

NAVISTAR, INC.		
Material, Parts, and Process Specifications (MPAPS)		NUMBER: MPAPS S-B-10.101-GS/PL
		Former Designation: ESP-B-10.101-GS
TITLE: Square Head Machine, Carriage, Step, Plow and Fin Neck Carriage Bolts – English Series (Noun Code 0810)		CURRENT REV No.: 1506
		DATE: June 2015
WRITTEN/EDITED BY: Materials Engineering	APPROVED BY: Materials Engineering	SUPERSEDES: ESP-B-10.101-GS - August 2006
PRINTED COPIES OF THIS DOCUMENT MUST BE VERIFIED FOR CURRENT REVISION		
<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: Changed to New MPAPS format; Combined GS, PP, NPP.		

1.0 GENERAL: Square Head Machine Bolts, Carriage Bolts, Step Bolts, and Plow Bolts in Section B conform essentially with American National Standard ANSI B 18.5.

The Patent Head Bolt is peculiar to NAVISTAR and is not recognized by the American National Standards Institute.

Short Square Neck Carriage Bolts are limited to lengths up to and including 1-1/2 inches.

Square Neck Carriage Bolts are generally limited to lengths over 1-1/2 inches.

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3.0 POLICY FOR SELECTING PARTS FOR NEW DESIGN: Approved parts are so designated to reduce variety of parts and assure maximum availability, interchangeability and cost savings in volume buying.

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

3.1 All Except Plow Bolts

Material: MPAPS F-31, Part I, Type 5
Finish: Zinc Trivalent with Sealer (ZN8F) per MPAPS G-20, Class 8F
Phosphate Coating (PHC) per MPAPS G-1, Class B2
Nominal Sizes: 1/4, 5/16, 3/8, 1/2, 5/8, 3/4, and 1
Lengths: All Diameters - 1/4 Inch Increments thru 4 Inches
1/4 and 5/16 Diameters 1/2 Inch Increments - 4 thru 7 Inches
1 Inch Increments - Over 7 Inches
3/8 thru 1 Diameters 1/2 Inch Increments - 4 thru 9 Inches
1 Inch Increments - Over 9 Inches
All preferred lengths beyond the 7 and 9 inch ranges indicated above will be carried in the "Not for New Design" section because of limited usage.

3.2 Plow Bolts

Head Style: #3
Material: MPAPS F-31, Part I, Type 8
Finish: Zinc Trivalent with Sealer (ZN8F) per MPAPS G-20, Class 8F
Nominal Sizes: 5/16, 3/8, 7/16, 1/2, and 5/8
Lengths: Same as above

4.0 SERVICE PARTS SUBSTITUTION POLICY: In the event that engineering does not indicate a "Do not substitute" in engineering specifications, the following substitutions may be implemented in service. This policy is the result of proposal circulated April 20, 1981, and subsequently approved by engineering departments worldwide.

4.1 Short and Regular Neck Carriage Bolts:

To be Replaced	Service Replacement
MPAPS F-31, Part I, Type 1, material with Plain (PLN), Phosphate Coated (PHC) or Zinc with Chromate (ZN8F) finishes.	MPAPS F-31, Part I, Type 5 material with Zinc Trivalent with Sealer (ZN8F) finish or MPAPS F-31, Part I, Type 1 material with Zinc Trivalent with Sealer (ZN8F) finish (if type 5 material is not set up for service).
MPAPS F-31, Part I, Type 5 material with Plain (PLN) finish	MPAPS F-31, Part I, Type 5 material with Zinc Trivalent with Sealer (ZN8F) finish.

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4.2 Plow Bolts

To Be Replaced	Service Replacement
MPAPS F-31, Part I, Type 1 material with Plain (PLN) finish.	MPAPS F-31, Part I, Type 1 material with Zinc Trivalent with Sealer (ZN8F) finish or MPAPS F-31, Part I, Type 8 material with Zinc Trivalent with Sealer (ZN8F) finish if set for service.
MPAPS F-31, Part I, Type 5 material with Plain (PLN) finish.	MPAPS F-31, Part I, Type 8 material with Zinc Trivalent with Sealer (ZN8F) finish.
MPAPS F-31, Part I, Type 8 material with plain (PLN) finish.	MPAPS F-31, Part I, Type 8 material with Zinc Trivalent with Sealer (ZN8F) finish.

5.0 MISCELLANEOUS DIMENSIONS AND TOLERANCES:

5.1 Head Periphery: Because the heads on these products normally are not machined or trimmed, the circumference may be somewhat irregular and the edge may be rounded or flat.

5.2 Swell of Fin: A swell or fin under the head or under corners of square neck will be permissible providing it does not affect serviceability, nor exceed the basic bolt diameter by more than the following:

- .030 inch for sizes up to and including 1/2 inch.
- .050 inch for sizes over 1/2 to 3/4 inches, inclusive.
- .063 inch for sizes over 3/4 to 1-1/4 inches, inclusive.
- .093 inch for sizes over 1-1/4 inches.

5.3 Tolerance on Length (Except Plow Bolts):

Nominal Bolt Sizes	1/4 thru 3/8	7/16 and 1/2	9/16 thru 3/4	7/8 and 1
Nominal Bolt Length	Tolerance on Length			
Up to 1 inch, incl	+.02	+.02	+.02	--
	-.03	-.03	-.03	--
Over 1 inch to 2-1/2 inches, incl.	+.02	+.04	+.06	+.08
	-.04	-.06	-.08	-.10
Over 2-1/2 inches to 4 inches, incl.	+.04	+.06	+.08	+.10
	-.06	-.08	-.10	-.14
Over 4 inches to 6 inches, incl.	+.06	+.08	+.10	+.12
	-.10	-.10	-.10	-.16
Over 6 Inches	+.10	+.12	+.14	+.16
	-.18	-.18	-.18	-.20

5.4 Tolerance on Length - Plow Bolts (6 Inches and Under):

1/4 to 3/8 incl	Sizes 7/16 to 1/2 incl	Sizes 5/8 to 1 Inch
± .031	± .062	± .125

Bolts over 6 inches will have a length tolerance of ± .187.

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