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Sunroof

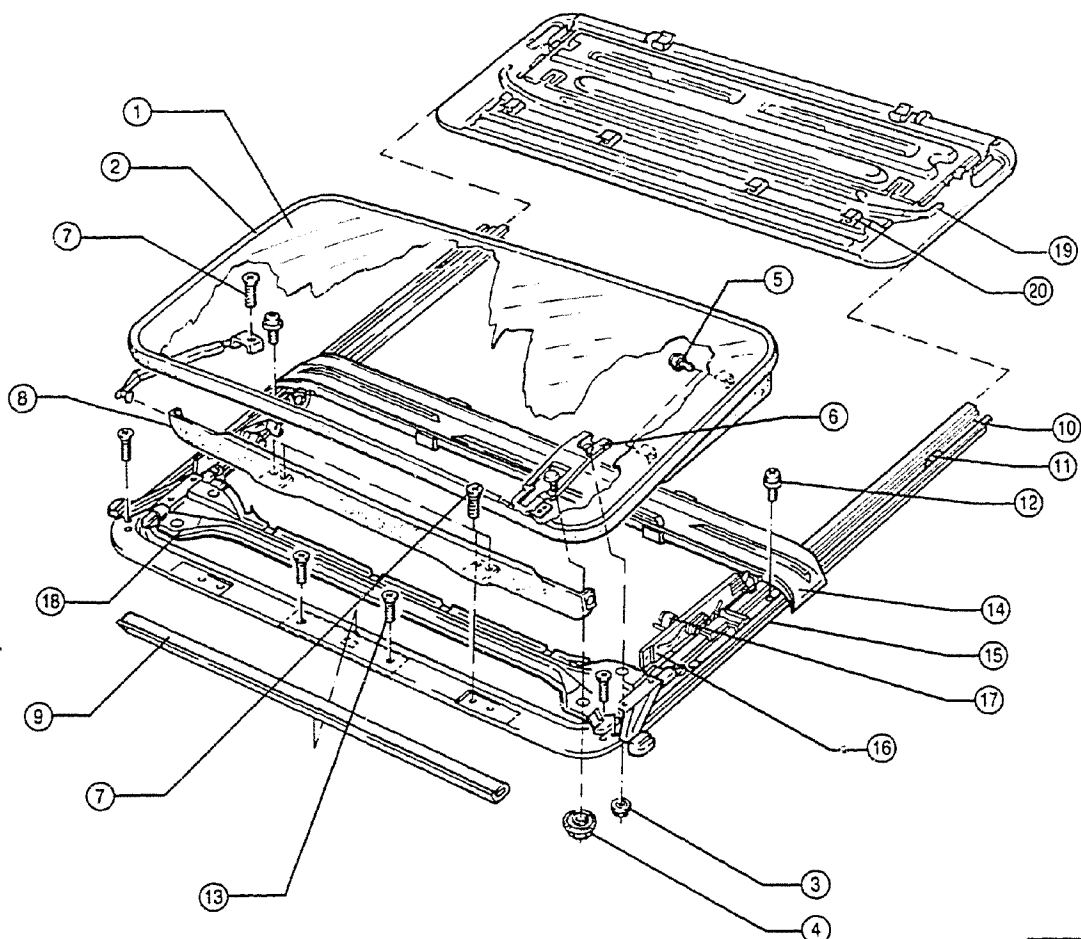
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Sunroof lid

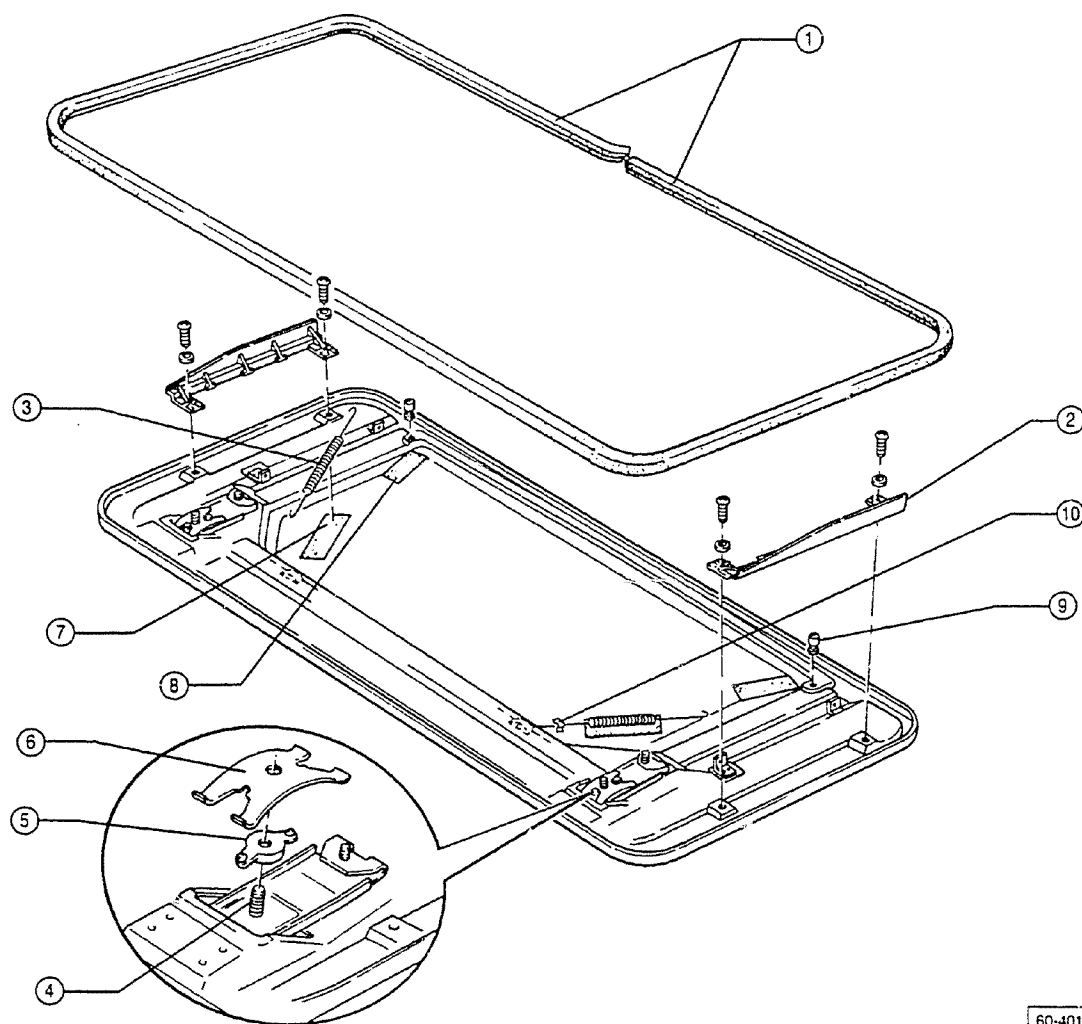
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Water drain hoses

- location 60.36



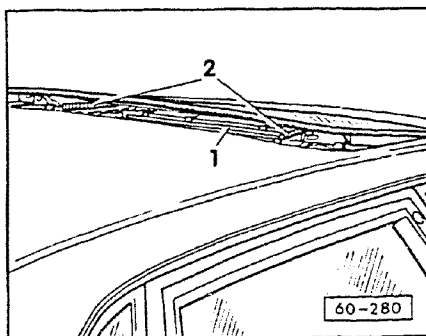
- | | |
|-----------------------------------|--|
| ① — Sunroof lid, removing 60.4 | ⑪ — Stop bracket |
| ② — Sunroof lid seal | ⑫ — Oval head screw |
| ③ — Sunroof lid bolt | ⑬ — Flat head screw |
| ④ — Height adjustment bolt, front | ⑭ — Rain deflector |
| ⑤ — Height adjustment screw, rear | ⑮ — Rear guide (with cable) |
| ⑥ — Sunroof lid hinge | ⑯ — Tilt bracket |
| ⑦ — Flat head screw | ⑰ — Sunroof headliner lifter/retainer |
| ⑧ — Wind deflector | ⑱ — Front sunroof support |
| ⑨ — Acoustic seal | ⑲ — Sunroof lid headliner |
| ⑩ — Side guide rail | ⑳ — Sunroof lid headliner retaining clip |



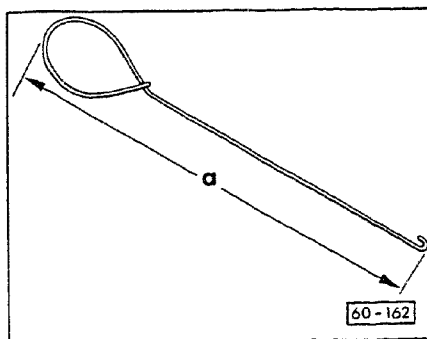
60-401

- ① — Sunroof lid seal
- ② — Trim piece
- ③ — Tension spring
- ④ — Sunroof lid hinge
- ⑤ — Rubber spring
- ⑥ — Leaf spring
- ⑦ — Protective felt strip
- ⑧ — Protective felt strip
- ⑨ — Rubber stop
- ⑩ — Tape (holds spring in place)

Sunroof lid, removing



- tilt sunroof up at rear
- push flap (1) downwards
- unhook both tension springs (2) from flap

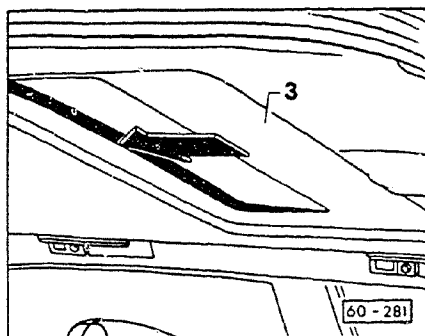


To make spring removal easier, make special removal tool

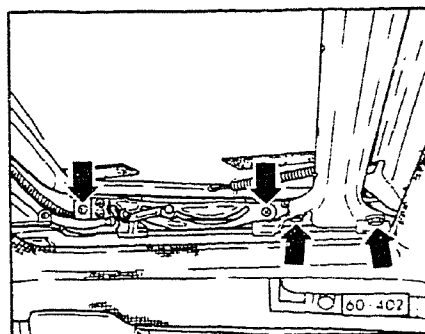
- a = approximately 300mm (12.0 in)
- dip hook in paint to prevent damage to vehicle

CAUTION

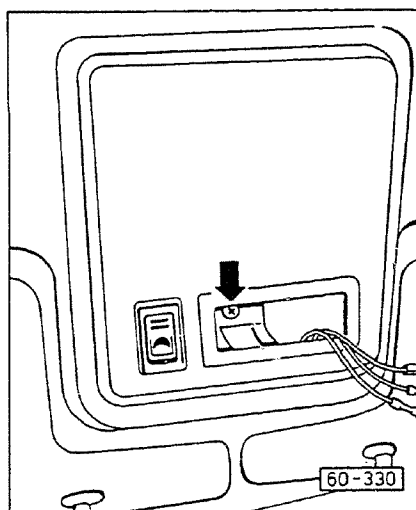
Put masking tape around front and rear of sunroof opening to protect paint when removing sunroof pieces.



