

Vario Roof R171 Troubleshooting Tree

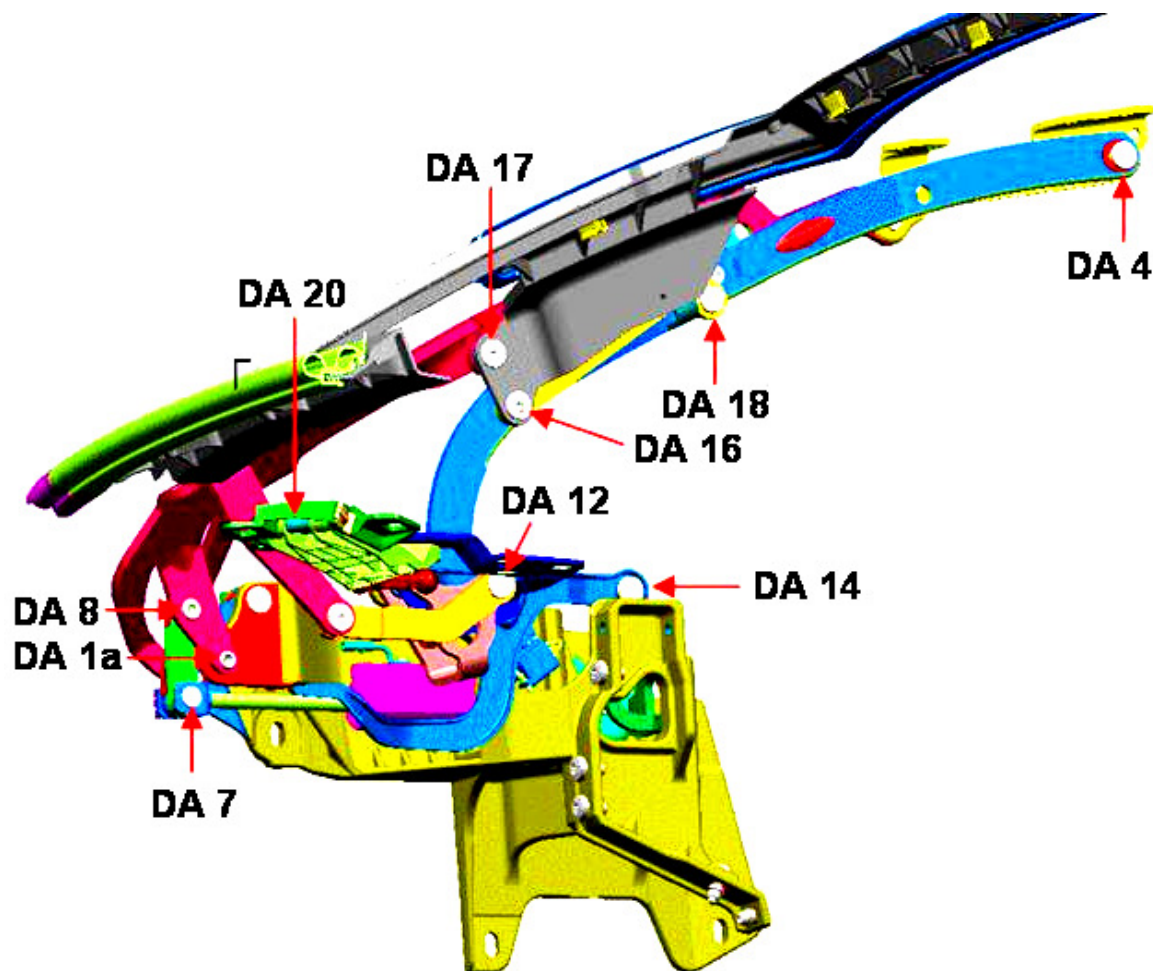
Noise, leaktightness, fit and function analyses as well as important repairs including related damage codes (SSL) and chassis numbers (VIN).

When processing complaints and cost settlements for repair orders, ensure that the specified damage codes and the relevant vehicle identification numbers are complied with to avoid unnecessary warranty and goodwill costs.

In case of a complaint, all repair work is to be carried out only on the basis of the released workshop literature and with the approved repair materials.

(e.g. noise reduction service kit, part no. A 000 580 03 50)

R171 Overview of pivots on kinematics



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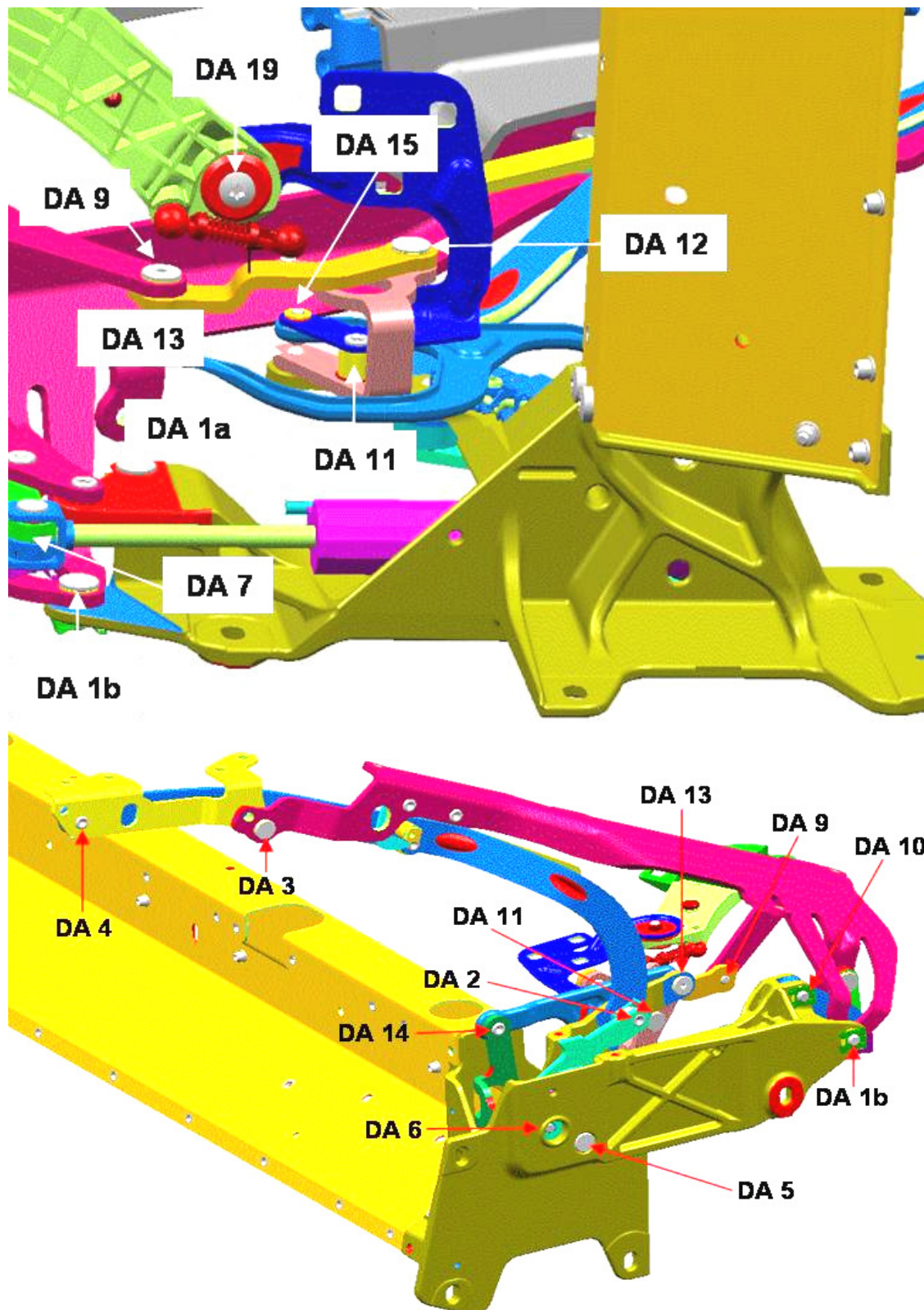


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1 Noises

1.1 General information on noises on the Vario roof

Ensure that the customer removes all personal belongings from the vehicle before the vehicle analysis. For achieving a correct noise analysis, the customer has to demonstrate the complaints to the workshop employee.

