



Land Rover  
Range Rover

## Workshop Bulletin

AUGUST 1987

BULLETIN No. LSM180WB3

**RANGE ROVER**

**TUDOR WEBASTO ELECTRICALLY OPERATED SUNSHINE ROOF**



# CONTENTS

Section	Page
<b>01</b> INTRODUCTION	
Introduction	1
<b>76</b> BODY	
Emergency operation	2
Headlining - remove and refit	6
Motor, micro-switch and stepper relay	2
Operation	2
Roof panel seals - remove and refit	2
Sunroof assembly	1
Sunroof assembly - remove and refit	3
Sunroof blind assembly - remove and refit	5
<b>86</b> ELECTRICAL	
Relays	1
Fuse	1
Circuit diagram	2

INTRODUCTION **01**

## RANGE ROVER

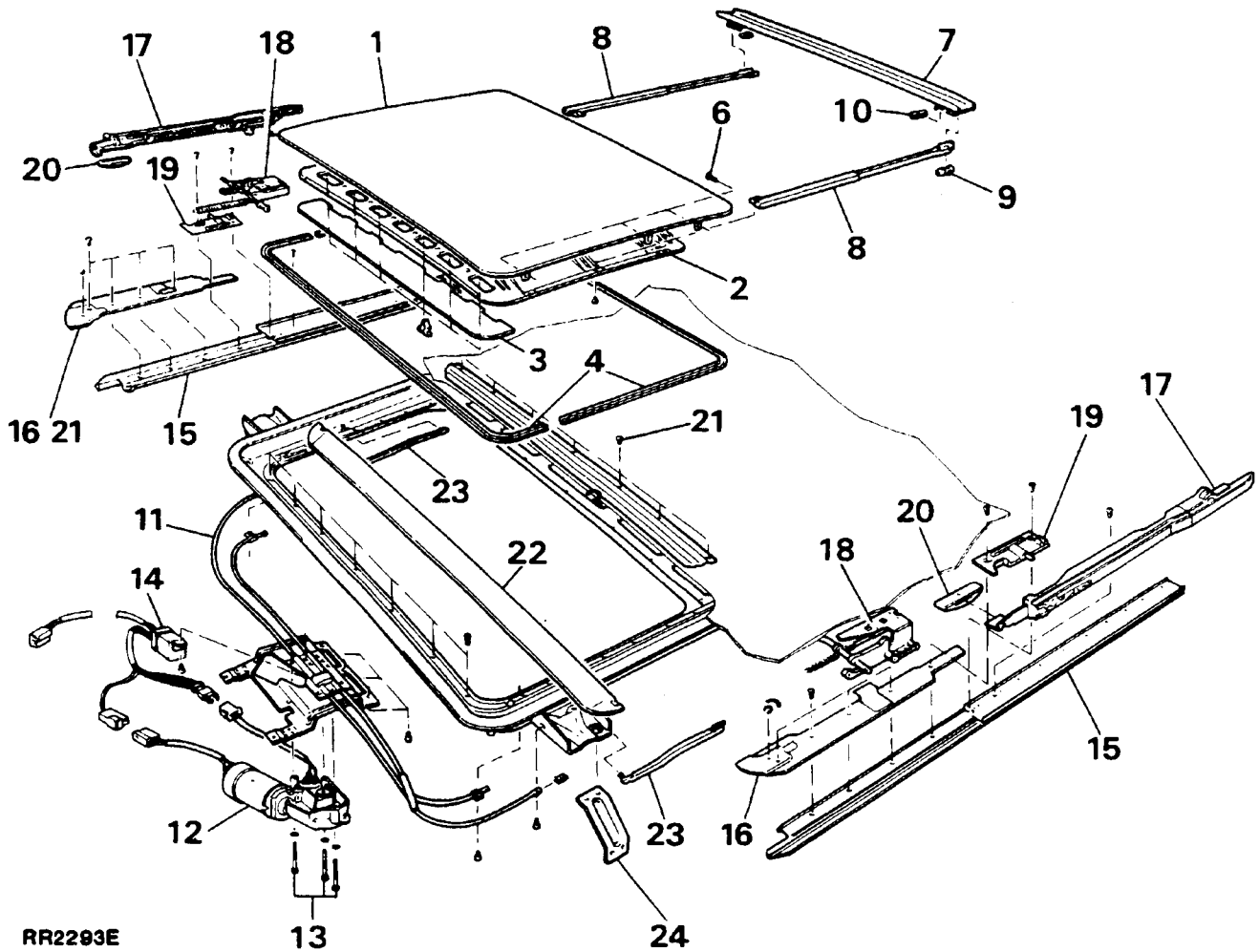
### 1987 MODEL YEAR IMPROVEMENTS

#### INTRODUCTION

As part of the 1987 model year programme Land Rover Ltd is continually looking at ways to improve the quality and characteristics of its products. This bulletin contains details of the electrically operated sunshine roof which will further enhance the specification of the Range Rover. A further model improvement is the introduction of a one piece headlining.



ELECTRICALLY OPERATED SUNSHINE ROOF



SUNROOF ASSEMBLY

- |  |                                   |
|--|-----------------------------------|
| 1. Roof panel                          | 13. Motor retaining screws        |
| 2. Blind                               | 14. Relay                         |
| 3. Insulation pad                      | 15. Lower guide rails             |
| 4. Roof seals (front and rear)         | 16. Front guide rails             |
| 5. Blind retaining clips (6 off)       | 17. Slide mechanism               |
| 6. Roof panel retaining screws (6 off) | 18. Rear guide                    |
| 7. Water channel                       | 19. Pivot bracket                 |
| 8. Water channel connectors            | 20. Slide shoe                    |
| 9. Support bracket-water channel       | 21. Rear edge trim finisher       |
| 10. Slide shoe-water channel           | 22. Wind deflector assembly       |
| 11. Motor bracket/guide tube assembly  | 23. Wind deflector operating arms |
| 12. Operating motor                    | 24. Support bracket (6 off)       |

## OPERATION

The sunroof operates in a tilt and slide action controlled by the rocker switch adjacent to the interior roof lamp, with ignition switched 'ON'.

1. Depress front of switch to lift rear edge of sunroof into 'Tilt' position.
