



Laboratory Evaluation of Shifter Subsystem Operation 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 select component sound quality metrics for the operation of shifter subsystems.

1.2 Applicability. Automatic shifter subsystems for use in all vehicles.

1.3 Remarks. Evaluation of the shifter sounds at the component level can provide an indications of shifter sound quality at the vehicle level.

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

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 specified in GMW14155.

3.2 Equipment. General sound recording and analysis equipment details specified in GMW14155.

3.2.1 Velocity Meter. Used to measure the speed of the shift lever during actuation to ensure repeatable results.

3.2.2 Fixture. Fixtures should be rigid, free of resonances in the 0 Hz to 200 Hz range and free from rattles, creaks and other potentially conflicting noises. Fixture resonances, when excited, can contribute to background noise levels, alter the vibration input to the component and potentially make test control very difficult.

3.2.3 Shift Lever Test Knob. The test knob attaches to the shift lever to keep the pawl button depressed to allow the shift lever to move freely though all of the detents in a single fluid motion. Refer to Figure 1.

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Figure 1: Test Shift Knob Example

3.3 Test Vehicle/Test Piece. Shifter subsystem without transmission cable or trim pieces.

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.

3.6 Personnel/Skills. To complete this test, at least one (1) technician and/or engineer skilled in sound data acquisition, analysis, equipment use, and test setup is required. Details specified in GMW14155.

4 Procedure

4.1 Preparation. General preparation specified in GMW14155.

4.1.1 Secure the shifter assembly to the test fixture.

4.1.2 Attach the shifter test knob to the shift lever ensuring that the pawl button is fully depressed.

4.1.3 Position the microphone 500 mm from the center of the top and perpendicular to the shifter assembly so that it points at the shifter in the manner shown in Figure 2. The tolerance for all microphone positioning in any direction is ± 20 mm.