- reach into sunroof opening and unclip trim panel (3) by pulling toward back
- push trim panel back into roof

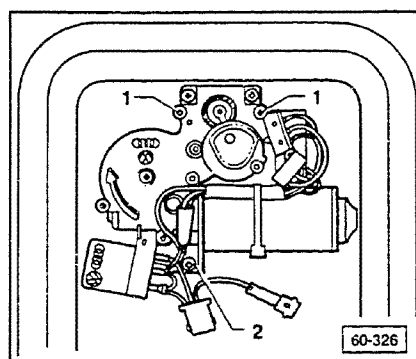


- close sunroof
- remove mounting screws and nuts (arrows)
- carefully lift sunroof lid from vehicle

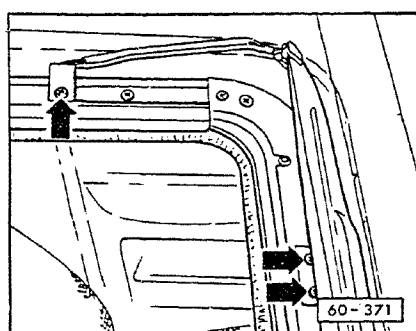


Sunroof motor, removing

- remove sunroof trim and sunroof lid from vehicle
- unclip dome light and disconnect electrical connectors
- unscrew cover (arrow) and push forward to remove

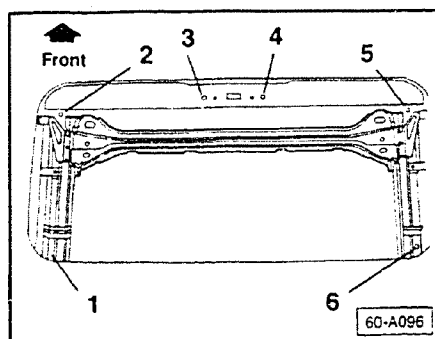


- disconnect motor electrical connectors
- remove screws (1) and (2) noting position of washer under screw (2) located between motor and roof



Sunroof assembly, removing

- remove sunroof lid
- remove sunroof motor
- push rear guide with cables and sunroof support back far enough to expose deflector mounting screws (arrows)
- unscrew wind deflector screws (arrows)
- remove wind deflector

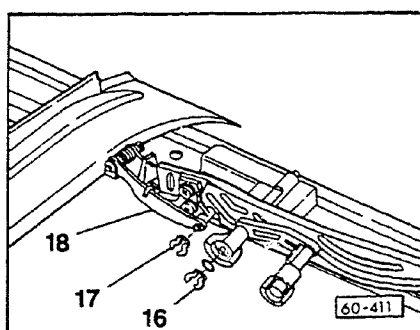


- remove six M4 X 16 oval head screws (arrows)
 - screws 1 and 6 have lock washers
- move complete sunroof assembly up and forward out of sunroof opening
- remove sunroof headliner from vehicle

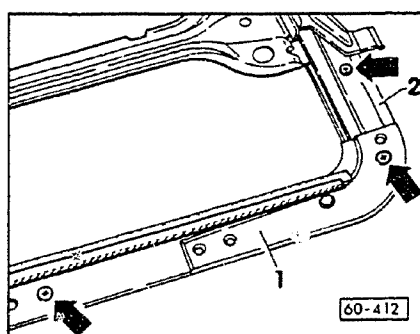
Note

The following repairs are done with the sunroof assembly on the workbench.

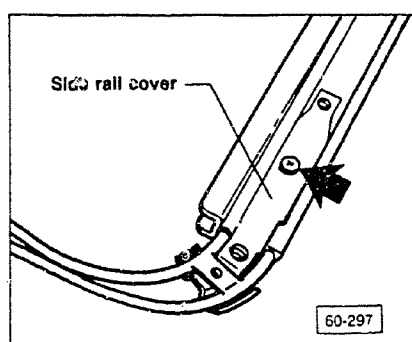
Sunroof assembly, disassembly



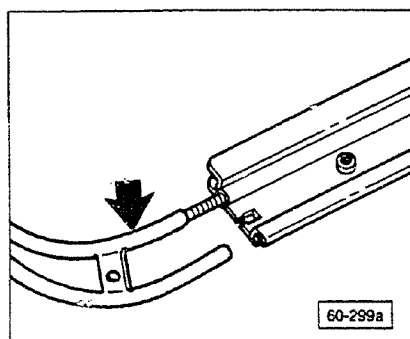
- remove sunroof assembly
- remove circlip (17) and pull off lever (18) on both sides
- remove circlip (16) and O-ring
- remove guide plate/tilt bracket



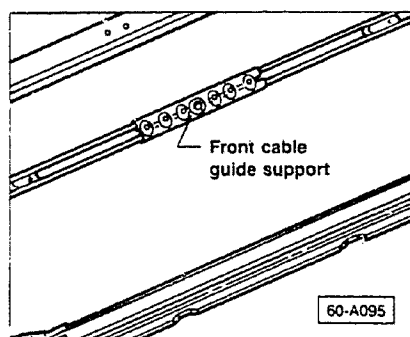
- remove screws (arrows) and remove front rail cover
- pull sunroof support forward and out of guide rails



- remove side rail cover screw (arrow) from both sides
- remove side rail covers



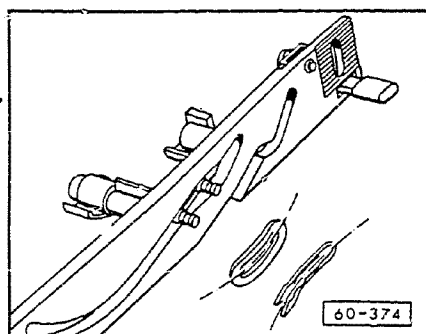
- remove cable guide tubes (arrow) from guide rail



- remove cable guide tubes from cable guide support

CAUTION

Check front cable guide support for broken metal clip. Replace clip if necessary. Clean all cable guide tubes, tracks and rails before reassembling.



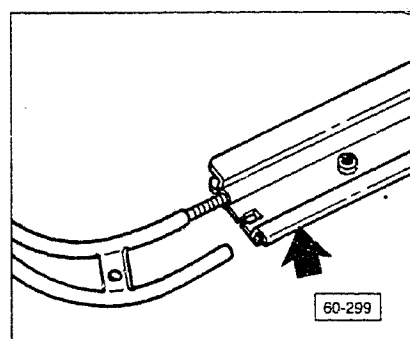
- remove sunroof lid trim retainer from guide plate/tilt bracket.

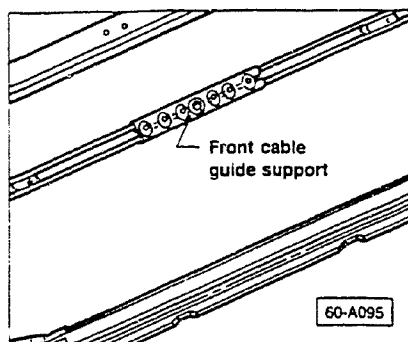
Sunroof assembly, assembling

Note

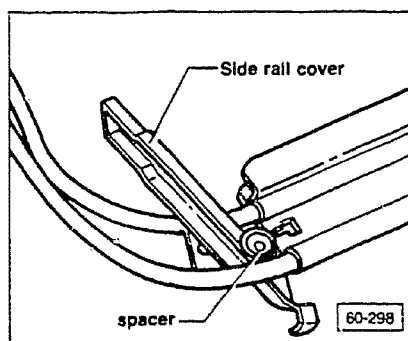
Assemble sunroof on bench and then install complete sunroof assembly in vehicle

- lightly lubricate new sunroof cables with mineral oil
- install cables into guide rail (arrow) on both sides
- install cables into guide tubes and push guide tubes into guide rail

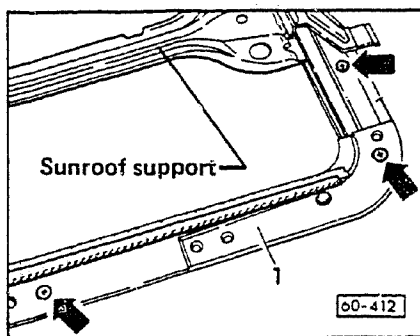




- install cable guide tubes into front cable guide support



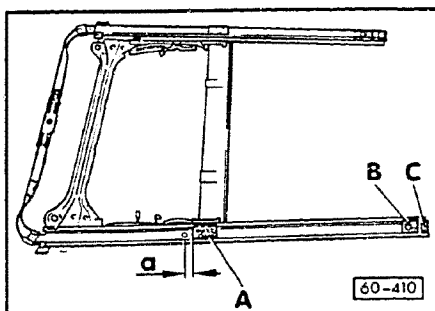
- install side rail covers (both sides)
- put Loctite on screws and tighten
 - 1.0 + 0.2 Nm



- slide sunroof support on to guide rails
- install front rail cover (1)
- coat screws with Loctite
 - 1.0 + 0.2 Nm

CAUTION

Front sunroof support is "twisted" when manufactured. Therefore, one end of guide rail will be higher than other. This is normal. Do not try to correct this condition.



- check that felt backing is installed

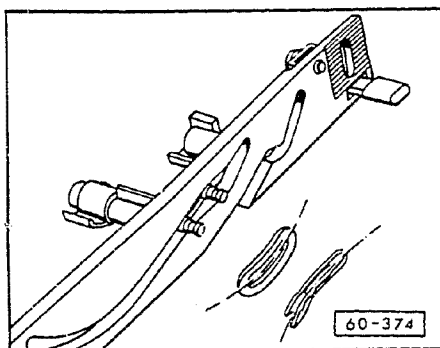
A = 55mm X 25mm

B = 50mm X 35mm

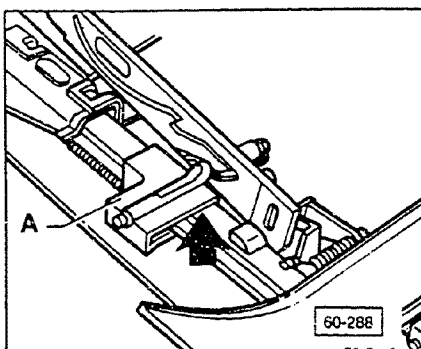
C = 15mm X 30mm

a = 20mm gap

- install sunroof trim retainer on guide plate/tilt bracket
- install washer and clip as shown



- install guide plate/tilt bracket over pin on sunroof cable
- install O-ring and clip (16)
- attach rain deflector lever (18) to guide plate/tilt bracket and install clip

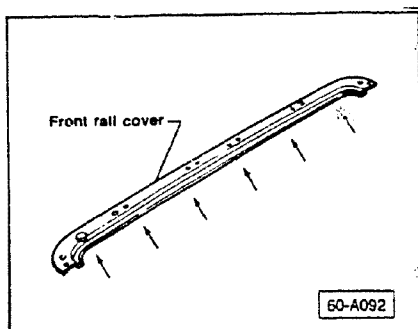


- slide cables A (guide plate/tilt bracket attached) rearward until aligned with marking line on guide rail (arrow)

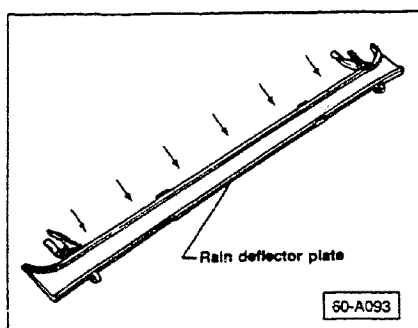
CAUTION

When lining up cables to guide rail, always move cables from front of vehicle rearward to marking lines. Do not move cables from rear of vehicle forward to marking lines.

- slide sunroof headliner into guide rails from rear



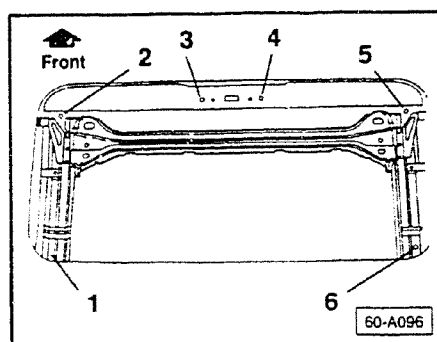
- install acoustic gasket on front rail cover (**arrows**)



- install acoustic gasket on rain deflector plate (**arrows**)

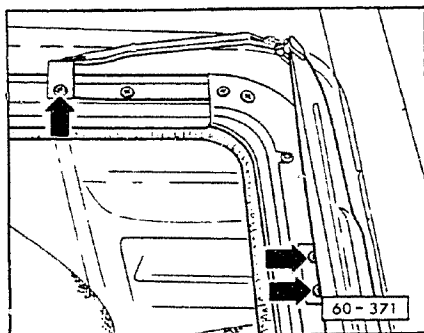
Note

Be sure that lip of rear acoustic gasket faces front of vehicle.



