Body repairs, general information

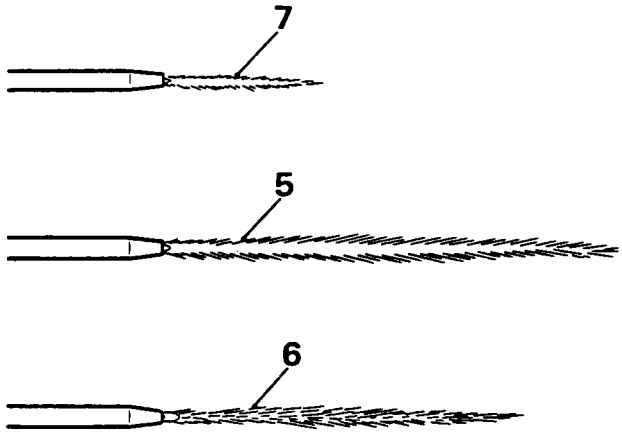
1. The Range Rover body consists of a steel frame to which alloy outer panels are attached. The radiator grille, front deck panel, front wings, side door outer panels, body side outer panels, roof, rear floor and upper rear quarter panels are made from a special light magnesium-aluminium alloy known as 'Birmabright'.
2. 'Birmabright' was developed for aircraft use, and it is much stronger and tougher than pure aluminium. It melts at a slightly lower temperature than pure aluminium and will not rust nor corrode under any normal circumstances. It is work-hardening, and so becomes hard and brittle when hammered, but it is easily annealed. Exposed to the atmosphere, a hard oxide skin forms on the surface of it.

Panel beating 'Birmabright'

3. 'Birmabright' panels and wings can be beaten out after accidental damage in the same way as sheet steel. However, under protracted hammering the material will harden, and then it must be annealed to prevent the possibility of cracking. This is quite easily done by the application of heat, followed by slow air-cooling, but as the melting point is low, heat must be applied slowly and carefully. A rough but very useful temperature control is to apply oil to the cleaned surface to be annealed. Play the welding torch on the underside of the cleaned surface and watch for the oil to clear, which it will do quite quickly, leaving the surface clean and unmarked. Then allow to cool naturally in the air, when the area so treated will again be soft and workable. Do not quench with oil or water. Another method is to clean the surface to be annealed and then rub it with a piece of soap. Apply heat beneath the area, as described above, and watch for the soap stain to clear. Then allow to cool, as for the oil method. When applying the heat for annealing, always hold the torch some little distance from the metal, and move it about, so as to avoid any risk of melting it locally.

Gas welding 'Birmabright'

4. A small jet must be used, one or two sizes smaller than would be used for welding sheet steel of comparable thickness. For instance, use a No. 2 nozzle for welding 18 swg (0.048 in.) sheet, and a No. 3 for 16 swg (0.064 in.) sheet.
5. The flame should be smooth, quiet and neutral, have a brilliant inner core with a well defined rounded end. The hottest point of the flame is close to the jet, and the flame should have a blue to orange envelope becoming nearly colourless at the end.
6. A slightly reducing flame may also be used, that is, there may be a slight excess of acetylene. Such a flame will have a brilliant inner core with a feathery white flame and a blue to orange envelope.



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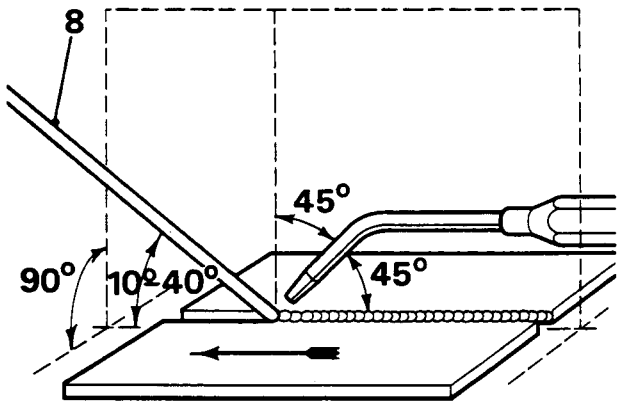
7. Do not use an oxydising flame, which has a short pointed inner core bluish white with a bluish envelope.
8. Use only 5 per cent magnesium/aluminium welding rod (5 Mg/A). Sifalumin No. 27 (MG.5 Alloy) (Use Sifbronze Special flux with this rod) or a thin strip cut of parent metal—that is to say, a strip cut from an old and otherwise useless 'Birmabright' panel or sheet. Do not use too wide or thick a strip, or trouble may be experienced in making it melt before the material which is being welded.



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9. Clean off all grease and paint, dry thoroughly and then clean the edges to be welded, and an area at least half an inch on either side of the weld, with a stiff wire scratch-brush or wire wool. Cleanliness is essential. Also clean the welding rod or strip with wire wool.
10. A special acid flux must be used, and we recommend 'Hari-Kari' which is obtainable from:
The Midland Welding Supply Co. Ltd.,
105 Lakey Lane,
Birmingham 28, England.
or
Sifbronze Special Flux, which is obtainable from:
Suffolk Iron Foundry (1920) Ltd.,
Sifbronze Works.
Stowmarket, England.

11. A small quantity of 'Hari-Kari' may be made into a paste with water, following the directions on the tin, and the paste must be applied to both surfaces to be welded, and also to the rod. In the case of Sifbronze Special Flux use in powder form as directed. Remember that aluminium and its alloys do not show 'red-hot' before melting, and so there is nothing about the appearance of the metal to indicate that it has reached welding temperature. A little experience will enable the operator to gauge this point, but a useful guide is to sprinkle a little sawdust over the work; this will sparkle and char when the right temperature is approached; a piece of dry wood rubbed over the hot metal will sparkle at the point of contact.
12. As the flux used is highly acid, it is essential to wash it off thoroughly immediately after a weld is completed. The hottest possible water should be used, with wire wool or a scratch-brush. Very hot soapy water is good, because of the alkaline nature of the soap, which will tend to 'kill' the acid.

13. It is strongly recommended that a few welds are made on scrap metal before the actual repair is undertaken if the operator is not already experienced in welding aluminium and its alloys.
14. The heat of welding will have softened the metal in the area of the repair, and it may be hardened again by peening with a light hammer. Many light blows are preferable to fewer heavy ones. Use a 'dolly' or anvil behind the work to avoid denting and deformation, and to make the hammering more effective. Filing of surplus metal from the weld will also help to harden the work again.

Welding tears and patching

15. If a tear extends to the edge of a panel, start the weld from the end away from the edge and also at this point drill a small hole to prevent the crack spreading, then work towards the edge.
16. When welding a long tear, or making a long welded joint, tack the edges to be welded at intervals of from 2 in to 4 in (50 to 100 mm) with spots. This is done by melting the metal at the starting end and fusing into it a small amount of the filler rod, repeating the process at the suggested intervals. After this, weld continuously along the joint from right to left, increasing the speed of the weld as the material heats up.
17. After the work has cooled, wash off all traces of flux as described above, and file off any excess of build-up metal.
18. When patching, cut the patch to the correct shape for the hole to be filled, but of such sizes as to leave a gap of $\frac{1}{32}$ in (0.80 mm) between it and the panel, and then weld as described above. Never apply an 'overlay' patch.

Electric welding

19. **CAUTION. The battery earth lead must be disconnected before commencing electric welding, otherwise the alternator will be damaged.**

20. At the Rover factory the 'Argon-Arc' process is used, and this is very satisfactory, since all atmospheric oxygen is excluded from the weld by the Argon gas shield. For all body repair work normally undertaken by a Distributor's or Dealer's service department, the gas welding method is sufficient and quite satisfactory.

Spot welding

21. Spot welding is largely used in the manufacture of Range-Rover bodies, but this is a process which can only be carried out satisfactorily by the use of the proper apparatus. Aluminium and its alloys are very good conductors of heat and electricity, and thus it is most important to maintain the right conditions for successful spot welding. The correct current density must be maintained, and so must the 'dwell' of the electrodes. Special spot welding machines have been developed, but they are expensive, and though the actual work can be carried out by comparitively unskilled labour, supervision and machine maintenance must be in the hands of properly qualified persons.

Riveting

22. Where both sides of the metal are accessible and it is possible to use an anvil or 'dolly', solid aluminium rivets may be used, with a suitable punch or 'pop' to ensure clean rounded head on the work. For riveting blind holes, 'pop-rivets' must be used. These are inserted and closed by special 'Lazy-Tong' 'pop-rivet' pliers.

Painting 'Birmabright'

23. Refer to the procedure detailed in Paintwork.

PAINTWORK

General information

Body panels

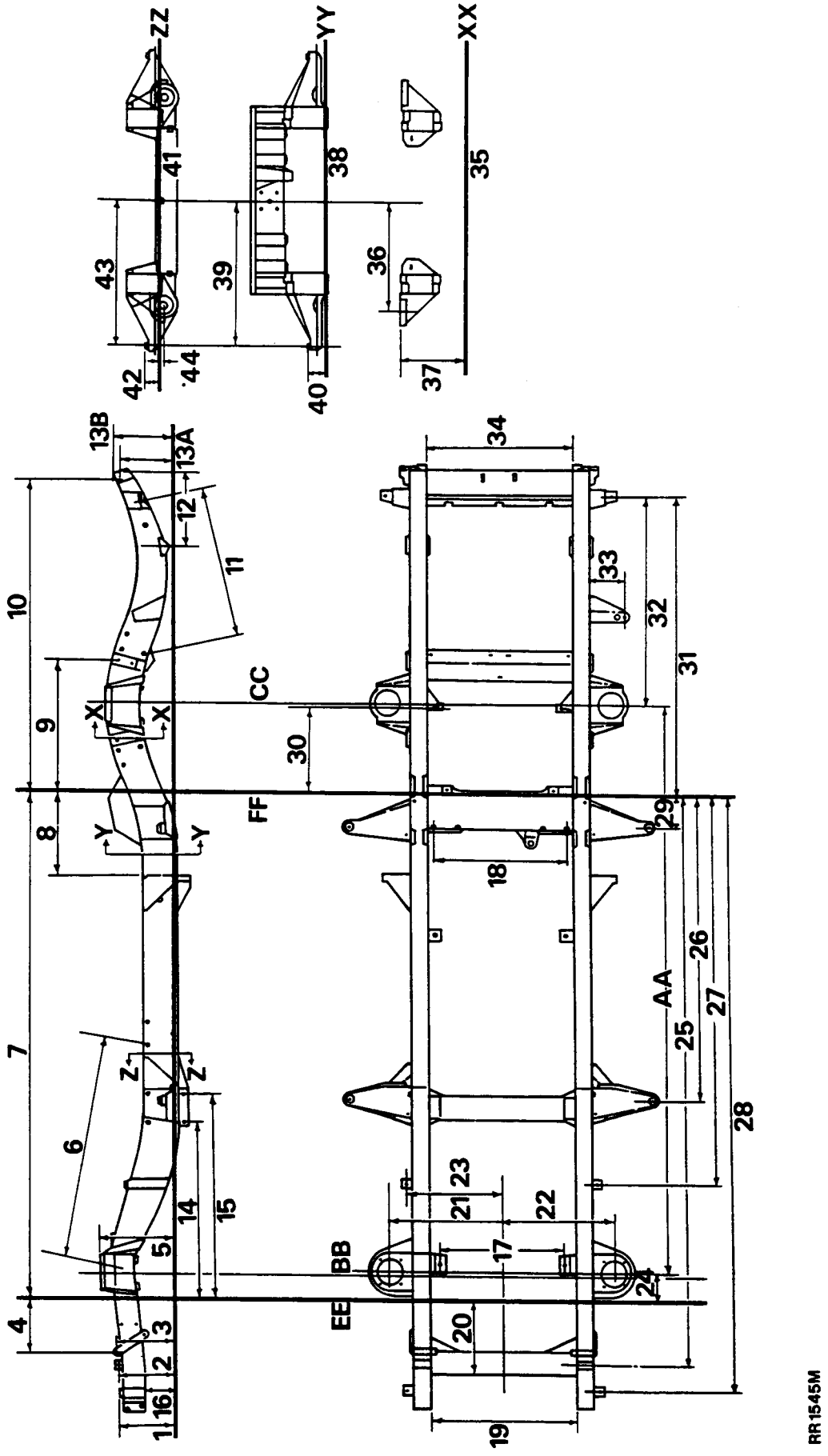
1. Range Rover body panels are manufactured from a special aluminium-alloy known as 'Birmabright' and the following paintwork procedure should be followed on these panels.

Painting 'Birmabright'

2. The area to be painted must be flatted to remove the hard oxide skin which forms on the surface of the alloy when exposed to the atmosphere. Degrease and dry the area, then apply a suitable etch-primer. Unless an etch-primer is used, paint is liable to come away as it cannot 'key' into the hard oxide of an untreated alloy surface and the use of ICI Etching Primer P565-5002 is recommended. It is quick and easy to apply, and it prolongs the life of the paint film by ensuring excellent adhesion.

