

**ROTTLER**

**EM103/4/5H SERIES CNC  
MACHINING CENTER  
OPTIONAL EQUIPMENT  
PARTS MANUAL**







## ORDERING PROCEDURE

Contact your regional Rottler sales rep for assistance in ordering optional equipment, replacement parts, or tooling.

If you are unable to contact your regional Rottler sales rep, call the factory at 253-872-7050 and ask to speak to the parts sales specialist.

Have the following information handy to expedite the ordering process:

1. Your name, business name, and contact number
2. Customer number
3. If you do not have a customer number, your billing address
4. Shipping address if different from billing address
5. Machine model and serial number
6. Part number and description of what you want to order
7. Preferred method of shipment

You may also contact us via e-mail with the above information. For customers within the U.S. send emails to [parts@rottermfg.com](mailto:parts@rottermfg.com), for customers outside of the U.S. use [intlparts@rottermfg.com](mailto:intlparts@rottermfg.com)

In some cases you may be requested to send a photo of the part you are ordering if it is a replacement part, or doesn't appear in the database.

If you are unsure which part you need to order, contact our service department and ask to speak to one of our service consultants. They will assist you in determining which part you require.

**THERE IS A MINIMUM ORDER OF \$25.00**

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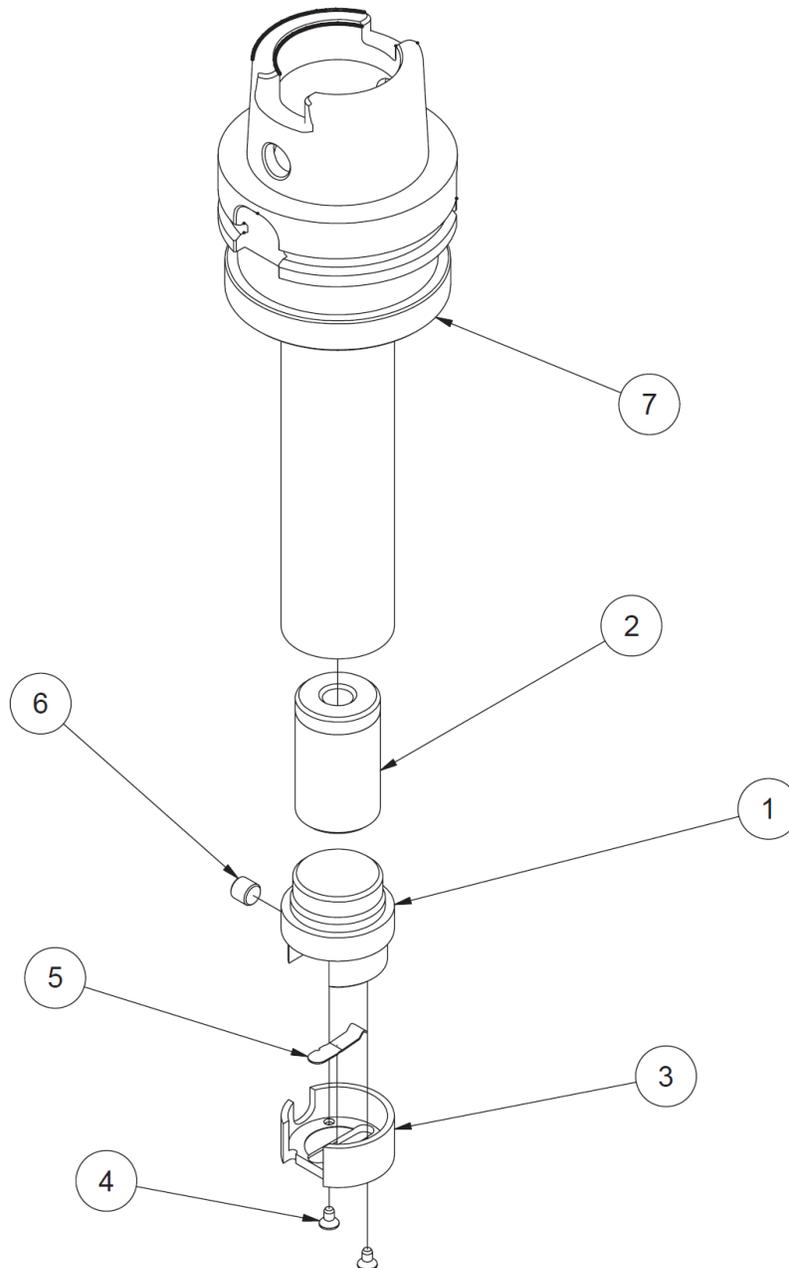
## Cutting Tools

### Boring Tools

10118 Blind Hole Cutterhead Kit, 1 1/2"-4.1" (38-104mm) x 7" (176mm)



		Tool Diameter Range						
Cutterhead Diameter	Centerline Offset		6801A	6801B	6801C	6801D	6801E	6801F
1.5"	-0.655"	Min	1.50"	1.93"	2.30"	2.69"	3.10"	3.50"
		Max	2.02"	2.53"	2.90"	3.29"	3.70"	4.10"

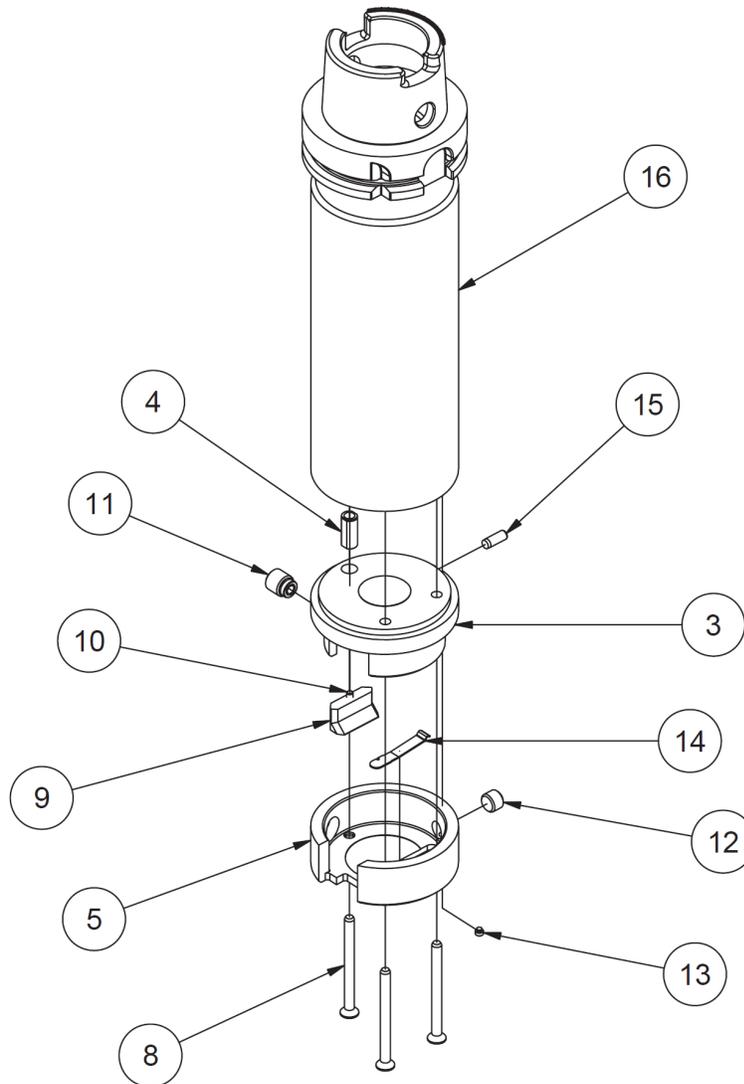


10118A CUTTERHEAD ASSEMBLY, 1 1/2"-4.1" (38-104mm) x 7" (176mm)			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	600-7-2D	Lower Body, 1 1/2" Stub Bar
2	1	600-8-2	Counter Weight
3	1	600-5	Cutter Head Cap
4	2	MF-120A	Socket Flat Head #6-32 UNC x 0.25"
5	1	100-1B	Tool Lock Spring
6	1	502-25-1	Tool Holder Lock Screw
7	1	10118B	HSK ADAPTER 2.88 DIA STUB BAR CUTTERHEAD

**10131 Blind Hole Cutterhead Kit, 2.92"-6.74" (74-171mm) Dia x 9 5/8" (245mm)**



		Tool Diameter Range						
Cutterhead Diameter	Centerline Offset		6593C	6593D	6520H (6598M)	6520A (6598M)	6520B (6598K)	
2.88"	-1.080"	Min	2.92"	3.36"	3.48"	3.74"	5.57"	
		Max	3.35"	3.79"	3.88"	4.24"	6.74"	

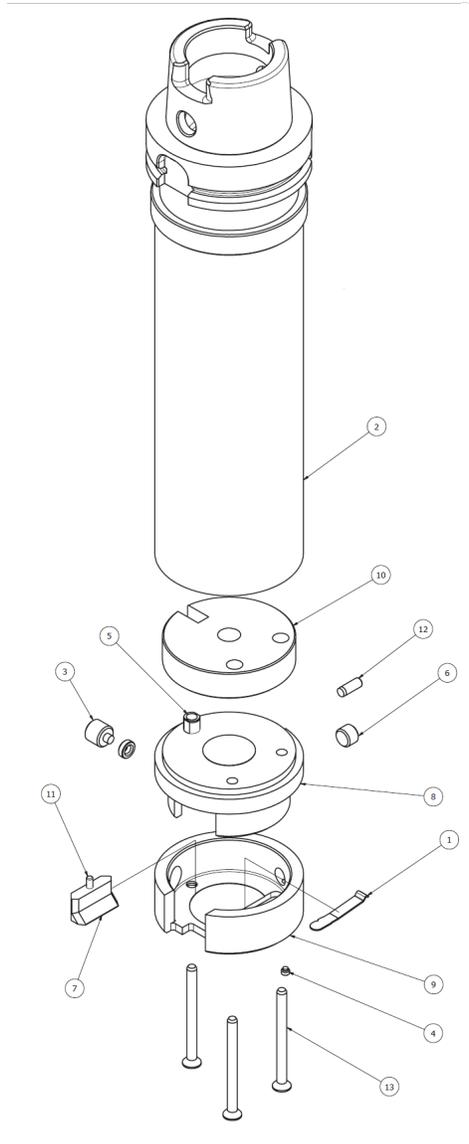


10131A 2 7/8" STUB BAR ASSEMBLY W/O TOOLING – F109HSK80A			
ITEM	QTY	PART NUMBER	DESCRIPTION
2	1	6521	COUNTERWEIGHT – BLIND HOLE STUB BAR CUTTER HEADS
3	1	650-2-16	BODY, 2.9" STUB BAR F60
4	1	502-2-45B	BUSHING – UPPER CENTERING FINGER RETAINER
5	1	650-2-17	Cap, 2.9" Stub Bar
8	3	MF-81C	Socket Flat Head #10-24 UNC x 2.25
9	1	6263A	Tool Holder Clamp Screw
10	1	MF-193	1/8 x 1/2 Dowel Pin
11	1	501-70A	Tool Holder Lock Screw ass'y
12	1	502-2-85B	Index Screw
13	1	502-12-4D	SOCKET SET SCREW, BRASS TIPPED, #8-32 X 1/8
14	1	100-1A	Tool Lock Spring
15	1	MF-196	3/16 x 1/2 Dowel Pin
16	1	10131B	ADAPTER, 2 7/8" DIA STUB BAR – F109 HSK 80A

**10108B Blind Hole Cutterhead Kit, 2.92"-6.74" (74-171mm) Dia x 11 1/4" (286mm)**



		Tool Diameter Range						
Cutterhead Diameter	Centerline Offset		6593C	6593D	6520H (6598M)	6520A (6598M)	6520B (6598K)	
2.88"	-1.080"	Min	2.92"	3.36"	3.48"	3.74"	5.57"	
		Max	3.35"	3.79"	3.88"	4.24"	6.74"	

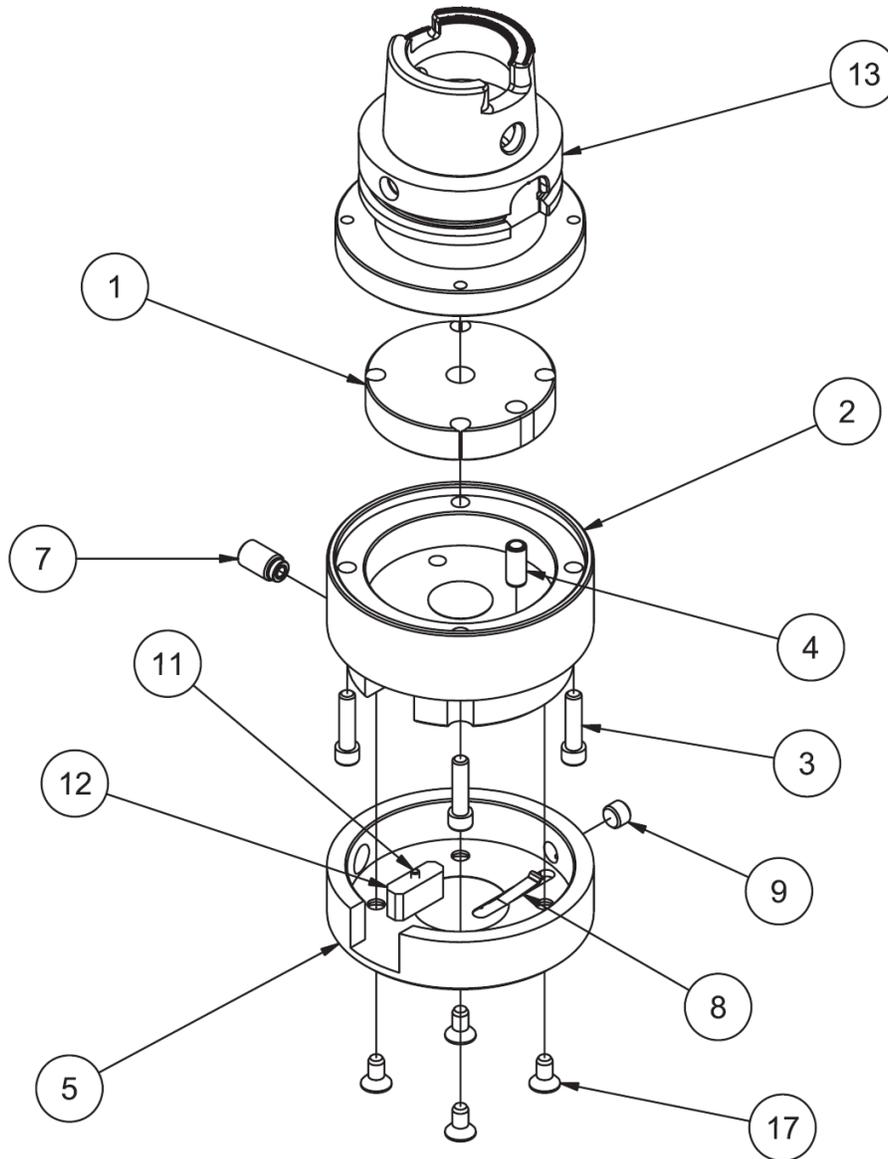


<b>10108 2 7/8 Stub Bar (W/O Tooling) - HSK</b>			
<b>ITEM</b>	<b>QTY</b>	<b>PART NUMBER</b>	<b>DESCRIPTION</b>
1	1	100-1A	Tool Lock Spring
2	1	10108A	HSK ADAPTER 2.88 DIA STUB BAR CUTTERHEAD
3	1	501-70A	Tool Holder Lock Screw ass'y
4	1	502-12-4D	SOCKET SET SCREW, BRASS TIPPED #8-32 X 1/8
5	1	502-2-45B	BUSHING – UPPER CENTERING FINGER RETAINER
6	1	502-2-85B	Index Screw
7	1	6263A	Tool Holder Clamp Screw
8	1	650-2-16	BODY, 2.9" STUB BAR F60
9	1	650-2-17	Cap, 2.9" Stub Bar
10	1	6521	Counter Weight
11	1	MF-193	1/8 x 1/2 Dowel Pin
12	1	MF-196	3/16 x 1/2 Dowel Pin
13	3	MF-81C	Socket Flat Head #10-24 UNC x 2.25

**10117 Blind Hole Cutterhead Kit, 5.63-9.34" (143-237mm) Dia**



		Tool Diameter Range							
Cutterhead Diameter	Centerline Offset		6259P	6259C	6259D	6259I	6259E	6259F	6259G
4.5"	-1.762"	Min	5.63"	5.73"	5.63"	5.63"	6.04"	7.04"	8.04"
		Max	6.64"	7.14"	7.64"	8.05"	7.34"	8.34"	9.34"

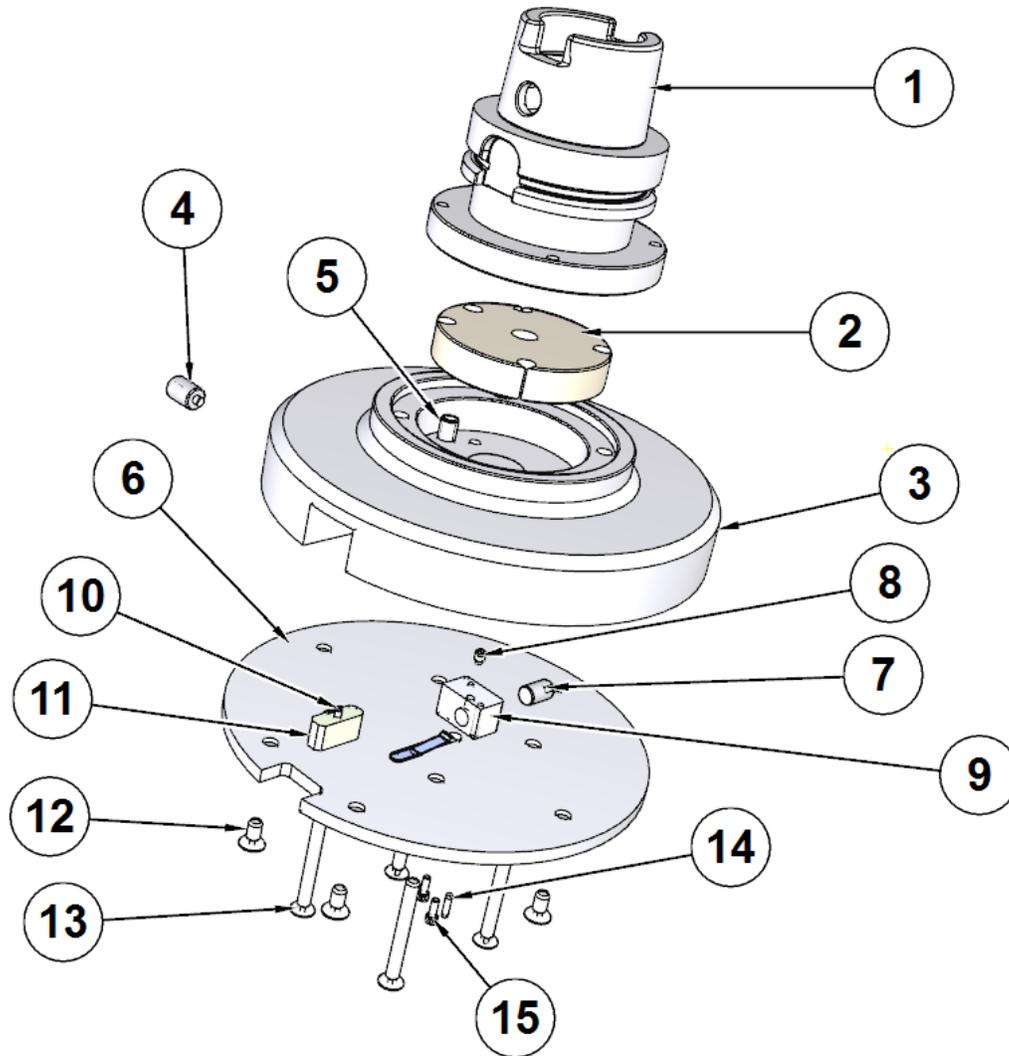


10117A 5.63-9.34" DIA PRODUCTION CUTTERHEAD ASSEMBLY, HSK80A, F100			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	600-20-11	COUNTERWEIGHT, CUTTERHEAD
2	1	6256L	BODY, CUTTERHEAD 4.50" (NO CENTERING)
3	4	MF-15	S.H.C.S 1/4-20 UNC X 1
4	1	502-2-45B	BUSHING – UPPER CENTERING FINGER RETAINER
5	1	6256N	CAP, 4.50" DIA CUTTERHEAD (NO CENTERING)
7	1	501-70	Tool Holder Lock Screw ass'y
8	1	100-1E	Tool Lock Spring
9	1	502-2-85B	Index Screw
10	1	502-12-4D	SOCKET SET SCREW, BRASS TIPPED #8-32 X 1/8
11	1	MF-193	1/8 x 1/2 Dowel Pin
12	1	6263B	Clamp Shoe (Tool Holder)
13	1	10107A	HSK ADAPTER 4.50 CUTTERHEAD
17	4	MF-82	1/4-20 UNC x .5" LONG SOCKET FLAT HEAD SCREW

**10107B Blind Hole Cutterhead Kit, 7 3/4" (197mm) Dia**



		Tool Diameter Range								
Cutterhead Diameter	Centerline Offset		6259C	6259D	6259I	6259E	6259F	6259G	6259H	6259J
7.75"	-0.280"	Min	8.68"	8.58"	8.58"	8.99"	9.99"	10.99"	11.99"	12.99"
		Max	10.09"	10.59"	11.00"	10.29"	11.29"	12.29"	13.29"	14.29"

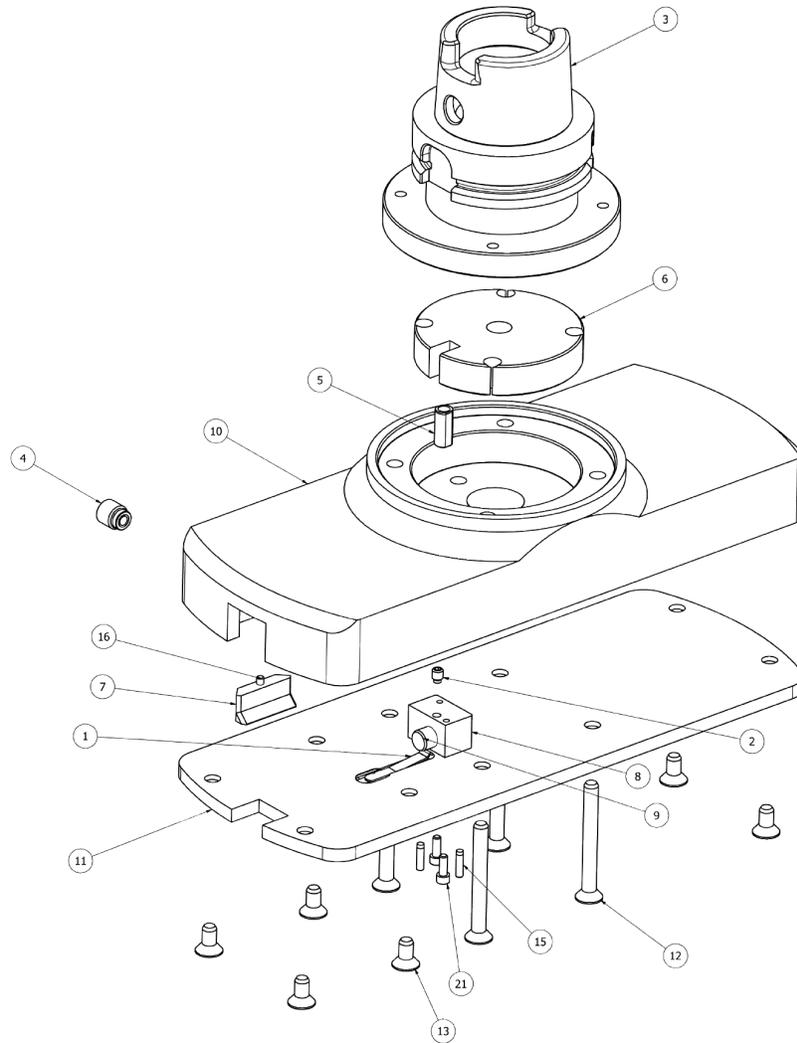


10107 CUTTERHEAD, 7 3/4" HSK W/O TOOLING (ASSEMBLY) – F100			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	10107A	ADAPTER, 4.5" CUTTERHEAD W/HSK80A SHANK
2	1	600-20-11	COUNTERWEIGHT, CUTTERHEAD
3	1	6466A	CUTTERHEAD, 7 3/4"
4	1	501-70F	SCREW, TOOL HOLDER LOCK
5	1	502-2-45B	BUSHING, UPPER RETAINER
6	1	6469A	CAP, 7 3/4" CUTTERHEAD
7	1	6468A	SCREW, ADJUSTING 3/8-24 X 5/8"
8	1	100-82-2	SCREW, SET – BRASS GIB – 3/16"
9	1	6468	PLUG
10	1	MF-193	DOWEL PIN 1/8 X 1/2"
11	1	6263B	SHOE, CLAMP TOOLHOLDER
12	5	MF-82	SOCKET FLAT HEAD SCREW 1/4-20 X 1/2"
13	4	MF-83A	SOCKET FLAT HEAD SCREW 1/4-20 X 2 1/4"
14	2	MF-193	DOWEL PIN 1/8 X 1/2"
15	1	MF-1B	SOCKET HEAD CAP SCREW #6-32 X 3/8"

**10104B Blind Hole Cutterhead Kit, 12" (305mm) Dia**



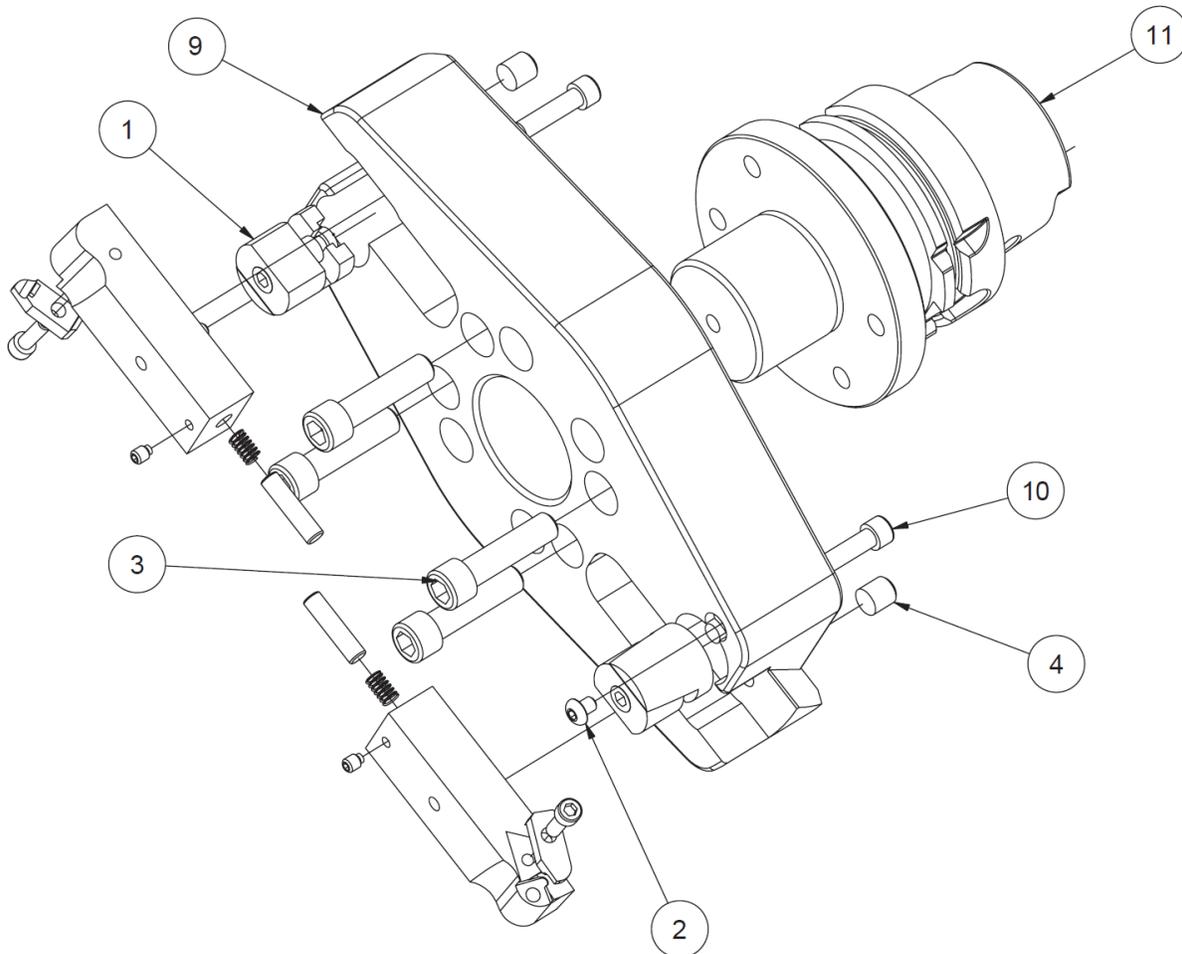
		Tool Diameter Range						
Cutterhead Diameter	Centerline Offset		6259C	6259D	6259I	6259E	6259F	6259G
12"	1.570"	Min	12.10"	12.10"	12.10"	12.51"	13.51"	14.51"
		Max	13.61"	14.11"	14.52"	13.81"	14.81"	15.81"



