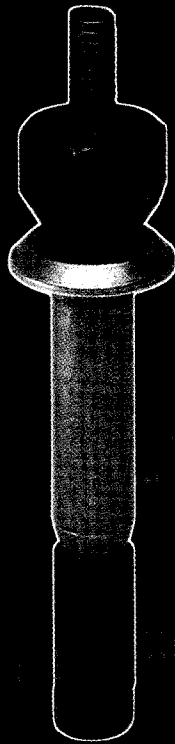


MONOGRAM PERFORMER MXP

One Fastener Through Thick or Thin!



MONOGRAM AEROSPACE FASTENERS



INTRODUCTION

MONOGRAM PERFORMER-MXP

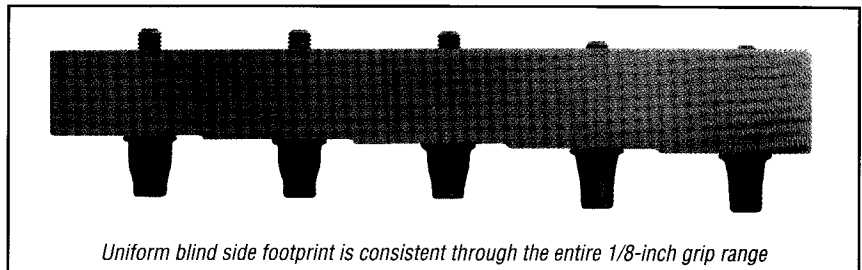
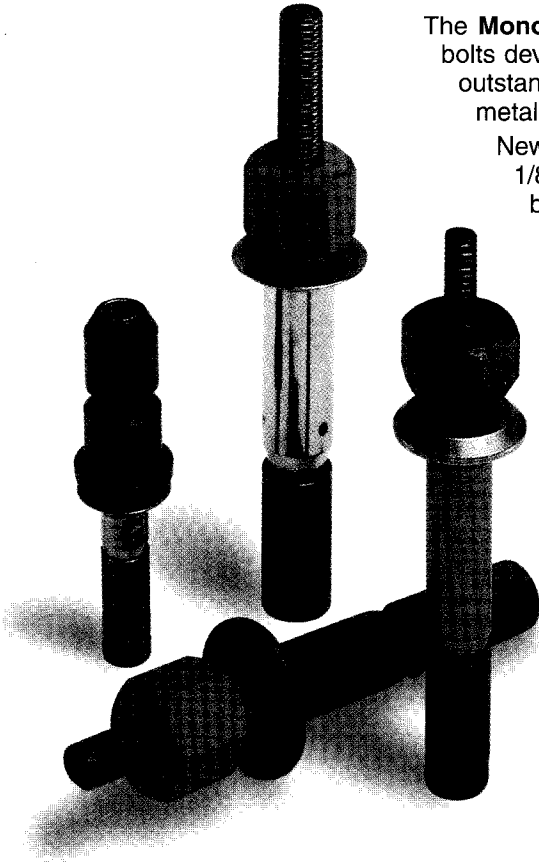
Featuring a full 1/8-inch grip accommodation

The **Monogram Performer-MXP** is the latest innovation in a long line of structural blind bolts developed by Monogram Aerospace Fasteners. This new fastener combines all the outstanding qualities of both Visu-Lok® and Composi-Lok® in that it performs equally well in metallic and composite structure.

New to the industry, the MXP is the first and only aerospace blind fastener to offer a full 1/8-inch grip accommodation. Imagine the purchasing and inventory savings achieved by having one fastener suitable for both metallic and composite applications, and with the grip capability of two or more conventional fasteners. Plus, the MXP's expanded grip accommodation greatly simplifies common production problems associated with grip changes due to variations in tolerance stack ups and the use of shims. In addition to the 1/8-inch grip accommodation, the fastener provides a further ±.010-inch grip forgiveness feature beyond the stated grip range.

The MXP also features a newly patented blind side sleeve which provides a large, flat and consistent footprint across the entire 1/8-inch grip range. It's this unique footprint that makes the MXP ideal for applications in both metallic and composite structure.

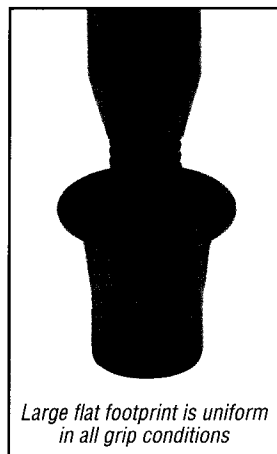
As with other Monogram structural blind bolts, the MXP consistently provides the highest preload of any blind fastener in the industry. Its minimum preloads are 40% of the ultimate joint strength (i.e. fastener yield strength) and this, combined with the large flat footprint, assures optimum joint performance.



Uniform blind side footprint is consistent through the entire 1/8-inch grip range

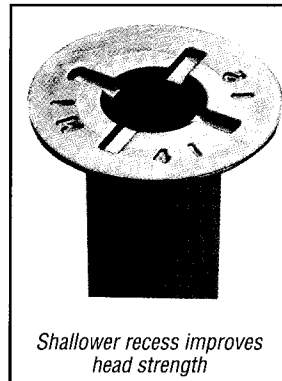
FEATURES

- 90 KSI shear strength
- 1/8" grip accommodation
- ±.010" grip forgiveness beyond the standard 1/8" grip range
- Uniform and consistent footprint across entire grip range
- Large flat footprint is ideally suited to both metallic and non-metallic structure
- Same high preload for min and max grip
- Larger grip accommodation reduces inventories and effectively saves on procurement costs by consolidating the number of fastener sizes required
- Utilizes the same patented Monogram "Drive Nut" concept common to Visu-Lok II® and Composi-Lok II®
- Handles up to 7° blind side slope



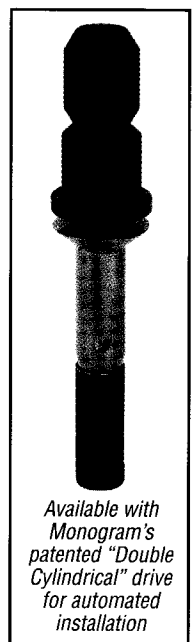
Large flat footprint is uniform in all grip conditions

- Uses same tooling as Visu-Lok II® and Composi-Lok II®
- Nominal diameters standard, oversize diameters available
- New shallower head recess improves flush head strength and at the same time provides centerline location for removal tooling



Shallower recess improves head strength

- Available in all popular head styles
- Fewer shop removals due to out of grip conditions
- Robot adaptable using double cylindrical installation method



Available with Monogram's patented "Double Cylindrical" drive for automated installation

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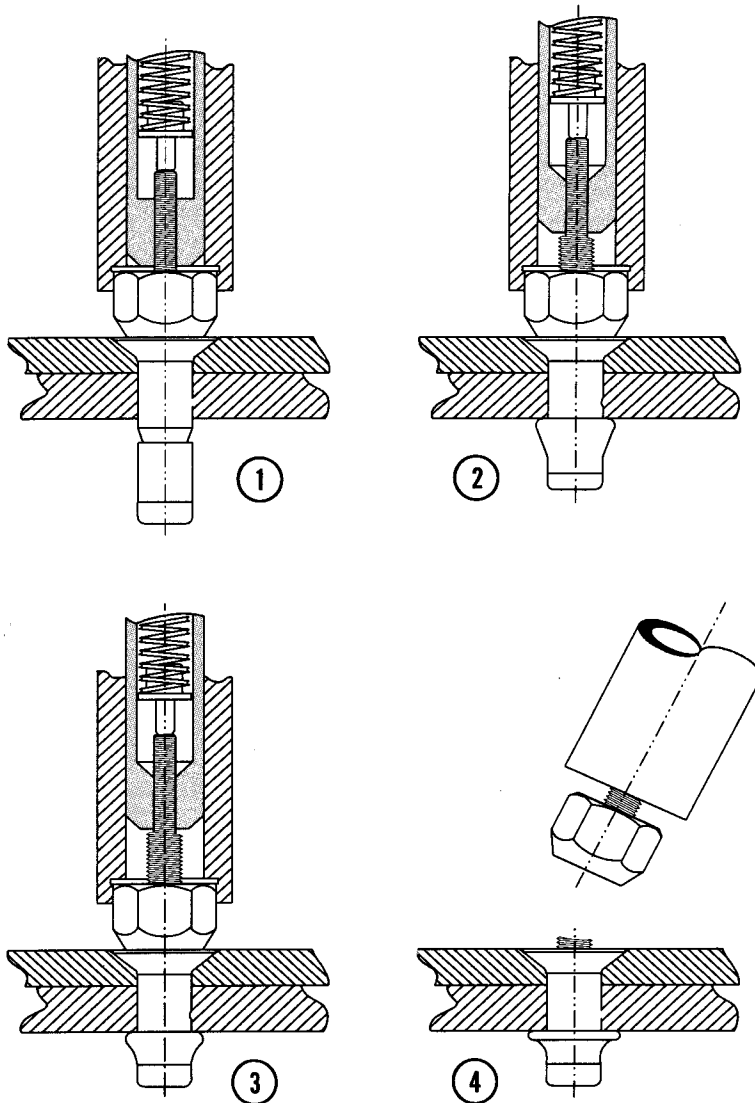