Application

3. The activated Etching Primer has a limited pot-life of about eight hours at normal temperatures and should not be used after this time, as it may have inferior adhesion and corrosion resistance. Any Etching Primer which has been mixed for more than eight hours must be thrown away, and not returned to the can.
4. Apply Etching Primer as soon as possible after cleaning, and paint as soon as the pre-treatment is completed. Undue delay may cause the surface to be contaminated again and thus nullify the treatment. Do not leave pre-treated work overnight before it is painted.
5. Etching Primer, when followed by a suitable paint system, gives a film which is very resistant to moisture, but the Etching Primer itself is water sensitive. It should therefore be coated with paint as soon as possible when it is dry.
6. Activate the Etching Primer by mixing it with an equal volume of Activator P273-5021 and allow to stand for 10 minutes.
7. Adjust the spraying viscosity of the mixture if necessary to 22-25 sec. BSB4 Cup by adding small quantities of Thinner 851-565; never add more Activator.
8. Apply by spray to a clean, dry surface in a thin uniform coat, rather than a thick heavy one which may impair adhesion.
9. Air dry for at least 15 minutes before applying undercoat by spray or for two hours before brush application. If required, these times can be shortened by force drying, this also gives increased hardness to the film.
10. Subsequent painting follows normal paintshop practice.
11. When wet flatting the subsequent paint layers take care not to rub through to the Etching Primer. If this does occur allow to dry out thoroughly, dry flat the area and spot in with Etching Primer.


ZZ
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RR1545M

CHASSIS FRAME

Alignment check

Diagram reference		millimetres	inches
AA	Wheelbase—Reference dimension	2540.00	100.000
BB	Centre line of front axle		
CC	Centre line of rear axle		
DD	Frame datum line		
EE	Side member datum line		
FF	Datum line		
1	(with mounting washers)	254.00 ± 0.63	$10.000 \pm .025$
	(without washers)	$263.525^{+1.91}_{-0.63}$	$10.375^{+.075}_{-.025}$
2		261.11 ± 2.54	$10.280 \pm .100$
3		266.70 ± 2.54	$10.500 \pm .100$
4		237.74 ± 1.27	$9.360 \pm .050$
5		327.81 ± 2.54	$12.906 \pm .100$
6		979.93 ± 1.27	$38.580 \pm .050$
7		2244.72 ± 2.54	$88.375 \pm .100$
8		356.74 ± 2.54	$14.045 \pm .100$
9		605.15 ± 2.54	$23.825 \pm .100$
10		1405.38 ± 2.54	$55.330 \pm .100$
11		694.44 ± 2.54	$27.340 \pm .100$
12		338.83 ± 2.54	$13.340 \pm .100$
13A		222.25 ± 5.08	$8.750 \pm .200$
13B		240.54 ± 2.54	$9.470 \pm .100$
14	Reference dimension	794.91	31.296
15	To face of boss	935.43 ± 2.54	$36.828 \pm .100$
16	Frame datum to underside of crossmember	150.79	5.937
17		535.94 ± 2.54	$21.100 \pm .100$
18		590.55 ± 0.64	$23.250 \pm .025$
19	Check Figure	630.93 ± 1.27	$24.840 \pm .050$
20		344.17 ± 1.27	$13.550 \pm .050$
21		485.77 ± 2.54	$19.125 \pm .100$
22		485.77 ± 2.54	$19.125 \pm .100$
23		414.32 ± 2.54	$16.312 \pm .100$
24		129.03 ± 2.54	$5.080 \pm .100$
25		2544.44 ± 0.25	$100.175 \pm .010$
26		1355.34 ± 0.38	$53.360 \pm .015$
27		1722.04 ± 0.38	$67.797 \pm .015$
28		2663.44 ± 0.38	$104.860 \pm .015$
29		144.09 ± 0.38	$5.673 \pm .015$
30		400.48 ± 2.54	$15.767 \pm .100$
31		1333.88 ± 0.38	$52.515 \pm .015$
32	Reference dimension	925.49	36.437
33	Reference dimension	147.62	5.812
34	Reference dimension	635.00	25.000
SECTION XX			
35	Frame datum line DD		
36		488.95 ± 2.54	$19.250 \pm .100$
37		295.27 ± 2.54	$11.625 \pm .100$
SECTION YY			
38	Frame datum line DD		
39		660.40 ± 0.17	$26.000 \pm .007$
40		$80.95^{+1.91}_{-0.63}$	$3.187^{+.075}_{-.025}$
SECTION ZZ			
41	Frame datum line DD		
42		$80.95^{+1.91}_{-0.63}$	$3.187^{+.075}_{-.025}$
43		660.4 ± 0.17	$26.000 \pm .007$
44		9.525 ± 2.54	$0.375 \pm .100$

BODY

Introduction:

The information which follows is concerned solely with the 'Monocoque' assembly of the inner body shell on Range Rover models.

Body repairs often require the removal of mechanical and electrical units and associated wiring. Where necessary, reference should be made to the relevant section of the Repair Manual for removal and refitting instructions.

The inner body shell is of 'Monocoque' construction and to gain access to the repair area, it may be necessary to remove exterior body panels, all exterior body panels are bolted to the inner body shell to facilitate easier panel removal and renewal or repair.

It is expected that a repairer will select the best and most economic repair method possible, making use of the facilities available. The instructions given are intended to assist a skilled body repairer by expanding approved procedures for panel replacement with the objective of restoring the car to a safe running condition and effecting a repair which is visually acceptable.

WELDING

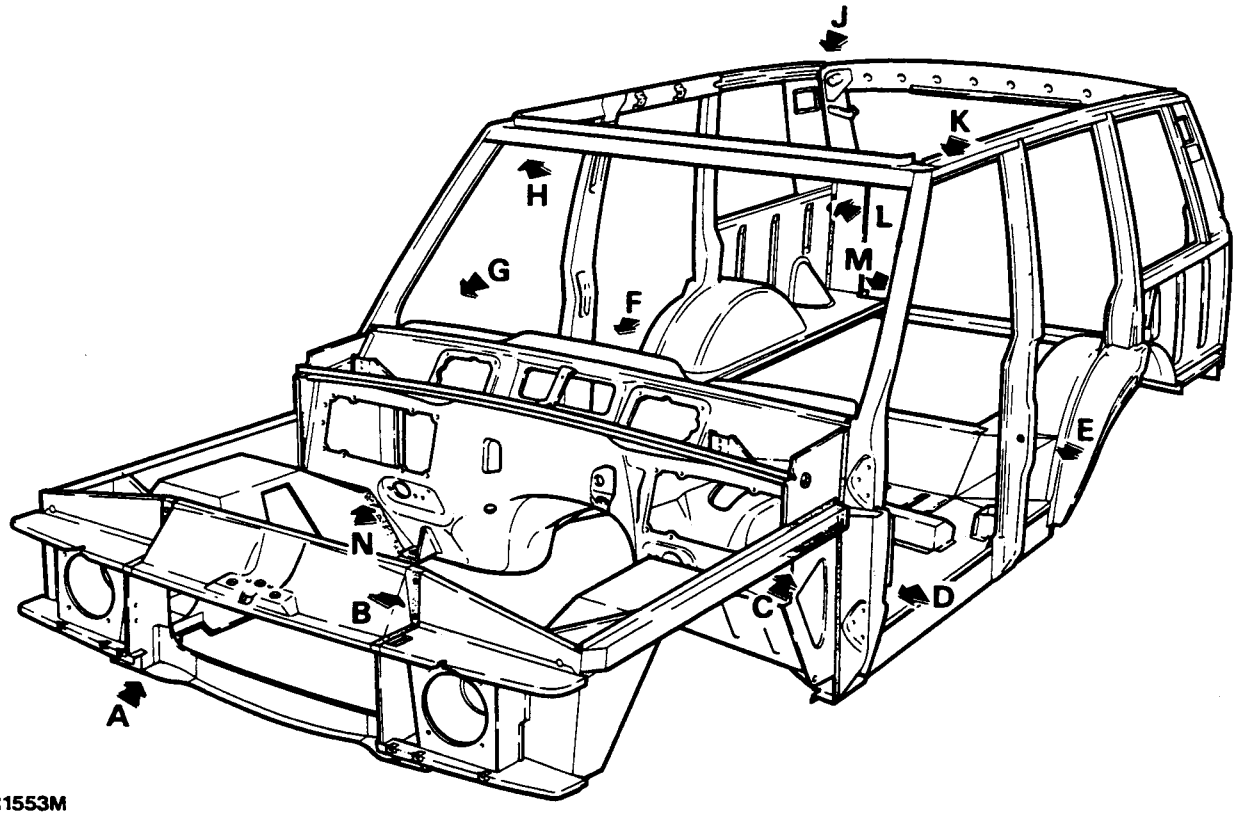
The following charts and illustrations show the locations and types of weld for securing the body side assembly, tailgate frame assembly and the front valance and wheel arch assembly. Before undertaking any spot weld joints to the inner body, it is advisable to make a test joint using offcuts of the damaged components, and to use this test piece to perform a weld integrity test.

Spot welding is satisfactory if the joints do not pull apart. If the weld pulls a hole or tears the metal the weld is satisfactory. It is defective if the weld joint pulls apart or if there are signs of burning, porosity or cracking evident.

PREPARATION

Thoroughly clean all areas to be welded, remove any sealants and corrosion protectives from around original panels. Align and clamp all new panels in position and check relationship to one another.

INNER BODY SHELL ASSEMBLY



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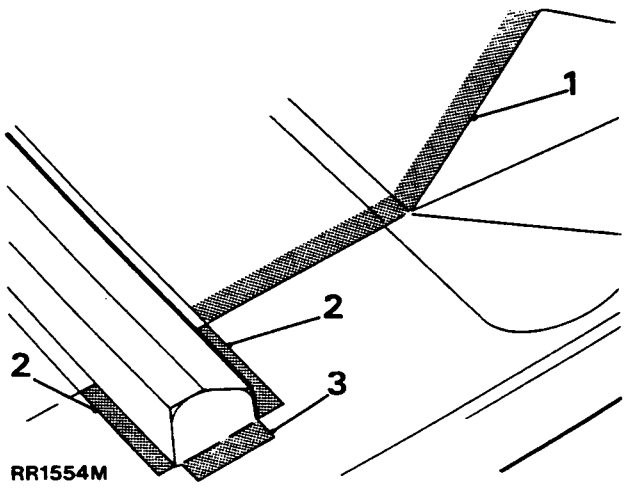
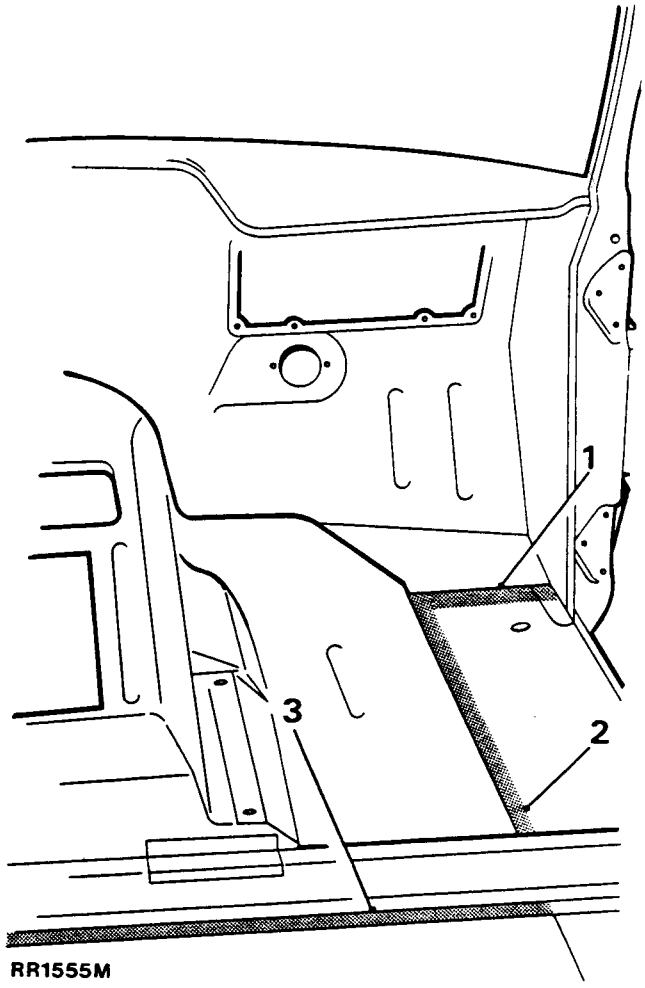
LOCATION	FACTORY JOINT (minimum number of spot welds quoted)
A. Front cross member to valance and wheel arch assembly	6 spot welds, 20 mm pitch
B. Bonnet locking platform to valance and wheel arch assembly	10 spot welds, 25 mm pitch
C. Valance and wheel arch assembly to dash and tunnel assembly	16 spot welds, 25 mm pitch
D. Body side complete to dash and tunnel assembly	10 spot welds, 65 mm pitch