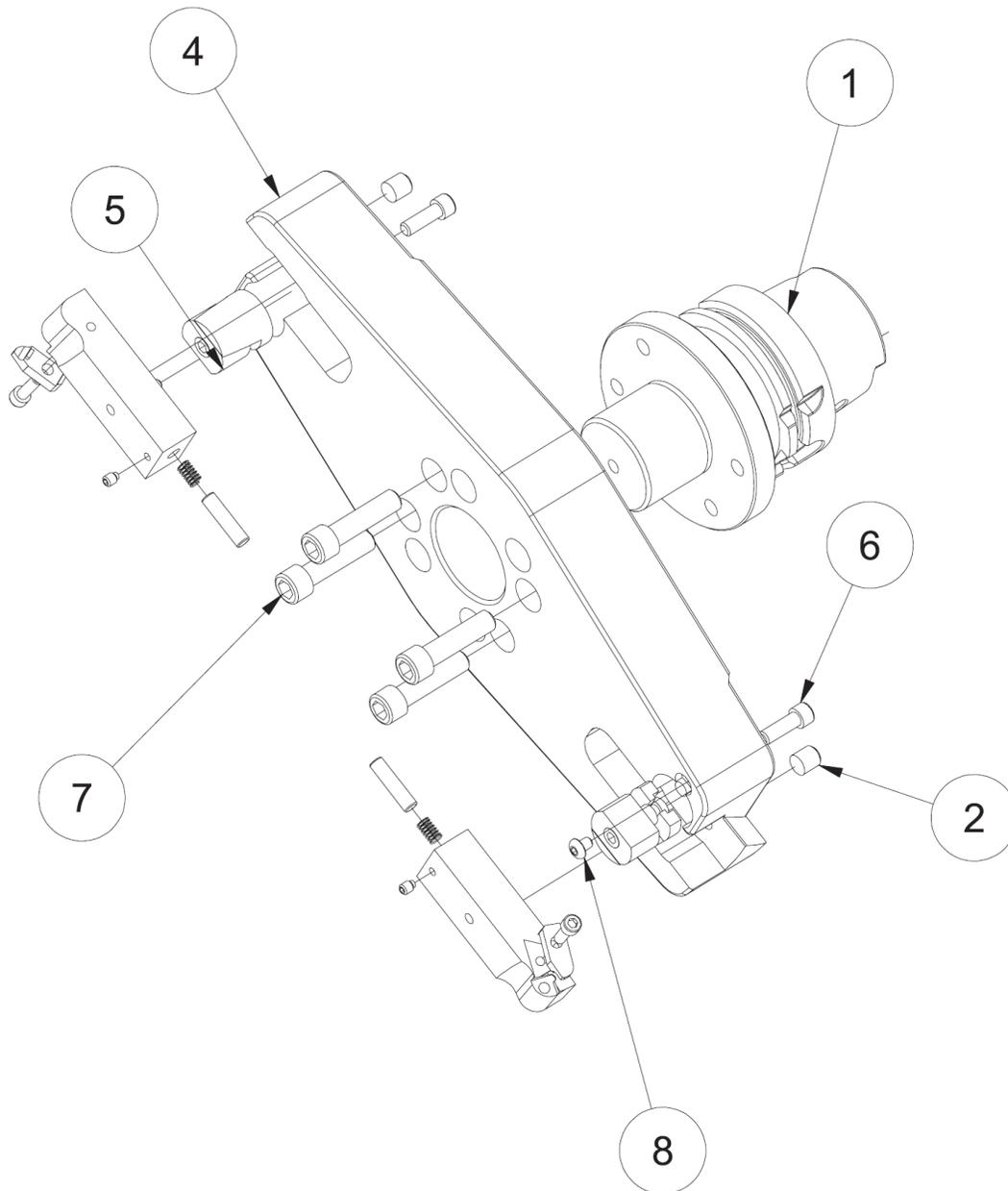
<b>10104 12" CUTTERHEAD ASSEMBLY (W/O TOOLING) - HSK</b>			
<b>ITEM</b>	<b>QTY</b>	<b>PART NUMBER</b>	<b>DESCRIPTION</b>
1	1	100-1E	Tool Lock Spring
2	1	100-82-2	Set Screw, Brass Tipped
3	1	10104A	HSK ADAPTER 7 3/4" DIA CUTTERHEAD
4	1	501-70A	Tool Holder Lock Screw ass'y
5	1	502-2-45B	BUSHING – UPPER CENTERING FINGER RETAINER
6	1	600-20-11	Counter Weight
7	1	6263	Tool Holder Clamp Shoe
8	1	6468	PLUG, CUTTERHEAD 7 3/4" CUTTERHEAD
9	1	6468A	Adjusting Screw
10	1	6588B	BODY, 12" CUTTERHEAD
11	1	6588C	CAP, 12" CUTTERHEAD
12	4	MF-83A	Socket Flat Head Screw, 1/4-20 x 2 1/4"
13	6	MF-82	Socket Flat Head Screw, 1/4-20 x 1/2"
15	2	MF-193	DOWEL PIN 1/8 X 1/2"
16	1	MF-193C	DOWEL PIN 1/8 X 3/8"
21	2	MF-1B	S.H.C.S #6-32 UNC X 3/8"

## Surfacing Tools

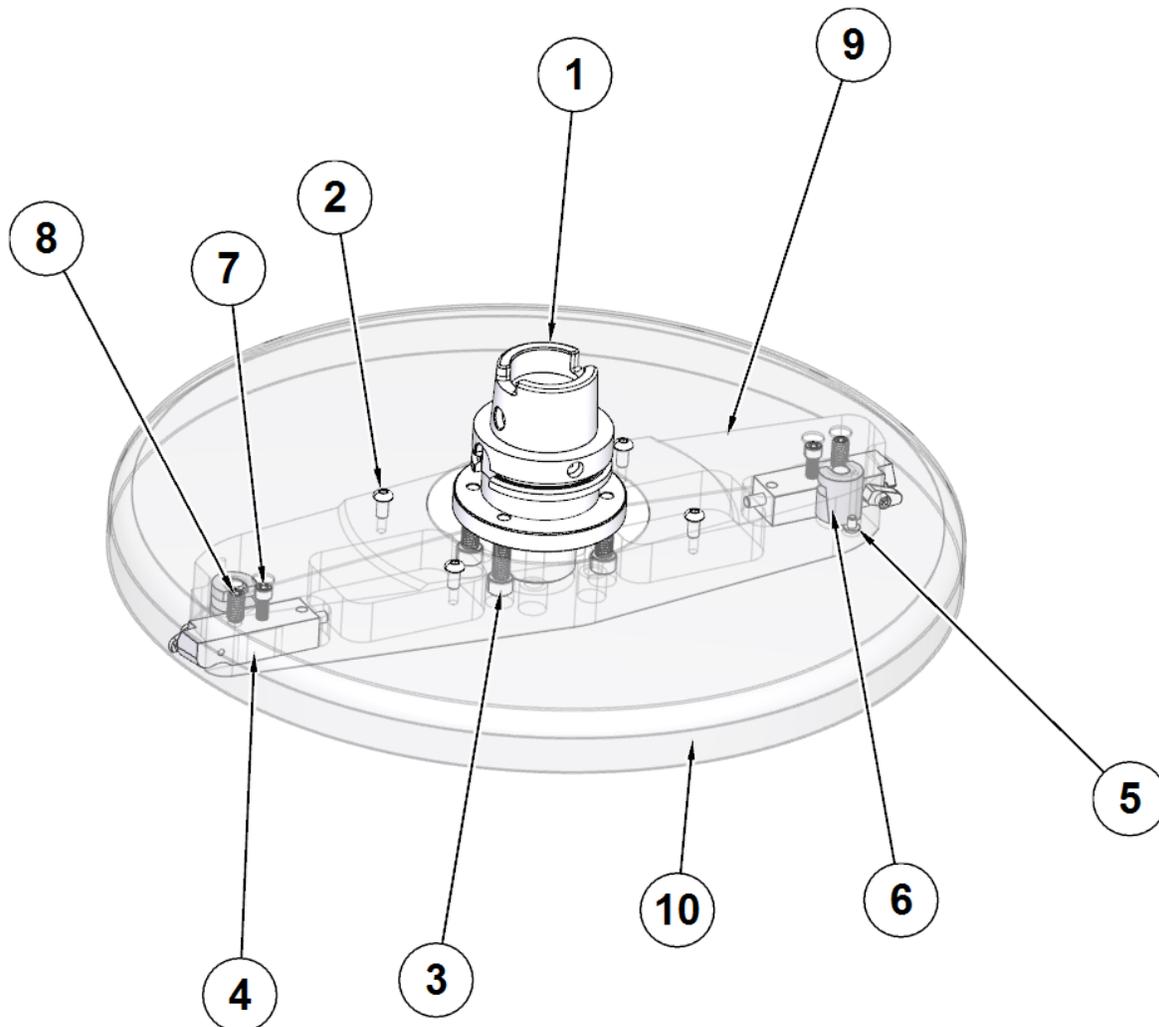
### 10119 Surfacing Flycutter Kit, 10" (254mm) Dia



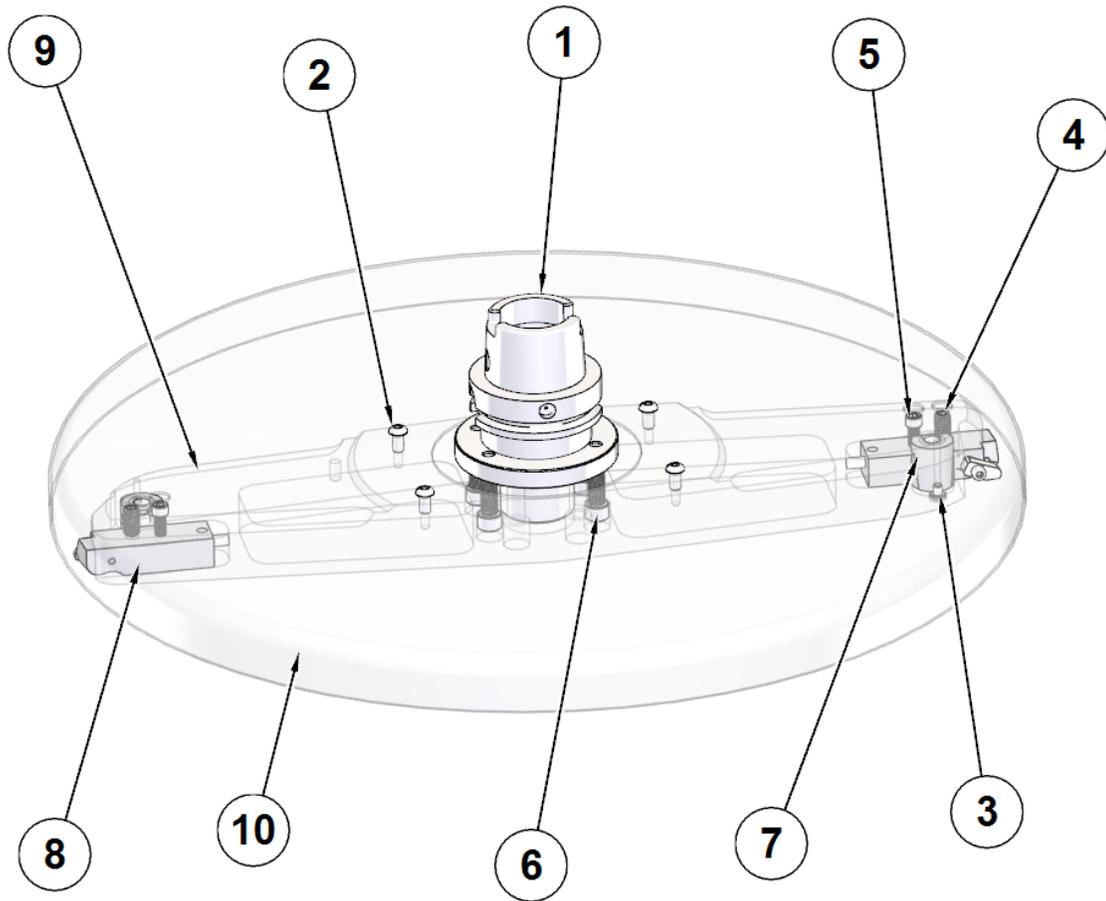
10119 10" FLYCUTTER ASSEMBLY			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	2	7206K	'L' LOCK
2	2	MF-87	SOCKET BUTTON SCREW #10-24 X 1/4"
3	4	MF-33	SOCKET CAP SCREW 3/8-16 X 1 1/2"
4	2	7202C	SOCKET SET SCREW, OVAL POINT 3/8-16 X 3/8"
6	2	7202W	TOOL HOLDER ASSEMBLY, FLY CUTTER
9	1	7206L	10" CUTTERHEAD BODY – SURFACING
10	2	MF-15	SOCKET CAP SCREW 1/4-20 X 1"
11	1	10106A	ADAPTER, MILLING CUTTERHEAD

**10106C Surfacing Flycutter Kit, 14" (356mm) Dia**


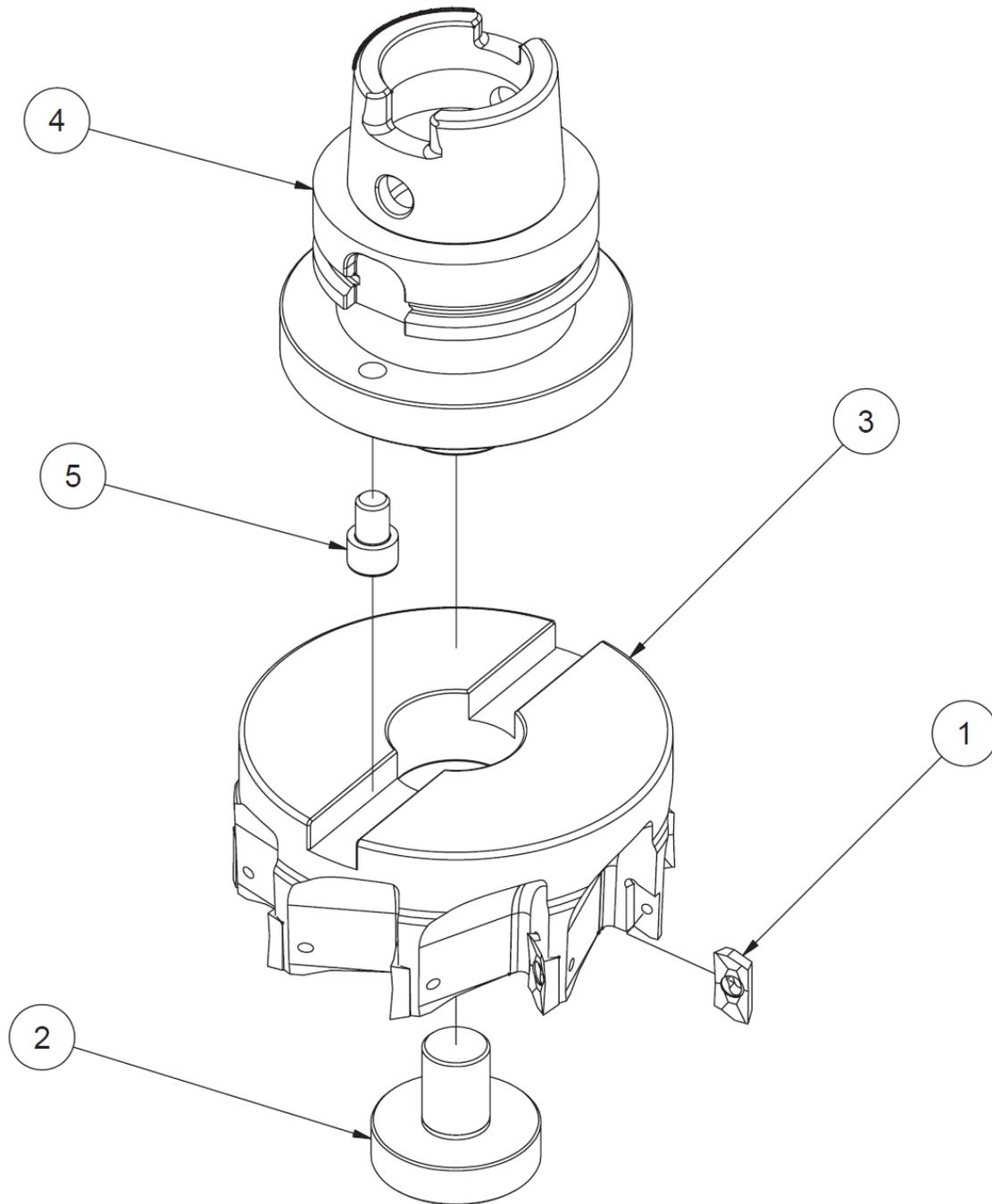
10106C 14" FLYCUTTER ASSEMBLY - HSK			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	10106A	ADAPTER, MILLING CUTTERHEAD
2	2	7202C	SOCKET SET SCREW, OVAL POINT $\frac{3}{8}$ -16 X $\frac{3}{8}$ "
3	2	7202W	TOOL HOLDER ASSEMBLY, FLY CUTTER
4	1	7206G	MILLING CUTTERHEAD, 14" DIA W/ $\frac{3}{4}$ X 1" TOOLHOLDER
5	2	7206K	'L' LOCK
6	2	MF-14	SOCKET CAP SCREW $\frac{1}{4}$ -20 X $\frac{3}{4}$ "
7	4	MF-33	SOCKET CAP SCREW $\frac{3}{8}$ -16 X 1 $\frac{1}{2}$ "
8	2	MF-87	SOCKET BUTTON SCREW #10-24 X $\frac{1}{4}$ "

**10115 Surfacing Flycutter Kit, 18" (457mm) Dia**


10106C 14" FLYCUTTER ASSEMBLY - HSK			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	10106A	ADAPTER, MILLING CUTTERHEAD
2	4	MF-90	SOCKET BUTTON HEAD SCREW 1/4-20 X 1/2"
3	4	MF-33	SOCKET HEAD CAP SCREW 3/8-16 X 1 1/2"
4	2	7202W	TOOL HOLDER ASSEMBLY, FLY CUTTER
5	2	MF-87	SOCKET BUTTON HEAD SCREW #10-24 X 1/4"
6	2	7206K	'L' LOCK
7	2	MF-15	SOCKET HEAD CAP SCREW 1/4-20 X 1"
8	2	7202C	SOCKET SET SCREW, OVAL POINT 3/8-16 X 3/8"
9	1	6294S	CUTTERHEAD BODY - SURFACING
10	1	650-2-8G	SHROUD, 18" SURFACING CUTTERHEAD

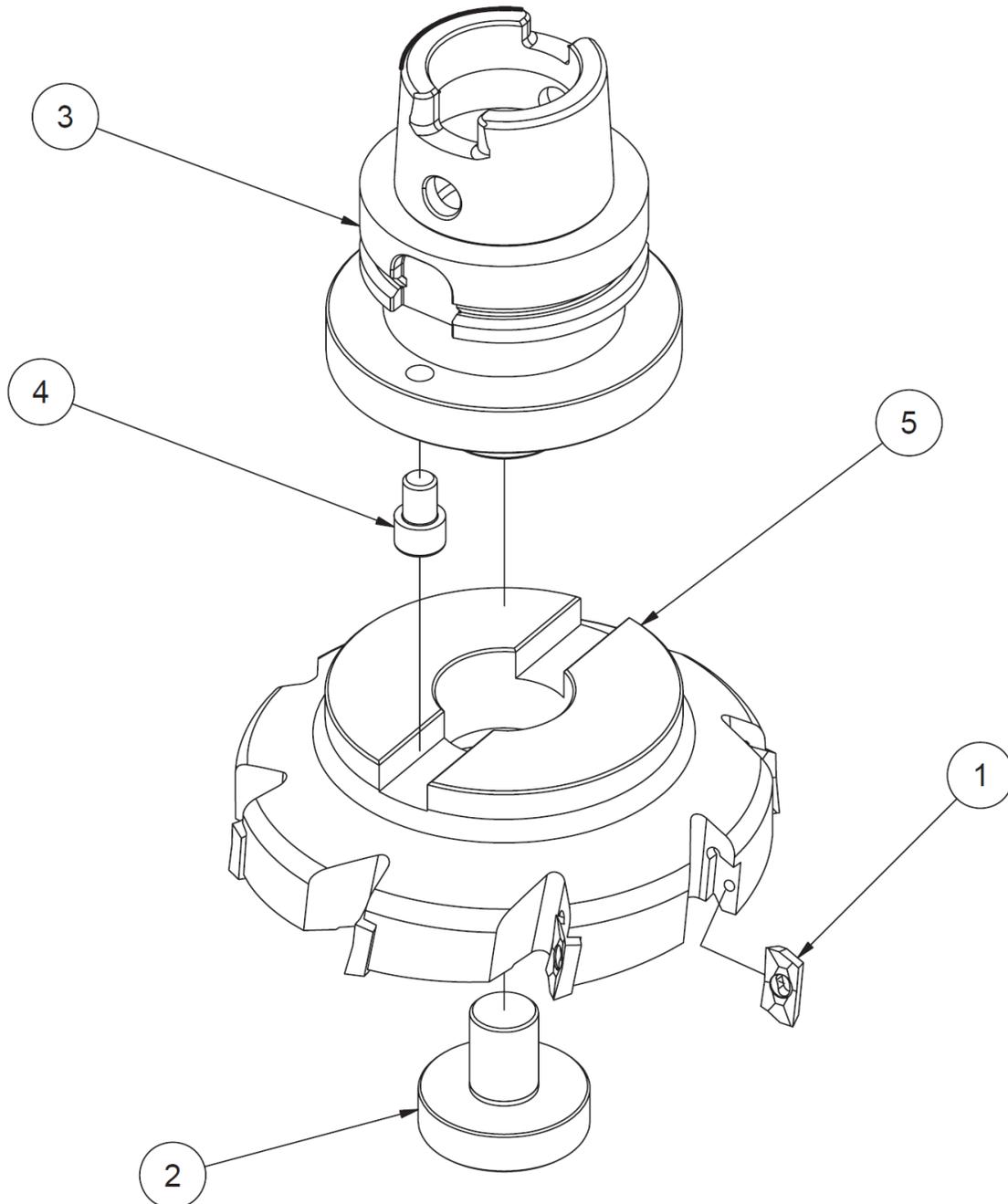
**10106B Surfacing Flycutter Kit, 22" (559mm) Dia**


10106B 22" (559mm) FLYCUTTER ASSEMBLY - HSK			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	10106A	ADAPTER, MILLING CUTTERHEAD
2	4	MF-90	SOCKET BUTTON HEAD SCREW 1/4-20 X 1/2"
3	2	MF-87	SOCKET BUTTON HEAD SCREW #10-24 X 1/4"
4	2	7202C	SOCKET SET SCREW, OVAL POINT 3/8-16 X 3/8"
5	2	7202W	TOOL HOLDER ASSEMBLY, FLY CUTTER
6	4	MF-33	SOCKET HEAD CAP SCREW 3/8-16 X 1 1/2"
7	2	7206K	'L' LOCK
8	2	7202P	HOLDER, FLY CUTTER TOOL
9	1	6294X	CUTTERHEAD BODY - SURFACING
10	1	650-2-8H	SHROUD, 22" SURFACING CUTTERHEAD

**10129 Shell Mill Parts, 5" (127mm) Dia**


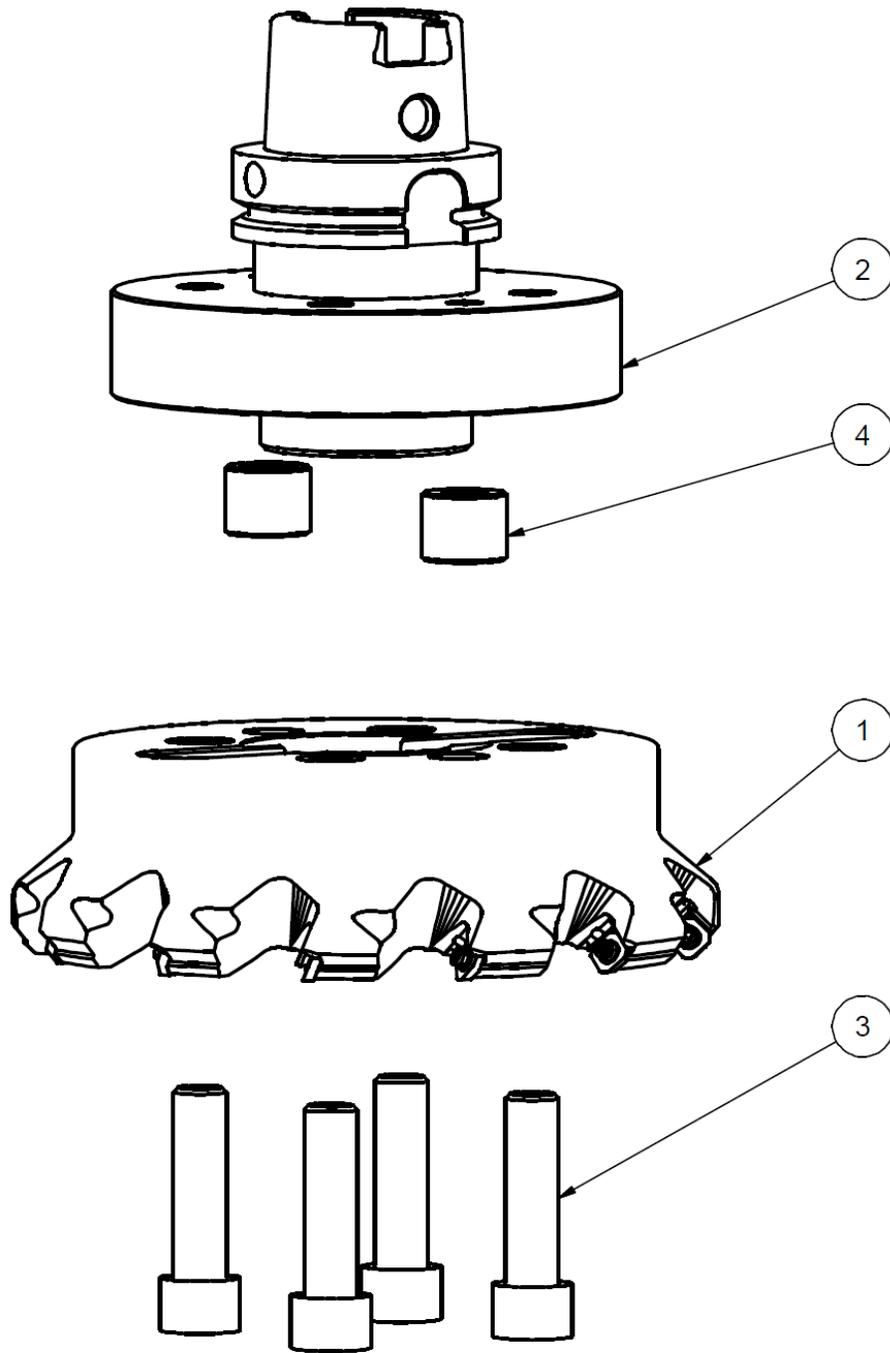
10129 5" SHELL MILL ASSEMBLY - HSK			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	9	6514T	INSERT, SHELL MILL 18mm
2	1	6514R SCREW	MOUNTING SCREW, 5" SHELL MILL
3	1	6514S	5" SHELL MILL
4	1	10130A	HSK ADAPTER, LARGE SHELL MILL
5	1	MF-29	S.H.C.S. $\frac{3}{8}$ - 16 UNC X $\frac{1}{2}$ "

### 10130 Shell Mill Parts, 6" (152mm) Dia

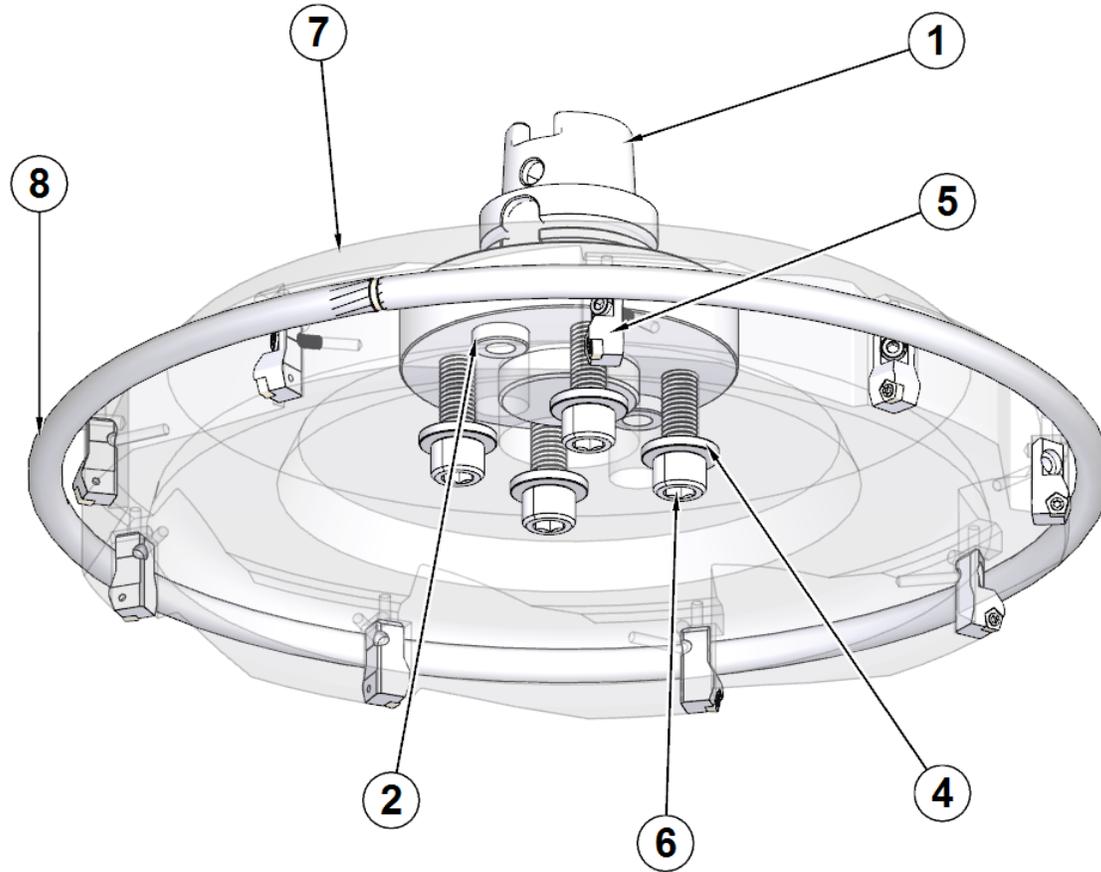


10130 6" SHELL MILL ASSEMBLY - HSK			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	8	6514T	INSERT, SHELL MILL 18mm
2	1	6514R SCREW	MOUNTING SCREW, 5" SHELL MILL
3	1	10130A	HSK ADAPTER, LARGE SHELL MILL
4	1	MF-29	S.H.C.S. $\frac{3}{8}$ - 16 UNC X $\frac{1}{2}$ "
5	1	7224H	SHELL MILL, 6" DIA

**10109D Shell Mill Kit, 8" (203mm) Dia**



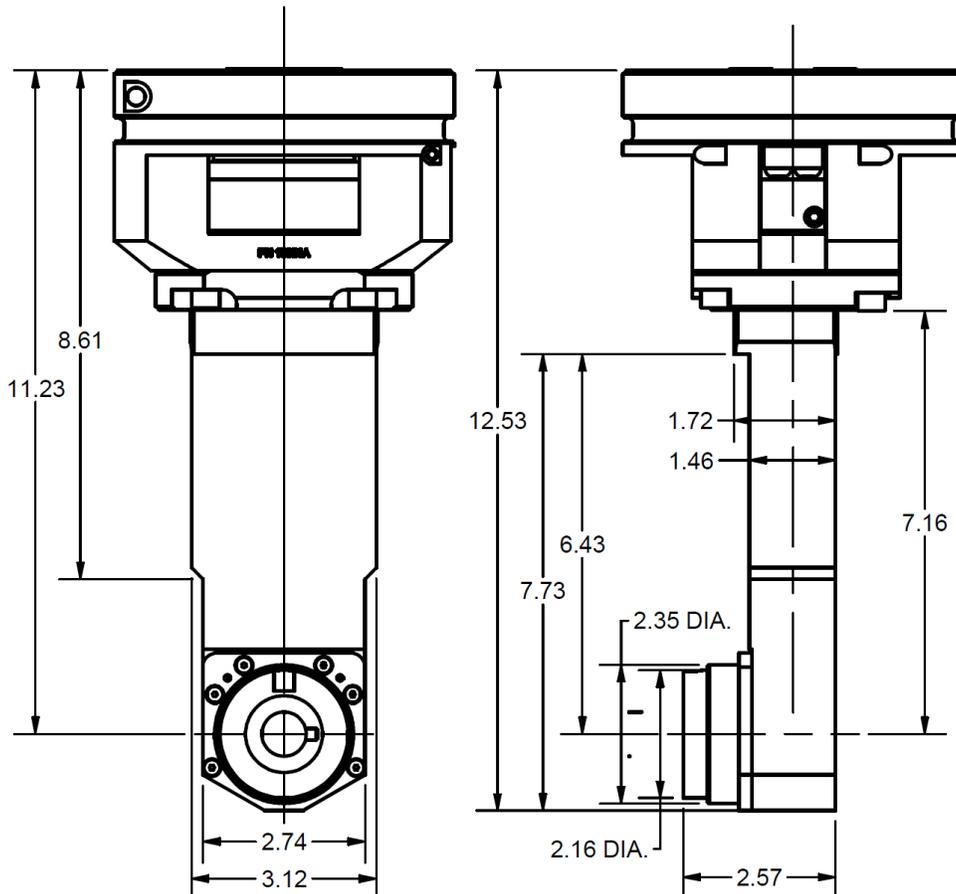
10109D 8" SHELL MILL ASSEMBLY - HSK			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	6515B	SHELL MILL, 8" DIA, MITSUBISHI
2	1	10109A	HSK ADAPTER LARGE SHELL MILL
3	4	MF-46E	S.H.C.S. $\frac{5}{8}$ - 11 UNC X 2 $\frac{1}{4}$ "
4	2	6514U	DRIVE KEY - LARGE SHELL MILL ADAPTER

