



Laboratory Evaluation of Power Seat Sounds

1 Introduction

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. This procedure describes a laboratory method for evaluating the noise of a power seat system when mounted on a fixture.

1.2 Applicability. Passenger vehicles and on-road vehicles equipped with power seats.

1.3 Remarks. The noise of a power seat system during operation is evaluated using the Zwicker loudness method.

Each of the modes of operation (seat adjuster; fore/aft, up/down, front and rear tilt, recliner; up/down, headrest; up/down, fore/aft, and lumbar; up/down, fore/aft) are evaluated independently and then the results from each mode are compared together. For power accessory systems that have multiple modes of operation, an attribute indicating good quality is consistency among the modes. Therefore, it is important that the sound of each mode be nearly the same.

This method does not evaluate all the sound quality issues that may occur during power seat operation such as grating sounds, sandy/gravelly sounds, etc., any of which can make a seat system, with acceptable loudness, unacceptable for use in the vehicle.

This method does not evaluate the structure-borne sound that can result when the power seat system is mounted to a vehicle. It is assumed that a power seat system that has poor sound quality in a laboratory situation will also have poor sound quality when mounted on the vehicle. Identification of airborne noise problems using a laboratory test is an efficient use of resources because it does not require a full vehicle.

2 References

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

2.1 External Standards/Specifications.

SAE J4002 SAE J4003

2.2 GM Standards/Specifications.

GMW14155

2.3 Additional References. None.

3 Resources

3.1 Facilities.

3.1.1 Calibration. The test facilities and equipment shall be in good working order and shall have a valid calibration label.

3.1.2 Alternatives. Alternative test facilities and equipment may also be used. However, all measuring variables as specified in this standard shall be determined correctly with respect to their physical definition.

3.1.3 Test Room. Details given in Master Procedure GMW14155.

3.1.4 Test Fixture. Use a design intent floor pan with trim or a similar fixture to mount the seat using design intent attachments.

GM Confidential

© Copyright 2015 General Motors Company All Rights Reserved

November 2015

Page 1 of 5

3.2 Equipment. Details given in Master Procedure GMW14155.

3.2.1 SAE H-Point (or Hip-Point) Machine (HPM) or HPM II

3.2.2 Various weight plates to total 75 kg (165 lb) and an individual 10 kg (22 lb) weight.

3.3 Test Vehicle/Test Piece. Complete trimmed seat assembly.

3.4 Test Time.

Calendar time: 1 to 2 days

Test time: 1 to 2 hours

Coordination time: 1 to 2 hours

3.5 Test Required Information. Unless otherwise specified the voltage setting for the DC power supply shall be 14.0 V $\pm$ 0.5 V.

3.6 Personnel/Skills. Details given in Master Procedure GMW14155.

4 Procedure

4.1 Preparation.

4.1.1 General preparation given in Master Procedure GMW14155.

4.1.2 Mount the seat subsystem on the test fixture.

4.1.3 Position the seat system and fixture in the center of the test room.

4.1.4 Connect the electrical power to the seat subsystem using an appropriate cable and control switch. The power supply and controls must be located outside the test room. Adjust to the voltage specified in the requirement.

4.1.5 Mount the microphone and preamp on the microphone stand.

4.1.6 Connect the preamplifier to the microphone power supply via an extension cable.

4.1.7 Connect the power supply (AC output) to the sound recording system. The sound recording system and controls must be located outside the test room if they make noise that will interfere with the test.

4.1.8 Calibrate the microphone, power supply, and digital recording system as described in Master Procedure GMW14155.

4.1.9 Install Data Acquisition Equipment. Install the microphone as specified in Appendix A, Figures A1 and A2. Attach the microphone to the head restraint posts to allow the microphone to move with the seat when recording the power recliner operation.

4.2 Conditions.

4.2.1 Environmental Conditions. Ambient room temperature 23 °C $\pm$ 5 °C (73.5 °F $\pm$ 41 °F).

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 Record the sound while operating the seat in each mode of operation in accordance with Master Procedure GMW14155.

4.3.1.1 Power Seat Adjuster.

4.3.1.1.1 Load the seat cushion with 75 kg (165 lb) by placing the weights centered on top of the cushion.

Optional: Install HPM without the leg attachments per SAE J4002 or SAE J4003.

4.3.1.1.2 With the seat adjuster centered in the up and down position, record three (3) events as follows:

- a. Move from full rearward to full forward.
- b. Move from full forward to full rearward.

4.3.1.1.3 With the seat centered in the forward and rearward position record three (3) events as follows:

- a. Move the seat from full down to full up.
- b. Move the seat from full up to full down.

GM Confidential

© Copyright 2015 General Motors Company All Rights Reserved

November 2015

Page 2 of 5

Documents
Document Sharing Hub