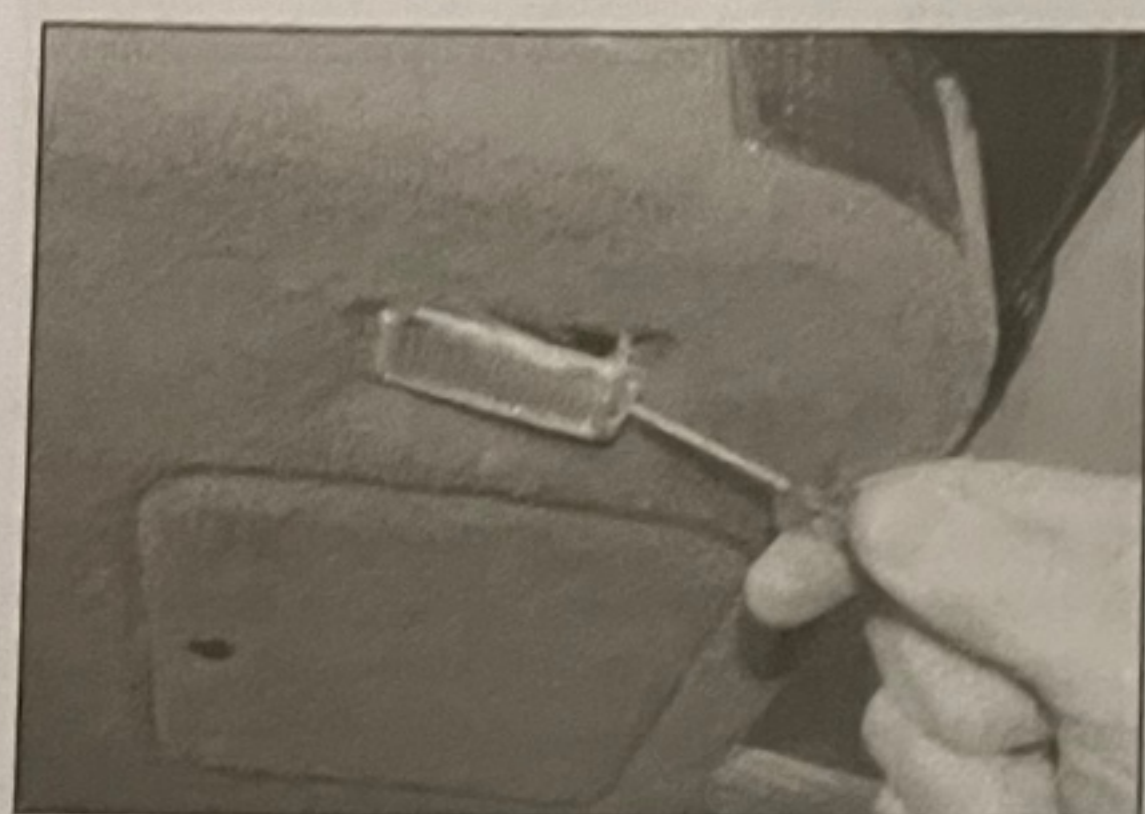
5.8 ... then depress and twist the side bulbs, or release the central festoon-type bulb from its terminals



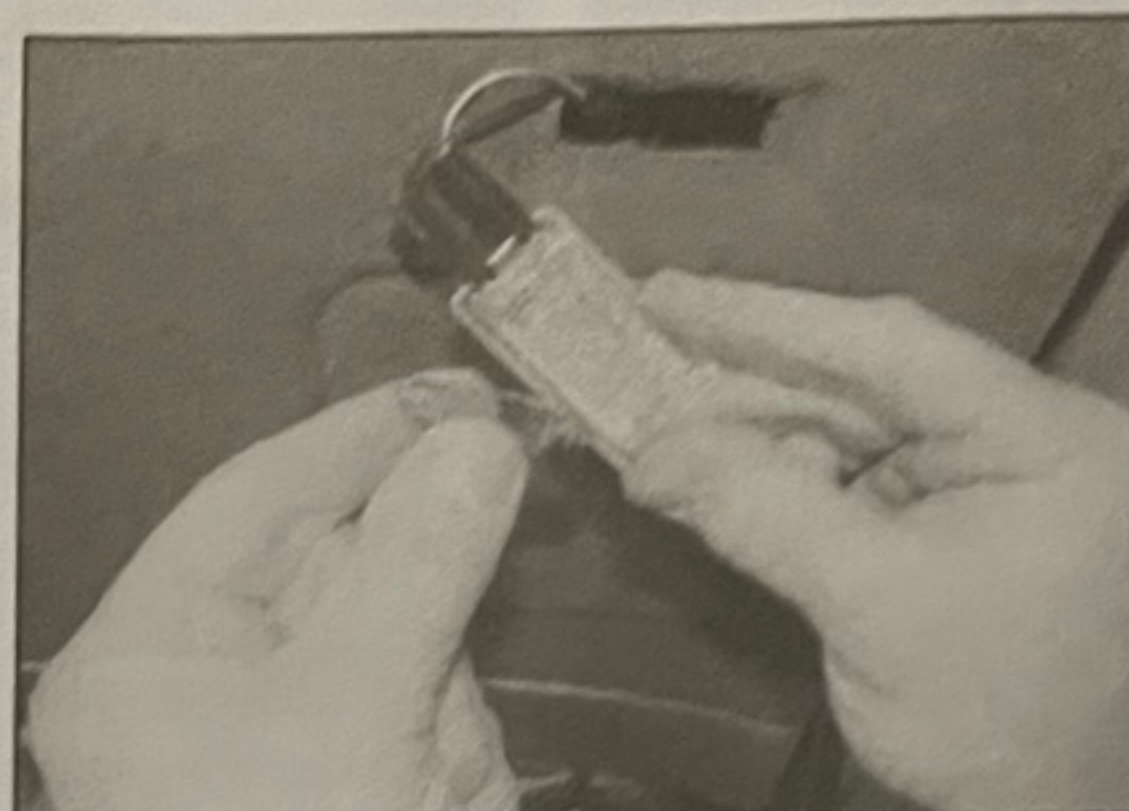
5.10 Removing the luggage compartment interior light lens ...



5.11 ... and bulb



5.16 Prise out the interior light lens ...



5.17 ... and remove the festoon-type bulb from the terminals

8 To remove the side bulbs, depress and twist them; to remove the centre festoon-type bulb, release it from the terminals (see illustration).  
9 Fit the new bulb using a reversal of the removal procedure.

#### Estate luggage compartment

10 Using a screwdriver, carefully prise out the interior light lens (see illustration).  
11 Remove the festoon-type bulb from the terminals (see illustration).

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

#### Saloon luggage compartment

13 Using a screwdriver carefully prise the interior light lens from the trim panel.  
14 Remove the festoon-type bulb from the terminals.  
15 Fit the new bulb using a reversal of the removal procedure.

#### Tailgate loading light

16 Using a screwdriver, carefully prise the interior light/lens from the trim panel (see illustration).  
17 Remove the festoon-type bulb from the terminals (see illustration).  
18 Fit the new bulb using a reversal of the removal procedure.

#### Glovebox illumination

19 With the glovebox open, use a screwdriver to prise out the lens/light unit.  
20 Remove the festoon-type bulb from the terminals.  
21 Fit the new bulb using a reversal of the removal procedure.

#### Front interior/map reading lights

22 Prise off the lens using a small screwdriver, and remove the festoon-type bulb from the terminals (see illustrations).  
23 Undo the cover retaining screw. Where applicable, remove the microphone and temperature sensor from the cover (see illustrations).  
24 To remove the spotlight bulb, turn the



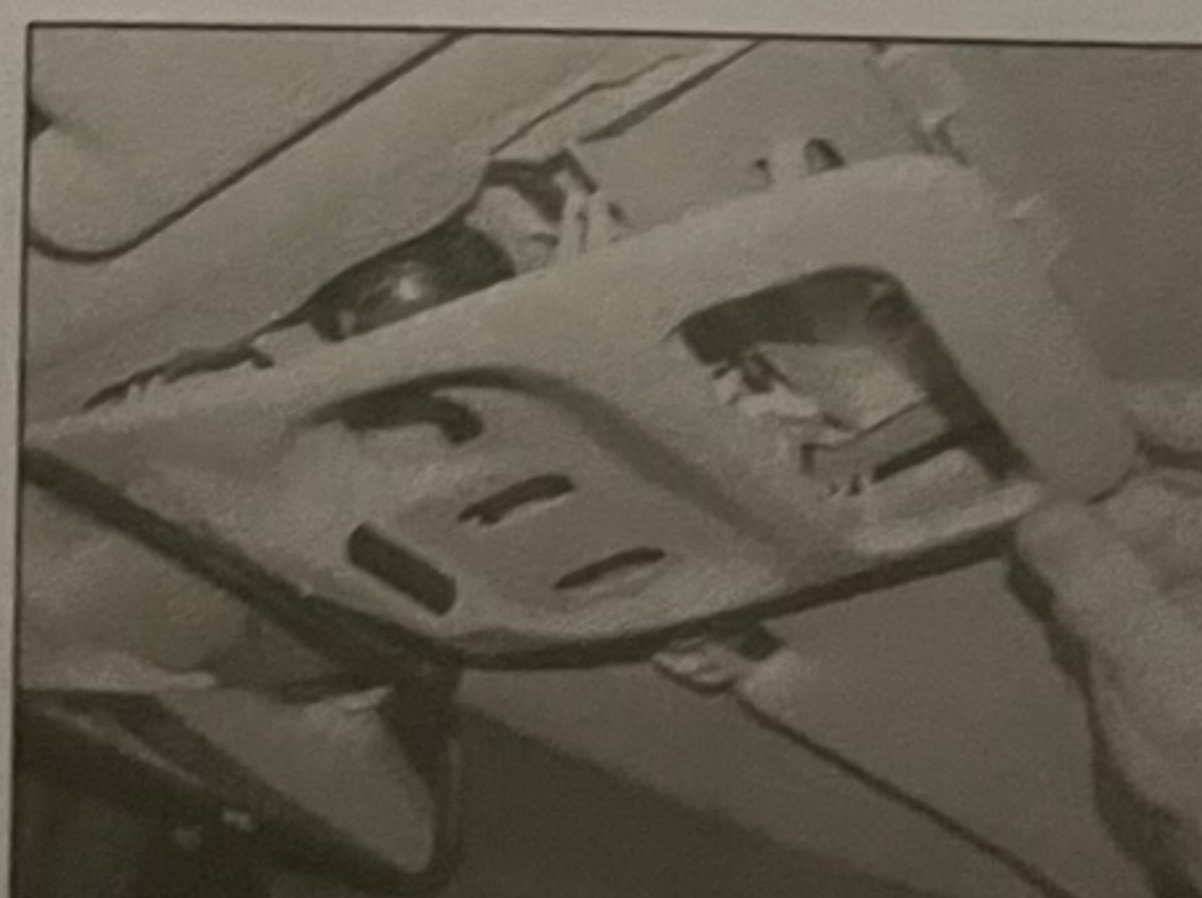
5.22a Prise off the lens ...



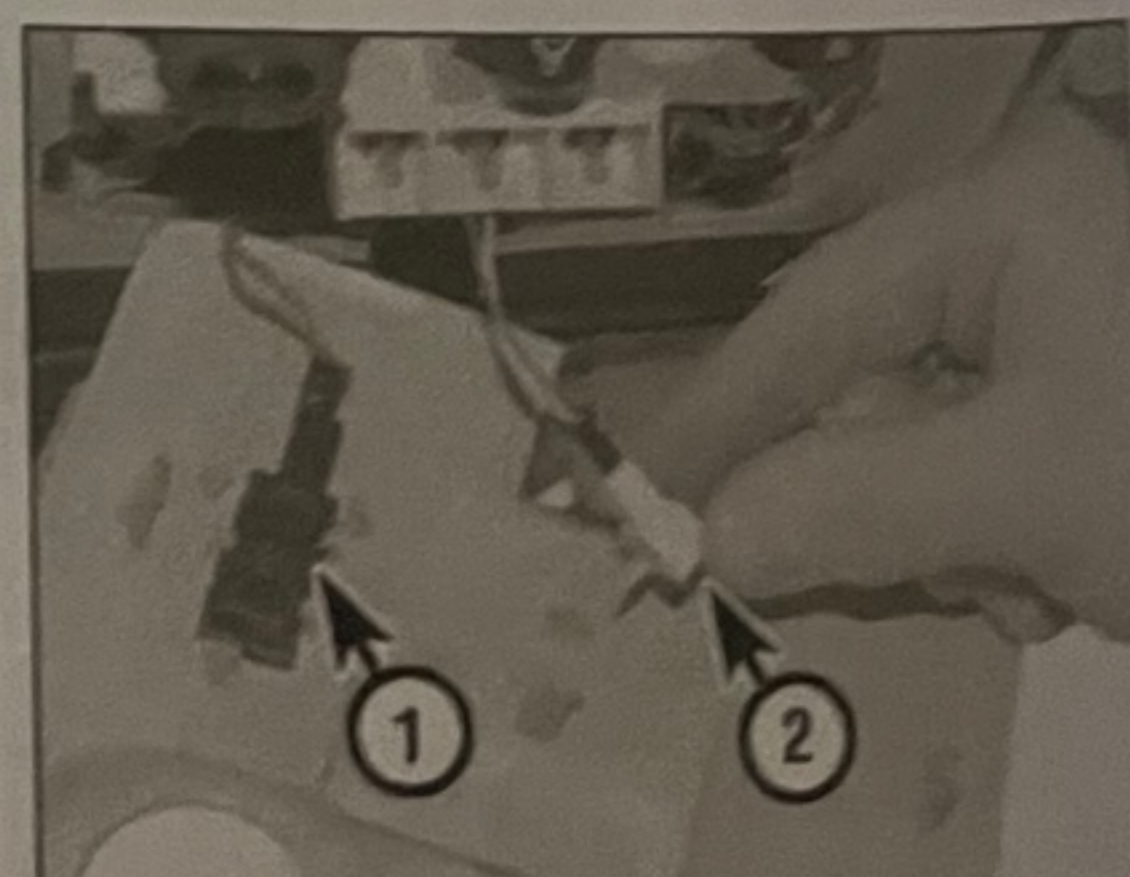
5.22b ... and remove the festoon-type bulb



5.23a Undo the retaining screw ...

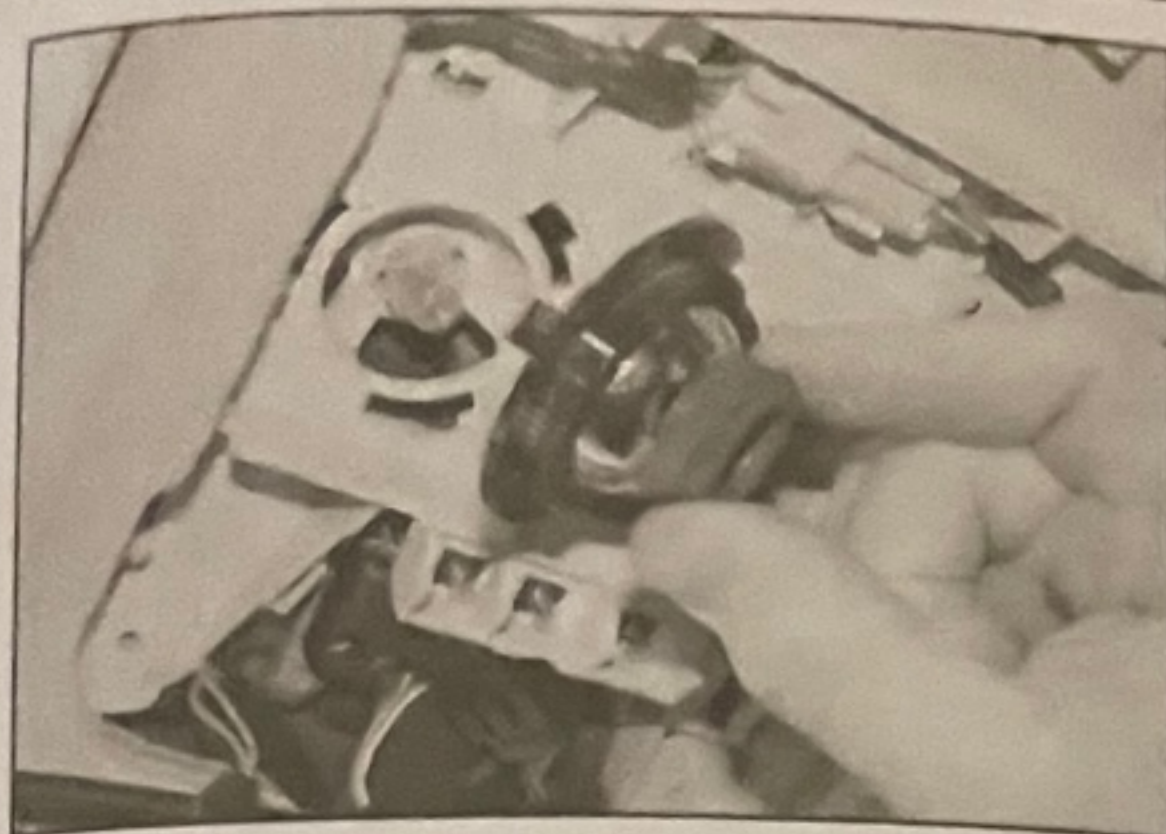


5.23b ... lower the cover ...

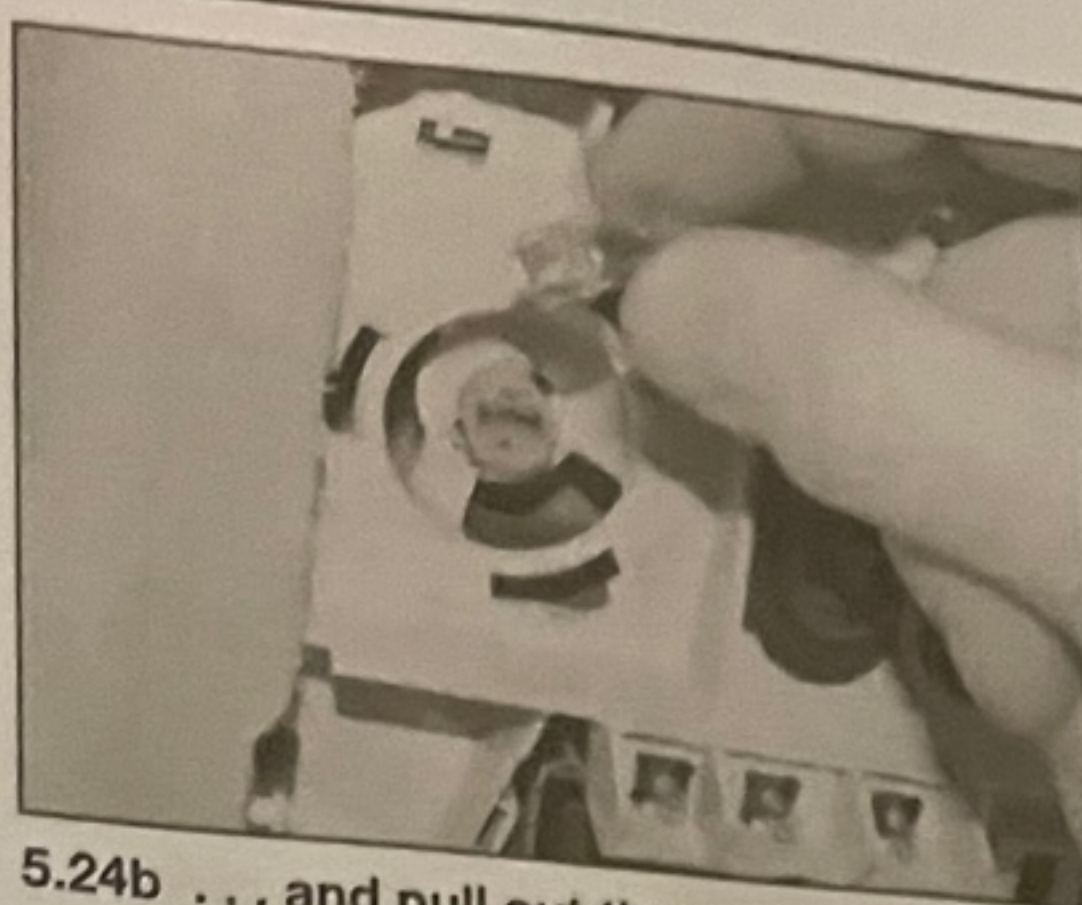


5.23c ... and remove the microphone (1) and temperature sensor (2)





5.24a Turn the spotlight reflector anti-clockwise from the housing . . .



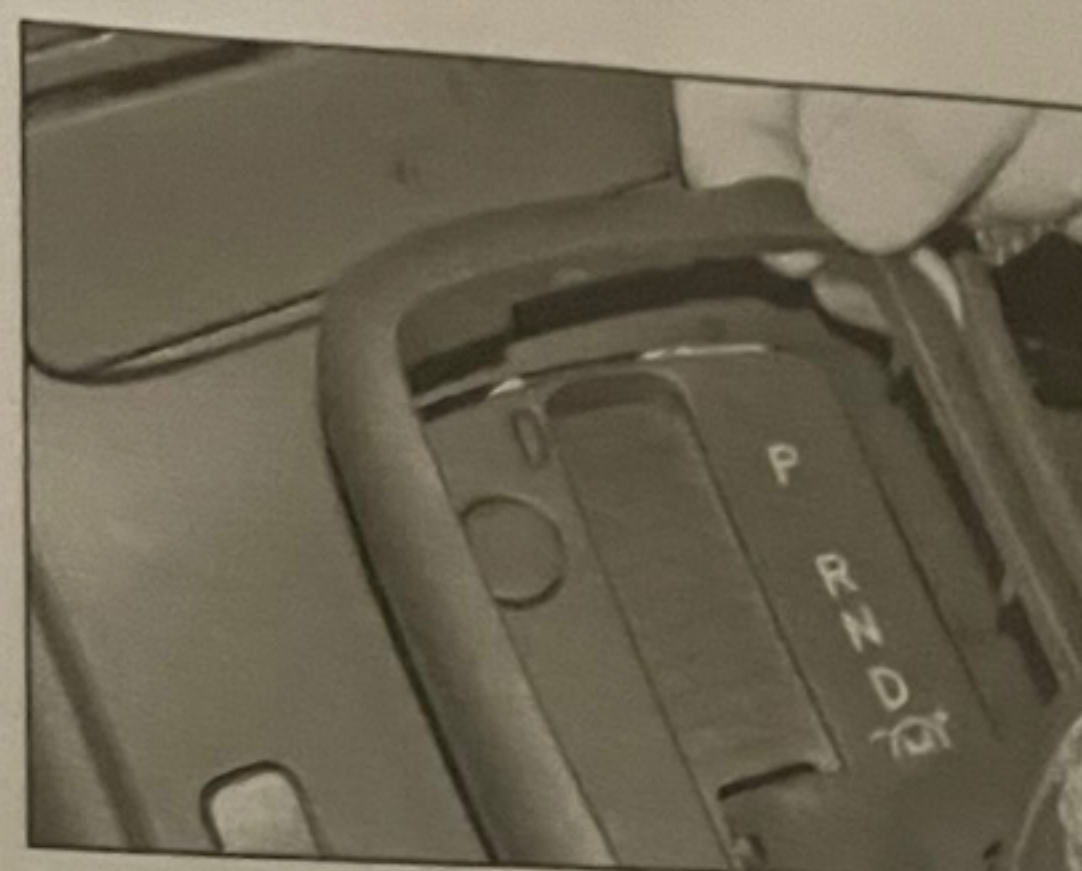
5.24b . . . and pull out the wedge-type bulb



5.24c Use washer tubing to remove . . .



5.24d . . . the wedge-type illumination bulbs



5.26 Removing the selector lever surround (automatic transmission models)



5.27 Removing the outer trim panel from the ashtray

Turn the spotlight reflector anti-clockwise and pull out the wedge-type bulb. To remove the illumination bulbs, use a length of washer tubing to grip the wedge-type bulbs (see illustrations).

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

### Cigarette lighter

26 On manual transmission models, prise the gear lever gaiter from the centre console. On automatic transmission models, use a screwdriver to prise up the selector lever surround (see illustration).

27 Open the ashtray and remove the outer trim panel together with the ashtray (see illustration).

28 Using a screwdriver, prise back the retaining tabs and prise the ashtray/oddments box from the centre console (see illustrations). Use tape to protect the walnut veneer.

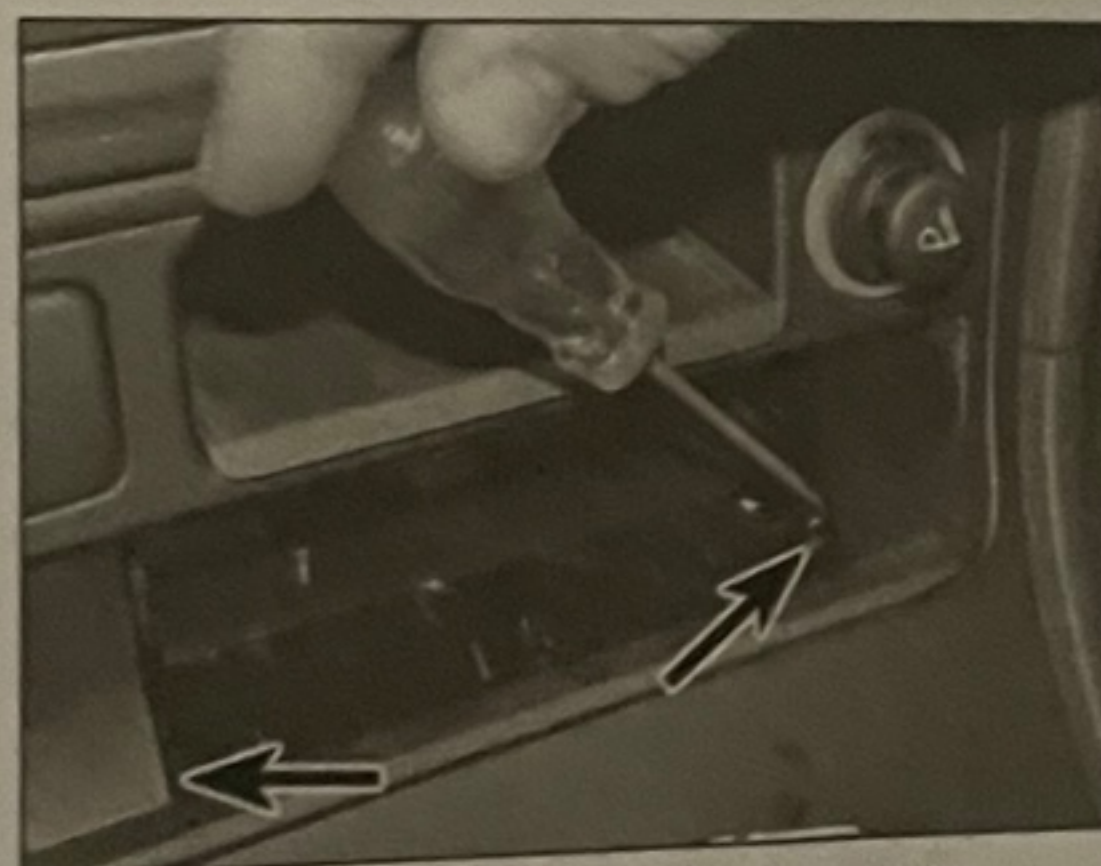
29 Undo the screws and remove the gear lever/selector cover. Identify the wiring locations then disconnect the plugs – there are plugs for the seat heating, seat ventilation and cigarette lighter. Also disconnect the wiring from the central locking switch (see illustrations).

30 With the cover removed, disconnect the bulb wiring from the rear of the cigarette lighter, then remove the bulbholder and extract the bulb.

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

### Window switch illumination

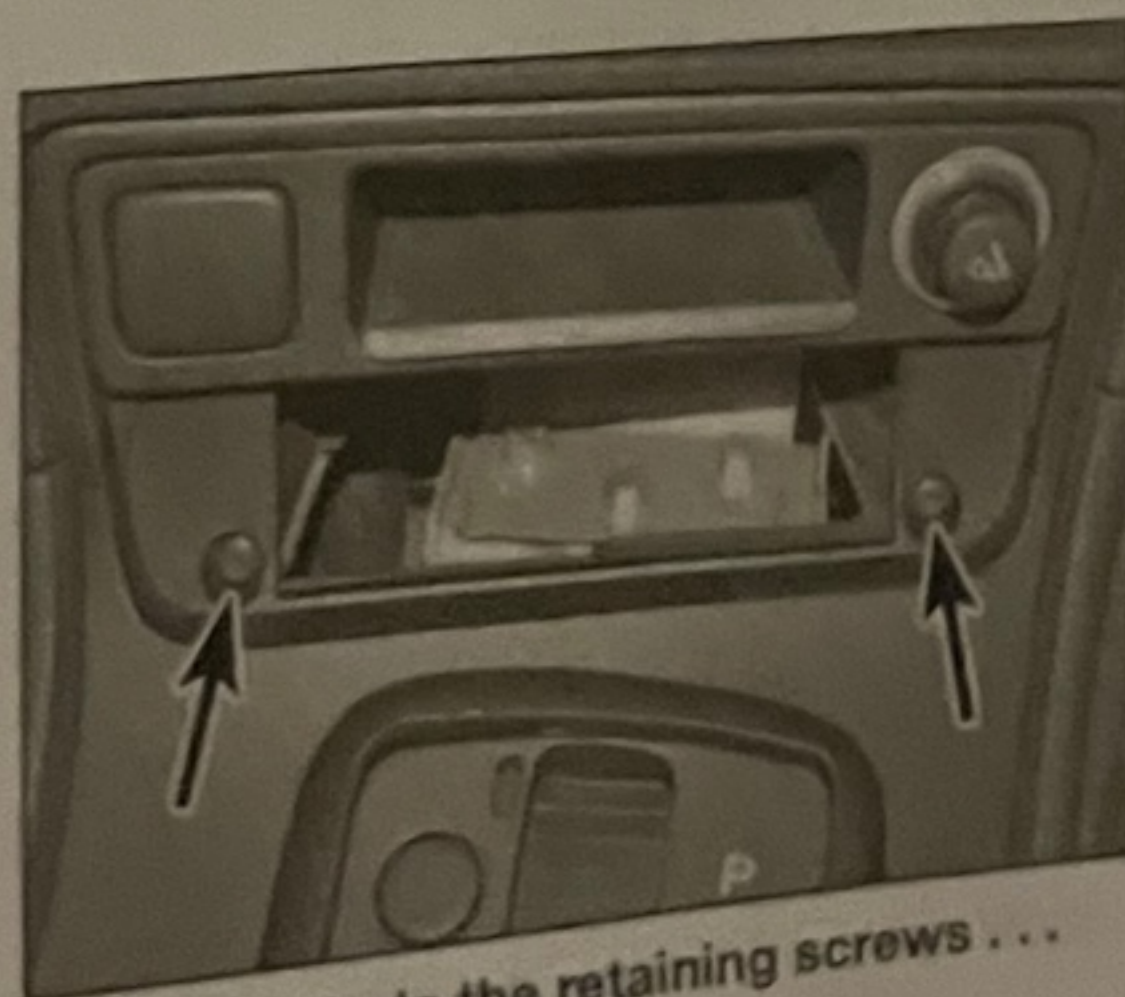
32 Remove the electric window control switch as described in Section 4.



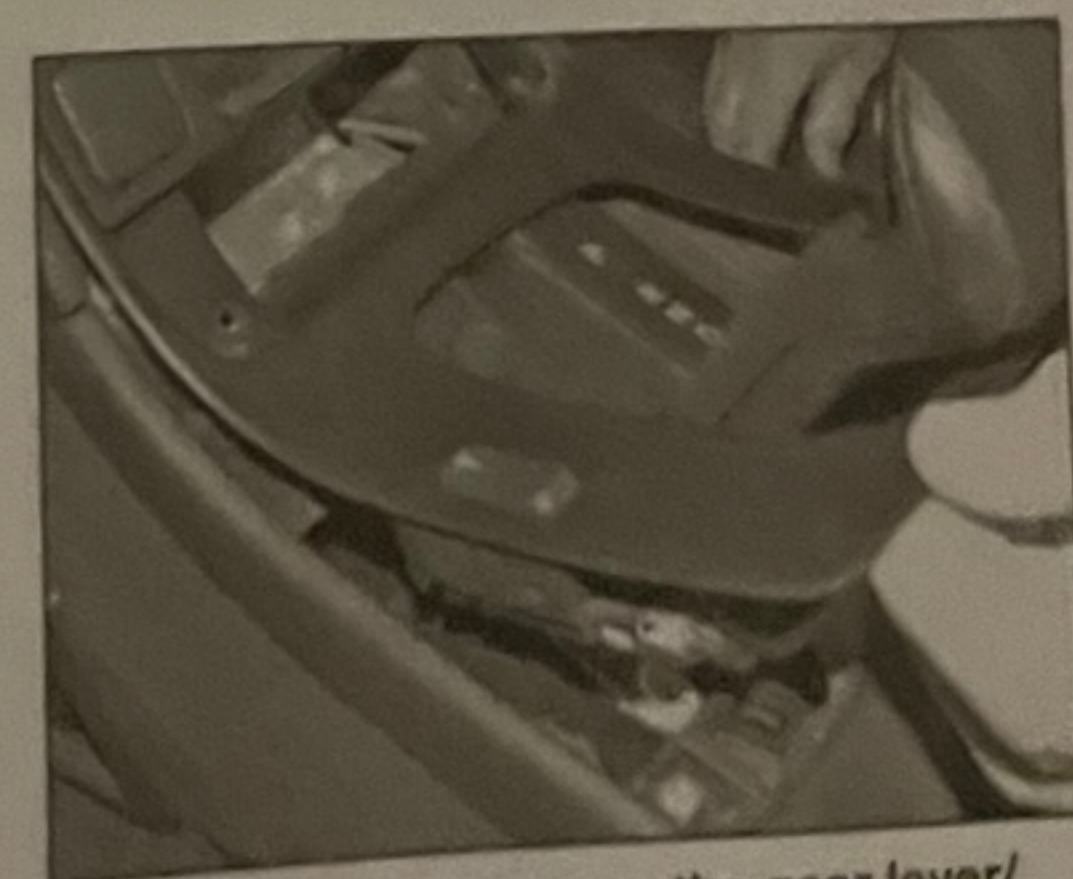
5.28a Prise back the retaining tabs . . .



5.28b . . . and remove the ashtray box from the centre console



5.29a Undo the retaining screws . . .



5.29b . . . and remove the gear lever/selector cover

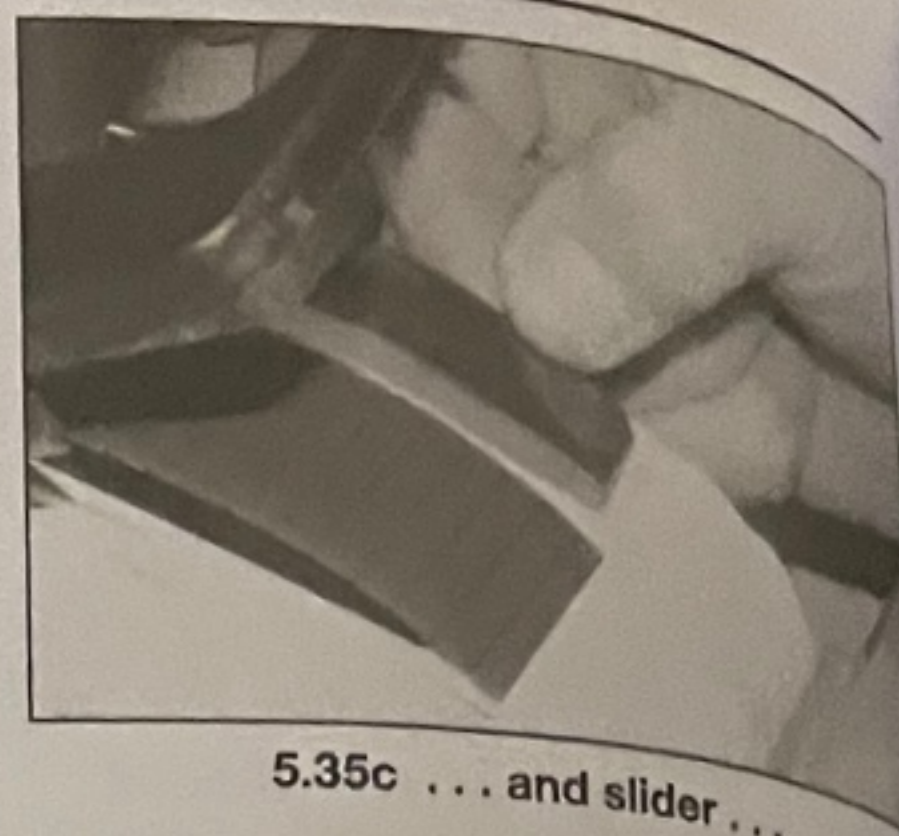




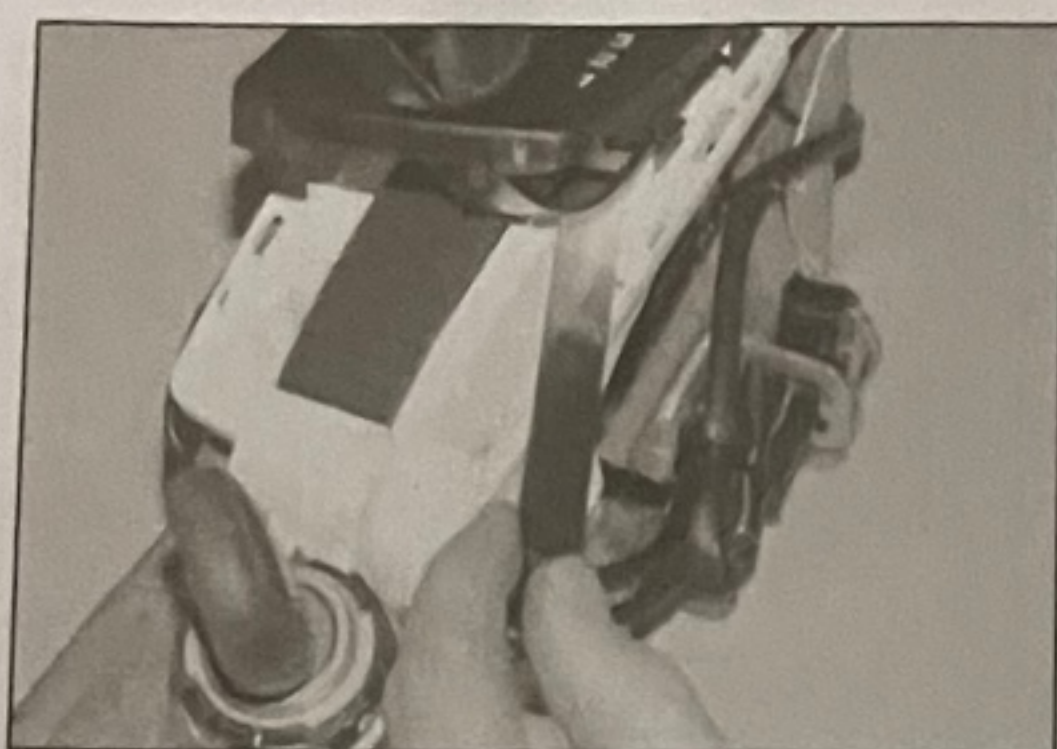
5.35a Remove the position indicator panel...



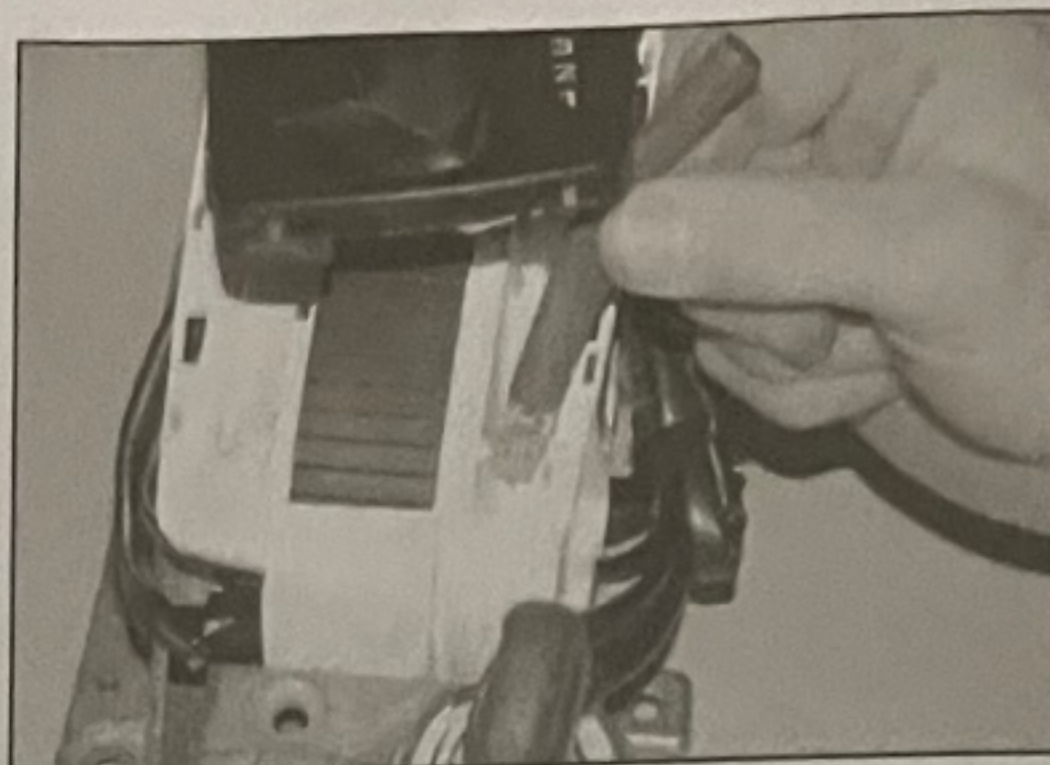
5.35b ... followed by the green strip...



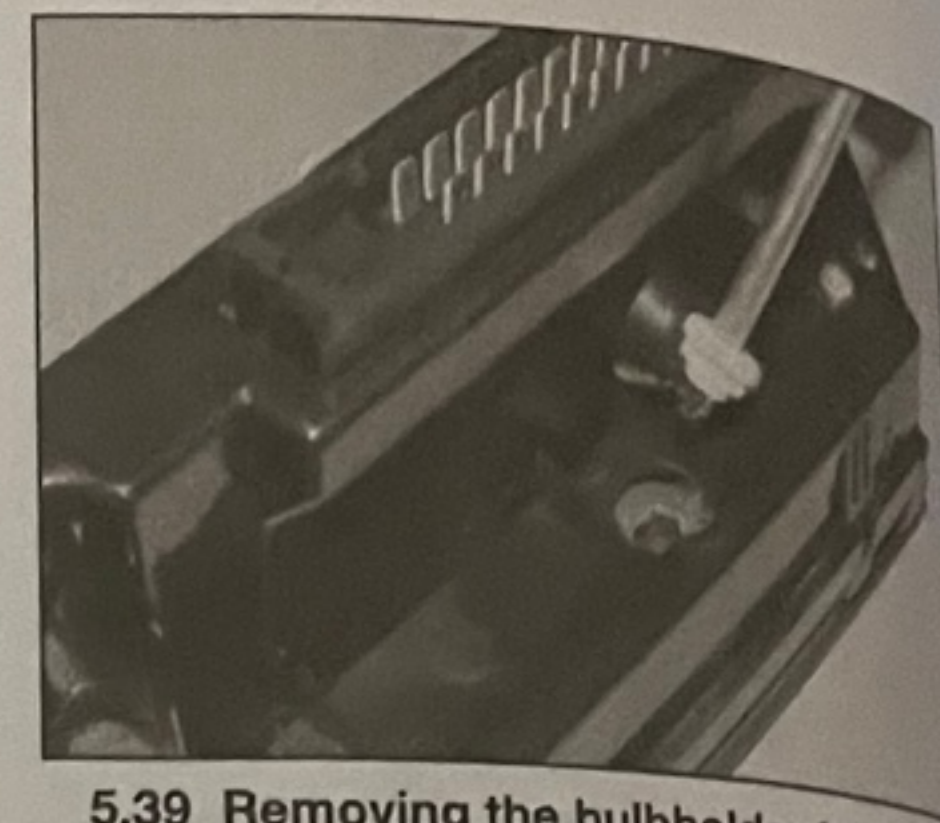
5.35c ... and slider...



5.36a ... remove the graded strip...



5.36b ... and use a suitable rubber tube to extract the bulb



5.39 Removing the bulbholder from the Saab Information Display (SID) module

followed by the green strip and slider (see illustrations).

36 Remove the graded strip, then use a suitable rubber tube to extract the illumination bulb (see illustrations).

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

#### Saab Information Display module illumination

38 Remove the SID module (see Section 10).

39 Using a screwdriver, twist the bulbholder anti-clockwise and remove it from the module (see illustration). There are 6 bulbholders in all, and Saab recommend that all are renewed at the same time as they all have an identical life expectancy.

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

#### Lighting switch illumination

41 Remove the lighting switch (see Section 4).

42 Twist the bulbholder from the rear of the switch (see illustration).

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

#### Hazard switch illumination

44 Remove the hazard switch as described in Section 4.

45 Twist the bulbholder from the side of the switch (see illustration).

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

#### Climate control module illumination

47 Remove the climate control module as described in Chapter 3, Section 9.

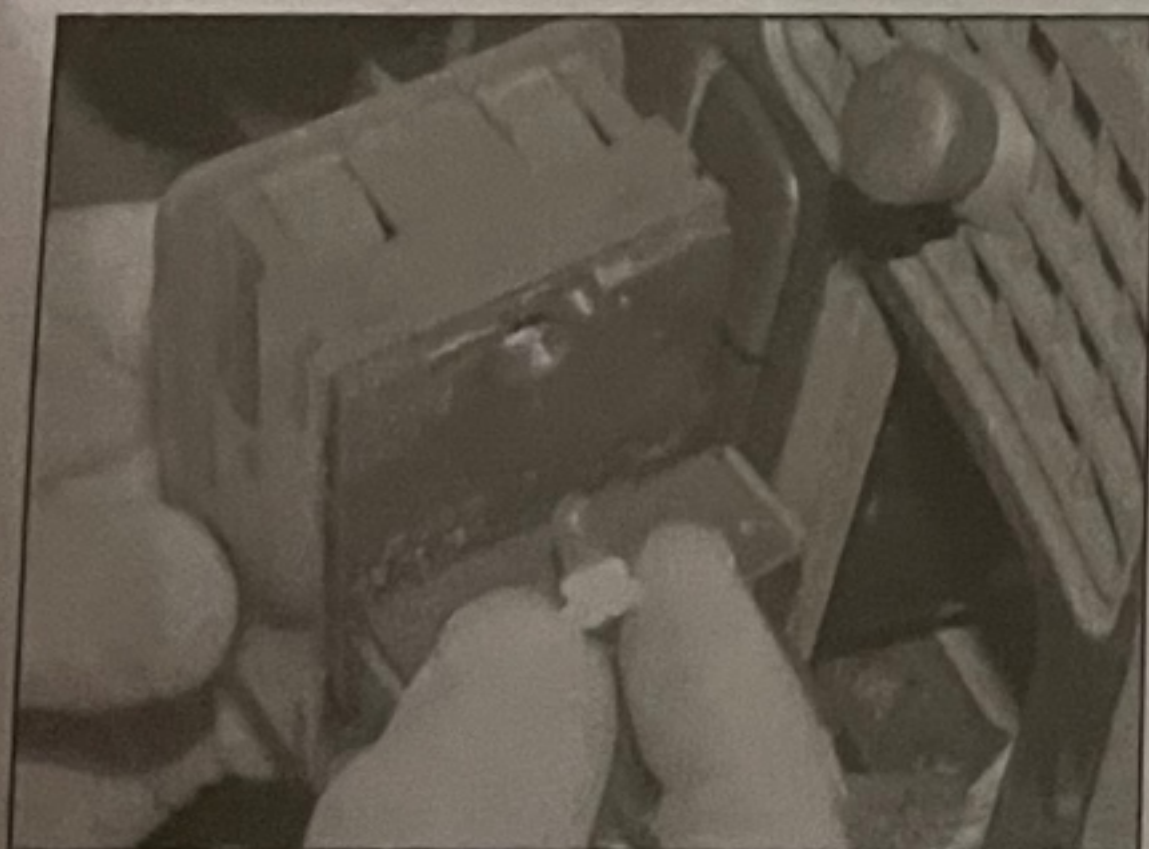
48 Using a screwdriver, twist the bulbholder from the rear of the module (see illustration).

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

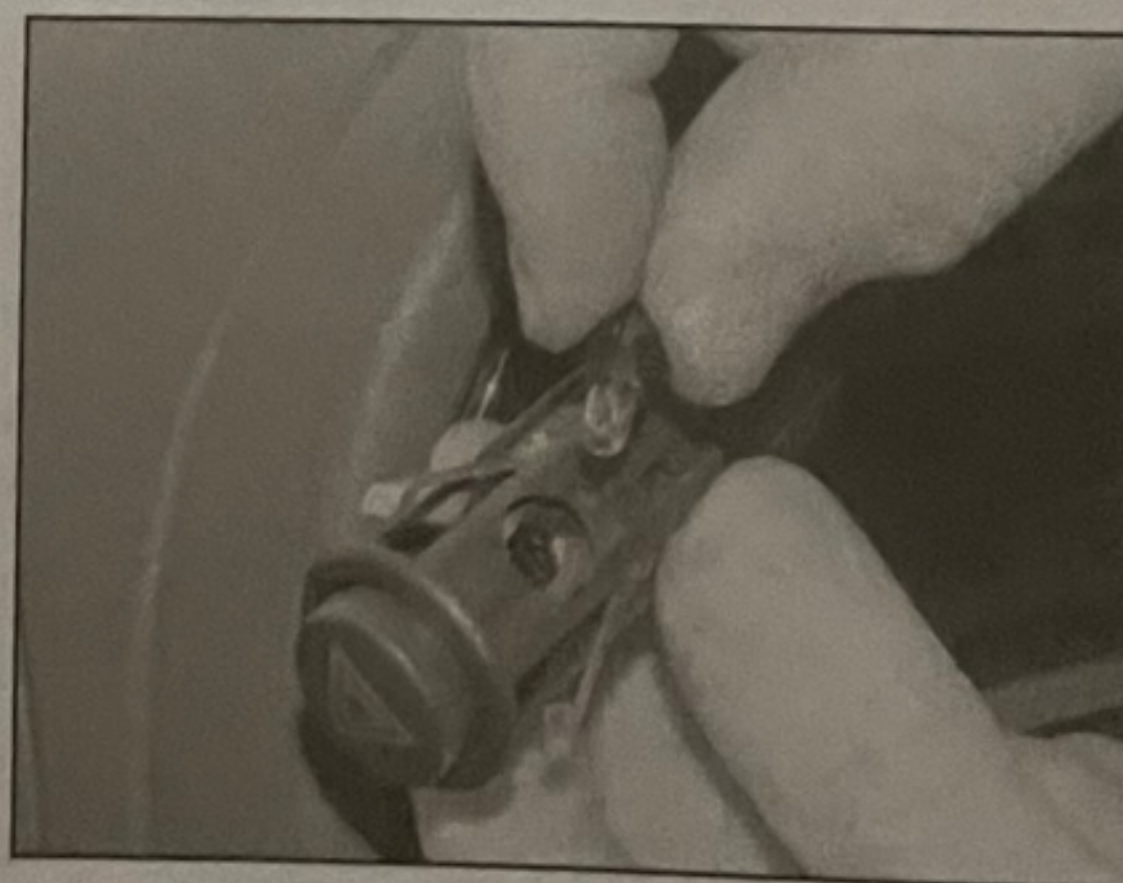
## 6 Exterior light bulbs - renewal

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

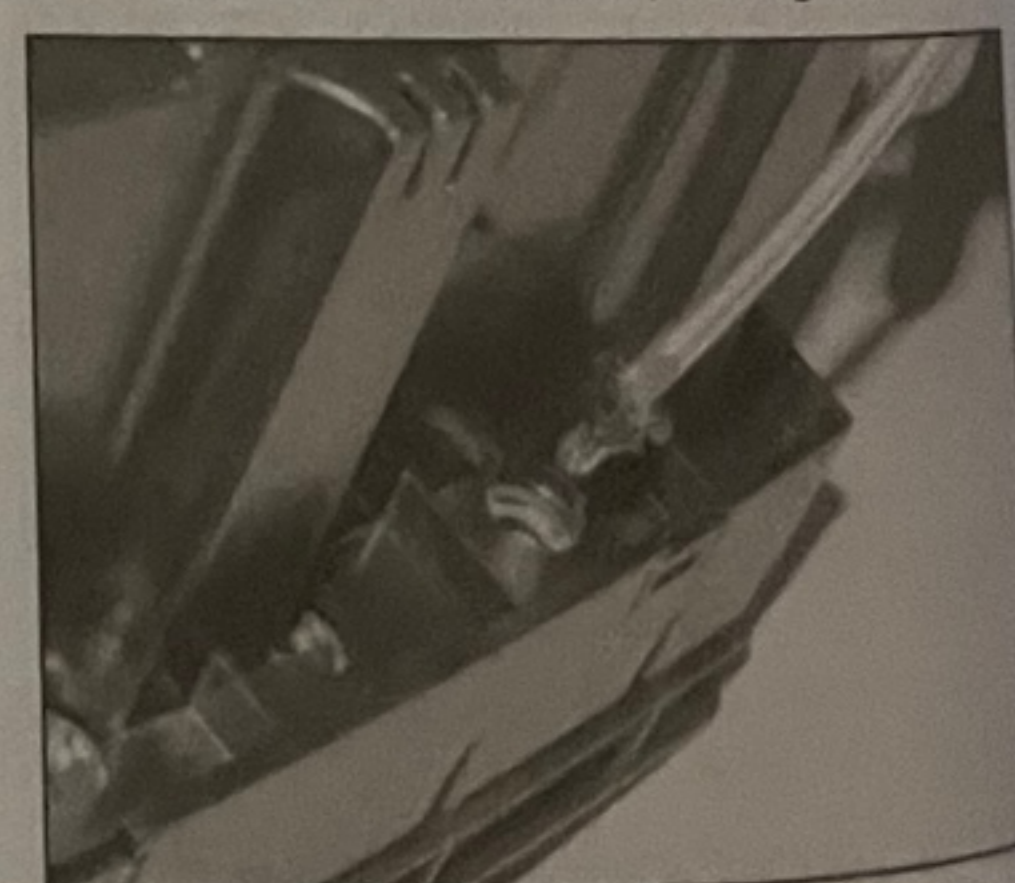
- Switch off all exterior lights and the ignition.
- Remember that if the light has just been in use, the bulb may be extremely hot.
- Always check the bulb contacts and holder, ensuring that there is clean metal-to-metal contact.
- Always ensure that the new bulb is of the correct rating and that it is completely clean before fitting it.
- Do not touch the glass of halogen-type bulbs (headlights, front foglights) with the fingers, as this may lead to premature failure of the new bulb; if the glass



5.42 Removing the bulbholder from the rear of the lighting switch

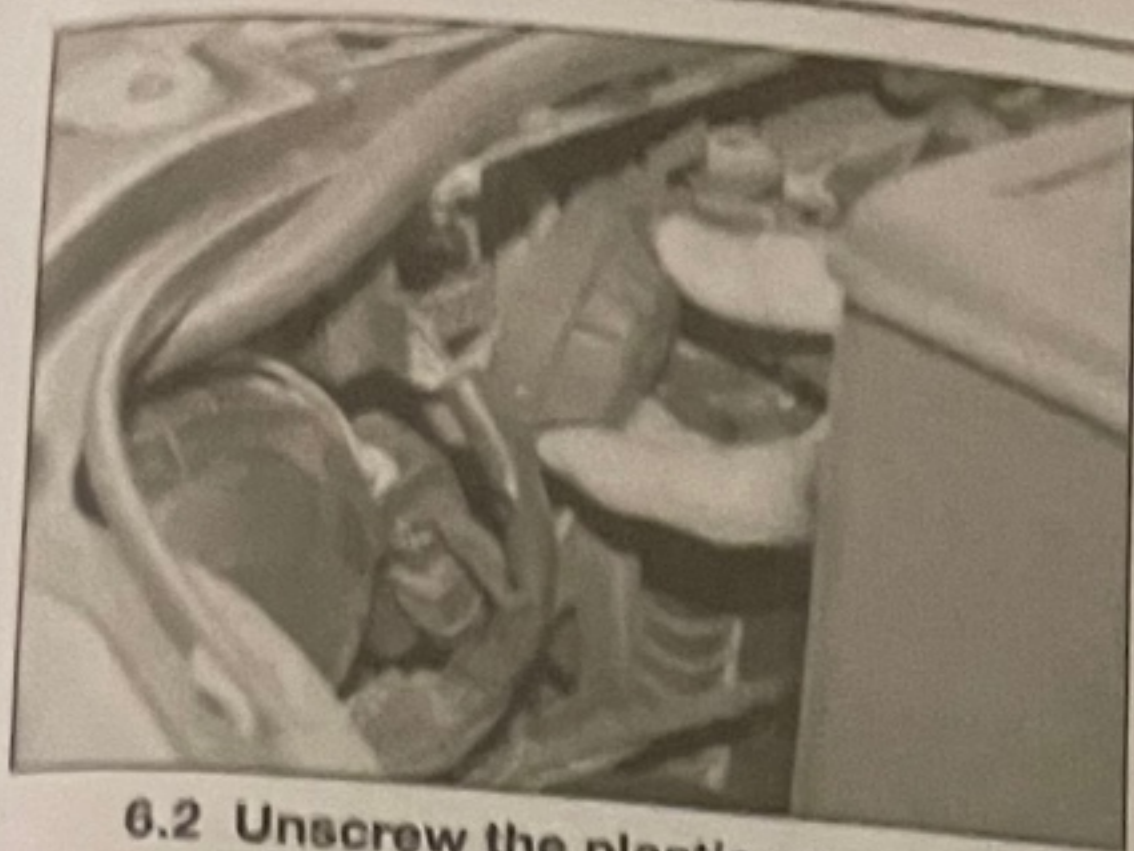


5.45 Removing the bulbholder from the side of the hazard switch



5.48 Removing the bulbholder from the rear of the climate control module





6.2 Unscrew the plastic cover . . .

is accidentally touched, clean it with methylated spirit.