**10109B Shell Mill Kit, 18" (457mm) Dia**

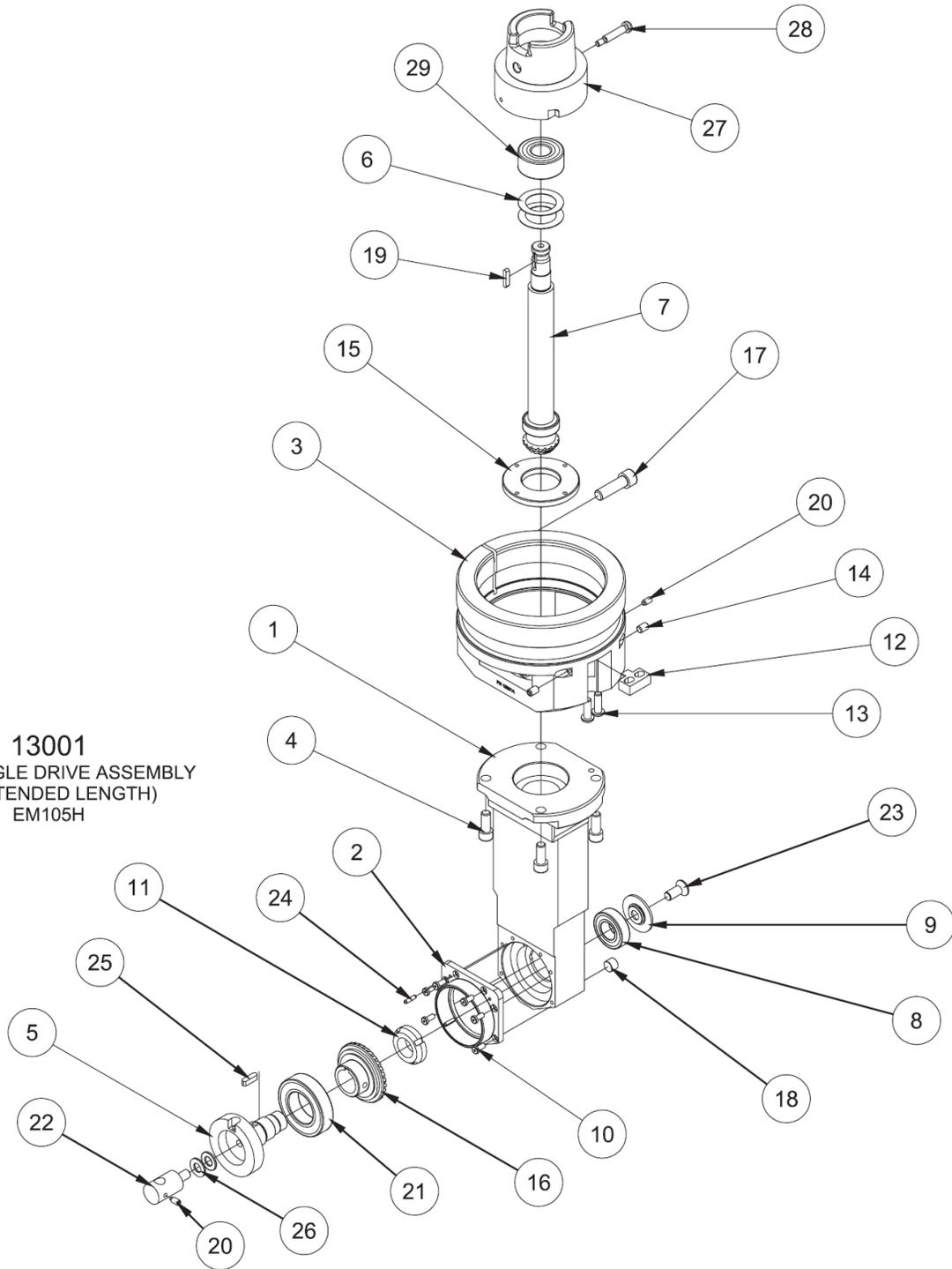
10109B 18" SHELL MILL ASSEMBLY - HSK			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	10109A	ADAPTER, LARGE SHELL MILL – HSK80A
2	2	6514U	DRIVE PIN – 18" MILLING HEAD
4	4	502-1-16	WASHER, HARDENED
5	9	6864D	CARTRIDGE, COMPLETE WITH 6864F INSERT SCREW
6	4	MF-46E	SOCKET HEAD CAP SCREW $\frac{5}{8}$ -11 X 2 $\frac{1}{4}$ "
7	1	6864A	SPECIAL 18" MULTI-TOOTH MILLING HEAD
8	1	6864H	DAMPENER ASSEMBLY

## Right Angle Drives

### 13001 Right Angle Drive, 2" Extended

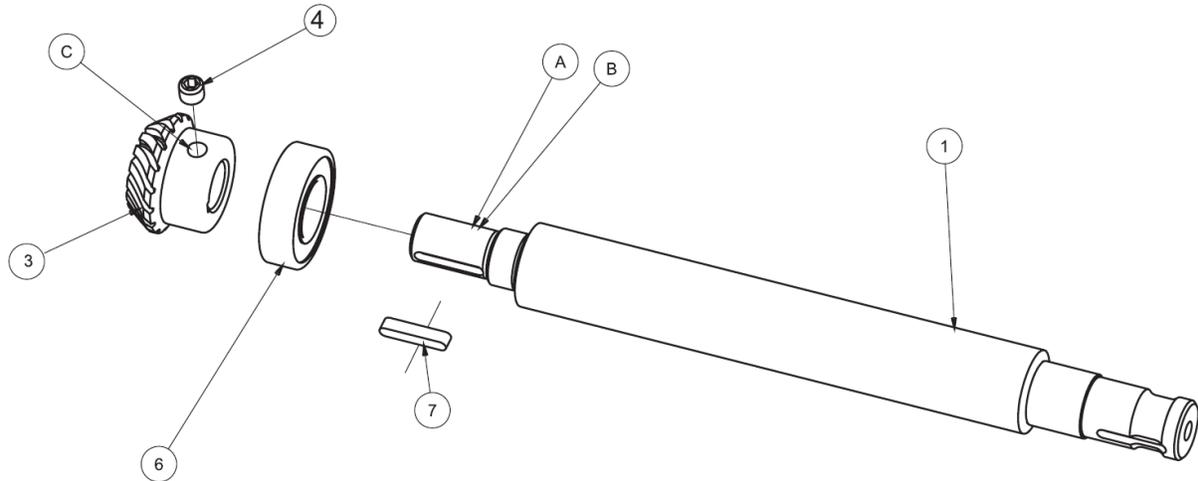


**13001**  
RIGHT ANGLE DRIVE ASSEMBLY  
(2" EXTENDED LENGTH)  
EM105H

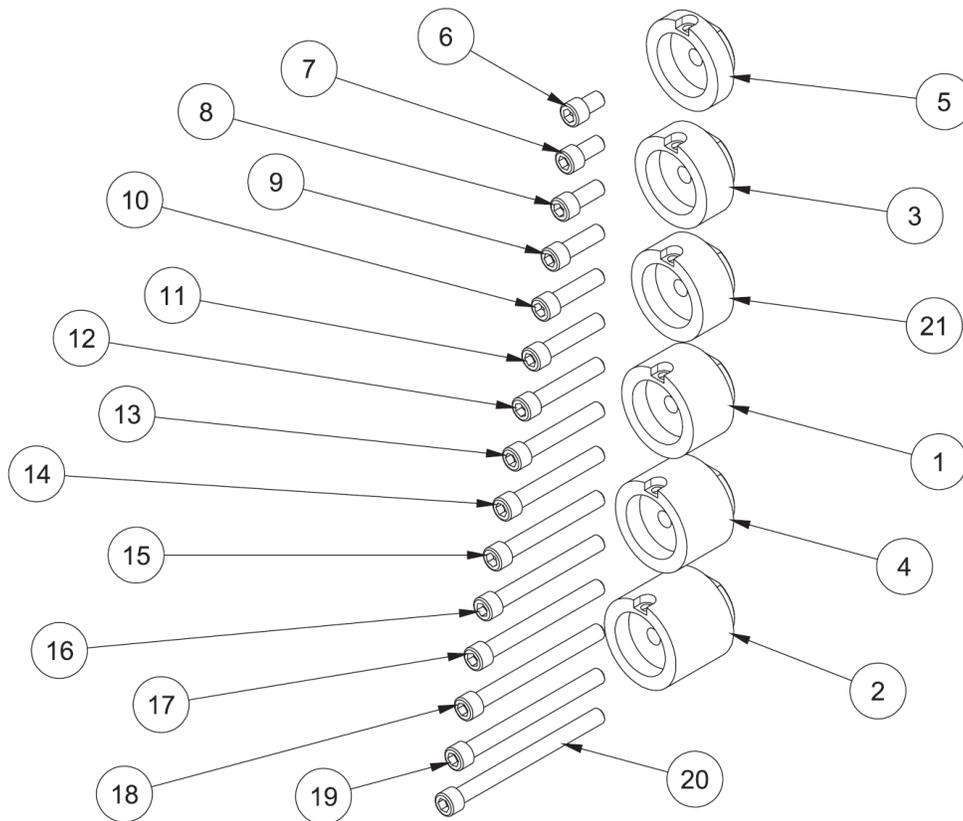




<b>13003 RIGHT ANGLE DRIVE ASSEMBLY (2" EXTENDED) EM105H</b>			
<b>ITEM</b>	<b>QTY</b>	<b>PART NUMBER</b>	<b>DESCRIPTION</b>
1	1	6773D	HOUSING, GEAR – RIGHT ANGLE DRIVE (EXTENDED)
2	1	6774	COVER, BEARING RETAINER
3	1	13001A	HUB, MOUNTING, 90 DEGREE BORING HEAD, EM105H
4	4	MF-22	S.H.C.S. 5/16-18 UNC X 3/4"
5	1	650-2-42A	SHAFT, HORIZONTAL – INTERMEDIATE PRECISION LINE BORE HEAD
6	2	6007A	BELLVILLE SPRING
7	1	6775K	PINION AND SHAFT ASSEMBLY (2" EXTENDED) R.A.D.
8	1	6753E	BEARING
9	1	6766F	END CAP
10	6	6774E	SOCKET HEAD CAPSCREW, #8-32 X 3/8"
11	1	6705B	BEARING LOCK NUT
12	1	6750K	KEY, LOCATION 90 DEGREE HEAD
13	2	MF-92	SOCKET BUTTON HEAD, 1/4-20 UNC X 3/4"
14	2	MF-59	SOCKET SET SCREW, FLAT POINT, 1/4-20 UNC X 3/8"
15	1	6772A	NUT, BEARING LINE BORE HEAD
16	1	6766H	RING GEAR REWORK – SMALL 90 DEG R.A.D.
17	1	MF-32	S.H.C.S. 3/8-16 UNC X 1 1/4"
18	1	MF-233	COUNTERSUNK HEX-HEAD PLUG 1/8"
19	1	6753V	KEY (MICARTA), PINION – 90 DEGREE HEAD
20	2	100-82-2A	SOCKET SET SCREW, BRASS TIPPED #10-24
21	1	502-9-72B	BALL BEARING
22	1	502-9-9S	INDICATOR MOUNT, R.A.D.
23	1	6774K	SOCKET FLAT HEAD SCREW 5/16-24 UNF X 3/4"
24	2	MF-217	PIN – SLOTTED SPRING
25	1	7088A	KEY, PULLEY
26	2	MF-177	SAE FLAT WASHER 5/16"
27	1	10114A	ADAPTER, DRIVE, R.A.D. – HSK 80A
28	1	10114G	1/4" X 1" LG SOCKET HEAD SHOULDER SCREW
29	1	502-9-32	BALL BEARING

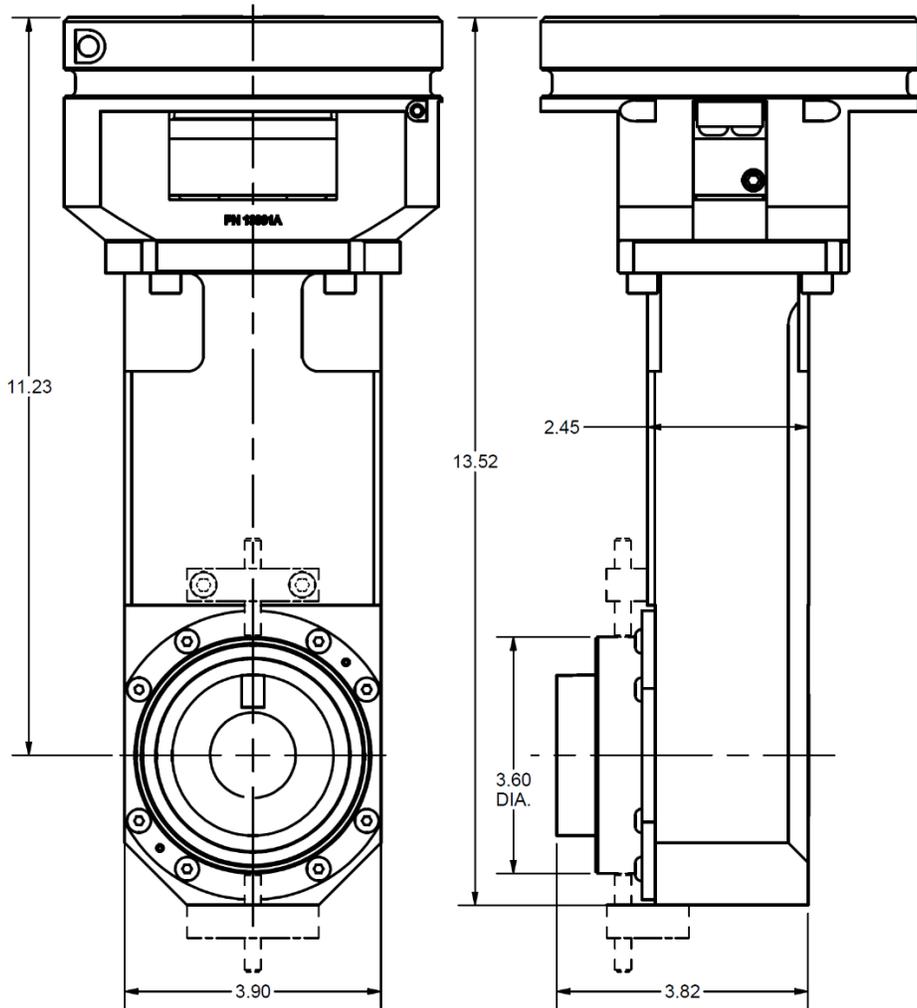


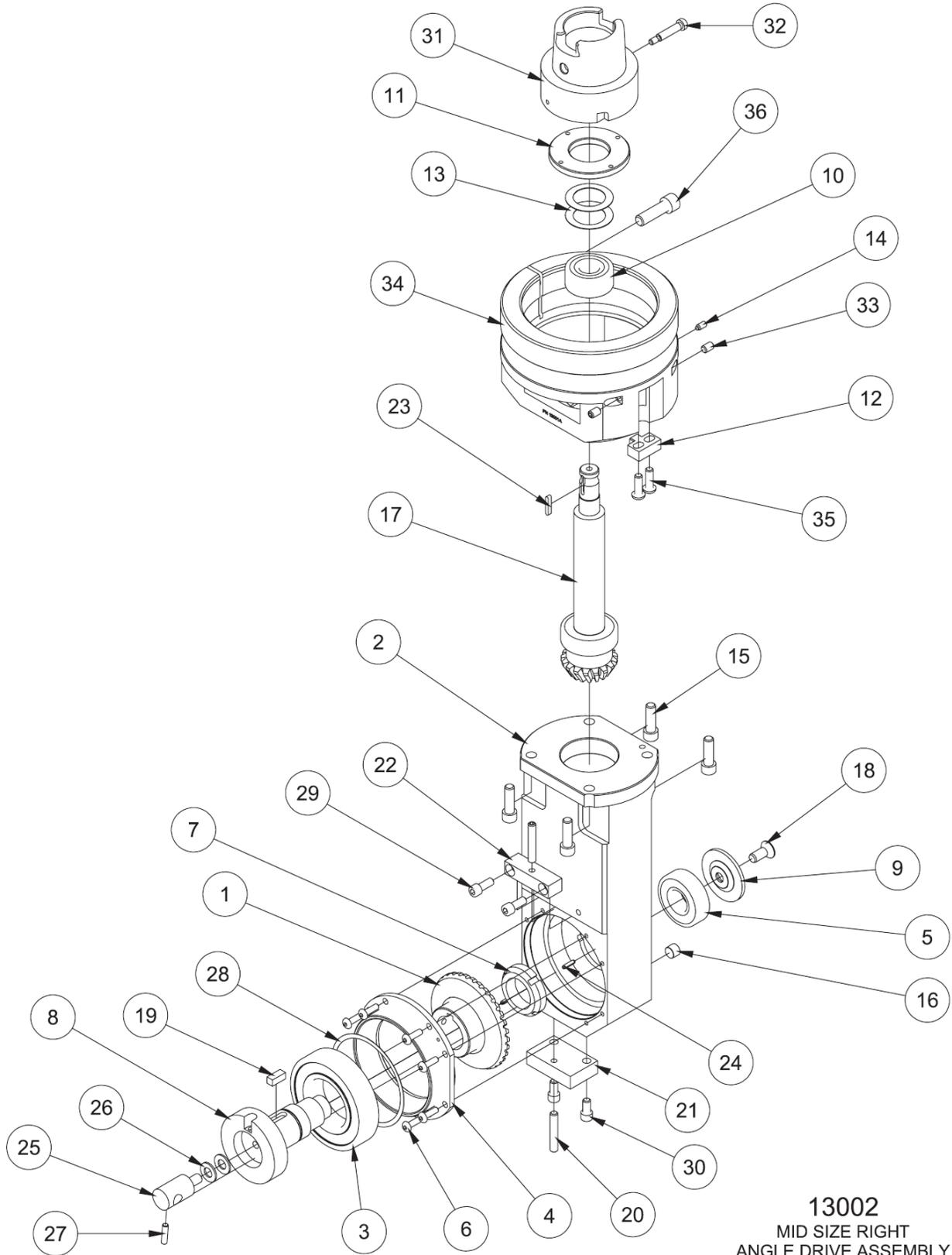
6775K PINION SHAFT ASSEMBLY – R.A.D.			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	6775J	SHAFT – PINION EXTENDED SMALL R.A.D – F109 HSK
3	1	6752M	PINION, 90 DEG HEAD
4	1	MF-59B	SOCKET SET SCREW, CONE POINT, 1/4-20 UNC X 5/16"
6	1	700-11	BEARING
7	1	6752Q	KEY, PINION 90 DEG HEAD



<b>SPACER SET – R.A.D. ASSEMBLY, EM105H</b>			
<b>ITEM</b>	<b>QTY</b>	<b>PART NUMBER</b>	<b>DESCRIPTION</b>
1	1	650-2-43	SPACER (1.05" LG) PRECISION LINE BORE HEAD
2	1	650-2-43A	SPACER (1.50" LG) PRECISION LINE BORE HEAD
3	1	650-2-43B	SPACER (.70" LG) PRECISION LINE BORE HEAD
4	1	650-2-43D	SPACER (1.215" LG) PRECISION LINE BORE HEAD
5	1	650-2-43E	SPACER (.41" LG) PRECISION LINE BORE HEAD
6	1	MF-21A	S.H.C.S 5/16-18 UNC X ½
7	1	MF-21	S.H.C.S 5/16-18 UNC X ⅝
8	1	MF-22	S.H.C.S 5/16-18 UNC X ¾
9	1	MF-23	S.H.C.S 5/16-18 UNC X 1
10	1	MF-24	S.H.C.S 5/16-18 UNC X 1 ¼
11	1	MF-25	S.H.C.S 5/16-18 UNC X 1 ½
12	1	MF-26	S.H.C.S 5/16-18 UNC X 1 ¾
13	1	MF-27	S.H.C.S 5/16-18 UNC X 2
14	1	MF-27C	S.H.C.S 5/16-18 UNC X 2 ¼
15	1	MF-27A	S.H.C.S 5/16-18 UNC X 2 ½
16	1	MF-28	S.H.C.S 5/16-18 UNC X 2 ¾
17	1	MF-28E	S.H.C.S 5/16-18 UNC X 3
18	1	MF-28F	S.H.C.S 5/16-18 UNC X 3 ¼
19	1	MF-28A	S.H.C.S 5/16-18 UNC X 3 ½
20	1	MF-28G	S.H.C.S 5/16-18 UNC X 3 ¾
21	1	650-2-43G	SPACER (.80" LG) PRECISION LINE BORE HEAD

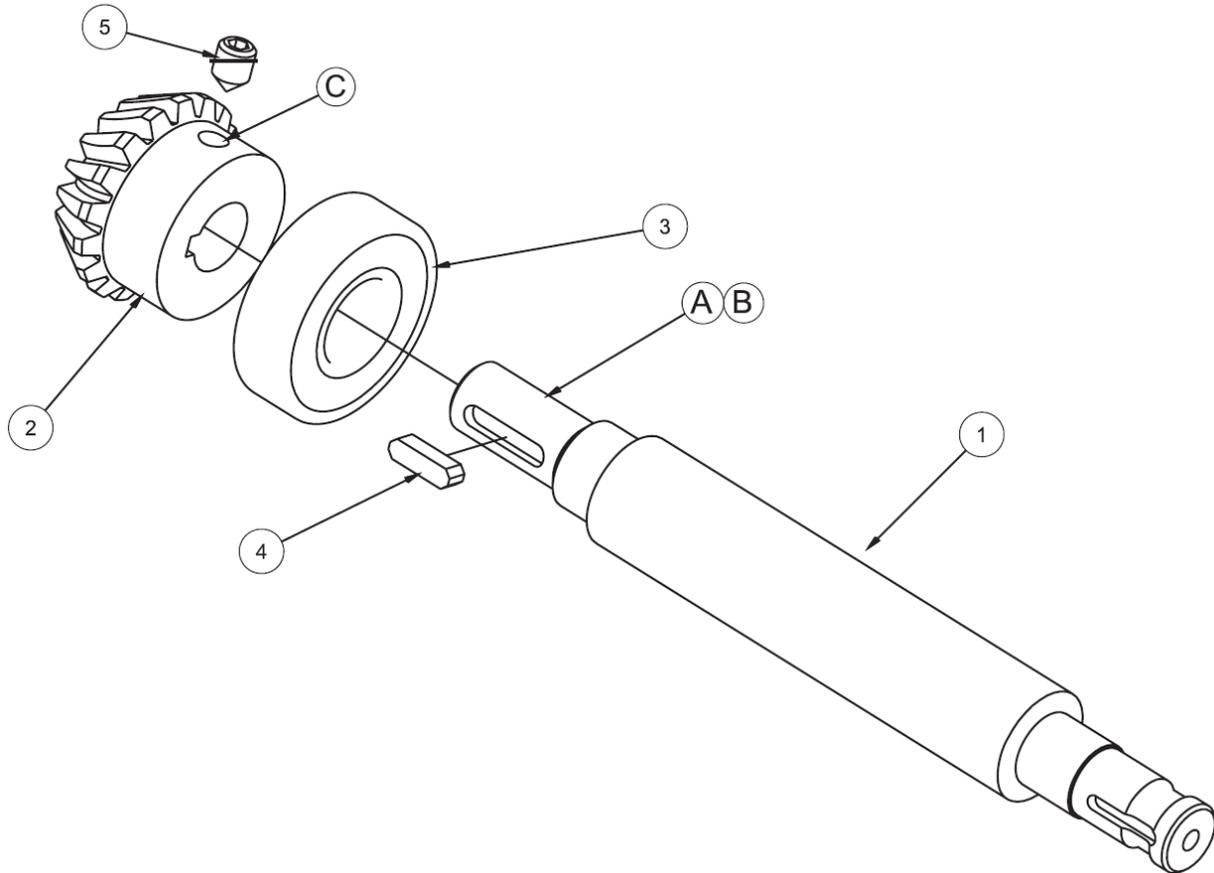
### 13002 Mid-Size Right Angle Drive



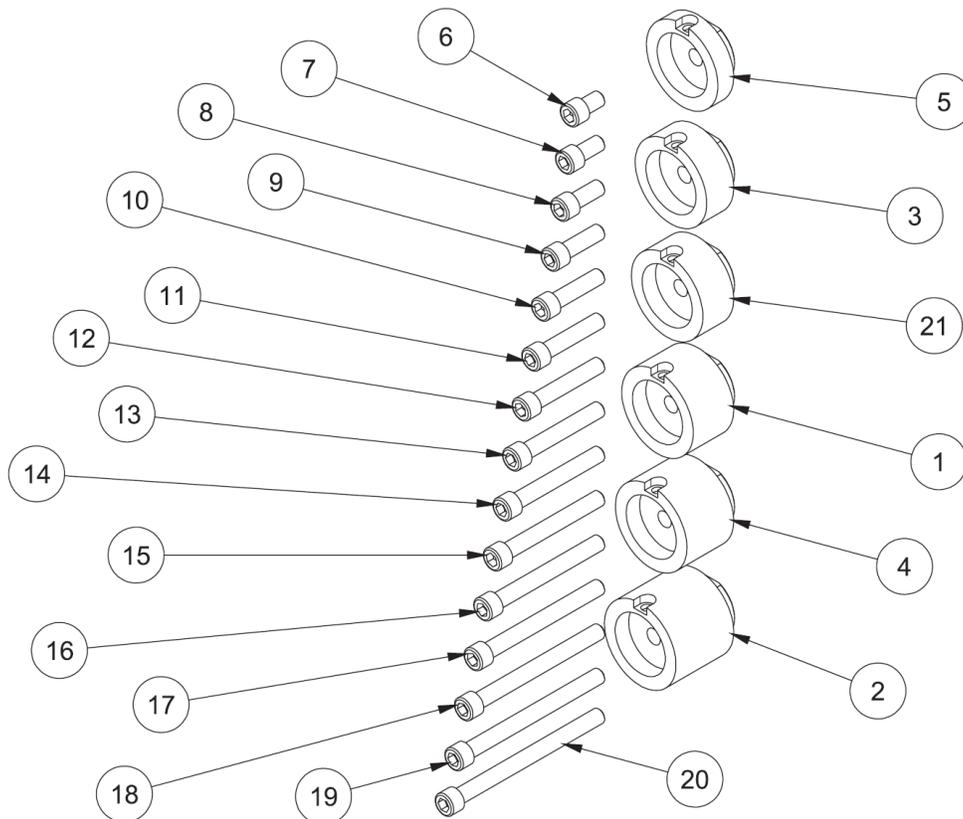


**13002**  
MID SIZE RIGHT  
ANGLE DRIVE ASSEMBLY  
EM105H APPLICATION

13002 MID-SIZE RIGHT ANGLE DRIVE ASSEMBLY - EM105H			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	6859	REWORK 6859A SPIRAL BEVEL GEAR
2	1	6857	HOUSING, MID-SIZE RIGHT ANGLE DRIVE
3	1	650-1-21A	BEARING, MID-SIZE R.A.D.
4	1	6861	COVER, BEARING RETAINER – MID-SIZE R.A.D.
5	1	502-35-14	BEARING
6	8	MF-89	SOCKET BUTTON HEAD #10-24 UNC X 5/8"
7	1	6048	BEARING NUT
8	1	6860	HORIZONTAL SHAFT – MID-SIZE R.A.D.
9	1	6862	END CAP, BEARING RETAINER – MID-SIZE R.A.D.
10	1	502-9-32	BALL BEARING
11	1	6772A	NUT, BEARING LINE BORE HEAD
12	1	6750K	KEY, LOCATION 90 DEGREE HEAD
13	2	6007A	BELLVILLE SPRING
14	1	100-82-2A	SOCKET SET SCREW, BRASS TIPPED #10-24
15	4	MF-23	SOCKET HEAD CAP SCREW, 5/16-18 UNC X 1
16	1	MF-233	1/8-27 NPT PIPE PLUG
17	1	6858F	PINION SHAFT ASSEMBLY – MID-SIZE R.A.D.
18	1	6774K	SOCKET FLAT HEAD SCREW, 5/16-24 UNF X 3/4"
19	1	7191K	KEY, HORIZONTAL SHAFT MID-SIZE R.A.D.
20	2	MF-66	SOCKET SET SCREW, 1/4-20 UNC X 1 1/2"
21	1	6857F	FINE ADJUSTING BLOCK, LOWER – MID-SIZE R.A.D.
22	1	6857E	FINE ADJUSTING BLOCK, UPPER – MID-SIZE R.A.D.
23	1	6753V	KEY (MICARTA), PINION – 90 DEGREE HEAD
24	2	MF-217	PIN – SLOTTED SPRING
25	1	502-9-9S	INDICATOR MOUNT, R.A.D.
26	2	MF-177	SAE FLAT WASHER, 5/16"
27	1	MF-58	SOCKET SET SCREW, #10-24 X 1/2"
28	1	6861A	SHIM, BEARING SPACER – HORIZONTAL SHAFT – MID-SIZE R.A.D.
29	2	MF-13	S.H.C.S. 1/4-20 UNC X 5/8"
30	2	MF-12	S.H.C.S. 1/4-20 UNC X 1/2"
31	1	10114A	ADAPTER, DRIVE, R.A.D. – HSK80A
32	1	10114G	SOCKET SHOULDER SCREW, 1/4" X 1"
33	2	MF-59	SOCKET SET SCREW, FLAT POINT, 1/4-20 UNC X 3/8"
34	1	13001A	HUB, MOUNTING, 90 DEGREE BORING HEAD, EM105H
35	2	MF-92	SOCKET BUTTON HEAD SCREW, 1/4-20 X 3/4"
36	1	MF-32	S.H.C.S. 3/8-16 UNC X 1 1/4"

