

Troubleshooting tree for Vario roof R230

Noise, leakage, fit and function analyses and the most important repair jobs including the associated damage codes and chassis numbers (VIN)

When processing complaints and invoicing repair orders, care must be taken to ensure that the listed damage codes and the affected VINs are complied with in order to avoid unnecessary warranty and goodwill costs.

In the event of complaints, repair work must be carried out using only the published workshop literature and the approved repair materials.

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

Contents:

1 NOISES	4
1.1 General information on noises from the Vario roof	4
1.2 Noises while driving	5
1.2.1 At the seals	5
1.2.2 Area of front latch socket.....	6
1.2.3 Area of C-pillar pivot point.....	7
1.2.4 Area of rear window stop on C-pillar.....	8
1.2.5 Area of rear window stop buffers.....	9
1.2.6 Area between C-pillar guide stop screw and intermediate bearing.....	10
1.2.7 Area of locking cam on C-pillar	11
1.2.8 Area of lock cover on main guide	12
1.2.9 Area of C-pillar	13
1.2.10 Area of bracket at front section of Vario roof.....	14
1.2.11 Area of center pillar paneling at the top	15
1.2.12 Area of paneling on Vario roof C-pillar	16
1.2.13 Area of roof paneling at pivot point 1	17
1.3 Wind noises	18
1.3.1 Area of windshield frame.....	18
1.3.2 Wind noises occurring suddenly in area of Vario roof at center/rear	19
1.4 Operating noises	20
1.4.1 Area of lock on front of C-pillar.....	20
1.5 Bodyshell noises	21
1.5.1 Area of rear window lifter retaining plate	21
1.5.2 Creaking noise in area of B-pillar.....	22
1.5.3 Cracking noises from area of trunk/Vario roof C-pillar	23
1.5.4 Cracking noises from area of B-pillar	24

1 Noises

1.1 General information on noises from the Vario roof

Before analyzing the vehicle, make sure that the customer removes all his personal objects from inside the vehicle. For effective noise analysis it is necessary for the customer to demonstrate the complaints to the workshop staff.

Dry, dirty seals on the Vario roof are the most common cause of cracking and tearing noises while driving. For this reason it is absolutely essential to deal with the seals first.

Tearing noises, cracking noises and creaking noises while driving can also be transmitted to the Vario roof by the bodyshell or by loose threaded connections on add-on parts, e.g. via the C-pillar.

In the event of complaints, repair work must be carried out using only the published workshop literature and the approved repair materials (e.g. noise reduction service set, part no. A 000 580 03 50).

A helpful tool for localizing noises in the vehicle is a noise listening set such as the "Chassis Ear" produced by Steelman, which is being used successfully by Chrysler.



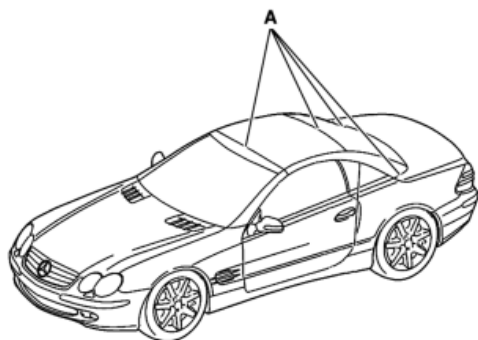
"Wireless Chassis Ear"

1.2 Noises while driving

1.2.1 At the seals

Complaint: Tearing/rubbing noises at all the seals on the Vario roof.

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



Action: Treat seals (A) on Vario roof with special antifriction agent, part no. A 000 989 50 51 or A 001 989 36 60, see AF77.30-P-1501AG.

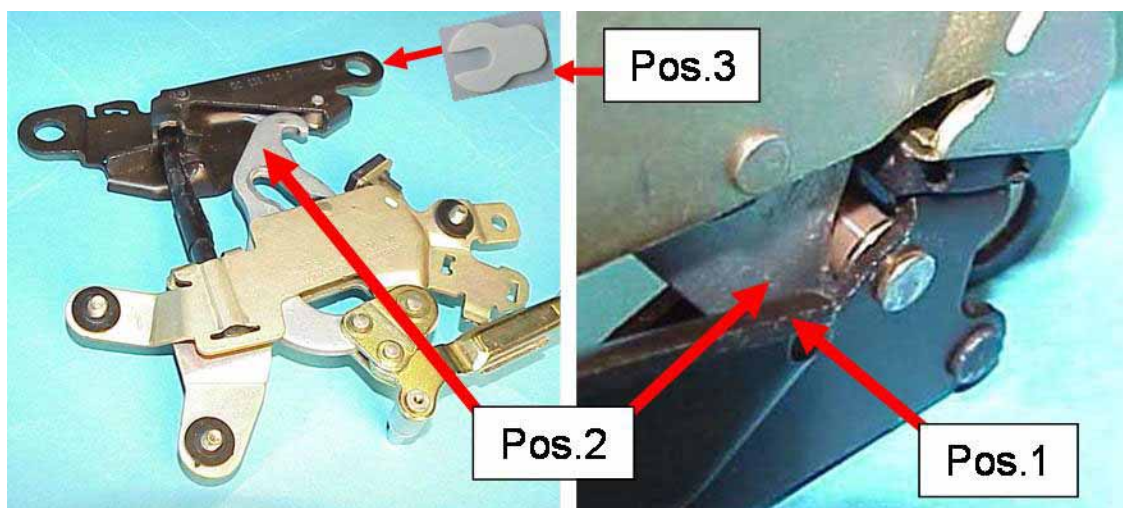
Note: Observe proper application (penetration time 20 min) of the special antifriction agent.

Damage code: 7931536 Upper windshield seal, noises
7931636 Upper rear window sealing rail, noises
7931736 Lower rear window sealing rail, noises
7931836 Inner C-pillar sealing rail, noises

1.2.2 Area of front latch socket

Complaint: Hard tearing noise (cracking) from the area of the front Vario roof socket/latch while driving.

Cause: Base of socket (item 1) for latch hook (item 2) too high, latch hook (item 2) touches the base (item 1) in the socket.



Action: Adjust the socket (item 1) so that the latch hook (item 2) is in the center of the latch (item 1) and does not come into contact with the base when the Vario roof is locked, see AF77.30-P-1560AG.