Continued

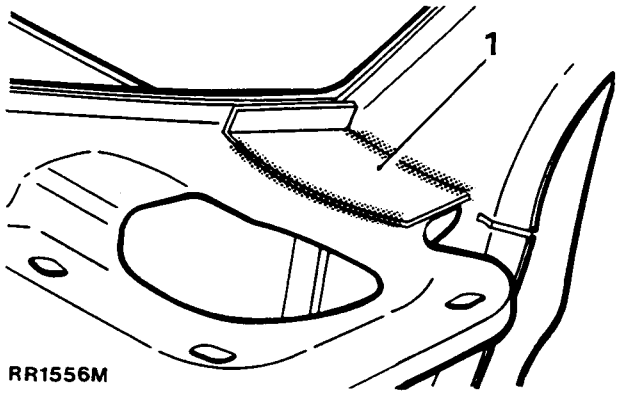


LOCATION E

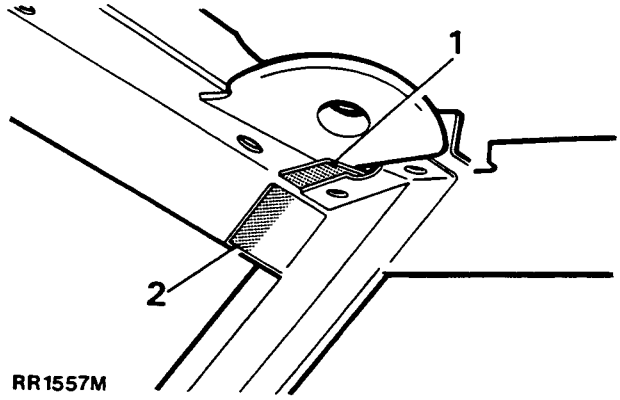


LOCATION F

LOCATION	FACTORY JOINT (minimum number of spot welds quoted)
E. 1. Body side complete to heelboard panel assembly	14 spot welds, 35 mm pitch
2. Body side complete to dash and tunnel assembly complete	10 spot welds, 25 mm pitch
3. Body side complete to dash and tunnel assembly	3 spot welds, 30 mm pitch
F. 1. Body side complete to dash and tunnel assembly complete	7 spot welds, 30 mm pitch
2. Body side complete to dash and tunnel assembly complete	18 spot welds, 40 mm pitch
3. Body side complete to dash and tunnel assembly complete	30 spot welds, 34 mm pitch

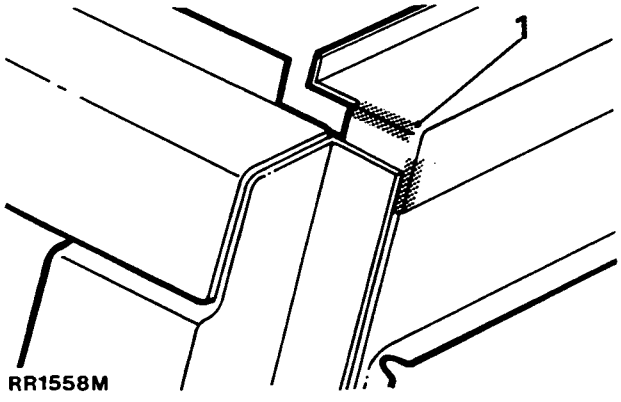


LOCATION G

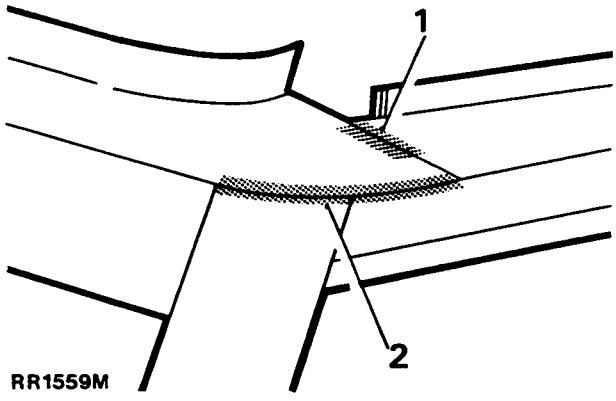


LOCATION H

LOCATION	FACTORY JOINT (minimum weld requirement quoted)
G. 1. Reinforcement plate to dash and tunnel assembly and body side assembly complete	CO_2 weld, 2 places 75 mm long each weld
H. 1. Body side complete to roof header panel assembly (internal joint) 2. Body side complete to roof header panel assembly (internal joint)	3 spot welds, 15 mm pitch 3 spot welds, 15 mm pitch

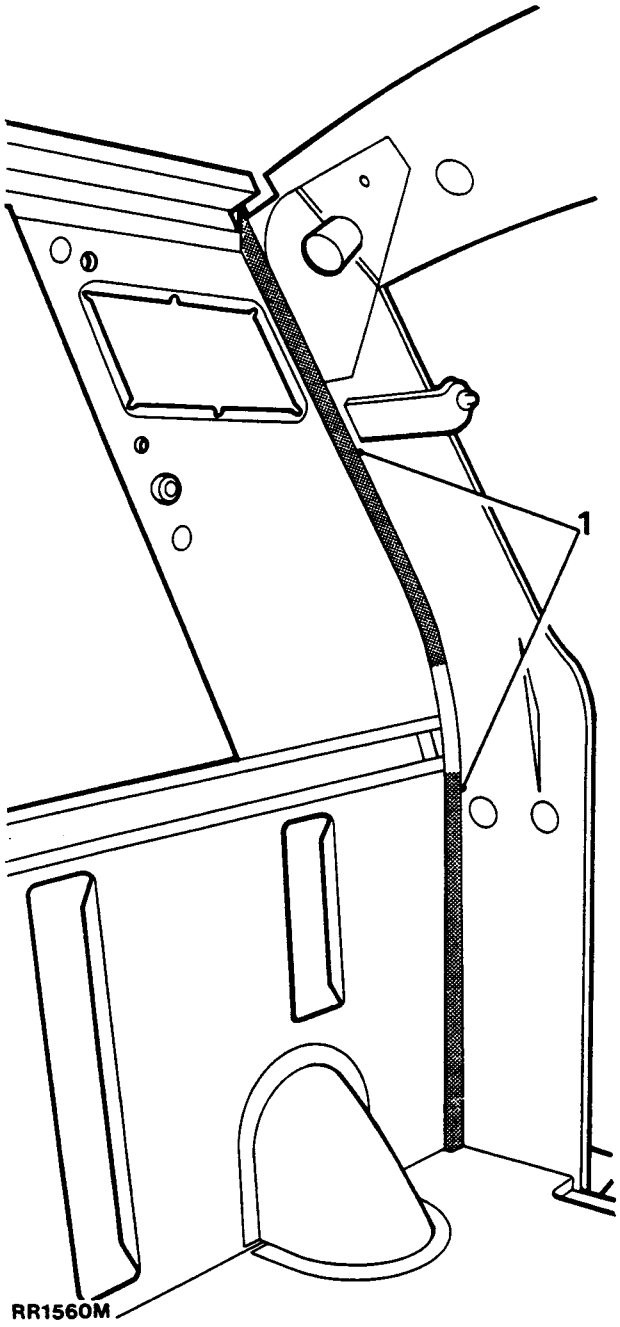


LOCATION J

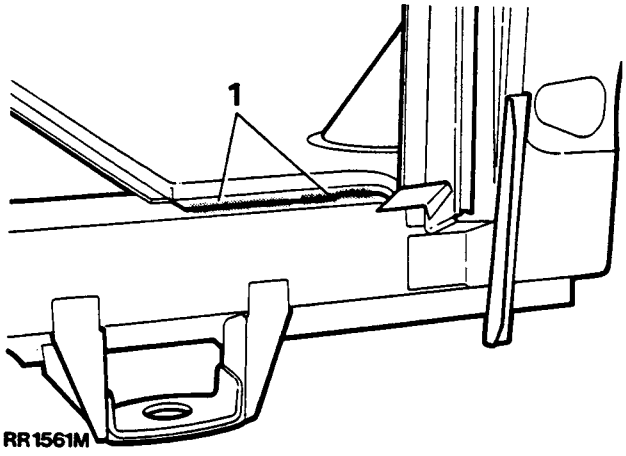


LOCATION K

LOCATION	FACTORY JOINT (minimum weld requirement quoted)
J. 1. Body side complete to rear tailgate frame assembly	CO_2 weld, one run 40 mm long
K. 1. Body side complete to roof header panel assembly (External joint) 2. Body side complete to roof header panel assembly (External joint)	CO_2 weld, one run 20 mm long CO_2 weld, one run 100 mm long

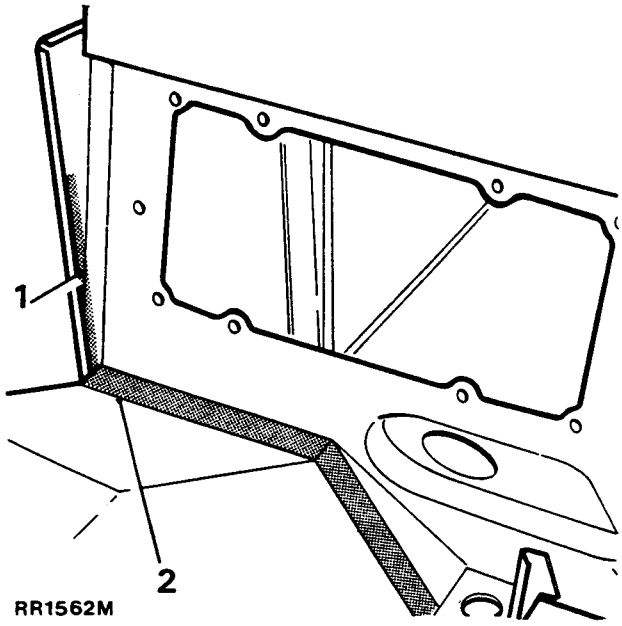


LOCATION L



LOCATION M

LOCATION	FACTORY JOINT (minimum weld requirement quoted)
L. 1. Body side complete to rear tailgate side member	32 spot welds, 30 mm pitch
M. 1. Body side complete to rear tailgate bottom cross member	CO_2 weld, 2 runs 40 mm long



LOCATION N

LOCATION	FACTORY JOINT (minimum number of spot welds quoted)
N. 1. Valance and wheel arch assembly to dash and tunnel assembly	4 spot welds, 45 mm pitch
2. Valance and wheel arch assembly to dash and tunnel assembly	15 spot welds, 25 mm pitch

FRONT AND REAR HEADLINING AND ROOF PANEL

Remove and refit

Removing

1. Remove the two roof lamp assemblies.
2. Remove the rear view mirror and mounting bracket.
3. Remove the two sun visors and centre retaining bracket.
4. Remove the rear passenger grab rails.
5. Prise out the four plastic retaining clips securing the front and rear sections of the headlining to the roof panel.
6. Lower the front headlining and remove it from the vehicle.
7. Remove the two plastic retaining clips securing the end of the rear headlining, located adjacent to the upper tailgate hinges.
8. Lower the headlining and disconnect the electrical leads from the rear radio speakers, and remove the lining from the vehicle.
9. Remove the screws (with washers) from around the inner edge of the roof panel.
10. Lift the roof panel from the body and remove any previous sealing compounds from around the edge of the roof panel and body.

Refitting

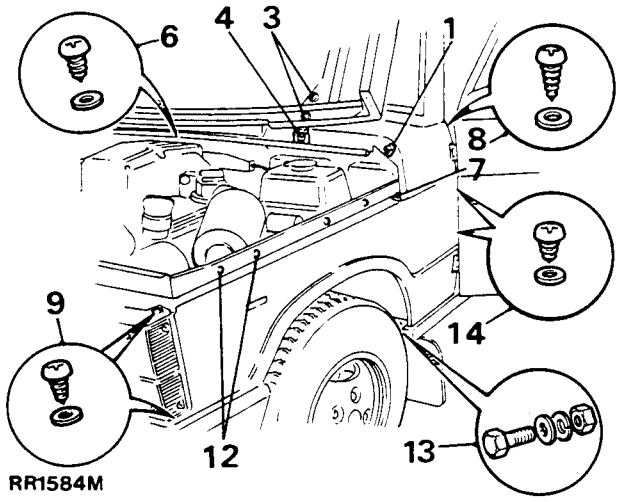
11. Reverse the removal instructions 1 to 9.
12. Apply a suitable waterproof sealant to roof and body mating faces.

BONNET—DECKER PANEL—FRONT WING

Remove and refit

Removing

1. Open the bonnet and disconnect the under-bonnet lamp electrical leads.
2. Disconnect the windscreen washer tube at the 'T' joint.
3. Release the four bolts securing the bonnet to the hinges, and lift the bonnet clear of the vehicle.
4. Remove the four cross-head screws securing the hinges to the bulkhead mounting brackets.
5. Remove the wiper arms and two nuts securing the wheel boxes to the decker panel and remove the two exterior sealing rubbers.
6. Remove the nine cross-head screws securing the front of the decker panel.



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7. Remove the four bolts (with spring and plain washers) retaining the decker panel to the top of the wing, retrieve the nylon spacing washers from between decker panel and wing.
8. Remove the four cross-head screws retaining the panel to the 'A' post mounting brackets located above the front door hinges.

NOTE: If a radio aerial is fitted, remove it from the panel to enable the panel to be lifted clear of the body.

9. Remove the two cross-head screws from the top of the front side light assembly, manoeuvre the assembly out of the two bottom location holes and disconnect the electrical plug at the rear of the lamp. Remove the two screws (with plain washers) from the bottom of the side light aperture.
10. Disconnect the side flasher lamp electrical plug, located inside the engine compartment and feed the plug and grommet through the hole in the inner wing to the underside of the exterior wing.
11. Remove the three fixings securing the bumper wrap around end cap and remove the moulding from the bumper.

