

CHAPTER 13

THE BODYWORK

13:1 Bodywork finish
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13:1 Bodywork finish

Large scale repairs to body panels are best left to expert panel beaters. Even small dents can be tricky, as too much hammering will stretch the metal and, make things worse instead of better. If panel beating is to be attempted, use a dolly on the opposite side of the panel. The head of a large hammer will suffice for small dents, but for large dents a heavy block of metal will be necessary. Use light hammer blows to reshape the panel, pressing the dolly against the opposite side of the panel to absorb the blows. If this method is used to reduce the depth of dents, final smoothing with a suitable filler will be easier, although it may be better to avoid hammering minor dents and just use the filler.

Clean the area to be filled, making sure that it is free from paint, rust and grease, then roughen the area with emerycloth or a file to ensure a good bond. Use a proprietary fibre glass filler paste mixed according to the instructions and press it into the dent with a putty knife. Allow the filler to stand proud of the surrounding area to allow for rubbing down after hardening. Use a file and emerycloth or a disc sander to blend the repaired area to the surrounding bodywork, using finer grade abrasives as the work nears completion. Apply a coat of primer surfacer and, when it is dry, rub down with

'Wet-or-Dry' paper lubricated with soapy water, finishing with 400 grade. Apply more primer and repeat the operation until the surface is perfectly smooth. Take time in achieving the best finish possible at this stage as it will control the final effect.

The touching-up of paintwork can be carried out with self-spraying cans of paint, these being available in a wide range of colours. Use a piece of newspaper or board as a test panel to practice on first, so that the action of the spray will be familiar when it is used on the panel. Before spraying the panel, remove all traces of wax polish. Mask off large areas such as windows with newspaper and masking tape. Small areas such as trim strips or door handles can be wrapped with masking tape or carefully coated with grease or petroleum jelly. Apply the touching-up paint, spraying with short bursts and keeping the spray moving. Do not attempt to cover the area in one coat, applying several successive coats with a few minutes drying time between each. If too much paint is applied at one time, runs will develop. If so, do not try to remove the run by wiping but wait until it is dry and rub down as before.

After the final coat has been applied, allow a few hours of drying time before blending the new finish to the old with fine cutting compound and a cloth, buffing