### Halogen headlight

2 With the bonnet open, remove the cover from the rear of the headlight (see illustration). Access to the left-hand headlight can be improved by unclipping the cover from the battery. Depending on model, access to the right-hand headlight can be improved by moving the air intake hose to one side.

3 Disconnect the wiring from the main beam bulb (see illustration).

4 Release the spring clip and remove the bulb (see illustration).

5 Remove the bulb using a reversal of the removal procedure, but make sure that the bulb pins engage correctly in the rear of the headlight. On later models, the plastic cover must be refitted with the tab facing upwards.

### Xenon headlight

**Warning:** It is recommended that protective gloves and safety glasses be worn when renewing xenon headlamp bulbs. The bulbs contain mercury and are highly pressurised. Do not switch on the headlamps with the bulb removed – high voltages (23 000 volts minimum) are present which could cause personal injury.

#### Dipped beam

6 Remove the headlight as described in Section 7.

7 Remove the cover from the rear of the headlight (see illustration).

8 Release the securing clips and withdraw the xenon light bulb unit slightly, then disconnect the wiring connector (see illustrations).

9 Withdraw the bulb and xenon light bulb unit from the headlamp (see illustration).

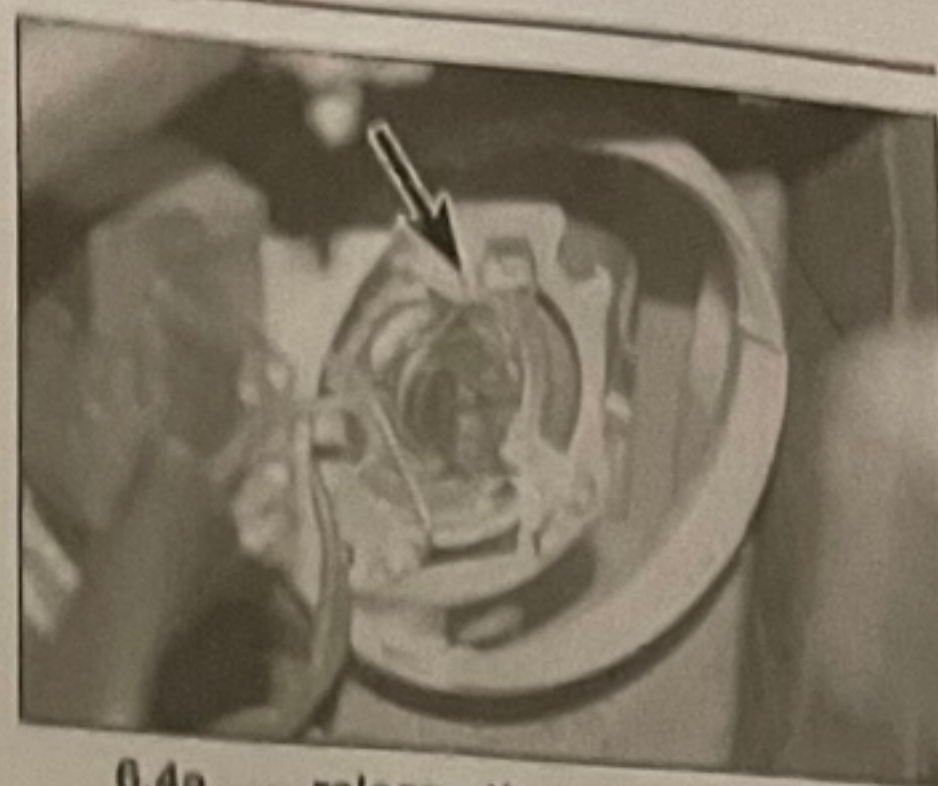
10 Fit the new bulb unit using a reversal of the removal procedure.

#### Main beam

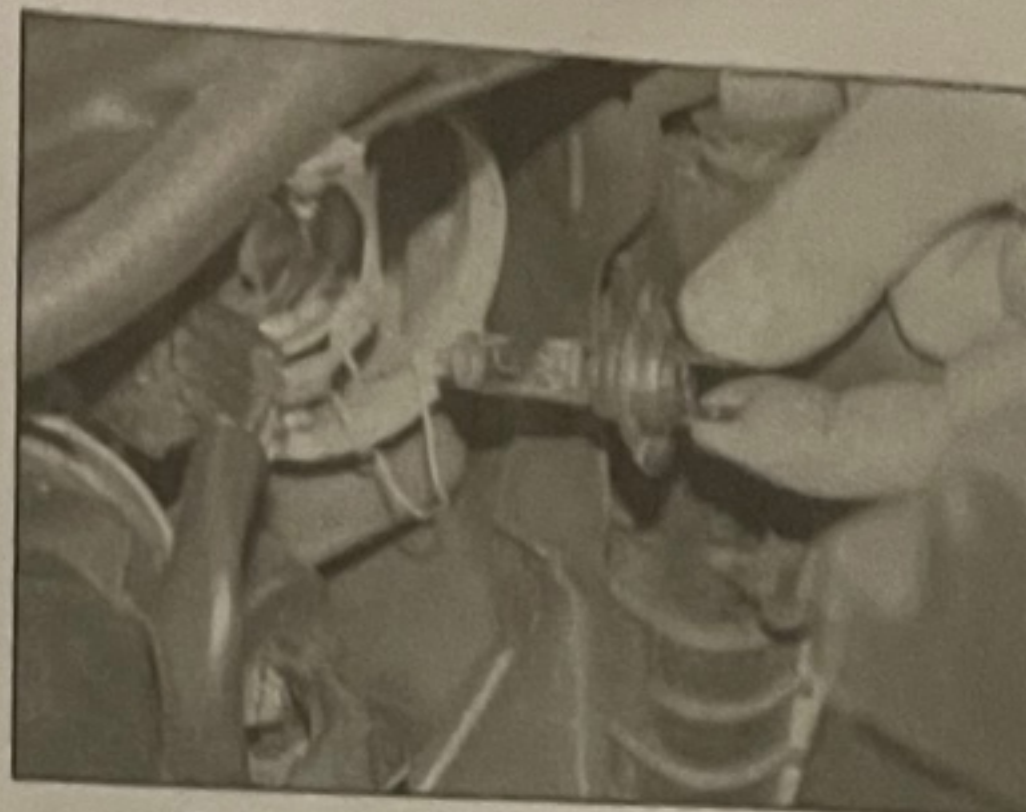
11 With the bonnet open, unclip the round rubber cover from the rear of the headlight (see illustration). Access to the left-hand headlight can be improved by unclipping the cover from the battery. Depending on model, access to the right-hand headlight can be



6.3 . . . disconnect the wiring . . .



6.4a . . . release the spring clip . . .



6.4b . . . and remove the bulb



6.7 Remove the rubber cover . . .

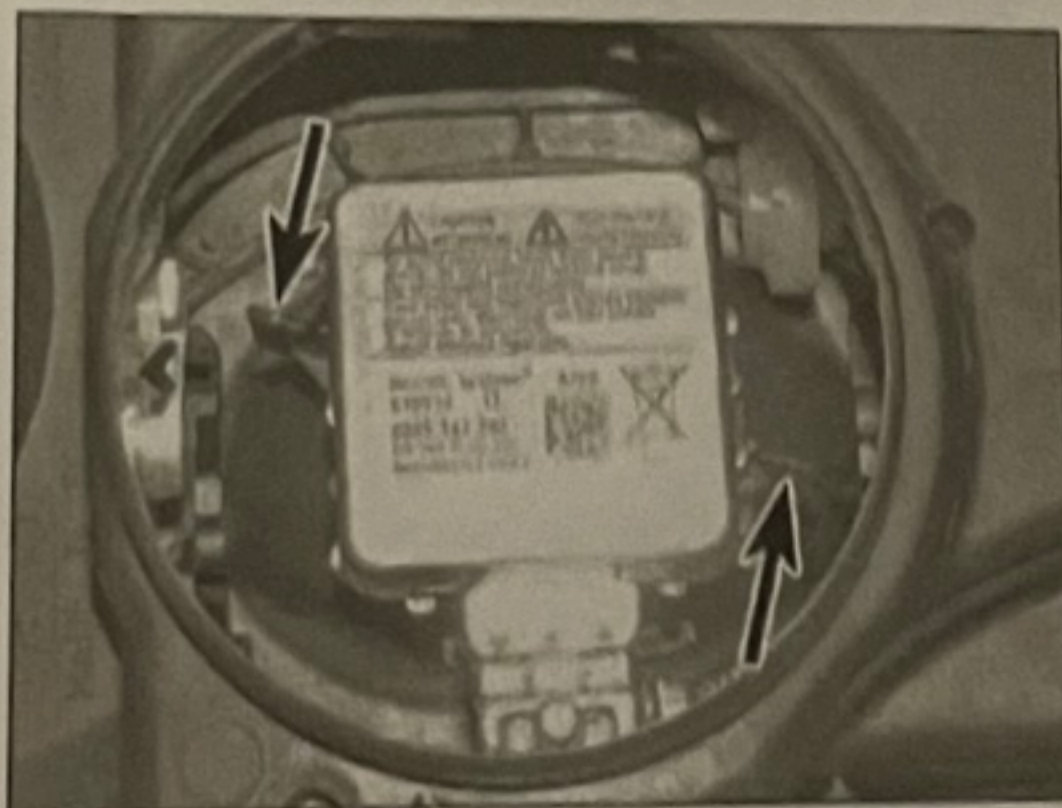
improved by moving the air intake hose to one side.

12 Disconnect the wiring from the bulb (see illustration).

13 Release the spring clips and pull the bulb

from the bulbholder (see illustrations). Use a tissue or clean cloth to prevent touching the bulb.

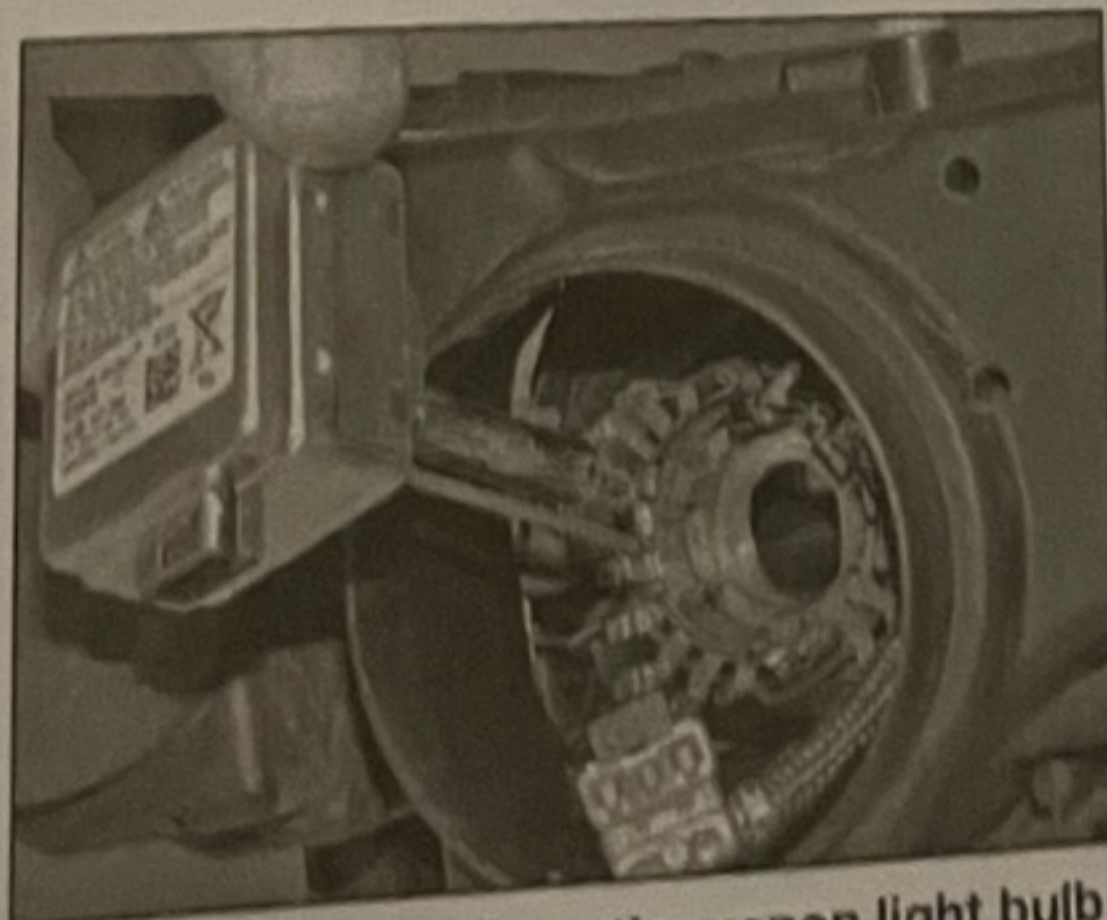
14 Fit the new bulb using a reversal of the removal procedure, but make sure that the



6.8a . . . release the clips in the direction of the arrows . . .



6.8b . . . then disconnect the wiring . . .

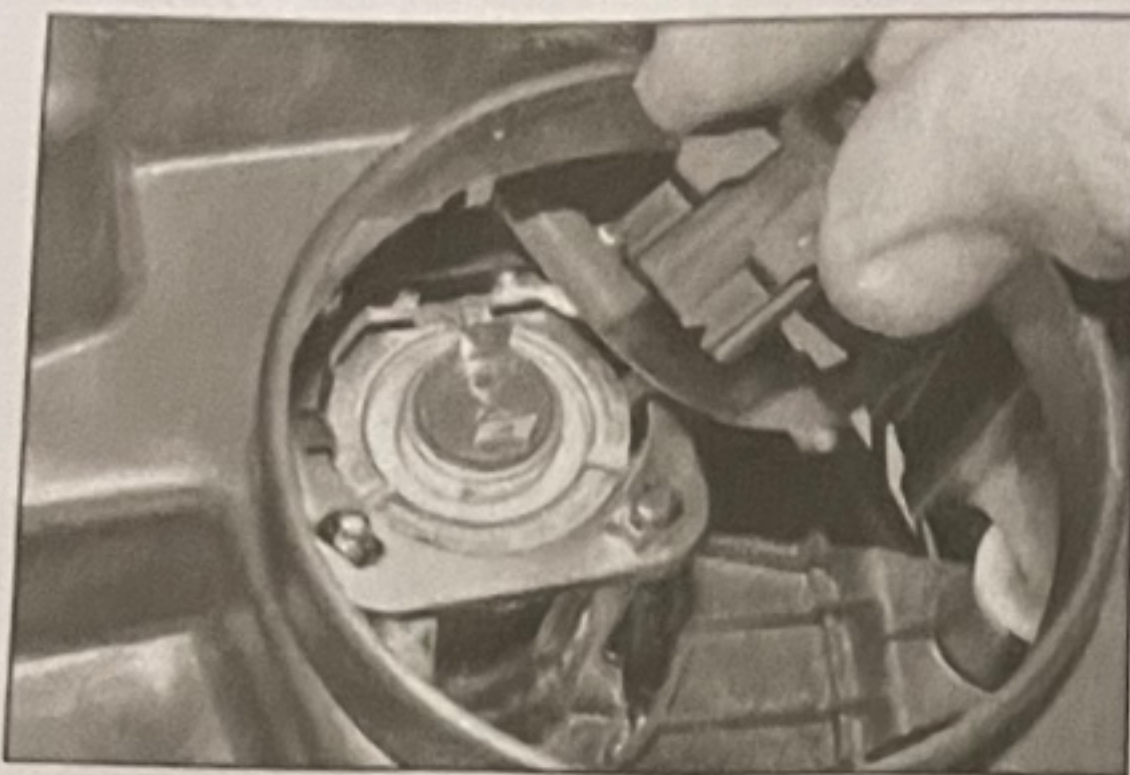


6.9 . . . and withdraw the xenon light bulb unit

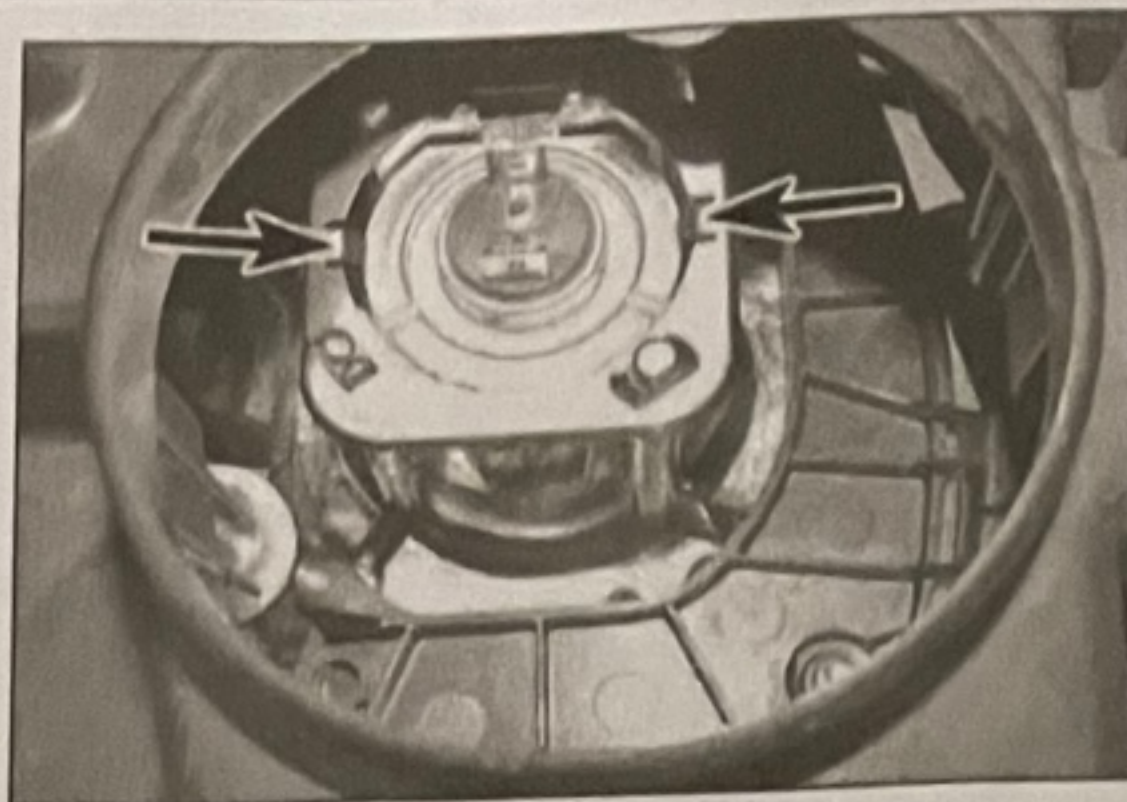


6.11 Unclip the rubber cover . . .

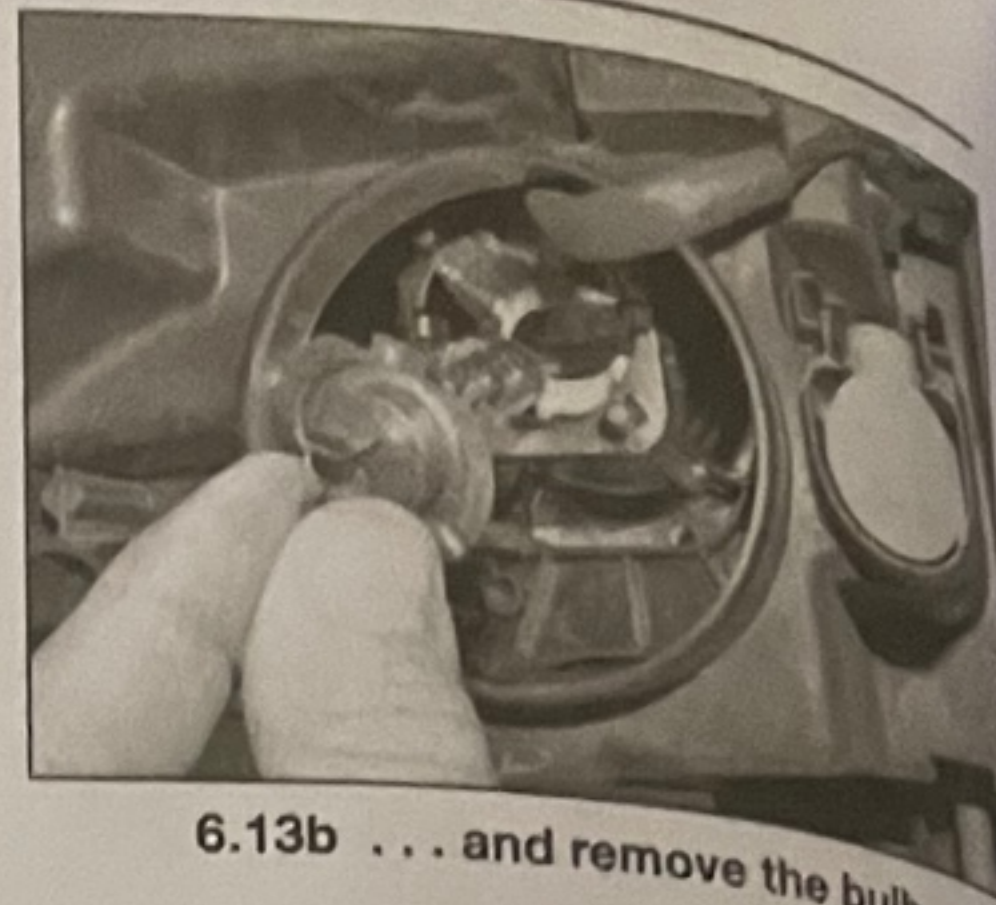




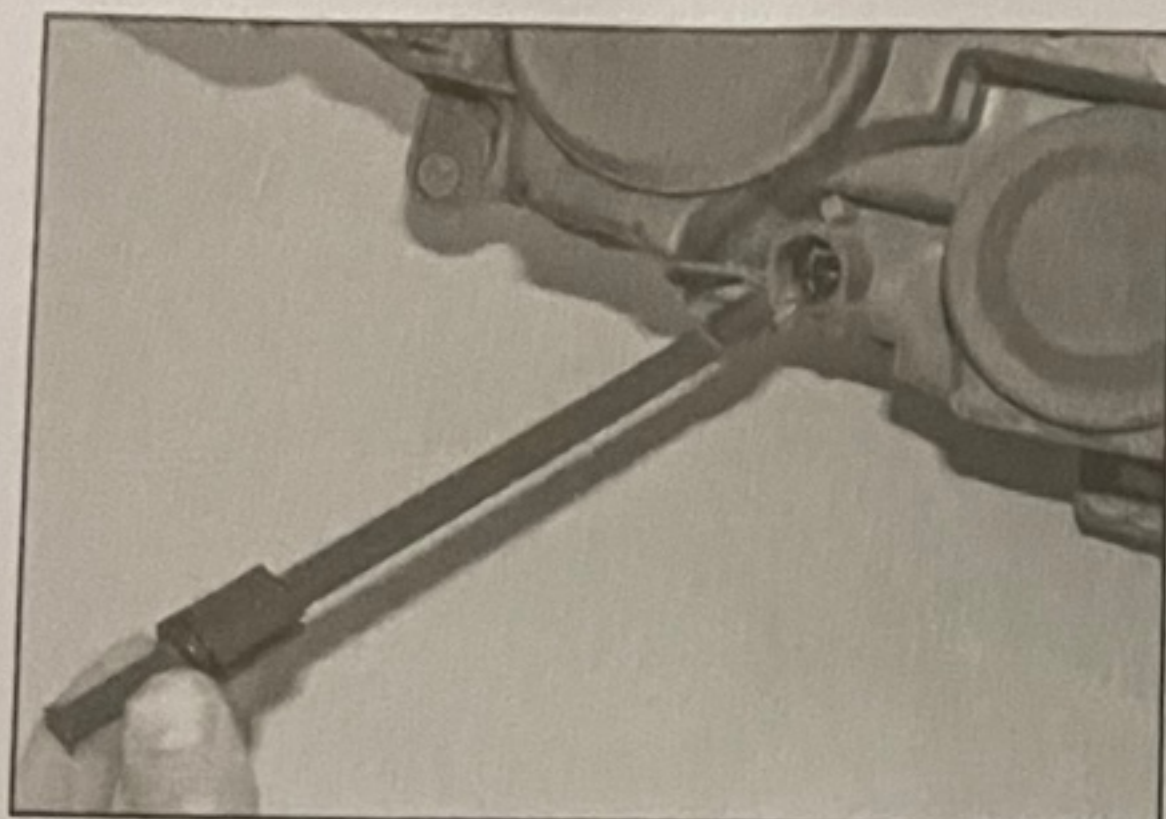
6.12 ... disconnect the wiring ...



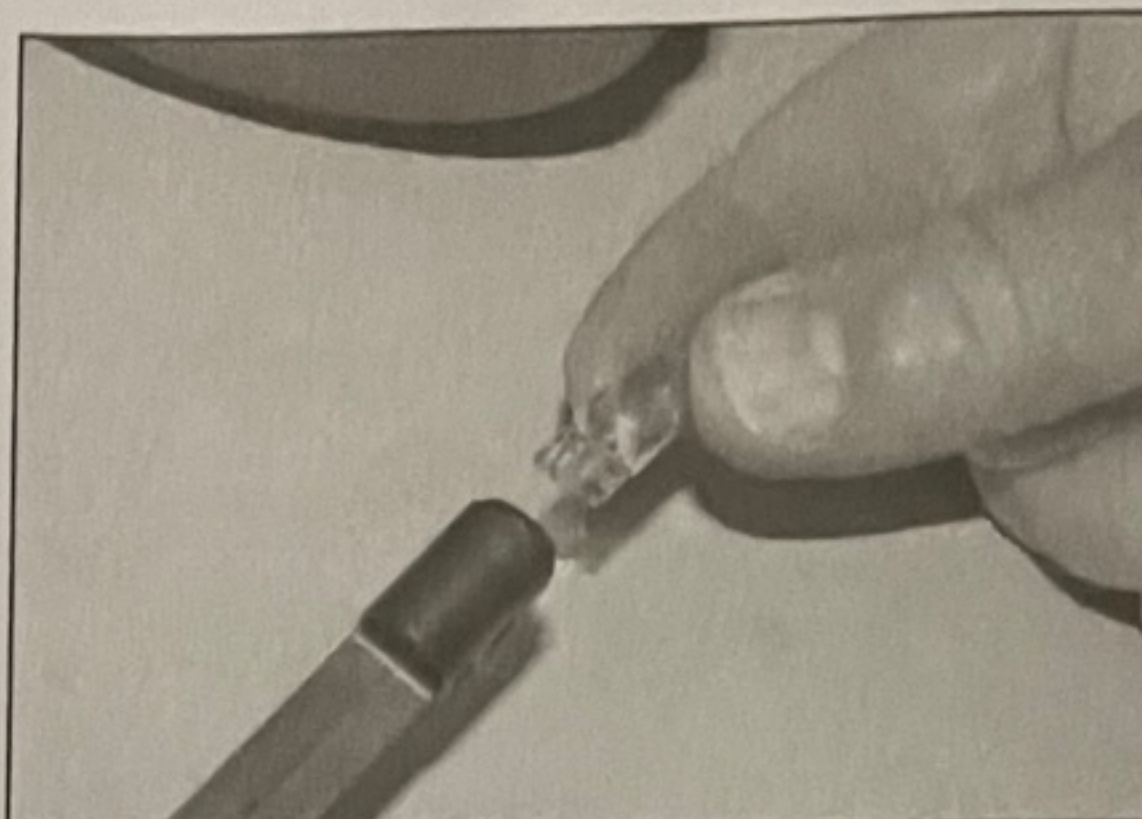
6.13a ... release the spring clips (arrowed) ...



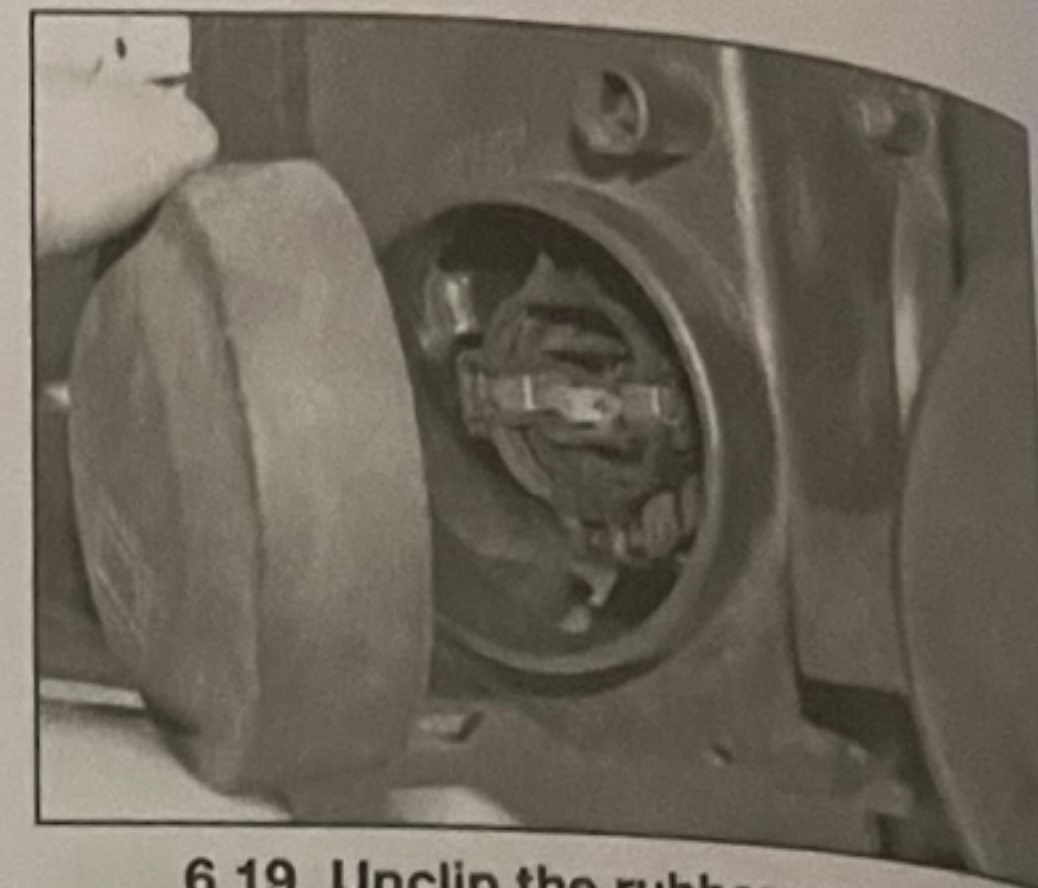
6.13b ... and remove the bulb



6.16a Pull the front sidelight bulbholder from the headlight ...



6.16b ... and pull out the wedge-type bulb



6.19 Unclip the rubber cover ...

bulb location lugs engage correctly in the rear of the headlight. The plastic cover must be refitted with the UP arrow facing upwards.

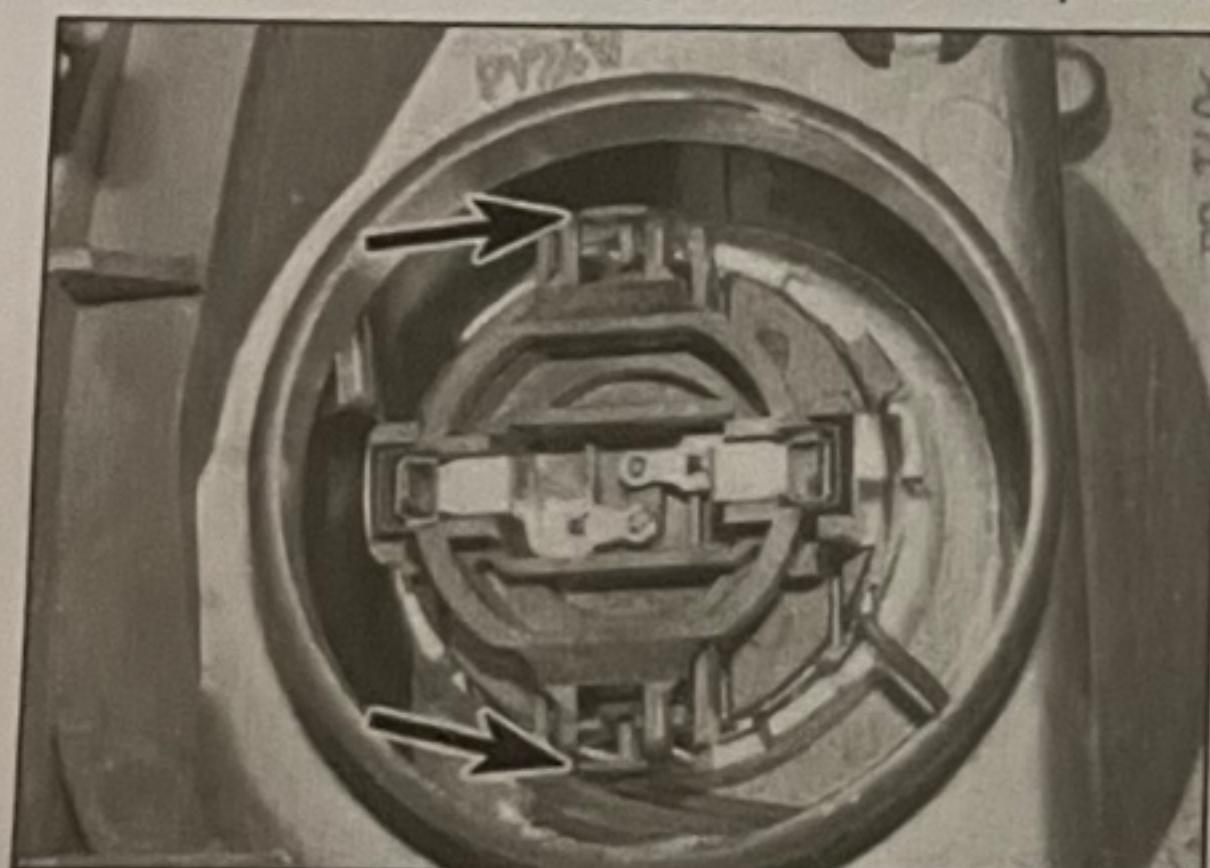
### Sidelight

15 With the bonnet open, locate the plastic

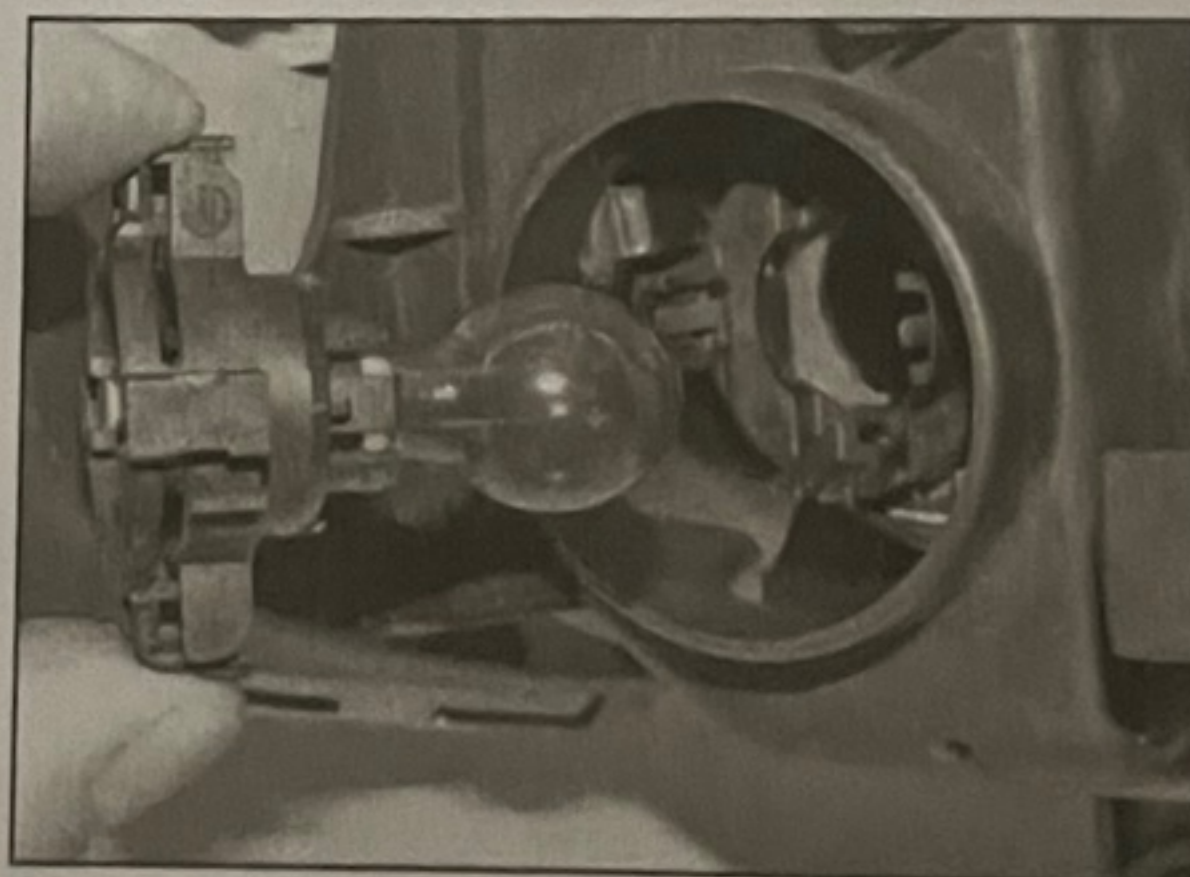
peg at the lower rear of the headlight unit. Access to the left-hand headlight can be improved by unclipping the cover from the battery. Depending on model, access to the right-hand headlight can be improved by moving the air intake hose to one side.

16 Pull the bulbholder from the headlight unit, and then pull the wedge-type bulb from the bulbholder (see illustrations).

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



6.20a ... release the retaining clips (arrowed) ...



6.20b ... and remove the bulb and holder

### Direction indicator

18 Remove the front headlight unit as described in Section 7 of this Chapter.

19 Remove the cover from the rear of the headlight (see illustration).

20 Release the retaining clips and pull the bulbholder from the light unit (see illustrations).

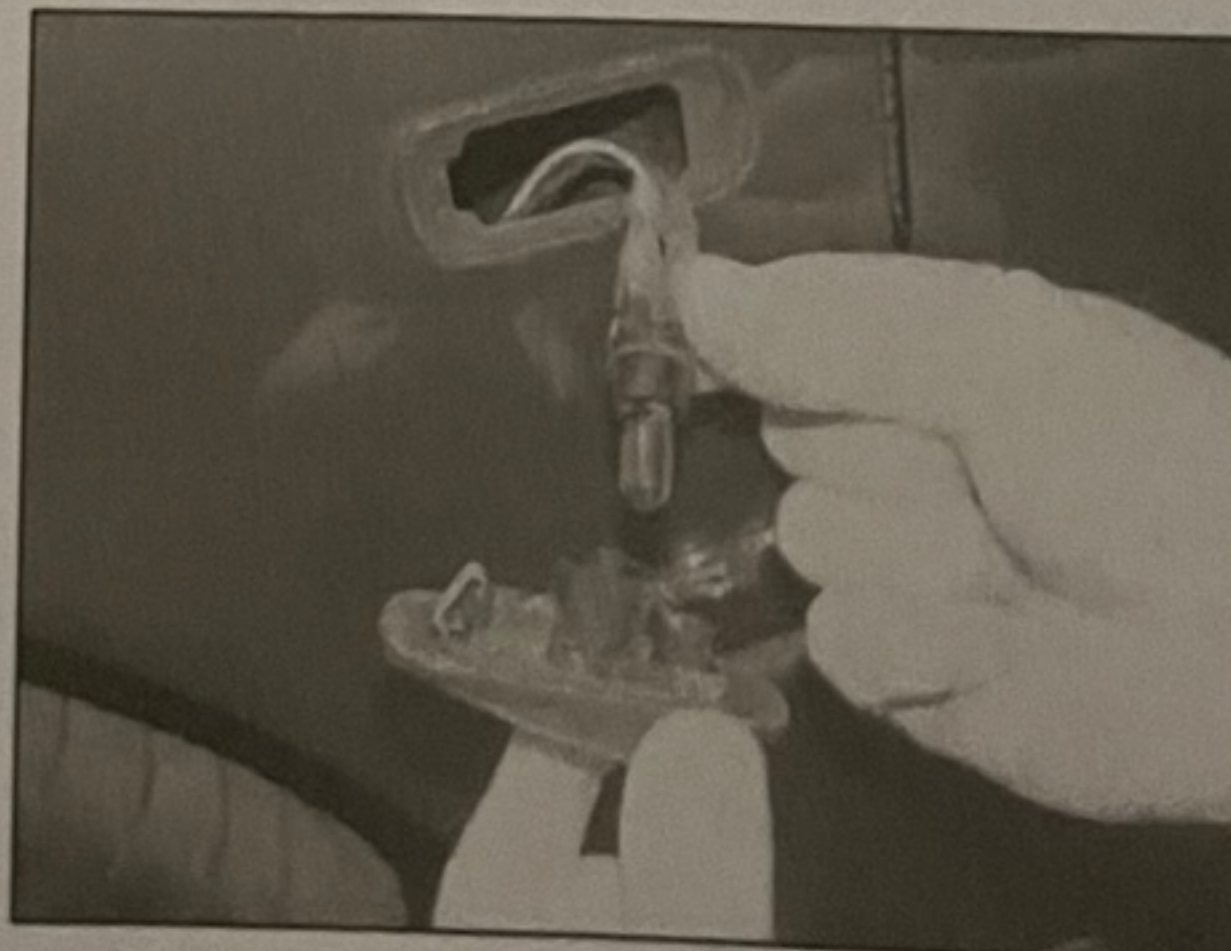
21 Fit the new bulb using a reversal of the removal procedure.

### Side repeater lights

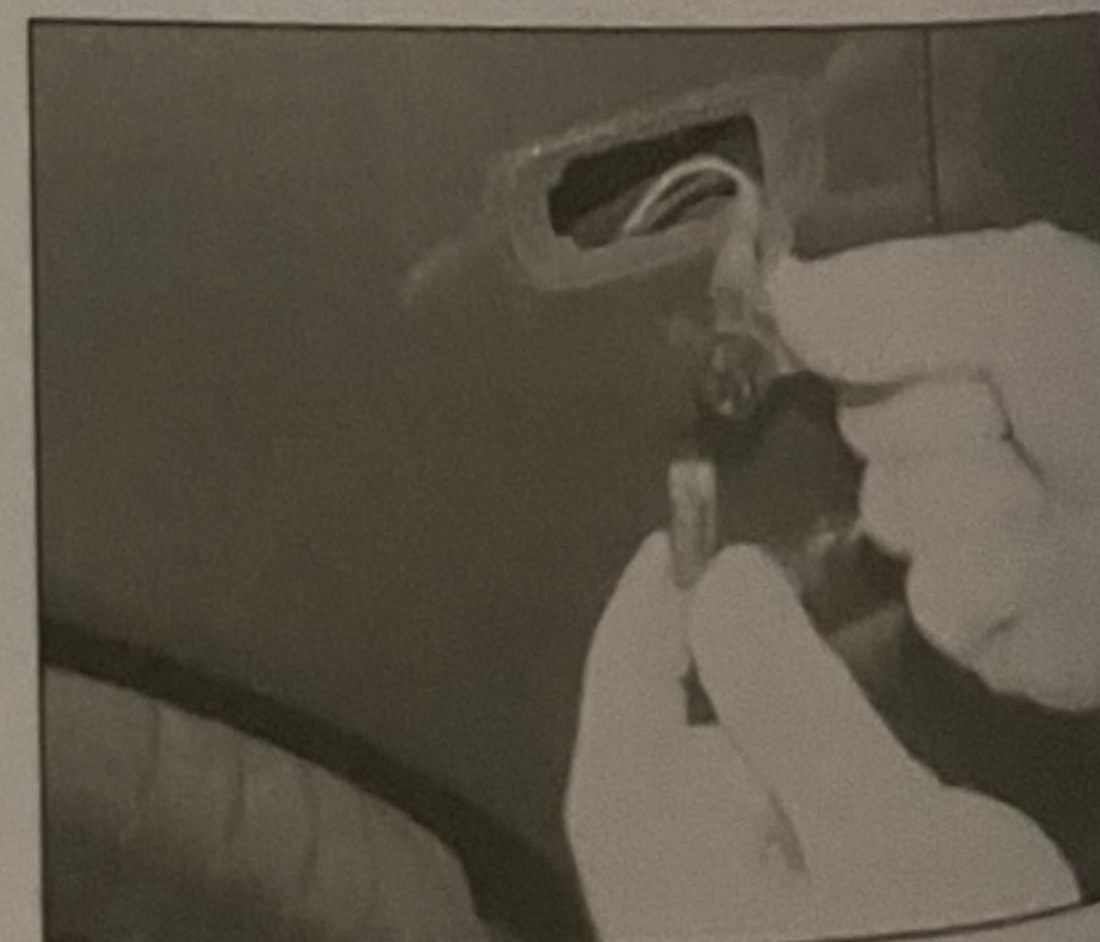
22 Carefully press the light forwards against the tension of the plastic clip, and then release the rear of the light from the front wing (see illustration).



6.22 Press the side repeater light forwards ...



6.23a ... remove the bulbholder ...



6.23b ... then pull out the wedge-type bulb





6.26 Unclip the trim panel

23 Twist the bulbholder and remove the lens unit, then pull out the wedge-type bulb (see illustrations). Do not allow the wiring to drop into the space behind the wing.

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

### Rear light light unit

#### Saloon models

25 The rear light assembly consists of light units in the rear body and also in the boot lid.

26 To access the body light unit, open the boot lid and unclip the plastic trim from the rear of the light unit (see illustration). To access the boot lid light unit, release the trim by removing the grab handle and relevant fasteners (depress the fastener centres).

27 Squeeze together the locking tabs and remove the bulbholder from the light unit (see illustrations). In the boot lid, twist the bulbholder from the rear of the light unit.

28 Depress and twist the relevant bulb and remove it from the bulbholder (see illustration).

29 Fit the new bulb using a reversal of the removal procedure. Before refitting the fasteners, pull out their centres.

#### Estate models

30 The rear light assembly consists of light units in the rear body and also in the tailgate. To access the body light unit bulb, remove the trim panel as described in Section 7. To access the tailgate light unit bulb, open the tailgate then turn the fastener a quarter turn anti-clockwise and remove the cover (see illustration).

32 Release the retaining clips, and remove the bulbholder from the light unit.

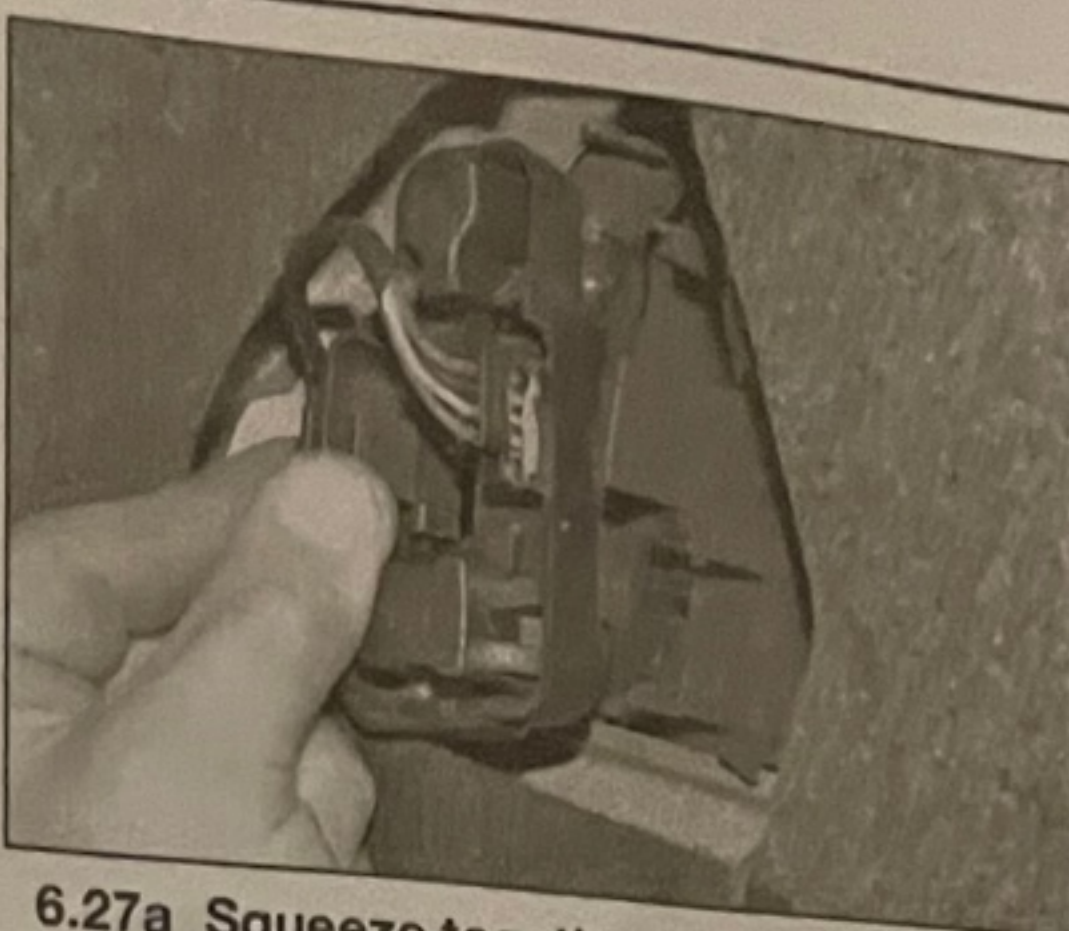
33 Depress and twist the bulb and remove it from the bulbholder (see illustrations).

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

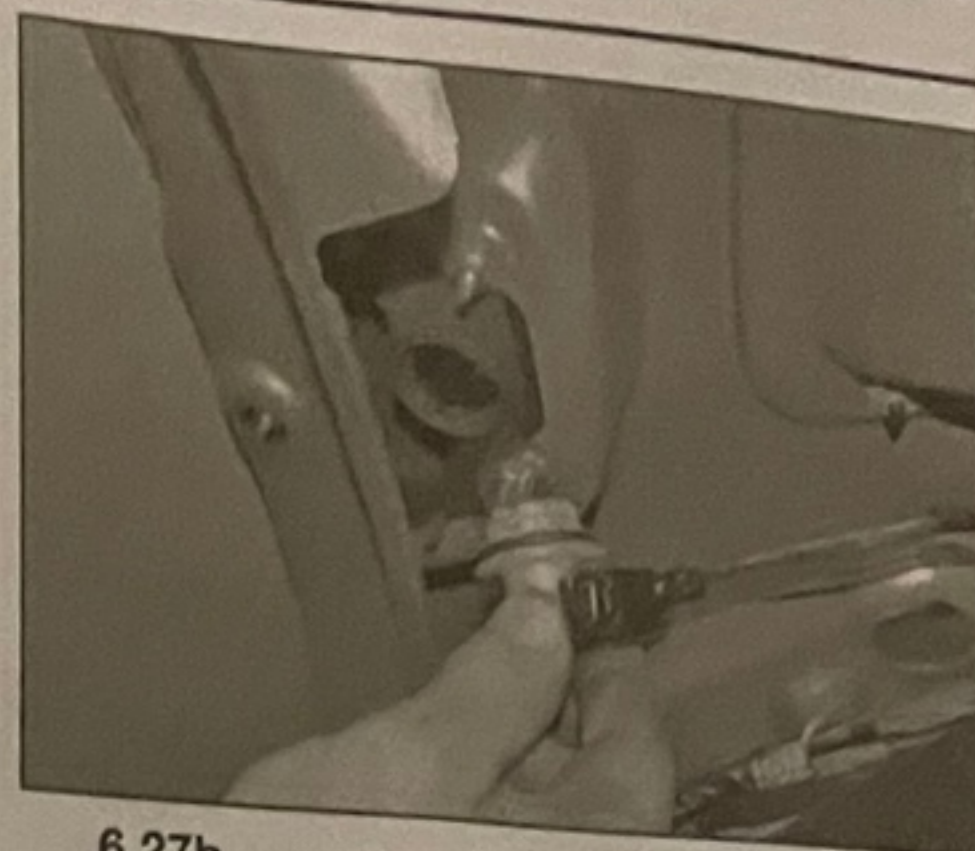
### Front foglight

35 Apply the handbrake, then jack up the front of the vehicle and support it on axle stands (see *Jacking and vehicle support*).

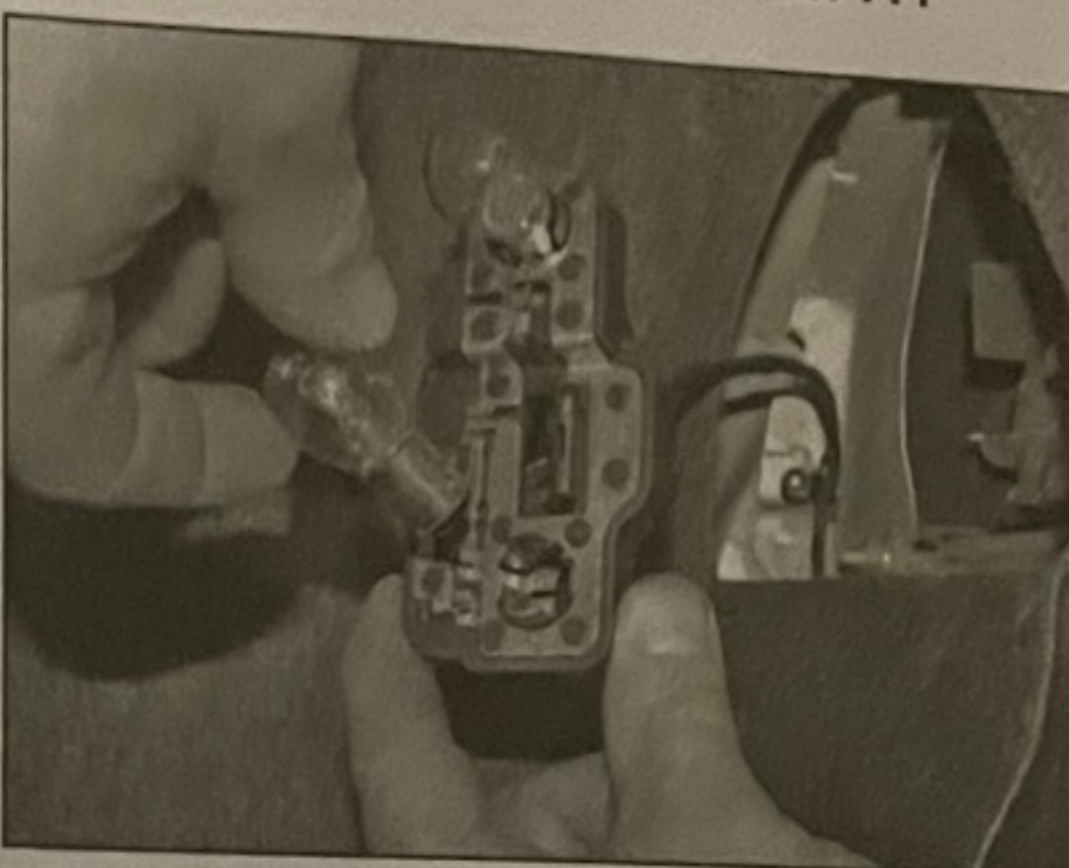
36 Reach up behind the foglight and disconnect the wiring connector, twist the bulbholder anti-clockwise to remove it (see illustrations).