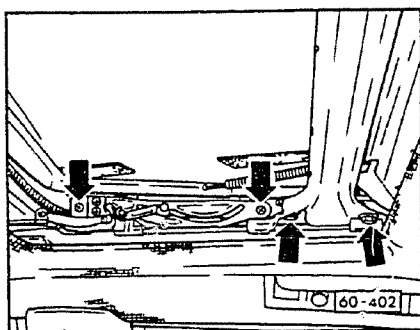
Sunroof assembly, installing

- install entire sunroof assembly into vehicle
- coat six M4 X 16mm screws with Loctite and tighten (**arrows**)
 - 1.0 + 0.2 Nm

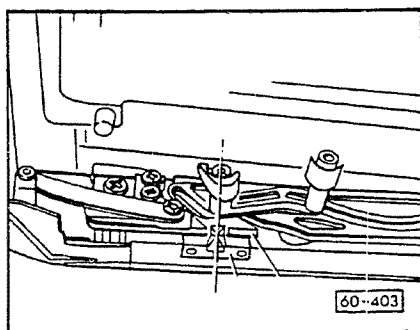


- install sunroof wind deflector
- coat screws (**arrows**) with Loctite and tighten
 - 1.0 + 0.2 Nm
- remove masking tape from around sunroof opening

Sunroof lid, installing



- install sunroof lid in opening
- start all screws and bolts but **do NOT** tighten



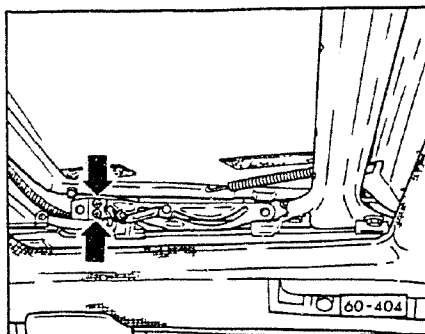
- check that mark on rear guide aligns with mark on guide rail (both sides)

CAUTION

Sunroof drive gear must not be engaged when trying to check parallel running of sunroof cables.

CAUTION

When lining up cables to guide rail, always move cables from front of vehicle rearward to marking lines. Do not move cables from rear of vehicle forward to marking lines.



- check that serrations mesh on sunroof lid and rear guide

If **NOT**

- loosen screws (arrows) and adjust
- tighten screws
 - 2.0 Nm

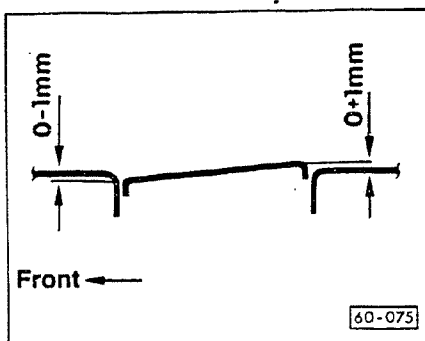
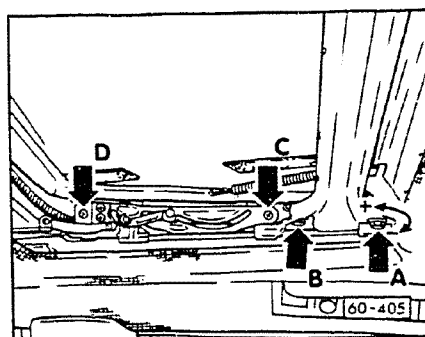
Sunroof lid, adjusting

Note

To reduce the possibility of wind noise, the front of sunroof lid must be lower than roof line and rear of sunroof lid must be higher than roof line.

Front height, adjusting

- turn in adjusting nut **A** but do not tighten
- thread nut **B** on to bolt and tighten
 - 6.0 Nm
- turn adjusting nut **A** until front of sunroof lid is approximately 1.0mm below roof line (see illustration 60-075)



CAUTION

Never tighten nut **A** to a specific torque or tighten securely.

Coat adjusting nut **A** with Loctite to prevent it from loosening.

Rear height, adjusting

Note

Sunroof remains closed during adjustment.

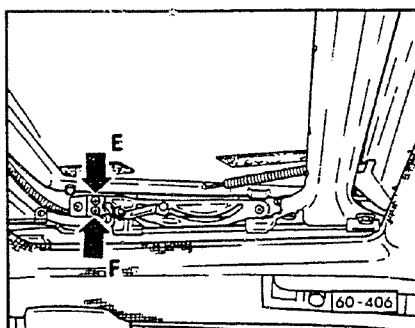
With **C** and **D** loose,

- push sunroof lid to proper height according to illustration 60-075

- tighten screws **D** (both sides)
 - 4.5 Nm

- tighten screws **C** (both sides)
 - 4.5 Nm

- open sunroof lid to rear 50mm and close until marks on guide and side rail align
- check height adjustment (front and rear)
- re-adjust if necessary



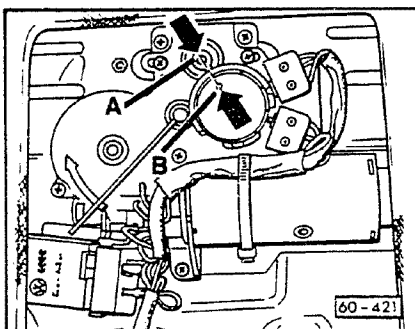
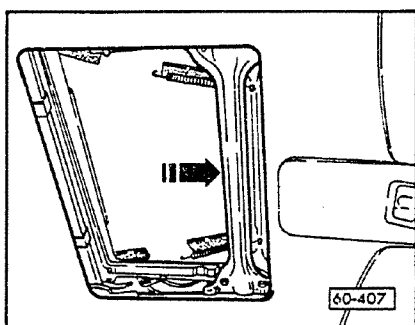
Sealing gap, fine adjustment

Note

This procedure ensures that the gap between the water drain tray and the sunroof lid is properly sealed.

Do this adjustment after height adjustment and before installing sunroof headliner trim.

- tilt sunroof lid fully to top
- loosen screws E and F on both sides
- close sunroof
- open sunroof lid to rear 50mm and close until marks on guide and side rail align (both sides)
- push lid forward lightly by hand
- tighten screws E (both sides)
 - 2.0 Nm
- tighten screws F (both sides)



Electrical drive, checking/adjusting

Note

Check electrical drive positioning with sunroof motor installed.

- detach sunroof lid headliner and slide back into roof
- remove cover to sunroof motor
- open sunroof 50mm to rear (never to the tilt position) and close
 - tab A on cable drive gear must align with hole B in motor cam

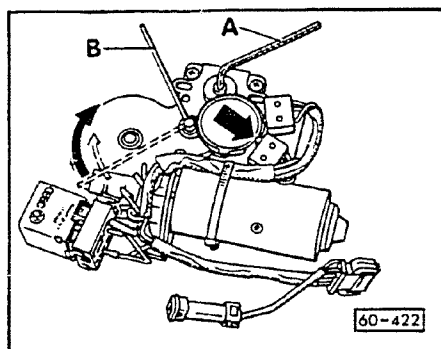
Note

When these points are aligned, the sunroof motor is in the "0" position

If the motor is not in the "0" position after opening and closing,

- adjust motor to "0" position

more



Adjusting

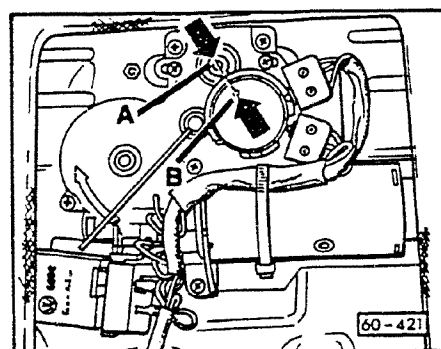
Note

This adjustment can only be done with the sunroof motor removed.

- remove sunroof motor
- disengage sunroof motor from drive gear by moving lever **B** in direction of arrow cast on motor
- insert hand crank or 4mm inside hex wrench into drive pinion **A**
- turn drive pinion (to right only) with crank or wrench until the pin on the sunroof stop switch (closed position) falls into the recess of the motor cam (arrow)

Note

In this position the tab on the pinion drive gear **A** is aligned with the hole in motor cam **B**



Sunroof motor, installing

CAUTION

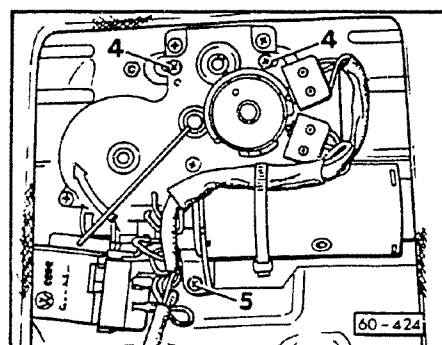
Follow motor tightening sequence exactly or motor will be noisy during operation.

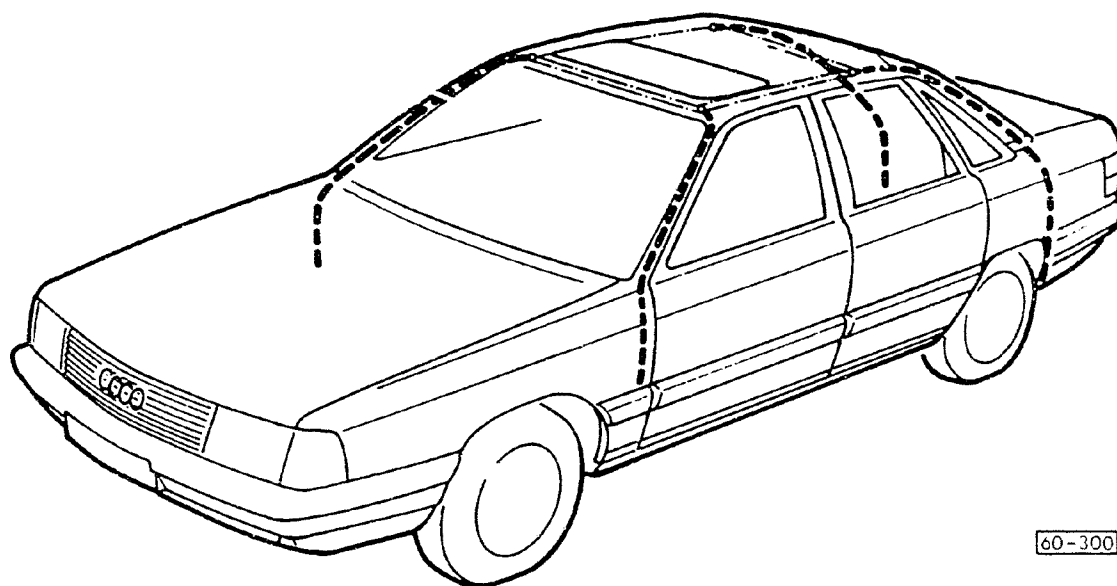
- apply Loctite to all screws
- start all screws but do not tighten

Note

Check that spacer is in place on screw **5** between sunroof motor and mounting point on roof.