Note: The installation position and part no. of the shims (item 3) have been changed. Install shims (item 3) in the direction of the arrow.

New part no. of shims: A 230 795 14 96

Damage code: 7920636 Front Vario roof latch socket, noises

Important: The entire latch must not be replaced for this reason.

1.2.3 Area of C-pillar pivot point

Complaint: Rattling noises or knocking in the area of the C-pillar pivot point.

Cause: Play at the bolt (A) in the C-pillar pivot point.



Action: Replace bolt (A), part no. A 007 990 09 04, in intermediate bearing, see AF77.30-P-1502AG.

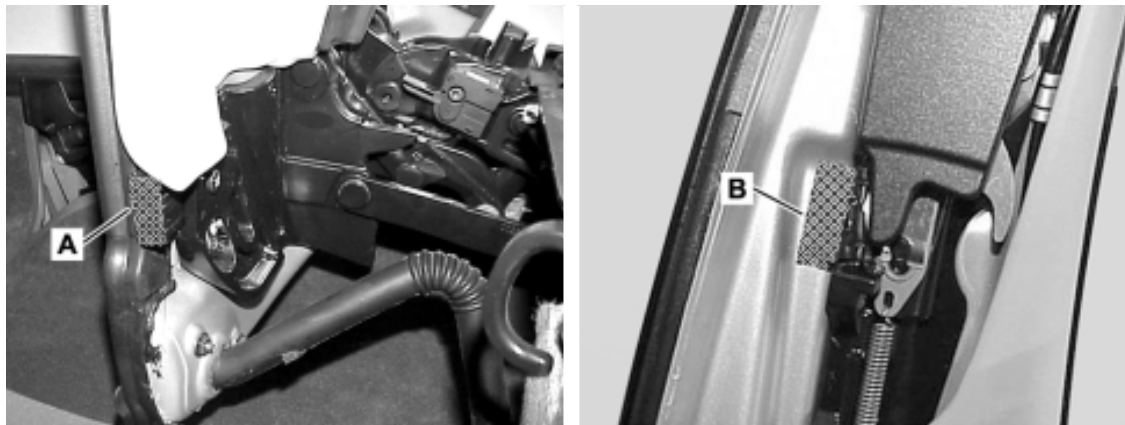
Damage code: 7930236 C-pillar pivot point, noises

Important: Vehicles OK as of: VIN 054902

1.2.4 Area of rear window stop on C-pillar

Complaint: Noises in the area of the rear window Y-stops at the bottom of the C-pillar.

Cause: Adjustment of Y-stops not OK (too much play).



Action: Check adjustment of Y-stops (A)/(B) on C-pillar and correct if necessary. Grease Y-stops with lubricant paste, part no. A 001 989 46 51 (hatched area).

Note: The Y-stops (A) at the bottom of the C-pillar are accessible under the Vario roof when the trunk lid is open. Slacken the bolts, slide the stop as far as the thrust bearing of the rear window and retighten the bolts.

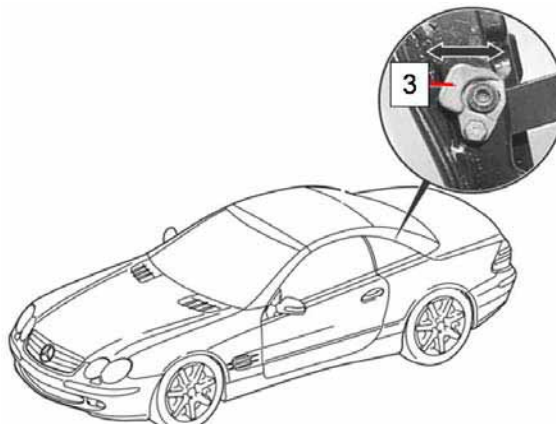
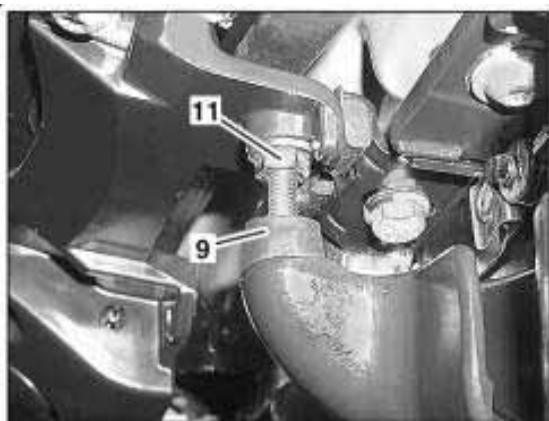
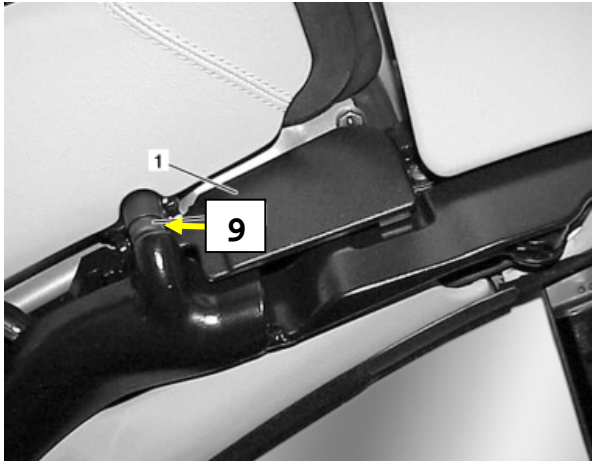
The Y-stops (B) at the top of the C-pillar are not usually the cause of complaints and can be adjusted, if necessary, with the Vario roof in the upright position.

Damage code: 7930336 C-pillar rear window stops, noises

1.2.5 Area of rear window stop buffers

Complaint: Noises in the area of the rear window stop buffer.

Cause: Adjustment of stop buffers (9) not OK.



Action: **Adjust stop buffer:**
Move Vario roof to upright position, remove left and right cover sleeves, slacken lock nut (11), screw in stop buffer (9) and close Vario roof again. Unscrew stop buffer (9) until it touches the roof frame, open Vario roof again, unscrew stop buffer (9) one half turn, tighten lock nut (11), push on cover sleeve. Grease stop buffer (9) with lubricant paste, part no. A 001 989 46 51.

