



SERVICE MANUAL

VOLVO 164 1971

OTHER ELECTRICAL STANDARD EQUIPMENT DESCRIPTION

DIRECTIONAL INDICATOR SYSTEM

The directional indicator system consists of a thermal-type flasher relay, directional indicator switch, flash lamps on the front bumper and bulbs in the rear lights.

The directional indicators can also be used as simultaneous warning hazard signal flasher lights, when the special switch for this function on the instrument panel is switched on.

The flasher relay is mounted on the switch for the warning hazard signal flashers (see Fig. 3-73). The directional indicator lever switch, see Fig. 3-74, which has automatic parking, is placed under the plastic cover on the steering column.

IGNITION SWITCH

The ignition switch is integrally built with the steering wheel lock. The switch has four positions:

0. Complete electrical system disconnected and steering wheel locked.
1. Current to fusebox (Garage position).
2. Same as position 1 but also current to ignition coil (Driving position).
3. Same as position 2 but also current to starter motor solenoid (Starting position).

When the ignition key is released in position 3, it returns automatically to position 2.

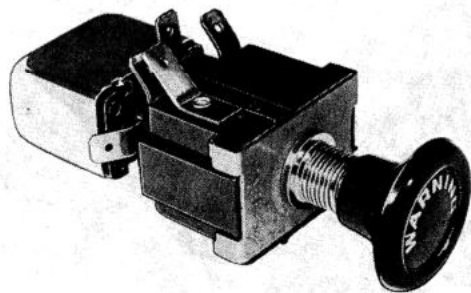


Fig. 3-73. Switch with flasher relay

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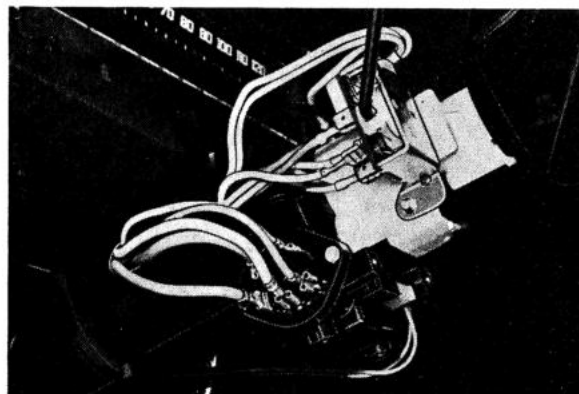


Fig. 3-74. Directional indicator lever switch and ignition switch

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Vehicles intended for U.S.A. are fitted with a special steering wheel lock with a warning device which buzzes when the one of the front doors is opened and the ignition key is left in the ignition switch, in other words, if the steering wheel is not locked.

The buzzer is placed under the dashboard on the left-hand side and is connected between the fusebox (via the ignition) and the door switch on the driver's side.

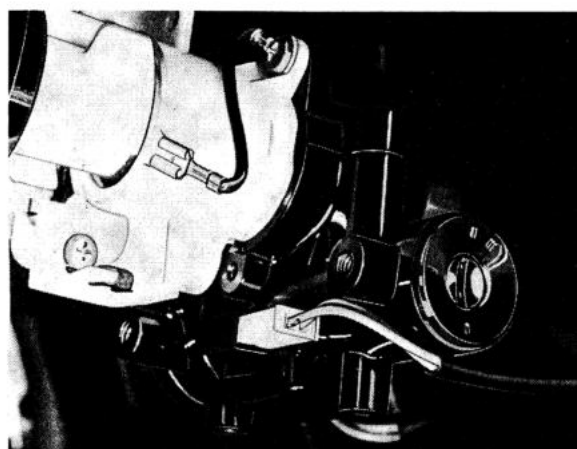


Fig. 3-75. Ignition switch with connection for warning buzzer

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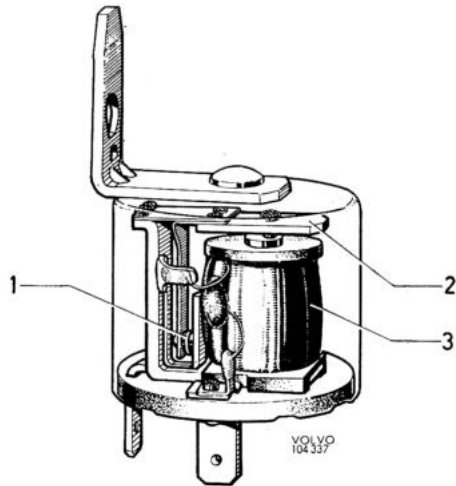