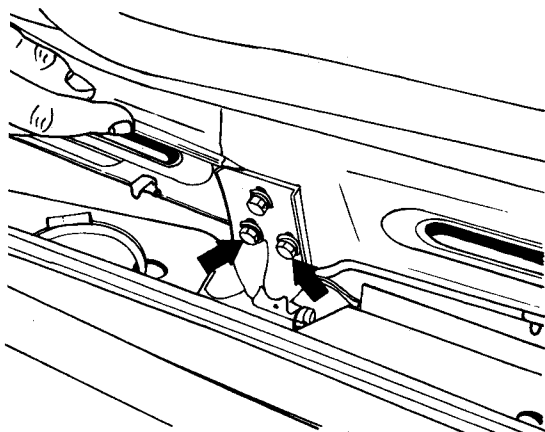


FIG 13:1 Bonnet hinge details

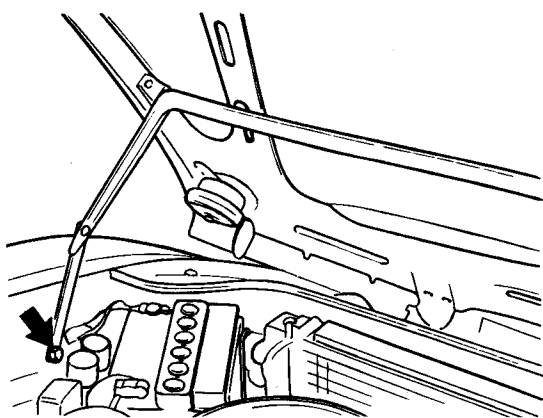


FIG 13:2 Bonnet support arm fixing

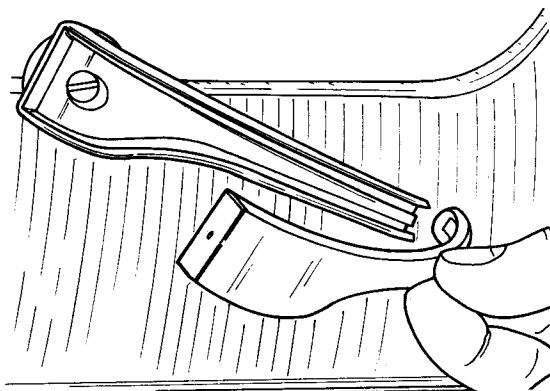


FIG 13:3 Removing inside door handle

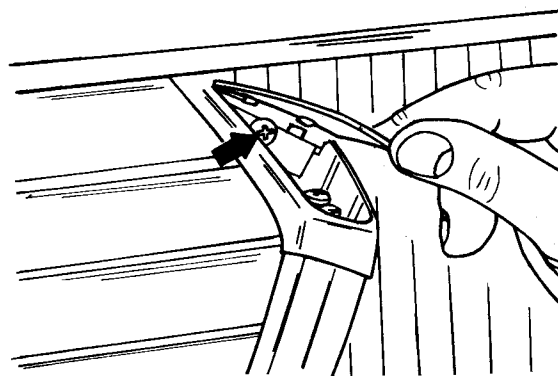


FIG 13:4 Removing front door armrest

with a light circular motion. Leave the paint to harden for a period of weeks rather than days before applying wax polish.

13:2 The bonnet

Bonnet removal:

Open the bonnet fully, then detach the horn wiring from the clips on the bonnet panel and detach the wiring connector from the horn. Refer to FIG 13:1 and scribe round the outline of the hinge plates so that the bonnet panel can be refitted in its original position. Remove the two lower bolts which are arrowed and slacken the third upper bolt. Have an assistant steady the bonnet panel, then remove the bolts securing the support arms on each side as shown in FIG 13:2. Remove the remaining hinge mounting bolt and carefully lift off the bonnet panel.

Refitting is a reversal of the removal procedure, carefully aligning the hinges with the scribe marks on the panel.

Bonnet alignment:

If the bonnet panel does not fit correctly in the body aperture, scribe round the hinge plates as shown in FIG 13:1 so that the amount of adjustment can be assessed, then slacken the hinge mounting bolts and move the panel within the limits allowed by the slotted mounting holes. Tighten the bolts and recheck alignment.

13:3 Door components

Removing trim panel:

Remove the lock knob, which is threaded on to the lock rod. Press the inside door handle trim down at the rear and lift out at the front, as shown in FIG 13:3. Remove the single screw and detach the handle. Remove the armrest on front doors by lifting the cover plate as shown in FIG 13:4, then removing the single screw arrowed and the remaining three lower screws. On rear doors, remove the armrest by pressing together the upper and lower ends of the trim pad as shown in FIG 13:5, then removing the two lower fixing screws. Remove the regulator handle by pulling out the trim, then removing the single screw. Collect the thrust washer.

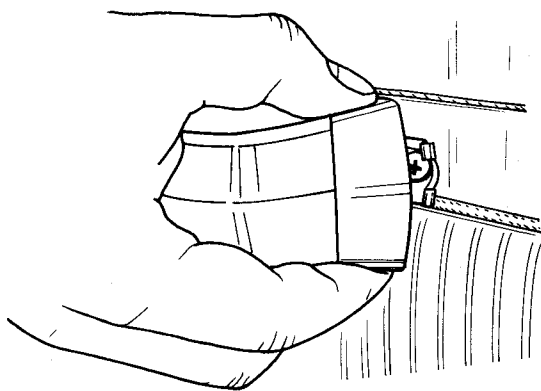


FIG 13:5 Removing rear door armrest

Lift out the front and rear window aperture corner seals, then remove the two fixing screws which secure the upper part of the trim panel to the door frame. Carefully pull the trim panel away from the door to release the spring clips. If access to door internal components is required, carefully pull the plastic sealing sheet from the door panel. Always renew the sealing sheet if it is damaged in any way.