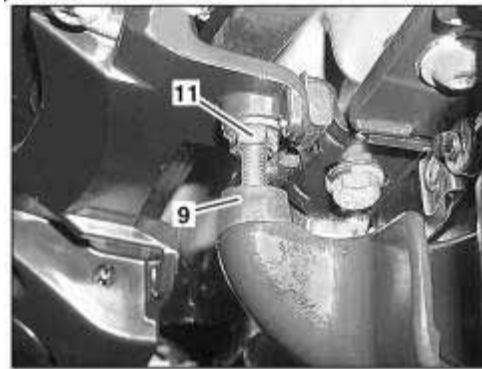
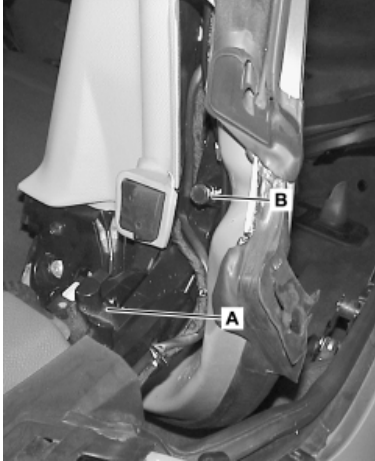
Important: If the setting of the stop buffer (9) is changed, the setting of the cam (3) must then be checked and corrected if necessary. The settings of the stop buffer (9) and of the cam (3) influence each other.

Damage code: 7930636 Rear window stop buffer, noises

1.2.6 Area between C-pillar guide stop screw and intermediate bearing

Complaint: Cracking noises in the area of the C-pillar guide.

Cause: Unfavorable material pairing between stop screw and intermediate bearing.



Action: Check contact pressure of stop screw (B) on intermediate bearing (A) using a strip of paper, and adjust if necessary.

Important: If the setting of the stop screw (B) is corrected, you must then carry out the steps 1.2.5 "Adjust stop buffer (9)" and 1.2.7 "Locking cam (3) on C-pillar".

Adjust stop screw (B):

Open Vario roof, slacken lock nut on stop screw, unscrew stop screw one half turn and tighten lock nut. Grease head of stop screw (B) with lubricant paste, part no. A 001 989 46 51.

Note: The stop screw (B) is correctly set if the paper strip cannot be pulled out under moderate pressure when the Vario roof is locked.
Lowering the rear side windows makes it easier to position the paper strip.

Important: If the stop screw is set with excessive bias, the contour of the Vario roof will be negatively affected and this may in certain circumstances result in wind noises and water ingress.

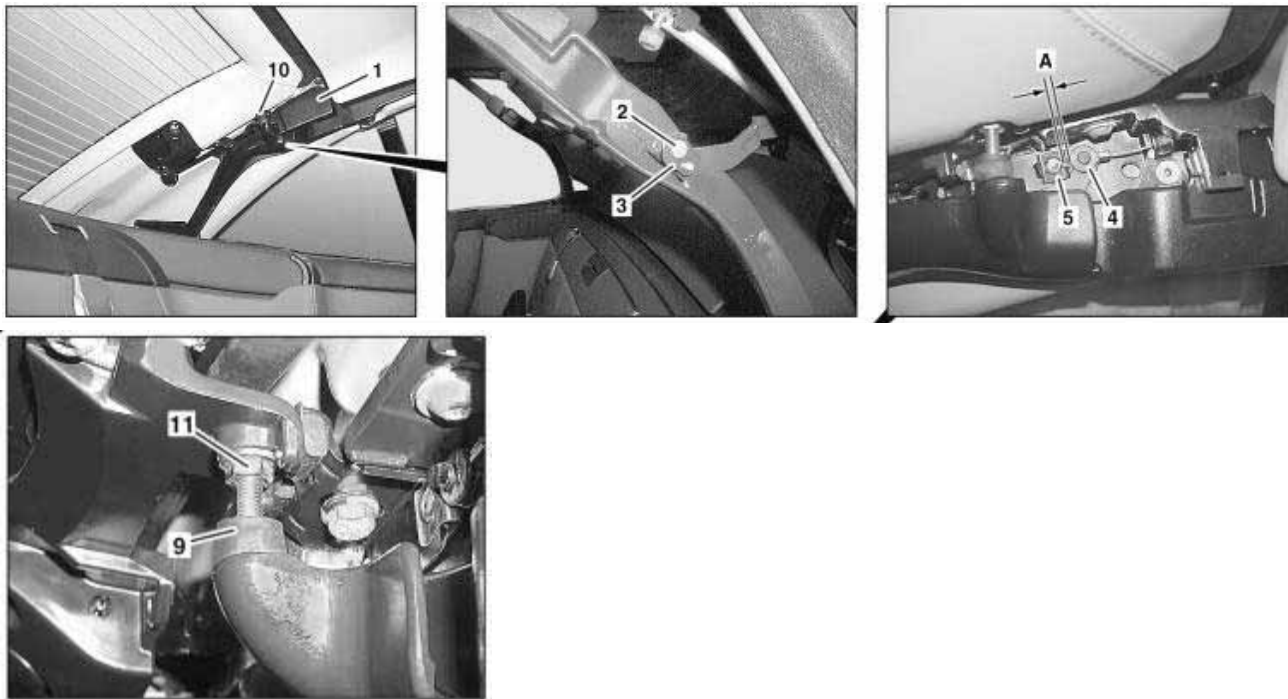
Damage code: 7930736 C-pillar stop screw, noises

Important: Vehicles OK as of: VIN 054902
Stop screw modified (rubber buffer).

1.2.7 Area of locking cam on C-pillar

Complaint: Noises in the area of the locking cam.

Cause: Settling of the Vario roof after long periods of operation.



Action: Adjust cam (3), see AR77.50-P-3045R.