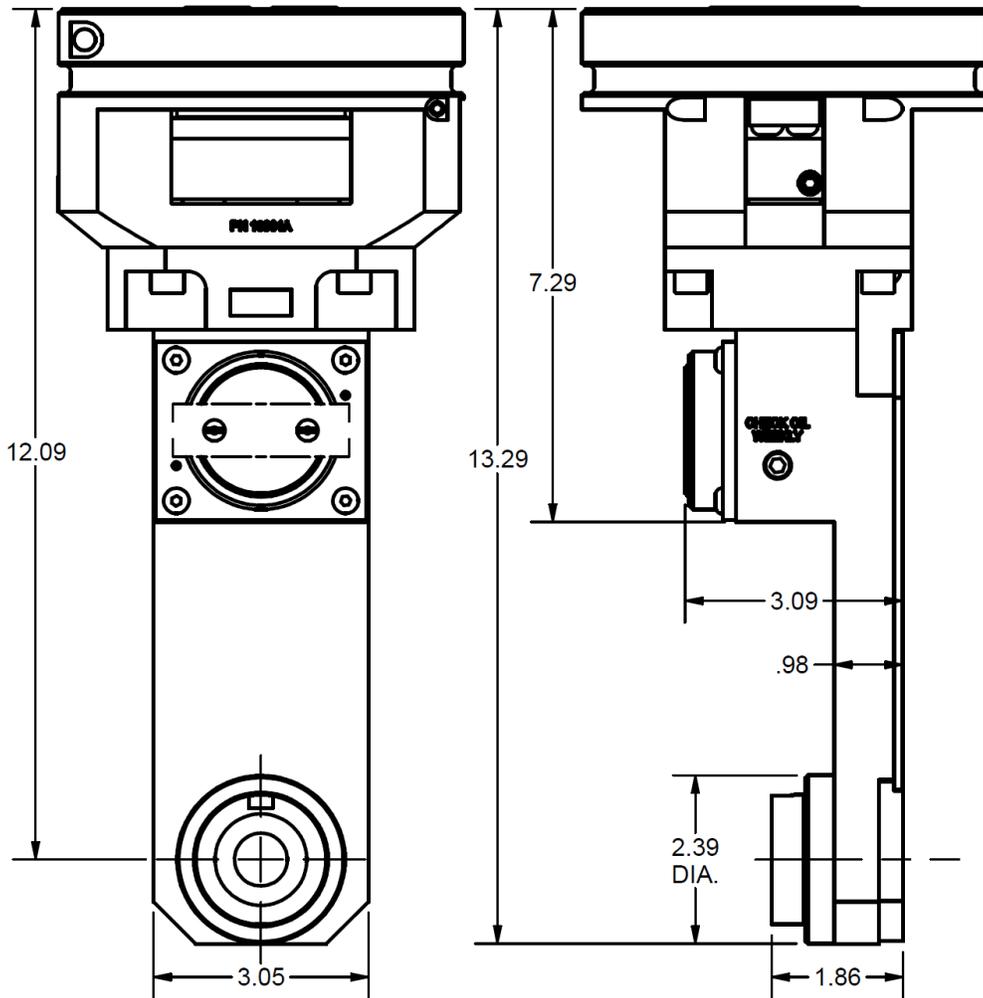


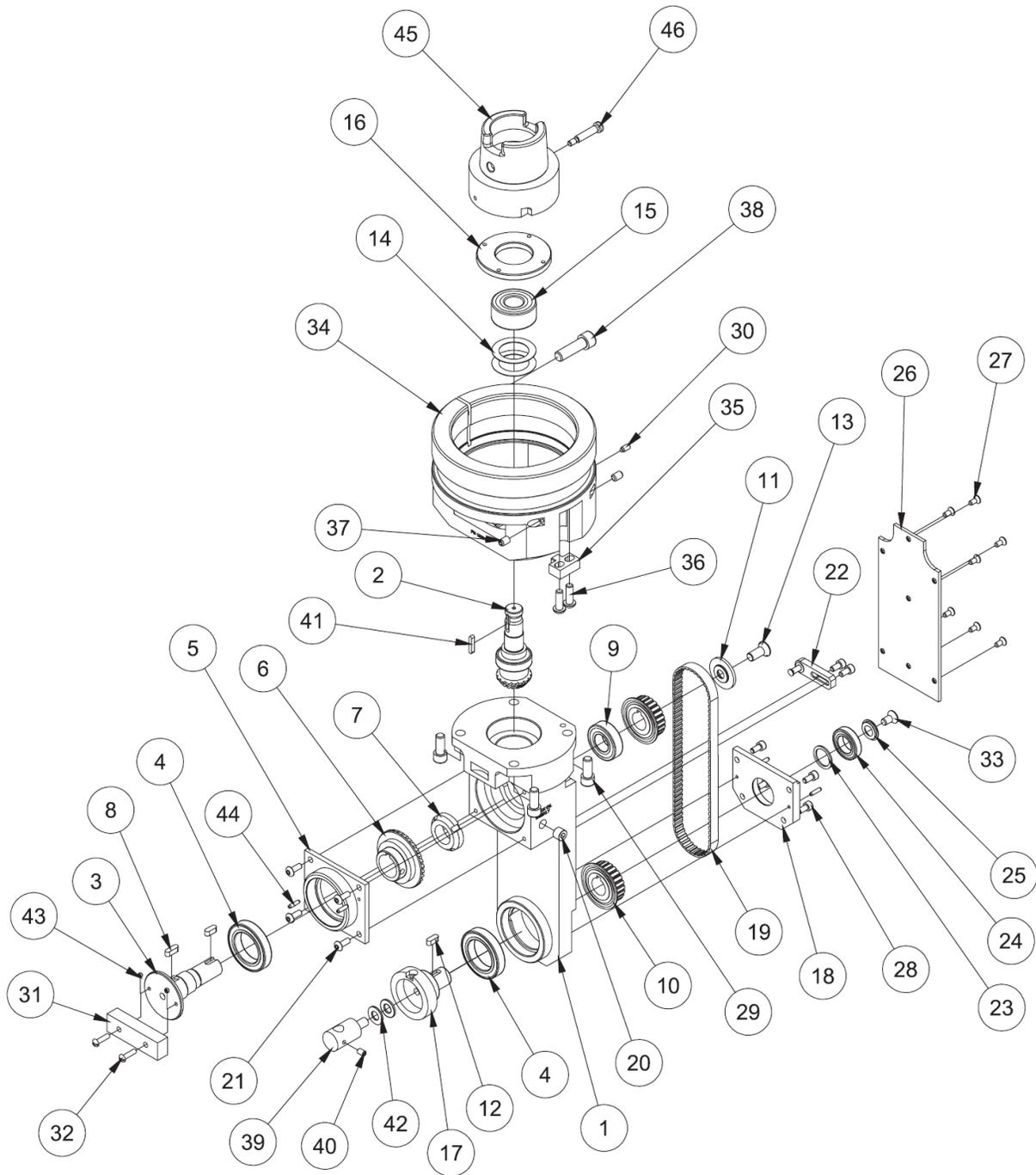
<b>6858F PINION SHAFT ASSEMBLY – R.A.D.</b>			
<b>ITEM</b>	<b>QTY</b>	<b>PART NUMBER</b>	<b>DESCRIPTION</b>
1	1	6858G	VERTICAL SHAFT
3	1	6858C	PINION, MID-SIZE 90 DEGREE LINE BORE HEAD
4	1	502-35-14	BEARING
6	1	7088A	KEY, PULLEY SF-1
7	1	6863	SOCKET SET SCREW, CONE POINT, 5/16-18 X 5/16"



<b>SPACER SET – R.A.D. ASSEMBLY, EM105H</b>			
<b>ITEM</b>	<b>QTY</b>	<b>PART NUMBER</b>	<b>DESCRIPTION</b>
1	1	650-2-43	SPACER (1.05" LG) PRECISION LINE BORE HEAD
2	1	650-2-43A	SPACER (1.50" LG) PRECISION LINE BORE HEAD
3	1	650-2-43B	SPACER (.70" LG) PRECISION LINE BORE HEAD
4	1	650-2-43D	SPACER (1.215" LG) PRECISION LINE BORE HEAD
5	1	650-2-43E	SPACER (.41" LG) PRECISION LINE BORE HEAD
6	1	MF-21A	S.H.C.S 5/16-18 UNC X ½
7	1	MF-21	S.H.C.S 5/16-18 UNC X ⅝
8	1	MF-22	S.H.C.S 5/16-18 UNC X ¾
9	1	MF-23	S.H.C.S 5/16-18 UNC X 1
10	1	MF-24	S.H.C.S 5/16-18 UNC X 1 ¼
11	1	MF-25	S.H.C.S 5/16-18 UNC X 1 ½
12	1	MF-26	S.H.C.S 5/16-18 UNC X 1 ¾
13	1	MF-27	S.H.C.S 5/16-18 UNC X 2
14	1	MF-27C	S.H.C.S 5/16-18 UNC X 2 ¼
15	1	MF-27A	S.H.C.S 5/16-18 UNC X 2 ½
16	1	MF-28	S.H.C.S 5/16-18 UNC X 2 ¾
17	1	MF-28E	S.H.C.S 5/16-18 UNC X 3
18	1	MF-28F	S.H.C.S 5/16-18 UNC X 3 ¼
19	1	MF-28A	S.H.C.S 5/16-18 UNC X 3 ½
20	1	MF-28G	S.H.C.S 5/16-18 UNC X 3 ¾
21	1	650-2-43G	SPACER (.80" LG) PRECISION LINE BORE HEAD

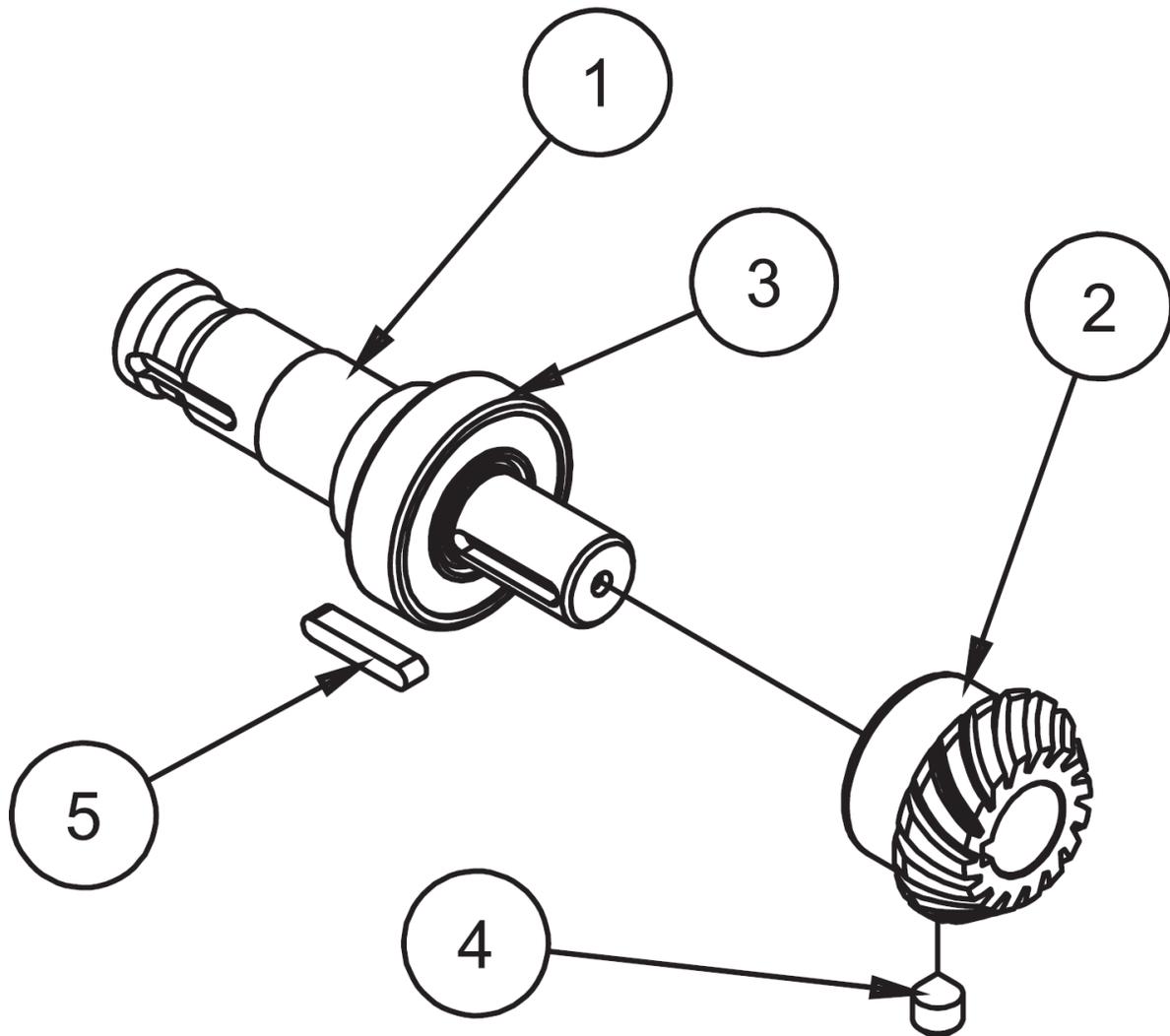
### 13003 Belt Driven Right Angle Drive



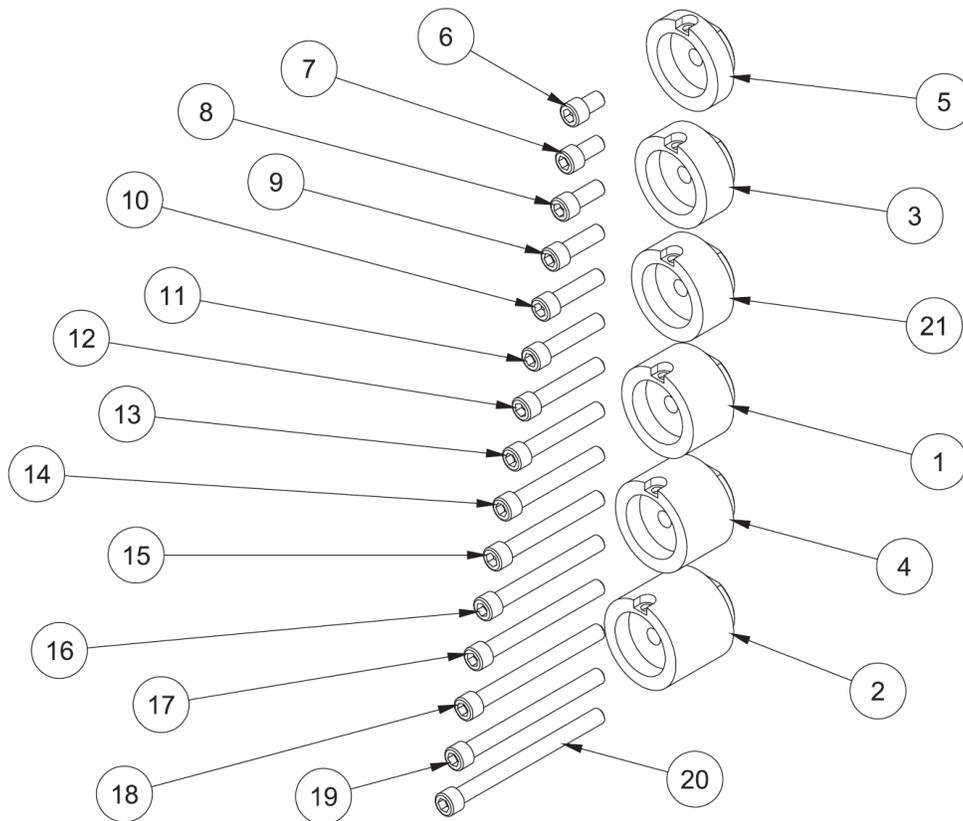


13003  
BELT DRIVE LINE BORE HEAD  
EM105H

13003 BELT DRIVE RIGHT ANGLE DRIVE ASSEMBLY - EM105H			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	650-2-38B	HOUSING, RIGHT ANGLE DRIVE, BELT DRIVE
2	1	13003A	PINION & SHAFT ASSEMBLY BELT DRIVE LINE BORE HEAD – EM105H
3	1	650-2-37D	SHAFT, HORIZONTAL UPPER, BELT DRIVE LINE BORE HEAD
4	2	502-9-72C	OUTER BALL BEARING, RIGHT ANGLE LINE BORING HEAD
5	1	650-2-37C	BEARING COVER, BELT DRIVE RIGHT ANGLE DRIVE
6	1	6766W	RING GEAR REWORK, SMALL 90 DEG R.A.D.
7	1	6705B	BEARING LOCK NUT
8	1	650-2-18M	KEY, HORIZONTAL SHAFT, R.A.D.
9	1	6753E	BEARING
10	2	650-2-37G	PULLEY (REWORK), BELT DRIVE R.A.D.
11	1	650-2-37E	ENDCAP, UPPER PULLEY RETAINER – BELT DRIVE LINE BORE HEAD
12	2	650-2-37U	MICARTA KEY, BELT DRIVE LINE BORE HEAD
13	1	6774K	SOCKET FLAT HEAD SCREW, 5/16-24 UNF X ¾"
14	2	6007A	BELLVILLE SPRING
15	1	502-9-32	BALL BEARING
16	1	6772A	NUT, BEARING LINE BORE HEAD
17	1	650-2-42B	HORIZONTAL SHAFT
18	1	650-2-37L	LOWER BEARING RETAINER – BELT DRIVE LINE BORE HEAD
19	1	650-2-38D	TIMING BELT, BELT DRIVE LINE BORE HEAD
20	1	MF-233	½-27 NPT PIPE PLUG
21	4	MF-88A	S.H.C.S. #10-24 X ½"
22	1	650-2-37P	BELT TENSIONER ASSY, BELT DRIVE LINE BORE HEAD
23	1	650-2-37V	SPACER, LOWER PULLEY – BELT DRIVE LINE BORE HEAD
24	1	650-2-37J	BEARING, BELT DRIVE LINE BORE HEAD
25	1	650-2-37K	END CAP, LOWER – BELT DRIVE LINE BORE HEAD
26	1	650-2-38C	BELT COVER, BELT DRIVE LINE BORE HEAD
27	7	MF-76	SOCKET FLAT HEAD SCREW, #8-32 X ¾"
28	6	MF-4	S.H.C.S #10-24 X ¾"
29	4	MF-22	S.H.C.S 5/16-18 X ¾"
30	1	100-82-2A	SOCKET SET SCREW, BRASS TIPPED, #10-24
31	1	650-2-38A	RETAINING TOOL – BELT DRIVE R.A.D.
32	2	MF-105	ROUND HEAD MACHINE SCREW #8-32 X 5/8"
33	1	650-2-37Z	SOCKET FLAT HEAD SCREW, ¼-28UNF X ½"
34	1	13001A	HUB, MOUNTING, 90 DEGREE BORING HEAD – EM105H
35	1	6750K	KEY, LOCATION 90 DEGREE HEAD
36	2	MF-92	SOCKET BUTTON HEAD SCREW, ¼-20UNC X ¾"
37	2	MF-59	SOCKET FLAT HEAD SCREW, ¼-20UNC X ¾"
38	1	MF-32	S.H.C.S ¾-16 X 1 ¼"
39	1	502-9-9S	INDICATOR MOUNT, R.A.D.
40	1	MF-52	SOCKET SET SCREW, #10-24 X ¼"
41	1	6753V	KEY (MICARTA), PINION – 90 DEGREE HEAD
42	2	MF-177	SAE FLAT WASHER 5/16"
43	2	MF-49	SOCKET SET SCREW, #8-32 X 1/8"
44	4	MF-217	PIN – SLOTTED SPRING
45	1	10114A	ADAPTER, DRIVE, R.A.D.
46	1	10114G	SOCKET SHOULDER SCREW, ¼" X 1" LG

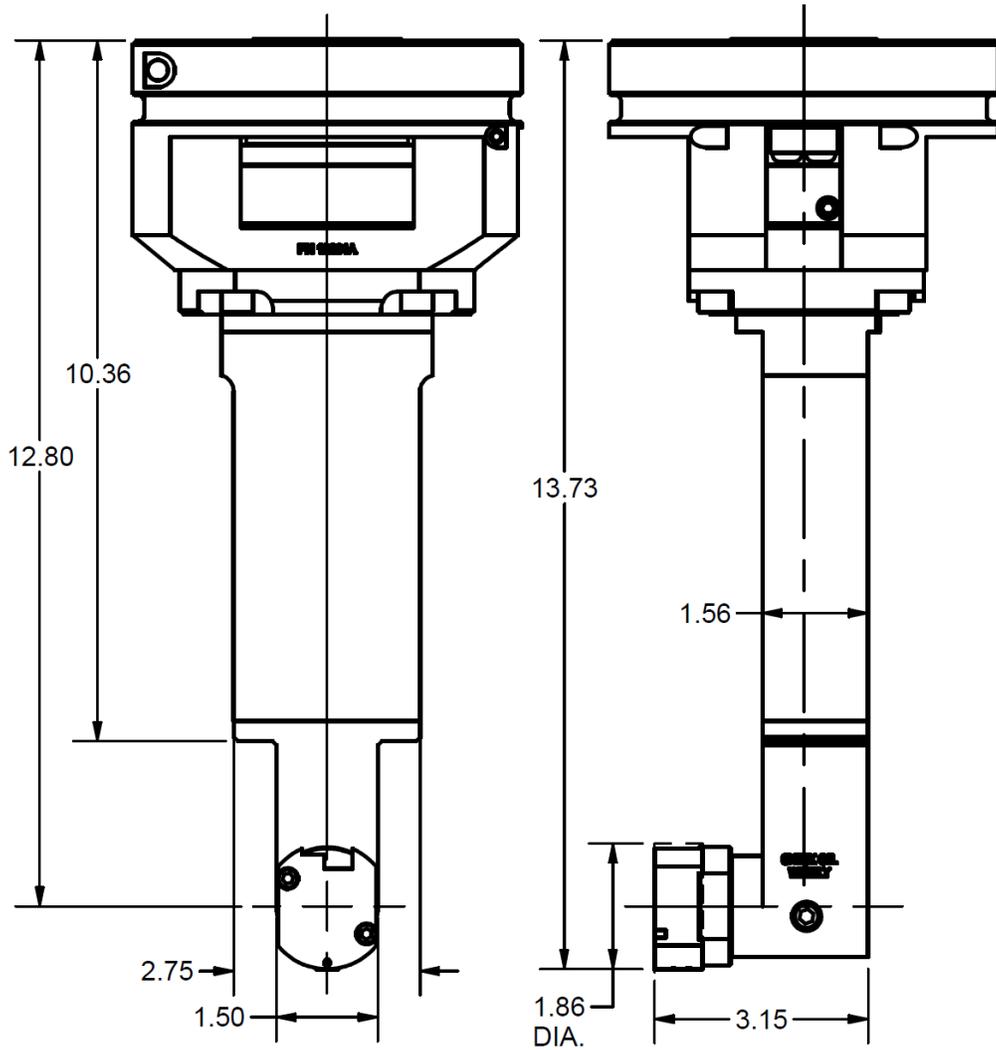
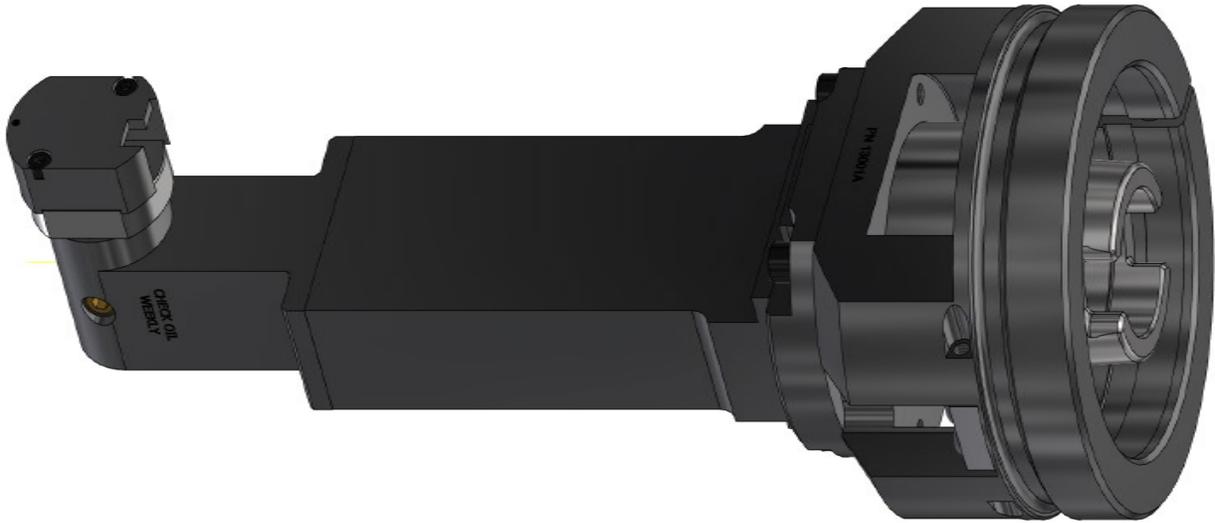


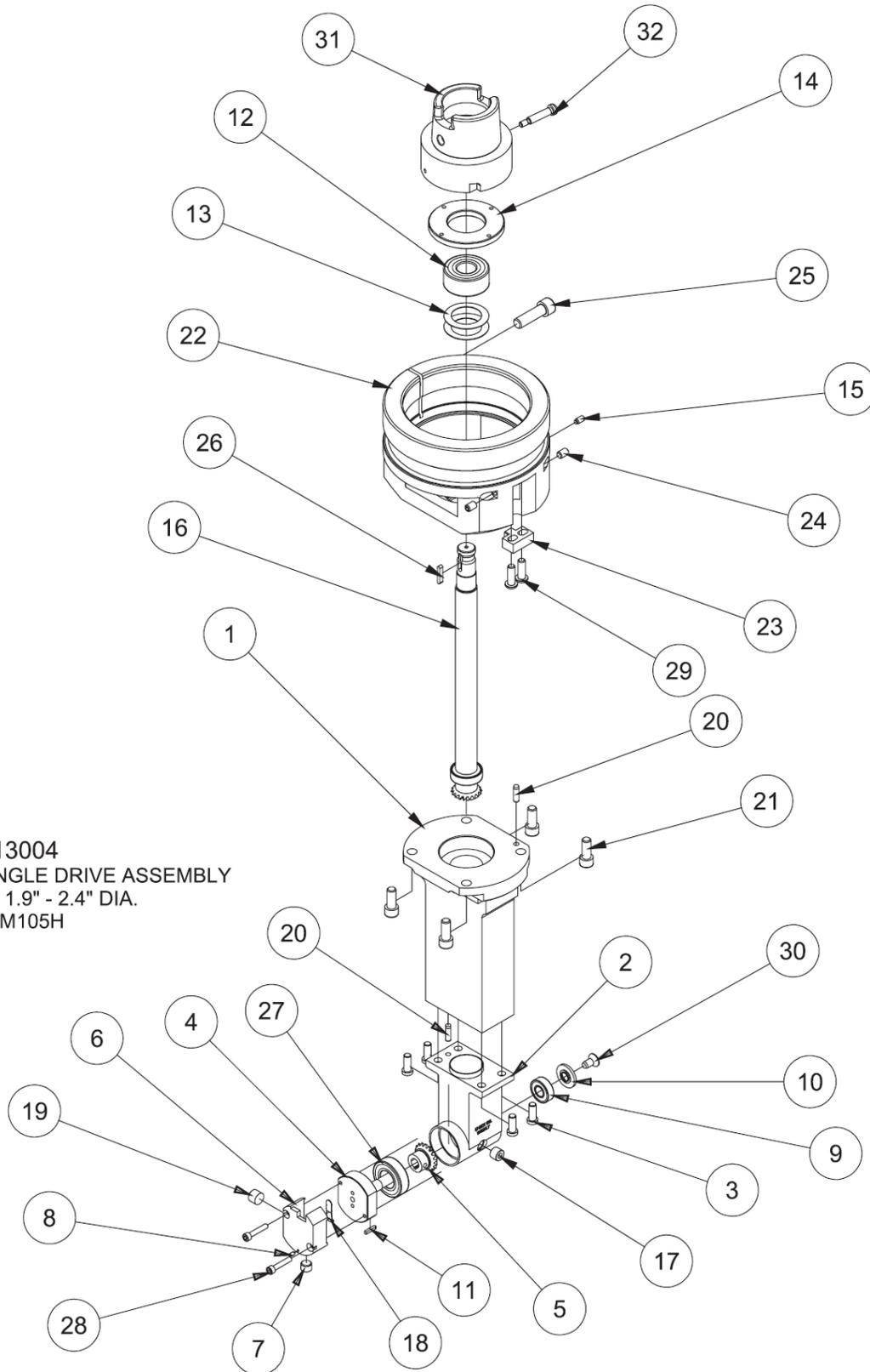
13003A VERTICAL SHAFT ASSEMBLY – BELT DRIVE R.A.D. – EM105H			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	6858G	VERTICAL SHAFT
3	1	6858C	PINION, MID-SIZE 90 DEGREE LINE BORE HEAD
4	1	502-35-14	BEARING
6	1	7088A	KEY, PULLEY SF-1
7	1	6863	SOCKET SET SCREW, CONE POINT, 5/16-18 X 5/16"



<b>SPACER SET – R.A.D. ASSEMBLY, EM105H</b>			
<b>ITEM</b>	<b>QTY</b>	<b>PART NUMBER</b>	<b>DESCRIPTION</b>
1	1	650-2-43	SPACER (1.05" LG) PRECISION LINE BORE HEAD
2	1	650-2-43A	SPACER (1.50" LG) PRECISION LINE BORE HEAD
3	1	650-2-43B	SPACER (.70" LG) PRECISION LINE BORE HEAD
4	1	650-2-43D	SPACER (1.215" LG) PRECISION LINE BORE HEAD
5	1	650-2-43E	SPACER (.41" LG) PRECISION LINE BORE HEAD
6	1	MF-21A	S.H.C.S 5/16-18 UNC X 1/2
7	1	MF-21	S.H.C.S 5/16-18 UNC X 5/8
8	1	MF-22	S.H.C.S 5/16-18 UNC X 3/4
9	1	MF-23	S.H.C.S 5/16-18 UNC X 1
10	1	MF-24	S.H.C.S 5/16-18 UNC X 1 1/4
11	1	MF-25	S.H.C.S 5/16-18 UNC X 1 1/2
12	1	MF-26	S.H.C.S 5/16-18 UNC X 1 3/4
13	1	MF-27	S.H.C.S 5/16-18 UNC X 2
14	1	MF-27C	S.H.C.S 5/16-18 UNC X 2 1/4
15	1	MF-27A	S.H.C.S 5/16-18 UNC X 2 1/2
16	1	MF-28	S.H.C.S 5/16-18 UNC X 2 3/4
17	1	MF-28E	S.H.C.S 5/16-18 UNC X 3
18	1	MF-28F	S.H.C.S 5/16-18 UNC X 3 1/4
19	1	MF-28A	S.H.C.S 5/16-18 UNC X 3 1/2
20	1	MF-28G	S.H.C.S 5/16-18 UNC X 3 3/4
21	1	650-2-43G	SPACER (.80" LG) PRECISION LINE BORE HEAD

