

NAVISTAR, INC.		
Material, Parts, and Process Specifications (MPAPS)	NUMBER: MPAPS S-M-2.101-GS/PL	
	Former Designation: ESP-M-2.101-GS	
TITLE: Automotive Pipe Plugs and Filler Drain Plugs English Series (Noun Code 6400)	CURRENT REV No.: 1506	DATE: June 2015
WRITTEN/EDITED BY: Materials Engineering	APPROVED BY: Materials Engineering	SUPERSEDES: ESP-M-2.101-GS - August 2006
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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: Changed to New MPAPS format; Combined GS, PP, NPP.		

1.0 GENERAL: This standard conforms to SAE Standard J531 and covers specifications and dimensions for those types of pipe, filler and drain plugs having tapered pipe threads which are commonly used in automotive and related industrial applications.

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3.0 MISCELLANEOUS DIMENSIONS AND TOLERANCES: The tabulated dimensions will apply to the finished parts, plated, hardened or otherwise processed or specified by the purchaser. Maximum taper on head of square head plugs will be minus four degrees total. Tolerance on dimensions not otherwise limited will be plus and minus .010 inch.

The minimum across corners dimensions of external hexagons will be 1.092 times the nominal width across flats. The minimum across corners dimensions of external squares will be 1.25 times the nominal width across flats, but will not result in a side flat width of less than .75 times the nominal width across flats. At maximum material condition, the radii at corners of hexagon and square sockets in broached and upset plugs will not exceed .005 inch.

4.0 THREADS: The pipe threads on Automotive Pipe Plugs, unless there is specific authorization to the contrary, will conform with the Dryseal American Standard Taper Pipe Thread (NPTF) and be gaged accordingly. The Automotive Pipe Plug dimensions are based on the length of the (NPTF)

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thread and are intended for assembly with all types of Dryseal Taper and Straight Internal Pipe Threads. It is the consensus of manufacturers and users that trouble-free assembly and pressure-tight joints without lubricant or sealer cannot be assured unless a full length of thread is used.

The pipe threads on Automotive Filler and Drain Plugs, unless there is specific authorization to the contrary, will conform with the Dryseal SAE Short Taper Pipe Thread (PTF-SAE Short) and be gaged accordingly. The Automotive Filler and Drain Plug dimensions are based on the length of the (PTF-SAE Short) thread and are primarily intended for assembly with Dryseal American Standard Taper (NPTF) or Dryseal American Standard Intermediate Straight (NPSI) internal pipe threads in installation where it is desirable to limit the entry of the small end of the plug. Limitation on other applications of this thread are explained in the SAE Dryseal Pipe Thread Standard.

Pipe threads will be chamfered or rounded to the closest 1/64 inch diameter smaller than the minor diameter within a tolerance of minus .016 inch to produce approximately one incomplete thread and not to exceed one and one-half incomplete threads.

The pipe threads on square and hexagon socket plugs will be full or complete for the overall length specified and will be chamfered on both ends.

Specifications for Dryseal pipe threads and related specifications covering blank sizes, dies or chasers, gages, gaging, etc., are given in detail in the SAE Dryseal Pipe Thread Standards.

Sealant Coating: All fittings that have external pipe threads will be furnished with a pre-applied sealant coating on the pipe threads that meets the requirements of CEMS D-31.

5.0 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.

Material:	Brass (BRS)
Finish:	Plain (PLN)
Design:	Hex

6.0 MATERIAL: Plugs may be made by casting, forging, milling from the bar or upsetting from a grade of material free from defects that might affect their serviceability. Material will be as designated by part number per the specification called for below:

Steel (STL) - Free-machining steel with 0.30% maximum carbon content.

Malleable Iron (MI) - ASTM-A197 or equivalent.

Aluminum (AL) - Aluminum Association AA2011-T3, 2024-T351, 6061-T651 per MPAPS C-10.

Cast Iron (CI) - CEMS E-6 - Gray Iron, Grade 25-S.

7.0 FINISHES: As designated by part number, parts will be furnished plain, plated or coated in accordance with MPAPS and class listed below:

Plain (PLN)
Zinc Trivalent (ZN6A) – MPAPS G-20, Class 6A
Phosphate Coating (PHC) – MPAPS G-1, Class 2

8.0 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.

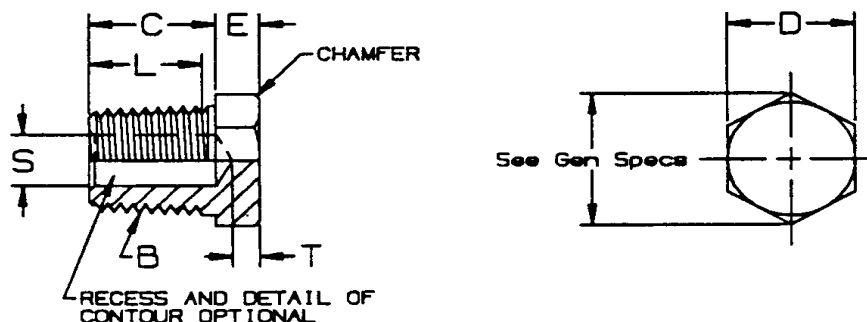
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9.0 WORKMANSHIP: Parts will be free from burrs, loose scale, sharp edges, eccentricity of diameters and all other defects that may affect their serviceability.

10.0 AUTOMOTIVE HEXAGON HEAD PIPE PLUGS AND FILLER AND DRAIN PLUGS (NOUN CODE – 6400):



10.1 Part List:

10.1.1 Approved:

Dimensions in Inches:

PIPE PLUGS								
B	Dryseal Thread (NPTF)	1/16-27	1/8-27	1/4-18	3/8-18	1/2-14	3/4-14	1-11-1/2
C	Shoulder Length	.37	.37	.56	.56	.75	.75	.94
L	Full Thread Length	.30	.30	.46	.46	.61	.62	.77
D	Head Width, Max	.315	.440	.565	.690	.877	1.065	1.315
	Head Width, Min	.304	.428	.551	.674	.860	1.044	1.292
E	Head Thickness, Max	.162	.194	.194	.227	.227	.323	.323
	Head Thickness, Min	.151	.181	.181	.212	.212	.304	.304
S	Recess Diameter, Max	.10	.16	.25	.38	.50	.69	.88
T	Wall Thickness, Min	.09	.12	.12	.16	.16	.19	.19
Material & Finish		PART NUMBERS						
	Brass Plain (PLN)		444614	20988R1	20990R1	444632	444638	444644
	Steel Zinc Trivalent (ZN6A)		444613	444619				
	Steel Plain (PLN)			444618	444624	444630	444636	444642

Dimensions in Inches:

FILLER AND DRAIN PLUGS								
B	Dryseal Thrd (PTF-SAE Short)	1/16-27	1/8-27	1/4-18	3/8-18	1/2-14	3/4-14	1-11-1/2
C	Shoulder Length	.32	.32	.49	.49	.64	.65	.81
L	Full Thread Length	.26	.27	.41	.41	.53	.55	.69
D	Head Width, Max	.315	.440	.565	.690	.877	1.065	1.315
	Head Width, Min	.304	.428	.551	.674	.860	1.044	1.292
E	Head Thickness, Max	.162	.194	.194	.227	.227	.323	.323
	Head Thickness, Min	.151	.181	.181	.212	.212	.304	.304
S	Recess Diameter, Max	.10	.16	.25	.38	.50	.69	.88
T	Wall Thickness, Min	.09	.12	.12	.16	.16	.19	.19
Material & Finish		PART NUMBERS						
	Brass Plain		444814			28641R1		

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