Refitting:

This is a reversal of the removal procedure. The plastic sealing sheet should be attached to the door panel using Terokal 2012 adhesive or similar, carefully smoothing the sheet into place to ensure an effective seal against water leakage. When installing the trim panel, note that the larger diameter of conical spring for regulator handle must face the trim panel.

Removing regulator mechanism:

Remove the trim panel as described previously. Make sure that the window is fully closed, then refer to FIG 13:6 and remove the four screws on front door or three screws on rear door to detach regulator mechanism.

Use a wedge or other suitable means to hold the glass firmly in the closed position, then move the regulator arm to the open end of the slot to detach from the lift rail, as shown in FIG 13:7. Note that the plastic washers 1 must locate on each side of the lift rail when the regulator mechanism is installed.

Refitting is a reversal of the removal procedure. Lubricate toothed segment on regulator mechanism using multi-purpose grease.

Front door glass removal:

Remove the trim panel as described previously. Refer to FIG 13:8 and lift out the cover clips at front and rear of window frame. Beginning at the rear, loosen the window aperture trim strip by light blows against a suitable hardwood wedge, then remove the trim strip. Refer to FIG 13:9 and remove the window lift rail holder. Lower the glass by approximately 17cm (7in), then tilt forwards and detach the lift arm from the lift rail as shown in FIG 13:7. Carefully remove the glass from the door panel.