Fig. 3-76. Buzzer

1. Contacts 2. Armature 3. Coil

The buzzer consists of a pair of contacts and a coil. When current passes across the contacts and through the coil, the armature is drawn down towards the core of the coil. While the armature is being drawn down towards the core, the contacts cut out the current and the armature springs back, etc. This cycle is repeated continuously as long as current is switched on, that is, as long as the driver's door is open and the ignition key is in the ignition.

HORN

The horn is mounted on the support irons for the front bumper.

One of the horns has a low frequency and the other a high frequency.

The horns can be engaged via a control relay by the horn ring mounted inside the steering wheel.

WINDSHIELD WIPERS

The windshield wipers are driven by an electric motor. The motor is connected to the wiper blades by means of link arms. The motor, which has a permanently magnetized field, has two speeds which are selected by means of the switch mounted on the dashboard. The motor is fitted with 3 brushes, one negative brush and two positive brushes. The positive brushes are connected up one at a time for full and half speed respectively. The gear housing for the wiper unit contains an integrally built parking switch. The

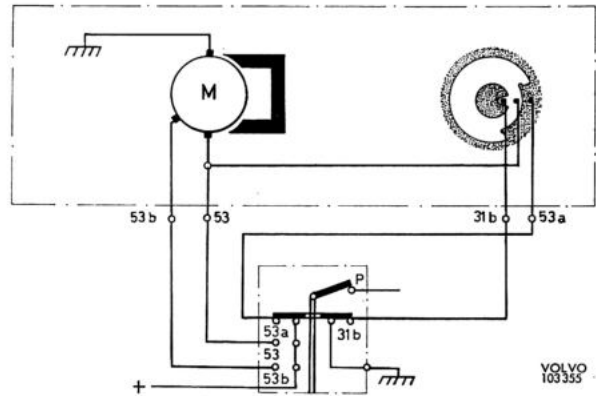


Fig. 3-77. Wiring diagram for windshield wiper motor

purpose of this switch is to return the blades to a suitable, previously determined, parking position irrespective of where the blades are when shut off. See Fig. 3-77.

WINDSHIELD WASHER

The windshield washer, which is placed on the left-hand wheel arch, is driven by an electric motor. The pump located at the bottom of the water container is connected to the motor by means of a shaft. The pump is of the centrifugal type.

Turning the windshield washer switch mounted on the dashboard engages the windshield washer.

SWITCHES

All switches are of the pull-push type. The switches for lighting, ventilation and rear window defroster have three positions. The switch for the windshield wiper has also three positions but the washer is also engaged by turning the knob on this switch. The switch for the warning signal flashers and foglights have two positions.

INTERIOR LIGHTING

The interior lighting consists of a lamp located in the middle of the roof. The lamp is switched on by means of a switch built into the light. The switch has three positions. In its first position, the light is switched off completely, in the second position the light is on when any of the front doors is opened, and in the third position the light is on continuously.

