



Consumer Reports Magazine Fade 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 describes the method to test the brake fade performance in a manner similar to that used by Consumer Reports magazine published in the United States of America.

1.2 Applicability. This standard is applicable to passenger cars, light duty trucks, and light duty multipurpose vehicles.

1.3 Remarks. This standard was developed based on information obtained from the test staff of Consumer Reports magazine.

2 References

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

2.1 External Standards/Specifications.

CMVSS 135 FMVSS 135

2.2 GM Standards/Specifications.

GMW14927 GMW15102

2.3 Additional References.

Consumer Reports, Yonkers, New York (www.consumerreports.org)

Global Document Management (GDM) System (<https://documents.gm.com/gdm3/component/main>) (ID)

(ID) = This website is limited to internal access within General Motors and shall not be accessed outside this company. Contact the GM Lead Engineer for further instructions.

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 Circular test track, or equivalent, for continuous acceleration and deceleration driving cycles.

3.1.4 Vehicle weighing station providing at least the mass (weight) per each axle.

3.1.5 Vehicle ballast station.

3.2 Equipment.

3.2.1 Brake pedal force transducer.

3.2.2 Brake pedal travel transducer (optional).

3.2.3 Accelerometer.

3.2.4 Accelerometer (U-Tube or display) visible to driver.

3.2.5 Fifth wheel.

GM Confidential

© Copyright 2017 General Motors Company All Rights Reserved

March 2017

Page 1 of 5

3.2.6 Brake fluid thermocouples (optional).

3.2.7 Brake lining thermocouples. Brake lining thermocouples should be used per GMW15102 (Federal Motor Vehicle Safety Standard (FMVSS)/Canada Motor Vehicle Safety Standard (CMVSS) 135).

3.2.8 Digital data acquisition system with 100 Hz sample rate for all channels.

3.2.9 Optional instrumentation may be requested. Review test request for instructions.

3.2.10 All instrumentation is to be calibrated as required. Record instrumentation details and calibration dates in the test record.

3.3 Test Vehicle/Test Piece. In selection of the test vehicle, consideration is to be given to the combination of axle ratio, type and size of tires, type of wheels and wheel covers, engine, body type and front-to-rear mass (weight) distribution. The test vehicle should be representative of the extreme characteristics of the vehicle family.

3.4 Test Time.

Calendar time: 2 days to 4 days

Test time: 12 hours to 16 hours

Coordination time: 4 hours

3.5 Test Required Information. The ambient temperature will affect the cooling during the magazine and abuse fade tests. Always document the ambient temperature in the test record and use engineering judgment when comparing results from tests run at significantly different ambient temperatures.

3.6 Personnel/Skills. An experienced, trained brake technician or engineer.

4 Procedure

4.1 Preparation.

4.1.1 Document basic information such as vehicle make, model, year, Vehicle Identification Number (VIN), mileage, car number and full brake system, and tire and wheel description in the test record.

4.1.2 Build brake system per test request. The initial brake build should be new hardware unless specified otherwise by requesting engineer.

4.1.3 Install the instrumentation, including any optional equipment specified in the test request. If brake line pressure transducers are requested, brake floor checks must be done both before the hydraulic system is opened and after instrumentation. Follow standard GMW14927 Brake System Floor Check. Perform brake bleeds as necessary to remove any air introduced during the instrumentation.

4.1.4 Fill fuel tank to capacity. Maintain fuel level above 75% during the testing.

4.1.5 Adjust tire pressure to manufacturer's specifications and record.

4.1.6 All vehicle openings are to be closed except as required for instrumentation or ventilation. Record any exceptions.

4.2 Conditions.

4.2.1 Environmental Conditions.

4.2.1.1 The ambient temperature should be between -10 °C and 40 °C.

4.2.1.2 Wind speed should be less than 32 km/h in any direction.

4.2.1.3 The track surface must be dry.

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 Brake Burnish. Ballast vehicle to Gross Vehicle Weight Rating (GVWR) as defined in 7.1. Burnish brake hardware using brake burnish instructions in GMW15102 (200 stops from 80 km/h to 0 km/h at 3.0 m/s² at 2 km intervals).

GM Confidential

© Copyright 2017 General Motors Company All Rights Reserved

March 2017

Page 2 of 5



Documents

Document Sharing Hub