2. Depress rear edge of switch to close roof.
3. Depress rear of switch to slide sunroof into 'Open' position.
4. Depress front of switch to slide sunroof into 'Close' position.

**NOTE: The electric drive cuts out automatically in the closed, tilt and open positions. If the switch is operated in the wrong direction in one of these positions, press the switch once to reset and again to operate roof.**

## EMERGENCY OPERATION

If the sun roof fails in the open position carry out the following procedure:

1. Lower the interior lamp mounting panel by releasing two turnbuckles.
2. Remove the emergency handle from the vehicle tool kit.
3. Engage handle in motor drive spindle and turn to close roof.

## MAINTENANCE

At each service blow drain tubes out to ensure they are not blocked or kinked. Blow upwards to clear rear drain tubes which are clipped to the rear mud flap supports. Blow downwards to clear front drain tubes which run down each 'A' post and exit at back of engine bay.

Annually: Clean sunroof opening thoroughly.

**Note: Where the vehicle is operated in extremely dusty conditions more frequent cleaning is recommended.**

## OPERATING MOTOR, MICRO-SWITCH AND RELAY

### Remove and refit

#### Removing

1. Ensure sunroof is fully closed. Disconnect the battery negative lead.
2. Remove interior lamp mounting panel by loosening two turnbuckles to gain access to the motor.
3. Disconnect two wiring connectors.
4. Remove three securing screws and withdraw motor.
5. Remove securing screw and withdraw relay.
6. Remove micro-switch from motor by drilling out securing rivets, if required.

#### Refitting

7. Secure new micro-switch using suitable nuts and bolts to replace rivets. Tighten nuts and apply a spot of paint to threads.
8. Ensure motor is in the 'park' position, i.e. hole on driven gear aligned with drive spindle.
9. Reverse removal procedure.
10. Check operation of sunroof in all positions.

## ROOF PANEL SEALS

### Remove and refit

#### Removing

1. Position sunroof in the tilt position and disconnect battery negative terminal.
2. Unclip blind from roof panel front and slide the blind back fully.
3. Remove three roof panel fixing screws from each side and remove panel.
4. Place the roof panel on a suitable surface to avoid damage, and remove both seals.