Dry, dirty seals at the Vario roof are the most common cause for cracking and ripping noises while driving. Therefore, it is imperative to attend to the seals first.

Ripping and creaking noises in driving can also be transmitted to the Vario roof through the vehicle shell or loose threaded connections of assembly parts, e.g. C-pillar.

In case of complaint, all repair works are to be carried out only on the basis of the released workshop literature and with the approved repair materials (e.g. noise reduction service kit, part no. A 000 580 03 50).

A helpful medium for locating noises in the vehicle is a noise hearing set, e.g. the "Chassis Ear" from Steelman that Chrysler has employed successfully.



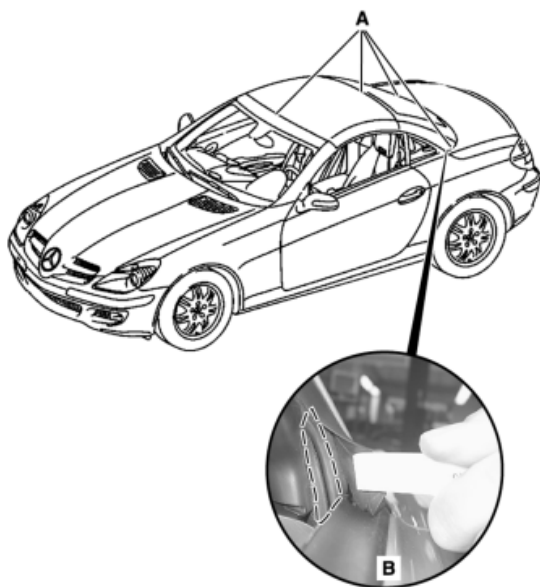
"Wireless Chassis Ear"

1.2 Noises while driving

1.2.1 Noises on the Vario roof seals while driving

Complaint: Ripping/friction noises on all the Vario roof seals while driving.

Cause: Dry, dirty seals on the Vario roof are the most common cause for cracking and ripping noises while driving.



Measure: Treat the seals on the Vario roof and the bar seal on the upper rear side window (pos. 1) with a special antifriction agent, part no. A 001 989 50 51 or A 000 989 36 60, see AF77.30-P-1501AG.

Note: Observe the soaking time of the special antifriction agent.

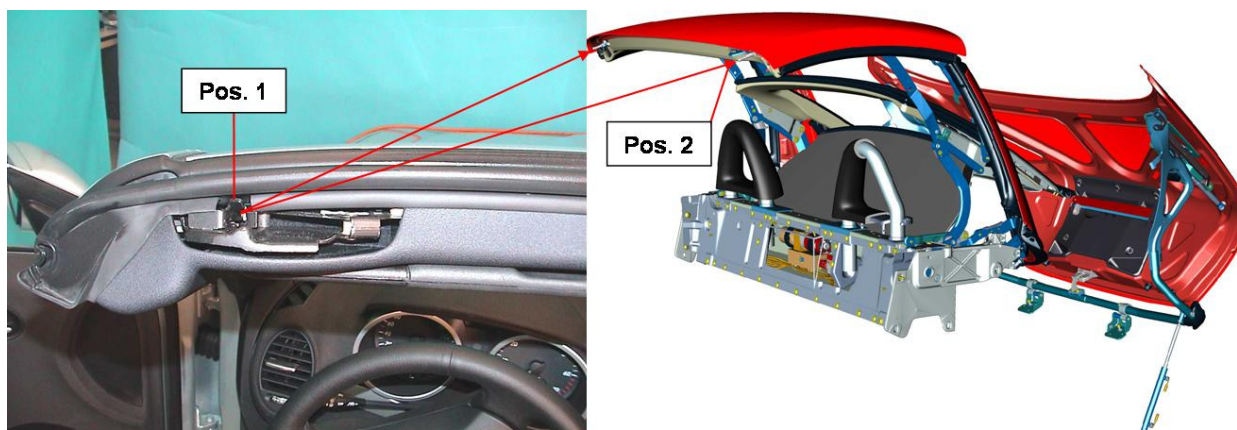
SSL: 7921736 Upper rear window seal noises
7205136 Windshield frame seal noises
7922036 Lower rear window frame seal noises
7922536 Interior C-pillar seal noises

1.2.2 Vario roof/windshield frame area

1.2.2.1 Rattling noises in the front Vario roof lock area

Complaint: Rattling noises in the front Vario roof lock support when driving on rough roads.

Cause: Funnel opening of the support (pos. 1) can be too large for the locking pin (pos. 2). As a result, noises may occur in the front Vario roof area when driving on rough roads.



Measure: See GI77.33-P-035782.

SSL: 7920636 Front Vario roof locking pin support noises

Important: Do not replace the complete front Vario roof lock.

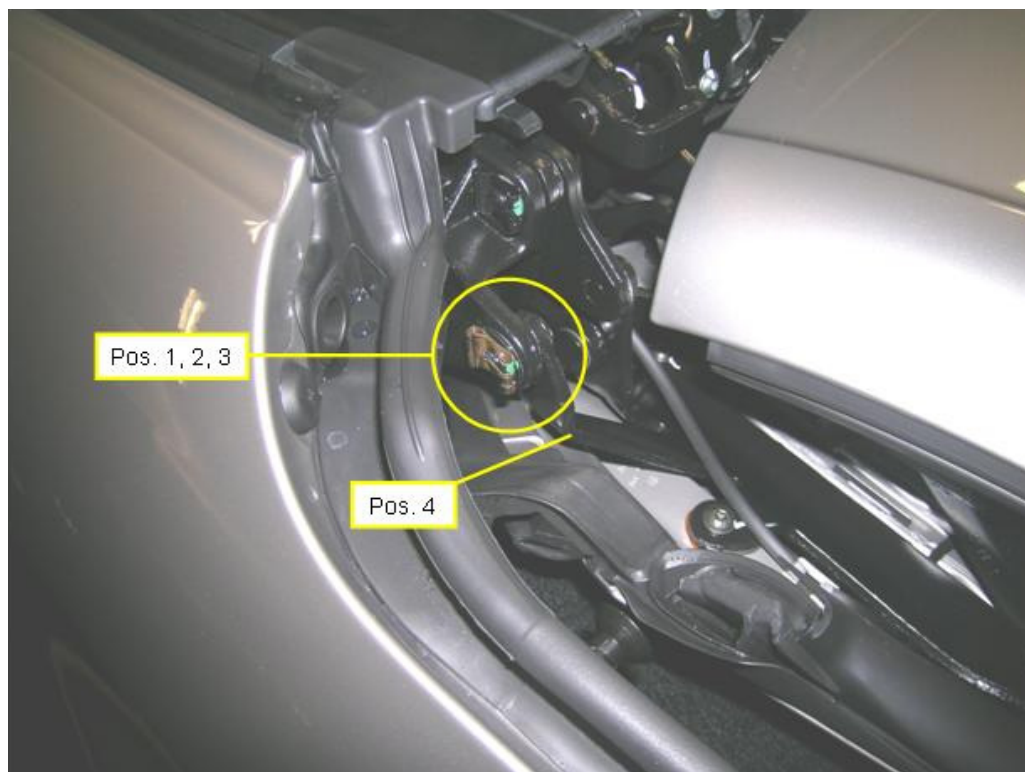
Important: Vehicles are OK from VIN 048760

1.2.3 Roof frame area

1.2.3.1 Cracking noises in the pivot 1 area on the roof frame

Complaint: Cracking noises in the pivot 1 area on the roof frame.

Cause: Washer and safety clip at pivot point 1 stuck together.



