

# Chapter 12 Bodywork and underframe

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### 1 General description

The Jaguar range of cars covered by this manual are compact four/five seater saloons of unitary construction. That is to say, the body is made up of panels as illustrated in Fig.12.1 which are welded together to make up the well styled and attractive shape with which we are all familiar. The body is mounted on an underframe the parts of which are shown at Fig.12.2. All the items of the body and underframe shown in Figs.12.1 and 12.2 are catalogued as spares and so can be obtained for the repair in whole, or in part, of damaged components depending, of course, on the degree of damage to the vehicle as to whether or not

repair is a worthwhile proposition.

Modifications to styling since introduction of the Mk 1 model in 1955 have been of a comparatively minor nature only and are confined mainly to the introduction of cut-away rear wheel covers, new wrap round rear window, slimmer window pillars and a larger windscreen. The main interior difference has been the introduction of a red signed instrument panel from which, in later cars, the speedometer and revolution counter has been removed to a position directly in front of the driver.

The interior features two bucket seats at the front which are adjustable for height and reach and which are upholstered in leather. The rear seat squab and backrest, also upholstered in leather, are provided with a centre armrest.

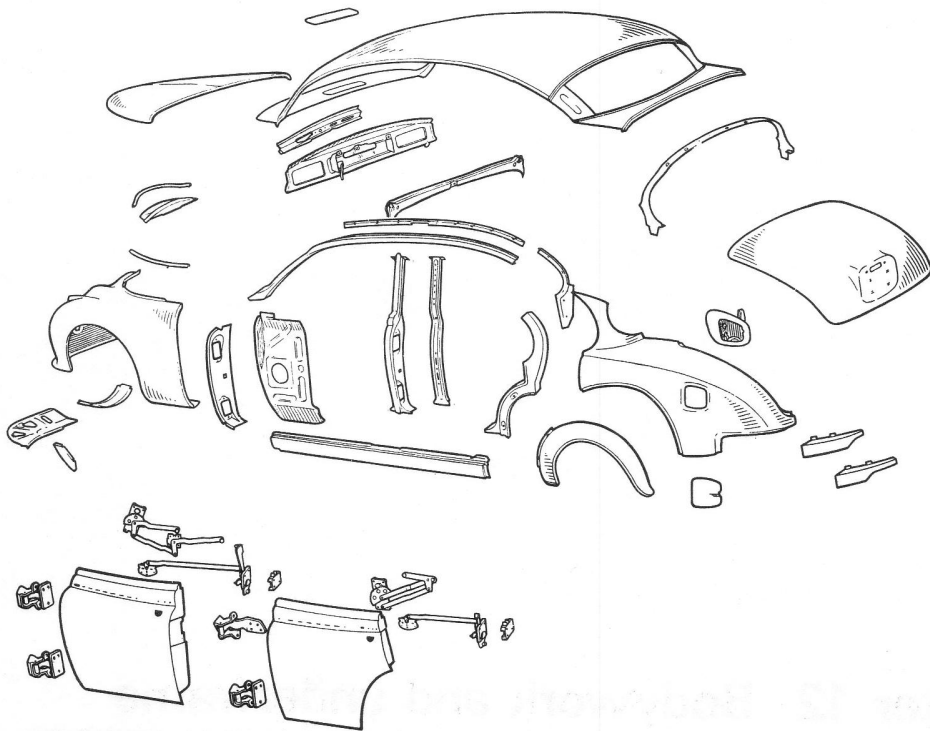


Fig.12.1. The body panels

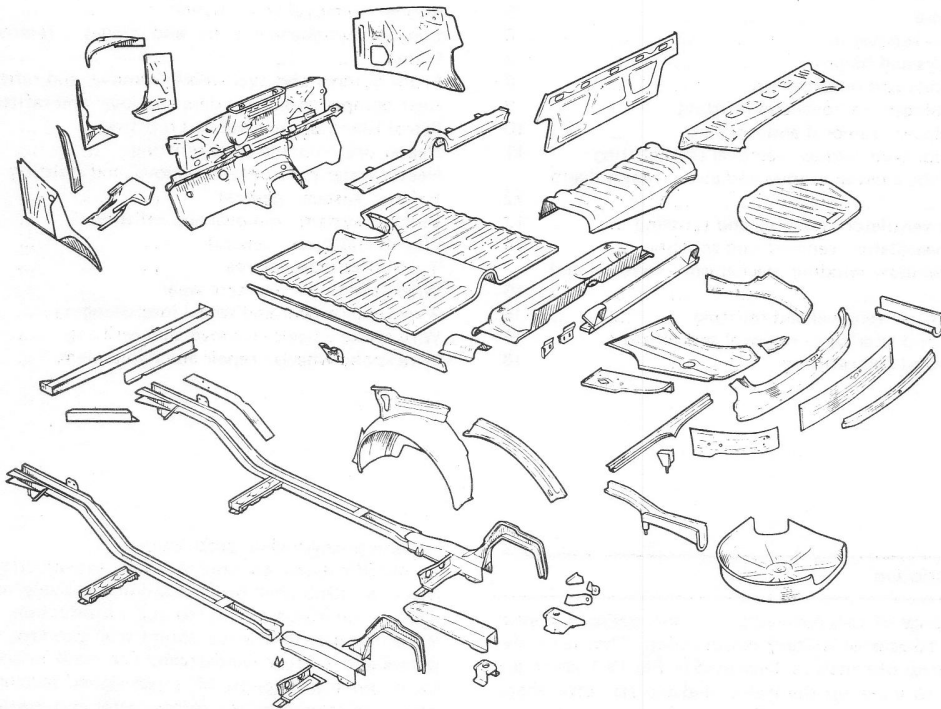


Fig.12.2. The underframe components

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## 2 Maintenance - body and underframe

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1 The condition of the bodywork is of considerable importance as it is on the visual condition of this that the re-sale value of the car will mainly depend. It is much more difficult, and costly, to repair neglected bodywork than it is to renew mechanical assemblies. Attention to the hidden portions of the body such as the wheel arches and the underframe is as important, if not more so, than periodic cleaning and polishing of the paintwork.

2 At frequent intervals, especially during the winter months, remove the rear wheel covers, raise the car and thoroughly hose Down underneath to remove all mud and road dirt from the wheel arches and projections on the underframe. Pay particular attention to the front part of the front wheel arches, the valance beneath the radiator, inside as well as the outside of the four jacking points, and do make sure that the rubber plugs are fitted at these points, the space between the petrol tank and the body and the wheel covers themselves. These, amongst others, are all places where mud will collect and cause corrosion especially if impregnated with salt.

3 The insides of the doors are fairly well protected but nevertheless take off the door panels at least once a year, to make sure that the drain holes are clear and that there is no corrosion.

4 Once a year, preferably in the summer, is advisable to have the underside of the body steam cleaned. This will remove all traces of dirt and oil so that the underside can be examined for rust, damaged pipes or electrical wiring.

5 The wheel arches should be given particular attention to ensure that the undersealing has not been damaged by stones thrown up from the wheels. If damage is found, clean down to the bare metal using a wire brush and then paint on a rust inhibitor or, if preferred, red lead and finally recover the area with underseal.

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## 3 Maintenance - upholstery and carpets

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1 Remove the carpets and thoroughly vacuum clean the interior of the car at frequent intervals at the same time checking that dampness, to the extent of causing corrosion of the floor, is not present.

2 Use the vacuum cleaner on the seats and backrests to remove grit from the partitions as may cause chafing and breakage of the stitching.

3 Vacuum clean the carpets and if they are dirty they can be cleaned with one of the many proprietary cleaners which are now on the market.

4 It is suggested that you use saddle soap on the leather upholstery. This will not only clean the leather but will also "feed" it and help to keep it supple.

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## 4 Body repair - minor

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1 The rectification of major body damage should be left to a body repair specialist having the necessary equipment and "know-how" to restore the car to the condition it deserves. However, there is no reason why you cannot successfully beat out, repair and respray minor damage yourself.

2 The most common defect arising in the bodywork is chipping of the paint by stones thrown up from other cars. These blemishes can be repaired by first treating the chip with a rust inhibitor and then applying "touch-up" paint of the matching colour of your car. Allow the paint to dry. You will probably find that it has shrunk and left a depression in which case apply more paint, but not too much, and again allow to dry. Carry on applying paint until it stands slightly proud of the chip and now leave it for a couple of days to harden off. Now obtain a handy sized block of wood for rubbing down, cover the block evenly with cloth (flannel is ideal) and impregnate the cloth with metal polish. Rub down on the paint using a motion to conform to the particular shape of the panel, do not worry about damaging the

surrounding area of old paint finish as this will be much harder than the new surface which you have applied and which will quickly rub down to give a perfect match.

3 Larger areas of damage will need a different approach to the above.

4 Dents can be knocked out from underneath but never use a metal hammer as this will bruise and distort the metal. Use a mallet or hide faced hammer when knocking out a dent and at the same time support the metal with a sandbag or wooden block; beat out the dent as best you can but under no circumstances beat it out to the extent of standing proud of the surrounding metal because in this case the raised portion of metal will have to be cut out in order to get a flat finish.

5 Having beaten out the dent, clean down to the bare metal and, then, if there is no rust present, apply a filler such as Holts "Cataloy" and smooth it over the area as evenly as possible. Do not mix the filler too thinly or it will tend to run on the other hand a stiff mix will be difficult to apply and will harden off as you are working.

6 Allow time for the filler to harden (usually about 30 minutes) and then follow the instructions for rubbing down the type of filler you used. Fillers of the Holts "Cataloy", Isopon etc can first be roughly filed to shape and then carry on with glass paper followed by a medium and fine grade wet and dry paper to feather the patch in to the surrounding area.

7 When doing any rubbing down, use a block of wood padded with cloth to support the rubbing down paper. If you use your hand or fingers they will follow any irregularities and you will never finish up with a flat surface.

8 Protect surfaces as necessary from paint using masking tape, newspaper held on by tape etc. or even use grease for small areas but do not allow any oil or grease to come into contact with the area you are going to paint. Now spray on an undercoat, allow it to harden and look for blemishes in your filling work, it is surprising how defects will now show up. Use more filler and rub down again as necessary.

9 When satisfied with the undercoat, rub down with a fine grade wet and dry paper and then, when the surface is clean and dry, apply the finishing coats of the matching colour of your car. The number of coats applied is a matter of choice but do not try to finish the job in one application, several very light coats are better than a couple of heavy applications which in any event will most likely result in "runs". Rub down between each coat and then when the final coat has had time to harden, polish the whole area with a fine cutting paste.

10 The final treatment for the repair of holes or cuts is the same as the foregoing but first a base has to be provided to hold the filler. This can be done by welding (and this may be the only answer if a large hole, the result of body rot due to rust, is to be repaired) or by using fibre glass as a patching agent.

11 Assuming you are going to use fibre glass to repair a hole resulting from rust, first cut away all other corroded metal and then clean down to the bare metal for a distance of about 1½" all round the hole and apply a rust inhibitor.

12 Knock down the edge of the hole so that it is below the surface. Apply the fibre glass patch in accordance with the instructions for the type being used and then, when it is dry and hard, treat as for a dent as already described in this Section.

13 Beat out a cut but leave the edges below the surface. Clean down to the bare metal and then carry on to patch and fill as described previously.

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## 5 Body repairs - major

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Repairs to rectify extensive damage affecting the main members of the underframe must be carried out so that when the repair is completed the main mounting points for the engine, front and rear suspension etc., are in correct relation to each other. Checking of those features requires a jig and specialised knowledge of the car and its construction. We strongly recommend that, in the event of major damage to your car, you ensure that your repairer, if not a Jaguar agent, has the align-

ment of the underframe checked in both the vertical and horizontal plane by a Jaguar specialist.

### 6 Wood trim panels - renovation

The wooden screen rail capping and the door trim strips are prone to damage by the varnish lifting due to heat of the sun. We have found that a good method of renovation is to remove them as described later in this Chapter and then scrape off all the old varnish and rub down to the bare wood with a fine garnet paper. Now apply a walnut polyurethane wood filler and when this is dry, rub it down to a fine finish. Finally apply two coats of either a gloss or matt finish, depending on your choice, polyurethane varnish, rubbing down after each coat. You will find that this will give a durable surface which will last for a considerable time.

### 7 Maintenance - locks and hinges

Once every 6,000 miles (10,000 km) the door, bonnet and boot hinges should be oiled with a few drops of engine oil from an oil can. The door striker plates should be given a smear of grease to reduce wear and ensure free movement.

