



Aluminum Parts for Engine - Transmission Brackets and Aluminum Internal Cores of Dampening Blocks

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 determines the requirements for aluminum parts of the propulsion system mounting, e.g., damping blocks, hydro mounts, hydro bushings, brackets, and describes the material tests of the components.

1.2 Applicability. Aluminum parts of the propulsion system mounting, e.g., damping blocks, hydro mounts, hydro bushings, brackets.

2 References

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

2.1 External Standards/Specifications.

None

2.2 GM Standards/Specifications.

GMW3059

GMW14676

3 Test Preparation and Evaluation

3.1 Resources.

3.1.1 Facilities. Typical of material test laboratory.

3.1.1.1 Calibration. The test facilities and equipment shall be in good working order and shall have a valid calibration label.

3.1.1.2 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.

3.1.2 Equipment. Load frame capable of attaching test pieces to a rigid structure and of applying loads in excess of test limits.

3.1.3 Test Vehicle/Test Piece. Representative sections of aluminum brackets, internal cores, and interfacing components.

3.1.4 Test Time.

Calendar time: 1 d

Test time: 8 h

Coordination time: 2 h

3.1.5 Test Required Information. Not applicable.

3.1.6 Personnel/Skills. Experienced material test laboratory personnel trained in the application of this procedure and in all appropriate safety practices and procedures.

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May 2018

Page 1 of 5

3.2 Preparation. The number of test pieces shall be as per the appropriate test methods, or where no such details are given, at least three (3) test pieces shall be tested for initial sample and arbitration purposes, and one (1) test piece minimum for routine quality control.

3.3 Conditions.

3.3.1 Environmental Conditions. If not otherwise specified the tests shall be performed in the as received condition at $+23\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$ without any special preconditioning

3.3.2 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.

3.4 Instructions. See individual procedures in Section 4.

3.5 Data. See 3.7.

3.6 Safety.

This Engineering Standard may involve safety requirements for hazardous materials, the method of operations and equipment. This standard does not propose to address all the safety issues associated with its use. It is the responsibility of the user of this standard to ensure compliance with all appropriate safety and health practices. This would include any specific training that may be required. The safety and health standards include site specific rules and procedures, company rules and procedures, and Government Standards. Contact shall be made with the appropriate site Safety and Health personnel for further direction and guidance in these matters.

3.7 Documentation. Samples of components or material released to this standard shall be tested for conformity with the requirements of this standard and approved by the responsible GM Department prior to the start of delivery of production level components or materials.

Any change to the component or material, e.g., design, function, properties, manufacturing process and/or location of manufacture requires a new release of the product. It is the sole responsibility of the supplier to provide the customer, unsolicited, with documentation of any change or modification to the product/process, and to apply for a new release.

If not otherwise agreed to, the entire verification test shall be repeated and documented by the supplier prior to start of delivery of the modified or changed product. In some cases, a shorter test can be agreed to between the responsible GM department and the supplier.

3.7.1 Test Results. Provide all results of the test (Section 4) in a test report.

4 Requirements and Procedure

4.1 Thread Test: Push-out Force. See Table 1 for requirements and Figure 1 for test setup.

4.1.1 Test Piece. The test piece shall be from the original part sectioned around the threaded hole. All threaded holes in a given part shall be tested. If it is not possible to test all of the threaded holes on a part, then consult with General Motors Engineer to determine an alternative test setup.

4.1.2 Thread Engagement. The length of full thread engagement between the test bolt and the test piece shall be $1.7 \times \text{Bolt Thread Major Diameter (d)}$, i.e., 17.0 mm when testing an M10 $\times$ 1.5 6g bolt.

4.1.3 Support Material. The support material type and the area of contact between the support and test piece shall be such that no yielding occurs between the support and test piece during the test.

4.1.4 Test Bolt Thread Class. Test bolt thread class shall be 6g.

4.1.5 Test Piece Thread Class. Test piece thread class shall be as specified on the art drawing, typically 6H.

4.1.6 Clearance Hole. The clearance hole diameter shall be sized such that the bolt easily passes through the hole during testing, i.e., 10.5 mm to 11.0 mm for an M10 bolt.

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Page 2 of 5

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