



Durability Test on Sunroof

1 Scope

Note: Nothing in this standard supercedes applicable laws and regulations.

Note: In the event of conflict between the English and domestic language, the English language shall take precedence.

1.1 Purpose. The purpose of this test is to verify that the sunroof fulfils the durability requirements stated in the technical specification.

1.2 Foreword. Not applicable.

1.3 Applicability. Passenger vehicles and on-road vehicles equipped with power sunroofs. All sunroof systems as defined in the Vehicle Technical Specifications (VTS).

2 References

Note: Only the latest approved standards are applicable unless otherwise specified.

2.1 External Standards/Specifications.

None

2.2 GM Standards/Specifications.

GMW8518

GMW16591

3 Resources

3.1 Facilities. The test facilities shall be accredited to International Organization for Standardization (ISO)/International Electrotechnical Commission (IEC) standards or by the International Laboratory Accreditation Cooperation. However, all measuring variables as specified in this specification shall be determined correctly with respect to its physical definition

3.1.1 Environmental Chamber with the following requirements:

- Relative Humidity of 10% to 95% is required
- Hot $T_{max} = 90\text{ }^{\circ}\text{C}$
- Cold $T_{min} = -30\text{ }^{\circ}\text{C}$

3.1.2 Test track with rumble strip.

3.2 Equipment.

- Controller for running the sunroof with connection for outer guards
- Battery eliminator
- Complete vehicle, vehicle body rig or vehicle body
- Dust
- Balance
- Camera

3.3 Test Vehicle/Test Piece. As test object a complete sunroof is used.

- The sunroof can either be mounted on a complete vehicle, in a vehicle body rig or in a vehicle body.
- If a vehicle body rig or a vehicle body is used it shall be painted.
- For verification it is best if a complete vehicle could be used.
- Number of system to be tested shall be agreed with the responsible test engineer and DE.

3.4 Test Time. Not applicable.

3.5 Test Required Information. Not applicable.

3.6 Personnel/Skills. Not applicable.

4 Procedure

4.1 Preparation.

4.1.1 Mount the sunroof in complete vehicle, in a vehicle body rig or in a vehicle body. Observe that all testing shall be done on test material with right status so that reliable results will be received.

4.1.2 Document the status of the test material before the beginning of the test. Document the part name, part number, design level, mass, etc.

4.1.3 Ensure that the system components are properly assembled. If necessary, correct the gap between the parts and the body per drawing specification.

4.1.4 Measure the tightening torque in the attachments. Mark the position of the screws and plate in relation to the body in white (BIW) by drawing a line on the screw head, plate and the BIW. This is to determine if the bolt will back out during the test.

4.1.5 Spray white color where cracks are expected.

4.1.6 Document the test set-up and the test object with a camera.

4.1.7 If the durability test is performed using a complete vehicle, a test on the test track and the rumble strip shall be performed before start of the durability test. Check for squeak and rattle and perform a wind lifting test on the sunroof, per GMW8518

4.2 Conditions. The tests are performed in an Environmental Chamber at different temperatures according to a valid Subsystem Technical Specification (SSTS) or Appendix A.

4.2.1 Environmental Conditions.

4.2.2 Test Conditions. Deviations from the requirements of this standard shall have been agreed upon. Such requirements shall be specified on component drawings, test certificates, reports, etc.

4.3 Instructions.

4.3.1 Perform preparations according to Section 4.1.

4.3.2 Place the vehicle, vehicle body rig or a vehicle body in the Environmental Chamber.

4.3.3 Connect the control equipment and the guards.

4.3.4 Photograph the test setup.

4.3.5 Start the fatigue test with cycle numbers and temperature according to valid SSTS. If not specified in SSTS, the cycle numbers and temperature in Appendix A are to be used.

4.3.6 Examine the test object at regular intervals. When examining look for cracks, crack length, broken parts, loss of function and paint wear.

4.3.6.1 Listen for noise such as squeaking, rattling, itch, etc.

4.3.6.2 Also check the tightening torque in attachments and look for change of adjustment position.

4.3.6.3 Measure the maximum block force. Test the anti pinch forces, if this is applicable, per GMW16591.

4.3.7 Abort test when damage of such kind occurs that the test cannot be continued with sufficient test value or 100% of the requirements have been reached.

4.3.8 Check the features listed in paragraph 4.3.6. Also check the rest tightening torque at every bolt that the sunroof is tightening with.

4.3.9 If the test is performed using a complete vehicle, check squeak and rattle and perform a wind lifting test on the test track and the rumble strip and compare with the test performed before start of the durability test.