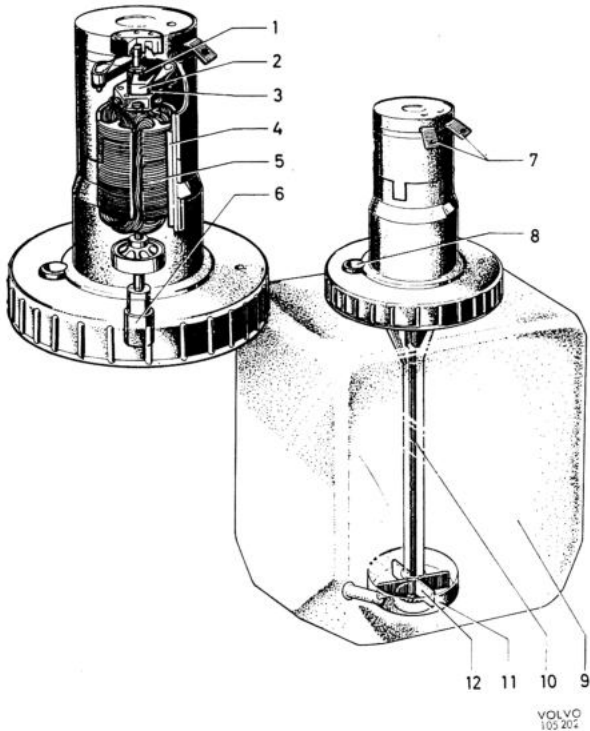


Fig. 3-78. Windshield washer

- | | |
|---------------------|--------------------------|
| 1. Commutator | 7. Connecting lip |
| 2. Brush | 8. Wiper fluid hose hole |
| 3. Spring | 9. Container |
| 4. Permanent magnet | 10. Shaft |
| 5. Rotor | 11. Pump housing |
| 6. Flange | 12. Pump impeller |

CONTROL RELAYS

As standard the car is fitted with five control relays. Four of them are mounted on a holder situated on the left-hand wheel arch, see Fig. 3-79. One of these relays is a control relay for the horn, another is a control relay for the reversing light, while a third is a step relay for fullbeam and dipped headlights and a fourth is a control relay for the fog lights. The fifth relay, for the electrically heated rear window, is placed under the dashboard, to the right of the car heater, see Fig. 3-80. The relay cuts out current to the rear window, when the ignition is shut off, this in order to prevent the battery from being discharged when the engine is switched off.

Vehicles with automatic transmission are fitted with a start relay instead of a control relay for the back-up lights.

LUGGAGE/ENGINE COMPARTMENT LIGHTING

The vehicle is equipped with luggage and engine compartment lighting which automatically switches on when the luggage compartment lid or the engine bonnet is opened. In a later type the automatic switches for the lights have been provided with a stop to permit also manual switching on and off.

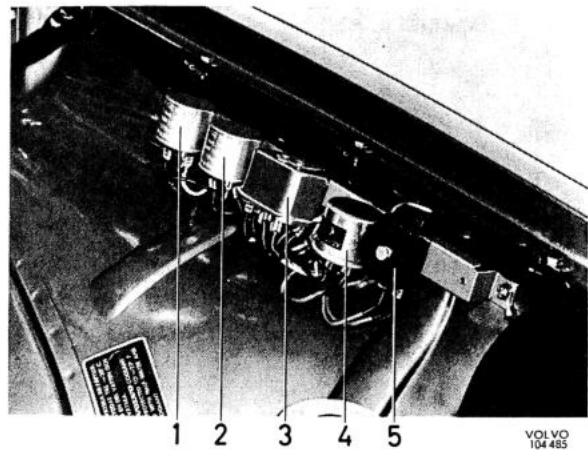


Fig. 3-79. Control relays

1. Reversing light relay (or start relay for vehicles with automatic transmission)
2. Horn relay
3. Step relay for dipped/fullbeam switching
4. Foglight relay
5. Fusebox for foglights

FUSES

The fuses are mounted in a fusebox secured to a bracket fitted on the car heater behind an opening in the protection panel under the dashboard.

The fuses for the fog lights are mounted in a fusebox on a holder situated on the left-hand wheel arch, see Fig. 3-79.

BRAKE LIGHT SWITCH

The brake light switch is placed on the pedal carrier beneath the dashboard. It is operated mechanically by the brake pedal.

