



Shock Bracket Ultimate Test, Axle

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 the Shock Bracket Ultimate test is to determine the force to yield and the ultimate strength of the axle shock bracket and attachment points.

1.2 Applicability. This procedure is applicable for live beam axles that have provisions for shock bracket attachment.

1.3 Remarks. Consider coordinating this test with the Shock Bracket Fatigue Test.

2 References

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

2.1 External Standards/Specifications.

ASTM E1444

2.2 GM Standards/Specifications.

GMW14048 GMW17215

2.3 Additional References.

- CG4914 Data Log Sheet
- Component Technical Specification (CTS)
- Statement of Requirements (SOR)
- Subsystem Technical Specification (SSTS)
- Validation Cross Reference Index (VCRI)

3 Resources

3.1 Facilities. A bedplate large enough for securing the test rig and capable of withstanding dynamic loading of the rig/specimen is required.

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 Bracket Fatigue Table. See Appendix A, Figure A1.

3.2.2 Hydraulic Actuators with sufficient force to exert the maximum loads.

3.2.3 Structural Test Machine.

3.2.4 Tube Clamp coupling to mount the axle tube rigidly to the bedplate in the shock absorber bracket area.

3.2.5 Load Cell.

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3.2.6 Shock Bracket Adapter rod and stud to adapt the actuator to the shock absorber bracket. Load is to be applied to the bracket through the shock fitting representing the production condition.

3.2.7 Test control computer.

3.3 Test Vehicle/Test Piece. Axle tube assembly with attached shock bracket.

3.4 Test Time.

Calendar time: 1 day

Test time: 1 hour

Coordination time: 8 hours

3.5 Test Required Information. See the following:

- CG4914 data log sheet.
- Component Technical Specification (CTS).
- GMW17215.
- GMW14048.
- Statement of Requirements (SOR).
- Subsystem Technical Specification (SSTS).
- Validation Cross Reference Index (VCRI).

3.5.1 Contact the Structural Development Laboratories (department D0400), Controls and Computer Infrastructures Technical Lead Engineer, for determination of maximum test load and angle of application required for ultimate load test. Record on CG4914 data log sheets.

3.6 Personnel/Skills. Test Technician should be proficient in operation of the facilities listed in 3.1, as well as in proper selection and operation of the equipment listed in 3.2 and familiar with the general operation of axle assemblies.

4 Procedure

4.1 Preparation.

4.1.1 All samples shall be inspected for geometrical conformance with the appropriate specimen drawing (and weld specification, if applicable). Any non-compliant specimens must be set aside and a compliant specimen be tested in its place.

4.1.2 Check that all parts and fixtures needed are included for the mounting.

4.1.3 Stencil Ink. Crack highlighting paint (white stencil ink) should be applied to areas of interest on the test piece. Cracks will show up as a black line. Do not use regular spray paint, as it can hide cracks or show false signs of cracking.

4.1.4 Test Stand Review. The test setup and methodology must be reviewed with the GM System Validation Engineer (SVE). The GM SVE may request review by the Design Release Engineer (DRE) and/or the Bill of Material (BOM) Family Owner (BFO). Photographs and/or Computer Aided Design images of the test must be provided.

4.2 Conditions.

4.2.1 Environmental Conditions. Unless otherwise specified, the typical environmental conditions for this procedure are the temperature, humidity and pressure at the test facility. Unless otherwise noted, these conditions are typically 22 °C to 25 °C, relative humidity of 40% to 60%, and atmospheric pressure equivalent to the local barometric pressure.

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.

4.2.3 New test samples shall be used. For product validation testing off-tool parts are mandatory. For design validation testing prototype parts may be used.

4.2.4 Test shall be controlled and monitored by a computer program. Load and displacement of the specimen shall be monitored through entire test until failure.

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