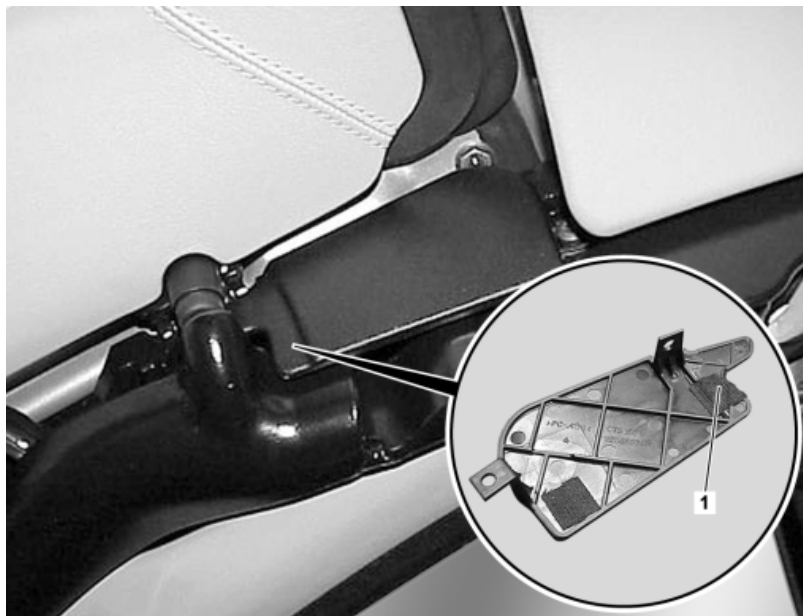
Important: If the setting of the cam (3) is changed, the setting of the rear window buffer (9) must be rechecked and corrected if necessary. The settings of the cam (3) and of the rear window buffer (9) influence each other.

Damage code: 7931936 Mechanism lock, noises

1.2.8 Area of lock cover on main guide

Complaint: Whirring noises in the area of the lock cover on the main guide.

Cause: Cover (1) touching the main guide.



Action: Remove cover, stick on a thin felt strip (1), part no. A 001 983 17 10, and reinstall the cover, see AF77.30-P-1509AG.

Damage code: 7930936 C-pillar lock cover, noises

Important: Vehicles OK as of: VIN 047857

1.2.9 Area of C-pillar

Complaint: Tearing noises (crackling) in the area of the C-pillar.

Cause: C-pillar touching the mechanism.



Action: Shim the bolting points on the roof frame at the side (item 1) and bottom (item 2).

New part no. of shims:

For item 1: 0.5 mm (steel) Part no. A 230 795 11 96
1 mm (steel) Part no. A 230 795 12 96

For item 2: 0.5 mm (brown) Part no. A 230 795 05 96
1 mm (brown) Part no. A 230 795 06 96

Thread locking agent: part no. A 003 989 31 71 must be used.

Tightening torque of bolts: 10 Nm

Damage code: 63B3136 Left C-pillar, noises
63P3136 Right C-pillar, noises

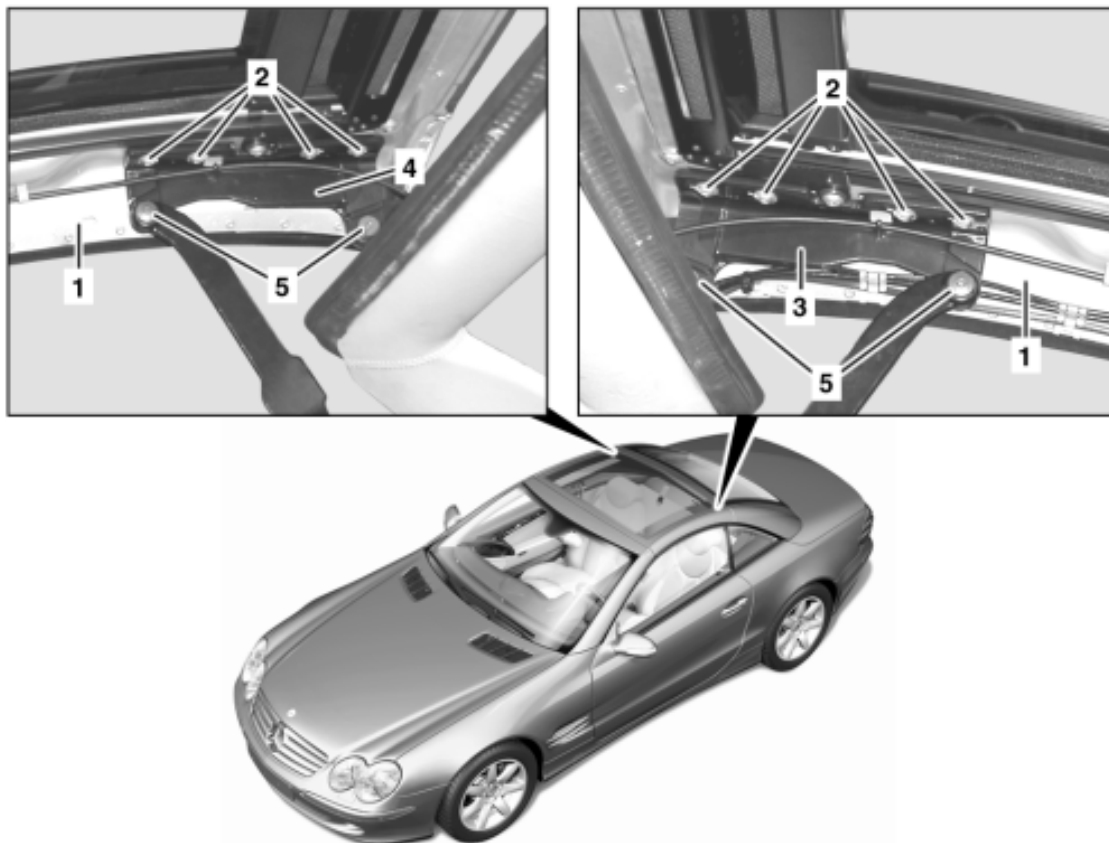
Note: Start with 0.5 mm shims; if the noises persist, use 1 mm shims.

Important: Check the adjustment of the rear window on the Vario roof and correct if necessary, see AR77.50-P-3045R and AR67.20-P-3000-06R.

1.2.10 Area of bracket at front section of Vario roof

Complaint: Slight crackling in the area of the connection of the front section of the Vario roof.

Cause: Bracket (3/4) at front section of Vario roof under stress.