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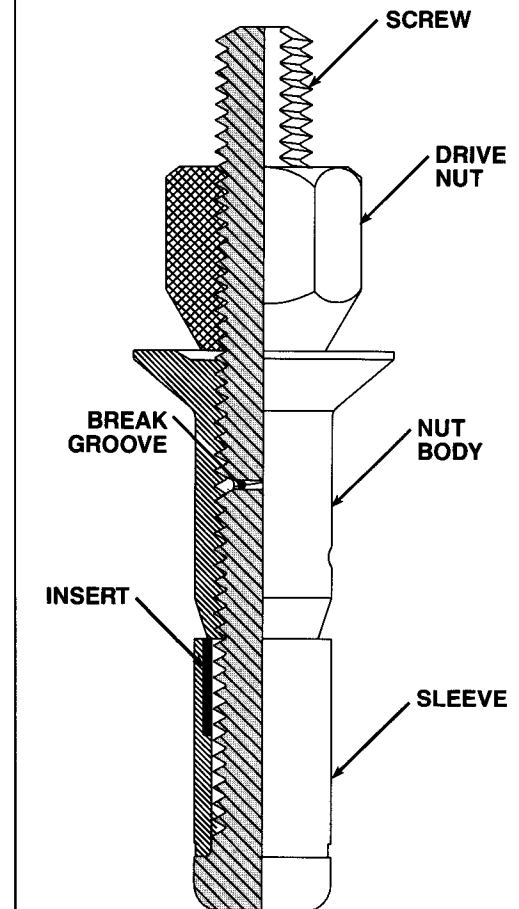


DRIVE NUT CONCEPT

INSTALLATION SEQUENCE



MONOGRAM PERFORMER MXP



HOW THEY WORK

1. The Monogram Performer MXP fastener is inserted into the prepared hole. The installation tool is placed over the screw simultaneously engaging the wrench flats and the DRIVE NUT.
2. Torque is applied to the screw while the DRIVE NUT is held stationary. In the event that the DRIVE NUT is not already threaded down tight then both the screw and nut body rotate until the drive nut is seated against the nut body. This restrains further rotation of the nut body. The screw continues to advance through the nut body causing the sleeve to be drawn up over the tapered nose of the nut body. Initial blind head formation is started.
3. Continued tightening removes sheet gap, completes formation of the large blind head and clamps the sheets tightly together.
4. Once the sleeve has fully formed against the blind side of the structure the screw will fracture in the break groove. The tool is pulled away and the pintail-DRIVE NUT assembly is discarded.

Monogram Performer LOW PROFILE PROTRUDING HEAD

MXP 4110 & 4120 Series

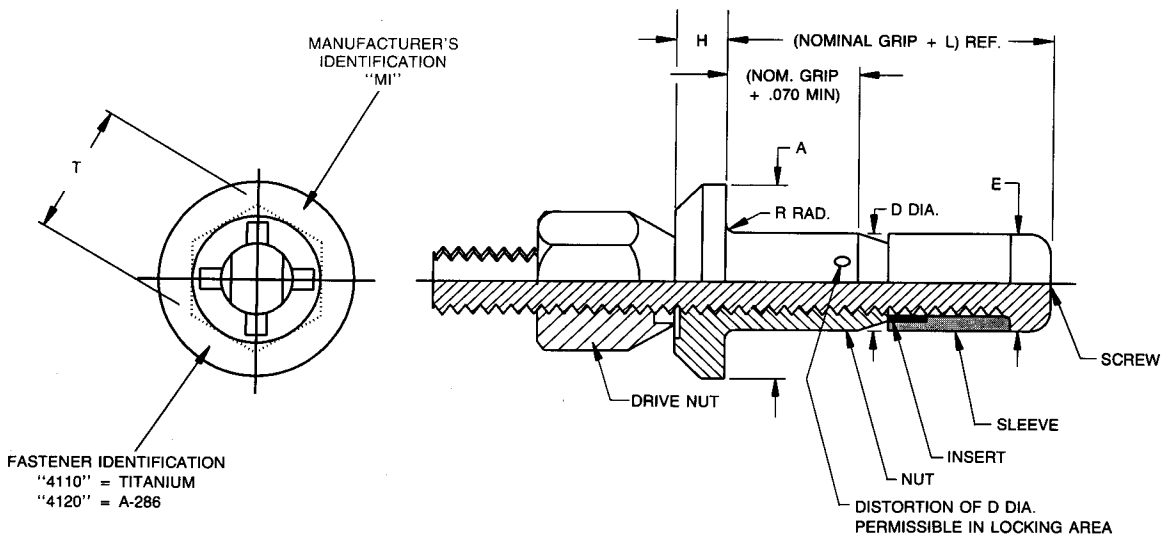


TABLE 1

BASIC DIA DASH NO.	A DIA	D DIA	E DIA MAX	H REF	L REF	R RADIUS MAX	T FLATS REF
-05	.359	.1635	.1635	.060	.700	.030	.375
	.329	.1625	.1635	.053			
-06	.421	.1885	.1895	.070	.900	.040	.500
	.391	.1895	.1895	.063			
-08	.546	.2495	.2495	.085	1.000	.040	.500
	.516	.2485	.2495	.078			
-10	.640	.3120	.3120	.105	1.100	.040	.500
	.610	.3110	.3120	.098			
-12	.765	.3745	.3745	.125	1.100	.040	.500
	.735	.3735	.3745	.118			

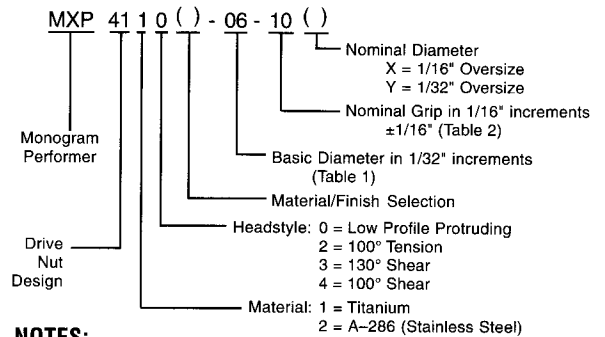
TABLE 2

NOMINAL GRIP DASH NO.	GRIP RANGE		NOMINAL GRIP DASH NO.	GRIP RANGE	
	MIN. GRIP	MAX. GRIP		MIN. GRIP	MAX. GRIP
-2	.062	.187	-10	.565	.687
-3	.125	.250	-11	.625	.750
-4	.187	.312	-12	.687	.812
-5	.250	.375	-13	.750	.875
-6	.312	.437	-14	.812	.937
-7	.375	.500	-15	.875	1.000
-8	.437	.565	-16	.937	1.062
-9	.500	.625			

TABLE 3

BASIC PART NO	COMPONENT	MATERIAL	HEAT TREAT	FINISH	LUBRICATION
4120	NUT	A-286 Stainless Steel Per AMS 5731	As Required for Performance	Kal-Gard Ann-Ro #1012 Conversion Coating or Phosphate Fluoride per PS741 as Mfr's Option	Dry Film Lubricant per the Chemical Requirements of MIL-L-46010 Type I, Paraffin Wax and/or Cetyl Alcohol per MIL-L-87132 used (any or all) as Required for Performance
	SCREW	Inconel 718 Per AMS 5662	To 125 KSI FSU min.	Kal-Gard Ann-Ro #1013 Conversion Coating, or Passivate per ASTM-A-967-96	
	SLEEVE	304 Stainless Steel Per AMS 5639	Fully Annealed		
	DRIVE NUT	Mild Steel	As Required for Performance	Color Black	
4110	NUT	6AL-4V Titanium MIL-T-9047 AMS 4928; AMS 4967	Per MIL-H-81200 to 95 KSI Shear Strength Min. Max. Hydrogen 125 ppm	Kal-Gard Ann-Ro #1012 Conversion Coating or Phosphate Fluoride per PS741 as Mfr's Option	Dry Film Lubricant per the Chemical Requirements of MIL-L-46010 Type I, Paraffin Wax and/or Cetyl Alcohol per MIL-L-87132 used (any or all) as Required for Performance
	SCREW	Inconel 718 Per AMS 5639	To 125 KSI FSU Min.	Kal-Gard Ann-Ro #1013 Conversion Coating, or Passivate per ASTM-A-967-96	
	SLEEVE	304 Stainless Steel Per AMS 5639	Fully Annealed		
	DRIVE NUT	Mild Steel	As Required for Performance	Color Gray	

PART NUMBER EXAMPLE:



NOTES:

- 1 Procurement specification MXP 4000
- 2 See MXP 4003 for detailed installation, removal and inspection information.
- 3 Locking feature consists of three indentations located 120° apart on periphery of the nut component.
- 4 MXP fasteners with selected combinations of the lubricants and finishes shown in Table 3 are specially coded and may be substituted for the equivalent non-coded parts at manufacturer's option. Refer to special lubricant and finish codes specification MXP 4002.
- 5 Titanium nut finish may be: Phosphate Fluoride per specification PS741 or KAL-GARD ANN-RO #1012 conversion coating at manufacturer's option.