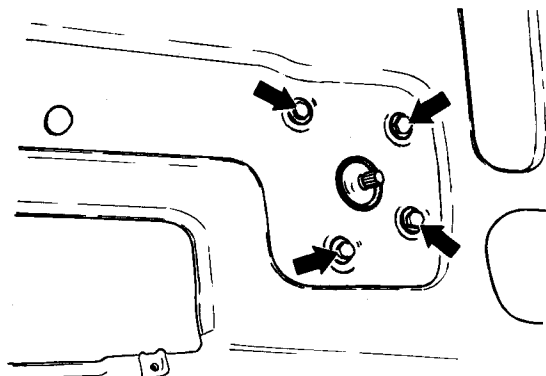


FIG 13:6 Regulator fixing screws, front door shown

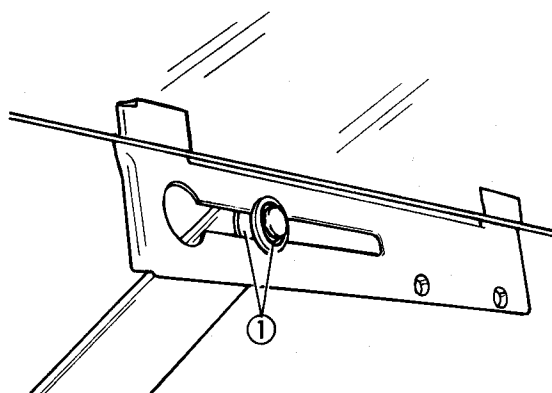


FIG 13:7 Window lift rail, front door shown

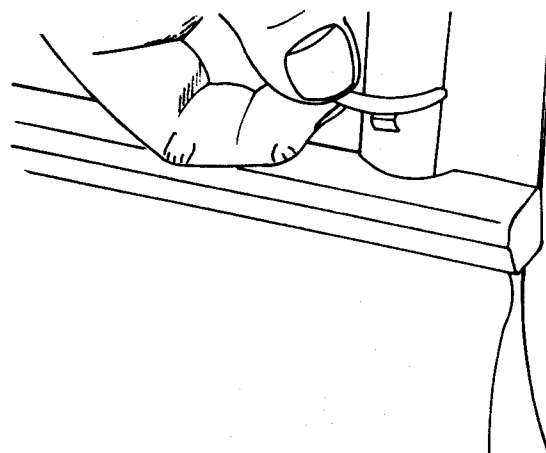


FIG 13:8 Window aperture trim clip

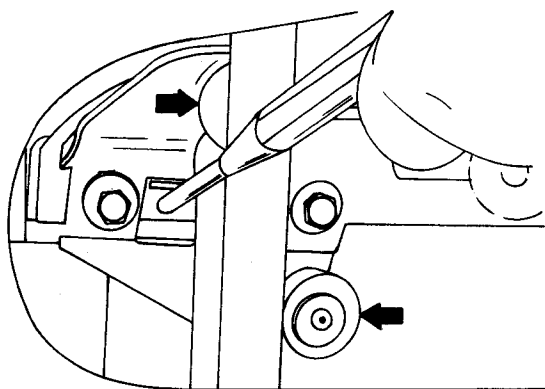


FIG 13:9 Window lift rail holder

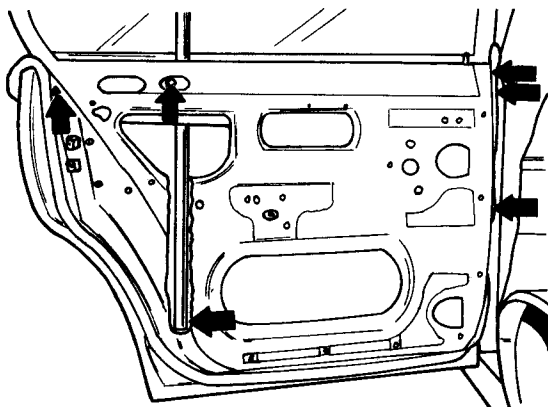


FIG 13:10 Rear door window frame securing screws

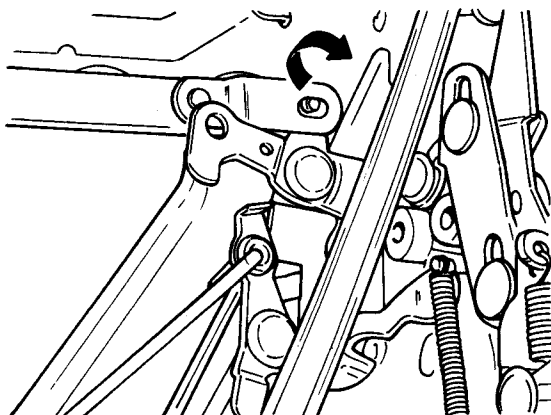


FIG 13:11 Rear door lock connecting rod

Refitting:

This is a reversal of the removal procedure. Before tightening the lift rail holder attachments, move the guide rail to align the door window with the frame. When tightening the lift rail holder fixings, press the holder upwards as shown in FIG 13:9 so that the guide rollers are pressed against the guide rail as indicated by the arrows. Note that the plastic washers shown at 1 in FIG 13:7 must run on each side of the lift rail.

Rear door glass removal:

Remove the trim panel as described previously. Remove the outer window aperture trim strip in the manner previously described for front door components. Lift out the short inner window aperture seal, then pull the door sealing rubber away from the window frame. Remove the fixing screws arrowed in FIG 13:10, then lower the window glass fully and pull out the complete window frame. Detach the lift arm from the lift rail in the manner shown in FIG 13:7, then carefully lift out the glass.

Refitting:

This is a reversal of the removal procedure. Note that the plastic washers shown at 1 in FIG 13:7 must run on each side of the lift rail. Before fully tightening the window frame securing screws shown in FIG 13:10, check that the window can be raised and lowered smoothly. If necessary, lower the glass and adjust the position of the window frame then tighten the screws and raise the glass to recheck. Always adjust window frame position with the glass lowered.

Front door lock removal:

Remove the door trim panel as described previously, then lower the window fully. Remove the fixing screws and detach the inner window aperture trim strip. Partly pull away the rubber seal from the window frame and door then remove the Allen screw securing the upper front of the window frame, working through the access hole provided. Pull the rubber seal away from the door at the rear, then take out the upper and lower sealing plugs and remove the bolts exposed. Remove the upper and lower door window frame retaining screws through the apertures in the door panel, then lift out the window frame trim clips as shown in FIG 13:8. Pull out the window frame assembly.