NOTE: If a front spoiler is fitted, remove the single bolt which secures the end of the spoiler to the front of the wheel arch, located forward of the road wheel at the bottom of the wing.

12. Remove the five nuts and bolts (with plain and spring washers) securing the top edge of the wing to the wheel arch and valance assembly.
13. Remove the two bolts (with plain washers) securing the sill finishing strip to the bottom of the wing.
14. Remove the two cross-head screws securing the wing to the mounting bracket attached to the 'A' post located in between the front door hinges.

Refitting

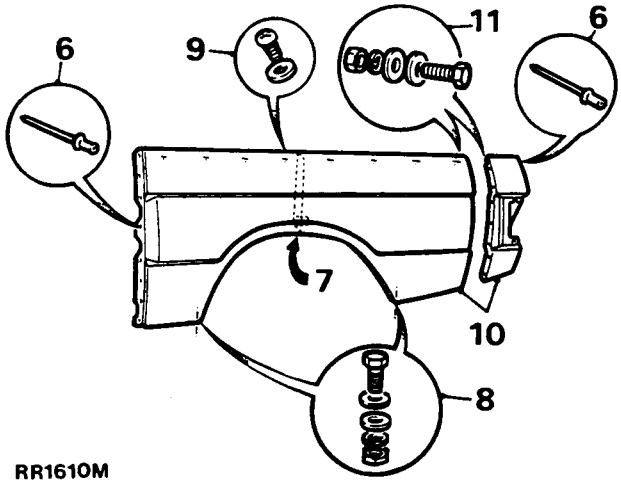
15. Apply a suitable underseal to the inner face of the wing.
16. Ensure that before final tightening of the wing securing bolts the wing aligns with the edge of the front door.
17. Locate the decker panel under the lip of the windscreen sealing rubber.
18. Fit the bonnet ensuring that before final tightening of the securing bolts, the bonnet aligns with the decker panel, wing and front grille.
19. Reverse the remaining removal instructions.

BODY REAR CORNER PANEL AND WING—TWO AND FOUR DOOR MODELS

Remove and refit

Removing

1. Remove the fuel tank filler cap (right hand rear wing only).
2. Remove the fuel tank filler neck (right hand rear wing only).
3. Remove the rear stowage area parcel shelf, shelf side panels and spare wheel.
4. Remove the two nuts (with washers) securing the bumper wrap around end cap and slide the cap off the bumper.
5. Release the rear tail light cluster from the rear corner panel and disconnect the electrical plug.
6. Drill out all the pop-rivets securing the front of the wing (**two door model only**) and the corner panel (**two and four door**).
7. Remove the two nuts and bolts securing the front of the wing to the 'D' post located beneath the wheel arch (**four door only**).
8. Release the single nut and bolt retaining the mud-flap to the bottom of the wing.
   Two door models only: Remove the single bolt from the bottom of the wing forward of the road wheel.



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9. From inside the tailgate area remove all the cross-head screws retaining the top of the wing.
10. Remove the rear wing and cover panel complete.
11. Remove the seven bolts (with plain and spring washers) securing the wing to the corner panel and separate the two panels.

Refitting

12. Apply a suitable waterproof sealant to the wing and cover panel mating faces, fit the bolts and ensure both panels align before final tightening.
13. Fit the assembly to the vehicle ensuring the door shut face to wing and corner panel to lower tailgate are in alignment before the final tightening of screws and fitting of pop-rivets.
14. Coat the underside of panels with a suitable underseal.
15. Reverse the remaining removal instructions.

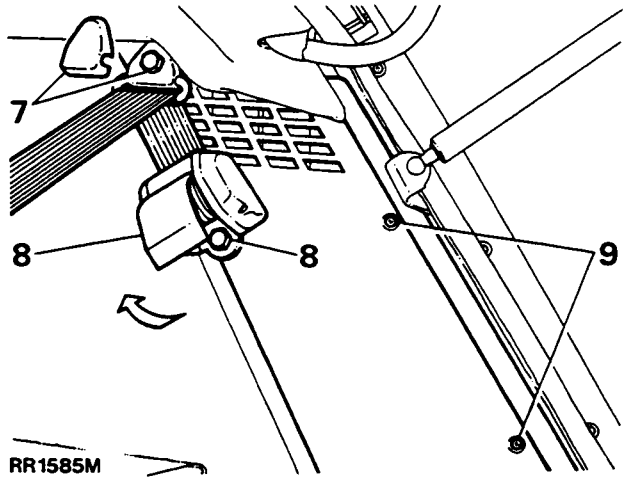
BODY REAR QUARTER PANEL — INTERIOR

Remove and refit

Removing

1. Remove the rear passenger grab rails.
2. Remove the rear interior light assembly.
3. Remove the four plastic retaining clips securing the front and rear headlining sections to the centre of the roof panel.
4. Remove the two rear plastic retaining clips located adjacent to the upper tailgate fixings from the rear headlining section.
5. Lower the headlining and disconnect the electrical leads from the two radio speakers.
6. Remove the rear headlining section from the vehicle.

NOTE: If rear seat belts are fitted it will be necessary to remove them to enable the interior panel to be detached, these are removed as follows.



RR1585M

Continued

7. Detach the plastic cover from the upper seat belt guide bracket and remove the single bolt.
8. Remove the clip-on black plastic cover from the seat belt inertia reel. Remove the two retaining bolts and place the reel to one side.
9. Release the two small cross-head screws and remove the panel from the vehicle.

Refitting

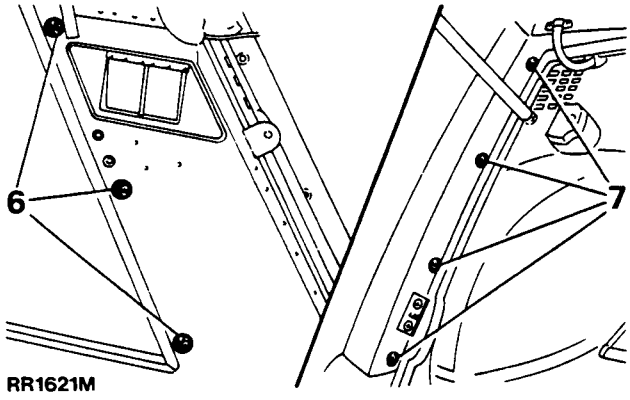
10. When refitting the seat belt assembly ensure the belts are not twisted and that the securing bolts are tightened to the correct torque.
11. Reverse the removal procedure.

BODY REAR QUARTER PANEL — EXTERIOR

Remove and refit

Removing

1. Remove the rear passenger grab rails.
2. Remove the rear interior light assembly.
3. Remove the rear headlining section.
4. Remove the rear seat belts (if fitted).
5. Remove the two securing screws and detach the interior quarter panel.
6. Remove the three nuts (with plain washers) securing the outer quarter panel to the body side. The nuts are accessible through the large holes located adjacent to the rear window.
7. Remove the four screws securing the quarter panel to the inside edge of the tailgate aperture.
8. Withdraw the panel.



RR1621M

Refitting

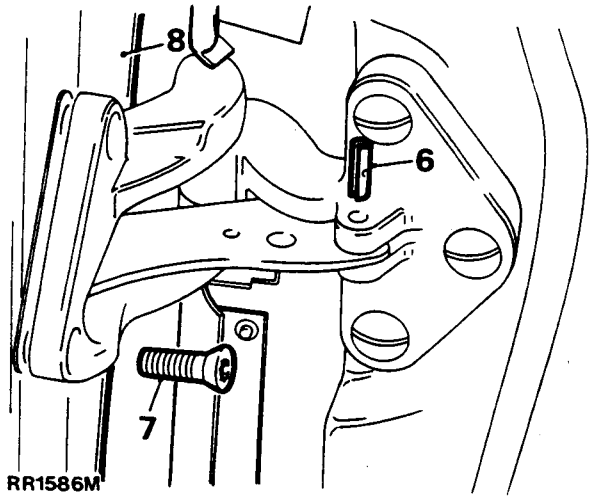
9. Reverse the removal instructions.
10. Using a suitable tool carefully ease the rear side window sealing rubber over the front edge of the exterior quarter panel.

FRONT DOOR

Remove and refit

Removing

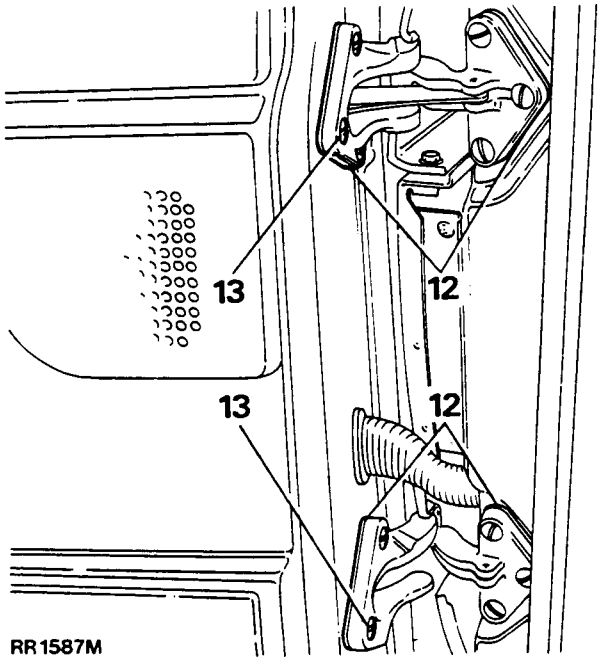
1. Disconnect the battery negative lead.
2. Open the appropriate door to be removed.
3. Remove the two screws and detach the side trim panel from the front footwell.
4. Carefully pull the door wiring harness from above the fascia until the electrical plugs are exposed.
5. Disconnect the electrical plugs and feed them through the aperture in the 'A' post.
6. Drive out the roll pin from the door check strap.
7. With assistance support the door and remove the screws, securing door to hinges.
8. Lift the door clear.



RR1586M

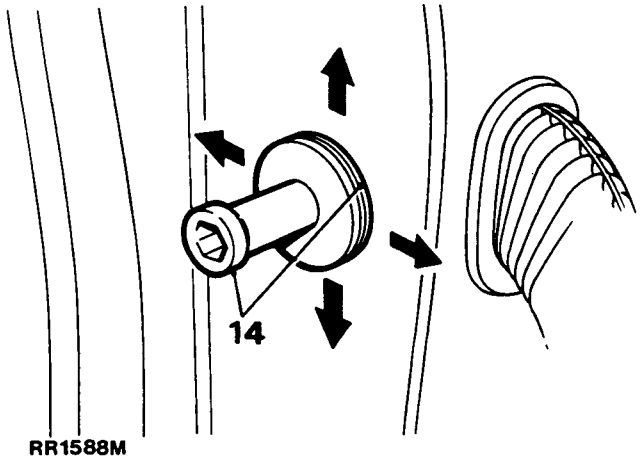
Refitting

9. Refit the door and feed the electrical cables through the 'A' post.
10. Fully open the door and reconnect the electrical leads, take up the slack in the leads and clip them securely to the footwell side panel, refit the convolute grommet to the 'A' post aperture.
11. Check the location of the door and the operation of the door lock. If necessary, adjust the door and striker plate.
12. By the addition of shims between the hinge and door or hinge and 'A' post to take the door forward or rearward in the aperture.
13. By slackening the six screws securing the hinges to the door, the door can be adjusted up and down or in and out of the aperture.



RR1587M

14. The door lock striker can be adjusted by slackening the striker and moving it in the appropriate direction or adding and subtracting spacing washers between the striker and 'B' post.



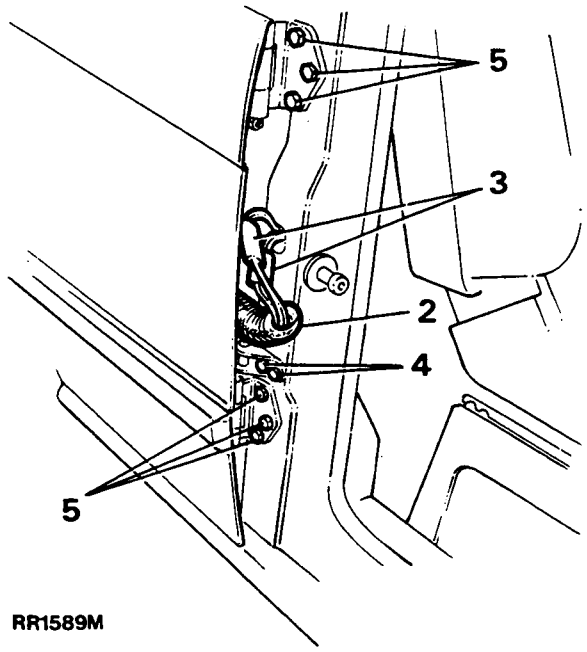
RR1588M

REAR PASSENGER DOOR

Remove and refit

Removing

1. Disconnect the battery negative lead.
2. Pull the convolute grommet out of the face of the 'B' post.
3. Withdraw the electrical leads from the 'B' post until the electrical plugs are exposed and disconnect the plugs.
4. Remove the two bolts (with spring and plain washers) securing the door check strap.
5. Open the door slightly, support the door and remove the six bolts (with spring washers) securing the hinges to the 'B' post.
6. Lift the door clear.



