



**HOWMET  
AEROSPACE**

Howmet Fastening Systems  
Carson Operations  
900 E. Watson Center Road  
Carson, California 90745 U.S.A.

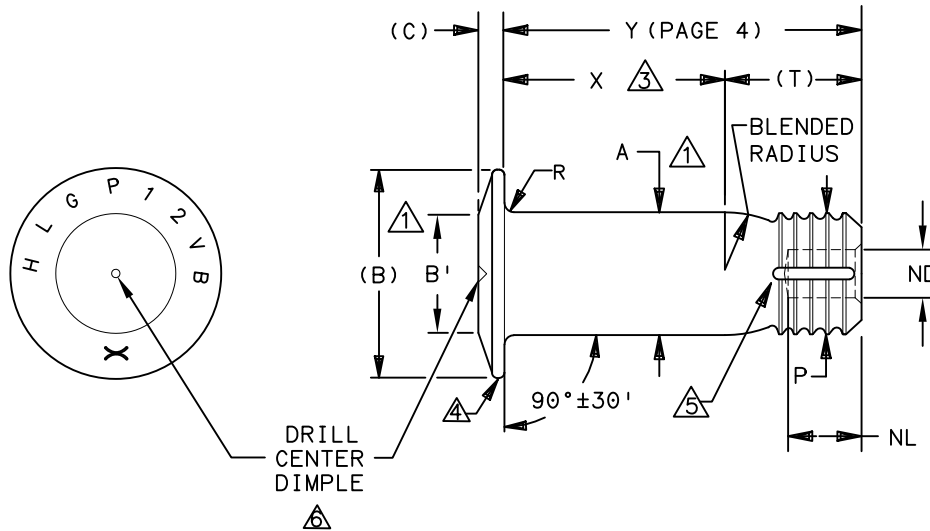
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**LGP®**  
Composite  
**ENGINEERING  
STANDARD**

THIS DRAWING, THE STRUCTURAL DESIGN DISCLOSED THEREIN AND THE TECHNICAL DATA AND ENGINEERING SERVICE REPRESENTED THEREBY ARE THE EXCLUSIVE PROPERTY OF HUCK INTERNATIONAL INCORPORATED.



LGP STUMP FAMILY NUMBER	NOM SIZE	A SHANK DIA +.0005 -.0000	A SHANK DIA COATED ±.0005	(B) HEAD DIA ±.005	B' FLAT DIA ±.010	C HEAD HEIGHT ±.005	ND DIA REF	NL DEPTH MAX	P DIA MAX	R RAD ±.005	S △	(T) REF
(H)LGSP12SPV05B( ) ( )	.1640	.1630	.1630	.329	.237	.060	.065	.116	.156	.020	.0045	.187
(H)LGSP12SPV06B( ) ( )	.1900	.1890	.1890	.372	.268	.069	.086	.118	.184	.020	.0045	.196
(H)LGSP12SPV08B( ) ( )	.2500	.2490	.2490	.472	.345	.085	.109	.162	.244	.020	.0045	.265
(H)LGSP12SPV10B( ) ( )	.3125	.3115	.3115	.594	.400	.107	.141	.216	.306	.035	.0045	.342
(H)LGSP12SPV12B( ) ( )	.3750	.3740	.3740	.710	.513	.135	.171	.243	.370	.035	.0060	.398
(H)LGSP12SPV14B( ) ( )	.4375	.4365	.4365	.844	.599	.155	.199	.260	.431	.035	.0060	.454
(H)LGSP12SPV16B( ) ( )	.5000	.4990	.4990	.965	.688	.183	.230	.275	.492	.035	.0060	.516

- △1 CONCENTRICITY: CONICAL SURFACE OF PROTRUDING HEAD TO "A" DIAMETER TO BE WITHIN .005 TIR.
- △2 SHANK STRAIGHTNESS: WITHIN "S" VALUES TIR PER INCH OF SHANK LENGTH.
- △3 GRIP LENGTH IS MEASURED FROM THE UNDERSIDE OF THE HEAD TO THE END OF THE FULL CYLINDRICAL PORTION OF THE SHANK. (SEE DIMENSION "X" PAGE 4).
- △4 PERMISSIBLE NATURAL FLOW OF MATERIAL. MUST BE FREE FROM SHARP CORNERS.
- △5 SEALANT ESCAPE GROOVE (SEE PAGE 2).
- △6 DRILL CENTER DIMPLE IN TOP OF HEAD .035 MAX DIA, .010 MAX DEPTH AND CONCENTRIC TO "A" WITHIN .008.

