



In Band On Channel (IBOC) Digital Radio Reception Drive Test

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 determine the Amplitude Modulation (AM) (530 kHz thru 1710 kHz) and Frequency Modulation (FM) (87.9 MHz thru 107.9 MHz) High Definition (HD) reception performance for all motor vehicles equipped with HD Radio receivers.

1.2 Applicability. All GM vehicle audio systems capable of reception and playback of HD Radio that will be marketed and sold inside the United States of America and Mexico. This procedure applies to passenger vehicles and light-duty trucks.

1.3 Remarks. The results of this test will be a collection of maps indicating the observed digital audio coverage for each of the specified routes. These maps will be used to determine total distance of digital coverage over the test route. These values will be used in a calculation to determine HD Radio performance. In order to expect good results for HD radio reception, the infotainment system under test shall meet the requirements called out in GMW16273 tuner bench test, GMW15650 AM/FM antenna range testing, GMW15649 Active Antenna Electrical Characteristics, and GMW15648 AM/FM reception drive test (analog broadcast). All HD Radio system components shall meet the design guidelines outlined in Global Infotainment Specifications (GIS), GIS-24, GIS-90, GIS-305, GIS-324, GIS-334, GIS-605, and GIS-634.

2 References

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

2.1 External Standards/Specifications.

None

2.2 GM Standards/Specifications.

GMW15648 GMW15650 GMW16261 GMW16273
GMW15649

2.3 Additional References.

- CG4051 In Band On Channel (IBOC) Reception Drive Test Supplement (internal).
- GIS-24 SILVERBOX/AM/FM Antenna Interface Specification (Color Connected/Navigation Radio, InTouch Color Radio).
- GIS-90 AM/FM Antenna Component Performance Specification.
- GIS-305 HD Radio Requirements (Next Generation Infotainment (NGI)/Infotainment (Info) 3.x).
- GIS-324 AM/FM Antenna Interface Specification (NGI/Info 3).
- GIS-334 Development Screen Helper Document (NGI).
- GIS-605 HD Radio Requirements (Info 3.x).
- GIS-634 Tuner Development Screen Interface Specification (Info 3.x).

GM Confidential

© Copyright 2017 General Motors Company All Rights Reserved

April 2017

Page 1 of 6

3 Resources

3.1 Facilities. As of 2017, infrastructure for HD Digital Radio Service is only available in the United States and Mexico. Therefore, General Motors North America (GMNA) personnel, specifically Infotainment Dev/Val, will perform testing. For vehicles originating at an engineering center outside of GMNA, a workshare agreement between the engineering center and GMNA is required for all vehicles to be sold in North America will be tested at Milford Proving Ground (MPG). Testing for HD Radio Reception shall take place on the public roads of southeast Michigan, along with MPG test roads.

3.1.1 Calibration. The test facilities and equipment shall be in good working order and shall have a valid calibration label. The calibration label must be NIST traceable.

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. This test requires the use of various pieces of equipment which are detailed in CG4051. The supplier shall work with the GM Design Responsible Engineer to comprehend this requirement.

3.3 Test Vehicle/Test Piece. The vehicle under test shall be verified to have the intended AM/FM antenna and receiver system, including coaxial cable(s) installed and fully functional, meeting the applicable AM/FM antenna system gain and tuner requirements. Testing shall be performed with any movable obstructions to the antenna (sunroofs, roof racks, etc.) moved to the least obstructive positions and vehicle in customer deliverable condition. Testing shall be performed using the poorest performing production-intent antenna for the vehicle model based on antenna testing results of GMW16261.

3.4 Test Time.

Calendar time: 2 days

Test time: 3.5 h

Coordination time: 8 h

3.5 Test Required Information. Record the following information for each of the test vehicles prior to testing:

- Vehicle number.
- Vehicle content that may impact HD radio reception, such as roof racks, spoilers, sunroofs, etc.
- Antenna part number and serial number.
- Receiver part number, serial number, and software levels (operating system, firmware, calibration information).
- Coaxial cable type and part number, if applicable.

3.6 Personnel/Skills. The test personnel shall have a valid United States driver's license and be familiar with the operation of Global Positioning System (GPS) data tools required to collect the digital coverage data. It is required to have two people per vehicle, one to collect data and one dedicated to driving.

4 Procedure

4.1 Preparation.

4.1.1 The vehicle to be tested shall be fully fueled and prepared for a 242 km (150 mi) trip.

4.1.2 Two conditions will be tested, an AM station with HD and analog coverage, and three FM stations with both HD and analog coverage.

4.1.3 The GPS data tool shall be readied to track GPS location when digital audio is produced. It shall be capable of saving a GPS location while running, and be paused when in analog coverage in order to distinguish the two types of coverage on a map that can be reviewed later. See CG4051 for recommended smartphone applications and setup instructions. The supplier shall work with the GM Design Responsible Engineer to comprehend this requirement.

4.2 Conditions.

4.2.1 Environmental Conditions. It is recommended the HD Radio reception drive test be performed mid-day when weather conditions are clear with no precipitation. It may be cancelled at the discretion of the trip captain

GM Confidential

© Copyright 2017 General Motors Company All Rights Reserved

April 2017

Page 2 of 6

AVA Documents
Document Sharing Hub