

NAVISTAR, INC.		
Material, Parts, and Process Specifications (MPAPS)		NUMBER: MPAPS F-1053 Former Designation: TMS-1053
TITLE: U-Bolts, High Strength		CURRENT REV. No.: 1404 DATE: April 2014
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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: Updated to new MPAPS format; revised Section 4.1 related to rolled threads; updated Section 4.2 on phosphate coating classification; revised Table 1 related to Type B elongation requirement; revised Table 2 related to Type B CDSR carbon level; updated Section 8.0 drawing designations; editorial changes.		
Reference: File 20-2C	Keywords: U-Bolts, high strength fasteners.	

1.0 APPLICATION

This specification covers two types (Type A and Type B) of high strength U-Bolts used to fasten springs, fifth wheels, tow loops, and similar parts, where higher clamp load capacity is required. Both types of U-Bolts can be provided as either quenched and tempered (Q&T) products or as cold-drawn and stress-relieved (CDSR) products. The new Type B U-Bolt exhibits higher strength properties.

1.1 Type A

Type A is the traditional **MPAPS F-1053** U-Bolt. It may be provided as either a Q&T or CDSR product. It provides high strength (equivalent to the obsolete SAE Grade 7) properties as indicated in Section 4.3. Type A U-bolts, CDSR, ¾" dia and smaller, will meet the mechanical property requirements of Grade 8.1 studs as shown in Table 1 for Type B material.

NOTE: For all existing Engineering drawings (and/or part numbers) that reference this specification without designating a material TYPE, Type A U-Bolt product shall be supplied, unless otherwise specified on the Engineering drawing as MPAPS F-1053 U-Bolt, Q&T, with SAE Grade 8.1 mechanical properties.

1.2 Type B

Type B is a new higher strength U-Bolt (having strength properties equivalent to SAE Grade 8.1) as indicated in Section 4.3. It may be provided as either a Q&T or CDSR product.

1.2.1 Restriction on Application of Type B

Application of the Type B material is restricted to the "round-top" series of U-Bolts, designated as STYLE 065 (See Eng. Dwg 453945C1). The Type B material shall not be applied to any of the "flat-top" series of U-Bolts designated as either STYLE 050 (see Eng. Dwg 453872C1) or STYLE 060 (see Eng. Dwg 453892C1). The Type B material shall not be provided for any U-Bolt part whose Engineering drawing does not specify U-Bolt Type B. All new Engineering drawings for U-Bolts must specify a bolt Type as: U-Bolt Type A or U-Bolt Type B.

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1.3 Preferred Manufacturing Process

Types A and B U-Bolts may be manufactured using either the Q&T or CDSR process. The CDSR process provides improved resistance to fatigue loading and is the preferred manufacturing process.

2.0 SCOPE

This specification covers the requirements for manufacture, coating, mechanical properties, microstructure, chemical composition, quality, quality plan and source approval and quality control. Recommended steel grades are given in Section A.0 - General Information.

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	The Society For Protective Coatings SSPC-VIS-2	ASTM F 606
CFR Title 29, Part 1910	NAVISTAR MPAPS B-50	ASTM B 117
NAVISTAR Manufacturing Standard MS-D-13	NAVISTAR TMS-4516	ASTM E 112
NAVISTAR Engineering Design STD. A-16	NAVISTAR MPAPS G-1	SAE J121
NAVISTAR MPAPS A-0, Part I	ASTM A 29	
NAVISTAR MPAPS F-31, Pt. I		

4.0 REQUIREMENTS

4.1 Manufacturing

U-Bolt material shall be either cold drawn stress relieved, or quench and temper (Q&T) heat treated, hot or cold rolled, medium carbon steel. The bolts may be formed hot or cold. However, if bolts are formed hot, they shall be quenched and tempered after the forming operation. A minimum tempering temperature of 370°C (700°F) shall be used in the heat treatment of bolts. U-Bolts shall have rolled threads. Rerolling of threads shall not be permitted. (Note: CDSR U-bolts must be stress relieved unless prior approval is given by Navistar Fastener Engineering.)

4.2 Coating

U-Bolts shall be phosphate coated on all surfaces in accordance with MPAPS G-1, Class Z-3, except coated parts shall be clean and dry to the touch when received by Navistar (should be shipped by supplier slightly wet). Coated U-bolts shall be subjected to a 96-hour salt spray test per ASTM B 117. Tested samples will be rated visually per SSPC-VIS 2 (The Society for Protective Coatings) to assign the appropriate "Rust Grade and Distribution"; a rating of Grade 9-G or better is required. To reduce embrittlement effects during the coating process, the use of acidic washes/cleaners should be avoided. Coated production U-bolts will be supplied to Navistar without any significant scratches, scrapes, or coating defects which might compromise the corrosion performance of the parts. Potential new suppliers of MPAPS F-1053 U-bolts will provide 5 production representative coated U-bolt samples to Navistar Fastener Engineering to validate the 96-hr corrosion performance.

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