



Fatigue Test of Suspension Strut Dampers

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. Testing of service life of suspension strut dampers (MacPherson and High Performance (HiPer) strut types) during loading similar to operating conditions.

1.2 Applicability. This procedure applies to all struts

2 References

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

2.1 External Standards/Specifications.

None

2.2 GM Standards/Specifications.

GMW3425

GMW14243

GMW14540

GMW15462

GMW3428

GMW14264

GMW14804

2.3 Additional References. If applicable, part drawing(s) shall include deviations from or clarifications of this procedure.

3 Resources

3.1 Facilities. A servo hydraulic vibration damper testing machine is required. For the test specimen holder, see Figure 1.

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 Calibrated measuring instruments (permissible tolerance is 1% for machines and measuring devices) for recording the test specimen temperature and damping force during the durability test.

3.2.2 Cooling device for cooling the test specimens during the durability test which includes:

- Cooling fluid: Water or other (i.e., ethylene glycol based) fluid intended for cooling
- Cooling jacket cooling water outlet: In the vicinity of the piston rod guide
- Cooling jacket cooling water inlet: In the vicinity of the base valve
- Cooling jacket shall be fitted externally on the supporting tube

3.2.3 The test specimen shall be subjected to a lateral force of $F_s = F_m \pm F_a$ in the vicinity of the piston rod guide. Therefore, a side load fixture will be required. See Figure 1.

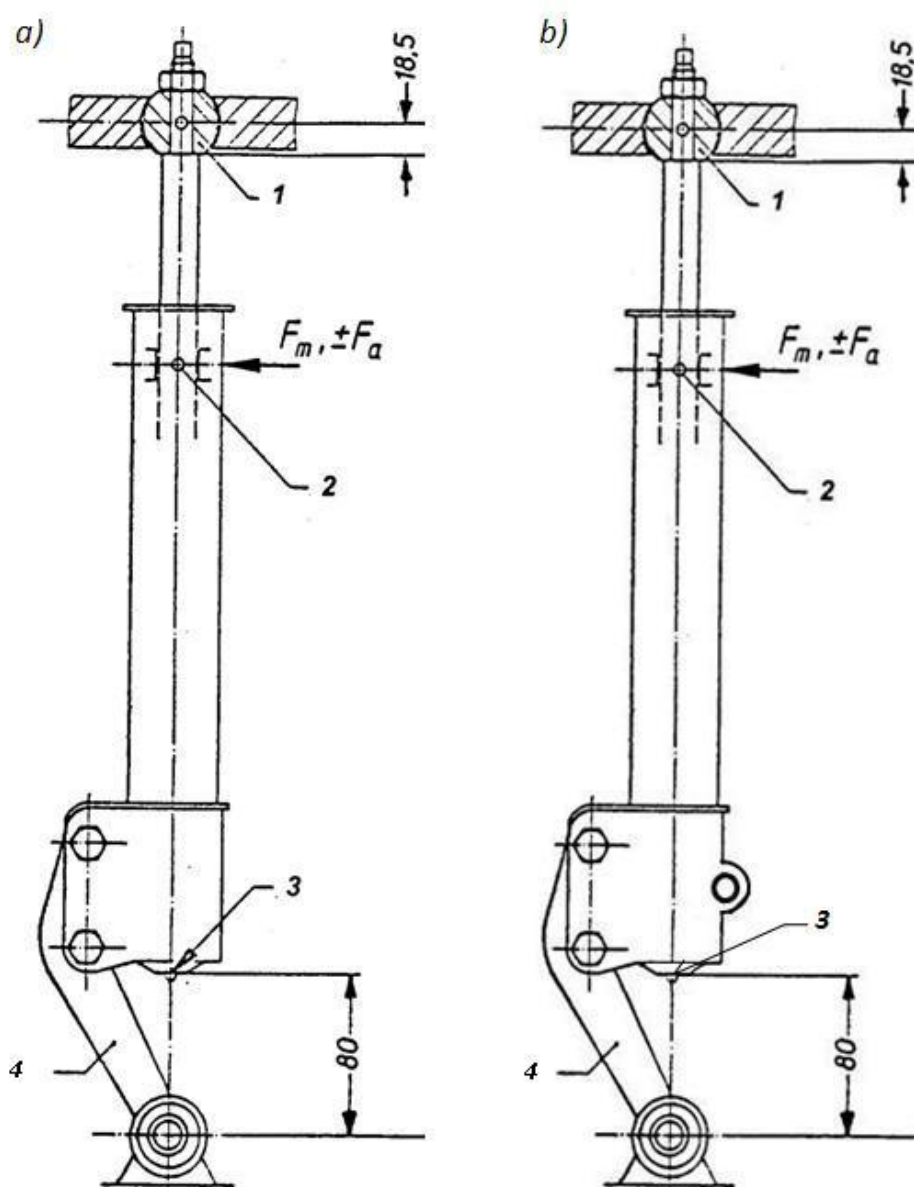
3.3 Test Vehicle/Test Piece. A minimum number of samples to meet the reliability and confidence for validation (i.e., 99% reliability with 50% confidence) should be tested. GM Design and Validation engineers should be consulted. Six (6) parts should be tested unless agreed upon with GM Validation and Engineering.

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**Note:**

- a) MacPherson Strut
- b) HiPer Strut
- 1 Ball
- 2 Center of guide
- 3 Temperature measuring point
- 4 Adapter or Knuckle

Figure 1: Strut Forces and Reference Measurement Points**3.4 Test Time.** Not applicable.

Calendar time: 12 days to 14 days

Test hours: 280 hours to 300 hours

Coordination hours: 1 hour

3.5 Test Required Information. Use program specific side load magnitudes (if available).**GM Confidential**

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