GM WORLDWIDE ENGINEERING STANDARDS	Test Procedure	GMW17529

Electronic Brake Control Module (EBCM) Driveline Damping Ground Hold System Performance

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. The purpose of this standard is to determine the performance of a vehicle equipped with a Electronic Brake Control Module (EBCM) Driveline Damping Ground Hold system with Hill Start Assist (HSA) or Extended Hold Hill Start Assist (EHHSA). This standard may be used for development or validation of requirements within the GM VTS and for regional regulations.

1.2 Applicability. Vehicles equipped with the Driveline Damping Ground Hold System.

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.

- CG4275, EBCM Driveline Damping Control Hold Integration with HSA or EHHSA Functionality Check
- Electrical Subsystem Technical Specification (SSTS), Electronic Brake Control Module (EBCM)
- Vehicle Technical Specification (VTS)

3 Resources

3.1 Facilities. Test is to be conducted on a flat surface as well as 7%, 12% and 20% incline grade surfaces, such as those located at the Milford Proving Ground (MPG), or any other applicable surface.

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. Appropriate equipment capable of monitoring and recording the following signals:

3.2.1 Left front, right front, left rear, and right rear brake caliper pressure.

3.2.2 Serial data $2F9_HS Brake System Hill Start Assist Status and $214_HS Hill Start Assist Active Indication On.

3.2.3 Serial data $230_HS Electric Park Brake Status, Electric Parking Brake (EPB) System Brake Lights Requested, EPB System Status.

3.2.4 Serial Data $140_HS Brake Lights Active.

3.2.5 Serial Data $17D_HS Antilock_Brake_and_TC_Status_HS - Brake System Brake Lights Requested.

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3.2.6 Serial Data $0F1_HS Brake Pedal Position, Brake Pedal Initial Travel Achieved.

3.2.7 Serial Data $0C9_HS Accelerator Actual Position.

3.2.8 Serial Data $12A_HS Driver Door Ajar Switch active, Driver Door Ajar Switch Active Mask, Driver Seatbelt Attached, Driver Seatbelt Attached Validity.

3.3 Test Vehicle/Test Piece. See Section 4.

3.4 Test Time.

Calendar time:	2 days
Test time:	4 hours
Coordination time:	1 day

3.5 Test Required Information. Possible sources include; EBCM SSTS.

3.6 Personnel/Skills. Chassis controls engineer certified to run braking tests.

4 Procedure

4.1 Preparation.

4.1.1 Build or verify the test vehicle with the EBCM driveline damping ground hold system. Record vehicle and brake system information in the test record (see Appendix A, Data Sheet A1). The vehicle to be tested must be in safe operating condition. Condition of tire, brake and suspension components should be inspected carefully. All vehicle safety equipment must be in proper operating condition.

4.1.2 Inflate tires to manufacturer's recommended pressure or per test engineer's instructions.

4.2 Conditions.

4.2.1 Environmental Conditions. Dry asphalt test surfaces are required.

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. Follow the instructions and record vehicle reactions according to CG4275.

5 Data

5.1 Calculations. Not applicable.

5.2 Interpretation of Results. Results of vehicle reactions from testing and any comments are recorded in CG4275.

5.3 Test Documentation. The vehicle information, test information and test results shall be published following GM corporate protocol using the Evaluation Report template and the approved engineering document management system/repository.

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.

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