



Spoiler Stud Retention and Torque Test

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 procedure is to determine if molded in studs, nuts or doghouse type fasteners within a spoiler meet the attachment integrity requirements of the Subsystem Technical Specification (SSTS).

1.2 Applicability. This test procedure is to be used for spoilers that are injection molded or blow molded with integral attachment studs, nuts or doghouses.

2 References

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

2.1 External Standards/Specifications.

None

2.2 GM Standards/Specifications.

None

2.3 Additional References.

- Subsystem Technical Specification (SSTS)

3 Resources

3.1 Facilities.

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. Tensile test machine with > 1000 N load capability. Torque wrench with minimum capable of 12 N·m. Steel plates or fixtures for holding sample and metal leveling bars. Paint pen or marker.

3.3 Test Vehicle/Test Piece.

3.3.1 Test Piece. The spoilers are to be production-representative part with the correct fasteners.

3.4 Test Time.

Calendar time: 1 d

Test time: 8 h

Coordination time: 4 h

3.5 Test Required Information. The peak force to separate the stud or nut from the spoiler. The peak torque to rotate the stud or nut within the spoiler.

3.6 Personnel/Skills. Prior experience in setting up and running similar tests and experience in the use of the referenced test equipment is critical to achieving the estimated times shown in 3.4.

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4 Procedure

4.1 Preparation.

4.1.1 Before the test, verify the assembly part release or change level. Record this information on Data Sheet A1 in Appendix A.

4.2 Conditions.

4.2.1 Environmental Conditions. Test at ambient.

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.

4.3 Instructions.

4.3.1 Stud Pullout Retention.

4.3.1.1 Test Preparation. Use either Method A or Method B as appropriate.

4.3.1.1.1 Method A.

4.3.1.1.1.1 Cut a 4 mm thick, 50 mm wide by 90 mm long piece of steel. Drill or mill out a hole at the center of the steel plate that is 5.0 mm larger in diameter than the stud standoff or doghouse. Remove any burrs from the metal to avoid sharp edges. See Figure 1.

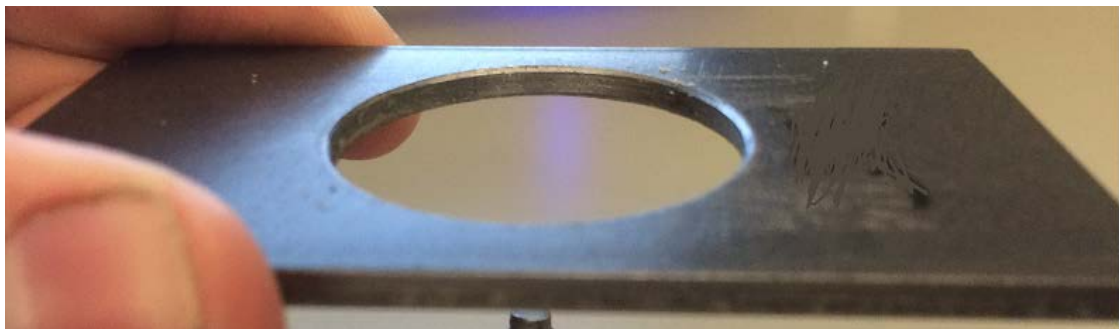


Figure 1: Metal Plate with Hole in Center

4.3.1.1.1.2 Cut an approximate 40 mm x 40 mm coupon from the spoiler surrounding the stud. Remove any flanges, bumps or edges from the coupon surface. See Figure 2.



Figure 2: Section of Spoiler at Stud Location (40 mm x 40 mm)

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4.3.1.1.1.3 Attach a M6 internally threaded cylinder or similar device onto the tensile testing equipment (this is for attaching the stud/spoiler coupon to the tensile equipment). See Figure 3.