INSERT IS ACETAL PER FED SPEC. ASTM D4181

U.S. PATENT NO. 5498110. OTHER PATENTS ISSUED AND PENDING



Monogram Performer 100° FLUSH TENSION HEAD

MXP 4112 & 4122 Series

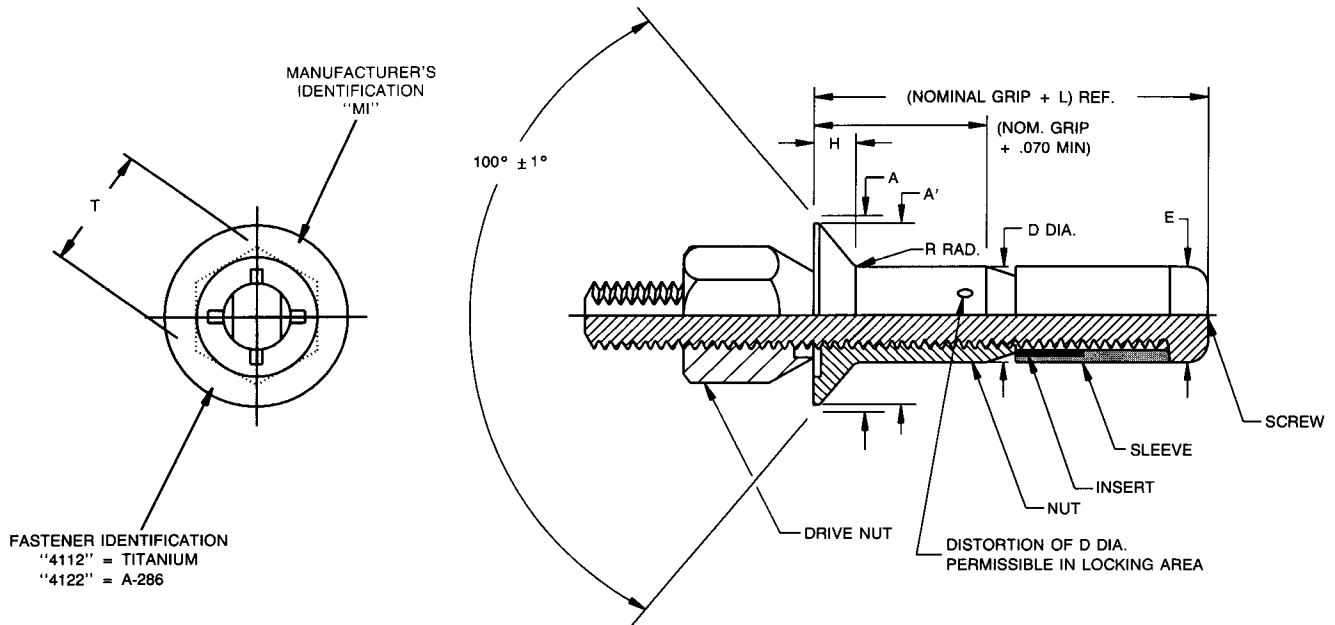


TABLE 1

BASIC DIA DASH NO.	A DIA THEO	A' DIA MIN	D DIA	E DIA MAX	H REF	L REF	R RADIUS MAX	T FLATS REF
-05	.330 .326	.307	.1635 .1625	.1635	.070	.700	.030	.375
-06	.381 .377	.350	.1885 .1895	.1895	.080			
-08	.506 .502	.475	.2495 .2485	.2495	.108			
-10	.633 .629	.601	.3120 .3110	.3120	.135	1.000	.040	.500
-12	.760 .756	.728	.3745 .3735	.3745	.162	1.100		

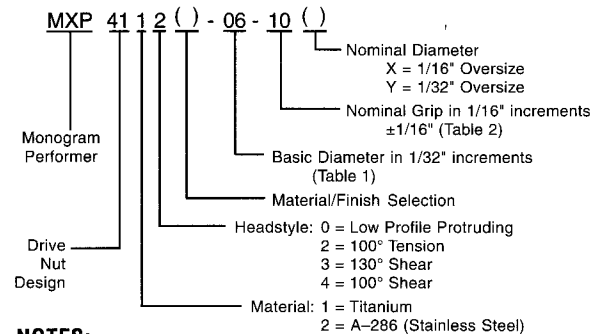
TABLE 2

NOMINAL GRIP DASH NO.	GRIP RANGE		NOMINAL GRIP DASH NO.	GRIP RANGE	
	MIN. GRIP	MAX. GRIP		MIN. GRIP	MAX. GRIP
-3	.125	.250	-10	.565	.687
-4	.187	.312	-11	.625	.750
-5	.250	.375	-12	.687	.812
-6	.312	.437	-13	.750	.875
-7	.375	.500	-14	.812	.937
-8	.437	.565	-15	.875	1.000
-9	.500	.625	-16	.937	1.062

TABLE 3

BASIC PART NO	COMPONENT	MATERIAL	HEAT TREAT	FINISH	LUBRICATION
4122	NUT	A-286 Stainless Steel Per AMS 5731	As Required for Performance	Kal-Gard Ann-Ro #1012 Conversion Coating or Phosphate Fluoride per PS741 as Mfr's Option	Dry Film Lubricant per the Chemical Requirements of MIL-L-46010 Type I, Paraffin Wax and/or Cetyl Alcohol per MIL-L-87132 used (any or all) as Required for Performance
	SCREW	Inconel 718 Per AMS 5662	To 125 KSI FSU min.	Kal-Gard Ann-Ro #1013 Conversion Coating, or Passivate per ASTM-A-967-96	
	SLEEVE	304 Stainless Steel Per AMS 5639	Fully Annealed		
	DRIVE NUT	Mild Steel	As Required for Performance	Color Black	
4112	NUT	6AL-4V Titanium MIL-T-9047 AMS 4928, AMS 4967	Per MIL-H-81200 to 95 KSI Shear Strength Min. Max. Hydrogen 125 ppm	Kal-Gard Ann-Ro #1012 Conversion Coating or Phosphate Fluoride per PS741 as Mfr's Option	Dry Film Lubricant per the Chemical Requirements of MIL-L-46010 Type I, Paraffin Wax and/or Cetyl Alcohol per MIL-L-87132 used (any or all) as Required for Performance
	SCREW	Inconel 718 Per AMS 5639	To 125 KSI FSU Min.	Kal-Gard Ann-Ro #1013 Conversion Coating, or Passivate per ASTM-A-967-96	
	SLEEVE	304 Stainless Steel Per AMS 5639	Fully Annealed		
	DRIVE NUT	Mild Steel	As Required for Performance	Color Gray	

PART NUMBER EXAMPLE:



NOTES:

- 1 Procurement specification MXP 4000
- 2 See MXP 4003 for detailed installation, removal and inspection information.
- 3 Locking feature consists of three indentations located 120° apart on periphery of the nut component.
- 4 MXP fasteners with selected combinations of the lubricants and finishes shown in Table 3 are specially coded and may be substituted for the equivalent non-coded parts at manufacturer's option. Refer to special lubricant and finish codes specification MXP 4002.
- 5 Titanium nut finish may be: Phosphate Fluoride per specification PS741 or KAL-GARD ANN-RO #1012 conversion coating at manufacturer's option.

INSERT IS ACETAL PER FED SPEC. ASTM D4181

U.S. PATENT NO. 5498110. OTHER PATENTS ISSUED AND PENDING

Monogram Performer 130° FLUSH SHEAR HEAD

MXP 4113 & 4123 Series

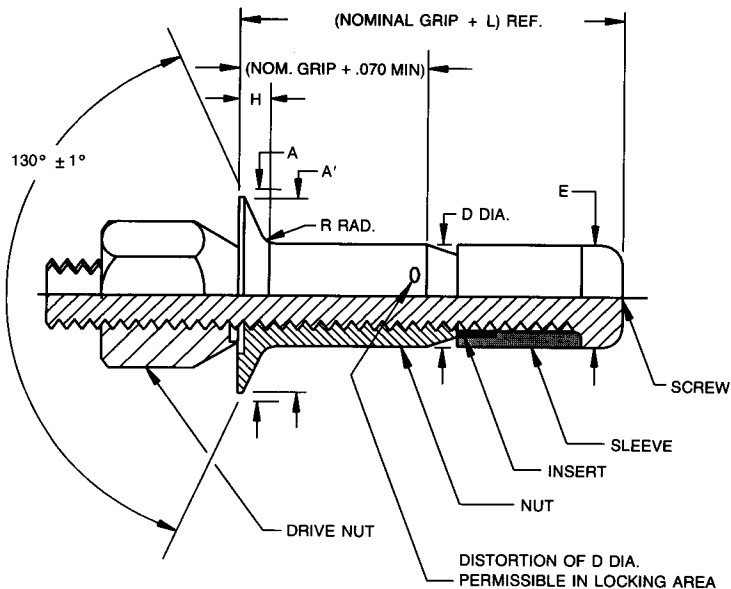
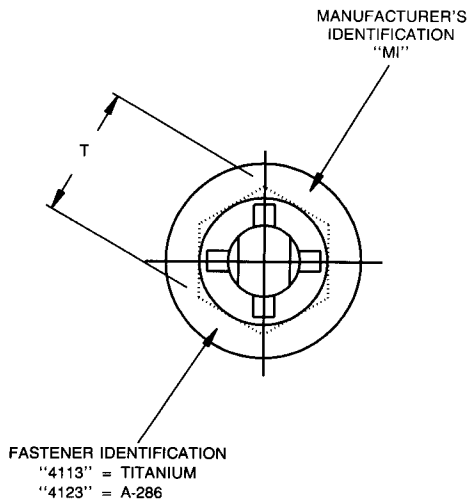


