GM WORLDWIDE ENGINEERING STANDARDS	Test Procedure	GMW17623

ETRS/EBCM/EPB System Interface and 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 interface performance of a vehicle equipped with an Electronic Transmission Range Select (ETRS) transmission, an Electronic Brake Command Module (EBCM) and an Electric Parking Brake (EPB) system. The sequence of ETRS requesting a brake hold and the EBCM commanding a service brake hold until EPB engages is examined. This standard may be used for development or validation of requirements within the GM Vehicle Technical Specification (VTS) and for regional regulations.

1.2 Applicability. This standard is applicable for vehicles equipped with the ETRS transmission 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.

- CG4406, ETRS EBCM Functional Checkout External Supplement
- Subsystem Technical Specification (SSTS), Brakes Global A124 Final
- Subsystem Technical Specification (SSTS), Electronic Brake Command Module (EBCM)
- Vehicle Technical Specification (VTS)

3 Resources

3.1 Facilities. Test is to be conducted on a flat surface as well as 12% and 20% 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:

- Serial data $1F5 PPEI_Trans_General_Status_2 - Transmission Estimated Gear
- Serial data $1F5 PPEI_Trans_General_Status_2 - Transmission Shift Lever Position
- Serial data $368_HS ETRS_General_Request_2_HS - Electronic Shift Braking Request: Automatic Braking Requested
- Serial data $368_HS ETRS_General_Request_2_HS - Electronic Shift Braking Request: Automatic Braking Request Type

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- Serial data $22A_HS Electric_Park_Brake_Status_HS - Electric Park Brake Application Status
- Serial data $22A Electric_Park_Brake_Status_HS - Electric Park Brake Availability Status
- Serial data $2F9_PPEI_Chassis_General_Status_2 - Brake System Hill Start Assist Status

3.3 Test Vehicle/Test Piece. See Procedure Section.

3.4 Test Time.

Calendar time:	3 days
Coordination time:	2 days
Instrumentation time:	1 day
Test time:	2 hours

3.5 Test Required Information. Possible sources are:

- Brakes Global A124 Final SSTS
- 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 an ETRS transmission and the EPB 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 CG4406.

5 Data

5.1 Calculations. Not applicable.

5.2 Interpretation of Results. Results of vehicle reactions from testing and any comments are recorded in CG4406. Results of the recorded serial data should be examined to verify that the expected result occurred. (See: Appendix B, Figure B1). If the expected result did not occur, root cause should be determined.

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. See responsible GM contact for details.

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

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