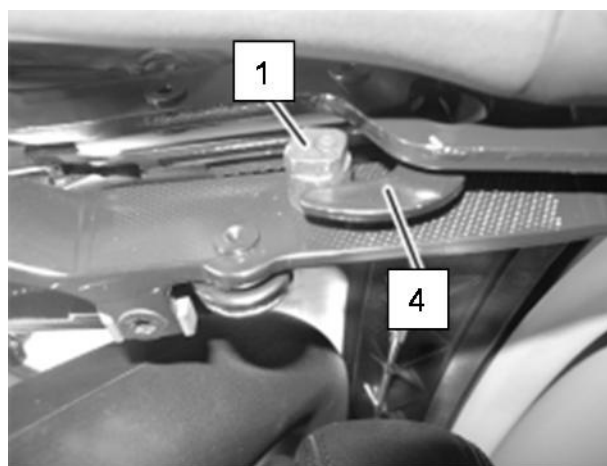
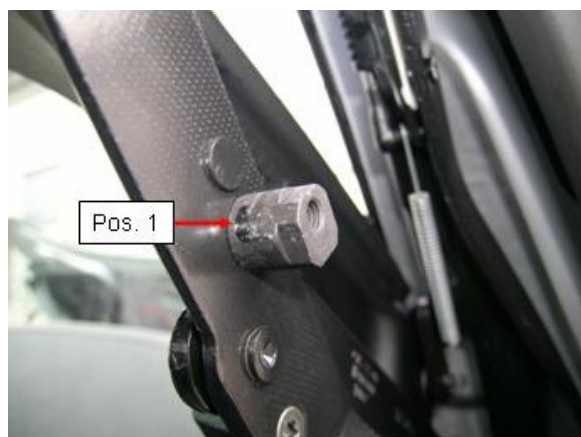
Measure: Remove safety clip and washer (pos. 1, 2). Clean the contact surfaces of the safety clip, washers and roof frame and afterwards grease with low-friction paste, part no. A 001 989 46 51. Press the handle (pos. 4) a bit to the inside and grease the pin (pos. 3) on pivot 1 with low-friction paste, see GI77.33-P-036569.

SSL: 7920336 Vario roof frame noises

1.2.3.2 Cracking noises (knocking) in the eccentric area on the roof frame

Complaint: Cracking noises while driving.

Cause: Eccentric is loose since:
1. Contact surface of the countersunk bolt in the roof frame is too small.
2. Contact surface of the eccentric to the roof frame is painted.



Measure: 1. Only if the eccentric is loose:
Remove eccentric (pos. 1), drill bore (pos. 2) in the handle (6.2 mm), apply corrosion protection (briefcase black) in the bore, see GI77.33-P-032755.

Remove paint from the contact surface (pos. 3) of the eccentric.

Install and adjust eccentric again, see AR77.33-P-3475V, ensure correct position of the gate valve (pos. 4) in the locked Vario roof.

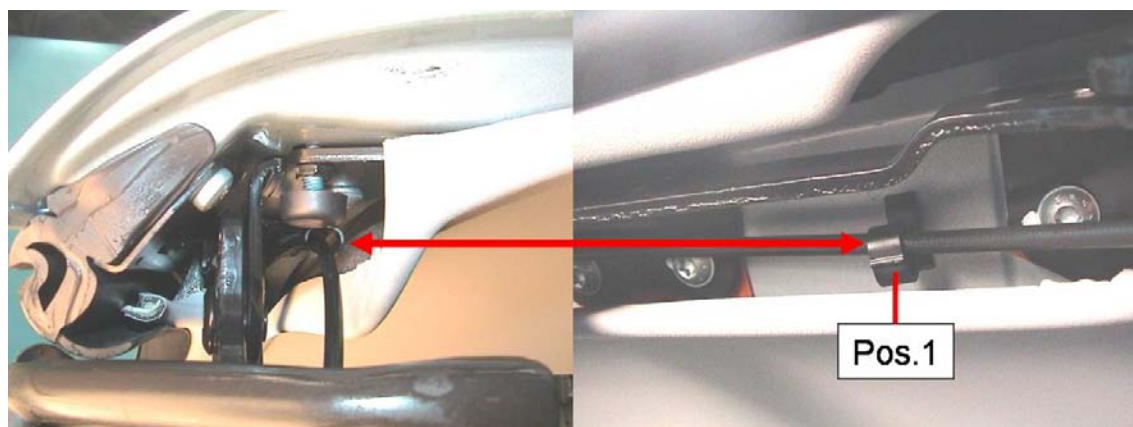
2. For fixed eccentric with rattling noises – adjust gate valve, see AR77.33-P-3475V.

SSL: 7920836 Roof frame latch noises (assigned damage code)

Important: Vehicles are OK from VIN 082324

1.2.3.3 Ripping noises in the Bowden cable joint 2 area

Complaint: Fine ripping noises in the Bowden cable joint 2 area.



Measure: Replace omega clips (pos. 1) (with short foot), part no. A 000 995 54 44.

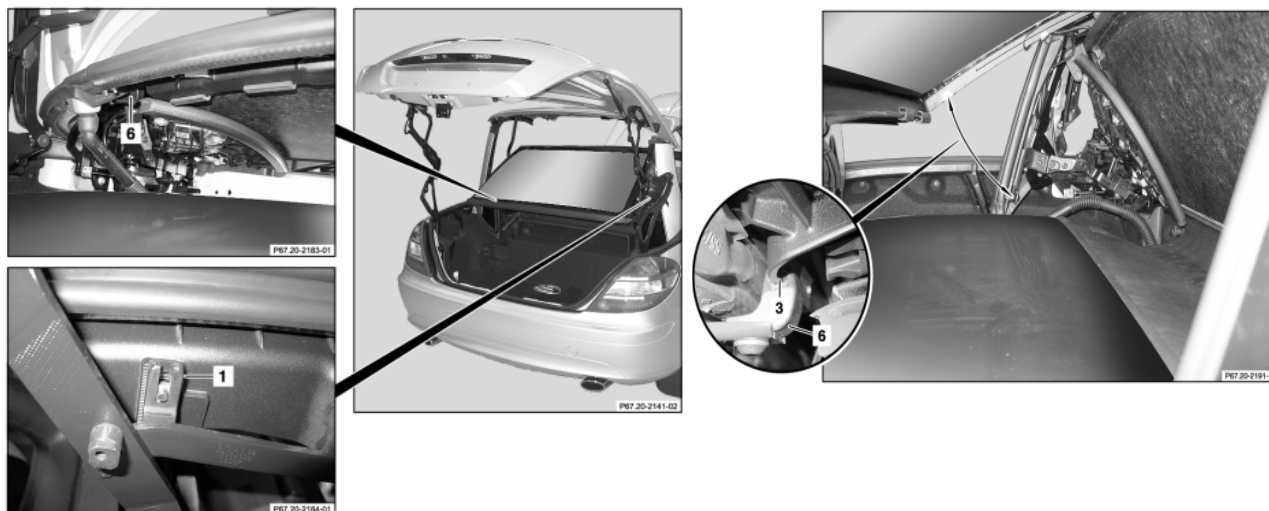
SSL: 7921536 Roof frame latch cable noises

Important: Vehicles are OK from VIN 007366

1.2.3.4 Noises in the Y-Z fixing stop area

Complaint: Noises in the Y-Z fixing stop area of the upper/lower rear window.

Cause: 1. Adjustment of the stops is not OK.
2. Stops not/insufficiently greased.



Measure: Check the position of the rear window, if necessary adjust, see AR67.20-P-3002V.
Grease rear window stops with (pos. 1 and 6) with low-friction paste, part no. A 001 989 46 51.