- tighten screws **4** (the longer screws)
 - 2.0 Nm (1.4 ft lb)
- tighten screw **5** (the shorter screw)
 - 2.0 Nm (1.4 ft lb)
- install electrical connectors and cover with foam to prevent rattles
- install sunroof lid headliner trim
- install cover over sunroof motor.
- install dome light





60-300

Electric sunroof does not operate

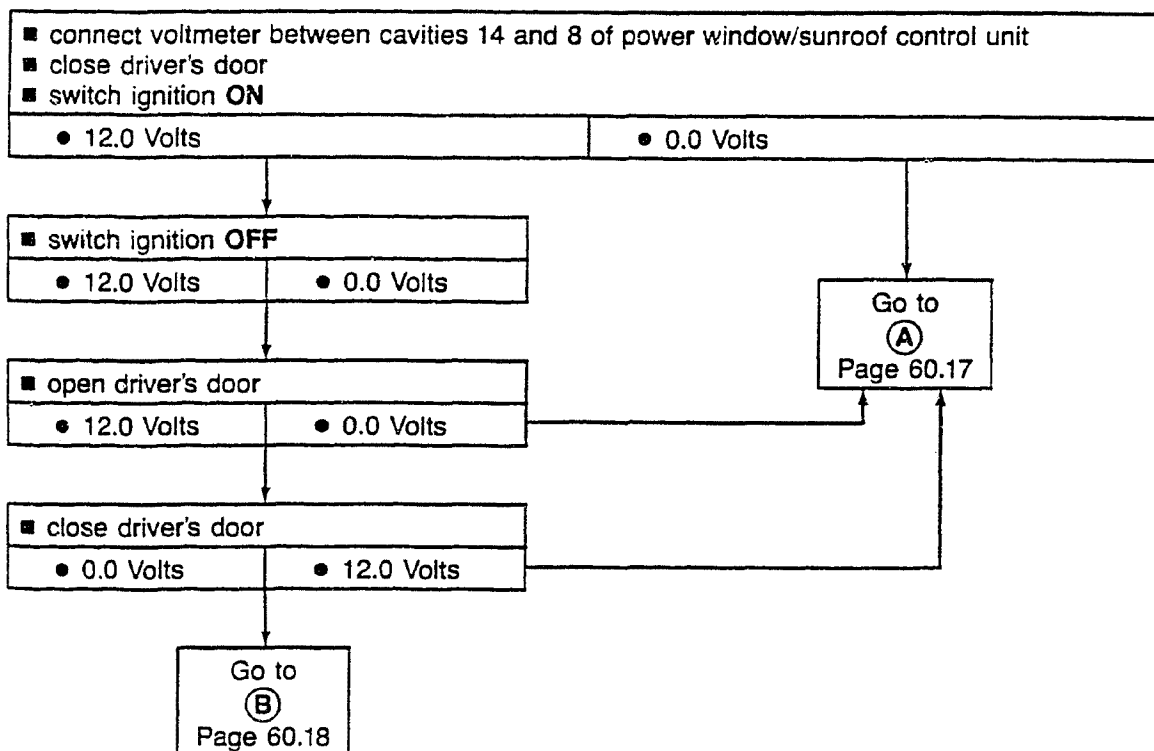
Troubleshooting preparations

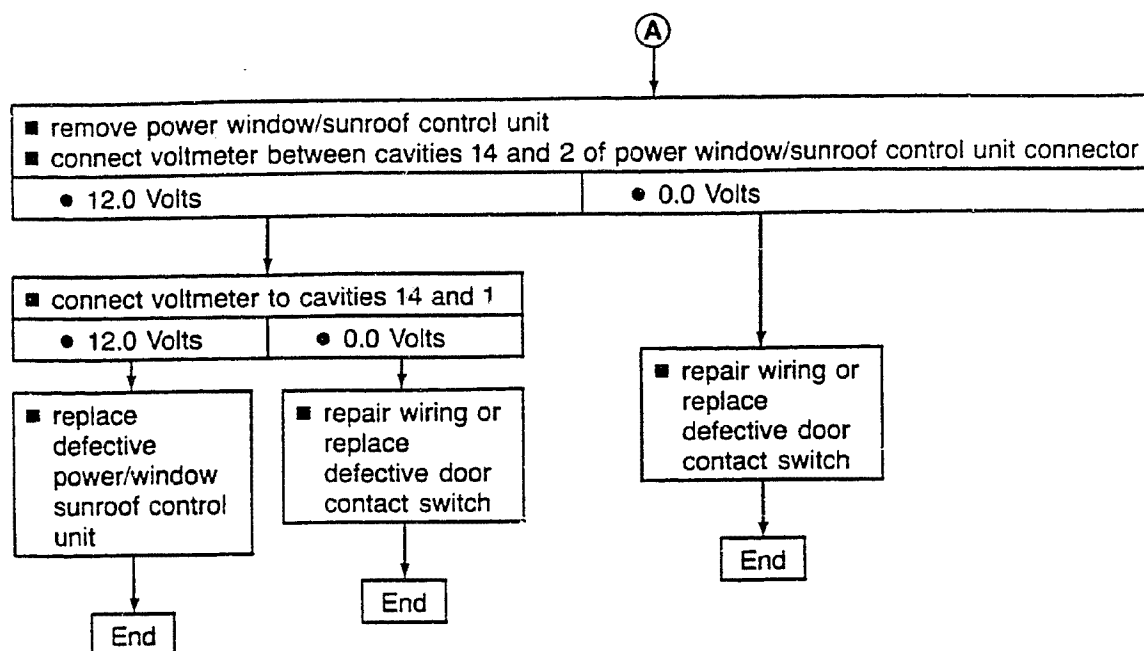
- thermofuse for power window/sunroof is OK
- interior light removed
- sunroof motor cover removed

Power window/sunroof control unit, checking

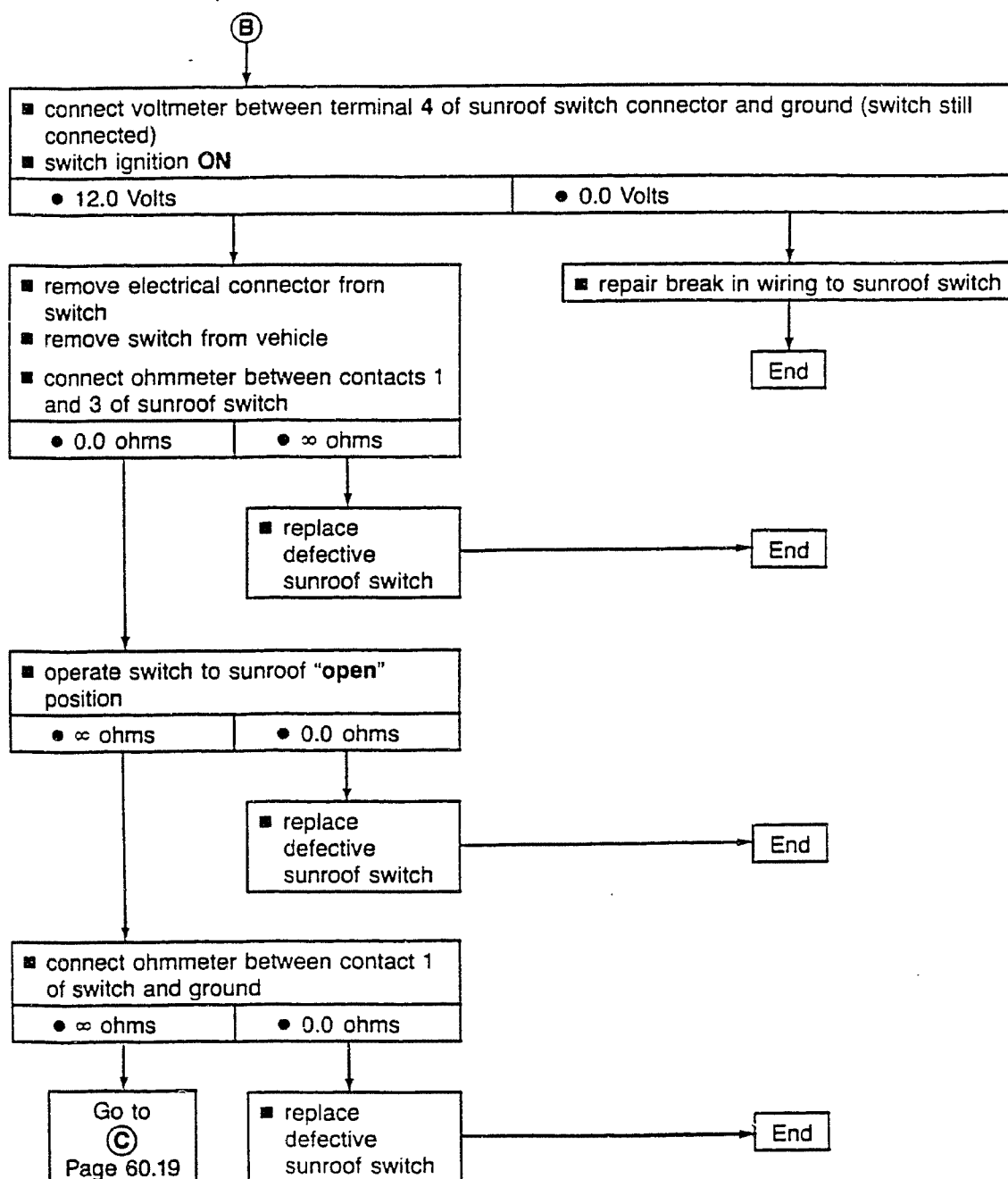
Note

Do first test with control unit connected.