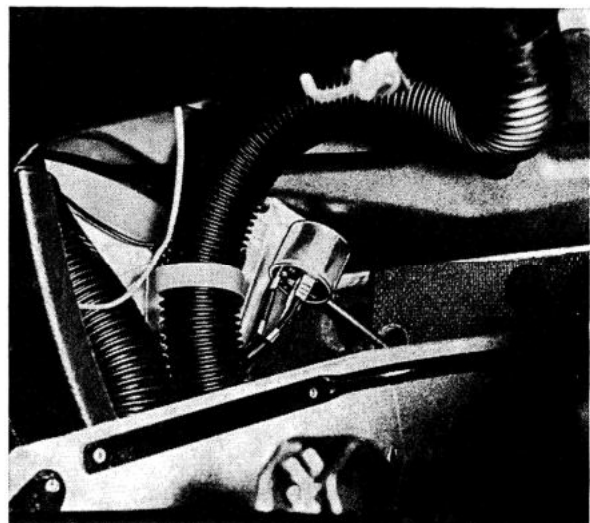
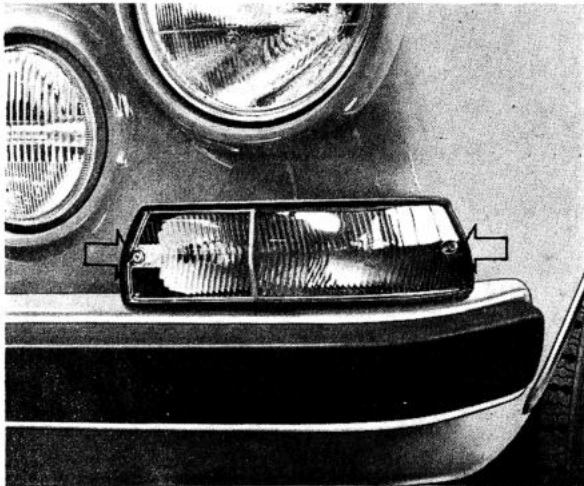


Fig. 3-80. Control relay for rear window defroster

REPAIR INSTRUCTIONS



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Fig. 3-81. Screws holding the glass for directional flashers

REPLACING THE DIRECTIONAL INDICATOR LEVER SWITCH

Remove the screws holding the plastic covers (one screw for the upper cover, three screws for the lower cover) and remove the covers. Remove the screws holding the switch. (If the vehicle is fitted with an overdrive, the bracket holding the switch for the overdrive must first be removed.) Replace the switch and secure the new one firmly. Fit the plastic covers.

REPLACING THE IGNITION SWITCH

Remove the plastic covers round the ignition switch. Remove the ignition switch from the steering wheel lock by taking off the two screws holding the ignition switch to the steering wheel lock. Replace the ignition switch and fit the new one on the steering wheel lock. Re-fit the plastic covers.

REMOVING AND ADJUSTING THE HORN RING

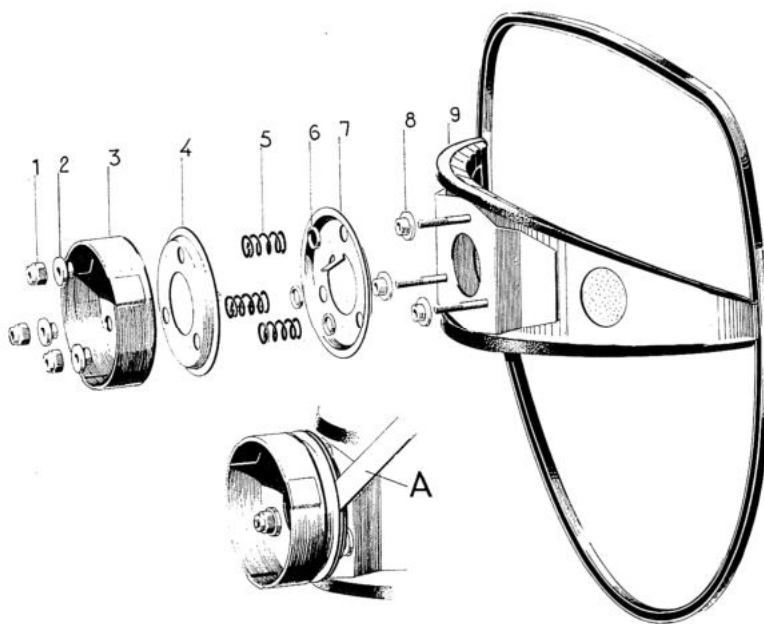
To remove the horn ring unscrew the two screws underneath the steering wheel. Then turn the ring about 30° and pull it upwards. The electric cable is then accessible and can be removed.

