



Durability Event: Serpentine

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 subject a vehicle to a concentrated sequence of full steering maneuvers at low speeds, representative of greater than average customer service.

1.2 Applicability. The test instructions covered in this standard are intended for use in passenger car and truck testing and should be adapted at all major GM test sites:

- Cruz Alta Proving Ground – Brazil
- Desert Proving Ground – Yuma, United States of America
- Dudenhofen Proving Ground - Germany
- Guangde Proving Ground – China
- Lang Lang Proving Ground – Australia
- Milford Proving Ground – United States of America

This global test procedure is intended to document the test facility requirements and driving instructions necessary to properly execute this durability event. Regional test procedures exist in order to implement this global procedure at the various GM proving grounds. Each regional test procedure includes the driving instructions for the specific access roads to and from the test facility, references to local signs and landmarks, and any other region-specific information necessary to implement this GMW durability event.

2 References

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

2.1 External Standards/Specifications.

None

2.2 GM Standards/Specifications.

GMW15444 GMW15445

2.3 Additional References.

2.3.1 Cruz Alta. DR.CA.1303

2.3.2 Yuma. DR.YU.SP

2.3.3 Dudenhofen. DR.DH.SERP

2.3.4 Guangde. DR.GD.SP

2.3.5 Lang Lang. DR.LL.7S

2.3.6 Milford. DR.MF.SP, DL.MF.ES

3 Resources

3.1 Facilities. Flat asphalt or concrete surface.

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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. Refer to the appropriate proving ground driving instruction document.

3.3 Test Vehicle/Test Piece. Not applicable.

3.4 Test Time. 12 minutes (proving ground dependent).

3.5 Test Required Information. Not applicable.

3.6 Personnel/Skills. Refer to the appropriate proving ground driving instruction document.

4 Procedure

4.1 Preparation. Refer to the appropriate proving ground driving instruction document.

4.2 Conditions.

4.2.1 Environmental Conditions. This procedure can be performed in all types of weather typically experienced at the Proving Ground. However, in situations where severe weather causes certain driving maneuvers to be unsafe, this event should be postponed until road conditions improve.

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. See Appendix A "Driving Instructions" for driving speeds and maneuvers relating to this event. This driving instruction consists of the designated number of laps of the Serpentine Course Facility, and is intended to provide a common steering path for all applicable vehicles. Each region will use its established facility to most efficiently produce full steer maneuvers. Figure B1 in Appendix B shows two possible facility designs. Refer to local standards for facility details.

A full steering maneuver is required where specified in this standard even when the vehicle can accomplish the turn without one.

5 Data

5.1 Calculations. Refer to the appropriate durability test standard.

5.2 Interpretation of Results. Refer to the appropriate durability test standard.

5.3 Test Documentation. Refer to the appropriate durability test standard.

6 Safety

This standard may involve hazardous materials, operations, and equipment. This standard does not propose to address all the safety problems associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

In general, a risk assessment needs to be performed for every driving instruction prior to executing this standard. (**Note:** National law needs to be considered while performing a risk assessment.) The required rating of risk by exposure probability and possible violation will be done in a separate document. Every identified risk must be named inside the risk assessment for the relevant driving instruction in order to announce that risk to employees. Within the risk assessment, the vehicle equipment and different vehicle build stages have to be considered. After performing a risk assessment, non-acceptable risk needs to be mitigated by appropriate countermeasures. Here technical measures are preferred because these are independent from attendant circumstances. In case technical measures are not appropriate, organizational and/or personal measures will apply. This includes training, wearing of Personal Protection Equipment, or arrangement of idle time.

6.1 Safety Precautions.

6.1.1 Instrumentation and other test equipment must be securely mounted in accordance with proving grounds traffic safety guidelines for mounting and usage of in-vehicle instrumentation.

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