NAVISTAR, INC.			
Material, Parts, and Process Specifications (MPAPS)		*NUMBER:* **MPAPS S-C-29.101-GS/PL**	
		Former Designation: **ESP-C-29.101-GS**	
TITLE: **Flanged 12- Point Screws – English Series (Noun Code 7450)**		*CURRENT REV No.:* **1506**	*DATE:* **June 2015**
WRITTEN/EDITED BY: **Materials Engineering**	*APPROVED BY:* **Materials Engineering**	*SUPERSEDES:* **ESP-C-29.101-GS - February 2011**	

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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 GS, PP, NPP.**

1.0 GENERAL: This standard conforms essentially with the SAE J58 Standard for Flanged 12-Point Screws, with the notable exception of material.

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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.

Finishes: Phosphate Coated (PHC)

Material: Navistar Type 9
Threads: Unified Coarse
Diameters: 1/4, 5/16, 3/8, 1/2, 5/8, 3/4, 1, 1-1/4, and 1-1/2
Lengths: All diameters - 1/4 inch increments thru inches.

1/4 and 5/16 diameters	1/2 inch increments - 4 thru 7 inches 1 inch increments - over 7 inches
3/8 thru 1-1/2 diameters	1/2 inch increments - 4 thru 9 inches 1 inch increments - over 9 inches

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 a proposal circulated April 20, 1981, and subsequently approved by engineering departments worldwide.

Flanged 12-Point Screws

To Be Replaced	Service Replacement
Plain (PLN) Finish	Phosphate Coated (PHC) Finish

5.0 TOP OF HEAD: The top of head may be full form or indented at the option of the manufacturer. If full form, the top of head will be chamfered or rounded with the diameter of chamfer circle or start of rounding being equal to the specified maximum width across flats within a tolerance of -15%. If the top of head is indented, the periphery may be rounded.

6.0 CORNER FILL: The rounding due to lack of fill at all 12 corners of the head will be reasonably uniform and the width across corners of the head be such that when a sharp ring, having an inside diameter equal to the "T" dimension and a thickness within the limits for "A" specified in dimensional table, is placed on the top of the head, normal to the screw axis, the head may enter but will not protrude through the gage.

7.0 WRENCHING HEIGHT: The wrenching height will be measured, parallel to the axis of screw, from the intersection of the top contour of flange with any corner of head to the top of the head.

8.0 BEARING SURFACE: The outer periphery may be rounded or chamfered to the extent permitted by "X," as measured on the bearing face. The plane of the bearing face will be perpendicular to the axis of screw within the runout limit specified in dimensional table. Measurement of runout will be made as close to the periphery of bearing face as possible while the screw is held in a collet or other gripping device at a distance equal to one screw diameter from the underside of the head.

9.0 LENGTH: The length of the screw (L) will be measured on a line parallel to the axis, from the plane of the bearing surface under the head, to the plane of the flat of the point. The tolerances for length are as follows:

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Nominal Screw Size	0 thru 3/8	7/16 thru 3/4	7/8 thru 1-1/2
Nominal Screw Length, in	Tolerance on Length		
Up to 1, incl	-.03	-.03	-.05
Over 1 to 2-1/2, incl	-.04	-.06	-.10
Over 2-1/2 to 6, incl	-.06	-.08	-.14
Over 6	-.12	-.12	-.20

10.0 BODY DIAMETER: On screws threaded full length, the diameter of the screw under the head will not be less than the specified minimum pitch diameter of the thread.

11.0 THREADS: Unified coarse or fine series (UNC or UNF), Class 3A limits will apply.

12.0 LENGTH OF THREAD: The length of thread on screws will be controlled by grip length LG max and the body length LB min as set forth in the following:

12.1 Grip Gaging Length - LG max is the distance, measured parallel to the axis of screw, from the underside of head to the face of a noncounterbored or nonchamfered standard GO thread ring gage assembled by hand as far as the thread will permit. It represents the minimum design grip length and will be used as the criterion for inspection and for determining thread availability when selecting screw lengths even though usable threads may extend beyond this point. Values for LG max applicable to common nominal screw lengths are shown in Table 1.

For screws having nominal lengths which fall between those tabulated in Table 1, the LG max value shown for the next shorter tabulated nominal length and respective screw size will apply.

For screws having nominal lengths longer than those specified in Table 1 for the respective screw size, the LG max value will be determined by subtracting the LT value from the nominal screw length.

For screws having shorter nominal lengths than those specified in Table 1 for the respective screw size, the complete (full form) thread, as measured with a thread ring gage, will extend to within two threads (pitches) of the bearing face for sizes up to and including 5/8 in, and as close to the head as practicable for larger sizes.

12.2 Body Length - LB min is the distance, measured parallel to the axis of screw, from the underside of the head to the last scratch of thread or the top of extrusion angle. The minimum body length for any screw length will be equal to the maximum grip length minus the transition thread length (LB min = LG max - Y max). It will be used as a criterion for inspection.

12.3 Basic Thread Length - LT is a reference dimension, intended for calculation purposes only, which represents the distance from the extreme end of the screw to the last complete (full form) thread.

12.4 Transition Thread Length - Y max is a reference dimension, interviewed for calculation purposes only, which represents the length of incomplete threads and the tolerance on grip length.

12.5 Point - The point will be flat and chamfered from a diameter approximately .016 inch below the minor diameter of thread to produce a length of point equivalent to 1/2 to 1-1/2 threads (pitches).

12.6 Incomplete Thread Diameter - The major diameter of incomplete thread will not exceed the actual major diameter of the full form thread.

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