The distance A, Fig. 3-82, should be .4—.6 mm (.016—.024") if the horn ring is to function satisfactorily. The distance is adjusted by means of the three self-locking nuts (1, Fig. 3-82).

WINDSHIELD WIPERS

REMOVING THE WINDSHIELD WIPER UNIT, COMPLETE

Disconnect the negative (ground) battery lead from the battery. Remove the wiper arms. Take off the



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Fig. 3-82. Horn ring

1. Nut
2. Bush
3. Retainer
4. Plate
5. Spring
6. Washer
7. Contact plate
8. Bush
9. Horn ring

panel under the dashboard. Remove the heater switch. Take off the combined instrument. See Group 38. Remove the intermediate defroster nozzle and its hoses. Remove the wiper motor. Disconnect the control cables for the heater. Remove the fusebox and disconnect the ground cables. Remove the choke control. Release the attaching screws for the wiper frame and carefully pull out the frame.

DISMANTLING THE WINDSHIELD WIPER MOTOR

Remove the nut on the outgoing shaft and tap loose the crank arm.

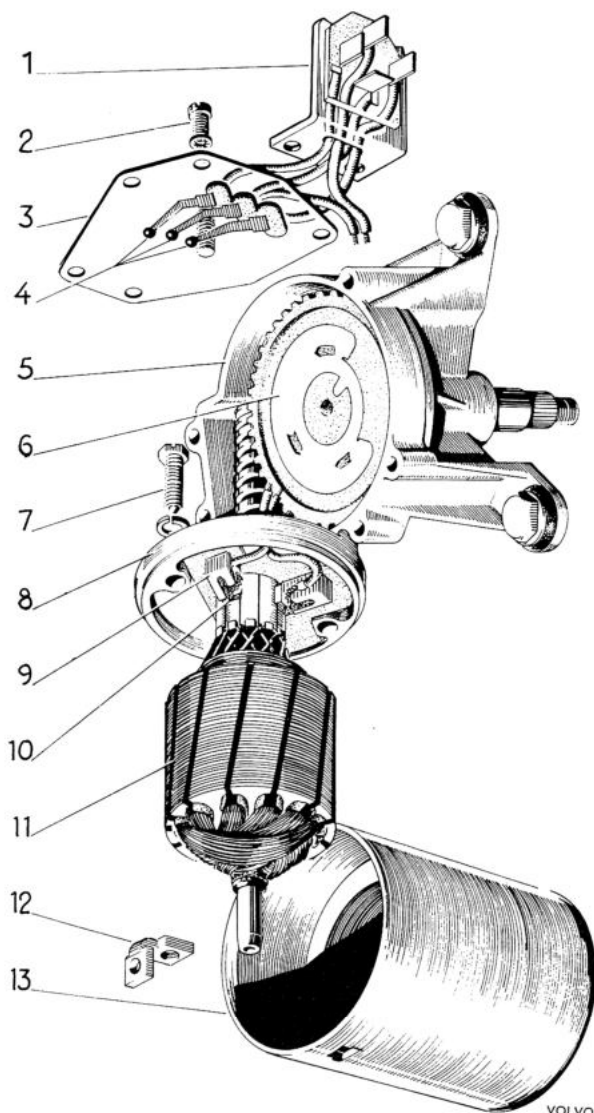


Fig. 3-83. Windshield wiper motor

- | | |
|---------------------|-----------------|
| 1. Terminal contact | 8. End |
| 2. Screw | 9. Brush holder |
| 3. Cover | 10. Brush |
| 4. Contacts | 11. Rotor |
| 5. Housing | 12. Nut |
| 6. Gear | 13. Stator |
| 7. Screw | |

Release the five screws (2, Fig. 3-83) and bend the cover (3) out of the way, then press out the plastic gear wheel. Remove the screws (7) and pull out the stator. Remove the screws for the negative brush and the washer on the ball bearing axial lock. Remove the washer for the axial lock. Move the brushes aside and carefully pull out the rotor. Take great care with the brushes since the ball bearing has a larger diameter than the commutator.

When assembling the motor, adjust the axial play of the plastic gear wheel (6) by means of the adjusting screw in the cover.