Remove the three fixing bolts located around the inner door handle shaft to release the remote control mechanism from the panel. Remove the guide buffer from the edge of the door, collecting the spacing rollers. Remove the four cross-headed screws securing the lock mechanism to the door panel, then remove the lock in the closed position complete with remote operating mechanism.

Refitting is a reversal of the removal procedure. Make sure that the spacing rollers are inserted into the guide buffer. Install the window frame assembly loosely at first, then check that the window glass raises and lowers fully and fits accurately in the frame. If necessary, lower the glass and adjust the frame position, then raise the glass and recheck. Always carry out adjustments with the glass lowered. Fully tighten the frame fixings on completion.

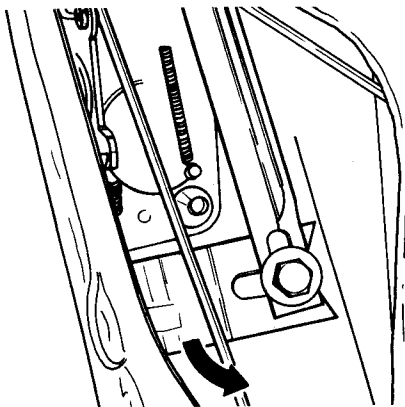


FIG 13:12 Rear door window frame front support bracket

Rear door lock removal:

Remove the trim panel as described previously. Remove the three screws located around the inner door handle shaft to release the remote control mechanism. Refer to **FIG 13:11** and detach the connecting rod at the door lock. Unscrew the front support bracket for the window frame as shown in **FIG 13:12**, then swing the bracket inwards. Remove the guide buffer from the edge of the door, collecting the spacing rollers. Remove the three cross-headed screws securing the lock to the door panel, then remove the lock complete with remote operating mechanism in the closed position.

Refitting is a reversal of the removal procedure. Note that the child-proof locking mechanism lever on the door lock assembly must be in the upper (open) position when installing the assembly. Make sure that the spacing rollers are correctly inserted into the guide buffer.

Outside door handle removal:

To remove the outside handle on front or rear door, pull the handle outwards and take out the two screws to release the handle from the operating levers. To remove the inner mechanism, detach the trim panel as described previously then remove the two fixing screws securing the assembly to the door panel.

Refitting is a reversal of the removal procedure, making sure that the outer handle rests against the rubber buffers provided when it is in the closed position.

Front door lock barrel removal:

Remove the trim panel as described previously. Refer to **FIG 13:13** and remove the nut from the inside of the lock barrel. Extract the lock barrel towards the outside. Do not attempt to dismantle the lock barrel. The key number is stamped on the side of the barrel.

Refitting is a reversal of the removal procedure.

13:4 Heating and air conditioning

Heater blower motor removal:

Remove the heater motor cover plate as described in **Chapter 12, Section 12:6**. Lift out the mesh grid fitted over the heater blower assembly, then pull off the cable connectors. Remove the screws securing the