RR1589M

Refitting

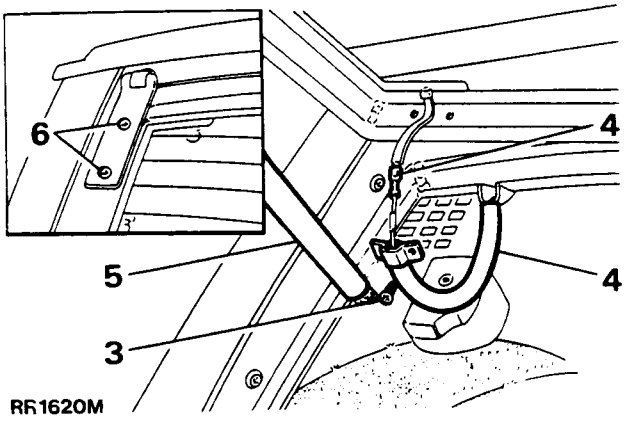
7. Reverse the removal procedure.
8. Adjustment to the rear doors is made by releasing the six hinge securing bolts (hinge to 'B' post) and moving the door either rearwards, forward, up or down in the door aperture.
9. Adjustment to the door striker is identical to front door adjustment.

UPPER TAILGATE

Remove and refit

Removing

1. Disconnect the battery negative lead.
2. Remove the tailgate wiper arm
3. Open the tailgate and remove the four screws securing the two rear screen electrical lead shrouds located at either end of the tailgate.
4. Manoeuvre the shroud away from the screen and out of the headlining to reveal the electrical connections, disconnect the leads.
5. Prise the two stays off the tailgate.



RR1620M

6. Remove the four hinge to tailgate screws.
7. Lift the upper tailgate clear.

Refitting

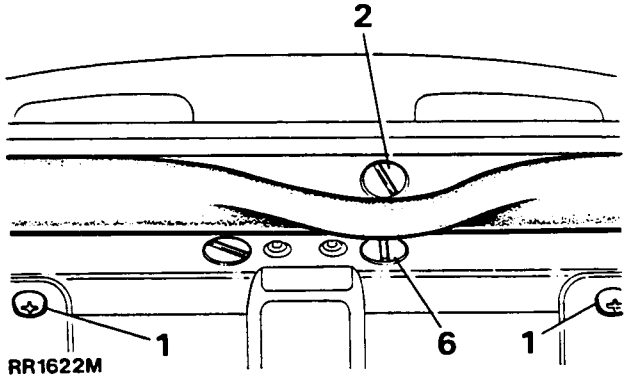
8. Reverse the removal instructions.

UPPER TAILGATE — LOCK

Remove and refit

Removing

1. Remove the two cross-head screws securing the upper tailgate release handle.

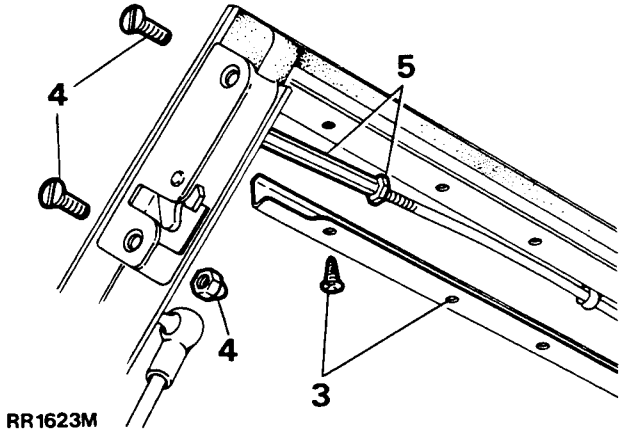


RR1622M

2. Ease the sealing rubber away to reveal the single screw securing the centre of the release handle, remove the screw and detach the handle from the lock mechanism complete with key barrel.

NOTE: At this stage the barrel can be removed from the handle by releasing the two small cross-head screws at the joint-face. Remove the retaining plate and release the spring and key barrel from its bore.

3. Release the eight screws and remove the operating rod covers located either side of the centre lock mechanism.
4. Remove the four screws and two nuts securing the lock catches to the sides of the tailgate.
5. Release the two small locknuts on the operating rods and rotate the hexagonal connecting rod until the side catches can be removed.
6. Release the two screws securing the centre lock mechanism and remove the unit complete with operating rods.



RR1623M

Refitting

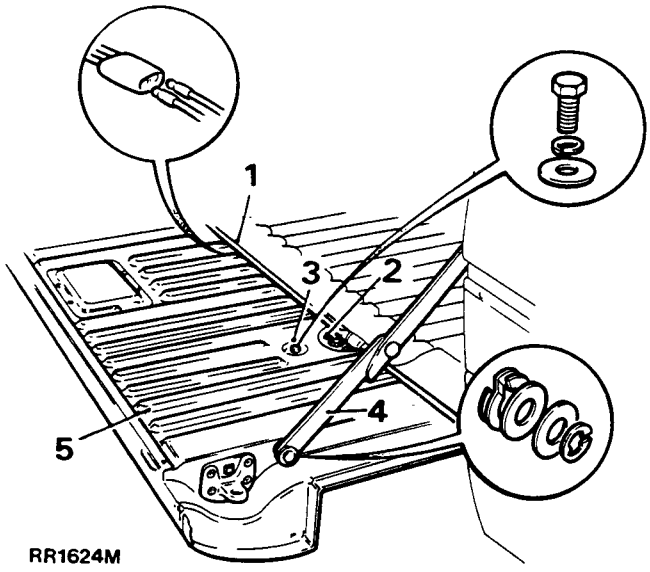
7. Reverse the removal procedure.
8. Adjustment of the side catches may be required after assembly, this is achieved by releasing the locknuts on the operating rods, and rotating the hexagonal link clockwise or anti-clockwise to shorten or extend the length of the operating rods.

LOWER TAILGATE

Remove and refit

Removing

1. Disconnect the electrical leads from the rear number plate lamp.
2. Remove the four cross-head screws securing the sealing rubber around the tailgate hinge bolts.
3. Remove the fixings, tailgate to hinges.
4. Disconnect the check straps.

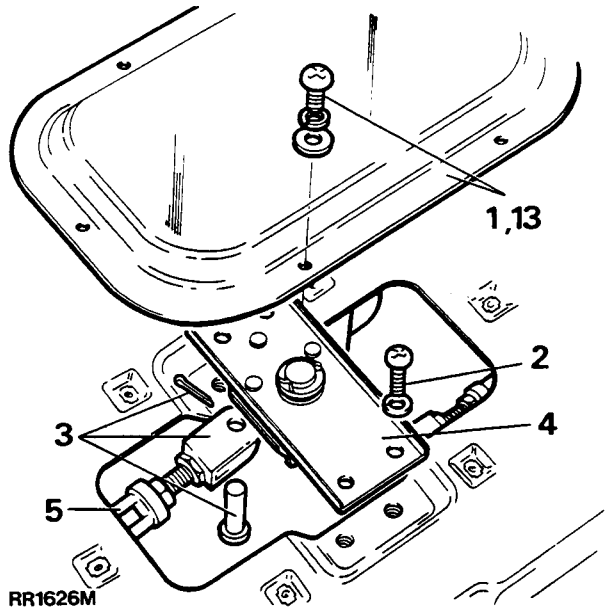


RR1624M

5. Withdraw the tailgate.

Refitting

6. Reverse 1 to 4.



RR1626M

Refitting

6. Reverse 2 to 5.
7. Close the lower tailgate and check the operation of the lock, the bolts should engage automatically and release when the handle is moved fully right against spring pressure.

Adjusting the lock 8 to 12

8. Slacken the locknuts at the lock end of the adjuster.
9. Slacken the locknuts at the bolt end of the adjuster, noting that they have a LEFT HAND thread.
10. Turn the adjuster as required to move the bolt in or out.
11. Secure the adjuster locknuts.
12. The eye brackets at each side of the tailgate can also be adjusted to align with their locating dowels, by slackening the fixings, slightly repositioning the brackets and retightening the fixings.

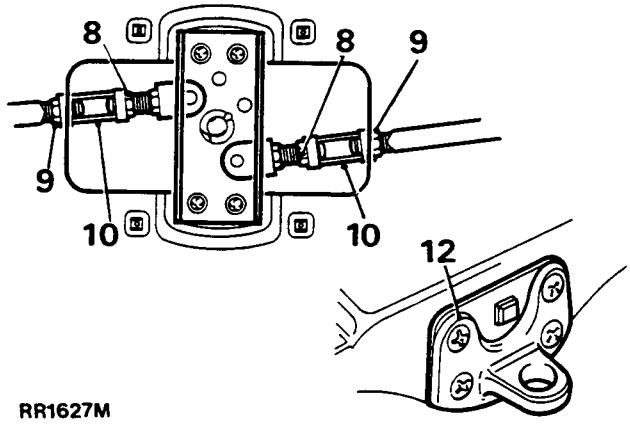
LOWER TAILGATE LOCK

Adjust 1 and 8 to 13

Remove and refit 1 to 7 and 13

Removing

1. Remove the lock cover plate.
2. Remove the fixings from the lock mounting plate.
3. Disconnect either one of the bolt arms from the door lock.
4. Withdraw the lock complete with the fixed bolt arm.
5. Withdraw the loose bolt arm.



RR1627M

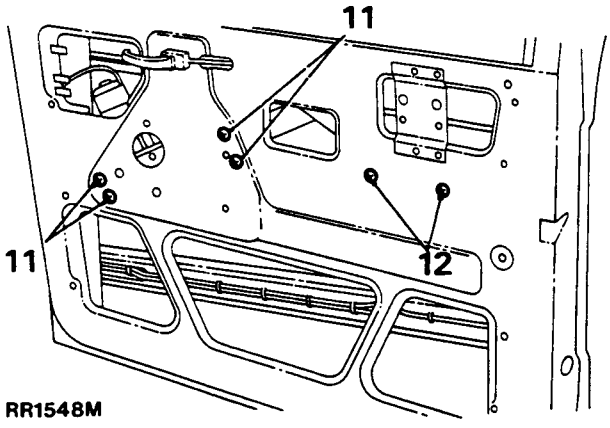
13. Fit the lock cover plate.

FRONT DOOR GLASS AND REGULATOR—Four door models

Remove and refit

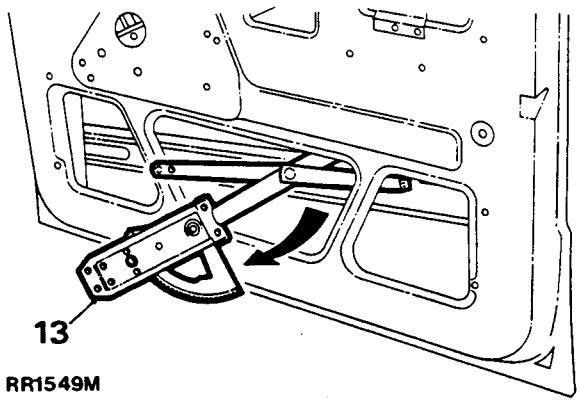
Removing

1. Ensure the window is in its fully closed position and secure it with adhesive tape to prevent the window dropping down.
2. Disconnect the battery.
3. Detach the armrest/door-pull finisher to reveal the two securing screws.
4. Remove the two securing screws (with plain washers) to enable the armrest/door-pull to be detached from the inner door panel.
5. Remove the interior door handle finisher button to reveal the screw retaining the handle surround.
6. Remove the screw and detach the handle surround from the inner door panel.
7. Detach the inner door trim pad by inserting a screwdriver between the trim pad and inner door panel, gently prising out the nine plastic securing clips from their respective holes in the inner door panel.
8. Disconnect the two speaker connections inside the door and remove the door trim pad complete with speaker.
9. Remove the plastic weather sheet.
10. Remove the window lift motor (refer to electrical section).
11. Remove the four window regulator retaining bolts with shakeproof washers from the inner door panel.



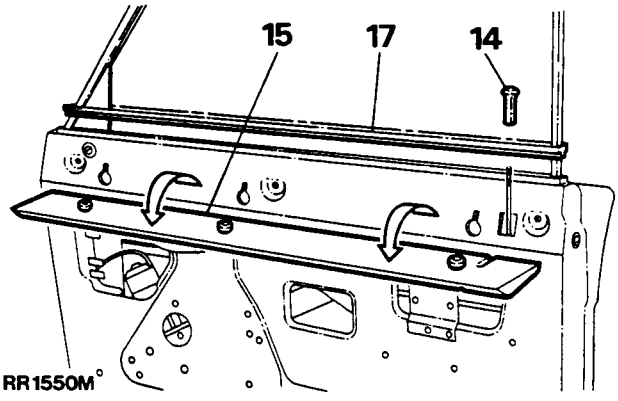
RR1548M

12. Remove the two screws with shakeproof washers retaining the lower window lift channel and slide the channel off the stud.
13. Disengage the lifting arm stud from the upper lifting channel, manoeuvre the window regulator and remove it from the lower centre aperture in the inner door panel.



