



Subjective Evaluation of Electrically Coupled Noise in a Wireless Audio System

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. The intent of this test procedure is to evaluate the electrically coupled noise present during a phone call.

1.2 Applicability. This test procedure is applicable to vehicles with telematics systems.

1.3 Remarks. A phone call is made with the in-vehicle telematics system to another phone. The phone on the far end is muted and the electrically coupled noise in the phone call is assessed while electrical components in the vehicle are actuated.

2 References

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

2.1 External Standards/Specifications.

None

2.2 GM Standards/Specifications.

None

2.3 Additional References.

CG190, GM Evaluation Report.

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.

3.2 Equipment.

3.2.1 Wireless enabled cellular phone.

3.2.2 Destination phone with mute capability.

3.3 Test Vehicle/Test Piece. The test vehicle must be as close to production intent as possible. In addition, the following items must be production intent and are a minimum requirement to perform the test.

- Telematics module.
- All cables, including their positioning, type, and length.
- Vehicle interior/exterior components and materials.
- Audio system.
- Cellular antenna.

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3.4 Test Time.

Calendar time:	1 day
Test hours:	2 hours
Coordination hours:	2 hours
Report time	4 hours

3.5 Test Required Information. Prior to testing, the vehicle component information shall be entered into Data Sheet A1 in Appendix A.

3.6 Personnel/Skills. One (1) expert listener will assess performance. This person will evaluate performance on landside end of the phone connection. Expert listeners are people who have experience in identifying and diagnosing the cause of audio impairments.

4 Procedure

4.1 Preparation.

4.1.1 Vehicle Setup.

4.1.1.1 All windows and doors must be completely shut.

4.1.1.2 Phone number of the far end point phone must be readily available.

4.2 Conditions.

4.2.1 Environmental Conditions. The test should be performed during relatively clear atmospheric conditions. The test cannot be performed during periods of precipitation that drastically increase the ambient noise in the vehicle, i.e., extremely heavy rain elevates the noise levels in the vehicle to a point at which testing cannot be performed.

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.

4.2.2.1 Static Electrically Coupled Noise Evaluation. The vehicle is parked and in the idle state.

4.2.2.1.1 Embedded or Wireless Phone Call. A phone call is placed to a far end phone using the in-vehicle telematics system.

Note: A clear, noise free phone call must be used for this test. If background noise is detected at the beginning of the phone call, check the signal strength indicator on the phone for a low signal condition. Eliminate the background noise before proceeding with the test.

4.2.2.1.2 Mute Call. The far end phone is muted.

4.2.2.1.3 Evaluate Electrically Coupled Noise. The test operator actuates all electrical components in the vehicle while listening for electrically coupled noise in the phone call.

4.2.2.2 Dynamic Electrically Coupled Noise Evaluation. The test operator drives the vehicle at city and highway speeds while listening for electrically coupled noise in the phone call.

4.2.2.2.1 Exercising Electric Motors and Generators. Vehicles that employ electric motors at the wheels or in the drivetrain must be driven under conditions that produce maximum current flow. Typically, an aggressive acceleration and deceleration will produce maximum current flow in drivetrain motors. Electric power steering can be actuated by turning the steering system up against the stop in one direction. The test operator must listen carefully to the phone call during these maximum current conditions.

4.3 Instructions.

4.3.1 Scoring. If electrically coupled noise is detected in the phone call, the telematics system does not meet the requirements. Components that induce electrically coupled noise into the phone call will be documented in Appendix A, Data Sheet A1.

4.3.1.1 Generate GM Evaluation Report (CG190).

5 Data

5.1 Calculations. The procedure is subjective, and no calculations are required.

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