

Model series 223 with code 96B (Active driving noise compensation) [ANC] - static noise from speakers while driving

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| Topic number | LI82.62-P-076176 |
| Version | 4 |
| Function group | 82.62 - Loudspeakers, amplifiers, antennas |
| Date | 4/14/25 |
| Validity | Model series 223 with code 96B |
| Reason for change | Test and remedy adjusted |
| Reason for block | |

Complaint

Interference or static noise from speakers when driving.

Note:

If the noise only occurs at driving speeds between 12mph (20 km/h) to 111mph (180 km/h), it is possible that the noise is being caused by the "active driving noise compensation" (RNC).

If the static noise also occurs at speeds of less than 2mph (20 km/h) to 111mph (180 km/h), this static noise is NOT caused by the "active driving noise compensation" function.

If the noise, after

- opening a window by more than 20 mm, or by
- opening the tilting roof
- opening a door
- opening the trunk lid

is no longer perceptible, the noise is likely the result of unwanted compensation from the "active driving noise compensation" system.

| Attachments | |
|-------------------|------------------|
| File | Description |
| Noise+Video+1.mp4 | Example of noise |

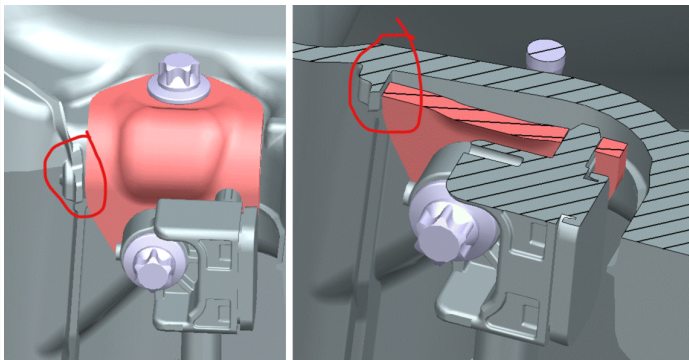
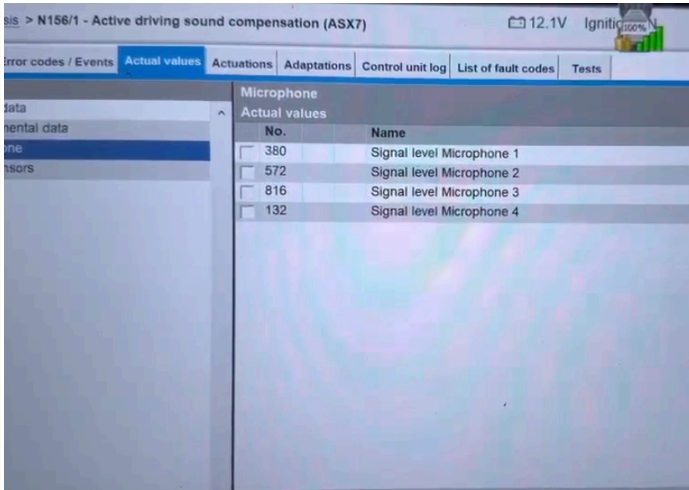

Cause

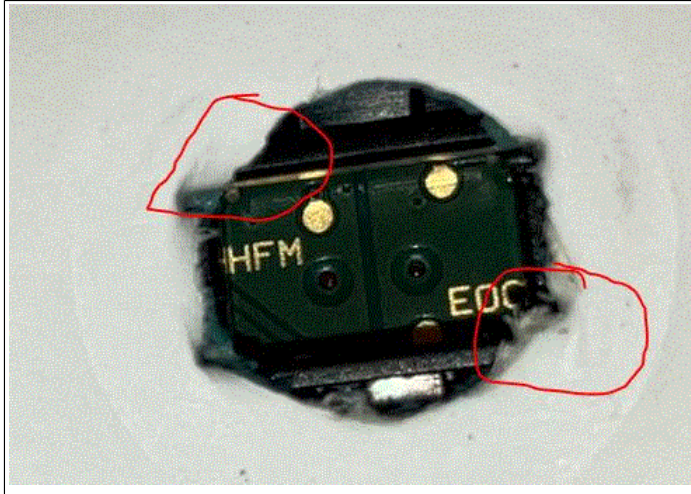
Definition and introduction: Active driving noise compensation:

- A total of 6 RNS sensors are installed in the vehicle for the "Active driving noise compensation" function (SA code 96B). 1 sensor is located at each of the 4 wheel carriers, and the top left integral carrier and top right integral carrier also each have 1 sensor.
- These 6 sensors record the driving noises in 2 spatial directions each and transmit these noises as electrical impulses (digital bus) to the ASX control unit N156/1.
- In addition, 4 ANC microphones are installed in the vehicle interior, which are non-visibly attached in a electrically completely separated manner from the 4 voice/telephony microphones behind the shared microphone grille in the headliner. These 4 ANC microphones check the function of the RNC system. If the RNC system in the vehicle interior is outputting unwanted signals via the speakers, this may indicate that these microphones are operating on a limited basis.