### 13004 Special Narrow Right Angle Drive



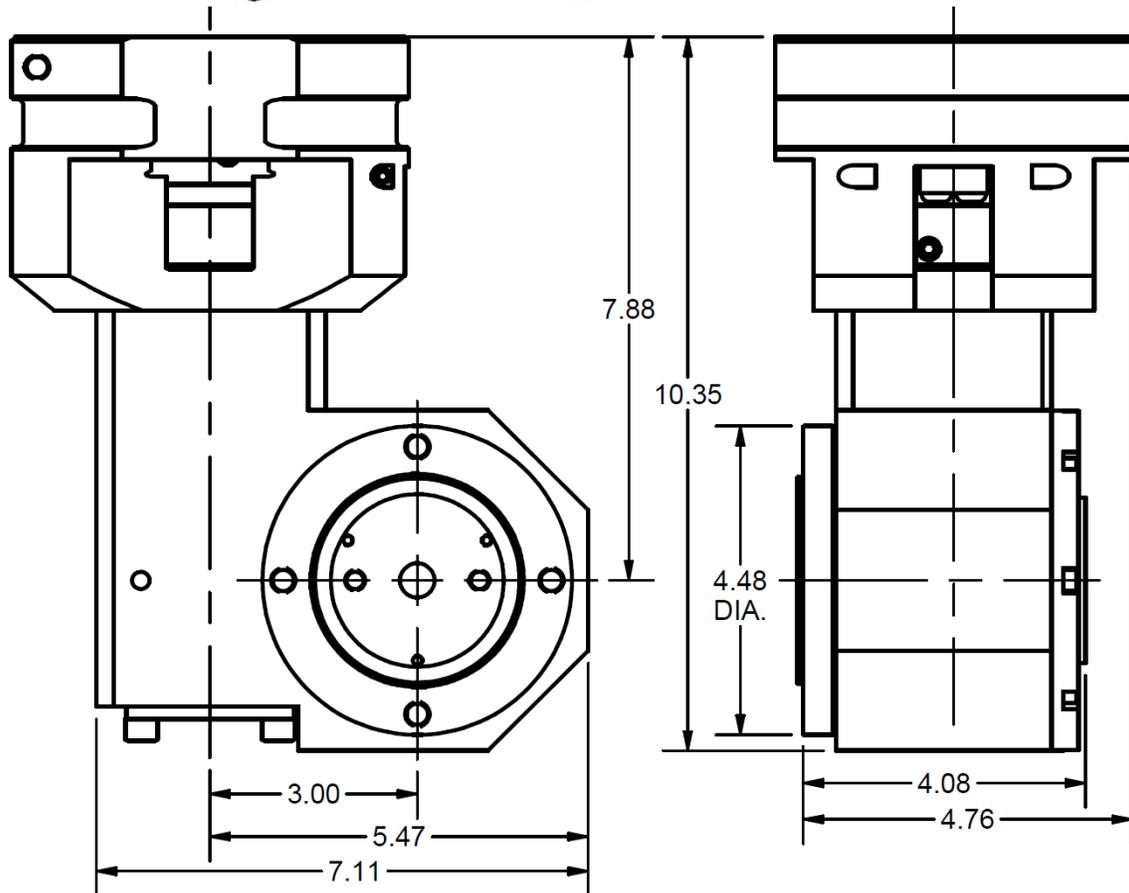


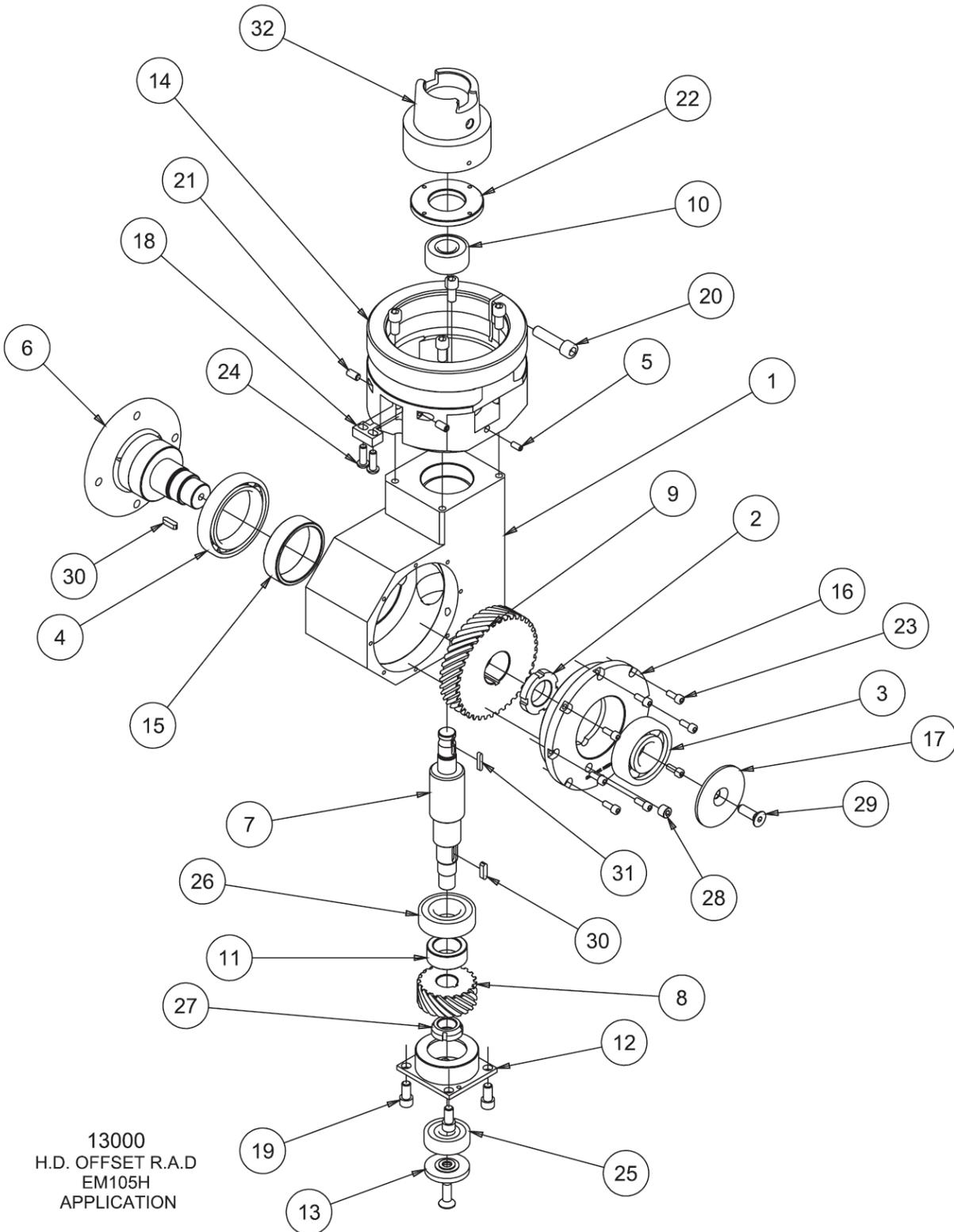
13004  
SPECIAL RIGHT ANGLE DRIVE ASSEMBLY  
NARROW 1.9" - 2.4" DIA.  
EM105H



13004 SPECIAL R.A.D.ASSEMBLY, NARROW 1.9-2.4" DIA - EM105H			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	650-2-19X	UPPER HOUSING, RIGHT ANGLE DRIVE, NARROW
2	1	650-2-19Y	LOWER HOUSING
3	4	650-4-18	LOW HEAD CAP SCREW, 1/4-20 X 5/8
4	1	650-2-19J	SHAFT, HORIZONTAL
5	1	650-2-19R	RING GEAR
6	1	650-2-19H	CUTTER HEAD CAP
7	1	502-2-85B	INDEX SCREW
8	1	650-2-6A	SOCKET SET SCREW, BRASS TIPPED, #4-40
9	1	650-2-19L	BEARING
10	1	650-2-19S	COVER, REAR, END CAP
11	1	650-2-19W	KEY
12	1	502-9-32	BALL BEARING
13	2	6007A	BELLVILLE SPRING
14	1	6772A	NUT, BEARING, LINE BORE HEAD
15	1	100-82-2A	SOCKET SET SCREW, BRASS TIPPED, #10-24
16	1	13004A	VERTICAL SHAFT ASSEMBLY, BELT DRIVE R.A.D. – EM105H
17	1	MF-233	COUNTERSUNK HEX-HEAD PLUG, 1/8
18	1	100-1B	TOOL LOCK SPRING
19	1	501-70G	SCREW, TOOL HOLDER LOCK ASSEMBLY
20	2	MF-197	3/16 X 5/8 DOWEL PIN
21	4	MF-22	S.H.C.S. 5/16-18 X 3/4"
22	1	13001A	HUB, MOUNTING, 90 DEGREE BORING HEAD – EM105H
23	1	6750K	KEY, LOCATION 90 DEGREE HEAD
24	2	MF-59	SOCKET SET SCREW, FLAT POINT, 1/4-20 UNC X 3/8"
25	1	MF-32	S.H.C.S. 3/8-16 UNC X 1 1/4"
26	1	6753V	KEY (MICARTA), PINION – 90 DEGREE HEAD
27	1	6753E	BALL BEARING
28	2	MF-3A	S.H.C.S. #8-32 X 7/8"
29	2	MF-92	SOCKET BUTTON HEAD SCREW, 1/4-20 X 3/4"
30	1	MF-82	SOCKET FLAT HEAD SCREW, 1/4-20 X 1/2"
31	1	10114A	ADAPTER, DRIVE, R.A.D.
32	1	10114G	SOCKET SHOULDER SCREW, 1/4" X 1"

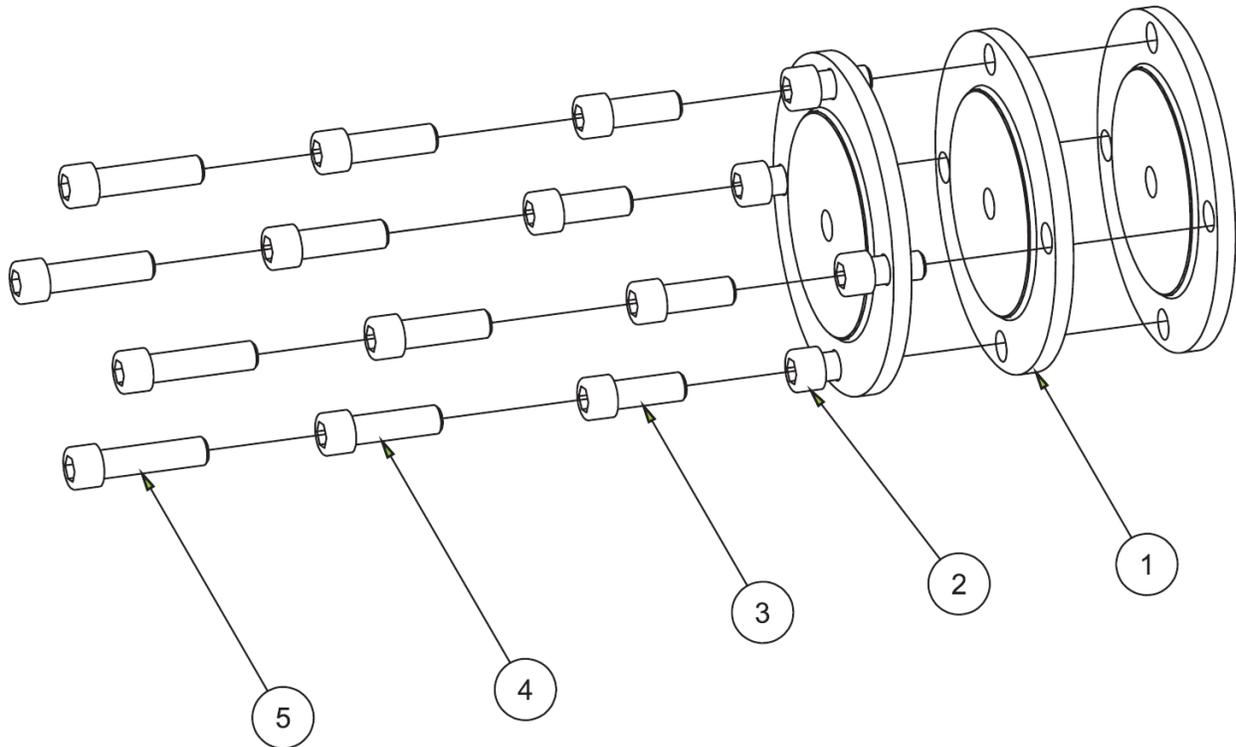
### 13000 Heavy Duty Offset Right Angle Drive







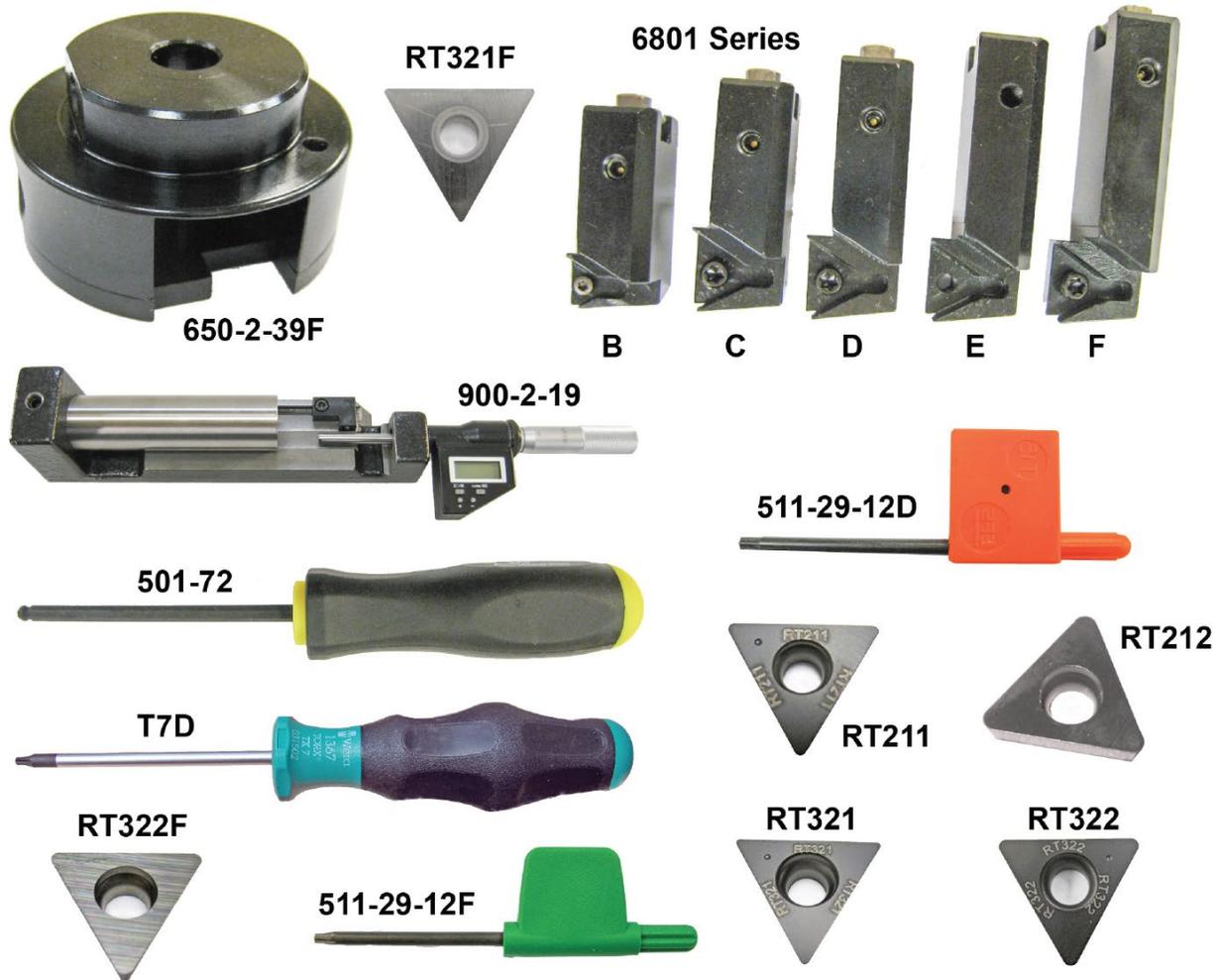
13000 H.D. OFFSET R.A.D. - EM105H			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	6773G	HOUSING, GEAR, HEAVY DUTY LINE BORE HEAD
2	1	6777B	BEARING NUT
3	1	6778F	BEARING
4	1	6778E	BEARING
5	1	100-82-2A	SOCKET SET SCREW, BRASS TIPPED, #10-24 X 1/2"
6	1	6766X	HORIZONTAL SHAFT, H.D. LINE BORE HEAD
7	1	13000B	SHAFT, VERTICAL H.D. OFFSET LINE BORE HEAD – EM105H
8	1	6778	DRIVE GEAR, HEAVY DUTY LINE BORE HEAD
9	1	6778B	DRIVE GEAR, HEAVY DUTY LINE BORE HEAD
10	1	502-9-32	BEARING, BALL
11	1	6775F	SPACER, BEARING VERTICAL
12	1	6774F	BEARING RETAINER, VERTICAL H.D. LINE BORE HEAD
13	1	6777A	CAP, END VERTICAL SHAFT
14	1	13000A	HUB, MOUNTING H.D. LINE BORE HEAD
15	1	6775D	SPACER, BEARING, HORIZONTAL
16	1	6774G	BEARING RETAINER – HORIZONTAL H.D. LINE BORE HEAD
17	1	6775E	CAP, END HORIZONTAL SHAFT
18	1	6750K	KEY, LOCATION 90 DEGREE HEAD
19	8	MF-21	S.H.C.S. 5/16-18 X 5/8"
20	1	MF-32	S.H.C.S. 3/8-16 X 1 1/4"
21	2	MF-59	SOCKET SET SCREW, FLAT POINT, 1/4-20 X 3/8"
22	1	6772A	NUT, BEARING LINE BORE HEAD
23	8	MF-5A	S.H.C.S. #10-24 X 1/2"
24	2	MF-92	SOCKET BUTTON HEAD SCREW, 1/4-20 X 3/4"
25	1	6778C	BEARING
26	1	6778D	BEARING
27	1	6777C	LOCK NUT
28	1	MF-233	COUNTERSUNK HEX-HEAD PLUG 1/8"
34	4	MF-21	S.H.C.S. 5/16-18 X 5/8"
29	2	MF-77B	SOCKET FLAT HEAD SCREW, 5/16-18 X 1"
30	2	7088A	KEY, PULLEY
31	1	6753V	KEY (MICARTA), PINION – 90 DEGREE HEAD
32	1	10114A	ADAPTER, DRIVE, R.A.D.



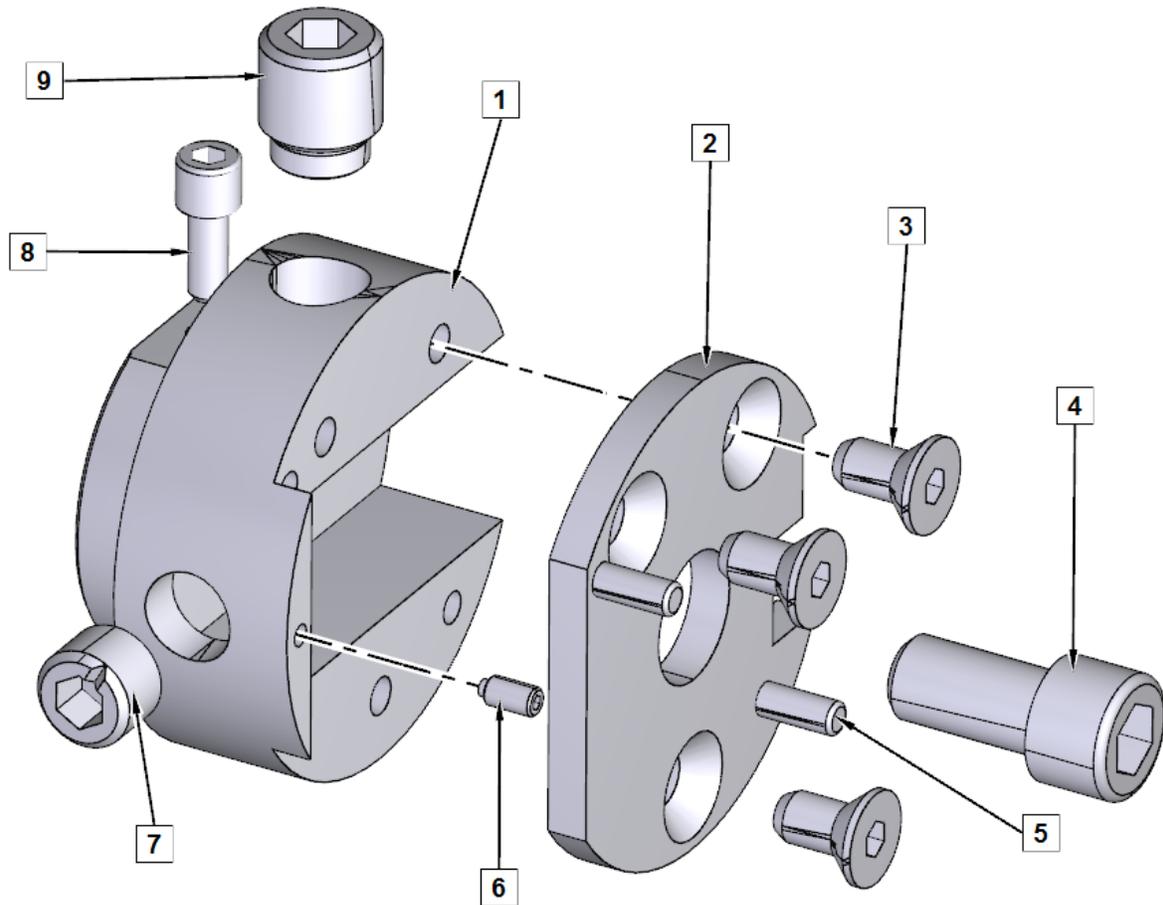
13000 R.A.D. CUTTERHEAD SPACERS AND SCREWS			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	3	6519W	1/4" SPACER, HEAVY DUTY LINE BORE HEAD
2	4	MF-30	S.H.C.S. 3/8-16 X 3/4"
3	4	MF-31	S.H.C.S. 3/8-16 X 1"
4	4	MF-32	S.H.C.S. 3/8-16 X 1 1/4"
5	4	MF-33	S.H.C.S. 3/8-16 X 1 1/2"

### Right Angle Drive Accessories

#### 650-2-39B Line Boring Cutterhead Kit, 1.94-4.11" (49.28-104.39mm) Dia



		Tool Diameter Range					
Cutterhead Diameter	Centerline Offset		6801B	6801C	6801D	6801E	6801F
1.9"	-0.650"	Min	1.94"	2.31"	2.70"	3.11"	3.51"
		Max	2.54"	2.91"	3.30"	3.71"	4.11"

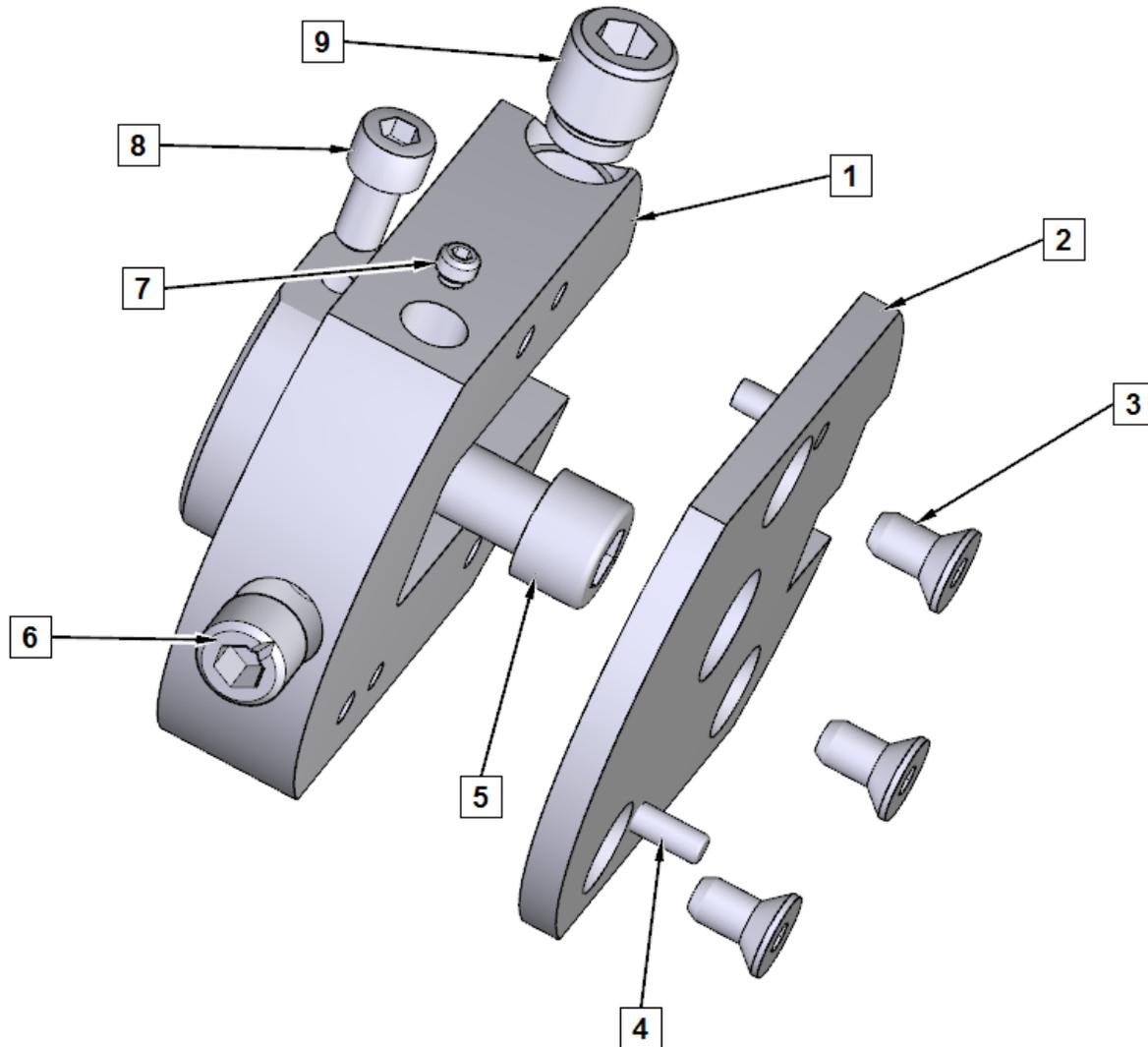


650-2-39F CUTTERHEAD PARTS			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	650-2-40A	BODY, 1.9" PRECISION LINE BORE CUTTERHEAD
2	1	650-2-41	CAP, 1.9" DIAMETER PRECISION LINE BORE HEAD
3	3	MF-78	SOCKET FLAT HEAD SCREW #10-24 X 3/8"
4	1	MF-21	SOCKET HEAD CAP SCREW 5/16-18 X 5/8"
5	2	MF-193C	DOWEL PIN, 1/8" X 3/8"
6	1	650-2-6A	SOCKET SET SCREW, BRASS TIPPED, #4-40 X 3/16"
7	1	502-2-85B	SOCKET SET SCREW, INDEX, 3/8-40 FINE THREAD
8	1	MF-4	SOCKET HEAD CAP SCREW #10-24 X 3/8"
9	1	501-70A	SCREW, TOOL HOLDER LOCK ASSY

**650-2-39C Line Boring Cutterhead Kit, 2.82-5.52" (71.63-140.21mm) Dia**



		Tool Diameter Range							
Cutterhead Diameter	Centerline Offset		6801C	6801D	6801E	6801F	6801G	6801H	6801J
2.82"	-0.500"	Min	2.82"	2.99"	3.40"	3.80"	4.20"	4.63"	4.92"
		Max	3.20"	3.59"	4.00"	4.40"	4.80"	5.23"	5.52"



650-2-39G CUTTERHEAD PARTS			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	650-2-16E	BODY, 2.9" PRECISION LINE BORE CUTTERHEAD
2	1	650-2-17A	CAP, 2.9" DIAMETER PRECISION LINE BORE HEAD
3	3	MF-78	SOCKET FLAT HEAD SCREW #10-24 X 3/8"
4	2	MF-193C	DOWEL PIN, 1/8" X 3/8"
5	1	MF-21	SOCKET HEAD CAP SCREW 5/16-18 X 5/8"
6	1	502-2-85B	SOCKET SET SCREW, INDEX, 3/8-40 FINE THREAD
7	1	502-12-4D	SOCKET SET SCREW, BRASS TIPPED, #8-32 X 1/8"
8	1	MF-4	SOCKET HEAD CAP SCREW #10-24 X 3/8"
9	1	501-70A	SCREW, TOOL HOLDER LOCK ASSY