RR1549M

14. Remove the sill locking knob.
15. Remove the inner door capping off its keyhole location.
16. Remove the exterior driving mirror (refer to exterior driving mirrors removal and refit in electrical section).
17. Remove the waist rail seal from the top of the door panel.



RR1550M

18. Remove the two bolts (shakeproof and plain washers) from the hinge face of the door which secure the front door frame.
19. Remove the single bolt (spring and plain washer) from the shut face of the door which secures the door rear frame.
20. Remove the bolt (spring and plain washer) from the recessed hole in the front of the inner door panel under the exterior driving mirror mounting plate.
21. Remove the single screw (spring and plain washer) from inside the door securing the bottom front glass channel.
22. Remove the single screw (spring and plain washer) from inside the door securing the bottom rear glass channel.
23. Lift the door glass frame complete with glass out of the door panel and remove to a suitable bench.
24. Remove the adhesive tape securing the glass to the frame.
25. Slide the glass out of the door frame channel.

Refitting

26. Reverse the removal instructions, items 1 to 25.

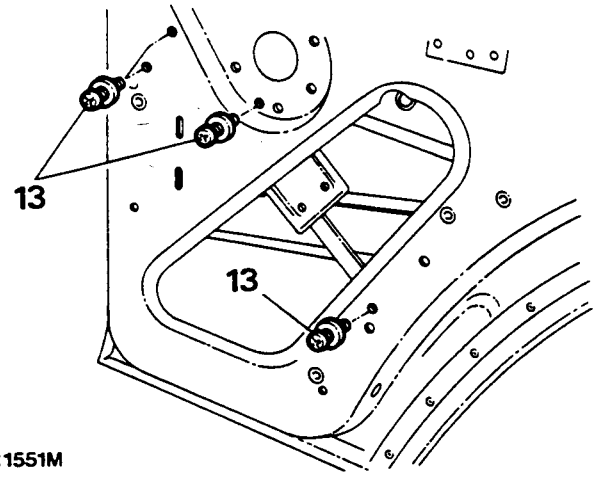
NOTE: When refitting the door glass frame, ensure it is repositioned to suit the door aperture before fully tightening the door frame securing bolts.

REAR DOOR GLASS AND REGULATOR

Remove and refit

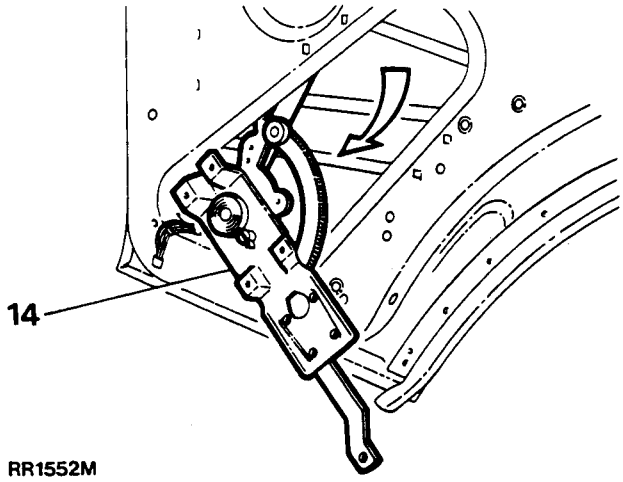
Removing

1. Ensure the window is in its fully closed position and secure it with adhesive tape over the top of the door to prevent the window dropping down.
2. Disconnect the battery.
3. Remove the armrest/door-pull finisher to reveal the two securing screws.
4. Remove the two securing screws (with plain washers) and detach the armrest/door-pull from the inner door panel.
5. Disconnect the window lift switch multi-plug at the rear of the armrest/door-pull.
6. Remove the interior handle finisher button to reveal the screw retaining the handle surround.
7. Remove the screw and detach the handle surround from the door trim pad.
8. Remove the door trim pad by inserting a screwdriver between the trim pad and the inner door panel, gently prising out the six plastic clips from their respective holes around the edges of the trim.
9. Remove the sill locking button.
10. Remove the inner door capping from its keyhole location.
11. Remove the plastic weather sheet.
12. Remove the window lift motor (refer to electrical section).
13. Remove the four window regulator securing screws (with shakeproof washer).



RR1551M

14. Carefully disengage the lifting arm stud from the glass lifting channel and remove the window regulator from the lower aperture in the inner door panel.



RR1552M

15. Remove the waist rail seal from the top of the door panel.
16. Remove the single bolt (spring and plain washers) from inside the door which secures the bottom of the short rear glass run channel.
17. Remove the two bolts (spring and plain washers) from the hinge face of the door which secure the front door frame.
18. Remove the two bolts (spring and plain washers) from the shut face of the door which secure the rear door frame.
19. Lift out the door frame with the glass in position and remove to a suitable workbench.
20. Remove the tape and slide the glass out of the door frame channel.

Refitting

21. Reverse the removal procedure items 1 to 20.

NOTE: When refitting the door glass frame securing bolts, ensure that the door frame is adjusted to suit the door aperture before fully securing the frame to the door.

FRONT DOOR LOCK, OUTSIDE AND INSIDE DOOR RELEASE HANDLES — FOUR DOOR MODELS

Remove and refit

Removing

1. Remove the window lift motor (refer to electrical section).
2. Remove door glass and regulator (refer to door glass and regulator remove and refit).
3. Remove door actuator units (refer to electrical section).
4. Disconnect the control rod from the private key operated lock by releasing the metal clip at the bottom of the rod.
5. Disconnect the control rod from the outside door release handle by pulling it out of the plastic ferrule.
6. Disconnect the control rod connector between the inside door release handle and the door lock by releasing the metal clip and pulling one of the control rods out of the plastic connecting block. This is accessible through the small centre cut-out in the door panel. (The control rod also passes through a guide bracket on the inside of the inner door panel).
7. Release the door lock by removing the two counter-sunk screws from the door shut face and the single screw (with shakeproof washer) on the inner door panel.
8. Withdraw the lock through the lower rear cut-out on the inner door panel.

NOTE: If necessary the following items can also be removed.

9. Remove the two nuts (with shakeproof washers) and retaining bracket securing the **outside door release handle** to the outer door panel, accessible through the upper rear cut-out on the inner door panel.
10. Carefully detach the door release handle from the outer door panel.
11. Remove the two screws securing the **inside door release handle** to the inner door panel.
12. Withdraw the handle from its location with half the connecting rod still attached.
13. Unclip the spring tensioned end of the connecting rod from the door release handle.

Refitting

14. Reverse the removal procedure items 1 to 13.

NOTE: When refitting the door glass frame, ensure that it is positioned to suit the door aperture before fully tightening the door frame securing bolts.

ADJUSTMENT — FRONT DOOR LOCK AND HANDLE ASSEMBLY

Inside door release handle to lock

Refit the inside door release handle surround before any adjustment is made, allowing the handle to be set from the correct operating position. Rotate the spring tensioned nyloc nut at the opposite end of the interior handle connecting rod, clockwise or anti-clockwise to shorten or extend the operating length.

Outside door release handle to lock

Disconnect the small connecting rod at the rear of the outer door release handle by releasing the small metal clip, rotate the rod clockwise or anti-clockwise to shorten or extend the operating length.

NOTE: Door release should be effective before the total handle movement is exhausted to provide a small over-throw movement.

REAR DOOR LOCK, OUTSIDE AND INSIDE DOOR RELEASE HANDLES

Remove and refit

Removing

1. Ensure the window is in its fully closed position.
2. Remove all the interior door trim (refer to door glass and regulator remove and refit, items 2 to 11).
3. Disconnect the control rod from the inside door release handle by pulling the rod out of its location at the door lock.
4. Disconnect the sill locking control rod from the door lock by releasing the metal clip.
5. Disconnect the control rod from the outside door release handle by pulling it out of the plastic ferrule.
6. Release the door lock by removing the two counter-sunk screws from the door shut face and the single screw (with shakeproof washer) on the inside of the door. Retrieve any spacing washers which may be fitted between the inner door panel and the lock.
7. Withdraw the lock through the upper rear aperture in the inner door panel.

NOTE: If necessary the following items can also be removed.

8. Remove the two nuts (with shakeproof washers) and retaining bracket securing the **outside door release handle** to the outer door panel, accessible through the upper rear cut-out on the inner door panel.
9. Carefully detach the outside door release handle from the outer door panel.
10. Remove the two screws (with plain washers) securing the **inside door release handle** to the inner door panel.

11. Withdraw the handle from its location with the connecting rod still attached.
12. Unclip the spring tensioned end of the connecting rod from the door release handle.

Sill locking quadrants

13. Use a small screwdriver, or 3.175 mm diameter (⅛ in) rod, to press the plastic locking pins through the respective square inserts in the inner door panel, until they can be retrieved from inside the door.
14. Release the quadrants from the inner door panel and unhook the respective connecting rods.
15. Withdraw the quadrant from inside the door.

NOTE: When refitting the quadrants the plastic locking pins are entered into the square insert from outside and pressed in flush.

Refitting

16. Reverse the removal procedure 1 to 15.

ADJUSTMENT — REAR DOOR LOCK AND HANDLE ASSEMBLY

Outside door release handle to lock

Disconnect the short cranked connecting rod at the rear of the outer door release handle, rotate the rod clockwise or anti-clockwise to shorten or extend the operating length.

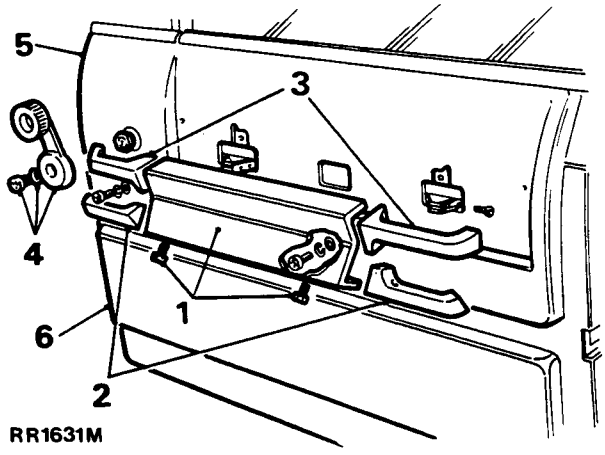
NOTE: Door release should be effective before the total handle movement is exhausted to provide a small over-throw movement.

FRONT DOOR GLASS AND REGULATOR—TWO DOOR MODEL

Remove and refit

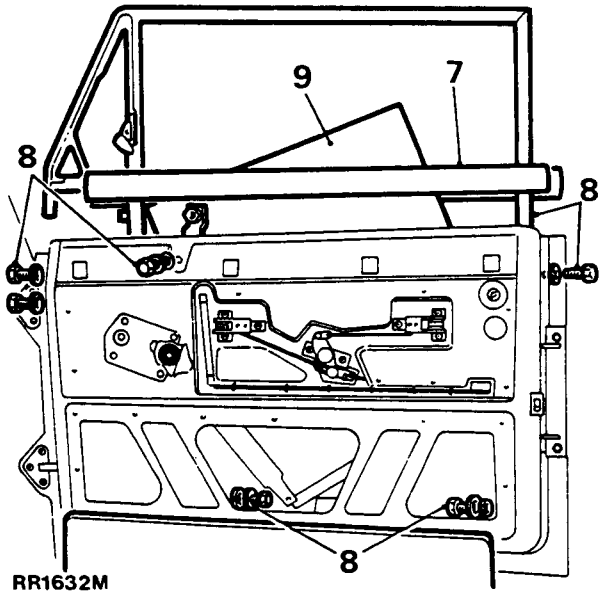
Removing

1. Remove the armrest.
2. Remove both interior door handles.
3. Remove both door-pull handles.
4. Remove the window regulator handle.
5. Prise the upper trim panel from the door.
6. Prise the lower trim panel from the door.



RR1631M

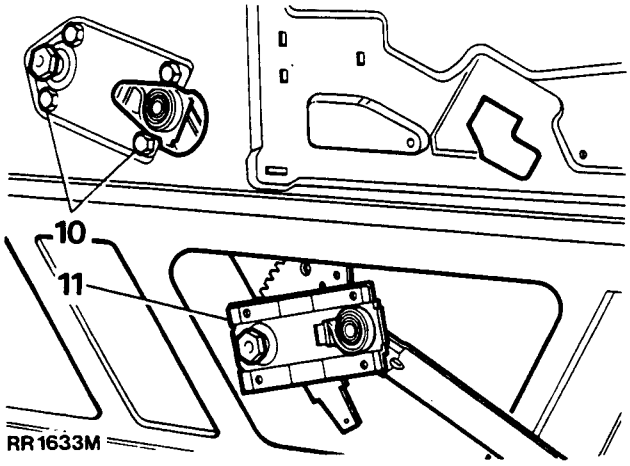
7. Withdraw the seals from the top edge of the door.
8. Remove the door glass frame.
9. Withdraw the glass.



