



Telematics System – Hands-Free Phone Objective Evaluation

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 and measure the speech quality parameters exhibited by a telematics hands-free system phone.

1.2 Applicability. This test procedure is applicable to vehicles with Telematics and Infotainment Systems which use microphones and Hands-Free phone systems.

1.3 Remarks. The measured values of the objective Hands-Free quality parameters should be considered relative to the subjective assessments and the overall subjective hands-free quality parameters. The combination of the different electronic devices should result in premium appearance on overall impression on speech quality, comprehensibility and double talk.

2 References

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

2.1 External Standards/Specifications.

GOST R 55531-2013	ITU-T P.340	ITU-T P.1110
ETSI EG 202 396-3	ITU-T P.502	ITU-T P.1140
ETSI TS 103 106	ITU-T P.1100	TR CU 018/2011

2.2 GM Standards/Specifications.

GMW14264	GMW15997
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2.3 Additional References.

- Anthropometric Reference Data for Children and Adults: United States, 2003-2006 from the Centers for Disease Control and Prevention (CDC), available at Uniform Resource Locator (URL) <http://wwwn.cdc.gov/nchs/nhanes/bibliography/Pubs.aspx?CatID=45&name=Anthropometry>
- Global infotainment Specification (GIS) GIS-4A, Global A Infotainment Chime, Volume, and Tone Audio Processing Requirements
- GIS-380, Hands-Free Requirements
- GIS-647, Global Telematics Hands-Free Tuning Process
- Made for iPhone/iPod/iPad (MFi) Accessory Protocol Specification available at URL: <https://developer.apple.com/programs/mfi/>

Note: European Telecommunications Standards Institute (ETSI) EG 202 396-3 and TS 103 106 are available at URL: <http://www.etsi.org/>. International Telecommunication Union - Telecommunication (ITU-T) Recommendations are available at URL: <http://www.itu.int/rec/T-REC-P/e> for: P.340, Transmission characteristics and speech quality parameters of hands-free terminals, P.502, Objective test methods for speech communication systems using complex test signals, P.1100, Narrow-band hands-free communication in motor vehicles, P.1110, Wideband hands-free communication in motor vehicles, and P.1140, Speech communication requirements for emergency calls originating from vehicles.

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3 Resources

3.1 Facilities.

- Office with installed analog and digital phones
- Quiet measuring chamber
- Roads with different road surface

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 Hands-Free Land-Line Station.

3.2.1.1 Personal computer with sound card.

3.2.1.2 Phone Network Simulator, e.g., Communications Management Unit (CMU) CMU200, CMD52, CMD55, CMD500.

3.2.1.3 Audio amplifier.

3.2.1.4 Analog land line phone.

3.2.1.5 Digital land line phone.

3.2.1.6 Global System for Mobile Communication (GSM) cellular telephone with Bluetooth.

3.2.1.7 Head Acoustics measuring system available at Uniform Resource Locator (URL): <http://www.head-acoustics.de/eng/index.htm>.

3.2.1.7.1 Measuring Front End (MFE).

3.2.1.7.2 Advanced Communication Quality Analysis (ACQUA) analysis system with 3Quest option.

3.2.1.7.3 Head and Torso Simulator (HATS).

3.2.2 In-Vehicle.

3.2.2.1 Personal computer with sound card.

3.2.2.2 Head Acoustics measuring system.

3.2.2.2.1 MFE Front end.

3.2.2.2.2 ACQUA analysis system.

3.2.2.2.3 HATS.

3.3 Test Vehicle/Test Piece.

3.3.1 The test vehicle must be as close to production intent as possible. Vehicle should be driven to determine if it can be used for validation testing. Vehicle should:

- Have minimal squeak and rattle
- Be acoustically sound
- Have reliable brakes
- Have tight-fitting wind and door seals
- Have latest interior materials

3.3.2 The following items must be production-intent and are a minimum requirement to perform the test.

3.3.2.1 Telematics module.

3.3.2.2 Microphone type, packaging, and location.

3.3.2.3 Microphone should exhibit a nominal frequency response.

3.3.2.4 All cables, including their positioning, type, and length.

3.3.2.5 Vehicle interior/exterior components and materials with good acoustic behavior.

3.3.2.6 Audio system.

3.3.2.7 Cellular antenna.

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