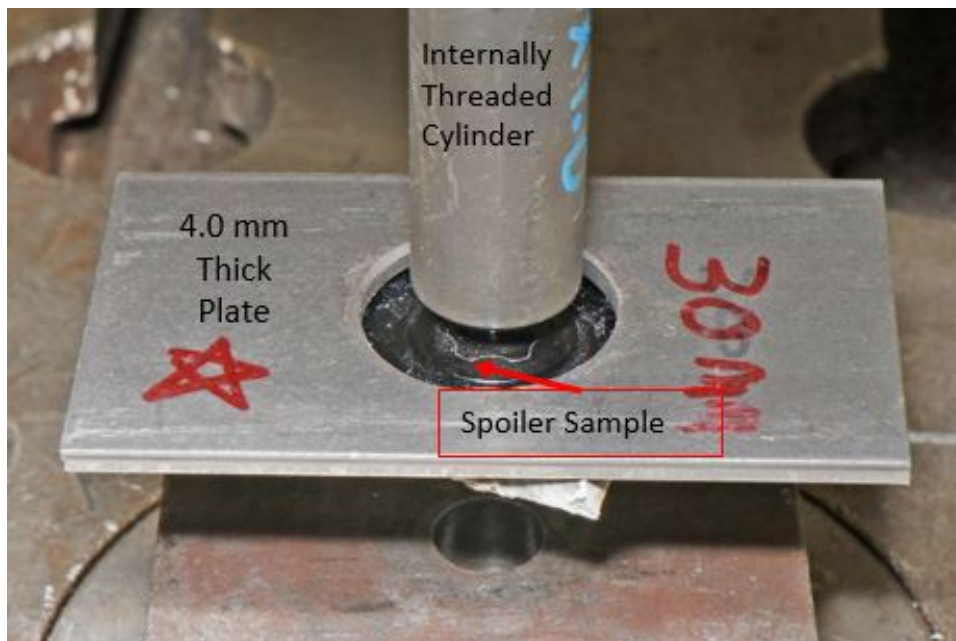


Figure 3: Spoiler Section Affixed to the Tensile Machine With Internally Threaded Cylinder and Metal Plate

4.3.1.1.1.4 Load the metal plate and thread the spoiler coupon to the threaded cylinder until end of threads are reached.

4.3.1.1.1.5 Level the metal plate and spoiler coupon to the table using a fixture or other device. Figure 4 and Figure 5 show leveling the sample using two metal bars mounted to the tensile machine table. These bars are adjustable to achieve a level sample.

