

NAVISTAR, INC.		
Material, Parts, and Process Specifications (MPAPS)	NUMBER: MPAPS S-N-5.101-GS/PL	
	Former Designation: ESP-N-5.101-GS	
TITLE: Retaining Rings - Tapered, Reduced Cross Section and Special Retaining Ring (Noun Code – 7175) - English Series	CURRENT REV No.: 1506	DATE: June 2015
WRITTEN/EDITED BY: Materials Engineering	APPROVED BY: Materials Engineering	SUPERSEDES: ESP-N-5.101-GS - April 2011
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, CR.		

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2.0 MATERIAL: The standard material for retaining rings will be carbon steel within a range of SAE 1060 to 1090 with a hardness range of RC 44 to 53 and tensile strength of 211,000 to 280,000 depending on size.

Special materials are identified on dimensional and part numbers pages with material abbreviations immediately following the size number.

3.0 FINISH: The standard finish will be plain with oil dip or phosphate coated. Finishes other than plain are identified on dimensions and part number pages with finish abbreviations immediately following the size number.

4.0 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.

5.0 POLICY FOR SELECTING PARTS FOR NEW DESIGN: It is recommended that for all new design, every effort should be made to select a carbon steel ring with plain finish or phosphate coating of the following thicknesses:

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

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Retaining Rings		Retaining Ring Grooves	
Thickness	Tolerance	Width	Tolerance
.025	±.002	.029	+.003 - .000
.035	±.002	.039	+.003 - .000
.042	±.002	.046	+.003 - .000
.050	±.002	.056	+.004 - .000
.062	±.003	.068	+.004 - .000
.078	±.003	.086	+.005 - .000
.093	±.003	.103	+.005 - .000
.109	±.003	.120	+.005 - .000
.125	±.004	.139	+.006 - .000
.156	±.005	.174	+.008 - .000
.188	±.005	.207	+.008 - .000
.250	±.006	.270	+.009 - .000

6.0 INSIDE RADII OF GROOVES:

Series	Size Number	Radii Max
5000	25 thru 100 102 thru 1000	.005 .010
5100	12 thru 23 25 thru 35 37 thru 100 102 thru 200	Sharp Corners .003 .005 .010
5002	100 thru 200 206 thru 1000	.005 .010
5102	100 thru 200 206 thru 1000	.005 .010
5008	75 thru 100 106 thru 400	.005 .010
5108	50 thru 100 106 thru 400	.005 .010
5103	12 thru 43 46 thru 100 112 thru 200	.005 .010 .015

Series	Size Number	Radii Max
5107	46 thru 98 112 thru 200 212 thru 337	.005 .010 .015
5131	11 thru 25 31 thru 43 50 and over	.005 .010 .015
5133	4 thru 6 9 thru 25 31 thru 43 50 thru 137	Sharp Corners .005 .010 .015
5139	9 thru 25 31 thru 43	.005 .010
5144	9 thru 25 31 thru 43 50 thru 56	.005 .010 .015
5160	39 thru 98 106 thru 200	.005 .010

7.0 WORKMANSHIP: Retaining rings will be free from burrs, rust, pit marks, and all defects which might affect their serviceability.

Note: Vendors will eliminate from shipment all rings which have been subject to hardness identifications tests. See Section 9.0 for location of retaining rings by vendor number.

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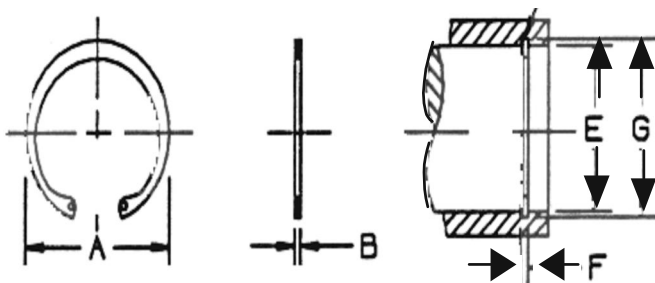
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8.0 APPROVED PART LIST:

8.1 Basic, Internal (Series N5000) **



ize Number	Housing Diameter	Ring Dimensions				Groove Dimensions				Part Number	
		Free Diameter		Thickness		Diameter		Width			
	E	A	Tol	B	Tol	G	Tol	F	Tol		
25	.250	.280	+.010 -.005	.015	±.002	.268	±.001	.018	+ .002	321298R1	
31	.312	.346		.015		.330	.0015 FIM	.018	- .000		
37	.375	.415		.025		.397	±.002 .002 FIM	.029	264038R1		
37 (BLO)	.375	.415		.027		.397		.029			
43	.438	.482		.025		.461	.029	±.002 .004 FIM		.039	336919R1
50	.500	.548		.035		.530	.039				
56	.562	.620		.035		.596	.039				
62	.625	.694		.035		.665		.039			
68	.688	.763	+.015 -.010	.035	±.002	.732		.039	+.003 -.000	55163R1 243019R1	
75	.750	.831		.035		.796	.039				
77	.777	.859		.042		.825	.046				
81	.812	.901		.042		.862	.046				
86 (SST)	.866	.961		.042		.920	.046				
87	.875	.971		.042		.931	.046				
90	.901	1.000		.042		.959	.046				
90 (ZN6A)	.901	1.000		.044		.959	.046				
93	.938	1.041		.042		1.000	.046				
100	1.000	1.111		.042		1.066	.046				
102	1.023	1.136		.042		1.091	.046				
106	1.062	1.180		+.025 -.020		.050	1.130	.056	+.004 -.000	338835R1 228275R1	
112	1.125	1.249				.050	1.197	.056			
118	1.188	1.319				.050	1.262	.056			
118 (BLO)	1.188	1.319	.052		1.262	.056					
125	1.250	1.388	.050		1.330	.056					
131	1.312	1.456	.050		1.396	*.056					
137	1.375	1.526	+.035 -.025	.050	1.461	.056	+ .004 - .000	273026R1			
143	1.438	1.596		.050	1.528	.056					
145	1.456	1.616		.050	1.548	.056					
150	1.500	1.660		.050	1.594	.056					
156	1.562	1.734		.062	1.658	.068					
162	1.625	1.804		.062	1.725	.068					
165	1.653	1.835		.062	1.755	.068					
168	1.688	1.874		.062	1.792	.068					
175	1.750	1.942	± .003	.062	1.858	.068	272842R1				
181	1.812	2.012		.062	1.922	.068					
185	1.850	2.054		.062	1.962	.068					
187	1.875	2.072		.062	1.989	.068					
193	1.938	2.141		.062	2.056	.068					
200	2.000	2.210		.062	2.122	.068					
									133213R1		
									299470R1		
							376219R1				

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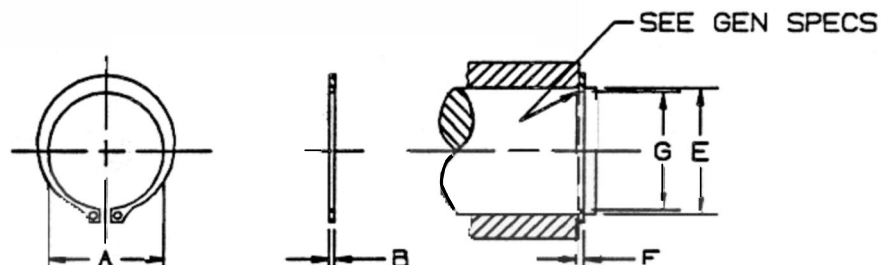
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ize Number	Housing Diameter	Ring Dimensions				Groove Dimensions				Part Number
		Free Diameter		Thickness		Diameter		Width		
		A	Tol	B	Tol	G	Tol	F	Tol	
206	2.062	2.280		.078		2.186		.086		456736R1
212	2.125	2.350		.078		2.251		.086		
218	2.188	2.415		.078		2.318		.086		
225	2.250	2.490		.078		2.382		.086		
231	2.312	2.560		.078		2.450		.086		
237	2.375	2.630		.078		2.517		.086		
244	2.440	2.702		.078		2.584		.086		641207R1
250	2.500	2.775	+ .040	.078		2.648		.086		
250 (ZN6A)	2.500	2.775	- .030	.080		2.648		.086		
256	2.562	2.844		.093		2.714		.103		
262	2.625	2.910		.093		2.781		.103		
268	2.688	2.980		.093		2.837		.103		
275	2.750	3.050		.093		2.914		.103		
281	2.812	3.121		.093		2.980		.103		
287	2.875	3.191		.093		3.051		.103		
300	3.000	3.325		.093	±.003	3.182	±.006	.103	+ .005	
306	3.062	3.418		.109		3.248	.006 FIM	.120	- .000	292810C1
312	3.125	3.488		.109		3.315		.120		
315	3.156	3.523		.109		3.348		.120		
325	3.250	3.623	±.055	.109		3.446		.120		
334	3.346	3.734		.109		3.546		.120		
350	3.500	3.890		.109		3.710		.120		
354	3.562	3.936		.109		3.776		.120		
375	3.750	4.157		.109		3.974		.120		
387	3.875	4.291		.109		4.107		.120		
393	3.938	4.358		.109		4.174		.120		
400	4.000	4.424		.109		4.240		.120		475962R1
412	4.125	4.558	±.065	.109		4.365		.120		
425	4.250	4.691		.109		4.490		.120		
433	4.331	4.756		.109		4.571		.120		
450	4.500	4.940		.109		4.740		.120		

* Optimum for use with standard grooves. Allows maximum interchangeability with other vendor series.

** For vendor series location and cross reference, see section 9.0.

8.2 Basic, External (Series 5100) **



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