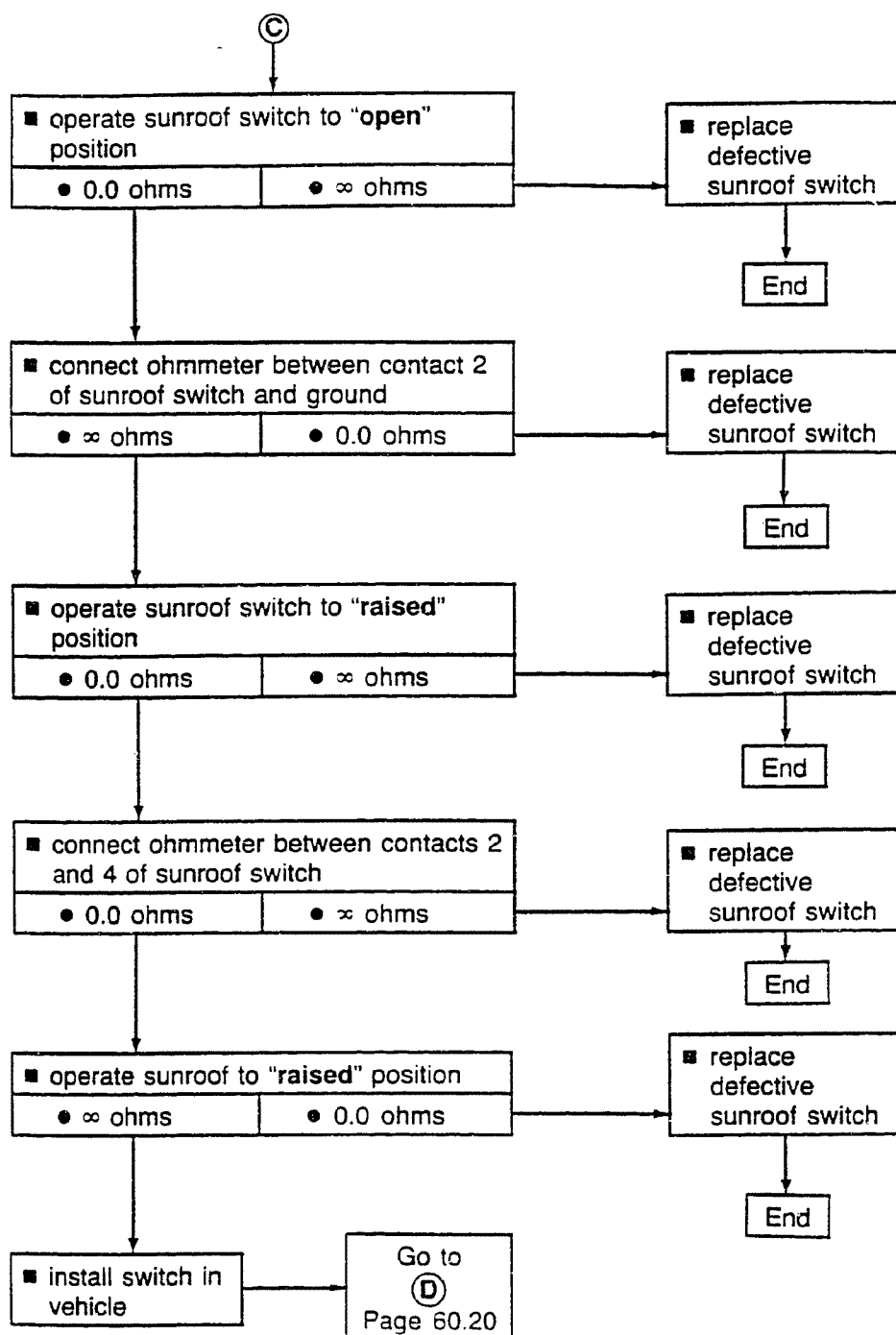




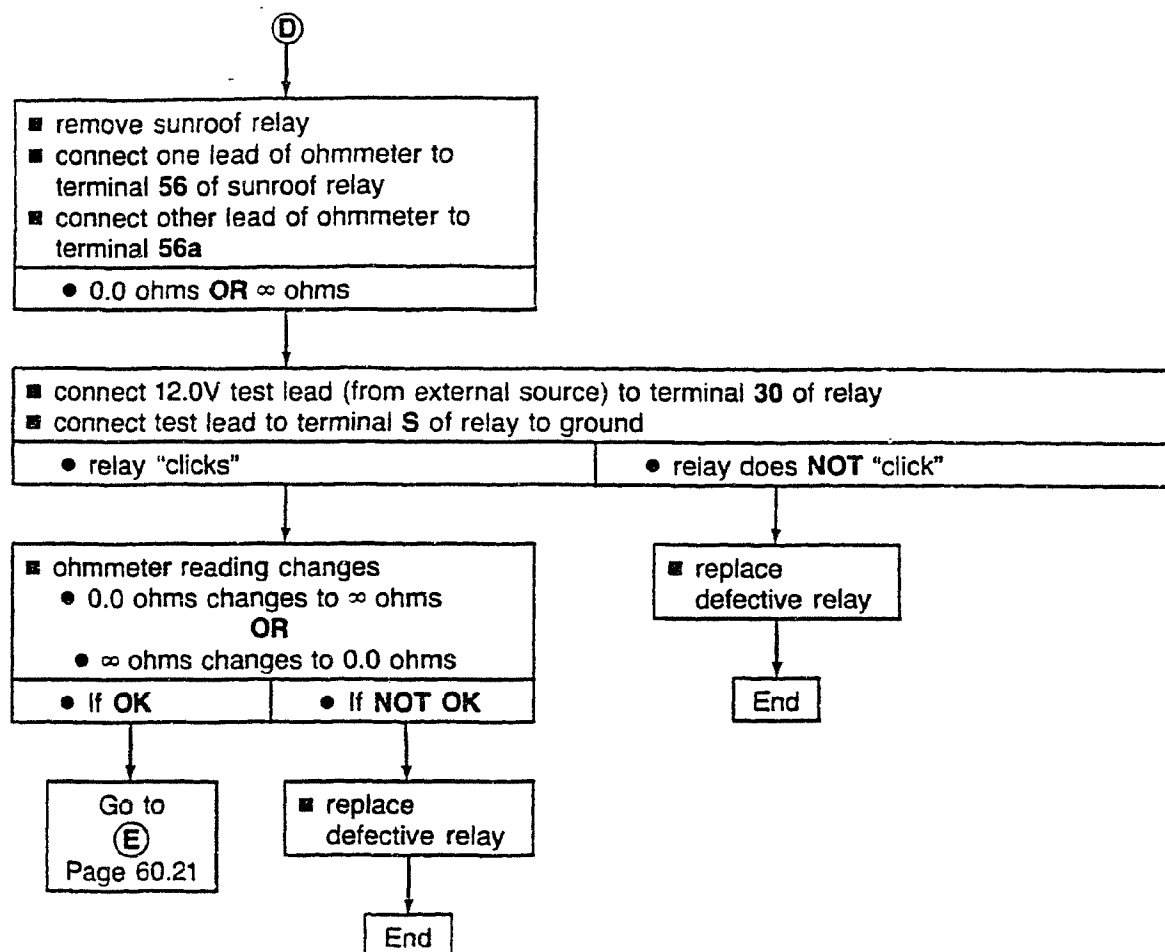
Sunroof switch, checking



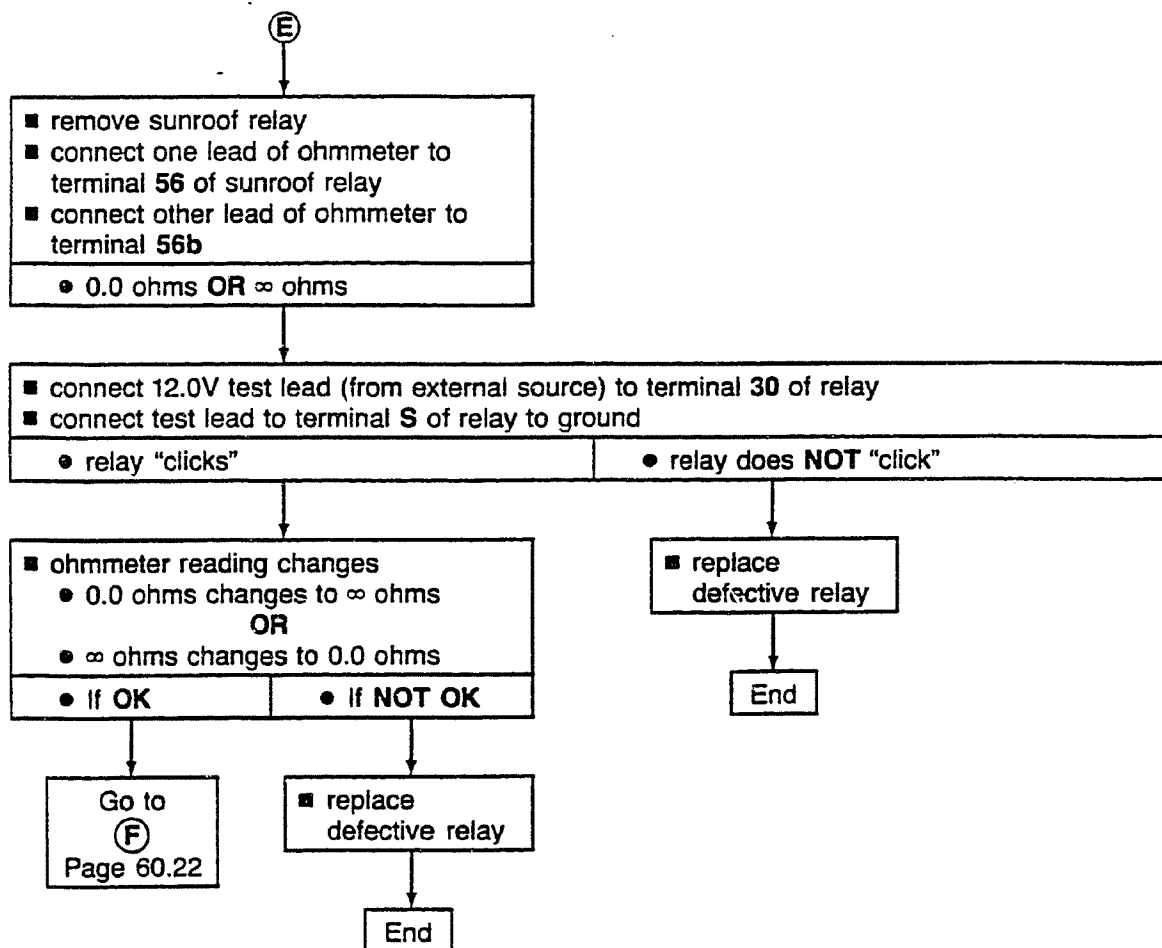
Sunroof switch, checking, continued



Sunroof relay, checking

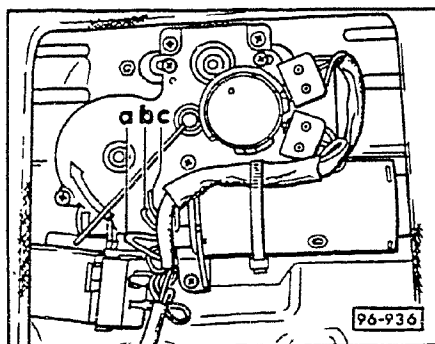


Sunroof relay, checking, continued



Microswitches and wiring harness, replacing

Ⓒ



If sunroof switch, sunroof relay and sunroof motor work properly

- replace microswitches and microswitch wiring harness Part No. 443 998 003
- drill out microswitch mounting rivets with 3 mm drill
- remove wires from solder joints a, b, c on sunroof motor
- install microswitches
- solder wires a, b, c, to motor in order
- fasten wires with tie wrap to keep them away from drive gear