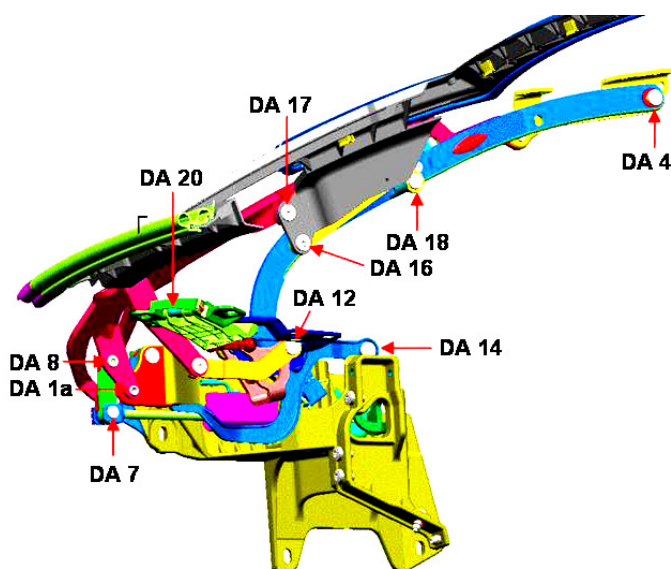
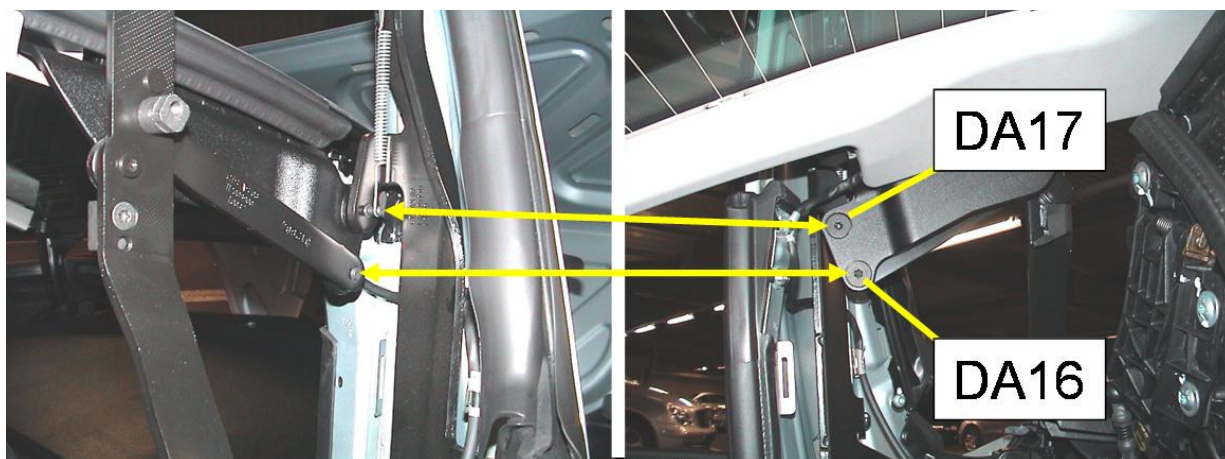
Note: When doing adjustment operations, bear in mind the fit of the rear window to the Vario roof.

SSL: 7921036 Rear window adjustment buffer noises
7923336 Lower rear window XY guide noises

1.2.3.5 Noises in the rear window control linkage

Complaint: Ripping noise/crackling noise/cracking noise from the Vario roof C-pillar.

Cause: 1. Residues of thread lock paint and cataphoretic immersion primer in the bushings and between the pivots (DA16, DA17).



Measure:

1. Remove screw completely at DA16.
Note: When removing the screw, pay attention to the washer on the pivot.
Clean the bushing, remove the residues of thread lock and cataphoretic immersion primer and turn in and tighten the screw with thread locking agent, part no.: A 003 989 31 71 (tightening torque 20 Nm).
2. Remove screw completely at DA17.
Note: When removing the screw, pay attention to the washer on the pivot.
Clean the bushing, remove the residues of thread lock and cataphoretic immersion primer and turn in and tighten the screw with thread locking agent, part no.: A 003 989 31 71 (tightening torque 20 Nm).

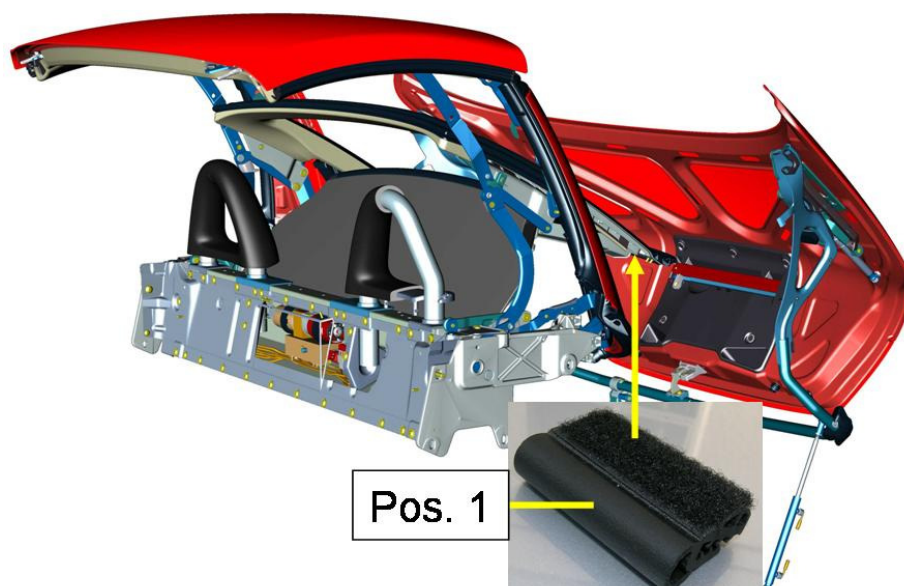
SSL: 7920336 Vario roof frame noises

1.2.4 Trunk area

1.2.4.1 Noises (thumping) in the rear shelf area of the lower rear window

Complaint: Noises (thumping) in the rear shelf area of the lower rear window while driving.

Cause: Insufficient pre-tension of the rear shelf to the rear window frame.



Measure: Install damping material, part no. A 171 694 00 92, with fleece tape (pos. 1). Fasten damping material to the rear window frame with superglue. Parts were modified while retaining the previous part no.

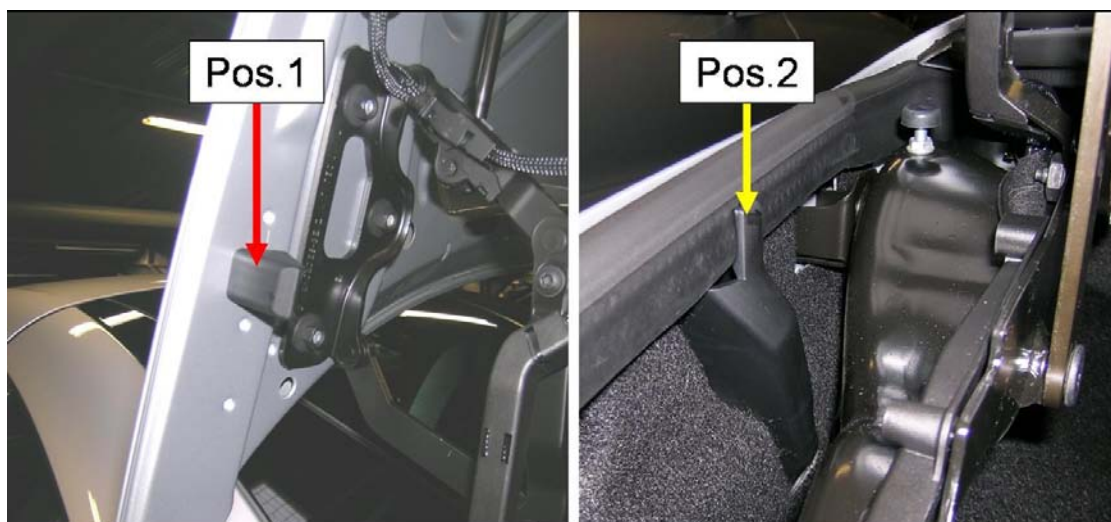
SSL: 6901536 Rear shelf noises

Important: Vehicles are OK from VIN 073287

1.2.4.2 Noises in the trunk lid area

Complaint: Noises when cornering or on rough roads

Cause: Stops on the side of the trunk lid (pos. 1) cause ripping/friction noises if fitted too tightly.



Measure: 1. Adjust stops (pos. 1) in such a way that they rest against the fixings (pos. 2) when the trunk lid is closed, then push 1 mm to the outside (pre-tension) and tighten, see AR88.50-P-5200V.
2. Grease trunk lid guide (pos. 1) with low-friction paste, part no. A 001 989 46 51.

Note: Apply a thin coat of low-friction paste.
Always observe 1 mm pre-tension.

