



Stabilizer Bar Bushing 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. Determine stabilizer bar bushing durability performance.

1.2 Applicability. This procedure will apply to all passenger cars and light trucks having suspensions designs using stabilizer bar systems.

2 References

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

2.1 External Standards/Specifications.

None

2.2 GM Standards/Specifications.

GMW14682

GMW14736

GMW14738

3 Resources

3.1 Facilities. The facility must be adequate to house the equipment to perform the procedure(s).

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.

3.2.1 Fixture that simulates the vehicle installation of the stabilizer bar, bushing, and clamp. See Figure A2 in Appendix A for a sample test setup.

3.2.2 Capability to apply reversing radial load along with torsional rotation.

3.2.3 Capability to measure radial displacement, rotation angle, load, and torque.

Note: All instrumentation is to be calibrated as required; record instrumentation details and date of calibration on data sheet.

3.3 Test Vehicle/Test Piece. Test must be completed using design intent parts. In addition, the clamp shall be design intent, along with the stabilizer bar section (design intent, representative production process).

3.4 Test Time.

Calendar time: 5 days

Test hours: 40 hours

Coordination hours: 1 hour

3.5 Test Required Information. Radial loading to be supplied by GM responsible engineer.

3.6 Personnel/Skills. The test technician should be familiar with the test machine and the instrumentation required to obtain test data.

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3.7 Development/Validation Items. A minimum of six (6) samples should be tested for each test phase. To the extent possible, bushing samples should come from a population of mold cavities over time in order to comprehend as many manufacturing variables as possible.

4 Procedure

4.1 Preparation.

4.1.1 All samples must be checked to ensure conformance to all print dimensional requirements.

4.1.2 Before testing, the samples should be installed in vehicle design condition including fastener torque and installation angle. To the extent possible, mating parts must have design and process intent material, dimensions, surface treatments, and coatings.

4.1.3 Precondition bushing by baking for 24 h at 100 °C.

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 Install the preconditioned bushing and mating components in the test machine using design intent materials, orientation, and fastener torque. Test to be performed at ambient temperature.

4.3.2 Perform initial rate checks for radial rate and torsional rate per GMW14682, GMW14736 and GMW14738.

4.3.3 Apply 25 degrees of rotation and verify no slip condition. Applies to gripper and bonded style bushings only.

4.3.4 Apply the reversing radial load and reversing torsional displacement according to the parameters:

- Cycles: 200 000
- Radial Frequency: 2.0 Hz $\pm$ 0.1 Hz
- Torsional Frequency: 1.5 Hz $\pm$ 0.1 Hz
- Torsional Displacement: $\pm$ 15 degrees
- Radial Load: Supplied by GM Engineer

4.3.5 Radial load as supplied by GM responsible engineer. Suggested values of 0.8G turn for Body Frame Integral (BFI) Programs, and 18 cm (7 in) static twist for Body on Frame (BOF) Programs.

4.3.6 GM responsible engineer may alter torsional displacement value based on specific vehicle geometry.

4.3.7 Apply 25 degrees of rotation and verify no slip condition as in 4.3.3. Applies to gripper and bonded style bushings only.

4.3.8 Repeat rate checks performed in 4.3.2 and record posttest results.

4.3.9 Analysis. Review rate change (displacement change) over test cycles, example plot in Appendix A, Figure A1.

4.3.10 Requirements.

4.3.10.1 Bushing shall have < 20% radial rate loss at end of test.

4.3.10.2 Bushing shall have < 20% torsional rate loss at end of test. Applies to gripper and bonded style bushings only.

4.3.10.3 Bushing shall show no signs of cracking, tearing or other defect as to cause loss of function at end of test.

4.3.10.4 Bushing Inner Diameter (ID) shall not be greater than bar Outer Diameter (OD) at end of test. Applies to slipper bushings only.

4.3.10.5 Bushing shall not slip to $\pm$ 25 degrees of rotation at beginning or end of test. Applies to gripper and bonded bushings only.

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