### 8 Door rattles - tracing and rectification

- 1 The most common cause of door rattles is a misaligned, loose or worn striker plate.
- 2 To remove the striker plate, take out the three securing screws and lift the plate away from the door pillar.
- 3 Fit the new striker plate and assemble the three screws loosely to the adjustable tapping plate in the pillar.
- 4 Positioning is a matter of trial and error until the door can be closed easily without rattling and when no lifting or dropping of the door is apparent, when opening or closing.
- 5 Other causes of door rattles may be:-
  - a) Loose door handles, window winder handles or door hinges.
  - b) Loose worn or misaligned door lock components.
  - c) Loose or worn remote control mechanism.
  - d) A combination of the above.

### 9 Front doors and hinges - removal and refitting

- 1 Obtain the services of an assistant to take the weight of the door when the securing bolts are removed.
- 2 Take out the split pin and the clevis pin on the door check strap bracket.
- 3 Mark the positions of the hinges on the door for ease of alignment on refitment.
- 4 Slacken the six bolts securing the hinges to the door and then have your assistant take the weight of the door.
- 5 Remove the six bolts and then lift off the door.
- 6 Take off the scuttle side casing by removing the three screws.
- 7 Take out the two screws and remove the aperture cover plate.
- 8 Remove the door courtesy light switch from the bottom hinge recess and disconnect the cable at the rear of the switch.
- 9 Remove the hinges (Fig.12.3) by taking out the cross headed screws and the bolts inside the hinge recess.
- 10 Refitting is the reverse of the removal procedure but adjust the hinges to your marks or until the door fits correctly and then check adjustment of the striker plate as described in Section 8.

### 10 Rear doors and hinges - removal and refitting

- 1 Obtain the services of an assistant to take the weight of the door when the securing bolts are removed.
- 2 Remove the split pin and the clevis pin on the door check

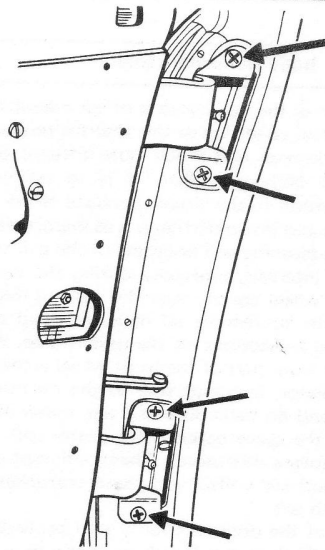


Fig.12.3. The screws securing the front door hinges

strap bracket.

- 3 Refer to Section 11 and take off the door trim casing.
- 4 Mark the position of the hinges on the door.
- 5 Slacken the three bolts securing the bottom hinge and the four cross headed screws securing the top hinge and then have your assistant to take the weight of the door.
- 6 Remove the bolts and screws from the hinges and lift off the door.
- 7 Take out the two cross headed screws on the rear door side of each hinge (Fig.12.4) and the cross headed screw to each hinge from the front door side of the door pillar (Fig.12.5) and then take off the hinge.
- 8 Refitting is the reverse of the above removal sequence but adjust the hinges to your marks or until the door fits correctly and then check the position of the striker plate as described in Section 8.

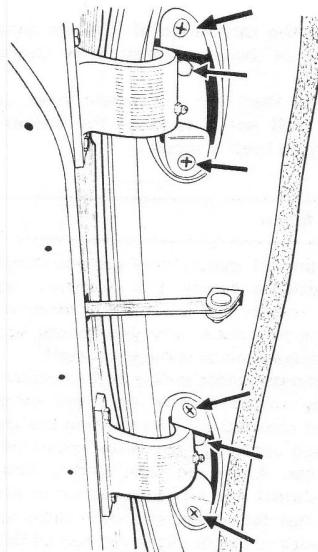


Fig.12.4. The screws securing the rear door hinges

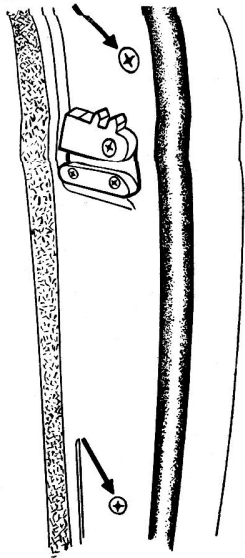


Fig.12.5. Showing the two screws at the front of the centre pillar which secure the rear door hinges

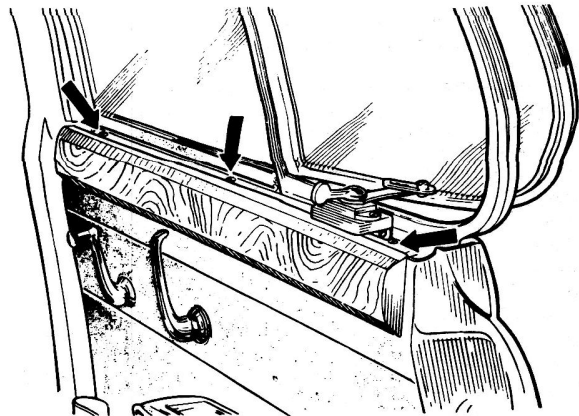


Fig.12.7. Showing the three screws securing the waist rail to the door frame

#### 11 Front and rear door trim casings - removal and refitting

- 1 Take out the four screws which attach the wood capping to the waist rail (Fig.12.6). Lift off the capping and now prise up the tacks securing the felt to the waist rail.
- 2 Take out the three screws shown in Fig.12.7 which hold the waist rail to the door frame and remove the waist rail.
- 3 The door casing covering is attached to the door frame at the bottom of the window aperture by adhesive so pull it away carefully. Four screws holding the millboard casing to the door frame will now be uncovered (Fig.12.8) and these must be removed.
- 4 Refer to Fig.12.9. Press in the spring loaded cap on both the door and window handles. A small retaining pin will now be uncovered and this should be pressed out to remove the handles.
- 5 The door casing is now held to the door by clips, twenty-one in the case of the front door and eighteen for the rear. Prise the casing off the door by inserting a thin bladed screwdriver and working round evenly.
- 6 Refitment of the trim casings is the reverse of the above. Take care that your screwdriver does not slip when refitting the waist rail capping and damage it.

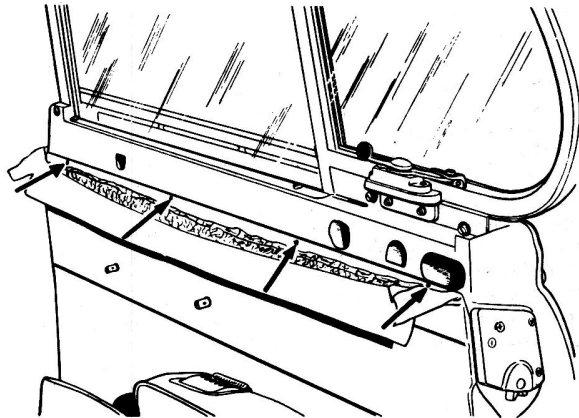


Fig.12.8. Showing the screws securing the top of the door trim casing

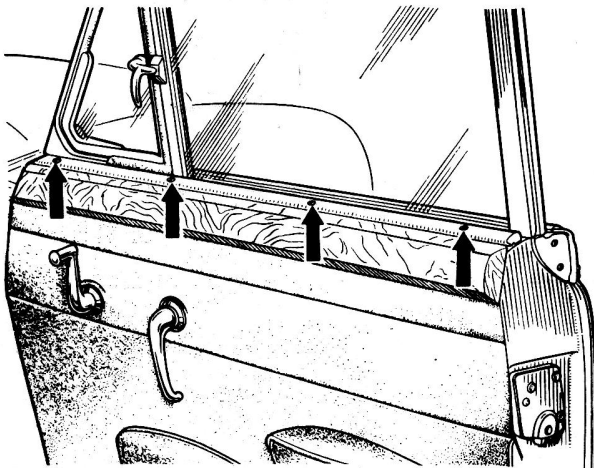


Fig.12.6. Showing the screws holding the wood capping to the waist rail

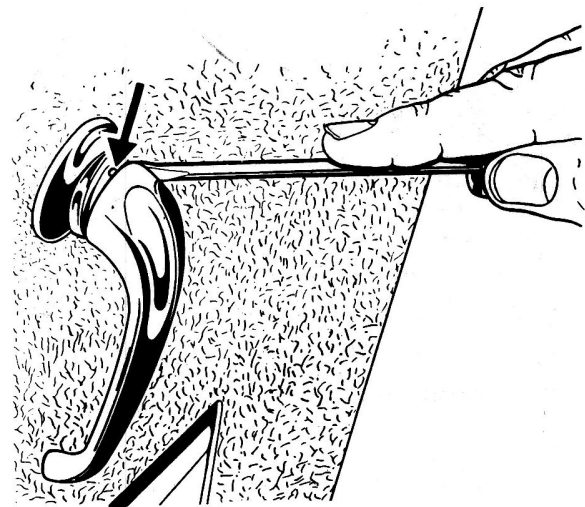


Fig.12.9. Showing the retaining pin for the door lock and window handles

### 12 Front and rear door window frames and glass - removal and replacement

- 1 Refer to Section 11 and remove the trim casing.
- 2 Pull off the plastic sheet which is stuck to the door frame.
- 3 Remove the round headed screws which secure the window frame just below the top of the door panel (Fig.12.10). Note the number of packing pieces under each screw as these must be put back in the same place.
- 4 Take out the two bolts which secure the two legs of the window frame to the door and collect the wooden packing pieces.
- 5 The weatherstrip is held to the door frame by four clips, prise it off.
- 6 Withdraw the window frame from the door frame and slide the glass out of the retaining channel.
- 7 To refit, first place the four clips in position and then clip on the weatherstrip.
- 8 Place a layer of sealing compound on that section of the door frame on which the no draught ventilator window in the window frame seats.
- 9 Fit the door glass into position in the slide channel of the winding mechanism and then slide the glass into position between the door frame.
- 10 Assemble the window frame to the door frame but on the rear door first wind up the window glass to about one third of its maximum height before inserting the window frame.
- 11 Loosely fit all screws and bolts making sure that all packing pieces are replaced correctly.
- 12 At this stage the window frame should clear the front screen pillar by 1/16" (1.5 mm), move it if necessary to obtain this clearance and then tighten the four round headed screws and the two bolts which hold the window frame to the door.
- 13 Refit the round headed screw which holds the metal tab on the door frame end to the window frame.
- 14 Remove any excess sealing compound from the bottom of the no draught ventilator and then refit the door trim casing and the wooden capping strips as described in Section 11.

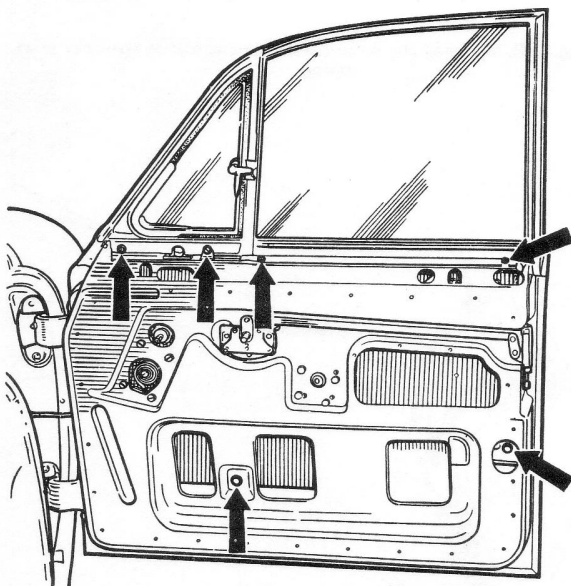


Fig.12.10. Location of the window frame securing screws and bolts

### 13 Front no draught ventilator - removal and refitting

- 1 The following paragraphs refer to Mk 1 cars.
- 2 Insert a thin bladed screwdriver between the metal window frame and the window surround capping to prise it off the five spring clips.
- 3 Take out the screws securing the waist rail capping to the door and lift the capping upward and off.
- 4 Pull down the door covering which is attached by adhesive to the door frame at the bottom of the window aperture. The ventilator adjustment and securing mechanism (Fig.12.11) can now be seen through a small aperture in the door.
- 5 Remove the two nuts, washers, spring and quadrant at the bottom of the ventilator post and then remove the split pin and the segment on the post.
- 6 Unscrew the ventilator securing pin on the top mounting and the ventilator can now be removed.
- 7 The following paragraphs refer to Mk 2 and later models.
- 8 Refer to Section 11 and remove the door trim casing.
- 9 The ventilator adjustment and securing mechanism is now accessible through an aperture in the door frame and is basically similar to that fitted on Mk 1 cars.
- 10 Remove the locknut and washer which hold the spring against the quadrant on the ventilator post and then remove the pin and the segment from the post.
- 11 Take out the two screws which fix the front hinge to the window frame.
- 12 Turn the catch to allow the ventilator to open and it can now be withdrawn.
- 13 Refitting in each case is the reverse of the removal sequence but tighten the adjustment nut on the ventilator post until there is a positive feel between the segment and the quadrant when the ventilator is moved to any of its three positions.