6.27a Squeeze together the locking tabs and remove the bulbholder ...



6.27b ... or on the boot lid twist the bulbholder to remove



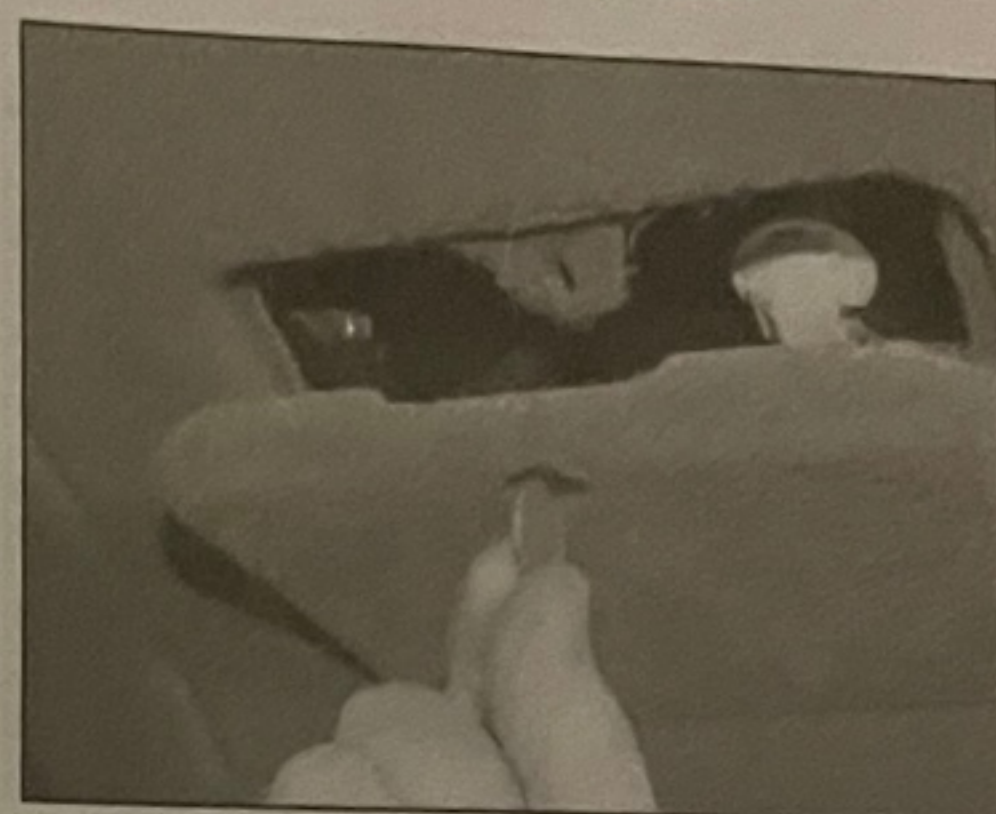
6.28 Depress and twist the bulb to remove

37 Pull the bulb from the bulbholder. **Note:** The bulb may be part of the bulbholder, check with your local Saab dealer.

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



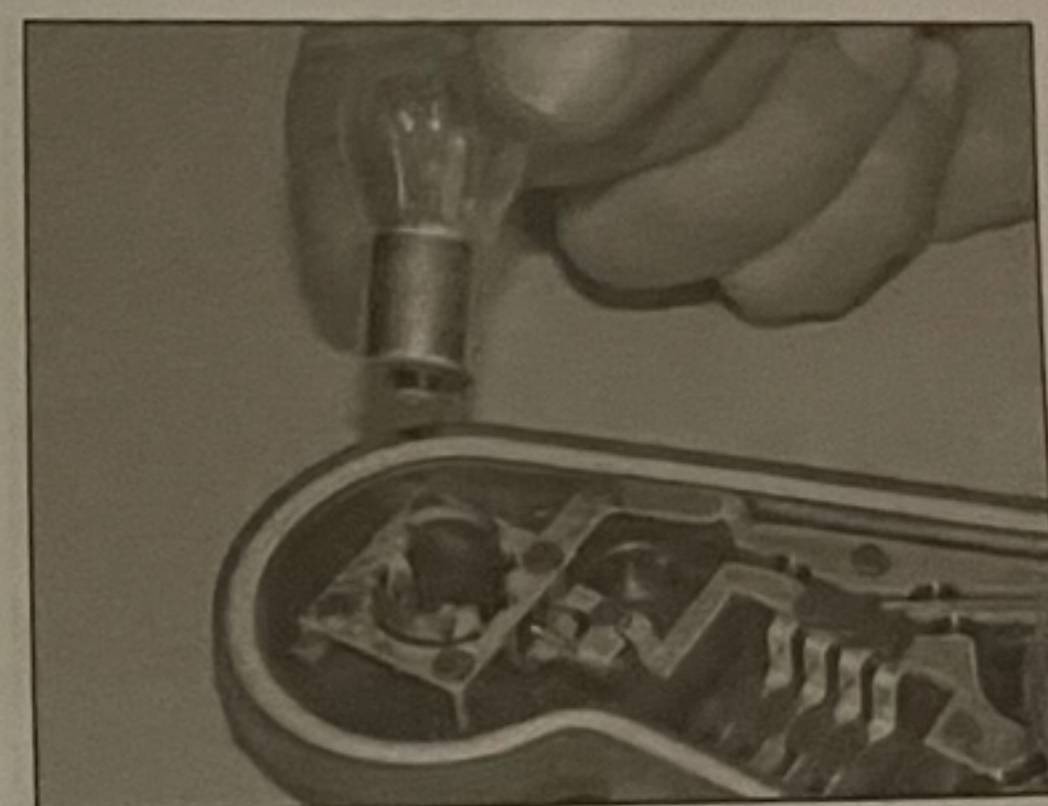
6.33a Remove the bulbholder, then depress and twist the bulb to remove it



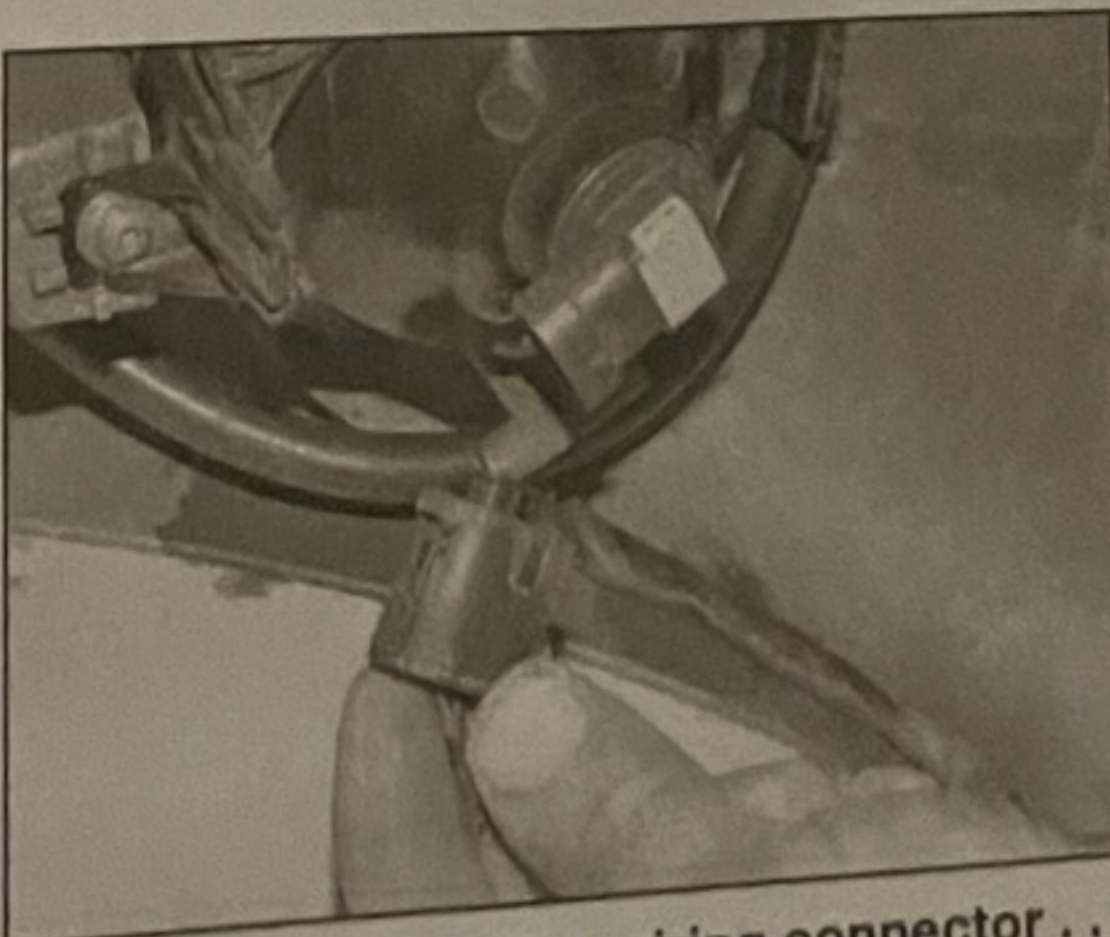
6.31 To access the tailgate light unit bulb, open the access flap

### Number plate light

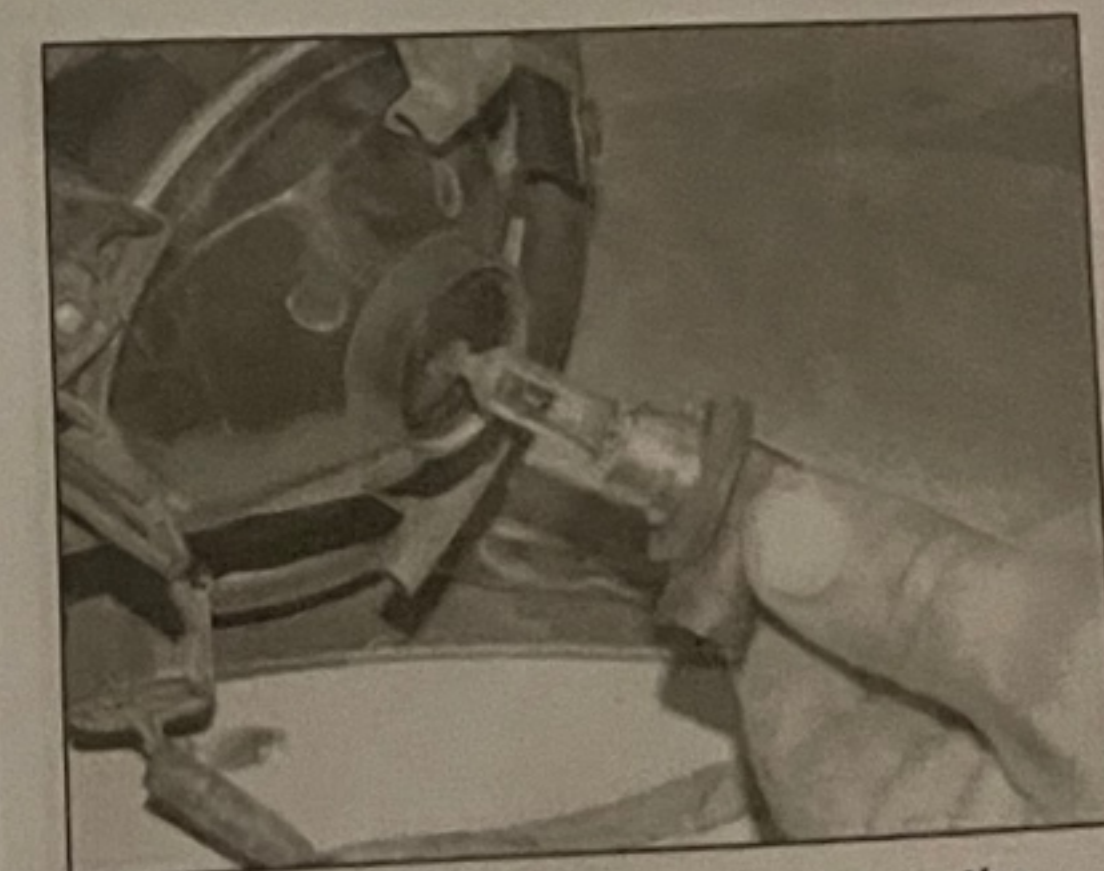
39 Using a small screwdriver carefully unclip the lens from the number plate light (see illustrations). Recover the seal, and check it for damage.



6.33b Removing a body rear light unit bulb



6.36a Disconnect the wiring connector ...

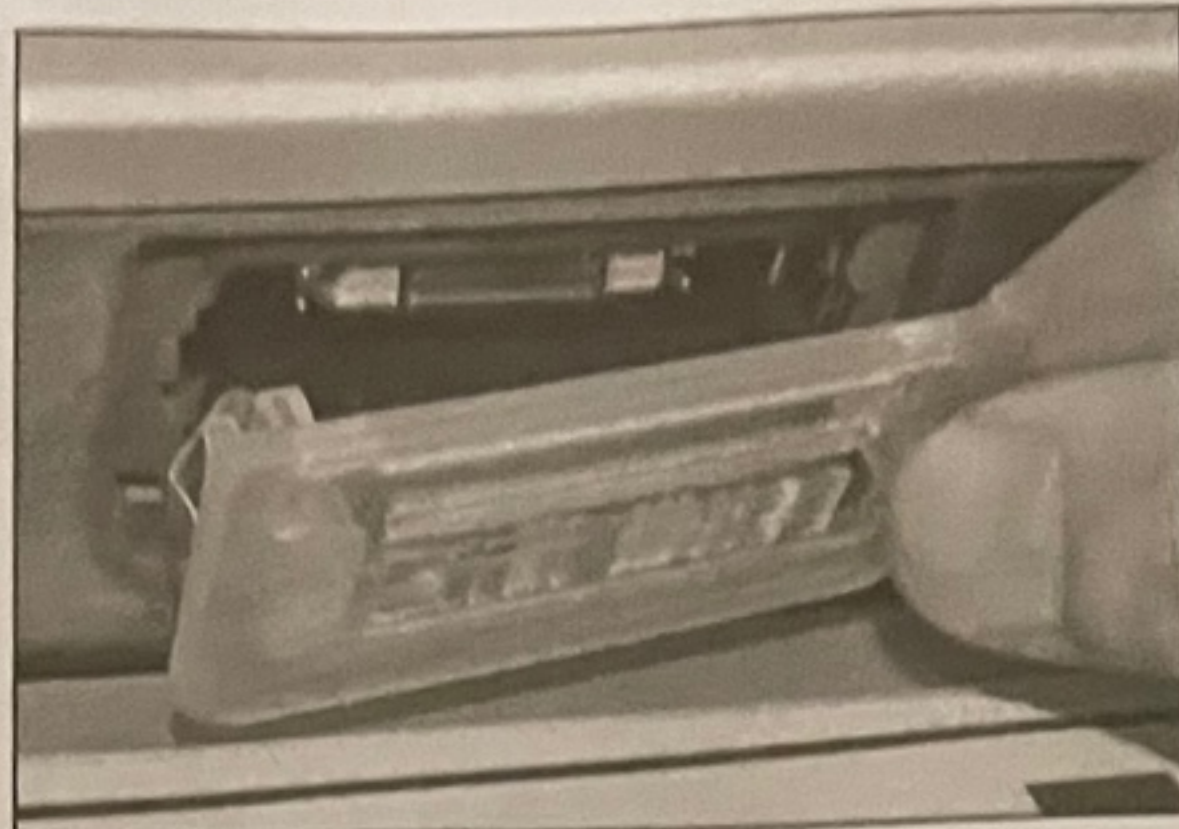


6.36b ... then twist and remove the bulbholder

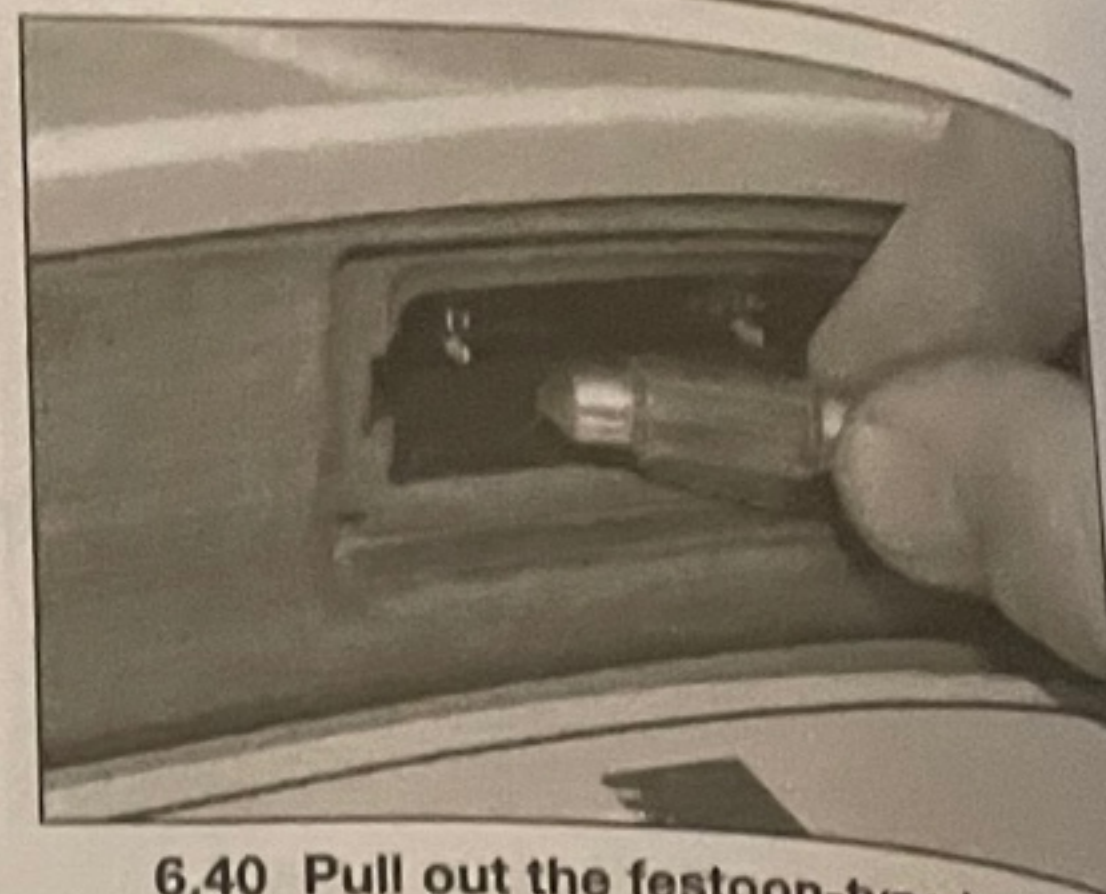




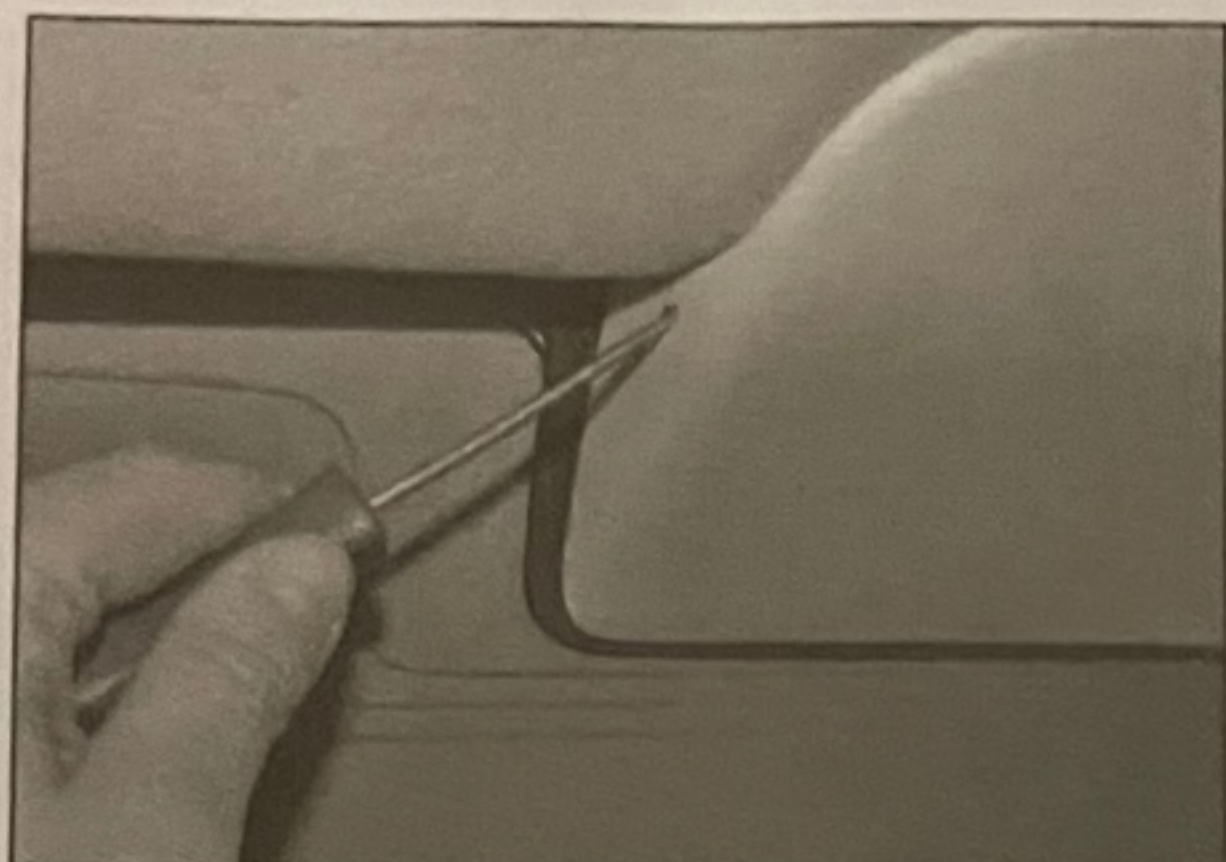
6.39a Using a small screwdriver . . .



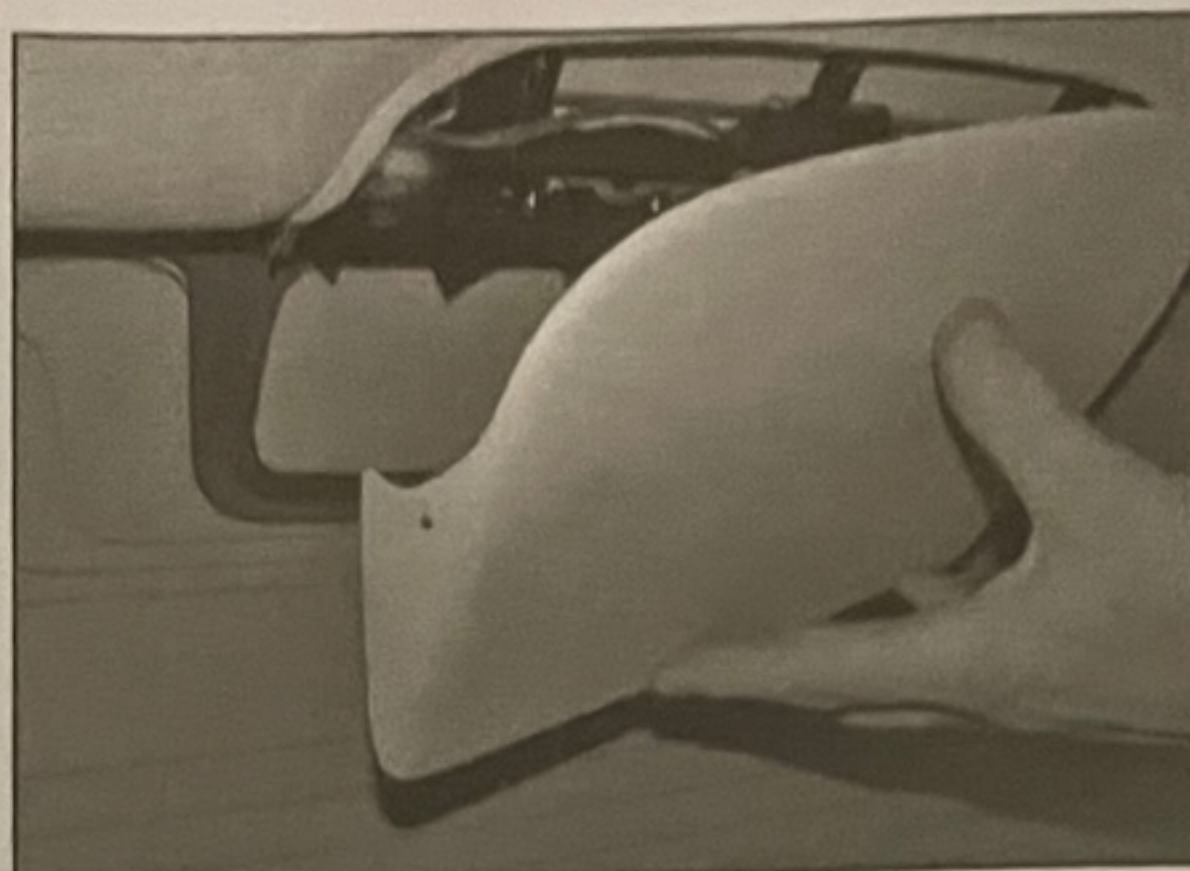
6.39b . . . unclip the light unit lens



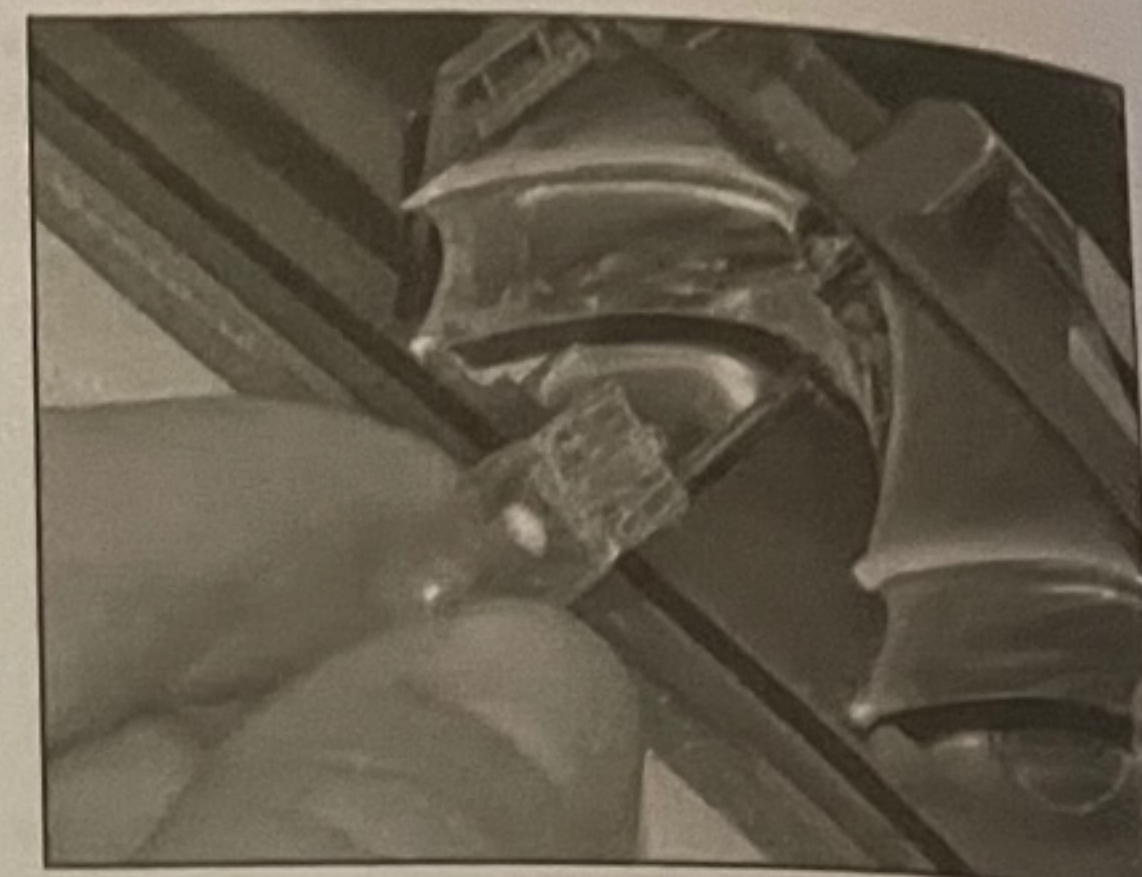
6.40 Pull out the festoon-type bulb



6.42a Release the securing clips . . .



6.42b . . . and remove the plastic trim cover



6.43 Pull out the wedge-type bulb

40 Pull out the festoon-type bulb from the bulbholder (see illustration).

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

### High-level stop-light

#### Saloon models

42 Remove the cover panel from the rear of

the headlining by carefully pressing in the two clips on each side (see illustration).

43 Pull out the relevant wedge-type bulb from the bulbholder (see illustration).

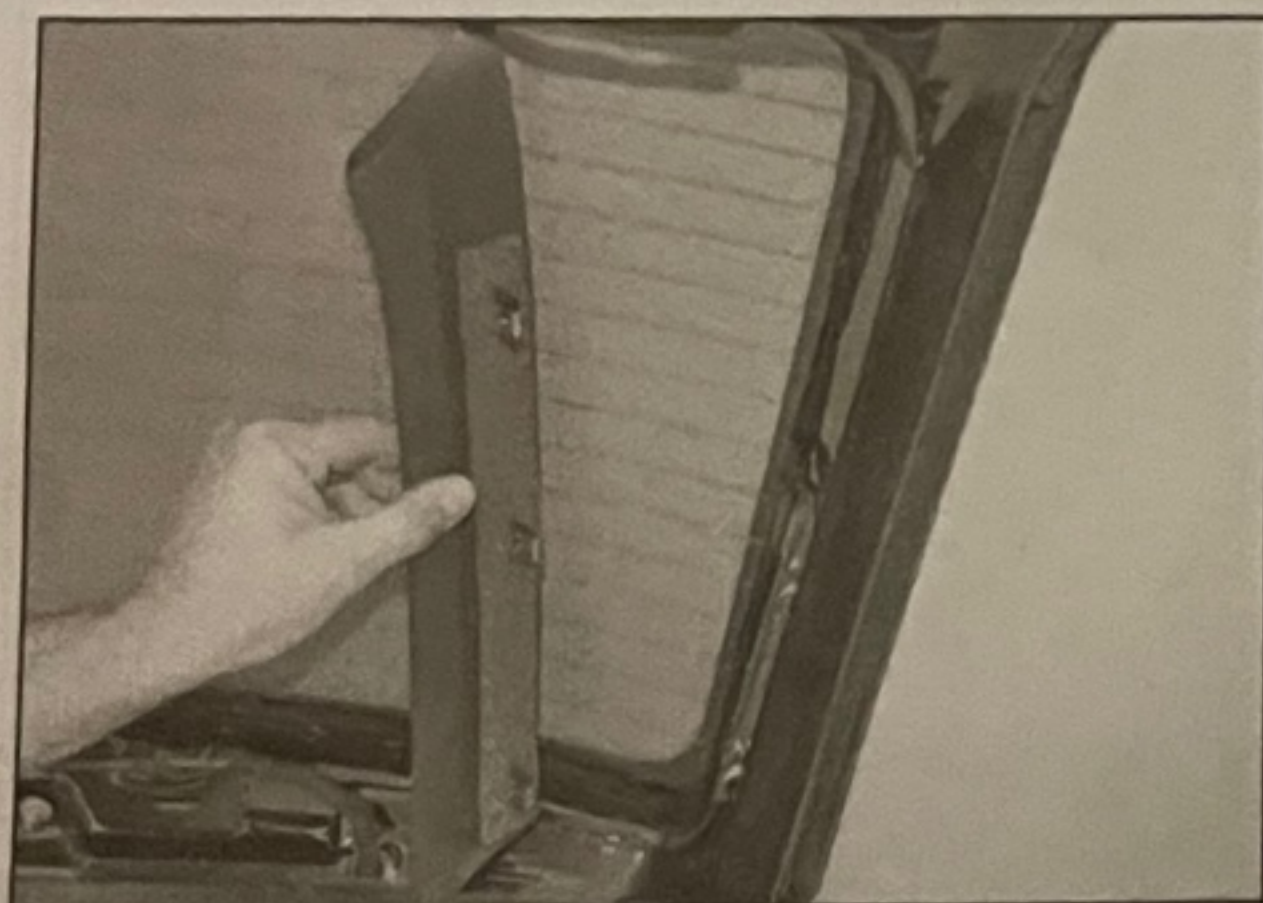
44 Fit the new bulb using a reversal of the removal procedure. Make sure the cover panel is fully entered in the clips.

#### Estate models

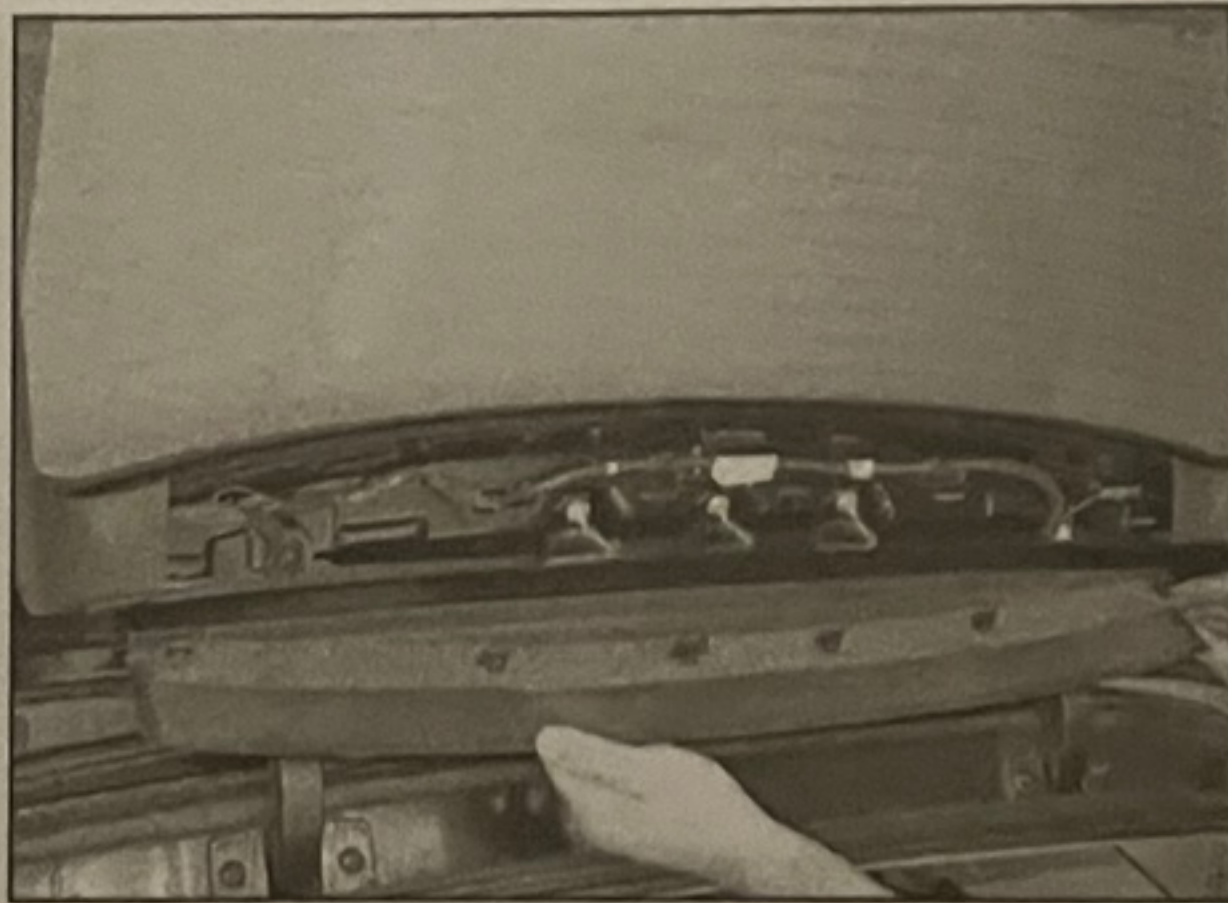
45 With the tailgate open, prise off the covers, then undo the screws and remove the rear window side and upper trim covers (see illustrations).

46 Disconnect the wiring from the high-level stop-light, then unscrew the nuts and withdraw the light unit from the tailgate (see illustrations).

47 Undo the screws and separate the principal



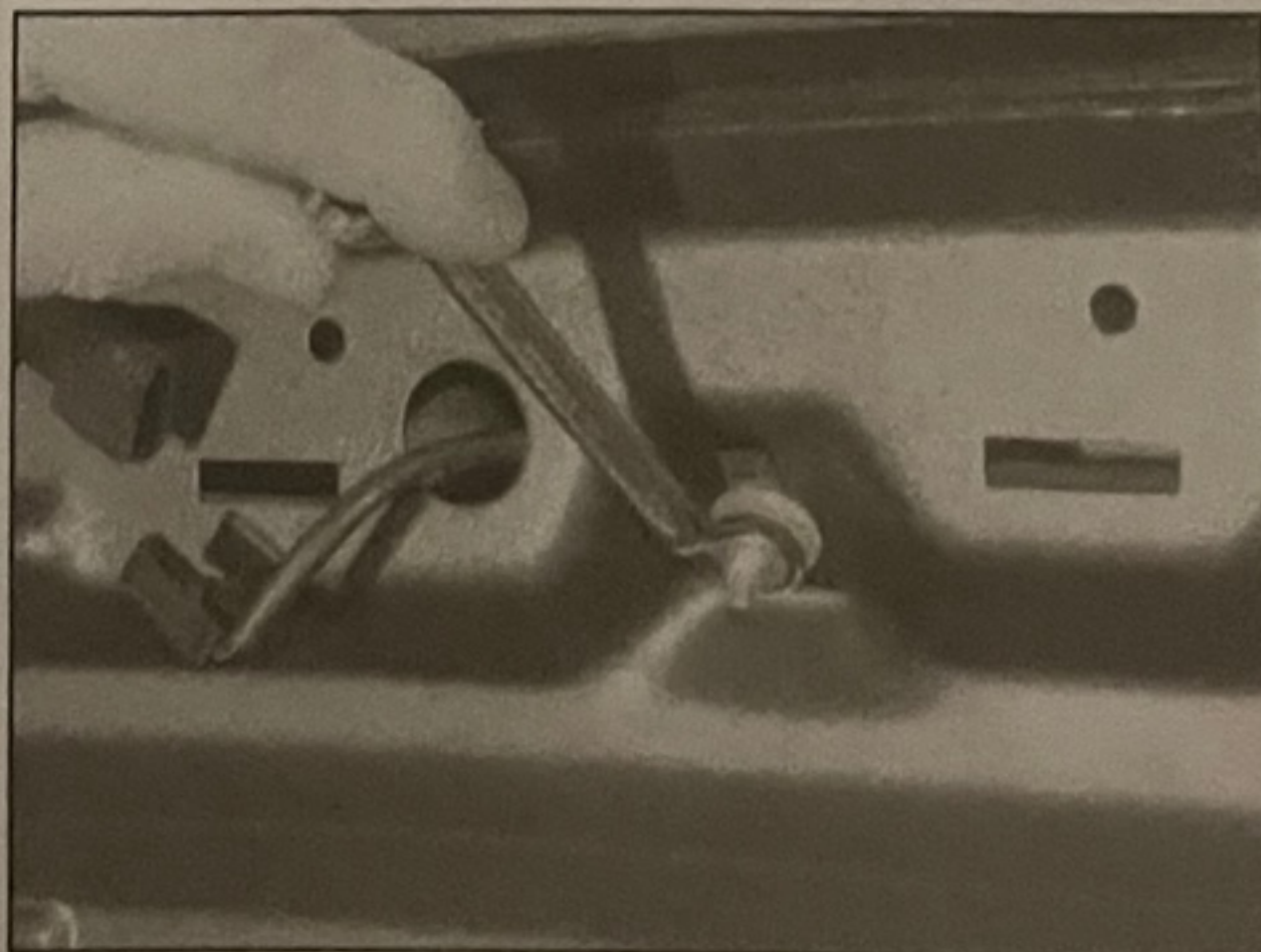
6.45a Remove the rear window side trim covers . . .



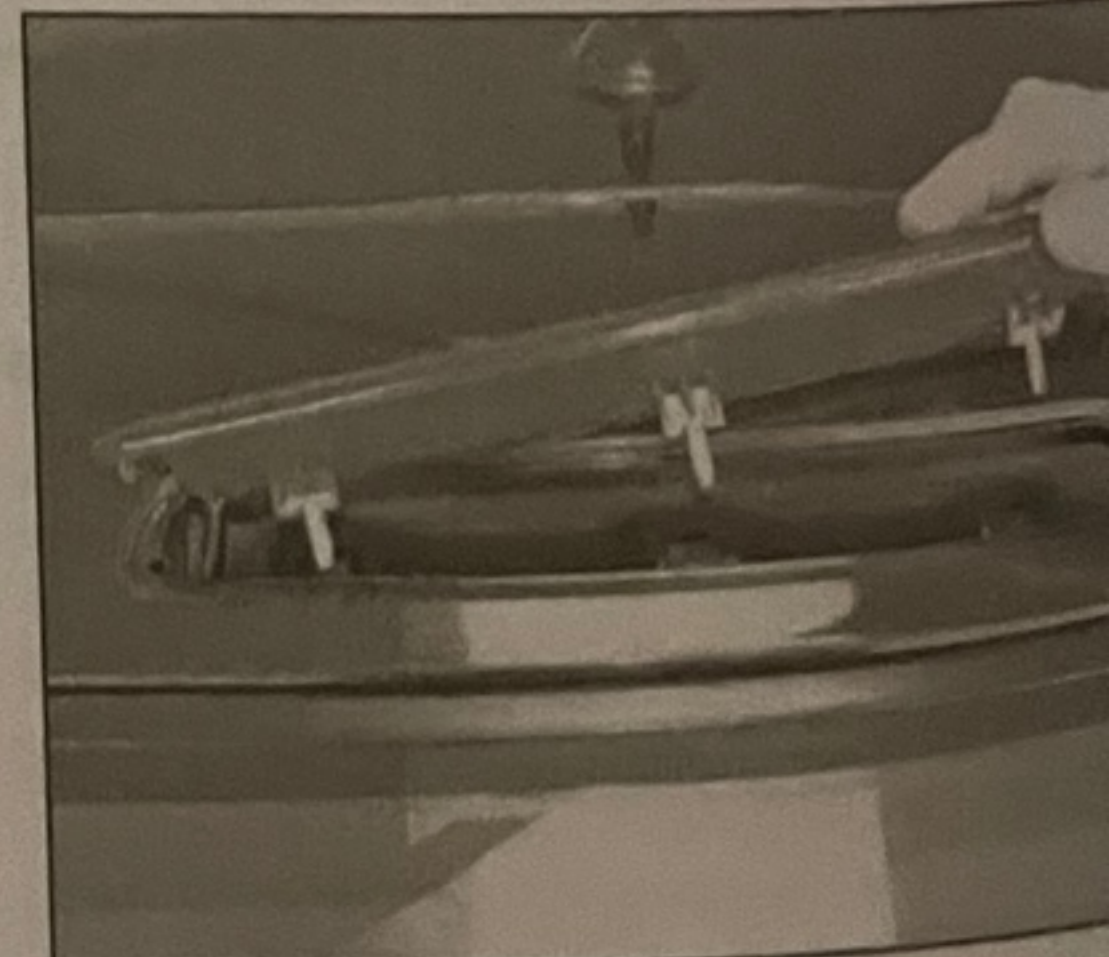
6.45b . . . and upper trim cover



6.46a Disconnect the wiring . . .



6.46b . . . then unscrew the nuts . . .



6.46c . . . and withdraw the light unit from the tailgate

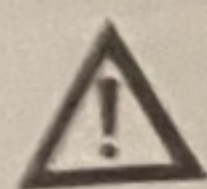


circuit board together with the LEDs (see illustrations). Take care not to damage the guide pins.

48 Fit the new printed circuit board using a reversal of the removal procedure.

## 7 Exterior light units - removal and refitting

### Headlight

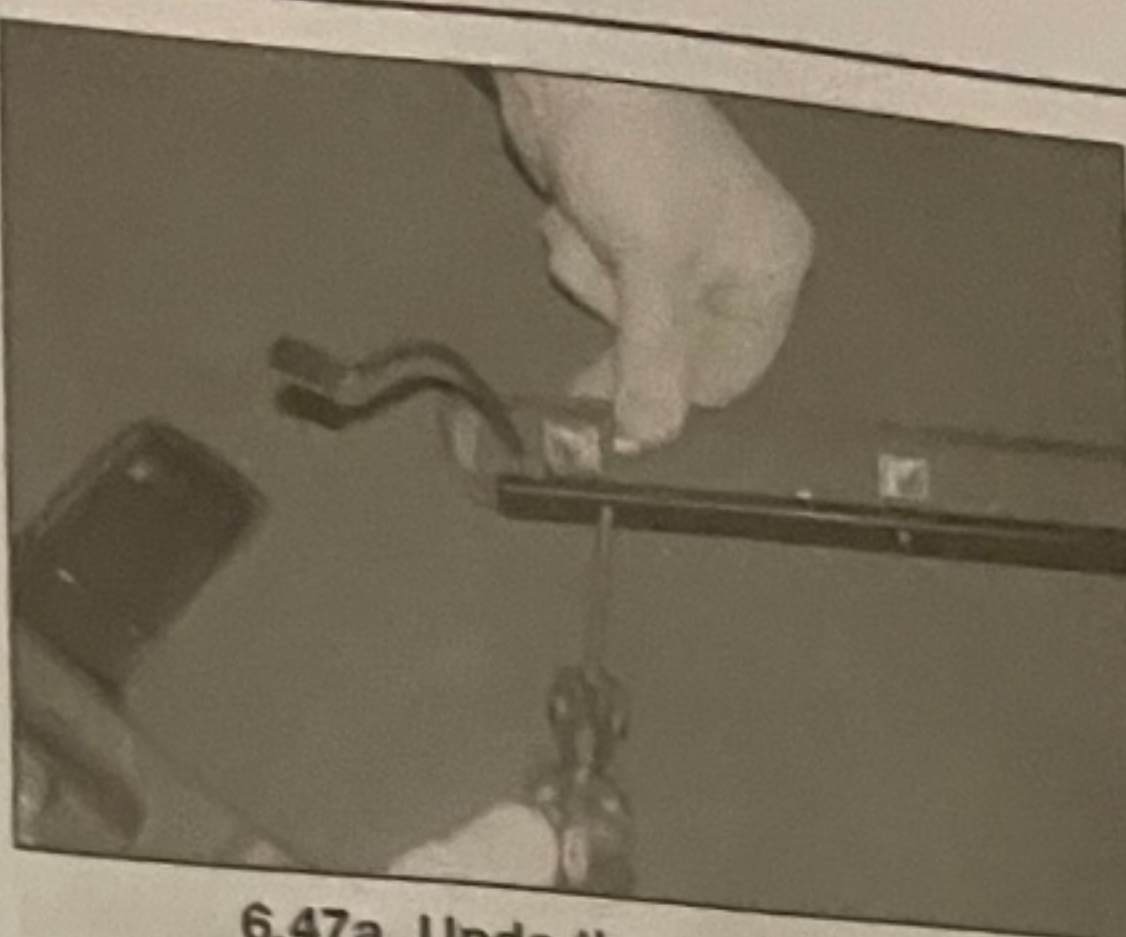


**Warning:** On models with xenon headlights, the ignition switch must be off and in its LOCK position.

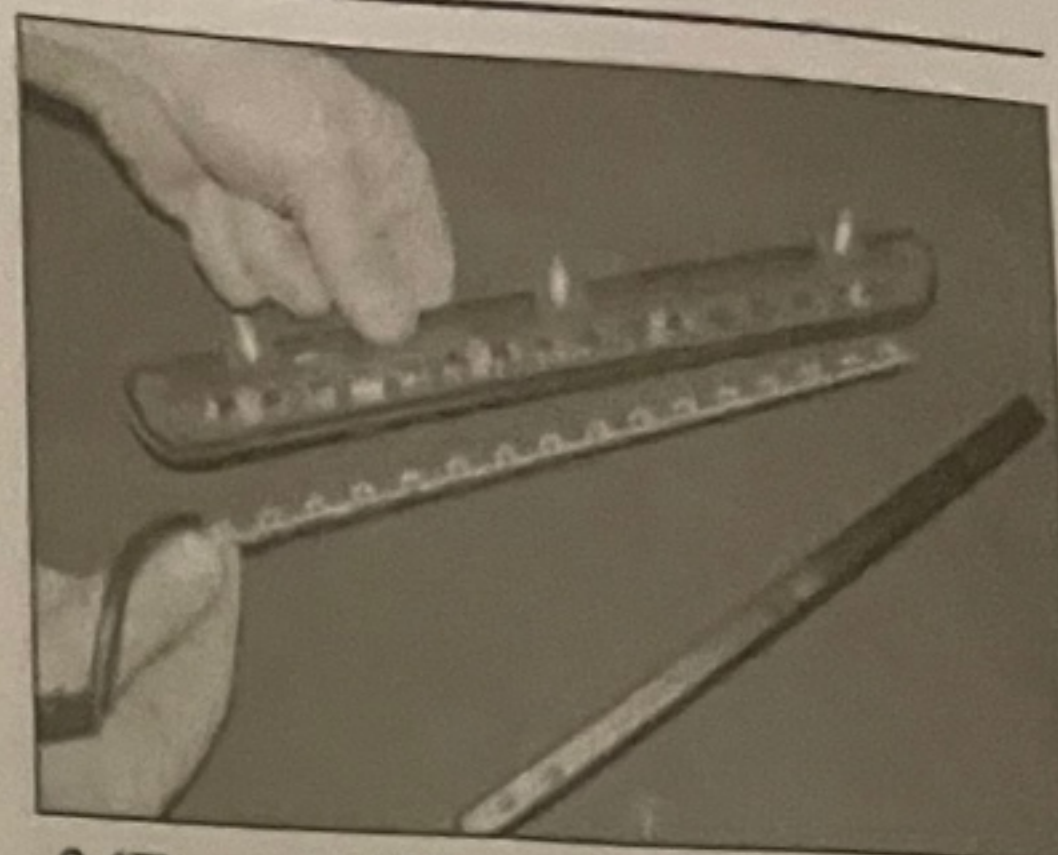
- 1 Remove the front bumper as described in Chapter 11.
- 2 Undo the upper and lower headlight mounting bolts (see illustrations).
- 3 Withdraw the headlight unit forwards, releasing it from the mounting brackets (see illustration).
- 4 Disconnect the wiring plug as the headlight unit is withdrawn from the vehicle (see illustration).
- 5 Refitting is a reversal of removal, but have the headlight beam alignment checked and adjusted as soon as possible.

### Direction indicator light

The front indicator unit is part of the headlight unit, remove the headlight unit as described in paragraphs 1 to 5.



6.47a Undo the screws...



6.47b ... and separate the printed circuit board and LEDs

### Side repeater light

- 7 See procedure for side repeater lights in Section 6 (exterior light bulbs) of this Chapter.

### Rear light units

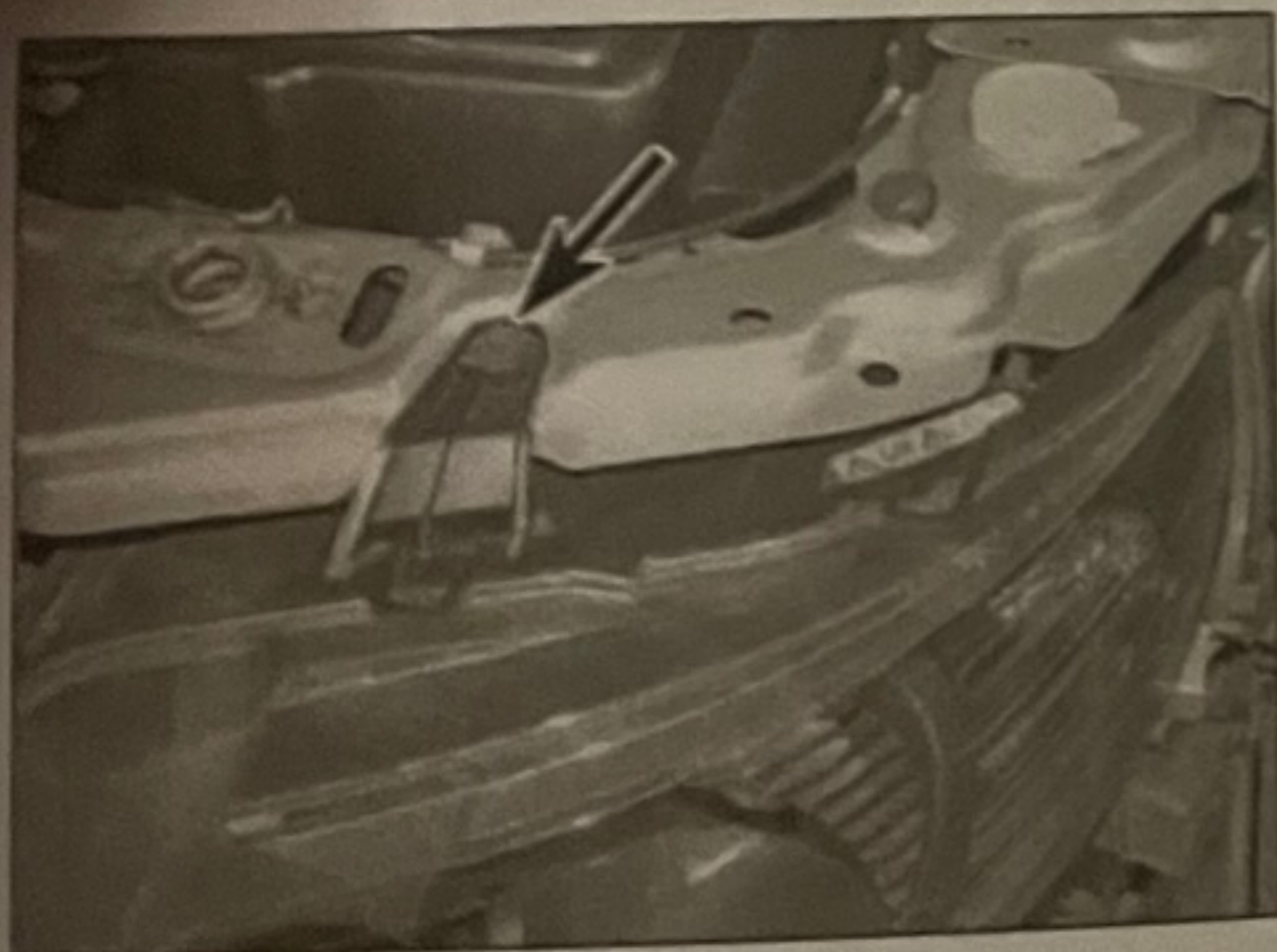
#### Saloon models

- 8 The rear light units consist of lights in the rear body and also in the boot lid.
- 9 To remove the body light unit, open the boot lid and pull back the carpet flap in the luggage compartment.
- 10 To remove the boot lid light unit, release the trim by removing the grab handle and relevant fasteners (depress the fastener centres).
- 11 Remove the bulbholders from the rear light units as described in Section 6 (exterior light bulbs) of this Chapter.

