GM WORLDWIDE ENGINEERING STANDARDS	Test Procedure	GMW15749

Laboratory Evaluation of Power Window Lifter 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 window lifter system when mounted on a fixture.

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

1.3 Remarks. The noise of a power window lifter system during up and down operation is evaluated using the Zwicker loudness method.

1.3.1 Each mode of operation (up and down) is 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.

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

1.3.3 It is assumed that a power window lifter system that has poor sound in a laboratory situation will also have poor sound quality when mounted on the vehicle. Identification of 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.

None

2.2 GM Standards/Specifications.

GMW14155

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. As detailed in Master Procedure GMW14155.

3.1.3.1 Test Fixture. The fixture shall consist of a framework to support the window lifter assembly in a manner that simulates the way the assembly is mounted in a vehicle (body position).

3.1.3.1.1 The test item shall be constrained in a realistic fashion. The general recommendation is that test fixtures are used which reflect a boundary condition that reflects what the test item experiences in operation. This implies that the force and response are to be located as close as possible to what the test item experiences in operation.

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3.1.3.1.2 A load shall be applied to the power window lifter system to reflect the load that will be experienced in operation.

3.2 Equipment. As detailed in Master Procedure GMW14155.

3.3 Test Vehicle/Test Piece. Power window lifter subsystem mounted on a fixture.

3.4 Test Time.

Calendar time:	1 to 2 days
Test hours:	1 to 2 hours
Coordination hours:	1 to 2 hours

3.5 Test Required Information. Unless otherwise specified, the voltage setting for the Direct Current (DC) power supply shall be 14.0 V ± 0.5 V.

3.6 Personnel/Skills. As detailed in Master Procedure GMW14155.

4 Procedure

4.1 Preparation.

4.1.1 General preparation as detailed in Master Procedure GMW14155.

4.1.2 Mount the window lifter subsystem of the test fixture.

4.1.3 Position the fixture in the center of the test room in body position.

4.1.4 Connect the electrical power to the window lifter 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 Set up the equipment that will apply a load to the power window lifter system.

4.1.6 Mount the microphone and preamp on the microphone stand.

4.1.7 Connect the power supply (Alternating Current (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 Position the microphone as shown in Figure 1 and Figure 2. The microphone shall be positioned at the center of the window lifter opening and pointed at it from a distance of 500 mm. The microphone shall be pointed in a manner that is perpendicular to window lifter assembly in both the vehicle and fore-aft directions. The tolerance for all microphone position distances is ± 20 mm.

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