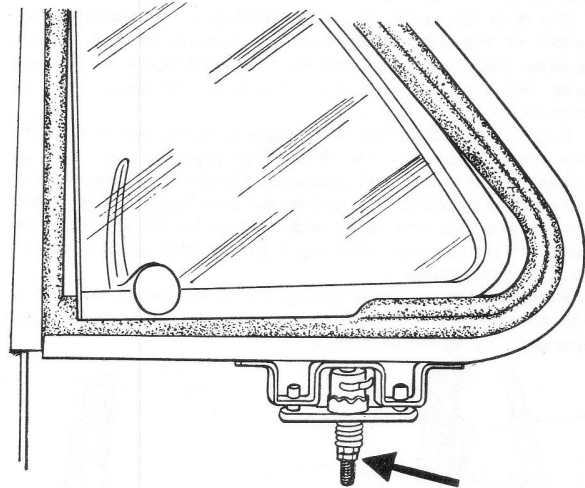


Fig.12.11. Adjustment and securing mechanism front no draught ventilator Mk 1 cars

### 14 Rear no draught ventilator - removal and refitting

- 1 Mk 1 model cars were not provided with a rear no-draught ventilator.
- 2 Take off the nut, screw and fibre washer which secure the ventilator bracket to the catch arm.
- 3 Open the ventilator.
- 4 Refer to Fig.12.12 and take out the five screws which secure the ventilator hinge to the window frame.
- 5 Refitting is the reverse of the above.

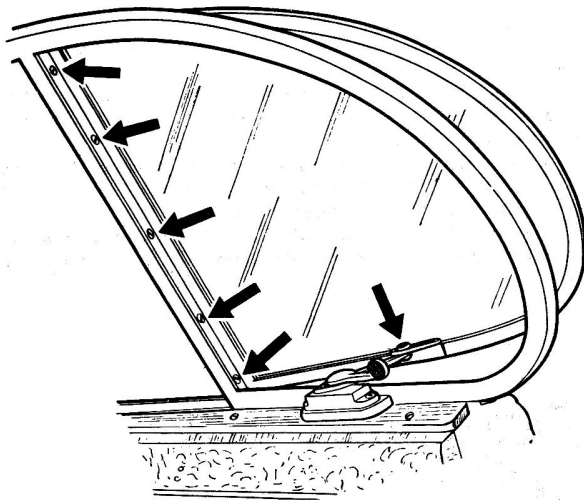


Fig.12.12. Location of screws securing the rear no draught ventilator

#### 15 Front and rear window winding mechanism - removal and refitting

- 1 First remove the door trim casing and the window frame and glass as described in Sections 11 and 12 respectively.
- 2 Refer to Fig.12.13.
- 3 Take off the felt placed over the window regulator spindle and then take out the four screws which hold the window regulator to the door frame followed by the four screws which hold the regulator spring to the frame.
- 4 Withdraw the mechanism from the door frame as shown in Fig.12.14.
- 5 Refitting is the reverse of the above procedure.

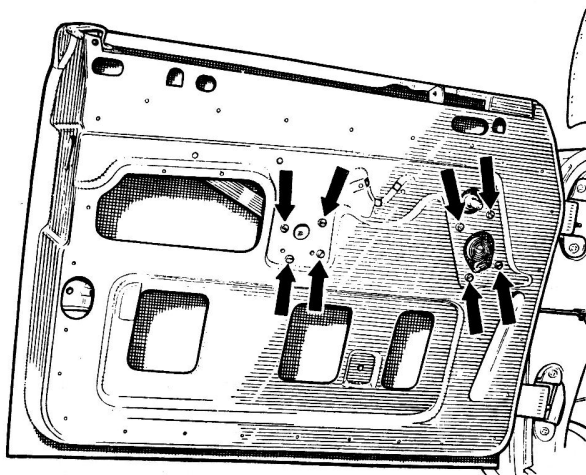


Fig.12.13. Location of the screws securing the window winding mechanism

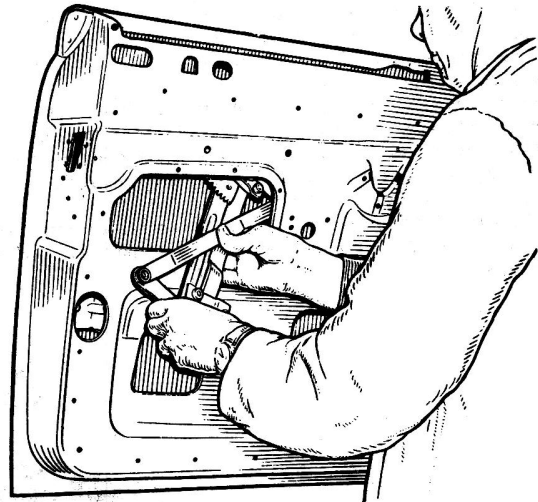


Fig.12.14. Removing the window winding mechanism

#### 16 Door locks Mk 1 cars - removal and refitting

- 1 The door lock mechanism as fitted to Mk 1 cars is shown at Fig.12.15.
- 2 To remove the lock, first take off the door trim casing in the manner described in Section 11.
- 3 Disconnect the connecting link, which is retained by a spring, from the dowel at the rear of the lock between the door frame.
- 4 Take out the four cross headed screws which secure the lock to the end of the door frame.
- 5 Remove the three screws which secure the remote control to the door frame and now withdraw the mechanism.
- 6 Unscrew the nut and screw inside the door which retain the outside push button handle.
- 7 When refitting the lock, first of all secure it loosely to the door and it should be noted that on rear door locks a shorter screw is fitted in the front elongated hole (J) of the remote control unit.
- 8 Tighten the four screws holding the lock unit first and then align the remote control unit by sliding it as far as possible towards the lock unit and in this position the operating lever (K) will be in contact with the lock case as shown in the drawing. Tighten down on the three securing screws.
- 9 The plunger housings on the outside door handles are stamped "N.S" (near side) and "O.S" (off side) and the appropriate handle, with its two seating washers, should be held in position on the door panel and the clearance between the plunger (L) and the lock contactor (M) checked through the aperture in the inner door panel.
- 10 The clearance should be  $1/32$ " (0.8 mm) but before making any adjustment, turn the plunger operating lever (N) to the unlocked position and depress the push button.
- 11 With the push button depressed, release the locknut (O) and screw the plunger bolt (L) in or out as required and retighten the locknut before releasing the push button.
- 12 Before fitting the handle to the door attach the extendable connecting link (F) (a rigid link is used on the rear doors) to the plunger operating lever (N) and retain it by its circlip. The link must be fitted so that the bent part at the top is inclined towards the outside handle.
- 13 Now manoeuvre the connecting link through the handle aperture and allow it to hang downwards inside the door so that the handle with its seating washers can be finally fixed to the door.
- 14 The plunger operating lever (N) should now be turned to the locked position so that the location holes in the operating lever and the plunger housing are in line and to hold it in this position, insert a short length of  $1/8$ " (3.2 mm) rod through the aperture in the inner door panel and through the locating holes. As the

window channel in the front doors may partially obscure the plunger housing, slacken off the nut which holds the bottom of the rearmost window channel to the bracket in the door and now push the window channel out of the way.

15 Check that the remote control cam is set in the locked position and for the front doors, is retained by the peg (H).

16 One of the holes in the bottom of the connecting link (F) can now be aligned with the dowel (G), press it into position where it will be retained by the spring (E).

17 Close the door and check the lock for correct operation and make sure that its position in relation to the striker plate has not been upset.

units need be removed if required.

4 Take off the outside handle base plate assembly by removing the two nuts (I) (two screws were used on the rear doors of early models).

5 The outside push button handle is removed by taking off the two nuts (J) but we suggest you leave it in position unless it is required to fit a new handle.

6 When refitting remote controls they must be in the locked position. You will find that a new remote control is supplied pinned in the locked position as illustrated at (L).

7 Loosely fit the remote control and the lock to the door and hold in position by their screws (G) and (H). On later model cars

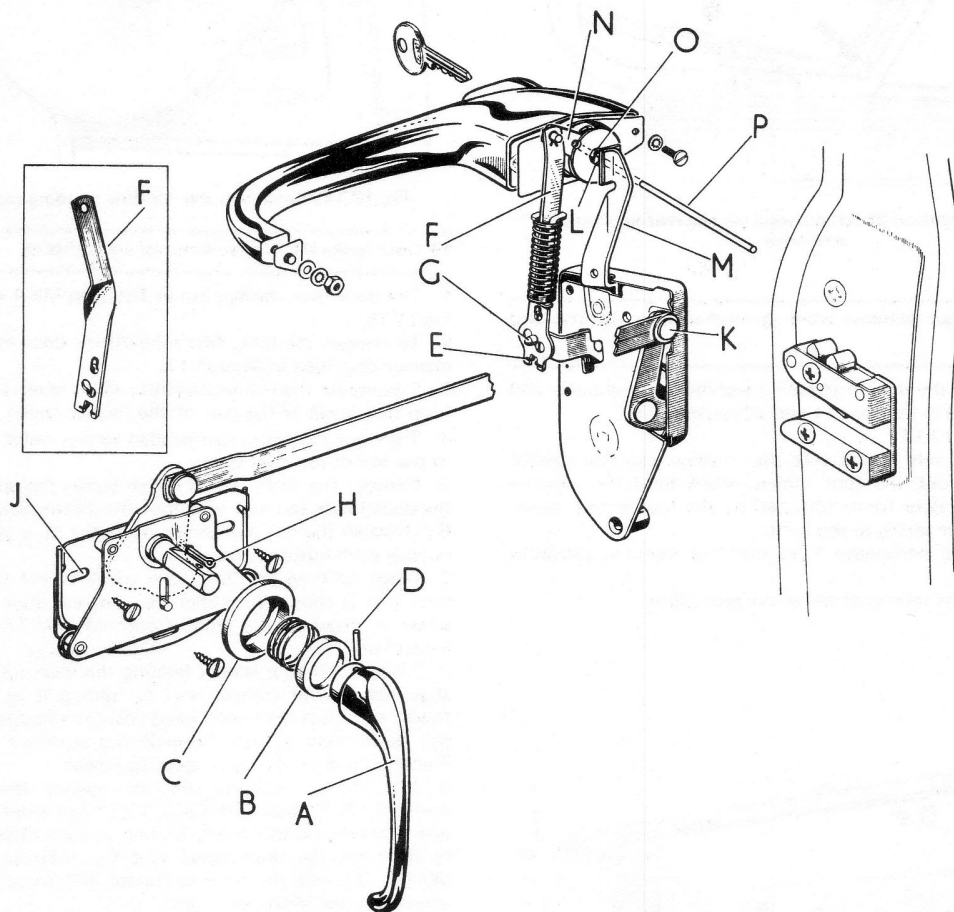


Fig.12.15. The Mk 1 door lock mechanism

#### 17 Door locks Mk 2 and later cars - removal and refitting

1 The latest type of door lock mechanism is shown at Fig.12.16.

2 First take off the door trim casing as described in Section 11.

3 Release the spring clip holding the bottom of the outside handle connecting link (E or Ea).

3 Remove the lock and the remote control units by taking out the four screws securing the lock (G) followed by the three remote control screws (H). On Latest model cars, the remote control can be detached from the lock unit so only one of these

which have the remote control as a separate unit, the connecting link has to be attached to the dowel on the operating lever (M) with a waved and plain washer between the lever and the connecting link. The assembly is retained by a spring clip.

8 Now tighten the screws (G) holding the lock unit and then align the remote control unit by sliding it, on its elongated holes, towards the lock unit. In this position the operating lever (M) will be in contact with the lock case and the three securing screws must now be tightened.

9 If the outside push button handle was removed it should now be refitted. Make sure that the packing washer (N) is fitted to the front fixing stud and now locate the handle on the door, fit



the shakeproof washers followed by the nuts (J) and tighten down.

10 The base plate assemblies are stamped LH or RH. Place the appropriate assembly in position inside the door panel and check the clearance between the push button plunger (O) and the lock contactor (P). The clearance should be  $1/32''$  and, if adjustment is necessary, slacken the locknut (Q) and screw the plunger bolt (O) in or out as required. Retighten the locknut when the adjustment is correct.

