



Laboratory Evaluation of Component Latch 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 component door latch.

1.2 Applicability. Passenger vehicles and on-road vehicles equipped with component door latches.

1.3 Remarks. The noise of a component door latch during latching and power locking and unlocking is evaluated using the DIN 45631/A1 loudness vs. time and sharpness vs. time method.

This method does not evaluate all the sound quality issues that may occur during component door latch operation which can make a component door latch, with acceptable loudness, unacceptable for use in the vehicle.

This method does not evaluate the structure-borne sound that can result when the component door latch is mounted to a vehicle. It is assumed that a component door latch 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.

DIN 45631/A1

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.

3.1.4 Test Fixture. Use GM component latch test fixture for the latching sound evaluation. Specifications for the latch test fixture can be obtained through the Global Subsystem Leadership Team (GSSLT) - Side Door Latching. Power lock and unlock sounds will be evaluated in a free-free condition and do not require a standard test fixture.

3.2 Equipment. As detailed in master Procedure GMW14155.

3.2.1 Velocity Meter (e.g., Debron Door Velocity Meter model 1052).

3.3 Test Vehicle/Test Piece. Component door latch.

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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 $14.0 \text{ V} \pm 0.5 \text{ V}$

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

4 Procedure

4.1 Preparation. General preparation as detailed in Master Procedure GMW14155.

4.1.1 Latching.

4.1.1.1 Attach the test fixture to a suitable support in a manner that isolates the test fixture from the support to reduce resonances from the support during the latching event.

4.1.1.2 Position the fixture in the center of the Test Room.

4.1.1.3 Attach the component latch to the adapter plate and then attach the latch and adapter plate assembly to the base of the test fixture. Attach the striker to the swing arm.

4.1.1.4 Mount the microphone and preamp on the microphone stand.

4.1.1.5 Connect the preamp to the microphone power supply via an extension cable.

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

4.1.1.7 Position the microphone as shown in Figure 1. The microphone shall be pointed in a manner that is perpendicular to the latch opening and at a distance of 500 mm, measured to and centered on, the base of the test fixture. The tolerance for all microphone position distances is $\pm 20 \text{ mm}$.

4.1.1.8 Attach the velocity meter as shown in Figure 2. Attach the sensor to the base of the test fixture and the flag to the swing arm. Adjust the positions of the flag and the sensor so that the flag just begins to enter the gate of the sensor when the striker is $48 \text{ mm} \pm 10 \text{ mm}$ from the fork bolt.

4.1.1.9 A support device that positions the swing arm and striker at the correct distance from the latch to achieve the target velocity is recommended. An example of a notched support device is shown in Figure 2. Graduations marked on the test fixture will allow consistent placement of the support device. The support device is used to position and release the swing arm.

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