DIMENSIONS IN INCHES

PROCUREMENT SPECIFICATION: C2022

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DRAWN BY	DH	FSCM (Cage Code) 17446 - Carson FSCM (Cage Code) F6167 - France
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A <sub>7</sub> REVISED COMPANY LOGO & UPDATED TRADEMARK INFORMATION. (REF. ECR2872)		
ISSUED	12/11/87	STUMP, COMPOSITE APPLICATIONS, LIGHTWEIGHT HUCKCOMP LGP, SHEAR TYPE, PROTRUDING HEAD, SWAGE LOCKING, 6AL-4V TITANIUM. (95 KSI SHEAR)
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		(H)LGSP12SPV( )B( ) ( ) COM110

A<sub>7</sub>



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**MATERIAL:** 6AL-4V TITANIUM ALLOY PER AMS4967.  
**MINIMUM SHEAR STRENGTH:** 95 KSI.  
**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.

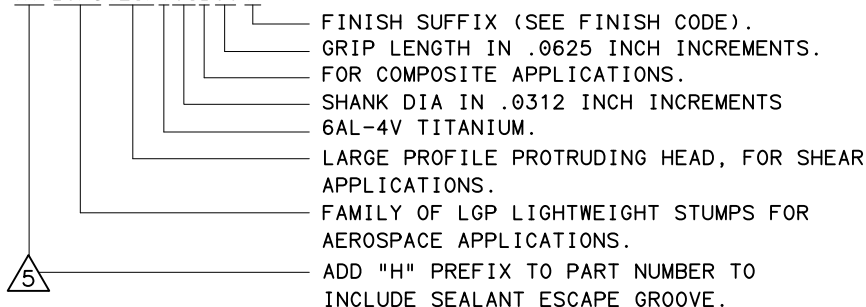
**FINISH:** SUFFIX "AC" = ALUMINUM COAT (KALGARD 2240 OR HI-KOTE I) PER NAS4006, OPTIONAL ON PINTAIL END, PLUS CETYL ALCOHOL LUBE PER MIL-L-87132.  
 SUFFIX "AD" = ALUMINUM COAT (KALGARD 2245) PER NAS4006 OPTIONAL TO COLOR PINTAIL END WHITE, PLUS CETYL ALCOHOL LUBE PER MIL-L-87132.  
 SUFFIX "AS" = SULFURIC ACID ANODIZE (BLUE) PER ISO 8080 PLUS CETYL ALCOHOL LUBE PER MIL-L-87132.  
 SUFFIX "B" = UNCOATED PIN AND NO LUBRICATION.  
 SUFFIX "EP" = PHOSPHATE FLOURIDE TREAT PER AMS2486.  
 SUFFIX "EPR" = PHOSPHATE FLOURIDE PER BAC5861, WITH RED IDENTIFICATION DYE ON PINTAIL END. PLUS CETYL ALCOHOL LUBE PER MIL-L-87132.  
 SUFFIX "PB" = POWDER BLAST TOP SURFACE OF HEAD PLUS CETYL ALCOHOL LUBE PER MIL-L-87132 (Ra 50/80 SURFACE ROUGHNESS).  
 NO LETTER = UNCOATED STUMP PLUS CETYL ALCOHOL LUBE PER MIL-L-87132.

**HEAD MARKING:** HEADS SHALL BE MARKED WITH THE MANUFACTURER'S SYMBOL, THE BASIC NUMBER (LGP12), AND (VB) DEPRESSED .006 MAX DEPTH ARRANGEMENT OPTIOAL, FOR STUMPS REQUIRING A SEALANT ESCAPE GROOVE, AN "H" WILL BE INCLUDED ON THE HEAD IDENTIFICATION CALLOUT.

