



Drum-in-Hat Park Brake Lining Wear 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. The purpose of this standard is to determine the lining life of the drum-in-hat park brake system. The two (2) measurements that characterize park brake lining life are miles to first adjustment, and miles to park brake lining wearout.

1.2 Applicability. This standard is applicable to all passenger cars, utility vehicles, and light truck vehicles with a drum-in-hat park brake system.

1.3 Remarks. This standard is a drive schedule (park brake unapplied) used to evaluate wear of the park brake friction material due to typical city, suburban, and rural road usage. The park brake grade holding performance is measured at specified mileage intervals.

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

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 Park brake grade facility or vehicle draw-bar pull test facility.

3.1.4 Vehicle build area.

3.2 Equipment.

3.2.1 Park brake apply system force transducer.

3.2.2 Park brake apply system travel transducer.

3.2.3 Digital data acquisition system.

3.2.4 Tools to measure lining material thickness.

3.2.5 Optional. If using a park brake draw-bar pull test facility, instrumentation to sense and record data channels needed for calculation of grade holding is required. See facility test engineer for details. If a draw-bar test is utilized, correlation to percent of the grade must be demonstrated.

3.3 Test Vehicle/Test Piece.

GM Confidential

© Copyright 2016 General Motors Company All Rights Reserved

September 2016

Page 1 of 5

3.3.1 Test vehicle must be built with correct brake corner hardware, rear suspension, wheels, and tires. Exceptions should be noted in test record.

3.3.2 New park brake linings shall be installed at start of test. Exceptions should be noted in test record.

3.3.3 New park brake apply system shall be installed at start of test. Exceptions should be noted in test record.

3.4 Test Time.

Calendar time: 60 days at 1 shift/day

Test hours: 8 hours at 1 shift/day

Coordination hours: 40 hours

3.5 Test Required Information.

3.5.1 Drive schedule should utilize public roads. Contracted driver and data services may be required.

3.5.2 Drive schedule for each shift shall be one (1) time around the scheduled road course.

3.5.3 Select the vehicle loading to allow same loading for both the driving schedule and the park brake grade test. A 50% payload condition is recommended.

3.5.4 Required instrumentation has been minimized. Requests for additional instrumentation shall be reviewed for safety implications for the driver.

3.6 Personnel/Skills.

3.6.1 Drivers capable of performing the drive schedule.

3.6.2 Test technicians trained to measure park brake performance and lining thickness.

4 Procedure

4.1 Preparation.

4.1.1 Document vehicle, brake system, and park brake system information in the test record.

4.1.2 Measure the thickness of the park brake lining material for at least three (3) locations per lining (tip, center, tip). Measurement locations should be close to center of the width of the lining. Mark measurement locations with a punch or paint mark on underside of shoe web. These measurements determine the baseline for the lining thickness.

4.1.3 Build vehicle with new park brake apply system and park brake lining unless otherwise instructed. Set clearances following manufacturer's recommendations or assembly adjustment process unless otherwise specified.

4.1.4 Adjust rear suspension if requested.

4.1.5 Adjust tire pressure to manufacturer's specification.

4.1.6 Load vehicle to requested weight. Unless otherwise specified, load light truck and utility vehicles to 50% payload. Test record should include vehicle total weight and axle weights.

4.1.7 Perform a park brake grade test to determine the minimum force/travel in uphill and downhill direction to meet hill hold/draw-bar requirements using the procedure applicable for the available facility. The apply force and apply travel must be recorded during the test. This test determines the baseline performance for the park brake system.

4.2 Conditions.

4.2.1 Environmental Conditions.

4.2.1.1 Environmental conditions are not restricted. Follow instructions from test engineer about inclement weather testing.

4.2.1.2 Document ambient temperature, precipitation (none, light, heavy, continuous, scattered, etc.), and road surface conditions in the test record for each shift.

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.

4.2.2.1 Each driving shift should be approximately 405 km. The number of driving shifts that make up the test shall be specified in the work request. The recommended accumulated mileage for validation is 16 200 km.

GM Confidential

© Copyright 2016 General Motors Company All Rights Reserved

September 2016

Page 2 of 5