TABLE 1

BASIC DIA DASH NO.	A DIA THEO	A' DIA MIN	D DIA	E DIA MAX	H REF	L REF	R RADIUS MAX	T FLATS REF
-05	.330 .326	.307	.1635 .1625	.1635	.039	.700	.030	.375
-06	.381 .377	.350	.1885 .1895	.1895	.044			
-08	.506 .502	.475	.2495 .2485	.2495	.059			
-10	.633 .629	.601	.3120 .3110	.3120	.075	1.000	.040	.500
-12	.760 .756	.728	.3745 .3735	.3745	.089	1.100		

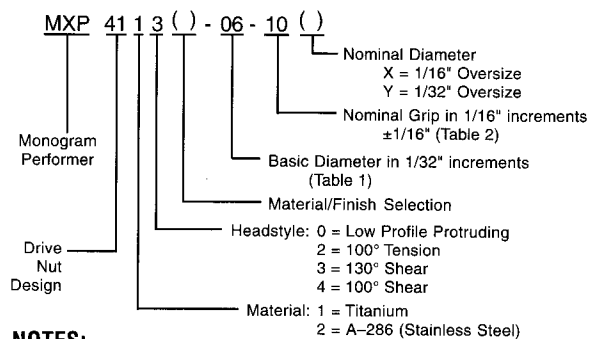
TABLE 2

NOMINAL GRIP DASH NO.	GRIP RANGE		NOMINAL GRIP DASH NO.	GRIP RANGE	
	MIN. GRIP	MAX. GRIP		MIN. GRIP	MAX. GRIP
-3	.125	.250	-10	.565	.687
-4	.187	.312	-11	.625	.750
-5	.250	.375	-12	.687	.812
-6	.312	.437	-13	.750	.875
-7	.375	.500	-14	.812	.937
-8	.437	.565	-15	.875	1.000
-9	.500	.625	-16	.937	1.062

TABLE 3

BASIC PART NO	COMPONENT	MATERIAL	HEAT TREAT	FINISH	LUBRICATION
4123	NUT	A-286 Stainless Steel Per AMS 5731	As Required for Performance	Kal-Gard Ann-Ro #1012 Conversion Coating or Phosphate Fluoride per PS741 as Mfr's Option	Dry Film Lubricant per the Chemical Requirements of MIL-L-46010 Type I, Paraffin Wax and/or Cetyl Alcohol per MIL-L-87132 used (any or all) as Required for Performance
	SCREW	Inconel 718 Per AMS 5662	To 125 KSI FSU min.	Kal-Gard Ann-Ro #1013 Conversion Coating, or Passivate per ASTM-A-967-96	
	SLEEVE	304 Stainless Steel Per AMS 5639	Fully Annealed		
	DRIVE NUT	Mild Steel	As Required for Performance	Color Black	
4113	NUT	6AL-4V Titanium MIL-T-9047 AMS 4928, AMS 4967	Per MIL-H-81200 to 95 KSI Shear Strength Min. Max. Hydrogen 125 ppm	Kal-Gard Ann-Ro #1012 Conversion Coating or Phosphate Fluoride per PS741 as Mfr's Option	Dry Film Lubricant per the Chemical Requirements of MIL-L-46010 Type I, Paraffin Wax and/or Cetyl Alcohol per MIL-L-87132 used (any or all) as Required for Performance
	SCREW	Inconel 718 Per AMS 5639	To 125 KSI FSU Min.	Kal-Gard Ann-Ro #1013 Conversion Coating, or Passivate per ASTM-A-967-96	
	SLEEVE	304 Stainless Steel Per AMS 5639	Fully Annealed		
	DRIVE NUT	Mild Steel	As Required for Performance	Color Gray	

PART NUMBER EXAMPLE:



NOTES:

- 1 Procurement specification MXP 4000
- 2 See MXP 4003 for detailed installation, removal and inspection information.
- 3 Locking feature consists of three indentations located 120° apart on periphery of the nut component.
- 4 MXP fasteners with selected combinations of the lubricants and finishes shown in Table 3 are specially coded and may be substituted for the equivalent non-coded parts at manufacturer's option. Refer to special lubricant and finish codes specification MXP 4002.
- 5 Titanium nut finish may be: Phosphate Fluoride per specification PS741 or KAL-GARD ANN-RO #1012 conversion coating at manufacturer's option.

INSERT IS ACETAL PER FED SPEC. ASTM D4181

U.S. PATENT NO. 5498110. OTHER PATENTS ISSUED AND PENDING



Monogram Performer 100° REDUCED SHEAR HEAD

MXP 4114 & 4124 Series

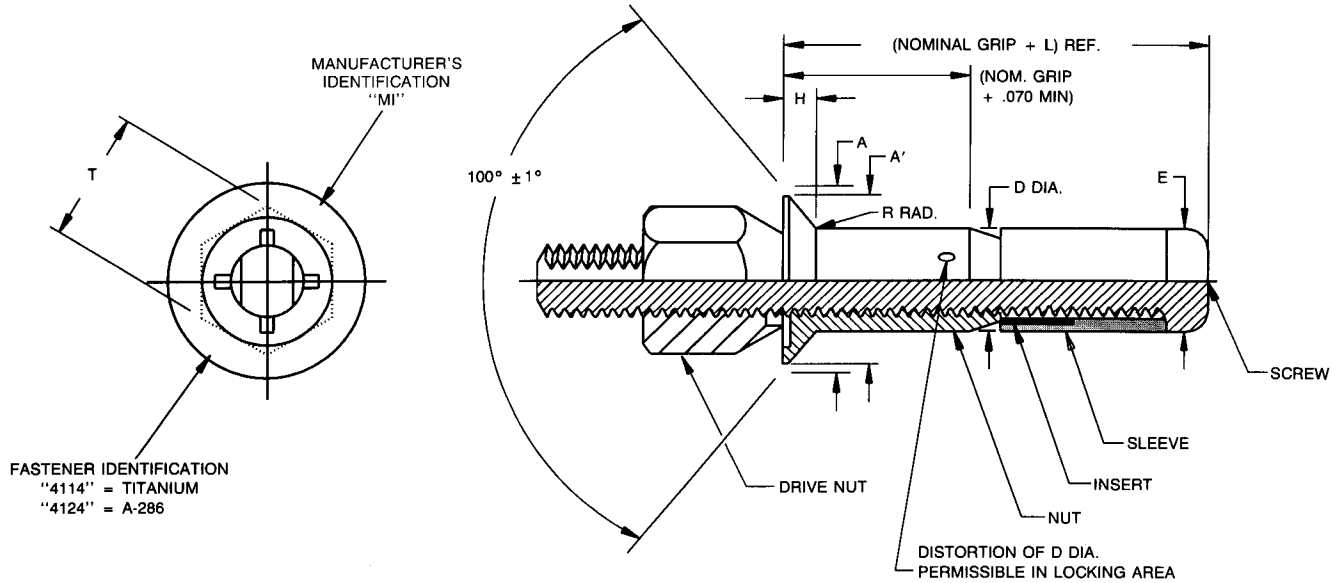


TABLE 1

BASIC DIA DASH NO.	A DIA THEO	A' DIA MIN	D DIA	E DIA MAX	H REF	L REF	R RADIUS MAX	T FLATS REF
-05	.2612 .2564	.241	.1635 .1625	.1635	.040	.700	.030	.375
-06	.3016 .2966	.270	.1885 .1895	.1895	.046			
-08	.3948 .3898	.363	.2495 .2485	.2495	.060	.900	.040	.500
-10	.4739 .4689	.442	.3120 .3110	.3120	.067	1.000		
-12	.5604 .5554	.529	.3745 .3735	.3745	.077	1.100		