11 Now attach the connecting link (E) (Ea for rear doors) to the dowel on the plunger operating lever (R) and then fit the circlip. The links must be fitted in the positions shown in Fig.12.16 but the extendable link used on early models is fitted in the reverse direction and the middle of the three holes is used as shown at the inset at the bottom right hand of the Figure. The old pattern link should be replaced by the latest type if practicable.

12 Secure the base plate in position by tightening down on the two bolts (I).

13 Check that the remote control cam is set in the locked position and is retained by the split pin (L) as illustrated. On the

rear doors the operating lever (R) is pegged in the locked position, before fitting the link (Ea), by inserting a short length of  $1/8''$  diameter rod (S) through the base plate as shown.

14 The links (E and Ea) are provided with three holes at the bottom end and it will be found that one of these holes will align with the dowel (F) on the intermediate lever. Press the link on to the dowel and it will be automatically retained by the spring clip.

15 Take out the split pin (L) and the piece rod (S) and now check the door locking operation.

16 Depress the push button and make sure that the plunger (O) clears the lock contactor (P). Now set the remote control in the unlocked position when the plunger (O) should pass squarely behind the lock contactor (P) and come into contact with it when the push button is operated.

17 Grease the accessible moving parts of the lock and remote control mechanism and then introduce a few drops of thin oil into the oil hole (T) and into the private lock key slots.

18 Finally refit the door trim casing.

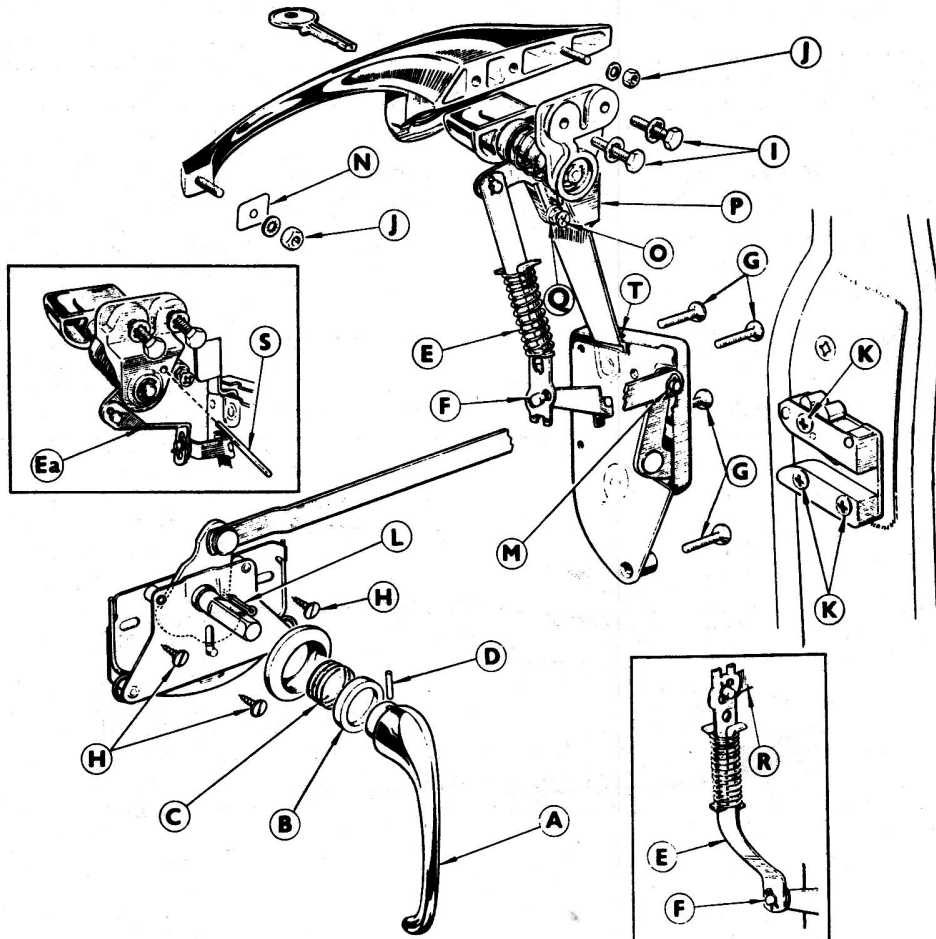


Fig.12.16. Latest type door lock mechanism

**18 Windscreen - removal and refitting**

Replacement of a windscreen is one of those jobs which you would be well advised to leave to a professional. However, if you decide to do the job yourself, the procedure is as follows.

- 1 Release the catch and pull the wiper arms off the posts.
- 2 Prise the chrome finisher off the rubber seal round the windscreen but for Mk 2 and later models, first prise off the two chrome finisher pieces which secure the ends of the encircling finisher.
- 3 For later models, extract one end of the rubber insert which is under the chrome finisher, and withdraw it completely.
- 4 Now for both models, run a thin bladed, but blunt, tool around the windscreen to break the seal between the rubber and the windscreen aperture flange.
- 5 The windscreen is now removed from Mk 1 models by inserting a piece of flat metal between the top of the windscreen aperture flange and the sealing rubber. With a block of wood on the glass for use as a fulcrum and using the piece of metal as a lever, force the windscreen inwards. Repeat this all along the top of the windscreen until it can be withdrawn into the car.
- 6 The windscreen on Mk 2 and later cars however, is removed by striking the glass with the flat of the hand from inside the car, start in one corner and work towards the bottom and then carry on all round the windscreen until it can be withdrawn from outside the car.
- 7 Remove the rubber seal from the windscreen flange.
- 8 Clean all old sealing compound from the windscreen flange.
- 9 If the windscreen has been broken by some outside agency, carefully clean away all trace of glass from the rubber if it is being used again, but if the screen was of the toughened glass type the rubber should be replaced as small particles of glass may impregnate the rubber and cause breakage of the new windscreen.
- 10 If the glass broke due to some unknown cause, examine the windscreen aperture flange for irregularity in the metal which, if present should be filed down as this too could be the cause of a new screen breaking.
- 11 Examine the rubber, if it is being re-used, for cuts and signs of perishing. If the condition of the rubber is at all doubtful it is advisable to replace it because if a perfect seal is not obtained when the screen is refitted it can only result in rain getting past

the rubber especially when driving at high speed in wet weather. 12 Now for Mk 1 cars, attach the rubber to the windscreen with the flat side of the rubber towards the rear and with the joint preferably at the bottom. Thread some strong cord (blind cord is ideal) around the rubber groove into which the flange of the windscreen aperture fits and leave the tow loose ends of the cord at the top of the windscreen.

13 Next, working from inside the car, offer up the screen to the aperture with the top edge foremost and keeping the screen as low down at the back of the instrument panel as possible. Have an assistant to exert steady hand pressure at each side of the screen whilst, from outside of the car, you pull on the cord to lip the edge of the rubber over the flange as illustrated in Fig.12.17.

14 For Mk 2 and later model cars, first fit the rubber to the windscreen aperture with the flat side of the rubber to the rear and the joint at the bottom.

15 Two special tools are used when fitting the windscreen and these are illustrated at Fig.12.18. Tool "A" is used to lift the rubber over the glass and tool "B" is used when refitting the rubber sealing strip. You will find that these tools will make the job much easier and every effort should be made to borrow them if you decide to replace the screen yourself.

16 Working from outside the car and with the help of an assistant, offer up the glass to the rubber and, working from the bottom of the glass, use tool "A" to lip the rubber over the glass as shown in Fig.12.19.

17 Having got the glass seated in the rubber, use tool "B" to insert the rubber sealing strip (Fig.12.20) with the rounded wide edge of the strip to the outside.

18 It is most important for all models that the glass is fitted equally. DO NOT fit one end and then try to fit the other.

19 It is now necessary to force sealing compound into the joints and the procedure for this is the same for all models. Use a pressure gun, as illustrated in Fig.12.21, filled with a sealing compound and fitted with a copper nozzle so that the glass will not be scratched. Apply the nozzle of the gun between the metal body flange and the rubber and fill it all round with sealer and now repeat the operation to seal between the glass and the rubber. Excess sealing compound can be removed with a rag dampened with white spirit, do not be too lavish with the white spirit as it is advisable to prevent it running into the sealer.

20 Coat the inside of the chrome strip with a liberal layer of Bostik 1251 and allow it to become tacky. Fit the chrome strips,

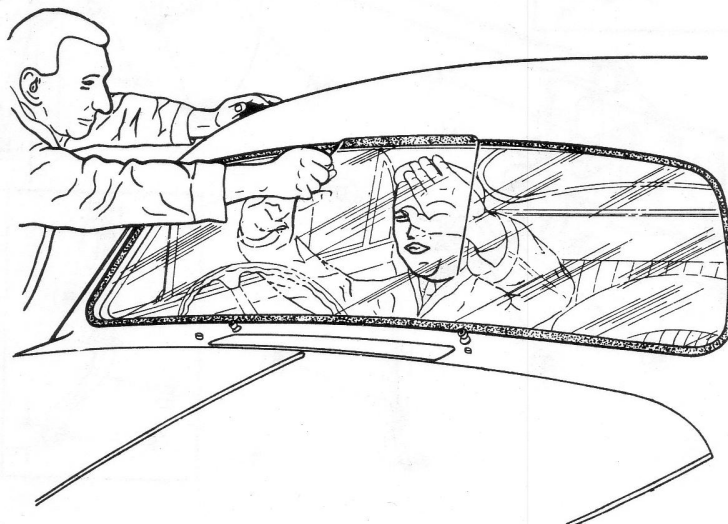


Fig.12.17. Fitting the windscreen to Mk 1 cars

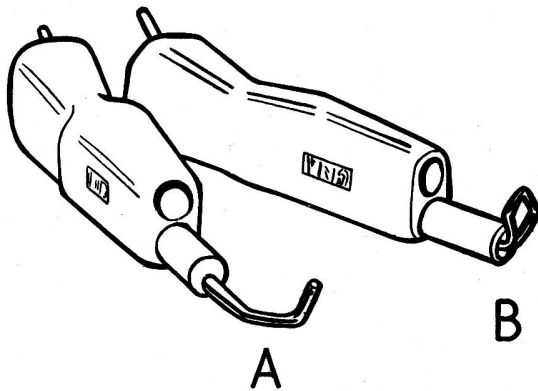


Fig.12.18. Special tools used for fitting the windscreen to Mk 2 and later type cars

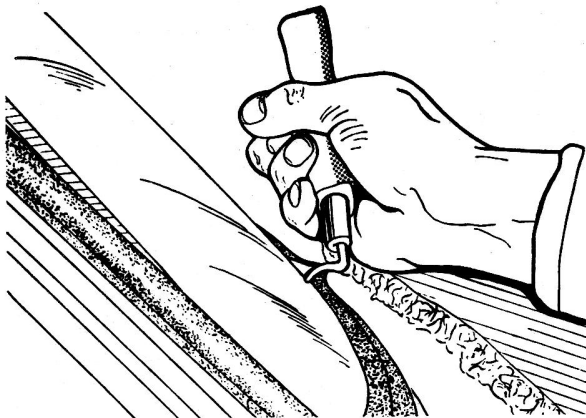


Fig.12.19. Lipping the windscreen rubber using tool A

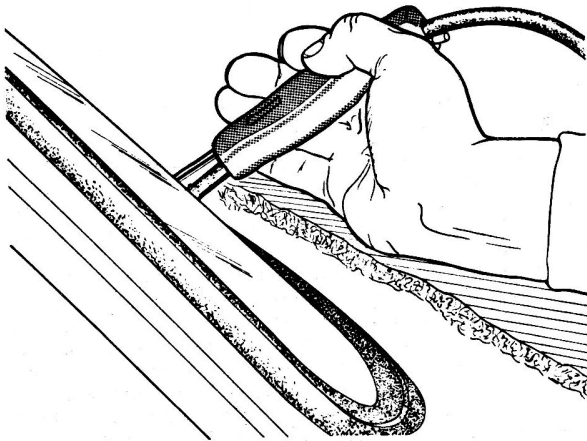


Fig.12.20. Using tool 'B' to insert the windscreen sealing rubber

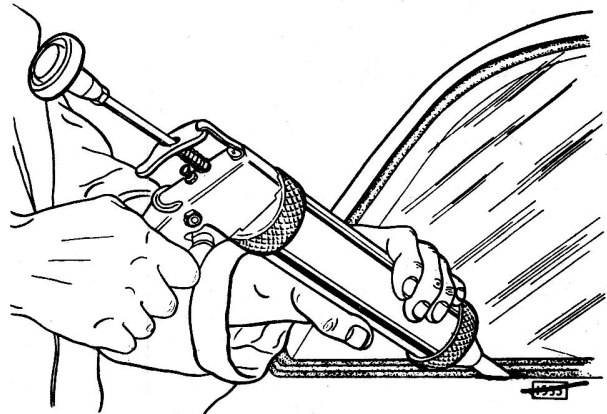


Fig.12.21. Sealing the windscreen

note that they are "handed", and with a hook (Use tool "A" if available) lip the rubber over the strip and continue all the way round. The centre chrome clips can now be fitted, treat them with Bostik 1251 and after ensuring that the more acute bend on each centre clip is facing away from the glass, place them in position lifting the rubber as before.