XENTRY Tips

- If the microphones are not correctly engaged, this means that the microphone grille visible in the vehicle interior is not completely clipped on to the microphone attached behind the headliner. This can usually be noticed due to reduced sound quality when making telephone calls. In extreme cases, this may have an affect on the RNC system.
- The microphones could be connected to the wrong channels at control unit ASX 156/1, i.e. with swapped connections. The correct assignment of the microphones can be checked with XENTRY. (See remedy)
- Due to tolerances, it may be the case under certain circumstances that the angle bracket of the sensors at the integral carrier does not have sufficient contact with the integral carrier ("longitudinal member") of the body. It is also possible that the stipulated tightening torque of the screw connection has not been adhered to, which results in the transferred impulses being falsified. As a result, unintended vibrations may be transferred via the holder to the sensor. During assembly, the contact areas must be clean and free of dust and foreign objects. Control unit N156/1 then interprets these falsified signals as driving noise and attempts to compensate for this, which results in static noise coming through the speakers.

| Attachments | | | | | | | | | | | |
|---|--|------|------------------------------|---------------------------|------------------------------|---------------------------|------------------------------|---------------------------|------------------------------|---------------------------|------------------------------------|
| File | Description | | | | | | | | | | |
| RNC.PNG  | Sensor Bracket | | | | | | | | | | |
| Diagnosis of microphones.png  <table border="1" data-bbox="341 1339 796 1480"> <thead> <tr> <th>No.</th> <th>Name</th> </tr> </thead> <tbody> <tr> <td><input type="checkbox"/> 380</td> <td>Signal level Microphone 1</td> </tr> <tr> <td><input type="checkbox"/> 572</td> <td>Signal level Microphone 2</td> </tr> <tr> <td><input type="checkbox"/> 816</td> <td>Signal level Microphone 3</td> </tr> <tr> <td><input type="checkbox"/> 132</td> <td>Signal level Microphone 4</td> </tr> </tbody> </table> | No. | Name | <input type="checkbox"/> 380 | Signal level Microphone 1 | <input type="checkbox"/> 572 | Signal level Microphone 2 | <input type="checkbox"/> 816 | Signal level Microphone 3 | <input type="checkbox"/> 132 | Signal level Microphone 4 | Diagnosis of microphones in N156/1 |
| No. | Name | | | | | | | | | | |
| <input type="checkbox"/> 380 | Signal level Microphone 1 | | | | | | | | | | |
| <input type="checkbox"/> 572 | Signal level Microphone 2 | | | | | | | | | | |
| <input type="checkbox"/> 816 | Signal level Microphone 3 | | | | | | | | | | |
| <input type="checkbox"/> 132 | Signal level Microphone 4 | | | | | | | | | | |
| Mikrofon.png  | Example of protruding material on microphone | | | | | | | | | | |



Remedy

Remedy:

If it has been verified that the noises are being caused by RNC, the following steps should be performed:

Check that the components involved are functioning properly:

1. Check that the speakers are functioning correctly: Front bass left (H22/23), Front bass right (H22/24), subwoofer (trunk). If unusual or distorted sounds can be heard from these, the speakers should be checked for foreign objects in the vicinity of the voice coils or replaced if any noticeable problems appear to be permanent.
2. Check the event memory of the two control units N156 (ASX7) and N40 (SND7).
3. Erase the event memories and reset control unit N156/1
4. Check whether newer software versions are available for control units N156/1 (ASX7) and N40 (SND7) and perform an update if necessary.
5. Check whether the 4 ANC microphones are correctly connected. This check is essential and should be performed in any event when problems with the RNC system occur. To do so, display the microphone level of the 4 microphones in XENTRY (see the picture in the attachment) and check that the microphones have been assigned correctly by scratching a finger against the microphone grille. The displayed level in [mV] normally increases to a value greater than 1000 mV when a fingernail is scratched against the microphone grille. Microphone
 - 380 microphone 1 = Front left position
 - 572 microphone 2 = Front right position
 - 816 microphone 3 = Rear left position
 - 132 microphone 4 = Rear right position
 - Check for correct assembly of the microphones: To do so, remove microphone cover in the headliner and perform visual inspection as to whether the edges of the cutout are frayed. (See picture in attachment)

Note: Fibers pinched between microphone and cover prevent the microphone from being sealed tightly, which causes unwanted external noise to be transmitted and therefore may impair system function. Carefully cut off protruding fibers with a suitable implement. When mounting the cover, make sure that you hear and feel it engage.

Only once the above testing points have been successfully carried out does it make sense to replace component parts. As a first step, it can be helpful to replace the 4 microphones in the headliner.

Replace the 4 ANC microphones in the vehicle interior in the headliner (at the driver's/front passenger seat, the HFM/ANC double microphones; in the rear passenger compartment, the ANC single microphones). When replacing the microphones, it is essential to use new microphone grilles. Do not reuse used microphone grilles.