RR1632M

Continued

10. Remove the four bolts securing the window regulator.
11. Withdraw the regulator out of the centre lower aperture.



Refitting

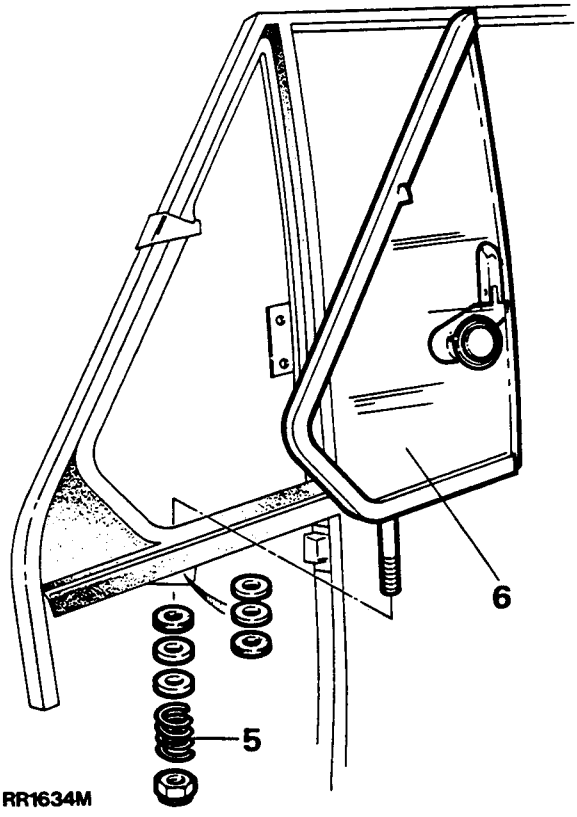
12. Fit the door frame and glass, do not fit the securing bolts at this stage.
13. Push the glass down the frame until the regulator runner is located in the glass channel.
14. Position the regulator and frame in the door panel and fit all retaining bolts.
15. Reverse the remaining removal instructions.

FRONT QUARTER VENT—TWO DOOR MODELS

Remove and refit

Removing

1. Remove the interior door handles.
2. Detach the upper and lower trim panels.
3. Remove all the door glass frame securing bolts (see Door glass and regulator removal instructions).
4. Remove the seals from the top edge of the door.
5. Pull the frame out of the door until access is gained to the nut, spring and washers at the bottom of the vent.
6. Remove the fixings and withdraw the quarter vent.



Refitting

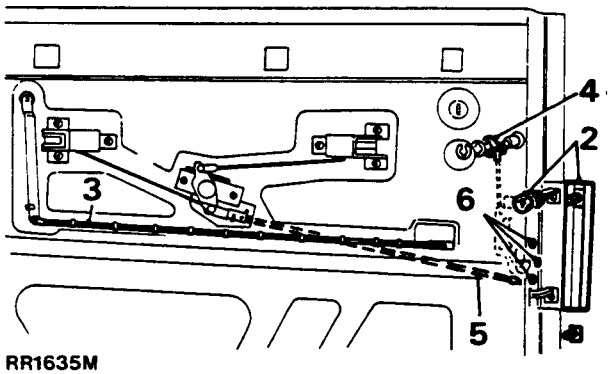
7. Reverse the removal instructions.

FRONT DOOR LOCK—TWO DOOR MODEL

Remove and refit

Removing

1. Remove the front door glass and frame (see door glass and regulator removal instructions).
2. Release the two nuts securing the exterior door handle, remove the handle from the door.
3. Disconnect the operating rod from between the interior locking lever and the lock.
4. Disconnect the operating rod at the private key lock.
5. Disconnect the operating rod from the interior door handle relay, at the lock end.
6. Remove the three screws securing the lock to the door panel, and withdraw the lock.



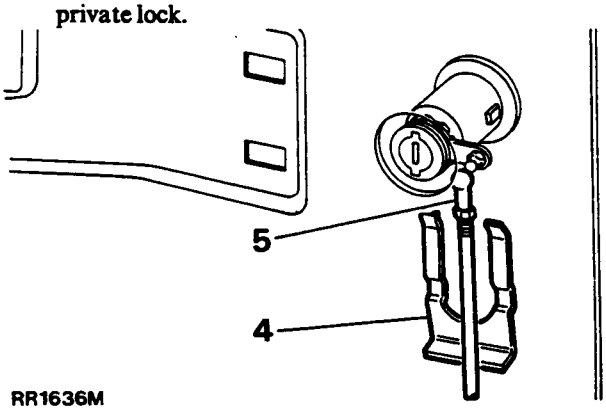
RR1635M

Refitting

7. Reverse the removal instructions.

PRIVATE LOCK, FRONT DOOR—TWO DOOR MODEL

1. Fully close the side door window.
2. Remove the interior door handles.
3. Carefully prise the upper and lower trim panels away from the door.
4. Disconnect the operating rod from the lever.
5. Using a bent piece of metal pull the spring clip off the private lock.



RR1636M

6. Manoeuvre the lock and remove it from the door.

Refitting

7. Reverse the removal instructions.

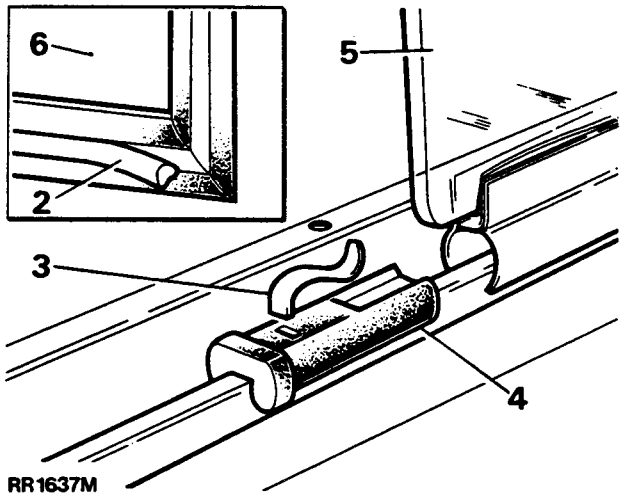
BODY SIDE GLASS—TWO DOOR MODEL

Front—remove and refit 3 to 7

Rear—remove and refit 1, 2 and 6

Removing

1. Remove the headlining rear section.
2. Remove the expander strip from the channel in the rubber moulding around the glass.
3. Lift the tongue of the spring clips from each of the front glass runners.
4. Slide both runners clear of the glass.
5. Lift out the front glass.
6. Lift out the rear glass.



RR1637M

Refitting

7. Reverse 1 to 6.

WINDSCREEN GLASS

Remove and refit

Removing

1. Remove the windscreen wiper arms.
2. Remove the expander strip from the channel in the rubber moulding around the glass.
3. Ease the bottom edge of the windscreen glass from the rubber moulding.
4. Lift the windscreen glass clear.

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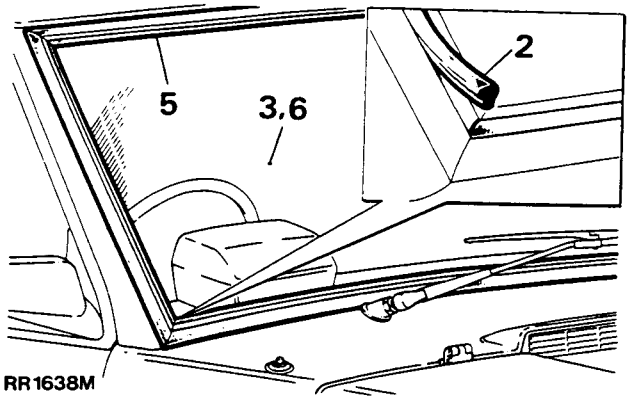


RR1638M

Refitting

5. Smear soft soap around the windscreen glass location channel in the rubber moulding.
6. Locate the bottom edge of the windscreen glass into the rubber moulding.
7. Use a suitable tool tapered to a thin end, to prise the rubber moulding over the windscreen glass all the way round.
8. Using a suitable tool insert the expander rubber into the channel around the windscreen moulding.

TAILGATE GLASS

Remove and refit

Removing

1. Remove the upper tailgate.
2. Remove the lock.
3. Remove the lift handle and trim.
4. The upper tailgate glass and frame are serviced as one unit.

Refitting

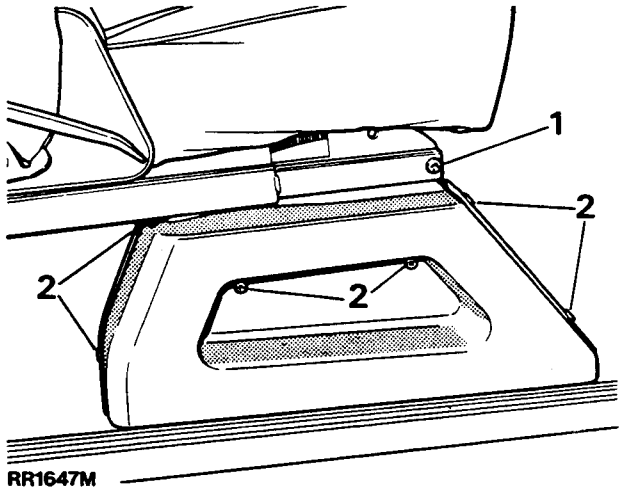
5. Reverse instructions 1 to 3.

FRONT SEAT—TWO DOOR MODEL

Remove and refit

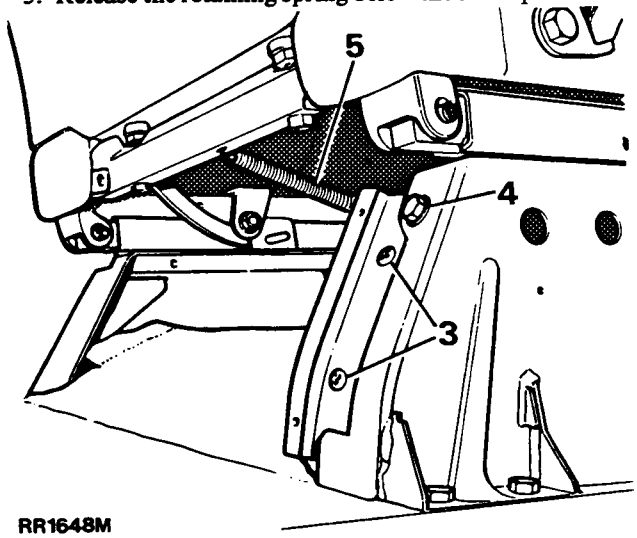
Removing

1. Remove the nut and bolt from the front of each seat slide.
2. Remove the six screws and the outside seat base cowling.



RR1647M

3. Remove the two screws and the plate from the outside rear of the seat base.
4. Remove the upper bolt from the rear retention bar and push the bar downward.
5. Release the retaining spring below the seat squab.



RR1648M

6. Working from the rear seat slide the front seat rearward and manoeuvre over the rear kick plate.
7. Withdraw the front seat.

NOTE: It may be found necessary to remove the 'B' post trim if fouling is experienced.

Refitting

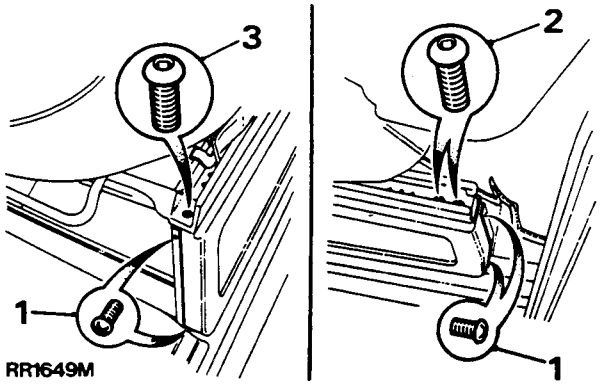
8. Reverse instructions 1 to 7.
9. Refit the 'B' post trim, if removed.

FRONT SEAT—FOUR DOOR MODEL

Remove and refit

Removing

1. Remove the four cross-head screws securing the outside seat base cowling.
2. Slide the seat forward and remove the four Allen type screws located inside the seat slide channel at the rear of the seat.
3. Move the seat rearwards and remove the two Allen type screws with nuts located inside the runner channel at the front of the seat.



4. Remove the seat from the vehicle.

Refitting

5. Reverse the removal procedure.

FRONT SEAT BASE—TWO AND FOUR DOOR MODELS

Remove and refit

Removing

1. Remove the seat.
2. Release the front and rear footwell carpets to give access to the seat belt bolts.
3. Remove the twelve bolts (with washers) securing the seat base to the floor.
4. Disengage the eyebolts, seat base to chassis.

NOTE: Four door Fuel Injection models only. Disconnect the multi-plug from the electronic control unit located under the right-hand front seat.

5. Withdraw the seat base.

Refitting

6. Reverse the removal procedure.

CUBBY BOX AND FLOOR MOUNTED CONSOLE ASSEMBLY

Remove and refit

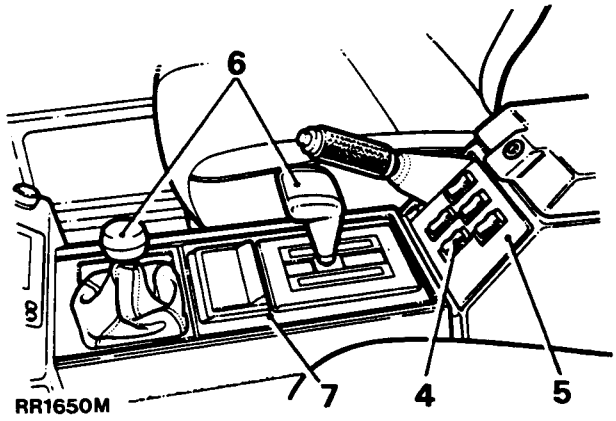
Removing

1. Disconnect the battery negative lead.
2. Remove the four cross-head screws securing the cubby box liner to the cubby box and withdraw the liner.
3. Disconnect the electrical leads to the rear passenger cigar lighter.
4. Disconnect the electrical multi-plugs from the rear of the window lift switches, labelling each plug for identification on re-assembly.
5. Prise out the window lift panel complete with switches.

