



Parking Brake Freeze 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. This standard is to evaluate freeze of the parking brake under cold conditions.

1.2 Applicability. This standard applies to passenger cars and light duty trucks.

2 References

Note: Only the latest approved standards are applicable unless otherwise specified.

2.1 External Standards/Specifications.

None

2.2 GM Standards/Specifications.

GMW15106

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 Test site must include:

- Cold chamber which can control the temperature below -20 °C.
- A level road.
- Water trough.

3.2 Equipment. This test equipment shall be calibrated and details of calibration shall be entered in test instrument calibration sheet in Appendix A, Figure A2 or similar.

3.2.1 Parking brake lever force transducer: 0 N to 1000 N.

3.2.2 Pedal force transducer: 0 N to 1000 N.

3.2.3 Indicator: 0 N to 1000 N.

3.3 Test Vehicle/Test Piece. As specified in test request.

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3.4 Test Time.

Calendar time: 2 days to 3 days
Test time: 24 hours to 28 hours
Coordination time: 6 hours to 8 hours

3.5 Test Required Information. Not applicable.

3.6 Personnel/Skills. Brake technician or engineer trained to perform the tasks in Section 4.

4 Procedure

4.1 Preparation.

4.1.1 Parking brake cable routing and the parking brake actuator should be production intent. Adjust parking brake apply according to manufacturer's specifications.

4.1.2 Adjust rear service brakes according to manufacturer's specifications. For parking brake with separate lining material from the service brakes, adjust the parking brake to manufacturer's specifications.

4.1.3 Adjust rear brakes according to manufacturer's recommendations.

4.1.4 Ballast the vehicle per test request.

4.1.5 Adjust tire pressure to recommended level for vehicle test weight.

4.1.6 Install parking brake lever force transducer on the specified position of parking brake lever per Appendix B, Figure B1 or similar.

4.2 Conditions.

4.2.1 Environmental Conditions. If not using cold chamber, ambient air temperature should be -10 °C or less during entire soak time.

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 If you have cold chamber facility, perform test per paragraph 4.3.2. Perform test per paragraph 4.3.3 if using ambient temperature soak.

4.3.2 Cold Chamber Evaluation.

4.3.2.1 Drive the vehicle through a water trough to soak the parking brake system. With the service brakes fully released at all times, drive the vehicle for two (2) minutes at a speed of 8 km/h in any combination of forward and reverse directions, through a trough having a water depth of 152.4 mm (6 in) (per GMW15106).

4.3.2.2 If water trough is not available, use a water hose to wet the parking brake system for at least one (1) minute.

4.3.2.3 Drive the vehicle into cold chamber.

4.3.2.4 Evaluate the parking brake apply lever force and travel prior to freeze. Evaluate full travel.

4.3.2.5 Apply parking brake lever force at 390 N.

4.3.2.6 Set cold chamber's temperature at -20 °C.

4.3.2.7 Soak the vehicle for over 18 h.

4.3.2.8 After finishing soak, evaluate vehicle's driving performance. Determine if wheel lock-up has occurred. If any wheel is locked up, determine which brake part was frozen and record in test report.

4.3.2.9 Evaluate the parking brake apply lever force and travel and compare with results recorded in 4.3.2.4.

4.3.3 Evaluation at Cold Ambient Temperature.

4.3.3.1 Drive the vehicle through a water trough to soak the parking brake system. With the service brakes fully released at all times, drive the vehicle for two (2) minutes at a speed of 8 km/h in any combination of forward and reverse directions, through a trough having a water depth of 152.4 mm (6 in) (per GMW15106).

4.3.3.2 If water trough is not available, use a water hose to wet the parking brake system for at least one (1) minute.

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