



Horn Blow Effort and Location 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. The purpose of this specification is to determine the effort required to activate the horn blowing mechanism, and to assure that this mechanism will operate when a force is applied to all possible locations of the horn blowing actuator.

1.2 Applicability. This specification is applicable to steering wheels used in passenger cars, Multipurpose Passenger Vehicles (MPV) and trucks.

2 References

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

2.1 External Standards/Specifications.

None

2.2 GM Standards/Specifications.

GMW14095

2.3 Additional References.

Testing laboratory records.

3 Resources

3.1 Facilities. Not applicable.

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 Test Equipment.

3.2.1.1 Temperature chamber capable of $(-30 \pm 3)^\circ\text{C}$ and $(85 \pm 3)^\circ\text{C}$.

3.2.1.2 Hand held ninety (90) Newton scale with a (12.75 ± 2.00) mm diameter flat indenter to measure load.

Note: Optional: Instron or similar tensile/compression tester with a (12.75 ± 2.00) mm diameter flat indenter to measure load.

3.2.1.3 Signal Buzzer.

3.2.1.4 Fixture to secure steering wheel/driver airbag/horn pad assembly at in vehicle column angle.

Note: Optional; Fixture to secure steering wheel/driver airbag/horn pad assembly at horizontal angle.

Note: All instrumentation is to be calibrated as required; record instrumentation details and date of calibration on Data Sheet A1, unless the information is otherwise preserved in the testing laboratory records. The supplier shall work with the GM Design Responsible Engineer to comprehend these requirements.

3.3 Test Vehicle/Test Piece. Not applicable.

3.4 Test Time.

Calendar time: 2 d

Test time: 2 h

Coordination time: 5 d

3.5 Test Required Information. Not applicable.

3.6 Personnel/Skills. Test technician familiar with test facilities and equipment.

3.7 Development/Validation Items.

3.7.1 Test Material. Steering wheel assemblies with a representative Driver Airbag (DAB) Module/Horn Pad with horn blowing mechanism.

4 Procedure

4.1 Preparation.

4.1.1 Secure Steering wheel and driver airbag/horn pad assembly to holding fixture at nominal steering column angle.

Note: Optional: Fixture to secure steering wheel/driver airbag/horn pad assembly at horizontal angle.

4.1.2 Mark spots to be checked as per part print or as specified.

4.1.3 Attach the signal buzzer to the horn blowing mechanism.

4.1.4 Check all locations of the horn actuator for non-actuation. Record results.

4.2 Conditions.

4.2.1 Environmental Conditions. Not applicable.

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.

4.3.1 Using the 90 N scale or tensile/compression tester, apply a load perpendicular to the surface of the horn pad (marked spots) at a rate that the load can be read accurately.

4.3.2 Record load of application at each spot when signal buzzes under the following conditions. Condition samples for 2 h minimum before testing.

4.3.2.1 Test at room temperature conditions (23 ± 3) °C.

4.3.2.2 Test in temperature chamber at (-30 ± 3) °C.

4.3.2.3 Test in temperature chamber at (85 ± 3) °C.

Note: If moving components from temperature chamber to tensile fixture, all test locations shall be tested within three (3) minutes of removal from chamber.

4.3.2.4 Evaluation: Horn actuation effort requirements per GMW14095 (paragraph "Horn Blow Effort and Location").

4.3.3 Optional Test Procedure. Using an Instron or similar tensile/compression tester with the steering wheel mounted horizontally to the base of the tester.

4.3.3.1 Apply a load perpendicular to the surface of the horn pad (marked spots) and record load when signal buzzes under the following temperature conditions.

4.3.3.1.1 Perform test at (-30 ± 3) °C, ($+23 \pm 3$) °C, and ($+85 \pm 3$) °C. Samples shall be conditioned for 2 h minimum prior to testing.

Note: If moving components from temperature chamber to tensile fixture, all test locations shall be tested within three (3) minutes of removal from chamber.

4.3.3.1.2 See 5.1 to calculate compensation factor to apply to results.

5 Data

5.1 Calculations. For optional horizontal test procedure (ONLY): Recorded results **shall** be corrected to compensate for effects of gravity, before comparisons to horn actuation effort requirements per GMW14095 (paragraph "Horn Blow Effort and Location").

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