



High Pressure Spray Wash Test (For Axle, Transfer Case, Power Transfer Unit (PTU), Rear Drive Module (RDM), or Front Drive Unit (FDU))

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 the high-pressure wash test is to mimic the conditions of a self-operated car wash and determine the sealing capability of a vehicle axle, transfer case, Power Transfer Unit (PTU), Rear Drive Module (RDM), or Front Drive Unit (FDU).

1.2 Applicability. This test is applicable to all passenger vehicles.

1.3 Remarks. Heating of the axle to simulate actual customer conditions is an optional component to this test procedure. It can be implemented at the discretion of the test requestor.

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.

- CG4916
- Component Technical Specification (CTS)
- Statement of Requirements (SOR)
- Subsystem Technical Specification (SSTS) (for front or rear axle, Transfer Case, PTU, RDM, FDU)
- Validation Cross Reference Index (VCRI)

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 Proving Ground Test Track (with roads suitable for optional warmup application).

3.1.4 Car Wash facility (i.e. truck wash building (Milford Proving Grounds (MPG))).

3.2 Equipment.

3.2.1 Tow ball and hitch (only for optional axle warmup).

3.2.2 Towing dynamometer capable of increasing axle temperature to 100 °C (only for optional axle warmup).

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3.2.3 High Pressure washer – water jet spray of 8274 kPa to 10 342 kPa (1200 psi to 1500 psi) (at source) at a rate of 13 L/minute to 9.8 L/minute (3.4 gal/minute to 2.6 gal/minute) and water at 40 °C and 8274 kPa to 10 342 kPa (1200 psi to 1500 psi) from a spray gun for 1 minute at a distance of 152.4 mm (6 in) from the components, typical of those encountered in a self-operated car wash to clean the engine compartment.

3.2.4 Thermocouple (only for optional axle warmup).

3.3 Test Vehicle/Test Piece.

3.3.1 Mule Vehicle – requires coordination with Program Office for vehicle acquisition and scheduling.

3.3.2 Test axle.

3.4 Test Time.

Calendar time: 2 days

Test time: 3 hours

Coordination time: 6 hours

3.5 Test Required Information. See the following:

- Component Technical Specification (CTS).
- Statement of Requirements (SOR).
- Subsystem Technical Specification (SSTS) (for front or rear axle, Transfer Case, PTU, RDM, FDU).
- Validation Cross Reference Index (VCRI).

3.6 Personnel/Skills. Test Technician should be proficient in operation of the facilities listed in 3.1, as well as in proper selection and operation of the equipment listed in 3.2 and familiar with the general operation of axle assemblies.

4 Procedure

4.1 Preparation.

4.1.1 Obtain permission and schedule use of towing dynamometer (only for optional axle warmup).

4.1.2 Fill-in the requested pretest information to the Data Sheet in CG4916.

4.1.3 Install test axle into vehicle

4.1.4 Install fill plug modified with thermocouple. Be sure not to interfere with seal, and ensure there are no leaks in the thermocouple interface (only for optional axle warmup).

4.1.5 Take pretest lube sample.

4.1.6 Fill differential to specified level.

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.

4.3.1 Connect dynamometer to vehicle via tow hitch (only for optional axle warmup).

4.3.2 Drive vehicle until axle temperature reaches +100 °C (only for optional axle warmup).

4.3.2.1 While axle temperature is at least 100 °C, drive to location of pressure washer (only for optional axle warmup).

4.3.3 Use pressure washer to spray Device Under Test (DUT). See Appendix A.

4.3.3.1 From driver's side of vehicle, position spray wand nozzle approximately 50 cm (20 in) from DUT and sweep water spray across entire unit at a rate of 30 cm/second for a duration of one minute. Do not dwell on seals interfaces or weep hole orifices.

Note: Mimic customer action typical of those encountered in a self-operated car wash facility.

4.3.3.2 Repeat 4.3.3.1 for passenger side of DUT.

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