CAUTION

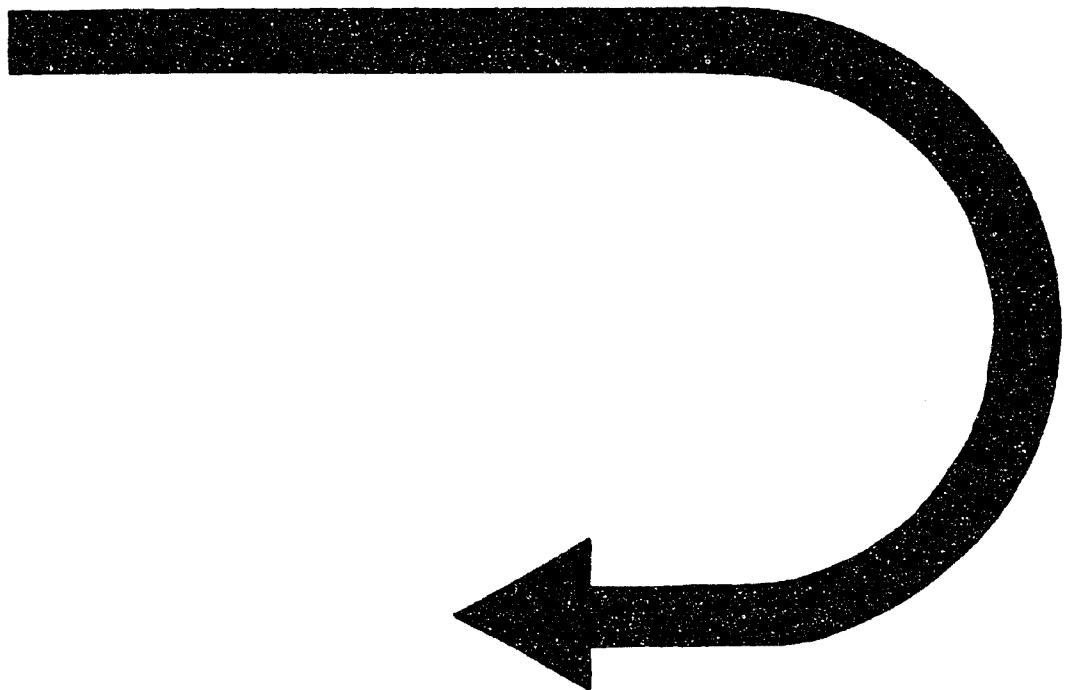
When installing white microswitch

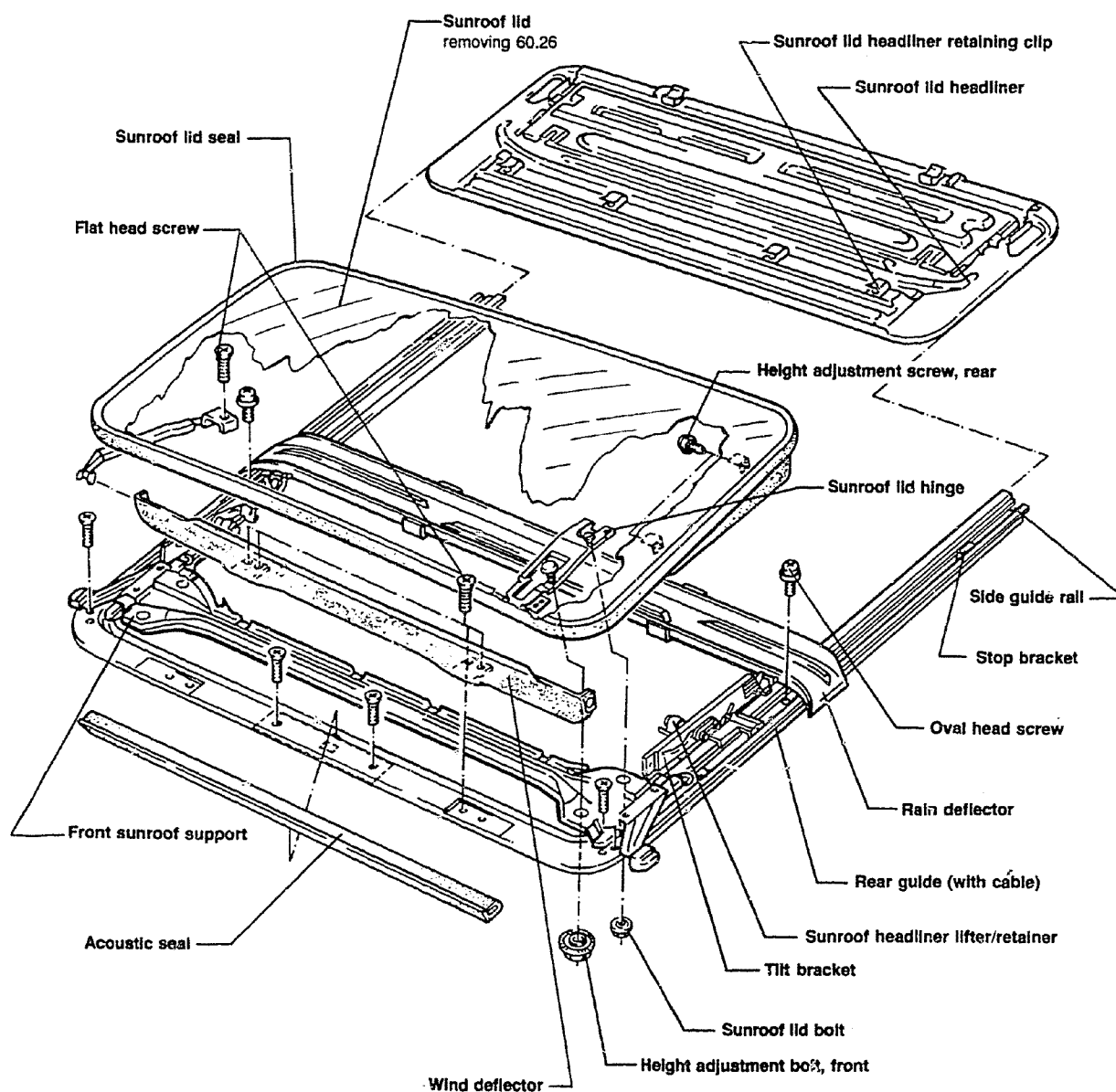
- use two M2 x 16 mm bolts

When installing blue microswitch

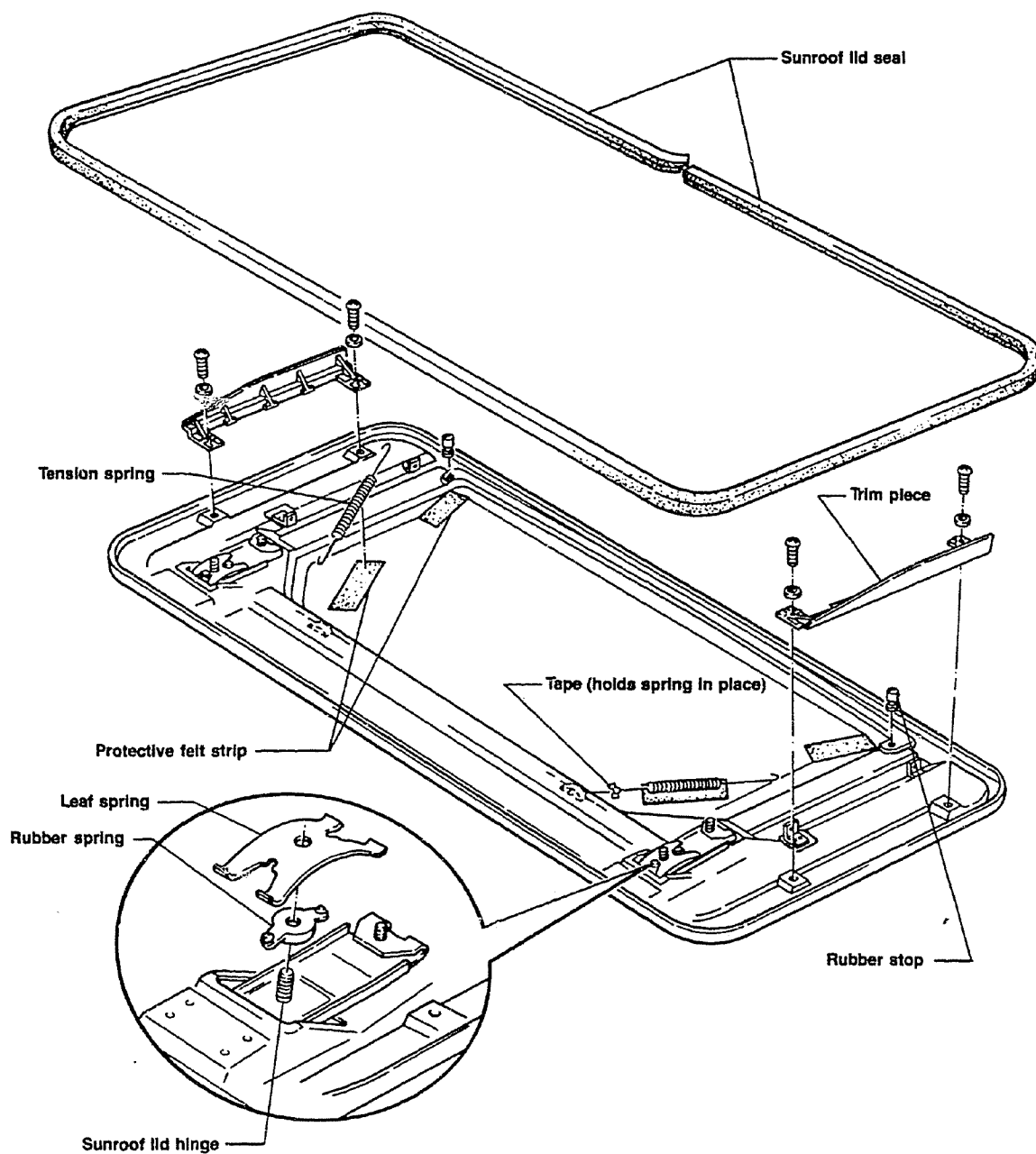
- use two M2 x 12 mm bolts

CONTINUED IN THE
BEGINNING OF NEXT ROW

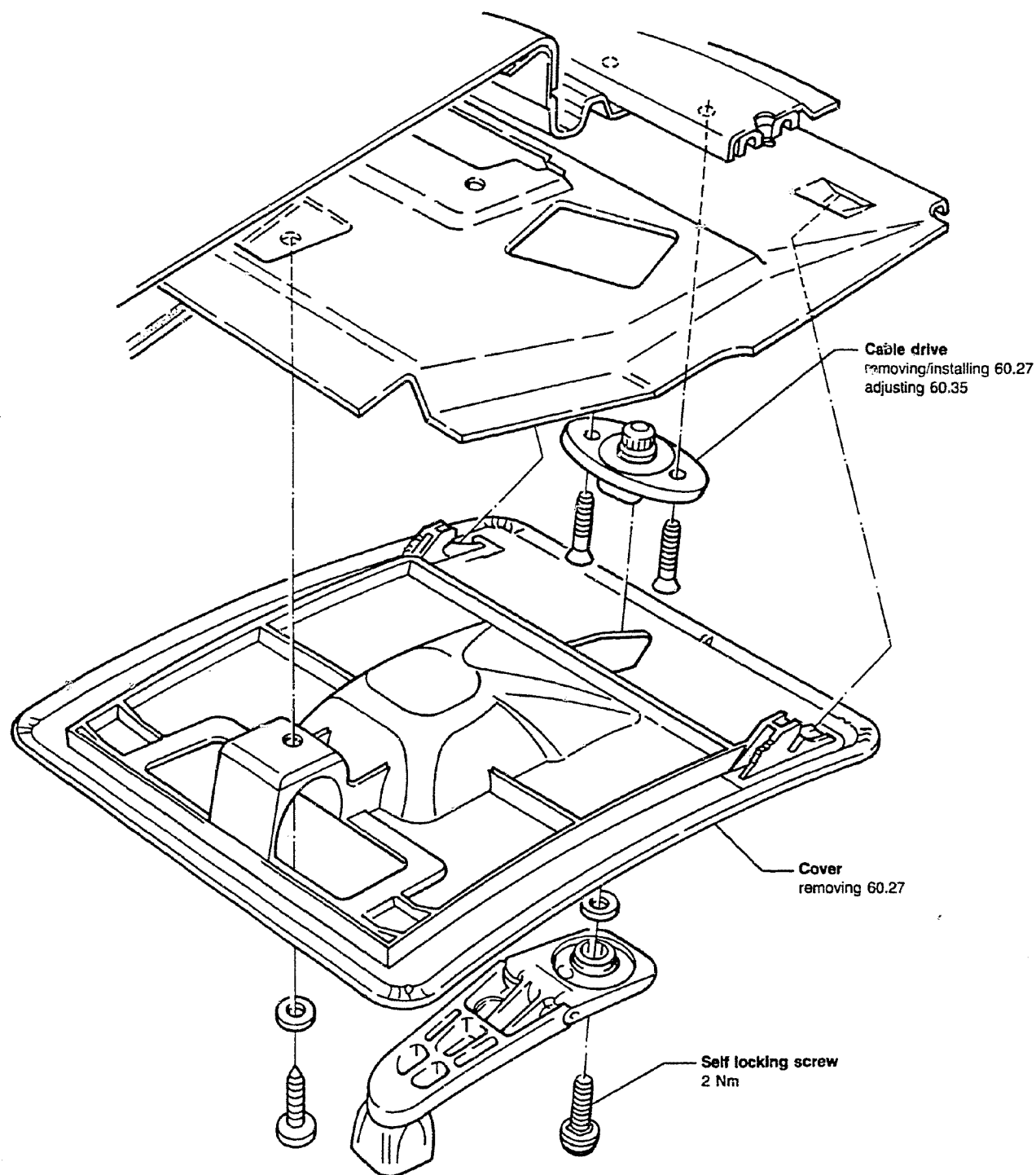




60-398

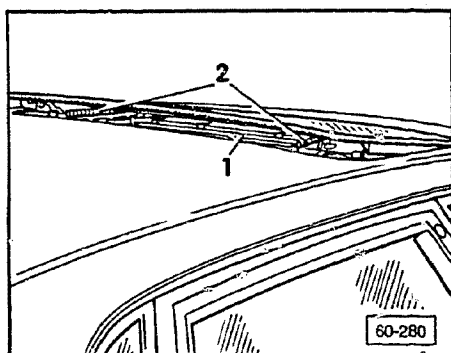


60-401

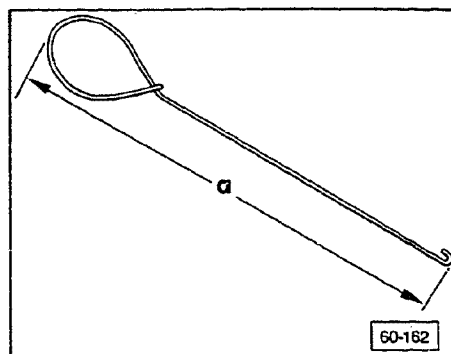


60-399

Sunroof lid, removing



- tilt sunroof up at rear
- push flap (1) downwards
- unhook both tension springs (2) from flap



