NAVISTAR, INC.			
Material, Parts, and Process Specifications (MPAPS)		*NUMBER:* **MPAPS S-J-10.101-GS/PL**	
		Former Designation: **ESP-J-10.101-GS**	
TITLE: **Woodruff Keys – English Series (Noun Code 4820)**		*CURRENT REV No.:* **1506**	*DATE:* **June 2015**
WRITTEN/EDITED BY: **Materials Engineering**	*APPROVED BY:* **Materials Engineering**	*SUPERSEDES:* **ESP-J-10.101-GS - April 2002**	

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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: Contains elements of SAE J502.

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 MATERIAL: Keys are to be alloy heat treated steel. Typical alloy steels are SAE 2330 or 8630 steel, heat treated to a hardness of 40-50 RC; or other alloy steels having equal physical properties at the same hardness.

5.0 IDENTIFICATION: Alloy heat treated keys are to be marked with depressions on the top to distinguish them from carbon steel keys.

6.0 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.

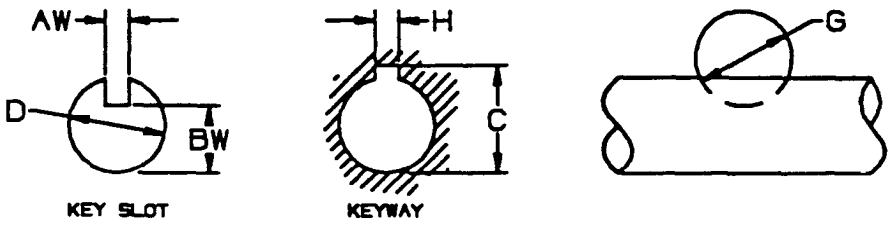
Material: Alloy Steel only
Sizes: As indicated.

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7.0 RECOMMENDED SHAFT SIZE AND PREFERRED ALLOY STEEL KEYS:



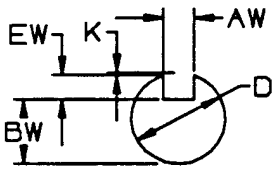
D	AW		BW		H		C		G		
	in	mm	in	mm	in	mm	in	mm	in	mm	KEY
Nominal In			+.003 -.003	+.08 -.08	+.0015 - 0	+.038 -0	+.002 -.002	+.05 -.05			in
	.0615	1.562							.5	12.7	#1
.3125	+.0015	+.038	.14	3.56			.349	8.86	+.018	+ .46	1/16 x 1/2
.375	- 0	- 0	.203	5.16	.0635	1.613	.412	10.46	- 0	- 0	(124541)
.4375	.1240	3.15	.29	7.37			.499	12.67	.5	12.7	#3
.5	+.0015	+.038	.354	8.99	.126	3.2	.563	14.3	+.018	+.46	1/8 X 1/2
.5625	- 0	-0	.418	10.62			.627	15.93	- 0	- 0	(124543)
.625	.1863	4.732	.394	10.01			.713	18.11	.75	19.05	#9
.6875	+.0017	+.043	.458	11.63	.1885	4.788	.777	19.74	+.018	+ .46	3/16 x 3/4
.75	- 0	- 0	.522	13.26			.841	21.36	- 0	- 0	(124549)
	.2487	6.317			.251	6.375			.875 +.02	22.22 + .51	#A
.8125	+.0018	+.046	.546	13.87			.927	23.55	- 0	- 0	1/4 x 7/8
.875	- 0	- 0	.61	15.49			.991	25.17			(124551)
.9375	.2487	6.317	.611	15.52			1.055	26.8	1.	25.4	#15
1.	+.0018	+.046	.674	17.12	.251	6.375	1.118	28.4	+.02	+.51	1/4 x 1
	- 0	- 0							- 0	- 0	(124553)
1.0625	.3111	7.899	.76	19.3			1.204	30.58	1.	25.4	
1.125	+.0019	+.048	.824	20.93	.3135	7.963	1.268	32.21	+.02	+.51	#B
1.1875	- 0	- 0	.888	22.56			1.332	33.83	- 0	- 0	5/16 x 1
1.25			.951	24.16			1.395	35.43			(124554)
1.3125	.3111	7.899	.906	23.01			1.459	37.06	1.25	31.75	#D
	+.0019	+.048	.969	24.61	.3135	7.963			+.023	+ .58	5.16 x 1-1/4
1.375	- 0	- 0					1.522	38. 66	- 0	- 0	(117991)
1.4375			.962	24.43			1.609	40.87			
1.5	.3735	9.487	1.026	26.06			1.673	42.49	1.5	38.1	#G
1.5625	+.002	+.051	1.089	27.66	.376	9.55	1.736	44.09	+.023	+.58	3/8 x 1-1/2
1.625	- 0	- 0	1.153	29.29			1.8	45.72	- 0	- 0	(117998)
1.6875			1.216	30.89			1.863	47.32			
1.75			1.279	32.49			1.926	48.92			
1.8125			1.28	32.51			2.036	51.71			
1.875			1.344	34.14			2.1	53.34			
1.9375	.4985	12.662	1.408	35.76			2.164	54.97	2.75	69.8	#V
2.	+.002	+.051	1.472	37.39			2.228	56.59	+.035	+ .9	1/2 x 2-3/4
2.0625	- 0	- 0	1.536	39.01	.501	12.725	2.292	58.22	- 0	- 0	(218216)
2.125			1.599	40.61			2.355	59.82			
2 1875			1.662	42.21			2.418	61.42			
2.25			1.725	43.82			2.481	63.02			
2.3125			1.648	41.86			2.592	65.84			
2.375	.6235	15.837	1.712	43.48			2.656	67.46	3.5	88.9	#34
2.4375	+.002	+.051	1.775	45.08			2.719	69.06	+.035	+ .9	5/8 x 3-1/2
2.5	- 0	- 0	1.839	46.71	.626	15.9	2.783	70.69	- 0	- 0	(26548R1)
2.625			1.966	49.94			2.91	73.91			
2.75			2.093	53.16			3.037	77.14			

