



Clinch Nut Assembly Performance Criteria

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 provides acceptance criteria for nuts clinched with or without prevailing torque features used in automotive products that GM is responsible for establishing or approving the product design. This standard covers only the clinch acceptance criteria. All other properties of the nut should be defined in the nut specification.

1.2 Applicability. This standard applies to clinch nut assembly performance criteria. The nuts may form their own hole or require a pre-pierced hole. The nuts may have prevailing torque feature.

1.3 Remarks.

1.3.1 A self-pierce-and-clinch nut is defined as an internally threaded fastener having a material piercing-punch feature along with anti-rotational and retention features, such that when pressed against the application sheet or plate material, the nut produces its own hole and engages the application material to become an integral part.

1.3.2 Clinch nut is defined as an internally threaded fastener along with anti-rotational and retention features such that when pressed against the application sheet or plate material with a pre-pierced hole, the nut engages the application material to become an integral part.

1.3.3 The criteria established in this standard becomes mandatory when referenced in an assembly or product drawing or math data. Deviation from the criteria provided in this standard must be identified on a drawing or other product engineering design document.

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

3 Test Preparation and Evaluation

3.1 Resources.

3.1.1 Facilities.

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. Not applicable.

3.1.2.1 Tightening tool or torque wrench with a peak value indicator.

3.1.2.2 Appropriate fixtures, bedplate, or slotted table.

3.1.2.3 Universal Testing Machine or axially applied force measuring device.

3.1.3 Test Vehicle/Test Piece. Either the production part or a test coupon of the same material and thickness could be used for testing. Typical coupon size is 50 mm x 50 mm $\leq$ M10, and 75 mm x 75mm for M12 and larger. The nut must be assembled using the nut manufacturer suggested process. Unless otherwise specified, a minimum of ten (10) samples are to be used for each procedure.

3.1.4 Test Time.

Calendar time: 2 d

Test time: 2 h

Coordination time: 4 h

3.1.5 Test Required Information. Not applicable.

3.1.6 Personnel/Skills. Test technician shall be qualified on the basis of appropriate education, training, experience, and/or demonstrated skills.

3.2 Preparation.

3.2.1 Unless otherwise specified in the test request, samples are to be tested in the as-received condition. This excludes any condition specifically caused by material storage or configuration (e.g., if debris falls into a threaded hole from laboratory rework, it is acceptable to blow debris out of holes).

3.2.2 Any modifications to parts, not specifically requested in the test request, which may affect test results, are to be documented in the test notes. All test configurations, parts and noted deviations to be approved prior to executing test.

3.3 Conditions.

3.3.1 Environmental Conditions. Not applicable.

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. Not applicable.

3.5 Data. See 4.1.

3.5.1 Provide statistical analysis of maximum torques and push out forces. Calculate averages, minimum values, maximum values, standard deviation and average-3 sigma values.

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. See 3.5.1.