**CODING:** THE FIRST SET OF LETTERS DESIGNATE THE FAMILY OF LIGHTWEIGHT GP STUMPS FOR SHEAR APPLICATION (LGPS).  
 THE SECOND SET OF LETTERS & NUMBER (12SP) DESIGNATE HEAD SIZE, STYLE, AND LOAD APPLICATION.  
 THE NEXT LETTER (V), IS THE MATERIAL DESIGNATOR FOR 6AL-4V TITANIUM ALLOY, MIN SHEAR STRENGTH: 95 KSI.  
 THE NUMBERS FOLLOWING THE MATERIAL DESIGNATE THE NOMINAL PIN SHANK DIAMETER IN .0312 INCH INCREMENTS.  
 THE LETTER B REPRESENTS COMPOSITE INSTALLATION LOAD.  
 THE FINAL NUMBERS DESIGNATE THE GRIP LENGTH NUMBER OR THE NOMINAL PIN SHANK LENGTH IN .0625 INCH INCREMENTS.  
 SEE FINISH CODE FOR SUFFIX INFORMATION.

PART NO.

EXAMPLE: (H)LGPS12SPV08B06()



DIMENSIONS IN INCHES

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MECHANICAL PROPERTIES							STANDARD COMPOSITE APPLICATIONS
LGP STUMP PART NUMBER	STUMP NOM SIZE	MINIMUM DOUBLE SHEAR POUNDS	COLLAR PART NUMBER	MIN ULTIMATE TENSILE LBS WITH LISTED COLLAR	MAXIMUM SQUEEZE LOAD	PIN POSITION SWAGE GAGE	
(H)LGPS12SPV05B( ) ( )	.1640	4010	SLFC-MV05	1500	2500	HG119-05	
(H)LGPS12SPV06B( ) ( )	.1900	5380	SLFC-MV06	1900	3000	HG119-06	
(H)LGPS12SPV08B( ) ( )	.2500	9300	SLFC-MV08	3450	5500	HG119-08	
(H)LGPS12SPV10B( ) ( )	.3125	14600	SLFC-MV10	6000	9300	HG119-10	
(H)LGPS12SPV12B( ) ( )	.3750	21000	SLFC-MV12	8000	10600	HG119-12	
(H)LGPS12SPV14B( ) ( )	.4375	28600	SLFC-MV14	12100	11000	HG119-14	
(H)LGPS12SPV16B( ) ( )	.5000	37300	SLFC-MV16	15300	11900	HG119-16	

MECHANICAL PROPERTIES							OPTIONAL COMPOSITE/METALLIC APPLICATIONS
LGP STUMP PART NUMBER	STUMP NOM SIZE	MINIMUM DOUBLE SHEAR POUNDS	COLLAR PART NUMBER	MIN ULTIMATE TENSILE LBS WITH LISTED COLLAR	MAXIMUM SQUEEZE LOAD	PIN POSITION SWAGE GAGE	
(H)LGPS12SPV05B( ) ( )	.1640	4010	3SLC-C05	1400	2500	HG138-05	
(H)LGPS12SPV06B( ) ( )	.1900	5380	3SLC-C06	1600	3000	HG138-06	
(H)LGPS12SPV08B( ) ( )	.2500	9300	3SLC-C08	3000	5500	HG138-08	
(H)LGPS12SPV10B( ) ( )	.3125	14600	3SLC-C10	5000	9300	HG138-10	
(H)LGPS12SPV12B( ) ( )	.3750	21000	3SLC-C12	7000	10600	HG138-12	
(H)LGPS12SPV14B( ) ( )	.4375	28600	3SLC-C14	9500	11000	HG138-14	
(H)LGPS12SPV16B( ) ( )	.5000	37300	3SLC-C16	12500	11900	HG138-16	