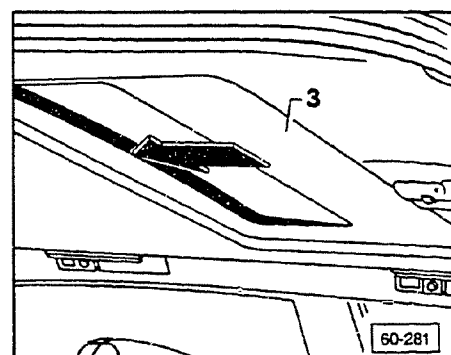
To make spring removal easier, make special removal tool

- a = approximately 300mm (12.0 in)

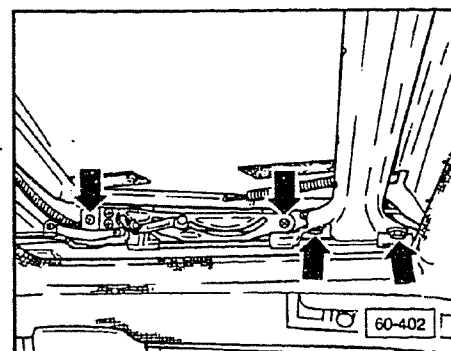
- dip hook in paint to prevent damage to vehicle

CAUTION

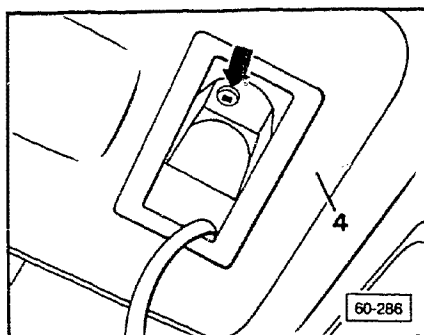
Put masking tape around front and rear of sunroof opening to protect paint when removing sunroof pieces.



- reach into sunroof opening and unclip trim panel (3) by pulling toward back
- push trim panel back into roof

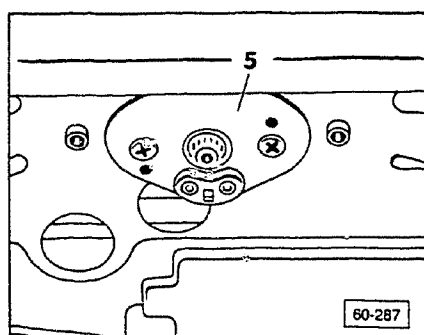


- close sunroof
- remove mounting screws and nuts (arrows)
- carefully lift sunroof lid from vehicle

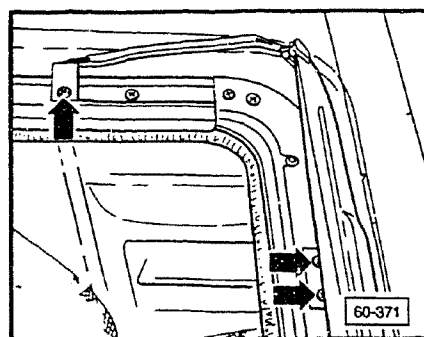


Cable drive gear, removing

- remove sunroof crank handle
- remove cover screw (**arrow**) and pull cover out of retaining tabs

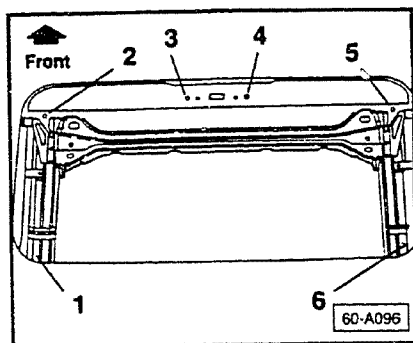


- remove cable drive gear retaining screws (**arrows**)
- remove cable drive gear (5)



Sunroof assembly, removing

- remove sunroof lid
- remove sunroof cable drive gear
- push rear guide with cables and sunroof support back far enough to expose deflector mounting screws (**arrows**)
- unscrew wind deflector screws (**arrows**)
- remove wind deflector

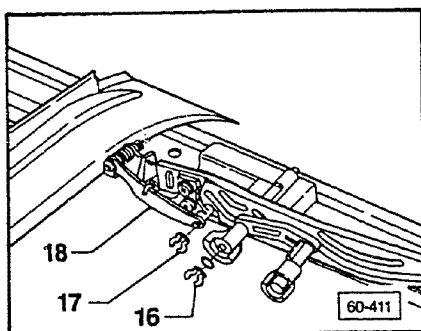


- remove six M4 X 16 oval head screws (arrows)
 - screws 1 and 6 have lock washers
- move complete sunroof assembly up and forward out of sunroof opening
- remove sunroof headliner from vehicle

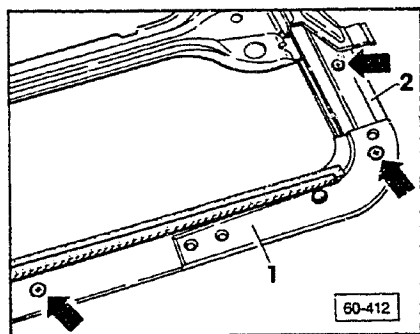
Note

The following repairs are done with the sunroof assembly on the workbench.

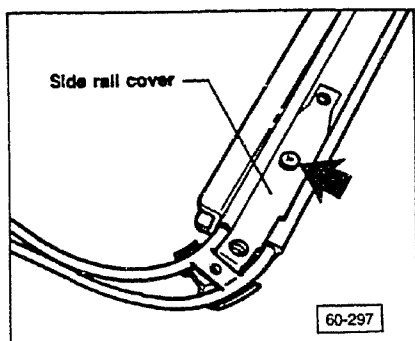
Sunroof assembly, disassembly



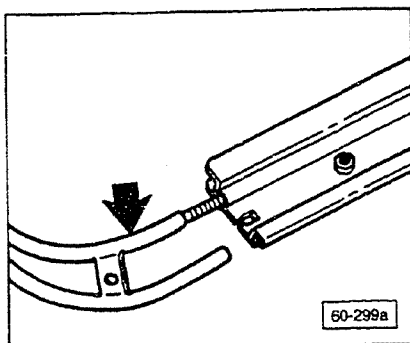
- remove sunroof assembly
- remove circlip (17) and pull off lever (18) on both sides
- remove circlip (16) and O-ring
- remove guide plate/tilt bracket



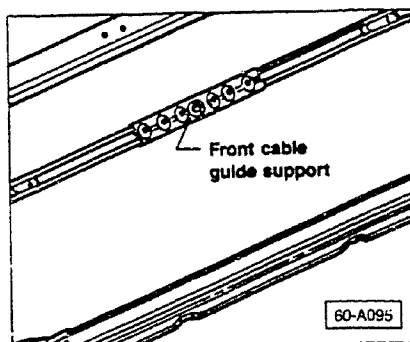
- remove screws (arrows) and remove front rail cover
- pull sunroof support forward and out of guide rails



- remove side rail cover screw (arrow) from both sides
- remove side rail covers



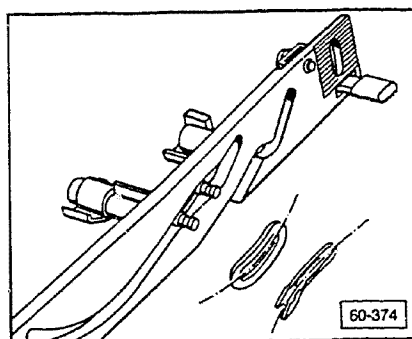
- remove cable guide tubes (arrow) from guide rail



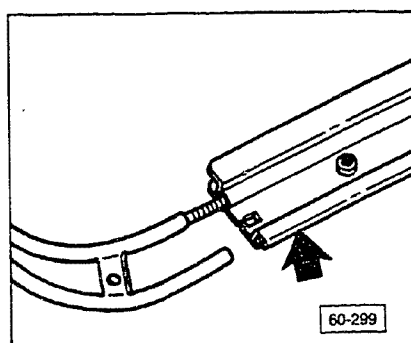
- remove cable guide tubes from cable guide support

CAUTION

Check front cable guide support for broken metal clip. Replace clip if necessary. Clean all cable guide tubes, tracks and rails before reassembling.



- remove sunroof lid trim retainer from guide plate/tilt bracket

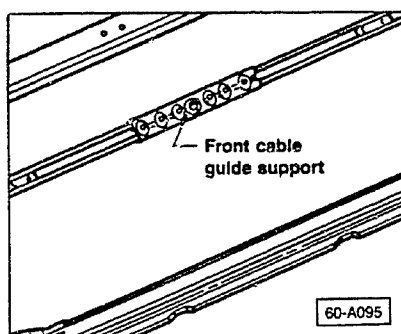


Sunroof assembly, assembling

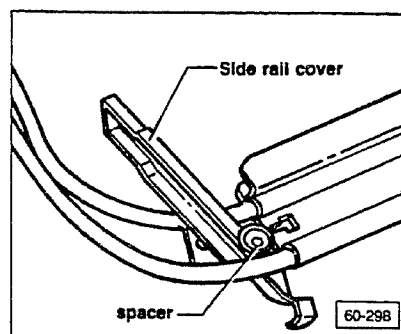
Note

Assemble sunroof on bench and then install complete sunroof assembly in vehicle

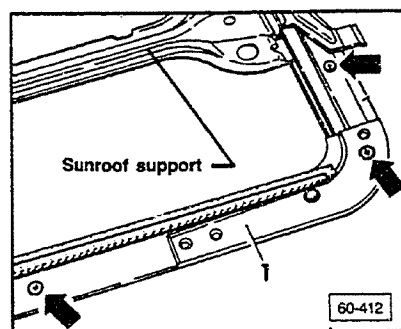
- lightly lubricate new sunroof cables with mineral oil
- install cables into guide rail (arrow) on both sides
- install cables into guide tubes and push guide tubes into guide rail



- install cable guide tubes into front cable guide support



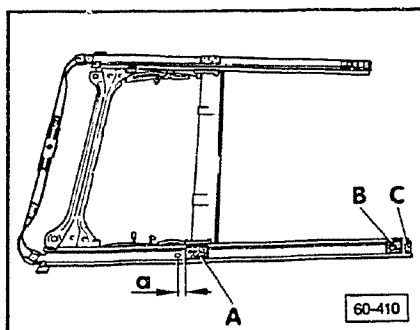
- install side rail covers (both sides)
- put Loctite on screws and tighten
 - 1.0 + 0.2 Nm



- slide sunroof support on to guide rails
- install front rail cover (1)
- coat screws with Loctite
 - 1.0 + 0.2 Nm

CAUTION

Front sunroof support is "twisted" when manufactured. Therefore, one end of guide rail will be higher than other. This is normal. Do not try to correct this condition.