When key slot and keyway dimensions other than those shown on previous page are required, the following formulas will be used to determine standard dimensions.

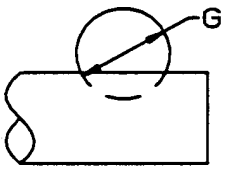
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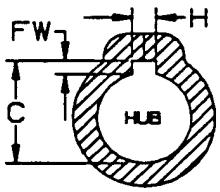
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WIDTH : Use Dimensions shown below. **KEYSEAT DIA** = G (Nominal Key Diameter.)	Theoretical Fits: **Top and** **Bottom:** .001 in (.025 mm) to .016 in (.406 mm) Loose
SHAFT DEPTH: BW Max = D – K – EW Min BW Min = BW Max - .006 in (.152mm)	**Side-Shaft:** .0005 in (.013 mm) Loose to .002/.0025 in (.015/.064mm) Tight
HUB HEIGHT: C Min = D – K + FW Min C Max = C Min + .004 in (.102 mm)	**Side-Hub:** 0 to .0025 in (.064mm) Loose



KEY SLOT





KEYWAY

Dimensions in Inches:

Mfrs No.	Key Size in	AW Min in	AW Min mm	MAX AW Tol in	MAX AW Tol mm	EW Min in	EW Min mm	H in +.0015 - 0	H mm +.038 - 0	G Min in	G Min mm	G Max in	G Max mm	FW Min in	FW Min mm
201	1/16 x 1/4	.0615	1.563			.072	1.829	.0635	1.613	.250	6.35	.268	6.81	.038	.966
206	1/16 x 5/16	.0615	1.563			.103	2.617	.0635	1.613	.312	7.92	.330	8.38	.038	.966
207	3/32 x 5/16	.0928	2.358			.087	2.21	.0948	2.408	.312	7.92	.330	8.38	.054	1.372
211	1/16 x 3/8	.0615	1.563			.135	3.43	.0635	1.613	.375	9.52	.393	9.98	.038	.966
212	3/32 x 3/8	.0928	2.358			.119	3.023	.0948	2.408	.375	9.52	.393	9.98	.054	1.372
213	1/8 x 3/8	.124	3.15	+.0015	.038	.104	2.642	.126	3.2	.375	9.52	.393	9.98	.069	1.753
* 1	1/16 x 1/2	.0615	1.563			.166	4.217	.0635	1.613	.500	12.7	.518	13.16	.038	.966
2	3/32 x 1/2	.0928	2.358			.15	3.811	.0948	2.408	.500	12.7	.518	13.16	.054	1.372
* 3	1/8 x 1/2	.124	3.15			.135	3.43	.126	3.2	.500	12.7	.518	13.16	.069	1.753
4	3/32 x 5/8	.0928	2.358			.197	5.004	.0948	2.408	.625	15.88	.643	16.33	.054	1.372
5	1/8 x 5/8	.124	3.15			.182	4.623	.126	3.2	.625	15.88	.643	16.33	.069	1.753
6	5/32 x 5/8	.1553	3.945			.166	4.217	.1573	3.995	.625	15.88	.643	16.33	.085	2.16
61	3/16 x 5/8	.1863	4.733	+.0017	.043	.151	3.836	.1885	4.788	.625	15.88	.643	16.33	.1	2.541
7	1/8 x 3/4	.124	3.15	+.0015	.038	.245	6.224	.126	3.2	.750	19.05	.768	19.51	.069	1.753