FITTING THE WINDSHIELD WIPER UNIT COMPLETE

Fit the wiper frame. Install the intermediate defroster nozzle. Re-fit the fusebox and secure the ground cables. Secure the control cables.

Fit the wiper motor. Fit the choke control and also the combined instrument. Install the switch for the heater. Fit the wiper arms and the battery lead.

REMOVING THE SWITCHES

To remove the lighting switch, first unscrew the switch knob and release the nut with a crosshead screwdriver, see Fig. 3-84.

The knob is screwed onto the threaded switch rod. To remove early prod type switches for the windshield wipers/washer, the plastic key in the knob must first be taken out. This is done with by inserting a wire in the switch rod slot and pressing out the key. See Fig. 3-85. For re-fitting, just push the key straight in.

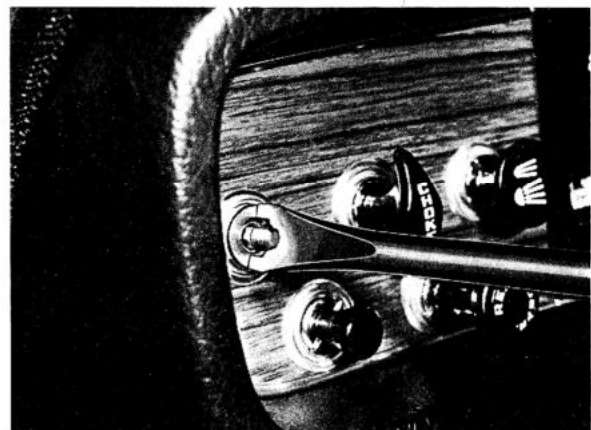
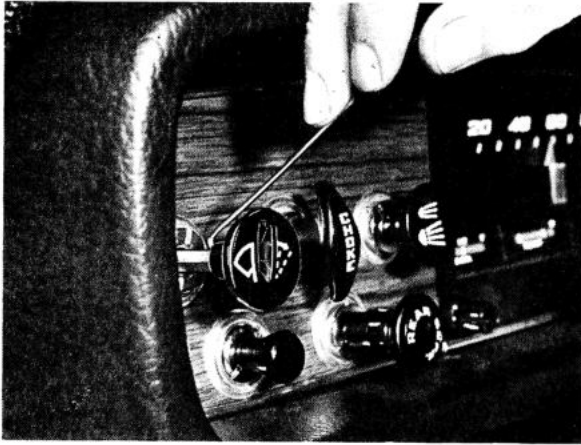


Fig. 3-84. Removing the switch nut

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Fig. 3-85. Removing the lock key (early prod., knob)

REPLACING THE INTERIOR LIGHT BULB

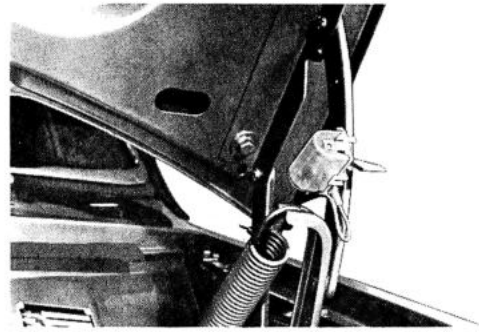
Pull down the glass at the short side opposite the switch. Pull out the bulb. The glass is re-fitted by hooking it securely at the side where the switch is situated and then pressing in the glass firmly.

REPLACING LUGGAGE OR ENGINE COMPARTMENT LIGHT BULB

Remove the plastic cover over the bulb by unscrewing the screw securing the cover. Replace the bulb. Re-fit the plastic cover and screw it on securely. Make sure that the tab on the plastic cover is fitted correctly.

REPLACING THE BRAKE LIGHT CONTACT

When replacing the brake light contact, make sure that the new contact is adjusted correctly so that it functions satisfactorily. The distance between the brake pedal released and the threaded bronze hub on the contact should be 4 ± 2 mm (0.16 ± 0.03 ") (A, Fig. 3-87). If the distance must be adjusted, release the attaching screw for the bracket and move the bracket until the correct distance is obtained.



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Fig. 3-86. Engine (or luggage) compartment light



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Fig. 3-87. Brake light contact