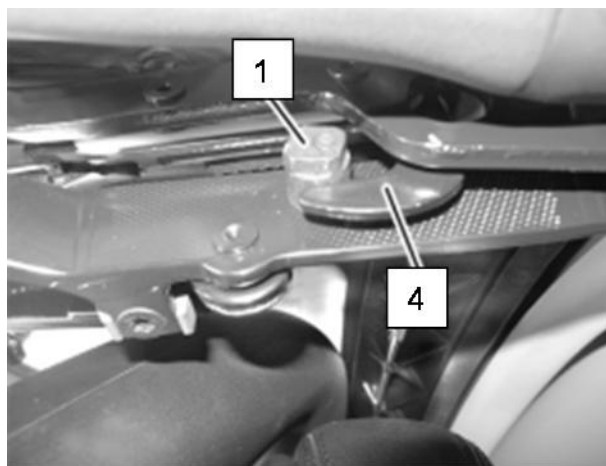
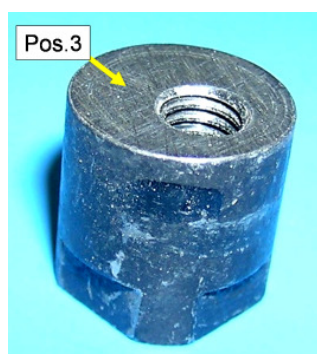
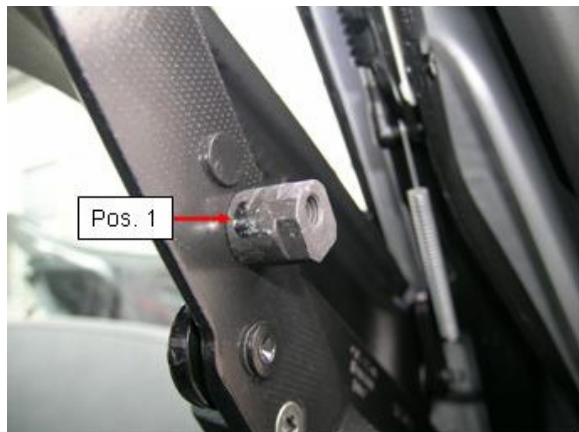
SSL: 7500136 Trunk lid noises (assigned damage code)

1.3 Wind noises

1.3.1 Wind noises in the front Vario roof joint area to the rear window

Complaint: Wind noises from approx. 140 km/h in the B/C pillar area.

Cause: Eccentric is loose



See 1.2.3.2

Measure: 1. Only if the eccentric is loose:
Remove eccentric (pos. 1), drill bore (pos. 2) in the handle (6.2 mm), apply corrosion protection (briefcase black) in the bore, see GI77.33-P-032755.

Remove paint on the contact surface (pos. 3) of the eccentric,

Install and adjust eccentric again, see AR77.33-P-3475V, ensure correct position of the gate valve (pos. 4) in the locked Vario roof.

2. For fixed eccentric with rattling noises – adjust gate valve,
see AR77.33-P-3475V, ensure the correct position of the gate valve (pos. 4) in the locked Vario roof.

SSL: 7920836 Roof frame latch noises (assigned damage code)

Important: Vehicles are OK from VIN 082324

1.3.2 Side window area

1.3.2.1 Wind noises in the side window/rear side window area

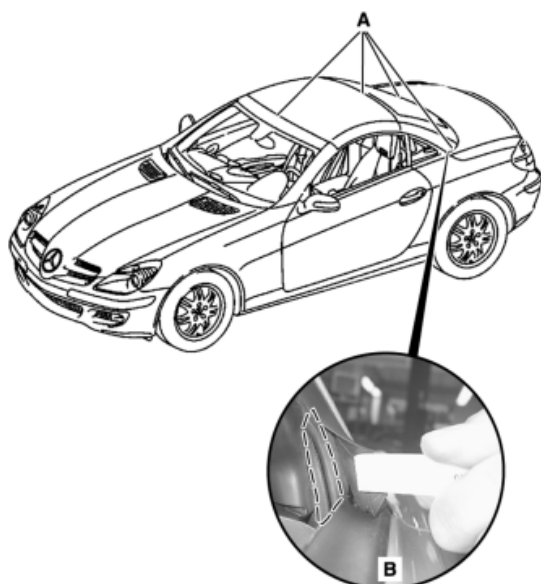
Complaint: Wind noises in the side window/rear side window area

Cause: Wedge-shaped gap in the bar seal area (B-pillar) between the side window and rear side window.
Adjustment of the rear side window is not OK.

Measure: 1. Treat the exterior C-pillar bottom seal with special antifriction agent, part no. A 001 989 50 51 or A 000 989 36 60, see AF77.30-P-1501AG.

Observe the soaking time of the special antifriction agent.

2. Adjust rear side window, see GI72.10-P-020305 Release 3.0.

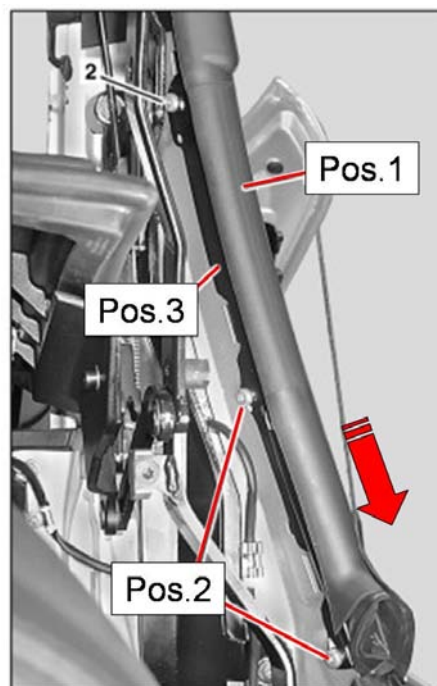


SSL: 6712442 Poor rear side window fit

1.3.2.2 Wind noises in the side rear window/lower C-pillar area

Complaint: Wind noises from 80 km/h

Cause: Gap dimension (arrow) between exterior C-pillar seal and rear fender is too large.



Measure: Mount exterior C-pillar seal lower.

Note: Loosen only the lower screws (pos. 2) of the retaining rail (pos. 3) and pull the seal (pos. 1) lower. The seal can be pulled lower **up to 1.5 mm**. Do not pull it out of the retaining rail as there is a seal mass below the retaining rail and this could cause leakages, see AR77.50-P-6766V.

SSL: 7705539 Joint 6 gap wind noises on left exterior C-pillar
7705639 Joint 6 gap wind noises on right exterior C-pillar

1.4 Noises in the body shell

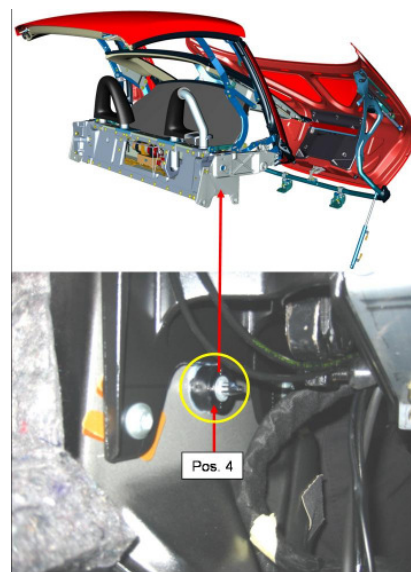
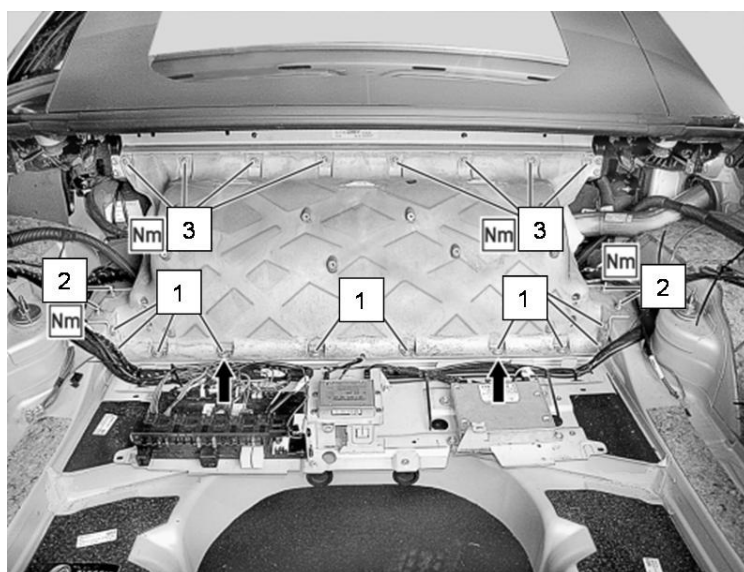
1.4.1 Cracking noises from the Vario roof trunk/C-pillar area

Complaint 1: Cracking/ripping noises from the trunk area.

