

NAVISTAR, INC.		
Material, Parts, and Process Specifications (MPAPS)	NUMBER: MPAPS S-N-7.101-GS/PL	
	Former Designation: ESP-N-7.101-GS	
TITLE: Spiral Retaining Rings - English Series (Noun Code – 7175)	CURRENT REV No.: 1506	DATE: June 2015
WRITTEN/EDITED BY: Materials Engineering	APPROVED BY: Materials Engineering	SUPERSEDES: ESP-N-7.101-GS - September 2000
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, NR.		

- 1.0 GENERAL:** This standard conforms essentially with the American National Standard B-27.6 for General Purpose Uniform Cross Section Spiral Retaining Rings.
- 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.
- 3.0 CONTENTS:**

	Page
General	1
Restricted Chemical Substances	1
Applicability	2
Material	2
Finish	2
Crimp	2
Removal Notches or Slots	3
Dish	3
Misalignment	3
Lateral Deformation	4
Ring Section Edge Radius	4
Total Free Height	4
Performance Test	4
Ring Gages	5
Assembly Precautions	5
Maximum Groove Bottom Radii	5
Alternate Groove Design	5
Workmanship	6
Policy for Selecting Parts for New Design	6
Part List	6
Technical Information	6

This document is restricted and may not be sent outside Navistar, Inc. or reproduced without permission from Corporate Technical Standards. Suppliers are required to assume all patent liability. ©2015 by Navistar, Inc.

JUNE 2015

NUMBER: MPAPS S-N-7.101-GS/PL	TITLE: <i>Spiral Retaining Rings</i>	REVISION: 1506
--	---	---------------------------------

4.0 APPLICABILITY: The rings denoted in this standard are intended primarily for use with the shaft, housing, and groove sizes recommended; however, in certain cases these diameters may be altered somewhat to suit the requirements of a particular design. When such changes are made, care should be taken to not alter the shaft or housing size to such an extent that the ring will take enough permanent set to allow a loose fit after the ring has been assembled into the groove. Neither should the groove diameter be altered to the extent to permit the ring to fit loosely.

5.0 MATERIAL: Carbon Spring Steel (CST) - Retaining rings made from carbon spring steel will conform to the chemical composition of SAE 1070 to 1090 or AISI 1070 to 1090 or equivalent and have the following physical properties. Special materials are identified on dimensional and part number pages with material abbreviations immediately following the size number.

Material Thickness (minimum)	Rockwell Scale	Hardness	Tensile Strength (psi)
.0067	15N	85-90	269,000 - 299,000
.0142	30N	68-73	255,000 - 285,000
.0213	A	72-78	221,000 - 251,000
.0433	C	43-49	211,000 - 236,000

Stainless Steel (SST) - Retaining rings made from corrosion resistant steel will conform to the chemical composition of SAE 30302 or equivalent and have the following physical properties:

Material Thickness (minimum)	Rockwell Scale	Hardness	Tensile Strength (psi)
.008	15N	83.0-86.0	210,000 - 250,000
.016	30N	64.0-69.5	210,000 - 250,000
.023	A	72.0-74.9	200,000 - 230,000
.048	C	39.8-48.5	185,000 - 235,000
.062	C	38.0-47.0	175,000 - 225,000

6.0 FINISH: Retaining rings will be plain and will have an oil dipped finish unless otherwise specified. Finishes other than plain are identified on dimensional and part number pages with finish abbreviations.

Plated or coated rings which are subject to hydrogen embrittlement will be baked for three hours at 375°F, or other suitable times and temperatures, as soon as possible after the plating or coating operation to obviate such embrittlement.

7.0 CRIMP: Unless otherwise specified, the following types of rings and sizes will be uncrimped: K suffix for sizes listed will be crimped.

Ring Type	Nominal Ring Size
Internal and External Medium Duty, Series RR - RS	.500 - 1.500
Internal and External Heavy Duty, Series RRT - RST	.469 - 1.500
Internal Standard Duty, Series RRN	.500 - .750
External Standard Duty, Series RSN	.469 - .669

All other rings will be crimped. See Figure 2 for crimped illustration.

This document is restricted and may not be sent outside Navistar, Inc. or reproduced without permission from Corporate Technical Standards. Suppliers are required to assume all patent liability. ©2015 by Navistar, Inc.

JUNE 2015