NAVISTAR, INC.			
Material, Parts, and Process Specifications (MPAPS)		*NUMBER:* **MPAPS S-G-1.101-GS/PL**	
		Former Designation: **ESP-G-1.101-GS**	
TITLE: **Solid Rivets – English Series Not Recommended (Noun Code 7220)**		*CURRENT REV No.:* **1506**	*DATE:* **June 2015**
WRITTEN/EDITED BY: **Materials Engineering**	*APPROVED BY:* **Materials Engineering**	*SUPERSEDES:* **ESP-G-1.101-GS - December 2013**	
PRINTED COPIES OF THIS DOCUMENT MUST BE VERIFIED FOR CURRENT REVISION			
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.			
Change Notice: **Changed to New MPAPS format; Combined GI, GS, PP, NPP, NR.**			

1.0 GENERAL: This standard covers complete general and dimensional data for solid rivets recognized as ASME B18.1.1 for small rivets and ASME B18.1.2 for large rivets.

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3.0 NOMINAL SIZES: Most nominal sizes listed in this standard are listed in fractions. Other non-standard sizes of rivets having "Birmingham Wire Gage" numbers are shown on part number pages. These numbered sizes are not recommended for new design.

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4.0 TOLERANCES: The tolerances given on the dimensional pages are for rivets made by the normal cold heading process. Tolerances for hot heading or forging will be as agreed upon between the purchaser and supplier.

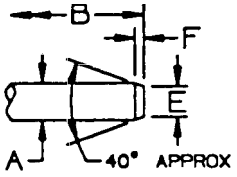
5.0 LENGTH TOLERANCES: Large rivet length tolerances are given below. Small solid rivets will have tolerance of ± .016.

Lengths	Rivet Diameter (in)	Length Tolerance (in)
Up to and Including 6 inches	1/2 and 5/8	±. 03
	3/4 and 7/8	±. 06
	1 and Larger	±. 09
Over 6 inches	1/2 and 5/8	±. 06
	3/4and 7/8	±. 12
	1 and Larger	± .19

6.0 HEADS: Because the heads of these rivets are not machined or trimmed, the circumference may be somewhat irregular and edges may be rounded or flat. Head dimensions reflected in the respective dimensional tables are applicable to rivets produced by the normal cold heading process.

7.0 UNDERHEAD FILLETS: Rivets other than countersunk types *will* be furnished with a definite fillet under the head; however, the radius of fillet will not exceed 10 percent of the maximum shank diameter or .03 inch whichever is the smaller for 7/16 inch nominal diameter and smaller, or will not exceed .062 inch for ½ nominal diameter and larger.

8.0 POINTS: Unless otherwise specified, rivets covered in this standard *will* have plain sheared ends. Ends will be at right angles, within 2 degrees, to the axis of the rivet and the end will be reasonably flat, sufficient for the purposes of driving that end satisfactorily. Where so specified by user, small solid rivets having standard header points (die pointing) will be obtainable at additional cost per specification below.



Dimensions in inches:

A Nominal Size	E Diameter of Point	F Length of Point	B Nominal Length of Shank
3/32	.077	.023	3/4
1/8	.102	.031	3/4
5/32	.127	.039	1
3/16	.154	.047	1
7/32	.179	.055	1- 3/8
1/4	.204	.062	1- 3/8
9/32	.230	.070	1- 1/2
5/16	.255	.078	1- 1/2
11/32	.281	.086	1- 5/8
3/8	.307	.094	1- 5/8
7/16	.358	.110	3

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9.0 MATERIALS: Carbon steel rivets listed here for the various head styles will be SAE Grade 0 (per SAE J430). For assembly reasons, additional requirements, such as killed fine grain steel, may be needed. Such additional requirements will be specified when the rivets are ordered. SAE 1006 and 1008 killed fine grain steels are preferred and used by most manufacturers and can be processed to meet the requirements specified by SAE Grade 0. Solid rivets will be annealed as specified to remove the effects of cold working and will rivet without cracking.

Corrosion resistant steel rivets require not less than 12 percent chromium content and after processing passivation per MPAPS A-37 Type 5.

Brass and copper rivets will be commercial grade, annealed. Tests for rivets of unannealed steel, brass, copper, and corrosion resistant steel will be as agreed upon between purchaser and supplier.

MECHANICAL AND CHEMICAL PROPERTIES OF CARBON STEEL RIVETS

SAE Grade	Tensile Properties of Rod or Bar from Which Rivets are Produced			Chemical Composition Ladle Analysis, Percent Max		Heat Treatment of Rivets
	Tensile Strength, psi	Yield Point, Min, psi	Elongation in 8 inches Min, Percent	Phosphorus	Sulphur	
0	40,000-55,000	23,000	27	.040	.050	Rivets for cold driving will be fully annealed to Rockwell B65 HRB max.

10.0 FINISHES: As designated by part number, rivets will be furnished plain, plated or coated to accordance with NAVISTAR Engineering Material Specification and class listed below. Because of the physical damage inflicted on a rivet finish during the process of riveting, a plain finish is preferred to a plated or coated finish in most cases.

Zinc Trivalent, Class 6A (ZN6A) on steel – MPAPS G-20, Class 6A.
Phosphate Coating (PHC) – MPAPS G-1, Class B-1.
Tin Plating (TIN) on steel requires a tin deposit of .0001 minimum.

11.0 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.

12.0 POLICY FOR SELECTING PARTS FOR NEW DESIGN: Head Styles: Button Head, 90 and 78 degrees Countersunk, Flat Head

For new design, parts shall be selected from "Approved" part list only.

Material: Annealed SAE 1008 steel (STL).
Nominal Sizes: Small Solid Rivets - 1/16 inch increments
Large Rivets - 1/8 inch increments

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