Complaint 2: Cracking/ripping noises from the trunk area when the vehicle is started or braked sharply.

Cause 1: Decrease in torque of the threaded connections (pos. 1, 2) of the tank cover in the trunk.

Cause 2: Plastic spacer (pos.3) at stud support for Vario roof main bearing.



Note: This cracking noise can also be transmitted to the Vario roof C-pillar area and is, therefore, often assigned to the Vario roof.

Measure 1: Loosen all threaded connections and re-tighten them.
Tightening torque for the screws (pos. 1): 10 Nm
Tightening torque for the nuts (pos. 2): 6 Nm
Tightening torque for the screws (pos. 3): 6 Nm, see GI68.64-P-038163.

Recommendation: When handling the tank cover, the plastic spacer (pos. 4) should also be removed, see measure 2.

Important: For complaint 1: Vehicles are OK from VIN 119481

Note: If the tank cover does not rest on the longitudinal member, washers may have to be inserted in the screw connections (pos. 2). This prevents the studs from breaking off when being tightened.

Measure 2: Remove plastic spacer (pos. 3), to do so, remove trim on the left and right side in the trunk, see AR68.30-P-4800V.

Important: Do not loosen screws on the main bearing of the Vario roof.

SSL: 6400136 Rear wall noises

SSL: 7920336 Vario roof frame noises

2 Fits

2.1 Seals (buckling)

2.1.1 Seal at joint 1 buckled

Complaint: Buckled seal

Cause: 1. Insufficient return force and rigidity of the seals.
2. Window adjustment not OK.



Measure 1: Install clamps (pos. 5) with opening for water drain in the windshield frame seal (pos. 4) and a clamp (pos. 3) in the Vario roof front part seal (pos. 2), see GI77.30-P-012632.

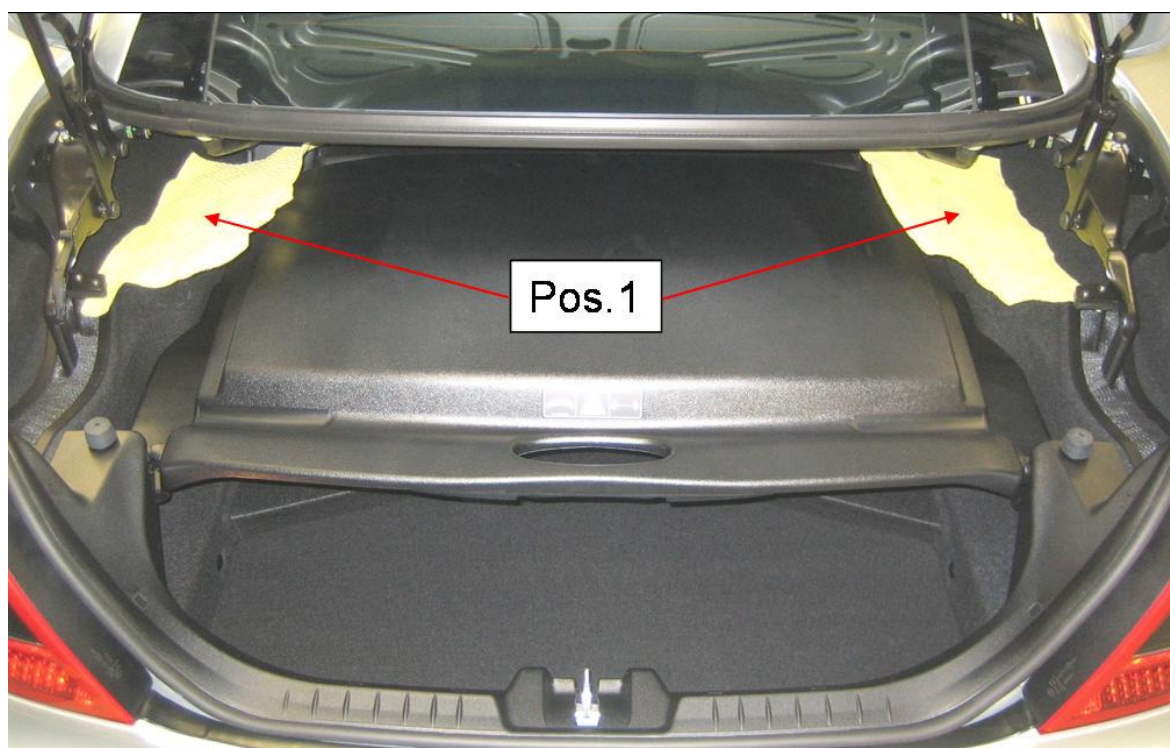
Measure 2: Adjust side window, see GI72.10-P-020305 Release 3.0.

SSL: 72051C6 Windshield frame seal bent
79216C6 Vario roof side seal bent
72D0151 Right front door window poorly adjusted
72S0151 Left front door window poorly adjusted

3 Leaktightness

3.1 General information on leaktightness check and sprinkling

1. **Consultation with the customer about the location of the water entry or conditions of water entry.**
2. **Clean the vehicle in the washing facility**
(mask the leaky section if there is excessive water penetration)
3. Position the dry sponge cloths.
4. Position the spray jet/sprinkling system.
5. **General information on shower:**
 - Duration of sprinkling: approx. 20 min.
 - Do not use any high pressure cleaner (line pressure is sufficient).
 - Plenty of water
6. **Before opening the vehicle, dry thoroughly with suitable cloths without compressed air.**
7. Open the trunk lid slowly approx. 10 cm wide, inspect the seal course with a light probe and check for water entry.
8. Open the trunk lid fully and wipe the interior of the lid edge to prevent afterdripping.
9. Check the cloths and localize the leakage.
10. In case of leakages, process the affected positions, otherwise proceed to step 12.
11. After processing the leakages, reshower the vehicle, duration: 20 min.
12. No water entry determined, reshower, duration 30 min.
Note: Some leakages can be determined only after a long reshower.
13. After viewing the sponge cloths, start again from step 9, if necessary.