Action: **Before unscrewing the bolts, mark the position of the bracket relative to the front section of the Vario roof.**

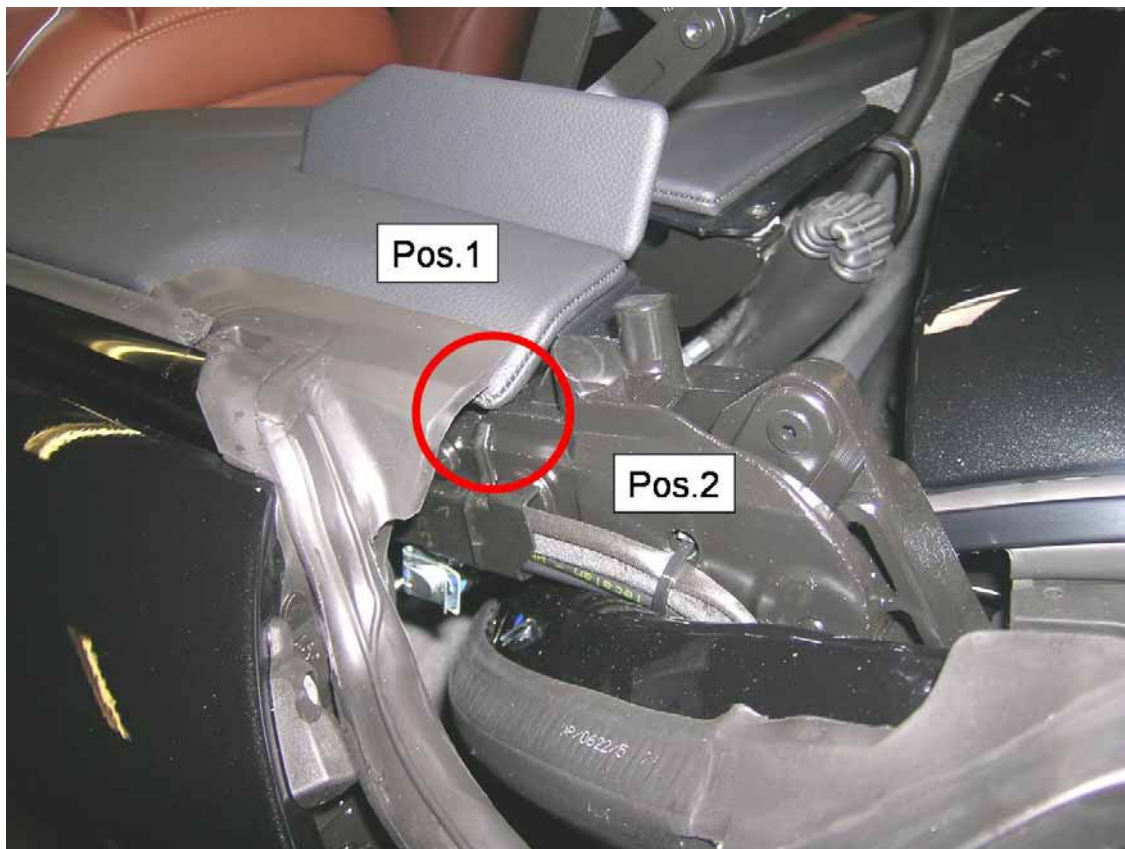
Note: First slacken and retighten the two bolts at the rear, and then slacken and retighten the two bolts at the front.

Damage code: 79320A4 Vario roof mechanism under stress

1.2.11 Area of center pillar paneling at the top

Complaint: Cracking noises between the center pillar paneling at the top and the Vario roof intermediate bearing.

Cause: Paneling (item 1) touching the intermediate bearing (item 2).



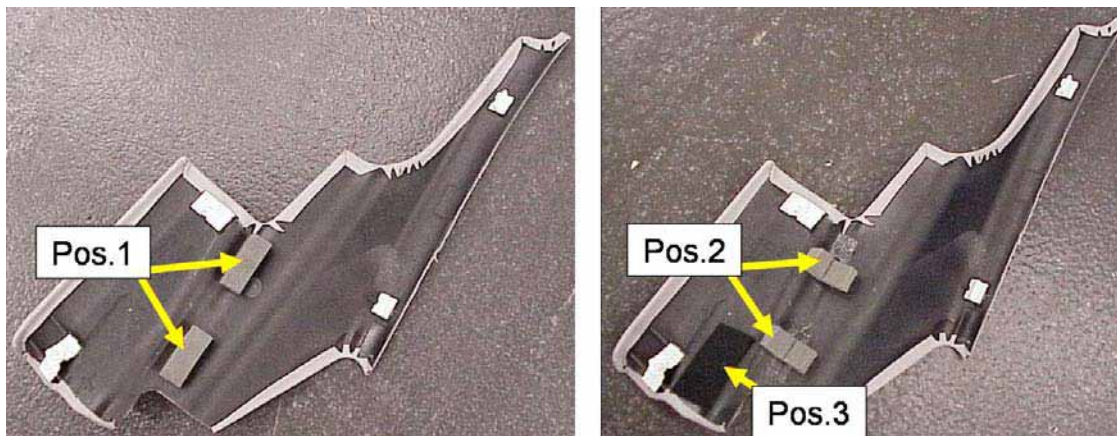
Action: Detach paneling and adjust to a higher position, see AR68.30-P-1077R.

Damage code: 6908807 Rear shelf paneling cracked at the side (damage type allocated)

1.2.12 Area of paneling on Vario roof C-pillar

Complaint: Cracking noises/crackling between the C-pillar roof paneling and the Vario roof frame.

Cause: Roof paneling touching the roof frame.



Action: Remove paneling on C-pillar, see AR68.30-P-4500R.
Detach foam padding (item 1) and stick down in revised position (item 2). In addition, stick self-adhesive fabric tape (item 3), part no. A 000 983 99 13 7098, on the paneling.

