

TABLE I

PART NUMBER	(Φ A)		Φ A' MIN		Φ D		Φ E MAX		F WRENCH FLATS		(G)		(H)		(L)		R RAD MAX		S MAX		(T HEX ACROSS FLATS)	
	INCH	mm	INCH	mm	INCH	mm	INCH	mm	INCH	mm	INCH	mm	INCH	mm	INCH	mm	INCH	mm	INCH	mm	INCH	mm
MBF2113-5-(-)	.332	8.43	.296	7.52	.1645	4.178	.1640	4.166	.085	2.16	.017	0.43	.039	0.99	.512	13.00	.030	0.76	.009	0.229	.375	9.52
MBF2113-5.5-(-)	.325	8.25			.1800	4.574	.1796	4.561	.080	2.03			.035	0.89		14.61	.030	0.76	.011	0.279	.375	9.52
MBF2113-6-(-)	.385	9.78	.342	8.69	.1985	5.042	.1985	5.042	.113	2.87	.027	0.68	.043	1.09			.030	0.76	.011	0.279	.375	9.52
MBF2113-6.5-(-)	.378	9.60			.2140	5.436	.2141	5.438	.108	2.74			.039	0.99	.605	15.37	.030	0.76	.011	0.279	.375	9.52
MBF2113-7-(-)	.416	10.57	.373	9.47	.2275	5.778	.2275	5.778	.121	3.07	.035	0.89	.043	1.09	.635	16.13	.030	0.76	.011	0.279	.375	9.52
MBF2113-8-(-)	.507	12.88	.463	11.76	.2595	6.591	.2595	6.591	.135	3.43	.055	1.40	.057	1.45	.700	17.78	.030	0.76	.011	0.279	.375	9.52
MBF2113-8.5-(-)	.499	12.67			.2750	6.985	.2751	6.987	.130	3.30			.040	1.02	.758	19.25	.030	0.76	.011	0.279	.375	9.52
MBF2113-9-(-)	.538	13.66	.494	12.55	.2895	7.353	.2895	7.353	.152	3.86	.065	1.65	.057	1.45	.815	20.70	.030	0.76	.011	0.279	.500	12.70
MBF2113-10-(-)	.635	16.13	.577	14.66	.3115	7.912	.3110	7.899	.152	3.73	.070	1.78	.075	1.90	.892	22.66	.040	1.02	.014	0.356	.500	12.70
MBF2113-11-(-)	.666	16.92	.608	15.44	.3435	8.725	.3433	8.720	.185	4.70	.075	1.90	.074	1.88	.941	23.90	.040	1.02	.015	0.381	.500	12.70
MBF2113-12-(-)	.762	19.35	.696	17.68	.3745	9.512	.3740	9.500	.185	4.57	.080	2.03	.089	2.26	1.090	27.69	.040	1.02	.016	0.406	.500	12.70

TABLE I (CONTINUED)

PART NUMBER	MIN AVAILABLE GRIP DASH NO.	INSTALLED DIMENSIONS						MECHANICAL PROPERTIES						V (GAGE PROTRUSION)		Φ W (GAGE)			
		RECOM. HOLE SIZE		Φ J MIN		K MAX		BREAK-OFF LIMITS		TENSILE STRUCTURAL FAILURE MIN		DOUBLE SHEAR MIN						LOCKING TORQUE MIN	
		INCH	mm	INCH	mm	INCH	mm	INCH	mm	LBS	N	LBS	N	IN-LBS	N-m	INCH	mm	INCH	mm
MBF2113-5-(-)	-100	.168	4.27	.250	6.35	.300	7.62	+1.03	+2.62	900	4000	3150	14010	1.0	0.113	.0115	0.292	.2832	7.193
MBF2113-5.5-(-)	-100	.183	4.65	.270	6.86	.325	8.26	+1.03	+2.62	900	4000	3780	16800	1.0	0.113	.0115	0.292	.2832	7.193
MBF2113-6-(-)	-150	.202	5.13	.300	7.62	.350	8.89	+1.03	+2.62	1400	6230	4600	20460	1.5	0.170	.0140	0.356	.3272	8.311
MBF2113-6.5-(-)	-150	.218	5.54	.330	8.38	.350	8.89	+1.03	+2.62	1400	6230	5350	23800	1.5	0.170	.0114	0.289	.3270	8.306
MBF2113-7-(-)	-150	.231	5.88	.350	8.89	.400	10.16	+1.03	+2.62	1600	7120	6050	26910	2.0	0.226	.0202	0.513	.3315	8.420
MBF2113-8-(-)	-150	.263	6.68	.400	10.16	.450	11.43	+1.03	+2.62	2100	9340	7900	35140	2.5	0.282	.0176	0.447	.3313	8.415
MBF2113-8.5-(-)	-150	.279	7.08	.420	10.67	.450	11.43	+1.03	+2.62	2100	9340	8850	39400	2.5	0.282	.0180	0.457	.4320	10.973
MBF2113-9-(-)	-150	.293	7.44	.450	11.43	.500	12.70	+1.03	+2.62	2600	11565	9800	43590	3.0	0.339	.0151	0.384	.4318	10.968
MBF2113-10-(-)	-200	.315	8.00	.475	12.06	.550	13.97	+1.03	+2.62	3600	16010	11350	50480	3.5	0.400	.0227	0.577	.5389	13.688
MBF2113-11-(-)	-200	.347	8.81	.525	13.33	.575	14.60	+1.03	+2.62	4400	19570	13850	61600	4.0	0.452	.0201	0.511	.5385	13.678
MBF2113-12-(-)	-250	.378	9.60	.575	14.60	.625	15.87	+1.03	+2.62	5000	22240	16450	73170	4.0	0.452	.0302	0.767	.5389	13.688