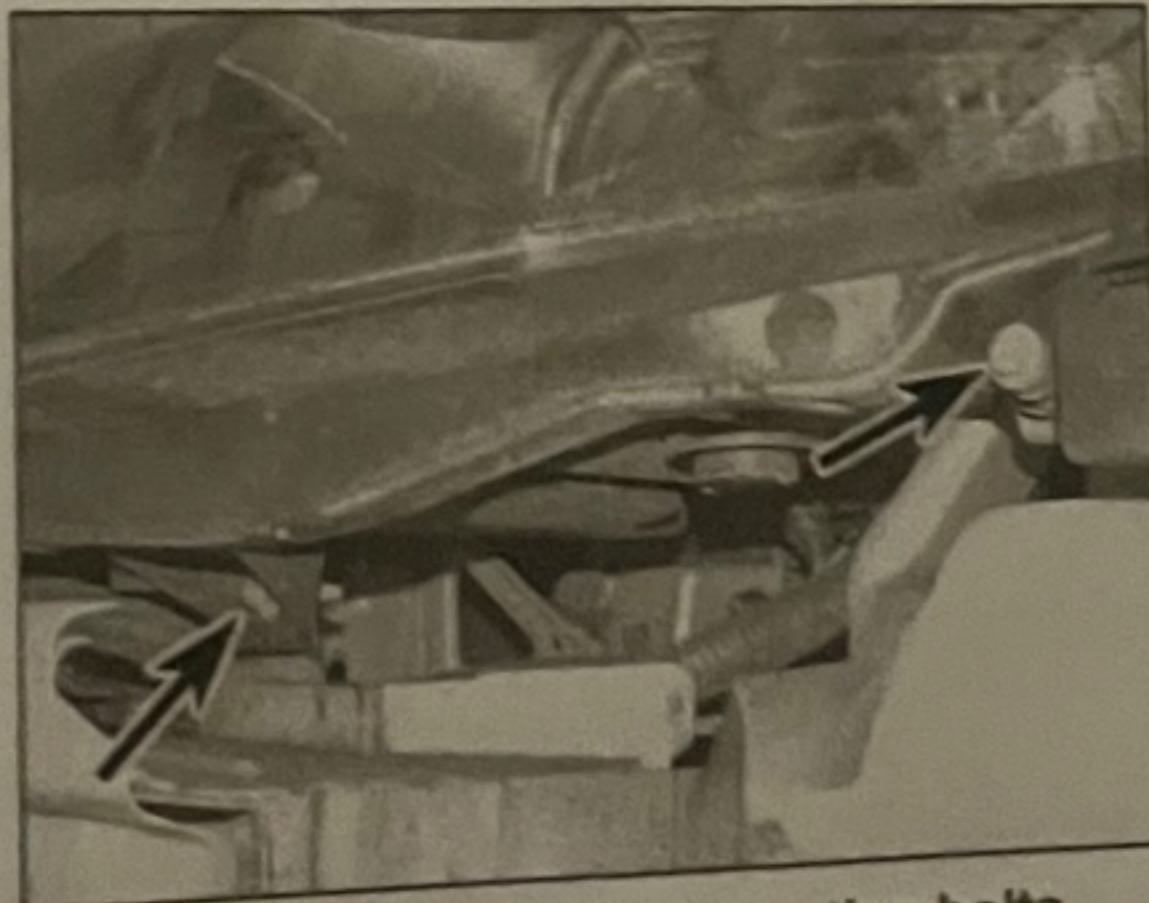
- 12 Unscrew the nuts and withdraw the rear light unit from the vehicle (see illustrations).
- 13 On the boot lid light unit, remove the rubber grommet from the edge of the boot lid to access the outer retaining nut (see illustrations).
- 14 Refitting is a reversal of removal, but firmly tighten the nuts.

#### Estate models

- 15 The rear light units consist of light units in the rear body and also in the tailgate.
- 16 To remove the body light unit open the tailgate and then undo the retaining screws on the inside edge of the rear light unit. Pull the light unit out to the rear of the car, to release it from the inner retaining clip at its front edge. Disconnect the wiring connector as the light is withdrawn (see illustrations).



7.2a Unscrew the headlight upper...



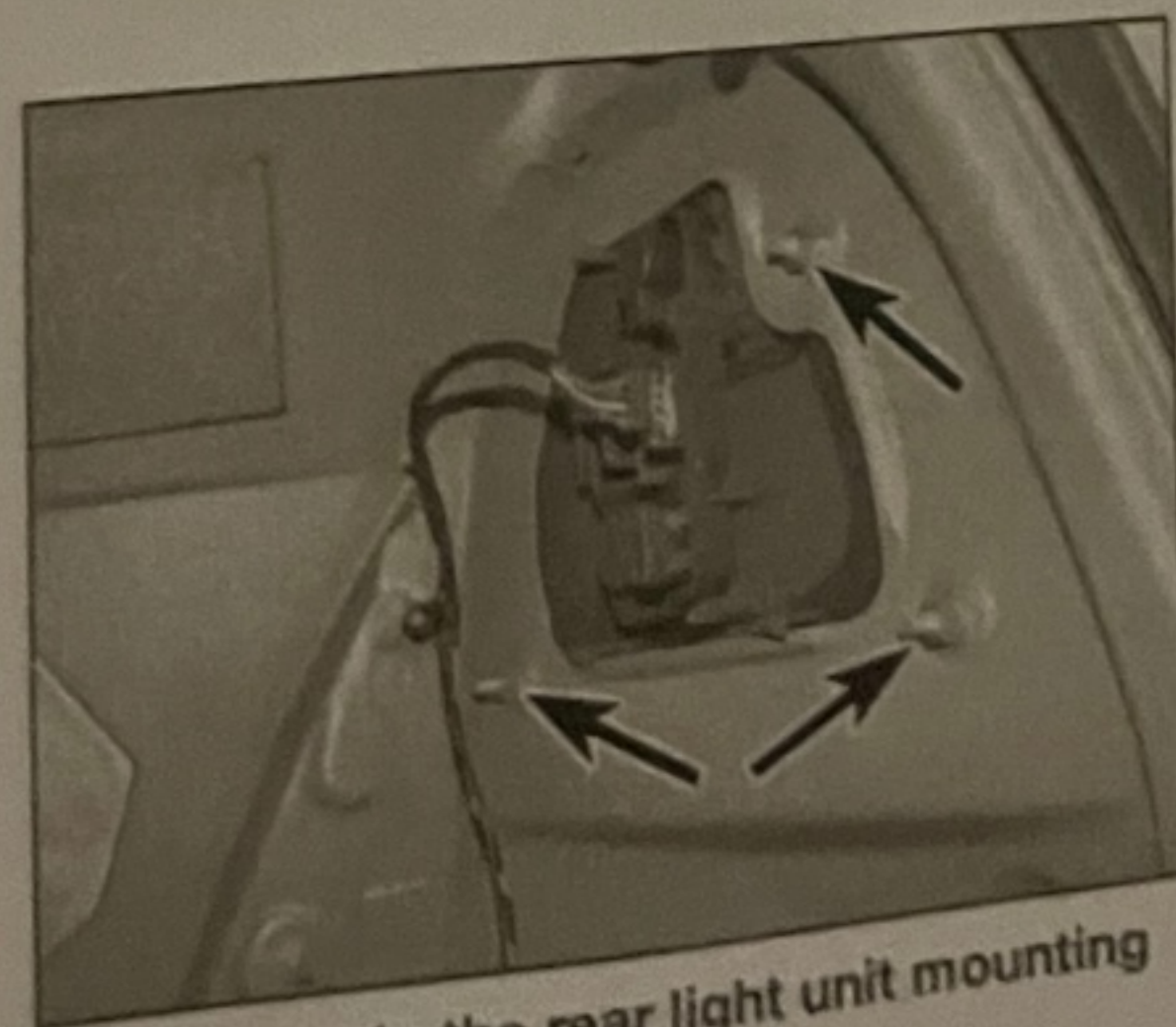
7.2b ... and lower mounting bolts



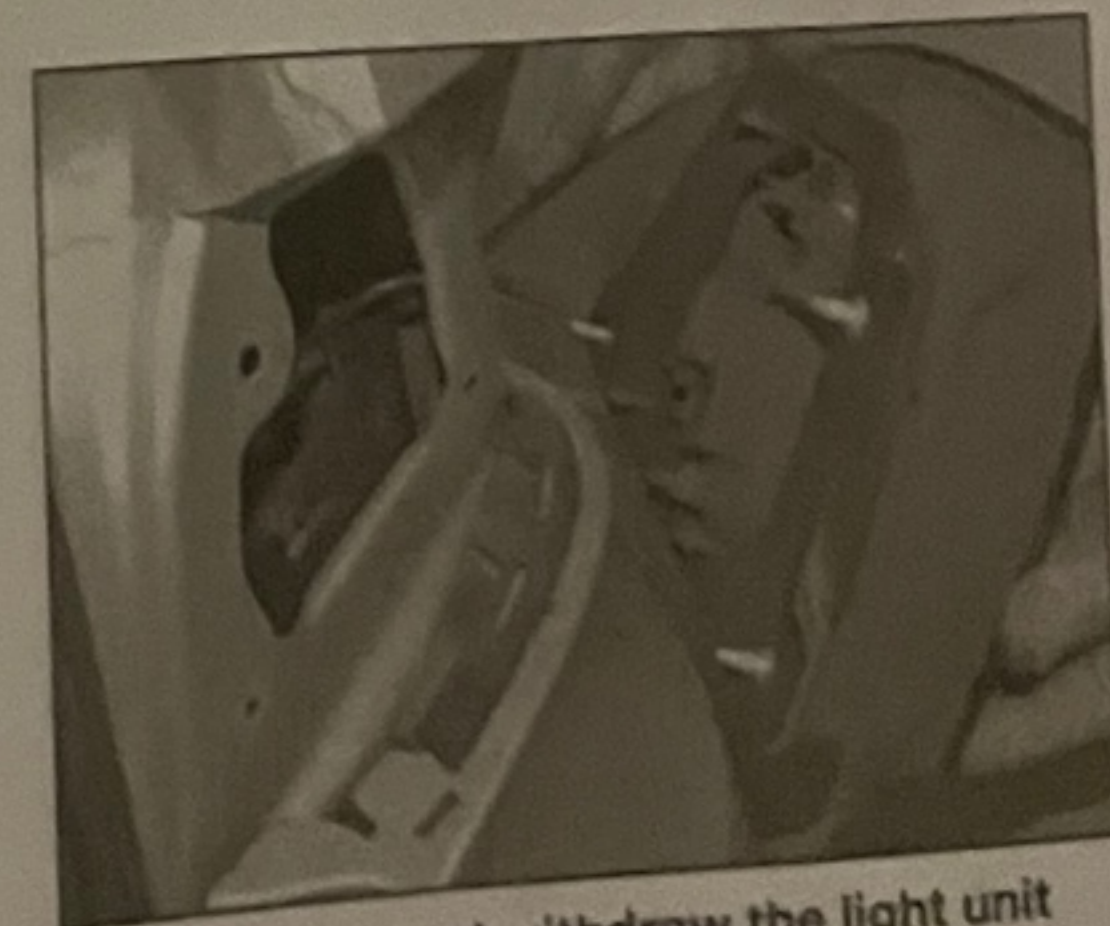
7.3 Withdraw the headlight...



7.4 ... and disconnect the wiring connector



7.12a Undo the rear light unit mounting nuts (arrowed)...

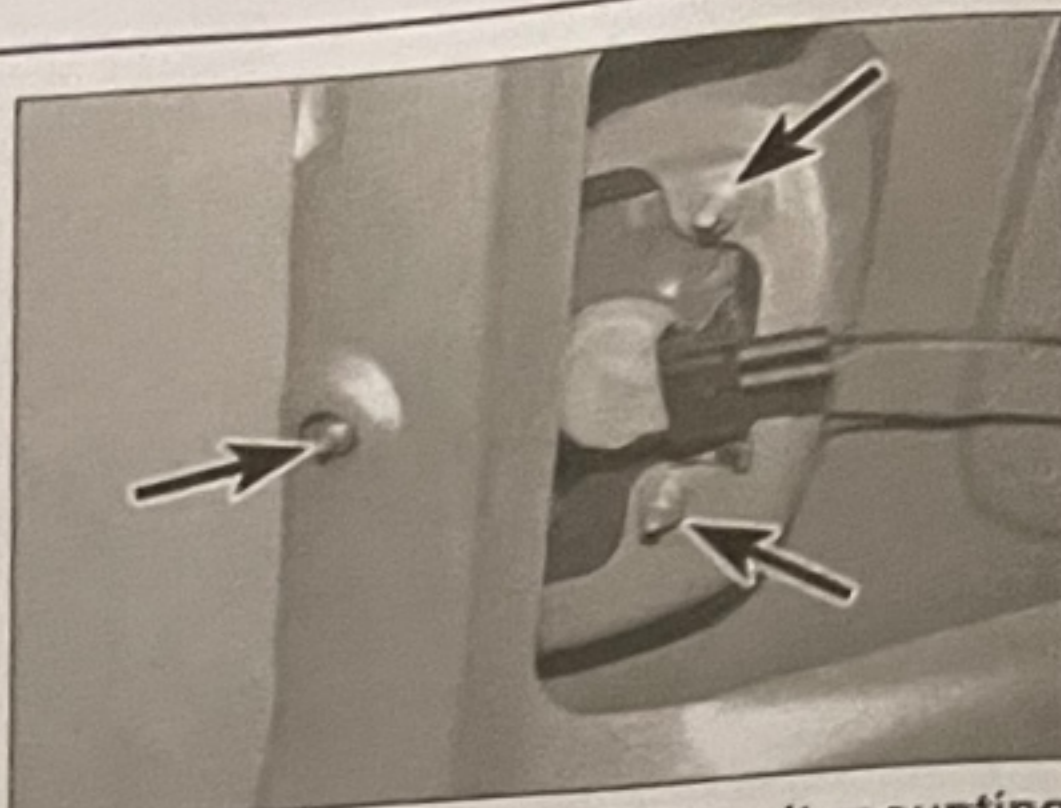


7.12b ... and withdraw the light unit

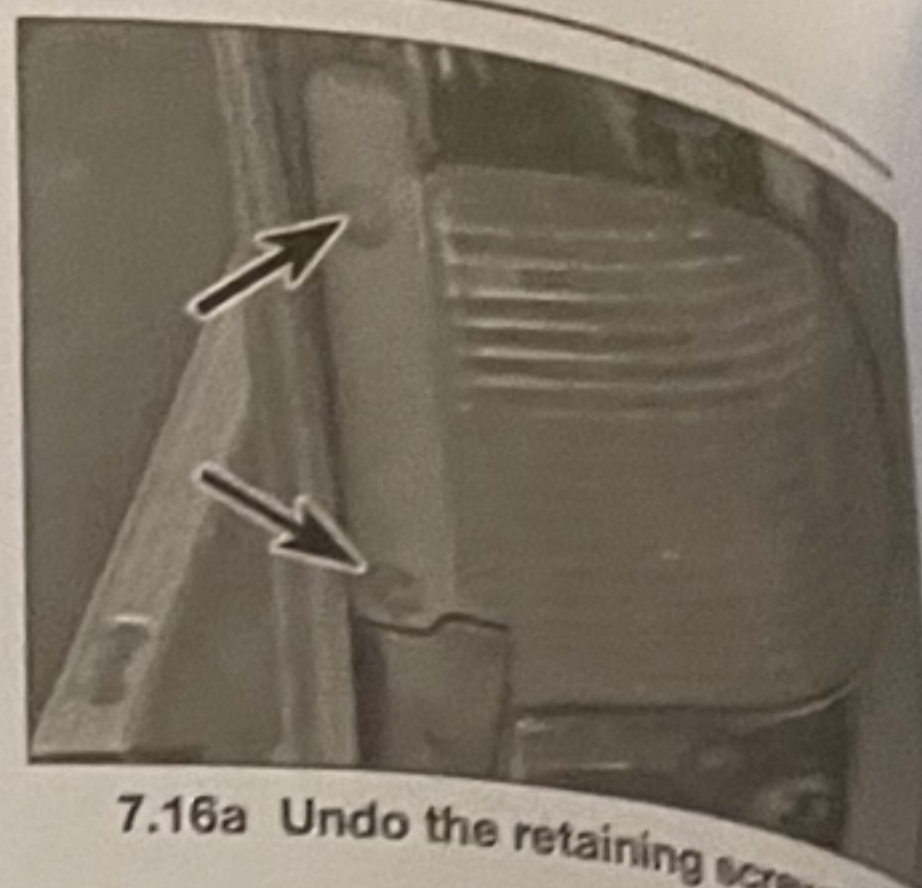




7.13a Remove the rubber grommet ...



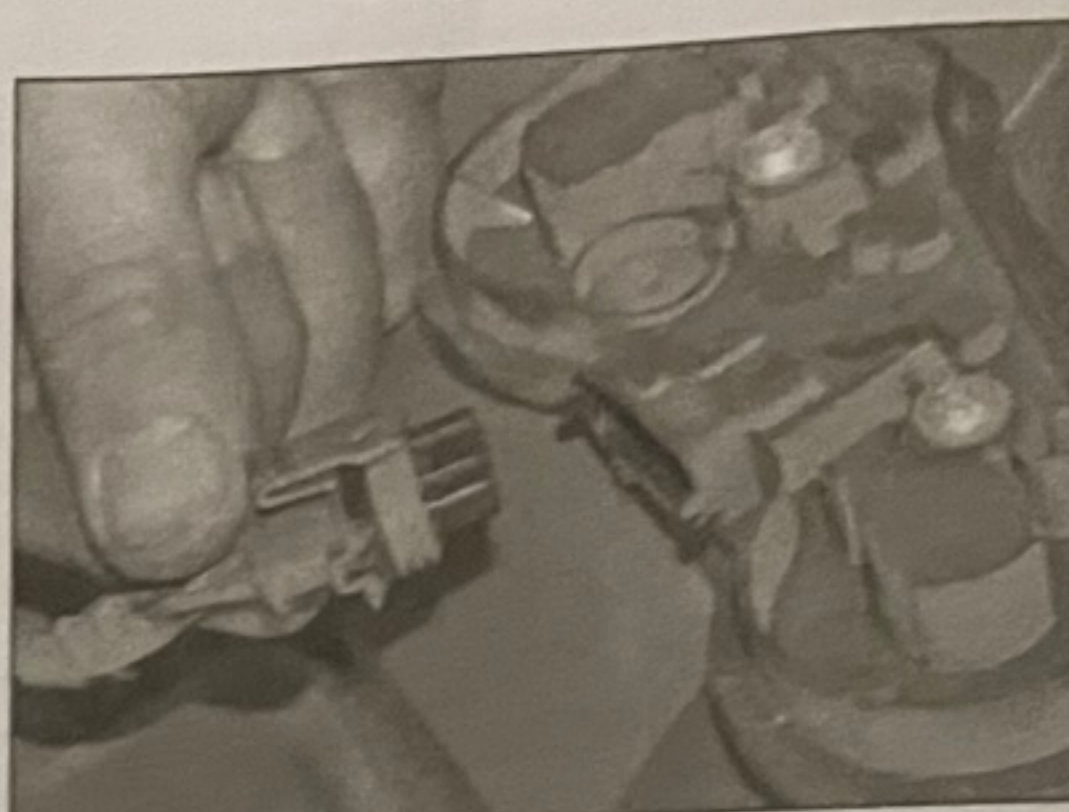
7.13b ... and undo the light unit mounting nuts (arrowed) ...



7.16a Undo the retaining screws ...



7.16b ... and withdraw the light unit to the rear to release it from the retaining clip (arrowed)



7.16c Disconnect the wiring connector

17 To remove the tailgate light unit, remove the rear cover panel and unclip the bulbholder from the rear of the light unit. Then remove the rubber grommet from the edge of the tailgate to access the outer securing nut, undo the

retaining nuts and withdraw the light unit from the tailgate (see illustrations).

18 Refitting is a reversal of removal. Before refitting the body light unit, remove the fastener from the body and refit it to the light

unit. Check the tailgate light unit seal before refitting it.

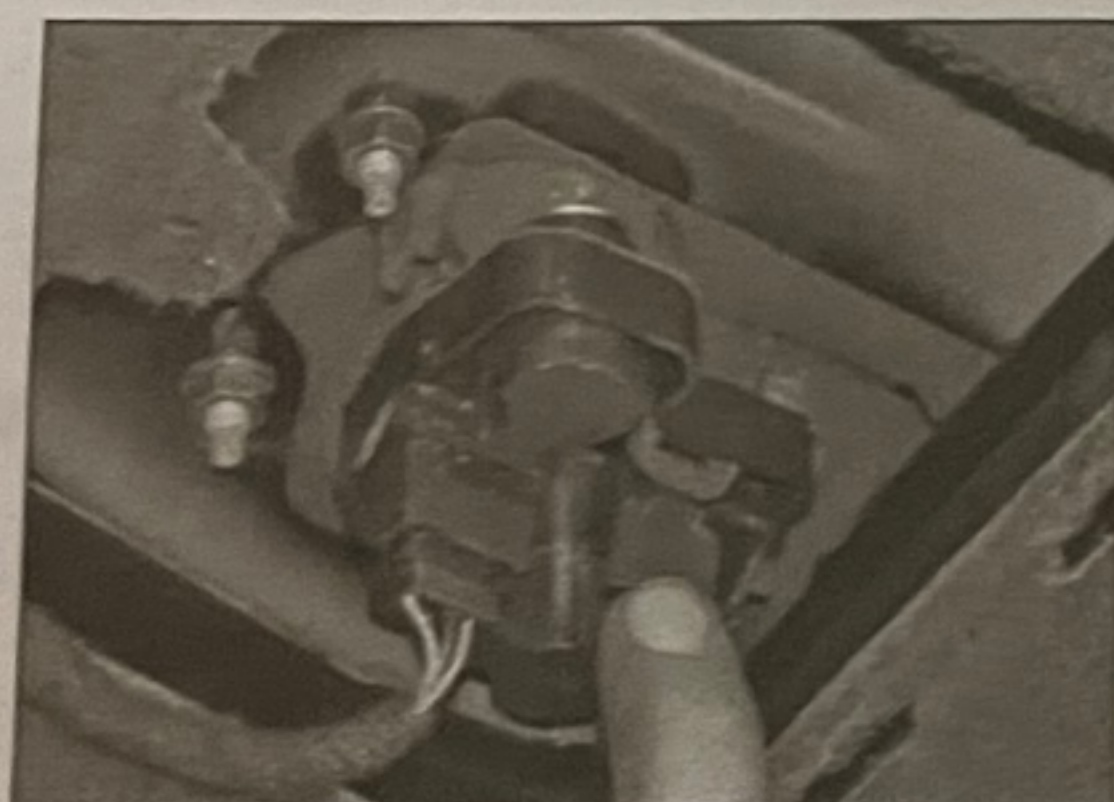
### Front foglight

19 Apply the handbrake, then jack up the front of the vehicle and support it on axle stands (see *Jacking and vehicle support*).

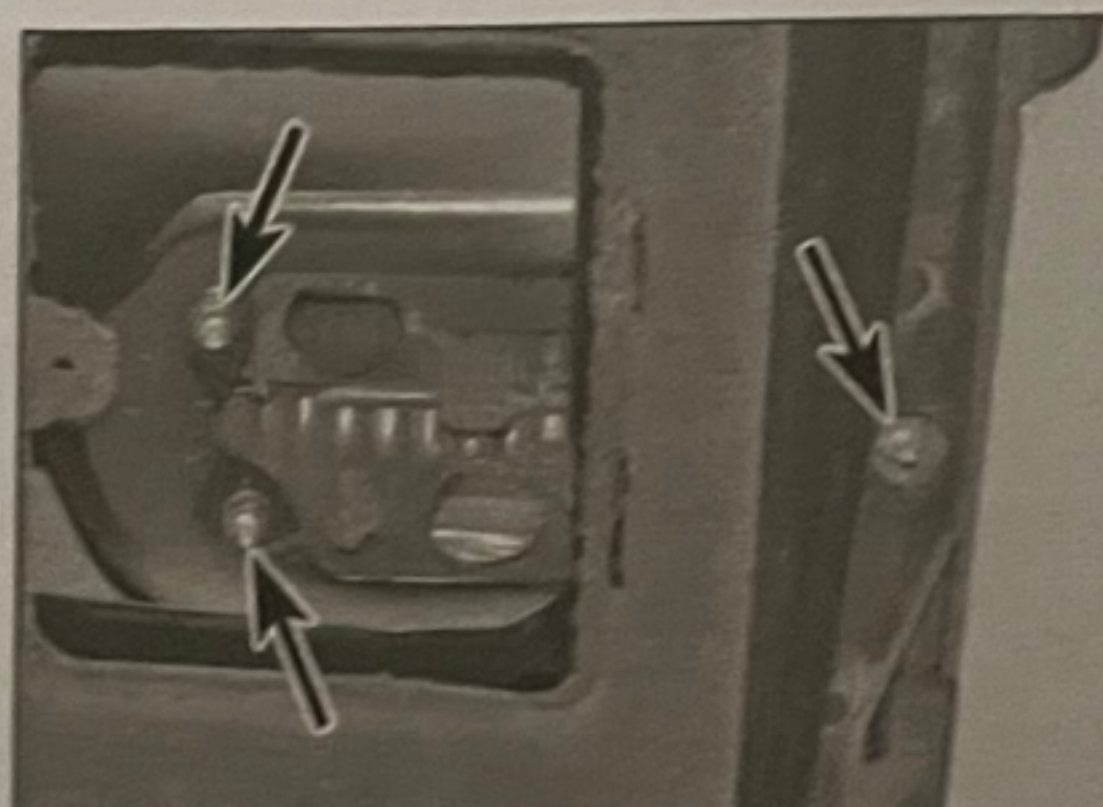
20 Reach up behind the foglight and twist the bulbholder anti-clockwise to remove it. If necessary, the bulbholder can be disconnected from the wiring.

21 Undo the retaining screws, and then withdraw the foglight from the rear of the bumper (see illustrations).

22 Refitting is a reversal of removal. To adjust the foglight, park the vehicle 10 metres from a wall and mark the wall with a cross at the same height as the centre of the lens. Make a further mark 10 to 20 cm below the cross, then adjust the foglight beam onto this mark by turning the adjuster knob at the inside of the light unit (see illustration).



7.17a Unclip the bulbholder ...



7.17b ... and undo the light retaining nuts (arrowed)

### Number plate light

23 To remove the light unit, release the trim by removing the grab handle and relevant fasteners from the boot lid/tailgate.

24 Undo the retaining nuts from the inside of the boot lid/tailgate and remove the number plate light.

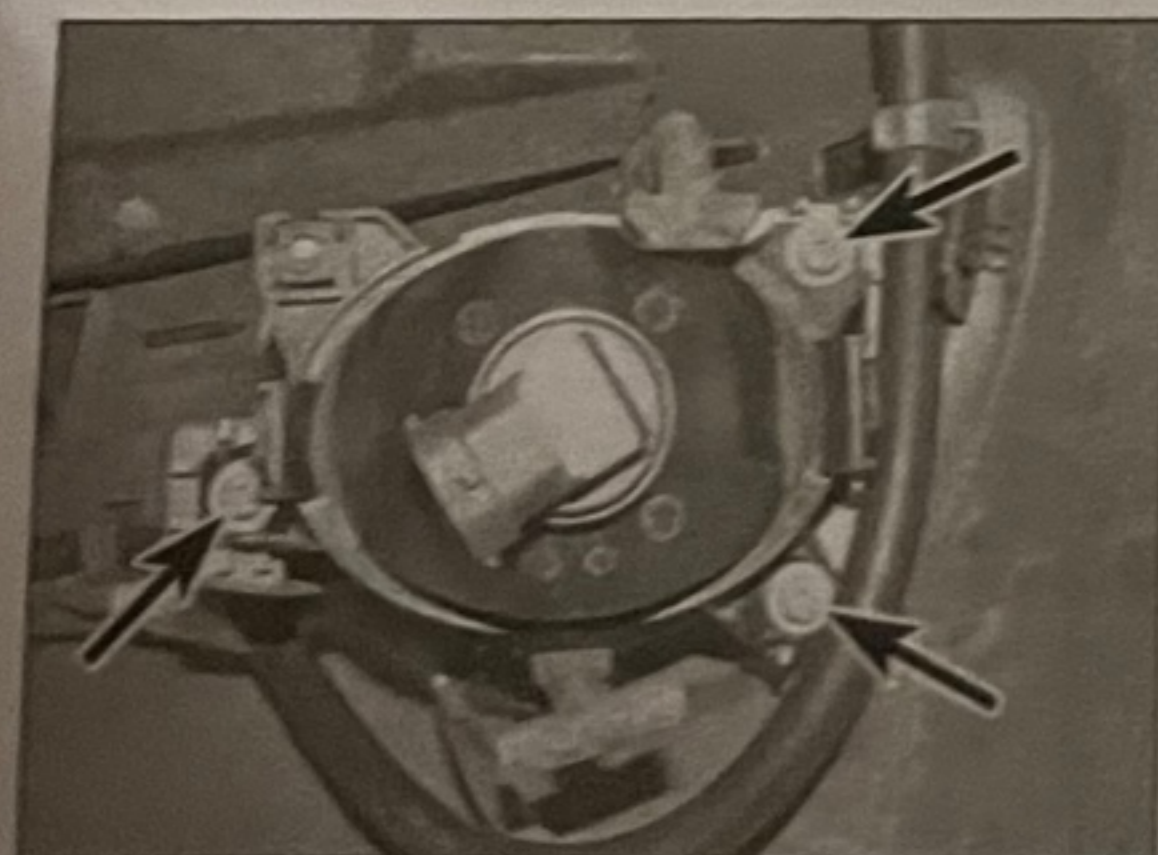
25 Disconnect the wiring as the light unit is removed.

26 Refitting is a reversal of removal.

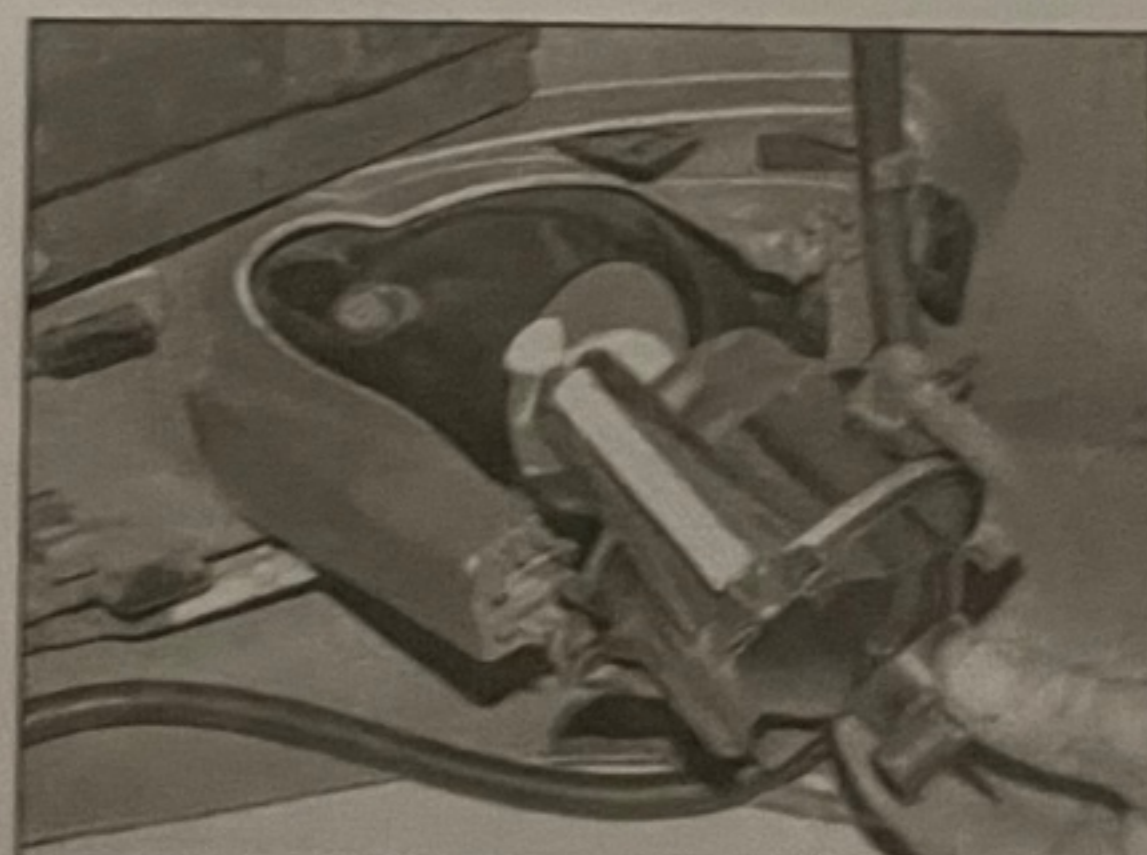
### High-level stop-light

#### Saloon models

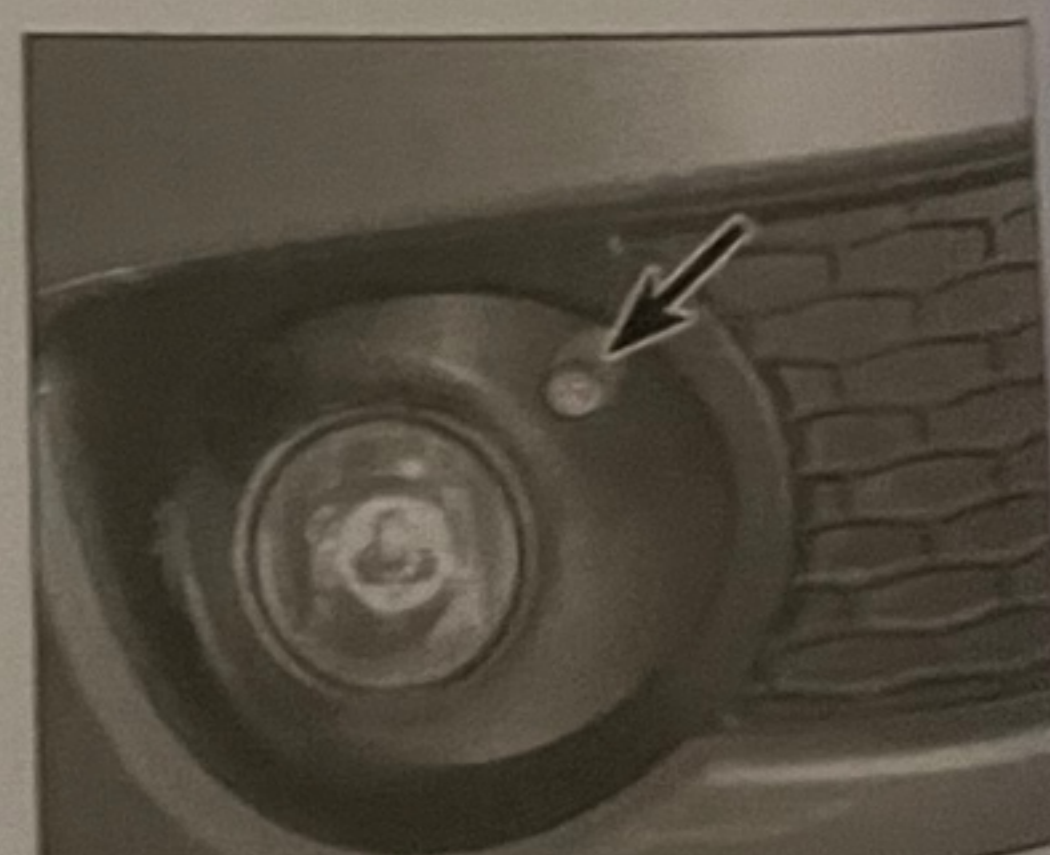
27 Remove the cover panel from the rear of



7.21a Undo the retaining screws (arrowed) ...

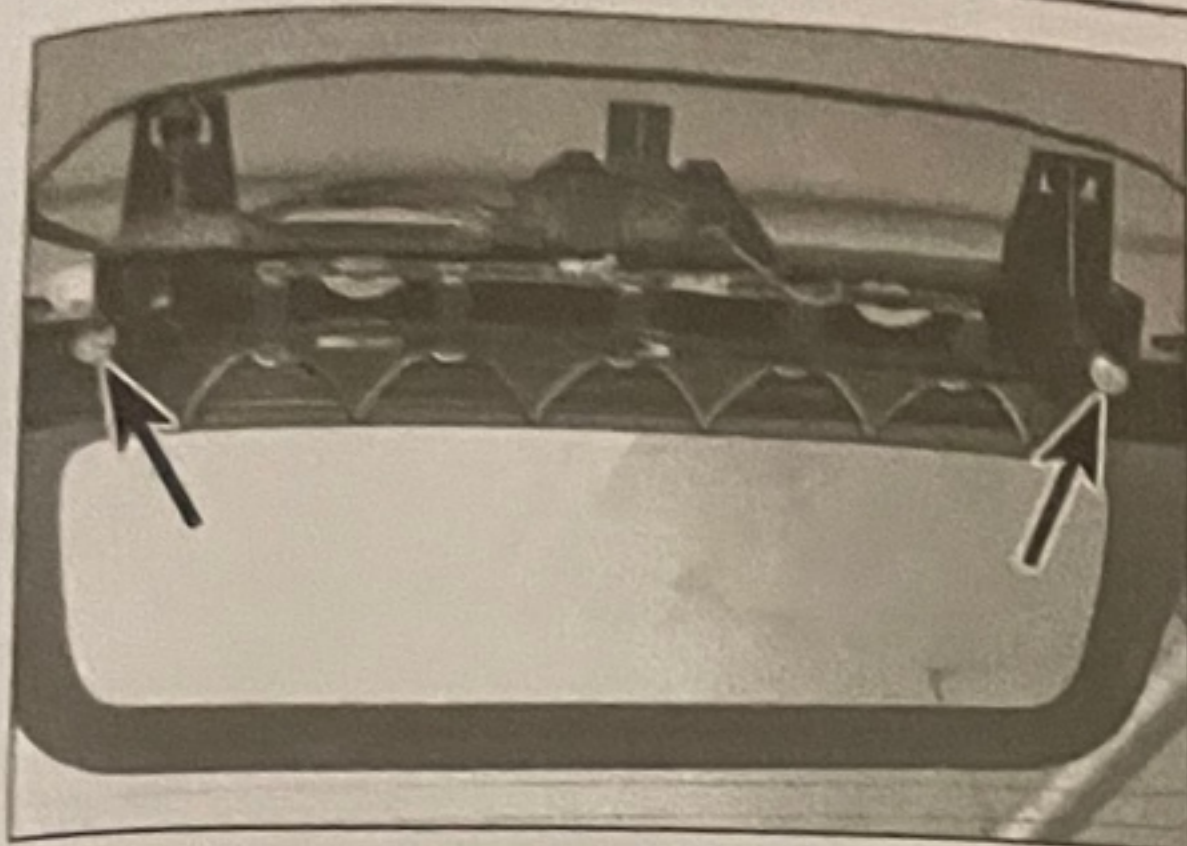


7.21b ... and remove the foglight from the bumper cover



7.22 Foglight adjusting screw (arrowed)





7.28a Undo the two retaining screws ...

the headlining by carefully pressing in the two clips on each side (see illustrations 6.42a and 6.42b).

28 Undo the bulbholder retaining screws then unplug the wiring and withdraw the light unit from the roof panel (see illustrations).

29 Refitting is a reversal of removal.

### Estate models

30 With the tailgate open, prise off the covers, then undo the screws and remove the rear window trim covers.

31 Unscrew the nuts, withdraw the high-level stop-light and disconnect the wiring as described in Section 6, paragraph 46.

32 Undo the screws and separate the tail light unit board together with the LEDs. Do not damage the guide pins (see illustrations 6.47a and 6.47b).

Refitting is a reversal of removal.

### Xenon headlight control module

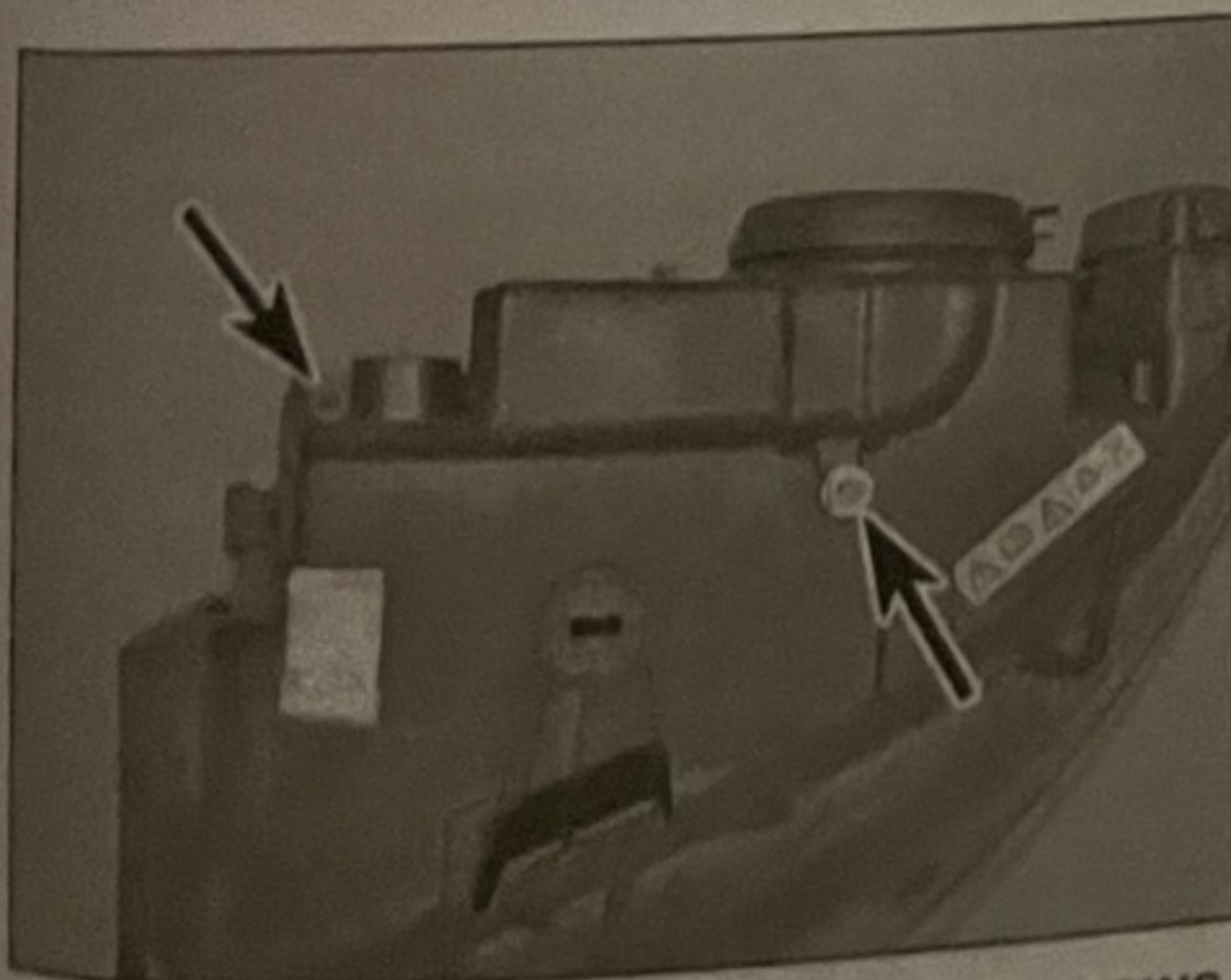
**Warning:** Observe the safety precautions for models with xenon headlights, given earlier in this Chapter. Also, note that the module is sensitive to static electricity; earth yourself regularly during the module removal and refitting procedure.

**Note:** If the module is renewed, it must be programmed by a dealer using specialist equipment.

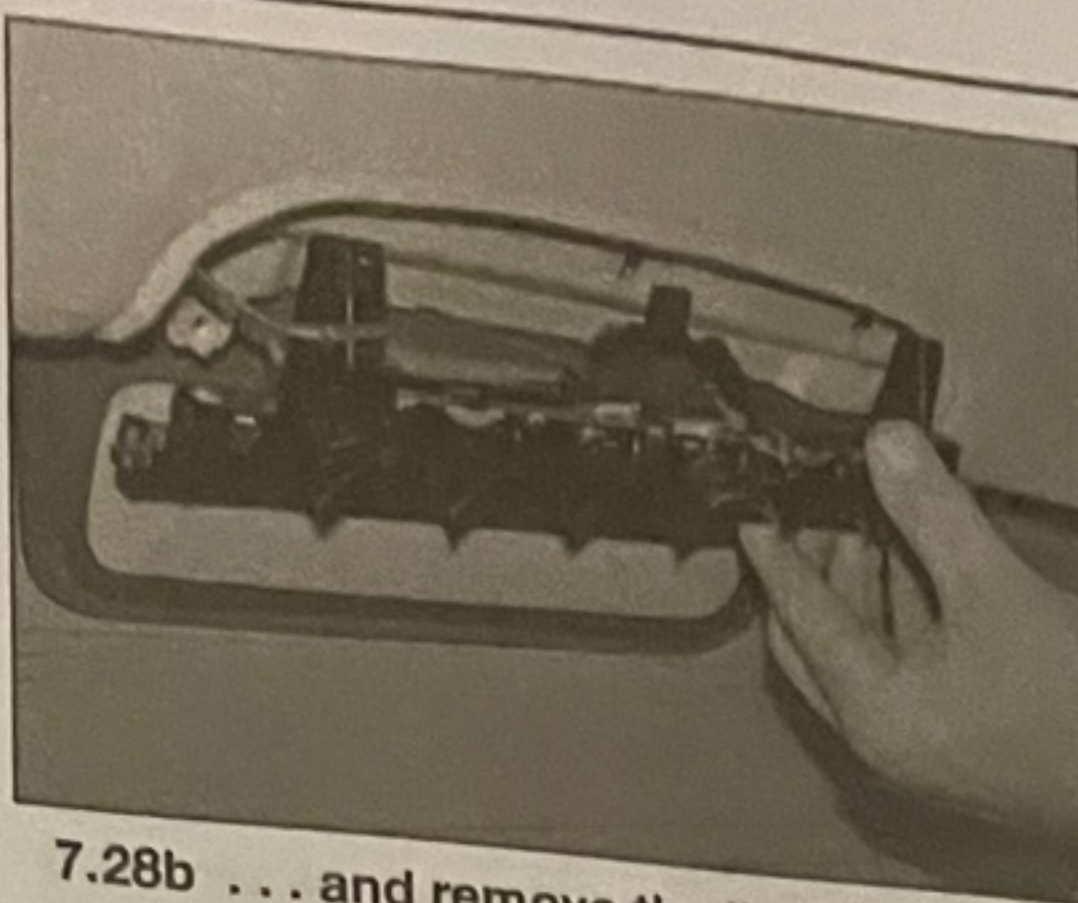
34 Remove the headlight as described earlier in this Section.

35 Undo the six screws and withdraw the module from the headlight (see illustration).

36 Disconnect the wiring and remove the module.



8.4a Manual headlight adjustment screws



7.28b ... and remove the light unit from the roof panel

37 Check the condition of the module seal and renew it if necessary.

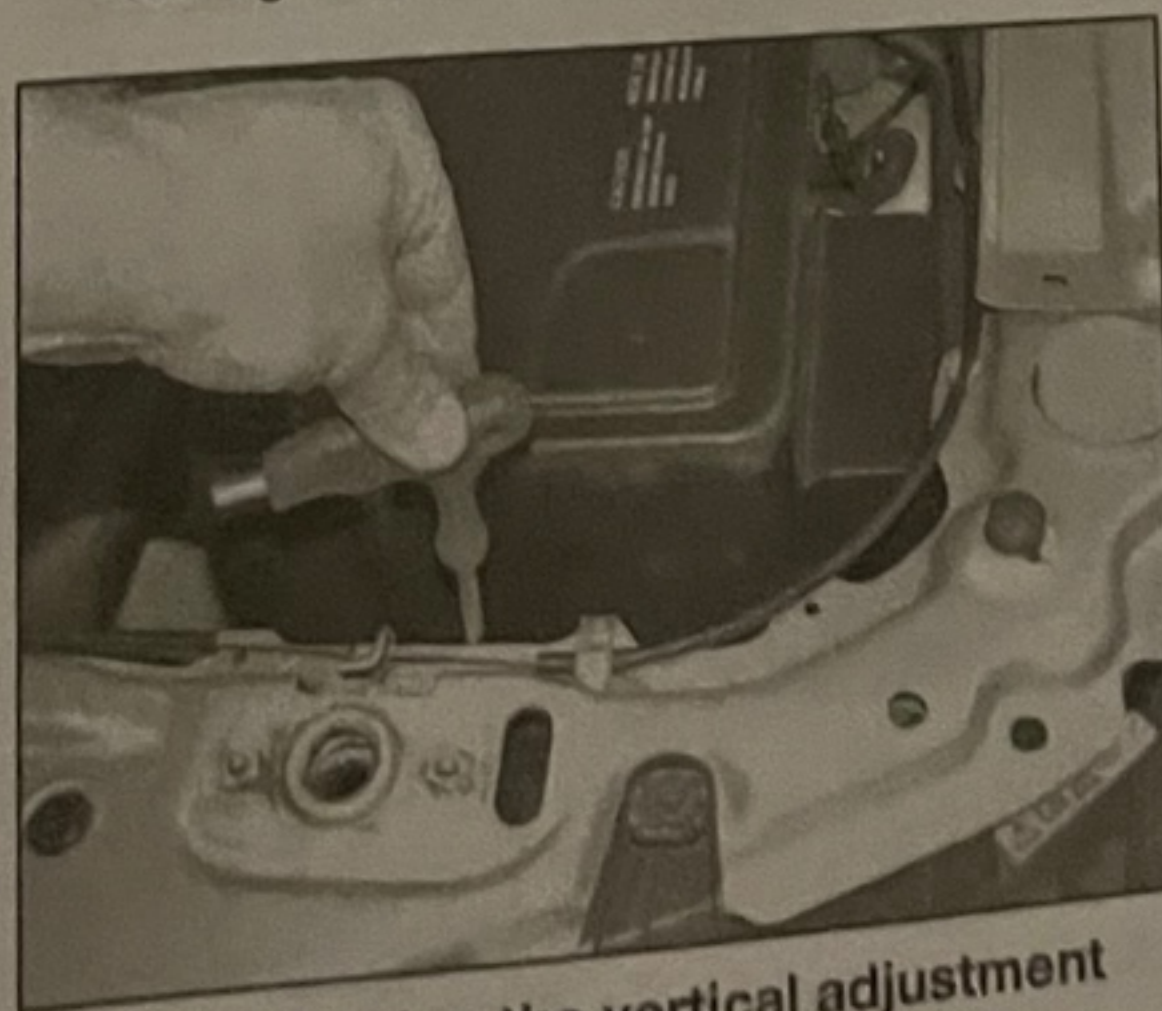
38 Refitting is a reversal of removal.

### 8 Headlight beam adjustment - general information

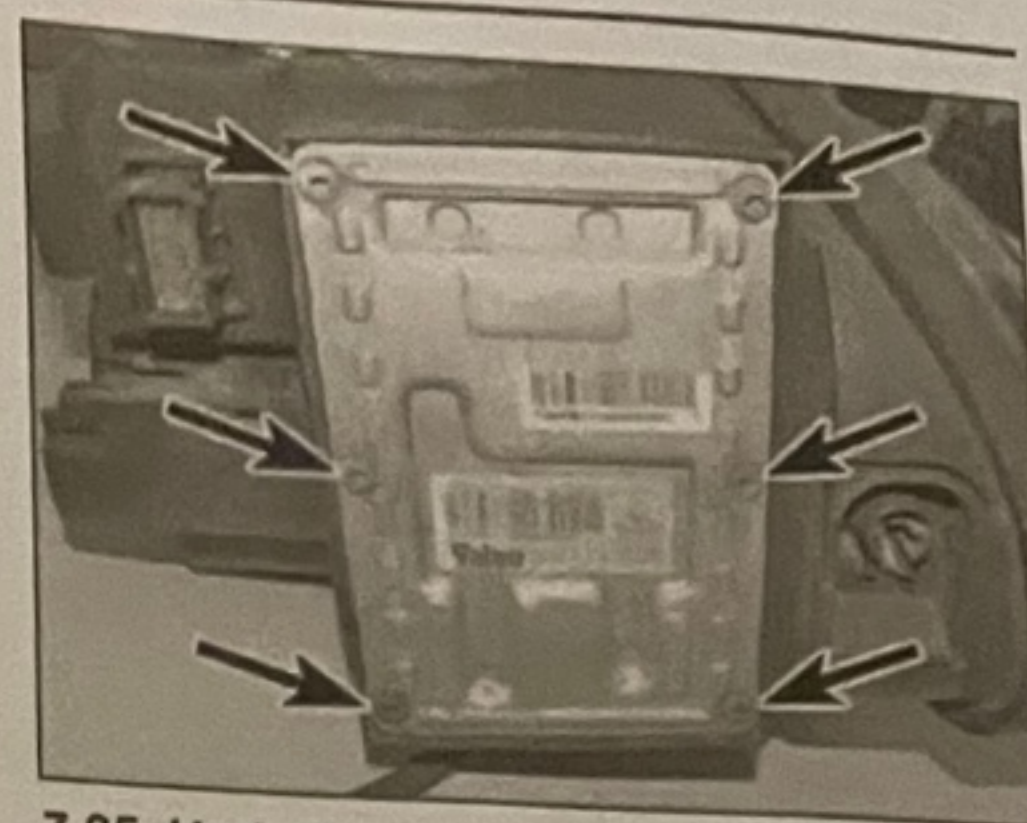
1 Accurate adjustment of the headlight beam is only possible using optical beam-setting equipment, and this work should therefore be carried out by a Saab dealer or suitably-equipped workshop. In an emergency, it is possible to adjust the headlights by turning the knobs located on the rear of the headlight.

2 Some models have a headlight beam adjustment control, which allows the aim of the headlights to be adjusted to compensate for variation in the vehicle's payload. The aim is altered by means of facia-mounted switch, which controls electric adjuster motors located in the rear of the headlight assemblies. The switch should be positioned as follows, according to the load being carried in the vehicle:

| Vehicle load  | Switch position |
|---|-----------------|
| Up to 3 occupants (no more than one in the rear seat), no luggage | 0               |
| Up to 3 occupants in rear seats, up to 30 kg in luggage           | 1               |
| Up to 3 occupants in rear seats, up to 80 kg in luggage           | 2               |
| Up to 5 occupants, luggage area full                              | 3               |
| Up to 5 occupants, luggage area full, towing caravan/trailer      | 3               |



8.4b Altering the vertical adjustment screw ...



7.35 Undo the screws (arrowed) to remove the xenon headlight control module

3 Models with xenon headlights have an automatic levelling system. If a fault occurs in this system, a warning light will show up on the instrument panel, and the headlights will be angled down to avoid dazzling oncoming traffic. If this happens, the driving speed must be adjusted accordingly to allow for decreased visibility.

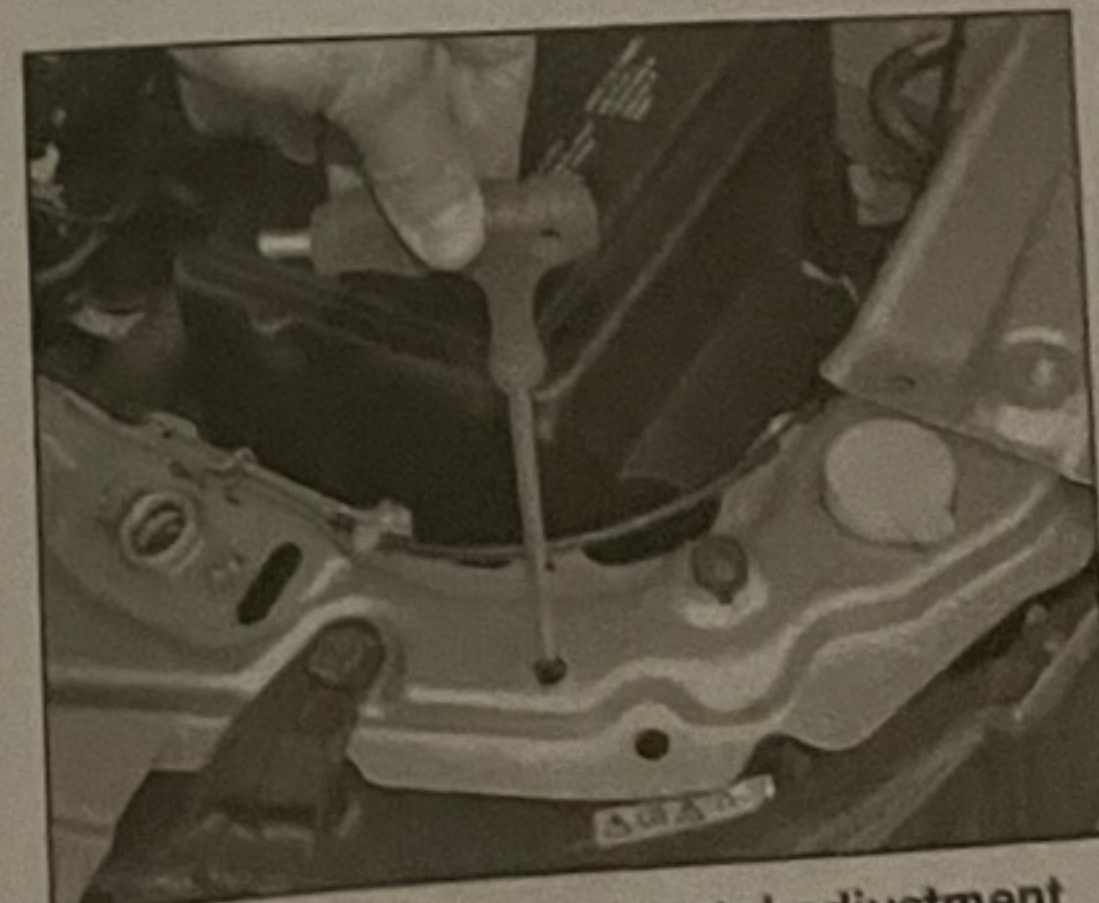
4 To make a temporary adjustment of the headlights, position the vehicle on a level surface 10 metres from a wall. The tyres must all be at the correct pressure, the fuel tank half full, and a person must be sitting in the driver's seat. Turn on the ignition, and where applicable check that the manual headlight setting is at 0. Measure the distance from the ground to the cross in the centre of the headlight, then deduct 5.0 cm for models with halogen lights and 7.5 cm for models with xenon lights. Draw a mark on the wall at this height, and then adjust the headlight beam centre point onto this mark by turning the adjustment knobs on the rear of the headlight unit (see illustrations).