**650-2-39A Line Boring Cutterhead Kit, 5.4-8.1" (137-206mm) Dia**



**650-2-39E**



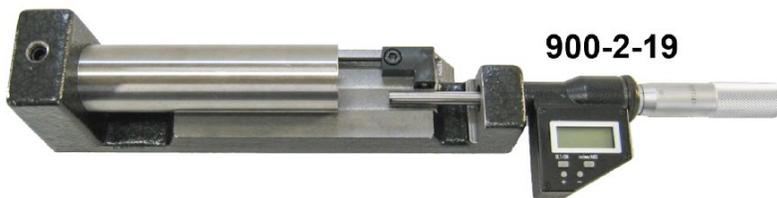
**501-72J**



**501-72**



**T8D**



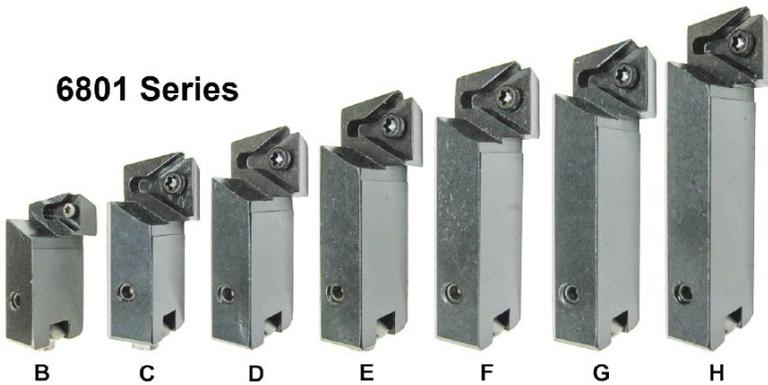
**900-2-19**



**511-29-12F**



**511-29-12D**



**6801 Series**

**B**

**C**

**D**

**E**

**F**

**G**

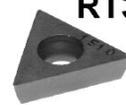
**H**



**RT211**



**RT212**



**RT321**



**RT322**

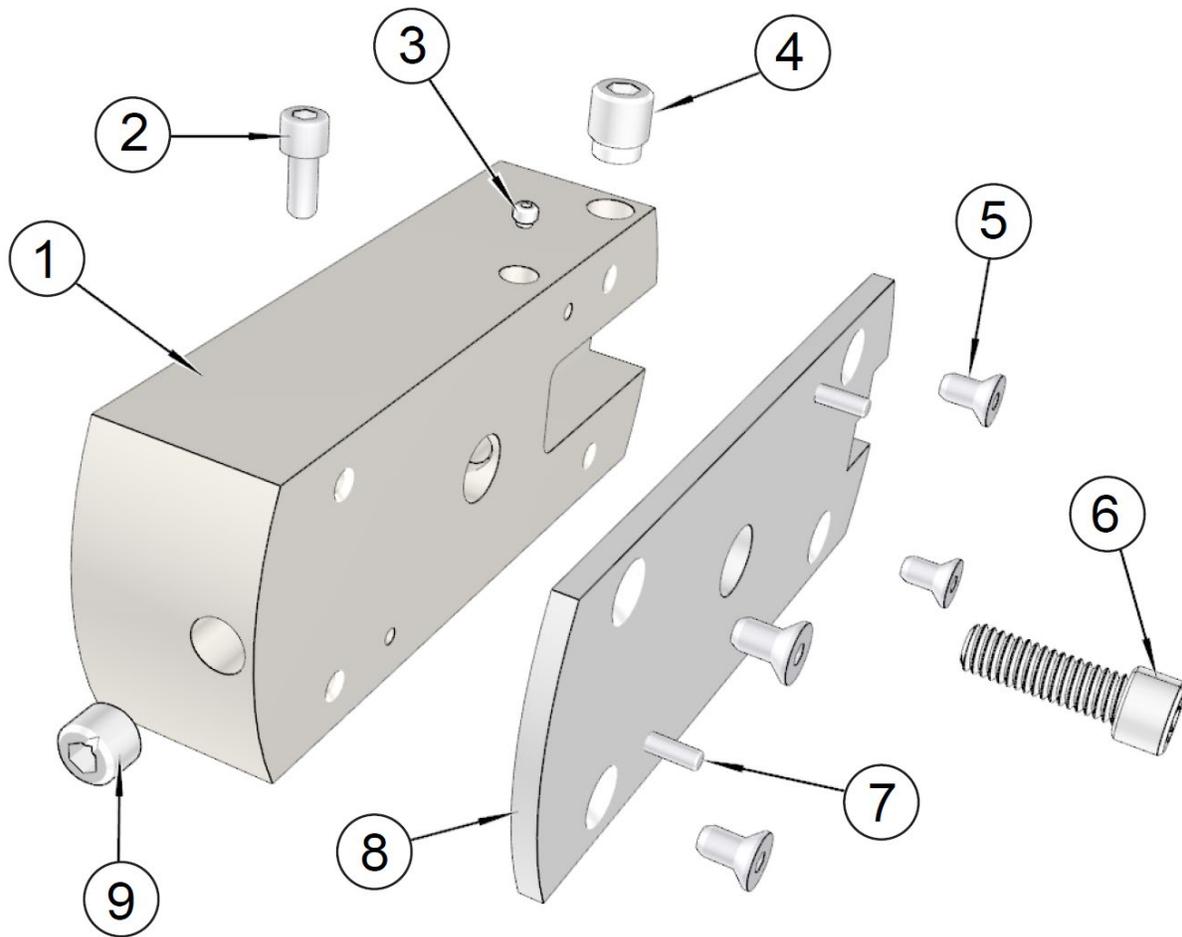


**RT321F**



**RT322F**

		Tool Diameter Range							
Cutterhead Diameter	Centerline Offset		6801B	6801C	6801D	6801E	6801F	6801G	6801H
5.4"	0.960"	Min	5.4"	5.46"	5.85"	6.26"	6.66"	7.06"	7.49"
		Max	5.69"	6.06"	6.45"	6.86"	7.26"	7.66"	8.09"

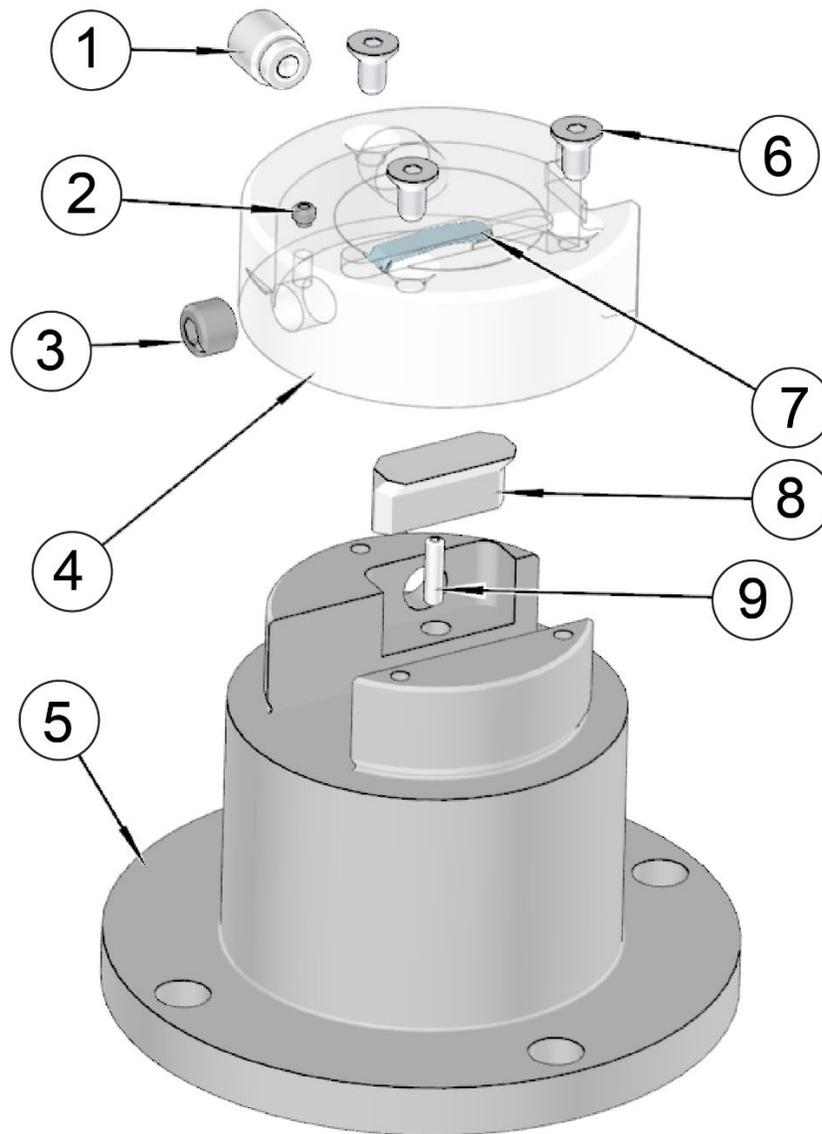


650-2-39E CUTTERHEAD PARTS			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	650-2-16C	BODY, 5.4" PRECISION LINE BORE CUTTERHEAD
2	1	MF-4	SOCKET HEAD CAP SCREW #10-24 X 3/8"
3	1	502-12-4D	SOCKET SET SCREW, BRASS TIPPED, #8-32 X 1/8"
4	1	501-70A	SCREW, TOOL HOLDER LOCK ASSY
5	3	MF-78	SOCKET FLAT HEAD SCREW #10-24 X 3/8"
6	1	MF-23	SOCKET HEAD CAP SCREW 5/16-18 X 1"
7	2	MF-193C	DOWEL PIN, 1/8" X 3/8"
8	1	650-2-17B	CAP, 5.4" DIAMETER PRECISION LINE BORE HEAD
9	1	502-2-85B	SOCKET SET SCREW, INDEX, 3/8-40 FINE THREAD

**6519V Heavy Duty Line Bore Cutterhead Kit, 5.74-9.84" (145.8-249.9mm) Dia x 3" (76mm)**



Tool Diameter Range					
Cutterhead Diameter	Centerline Offset		6520E	6520F	6520G
		2.88"	-1.080"	Min	5.74"
		Max	8.34"	8.84"	9.84"

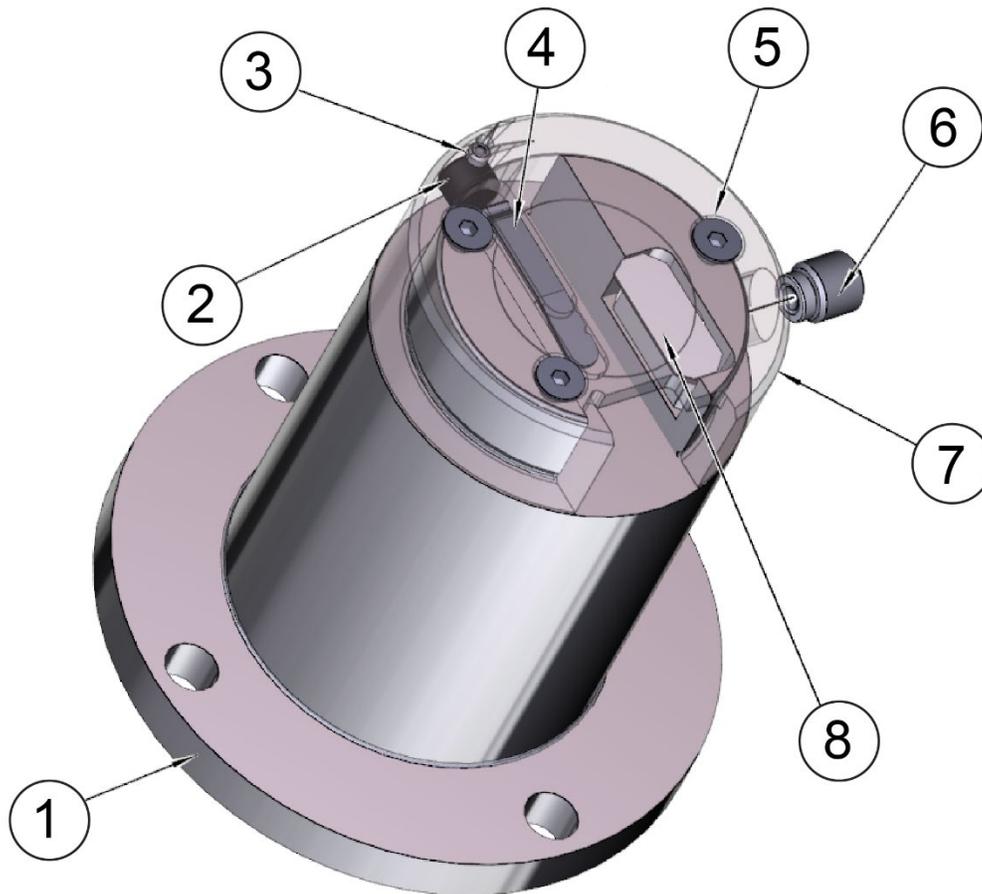


650-2-39E CUTTERHEAD PARTS			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	501-70A	SCREW, TOOL HOLDER LOCK ASSY
2	1	502-12-4D	SOCKET SET SCREW, BRASS TIPPED, #8-32 X 1/8"
3	1	502-2-85B	SCREW, SET, INDEX 3/8-40 UNF
4	1	650-2-17	CAP, 2.9" STUB BAR
5	3	6519T	CUTTERHEAD BODY
6	1	MF-78	SOCKET FLAT HEAD SCREW #10-24 X 3/8"
7	2	100-1A	SPRING, TOOL LOCK 1 13/32"
8	1	6263A	SHOE, CLAMP – TOOL HOLDER PRODUCTION STUB BAR
9	1	MF-217	ROLL PIN, 1/8 X 1/2"

**6519P Heavy Duty Line Bore Cutterhead Kit, 5.74-9.84" (145.8-249.9mm) Dia x 4.25" (108mm)**

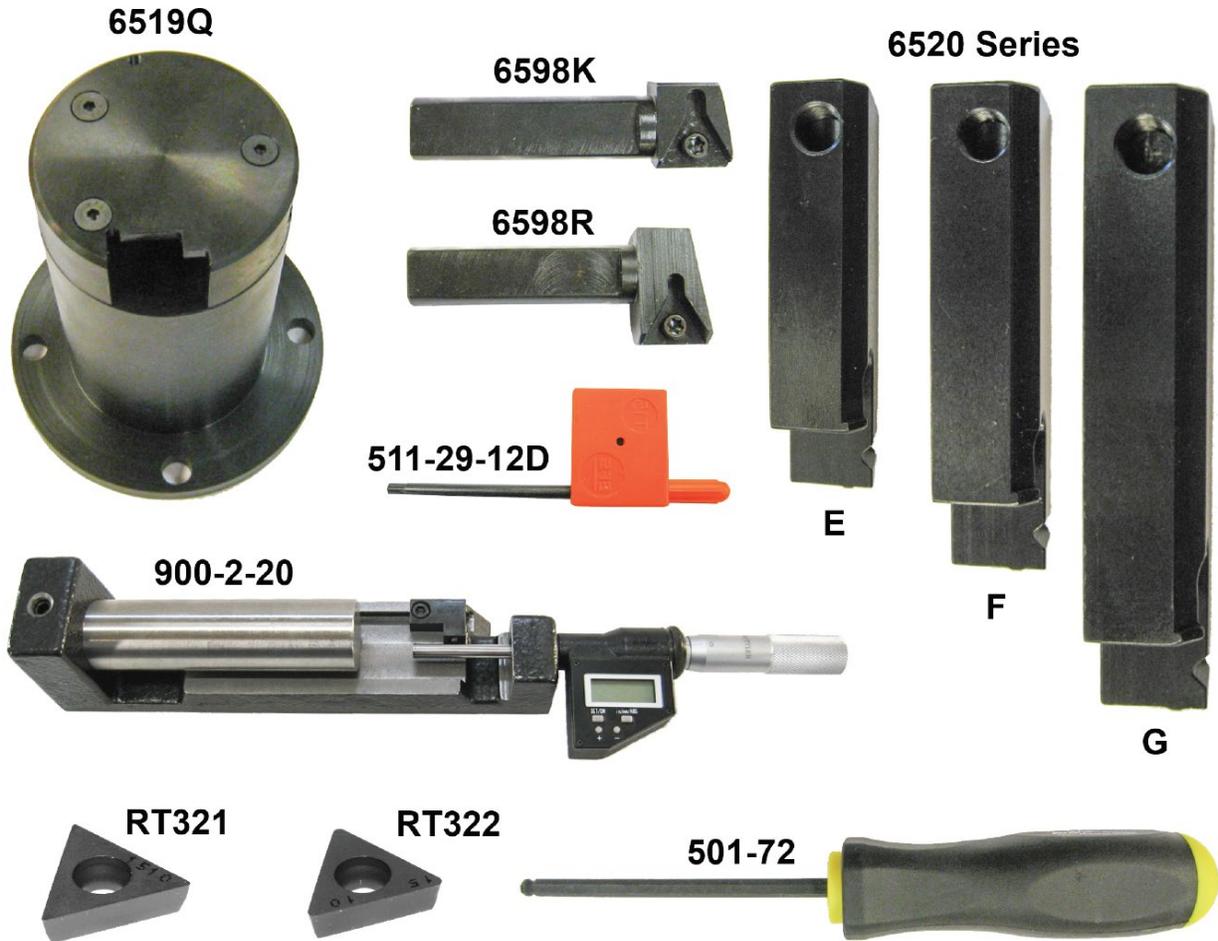


Tool Diameter Range					
Cutterhead Diameter	Centerline Offset		6520E	6520F	6520G
2.88"	-1.080"	Min	5.74"	6.24"	7.24"
		Max	8.34"	8.84"	9.84"

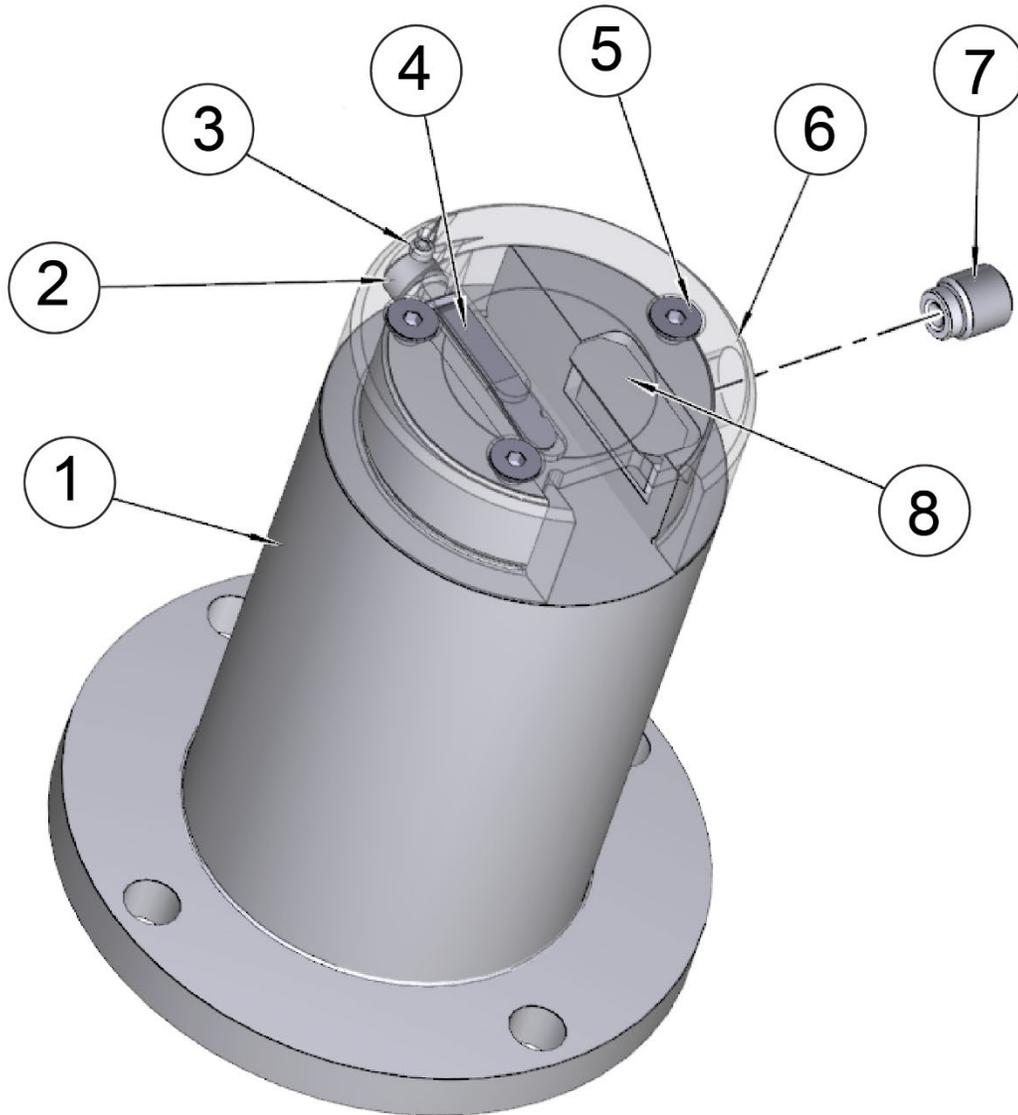


6519S CUTTERHEAD PARTS			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	6519T	CUTTERHEAD BODY
2	1	502-2-85B	SCREW, SET, INDEX $\frac{3}{8}$ -40 UNF
3	1	502-12-4D	SOCKET SET SCREW, BRASS TIPPED, #8-32 X $\frac{1}{8}$ "
4	1	100-1A	SPRING, TOOL LOCK 1 $\frac{13}{32}$ "
5	3	MF-78	SOCKET FLAT HEAD SCREW #10-24 X $\frac{3}{8}$ "
6	1	501-70A	SCREW, TOOL HOLDER LOCK ASSY
7	1	650-2-17	CAP, 2.9" STUB BAR
8	1	6263A	SHOE, CLAMP – TOOL HOLDER PRODUCTION STUB BAR

**6519M Heavy Duty Line Bore Cutterhead Kit, 5.74-9.84" (145.8-249.9mm) Dia x 5.1" (130mm)**

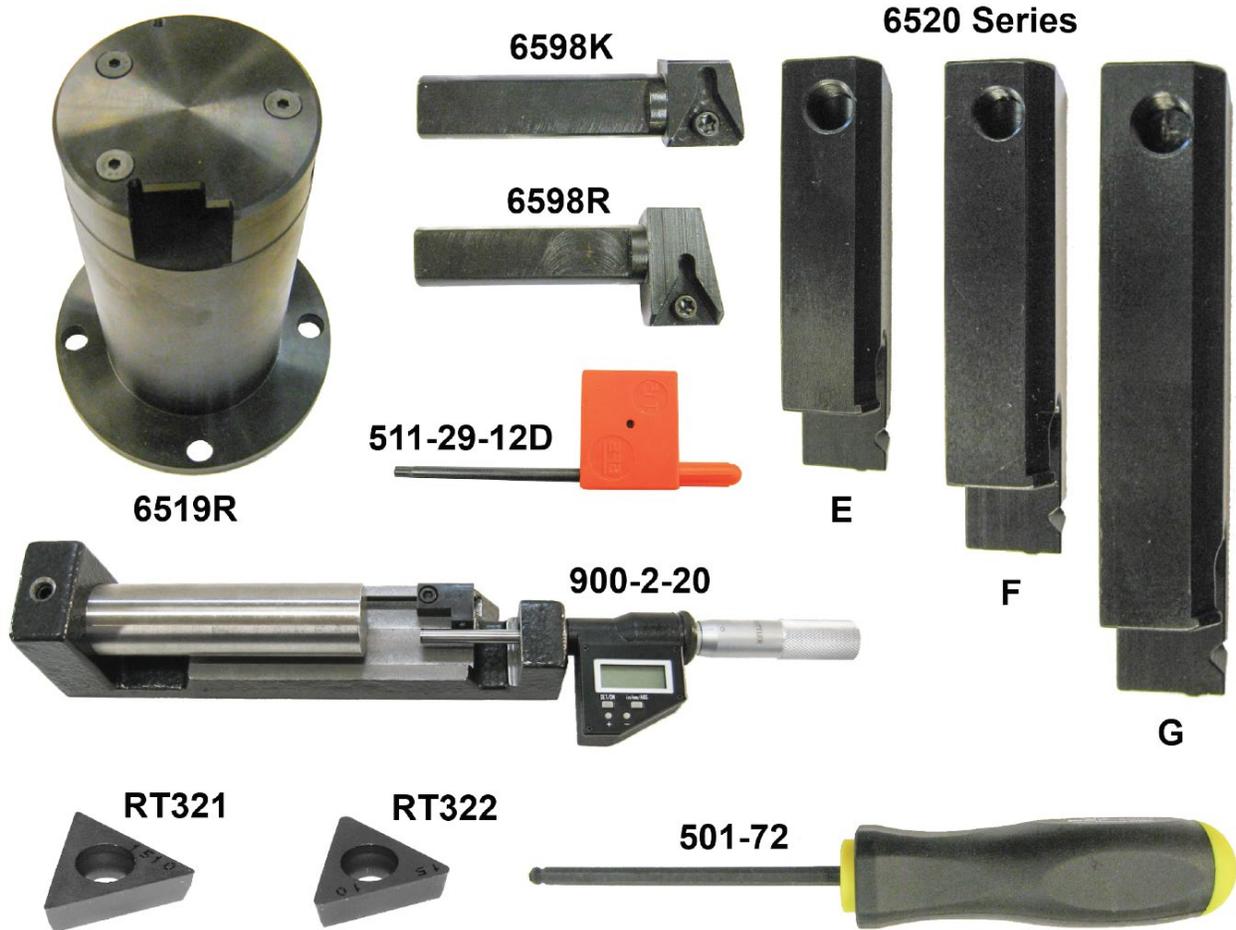


Tool Diameter Range					
Cutterhead Diameter	Centerline Offset		6520E	6520F	6520G
2.88"	-1.080"	Min	5.74"	6.24"	7.24"
		Max	8.34"	8.84"	9.84"

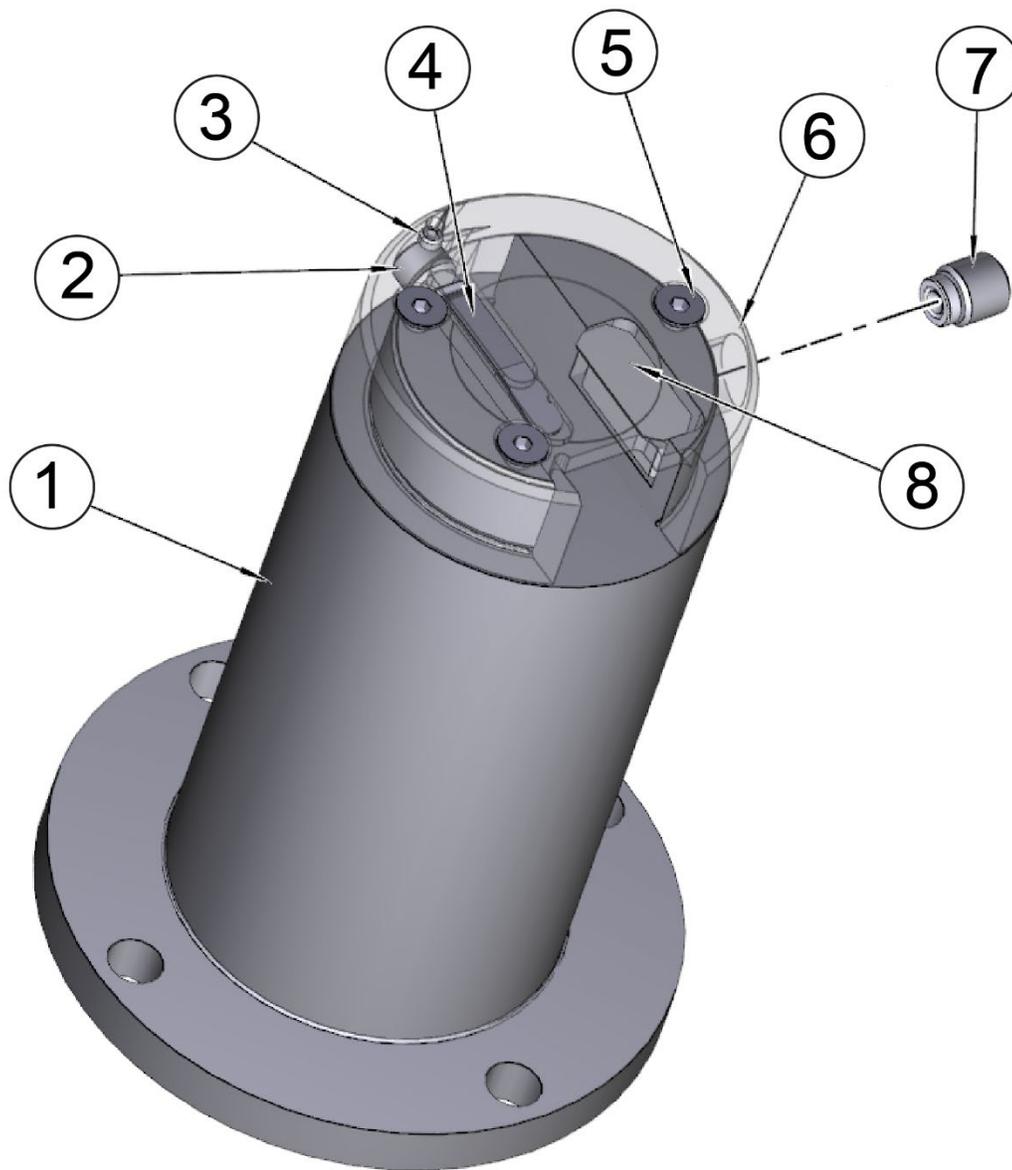


6519Q CUTTERHEAD PARTS			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	6519J	CUTTERHEAD BODY
2	1	502-2-85B	SCREW, SET, INDEX $\frac{3}{8}$ -40 UNF
3	1	502-12-4D	SOCKET SET SCREW, BRASS TIPPED, #8-32 X $\frac{1}{8}$ "
4	2	100-1A	SPRING, TOOL LOCK 1 $\frac{13}{32}$ "
5	3	MF-78	SOCKET FLAT HEAD SCREW #10-24 X $\frac{3}{8}$ "
6	1	650-2-17	CAP, 2.9" STUB BAR
7	1	501-70C	SCREW, TOOL HOLDER LOCK
8	1	6263A	SHOE, CLAMP – TOOL HOLDER PRODUCTION STUB BAR

**6519N Heavy Duty Line Bore Cutterhead Kit, 5.74-9.84" (145.8-249.9mm) Dia x 6" (152mm)**

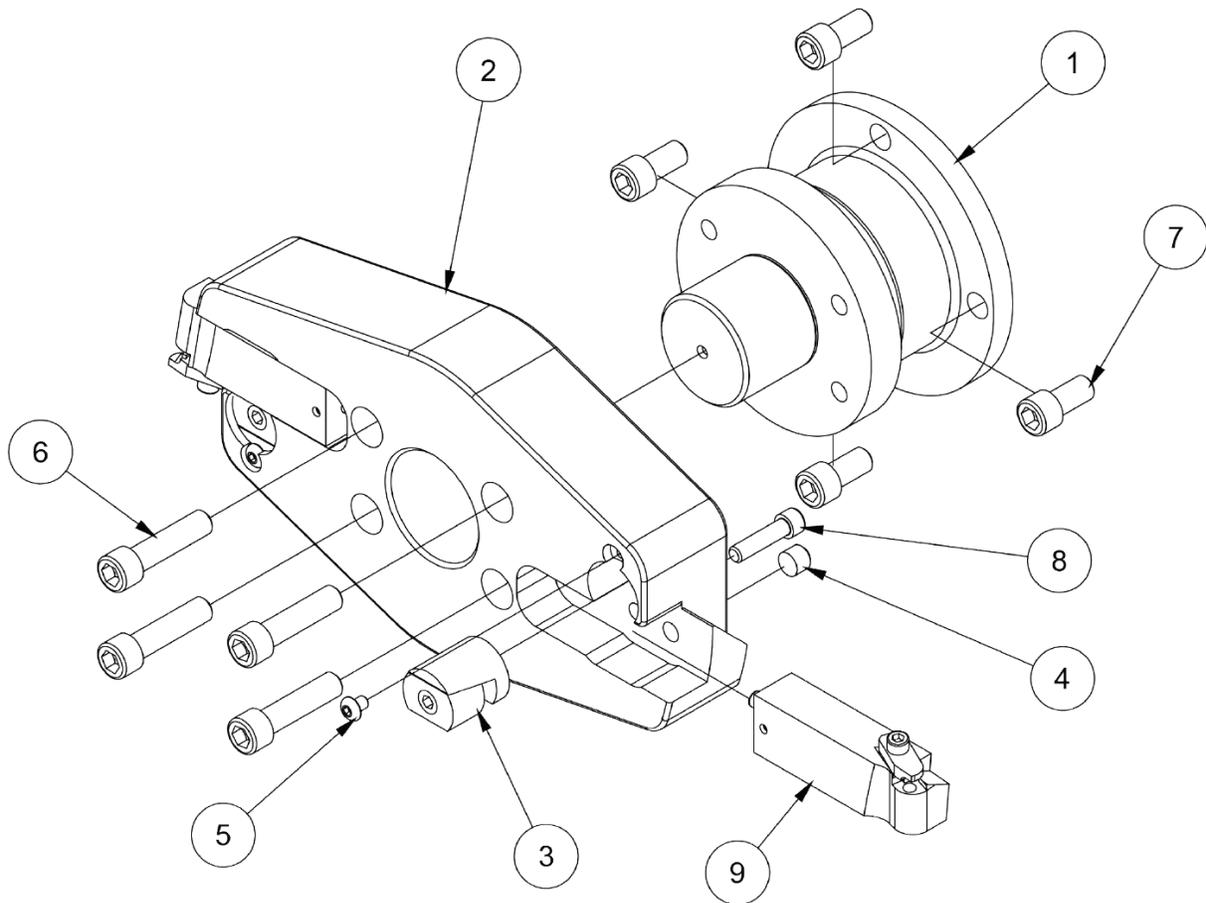


Tool Diameter Range					
Cutterhead Diameter	Centerline Offset		6520E	6520F	6520G
2.88"	-1.080"	Min	5.74"	6.24"	7.24"
		Max	8.34"	8.84"	9.84"



