



Vehicle Mud Intrusion 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. Evaluate vehicle performance during and after being driven in mud, and after allowing the mud to harden.

1.2 Applicability. All vehicles.

1.3 Remarks. This test is also to be used as a predictor of vehicle performance after being subjected to slush (wet snow) accumulation and ice. Testing of ice and slush performance can be difficult, time and resource intensive, non-repeatable and unreliable.

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.

Vehicle Technical Specification (VTS)

3 Resources

3.1 Facilities.

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.

3.1.3 A 60 degree Mud Trough Facility. The mud trough shall be prepared per local maintenance mud mixing procedure.

3.1.4 A dry area to allow mud to harden.

3.2 Equipment. Not applicable.

3.3 Test Vehicle/Test Piece.

3.3.1 In the event that not all models are available to test, determine which vehicles are “worst test case” scenarios (i.e., lowest ride height, low height vented systems, etc.)

3.3.2 Vehicle level Validation requires all parts being evaluated to be of production design including production intent material properties. This includes production intent fasteners.

3.3.3 The test vehicle shall be fitted with all the production front end features (bumper, grille, front openings, etc.) and all the components in the engine compartment affecting flow, such as engine encapsulation, cooling module, etc. If Active Grille Shutters are available on a specific model, the shutters shall be evaluated open and closed.

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3.3.4 For specific regions, a corresponding front license plate shall be mounted.

3.4 Test Time.

Calendar time: 4 days

Test time: 8 h

Coordination time: 8 h

3.5 Test Required Information. Not applicable.

3.6 Personnel/Skills. Trained personnel required to execute test.

4 Procedure

4.1 Preparation.

4.1.1 Measure and record vehicle data on Appendix A, Data Sheet A1.

4.1.2 Allow enough advance test notice (2 days) to allow preparation of the mud.

4.1.3 Ensure vehicle has a full tank of fuel.

4.1.4 Clean and dry vehicle.

4.2 Conditions.

4.2.1 Environmental Conditions. Ambient temperatures must be high enough to allow proper mud consistency per local maintenance mud mixing procedure.

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 Prep Requirements.

4.3.1.1 Prepare mud depth per VTS based on marketing specific requirement. (Moderate = 25 mm, Severe = 75 mm, Extreme = 125 mm nominal.)

4.3.1.2 Test must begin within 1 h after the mud has been mixed to ensure proper consistency.

4.3.1.3 Mud consistency is correct when a vehicle is driven through it and the tire tracks fill back in within 15 s to 30 s.

4.3.1.4 Mud must be remixed after five (5) vehicles have run complete tests to ensure proper consistency and depth.

4.3.1.5 If more than one (1) vehicle is run and will be compared to another, then all vehicles shall make their first pass, then all vehicles make their second pass, etc. This assures the best vehicle to vehicle consistency to mud exposure. Testing is limited to five (5) vehicles per mud batch (see 4.3.1.4).

4.3.1.6 Traction control systems should be "OFF" if system is user capable of being turned off, unless specified by engineer. This is necessary to maintain speed in the mud trough.

4.3.1.7 If vehicle has 4WD capability, lock vehicle in 4WD.

4.3.2 Application of Mud.

4.3.2.1 Make three (3) passes through the Mud Trough with the vehicle traveling forward at 30 km/h. During this maneuver, the steering wheel shall be turned 90 degrees left and right, five (5) times each way. This will direct the mud splash onto various areas of the vehicle underbody.

4.3.2.2 Make one (1) pass through the Mud Trough with the vehicle traveling in reverse at 15 km/h. During this maneuver, the steering wheel shall be turned 90 degrees left and right, five (5) times each way.

4.3.3 Hardening of Mud.

4.3.3.1 Drive vehicle immediately to soak area and allow the mud to harden for 24 h to 48 h.

4.3.4 Post-test Evaluation.

4.3.4.1 Measure and record vehicle data on Appendix A, Data Sheet A1.

4.3.4.2 Put vehicle on hoist and inspect underbody.

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