### 9 Instrument panel and electronic unit - removal and refitting

#### Instrument panel

##### Removal

- 1 Adjust the steering wheel to its lowest and most rearward position, then lock it.
- 2 Remove the steering column upper and



8.4c ... and the horizontal adjustment screw

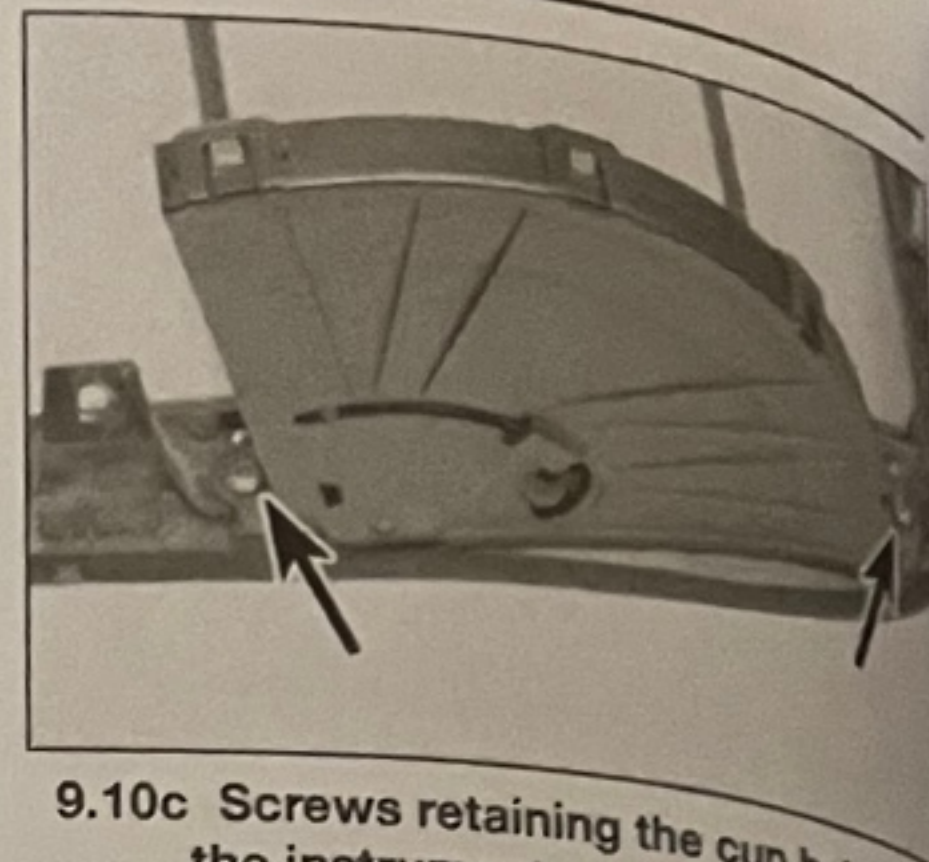




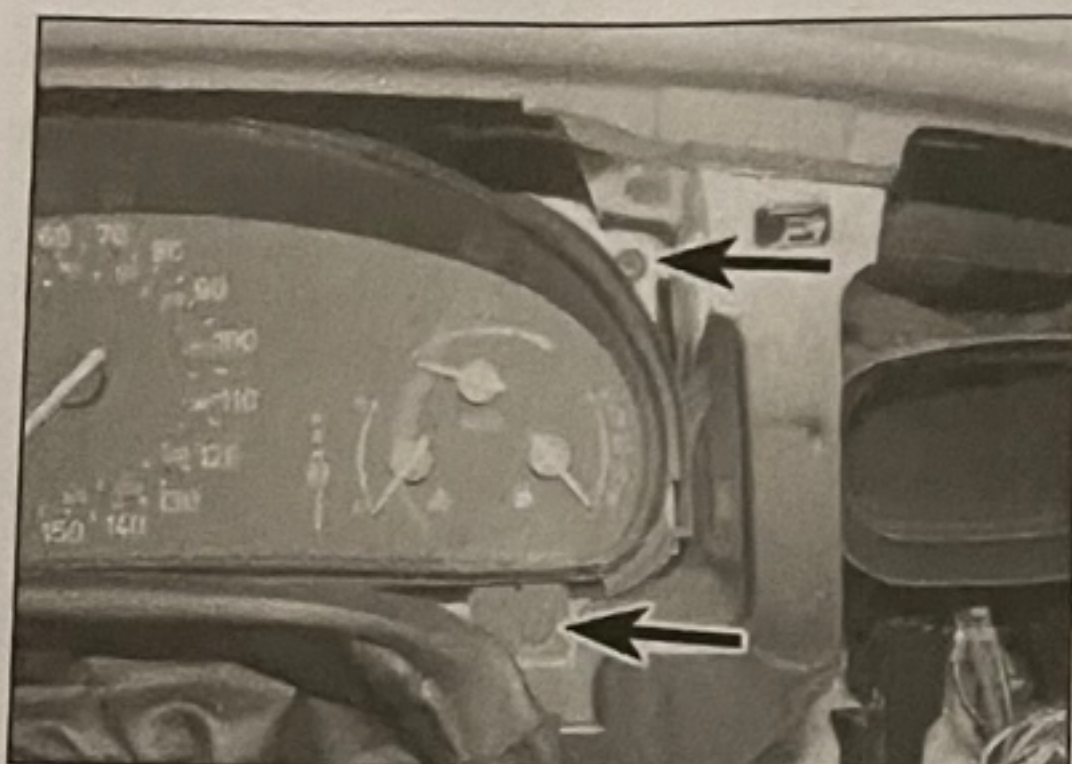
9.10a The retaining screws are located inside the apertures



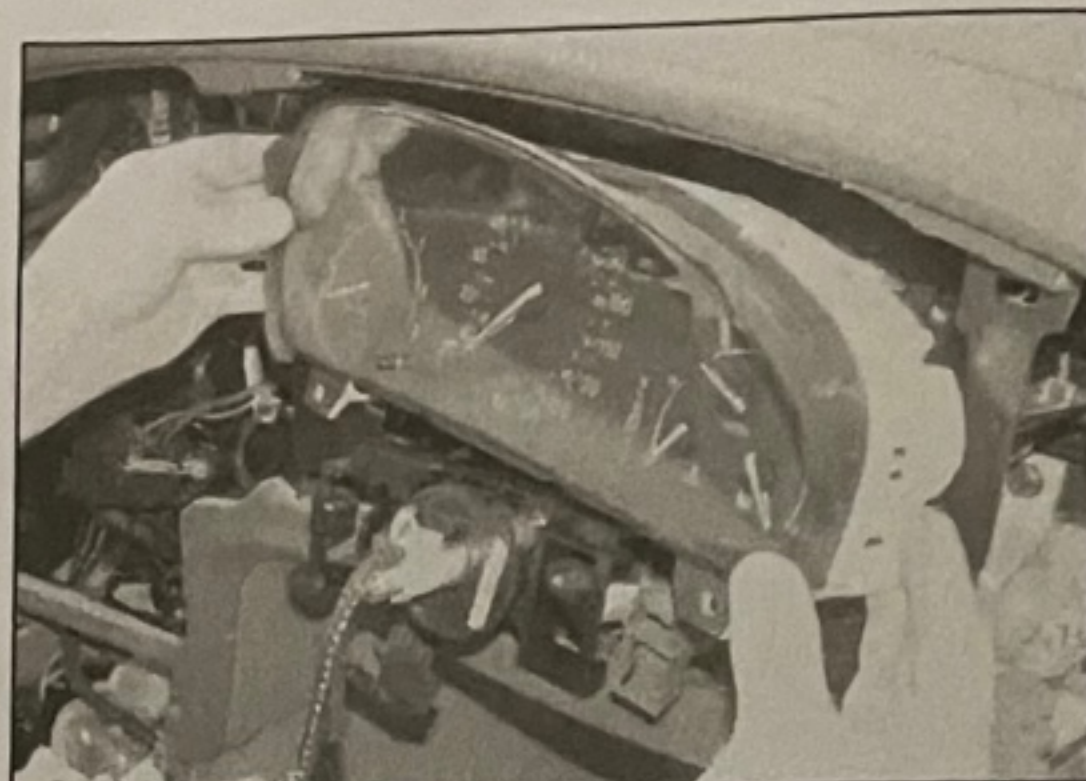
9.10b Removing the instrument surround panel



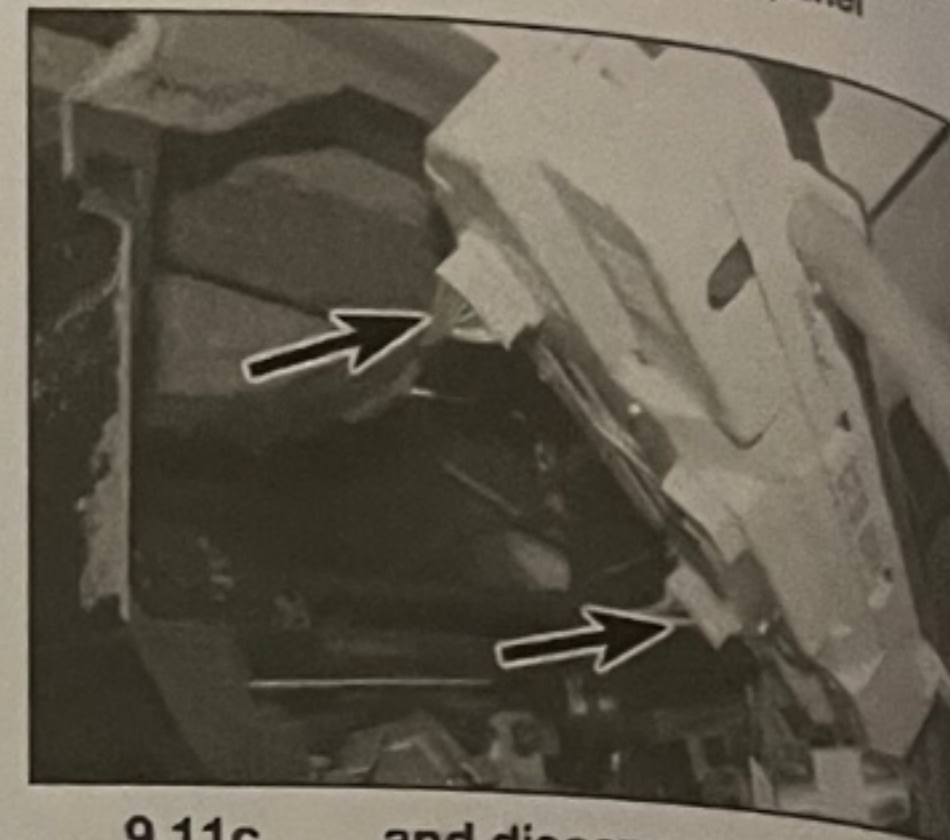
9.10c Screws retaining the cup holder to the instrument surround panel



9.11a Undo the mounting screws on each side ...



9.11b ... withdraw the instrument panel from the fascia ...



9.11c ... and disconnect the wiring

lower shrouds. There are two screws facing upwards in the upper shroud, and one screw located beneath the lower shroud.

3 Depress the retaining clips and withdraw the direction indicator and windscreen wiper combination switches, then disconnect the wiring.

4 Remove the radio/CD player and mounting box as described in Section 17.

5 Where applicable, remove the Saab Information Display (SID) unit (depending on models), as described in Section 10.

6 Remove the air conditioning/heating ventilation unit as described in Chapter 3. Do not remove the seat heating unit.

7 Remove the fascia switches located on the inner side of the steering column.

8 Remove the lid from the main fusebox on the end of the fascia. Insert a finger through the fusebox opening and press out the lighting switches from behind. Disconnect the black,

green and orange wiring connectors, noting their location.

9 Carefully prise out the button blanks from the fascia.

10 Undo the screws and remove the instrument surround panel – there are 6 screws and 4 clips located inside the various apertures. With the surround removed, if necessary the cup holder may be removed after undoing the retaining screws (see illustrations).

11 Undo the instrument panel mounting screws, then withdraw the unit and unplug the wiring connectors. Withdraw the unit from the bulkhead (see illustrations).

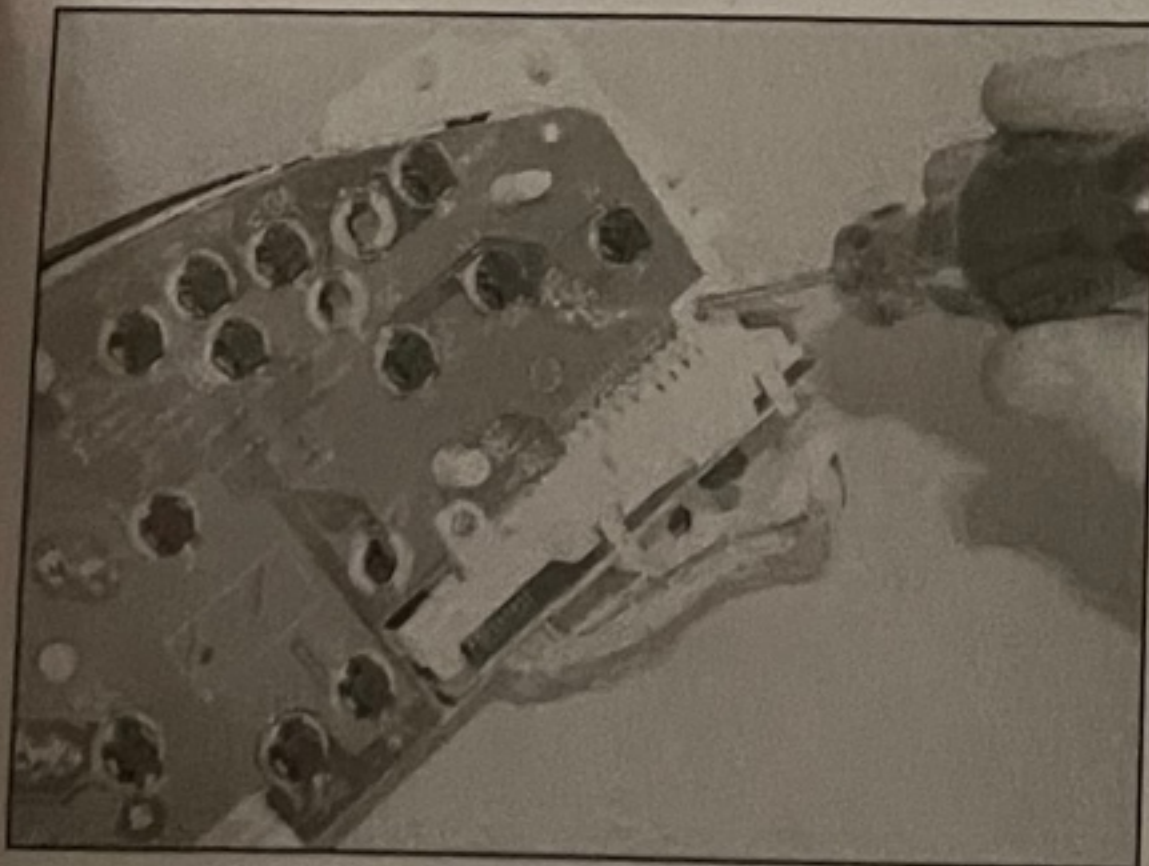
#### Refitting

12 Refitting is a reversal of removal.

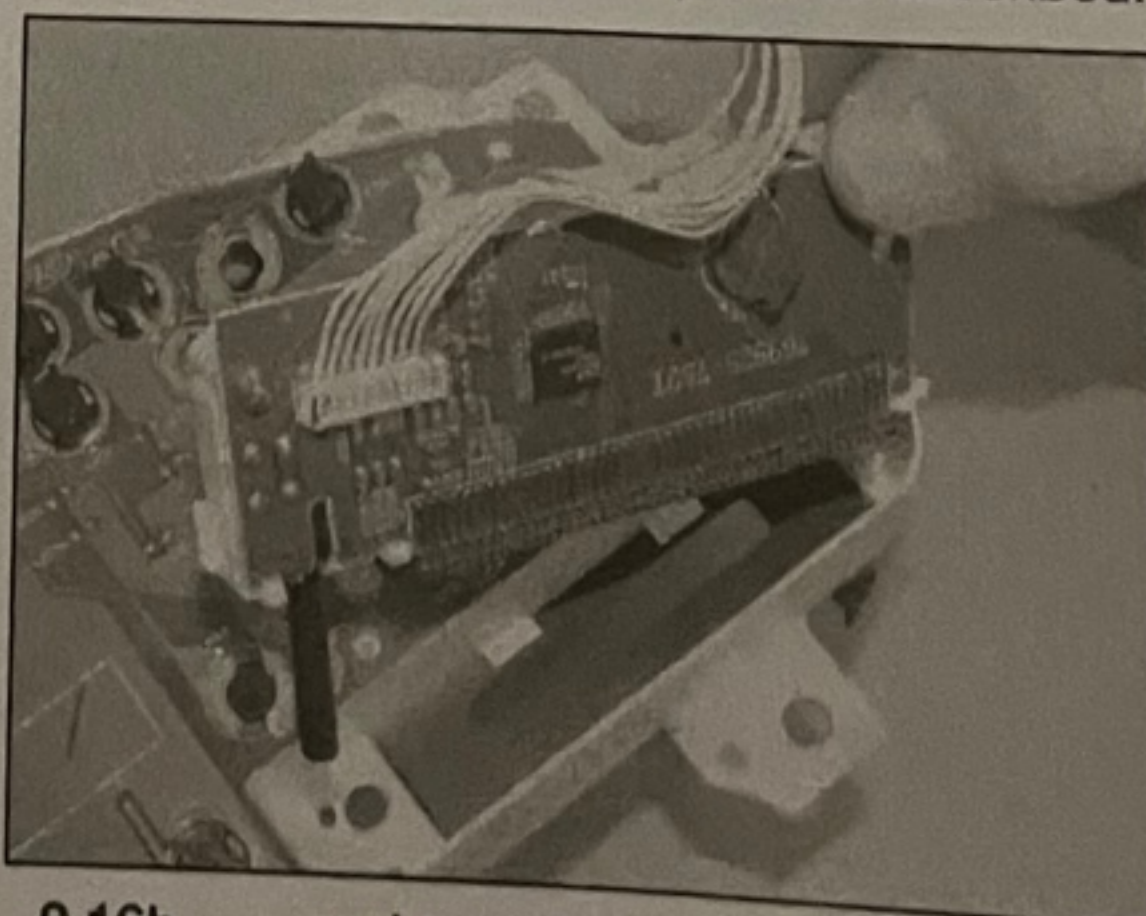
#### Electronic unit

##### Removal

13 Remove the instrument panel as described.



9.16a Undo the screws ...



9.16b ... and remove the electronic unit

14 Undo and remove the 8 screws securing the back panel to the module. Note that there are four screws, which are short, and four that are long, so record their positions.

15 Release the 2 side clips and withdraw the back panel.

16 Disconnect the wiring plugs and remove the printed circuit boards, then undo the screws and withdraw the electronic unit (see illustrations).

#### Refitting

17 Refitting is a reversal of removal.

#### 10 Saab Information Display (SID) module – general information, removal and refitting

**Note:** If a new SID module is fitted, it must be programmed by a Saab dealer using the special Saab Tech2 diagnostic tool.

#### General information

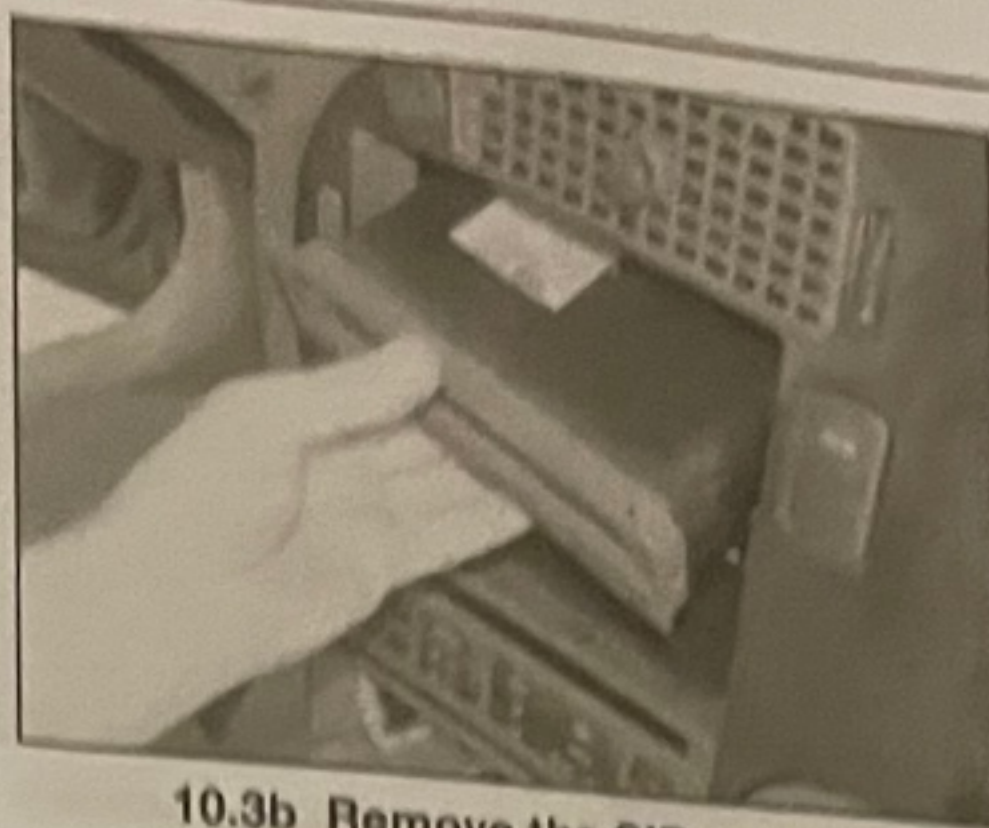
1 The Saab Information Display (SID) module provides the driver with information, and also controls the display lighting and trip computer. The module also displays service reminders. It uses the following components:

- Outside temperature sensor.
- Steering wheel horn and audio controls
- Coolant level sensor.
- Washer fluid level sensor.
- Headlight filament sensor.
- Display lighting rheostat.
- Interior light sensor for automatic control of the display illumination.





10.3a Reach through the radio/CD player aperture and push out the SID unit



10.3b Remove the SID unit ...



10.4 ... and disconnect the wiring

### Removal

**Note:** This procedure is for models with the SID module fitted above the radio/CD player.

- 2 First remove the radio/CD player as described in Section 17.
- 3 Reach in behind the SID module and push it out of the fascia panel (see illustrations).
- 4 Disconnect the wiring and remove the module (see illustration).

### Refitting

- 5 Refitting is a reversal of removal.

### 11 Cigarette lighter – removal and refitting

#### Removal

There are two cigarette lighters, one above the ashtray and the other on the rear of the centre console.

#### Front cigarette lighter

- 2 To remove the front cigarette lighter on manual transmission models, prise the gear lever gaiter from the centre console. On automatic transmission models, use a screwdriver to prise up the selector lever surround.

3 Using a screwdriver, release the retaining clips and remove the ashtray and holder, or oddments tray (as applicable), with reference to Chapter 11, Section 28.

4 Undo the screws and remove the gear lever cover. Identify the wiring locations then disconnect the plugs from the switches and cigarette lighter (see illustration).

5 Remove the lighter element, then release the cigarette lighter socket and illumination ring from the cover.

#### Rear cigarette lighter

6 Remove the rear end part of the centre console, with reference to Chapter 11, Section 28.

7 Remove the lighter element, then release the cigarette lighter socket and illumination ring (see illustration).

### Refitting

- 8 Refitting is a reversal of removal.

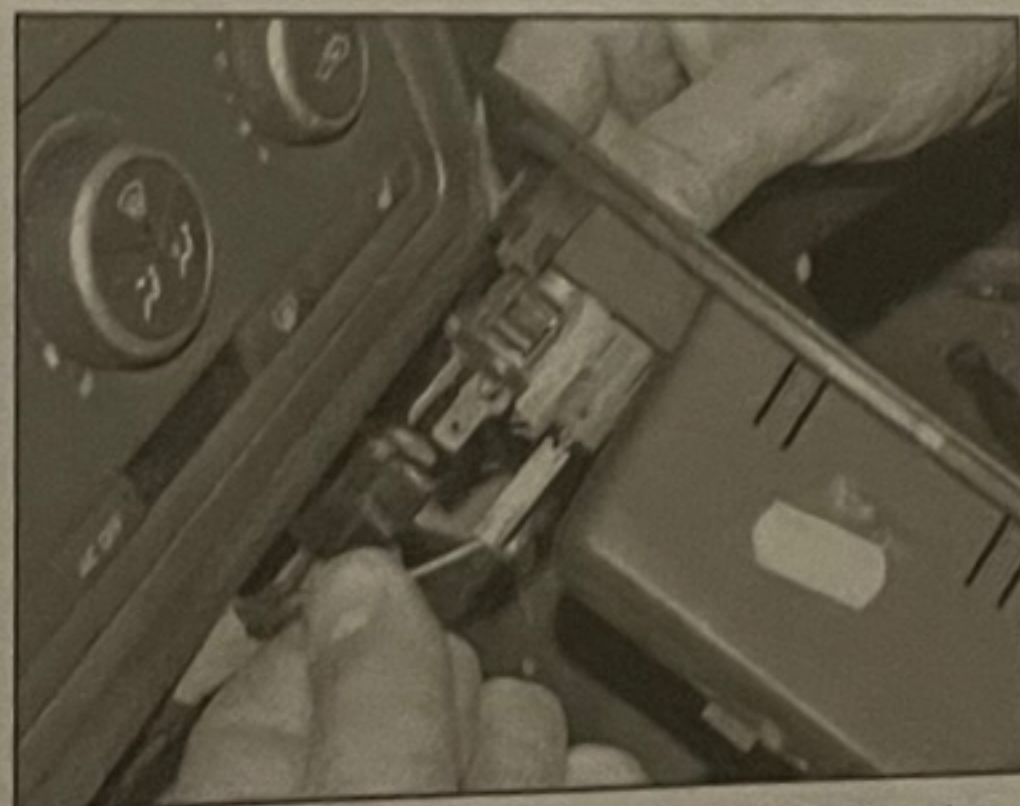
### 12 Horn – removal and refitting

#### Removal

- 1 Remove the front bumper cover as described in Chapter 11.
- 2 Disconnect the wiring from the horn (see illustration).
- 3 Note that the horns are each marked to indicate their tone – the high tone horn is marked with an H, and the low tone horn with an L.
- 4 Unscrew the bracket mounting nut and withdraw the horn assembly (see illustration).

#### Refitting

- 5 Refitting is a reversal of removal. When



11.4 Disconnect the front cigarette lighter wiring connectors

### 13 Windscreen and tailgate wiper arms – removal and refitting

#### Windscreen wiper arm

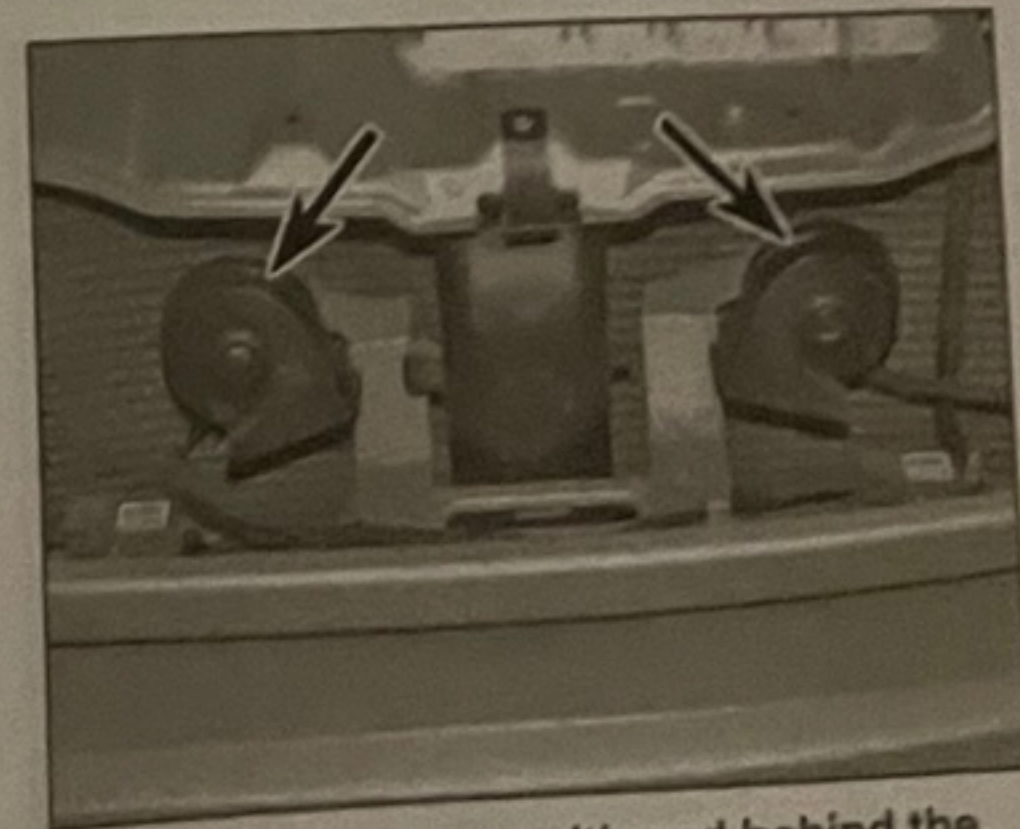
- 1 Make sure that the windscreen wipers are at their rest positions. Use a piece of tape to mark the position on the windscreen.
- 2 Where fitted, prise up the cover from the windscreen wiper arm securing nut.
- 3 Unscrew the nut securing the wiper arm to the spindle (see illustration).
- 4 Ease the arm from the spindle by carefully rocking it side-to-side. If it is tight, use a small puller to remove it (see illustration).
- 5 Refitting is a reversal of removal.



11.7 Disconnect the rear cigarette lighter wiring connectors



12.2 Horn wiring plug



12.4 Two horns positioned behind the front grille





13.3 Unscrew the nut . . .



13.4 . . . then use a small puller to remove the wiper arm from the spindle



13.8 Unscrew the nut . . .

### Tailgate wiper arm

6 Make sure that the tailgate wiper is at its rest position. Use a piece of tape to mark the position on the windscreen.

7 Lift up the cover at the base of the tailgate wiper arm.



13.9 . . . and ease the arm from the shaft

8 Unscrew the nut securing the wiper arm to the shaft (see illustration).

9 Ease the arm from the shaft by carefully rocking it side-to-side (see illustration). If it is tight, use a small puller to remove it.

10 Refitting is a reversal of removal.



15.2 Removing the rubber seals from the spindles



15.3 Pulling off the rubber weatherstrip



15.4a Unscrew the centre pins . . .



15.4b . . . remove the fasteners . . .

### 14 Rain sensor – removal and refitting

#### Removal

1 The rain sensor is located centrally, at the top of the windscreen, just in front of the rear view mirror.

2 Saab technicians use a special removal tool to remove the cover from the rain sensor; however, a suitable plastic or wooden lever may be used. To spread the force and prevent the windscreen from cracking, place a thin piece of wood on the windscreen to lever against. Carefully lever off the cover by pressing the sides individually towards the headlining.

3 Carefully press the sensor towards the windscreen, then bend out the retaining clamps and withdraw the sensor from the bracket. Take care not to scratch or damage the windscreen.

4 Disconnect the wiring and withdraw the sensor.

#### Refitting

5 Thoroughly clean the windscreen surface before refitting the sensor. Check that the sensor retaining clamps are in good condition; if not, renew them.

6 Refitting is a reversal of removal.

### 15 Windscreen and tailgate wiper motor and linkage – removal and refitting

#### Windscreen wiper motor

##### Removal

1 Remove the wiper arms as described in Section 13.

2 Remove the rubber seals from the spindles (see illustration).

3 Pull off the rubber weatherstrip from the front of the scuttle area (see illustration).

4 Remove the fasteners, and then withdraw the windscreen scuttle cover from the spindles, noting the location of the catches beneath the windscreen (see illustrations).

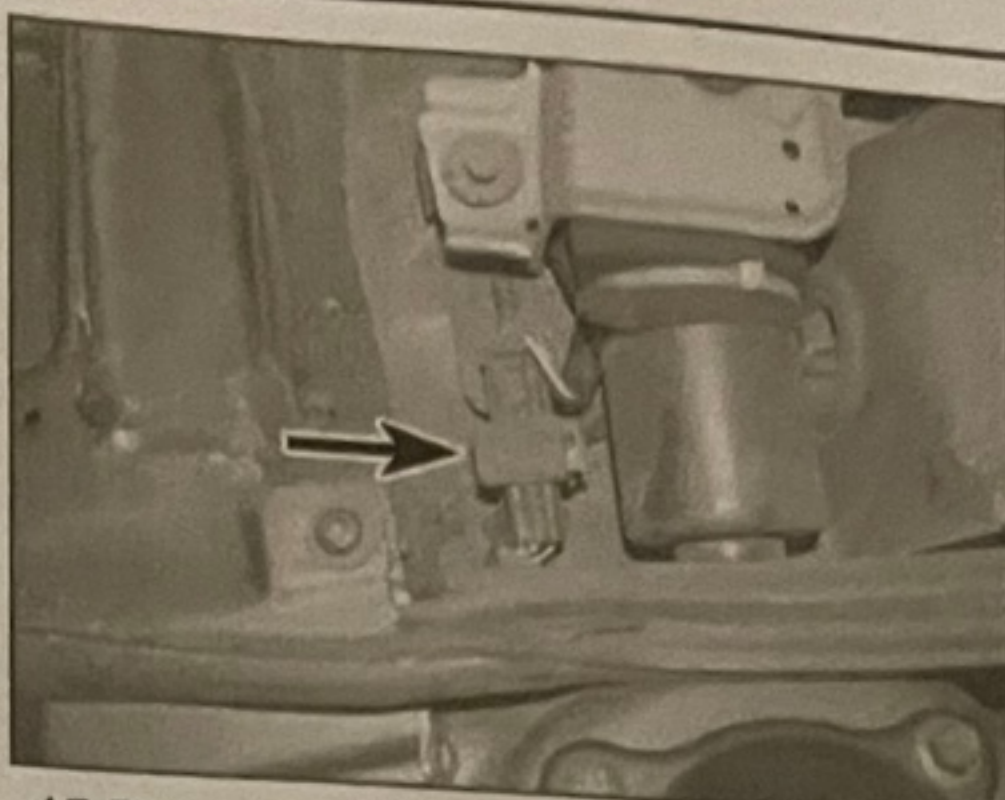


15.4c . . . and withdraw the scuttle cover





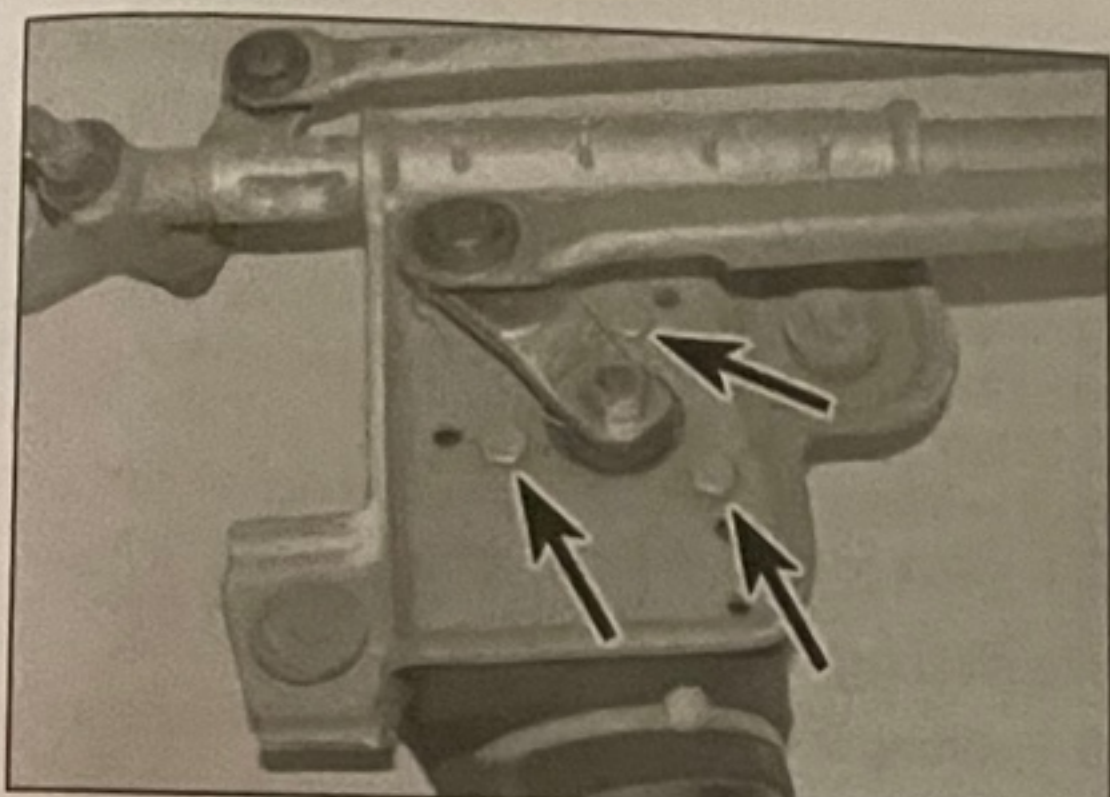
15.5a Remove the plastic cover . . .



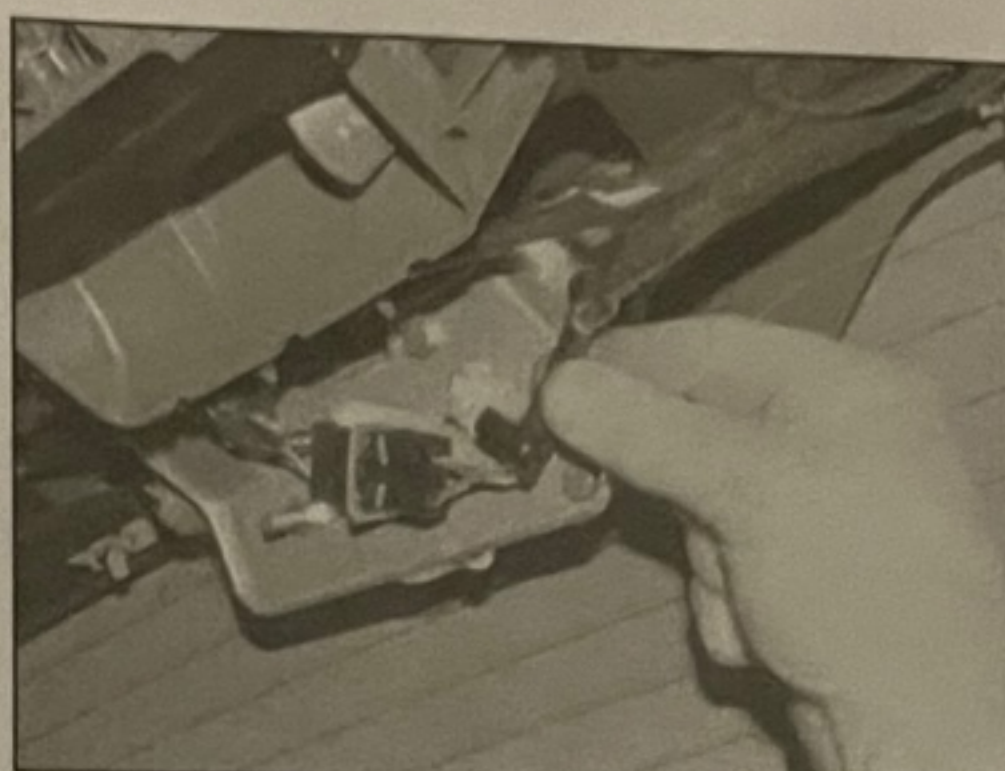
15.5b . . . and disconnect the wiring from the wiper motor



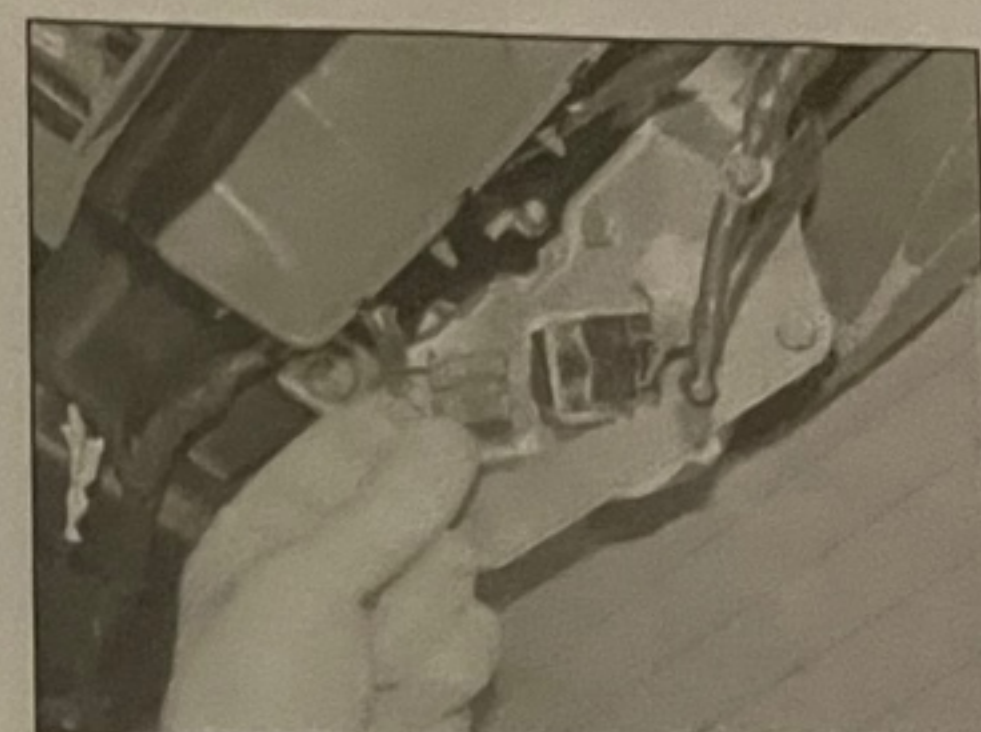
15.6 Removing the wiper motor and linkage



15.7 Wiper motor-to-frame mounting bolts



15.13a Disconnect the washer hose . . .



15.13b . . . and wiring from the tailgate wiper motor

Remove the plastic cover, and then disconnect the wiring from the wiper motor (see illustrations).

Undo the mounting bolts and lift the wiper motor and linkage from the bulkhead (see illustration).

7 If necessary, the wiper motor may be unbolted from the frame after disconnecting the link arm and removing it from the driveshaft (see illustration). Note that it may be necessary to turn the crank arm slightly in order to access one of the mounting bolts.

#### Refitting

8 Refitting is a reversal of removal, but tighten the mounting bolts to the specified torque.

#### Tailgate wiper motor

##### Removal

9 Remove the wiper arm as described in Section 13.

10 With the tailgate open, prise off the covers, then undo the screws and remove the rear window trim covers.

11 Undo the screws and remove the inner handgrip from the tailgate trim panel.

12 Undo the screws from the lower edge of the trim panel, then pull down the top of the panel to release it from the upper clips, and pull it to the rear to release the guide pin at the handgrip.

13 Disconnect the washer hose and wiring from the tailgate wiper motor (see illustrations).

14 Undo the mounting bracket screws, and withdraw the wiper motor assembly from the tailgate, while guiding the spindle housing through the rubber grommet (see illustrations).

15 Unbolt the mounting bracket from the wiper motor.

#### Refitting

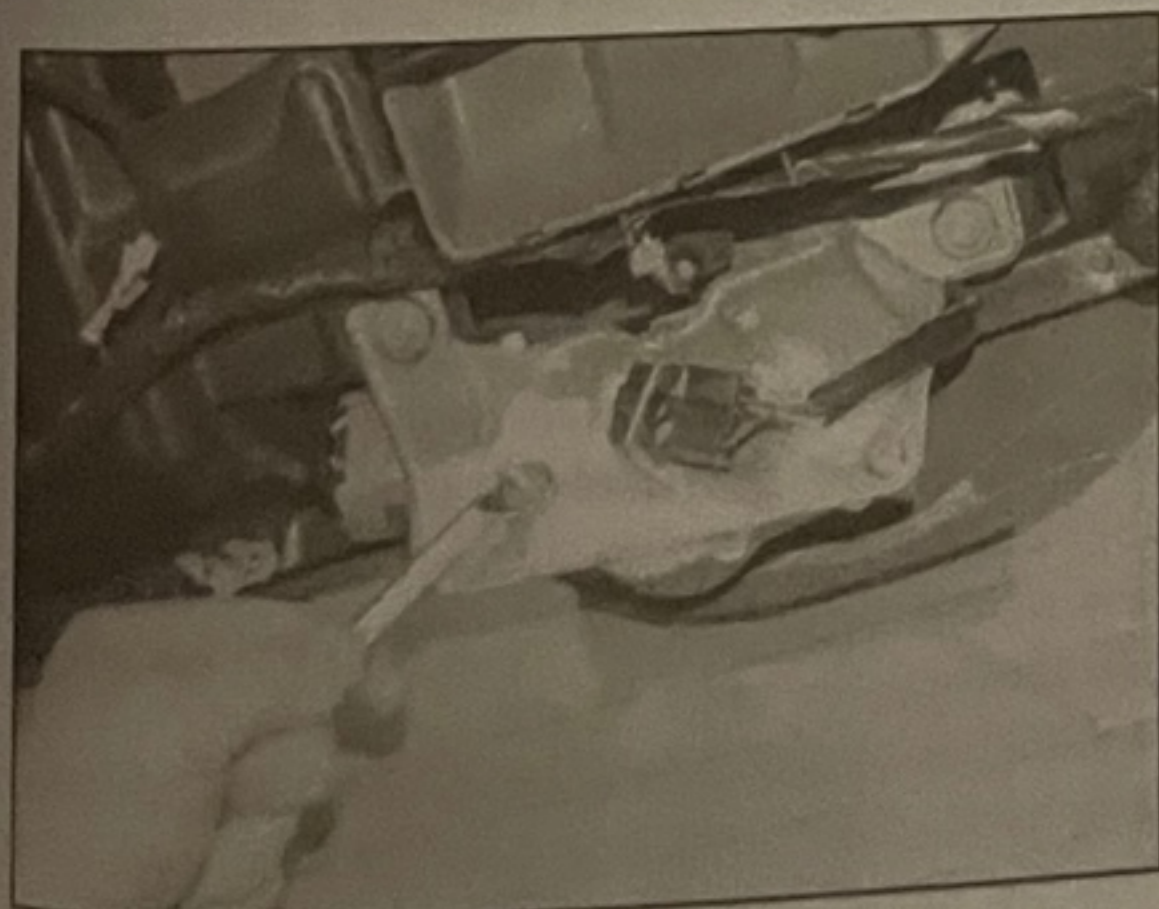
16 Refitting is a reversal of removal.

#### 16 Windscreen, tailgate and headlight washer system - removal and refitting

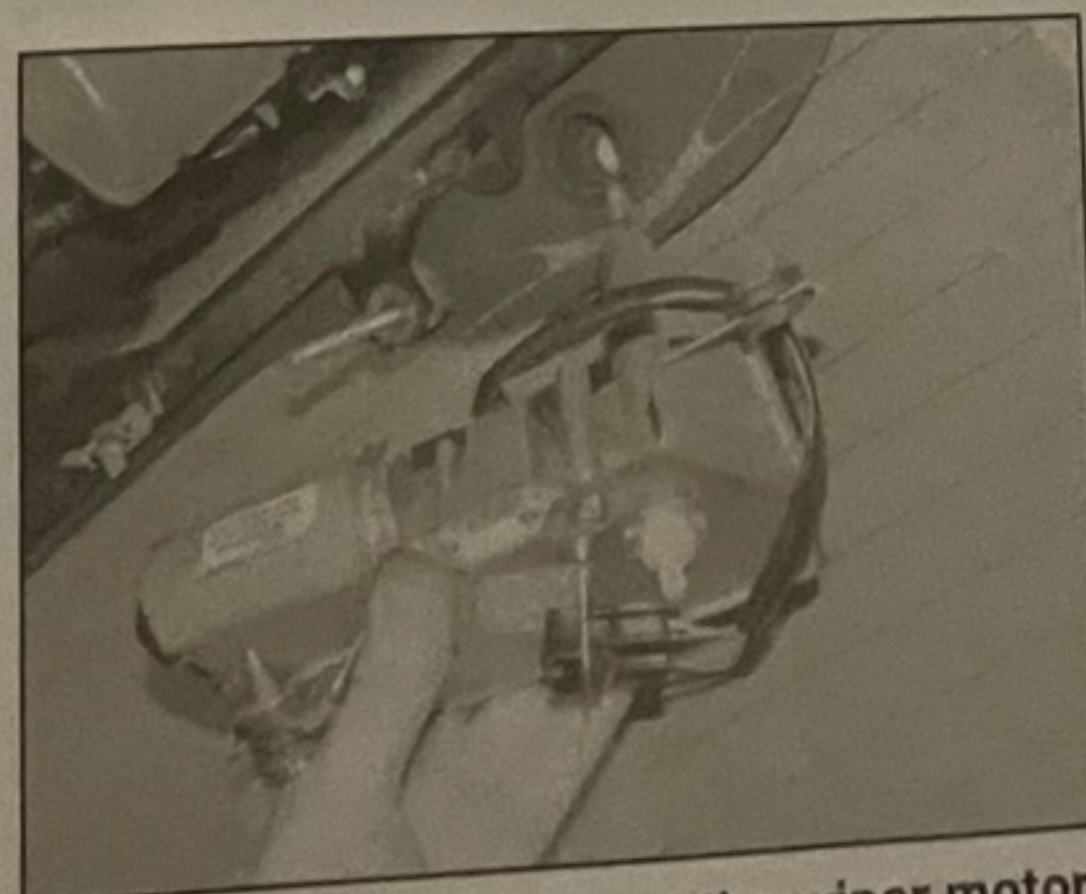
##### Removal

1 The washer fluid reservoir and pump are located beneath the front left-hand wing (see illustration). For access to them, remove the wheel arch liner. For additional working room, remove the front bumper.

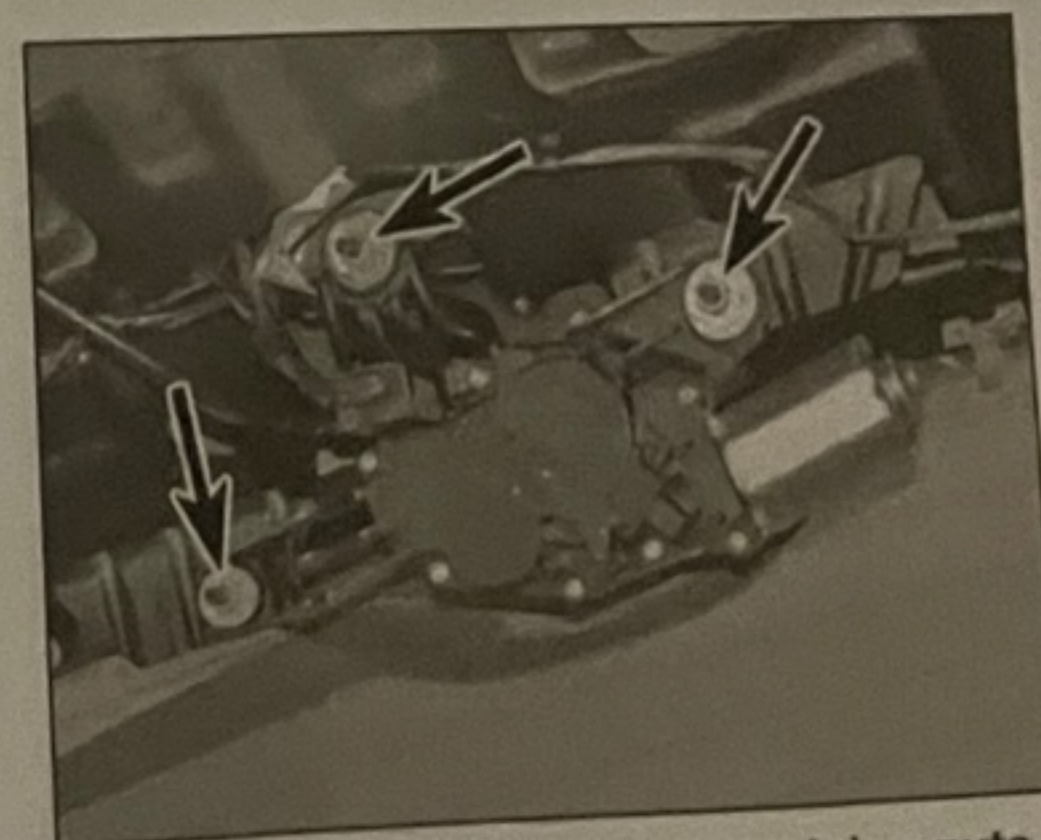
2 To remove the pump, position a container beneath the reservoir, then disconnect the pump wiring and washer tubes and allow the fluid to drain (see illustration). Pull the pump out of the reservoir then remove the rubber bush.



15.14a Undo the mounting bracket bolts (Saloon model) . . .