21 Refit the windscreen wiper arms and blades.

#### 19 Rear window glass - removal and refitting

- 1 This also is one of those jobs best left to a professional but it is not an impossible task for an amateur and if you decide to do it yourself, proceed as follows.
- 2 If a heated rear window is fitted, disconnect the battery and then, from inside the luggage compartment, disconnect the two leads which will be found at the top of the compartment just below the window.
- 3 Prise off the chrome finishing strip from the outside of the rubber.
- 4 Insert a tool between the rubber and the rear screen aperture and run it completely round the rubber moulding to break the seal.
- 5 Working from inside the car, exert sudden pressure on the glass to remove it.
- 6 Remove all trace of old sealer from the flange.
- 7 If the rear glass was broken, make sure that all particles of glass are removed and that the rubber is thoroughly cleaned. If breakage of the glass cannot be accounted for, examine the window aperture flange for irregularities in the metal and if any are found they should be filed away otherwise the new glass may break at an early date.
- 8 Examine the rubber for cuts or signs of perishing. We advise replacement of the rubber if its condition is at all doubtful.
- 9 Place the rubber around the glass without any sealer at this stage.
- 10 Thread some strong cord (blind cord is ideal) twice around the aperture groove and leave the two loose ends at the inside top of the window.
- 11 Have an assistant inside the car. Offer up the glass, with rubber attached, to the window aperture. Insert one end of the glass and lip the rubber over the aperture flange from inside the car.
- 12 Travel round the glass exerting sudden pressure from inside the car, whilst your assistant inside the car lips the rubber over the metal aperture by pulling on the cord but taking care not to pull directly against the rubber as this may tear it.
- 13 Now refer to paragraph 19 of Section 18 and apply a sealing compound and treat and replace the chrome strip in the same manner as described for the windscreen.
- 14 Finally, if a heated rear window is in use, remake the connections or, if a heated rear window is being fitted for the first time, refer to the appropriate wiring diagram in Chapter 10

for the necessary wiring and connections.

### 20 Facia panels - removal and refitting

Information on the method of removing and refitting the centre facia panel of Mk 1 cars and the right and left hand panels of all models will be found in Chapter 10 under the Sections dealing with the removal and refitment of the instrument panel and the windscreen wiper mechanism wheel boxes respectively.

### 21 Radiator grille - removal and refitting

- 1 Open the bonnet and remove the two setscrews securing the bonnet catch striker plate (Fig.12.22). Take off the plate.
- 2 Remove the setscrew with its plain and serrated washers and cup which hold the top of the grille to the body.
- 3 Unscrew the four nuts (five in the case of Mk 1 cars and six in the case of early 2.4 litre models) and remove the small angle brackets which secure the grille to the body. Lift off the grille (Fig.12.23).
- 4 The centre chrome strip of later models can now be removed by taking off the two bolts which hold it at the bottom of the

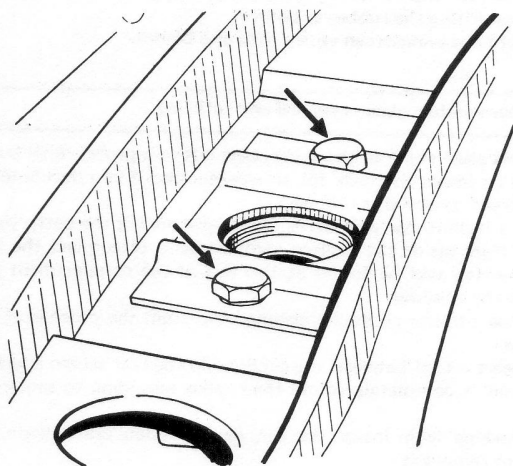


Fig.12.22. Location of the setscrews securing the bonnet catch striker plate

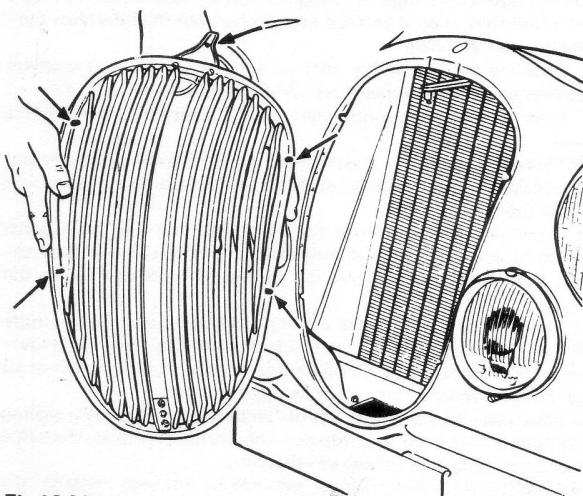


Fig.12.23. Showing the mounting points for the radiator grille

grille and the two screws holding it at the top.

5 Reassembly of the radiator grille and its refitment to the car is the reverse of the above sequence.

### 22 Bonnet lock - removal, refitting and adjustment

- 1 Open the bonnet and, using a thin spanner, slacken the locknut at the top of the peg.
- 2 Using the screwdriver slot in the peg, unscrew it and remove it complete with the locknut, two washers and the spring (Fig.12.24).
- 3 Now remove the radiator grille in the manner described in Section 21.
- 4 Slacken the nut securing the bonnet release cable and then withdraw the cable from the release lever.
- 5 Remove the striker plate, the catch plate, the base plate, spacers and spring.
- 6 Moving inside the car, take off the dash casing under the steering wheel by removing the three screws and, if applicable the bezels to the speedometer trip and the clock remote controls.
- 7 Unscrew the locknut holding the bonnet lock abutment to the reinforced panel and the release cable can now be withdrawn.
- 8 Refitting is the reverse of the above procedure but it will be necessary to adjust the bonnet lock peg before the locknut is tightened. The peg is correctly adjusted when there is approximately 1/16 inch (1.5 mm) movement between the catch plate and the peg, this is checked by closing the bonnet and then pressing down at the front, against the spring pressure, and observing the amount of movement. If the peg is screwed in too far you will find it difficult, if not impossible, to close the bonnet and considerable effort will be required to operate the catch.

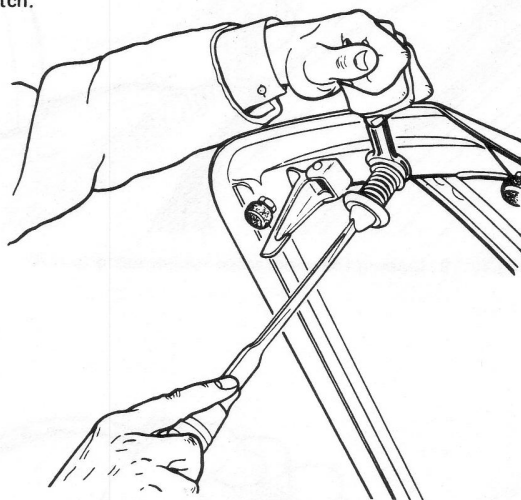


Fig.12.24. Removing the bonnet lock peg

### 23 Bonnet - removal and refitting

- 1 Open the bonnet and mark the position of the hinges for ease of location on refitment.
- 2 Slacken the two setscrews to each hinge and then obtain the help of an assistant to support the bonnet.
- 3 Remove the setscrews from each hinge and then lift the bonnet clear of the car and store it where it will not be damaged.
- 4 Refit the bonnet in the reverse order to the above, align the hinges with your marks and tighten down on the setscrews.
- 5 Close the bonnet and check that it is fitting correctly, if adjustment is required, slacken the hinge setscrews and move the bonnet until it is properly aligned in the body and is locking correctly. Tighten the setscrews.

**24 Luggage compartment lid and hinges - removal and refitting**

- 1 Disconnect the battery and then, from inside the luggage compartment lid, disconnect the electrical connections to the reverse/number plate light and then remove the setscrew securing the earth wire to the lid.
- 2 Withdraw the harness from the clips on the lid and then remove the two metal straps which hold the reverse lamp cable to the right hand hinge.
- 3 Mark the position of the hinges on the lid for ease of location when refitting.
- 4 Slacken the four setscrews holding each hinge to the lid and then have an assistant to support the lid whilst you remove the bolts with their plain and serrated washers. Lift off the lid.
- 5 Mark the position of the hinges on the body and then remove them by taking out the securing setscrews with their plain and serrated washers.
- 6 Refitting is the reverse of the removal sequence but check the lid for correct engagement with the lock. If adjustment is required, slacken the four setscrews securing the lock striker to the lid (Fig.12.25) and then move the striker in the elongated holes until the lock operates correctly and does not rattle.

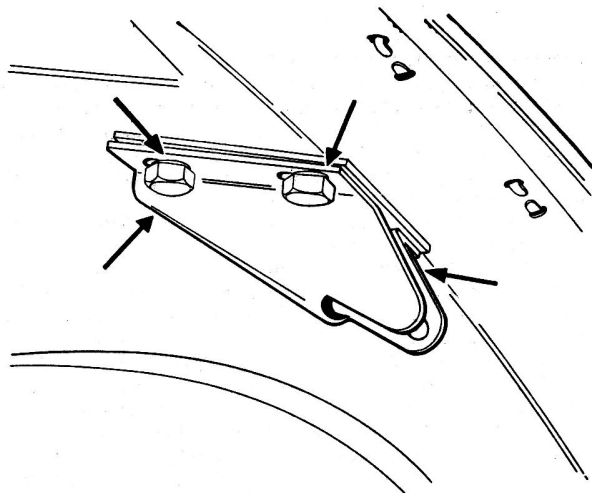


Fig.12.25. Showing means of adjustment for the boot lid striker

**25 Front bumper and over-riders - removal and refitting**

- 1 The attachment points for the front bumper are shown in Fig.12.26.
- 2 Take off the nuts, plain and spring washers to the chrome bolts at each side angle bracket.
- 3 Take off the nuts securing the bumper to the inner brackets, on Mk.1 cars these nuts also secure the over-riders.
- 4 Now slacken the nut securing one of the angle brackets to the outer bracket and turn the angle bracket through 90°. The bumper can now be withdrawn.
- 5 The over-riders on later models are held to the bumper by a nut and plain and serrated washers and when these are removed the over-rider and the beading can be lifted off.
- 6 Refitting is the reverse of the above removal sequence.

**26 Rear bumper and over-riders - removal and refitting**

- 1 The attachment points for the rear bumper are shown in Fig.12.27.
- 2 Remove the setscrews with the plain and serrated washers which hold the bumper to the two side mounting brackets.
- 3 Remove the two large setscrews which secure the bumper to the two mounting rubbers (inner position) and then lift off the bumper.
- 4 The mounting rubbers can be removed by taking off the two nuts holding each to the wings and reinforcement panels.
- 5 Remove the over-riders by taking off the securing nut, the over-rider and the beading can now be removed from the bumper.
- 6 Refitting is the reverse of the above removal sequence.