8	5/32 x 3/4	.1553	3.945			.229	5.817	.1573	3.995	.750	19.05	.768	19.51	.085	2.16
* 9	3/16 x 3/4	.1863	4.733	+.0017	.043	.214	5.436	.1885	4.788	.750	19.05	.768	19.51	.1	2.541
91	1/4 x 3/4	.2487	6.317	+.0018	.045	.182	4.623	.251	6.375	.750	19.05	.768	19.51	.132	3.353
10	5/32 x 7/8	.1553	3.945	+.0015	.038	.291	7.392	.1573	3.995	.875	22.22	.895	22.73	.085	2.16
11	3/16 x 7/8	.1863	4.733	+.0017	.043	.276	7.011	.1885	4.788	.875	22.22	.895	22.73	.1	2.541
12	7/32 x 7/8	.2175	5.525	+. 0018	.045	.26	6.605	.2198	5.583	.875	22.22	.895	22.73	.116	2.947
* A	1/4 x 7/8	.2487	6.317			.244	6.198	.251	6.375	.875	22.22	.895	22.73	.132	3.353
13	3/16 x 1	.1863	4.733	+.0017	.043	.339	8.611	.1885	4.788	1.000	25.4	1.020	25.91	.1	2.541
14	7/32 x 1	.2175	5.525	+.0018	.045	.323	8.205	.2198	5.583	1.000	25.4	1.020	25.91	.116	2.947
* 15	1/4 x 1	.2487	6.317			.307	7.798	.251	6.375	1.000	25.4	1.020	25.91	.132	3.353
* B	5/16 x 1	.3111	7.902	+.0019	.048	.276	7.011	.3135	7.963	1.000	25.4	1.020	25.91	.163	4.141
16	3/16 x 1-1/8	.1863	4.733	+.0017	.043	.385	9.78	.1885	4.788	1.125	28.58	1.145	29.08	.1	2.541
17	7/32 x 1-1/8	.2175	5.525	+.0018	.045	.369	9.373	.2198	5.583	1.125	28.58	1.145	29.08	.116	2.947
18	1/4 x 1-1/8	.2487	6.317			.353	8.967	.251	6.375	1.125	28.58	1.145	29.08	.132	3.353
C	5/16 x 1-1/8	.3111	7.902	+.0019	.048	.322	8.179	.3135	7.963	1.125	28.58	1.145	29.08	.163	4.141
19	3/16 x 1-1/4	.1863	4.733	+.0017	.043	.448	11.38	.1885	4.788	1.250	31.75	1.273	32.33	.1	2.541
20	7/32 x 1-1/4	.2175	5.525	+.0018	.045	.432	10.973	.2198	5.583	1.250	31.75	1.273	32.33	.116	2.947
21	1/4 x 1-1/4	.2487	6.317			.416	10.567	.251	6.375	1.250	31.75	1.273	32.33	.132	3.353
* D	5/16 x 1-1/4	.3111	7.902	+.0019	.048	.385	9.78	.3135	7.963	1.250	31.75	1.273	32.33	.163	4.141
E	3/8 x 1-1/4	.3735	9.487	+.002	.05	.353	8.967	.376	9.55	1.250	31.75	1.273	32.33	.195	4.954
22	1/4 x 1-3/8	.2487	6.317	+.0018	.045	.463	11.761	.251	6.375	1.375	34.92	1.398	35.51	.132	3.353
23	5/16 x 1-3/8	.3111	7.902	+.0019	.048	.432	10.973	.3135	7.963	1.375	34.92	1.398	35.51	.163	4.141

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