



Durability Event: Potholes

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 specification is intended to provide the definition and layout of a GM common pothole test facility. Three pothole profiles 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 pothole test facilities covered in this specification are intended for use in passenger car and light duty truck testing at all major GM test sites:

- Cheong Na Proving Ground – Korea
- Cruz Alta Proving Ground – Brazil
- Dudenhofen Proving Ground – Germany
- Guangde Proving Ground – China
- Lang Lang Proving Ground – Australia
- Milford Proving Ground – USA

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.

1.3 Remarks. This specification provides three distinct pothole profiles, Pothole #1 through Pothole #3, with increasing severity. Pothole #3 is the most severe. The three pothole profiles included in this specification are not intended to replicate specific real world profiles, but to provide a specific range of vehicle loads representative of severe usage worldwide.

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 Cheong Na. DR.CN.PHC, DR.CN.MPC

2.3.2 Cruz Alta. DR.CA.1316

2.3.3 Dudenhofen. DR.DH.PH-1&2

2.3.4 Guangde. DR.GD.PX, DR.GD.PY, DR.GD.PZ

2.3.5 Lang Lang. DR.LL.2PT, DR.LL.7GMC

2.3.6 Milford. DL.MF.PX, DL.MF.PY, DL.MF.PZ, DR.MF.MP, DR.MF.PX, DR.MF.PY, DR.MF.PZ

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3 Resources

3.1 Facilities. The specific location of the pothole facilities at each proving ground varies from one site to another. Refer to the appropriate GM test site for more information.

As shown in Figure A1 Roadway Layout, each pothole lane includes a pair of offset potholes. The preferred layout is for first pothole to be located in the right wheel path of the roadway. Farther down the lane, the second pothole would be located in the left wheel path. The dimensions of the left and right potholes are the same. The roadway consists of 25 m (82 ft) of flat concrete prior to each pothole. This section of road is intended to allow the vehicle's suspension time to damp out any road-induced ride motions that may influence the peak load experienced by striking the pothole. The potholes should not be located after a curve or on a hill or grade.

The left and right potholes are placed in the wheel path of a vehicle as it travels in the center of the lane. In other words, it should not be required to steer significantly to the left or right in order to align the vehicle with the pothole.

The number of cycles of Pothole #1, Pothole #2 and Pothole #3 specified in a durability test will usually vary from one another. For this reason, the potholes must be constructed in such a way that each pothole lane can be run independently.

Refer to the following figures in Appendix A for general pothole dimensions:

- Figure A1 Roadway Layout
- Figure A2 Pothole #1 Dimensions
- Figure A3 Pothole #2 Dimensions
- Figure A4 Pothole #3 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. 2 minutes per pothole (proving ground dependent).

3.5 Test Required Information. Not applicable.

3.6 Personnel/Skills. Refer to the driving procedure for the appropriate GM test site.

4 Procedure

4.1 Preparation. Periodic inspections of the pothole facilities are needed to insure appropriate loads. The pothole depressions should be free of accumulated water, snow, ice, dirt, etc.

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. The vehicle is to hit the potholes at 40 km/h (25 mph). The vehicle is to have no steering or braking inputs or significant change in throttle input near the time of impact.

5 Data

5.1 Calculations. Not applicable.

5.2 Interpretation of Results. Not applicable.

5.3 Test Documentation. Not applicable.

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