**MONOGRAM AEROSPACE FASTENERS**  
a TriMas company  
3423 SOUTH GARFIELD AVENUE  
COMMERCE, CALIFORNIA 90040  
(323) 722-4760 FAX (323) 727-1029

TITLE:  
**BLIND FASTENER, 130° FLUSH HEAD  
FOR ADVANCED COMPOSITE MATERIALS  
TITANIUM**

DRAWING NO:  
**MBF2113(-)-(-)-((-)**

DRAWN BY: **A PEREZ** DRAWN DATE: **07/02/13**

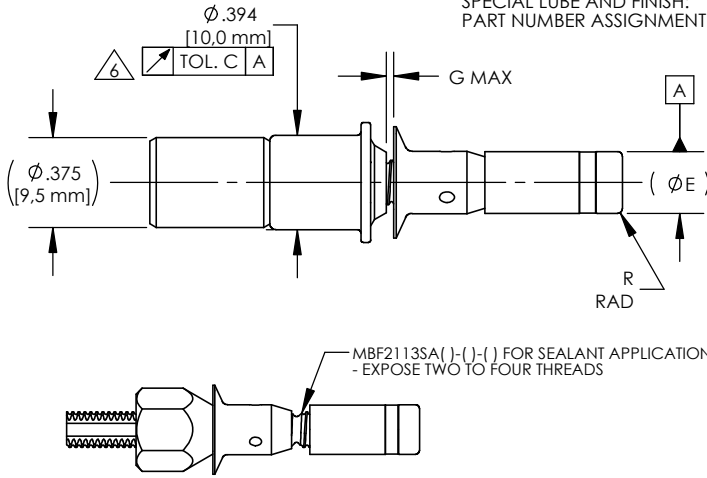
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**MONOGRAM** ECN NO: **17-0193** REV: **AP**  
CAGE CODE: **98524** ECN DATE: **08/17/17** SHEET 1 OF 2

APPLICABLE SPECIFICATIONS:  
 PROCUREMENT SPECIFICATION:  
 INSTALLATION AND INSPECTION SPECIFICATION:  
 SPECIAL LUBE AND FINISH:  
 PART NUMBER ASSIGNMENT:

MBF2000  
 MBF2003  
 MBF2002  
 MBF2004



ROBOTIC PART NUMBER	R RAD		G MAX (GAP)		"TOL. C" $\triangle$			
	INCH	mm	INCH	mm	GRIP < -500		GRIPS 500-1000	
					INCH	mm	INCH	mm
MBF2113( )-5-( )A MBF2113( )-5.5-( )A	.030 .010	0,762 0,254	.042	1,067	.030	0,762	.030	0,762
MBF2113( )-6-( )A MBF2113( )-6.5-( )A	.035 .015	0,889 0,381	.050	1,270	.027	0,686	.030	0,762
MBF2113( )-7-( )A	.035 .015	0,889 0,381	.055	1,397	.025	0,635	.030	0,762
MBF2113( )-8-( )A MBF2113( )-8.5-( )A	.040 .020	1,016 0,508	.062	1,575	.022	0,559	.030	0,762
MBF2113( )-9-( )A	.040 .020	1,016 0,508	.071	1,803	.022	0,559	.030	0,762
MBF2113( )-10-( )A	.040 .020	1,016 0,508	.071	1,803	.022	0,559	.030	0,762

**MATERIAL AND HEAT TREAT:**

- NUT: 6Al-4V TITANIUM ALLOY PER AMS-T-9047 STA OR AMS4928 OR AMS4967 HEAT TREATED PER AMS-H-81200 TO 95 KSI SHEAR STRENGTH MINIMUM. MAXIMUM HYDROGEN CONTENT 125 PPM.
  - SCREW: A286 CRES PER AMS5731, AMS5732 OR AMS5737 HEAT TREATED TO 175 KSI TENSILE MINIMUM.
  - SLEEVE: 304 CRES PER AMS5639, FULLY ANNEALED.
  - INSERT: ACETAL PER ASTM-D6778
  - DRIVE NUT: MILD STEEL.
- FINISH:**
- (-) NUT: PHOSPHATE FLUORIDE PER MONOGRAM SPECIFICATION PS741
  - SLEEVE AND SCREW: PASSIVATE PER AMS2700, AS5272 TYPE I OR TYPE II, CONVERSION COATING OPTIONAL.
  - INSERT: NONE
  - DRIVE NUT: COLOR GRAY

**LUBRICANT:**

SOLID FILM LUBRICANT PER AS5272 TYPE I OR TYPE II, PARAFFIN WAX, OR CETYL ALCOHOL PER AS87132 (AS REQUIRED FOR PERFORMANCE) (SEE FINISH CODE FOR ADDITIONAL RESTRICTIONS).