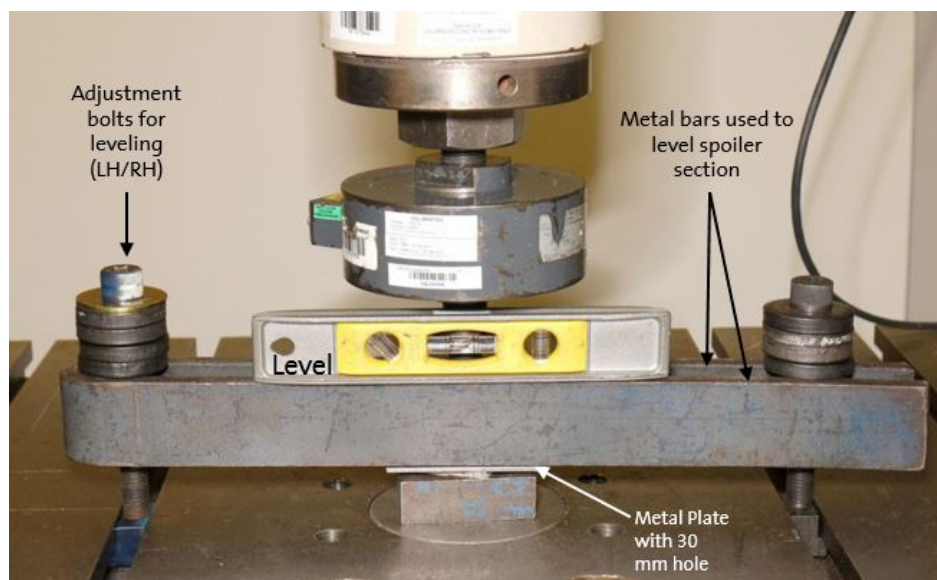


Figure 4: Test Setup

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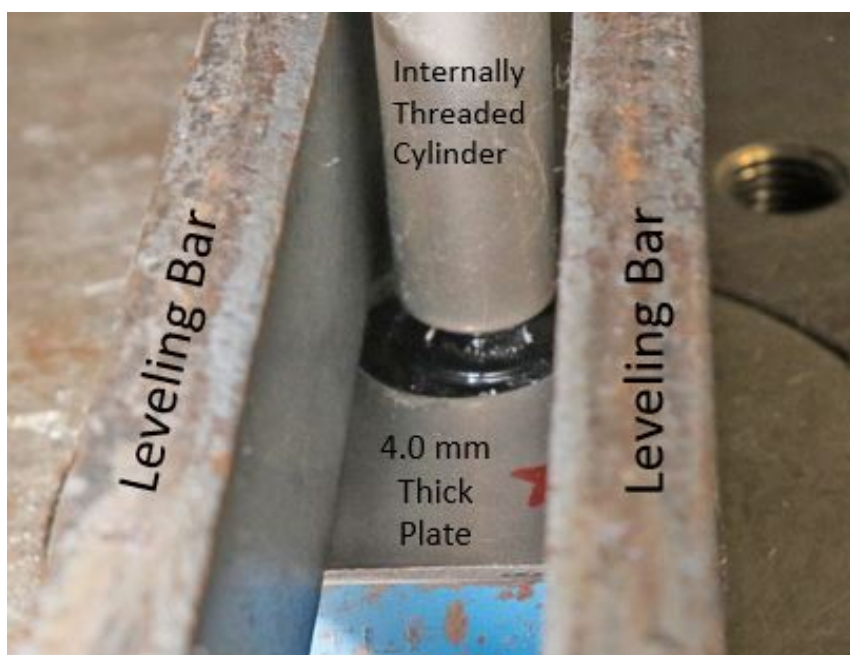
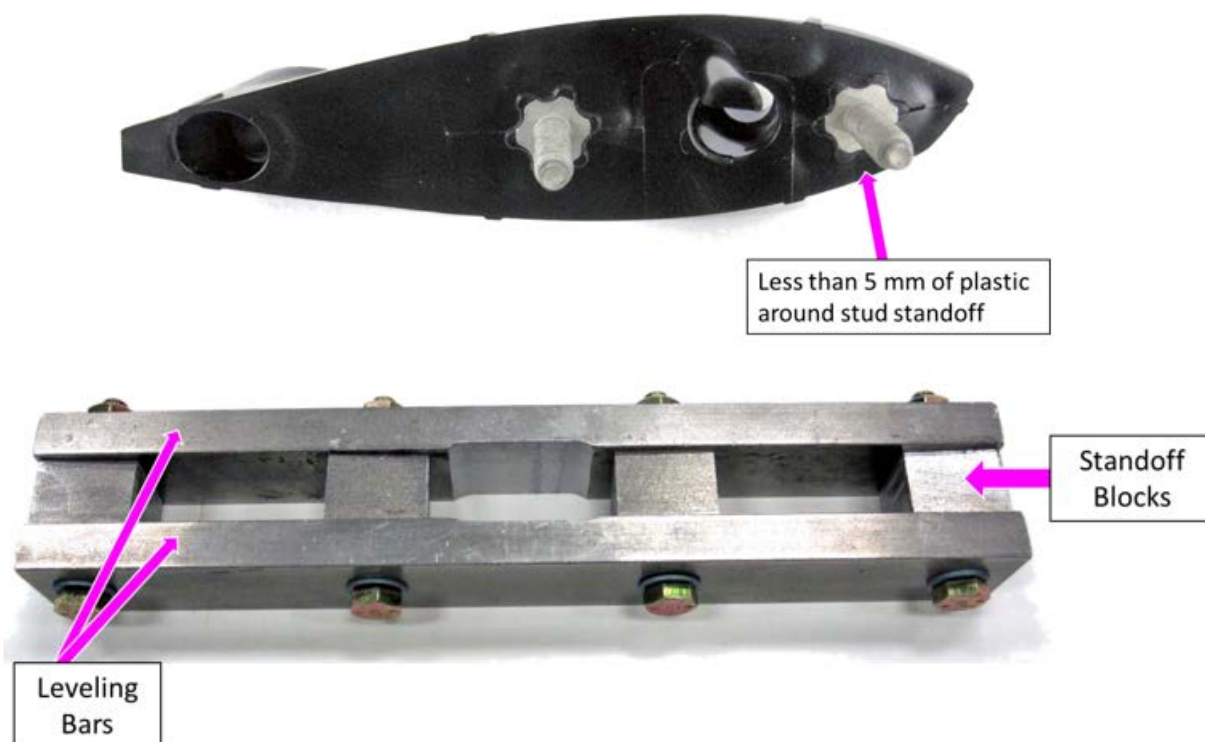


Figure 5: Top View of Test Setup Showing Metal Bars for Leveling

4.3.1.1.2 Method B (Complex Geometry).

4.3.1.1.2.1 Use leveling bars to support the spoiler sample as far from the stud as possible. Ensure the leveling bars are not overlapping the head of the stud. See Figure 6.



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