



Exhaust System Threaded Fasteners

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 General Specification contains the general requirements and associated tests regarding screw-fastening elements for exhaust systems.

1.2 Applicability. Threaded fasteners are used to connect individual components of the exhaust system.

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

GMW3286

GMW14566

3 Test Preparation and Evaluation

3.1 Resources. According to the relevant test procedures.

3.1.1 Facilities. According to the relevant test procedures.

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. According to the relevant test procedures.

3.1.3 Test Vehicle/Test Piece. According to the relevant test procedures.

3.1.4 Test Time. According to the relevant test procedures.

3.1.5 Test Required Information. According to the relevant test procedures.

3.1.6 Personnel/Skills. According to the relevant test procedures.

3.2 Preparation. According to the relevant test procedures.

3.3 Conditions.

3.3.1 Environmental Conditions. According to the relevant test procedures.

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. According to the relevant test procedures.

3.5 Data. According to the relevant test procedures.

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. The test results shall be summarized in a test report.

4 Requirements and Procedure

4.1 Dimensioning. For component and assembly dimensions, see part math data.

4.2 Functional Test.

4.2.1 Resistance to Temperature Cycling. The threaded fastener joint to be tested shall be fitted at $+23\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$ at the minimum test moment, M_{pmin} (torque) according to the math data.

4.2.1.1 Individual threaded fasteners shall be sprayed with a salt spray solution according to GMW3286.

4.2.1.2 Tested parts shall be subjected to ten (10) test cycles of the temperature cycling test. One (1) test cycle consists of Steps 1 thru 6.

1. Place test pieces in the oven at $+23\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$.
2. Heat oven to $+650\text{ }^{\circ}\text{C}$ and maintain this temperature for 1 h.
3. Cool oven to $+23\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$ and maintain for 1 h.
4. Start of a new cycle.
5. After the fifth cycle, the individual threaded fastener joints shall be sprayed with salt spray solution again.
6. The test is complete after ten (10) cycles.

Note: Clamped exhaust system joints are excluded from this test.

4.2.2 Detachability. The threaded fastener joints shall be demounted after the alternating temperature test has been completed.

With disassembly, the threaded fasteners shall be able to be released without any destruction.

4.3 Stress Measurement. Test to GMW14566.

4.4 Corrosion Test. The corrosion resistance shall be determined according to the material requirements.

4.5 Material Tests. See part math data.

4.6 Validation Summary. Reference Appendix A, Table A1.

5 Provisions for Shipping

Not applicable.

6 Notes

6.1 Glossary. Not applicable.

6.2 Acronyms, Abbreviations, and Symbols.

GSSLT Global Subsystem Leadership Team