

NAVISTAR, INC.		
Material, Parts, and Process Specifications (MPAPS)		NUMBER: MPAPS- FT-9548
		Former Designation: TMS-9548
TITLE: Assembly and Testing Procedures for Clinch Studs and Nuts		CURRENT REV No.: 1604
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<i>This specification may involve hazardous materials, equipment, and procedures. This specification does not purport to address all of the safety issues associated with its use. The user is responsible to consult appropriate safety and health practices and to determine the applicability of regulatory limits prior to use.</i>		
Change Notice: Released as MPAPS, editorial changes		

1.0 APPLICATION

This specification is applicable to all clinch type studs and nuts whose engineering drawings reference this specification for assembly and/or testing procedures and/or KCC requirements.

2.0 SCOPE

This specification covers the assembly and testing procedures for clinch studs and nuts. A quality plan and KCC values are included. Minimum values for the 'push-out' force and 'unsupported torsional resistance' for specific parts are shown on the engineering drawing for each NAVISTAR part number.

2.1 Restricted Chemical Substances

Effective January 1, 2007, all product supplied to the requirements of this specification must comply with the requirements of the MPAPS B-50 specification.

3.0 REFERENCE DOCUMENTS

Unless otherwise specified, the latest issue of all referenced standards shall apply. The following specifications, standards, and regulations are referenced in this specification:

Quality System Standard *ISO 9001 or TS-16949*
NAVISTAR Manufacturing Standard MS-D-13
NAVISTAR Eng. Design Standard A-16

CFR Title 29, Part 1910
MPAPS B-50

4.0 REQUIREMENTS

4.1 Assembly Procedure

Proper assembly of clinch type studs and nuts requires a lower backing die to support the workpiece and insure that the stud or nut is straight and centered in the hole. The upper insertion die or punch must be aligned perpendicular to the workpiece and centered over the hole and lower backing die. When the staking force is applied to the upper punch or insertion tool/die, the direction of the force should be perpendicular to the workpiece and lower backing die. The upper punch/die must be of a size to fully cover the clinch type nut or stud. The assembly procedure is tested and verified by the performance of torsional and push out tests. The clinch stud or nut is twisted off (torsional test) or pushed out of the workpiece.

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4.1.1 Example

An example of a clinch nut-installation tool is shown in Figure 1. Examples of test fixtures for the performance of the unsupported torsional load test and the push-out tests for studs and nuts are shown in Figures 2 through 5.

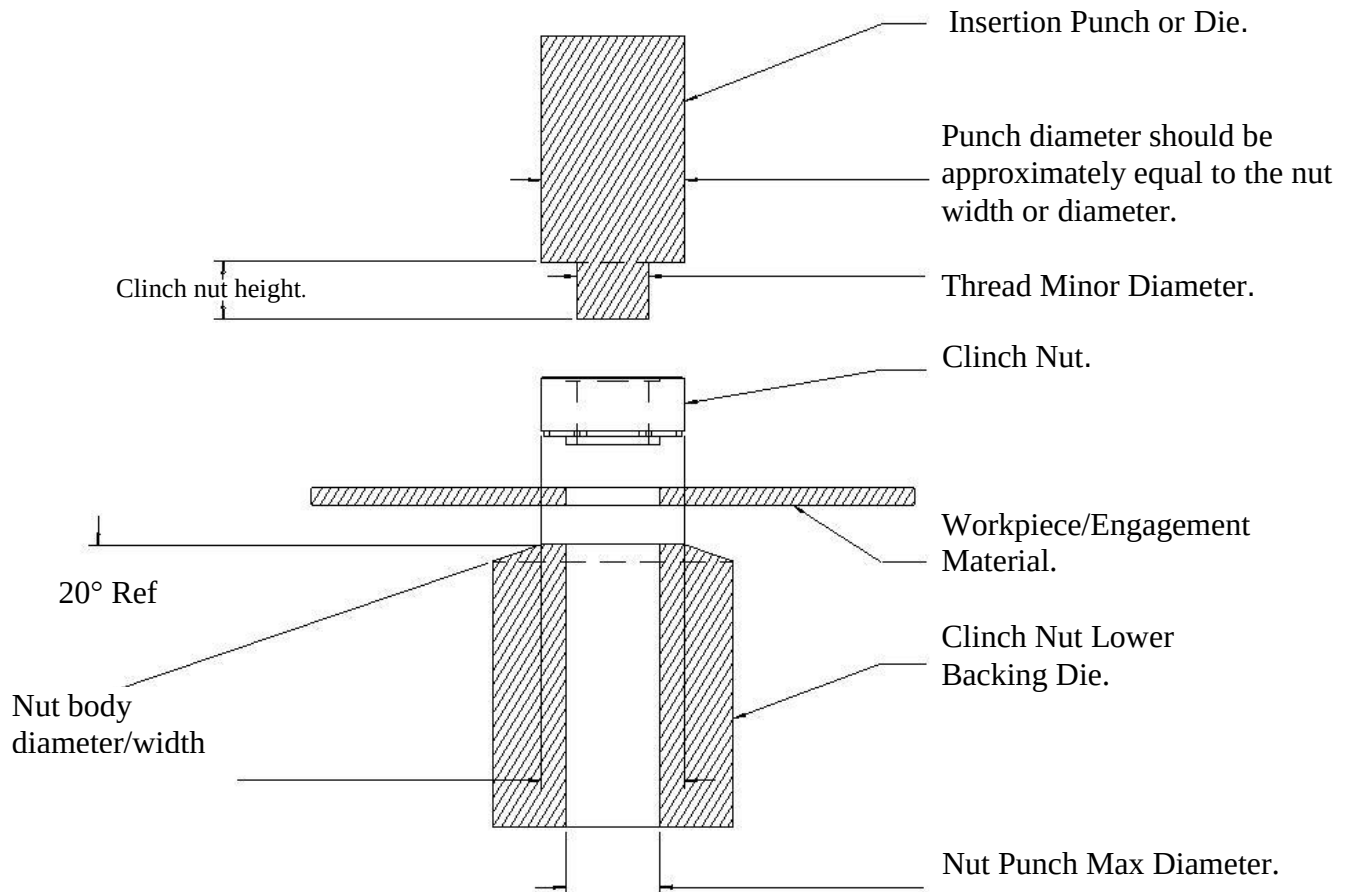


Figure 1: Typical Installation Tool
(An optional installation tool is shown in Figure 6 on Page 6)

4.2 Test Procedure

Each clinch type stud and nut part number, material, and material thickness combination shall be tested to verify the installation tooling and assembly procedure for that part number and material thickness combination. Sufficient testing shall be performed to fully define and establish control limits for those process parameters affecting the performance/strength of the clinch joint. Periodic testing during each production run shall be performed as required to demonstrate that the assembly process is both in-control and capable.

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