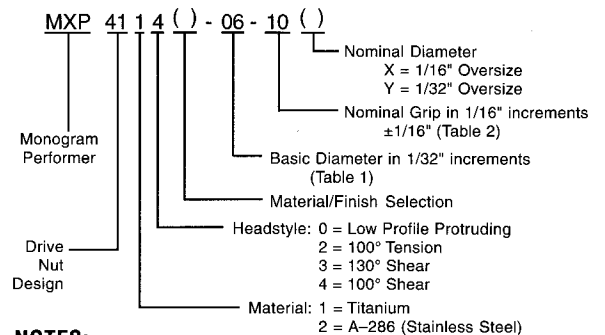
TABLE 2

NOMINAL GRIP DASH NO.	GRIP RANGE		NOMINAL GRIP DASH NO.	GRIP RANGE	
	MIN. GRIP	MAX. GRIP		MIN. GRIP	MAX. GRIP
-3	.125	.250	-10	.565	.687
-4	.187	.312	-11	.625	.750
-5	.250	.375	-12	.687	.812
-6	.312	.437	-13	.750	.875
-7	.375	.500	-14	.812	.937
-8	.437	.565	-15	.875	1.000
-9	.500	.625	-16	.937	1.062

TABLE 3

BASIC PART NO	COMPONENT	MATERIAL	HEAT TREAT	FINISH	LUBRICATION
4124	NUT	A-286 Stainless Steel Per AMS 5731	As Required for Performance	Kal-Gard Ann-Ro #1012 Conversion Coating or Phosphate Fluoride per PS741 as Mfr's Option	Dry Film Lubricant per the Chemical Requirements of MIL-L-46010 Type I, Paraffin Wax and/or Cetyl Alcohol per MIL-L-87132 used (any or all) as Required for Performance
	SCREW	Inconel 718 Per AMS 5662	To 125 KSI FSU min.	Kal-Gard Ann-Ro #1013 Conversion Coating, or Passivate per ASTM-A-967-96	
	SLEEVE	304 Stainless Steel Per AMS 5639	Fully Annealed		
	DRIVE NUT	Mild Steel	As Required for Performance	Color Black	
4114	NUT	6AL-4V Titanium MIL-T-9047 AMS 4928, AMS 4967	Per MIL-H-81200 to 95 KSI Shear Strength Min. Max. Hydrogen 125 ppm	Kal-Gard Ann-Ro #1012 Conversion Coating or Phosphate Fluoride per PS741 as Mfr's Option	Dry Film Lubricant per the Chemical Requirements of MIL-L-46010 Type I, Paraffin Wax and/or Cetyl Alcohol per MIL-L-87132 used (any or all) as Required for Performance
	SCREW	Inconel 718 Per AMS 5639	To 125 KSI FSU Min.	Kal-Gard Ann-Ro #1013 Conversion Coating, or Passivate per ASTM-A-967-96	
	SLEEVE	304 Stainless Steel Per AMS 5639	Fully Annealed		
	DRIVE NUT	Mild Steel	As Required for Performance	Color Gray	

PART NUMBER EXAMPLE:



NOTES:

- Procurement specification MXP 4000
- See MXP 4003 for detailed installation, removal and inspection information.
- Locking feature consists of three indentations located 120° apart on periphery of the nut component.
- MXP fasteners with selected combinations of the lubricants and finishes shown in Table 3 are specially coded and may be substituted for the equivalent non-coded parts at manufacturer's option. Refer to special lubricant and finish codes specification MXP 4002.
- Titanium nut finish may be: Phosphate Fluoride per specification PS741 or KAL-GARD ANN-RO #1012 conversion coating at manufacturer's option.

INSERT IS ACETAL PER FED SPEC. ASTM D4181

U.S. PATENT NO. 5498110. OTHER PATENTS ISSUED AND PENDING



This section describes the installation tooling and accessories to ensure the proper performance of Monogram Performer MXP Blind Bolts.

The MXP Blind Fastener uses standard NAS1675 tooling at standard air pressure levels. No secondary hydraulic units are required. A wide variety of low cost 90° offset tools, small hand tools and adapters meet limited access application needs.

The tooling, when used in conjunction with the proper "Nose Adapters" and "Wrench Adapters," will satisfactorily install all basic Monogram Performer Fastener configurations in the 5/32" thru 3/8" body diameters.

The basic configurations of installation tools and their accessories are described below:

1. THE DRIVER – Pneumatic power motor or hand driver.
2. THE NOSE ADAPTER – The nose adapter connects to the power motor housing or hand driver handle. Its function is to engage the DRIVE NUT and prevent fastener rotation during installation.
3. THE WRENCH ADAPTER – The wrench adapter is enclosed by the nose adapter and connects directly to the power source. Its function is to apply driving force to the fastener wrenching end of the screw and eject the DRIVE NUT/Pintail after screw breakoff.

Recommended Source for Tooling –



Monogram Aerospace Fasteners

3423 S. Garfield Avenue

Los Angeles, California 90040-3103

(213) 722-4760 • FAX: (213) 721-1851

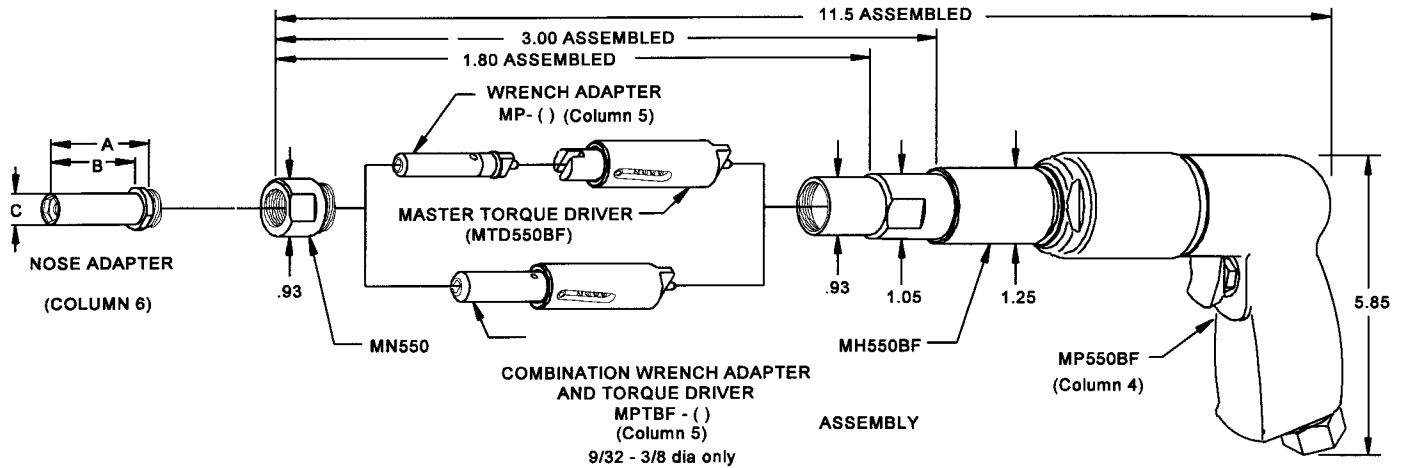
Web Site: www.monogramaerospace.com

E-Mail: techsales@monogramaerospace.com



INSTALLATION TOOLING

MP550BF Pneumatic Pistol



MOTOR SPECIFICATIONS

OPERATING PRESSURE 90 PSI (MIN)
 TORQUE OUTPUT 380 IN/LBS
 MOTOR SPEED 300 RPM
 AIR CONSUMPTION AT FREE SPEED 22 CFM
 HORSEPOWER 4.3
 WEIGHT 4 LBS (APPROX.)
 WORK SPACE NEEDED PORTABLE

