



Steering Wheel Assembly, Heat Distortion

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 evaluate the steering wheel assembly for resistance to appearance degrading effects due to heat distortion, for clearance to the steering column, clearance to driver airbag and for electrical function of horn switch.

1.2 Applicability. All steering wheel assemblies used in passenger cars, Multipurpose Passenger Vehicles (MPV), and trucks.

1.3 Remarks. Not applicable.

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.

None.

3 Resources

3.1 Facilities. Use facilities having the test equipment described in 3.2.

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 Circulating-air oven capable of maintaining a temperature up to 100 °C.

3.2.2 A fixture built to simulate the top of a steering column including steering column shroud; dimensions minus nominal (20 ± 5) degree column angle.

3.2.3 Steering System. Test equipment to electrically monitor and record function of horn switch assembly.

Note: All instrumentation is to be calibrated as required; record instrumentation details and date of calibration on Data Sheet A1 (Appendix A), unless the information is otherwise preserved in the testing laboratory records.

3.3 Test Vehicle/Test Piece.

3.3.1 Test Materials/Components. Steering wheel assembly.

3.4 Test Time.

Calendar time: 2 days

Test hours: 6 h

Coordination hours: 3 h

3.5 Test Required Information. Not applicable.

3.6 Personnel/Skills. Not applicable.

4 Procedure

4.1 Preparation.

4.1.1 Assemble steering wheel to fixture. Fastener assembly torque is to be specified by requesting engineer and noted on Data Sheet A2 (Appendix A).

4.1.2 Inspect the steering wheel for clearance to the fixture: to establish baseline before running test (see 3.2.2). Note condition on Data Sheet A2. Measure three (3) points on back cover surface to steering column shroud.

4.1.2.1 Observe overall appearance of steering wheel. For example: Measure trimplate to foam, backcover to foam or leather, leather to spokes and tuck grooves. Record on Data Sheet A2 (pre-test).

4.1.3 Prepare connection of test equipment to continuously monitor horn switch throughout temperature exposure to detect any inadvertent horn actuation.

4.1.4 Assemble driver airbag to steering wheel.

4.1.5 Measure the clearance of driver airbag to steering wheel to establish baseline before running test. Select three (3) points across top of module, also at all spoke interfaces and three (3) points along bottom of module to steering wheel. Note condition on Data Sheet A2.

4.1.5.1 Take pre-test photos of interface front and back of steering wheel and driver airbag assembly.

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 Appearance and Clearance Test.

4.3.1.1 Place the steering wheel/driver airbag assembly and fixture in the oven at $(96 \pm 2)^\circ\text{C}$ for (6.0 ± 0.2) h.

4.3.1.2 Remove steering wheel/driver airbag assembly and fixture from oven and allow to cool at room temperature for at least 30 minutes.

4.3.1.3 Observe the overall appearance of the steering wheel. Record any distortions obvious to the unaided eye on Data Sheet A2. Measure post-test dimensions in same locations as pretest and record in Data Sheet A2. Calculate difference between pre-test and post-test measurements and record in Data Sheet A2.

4.3.1.3.1 Take post-test photo of interfaces front and back of steering wheel and driver airbag assembly.

4.3.1.4 Inspect the steering wheel for clearance to the fixture and record any interference on Data Sheet A2.

4.3.1.5 Remove steering wheel from fixture.

4.3.1.6 Reassemble the steering wheel to fixture, using the specified fastener torque, and record any interference on Data Sheet A2.

4.3.2 Horn Switch Monitoring. Record if and when steering wheel horn switch is activated by either temperature and/or distortion. See Data Sheet A2.

5 Data

5.1 Calculations. Calculate difference between pre-test and post-test measurements and record in Data Sheet A2.

5.2 Interpretation of Results. Recorded distortions > 1.0 mm in the steering wheel to column or airbag gaps, and > 2.0 mm in other areas do not meet requirements.

5.3 Test Documentation. Record pertinent test results on the supplied data sheets.

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6 Safety

This Engineering Standard may involve safety requirements for hazardous materials, the method of operations and equipment. This standard does not propose to address all the safety issues associated with its use. It is the responsibility of the user of this standard to ensure compliance with all appropriate safety and health practices. This would include any specific training that may be required. The safety and health standards include site specific rules and procedures, company rules and procedures, and Government Standards. Contact shall be made with the appropriate site Safety and Health personnel for further direction and guidance in these matters.

7 Notes

7.1 Glossary. Not applicable.

7.2 Acronyms, Abbreviations, and Symbols.

MPV Multipurpose Passenger Vehicles

8 Coding System

This standard shall be referenced in other documents, drawings, etc., as follows:

Test to GMW14596

9 Release and Revisions

This standard was originated in October 2005. It was first approved by the Steering Wheel Global Subsystem Leadership Team in March 2006. It was first published in March 2006.

Issue	Publication Date	Description (Organization)
1	MAR 2006	Initial publication.
2	SEP 2011	5 year refresh, Update to one column format, Add driver airbag to steering wheel pre-test measurement. (Interiors)
3	OCT 2016	5 year refresh. (Interior - Safety, Lighting, Decorative Trim, Labels/Literature/VIN)