



Howmet Fastening Systems
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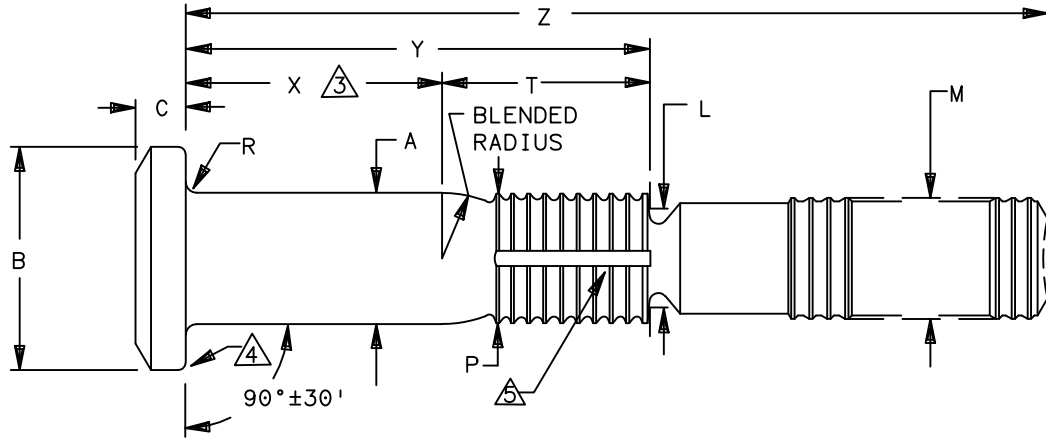
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GP™

ENGINEERING
 STANDARD

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GP PIN FAMILY NUMBER	NOM SIZE	A SHANK DIA +.0005 -.0000	A SHANK DIA COATED ±.0005	B HEAD DIA		C HEAD HEIGHT ±.005	L DIA REF	M DIA MAX	P DIA MAX	R RAD ±.005	S △	T REF
				MAX	MIN							
GPL8TP-V05-() ()	.1640	.1630	.1630	.332	.306	.060	.136	.156	.156	.020	.0045	.254
GPL8TP-V06-() ()	.1900	.1890	.1890	.377	.357	.069	.164	.184	.184	.020	.0045	.291
GPL8TP-V07-() ()	.2187	.2177	.2177	.410	.390	.080	.173	.213	.213	.020	.0045	.370
GPL8TP-V08-() ()	.2500	.2490	.2490	.440	.415	.085	.224	.244	.244	.020	.0045	.370
GPL8TP-V10-() ()	.3125	.3115	.3115	.505	.475	.107	.268	.306	.306	.025	.0045	.472
GPL8TP-V12-() ()	.3750	.3740	.3740	.600	.565	.135	.339	.368	.370	.025	.0060	.523

- △ CONCENTRICITY: CONICAL SURFACE OF PROTRUDING HEAD TO "A" DIAMETER TO BE WITHIN 5% OF "A" DIAMETER TIR.
- △ SHANK STRAIGHTNESS: WITHIN "S" VALUES TIR PER INCH OF SHANK LENGTH.
- △ GRIP LENGTH IS MEASURED FROM THE UNDERSIDE OF THE HEAD TO THE END OF THE FULL CYLINDRICAL PORTION OF THE SHANK.
- △ PERMISSIBLE NATURAL FLOW OF MATERIAL, MUST BE FREE FROM SHARP CORNERS.
- △ SEALANT ESCAPE GROOVE.

PROCUREMENT SPECIFICATION: C2011
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DIMENSIONS IN INCHES

DRAWN BY	DH	FSCM (Cage Code) 17446 - Carson
CHECKED BY	MM	FSCM (Cage Code) F6167 - France

REVISIONS 10 REVISED COMPANY LOGO & UPDATED TRADEMARK INFORMATION. CHANGED "KALGARD" TO "KAL-GARD" ON PAGE 2. (REF. ECR2779)		PIN, GROOVE PROPORTIONED GP™ PULL-TYPE, SWAGE LOCKING, TENSION PROTRUDING HEAD 6AL-4V TITANIUM, (95 KSI SHEAR)	GPL8TP-V()-() ()
ISSUED	04/01/77		
REVIS	08/10/21		GPL112
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MATERIAL: 6AL-4V TITANIUM ALLOY PER AMS4967.

SHEAR STRENGTH: 95 KSI MINIMUM

SURFACE TEXTURE: Ra MAX PER ANSI/ASME B46.1 BEFORE COATING. BEARING SURFACE OF HEAD, HEAD TO SHANK FILLET RADIUS, SHANK AND TRANSITION RADIUS, -32, OTHER SURFACES -125.

FINISH: NO LETTER = UNCOATED PIN PLUS CETYL ALCOHOL LUBE PER AS87132.

AC = ALUMINUM COATING KAL-GARD 2240C (EU ONLY) / HI-KOTE™ 1 PER NAS4006 OR KAL-GARD 2242 / HI-KOTE™ 1 NC PER NAS4006NC, OPTIONAL ON PINTAIL END. OPTIONAL TO COLOR PINTAIL END BLACK. PLUS CETYL ALCOHOL LUBE PER AS87132.