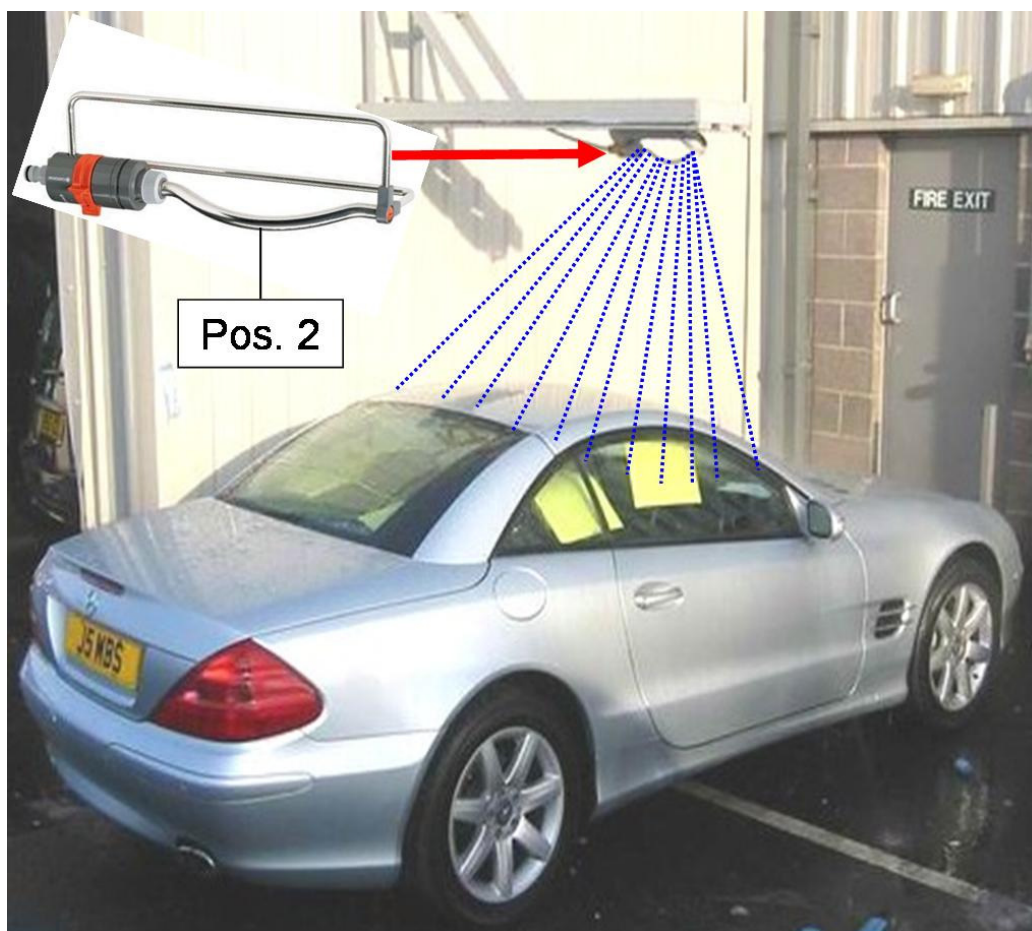


Location of the dry sponge cloths in the trunk

3.1.1 Examples of rain check/sprinkling with R230



Pos. 1: Gardena sprinkler



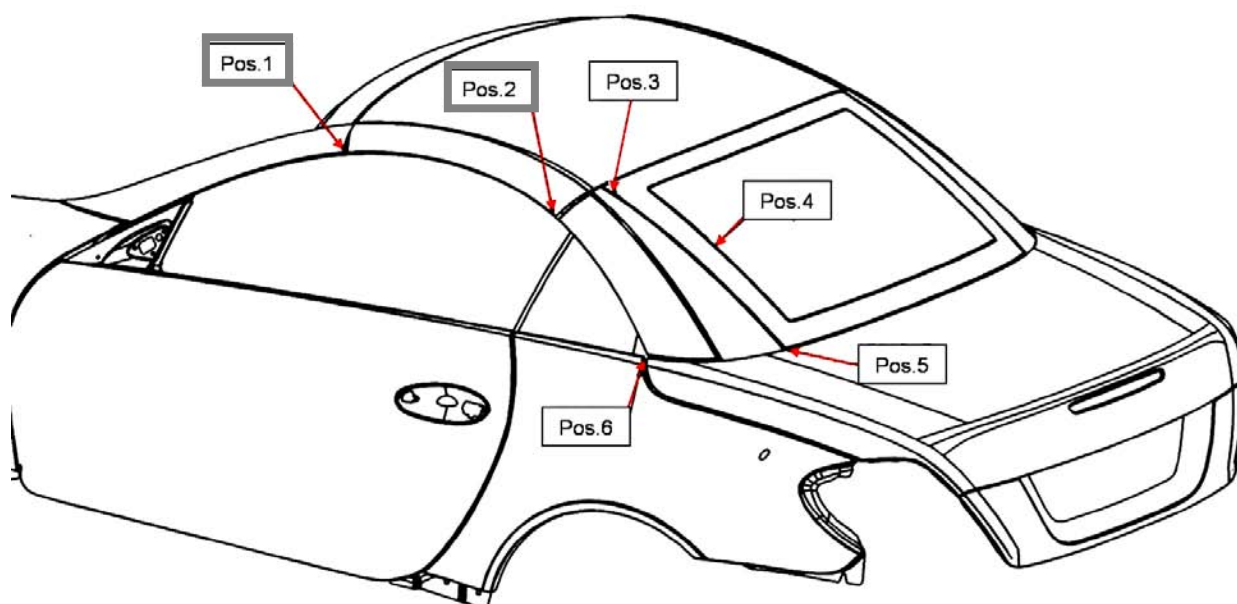
Pos. 2: Gardena sprinkler

3.2 Leaktightness in the Vario roof interior area

3.2.1 Water entry at joint 1/joint 2

Complaint: Joint 1 (pos. 1): 1. Water running down window 2. Water drips on the seat
Joint 2 (pos. 2): 1. Water running down window 2. Water on the B-pillar trim/rear trim behind seat

Cause: 1. Contact pressure too high/low = deformation/gap formation.
2. Window adjustment not OK.



Measure: 1. Adjust sealing, see AR 77.50-P-4200V.
2. Adjust rear window, see GI72.10-P-020305 Release 3.0.

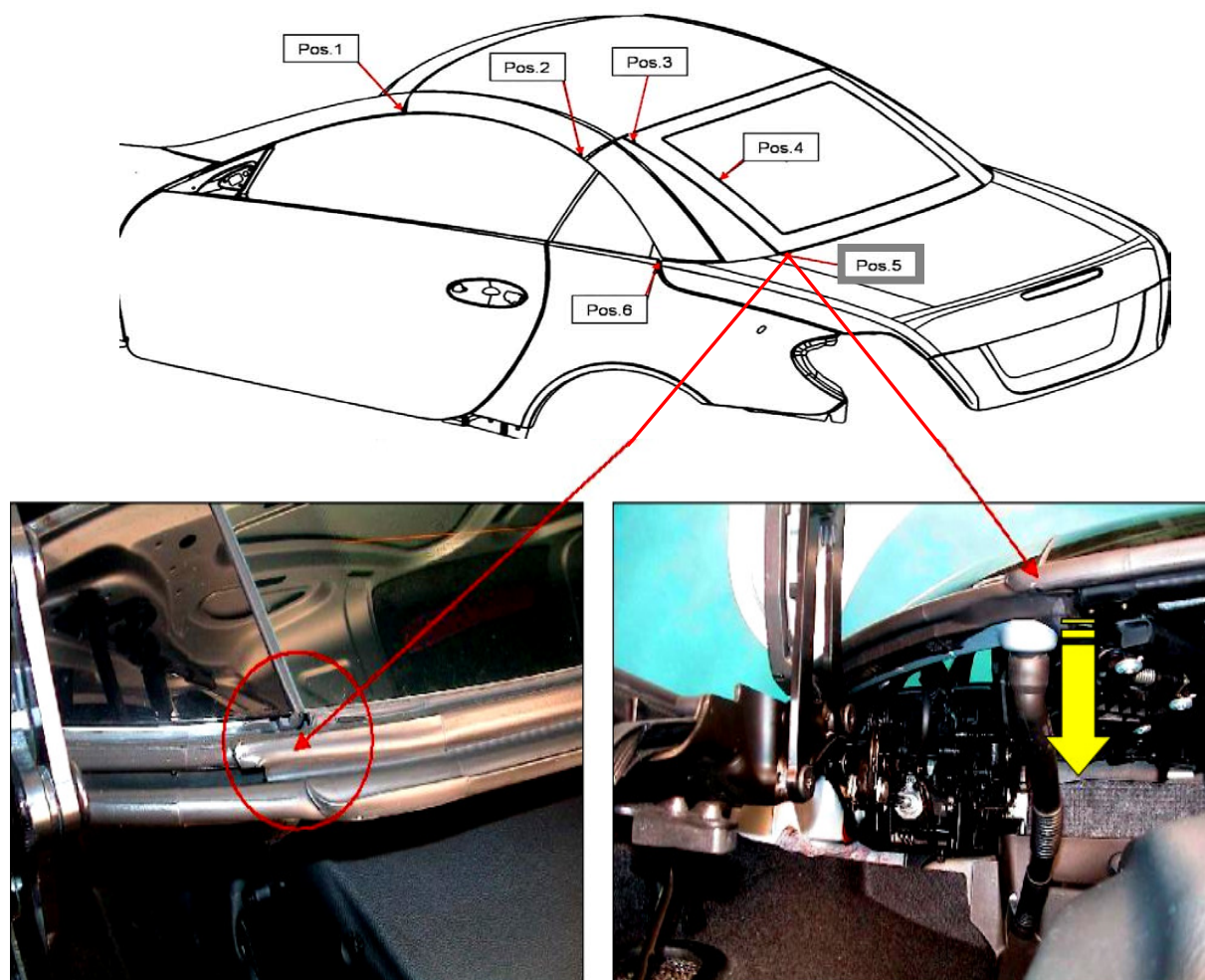
SSL: 7921604 Vario roof seal side seal leaky

3.3 Leaktightness in the trunk area

3.3.1 Water entry in the joint 5 area of the trunk

Complaint: Water near the luggage compartment partition.