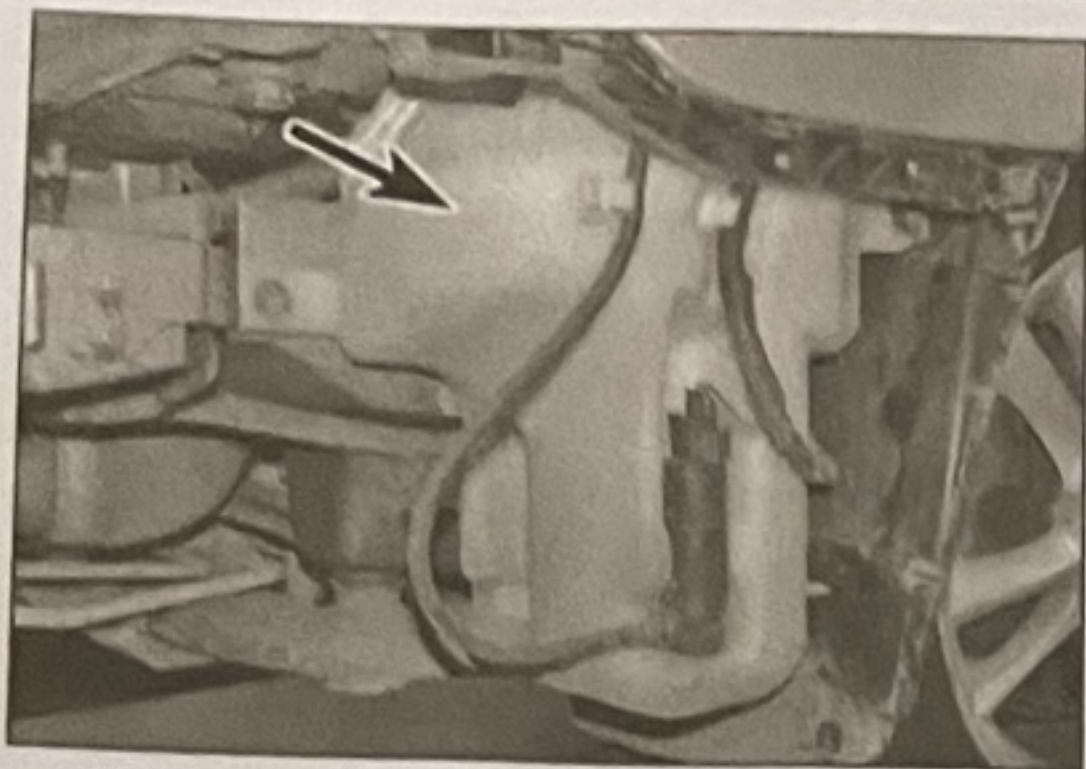


15.14b . . . and withdraw the wiper motor assembly from the tailgate

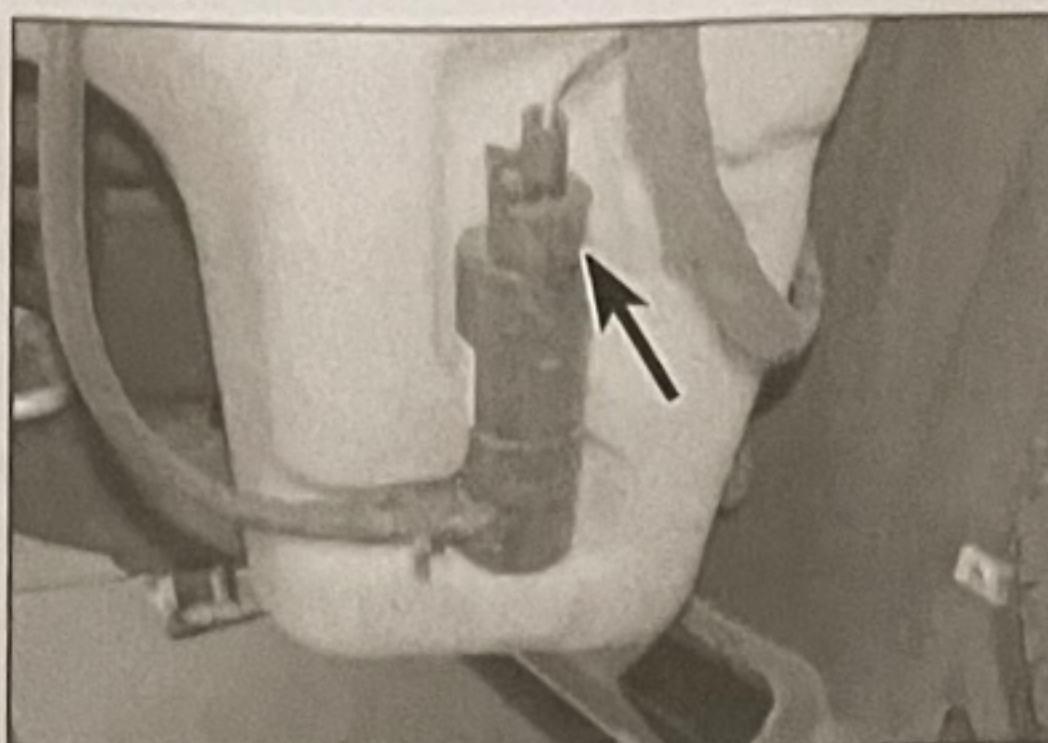


15.14c Mounting bracket retaining nuts (Estate model)

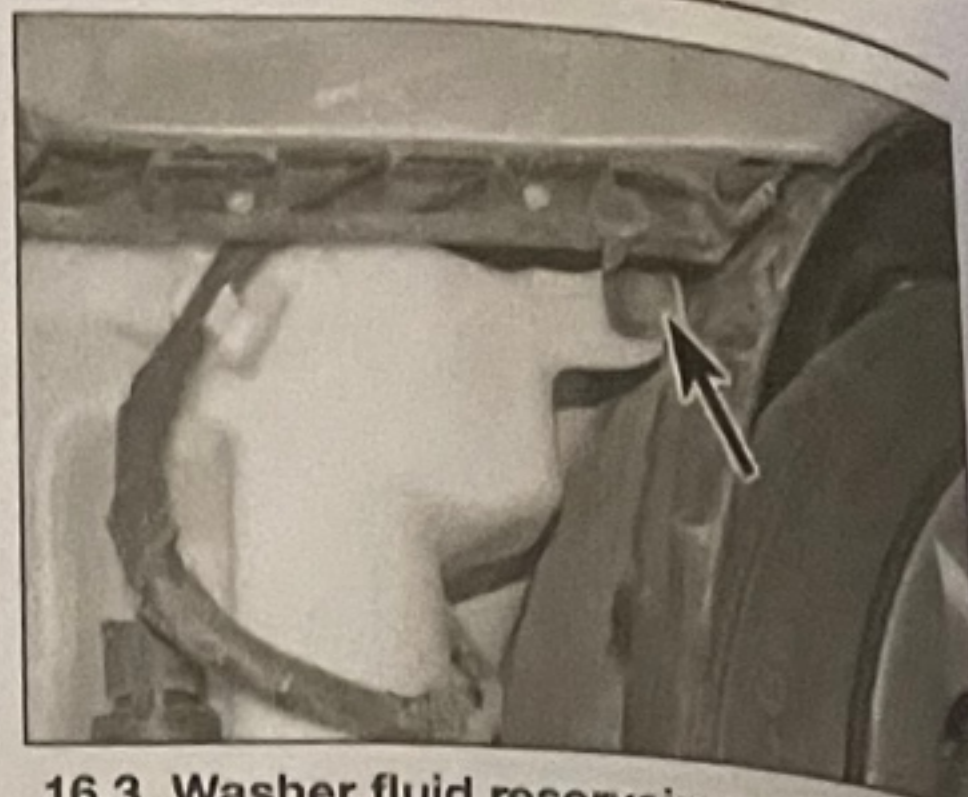




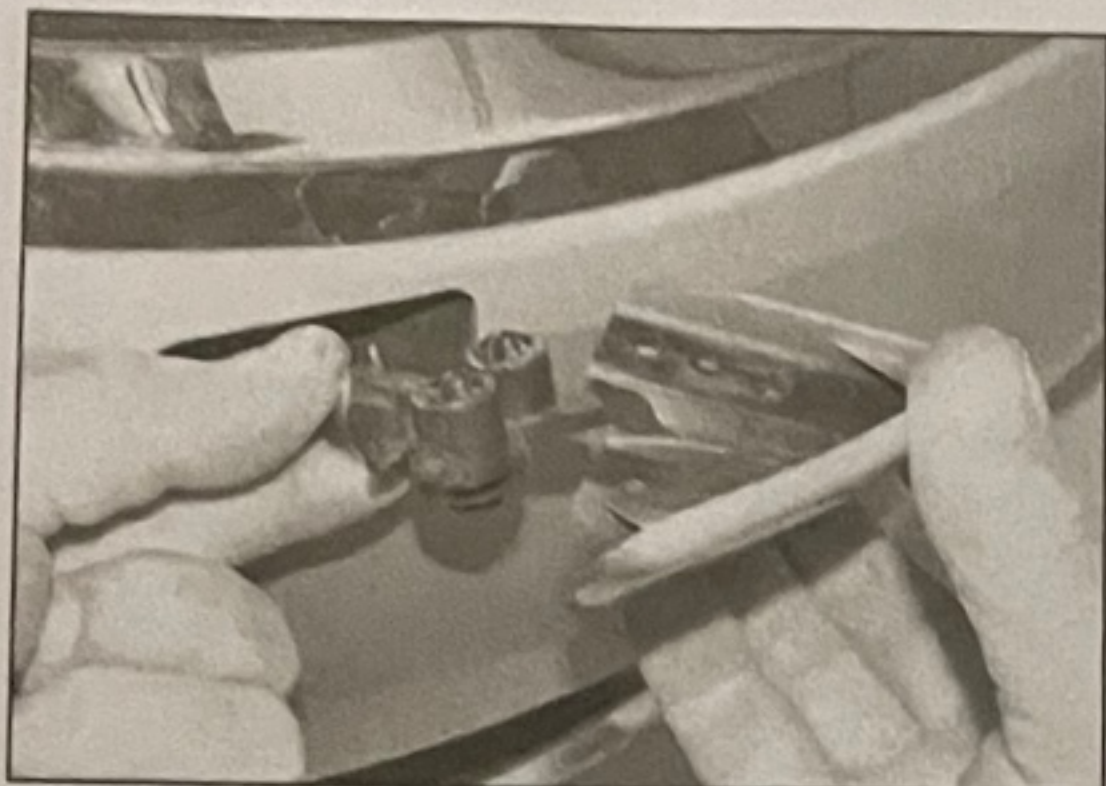
16.1 Washer fluid reservoir and pump (front bumper removed)



16.2 Washer pump wiring connector



16.3 Washer fluid reservoir rear mounting bolt



16.5a Carefully unclip the washer jet trim cover...



16.5b ... disconnect the washer pipe...



16.5c ... release the securing clip...



16.5d ... and unclip the washer jet assembly from the bumper cover panel (see illustration).

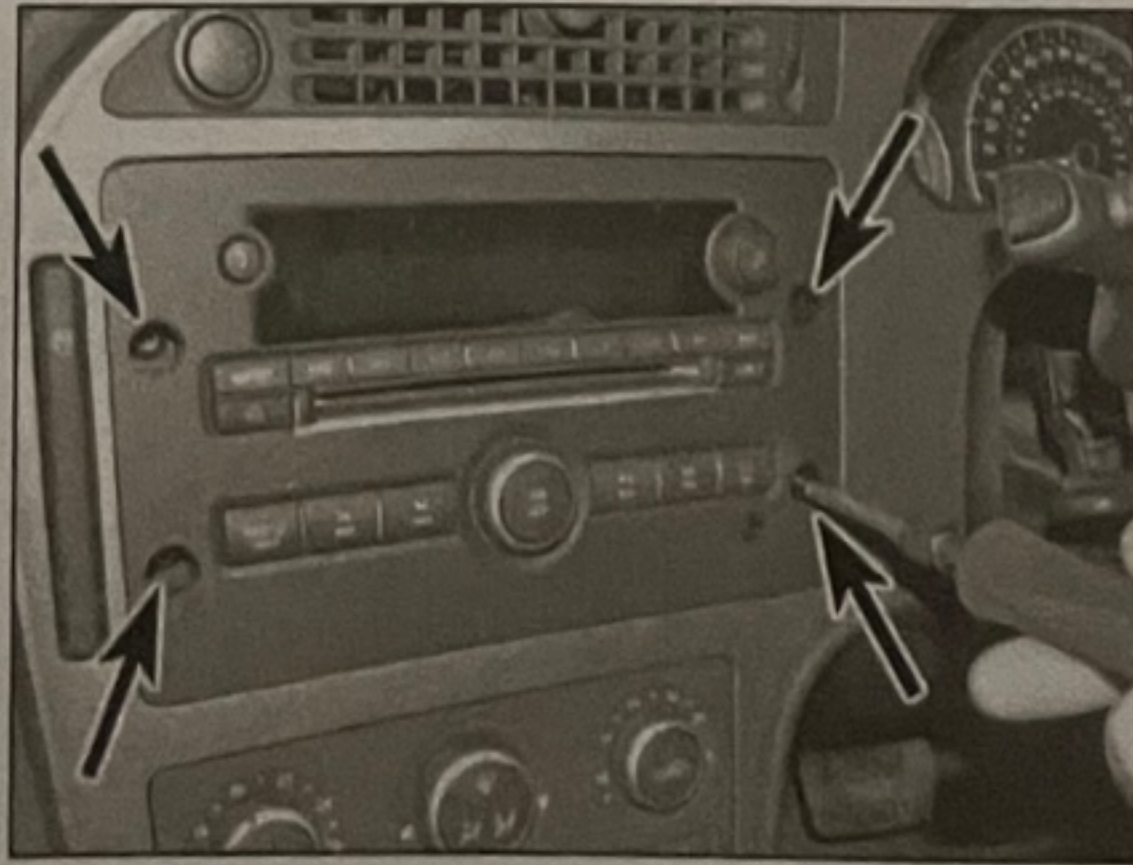
3 To remove the reservoir, disconnect the wiring connectors and washer fluid pipe from the washer pump. Remove the filler cap from the top of the filler neck, then unscrew the mounting bolts and remove the reservoir down and out from the front wing

panel (see illustration). If necessary (where fitted), remove the fluid level sensor from the reservoir.

4 To remove the windscreen washer jets, release the insulation from the bonnet, disconnect the tubes then depress the locking



17.1a Using strong sticky tape to remove plastic caps



17.1b Undo the four radio/CD player retaining screws

tabs and withdraw the jets from the bonnet.  
5 To remove the headlight washer jets, first remove the front bumper cover as described in Chapter 11. Pull out the washer jet and unclip the cover from the jet. Then, working on the inside of the bumper, disconnect the washer fluid pipe, remove the securing clip and remove the washer jet assembly from the bumper cover (see illustration).

### Refitting

6 Refitting is a reversal of removal.

### 17 Radio/CD player – removal and refitting

**Caution:** All models are fitted with a radio/CD player programmed for the specific vehicle it is fitted to, and no radio code is supplied or required. If a unit is removed from one vehicle and fitted to another vehicle, it must be reprogrammed by a Saab dealer using the special Tech2 equipment. Note also that the equipment must be used to 'divorce' the unit from the original vehicle before it is removed.

### Removal

1 For models with radio/CD players retained by screws, first carefully remove the blanking caps (new blanking caps may be required for refitting). Undo the four retaining screws, two at each side (see illustrations).

2 For models with radio/CD players retained by DIN fixings, two DIN removal tools will be required to release the retaining clips. The tools are available from car accessory shops, and are inserted into the holes on each side of the unit until they are felt to engage with the retaining strips (see illustration).

3 With the clips/screws released, carefully withdraw the unit from the fascia. Note the wiring and aerial sockets, which engage with the plugs, attached to the mounting box (see illustrations).

4 Where applicable (depending on model), the radio mounting box can be removed from the fascia by bending up the retaining tabs, withdrawing it, then disconnecting the wiring and aerial plugs.





17.2 Using two DIN removal tools to release the radio/CD player retaining clips

### Refitting

5 Refitting is a reversal of removal. Press the radio/CD unit firmly into the mounting box until the retaining strips engage.

### 18 Loudspeakers – removal and refitting

#### Facia-mounted speakers

##### Removal

- 1 Using a screwdriver carefully prise out the grille from the relevant speaker (see illustration).
- 2 Using a Torx key, undo the screws securing the speaker in the facia, and carefully lift it out.
- 3 Disconnect the wiring and tape it to the facia, leaving it hanging down inside (see illustration).

Reversal of removal.

#### Mounted speaker

##### Removal

- 5 Remove the door inner trim panel as described in Chapter 11.
- 6 Undo the mounting screws, then withdraw the speaker and disconnect the wiring (see illustrations).

##### Refitting

- 7 Refitting is a reversal of removal.

#### Parcel shelf speaker

##### Removal

- 8 Lower the rear seat backrest then unclip the speaker grille.
- 9 Undo the screws and lift out the speaker, then disconnect the wiring.

##### Refitting

- 10 Refitting is a reversal of removal.

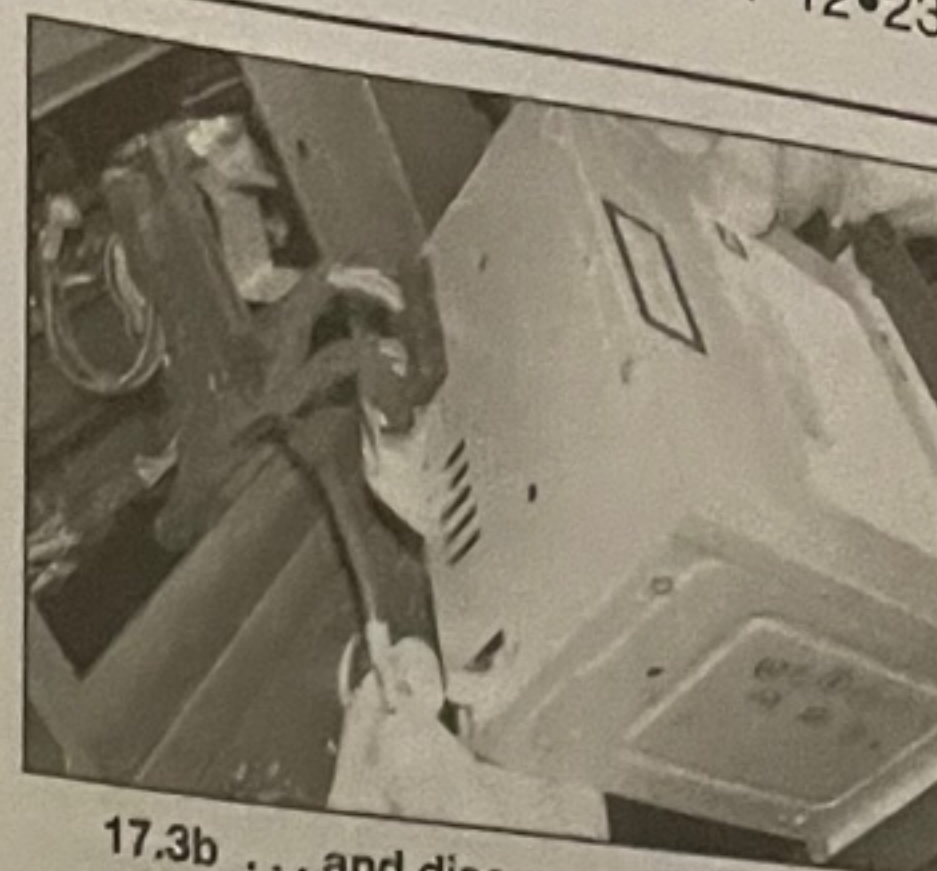
#### Luggage compartment speaker

##### Removal

- 11 Lower the rear seat backrest, then remove the right-hand side bolster from between the



17.3a Withdraw the audio unit from the facia panel ...



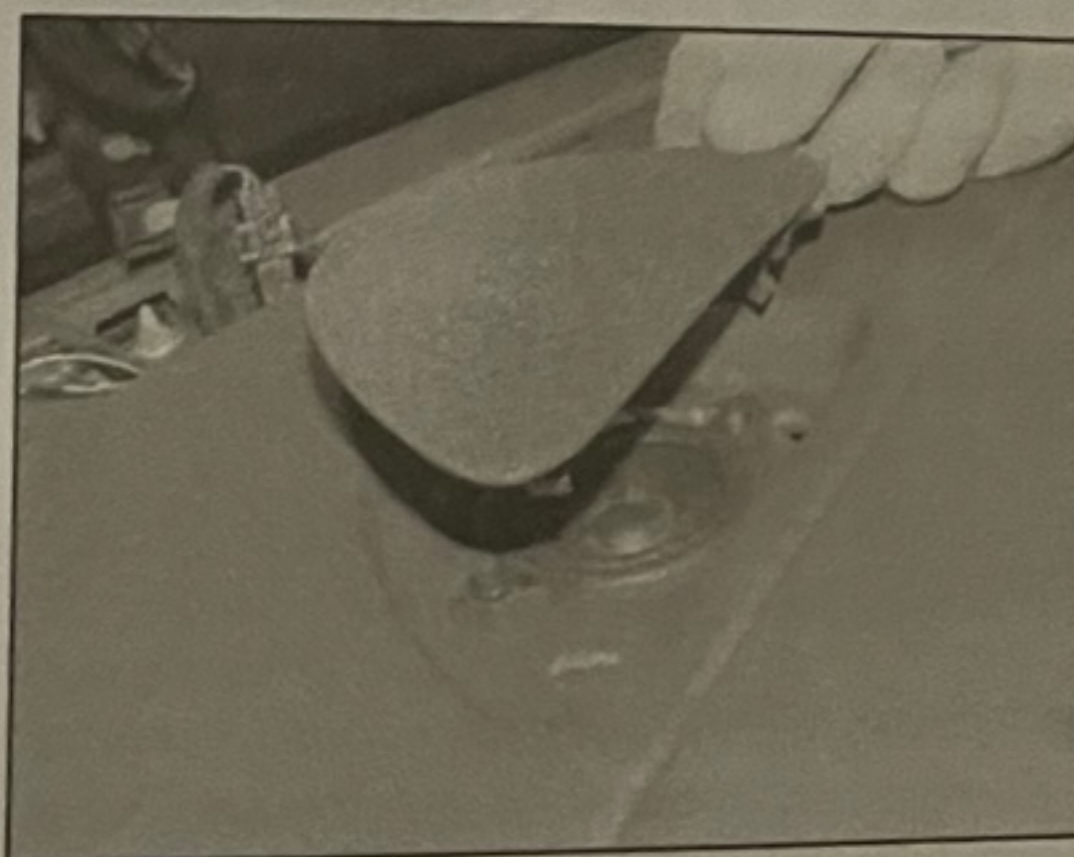
17.3b ... and disconnect the wiring connectors and the aerial cable socket

### 19 Audio amplifier – removal and refitting

**Note:** Although similar in appearance, the amplifiers for Saloon and Estate models are different due to the different cabin areas inside each vehicle.

##### Removal

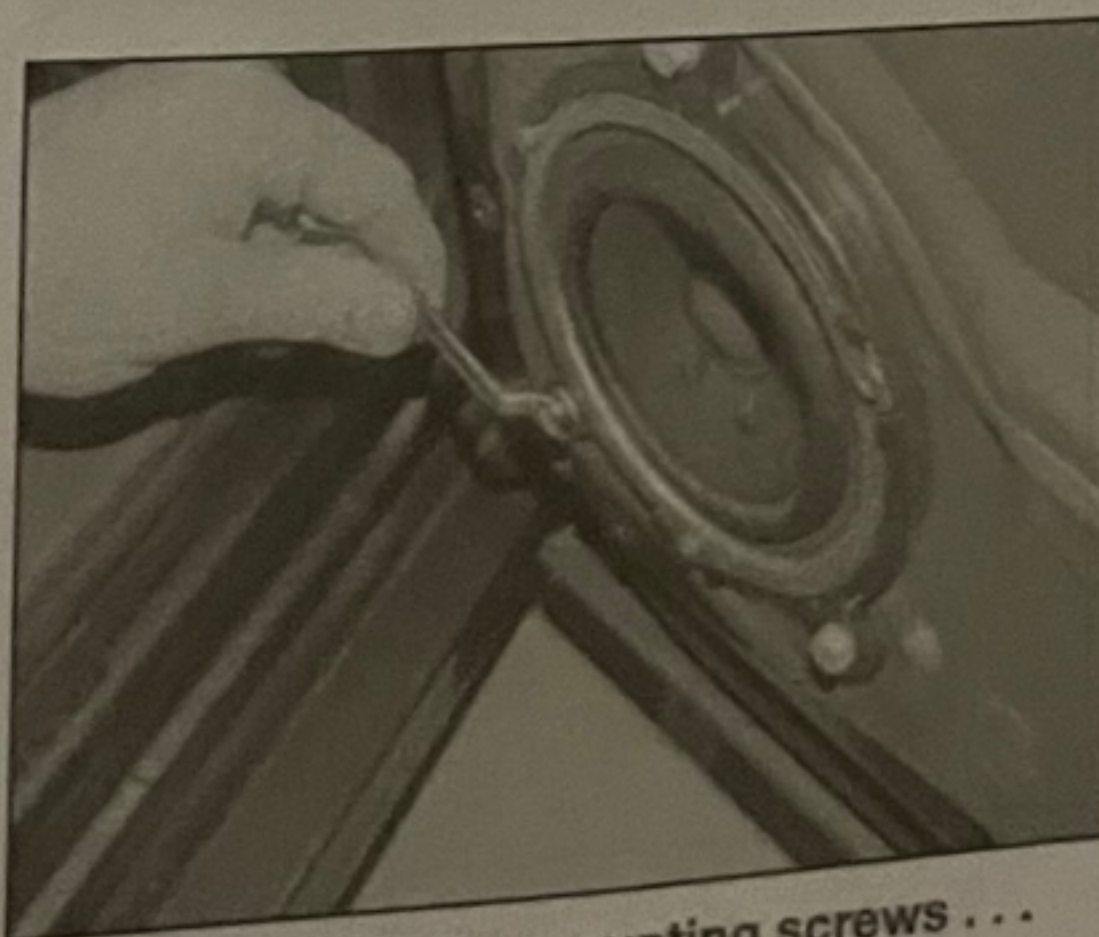
- 1 With the passenger's door open, remove the inner sill trim panel.
- 2 Remove the facia lower trim panel from under the glovebox.
- 3 Fold back the carpet and unscrew the audio amplifier lower mounting nuts. Loosen only the upper mounting nut.
- 4 Lift out the amplifier and disconnect the wiring plug.



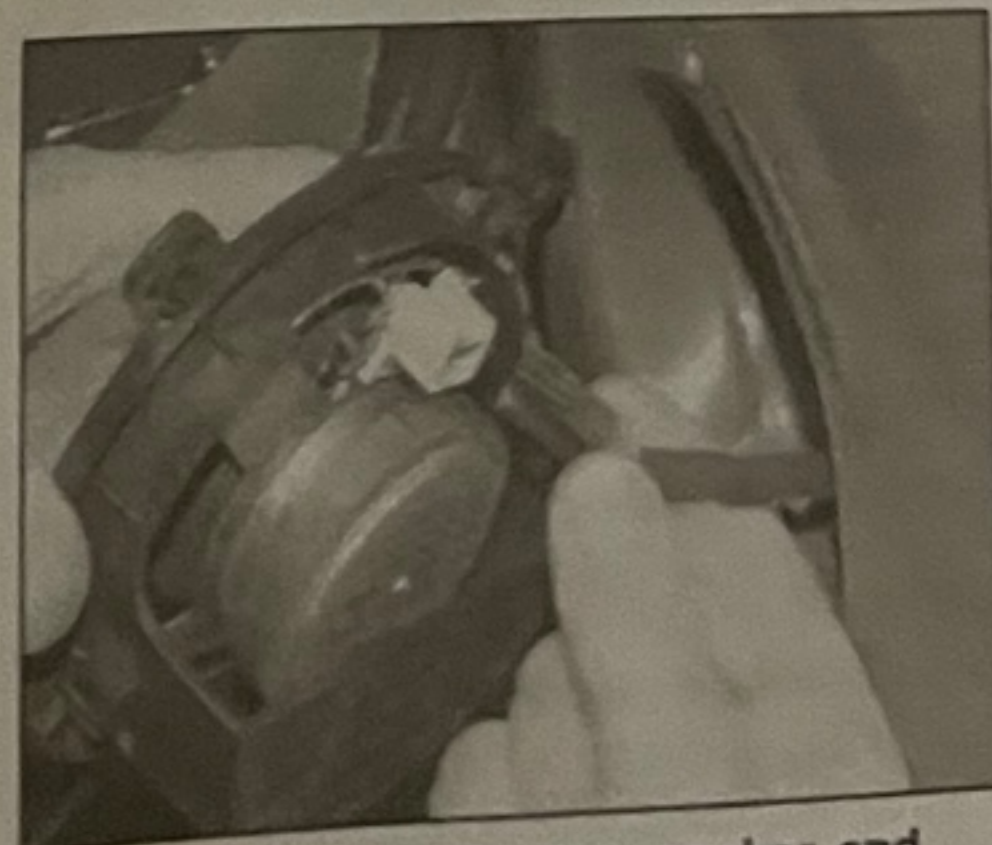
18.1 Prise out the grille ...



18.3 ... remove the speaker, and disconnect the wiring



18.6a Undo the mounting screws ...



18.6b ... remove the speaker, and disconnect the wiring



**Refitting**

5 Refitting is a reversal of removal.

### 20 CD changer – removal and refitting



**Caution:** As with the radio/CD player, the CD changer is programmed for the specific vehicle it is fitted to, and no radio code is supplied or required. If a unit is removed from one vehicle and fitted to another vehicle, it must be reprogrammed by a Saab dealer using the special Tech2 equipment. Note also that the equipment must be used to 'divorce' the unit from the original vehicle before it is removed.

**Removal**

- 1 Where fitted, the CD changer is located in the luggage compartment. Undo the mounting screws – there are two at the front and two at the rear.
- 2 Move the CD changer to one side and disconnect the wiring. Withdraw the unit from the luggage compartment.
- 3 If the CD changer is to be stored in a horizontal position, change the end setting so that the pointer points to the H mark. Note that four red transport screws are fitted to new units.

**Refitting**

- 4 Refitting is a reversal of removal.

### 21 Aerial amplifier and filter – removal and refitting



- 1 On Saloon models, the separate AM aerial loop is integrated into the top of the rear window, and the FM aerial is integral with the rear or side window heater element. The aerial signal is amplified by an amplifier located on the right-hand C-pillar, and an aerial filter located on the left-hand C-pillar.
- 2 One of two systems is fitted to Estate models. The first system uses an AM/FM aerial integrated into the rear right-hand side window and an adjacent amplifier and filter located on the D-pillar. In addition, the second system uses an FM aerial integrated into the rear left-hand side window and an adjacent amplifier and filter located on the D-pillar. The second system has a diversity function whereby the aerial with the best signal reception is used by the radio receiver.

**Aerial amplifier (Saloon models)****Removal**

- 3 Remove the trim panel from the right-hand C-pillar as described in Chapter 11.
- 4 Note the location of the wiring to the amplifier, and then disconnect it.
- 5 Disconnect the aerial from the amplifier;

however, take care not to damage the internal contacts.

- 6 Unscrew the retaining nuts and withdraw the amplifier from inside the car.

**Refitting**

- 7 Refitting is a reversal of removal.

**Aerial filter (Saloon models)****Removal**

- 8 Remove the trim panel from the left-hand C-pillar as described in Chapter 11.
- 9 Disconnect the single wire leading to the filter at the connector.
- 10 Undo the nut securing the filter lead to the body, and withdraw the filter from inside the car.

**Refitting**

- 11 Refitting is a reversal of removal.

**Aerial amplifier and filter (Estate models)****Removal**

- 12 Refer to Chapter 11 and remove the D-pillar trim, the rear headlining trim, and the two mouldings between the C- and D-pillars. Extract the clips from the headlining, and also remove the cargo safety net holders. Carefully bend down the rear of the headlining for access to the amplifier.
- 13 Note the location of the wiring to the amplifier and filter, and then disconnect it.
- 14 Disconnect the aerial from the amplifier; however, take care not to damage the internal contacts.
- 15 Unscrew the retaining nuts and withdraw the amplifier and filter from inside the car.

**Refitting**

- 16 Refitting is a reversal of removal.

### 22 Heated and ventilated seat components – general information, removal and refitting

**General information**

- 1 Certain models are fitted with thermostatically-regulated heated front and rear seats. Individual control switches are provided for each seat, which allow the heating



23.6a Undo the screws . . .

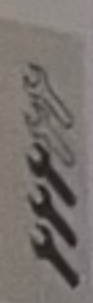
element temperature to be set to one of three levels, or switched off completely. Two heating element pads are fitted to each seat – one in the backrest, and one in the seat cushion.

2 Seat cooling is also available for the front seats on certain models, with individual fan speeds together with an off position. The fans extract the warm air from the seat fabric in contact with the body.

**Removal and refitting**

- 3 Access to the heating elements can only be gained by removing the upholstery from the seat – this is an operation which should be entrusted to a Saab dealer.
- 4 To remove the cooling fan, first remove the front seat as described in Chapter 11. Where a programmable control module is fitted to the driver's seat, remove this as described in Chapter 11 for access to the cooling fan. Unscrew the fan motor retaining nuts, disconnect the wiring and release the wiring from the cable-ties. Refitting is a reversal of removal.

### 23 DICE control module – general information, removal and refitting

**General information**

- 1 The Dash Integrated Central Electronics (DICE) system is a central control system for the vehicle main electrical circuits. The control module communicates with the various systems via the vehicle wiring harness and the instrument bus (I-bus). DICE is able to diagnose faults within the circuits and generate trouble codes, which can then be read to determine the faulty component or circuit. The main functions controlled by DICE is as follows:

- a) Exterior lighting.
- b) Interior lighting.
- c) Rheostat control.
- d) Acoustic warning for ignition and parking lights.
- e) Intermittent wiper operation between 2 and 15 seconds.
- f) Headlight washer system operation.
- g) Electrically-heated rear window and door mirrors.
- h) Radiator cooling fan.
- i) Air conditioning.

- 2 The DICE control module is programmable according to the country of origin. With the lighting system, this affects how main and dipped beam lighting functions, and whether daylight driving lights are necessary. The module is located next to the fusebox on the driver's side of the fascia.

**Removal**

- 3 Disconnect the battery negative lead.
- 4 Remove the lower fascia panel from the driver's side.
- 5 Undo the screw and lower the relay holder



from the housing for improved access to the DICE control module.

6 Undo the screws and withdraw the module from the housing (see illustrations).

7 Disconnect the wiring from the control module.

### Refitting

8 Refitting is a reversal of removal. If a new module is being fitted, it must be programmed specifically for the car by a Saab dealer.

## 24 Parking aid components – general information, removal and refitting

### General information

1 The Saab Parking Assistance (SPA) system is available as an option for all models. Four ultrasound sensors located in the rear bumper measure the distance to the closest object behind the car, and inform the driver using acoustic signals on the facia SID display unit. The nearer the object, the more frequent the acoustic signals. The text PARK ASSIST appears on the display unit when reverse gear is selected, and the signal tone changes to continuous when an object is closer than 12 inches (30 cm).

2 On Saloon models, the SPA control module is located behind the rear backrest, beneath the left-hand side. On Estate models, the module is located beneath the floor in the luggage compartment.

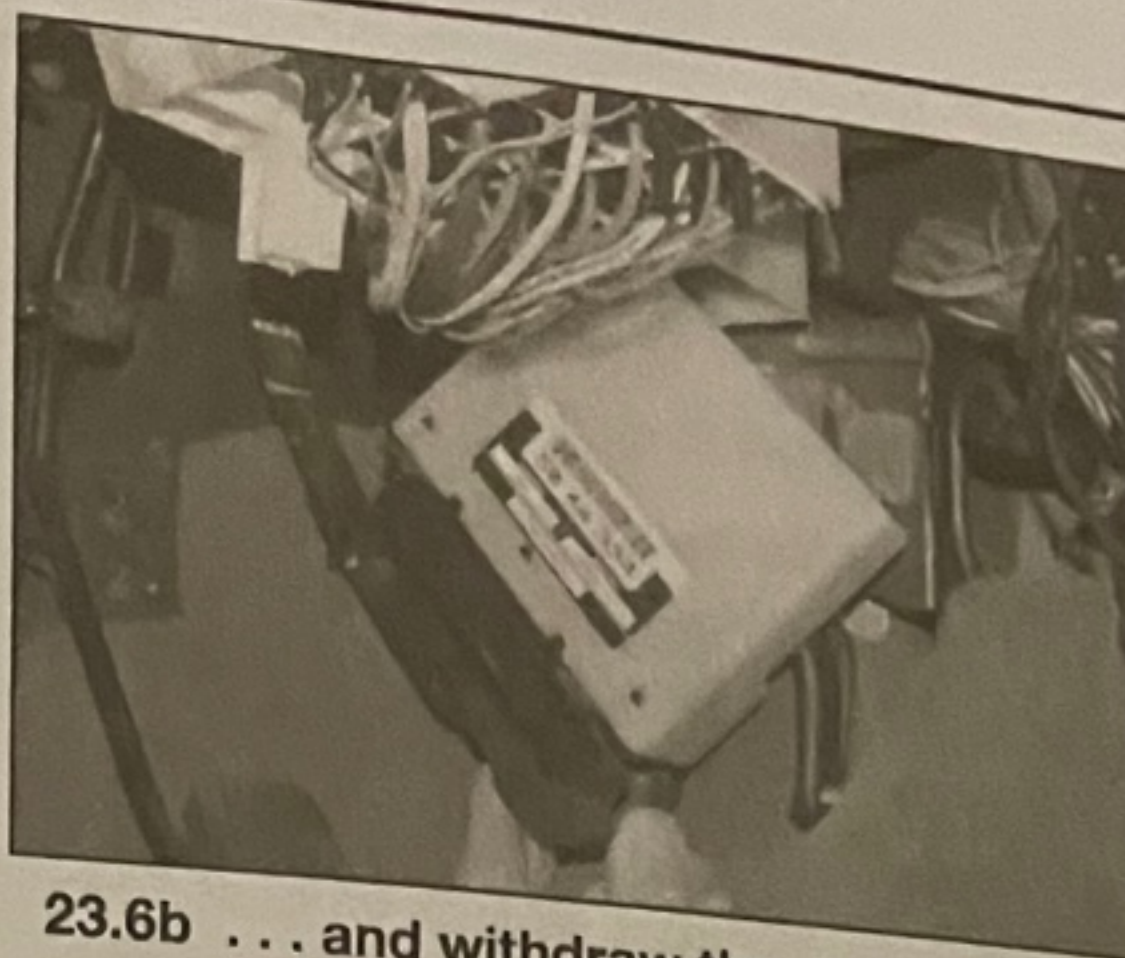
### Control module

#### Saloon models

- 3 With the left-hand rear door open, fold the 60% rear seat cushion and backrest forwards.
- 4 Pull back the door weatherseal for access to the rear side trim. Release the upper clip and carefully bend out the side trim.
- 5 Remove the sound insulation cushion.
- 6 Loosen the control module retaining screws, then lift the module and withdraw the screws through the slotted holes.
- 7 Disconnect the wiring and remove the module from inside the vehicle.
- 8 Refitting is a reversal of removal. Make sure that the grey plug is fitted to the grey socket, and the black plug to the black socket. Where fitted, the washers must be located in front of the mounting plate.

#### Estate models

- 9 Lift the rear seat cushions and fold the backrest forwards.
- 10 Unclip the front floor of the luggage compartment for access to the front of the lower trim. Remove the lower trim from the clips and lift it up.
- 11 Disconnect the wiring.
- 12 Unscrew the mounting nuts and withdraw the module from inside the vehicle.
- 13 Refitting is a reversal of removal. Make sure that the grey plug is fitted to the grey socket, and the black plug to the black socket.



23.6b ... and withdraw the module from the housing

Where fitted, the washers must be located in front of the mounting plate.

### Range/distance sensor

#### Saloon models

14 Working on each side, carefully prise out the rear bumper corner protection strips where they abut the centre strip. Saab technicians use a special tool to do this, however, careful use of a screwdriver is possible.

15 Prise out the centre strip from the bumper for access to the four distance sensors.

16 Release the plastic clips and remove the sensors from the retainers, then disconnect the wiring.

17 Depress the large and small fasteners and remove the retainers from the centre strip.

18 Refitting is a reversal of removal. Press the retainers firmly into the centre strip so that the fasteners engage.

#### Estate models

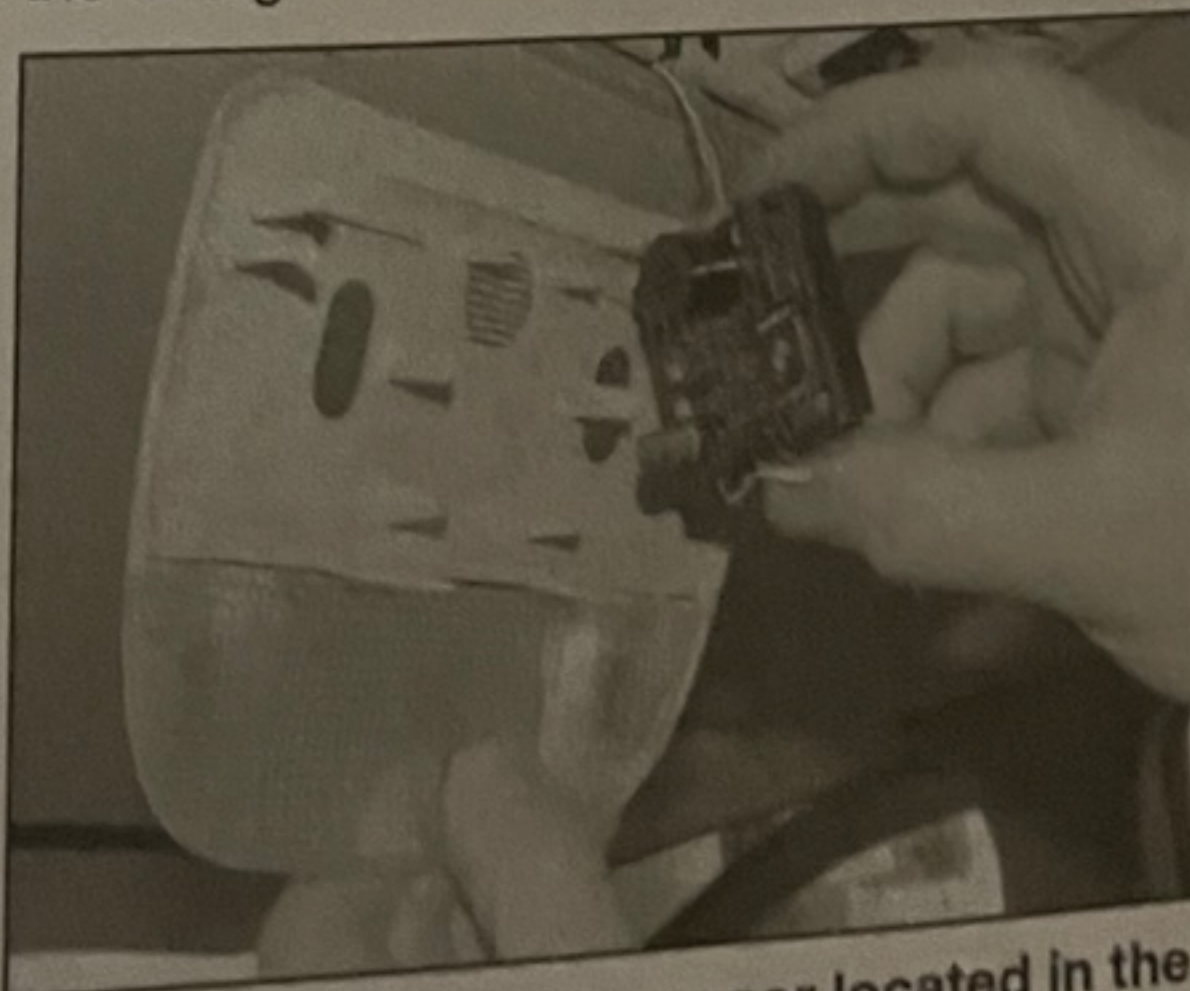
19 The distance sensors are fitted to the rear bumper upper centre panel, which can be removed separately to the main part of the rear bumper.

20 Working on each side, carefully prise off the rear bumper corner protection strips.

21 With the tailgate open, undo the rear bumper upper centre panel mounting screws.

22 Release the bottom of the centre panel from the retaining clips, then lift the panel to free the tabs from the screws. Press in the corners of the panel and withdraw it directly rearwards.

23 Release the plastic clips and remove the sensors from the retainers, then disconnect the wiring.



25.8 Glass breakage sensor located in the rear passenger interior light

24 Depress the large and small fasteners and remove the retainers from the centre strip.

25 Refitting is a reversal of removal. Press the retainers firmly into the centre strip so that the fasteners engage.

## 25 Anti-theft alarm system components – general information, removal and refitting

### General information

1 The Saab anti-theft alarm system is referred to as TWICE (Theft Warning Integrated Central Electronics). The TWICE electronic control module operates the following systems:

- a) Lamp check including parking and brake lights.
- b) Seat belt warning including passenger seat occupation sensor.
- c) Electrically-heated rear seat.
- d) Electrically-powered passenger seat.
- e) Central locking.
- f) Electric opening of the boot lid.
- g) Theft protection immobilisation.
- h) Anti-theft alarm including glass breakage and angle sensors.

### Electronic control module

**Caution:** If a new electronic control module is to be fitted, it must be reprogrammed by a Saab dealer using the special Tech2 equipment. All transponders and remote controls must be renewed, and all new ignition keys must be programmed at the same time.

### Removal

- 2 Remove the left-hand front seat as described in Chapter 11.
- 3 Fold back the carpet and if necessary remove the moulding for access to the control module on the floor panel.
- 4 Disconnect the wiring multiplug from the control module.
- 5 Unscrew the plastic nuts and remove the module from inside the car.

### Refitting

6 Refitting is a reversal of removal. If a new module is being fitted, it must be programmed specifically for the car by a Saab dealer.

### Glass breakage sensor

**Note:** On Estate models there are two glass breakage sensors, a central one over the rear passenger area, and a rear one in the luggage compartment interior light. The rear sensor is integral with the light unit and cannot be renewed separately.

### Removal

- 7 Carefully prise off the lens from the rear interior light, then use a screwdriver to release the light retainers and withdraw the unit from the headlining.
- 8 Disconnect the wiring and remove the glass breakage sensor from the lens cover (see illustration).





25.29 Remote control receiver location

### Refitting

9 Refitting is a reversal of removal, however, note that there are two types of sensor, one for models with fabric seat covers and the other for models with leather seats.

### Warning LED on top of facia

#### Removal

10 The LED is fitted to a plate; slide the plate forwards and remove it.

11 Press the LED from the plate, then disconnect the wiring and remove the diode. The LED terminal legs are fragile; so take care not to break them.

#### Refitting

12 Refitting is a reversal of removal.

### Bonnet switch

#### Removal

13 With the bonnet open, slide the bonnet

switch up from its location on the fusebox in the left-hand rear of the engine compartment.

14 Disconnect the wiring.

#### Refitting

15 Refitting is a reversal of removal.

### Luggage compartment switch

**Note:** On Estate models, the switch is integral with the tailgate lock and cannot be renewed separately.

#### Removal

16 Remove the boot lid lock as described in Chapter 11.

17 With the lock on the bench, prise off the grip washers and remove the switch from the lock.

#### Refitting

18 Refitting is a reversal of removal.

### Alarm horn/siren

#### Removal

19 Apply the handbrake, then jack up the front of the vehicle and support it on axle stands (see *Jacking and vehicle support*). Remove the left-hand front roadwheel.

20 Working beneath the front left-hand wheel arch, remove the front section of the wheel arch liner for access to the alarm horn.

21 Disconnect the wiring from the horn.

22 Undo the retaining nut and bolt and withdraw the alarm horn from under the front wing.

#### Refitting

23 Refitting is a reversal of removal.

### Tilt angle sensor

#### Removal

24 Refer to Chapter 11 and remove the inner sill trim from the front and rear of the B-pillar.

25 Remove the right-hand front seat (Chapter 11) then release the lower B-pillar clips and unclip the carpet. Fold the carpet to one side for access to the tilt sensor.

26 Disconnect the wiring then unscrew the retaining nuts and withdraw the tilt sensor from inside the car.

#### Refitting

27 Refitting is a reversal of removal. After fitting the tilt sensor, check the system by activating the alarm and checking that the diode glows for about 10 seconds, then flashes. Wait for 15 seconds then deactivate the alarm. Ideally, the system should be checked for trouble codes by a Saab dealer.

### Remote control receiver

#### Removal

28 Raise the armrest on the centre console, then use a screwdriver to release the front edge of the console rear panel until the clip is released. Lift the rear panel up and tilt it outwards, then disconnect the switch wiring.

29 Where fitted, remove the clip from the console sidewall. Remove the control receiver and disconnect the wiring (see illustration).

#### Refitting

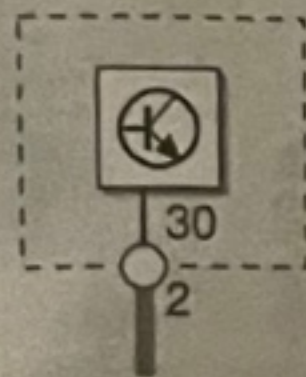
30 Refitting is a reversal of removal. Where necessary, use additional tape to secure the wiring to the console, and also use an extra clip.



## Key to symbols

|                                       |  |                               |          |
|---------------------------------------|--|-------------------------------|----------|
| Bulb                                  |  | Item no.                      | <b>2</b> |
| Flashing bulb                         |  | Single speed pump/motor       |          |
| Switch                                |  | Gauge/meter                   |          |
| Multiple contact switch (ganged)      |  | Earth point & location        |          |
| Fuse/fusible link                     |  | Diode                         |          |
| Resistor                              |  | Light emitting diode (LED)    |          |
| Variable resistor                     |  | Solenoid actuator             |          |
| Connecting wires                      |  | Heating element               |          |
| Wire colour (Black with brown tracer) |  | Wire splice or soldered joint |          |

Dashed outline denotes part of a system, containing in this case an electronic or solid state device. Standard DIN terminal location (battery positive), pin no. 2.



## Key to circuits

|            |   |
|------------|---|
| Diagram 1  | Information for wiring diagrams.  |
| Diagram 2  | Starting, charging, engine cooling fan & horn.                          |
| Diagram 3  | Side, tail, number plate, stop & reversing lights.                      |
| Diagram 4  | Halogen & xenon headlights.   |
| Diagram 5  | Foglights, direction indicators & hazard warning lights.                |
| Diagram 6  | Instrument cluster, cigarette lighter & electric sunroof.               |
| Diagram 7  | Heated seats, heated rear window, electric mirrors & compressor clutch. |
| Diagram 8  | Central locking & electric windows.                                     |
| Diagram 9  | Interior lighting & audio system.                                       |
| Diagram 10 | Headlight levelling, front & rear wash/wipe, headlight washer.          |

## Earth locations

|     |  |
|-----|--|
| E1  | On slam panel behind LH headlight                  |
| E2  | In luggage compartment under LH tail light         |
| E3  | On centre console between front seats              |
| E4  | On engine  |
| E5  | On cross member under LH front seat                |
| E6  | On cross member under RH front seat                |
| E7  | On gearbox   |
| E8  | LH inner wing behind battery                       |
| E9  | On slam panel behind RH headlight                  |
| E10 | Behind LH kick panel at bottom LH end of dashboard |
| E11 | On LH 'A' pillar at LH end of dashboard            |
| E12 | Behind centre of dashboard                         |
| E13 | Behind centre of dashboard                         |
| E14 | On RH 'A' pillar at RH end of dashboard            |
| E15 | Behind centre of dashboard                         |
| E16 | On parcel shelf by RH rear speaker                 |
| E17 | In roof above LH 'D' pillar                        |
| E18 | On RH inner wing by filler cap opening             |

## Diagram 1

## Typical engine compartment fuses

| Fuse | Rating | Circuit protected                         |
|------|--------|---|
| F1   | 40A    | LH & RH engine cooling fan                |
| F2   | 40A    | ESP                                       |
| F3   | 30A    | ESP                                       |
| F4   | 7.5A   | Load angle sensor                         |
| F5   | 15A    | Auxiliary heater                          |
| F6   | 10A    | Alarm, A/C compressor                     |
| F7   | 15A    | Headlight flasher, main beam relay        |
| F8   | -      | -   |
| F9   | 20A    | Headlight washer pump                     |
| F10  | 15A    | LH main beam                              |
| F11  | 15A    | LH dipped beam                            |
| F12  | 15A    | RH main beam                              |
| F13  | 15A    | RH dipped beam                            |
| F14  | 30A    | RH radiator fan, high speed               |
| F15  | 15A    | Fog lights                                |
| F16  | 30A    | Rear window wiper, headlight washer motor |
| F17  | 15A    | Horn                                      |

## Typical passenger compartment fuses

| Fuse | Rating | Circuit protected  |
|------|--------|--|
| FA   | 30A    | Trailer lighting   |
| FB   | 10A    | Traction control   |
| FC   | 7.5A   | Electric door mirrors, DICE, manual headlight adjustment   |
| F1   | 15A    | Stop light switch  |
| F2   | 15A    | Reversing lights   |
| F3   | 10A    | LH sidelight   |
| F4   | 10A    | RH sidelight   |
| F5   | 7.5A   | DICE/TWICE   |
| F6   | 30A    | Electric windows RH - pre-installed trailer wiring   |
| F6B  | 10A    | Stop lights - pre-installed trailer wiring   |
| F7   | 10A    | Fuel injection   |
| F8   | 15A    | Luggage compartment lighting, luggage compartment lock, door lighting, circulation pump, parking assistance, SID |
| F9   | 15A    | Audio system, CD changer, diagnostic socket  |
| F10  | 15A    | Heated rear seat, sunroof, central locking   |
| F11  | 30A    | Electrically adjusted passenger's seat   |
| F12  | 7.5A   | Traction control   |
| F13  | 20A    | Amplifier  |
| F14  | 30A    | Engine management  |
| F15  | 20A    | Fuel pump, pre-heating oxygen sensor   |
| F16  | 20A    | DICE, direction indicators   |
| F16B | 7.5A   | Road toll provision, OnStar  |
| F17  | 20A    | Engine management, instrument cluster, DICE/TWICE  |
| F18  | 40A    | Heated rear window and mirrors   |
| F19  | 10A    | Provision for mobile phone, OnStar   |
| F20  | 15A    | Automatic climate control, interior lighting, rear foglights   |
| F21  | 10A    | Radio, automatic dimming mirror, navigation, automatic headlight levelling, cruise control                       |
| F22  | 40A    | Blower motor   |
| F23  | 15A    | Central locking, telephone, door mirrors with memory   |
| F24  | 20A    | Light switch   |
| F25  | 30A    | Electrically adjusted driver's seat  |
| F26  | 7.5A   | Parking assistance, memory seats, sunroof, door mirrors with memory, climate control                             |
| F27  | 10A    | Engine management, instrument cluster, SID, DICE   |
| F28  | 7.5A   | Airbag   |
| F29  | 10A    | ESP  |
| F30  | 7.5A   | Starter motor  |
| F31  | 7.5A   | Cruise control, water valve, front fog lights, rain sensor, DICE   |
| F32  | -      | Spare  |
| F33  | 7.5A   | Direction indicator switch   |
| F34  | 30A    | Cigarette lighter  |
| F35  | 15A    | Daytime driving lights   |
| F36  | 30A    | Electric window LH   |
| F37  | 30A    | Windscreen wipers  |
| F38  | 30A    | Heated seats   |
| F39  | 20A    | Petrol limp home solenoid (auto. trans.)   |
|      | 30A    | Diesel fuel filter heating element   |



## Wire colours

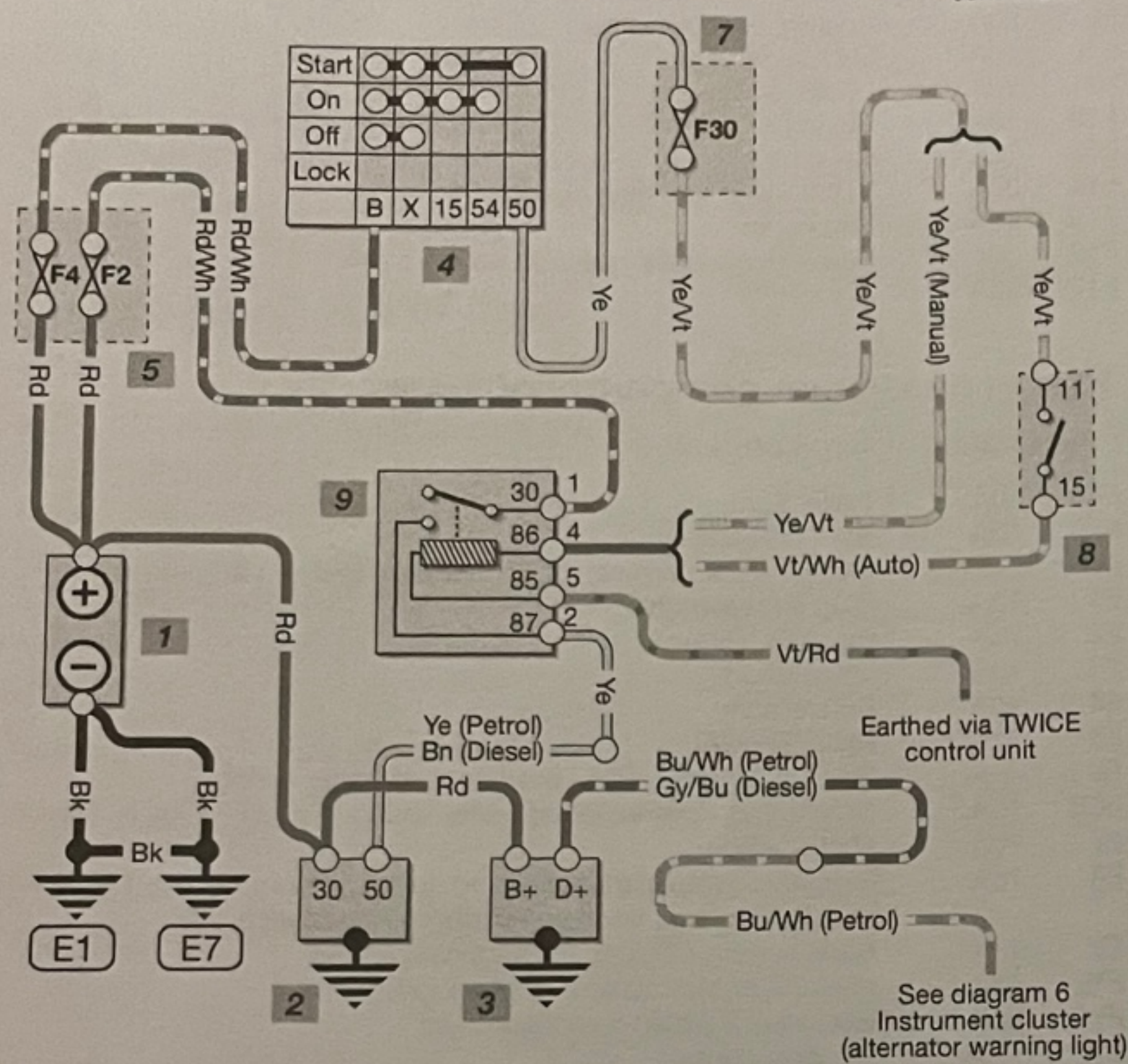
|    |        |    |        |
|----|--------|----|--------|
| Bu | Blue   | Rd | Red    |
| Vt | Violet | Ye | Yellow |
| Og | Orange | Bn | Brown  |
| Pk | Pink   | Wh | White  |
| Gy | Grey   | Bk | Black  |
| Gn | Green  |    |        |

