GM WORLDWIDE ENGINEERING STANDARDS	Test Procedure	GMW16227

OnStar Mono Mix Performance Evaluation Procedure

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. To describe the procedures for evaluating the OnStar Mono Mix settings and determining the delta values for Mono Mix. The delta value is the difference between the OnStar volume level and the radio source (AM, FM or XM) volume level as it pertains to the volume curve.

1.2 Applicability. This test procedure is applicable to vehicles with the OnStar System and active Mono Mix feature in the radio.

1.3 Remarks.

- The audio-source-to-OnStar delta is the difference in the position on the volume curve between the OnStar volume and the listener's selected audio source during a Mono Mix session.
- This OnStar Turn-By-Turn (TBT) navigation volume performance evaluation is a subjective evaluation and shall be completed with TBT guidance.
- The procedures in GMW15853 shall be completed before this test is begun.
- The equalization (EQ) settings of the radio or audio system amplifier will affect the overall performance of the Mono Mix session. If an adjustment in the EQ settings has been made in the radio or in the amplifier, repeat this procedure.

2 References

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

2.1 External Standards/Specifications.

None

2.2 GM Standards/Specifications.

GMW15853

2.3 Additional References.

- CG2498, GMW Mono Mix Evaluation Data Sheet

3 Resources

3.1 Facilities. This vehicle level test is to be performed while driving and performing TBT navigation.

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 Computer and vehicle communications bus equipment and software.

3.2.2 Test vehicle with Generation 9 or newer OnStar system where the On Board Navigation (OBN) is activated and the subscription is active.

3.2.3 Production-intent audio system.

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3.3 Test Vehicle/Test Piece. The vehicle must have production-intent hardware, including, but not limited to, the following items:

- OnStar module, including both production-release software and hardware
- Audio system, including radio, amplifier, and speakers
- All cabling, including its positioning, type, and length
- Production-intent vehicle interior components and materials

3.4 Test Time.

Calendar time:	1 day
Test hours:	1 hour to 3 hours
Calibration hours:	1 hour to 4 hours
Coordination hours:	4 hour to 6 hours

3.5 Test Required Information. Prior to testing, record the vehicle component information on the CG2498 data sheet.

3.6 Personnel/Skills. The test performance engineer shall have a working knowledge of the OnStar system's parameters and settings, as well as the radio's parameters, as they pertain to the TBT audio output levels.

4 Procedure

4.1 Preparation.

4.1.1 Completely close all windows and doors.

4.1.2 Secure all necessary equipment so that no squeaks or rattles are audible.

4.1.3 Remove all unnecessary equipment, personnel, and items from the vehicle.

4.1.4 Close the sunroof, if present, including the sun shade or pullover.

4.1.5 Turn off the HVAC fan. If the fan is needed while driving to clear windows, place at a minimum fan setting so as to not increase ambient noise level during the evaluation.

4.1.6 Configure the Telematics Control Unit (TCU) for the vehicle under test.

4.1.6.1 Set the OnStar audio output level to production-intent or to desired level for development/validation testing; e.g., 1.25 Vp-p, 2.5 Vp-p or 4.5 Vp-p.

4.1.7 Set the tone controls (e.g., bass, mid, treble) in the radio to zero (0).

4.1.8 Set the fade and balance controls for the radio to zero (0).

4.1.9 Verify that the radio and amplifier have the latest software and calibration.

4.2 Conditions.

4.2.1 Environmental Conditions. This test is performed on the road. It should not be performed in heavy winds, in rain or in other wet road conditions. Noise levels from weather and other outside sources must be reasonably low; otherwise, the raised ambient noise level in the vehicle causes ineffective lower volume evaluation.

Note: If equipped with the repeat button to repeat the TBT instructions this test can be done stationary.

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. For a Next Generation System Skip to 4.4.

4.3.1 Download the audio calibration to be tested to the radio. Drive the vehicle for about 1.6 km (1 mi) after the calibration file has been successfully downloaded. This is needed to enable the OnStar system to download a route.

4.3.2 Record the DELTA_MIX calibration value for the currently loaded calibration file on the CG2498 data sheet.

Note: The release engineer for the radio will be able to provide the DELTA_MIX information for the calibration files.

4.3.3 Determine the OnStar and radio minimum and maximum volumes. The DELTA_MIX will be evaluated over percentages of the volumes of OnStar and the radio. Reference GMW15853 for determining OnStar minimum and maximum volume levels.

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