**27 Petrol filler lid - removal and refitting**

- 1 The petrol filler lid assembly is shown in Fig.12.28.
- 2 Remove the return spring. This is quite a strong spring and removal will be made easier by opening the lid to its full extent and then looping a length of strong cord through the eye of the spring. Pull on the cord lifting upwards and at the same time partially close the door and the spring should lift off the anchorage.
- 3 Remove the two setscrews securing the lid and hinge to the inside wall of the filler cap compartment.
- 4 Remove the setscrews and washers securing the hinge to the lid.
- 5 Refitting is the reverse of the above using a similar technique

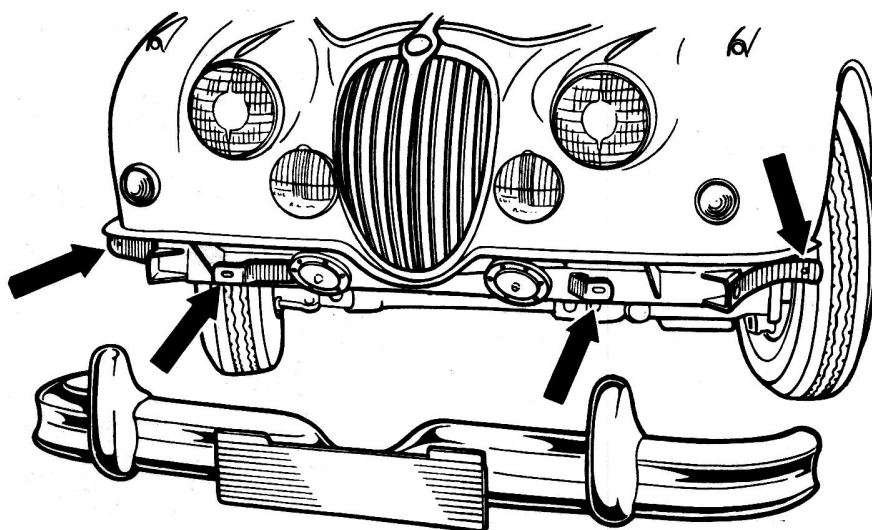


Fig.12.26. The attachment points for the front bumper

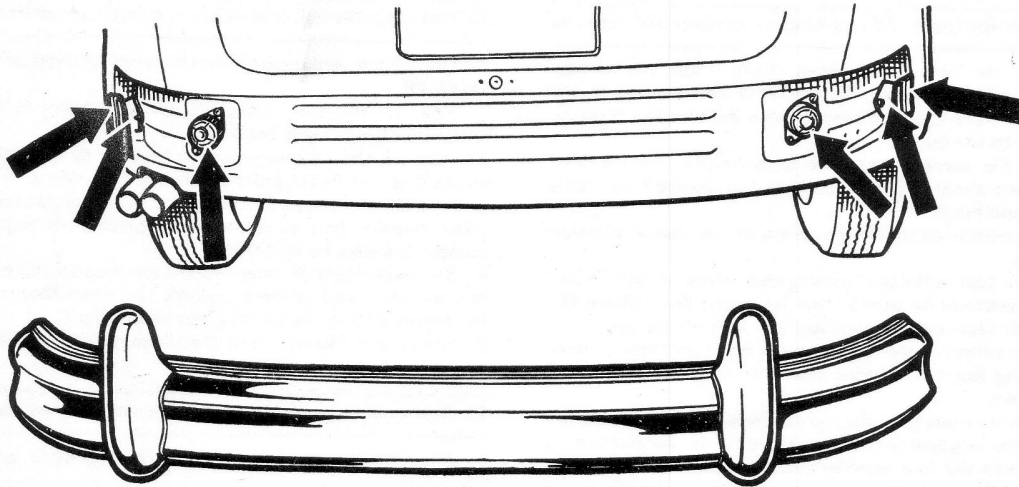


Fig.12.27. The attachment points for the rear bumper

for refitting the spring on its anchorage as was used for its removal.

6 Finally close the lid and align it to fit in its recess in the body panel; this is done by moving it as necessary in the elongated holes in the hinge.

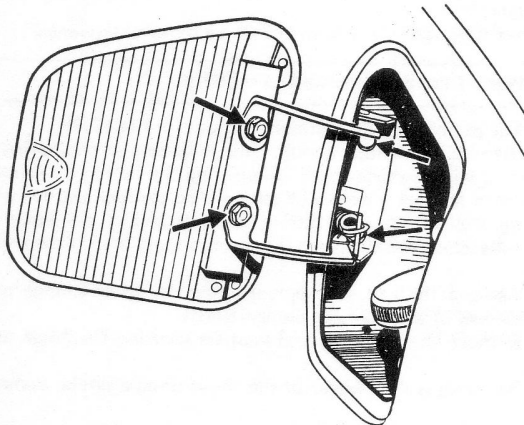


Fig.12.28. Attachment points for the petrol filler lid and hinge

### 28 Heater unit (Fig.12.29) - removal and refitting

- 1 Drain the coolant from the radiator and cylinder block in the manner described in Chapter 2.
- 2 Disconnect the battery.
- 3 Remove the two screws which hold the side panels each side of the heater control panel.
- 4 Disengage the water tap control wire at the rear of the panel by slackening the screw securing the outer casing and then slackening the screw securing the inner wire to the lever.
- 5 Unclip the heater air distribution wire from the spring clip on the lever.
- 6 Now move outside the car and first remove the bonnet as described in Section 23. Although the heater unit can be removed without taking off the bonnet we advise its removal as you will find you have more room and light in which to work.
- 7 Unscrew the wing nut in the centre of the paper element air cleaner (if applicable) and remove the complete air cleaner.
- 8 Disconnect the two wires to the fan motor at their snap

connectors and fold them out of the way.

9 Slacken the jubilee clips and pull off the water hose at the heater control tap and at the pipe leading the heater matrix.

10 Now unscrew the two bolts and the three nuts on the studs which secure the heater body to the scuttle.

11 Withdraw the heater body and control wires and pull out the demister hoses from the sealing rubbers.

12 Details of the method of removing the fan motor from the heater unit are given in Chapter 10.

13 Refitting the heater unit is the reverse of the above operations but before fitting the demister hoses, smear some sealing compound around the holes of the diameter sealing rubber shown in Fig.12.30.

14 When refitting the control cables, place the lever "A" in Fig.12.31 into the fully open (HOT) position, that is, as far as possible towards the heater. Similarly place the control lever in the car to the fully HOT position and then feed the control wire through the lever bracket couplings and tighten the screw which secures the wire to the lever and now tighten the screw holding the outer casing to the anchorage (shown as "A" and "B" respectively in Fig.12.32).

15 Press the flap operating lever, "B" in Fig.12.31, located on the side of the heater box, into the fully shut "screen" position and similarly place the distribution control lever in the car into the screen position. Feed the control wire through the lever bracket coupling and then tighten the screw securing the wire to the lever and the screw holding the outer casing on the bracket.

16 Refill the system with coolant and check for leaks at the pipe unions.

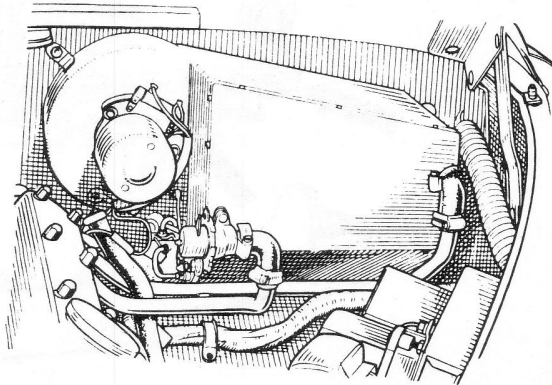


Fig.12.29. The heater unit and water control tap

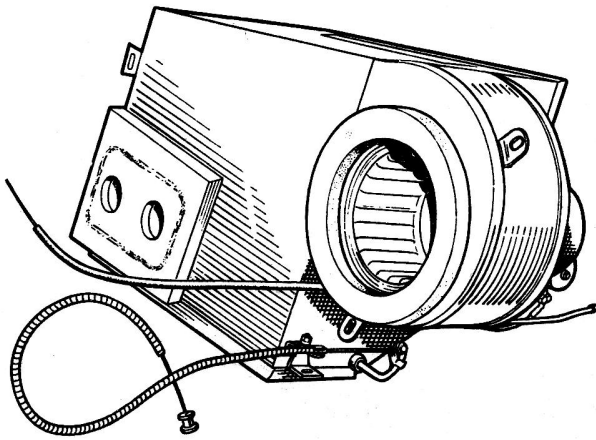


Fig.12.30. The demister duct

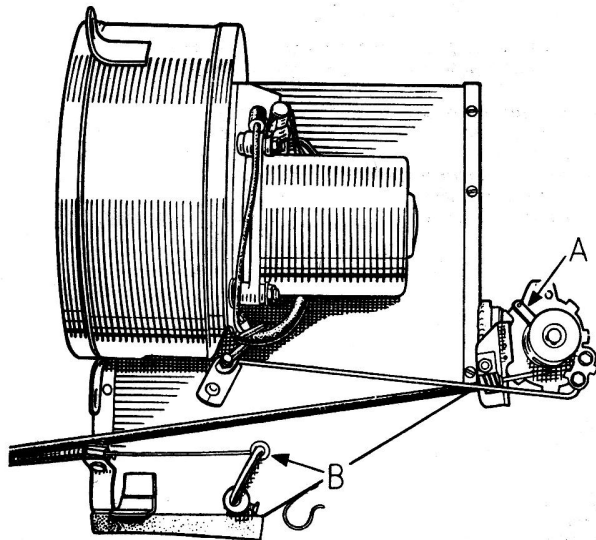


Fig.12.31. Setting the heater flap control

### 29 Heater water control tap - removal and refitting

- 1 Drain the coolant from the system in the manner described in Chapter 2.
- 2 Refer to Fig.12.29 which shows the location of the tap.
- 3 Slacken the jubilee clip securing the water pipe to the tap and then pull the pipe off the tap.
- 4 Slacken the bolt securing the outer cover of the control wire to the bracket on the tap and then slacken the locknut and setscrew which secure the control wire to the valve lever on the control tap.
- 5 Withdraw the remote control wire from the tap.
- 6 Slacken the locknut and the setscrew which secure the heater control flap wire to the valve lever and then withdraw the wire.
- 7 Remove the setscrews holding the tap to the heater body and remove the tap and the rubber sealing washer.
- 8 Refitting is the reverse of the above sequence but replace the rubber hose to the tap and the rubber sealing washer if their condition is at all doubtful.

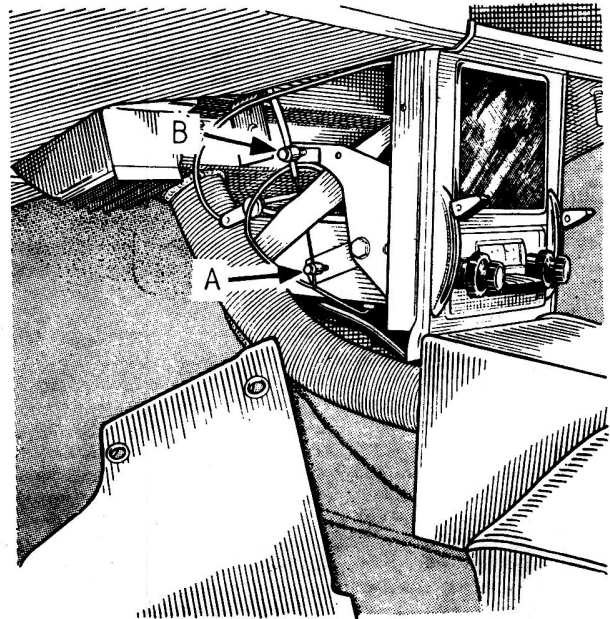


Fig.12.32. Setting the heater operating lever

### 30 Exhaust system - general

The exhaust system fitted to 2.4 litre Mk 1 and 2 models, illustrated at Fig.12.33, consists of a branched down pipe and a single silencer and tail pipe. There are slight differences in the system fitted to the two models. These are that on the Mk 2 car the mounting bracket is integral with the silencer and the tail pipe is of slightly different shape.

All other models are provided with what is in effect two separate exhaust systems as can be seen from the illustration at Fig.12.34. Except for the 3,4 litre Mk 1 and the down pipes of the 240 model, all later cars have identical components in the system.

### 31 Exhaust system - removal and refitting

- 1 The following paragraphs refer to 2.4 litre Mk 1 and 2 cars.
- 2 Remove the nut and bolt securing the tail pipe to the bracket under the rear bumper on the left hand side for Mk 2 models and on the right hand side of the car in respect of the Mk 1 range.
- 3 Slacken the clip securing the tail pipe to the silencer and remove the tail pipe.
- 4 Slacken the clip securing the silencer to the down pipe.
- 5 Remove the nuts and bolts securing the silencer to the rubber mounting brackets and remove the silencer. Whilst doing this, try not to put too much strain on the flexible portion of the down pipe.
- 6 Remove the four nuts and washers securing each branch of the downpipe to the exhaust manifold.
- 7 Take off the nut and bolt which secures the downpipe to the bracket on the bellhousing and the downpipe can now be removed. Discard the copper seals fitted between the downpipe and the exhaust manifold flanges.
- 8 Follow the same sequence as the above to remove the twin exhaust system from the other models except, of course, two clips have to be removed when disconnecting the downpipes and the tail pipes from the silencer assembly.
- 9 Considerable difficulty may be experienced, on all models, in separating the tail pipes and the downpipes from the silencer, there is no easy way of doing this and each case will have to be treated on its merits. All we can suggest is that you bend each section of the silencer pipe extension up slightly and then break the joint by tapping all round or even inserting a thin screwdriver

in the join.

10 Refitting is the reverse of the removal sequence but always use new copper sealing rings between the downpipe and the exhaust manifold.