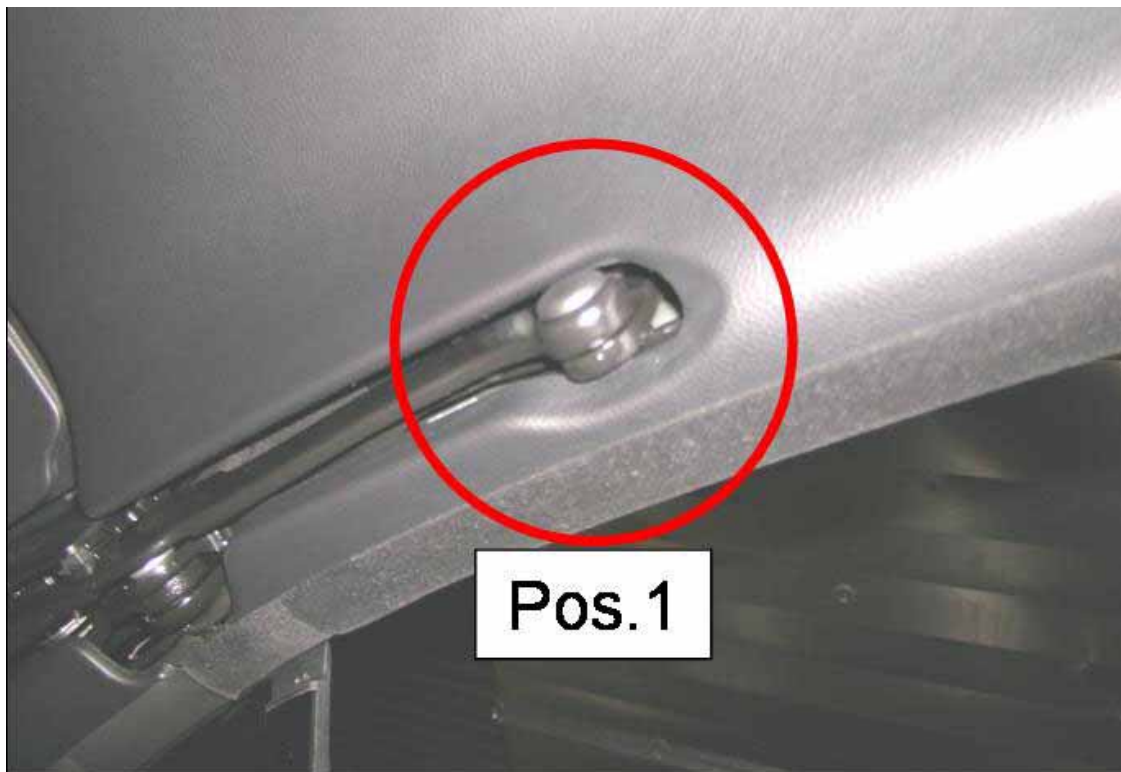
Note: When assembling the C-pillar roof paneling, make sure that the clips are properly seated.

Damage code: 7920436 C-pillar roof paneling, noises

1.2.13 Area of roof paneling at pivot point 1

Complaint: Friction noises between roof paneling and pivot point 1.

Cause: Insufficient play between the pivot point (item 1) and the roof paneling.



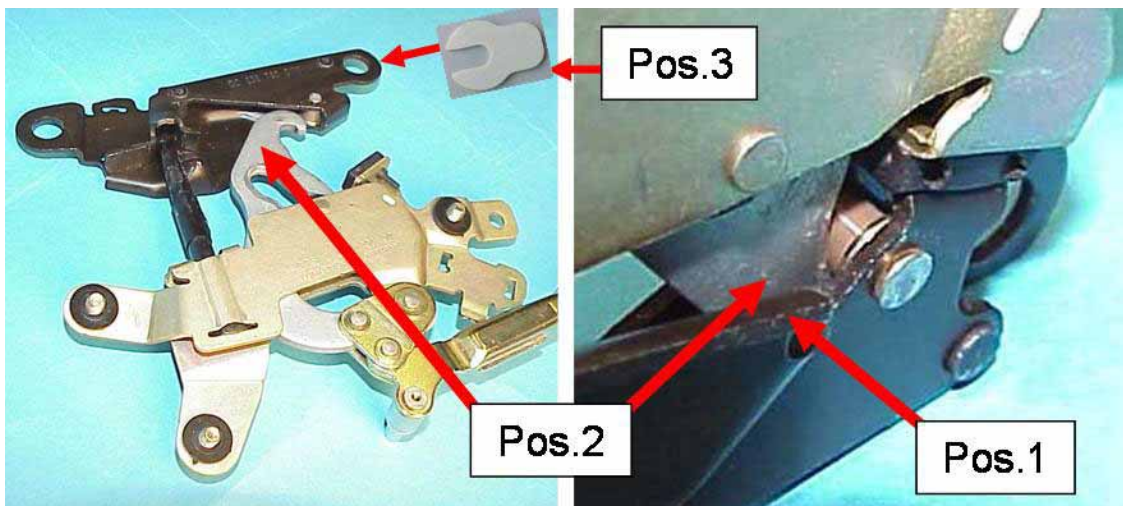
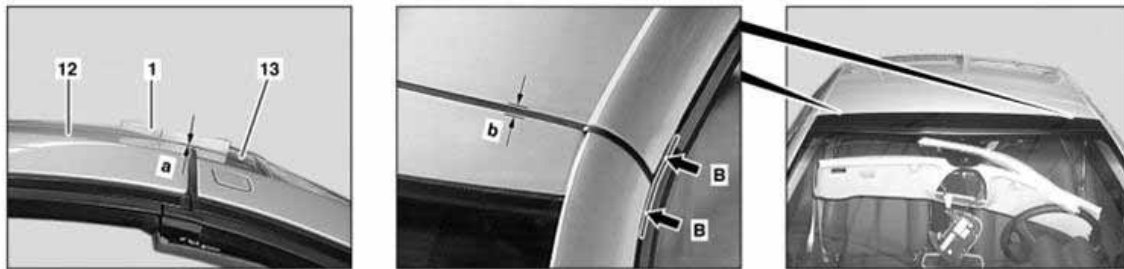
Action: Reposition the roof paneling at the pivot point (item 1) and relieve the stress by tapping gently vertically upwards with the palm of your hand.

Damage code: 6900136 Roof paneling/headliner, noises

1.3 Wind noises

1.3.1 Area of windshield frame

Cause: Socket for Vario roof latch shifted forwards; the gap (b) between the front section of the Vario roof and the crossmember above the windshield gets wider.



Action: Adjust the gap between the Vario roof and the crossmember above the windshield, see AR77.50-P-3035R.
Adjust the socket (item 1) so that the latch hook (item 2) is in the center of the latch (item 1) and does not come into contact with the base when the Vario roof is locked, see AF77.30-P-1560AG.

Note: The installation position and part no. of the shims (item 3) have been changed. Install shims (item 3) in the direction of the arrow.