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GRIP NUMBER TABULATION												
GRIP DASH NO.	MINIMUM PERMIS- SIBLE GRIP OVERLAP	DESIGN GRIP RANGE		MAXIMUM PERMIS- SIBLE GRIP OVERLAP	X ±.005	05	06	08	10	12	14	16
		MIN	MAX			Y	Y	Y	Y	Y	Y	
						±.010	±.010	±.010	±.010	±.010	±.010	±.010
02	.047	.063	.125	.141	.125	.312	.321	—	—	—	—	—
03	.109	.126	.188	.203	.188	.375	.384	.453	.530	—	—	—
04	.172	.189	.250	.266	.250	.437	.446	.515	.592	.648	.704	—
05	.234	.251	.312	.328	.312	.499	.508	.577	.654	.710	.766	.828
06	.297	.313	.375	.391	.375	.562	.571	.640	.717	.773	.829	.891
07	.359	.376	.438	.453	.438	.625	.634	.703	.780	.836	.892	.954
08	.422	.439	.500	.516	.500	.687	.696	.765	.842	.898	.954	1.016
09	.484	.501	.562	.578	.562	.749	.758	.827	.904	.960	1.016	1.078
10	.547	.563	.625	.641	.625	.812	.821	.890	.967	1.023	1.079	1.141
11	.609	.626	.688	.703	.688	.875	.884	.953	1.030	1.086	1.142	1.204
12	.672	.689	.750	.766	.750	.937	.946	1.015	1.092	1.148	1.204	1.266
13	.734	.751	.812	.828	.812	.999	1.008	1.077	1.154	1.210	1.266	1.328
14	.797	.813	.875	.891	.875	1.062	1.071	1.140	1.217	1.273	1.329	1.391
15	.859	.876	.938	.953	.938	1.125	1.134	1.203	1.280	1.336	1.392	1.454
16	.922	.939	1.000	1.016	1.000	1.187	1.196	1.265	1.342	1.398	1.454	1.516
17	.984	1.001	1.062	1.078	1.062	1.249	1.258	1.327	1.404	1.460	1.516	1.578
18	1.047	1.063	1.125	1.141	1.125	1.312	1.321	1.390	1.467	1.523	1.579	1.641
19	1.109	1.126	1.188	1.203	1.188	1.375	1.384	1.453	1.530	1.586	1.642	1.704
20	1.172	1.189	1.250	1.266	1.250	1.437	1.446	1.515	1.592	1.648	1.704	1.766
21	1.234	1.251	1.312	1.328	1.312	1.499	1.508	1.577	1.654	1.710	1.766	1.828
22	1.297	1.313	1.375	1.391	1.375	1.562	1.571	1.640	1.717	1.773	1.829	1.891
23	1.359	1.376	1.438	1.453	1.438	1.625	1.634	1.703	1.780	1.836	1.892	1.954
24	1.422	1.439	1.500	1.516	1.500	1.687	1.696	1.765	1.842	1.898	1.954	2.016
25	1.484	1.501	1.562	1.578	1.562	1.749	1.758	1.827	1.904	1.960	2.016	2.078
26	1.547	1.563	1.625	1.641	1.625	1.812	1.821	1.890	1.967	2.023	2.079	2.141
27	1.609	1.626	1.688	1.703	1.688	1.875	1.884	1.953	2.030	2.086	2.142	2.204
28	1.672	1.689	1.750	1.766	1.750	1.937	1.946	2.015	2.092	2.148	2.204	2.266
29	1.734	1.751	1.812	1.828	1.812	1.999	2.008	2.077	2.154	2.210	2.266	2.328
30	1.797	1.813	1.875	1.891	1.875	2.062	2.071	2.140	2.217	2.273	2.329	2.391
31	1.859	1.876	1.938	1.953	1.938	2.125	2.134	2.203	2.280	2.336	2.392	2.454
32	1.922	1.939	2.000	2.016	2.000	2.187	2.196	2.265	2.342	2.398	2.454	2.516

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A7 REVISED COMPANY LOGO & UPDATED TRADEMARK INFORMATION. (REF. ECR2872)

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STUMP, COMPOSITE APPLICATIONS, LIGHTWEIGHT  
 HUCKCOMP LGP, SHEAR TYPE,  
 PROTRUDING HEAD, SWAGE LOCKING,  
 6AL-4V TITANIUM. (95 KSI SHEAR)

(H)LGPS12SPV()B()()  
 COM110