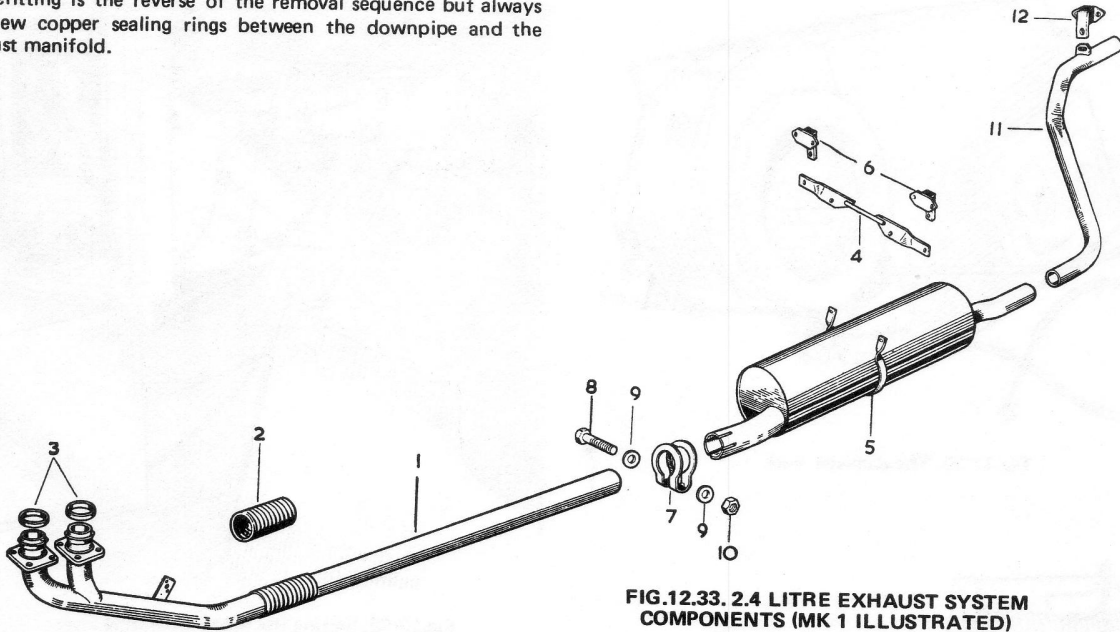


FIG.12.33. 2.4 LITRE EXHAUST SYSTEM COMPONENTS (MK 1 ILLUSTRATED)

- |                          |                    |
|--------------------------|--------------------|
| 1 Exhaust downpipe       | 7 Clip             |
| 2 Flexible pipe          | 8 Bolt             |
| 3 Sealing ring           | 9 Washer           |
| 4 Adaptor mounting plate | 10 Nut             |
| 5 Exhaust silencer       | 11 Tail pipe       |
| 6 Rubber mounting        | 12 Rubber mounting |

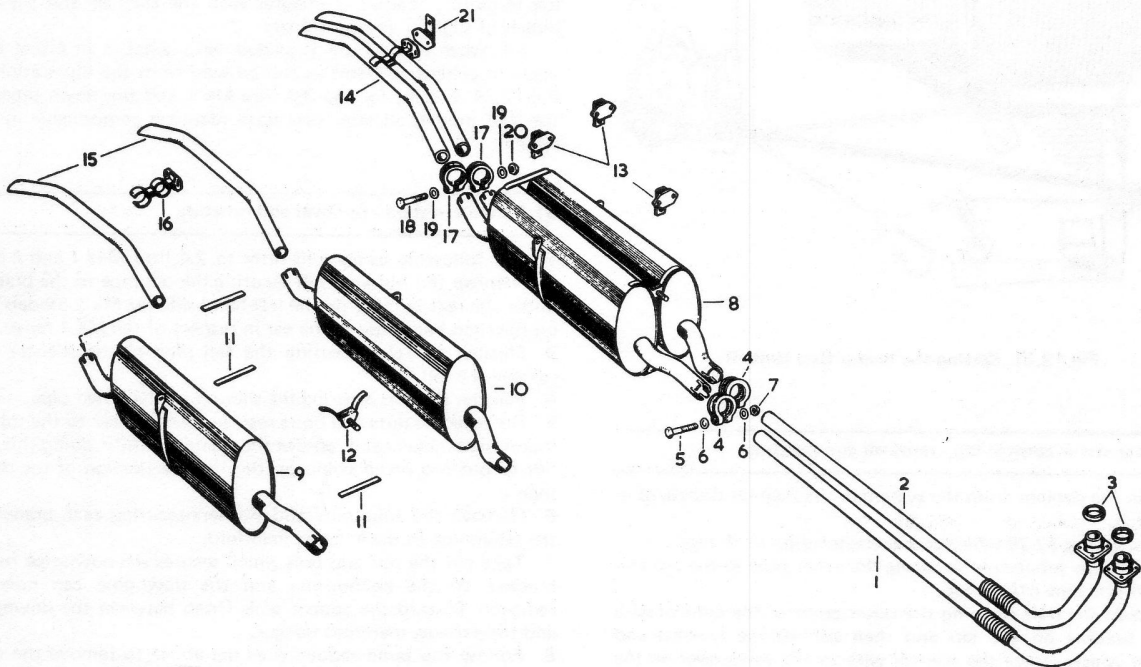


FIG.12.34. EXHAUST SYSTEM COMPONENTS 3.4, 3.8 LITRE AND 240, 340 MODELS

- |                       |                          |                               |                    |
|-----------------------|--------------------------|-------------------------------|--------------------|
| 1 Front downpipe      | 7 Nut                    | 13 Rubber mounting            | 18 Bolt            |
| 2 Rear downpipe       | 8 Twin silencer assembly | 14 Exhaust tail pipe assembly | 19 Plain washer    |
| 3 Copper sealing ring | 9 Inner silencer         | 15 Tail pipe                  | 20 Nut             |
| 4 Clip                | 10 Outer silencer        | 16 Mounting bracket           | 21 Rubber mounting |
| 5 Bolt                | 11 Strap                 | 17 Clip                       |                    |
| 6 Plain washer        | 12 Strap assembly        |                               |                    |



### 32 Wheels and tyres - general

All cars are fitted with pressed steel disc wheels as standard. Wire spoke wheels were available as optional equipment on most models. The wire spoke wheels fitted to early Mk 1 models had either 60 or 72 spokes per wheel and these should only be fitted to individual cars in complete sets.

Tyres, size 6.00/6.40 x 15, supplied with the later model cars were Dunlop Gold Seal C.41 (tubeless) for use with disc wheels and Dunlop RS5 (tubed) for use with disc or spoked wheels. Dunlop SP 41 (radial) are offered for optional fitment.

### 33 Tyre inflation pressures

It is important to maintain the tyre pressures at the correct figures as given below as incorrect pressure will affect the steering, riding comfort and tyre wear.

The pressure should be checked when the tyre is cold and not when it has attained its normal running temperature when an increase in pressure due to increased tyre temperature is to be expected and is allowed for in the quoted pressure when cold. Always ensure that the caps are fitted to the valves as they not only prevent the ingress of dirt but also act as a secondary seal to the valve core.

### 34 Wheel alignment and tyre wear

It is most important that correct alignment of the front wheels (see Chapter 11) is maintained as misalignment causes a tyre tread to be scrubbed off laterally because the natural direction of the wheel will differ from that of the car.

Misalignment of the front wheels is indicated by an upstanding sharp "fin" thrown up on the edge of each pattern rib. "Fins" on the inside edges of the ribs, that is the edges nearest the car, indicate excessive "toe-in" whilst those on the outside edges show that the wheels are "toeing-out".

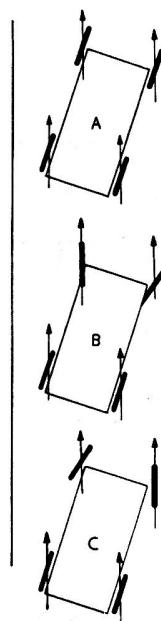
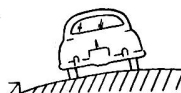
Road camber affects the direction of the car as it imposes a side thrust and the car drifts towards the nearside and this is instinctively, although perhaps not knowingly, corrected by steering towards the centre of the road. This action results in a crabwise motion of the car as shown in exaggerated form in Fig.12.35 which also illustrates why nearside tyres are very sensitive to too much "toe-in" and offside tyres to "toe-out".

### 35 Tyre replacement and wheel interchanging

It is common practice to interchange wheels at regular intervals with the object of getting even wear on the tyres. However, changing wheels with part worn tyres from the rear to the front positions can cause very adverse changes in steering characteristics. It is our experience that this can result in "wander" and vagueness in "feel" of the steering as is usually associated with misalignment of the front wheels. We recommend, therefore, as do Jaguar Cars Ltd, that wheels with part worn tyres are not transferred from the rear to the front positions. When the time comes to change the rear tyres, and these will invariably wear quicker than the front, fit these wheels with the new tyres on the front and transfer those from the front, which should still have a useful tyre life left, to the rear. If the tyre on the spare wheel is new this can, of course, be brought into use in the front position and one of the rear wheels with a new tyre then held as the spare.

### 36 Wire spoke wheels - removal and refitting

The removal and refitting of the Dunlop - 72 wire spoke wheels requires a slightly different technique to that employed with disc wheels attached with the conventional five nuts to



A. WHEELS PARALLEL IN MOTION; TYRE WEAR EQUAL

B. WHEELS TOED-OUT IN MOTION; RIGHT FRONT TYRE WEARS FASTER

C. WHEELS TOED-IN IN MOTION; LEFT FRONT TYRE WEARS FASTER

Fig.12.35. Showing how road camber and front wheel misalignment affect tyre wear

studs. The spoked wheels are mounted on splined hubs and are held in position by knock-on hub caps as illustrated in Fig.12.36. The hub caps are marked, as shown in the drawing, to indicate the side of the car to which they fit and the direction in which they have to be turned for undoing. But, in case the markings have been obliterated, it must be remembered that the nearside caps, that is the left hand side of the car looking forward, have a **right hand thread** and undo by turning in an **anti-clockwise** direction. The caps fitted to the offside of the car, right hand side looking forward, have a **left hand thread** and undo by turning in a **clockwise** direction.

1 To remove the wheels, place the car on level ground and prepare for jacking in the normal manner.

2 If the rear wheel is to be changed, open the appropriate rear door and undo the two screw headed quick release fasteners holding the nave plate. Lower the nave plate to disengage the lip with the body and then pull forward to disengage the peg at the rear.

3 Before lifting the car, slacken, but do not remove the hub cap by striking it in the appropriate direction with a copper or hide faced mallet.

4 Raise the car and unscrew the hub cap and then pull the wheel outwards off the splines.

5 To refit the wheel, mount it on the splined hub but try not to damage the "lead-in" to the splines as this will make fitting, and subsequent removal, difficult.

6 Fit the hub cap and tighten as much as possible by rotating it in the required direction (anti-clockwise for right hand side and clockwise for left hand side).

7 Lower the car and then finally tighten the hub fully, using the copper or hide faced mallet.

8 Refit the nave plate to the rear wheel arch (if applicable).

## TYRE PRESSURE CHART

On all the models it is advisable to increase the REAR tyre pressure by 4 lbs. per sq. in. (.28 kg/cm<sup>2</sup>) when undertaking a long journey with a full load of passengers and luggage.

### 2.4 LITRE AND 240 MODELS

#### DUNLOP GOLD SEAL C.41 (TUBELESS) TYRES

For conditions where maximum performance with sustained speeds is being used, or for touring conditions where the car is fully laden:

**Front**  
33 lb/in<sup>2</sup>  
(2,3 kg/cm<sup>2</sup>)

**Rear**  
33 lb/in<sup>2</sup>  
(2,3 kg/cm<sup>2</sup>)

For normal motoring with maximum speed up to 90 m.p.h. (145 k.p.h.)

28 lb/in<sup>2</sup>  
(2,0 kg/cm<sup>2</sup>)

28 lb/in<sup>2</sup>  
(2,0 kg/cm<sup>2</sup>)

For two-up normal motoring to give maximum comfort it is permissible and may be found desirable to reduce the rear tyre pressures by 3 lb/in (0,2 kg/cm).

### 2.4, 3.4 AND 3.8 LITRE MARK 2, 240 AND 340

#### DUNLOP RS5 TYRES

For conditions where maximum performance with sustained speeds is being used, or for touring conditions where the car is fully laden:

**Front**  
33 lb/in<sup>2</sup>  
(2,3 kg/cm<sup>2</sup>)

**Rear**  
33 lb/in<sup>2</sup>  
(2,3 kg/cm<sup>2</sup>)

For normal motoring with maximum speed up to 110 m.p.h. (176 k.p.h.)

