NAVISTAR, INC.			
Material, Parts, and Process Specifications (MPAPS)		*NUMBER:* **MPAPS S-L-9.101-GS/PL**	
		Former Designation: **ESP-L-9.101-GS**	
TITLE: **Spherical Sleeve (Compression) Tube Fittings-English Series (Noun Code 3300)**		*CURRENT REV No.:* **1506**	*DATE:* **June 2015**
WRITTEN/EDITED BY: **Materials Engineering**	*APPROVED BY:* **Materials Engineering**	*SUPERSEDES:* **ESP-L-9.101-GS - September 2000**	

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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.**

1.0 GENERAL: This standard is in accordance with SAE J246 and is intended for general use with annealed copper alloy tubing. These fittings have been used extensively with copper tubing in the piping of air brake systems on commercial vehicles. To assure satisfactory performance, tapered sleeve compression type fitting components should not be intermixed with spherical sleeve compression type fitting components when assembling connections in areas where both types are available.

2.0 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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4.0 DIMENSIONS AND TOLERANCES: The tabulated dimensions will apply to the finished parts, plated or otherwise processed as designated by part number. Unless otherwise specified, tolerance on hole diameters designated "Drill" in the dimensional tables will be as tabulated below:

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Drill Size Range	Tolerance	
in	Plus in	Minus in
.0135 - .1850	.003	.002
.1875 - .2480	.004	.002
.2500 - .7500	.006	.003
.7579 - 1.0000	.007	.004

Maximum and minimum across flats dimensions will be within commercial tolerances of bar or extruded material from which the parts are made. The minimum across corners dimensions of hexagons will be 1.092 times the nominal width across flats but will not result in a side flat width less than .43 times the nominal width across flats. Tolerance on all dimensions not otherwise limited will be plus or minus .010 inch. Fitting seats must be concentric with straight thread pitch diameters within .010 inch full indicator movement (FIM) and seating surfaces will be smooth except that annular tool marks up to 100 micro inches maximum will be permissible.

5.0 CONTOUR: Details of contour will be optional with manufacturer. Wrench flats on elbows and tees will be optional.

6.0 PASSAGES: Where straight fittings are machined from opposite ends, an offset of .015 inch will be permissible at the meeting point. On angle fittings, the cross sectional area at the junction of the passages will not be less than the cross sectional area of the smallest passage.

7.0 WALL THICKNESS: The wall thickness at any point on the fitting will not be less than the thickness established by the dimensions and tolerances for inside and outside diameters and eccentricities specified in the tables.

8.0 STRAIGHT THREADS: Unified Standard Class 2A external threads and Class 2B internal threads will apply to fittings of all types. Special diameter pitch combination will be based on diameter pitch and a length of engagement of 9 times the pitch.

For straight thread eccentricity tolerances, see MPAPS S-L-1.101-GS/PL.

Where external threads are produced by roll threading and the body is not undercut, the unthreaded portion of body adjacent to the shoulder may be reduced to the minimum pitch diameter.

Internal threads will be countersunk 90° included angle to the diameters specified.

9.0 PIPE THREADS: Unless there is specific authorization to the contrary, the pipe threads will conform with the Dryseal American National Standard Taper Pipe Thread (NPTF), except as hereinafter noted.

Due to design limitations, the tap drill depth for internal pipe threads in tube fittings is less than the standard Dryseal practice. The depths specified in the preceding tables necessitate the use of bottoming taps to produce full form thread lengths conforming with the (NPTF) standard.

External pipe threads will be chamfered to the diameters specified to produce a length of chamfered or partial thread equivalent to 3/4 to 1-1/4 times the pitch (rounded to a three place decimal).

Internal pipe threads will be countersunk 90° included angle to the diameter specified.

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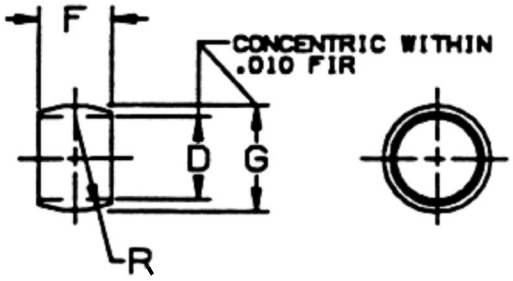
Specifications for Dryseal pipe threads and related specifications covering blank sizes, blind hole depth, pipe taps, chasers, tap drills, gages, etc., are given in detail in the SAE handbook.

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.

10.0 MATERIAL: Fittings will be brass (BRS) at manufacturer's option, and in accordance with his process of manufacture, they may be milled from the bar, cast or forged. Brass will be CDA 360 (half hard), CDA 345 or CDA 350 for bar or extruded stock; CDA 377 for forgings; and ASTM B145 alloy 5A or equivalent except the zinc content limited to 16% maximum for castings. However, it is recommended that cast fittings in sizes below 5/8 tube OD not be used for critical applications. Sleeves will be made from CDA 360 brass and annealed to a maximum hardness of Rockwell R70.

11.0 DIMENSIONS AND PART LIST:

11.1 Spherical Sleeve (Noun Code – 9560):

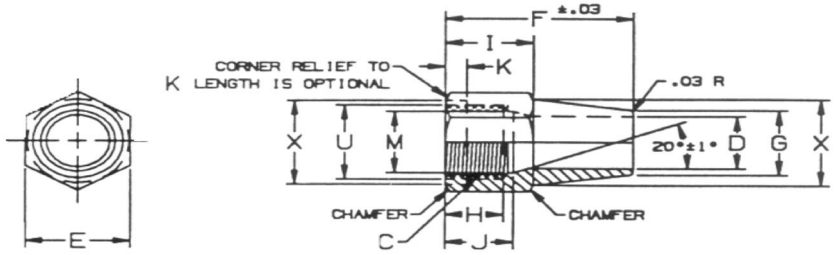


11.1.1 Approved:

Dimensions in inches:

	Tubing O.D	1/4	5/16	3/8	1/2	5/8	3/4	1
D	**Diameter, Max**	.257	.320	.384	.509	.634	.760	1.010
	Diameter, Min	.253	.316	.380	.505	.630	.756	1.006
G	**Diameter, Max**	.324	.390	.463	.596	.736	.876	1.154
	Diameter, Min	.320	.386	.459	.592	.732	.872	1.150
F	**Length ± .005**	.250	.281	.313	.375	.438	.500	.626
R	**Radius, Max**	.316	.362	.408	.502	.597	.690	.877
	Radius, Min	.312	.358	.404	.498	.593	.686	.873
Part Numbers-BRS,PLN		30774V		30644V		55896R1	76263H	

11.2 Spherical Sleeve Nut (Noun Code – 5780):



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