New part no. of shims: A 230 795 14 96

Damage code: 7920636 Front Vario roof latch socket, noises

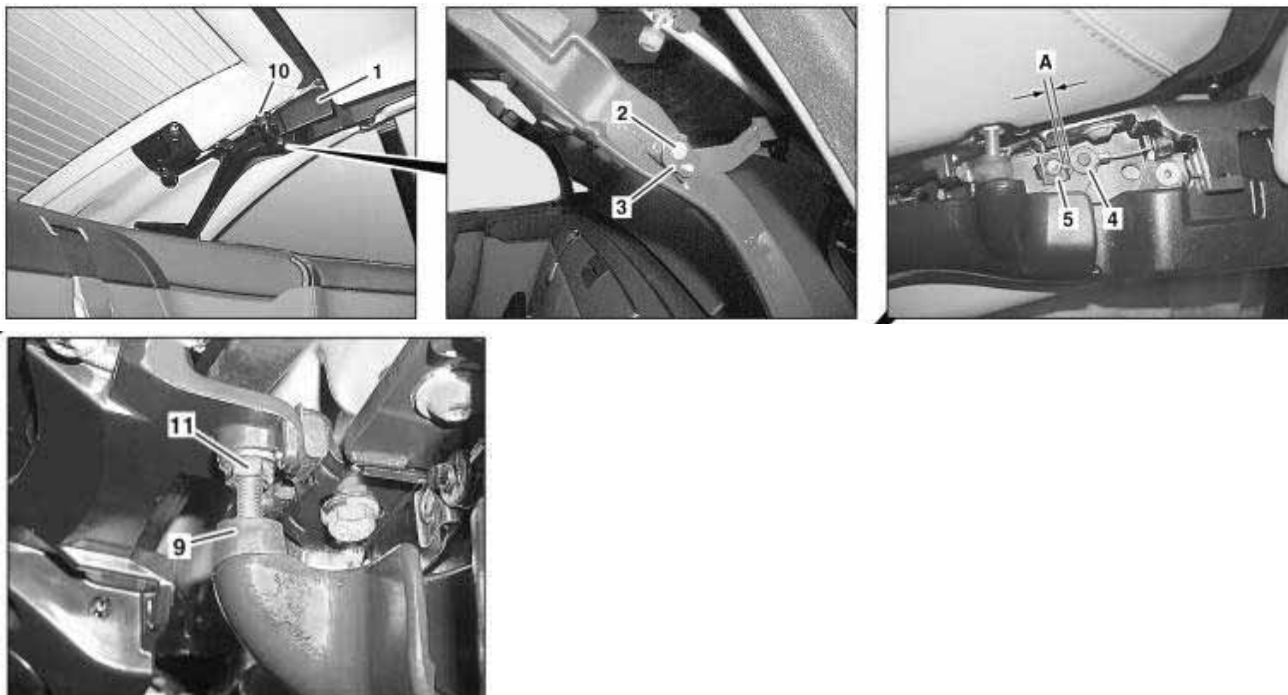
Important: The entire latch must not be replaced for this reason.

1.3.2 Wind noises occurring suddenly in area of Vario roof at center/rear

Complaint: Wind noises occurring suddenly at speeds above approx. 150 km/h.

Cause: Adjustment of C-pillar lock cam not OK.

Note: At high speeds the Vario roof can be pulled up in the area of the top edge of the rear window (A).



Action: Adjust cam (3), see AR77.50-P-3045R.

Important: If the setting of the cam (3) is changed, the setting of the rear window buffer (9) must be rechecked and corrected if necessary. The settings of the cam (3) and of the rear window buffer (9) influence each other.

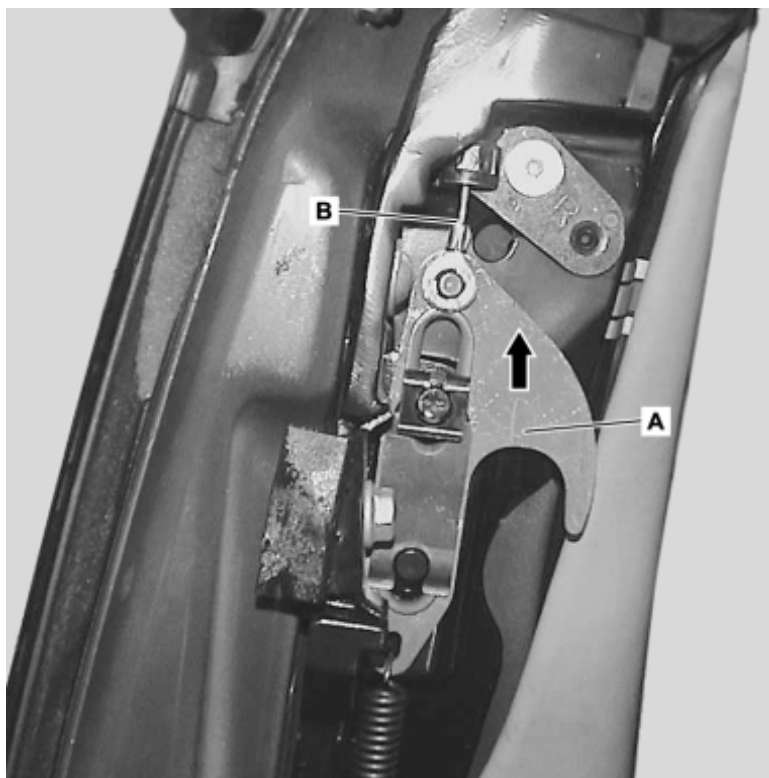
Damage code: 7931936 Mechanism lock, noises

1.4 Operating noises

1.4.1 Area of lock on front of C-pillar

Complaint: Snapping noises/whirring from the area of the lock cam on the C-pillar when opening the Vario roof.

Cause: Adjustment of the Bowden cables not OK.



Action: Adjust Bowden cable (B) for lock on C-pillar, see AR77.33-P-3470R.

Note: Adjust the Bowden cable (B) so that the lock (A) is pulled upwards (arrow) when the Vario roof is in the intermediate position.

Important: Do not adjust it all the way to the stop otherwise the sleeve of the Bowden cable will be crushed (leave a gap of approx. 2 mm at the top).