#### Refitting

5. Position front seal to front edge of panel, ensuring that there is an equal length of seal each side of the centre point. Secure seal using a rubber mallet.
6. Position the rear seal on one side immediately to rear of the front seal. Secure seal around panel edge ensuring a good fit around corners. Trim off excess seal at joint with front seal using suitable snips, ensuring that the joint is closed.
7. Refit the roof panel.

**SUNROOF ASSEMBLY**

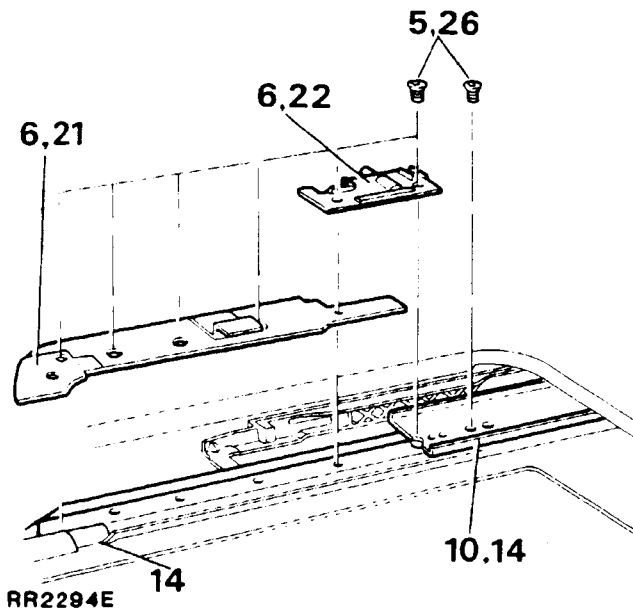
**Remove and refit**

- including roof panel, sliding mechanism, wind deflector, motor mounting bracket and guide tubes.

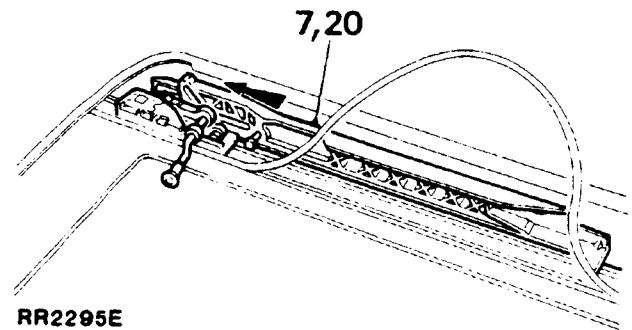
**Removing**

**NOTE:** Lower vehicle headlining ONLY if removing motor mounting bracket and guide tubes. Note that the headlining is secured around the roof opening using an adhesive tape. Remove edge trim and eight edge clips, carefully peel back headlining to remove.

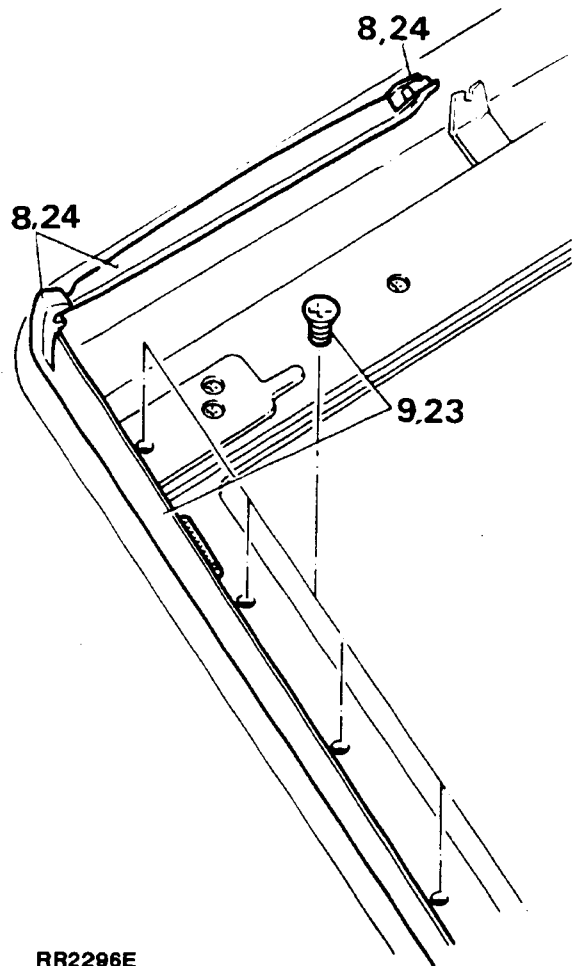
1. Partially open sunroof rearwards and carefully unclip blind from roof panel front. Slide the blind back fully.
2. Position sunroof in the tilt position and disconnect battery negative terminal.
3. Remove three roof panel fixing screws from each side and remove panel.
4. Remove motor securing screws and withdraw motor.
5. Remove the guide rail screws, seven each side.
6. Remove the pivot bracket and remove front guide rail.