## Key to items

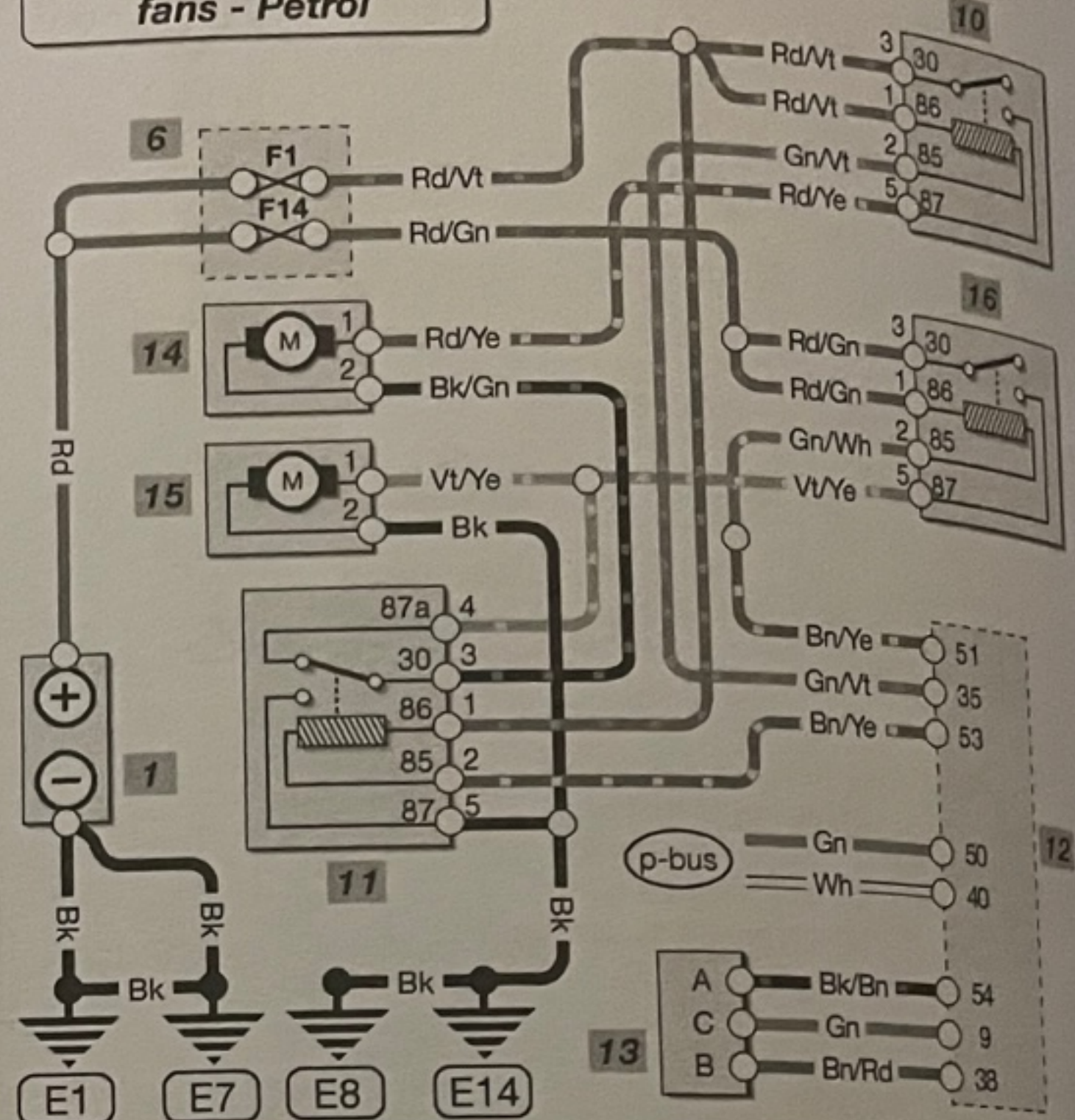
|   |                           |    |                                  |    |                                |
|---|---------------------------|----|----------------------------------|----|--------------------------------|
| 1 | Battery                   | 10 | Low speed relay                  | 19 | Horn relay                     |
| 2 | Starter motor             | 11 | LH fan high speed relay          | 20 | Horn switch                    |
| 3 | Alternator                | 12 | DICE control unit                | 21 | Steering wheel clock spring    |
| 4 | Ignition switch           | 13 | Air conditioning pressure sensor | 22 | Remote audio controls          |
| 5 | Maxi-fusebox              | 14 | LH engine cooling fan            | 23 | Engine management control unit |
| 6 | Engine fusebox            | 15 | RH engine cooling fan            | 24 | Coolant temperature sensor     |
| 7 | Passenger fusebox         | 16 | RH fan high speed relay          |    |                                |
| 8 | Transmission range switch | 17 | SID control unit                 |    |                                |
| 9 | Starter relay             | 18 | Horn                             |    |                                |

Diagram 2

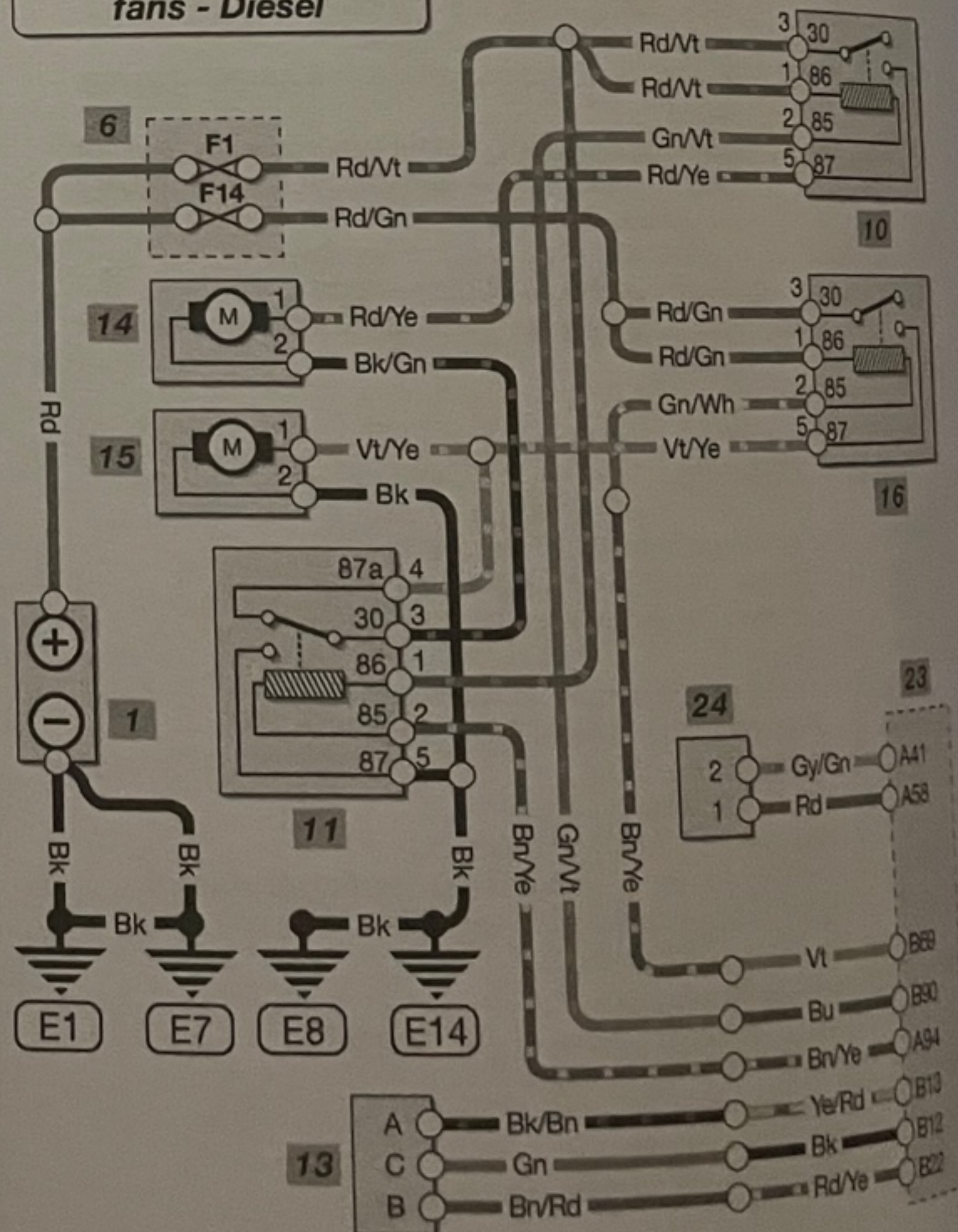
## Typical starting &amp; charging system



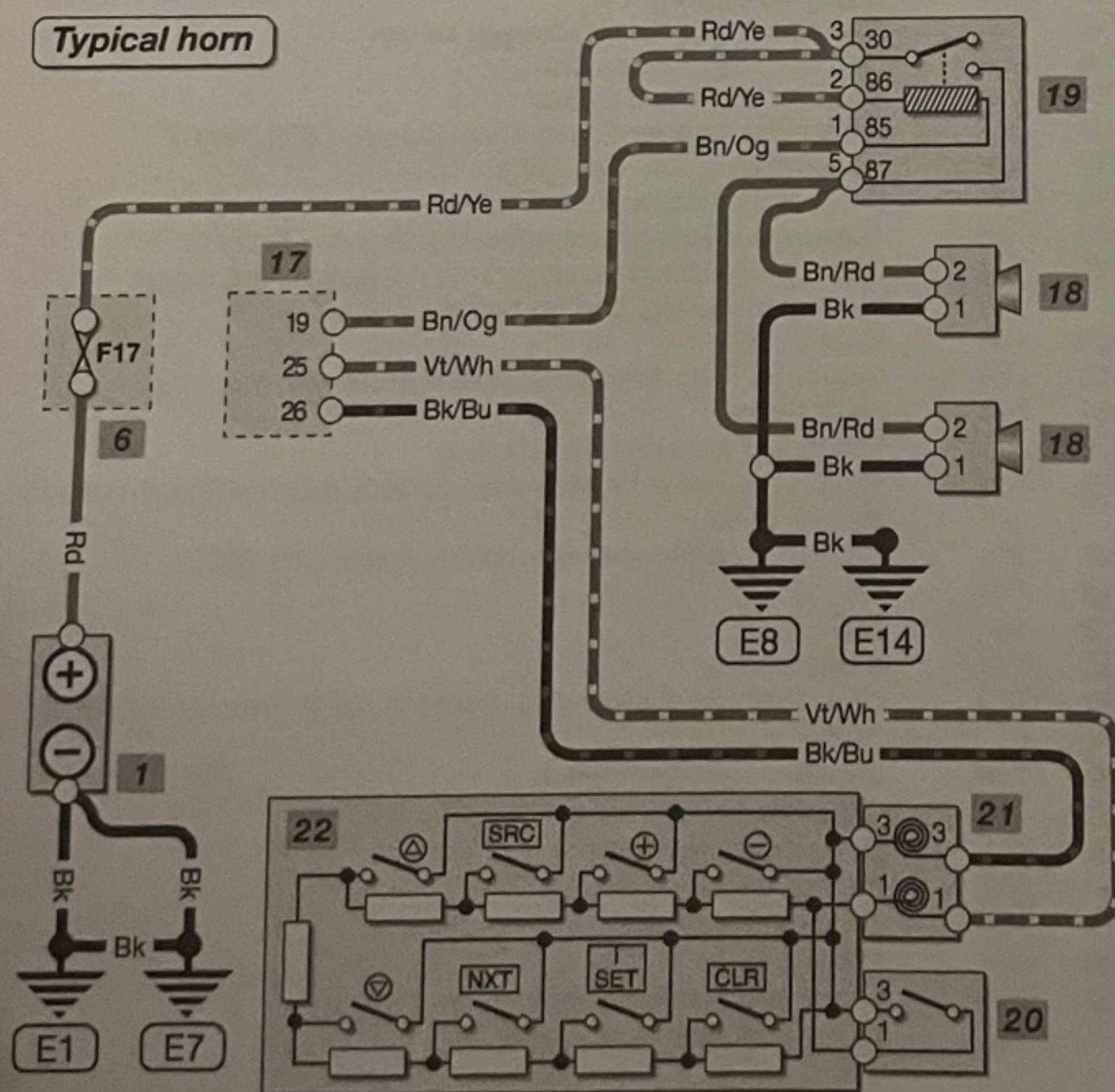
## Typical engine cooling fans - Petrol



## Typical engine cooling fans - Diesel



## Typical horn





# Wire colours

|    |        |    |        |
|----|--------|----|--------|
| Bu | Blue   | Rd | Red    |
| Vt | Violet | Ye | Yellow |
| Og | Orange | Bn | Brown  |
| Pk | Pink   | Wh | White  |
| Gy | Grey   | Bk | Black  |
| Gn | Green  |    |        |

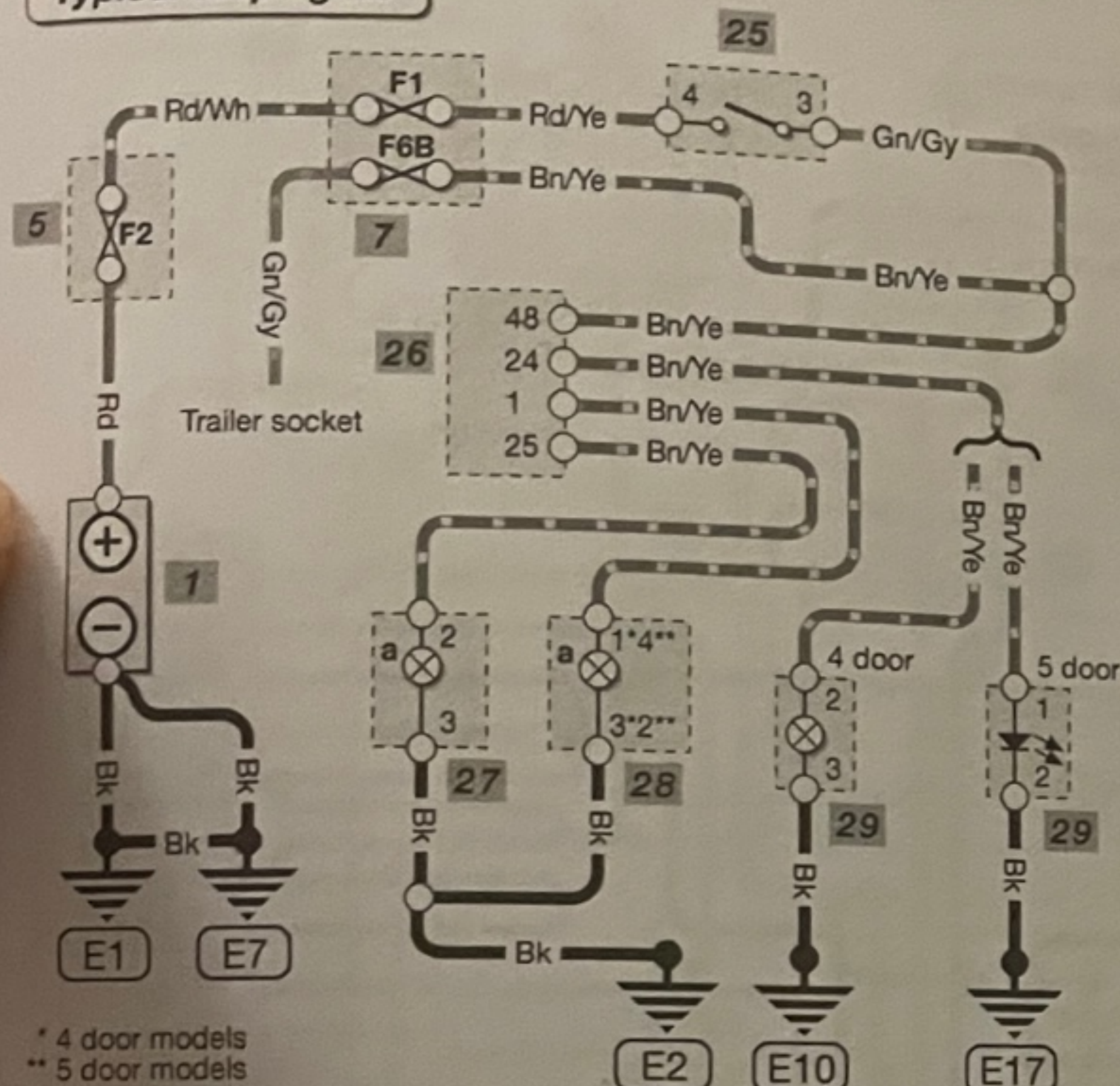
## Key to items

- |    |                           |    |                                 |
|----|---------------------------|----|---------------------------------|
| 1  | Battery                   | 28 | RH rear light unit              |
| 4  | Ignition switch           | a  | = stop light                    |
| 5  | Maxi-fusebox              | b  | = tail light                    |
| 7  | Passenger fusebox         | 29 | High level brake light          |
| 8  | Transmission range switch | 30 | Reversing light switch          |
| 12 | DICE control unit         | 31 | LH Boot/tailgate lid light unit |
| 25 | Stop light switch         | a  | = reversing light               |
| 26 | TWICE control unit        | 32 | RH Boot/tailgate lid light unit |
| 27 | LH rear light unit        | a  | = reversing light               |
|    | a = stop light            | 33 | Number plate light              |
|    | b = tail light            |    |                                 |

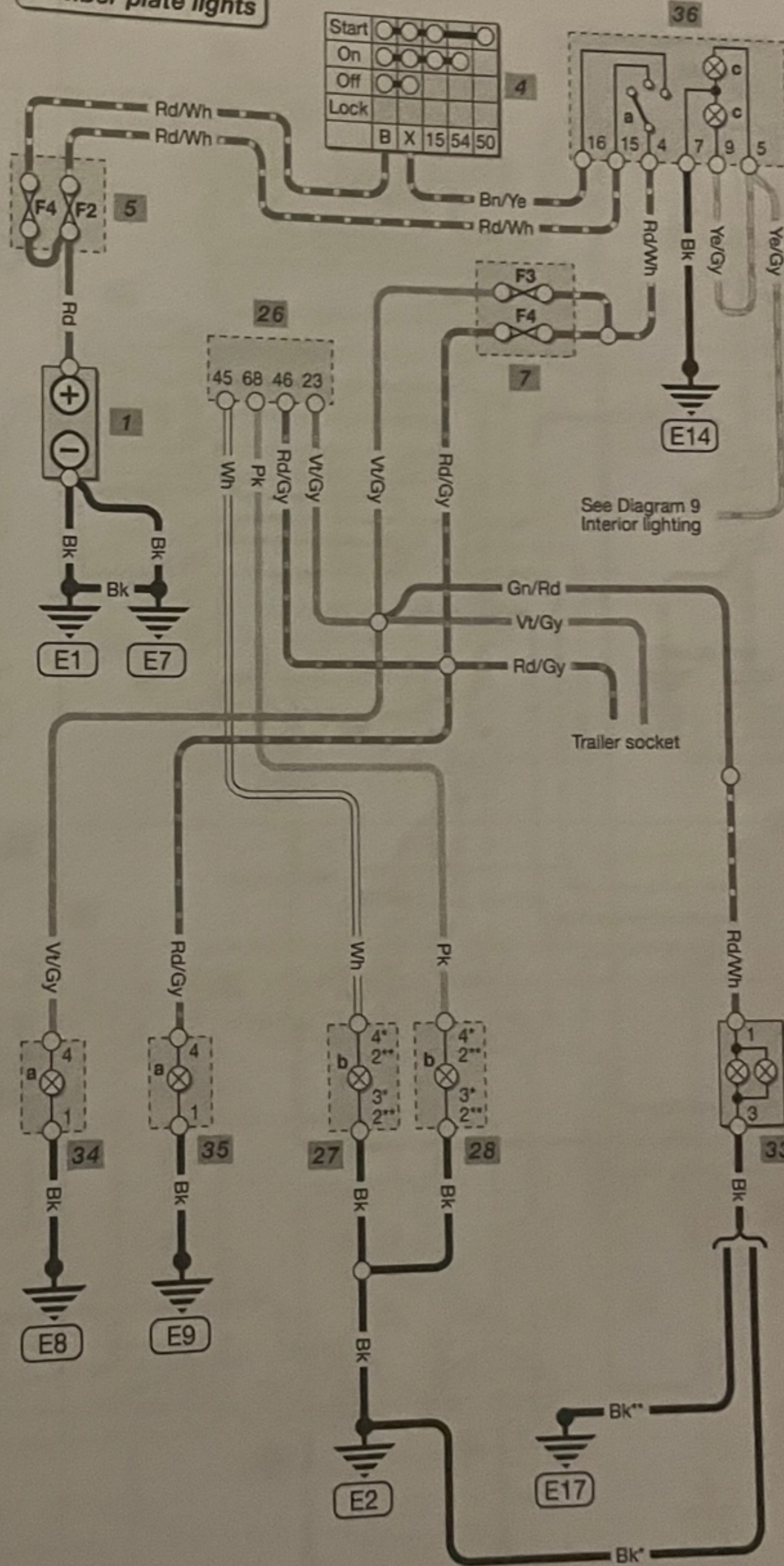
### Diagram 3

- |    |                          |
|----|--------------------------|
| 34 | LH headlight unit        |
| a  | = sidelight              |
| 35 | RH headlight unit        |
| a  | = sidelight              |
| 36 | Combined lighting switch |
| a  | = light switch           |
| c  | = switch illumination    |

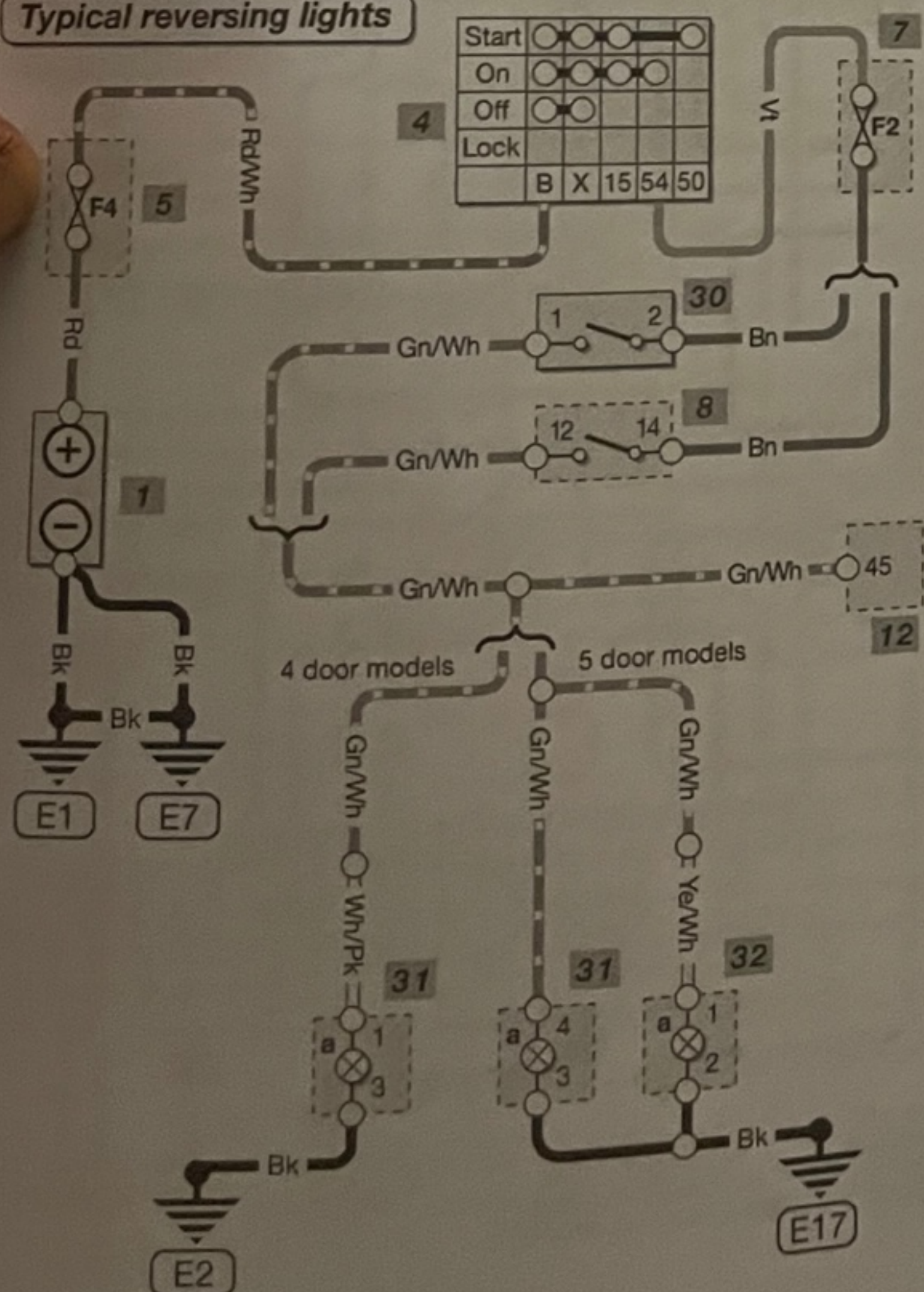
#### Typical stop lights



#### Typical side, tail & number plate lights



#### Typical reversing lights



\* 4 door models  
\*\* 5 door models



# Wire colours

|    |        |    |        |
|----|--------|----|--------|
| Bu | Blue   | Rd | Red    |
| Vt | Violet | Ye | Yellow |
| Og | Orange | Bn | Brown  |
| Pk | Pink   | Wh | White  |
| Gy | Grey   | Bk | Black  |
| Gn | Green  |    |        |

# Key to items

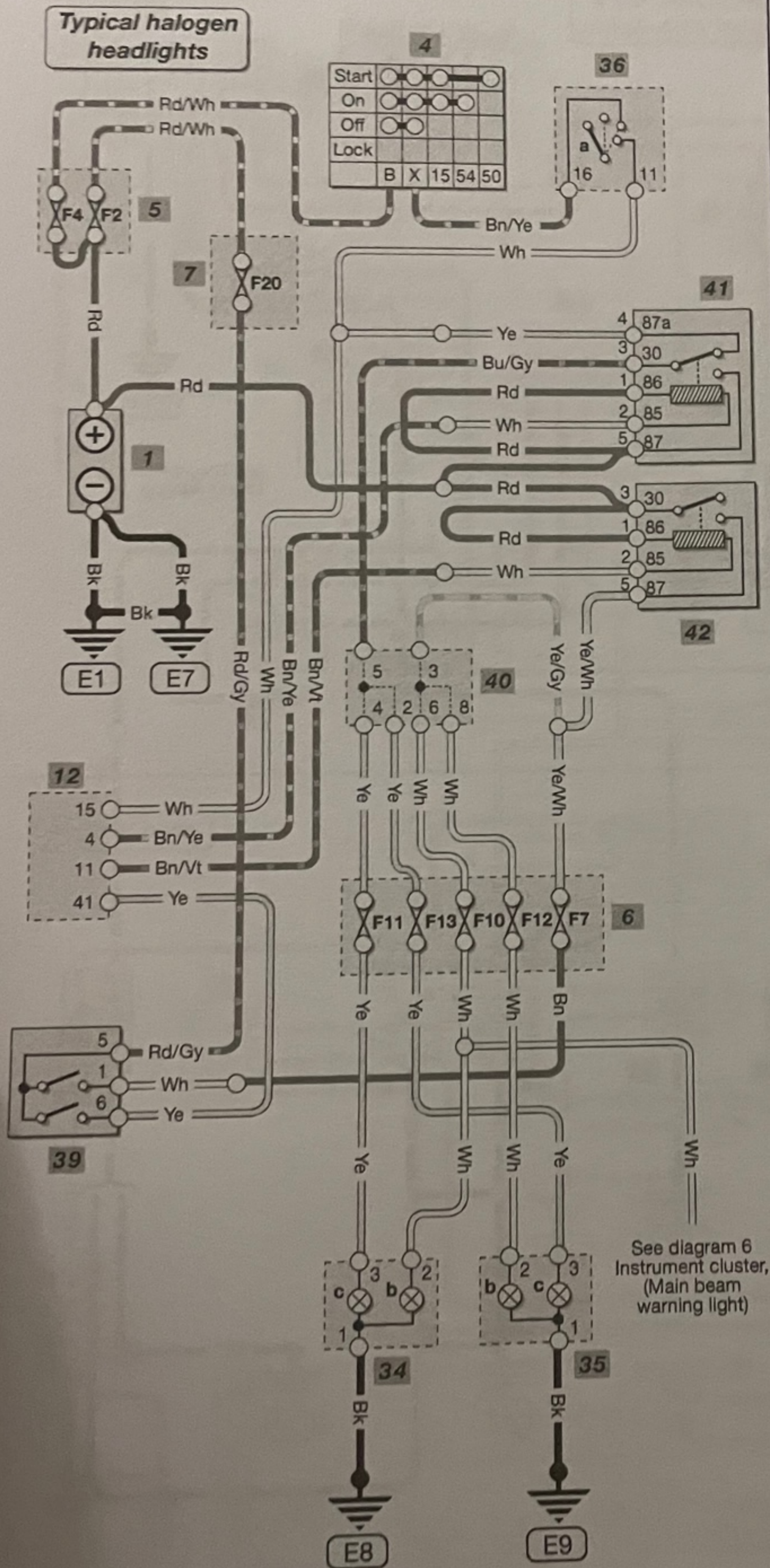
|    |                    |    |  |
|----|--------------------|----|--|
| 1  | Battery            | f  | = Auto. headlight levelling control unit |
| 4  | Ignition switch    | g  | = xenon light screen solenoid            |
| 5  | Maxi-fusebox       | 35 | RH headlight unit                        |
| 6  | Engine fusebox     | a  | = side light                             |
| 7  | Passenger fusebox  | b  | = main beam                              |
| 12 | DICE control unit  | c  | = dipped beam                            |
| 34 | LH headlight unit  | d  | = xenon light unit                       |
| a  | = side light       | e  | = levelling motor                        |
| b  | = main beam        | 36 | Combined lighting switch                 |
| c  | = dipped beam      | a  | = light switch                           |
| d  | = xenon light unit | 39 | Dip switch                               |
| e  | = levelling motor  |    |  |

|    |                   |
|----|-------------------|
| 40 | Filament monitor  |
| 41 | Dipped beam relay |
| 42 | Main beam relay   |

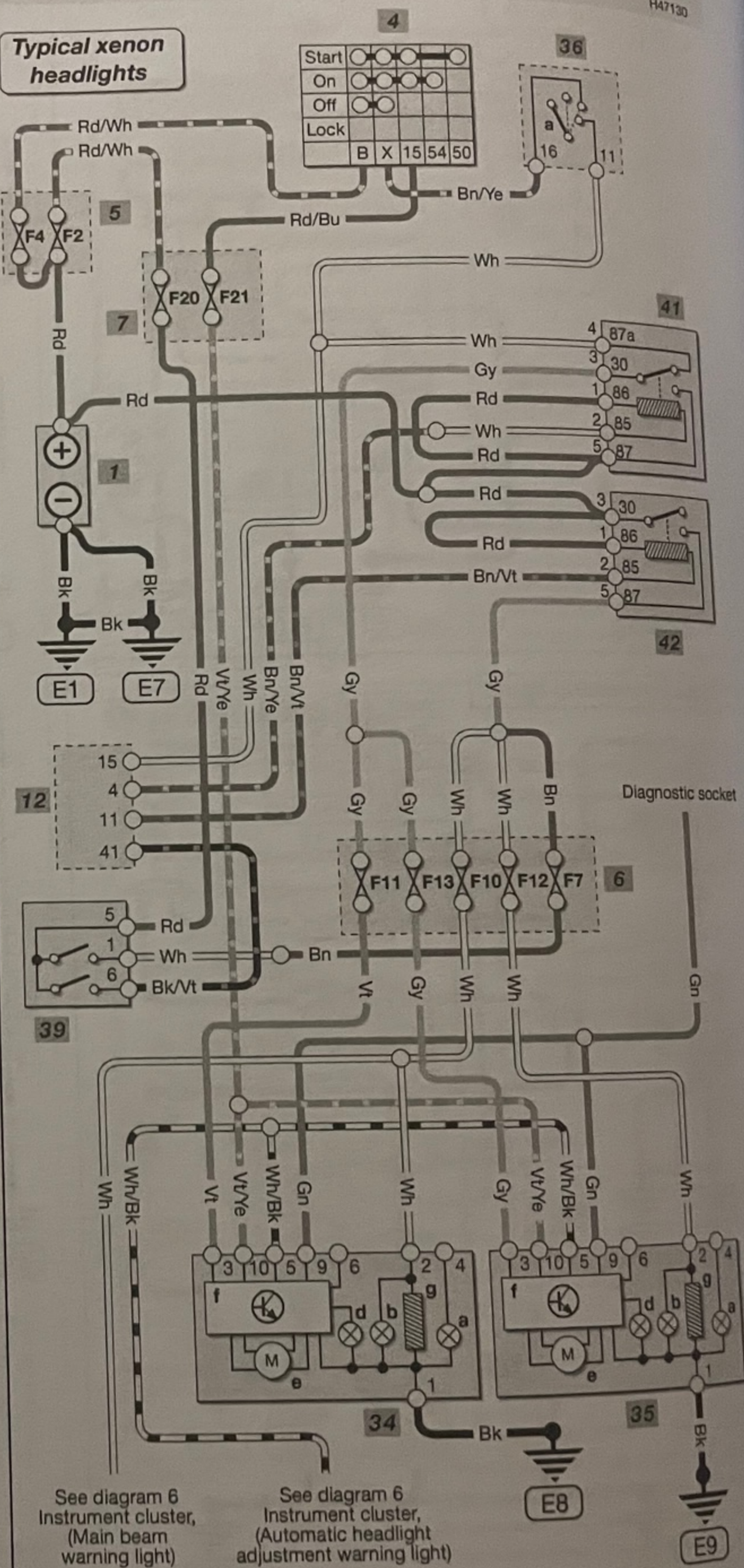
Diagram 4

H47130

## Typical halogen headlights



## Typical xenon headlights





# Wire colours

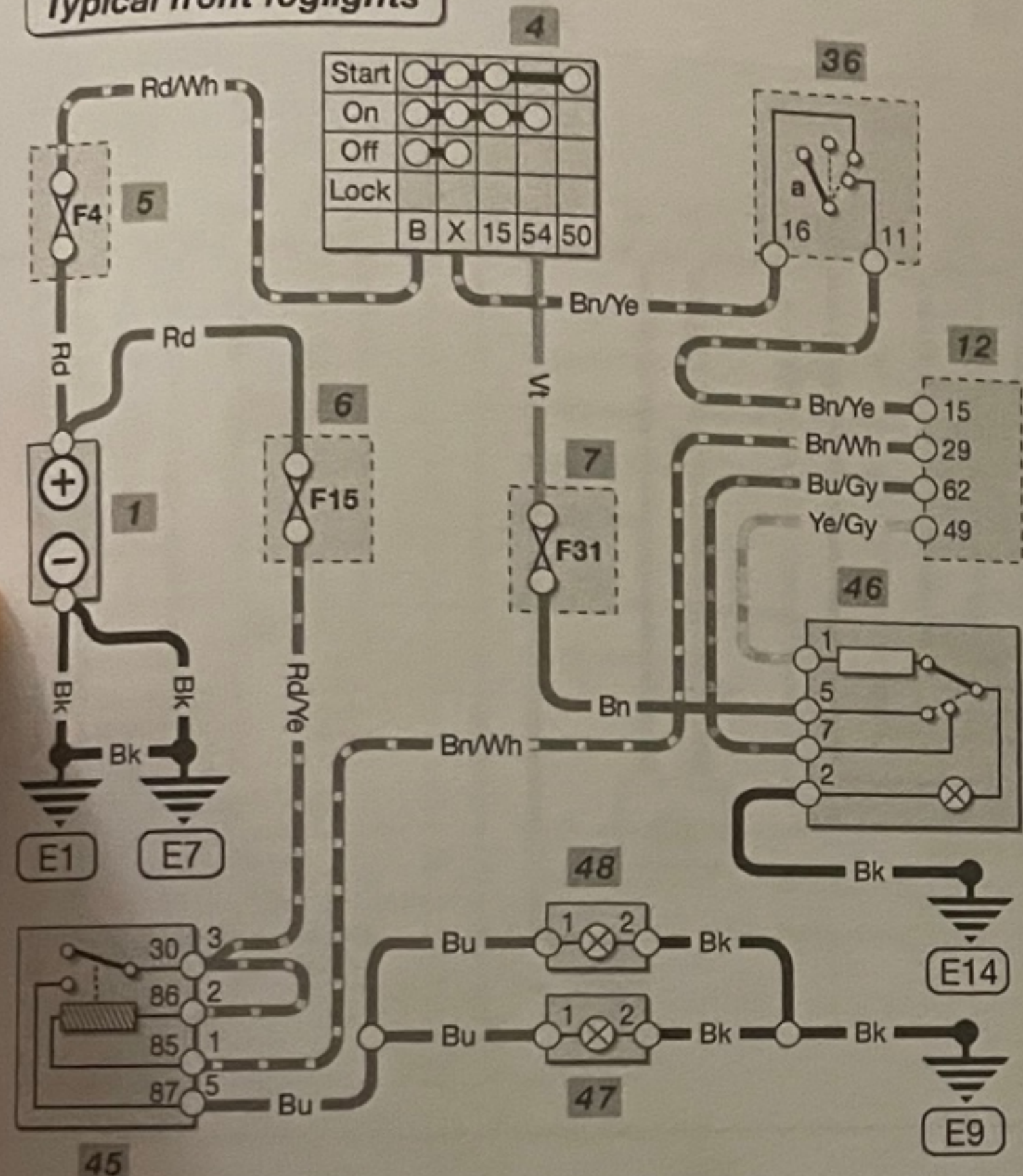
|    |        |    |        |
|----|--------|----|--------|
| Bu | Blue   | Rd | Red    |
| Vt | Violet | Ye | Yellow |
| Og | Orange | Bn | Brown  |
| Pk | Pink   | Wh | White  |
| Gy | Grey   | Bk | Black  |
| Gn | Green  |    |        |

## Key to items

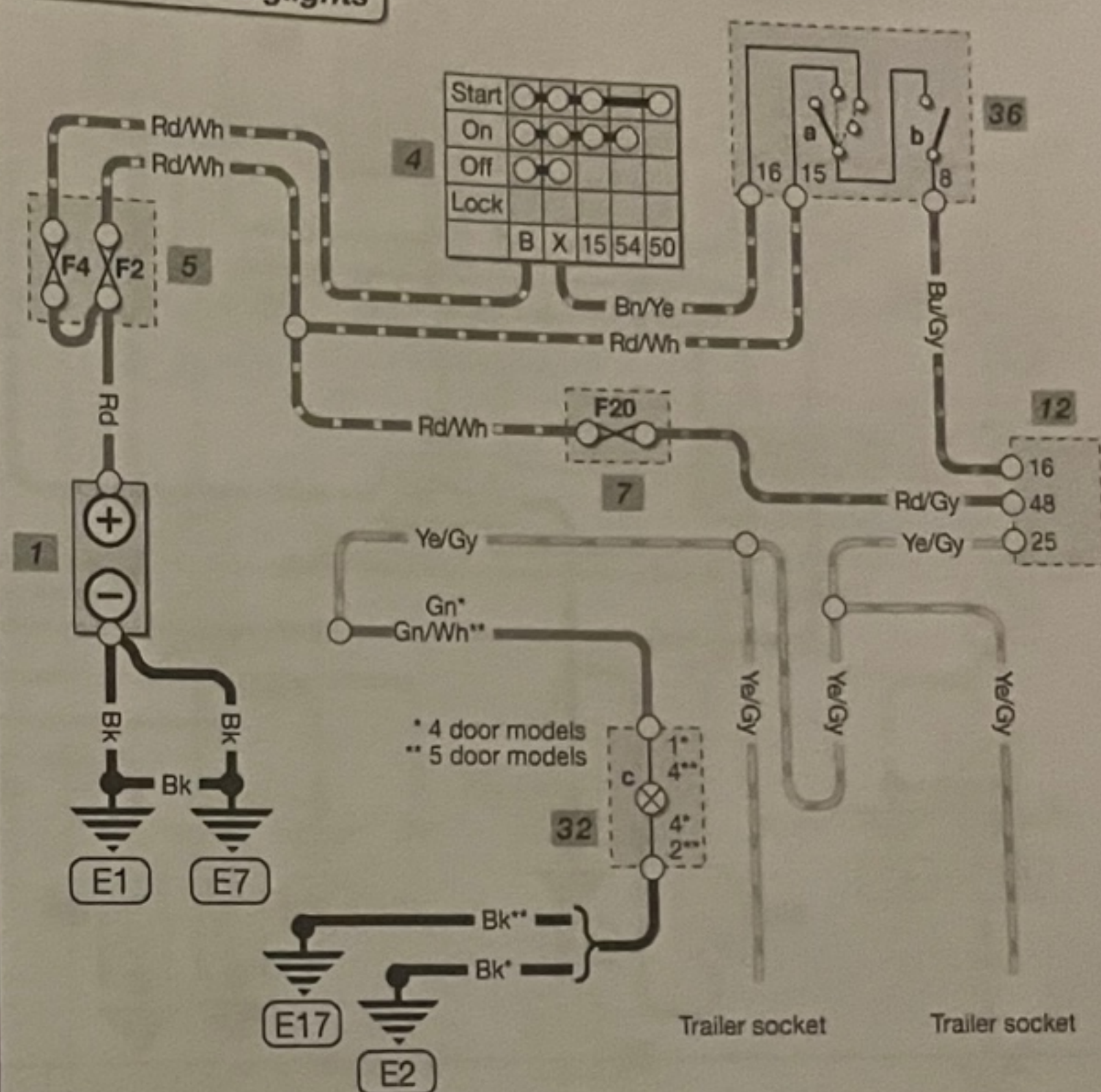
- |    |                                 |    |                          |
|----|---------------------------------|----|--------------------------|
| 1  | Battery                         | 34 | LH headlight unit        |
| 4  | Ignition switch                 | h  | = direction indicator    |
| 5  | Maxi-fusebox                    | 35 | RH headlight unit        |
| 6  | Engine fusebox                  | h  | = direction indicator    |
| 7  | Passenger fusebox               | 36 | Combined lighting switch |
| 12 | DICE control unit               | a  | = light switch           |
| 27 | LH rear light unit              | b  | = rear foglight switch   |
| c  | = direction indicator           | 45 | Front foglight relay     |
| 28 | RH rear light unit              | 46 | Front foglight switch    |
| c  | = direction indicator           | 47 | LH front foglight        |
| 32 | RH Boot/tailgate lid light unit | 48 | RH front foglight        |
| c  | = rear foglight                 | 50 | Ignition relay           |

Diagram 5

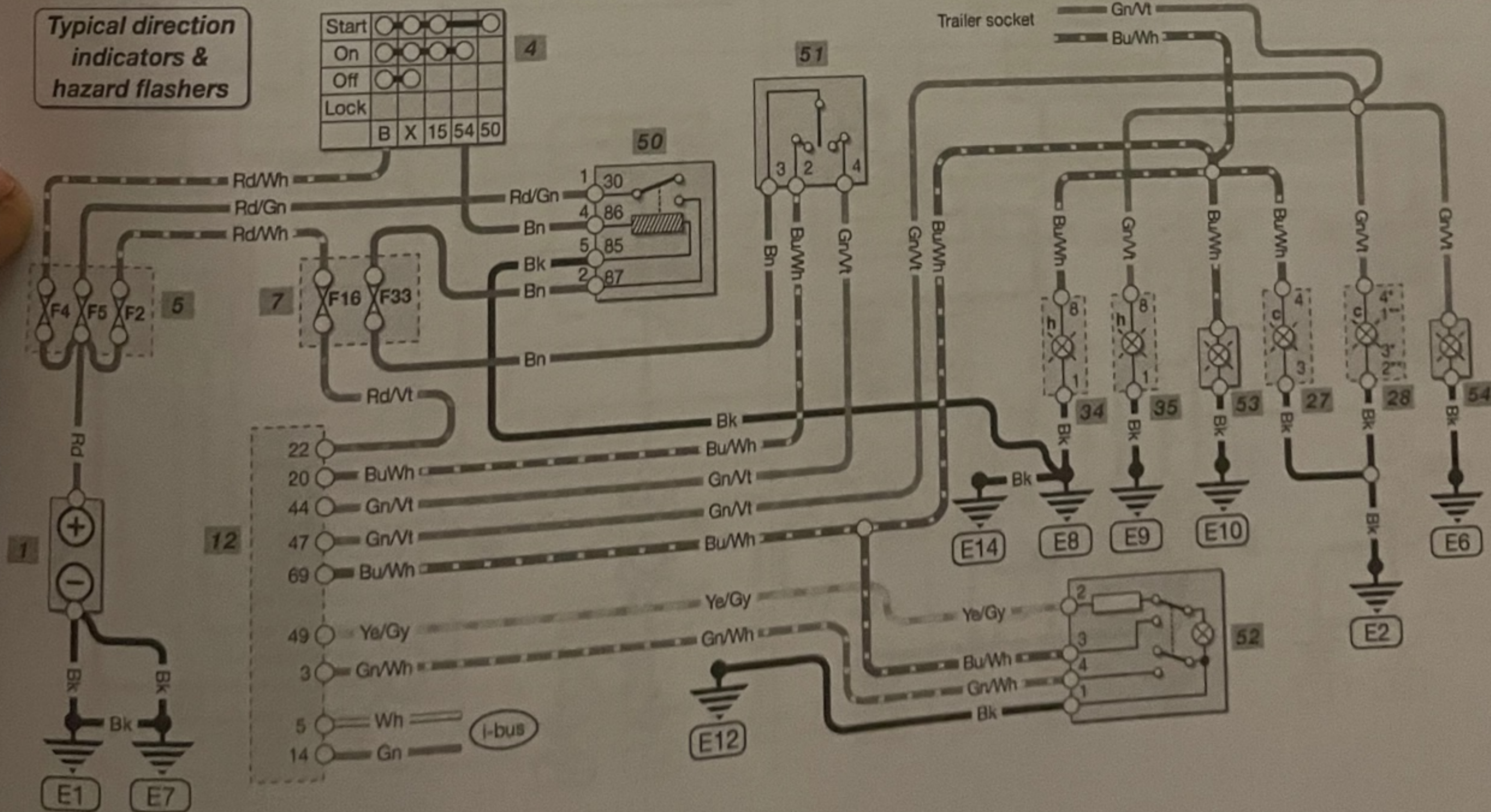
### Typical front foglights



### Typical rear foglights



### Typical direction indicators & hazard flashers





# Wire colours

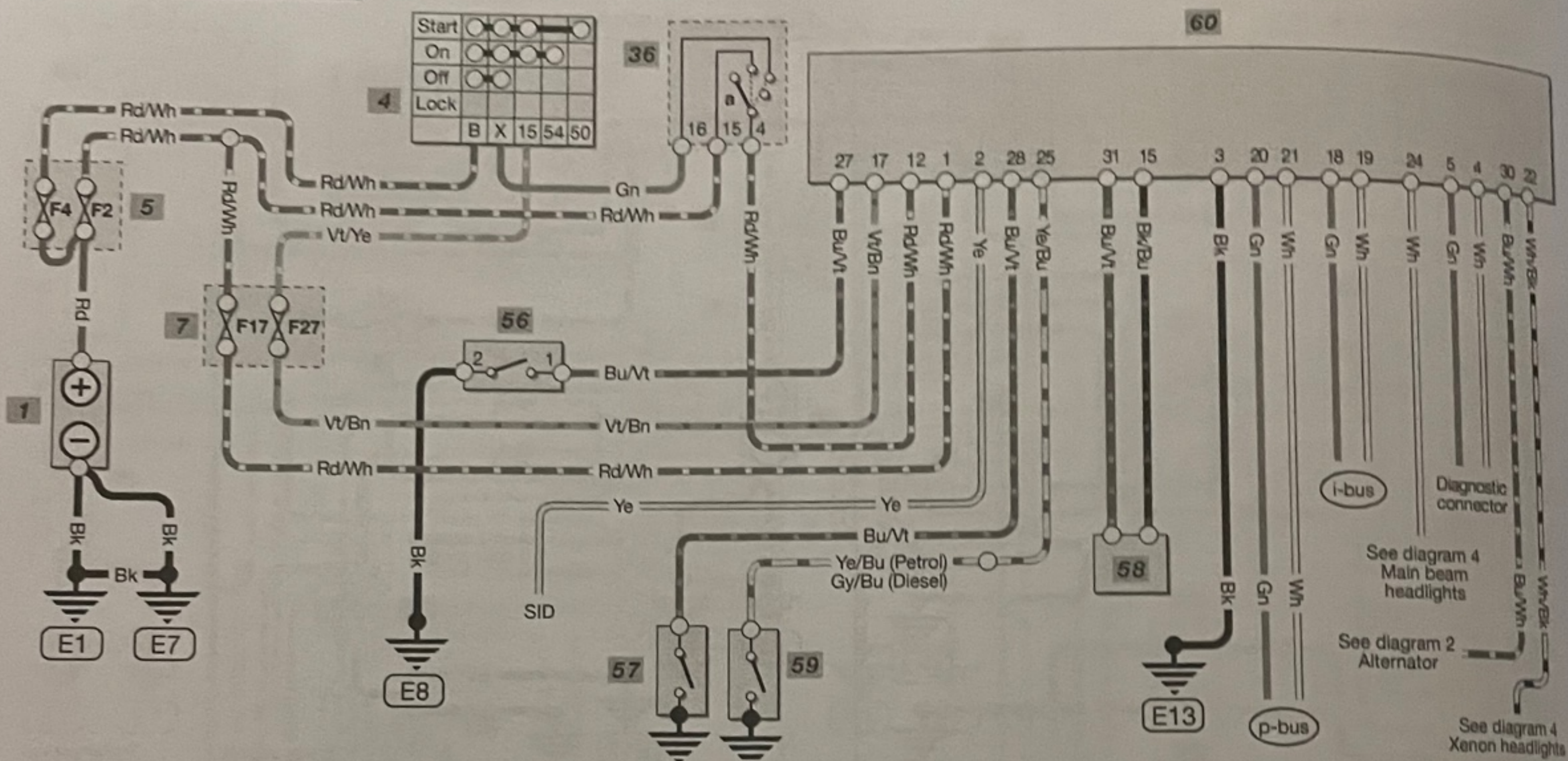
|    |        |    |        |
|----|--------|----|--------|
| Bu | Blue   | Rd | Red    |
| Vt | Violet | Ye | Yellow |
| Og | Orange | Bn | Brown  |
| Pk | Pink   | Wh | White  |
| Gy | Grey   | Bk | Black  |
| Gn | Green  |    |        |

## Key to items

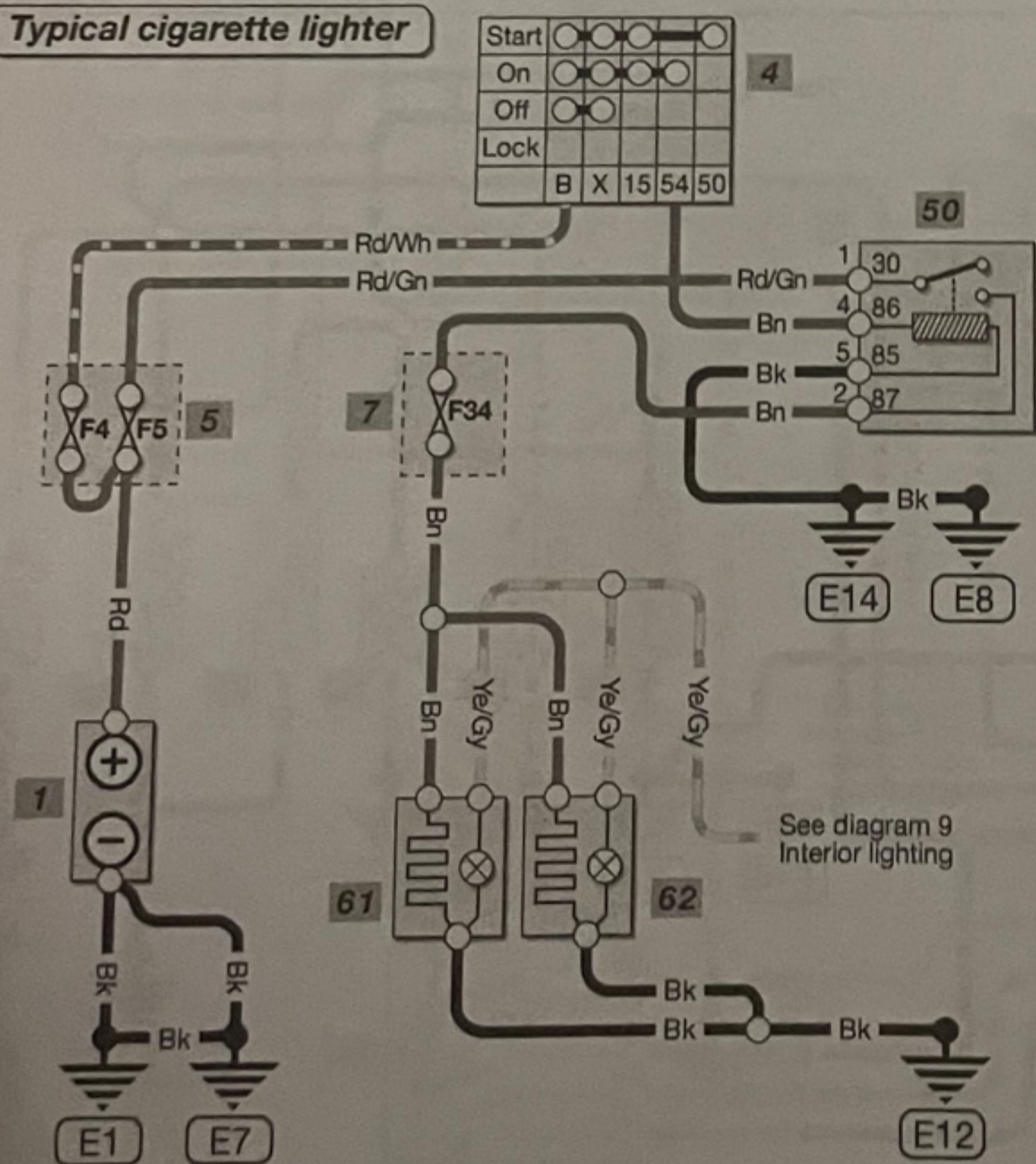
|    |                          |    |                        |
|----|--------------------------|----|------------------------|
| 1  | Battery                  | 58 | Fuel gauge sender unit |
| 4  | Ignition switch          | 59 | Oil pressure switch    |
| 5  | Maxi-fusebox             | 60 | Instrument cluster     |
| 7  | Passenger fusebox        |    |                        |
| 36 | Combined lighting switch |    |                        |
| a  | = light switch           |    |                        |
| 50 | Ignition relay           |    |                        |
| 56 | Low brake fluid switch   |    |                        |
| 57 | Handbrake switch         |    |                        |