28 lb/in<sup>2</sup>  
(2,0 kg/cm<sup>2</sup>)

28 lb/in<sup>2</sup>  
(2,0 kg/cm<sup>2</sup>)

For two-up normal motoring to give maximum comfort it is permissible and may be found desirable to reduce the rear tyre pressures by 3 lb/in<sup>2</sup> (0,2 kg/cm<sup>2</sup>).

#### DUNLOP SP 41 TYRES (OPTIONAL)

For conditions where maximum performance with sustained speeds is being used, or for touring conditions where the car is fully laden:

**Front**  
36 lb/in<sup>2</sup>  
(2,5 kg/cm<sup>2</sup>)

**Rear**  
36 lb/in<sup>2</sup>  
(2,5 kg/cm<sup>2</sup>)

For normal motoring with maximum speed up to 100 m.p.h. (160 k.p.h.)

30 lb/in<sup>2</sup>  
(2,1 kg/cm<sup>2</sup>)

30 lb/in<sup>2</sup>  
(2,1 kg/cm<sup>2</sup>)

For two-up normal motoring to give maximum comfort it is permissible and may be found desirable to reduce the rear tyre pressures by 3 lb/in<sup>2</sup> (0,2 kg/cm<sup>2</sup>).

### 37 Wire spoke wheels - repair and adjustment

Wire spoke wheels should be examined at regular intervals for damage to looseness of spokes. Either fault should be rectified without delay as it is likely that the wheel will be out of truth in a lateral or radial direction or a combination of both.

Spokes, 24 long and 48 short per wheel, with their securing nipples are available as spares and although their fitment presents no very great problem you may find difficulty in trueing the wheel as a free running trueing stand, and a certain amount of expertise are called for. However, if you wish to repair the wheel yourself, and have no access to a trueing stand and provided there is no play in the bearings of the front wheel hub on your car you may consider using the hub as a trueing stand, but it will make for awkward working.

The following paragraphs assume that the wheel is being completely rebuilt.

- 1 Place the wheel centre and the rim on a flat surface with the valve hole upwards in the 6 o'clock position.
- 2 Refer to Fig.12.37.
- 3 Starting at the valve hole fit one A, B, C and D spoke to produce the pattern shown in the drawing.
- 4 Once you have established the correct pattern, remove the A and B spokes.
- 5 Fit the nipple to the D spoke and screw it up finger tight. Leave the C spoke loose and without a nipple fitted.
- 6 Assemble all the D spokes and screw up the nipples finger tight.
- 7 Now insert all the C spokes through the hub shell but do not fit the nipples.
- 8 Attach all the B spokes and fit their nipples finger tight.
- 9 Repeat with all the A spokes.
- 10 Attach the nipples finger tight to all the C spokes.
- 11 Tighten the two C spokes and the two D spokes on each side of the valve hole until the ends of the spokes are just below the slot in the head of the nipple.
- 12 Repeat with the two C and two D spokes diametrically opposite the valve hole.

13 Work round the wheel and tighten all the C and D spokes as above.

14 Repeat with all the A and B spokes until the end of these spokes are also just below the slot in the nipple heads.

15 Work round the wheel and tighten the nipples on diametrically opposed spokes until some resistance is felt on all spokes.

16 Now mount the wheel on a trueing stand.

17 Spin the wheel and, with a piece of chalk, mark any high spots near the wall of the rim flange. Tighten the A and B spokes and slacken the C and D spokes in the region of the marks.

Note: No spoke should be tightened to the extent that it is impossible to tighten it further (maximum normal torque is 60 lb f in (0.7 kg f m). If a spoke is as tight as it will go, all the other spokes must be slackened.

18 Carry on until all lateral errors are corrected.

19 Radial errors must now be corrected and this is done by spinning the wheel and marking the high spots on the horizontal tyre seat.

20 Tighten all the spokes in the region of the marks, or, if those spokes are on the limit of tightness, slacken all the others.

21 Now refer to Fig.12.38 and check the "dish" of the wheel. This is the lateral dimension from the inner face of the flanges of the wheel centre to the inner edge of the region of the wheel rim and should be 3.7/16"  $\pm$  1/16" (8.73 mm  $\pm$  1.58 mm).

22 If the "dish" is in excess of the above dimension, tighten all A and B spokes and slacken all C and D by a similar amount. Conversely, if the dimension is less than that quoted, slacken all A and B and tighten all C and D spokes by a similar amount.

23 If correction for "dish" has been made, it will be necessary to repeat the lateral and radial trueing until the wheel is not more than 0.060" (1.5 mm) out of truth in either direction.

24 If the trueing operation has been completed properly, all the spokes should be uniformly tensioned and to a reasonably high degree, A correctly tensioned spoke should emit a high pitched note when lightly tapped with a hammer. If a nipple spanner of the torque recording type is used, the reading, as stated above, should be in the region of 60 lb f in (0.0 kg f m) for a properly tightened spoke.

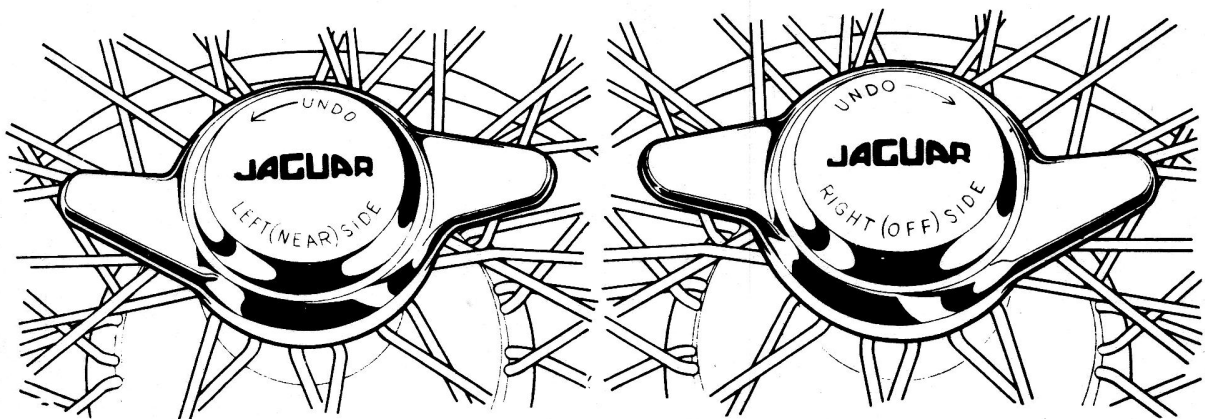


Fig.12.36. Hub caps left and right side

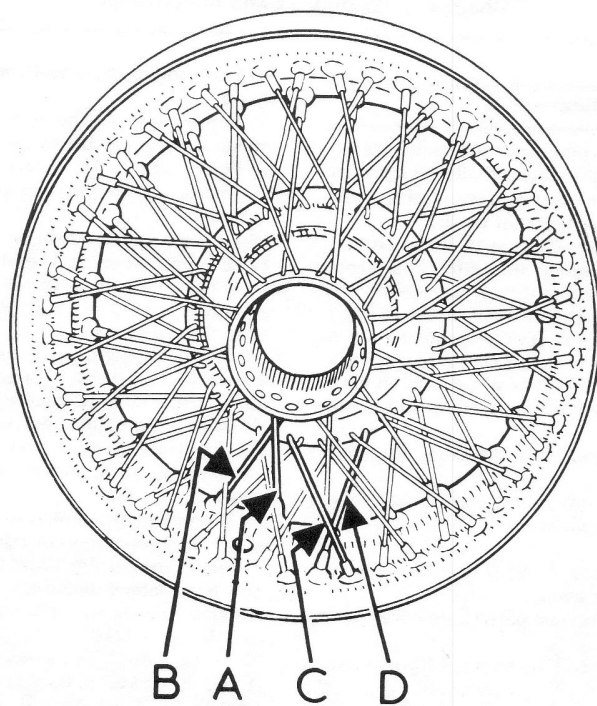


Fig.12.37. Showing the arrangement of spokes

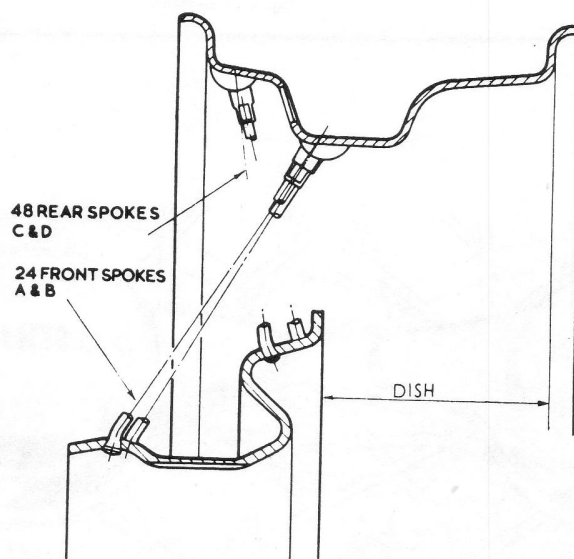


Fig.12.38. Measurement of 'dish' and location of spokes

As this book has been written in the United Kingdom, it uses the appropriate English component names, phrases, and spelling. Some of these differ from those used in America. Normally, these cause no difficulty, but to make sure, a glossary is printed below. In ordering spare parts remember the parts list will probably use these words:

## Glossary

## English

Allen screw ... ..  
 Anti-roll bar ... ..  
 Bonnet (engine cover) ... ..  
 Boot (luggage compartment) ... ..  
 Bottom gear ... ..  
 Bulk head... ..  
 Clearance ... ..  
 Crownwheel ... ..  
 Catch ... ..  
 Cam follower (or tappet) ... ..  
 Drop arm (steering box) ... ..  
 Drop arm shaft ... ..  
 Dynamo ... ..  
 Damper ... ..  
 Earth (electrical) ... ..  
 Estate car ... ..  
 Free play ... ..  
 Free wheel... ..  
 Gudgeon pin ... ..  
 Gearchange ... ..  
 Gearbox ... ..  
 Hood ... ..  
 Hard top ... ..  
 Hot spot ... ..  
 Leading shoe (of brake)... ..  
 Lay shaft (in gearbox) ... ..  
 Mudguard or wing ... ..  
 Motorway... ..  
 Petrol ... ..  
 Reverse ... ..  
 Split cotter (as in valve spring cap) ... ..  
 Split pin ... ..  
 Sump ... ..  
 Silencer ... ..  
 Self-locking nut ... ..  
 Steering arm ... ..  
 Saloon ... ..  
 Side light ... ..  
 Spanner ... ..  
 Tappet ... ..  
 Tab washer ... ..  
 Top gear ... ..  
 Transmission ... ..  
 Trailing shoe (of brake)... ..  
 Track rod (of steering) ... ..  
 Warning light... ..  
 Windscreen ... ..  
 Wing side lights ... ..

## American

Hexagon socket screw  
 Stabiliser or Sway bar  
 Hood  
 Trunk  
 1st gear  
 Firewall  
 Lash  
 Ring gear (of differential)  
 Latch  
 Valve lifter  
 Pitman arm  
 Pitman shaft  
 Generator (DC)  
 Shock absorber  
 Ground  
 Station wagon  
 Lash  
 Coast  
 Piston pin or wrist pin  
 Shift  
 Transmission  
 Soft top  
 Hard top  
 Heat riser  
 Primary shoe  
 Counter shaft  
 Fender  
 Freeway, Turnpike  
 Gas  
 Back-up  
 Lock (for valve spring retainer)  
 Cotter pin  
 Oil pan  
 Muffler  
 Pawl nut  
 Spindle arm  
 Sedan  
 Parking light  
 Wrench  
 Valve lifter  
 Tang; lock  
 High  
 Whole drive line from clutch to axle shaft  
 Secondary shoe  
 Tie rod (or connecting rod)  
 Tell Tale  
 Windshield  
 Cats eye illuminator

## Miscellaneous points

An 'Oil seal' is fitted to components lubricated by grease!

A 'Damper' is a 'Shock absorber': it damps out bouncing, and absorbs shocks of bump impact. Both names are correct, and both are used haphazardly.

Note that British drum brakes are different from the Bendix type that is common in America, so different descriptive names result. The shoe end furthest from the hydraulic wheel cylinder is on a pivot; interconnection between the shoes as on Bendix brakes is most uncommon. Therefore the phrase 'Primary' or 'Secondary' shoe does not apply. A shoe is said to be Leading or Trailing. A 'Leading' shoe is one on which a point on the drum, as it rotates forward, reaches the shoe at the end worked by the hydraulic cylinder before the anchor end. The opposite is a trailing shoe, and this one has no self servo from the wrapping effect of the rotating drum.

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