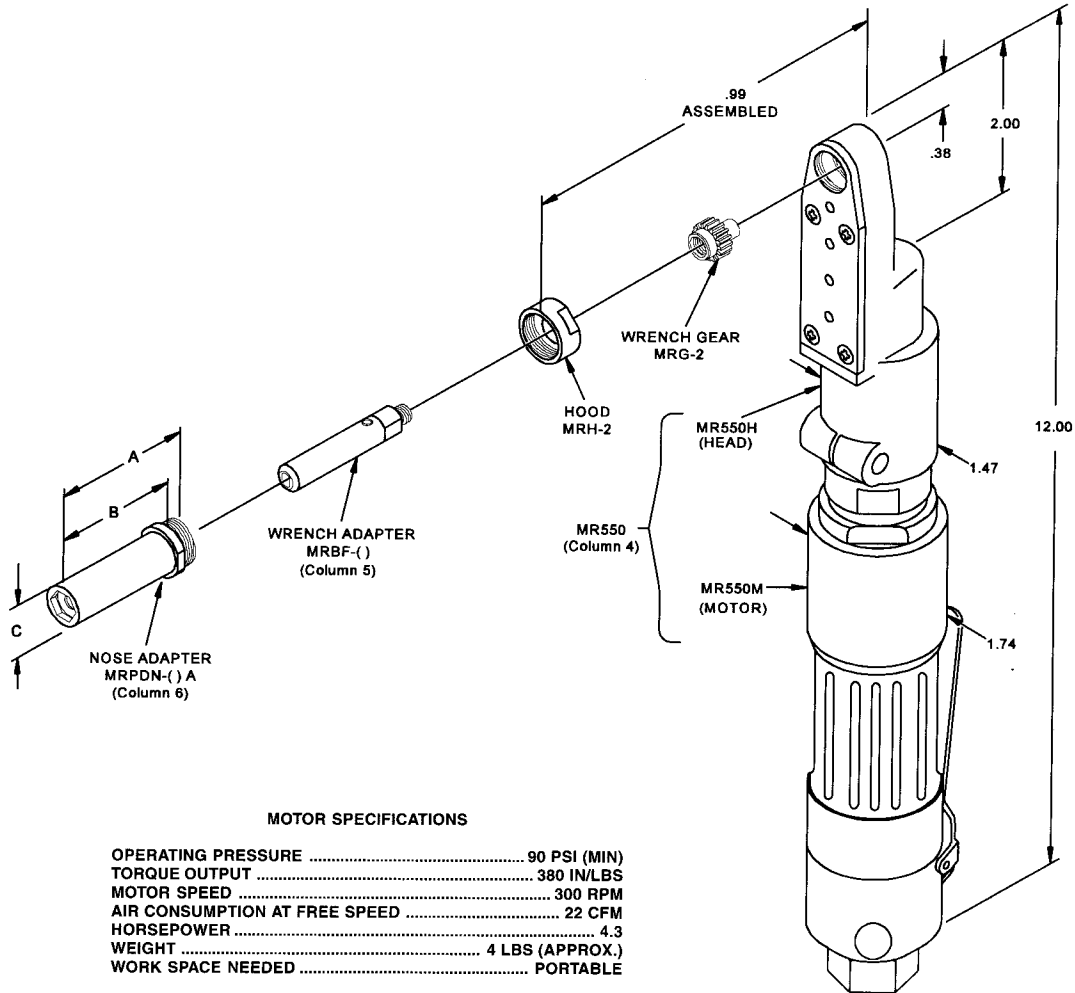
1	2	3	4	5	6	7	8	9
BASIC DIA.	TYPICAL MXP PART NO.	COMPLETE PNEUMATIC ASSEMBLY	PNEUMATIC MOTOR ASSEMBLY	WRENCH ADAPTER	NOSE ADAPTER	A (REF)	B (REF)	C (REF)
5/32 (-5)	MXP 4110 4112 4113 4114 4120 4122 4123 4124	MP550BFDN-5AA	MP550BF	MPBF-05	MPPBF-08	1.81	1.70	0.56
3/16 (-6)		MP550BFDN-6AA		MP-06	MPP-08			
7/32 (-7)		MP550BFDN-7AA		MPBF-07	MPPBF-08			
1/4 (-8)		MP550BFP-8AA		MPBF-08	MPP-12	1.48	1.36	0.75
9/32 (-9)		MP550BFDN-10AA		MPTBF-10				
5/15 (-10)								
11/32 (-11)								
3/8 (-12)				MP550BFDN-12AA		MPTBF-12		

NOTES:

1. Combination Wrench Adapter & Torque Driver – requires removal of Master Torque Driver (MTD550BF) supplied with the tool.
2. Larger male thread on Nose Adapters – requires removal of Aluminum Nut (MN550) supplied with the tool.

INSTALLATION TOOLING

MR550 Pneumatic Right Angle Tool



MOTOR SPECIFICATIONS

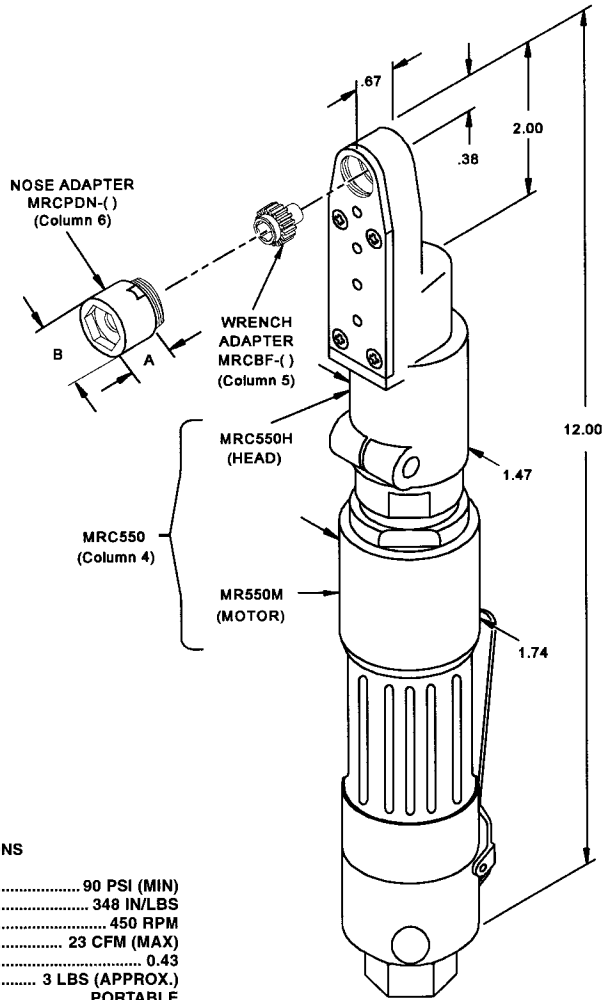
OPERATING PRESSURE	90 PSI (MIN)
TORQUE OUTPUT	380 IN/LBS
MOTOR SPEED	300 RPM
AIR CONSUMPTION AT FREE SPEED	22 CFM
HORSEPOWER	4.3
WEIGHT	4 LBS (APPROX.)
WORK SPACE NEEDED	PORTABLE

1	2	3	4	5	6	7	8	9
BASIC DIA.	TYPICAL MXP PART NO.	COMPLETE PNEUMATIC ASSEMBLY	PNEUMATIC MOTOR ASSEMBLY	WRENCH ADAPTER	NOSE ADAPTER	A (REF)	B (REF)	C (REF)
5/32 (-5)	MXP 4110	MR550BFDN-5AA	MR550	MRBF-05	MRPDN-01A	1.63	1.51	0.56
3/16 (-6)	4112	MR550BFDN-6AA		MR-06	MRPDN-01			
	4113			MRBF-07	MRPDN-02A	1.77	1.65	0.56
7/32 (-7)	4114	MR550BFDN-7AA						
	4120	MR550BFDN-8AA						
1/4 (-8)	4122							
	4123							
	4124							



INSTALLATION TOOLING

MRC550 Pneumatic Close Quarter Tool



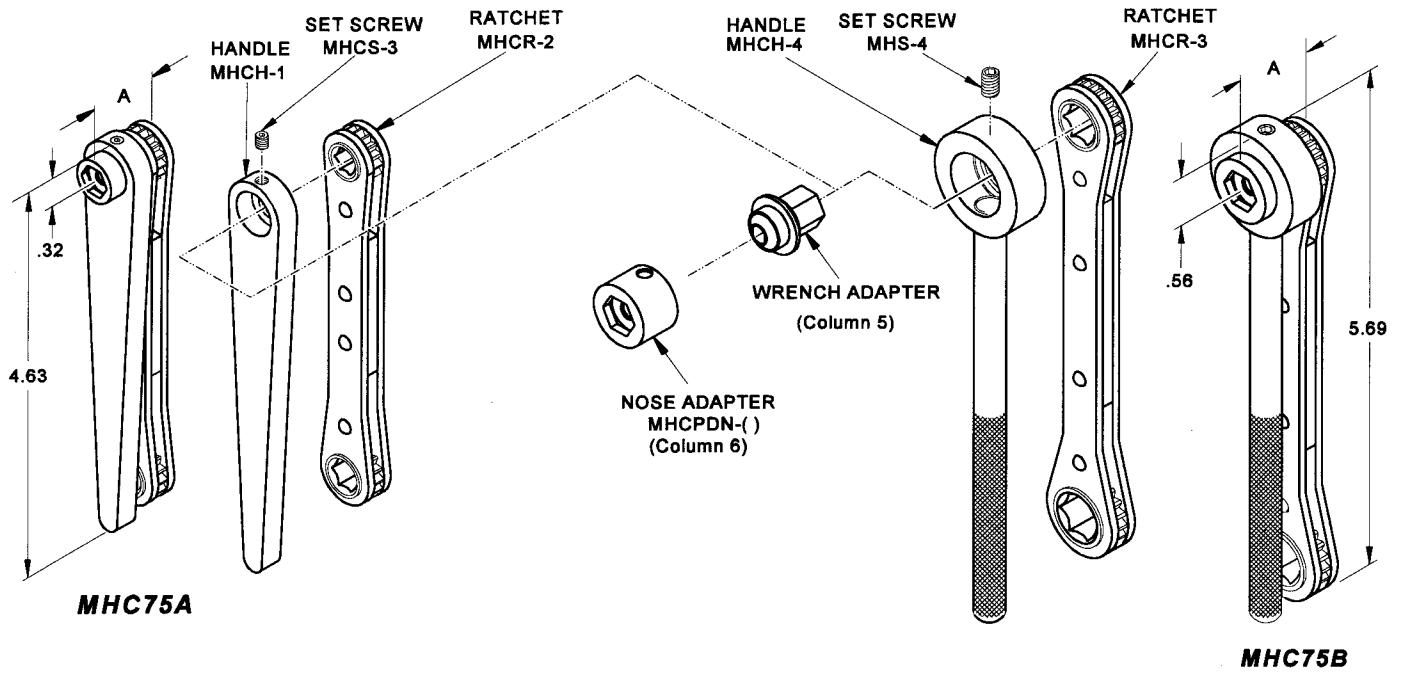
MOTOR SPECIFICATIONS

OPERATING PRESSURE	90 PSI (MIN)
TORQUE OUTPUT	348 IN/LBS
MOTOR SPEED	450 RPM
AIR CONSUMPTION AT FREE SPEED	23 CFM (MAX)
HORSEPOWER	0.43
WEIGHT	3 LBS (APPROX.)
WORK SPACE NEEDED	PORTABLE