7. Remove the slide and tilt mechanism complete with flexible drive cable from both sides. Do not strip these assemblies unless replacement parts are required.



8. Unclip both wind deflector operating arms from rear mounting brackets. Remove arms from deflector, if required.



Continued

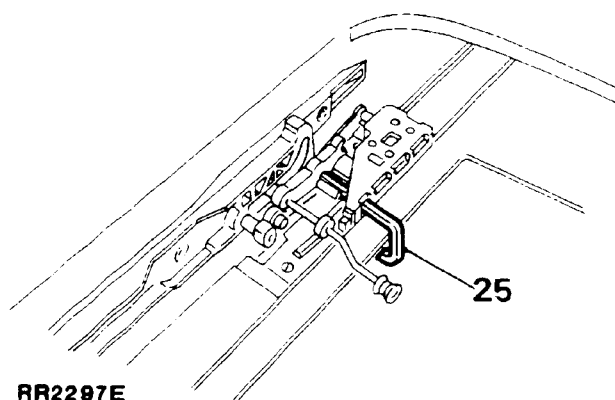
## 76 BODY

9. Remove seven fixing screws, and withdraw wind deflector.
10. Remove lower guide rails and rear edge finisher, seven screws, if required.
11. Remove fixing screws from guide tubes, two each side. Remove five fixing screws and withdraw motor mounting bracket.
12. Pull blind assembly forward and remove.

### Refitting

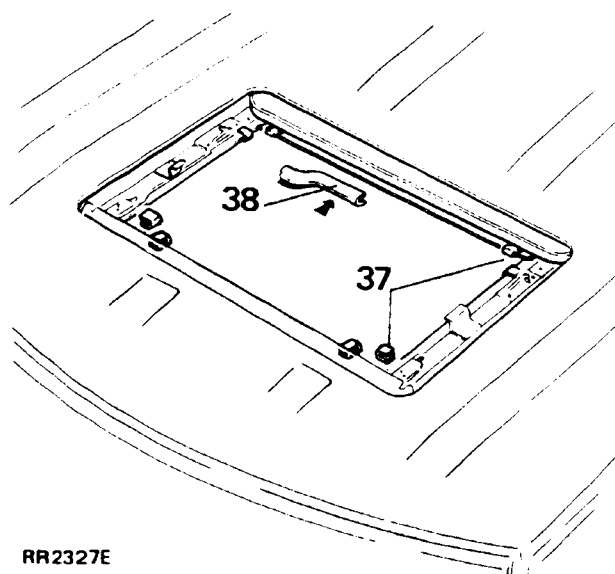
**NOTE: During assembly lightly lubricate all sliding parts using a silicon spray.**

13. Position motor bracket and guide tube assembly. Fit and tighten the securing screws.
14. Position right hand guide rail in rear retaining bracket, push rearwards fully and locate leading edge under drive cable opening. Repeat operation for left hand guide rail.
15. Align fixing holes, and loosely fit screw in seventh hole from the front.
16. Position finisher to rear edge of sun roof opening and secure using seven screws.
17. Position blind assembly into outer guide runners, and push fully rearwards.
18. Lightly lubricate drive cables. Ensure that the slide and tilt mechanism is fully assembled.
19. Push the cable fully into the right hand side guide tube. Loop remaining cable and enter the rear end into the right hand inner side runner.
20. Repeat operation 19. for left hand side. Push both assemblies rearwards to take up slack in the cables, and push a further 75 mm (3 in) to the rear.
21. Position both front guide rails, aligning with the four forward holes. Secure with screws, do not tighten.
22. Position both pivot brackets, fit but do not tighten fixing screws.
23. Fit the wind deflector and fully tighten fixings.
24. Position right hand operating arm in locating slot in deflector. Secure opposite end in frame bracket. Repeat for left hand side.
25. Pull right hand slide and tilt mechanism forward, align with pivot bracket and secure in position using setting key. Repeat operation for left hand side.