ACN = ALUMINUM COATING HI-KOTE™ 1 NC PER EN4473 TYPE II, OPTIONAL ON PINTAIL END. PLUS CETYL ALCOHOL LUBE PER AS87132.

AD = ALUMINUM COATING KAL-GARD 2245 / HI-KOTE™ 1 PER EN4473 TYPE I OR HI-KOTE™ 1 NC PER EN4473 TYPE II, OPTIONAL ON PINTAIL END. OPTIONAL TO COLOR PINTAIL END WHITE. PLUS CETYL ALCOHOL LUBE PER AS87132.

AS = SULPHURIC ACID ANODIZE (BLUE) PER ISO 8080. PLUS CETYL ALCOHOL LUBE PER AS87132.

D = ION VAPOR DEPOSITED ALUMINUM COATING PER MIL-DTL-83488 TYPE II, CLASS 3, EXCEPT THICKNESS .0002/.0005, OPTIONAL ON PINTAIL END. OPTIONAL TO COLOR PINTAIL END RED. PLUS CETYL ALCOHOL LUBE PER AS87132.

DR = ION VAPOR DEPOSITED ALUMINUM COATING PER BAC5315. OPTIONAL TO COLOR ON PINTAIL END RED. PLUS CETYL ALCOHOL LUBE PER AS87132.

HEAD MARKING: HEADS SHALL BE MARKED WITH THE MANUFACTURER'S SYMBOL, BASIC NUMBER (GPLT), AND MATERIAL DESIGNATOR (V), .010 MAX, ARRANGEMENT OPTIONAL. FOR PINS WITH A SEALANT ESCAPE GROOVE AN (H) WILL BE INCLUDED ON THE HEAD IDENTIFICATION.

CODING: THE FIRST SET OF LETTERS DESIGNATE THE FAMILY OF GROOVE PROPORTIONED GP™ PINS FOR AEROSPACE APPLICATIONS (GPL).

THE SECOND SET OF LETTERS & NUMBER 8TP DESIGNATE HEAD SIZE, STYLE, AND LOAD APPLICATION.


THE NEXT LETTER "V", IS THE MATERIAL DESIGNATOR FOR 6AL-4V TITANIUM MIN SHEAR STRENGTH: 95 KSI.

THE NUMBERS FOLLOWING THE MATERIAL DESIGNATE THE NOMINAL PIN SHANK DIAMETER IN .0312 INCH INCREMENTS.

THE FINAL NUMBER(S) DESIGNATES THE GRIP LENGTH NUMBER OR THE NOMINAL PIN SHANK LENGTH IN .0625 INCH INCREMENTS.

SEE FINISH CODE FOR SUFFIX INFORMATION.

E₁₀

 REVISED COMPANY LOGO & UPDATED TRADEMARK INFORMATION. CHANGED "KALGARD" TO "KAL-GARD" ON PAGE 2. (REF. ECR2779)		
ISSUED	04/01/77	PIN, GROOVE PROPORTIONED GP™ PULL-TYPE, SWAGE LOCKING, TENSION PROTRUDING HEAD 6AL-4V TITANIUM, (95 KSI SHEAR)
REVISED	08/10/21	
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		GPL8TP-V()-(-)(-)
		GPL112



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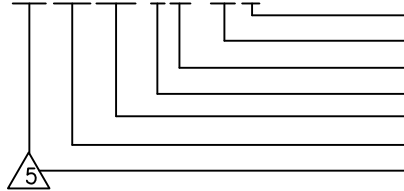
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EXAMPLE: (H)GPL8TP-V08-06()



FINISH SUFFIX (SEE FINISH CODE).
 GRIP LENGTH IN .0625 INCH INCREMENTS.
 SHANK DIA IN .0312 INCH INCREMENTS
 MATERIAL - 6AL-4V TITANIUM.
 LARGE PROTRUDING HEAD FOR TENSION APPLICATIONS
 FAMILY OF GP PINS FOR AEROSPACE APPLICATIONS
 ADD "H" PREFIX TO PART NUMBER TO INCLUDE
 SEALANT ESCAPE GROOVE.

MECHANICAL PROPERTIES					
GP PIN PART NUMBER	PIN NOM SIZE	MINIMUM DOUBLE SHEAR POUNDS	COLLAR PART NUMBER	MIN ULTIMATE TENSILE LBS WITH LISTED COLLARS	PIN POSITION SWAGE GAGE
GPL8TP-V05-(())	.1640	4010	2TCC-C05 2TC-C05	2180	HG100-05
GPL8TP-V06-(())	.1900	5380	2TCC-C06 2TC-C06	2750	HG100-06
GPL8TP-V07-(())	.2187	7200	2TCC-C07 2TC-C07	3875	HG100-07
GPL8TP-V08-(())	.2500	9300	2TCC-C08 2TC-C08	5000	HG100-08
GPL8TP-V10-(())	.3125	14600	2TCC-C10 2TC-C10	8300	HG100-10
GPL8TP-V12-(())	.3750	21000	2TCC-C12 2TC-C12	12700	HG100-12