Diagram 6

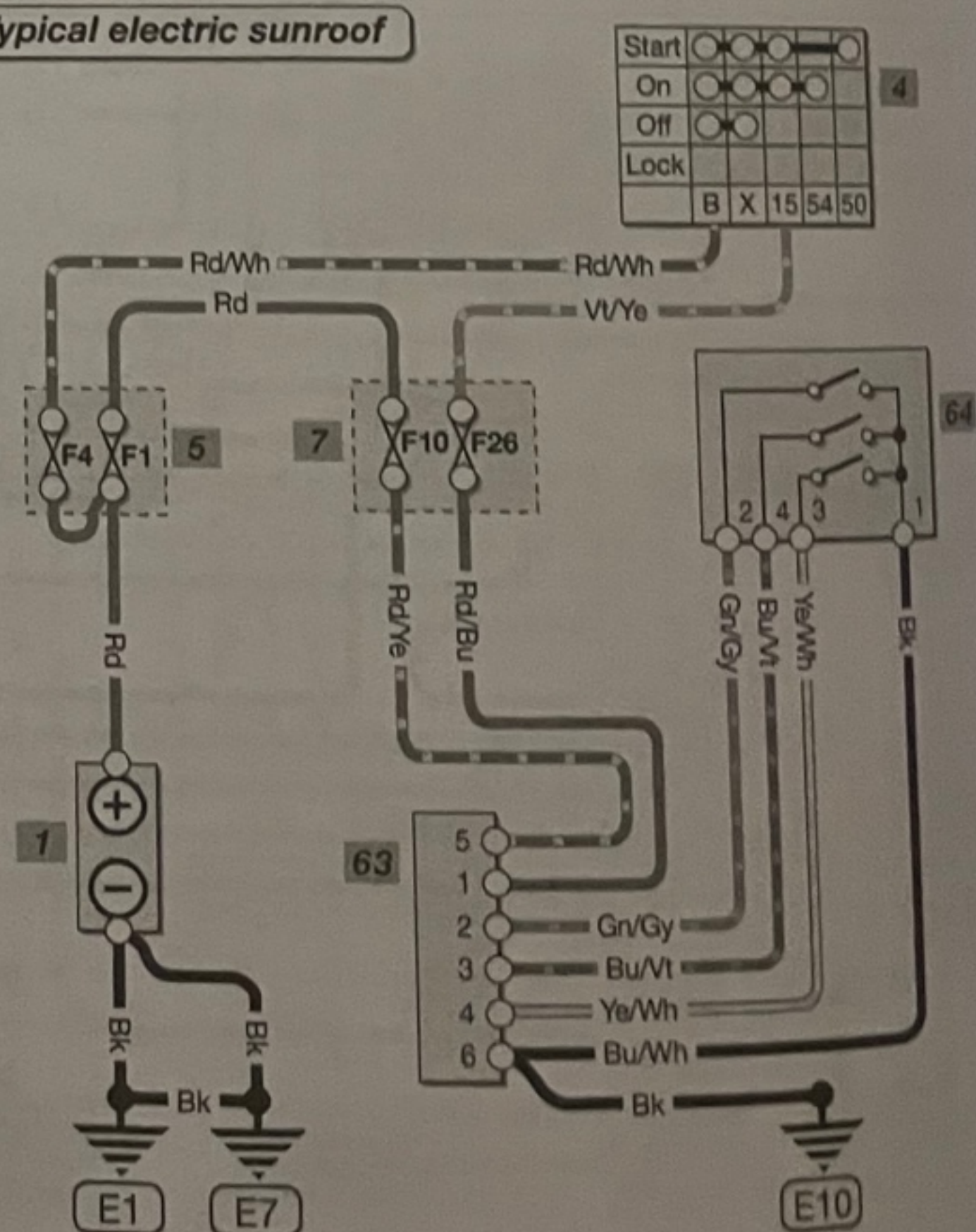
### Typical instrument cluster



### Typical cigarette lighter



### Typical electric sunroof





# Wire colours

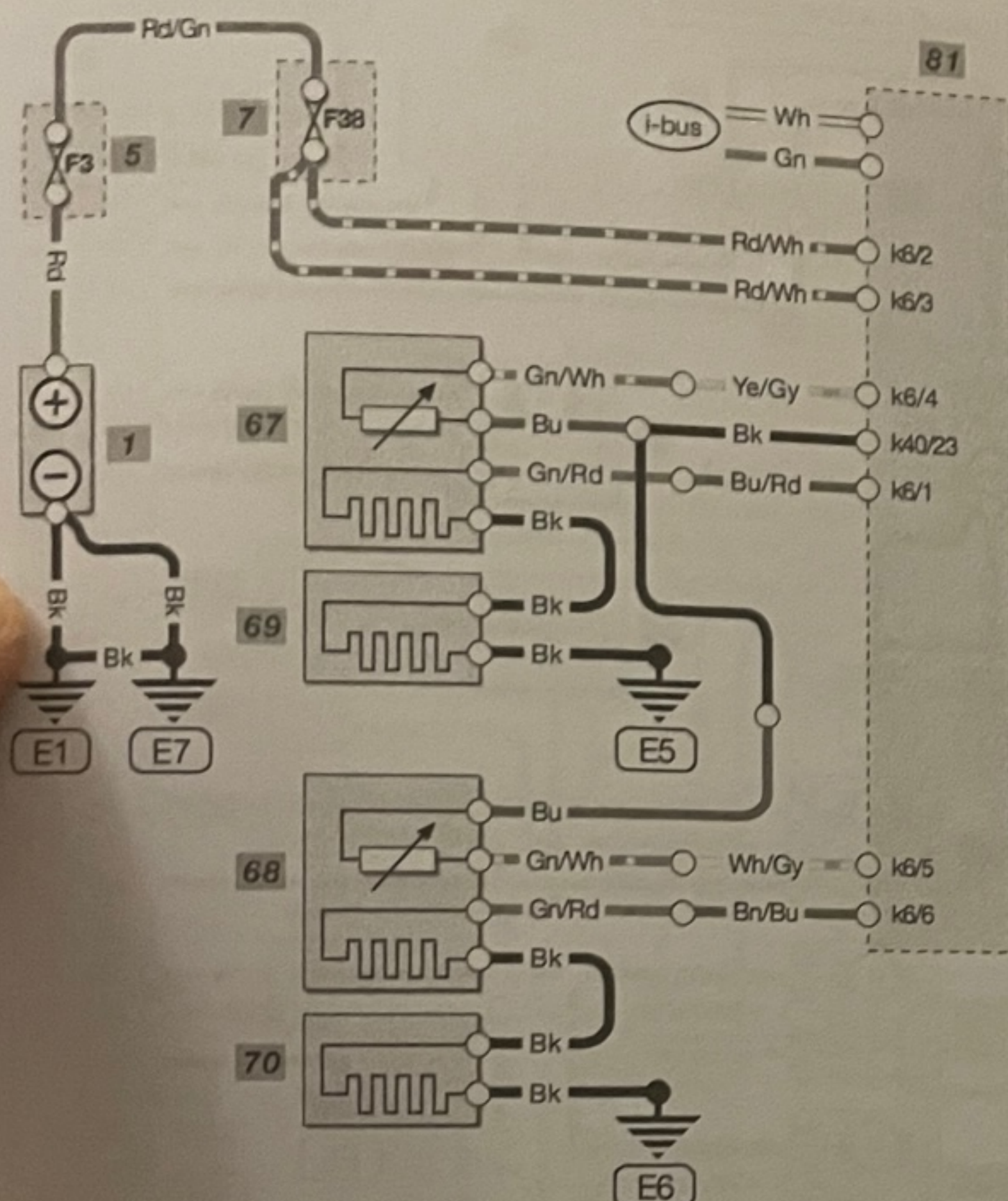
|    |        |    |        |
|----|--------|----|--------|
| Bu | Blue   | Rd | Red    |
| Vt | Violet | Ye | Yellow |
| Og | Orange | Bn | Brown  |
| Pk | Pink   | Wh | White  |
| Gy | Grey   | Bk | Black  |
| Gn | Green  |    |        |

## Key to items

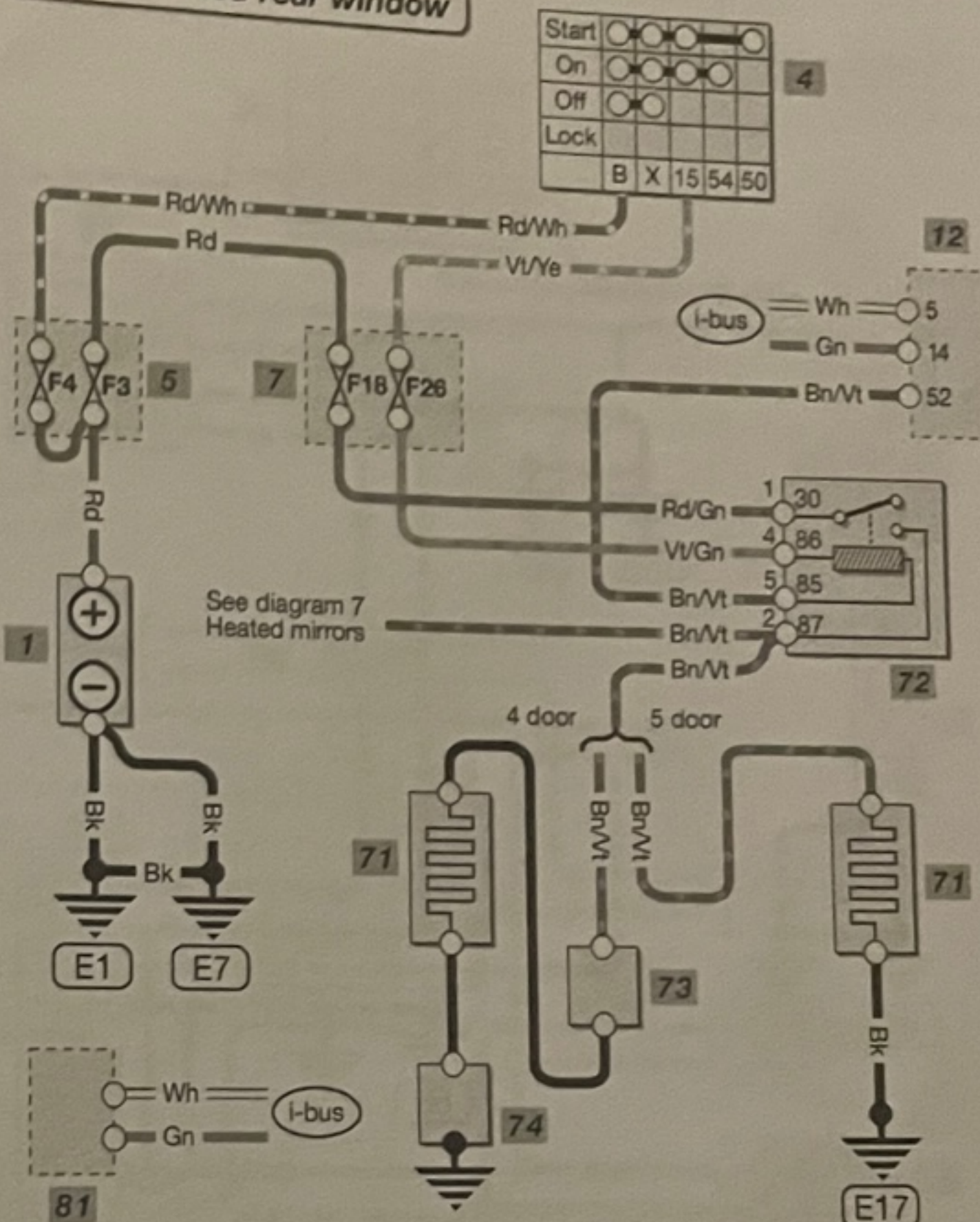
|    |                                |    |                                |
|----|--------------------------------|----|--------------------------------|
| 1  | Battery                        | 67 | LH front heated seat cushion   |
| 4  | Ignition switch                | 68 | RH front heated seat cushion   |
| 5  | Maxi-fusebox                   | 69 | LH heated seat backrest        |
| 7  | Passenger fusebox              | 70 | RH heated seat backrest        |
| 12 | DICE control unit              | 71 | Heated rear window             |
| 38 | Compressor clutch relay        | 72 | Heated rear window relay       |
| 50 | Ignition relay                 | 73 | Antenna module                 |
| 65 | Engine management control unit | 74 | Noise suppressing filter       |
| 66 | Engine management main relay   | 75 | Fuel filler cap release switch |

### Diagram 7

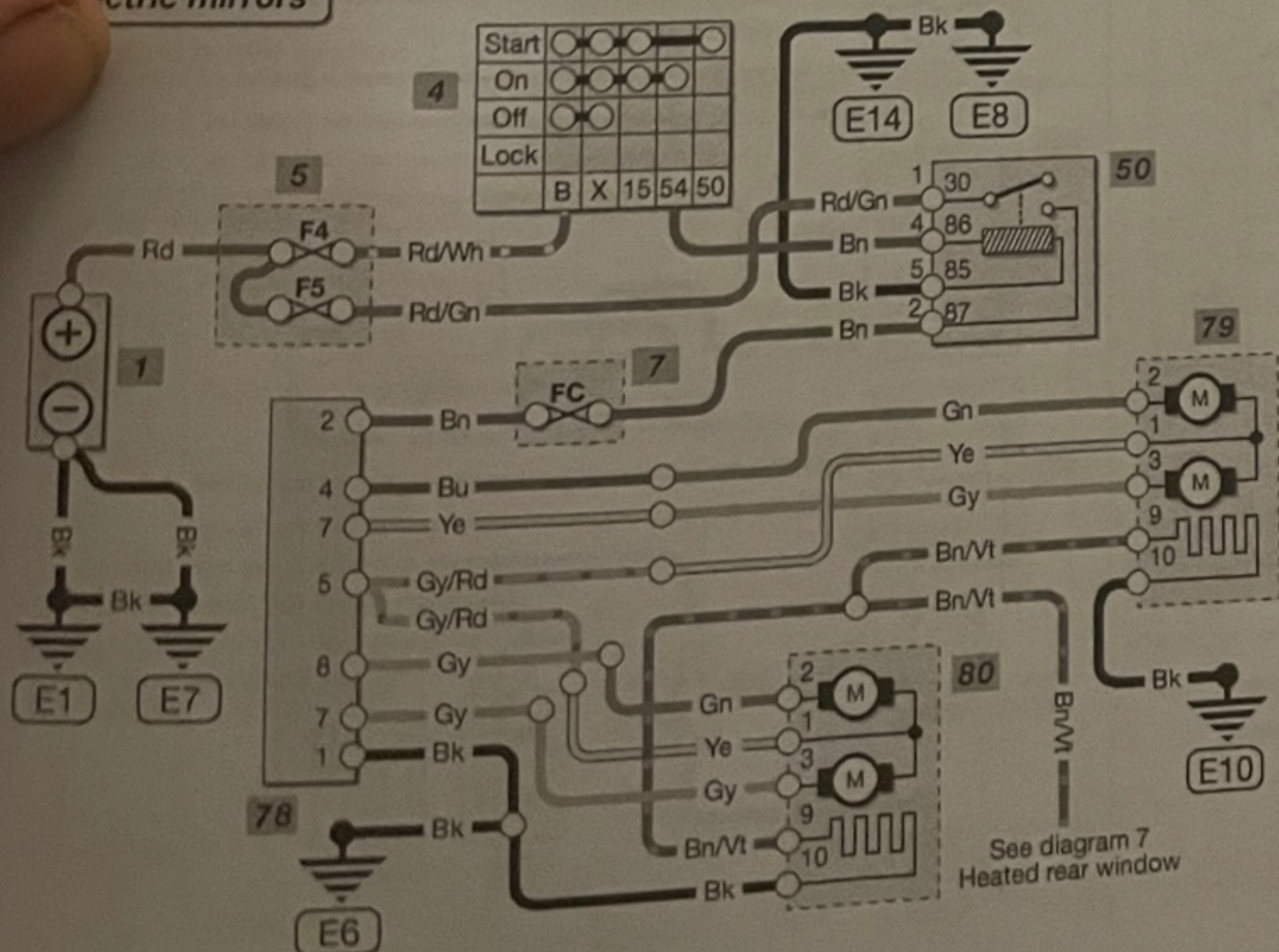
#### Typical heated seats



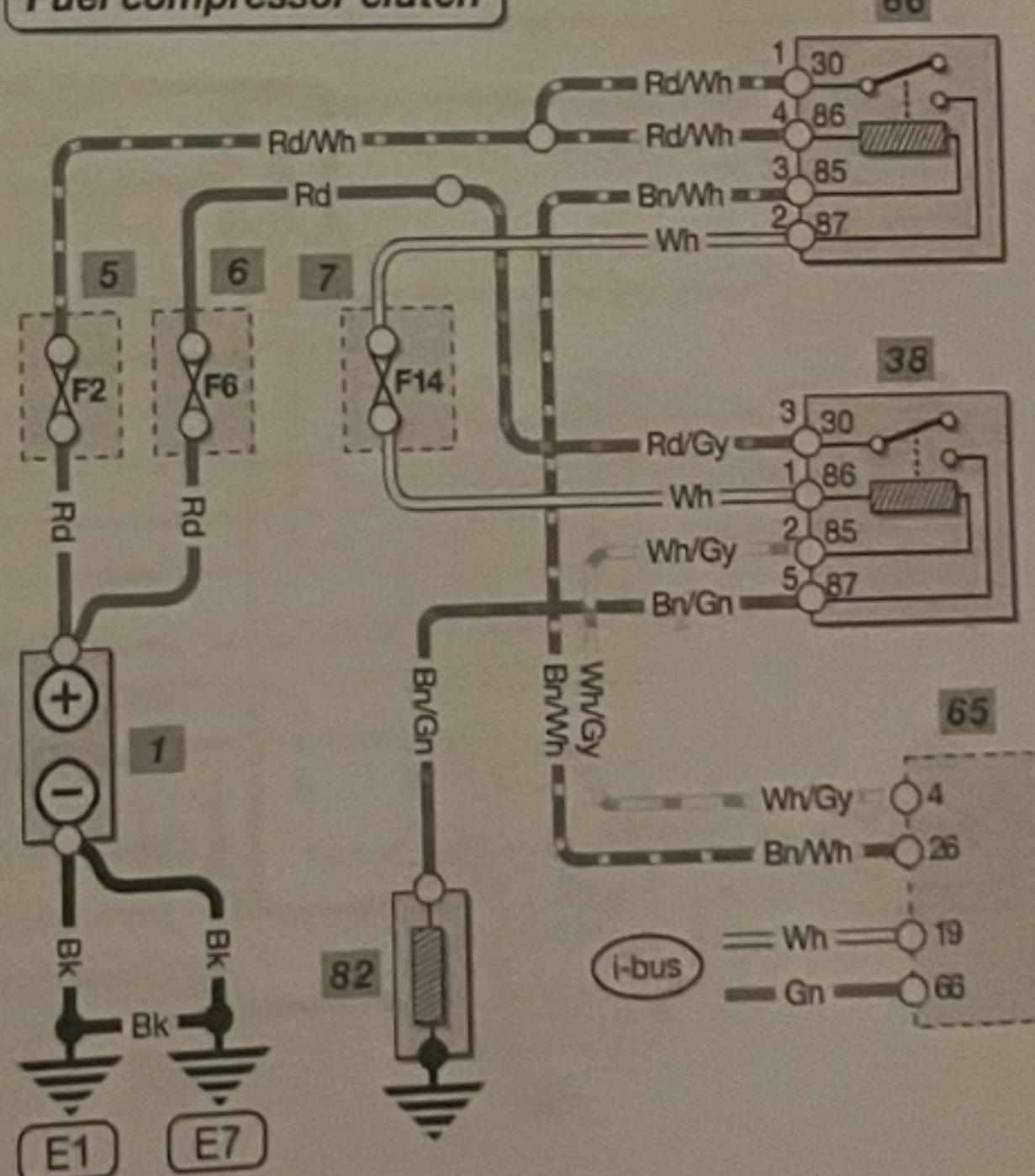
#### Typical heated rear window



#### Electric mirrors



#### Fuel compressor clutch





## Wire colours

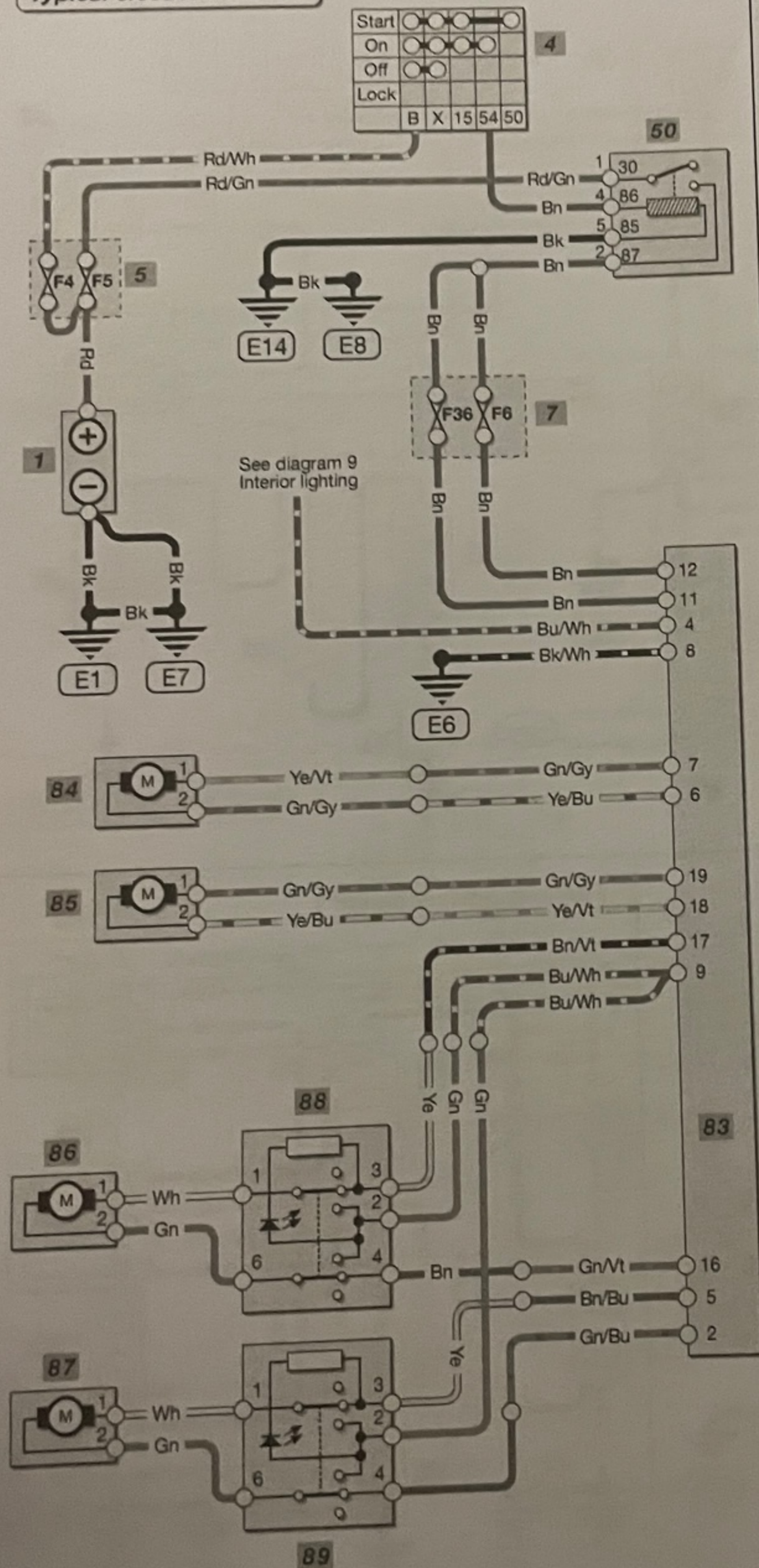
|    |        |    |        |
|----|--------|----|--------|
| Bu | Blue   | Rd | Red    |
| Vt | Violet | Ye | Yellow |
| Og | Orange | Bn | Brown  |
| Pk | Pink   | Wh | White  |
| Gy | Grey   | Bk | Black  |
| Gn | Green  |    |        |

## Key to items

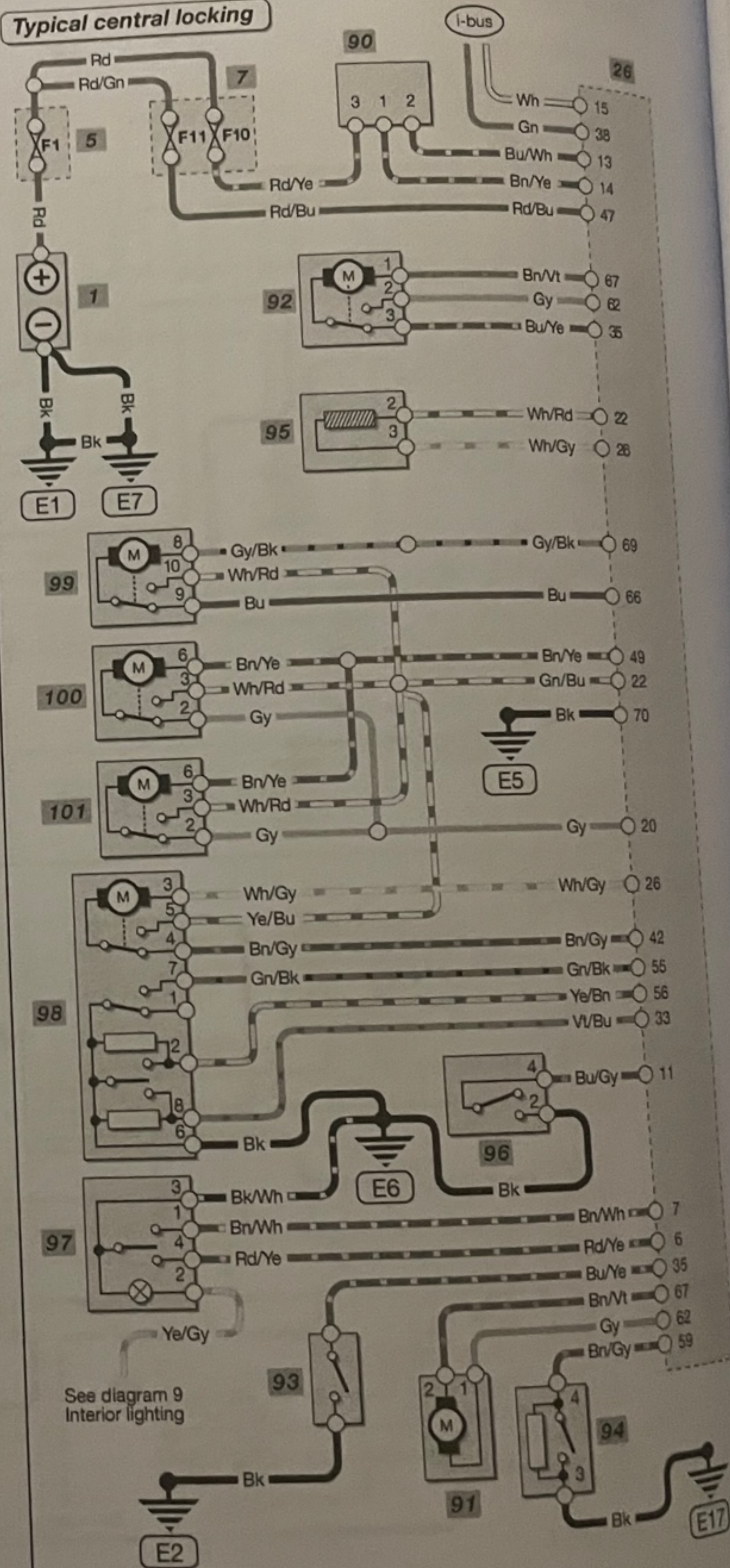
|    |                                     |    |   |     |                                    |
|----|-------------------------------------|----|---|-----|------------------------------------|
| 1  | Battery                             | 86 | LH rear window motor                    | 94  | Tailgate lock microswitch (5 door) |
| 4  | Ignition switch                     | 87 | RH rear window motor                    | 95  | Fuel filler flap solenoid          |
| 5  | Maxi-fusebox                        | 88 | LH rear window switch                   | 96  | Boot/tailgate release switch       |
| 7  | Passenger fusebox                   | 89 | RH rear window switch                   | 97  | Central locking master switch      |
| 26 | TWICE control unit                  | 90 | Central locking remote control receiver | 98  | Driver's lock assembly             |
| 50 | Ignition relay                      | 91 | Boot lock motor (4 door)                | 99  | Passenger's lock assembly          |
| 83 | Electric window switch control unit | 92 | Tailgate lock motor (5 door)            | 100 | LH rear lock motor                 |
| 84 | Driver's window motor               | 93 | Luggage compartment light switch        | 101 | RH rear lock motor                 |
| 85 | Passenger's window motor            |    |   |     |                                    |

## Diagram 8

## Typical electric windows



## Typical central locking



Wire colours

|    |        |
|----|--------|
| Bu | Blue   |
| Vt | Violet |
| Og | Orange |
| Pk | Pink   |
| Gy | Grey   |
| Gn | Green  |

Typical interior lighting



# Wire colours

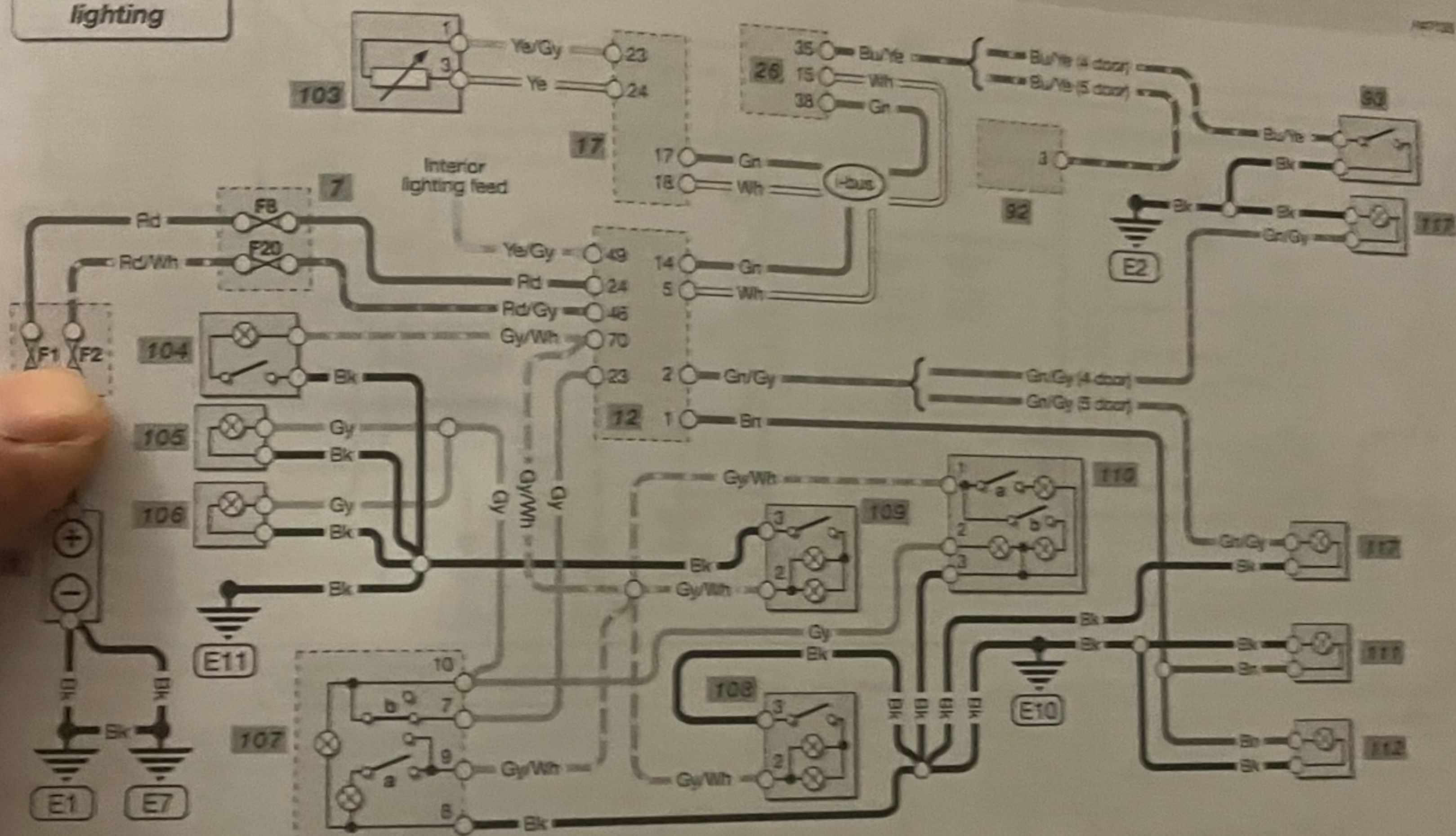
|    |        |    |        |
|----|--------|----|--------|
| Bu | Blue   | Rd | Red    |
| Vt | Violet | Ye | Yellow |
| Og | Orange | Bn | Brown  |
| Pk | Pink   | Wh | White  |
| Gy | Grey   | Bk | Black  |
| Gn | Green  |    |        |

## Key to items

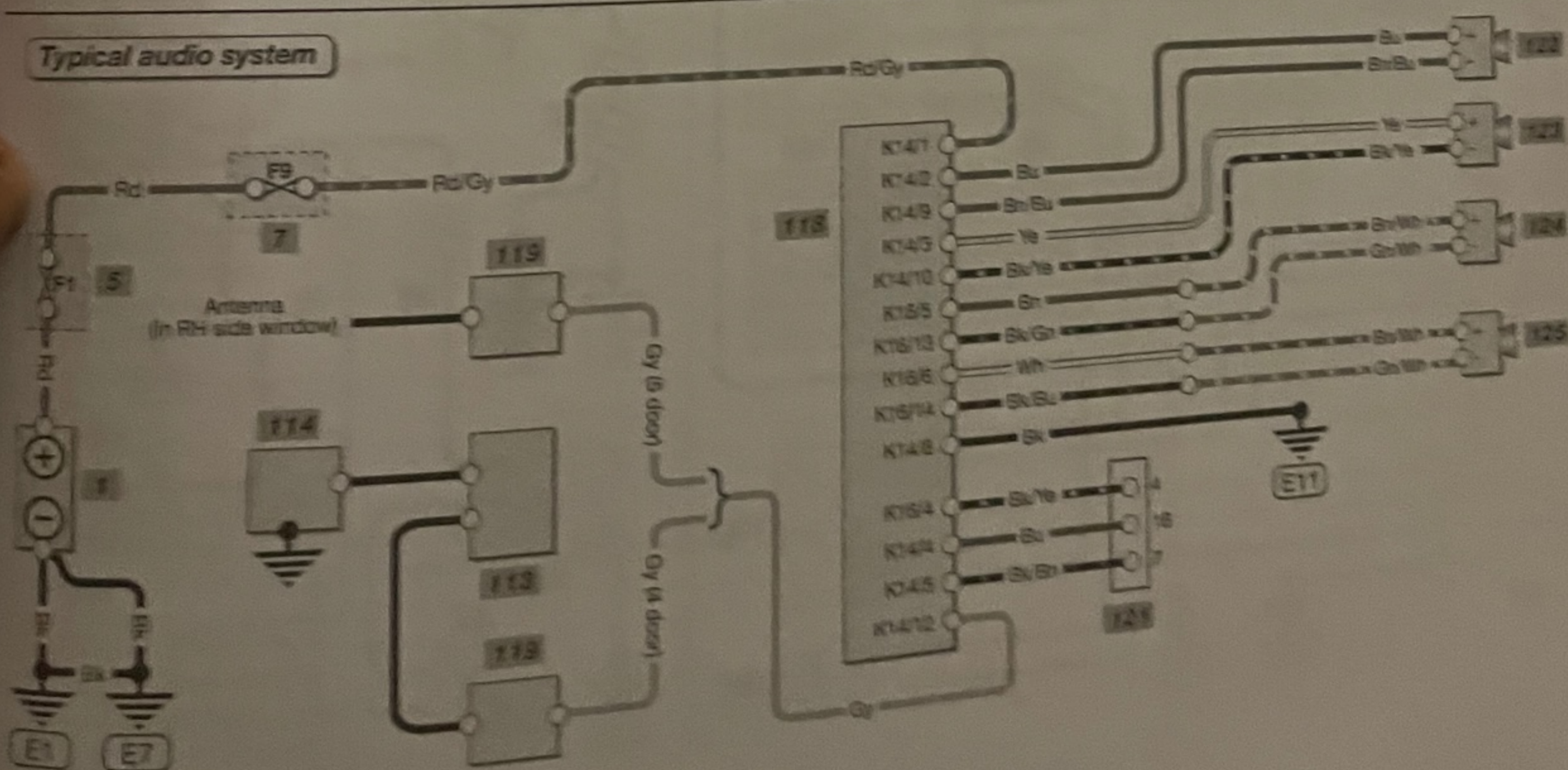
- 1 Battery
- 4 Ignition switch
- 5 Maxi-fusebox
- 7 Passenger fusebox
- 12 DICE control unit
- 17 SID control unit
- 26 TWICE control unit
- 92 Tailgate lock motor (5 door)
- 93 Luggage compartment light switch
- 103 Interior lighting rheostat
- 104 Glove box light & switch
- 105 LH footwell illumination
- 106 RH footwell illumination
- 107 Front roof light
- a = map reading
- b = interior light switch
- 108 LH vanity mirror
- 109 RH vanity mirror
- 110 Centre roof light
- a = reading light
- b = interior light switch
- 111 Driver's door courtesy light
- 112 Passenger's door courtesy light
- 113 Antenna (in rear window)
- 114 Filter
- 117 Luggage compartment light
- 118 Audio unit
- 119 Antenna amplifier
- 121 Connection to mobile phone
- 122 LH dash speaker
- 123 RH dash speaker
- 124 LH rear door speaker
- 125 RH rear door speaker

Diagram 9

### Typical interior lighting



### Typical audio system





Wire colours

|    |        |    |        |
|----|--------|----|--------|
| Bu | Blue   | Rd | Red    |
| Vt | Violet | Ye | Yellow |
| Og | Orange | Bn | Brown  |
| Pk | Pink   | Wh | White  |
| Gy | Grey   | Bk | Black  |
| Gn | Green  |    |        |

Key to items

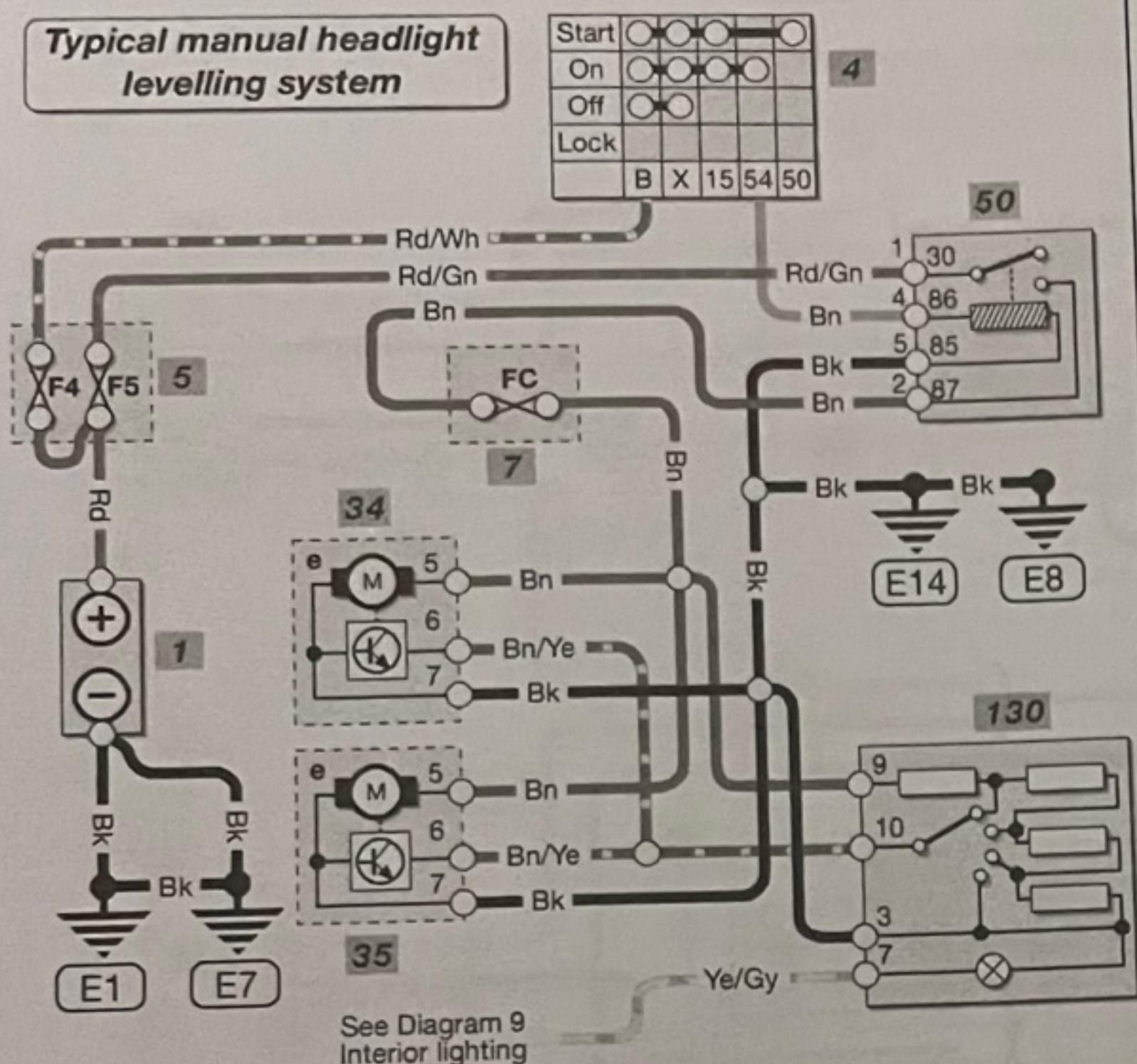
|    |                     |
|----|---------------------|
| 1  | Battery             |
| 4  | Ignition switch     |
| 5  | Maxi-fusebox        |
| 6  | Engine fusebox      |
| 7  | Passenger fusebox   |
| 12 | DICE control unit   |
| 50 | Ignition relay      |
| 34 | LH headlight unit   |
|    | e = levelling motor |

|     |                             |
|-----|-----------------------------|
| 35  | RH headlight unit           |
|     | e = levelling motor         |
| 130 | Headlight adjustment switch |
| 131 | Front wiper motor           |
| 132 | Front washer pump           |
| 133 | Front wash/wipe switch      |
|     | a = washer switch           |
|     | b = wiper switch            |
|     | c = wiper delay             |

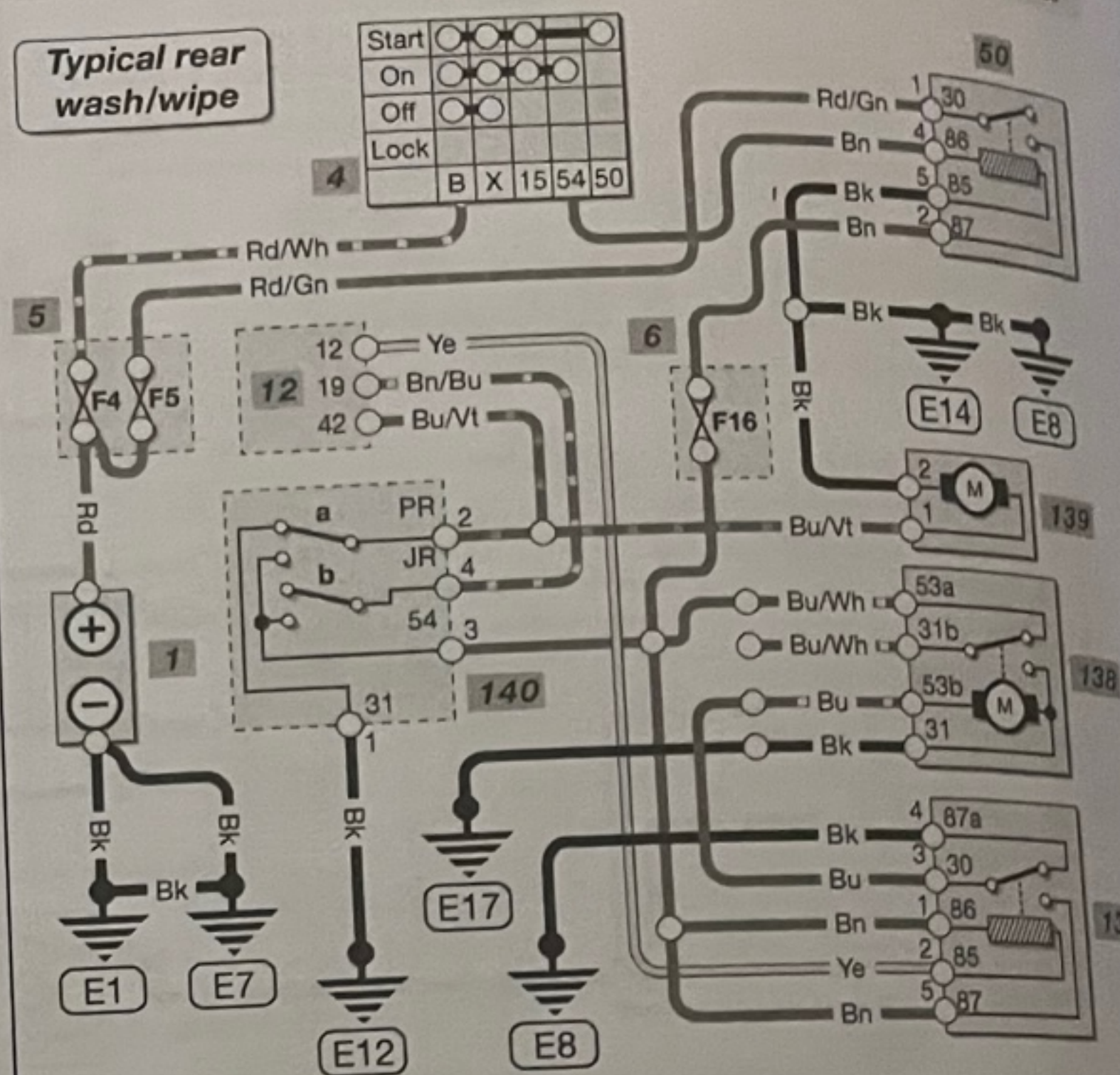
|     |                        |
|-----|------------------------|
| 134 | Front wiper relay      |
| 135 | Headlight washer relay |
| 136 | Headlight washer pump  |
| 137 | Rear wiper relay       |
| 138 | Rear wiper motor       |
| 139 | Rear washer pump       |
| 140 | Rear wash/wipe switch  |
|     | a = washer switch      |
|     | b = wiper switch       |

Diagram 10

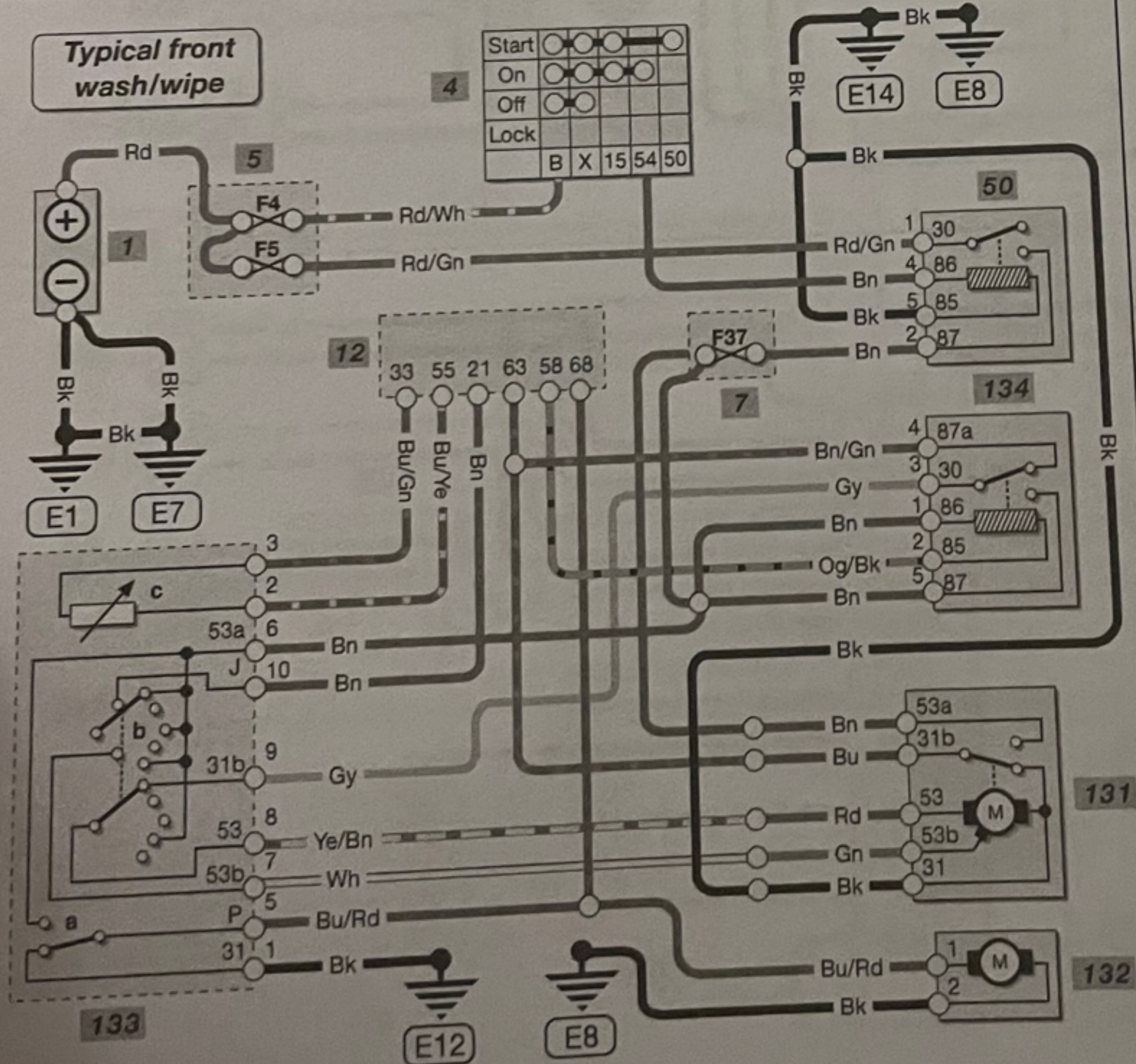
Typical manual headlight levelling system



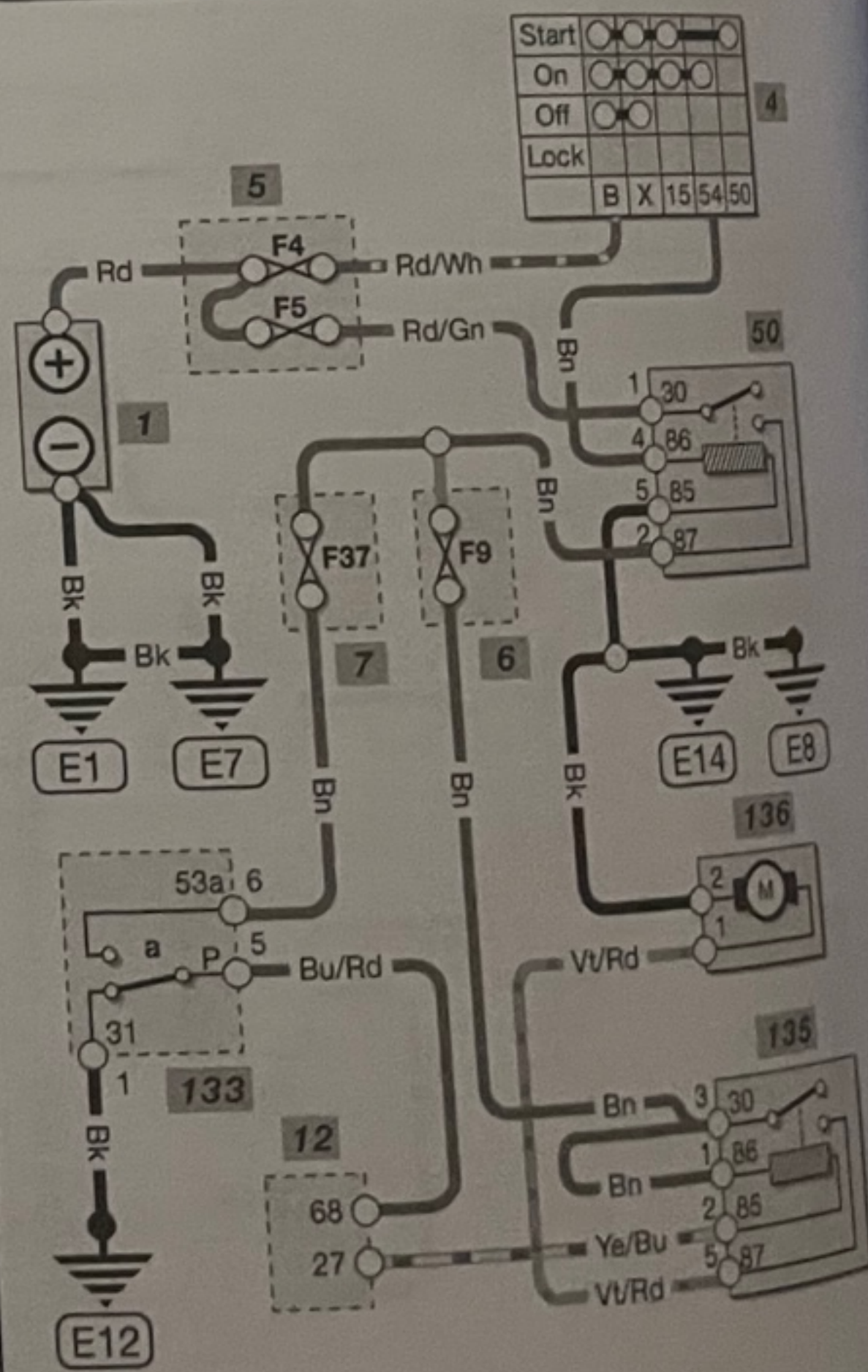
Typical rear wash/wipe



Typical front wash/wipe



Typical headlight washer



Dimensions and  
Fuel economy  
Conversion factors  
Buying spares  
Vehicle identification  
General repairs  
Jacking and

Dimensions

Note: All figures

Dimensions

Overall length  
Saloon...  
Estate...  
Overall width  
Saloon...  
Estate...  
Wheelbase  
Track width  
Front...  
Rear...  
Ground clearance  
Turning circle  
Wall to wall  
Kerb to kerb  
Luggage capacity  
Saloon...  
Rear...  
Rear...  
Estate...  
Rear...  
Rear...

Weights

Gross vehicle weight  
Saloon...  
Estate...  
Kerb weight  
Saloon...  
Estate...  
Maximum laden weight  
Saloon...  
Rear...  
Rear...  
Estate...  
Rear...  
Rear...  
Maximum laden weight  
Saloon...  
Estate...  
Maximum laden weight  
Saloon...  
Estate...  
Maximum laden weight  
Saloon...  
Estate...  
Maximum laden weight  
Saloon...  
Estate...



|                                   |       |   |        |
|-----------------------------------|-------|---|--------|
| Dimensions and weights .....      | REF•1 | Disconnecting the battery .....                           | REF•9  |
| Fuel economy .....                | REF•2 | Radio/cassette unit anti-theft system – precautions ..... | REF•9  |
| Conversion factors .....          | REF•6 | Tools and working facilities .....                        | REF•10 |
| Buying spare parts .....          | REF•7 | MOT test checks .....                                     | REF•12 |
| Vehicle identification .....      | REF•7 | Fault finding .....                                       | REF•16 |
| General repair procedures .....   | REF•8 | Index .....   | REF•24 |
| Jacking and vehicle support ..... | REF•9 |   |        |

## Dimensions and weights

**Note:** All figures are approximate, and vary according to model. Refer to manufacturer's data for exact figures.

### Dimensions

|  |         |
|--|---------|
| Overall length (including bumpers):          |         |
| Saloon .....                                 | 4836 mm |
| Estate .....                                 | 4841 mm |
| Overall width (including wing mirrors) ..... | 2042 mm |
| Overall height:                              |         |
| Saloon .....                                 | 1454 mm |
| Estate .....                                 | 1465 mm |
| Wheelbase .....                              | 2703 mm |
| Track width (depending on wheel size):       |         |
| Front .....                                  | 1522 mm |
| Rear .....                                   | 1528 mm |
| Ground clearance (typical) .....             | 116 mm  |
| Turning circle diameter:                     |         |
| Wall to wall .....                           | 11.9 m  |
| Kerb to kerb .....                           | 11.3 m  |
| Luggage compartment length:                  |         |
| Saloon:                                      |         |
| Rear seat upright .....                      | 1092 mm |
| Rear seat folded down .....                  | 1714 mm |
| Estate:                                      |         |
| Rear seat upright .....                      | 1087 mm |
| Rear seat folded down .....                  | 1732 mm |

### Weights

|   |                 |
|---|-----------------|
| Gross Vehicle Weight (GVW):                           | 2070 to 2150 kg |
| Saloon .....  | 2140 to 2220 kg |
| Estate .....  |                 |
| Kerb weight:  | 1525 to 1700 kg |
| Saloon .....  | 1590 to 1775 kg |
| Estate .....  |                 |
| Maximum axle load:                                    |                 |
| Saloon:   | 1175 kg         |
| Front axle .....                                      | 1050 kg         |
| Rear axle .....                                       |                 |
| Estate:   | 1175 kg         |
| Front axle .....                                      | 1125 kg         |
| Rear axle .....                                       | 100 kg          |
| Maximum roof rack load .....                          | 80 kg           |
| Maximum luggage compartment load .....                |                 |
| Maximum roof and luggage compartment weight combined: | 120 kg          |
| Saloon .....  | 120 kg          |
| Estate .....  |                 |
| Maximum towing weight:                                | 750 kg          |
| Un-braked trailer .....                               | 1800 kg         |
| Braked trailer .....                                  | 50 to 75 kg     |
| Maximum load on ball hitch .....                      |                 |