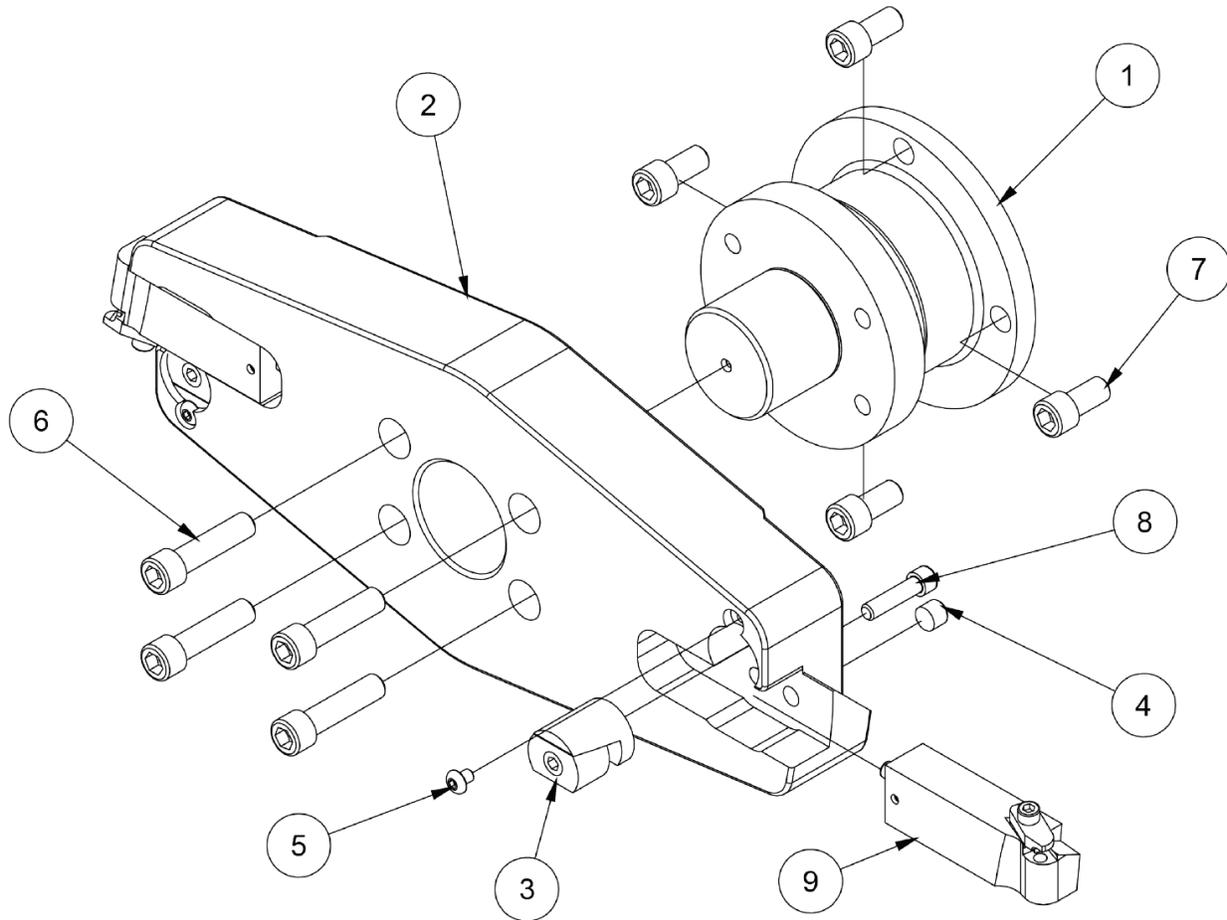
6519R CUTTERHEAD PARTS			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	6519K	CUTTERHEAD BODY
2	1	502-2-85B	SCREW, SET, INDEX $\frac{3}{8}$ -40 UNF
3	1	502-12-4D	SOCKET SET SCREW, BRASS TIPPED, #8-32 X $\frac{1}{8}$ "
4	2	100-1A	SPRING, TOOL LOCK 1 $\frac{13}{32}$ "
5	3	MF-78	SOCKET FLAT HEAD SCREW #10-24 X $\frac{3}{8}$ "
6	1	650-2-17	CAP, 2.9" STUB BAR
7	1	501-70C	SCREW, TOOL HOLDER LOCK
8	1	6263A	SHOE, CLAMP – TOOL HOLDER PRODUCTION STUB BAR

## 6779L Flycutter Kit for Right Angle Drive, 10" (254mm) Dia

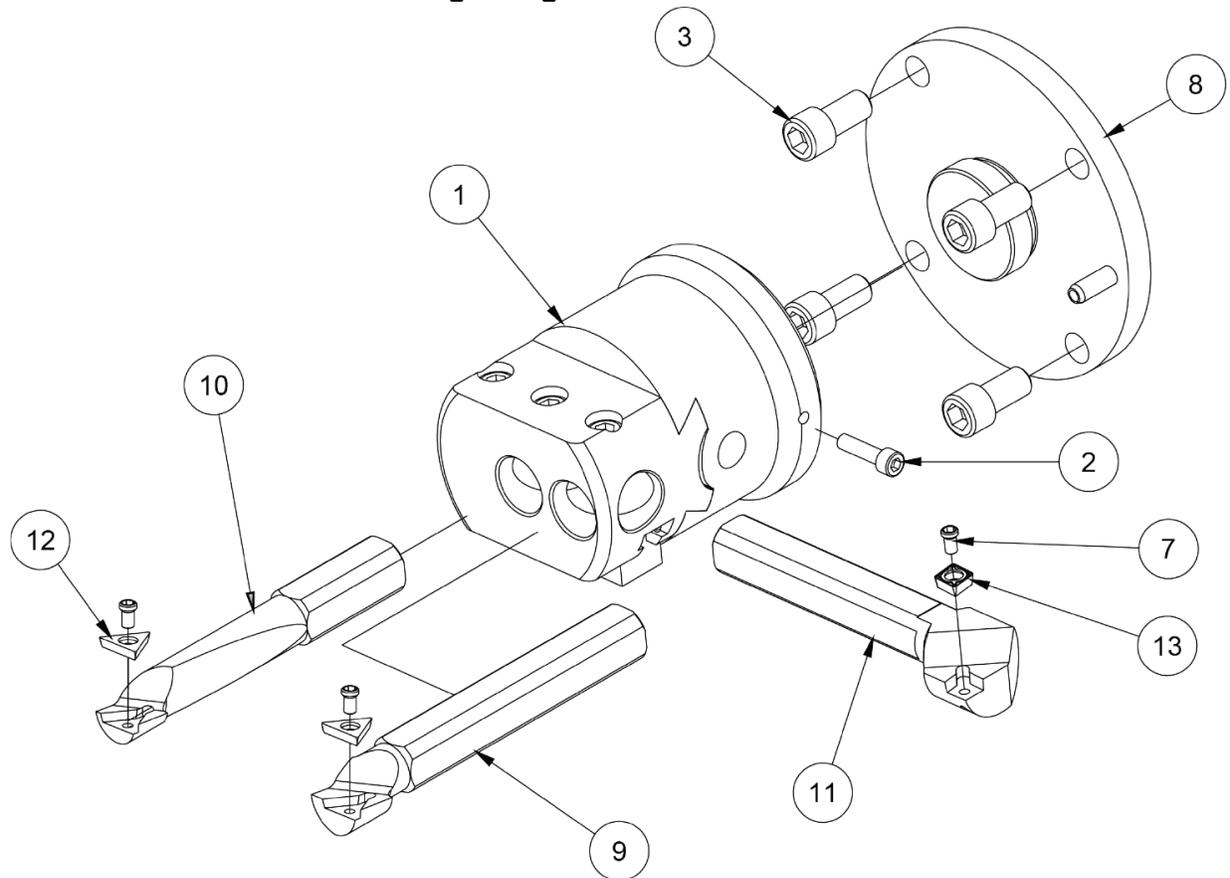


6779L CUTTERHEAD PARTS			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	6779G	ADAPTER, 7 3/4" CUTTERHEAD TO H.D. R.A.D.
2	1	7206L	CUTTERHEAD, SURFACING 10"
3	2	7206K	L-LOCK ASSEMBLY
4	2	7202C	SOCKET SET SCREW, OVAL POINT, #10-24 X 3/8"
5	2	MF-87	SOCKET BUTTON HEAD SCREW, #10-24 X 1/4"
6	4	MF-33	S.H.C.S. 3/8-16 X 1 1/2"
7	4	MF-30	S.H.C.S. 3/8-16 X 3/4"
8	2	MF-15	S.H.C.S. 1/4-20 X 1"
9	2	7202W	TOOL HOLDER ASSMEBLY, FLY CUTTER

## 6779M Flycutter Kit for Right Angle Drive, 14" (356mm) Dia

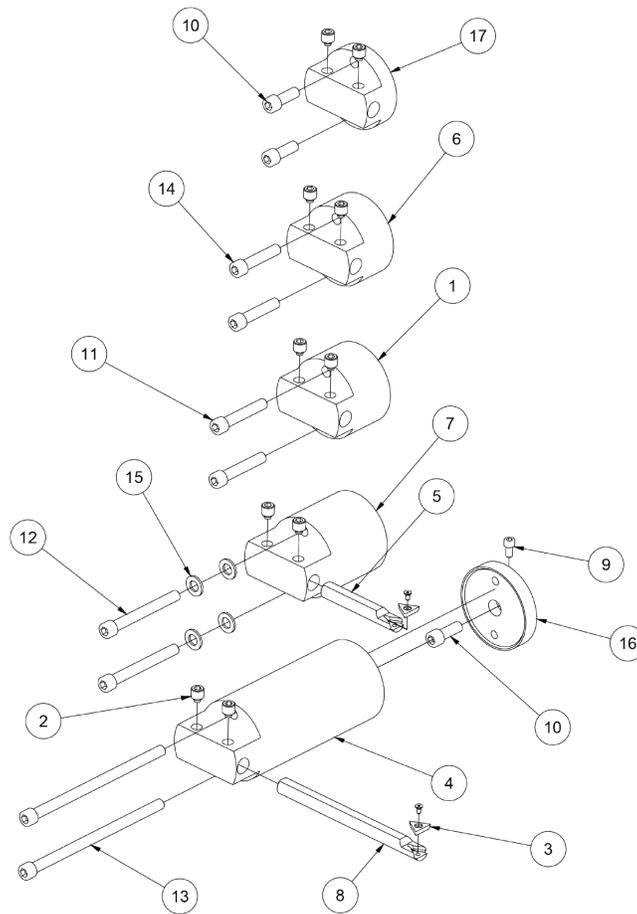


6779M CUTTERHEAD PARTS			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	6779G	ADAPTER, 7 3/4" CUTTERHEAD TO H.D. R.A.D.
2	1	7206G	CUTTERHEAD, SURFACING 14"
3	2	7206K	L-LOCK ASSEMBLY
4	2	7202C	SOCKET SET SCREW, OVAL POINT, #10-24 X 3/8"
5	2	MF-87	SOCKET BUTTON HEAD SCREW, #10-24 X 1/4"
6	4	MF-33	S.H.C.S. 3/8-16 X 1 1/2"
7	4	MF-30	S.H.C.S. 3/8-16 X 3/4"
8	2	MF-15	S.H.C.S. 1/4-20 X 1"
9	2	7202W	TOOL HOLDER ASSMEBLY, FLY CUTTER

**6779N Crossfeed Head Kit for Right Angle Drive**

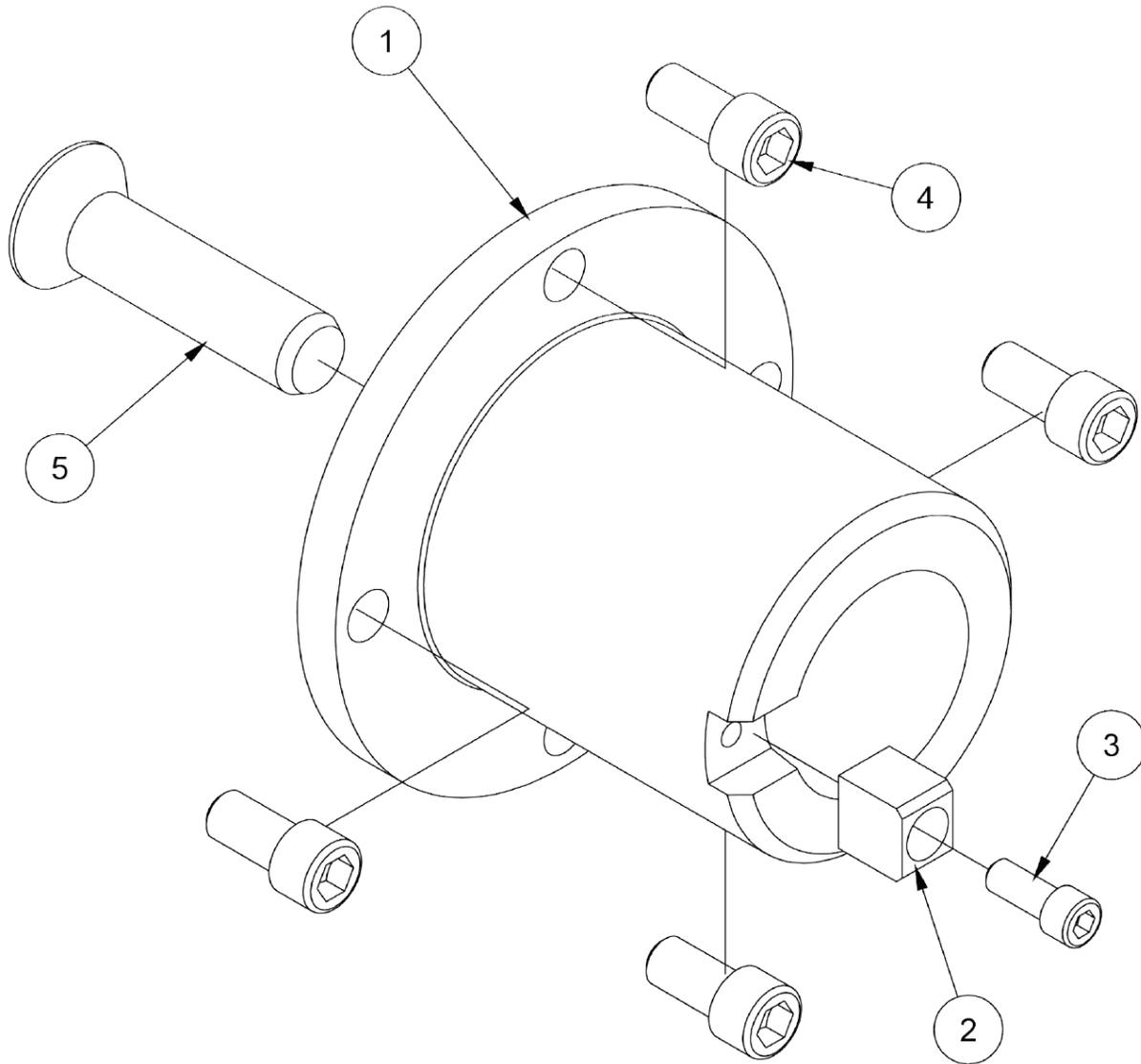
6779N CUTTERHEAD PARTS			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	6565X	HEAD, CROSSFEED, CRITERION
2	1	MF-10	S.H.C.S. #10-32 X 3/4"
3	4	MF-30	S.H.C.S. 3/8-16 X 3/4"
7	3	CLAMP SCREW	SUPPLIED WITH BORING BARS
8	1	6779P	ADAPTER ASSEMBLY, CROSSFEED HEAD TO HD OFFSET R.A.D.
9	1	650-2-34P	BORING BAR, 1" PRECISION BORING HEAD ASS'Y
10	1	650-2-34Q	BORING BAR, 3/4" PRECISION BORING HEAD ASS'Y
11	1	350-2-34U	FACING BAR – PRECISION BORING HEAD ASS'Y
12	2	350-2-34R	INSERT, TRIANGULAR POS. RAKE 3/8" I.C.
13	1	650-2-34V	INSERT, DIAMOND SHAPE 1/32" R.

### 6855C Thrust Facing Tooling Package



6779M CUTTERHEAD PARTS			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	6855A	HEAD, THRUST FACING (2.18" LONG) LINE BORE
2	10	502-30-10L	BRASS TIPPED SET SCREW
3	2	RT321	INSERT, TRIANGULAR POS. RAKE $\frac{3}{8}$ " I.C.
4	1	6855B	HEAD, THRUST FACING (6.25" LONG) LINE BORE
5	1	6855D	TRIANGLE INSERT CARTRIDGE – MAIN LINE THRUST FACING
6	1	6855E	HEAD, THRUST FACING (1.88" LONG) LINE BORE
7	1	6855F	HEAD, THRUST FACING (3.40" LONG) LINE BORE
8	1	6757R	TRIANGLE INSERT CARTRIDGE – MAIN LINE THRUST FACING
9	1	MF-4	S.H.C.S. #10-24 X $\frac{3}{8}$ "
10	3	MF-21C	S.H.C.S. 5/16-18 X $\frac{7}{8}$ "
11	2	MF-26	S.H.C.S. 5/16-18 X $1\frac{3}{4}$ "
12	2	MF-28	S.H.C.S. 5/16-18 X $2\frac{3}{4}$ "
13	2	MF-28D	S.H.C.S. 5/16-18 X $5\frac{1}{2}$ "
14	2	MF-25	S.H.C.S. 5/16-18 X $1\frac{1}{2}$ "
15	4	MF-177	5/16 SAE FLAT WASHER
16	1	6855	MOUNTING PLATE – THRUST FACING HEAD
17	1	6855J	HEAD, THRUST FACING (1.25" LONG) LINE BORE

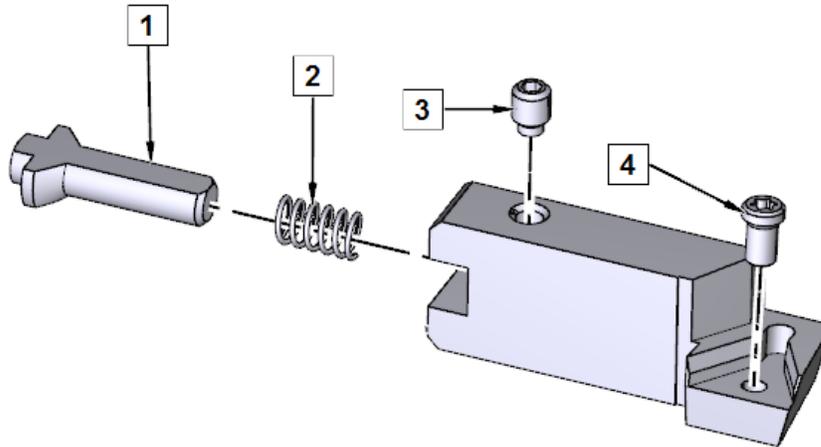
### 6779H CAT 40 Adapter Kit for Right Angle Drive



6779N CUTTERHEAD PARTS			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	6779J	CAT 40 ADAPTER – H.D. OFFSET R.A.D.
2	1	6170H	DRIVE KEY
3	1	MF-13	S.H.C.S. $\frac{1}{4}$ -20 X $\frac{5}{8}$ "
4	4	MF-30	S.H.C.S. $\frac{3}{8}$ -16 X $\frac{3}{4}$ "
5	1	502-1-86D	SOCKET FLAT HEAD SCREW, $\frac{5}{8}$ -11 X 2 $\frac{1}{2}$ "

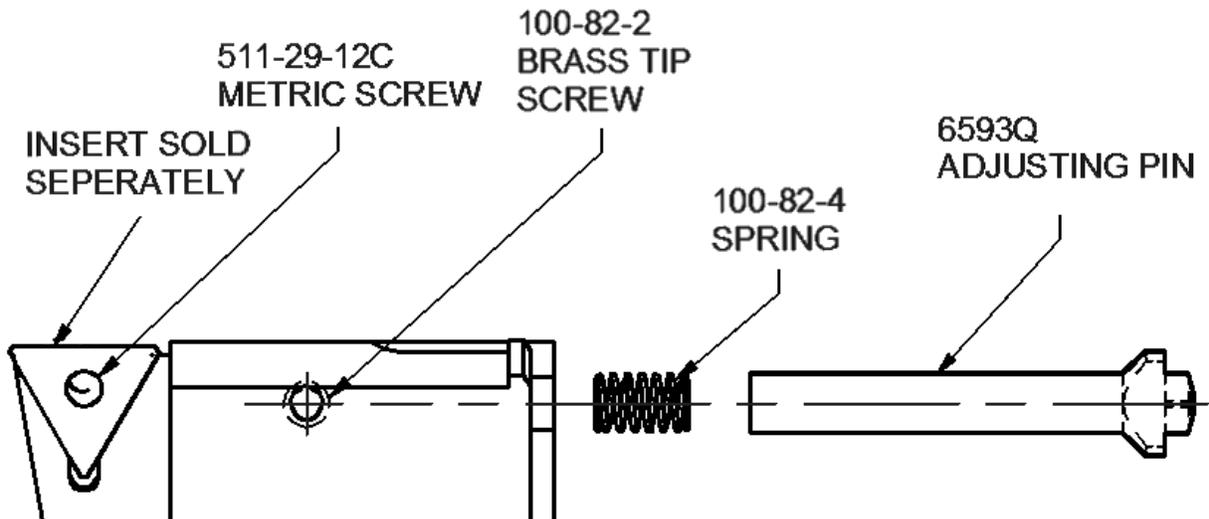
## Insert Holders

### 6801 Series Insert Holders

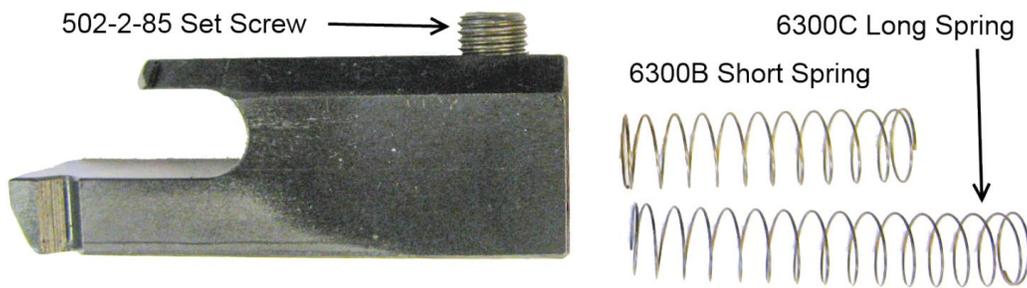
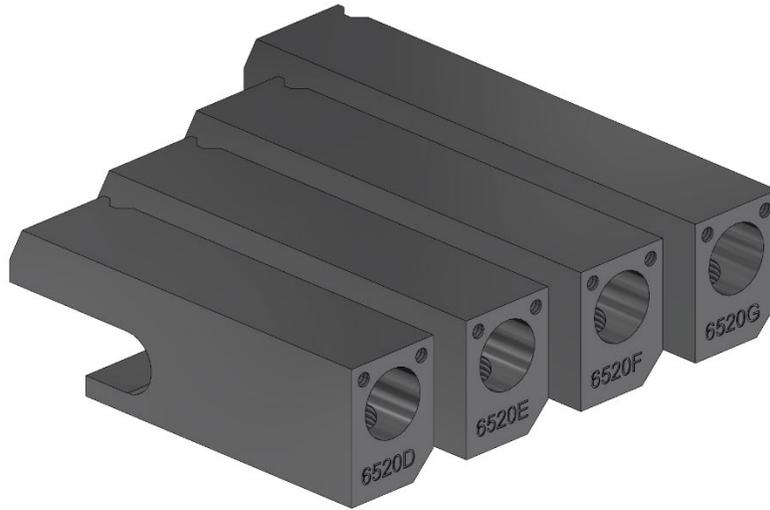


ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	100-82-3B	PIN ADJUSTING LONG INDEXABLE INSERT TOOLHOLDER
2	1	100-82-1	SPRING, ADJUSTING PIN
3	1	100-82-2	SOCKET SET SCREW, BRASS TIP, 3/16" LG
4	1	511-29-12C	SCREW, TORX M4x.7 X .315" LG

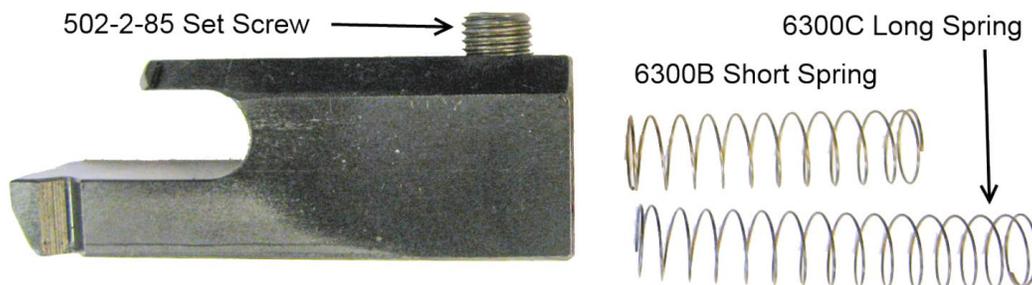
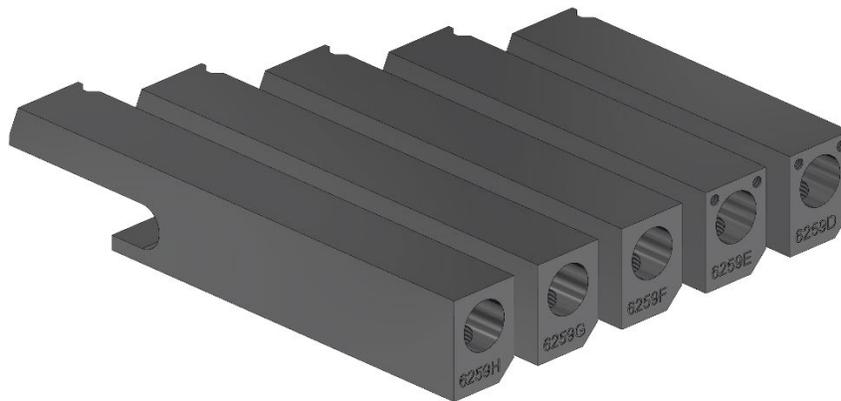
### 6593 Series Insert Holders



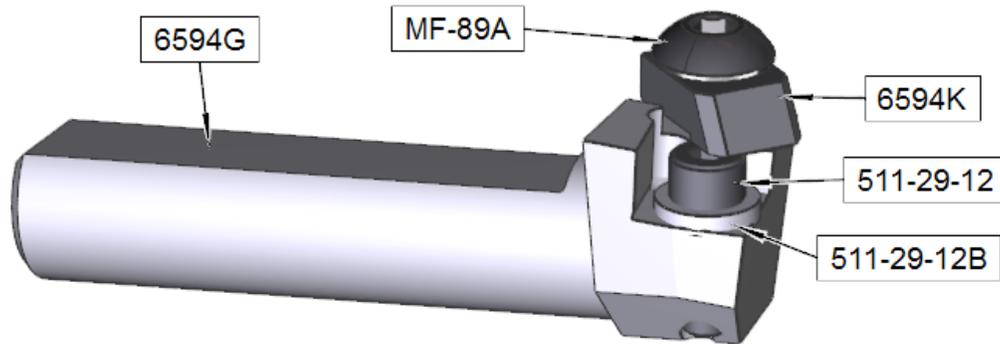
### 6520 Series Toolholders



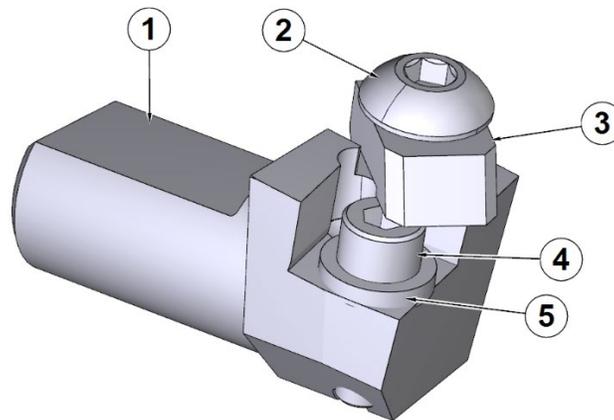
### 6259 Series Toolholders



### 6206L Tool Cartridge

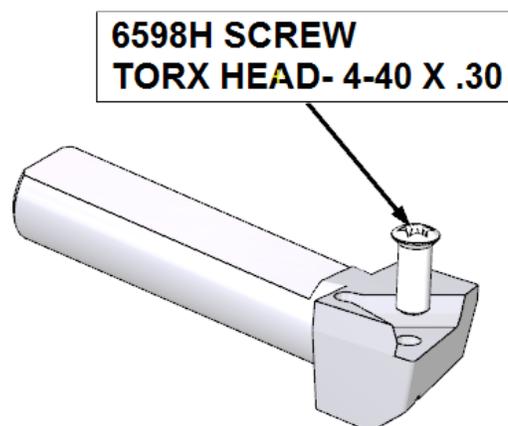


### 6206M Tool Cartridge

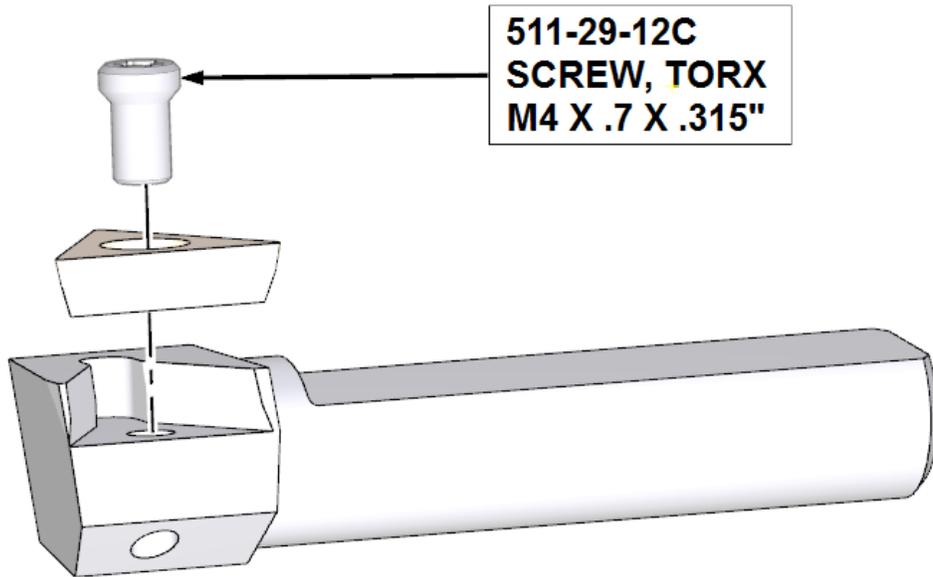


ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	6594H	CARTRIDGE ONLY, INDEXABLE INSERT 13/16" LONG
2	1	MF-89A	SOCKET BUTTON HEAD SCREW #10-32 X 5/8"
3	1	6594K	CLAMP, TOOL SQUARE INSERT
4	1	511-29-12	SOCKET HEAD CAPSCREW, #6-32 X 7/16"
5	1	511-29-12B	WASHER, PRECISION – HOLDING SCREW