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GRIP NUMBER TABULATION															
GRIP DASH NO.	MINIMUM PERMISSIBLE GRIP OVERLAP	DESIGN GRIP RANGE		MAXIMUM PERMISSIBLE GRIP OVERLAP	X ±.005	05		06		07 & 08		10		12	
		MIN.	MAX.			Y	Z	Y	Z	Y	Z	Y	Z	Y	Z
02	.047	.063	.125	.141	.125	.379	1.25	.416	1.16	—	—	—	—	—	—
03	.109	.126	.188	.203	.188	.442	1.31	.479	1.22	.558	1.40	.660	1.62	—	—
04	.172	.189	.250	.266	.250	.504	1.38	.541	1.29	.620	1.46	.722	1.68	.733	1.89
05	.234	.251	.312	.328	.312	.566	1.44	.603	1.35	.682	1.52	.784	1.75	.835	1.95
06	.297	.313	.375	.391	.375	.629	1.50	.666	1.41	.745	1.59	.847	1.81	.898	2.01
07	.359	.376	.438	.453	.438	.692	1.56	.729	1.47	.808	1.65	.910	1.87	.961	2.08
08	.422	.439	.500	.516	.500	.754	1.63	.791	1.54	.870	1.71	.972	1.93	1.023	2.14
09	.484	.501	.562	.578	.562	.816	1.69	.853	1.60	.932	1.77	1.034	2.00	1.085	2.20
10	.547	.563	.625	.641	.625	.879	1.75	.916	1.66	.995	1.84	1.097	2.06	1.148	2.27
11	.609	.626	.688	.703	.688	.942	1.82	.979	1.73	1.058	1.90	1.160	2.12	1.211	2.33
12	.672	.689	.750	.766	.750	1.004	1.88	1.041	1.79	1.120	1.96	1.222	2.18	1.273	2.40
13	.734	.751	.812	.828	.812	1.066	1.94	1.103	1.85	1.182	2.02	1.284	2.25	1.335	2.46
14	.797	.813	.875	.891	.875	1.129	2.00	1.166	1.91	1.245	2.09	1.347	2.31	1.398	2.52
15	.859	.876	.938	.953	.938	1.191	2.07	1.229	1.98	1.308	2.15	1.410	2.37	1.461	2.58
16	.922	.939	1.000	1.016	1.000	1.254	2.13	1.291	2.04	1.370	2.21	1.472	2.43	1.523	2.65
17	.984	1.001	1.062	1.078	1.062	1.316	2.19	1.353	2.10	1.432	2.27	1.534	2.50	1.585	2.71
18	1.047	1.063	1.125	1.141	1.125	1.379	2.25	1.416	2.16	1.495	2.34	1.597	2.56	1.648	2.77
19	1.109	1.126	1.188	1.203	1.188	1.442	2.31	1.479	2.22	1.558	2.40	1.660	2.62	1.711	2.83
20	1.172	1.189	1.250	1.266	1.250	1.504	2.38	1.541	2.29	1.620	2.46	1.722	2.68	1.773	2.89
21	1.234	1.251	1.312	1.328	1.312	1.566	2.44	1.603	2.35	1.682	2.52	1.784	2.75	1.835	2.95
22	1.297	1.313	1.375	1.391	1.375	1.629	2.50	1.666	2.41	1.745	2.59	1.847	2.81	1.898	3.01
23	1.359	1.376	1.438	1.453	1.438	1.692	2.56	1.729	2.47	1.808	2.65	1.910	2.87	1.961	3.08
24	1.422	1.439	1.500	1.516	1.500	1.754	2.63	1.791	2.54	1.870	2.71	1.972	2.93	2.023	3.14
25	1.484	1.501	1.562	1.578	1.562	1.816	2.69	1.853	2.60	1.932	2.77	2.034	3.00	2.085	3.20
26	1.547	1.563	1.625	1.641	1.625	1.879	2.75	1.916	2.66	1.995	2.84	2.097	3.06	2.148	3.27
27	1.609	1.626	1.688	1.703	1.688	1.942	2.82	1.979	2.73	2.058	2.90	2.160	3.12	2.211	3.33
28	1.672	1.689	1.750	1.766	1.750	2.004	2.88	2.041	2.79	2.120	2.96	2.222	3.18	2.273	3.40
29	1.734	1.751	1.812	1.828	1.812	2.066	2.94	2.103	2.85	2.182	3.02	2.284	3.25	2.335	3.46
30	1.797	1.813	1.875	1.891	1.875	2.129	3.00	2.166	2.91	2.245	3.09	2.347	3.31	2.398	3.52
31	1.859	1.876	1.938	1.953	1.938	2.191	3.07	2.229	2.98	2.308	3.15	2.410	3.37	2.461	3.58
32	1.922	1.939	2.000	2.016	2.000	2.254	3.13	2.291	3.04	2.370	3.21	2.472	3.43	2.523	3.65

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