



Durability Event: Driveway Ramps

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. This standard is intended to provide the definition and layout of a common GM Driveway Ramp test facility. Two separate and distinct Driveway Ramps are defined which are to be used by all global GM test sites for durability testing and as the basis for laboratory and analytical activities.

1.2 Applicability. The Driveway Ramp test facilities covered in this standard are intended for use in passenger car and light duty truck testing and should be constructed at all major GM test sites:

- CheongNa Proving Ground – Korea.
- Cruz Alta Proving Ground – Brazil.
- Desert Proving Ground – Yuma, AZ, 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.

The specification provides two distinct Driveway Ramps, the 13 Degree Driveway Ramp, and the 16 Degree Driveway Ramp. The 16 Degree Driveway Ramp is more severe.

1.3 Remarks. This standard provides a GM worldwide engineering standard to insure uniformity of Torsional inputs experienced by GM products being tested at various global test sites.

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. Driving Instructions:

2.3.1 CheongNa. DR.CN.DRC-1, DL.CN.DRC-2.

2.3.2 Cruz Alta. DR.CA.1312, DR.CA.1313.

2.3.3 Desert (Yuma). DR.YU.TD, DR.YU.SD.

2.3.4 Dudenhofen. DR.DH.13, DR.DH.16.

2.3.5 Guangde. DR.GD.SD, DR.GD.TD.

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2.3.6 Lang Lang. DR.LL.DW13, DR.LL.DW16.

2.3.7 Milford. DR.MF.SD, DR.MF.TD, DL.MF.DS, DL.MF.DT.

3 Resources

3.1 Facilities. The specific location of the Driveway Ramp facilities at each proving ground varies from one site to another. Refer to the appropriate GM test site and specific driving instruction document (see 2.3) for more information.

Refer to Figure A1 (16 Degree Driveway Ramp Dimensions) and Figure A2 (13 Degree Driveway Ramp Dimensions) for general driveway ramp dimensions.

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. Not applicable.

3.3 Test Vehicle/Test Piece. Many different types of vehicles may use this facility for various test purposes, i.e., durability testing, development testing and road load data acquisition.

3.4 Test Time. 4 minutes for each driveway ramp (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. Periodic inspections of the driveway ramp facilities are needed to insure appropriate loads. The driveway ramps should be free of ice and accumulated snow.

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. This driving event consists of four (4) entry/exits of the Driveway Ramps and is to be executed using full steering maneuvers. Centering of the steering wheel before and after each full turn is intended.

Refer to Figure A3 16 Degree Driveway Operation and Figure A4 13 Degree Driveway Operation for the specified left and right vehicle entries and exits. For some proving grounds, the order of the left and right Driveway entries may be performed in a different order due to the facility layout.

All Driveway entrances and exits are to be performed smoothly and in a moderate manner at 5 km/h (3 mph) or less to minimize ground contact. Avoid any abrupt transmission shifts, brake applications, or vehicle accelerations.

Vehicle position during this maneuver has a significant influence on vehicle forces. It is intended that the vehicle be positioned within 1 m of the edge of the road (driveway-side) when entering or exiting the Driveway. Reposition the vehicle, if necessary, before re-entering the driveway.

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.

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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.

6.1.2 All running lights and vehicle safety features must be operational according to proving grounds rules for running lights and power windows. Exterior lights must not be obscured by styling add-ons, covers or camouflage packages. The horn may be disabled because of steer angle transducer installation.

6.1.3 A helmet is required in accordance with the regulations of the test facility. The vehicle should never be operated in a manner where the vehicle leaves the roadway or goes onto the shoulder for any reason.

6.1.4 Check for proper attachment of the steering wheel to the gear via the intermediate shaft. If it feels loose or abnormal, do not run the test until the parts are properly assembled according to the intended design.

6.1.5 Check to be certain that all wheel lugs are present and have the specified torque. Loose or missing wheel fasteners are to be replaced, installed or tightened before the test may begin.

6.1.6 The driver's seatbelt must be worn at all times during the test. Passengers accompanying the test operator must also be safely belted in the vehicle, preferably in the right rear seat.

Note: Passengers are allowed for observation or training purposes.

6.1.7 If a crossbar is used to hold the steering wheel angle transducer base plate, the passenger side airbag is to be disabled or disconnected.

7 Notes

7.1 Glossary. Refer to GMW15444 "Global Durability Test Instructions and Definitions" for definitions of terms. Also refer to GMW15445 "Vehicle Ballast" for definitions of ballast related terms.

Driveway Ramp: Refers to a short inclined road surface located at the beginning of a driveway. These ramps are necessary when the driveway is at a higher elevation than the roadway and are, therefore, more common in hilly regions. There is a very wide spectrum of real world driveway ramp profiles, and these two ramp profiles have been chosen as appropriate for durability test purposes.

Full Steering Maneuver: Full right - turn the steering wheel clockwise until contacting a mechanical stop. Full left - turn the steering wheel counterclockwise until contacting a mechanical stop.

7.2 Acronyms, Abbreviations, and Symbols.

Fwd Forward

8 Coding System

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

Test to GMW3241

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Documents

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