RR2297E

26. Tighten screws to guide rails, seven each side.
27. Fit and secure relay.
28. Ensure operating motor is in the park position i.e. hole on driven gear aligned with drive spindle. Fit and secure to mounting bracket.
29. Remove setting keys. Temporarily connect operating switch and reconnect wiring including battery.
30. Operate switch sequence to 'tilt' position.
31. Position roof panel into roof opening and secure with six fixing screws, do not tighten.
32. Put roof into 'closed' position and adjust roof profile. The panel profile should be 0.5 mm low at forward edge, 1 mm high at rear edge.
33. Tighten roof panel screws.
34. Tilt sunroof, pull blind forward and locate rear brackets in tilt mechanism. Align front six clips and push to secure.
35. Check operation of sunroof in all operating modes.



RR2327E

36. Refit vehicle headlining. The headlining is secured around the sunroof opening with '3M' adhesive tape.
37. Refit the eight edge clips as shown.
38. Finally fit the edging finisher.



**SUNROOF BLIND ASSEMBLY**

**Remove, retrim and refit**

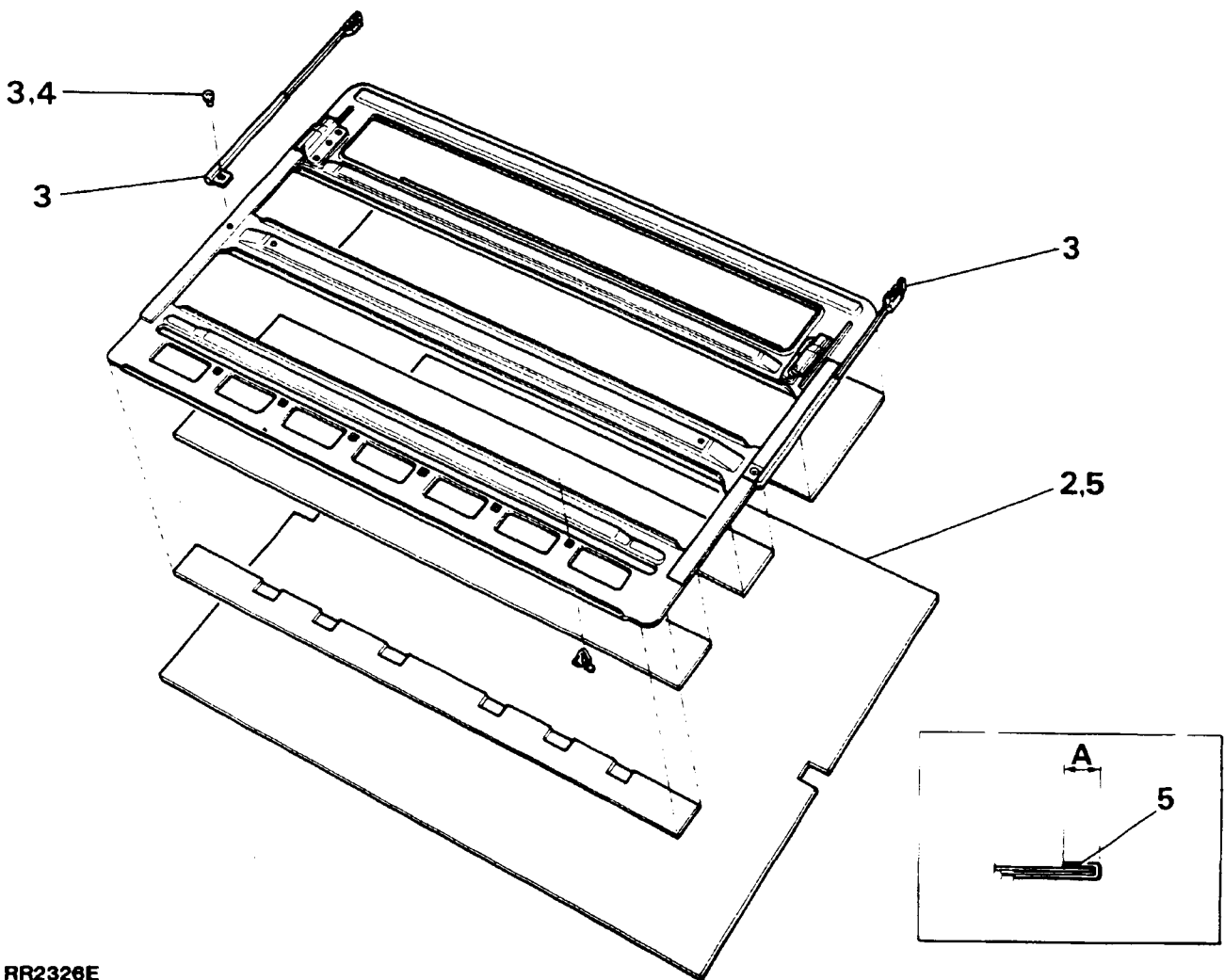
**Removing and retrimming**

1. Remove sunroof blind assembly as detailed in Sunroof Assembly - remove and refit.
2. Remove trim covering from frame assembly. Note that it is not normally necessary to remove the three pads and insulation pad shown in illustration.
3. If required: remove water channel by unclipping connecting arms. Drill out rivets securing connecting arms to frame.

4. Secure connecting arms to frame using suitable rivets before retrimming frame.
5. Retrim frame using a new blind cover. Inset shows section through frame indicating where adhesive is applied. Dimension 'A' should be radially constant.