Cause: 1. Sealing profile/sealing pad at the lower rear window seal is loose or not positioned correctly.



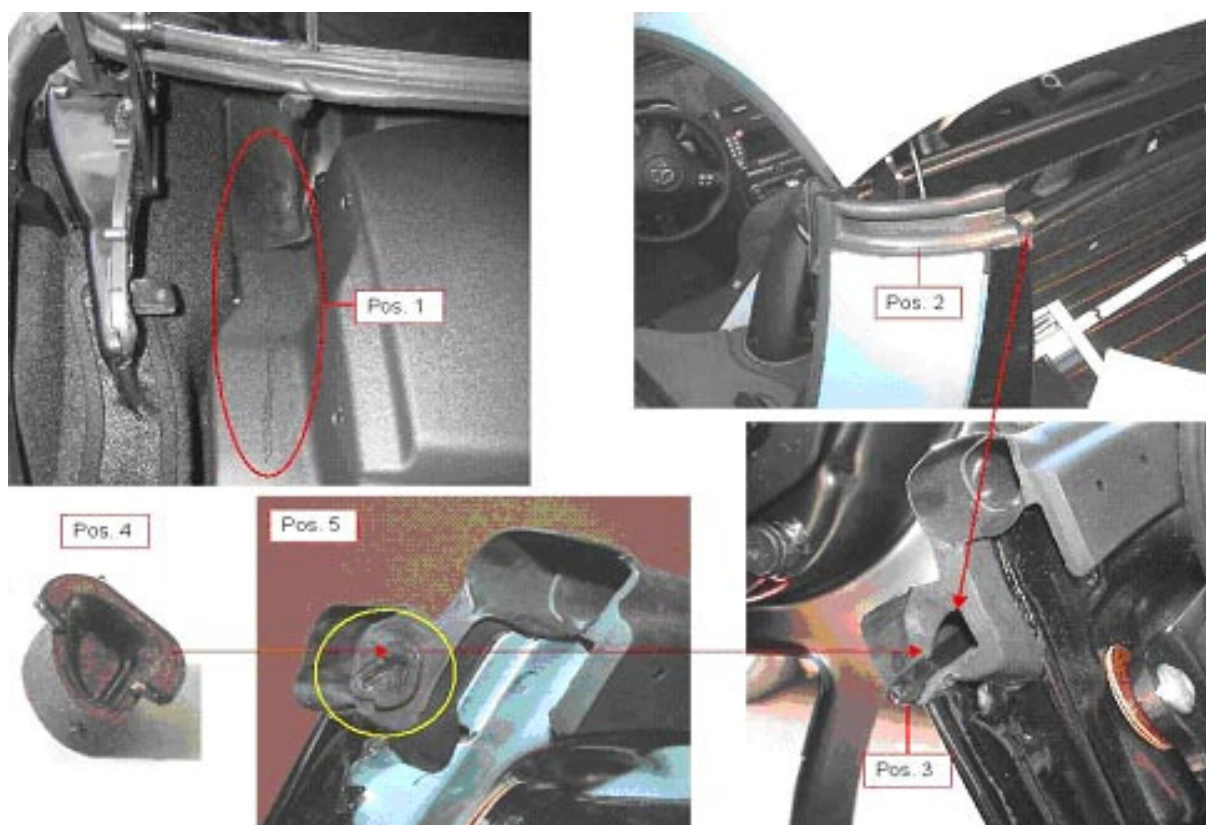
Measure: Glue new sealing pad onto joint 5, see GI77.30-P-018434.

SSL: 7922004 Lower rear window frame seal leaky

3.3.2 Water entry in the trunk on opening the Vario roof

Complaint: Water drips into the trunk on opening the Vario roof (pos. 1).

Cause: Seal plug missing in the upper C-pillar seal (pos. 4 and 5).



Measure: Glue sealing plug into the upper C-pillar seal, see GI77.30-P-012544.

SSL: 7922504 Interior C-pillar seal leaky

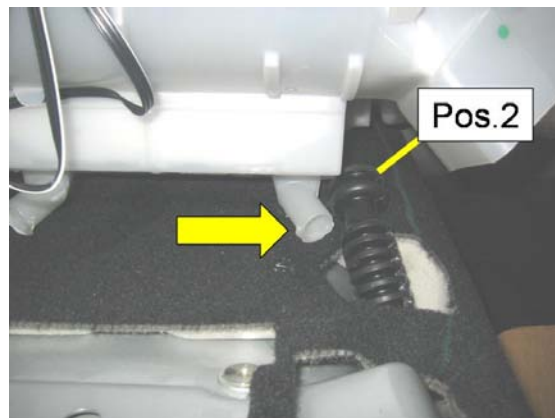
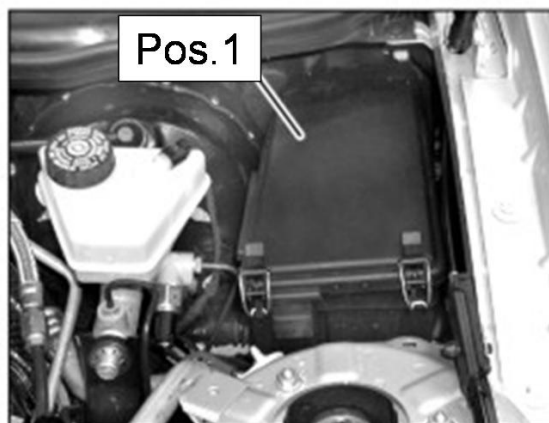
3.4 Other topics regarding water entry

3.4.1 Water entry in the front footwell

Complaint: Moisture in the front footwell.

Cause:

1. Cover of the fuse box (pos. 1) not closed properly.
2. Water drain hoses (pos. 2) not plugged to the air conditioning outlet in the footwell.
3. Water drain hose in the battery box clogged/no passage.



Measure:

1. Check the cover of the fuse box and if necessary, close it.
2. Check if the water drain hoses are fitted properly and if required, plug correctly.
3. Check water drain hose and if necessary, clean the hose.

SSL:

For 1. **5454738 Module box/control unit box cover loose**
For 2. **8349304 Condensation water – air conditioning drain hose leaky**
For 3. **6202304 Battery box leaky**

4 EE/hydraulic function

4.1 Malfunctions on actuation of the Vario roof

4.1.1 Roof cannot be opened

Complaint: Vario roof cannot be opened or closed.

Cause: Passenger side or driver side side window does not open.

Measure: Parameterize the door control unit with DAS,
see also GI77.39-P-011821.

Note: **Valid only for the DCU with SW release 20/03 and diagnosis identifier 0000**

SSL: 72220EK Left front door control unit
72230EK Right front door control unit

Important: The door control unit is not to be replaced for this fault profile.

4.2 Noises in the hydraulic pump

4.2.1 Intake noises

Complaint: Noise development in the hydraulic unit on actuation of the roof after lowering of the Vario roof from the stop function.

Cause: If the actuation of the Vario roof is interrupted, the Vario roof remains in an intermediate position (stop function). On lowering of the Vario roof backwards or forwards from the stop function, intake of air can take place in the drive cylinders (master cylinders). On subsequent actuation of the roof, an increased noise development (intake noise) can be heard from the hydraulic unit for a short time.

Measure: After a maximum of three actuations of the roof, the described noise can no longer be heard, see GI77.30-P-020502.

SSL: 7732152 Hydraulic pump does not function properly

Important: This increased noise development for a short time does not mean that the hydraulic unit is to be exchanged.
Hydraulic units replaced due to this reason may be redebited. See GI77.30-P-020502.

Departments participating in the generation of the troubleshooting tree:

Bremen plant:

Departments: BSL-MOR1
 BSL-MOR2
 QM-QPR-AS
 QM-QPE

Development department passenger cars:

Departments: EP-GKE

Service Product Engineering

Departments: GSP-TPS
 GSP/TPT