2ND DASH NO. (GRIP)	GRIP RANGE			
	MIN GRIP		MAX GRIP	
	INCH	mm	INCH	mm
100	.050	1.27	.100	2.54
150	.100	2.54	.150	3.81
200	.150	3.81	.200	5.08
250	.200	5.08	.250	6.35
300	.250	6.35	.300	7.62
350	.300	7.62	.350	8.89
400	.350	8.89	.400	10.16
450	.400	10.16	.450	11.43
500	.450	11.43	.500	12.70
550	.500	12.70	.550	13.97
600	.550	13.97	.600	15.24
650	.600	15.24	.650	16.51
700	.650	16.51	.700	17.78
750	.700	17.78	.750	19.05
800	.750	19.05	.800	20.32
850	.800	20.32	.850	21.59
900	.850	21.59	.900	22.86
950	.900	22.86	.950	24.13
1000	.950	24.13	1.000	25.40
1050	1.000	25.40	1.050	26.67
1100	1.050	26.67	1.100	27.94
1150	1.100	27.94	1.150	29.21
1200	1.150	29.21	1.200	30.48
1250	1.200	30.48	1.250	31.75
1300	1.250	31.75	1.300	33.02
1350	1.300	33.02	1.350	34.29
1400	1.350	34.29	1.400	35.56
1450	1.400	35.56	1.450	36.83
1500	1.450	36.83	1.500	38.10
1550	1.500	38.10	1.550	39.37
1600	1.550	39.37	1.600	40.64
1650	1.600	40.64	1.650	41.91
1700	1.650	41.91	1.700	43.18

**GENERAL NOTES:**

- EXAMPLE OF PART NUMBER:  
 MBF2113 ( ) - 6 - 100 ( )  
 "A" DESIGNATES DUAL DRIVE NUT SYSTEM FOR ROBOTIC INSTALLATION  
 DESIGNATES GRIP (TABLE III)  
 DESIGNATES BASIC DIMENSIONS (TABLE I)  
 DESIGNATES SPECIAL FINISH CODE  
 DESIGNATES BASIC PART NUMBER  
 (BASIC PART: MBF2113SA ( )-6-100 USE FOR SEALANT APPLICATION)
- LOCKING FEATURE CONSISTS OF THREE (3) INDENTATIONS LOCATED 120 ° APART ON THE PERIPHERY OF THE NUT COMPONENT AND APPROXIMATELY .040" ABOVE INTERSECTION OF THE NUT NOSE ANGLE AND O.D.
- HEAD MARKINGS: MANUFACTURER'S IDENTIFICATION: MONOGRAM = "M"  
 FASTENER IDENTIFICATION = "2113"  
 POSITION OPTIONAL  
 ALTERNATE HEAD MARKING: "M" AND "2013".
- COMPOSI-LOK FASTENERS WITH SELECTED COMBINATIONS OF THE ABOVE LUBRICANTS AND FINISHES ARE SPECIALLY CODED AND MAY BE SUBSTITUTED FOR EQUIVALENT NON-CODED PARTS AT MANUFACTURER'S OPTION. SEE INTERCHANGEABILITY SPECIFICATION MBF2007.
- DISTORTION SHALL NOT PREVENT INSERTION OF THE FASTENER INTO A RING GAUGE OF LENGTH EQUAL TO ONE DIAMETER AND HOLE DIAMETER EQUAL TO A MINIMUM REC Δ OMMENDED HOLE. FORCE FOR INSERTION SHALL NOT EXCEED 5.0 POUNDS.
- MAXIMUM RUNOUT FROM DRIVE NUT TO SCREW HEAD WHEN DRIVE NUT IS FULLY SEATED (G=0) FOR GRIPS UNDER/EQUAL -1000. FOR GRIPS LONGER THAN -1000 "TOL C" TBD.
- ALL OTHER DIMENSIONS ARE THE SAME AS IN TABLE I.
- HALF GRIP SIZES MAY BE ORDERED BY ADDING (.025) TO THE GRIP DASH NUMBERS.

EXAMPLE: MBF2113-08-525 INDICATES A NOMINAL GRIP LENGTH OF .500.  
 THE GRIP RANGE FOR THESE HALF-GRIP SIZES WILL BE NOMINAL GRIP +.025/-0.025.



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BLIND FASTENER, 130° FLUSH HEAD  
 FOR ADVANCED COMPOSITE MATERIALS  
 TITANIUM

DRAWING NO:

MBF2113( )-( )-( )

DRAWN BY:

A PEREZ

DRAWN DATE:

07/02/13

APPROVED BY:

CHECKED DATE:

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ECN NO:  
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REV:  
 AP  
 SHEET 2 OF 2