NOTE: To enable the cubby box/console assembly to be removed, disconnect the handbrake cable from the handbrake lever, to allow the lever to be raised to its uppermost position.

6. Remove the main and transfer gear selector knobs.
7. Carefully prise the inset panel around the main gear selector away from the outer surround.

NOTE: Automatic transmission models—Disconnect the graphics illumination bulbs from the selector panel.



8. Remove the two bolts (with washers) and two screws (with washers) securing floor-mounted console to the gearbox tunnel.
9. Ease the assembly rearwards to detach the small location tab at the front of the console from the bottom of the radio housing.
10. Manoeuvre the assembly from the handbrake and gear levers and remove it from the vehicle.

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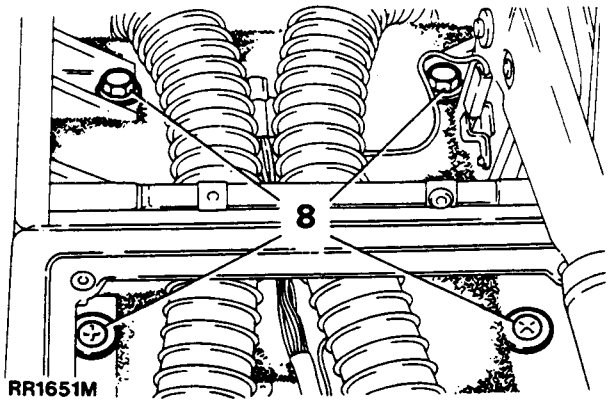


RR1651M

Refitting

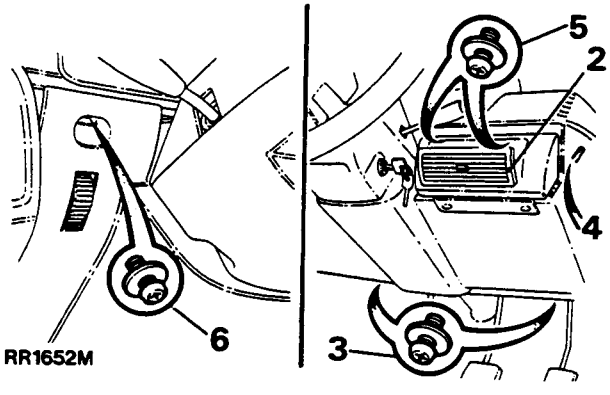
11. Reverse the removal procedure ensuring that all electrical plugs are fitted securely and correctly. Arrange the electrical wiring beneath the console to ensure it does not become trapped between any joint faces.

LOWER FASCIA PANEL

Remove and refit

Removing

1. Disconnect the battery negative lead.
2. Prise the louvre from the fascia (Air conditioning models only).
3. Remove the two cross-head screws from the bottom of the panel located above the pedals.
4. Remove the single cross-head screw from the side of the panel adjacent to the front door courtesy light switch.
5. Remove the two cross-head screws from the top of the louvre aperture.
6. Remove the single cross-head screw above the rheostat switch.



RR1652M

7. Lower the fascia and disconnect the electrical plug at the rear of the rheostat switch.
8. Remove the panel from the vehicle.

Refitting

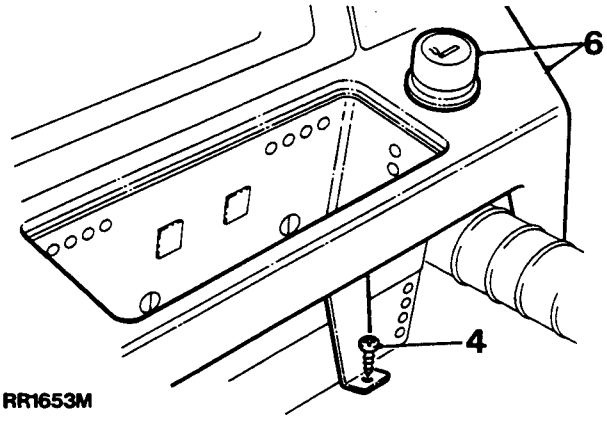
9. Reverse the removal procedure.

RADIO HOUSING

Remove and refit

Removing

1. Disconnect the battery negative lead.
2. Remove the cubby box and floor-mounted console assembly.
3. Remove the radio from the housing (see Radio—remove and refit in electrical section).
4. Remove the single screw securing the housing to the gearbox tunnel.
5. Tilt the front of the housing upwards and manoeuvre it away from the centre fascia unit as far as the cigar lighter electrical leads will permit.
6. Disconnect the leads from the rear of the cigar lighter and remove radio housing complete with lighter unit.



RR1653M

Refitting

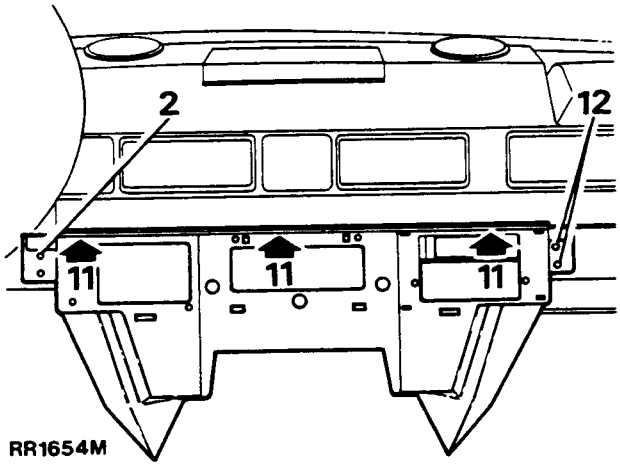
7. Reverse the removal procedure ensuring the radio electrical leads do not become trapped when refitting the radio to the housing.

CENTRE FASCIA PANEL

Remove and refit

Removing

1. Disconnect the battery negative lead.
2. Remove the lower fascia panel to give access to the single screw securing the side of the centre fascia and release the screw (driver's side).
3. Remove the cubby box and floor-mounted console assembly.
4. Remove the radio and radio housing.
5. Detach the fuse box cover and remove the three screws securing the main and auxiliary fuse box body to the fascia.
6. Pull the four heater control knobs off their levers.
7. Remove the two screws at the top of the heater graphics panel. Pull the panel away from the fascia and remove the illumination bulbs from their locations.
8. Withdraw the graphics panel.
9. Prise the auxiliary switch panel away from the fascia.
10. Identify each switch multi-plug to aid re-assembly, and disconnect them from the switches.
11. Release the three screws securing the top of the centre fascia to the louvre fascia panel.
12. Remove the two screws securing the side of the centre fascia unit (front passenger side).
13. Manoeuvre the centre fascia away from the louvre fascia and remove it from the vehicle.



RR1654M

Refitting

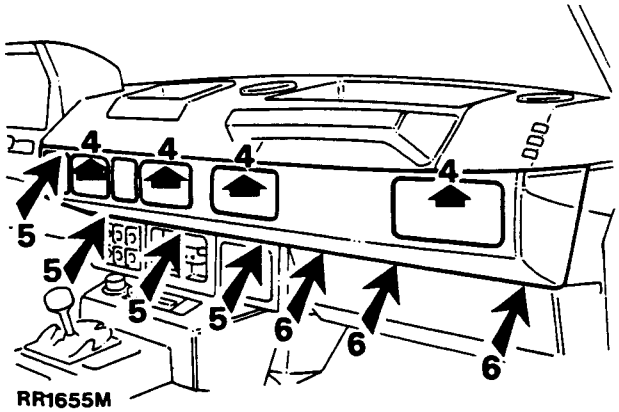
14. Reverse the removal procedure ensuring that all electrical multi-plugs are fitted correctly and secure in their respective switches.
15. Arrange all electrical wiring and harnesses so that they do not become trapped between any mating faces.

LOUVRE FASCIA PANEL

Remove and refit

Removing

1. Disconnect the battery negative lead.
2. Carefully prise the clock out of the fascia, disconnect the electrical leads and remove the bulb and holder from its holder.
3. Remove the single screw securing the end of the fascia panel located adjacent to the passenger courtesy light switch.
4. **AIR CONDITIONED MODELS**—Remove the four louvres to give access to the eight securing screws located at the top of the louvre apertures.
   NON-AIR CONDITIONED MODELS—Remove the five screws securing the parcel shelf, withdraw the shelf to give access to the four nuts and bolts (with plain washers) located behind the louvre fascia panel retaining the panel to the top rail. Prise out the two centre louvres and release the four screws located within the louvre apertures.
5. **AIR CONDITIONED MODELS**—Remove the remaining screw above the air-conditioning control panel.
6. Remove the three screws securing the bottom of the panel to the centre fascia panel (**both models**). Remove the remaining three screws above the blower motor trim panel (air-conditioned models only).



RR1655M

7. Ease the fascia panel forward and disconnect the electrical leads from the rear of the air conditioning switch (air conditioned models only).
8. Withdraw the panel from the vehicle.

Refitting

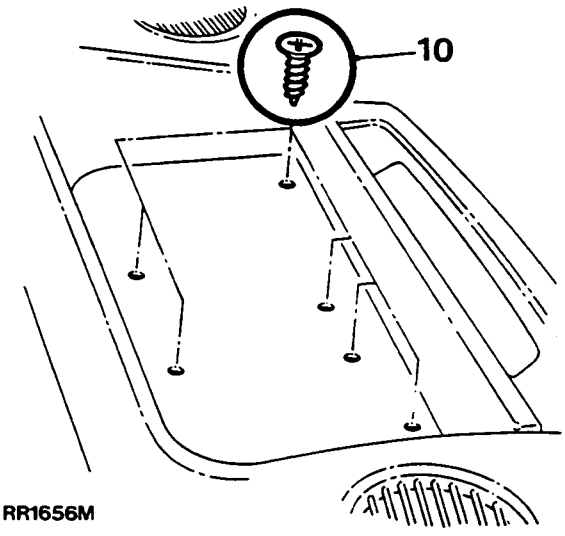
9. Reverse the removal procedure.

FASCIA TOP RAIL

Remove and refit

Removing

1. Disconnect the battery negative lead and remove the steering wheel.
2. Remove the lower fascia panel.
3. Remove the cubby box and floor mounted console assembly.
4. Remove the radio and radio housing.
5. Detach the heater control graphics panel, auxiliary switch panel and fuse box from the centre fascia panel.
6. Remove the centre fascia panel.
7. Remove the louvre fascia panel.
8. Remove the instrument binnacle (see instrument binnacle Remove and refit in Electrical section).
9. Remove the rubber mat from the passenger map tray.
10. Remove the five screws, nuts and washers securing the grab rail and fascia top rail to the inner bulkhead.



RR1656M

11. Disconnect side and centre air vent hoses from the heater unit.
12. Withdraw the fascia top rail.

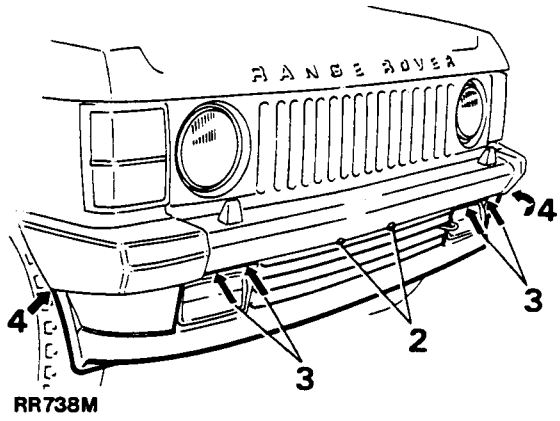
Refitting

13. Reverse the removal procedure ensuring that the fascia top rail locates on three brackets below the windscreen inner sealing rubber.
14. Ease the sealing rubber over the top of the fascia top rail.

FRONT SPOILER—option

A front spoiler is fitted as a standard item on Range Rover Vogue and as an option on all other Range Rover models. The spoiler, if fitted, will reduce the vehicle approach angle by approximately 10°. Where the vehicle is expected to perform on rough or hilly terrain, it is advisable to remove the spoiler to prevent any damage which may occur due to ground contact.
The spoiler may be removed as follows.

1. Disconnect the electrical connections at the rear of both auxiliary driving lamps, accessible through the front wheel arches.
2. Remove the two screws (with spring washers) securing the centre of the spoiler.
3. Remove the four nuts (with spring washers) located behind the front bumper above the driving lamp pockets, accessible from beneath the vehicle.
4. Remove the two bolts, nuts and washers securing the outer edges of the spoiler to the corners of the front wings, located forward of the front road wheels.



RR738M

5. Remove the spoiler complete with driving lamps.

Refitting

6. Reverse the removal instructions.