1	2	3	4	5	6	7	8
BASIC DIA.	TYPICAL MXP PART NO.	COMPLETE PNEUMATIC ASSEMBLY	PNEUMATIC MOTOR ASSEMBLY	WRENCH ADAPTER	NOSE ADAPTER	A (REF)	B (REF)
5/32 (-5)	MXP 4110	MRC550BFDN-5AA	MRC550	MRCBF-05	MRCPDN-01	0.44	0.69
3/16 (-6)	4112	MRC550BFDN-6AA		MRC-06			
	4114	MRC550BFDN-7AA		MRCBF-07	MRCPDN-02	0.55	0.69
7/32 (-7)	4120			MRC-08			
	1/4 (-8)	4122		MRC550BFDN-8AA			
4123							
	4124						

INSTALLATION TOOLING

MHC75 Close Quarter Hand Tool



1	2	3	4	5	6	7
BASIC DIA.	TYPICAL MXP PART NO.	COMPLETE HAND TOOL ASSEMBLY	HAND TOOL ASSEMBLY	WRENCH ADAPTER	NOSE ADAPTER	A (REF.)
5/32 (-5)	MXP 4110 4112 4114 4120 4122 4123 4124	MHC75BFDN-5AA	MHC75A	MHCBF-05	MHCPDN-01	1.00
3/16 (-6)		MHC75BFDN-6AA		MHC-06		
7/32 (-7)		MHC75BFDN-7AA	MHC75B	MHCBF-07	MHCPDN-02	1.25
1/4 (-8)		MHC75DN-8AA		MHC-08		
9/32 (-9) 5/16 (-10)		MHC75DN-10AA		MHC-10		
11/32 (-11) 3/8 (12)		MHC75DN-12AA		MHC-12		



STRENGTH

TENSILE & DOUBLE SHEAR

MPX 4110 MPX 4112 MPX 4113 MPX 4114	MPX 4120 MPX 4122 MPX 4123 MPX 4124	TENSILE STRENGTH (LBS. MIN.)	DOUBLE SHEAR STRENGTH (LBS. MIN.)	LOCKING TORQUE (IN./LBS. MIN.)
DIA.	DASH			
5/32	-5	1000	3780	1.0
3/16	-6	1600	5080	1.5
1/4	-8	2600	8800	2.5
5/16	-10	4200	13760	3.5
3/8	-12	6500	19830	4.0

NOTE: Values shown are fastener capabilities only.
Lap Shear & Tensile Strength in specific materials tested upon request.

Monogram Performer MXP Fasteners

Installed Weight

(Pounds Per Thousand)

MAT'L	HEAD STYLE	DIA DASH NO.	GRIP DASH NUMBER											
			-2	-3	-4	-5	-6	-7	-8	-9	-10	-11	-12	Adder*
S T A I N L E S S T E E L	100 FLUSH TENSION	-5	4.08	4.45	4.81	5.18	5.54	5.91	6.28	6.64	7.01	7.37	7.74	.37
		-6	5.89	6.39	6.89	7.38	7.88	8.38	8.88	9.37	9.88	10.36	10.86	.50
		-8	11.07	11.94	12.81	13.68	14.56	15.43	16.30	17.17	18.04	18.91	19.78	.87
		-10	20.92	22.29	23.65	25.02	26.38	27.75	29.11	30.48	31.84	33.21	34.57	1.37
		-12	33.78	35.73	37.67	39.62	41.57	43.52	45.46	47.41	49.36	51.30	53.25	1.95
	100 REDUCED SHEAR	-5	3.69	4.06	4.43	4.79	5.16	5.53	5.89	6.26	6.63	6.99	7.36	.37
		-6	5.27	5.77	6.27	6.76	7.26	7.76	8.25	8.75	9.25	9.74	10.24	.50
		-8	9.56	10.43	11.30	12.17	13.04	13.92	14.79	15.66	16.53	17.40	18.27	.87
		-10	17.62	18.99	20.35	21.72	23.08	24.45	25.81	27.18	28.54	29.91	31.27	1.37
		-12	28.14	30.09	32.04	33.98	35.93	37.88	39.82	41.77	43.72	45.66	47.62	1.95
	130 FLUSH SHEAR	-5	3.86	4.23	4.60	4.97	5.33	5.70	6.06	6.43	6.80	7.17	7.53	.37
		-6	5.56	6.06	6.55	7.05	7.55	8.05	8.55	9.04	9.54	10.03	10.54	.50
		-8	10.24	11.11	11.98	12.85	13.73	14.60	15.47	16.34	17.21	18.08	18.96	.87
		-10	19.30	20.67	22.03	23.40	24.77	26.13	27.50	28.86	30.23	31.59	32.96	1.37
		-12	30.89	32.84	34.79	36.73	38.68	40.63	42.58	44.52	46.47	48.41	50.37	1.95
	PROT.	-5	8.40	8.77	9.13	9.50	9.86	10.23	10.59	10.96	11.33	11.69	12.06	.37
		-6	10.91	11.41	11.90	12.40	12.90	13.40	13.89	14.39	14.89	15.38	15.88	.50
		-8	17.80	18.67	19.54	20.41	21.28	22.16	23.03	23.90	24.77	25.64	26.51	.87
		-10	28.79	30.16	31.52	32.89	34.26	35.62	36.99	38.35	39.72	41.08	42.45	1.37
		-12	43.22	45.17	47.11	49.06	51.01	52.96	54.91	56.85	58.80	60.74	62.69	1.95
T I T A N I U M	100 FLUSH TENSION	-5	3.46	3.74	4.01	4.29	4.56	4.84	5.12	5.39	5.66	5.94	6.21	.28
		-6	5.00	5.38	5.75	6.13	6.50	6.88	7.25	7.63	8.00	8.38	8.75	.38
		-8	9.26	9.93	10.60	11.28	11.96	12.63	13.30	13.98	14.65	15.33	16.00	.67
		-10	17.38	18.39	19.40	20.41	21.42	22.42	23.43	24.44	25.45	26.46	27.47	1.01
		-12	28.00	29.42	30.83	32.25	33.67	35.09	36.51	37.93	39.34	40.76	42.18	1.42
	100 REDUCED SHEAR	-5	3.25	3.53	3.80	4.08	4.35	4.63	4.90	5.18	5.45	5.73	6.00	.28
		-6	4.65	5.03	5.40	5.78	6.15	6.53	6.90	7.28	7.65	8.03	8.40	.38
		-8	8.40	9.07	9.75	10.42	11.10	11.77	12.44	13.12	13.79	14.47	15.14	.67
		-10	15.52	16.53	17.53	18.55	19.56	20.56	21.57	22.58	23.59	24.60	25.61	1.01
		-12	24.81	26.23	27.65	29.07	30.49	31.90	33.32	34.74	36.16	37.58	39.00	1.42
	130 FLUSH SHEAR	-5	3.34	3.62	3.89	4.17	4.44	4.72	4.99	5.27	5.54	5.82	6.09	.28
		-6	4.81	5.19	5.56	5.94	6.31	6.69	7.06	7.44	7.81	8.19	8.56	.38
		-8	8.79	9.46	10.14	10.81	11.49	12.16	12.83	13.51	14.18	14.86	15.53	.67
		-10	16.47	17.48	18.49	19.50	20.51	21.51	22.52	23.53	24.54	25.55	26.56	1.01
		-12	26.36	27.78	29.20	30.62	32.04	33.45	34.87	36.29	37.71	39.13	40.55	1.42
	PROT.	-5	5.90	6.18	6.45	6.73	7.00	7.28	7.55	7.83	8.10	8.38	8.66	.28
		-6	7.83	8.21	8.58	8.96	9.33	9.71	10.08	10.46	10.83	11.21	11.58	.38
		-8	13.06	13.73	14.41	15.08	15.76	16.43	17.10	17.78	18.45	19.13	19.80	.67
		-10	21.83	22.84	23.85	24.86	25.87	26.87	27.88	28.89	29.90	30.91	31.92	1.01
		-12	33.33	34.75	36.17	37.59	39.01	40.42	41.84	43.26	44.68	46.10	47.52	1.42