- check that felt backing is installed

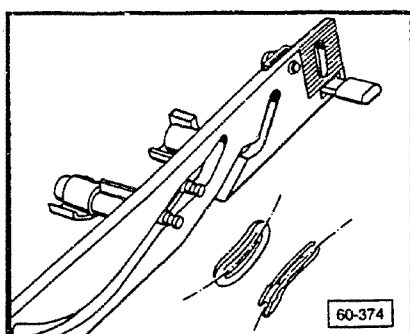
A = 55 mm X 25 mm

B = 50 mm X 35 mm

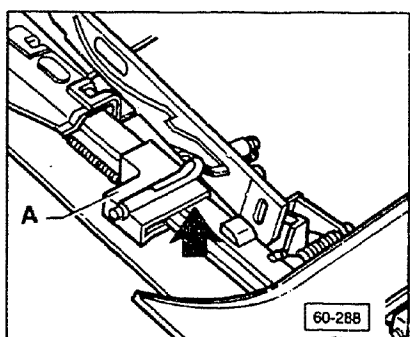
C = 15 mm X 30 mm

a = 20 mm gap

- install sunroof trim retainer on guide plate/tilt bracket
- install washer and clip as shown



- install guide plate/tilt bracket over pin on sunroof cable
- install O-ring and clip (16)
- attach rain deflector lever (18) to guide plate/tilt bracket and install clip

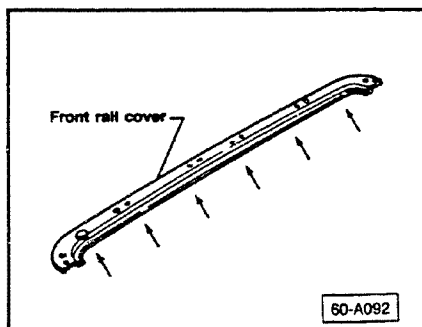


- slide cables A (guide plate/tilt bracket attached) rearward until aligned with marking line on guide rail (arrow)

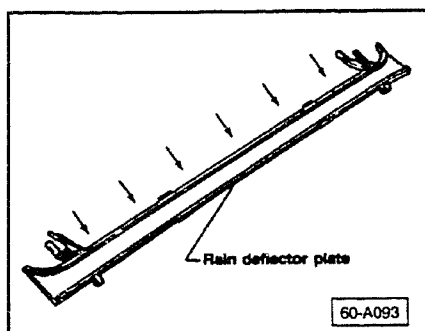
CAUTION

When lining up cables to guide rail, always move cables from front of vehicle rearward to marking lines. Do not move cables from rear of vehicle forward to marking lines.

- slide sunroof headliner into guide rails from rear



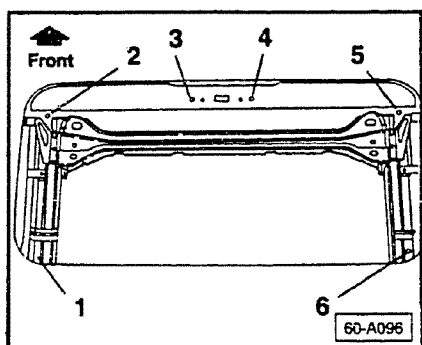
- install acoustic gasket on front rail cover (arrows)



- install acoustic gasket on rain deflector plate (arrows)

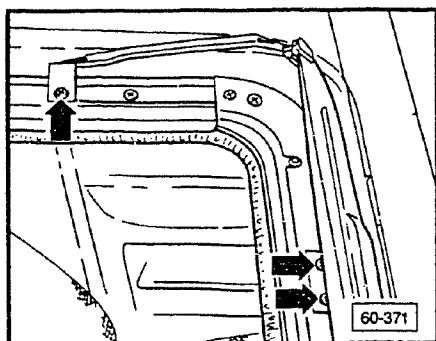
Note

Be sure that lip of rear acoustic gasket faces front of vehicle.

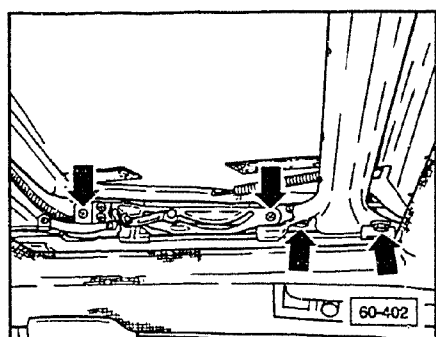


Sunroof assembly, installing

- install entire sunroof assembly into vehicle
- coat six M4 X 16 mm screws with Loctite and tighten (arrows)
 - 1.0 + 0.2 Nm

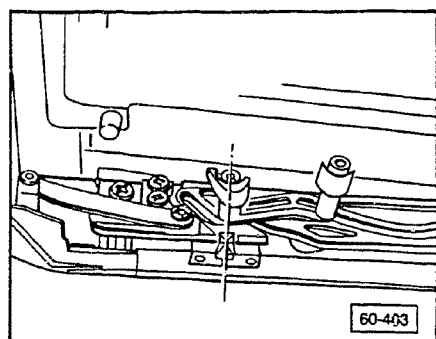


- install sunroof wind deflector
- coat screws (**arrows**) with Loctite and tighten
 - 1.0 + 0.2 Nm
- remove masking tape from around sunroof opening



Sunroof lid, installing

- install sunroof lid in opening
- start all screws and bolts but **do NOT** tighten



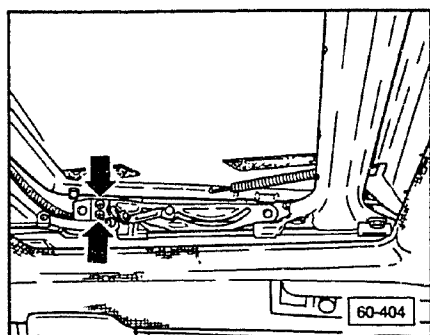
- check that mark on rear guide aligns with mark on guide rail (both sides)

CAUTION

Sunroof cable drive gear must not be engaged when trying to check parallel running of sunroof cables.

CAUTION

When lining up cables to guide rail, always move cables from front of vehicle rearward to marking lines. Do not move cables from rear of vehicle forward to marking lines.



- check that serrations mesh on sunroof lid and rear guide

If **NOT**

- loosen screws (arrows) and adjust
- tighten screws
 - 2.0 Nm

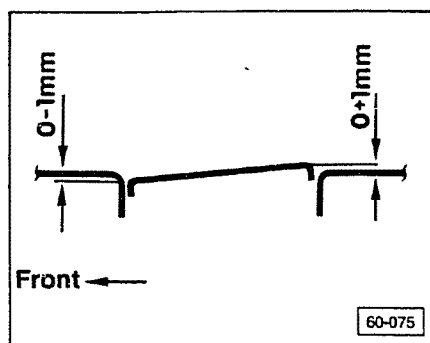
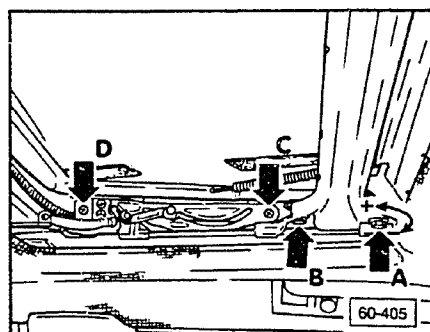
Sunroof lid, adjusting

Note

To reduce the possibility of wind noise, the front of sunroof lid must be lower than roof line and rear of sunroof lid must be higher than roof line.

Front height, adjusting

- turn in adjusting nut **A** but do not tighten
- thread nut **B** on to bolt and tighten
 - 6.0 Nm
- turn adjusting nut **A** until front of sunroof lid is approximately 1.0 mm below roof line (see illustration 60-075)



CAUTION

Never tighten nut **A** to a specific torque or tighten securely.

Coat adjusting nut **A** with Loctite to prevent it from loosening.

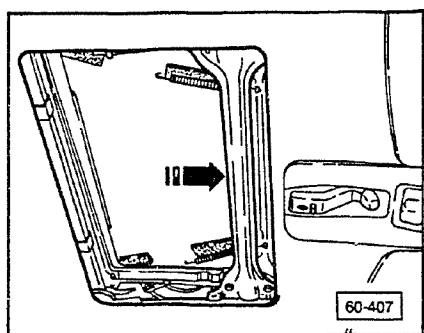
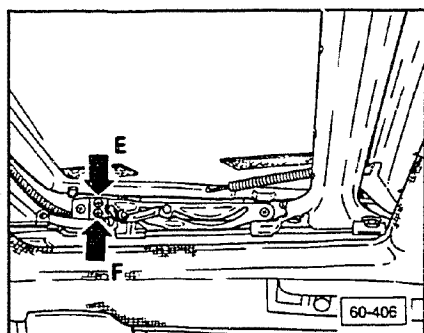
Rear height, adjusting

Note

Sunroof remains closed during adjustment.

With **C** and **D** loose,

- push sunroof lid to proper height according to illustration 60-075
- tighten screws **D** (both sides)
 - 4.5 Nm
- tighten screws **C** (both sides)
 - 4.5 Nm
- open sunroof lid to rear 50 mm and close until marks on guide and side rail align
- check height adjustment (front and rear)
- re-adjust if necessary



Sealing gap, fine adjustment

Note

This procedure ensures that the gap between the water drain tray and the sunroof lid is properly sealed.

Do this adjustment after height adjustment and before installing sunroof headliner trim.

- tilt sunroof lid fully to top
- loosen screws E and F on both sides
- close sunroof
- open sunroof lid to rear 50 mm and close until marks on guide and side rail align (both sides)
- push lid forward lightly by hand
- tighten screws E (both sides)
 - 2.0 Nm
- tighten screws F (both sides)

Sunroof cable drive, adjusting

CAUTION

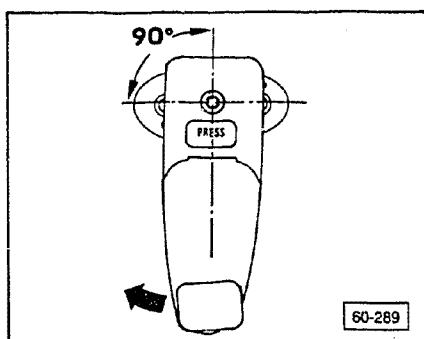
Do not install cable drive gear until it has been adjusted to the neutral position.

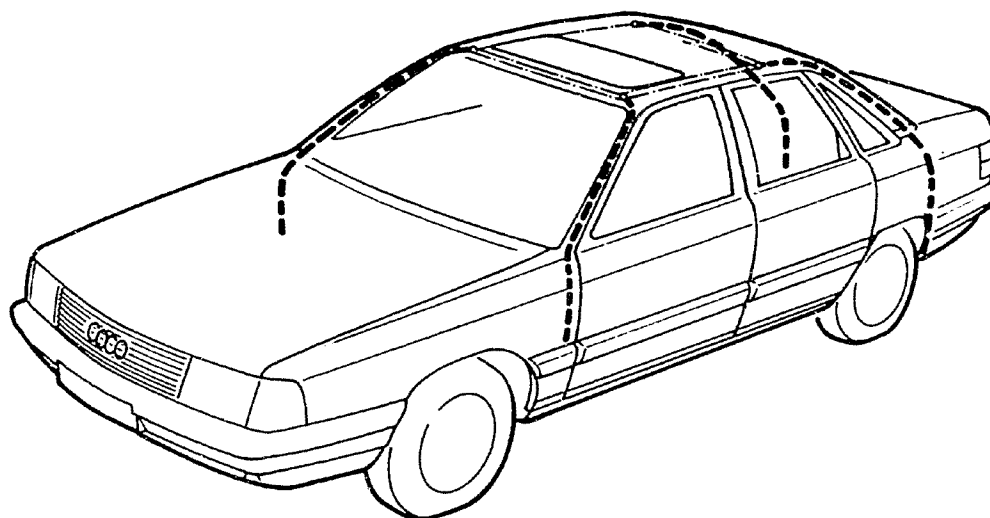
- place crank handle on cable drive (cable drive **NOT** installed)
- turn crank to right as far as it will go

Note

If necessary, after turning crank to right until stopped, remove crank and position 90° to the cable drive. The PRESS button of crank handle must be over the release pin of the cable drive gear.

- turn crank back two turns
- install cable drive gear in vehicle





60-300