



Rebound Integrity of Suspension Dampers (Rebound Springs and Piston Valve Retention)

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 describe durability testing of rebound springs and piston valve retention in dampers.

1.2 Applicability. For all suspension dampers to evaluate piston valve and rebound spring durability.

2 References

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

2.1 External Standards/Specifications.

ISO 17025

2.2 GM Standards/Specifications.

GMW14243

2.3 Additional References.

Statement of Requirements (SOR).

3 Resources

3.1 Facilities. Servo-hydraulic test rig, spring testing machine for durability test. Capable of cycling to react full rebound loads, and apply rotation to the piston rod.

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. Durability test.

3.2.1 Load cell.

3.2.2 Force – Travel – Rotation – Controller/Device with closed control loop for regulation of vibration period, load and rotation.

3.2.2.1 Travel control via digital display.

3.2.2.2 Pre-selection, counter for cycles.

3.2.2.3 Load control to maintain rebound load for rotational testing.

3.2.2.4 Apparatus to apply rotation of rod relative to strut, at rod or strut body under test conditions.

3.2.2.5 Side load application mechanism to apply desired force to strut body at rod guide center during all required test conditions.

3.2.2.6 Lower mount shall be constrained with spherical bearing to avoid inducing additional moment.

3.2.3 Functional damper hydraulic unit and rebound spring with minimum valving to function (i.e., one (1) disc in base valve). Goal is not to generate damping force, but to maintain oil in the pressure tube.

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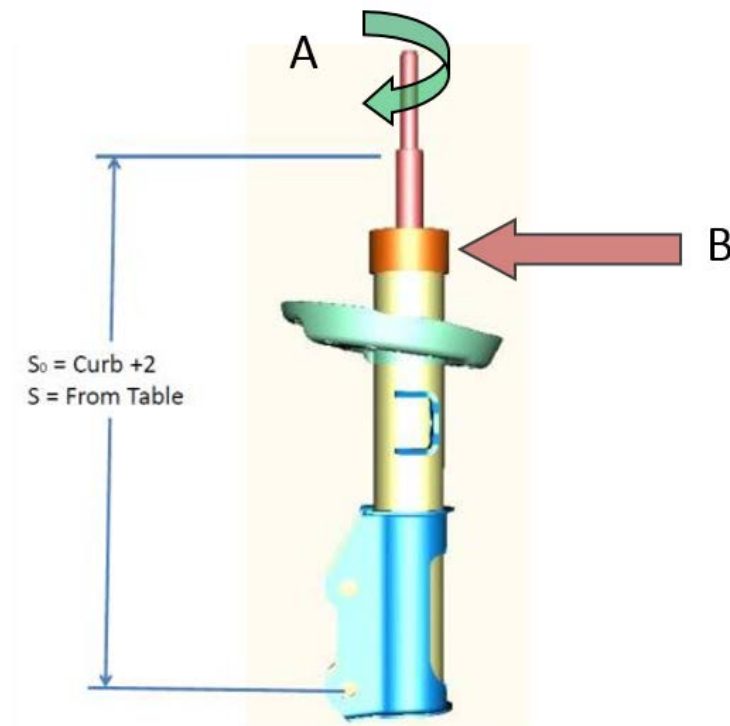
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3.3 Test Vehicle/Test Piece. For evaluation of dynamic durability (durability test) an adequate number of units (six (6) parts minimum) shall be tested.

3.4 Test Time.

Calendar time: 30 days to 35 days
 Test time: 120 hours per sample
 Coordination time: 20 hours

3.5 Test Required Information. The setup for testing dampers with rebound springs is shown by way of example in Figure 1.



Note:

A: Steering Rotation around Vertical Axis
 B: Side Load

Figure 1: Test Setup

3.6 Personnel/Skills. Operators shall be qualified and documented as capable to perform this test as required by ISO 17025.

4 Procedure

4.1 Preparation. Pretest parts to ensure functionality.

4.1.1 Measure damping forces per GMW14243.

4.1.2 Measure damper mass to 0.98 m/s^2 (0.1 g).

4.1.3 Measure damper extended length (full rebound spring compression if applicable) to verify full rebound engagement at $F_{\max}$.

4.1.4 Measure engagement point of rebound spring, and load at 20% (F_1), 50% (F_2) and 80% (F_3) compression.

4.1.5 Test to be conducted with dampers in vertical (or vehicle) position.

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