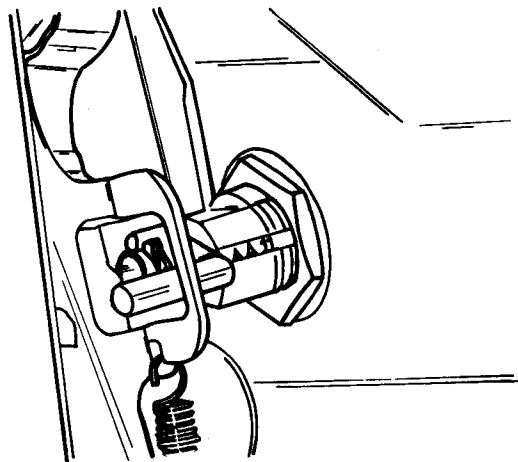


FIG 13:13 Front door lock barrel removal

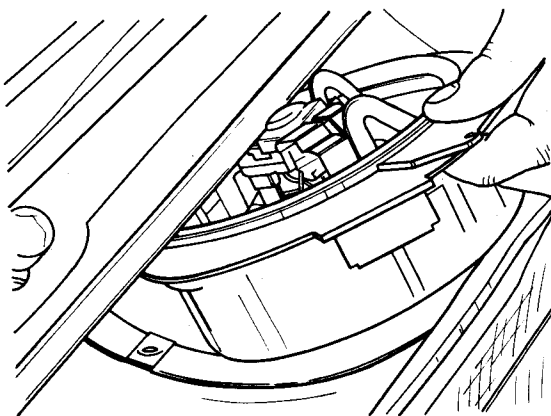


FIG 13:14 Removing heater blower motor assembly

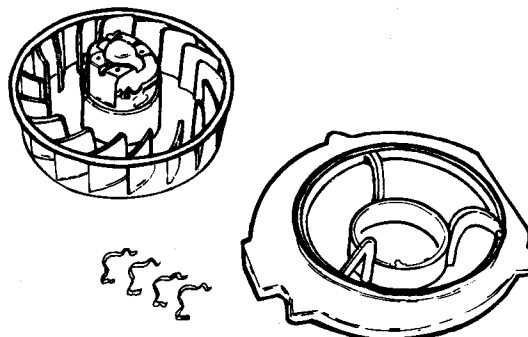


FIG 13:15 Blower unit and mounting

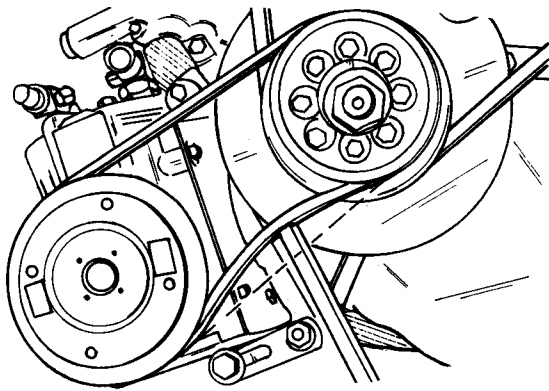


FIG 13:16 Checking compressor drive belt tension

motor mounting to the housing and pull the unit out diagonally upwards, as shown in **FIG 13:14**. Release the retaining clips, then pull the motor from its mounting as shown in **FIG 13:15**.

Do not attempt to separate the blower from the motor shaft as these components are balanced as a matched assembly. If the motor unit is faulty the motor and blower unit must be renewed complete.

Refitting:

This is a reversal of the removal procedure. When installing the motor assembly to the mounting, the shorter ends of the clips should be pressed over the motor mounting.

Air conditioning system:

Owners of vehicles fitted with air conditioning (refrigeration) systems should not attempt to remove or dismantle any of the related components due to the possibility of refrigerant leakage. If the pressurised system is opened, liquid refrigerant will escape, immediately evaporating and instantly freezing anything it contacts. Uncontrolled release of the refrigerant will cause frostbite or possibly more serious injury if it contacts any part of the body. For this reason, all work involving removal of air conditioning system components or opening of the pressurised system should be entrusted only to a BMW service station having the necessary special equipment and trained personnel.

Compressor drive belt tensioning:

The tension is correct when the belt can be deflected by 5 to 10mm (0.2 to 0.4in) when firmly pressed at the centre points between the pulleys as shown in **FIG 13:16**. To adjust the tension, slacken the upper bolt on the compressor swivel plate and the lower bolt in the slotted mounting link. Pull the compressor unit away from the engine until the tension is correct, then hold in position while tightening the mounting bolts. Recheck the tension. To remove the belt, slacken the bolts as described previously, then push the compressor towards the engine until the belt can be removed over the pulleys. Refit in the reverse order, correctly tensioning the belt as described previously.