XENTRY Tips

If, after doing so, the problem is still present: Replace the ASX7 control unit (N156)

If, after doing so, the problem is still present: Replace the 4 RNC sensors (RNS) at the 4 wheel carriers

If, after doing so, the problem is still present: Replace the 2 RNC sensors (RNS) at the left and right integral carriers respectively in the vicinity of the side shaft passage

In the event of a low-frequency static noise (typically around 80 Hz to 100 Hz), an interspersion of electrical signals in the vehicle wiring harness of the RNC system or swapped vehicle interior microphones (left/right swapped over) is possibly the cause. According to the current state of knowledge, it is not helpful to replace the RNC sensors, the holder of the RNC sensors at the integral carrier, the vehicle interior ANC microphones, amplifier SND7 or control unit N156. The correct assignment of the 4 vehicle interior microphones can and should be checked with XENTRY as a matter of principle.

In the event of a high-frequency static noise (typically between 300 Hz and 500 Hz), the following measures are possible:

Disassembly of both RNS sensors from the integral carrier. The RNS sensors should remain on the RNS sensor holders as a first step.

Apply an adhesive sealing disk to the RNS sensor holder. This adhesive sealing disk serves as an intermediate layer between the RNS sensor holder and integral carrier. The dampening adhesive film below the RNS sensor holder (as an intermediate layer for the integral carrier) can be minimally trimmed to achieve better dimensional accuracy.

Assemble the new RNC sensor holder fitted with the adhesive pad at the integral carrier. The following assembly notes must be adhered to.

Note: In the event of low-frequency noise (typically 80 Hz to 100 Hz), replacing the holders and sensors at the integral carrier will have no benefit.

Important notes for assembling the RNS sensors at the integral carrier:

To assemble new RNS sensors (structure-borne sound sensors, acceleration sensors) at the integral carrier that have been unscrewed from the RNS holders, new screws and new RNS sensor holders must be used. Reason: Use of self-tapping screws that cut their thread in the sensor holder themselves during assembly. The stipulated tightening torque of the screw must be adhered to.

New holders and new screws must be used for the assembly of the RNS sensor holders at the integral carrier. Reason: Use of self-tapping screws that cut their thread in the holder themselves during assembly. If the old sensor holders are used, the use of Helicoil is recommended to guarantee a secure hold of the screw in the integral carrier. The stipulated tightening torque of the screw must be adhered to. New screws should also be used for the attachment of the RNC sensors at the holder, since self-tapping screws are also used in this case.

During the assembly of the RNS sensor holder, it must be ensured that this only makes contact with the screwed-on surface at the integral carrier. Avoid having the outer edge of the RNS holder make contact with a protruding edge of the integral carrier, as otherwise no force-fitted, wide-area connection is established.

| Attachments | |
|--|-------------|
| File | Description |
| Sticker_Screw+marked.jpg | |



Disclaimer

NOTE: The information contained in this document is intended for use by trained, professional technicians with the knowledge to properly and safely perform diagnosis and repairs on Mercedes-Benz vehicles, using Mercedes-Benz approved tools and equipment. It informs service technicians about conditions that could occur in certain vehicles and provides information that could assist in proper vehicle diagnosis, service, or repair. It does not indicate that a defect is present in any vehicle referenced in this document nor does it imply warranty coverage. DO NOT assume that a symptom or condition, or a described cause of a symptom or condition, affects any particular vehicle or groups of vehicles, or that a described repair applies to any particular vehicle or groups of vehicles. There can be multiple causes resulting in the same or similar symptoms or conditions described in this document, and trained professional service technicians must use their diagnostic skills to make evaluations on a case-by-case basis. The information contained in this document does not guarantee warranty coverage nor does it extend the vehicle's warranty in any way.


Symptoms

Communication/information > Entertainment > Audio/Sound > Speakers emit interference noise

Parts

| Part number | ES1 | ES2 | Designation | Quantity | Note | EPC |
|-----------------|-----|-----|----------------------|----------|---|-----|
| A253 811 03 00 | | | Adhesive pad | 2 | | X |
| A 000 990 96 11 | | | Thread rolling screw | 6 | Must be replaced as a matter of necessity | X |
| A 223 331 07 00 | | | Bracket | 2 | | X |

XENTRY Tips

| Attachments | |
|---|-------------|
| File | Description |
| adhesive pad.JPG  | |

| Operation numbers/damage codes | | | | |
|--------------------------------|----------------|------|-------------|---|
| Op. no. | Operation text | Time | Damage code | Note |
| | | | 82N66 | Please refer to this LI document for warranty |
| | | | 82A66 | Please refer to this LI document for warranty |
| | | | 82N3C | Please refer to this LI document for warranty |
| | | | 82P0C | Please refer to this LI document for warranty |
| | | | 82U04 | Please refer to this LI document for warranty |
| | | | 82F04 | Please refer to this LI document for warranty |
| | | | 82B0C | Please refer to this LI document for warranty |
| | | | 82A3C | Please refer to this LI document for warranty |
| | | | 82A5Y | Please refer to this LI document for warranty |
| | | | 82N5Y | Please refer to this LI document for warranty |