*ADDER FOR ADDITIONAL GRIP LENGTHS



HOLE PREPARATION & INSPECTION

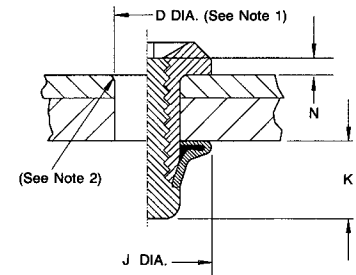
HOLE PREPARATION AND INSTALLED DIMENSIONS

DIA DASH NUMBER	D DIA RECOMMENDED HOLE SIZE	100° 130° CSK P DIA	J DIA MIN	K MAX	N (see Note 4) SCREW BREAK-OFF LIMITS
-5	.165-.168	.325-.332	0.240	0.475	+.185 -.015
-6	.190-.193	.376-.383	0.290	0.475	
-8	.250-.253	.501-.508	0.370	0.475	
-10	.313-.316	.628-.635	0.475	0.550	
-12	.375-.378	.755-.762	0.560	0.625	

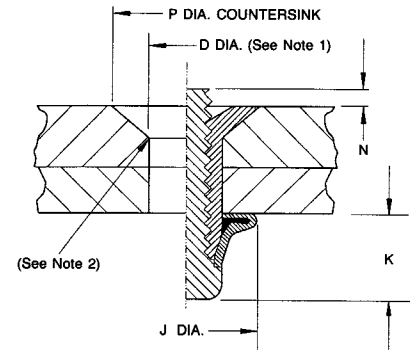
NOTES:

- Holes should be straight and perpendicular to surface. Holes should be reasonably round and free from delamination.
- Periphery of hole under the fastener head should be given a radius equal to or slightly greater than the fillet radius (R dimension) of the fastener.
- Sheets should be firmly clamped together during drilling.
- Screw break-off limits are measured from skin surface on protruding head fasteners only. Flush style fasteners are measured from the head of the fastener.

PROTRUDING HEAD (MXP 4110 & MXP 4120)



FLUSH HEAD (MXP 4112 & MXP 4122) (MXP 4113 & MXP 4123) (MXP 4114 & MXP 4124)



INSPECTION

The break-off position of the screw ("N" dimension) in the head of the nut is a positive indication that the fastener has been properly installed (provided that the correct grip length has been used). See Table 1 for break-off gages.

See above table for the acceptable screw break-off limits for a properly installed fastener. Screw break-off outside of these limitations is an indication of an unacceptable installation. The fastener should be removed, the grip carefully checked, and then replaced with the appropriate fastener.

If desired, clamp-up may be determined indirectly by seating torque. Adapt the applicable torque adapter (see Table 2) to a suitable torque wrench, engage the recess in the fastener head and measure the torque required to rotate the fastener in a counter-clockwise direction. The ability of the fastener installed to resist rotation when subjected to the torque values in Table 2 is a good indication that the required preload has been imparted to the joint.

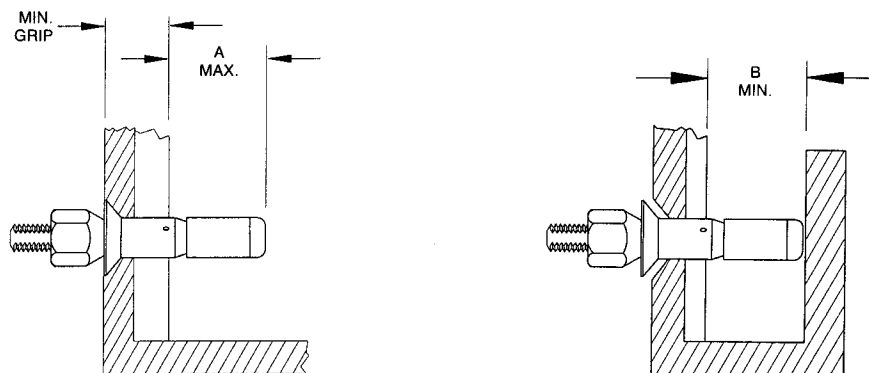
TABLE 1
SCREW BREAK-OFF GAGES

FASTENER DIA	FLUSH HEAD GAGE	PROTRUDING HEAD GAGE
-5	MXPFCL-5	MXPPCL
-6	MXPFCL-6	
-8	MXPFCL-8	
-10	MXPFCL-10	
-12	MXPFCL-12	

TABLE 2

FASTENER SIZE	TORQUE ADAPTER PART NUMBER	SEATING TORQUE IN/LB MINIMUM
-5	MHTFDN-5	4
-6	MHTFDN-6	6
-8	MHTFDN-8	10
-10	MHTFDN-10	20
-12	MHTFDN-12	30

BLIND SIDE PROTRUSION



NOMINAL SIZE DIAMETER	(A) BLIND SIDE PROTRUSION IN MIN GRIP	(B) BLIND SIDE MINIMUM CLEARANCE
5/32	.700	.490
3/16	.700	.520
1/4	.900	.640
5/16	1.000	.720
3/8	1.100	.780

The Monogram Performer MXP Fastener may be "walked in" tight clearance applications.



PINTAIL SHAVING & MILLING

PINTAIL SHAVING UNIT FOR SCREW BREAK-OFF SHAVING



FEATURES

- Lightweight (1¼ lbs.)
- One handed use
- Reduced operator fatigue
- Inexpensive, long-lasting cutting discs
- Trigger safety lever
- 3000 rpm promotes swift pintail "slicing"
- Cutting depth adjustment increments of .001"
- Easy to service and maintain
- Quick change of cutting discs (less than 30 seconds)
- Spindle lock plunger to ease in changing cutting discs

DESCRIPTION

The Pintail Shaving Unit is a unique and easily operated tool for shaving screw break-offs on Monogram's blind fasteners where flushness requirements must be met. This lightweight unit, at only one and a quarter pounds, may be easily and comfortably used with one hand. It utilizes economical, long-lasting abrasive cutting discs to "slice" the screw off. This design produces smooth, uninterrupted cuts as opposed to traditional shavers which mill the screw, producing high vibration, and in turn, frequent replacement of costly carbide cutters. Use of the Pintail Shaving Unit will result in time and tooling savings on the production line, and consequently reduce manufacturing costs.

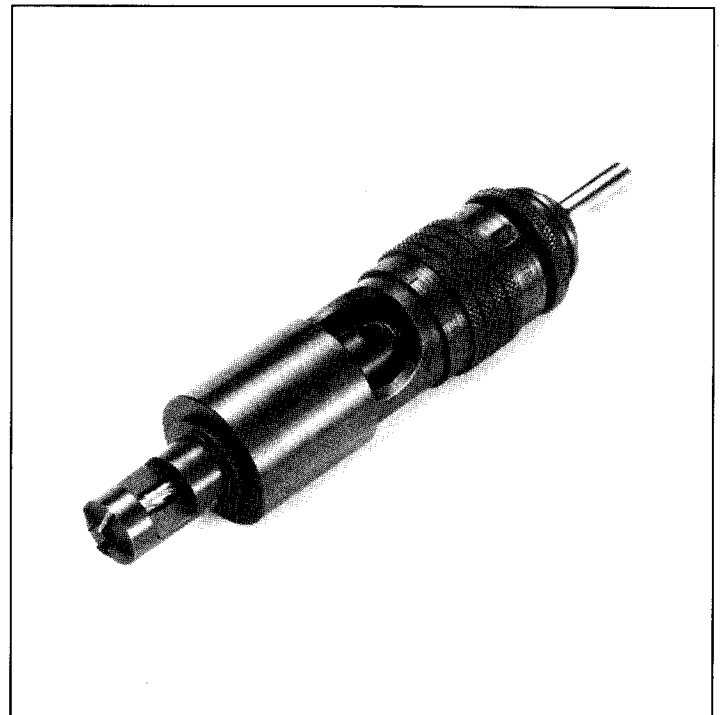
PINTAIL MILLING UNIT FOR SCREW BREAK-OFF MILLING

FEATURES

- Designed for precise cutting
- Operates with any drill motor
- Perfect for milling screws on fasteners recessed in the airframe structure
- .001" cutting depth increments
- Utilizes single rotation center cutting end mill
- Locating nibs on the Pintail Milling Unit Nose Piece help prevent drifting while cutting
- Compact design fits in the palm of your hand

DESCRIPTION

When accurate trimming and special flushing requirements of screws are necessary, Monogram's Pintail Milling Unit is an ideal tooling option to perform the job. In a single stroke, the unit can efficiently remove .001" to .005" of material depending on the tool depth adjustment. A supplement to our Pintail Shaving Unit, the Pintail Miller is a very effective corebolt flushing tool, particularly in stealth applications where fastener heads are intentionally seated below skin surfaces to avoid radar detection. It is also ideal for milling corebolts so that they rest slightly below the head of the fastener, a feature no other milling unit offers. The Pintail Miller itself utilizes a single rotation, center cutting end mill, which produces very clean, polished-like surfaces in seconds.





Monogram Aerospace Fasteners

Headquarters

**3423 South Garfield Avenue
Los Angeles, California 90022-0547
(323) 722-4760 Fax (323) 721-1851**

European Office

**Karenza, Little Barn, Thursley Rd
Elstead, Surrey, England
44.1252.702331 Fax 44.1252.703654**

Internet: www.MonogramAerospace.com

Email: techsales@MonogramAerospace.com