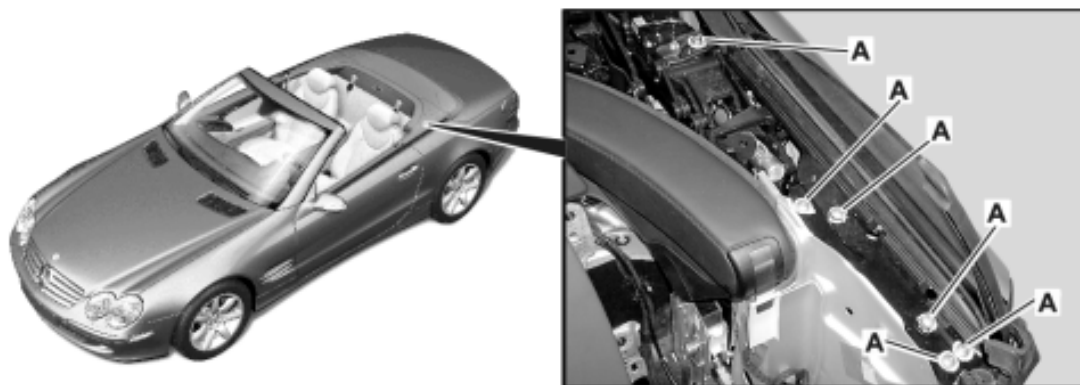
Damage code: 7921551 Roof frame latch cable poorly adjusted

1.5 Bodyshell noises

1.5.1 Area of rear window lifter retaining plate

Complaint: Cracking noises in the area of the window lifter retaining plate.

Cause: Unfavorable surface pairing between retaining plate and bodyshell.



Action: Remove paneling at top of center pillar. Mark bolt heads (A), slacken bolts, coat contact surfaces on underside of retaining plate with lubricant paste, part no. A 001 989 46 51, and retighten bolts, see AF77.30-P-1510AG.

Damage code: 793 1036 Rear window lifter retaining plate, noises

1.5.2 Creaking noise in area of B-pillar.

Complaint: Dry creaking noise in the area of the B-pillar when moving off or decelerating.

Cause: Stay panel within radius of inside of B-pillar produces a creaking noise.



Action: See GI63.20-P-009271*.

**Damage code: 63B2136 Left B-pillar, noises
63P2136 Right B-pillar, noises**

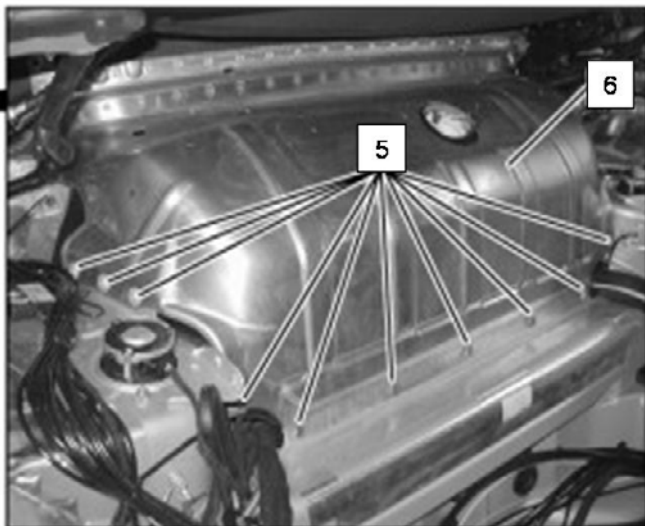
Important: Vehicles OK as of: VIN 095942

** Please observe the existing TIPS and/or DTB documents.*

1.5.3 Cracking noises from area of trunk/Vario roof C-pillar

Complaint: Cracking/tearing noises from the area of the trunk.

Cause: Torque decrease at the threaded connections (item 5) of the tank cover (item 6) in the trunk.



Action: Slacken and retighten all the threaded connections (item 5), see GI68.64-P-038205*.

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

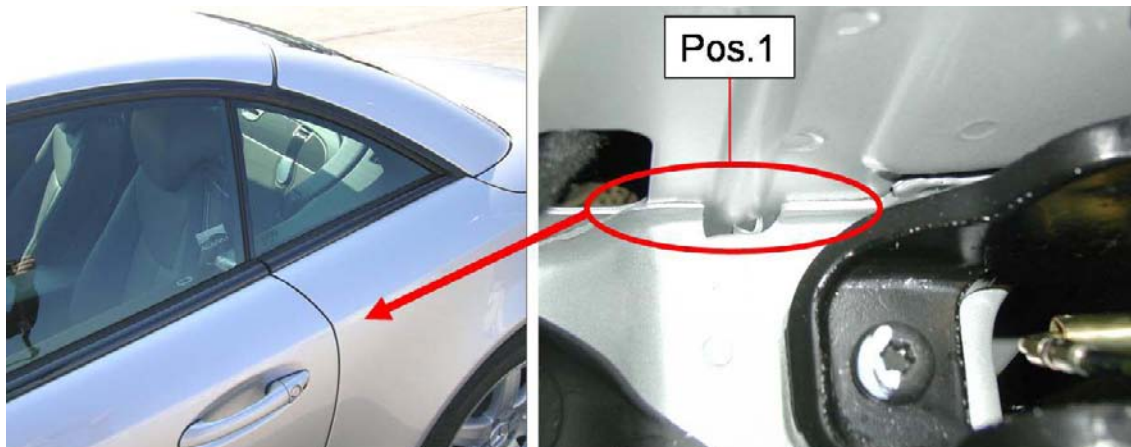
Damage code: 6400136 Rear panel, noises

** Please observe the existing TIPS and/or DTB documents.*

1.5.4 Cracking noises from area of B-pillar

Complaint: Cracking/tearing noise from the area of the B-pillar as the vehicle twists on rough roads.

Cause: Upright flange (item 1) of main bearing base mounting touching inner wall of B-pillar.



Action:

1. Remove paneling on center pillar, see AR68-30-P-1077R.
2. Use appropriate tools to bend the upright flange (item 1) of the main bearing base mounting away so that it is no longer in contact with the inner wall of the B-pillar. If the paint is damaged, apply anticorrosion agent, see GI 63.20-P-038600*.

** Please observe the existing TIPS and/or DTB documents.*

Departments involved in producing this troubleshooting tree:

Bremen Plant:

**Department: BSL-MOR1
BSL-MOR2
QM-QPR-AS
QM-QPE**

Passenger Car Development:

Department: EP-GKE

Service Product Engineering:

**Department: GSP-TPS
GSP/TPT**