**Refitting**

6. Refit blind assembly and reassemble sunroof.



RR2326E

**HEADLINING (One piece)****Remove and refit****Removing**

1. Remove spare wheel from the vehicle.
2. Remove the rear seat belt upper guide brackets and inertia reel assemblies.
3. Fold the rear seat backrest forward and recline the front seats as far as possible.
4. Disconnect the battery negative lead.
5. Remove the two roof lamp assemblies. (Lower and remove the interior lamp mounting panel if the vehicle has a sunroof)
6. Remove the rear view mirror and mounting bracket.
7. Remove the two sun visors and centre retaining bracket.
8. Remove the front and rear passenger grab handles. **Sunroof vehicles:** Remove edge trim and eight edge clips from roof opening, and carefully peel back headlining to remove.
9. With assistance support the front of the headlining, while removing the two plastic retaining clips above the rear quarter light glass.
10. While the headlining is still being supported, remove the two plastic retaining clips securing the rear end of the headlining, located adjacent to the upper tailgate hinges.
11. Pull the headlining forward to clear the rear quarter trim. Lower the headlining and disconnect the electrical leads from the roof mounted speakers.
12. Remove the headlining through the tailgate.

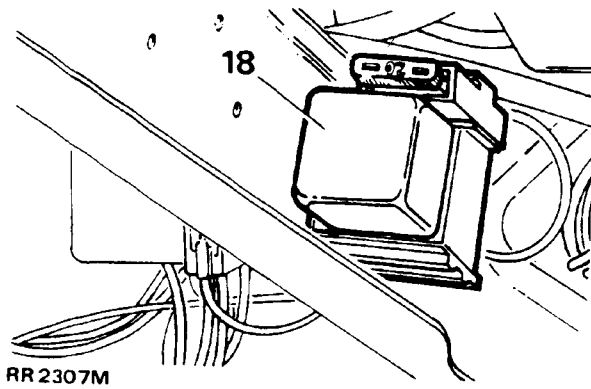
**CAUTION:** To assist removal tilt the headlining at an angle. **DO NOT** flex the headlining as damage may occur.

**Refitting**

8. Reverse the removal procedure. **Sunroof vehicles:** The headlining is secured around the roof opening with '3M' adhesive tape. Refit the eight edge clips and fit the edging finisher. See also Sunroof assembly, remove and refit.

**RELAYS**

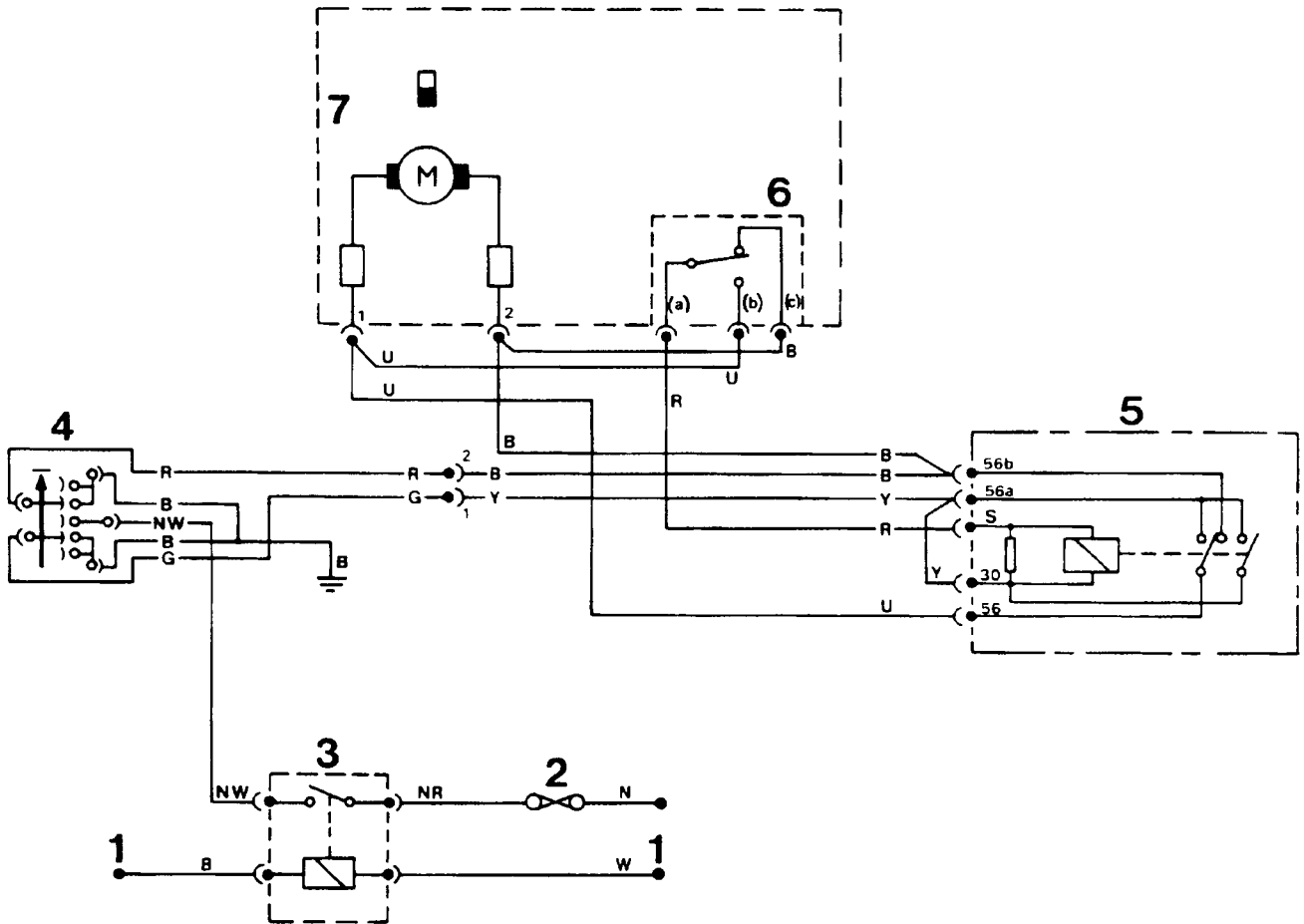
**Stepper relay:** mounted on motor mounting bracket, accessible by lowering interior lamp mounting bracket.



**Auxiliary relay (18):** mounted on side of pedal box. Accessible by removing lower fascia panel.

**Fuse:** 20 amp located on side of auxiliary relay.

**Continued**



RR2321E

**SUNSHINE ROOF - Circuit diagram**

**RR2321E**

1. Main harness connections  
Brown - live positive feed  
White - ignition positive feed  
Black - earth
2. Fuse
3. Auxiliary relay
4. Operating switch
5. Stepper relay
6. Micro-switch - motor switching:  
Contact (a) and (c)-CLOSED  
Contact (a) and (b)-OPEN/TILT
7. Drive motor

**CABLE COLOUR CODE**

- B** Black
- U** Blue
- N** Brown
- G** Green
- R** Red
- W** White
- Y** Yellow

The last letter of a colour code denotes the tracer.

(08/87)