### 6593S Insert Cartridge

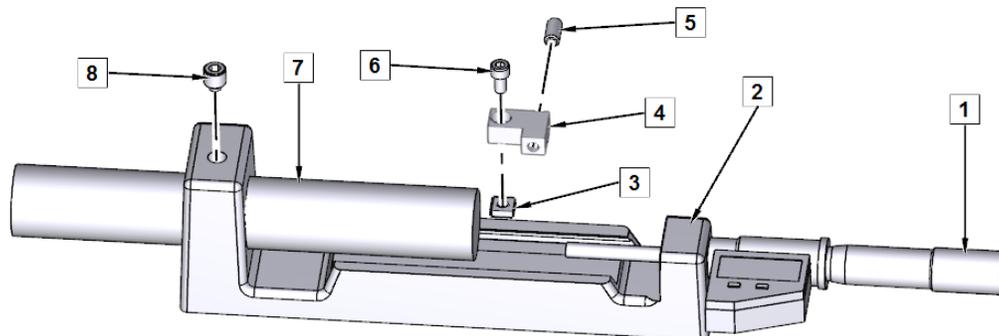


**6598 Series Insert Cartridges**



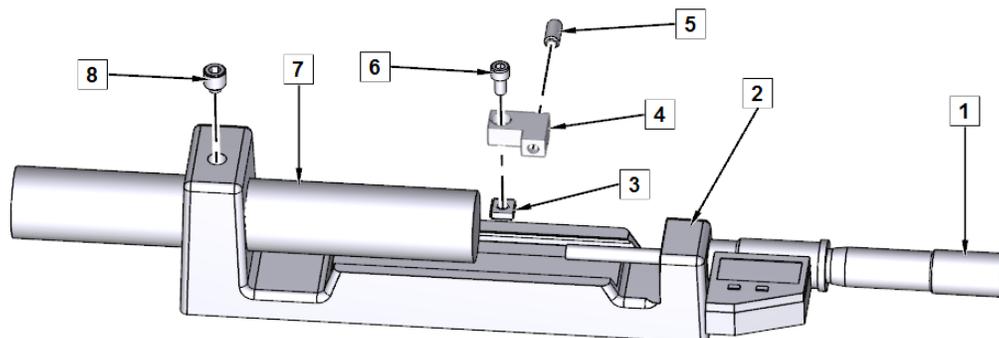
## Micrometers

### 900-2-19 Tool Setting Micrometer, 1/2" Tooling



ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	501-34-2R	HEAD, MICROMETER, UNIVERSAL MIC HEAD DIGITAL READING INCH/METRIC
2	1	502-30-10B	FRAME, MICROMETER
3	1	502-30-10J	SQUARE NUT - #10-24 MICROMETER FRAME
4	1	502-30-10M	CLAMP, MICROMETER
5	1	502-30-10K	BALL PLUNGER, 1/4-20 MICROMETER FRAME
6	1	MF-9A	SOCKET HEAD CAPSCREW #10-32 X 3/8"
7	1	502-30-10A	ANVIL, MICROMETER 7/8" DIA X 5 5/8" LG
8	1	502-30-10L	SET SCREW, BRASS TIPPED 3/8-24 X 3/8"

### 900-2-20 Tool Setting Micrometer, 3/4" Tooling



ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	501-34-2R	HEAD, MICROMETER, UNIVERSAL MIC HEAD DIGITAL READING INCH/METRIC
2	1	502-30-10C	FRAME, MICROMETER
3	1	502-30-10J	SQUARE NUT - #10-24 MICROMETER FRAME
4	1	502-30-10M	CLAMP, MICROMETER
5	1	502-30-10K	BALL PLUNGER, 1/4-20 MICROMETER FRAME
6	1	MF-9A	SOCKET HEAD CAPSCREW #10-32 X 3/8"
7	1	502-30-10A	ANVIL, MICROMETER 7/8" DIA X 5 5/8" LG
8	1	502-30-10L	SET SCREW, BRASS TIPPED 3/8-24 X 3/8"

## General Purpose Tooling

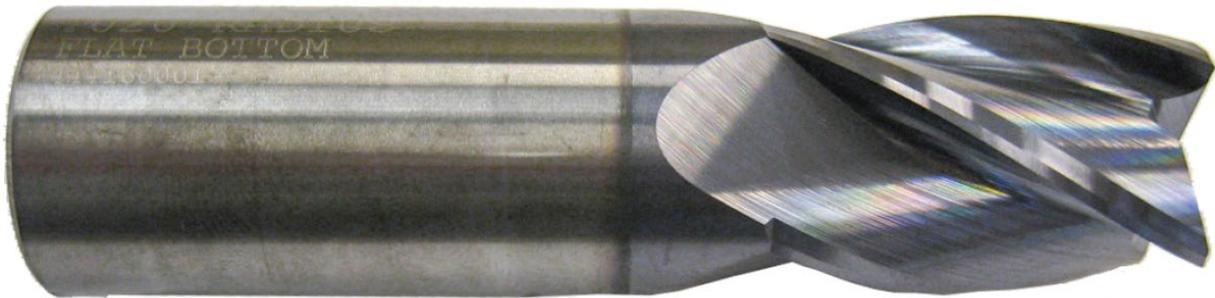
### 10121A Caterpillar 3400 Series Tappet Bore Repair Tooling Package



**10124 Collet Kit**



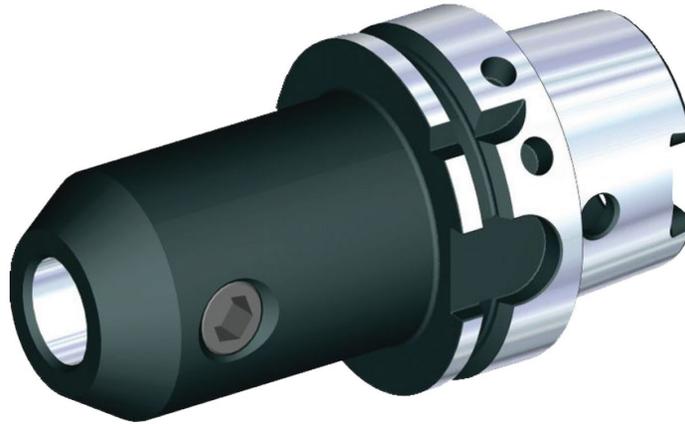
**650-2-45G Carbide End Mill, 1" (25.4mm) Dia x 4.00" (101.4mm)**



**650-2-43F Four Fluted End Mill, 3/4" (19.05mm) x 4.00" (101.4mm)**



**10113 Spindle Adapter for 1.0" (25.4mm) Diameter Shank Tooling**

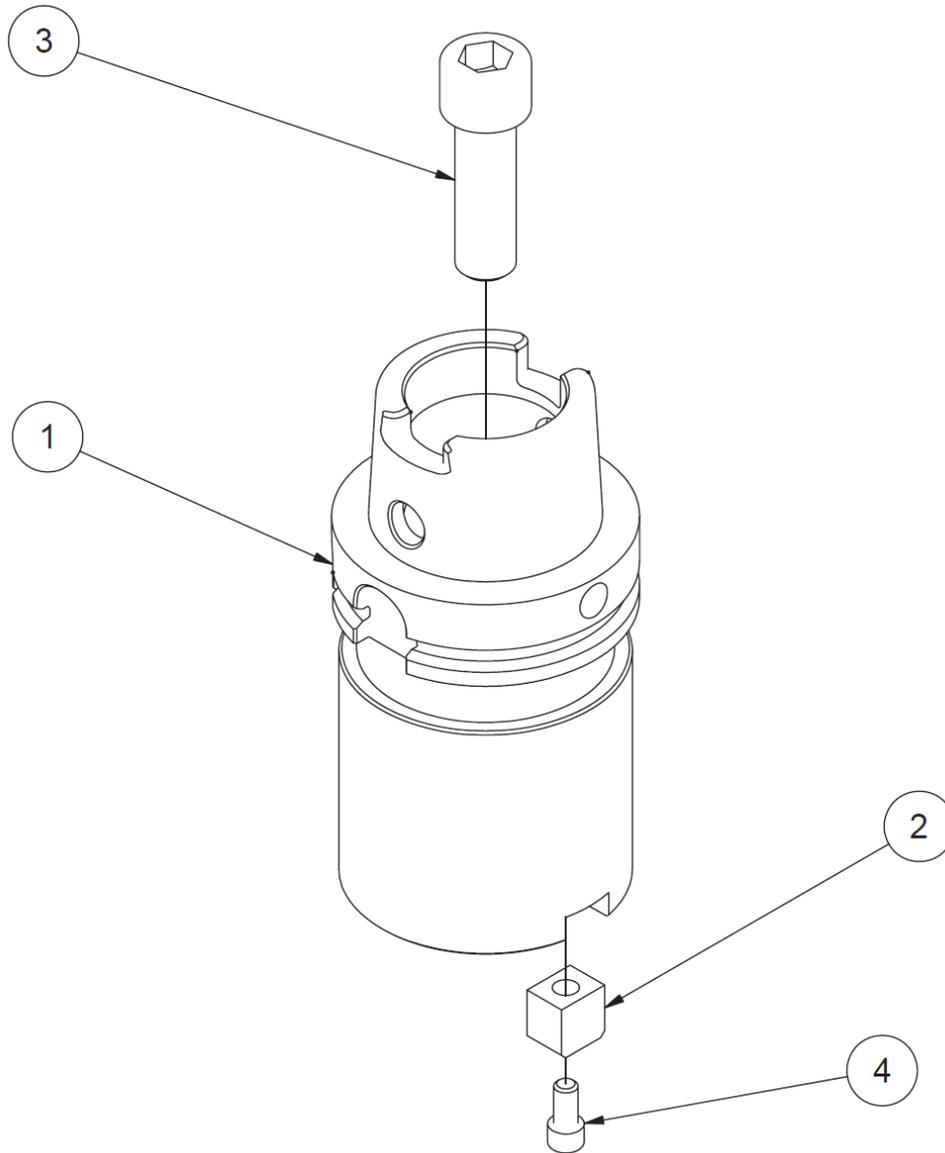


**10113A Spindle Adapter for 0.75" (19.05mm) Diameter Shank Tooling**



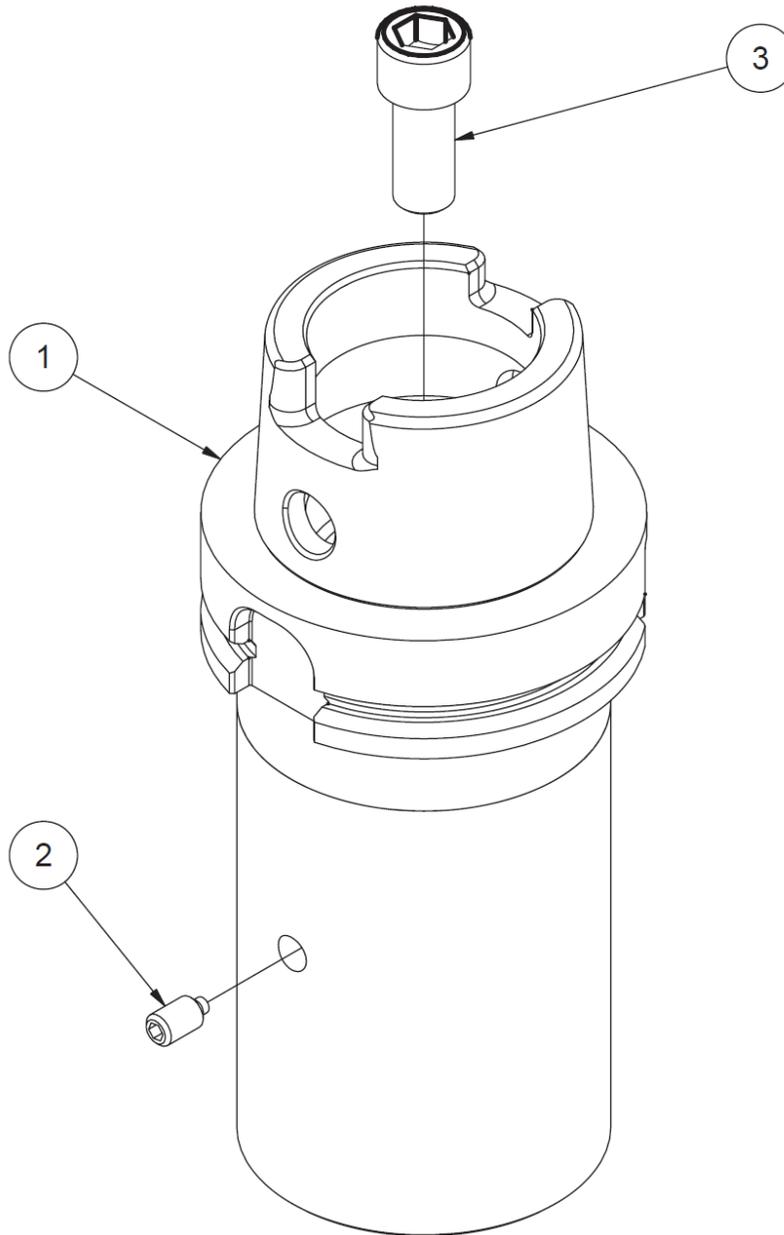
**10125 Adapter, Blank**



**10126 CAT 40 Taper Adapter**

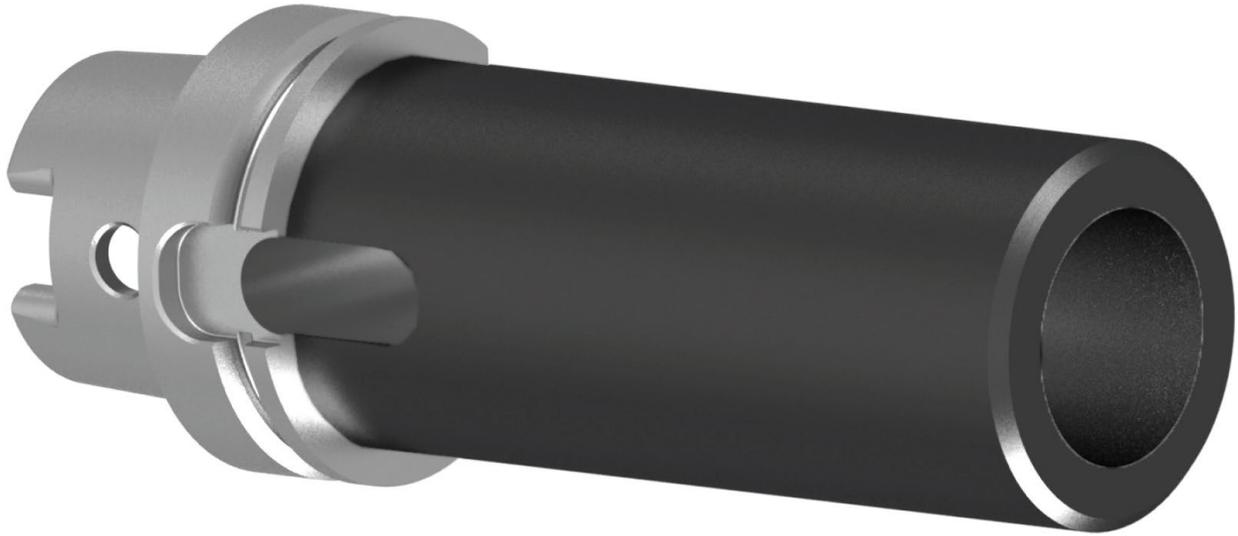
<b>10126 CAT 40 ADAPTER ASSEMBLY</b>			
<b>ITEM</b>	<b>QTY</b>	<b>PART NUMBER</b>	<b>DESCRIPTION</b>
1	1	10126A	ADAPTER, #40 TAPER – HSK80A
2	1	6170H	DRIVE KEY #40 TAPER ADAPTER
3	1	MF-46D	S.H.C.S. $\frac{5}{8}$ -11 X 2"
4	1	MF-12	S.H.C.S. $\frac{1}{4}$ -20 X $\frac{1}{2}$ "

### 10127 R8 Taper Adapter

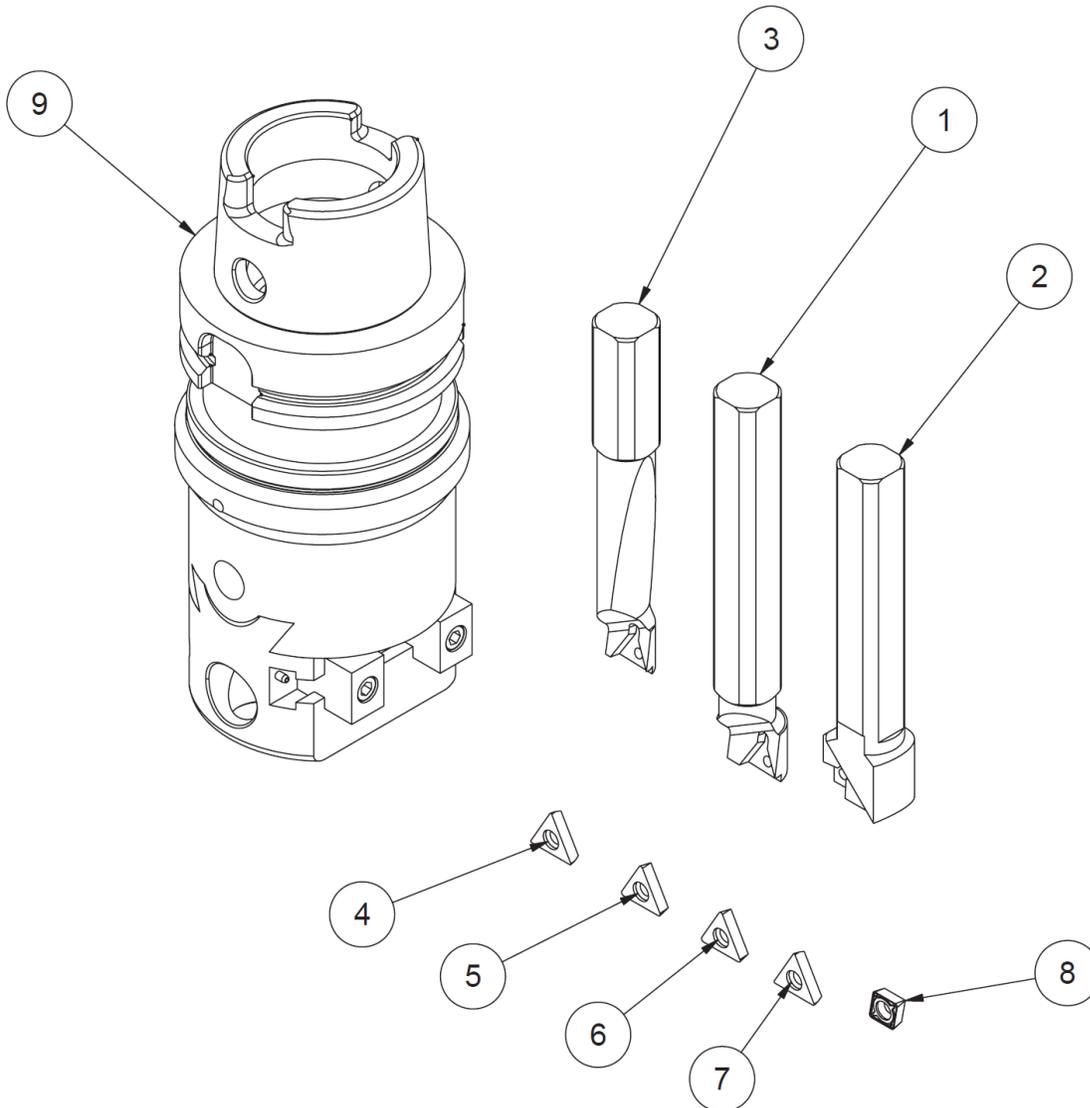


10127 R8 ADAPTER ASSEMBLY			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	10127A	ADAPTER, R8 TAPER – HSK80A
2	1	514-3-12K	SET SCREW – HALF DOG, 1/4-28 UNF
3	1	6170P	S.H.C.S. 7/16-20 X 1"

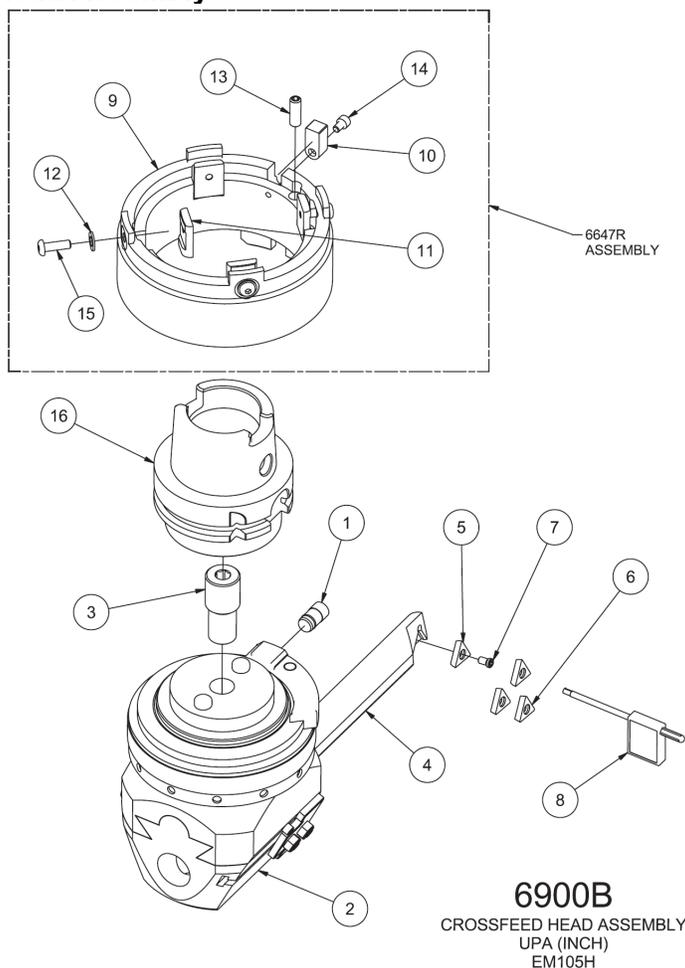
**10128 #5 Morse Taper Adapter**



### 10122 Small Precision Adjustable Boring Head Kit



10122 SMALL PRECISION BORING HEAD ASSEMBLY W/ TOOLING			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	650-2-34P	BORING BAR, 1" PRECISION BORING HEAD ASS'Y
2	1	650-2-34U	FACING BAR – PRECISION BORING HEAD ASSEMBLY
3	1	650-2-34Q	BORING BAR, 3/4" PRECISION BORING HEAD ASS'Y
4	1	RT321	INSERT, TRIANGULAR POS RAKE 3/8" I.C.
5	1	RT322	INSERT, TRIANGULAR 3/8" I.C.
6	1	RT322F	INSERT, TRIANGULAR 1/32" R PRECISION BORING
7	1	RT321F	INSERT, TRIANGULAR POS. RAKE 3/8" I.C. 1/64" R
8	1	650-2-34V	INSERT, DIAMOND SHAPE 1/32" R.
9	1	10122B	SMALL PRECISION BORING HEAD W/O TOOLING

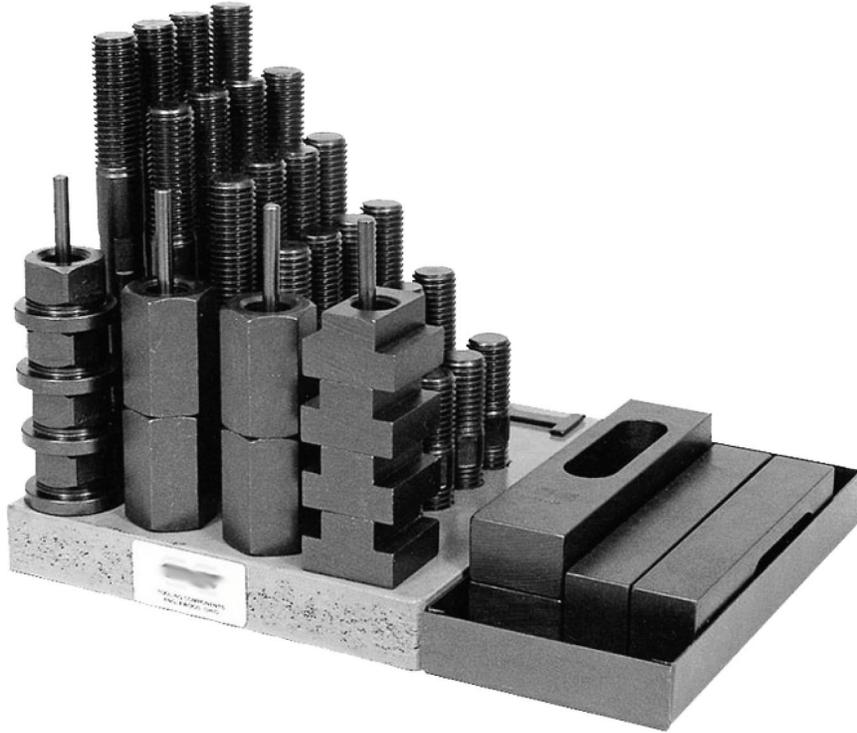
**6900B Cross Feed Head Assembly**

<b>6900B CROSSFEED HEAD ASSEMBLY UPA (INCH) – EM105H</b>			
<b>ITEM</b>	<b>QTY</b>	<b>PART NUMBER</b>	<b>DESCRIPTION</b>
1	1	6647H	TORQUE SHAFT REWORK, WOHLHAUPTER CROSSFEED HEAD
2	1	6900	WOHLHAUPTER CROSSFEED HEAD (INCH)
3	1	6517Z	DIFFERENTIAL SCREW
4	1	6647J	INDEXABLE BORING BAR, WOHLHAUPTER HEAD
5	2	RT321	INSERT, TRIANGULAR POS. RAKE $\frac{3}{8}$ " I.C.
6	2	RT322	INSERT, TRIANGULAR $\frac{3}{8}$ " I.C.
7	1	511-29-12C	TORX SCREW M4x.7
8	1	511-29-12D	TORX WRENCH, T-15
9	1	6647S	DRIVER, TORQUE SHAFT, CROSSFEED HEAD ASSEMBLY, EM105H
10	1	6647L	SPINDLE KEY, TORQUE SHAFT DRIVE ASSEMBLY
11	4	6647M	CLAMP PAD, TORQUE SHAFT DRIVE, CROSSFEED HEAD ASSEMBLY
12	4	MF-175	#10 FLAT WASHER
13	1	MF-64A	SOCKET SET SCREW, FLAT POINT, $\frac{1}{4}$ -20 X $\frac{3}{4}$ "
14	1	MF-3B	S.H.C.S. #8-32 X $\frac{1}{4}$ "
15	4	MF-89A	SOCKET BUTTON HEAD SCREW #10-32 X $\frac{5}{8}$ "
16	1	10132	ADAPTER, UPA TRIPLE FEED HEAD

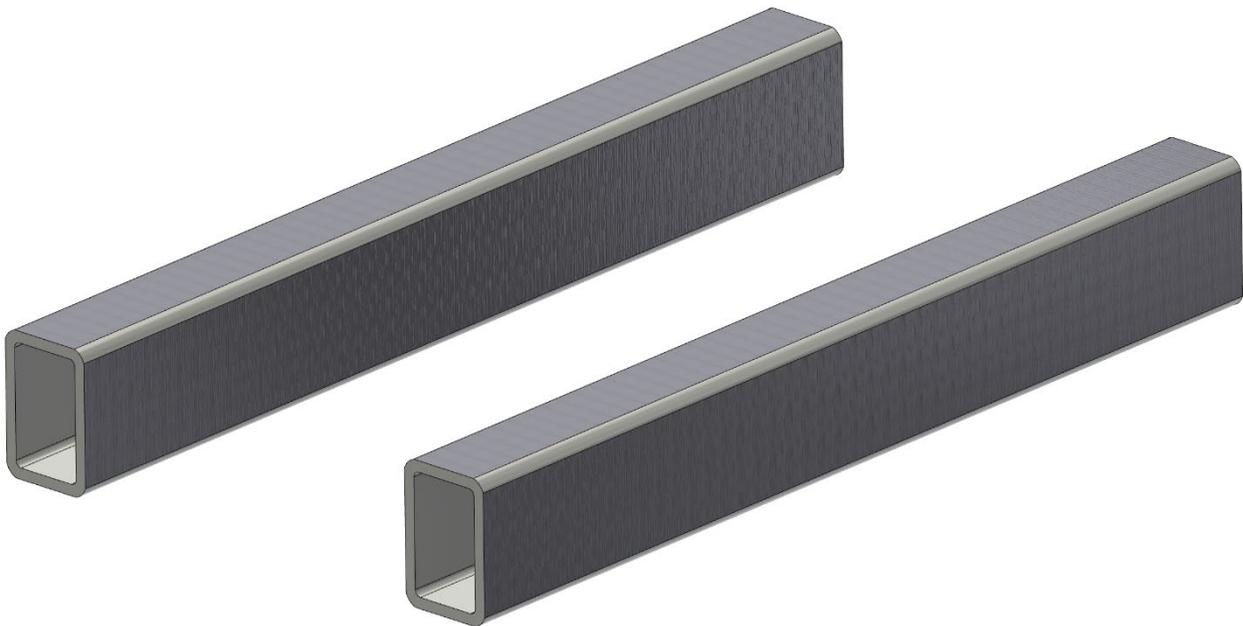
## Fixturing

### Parallels

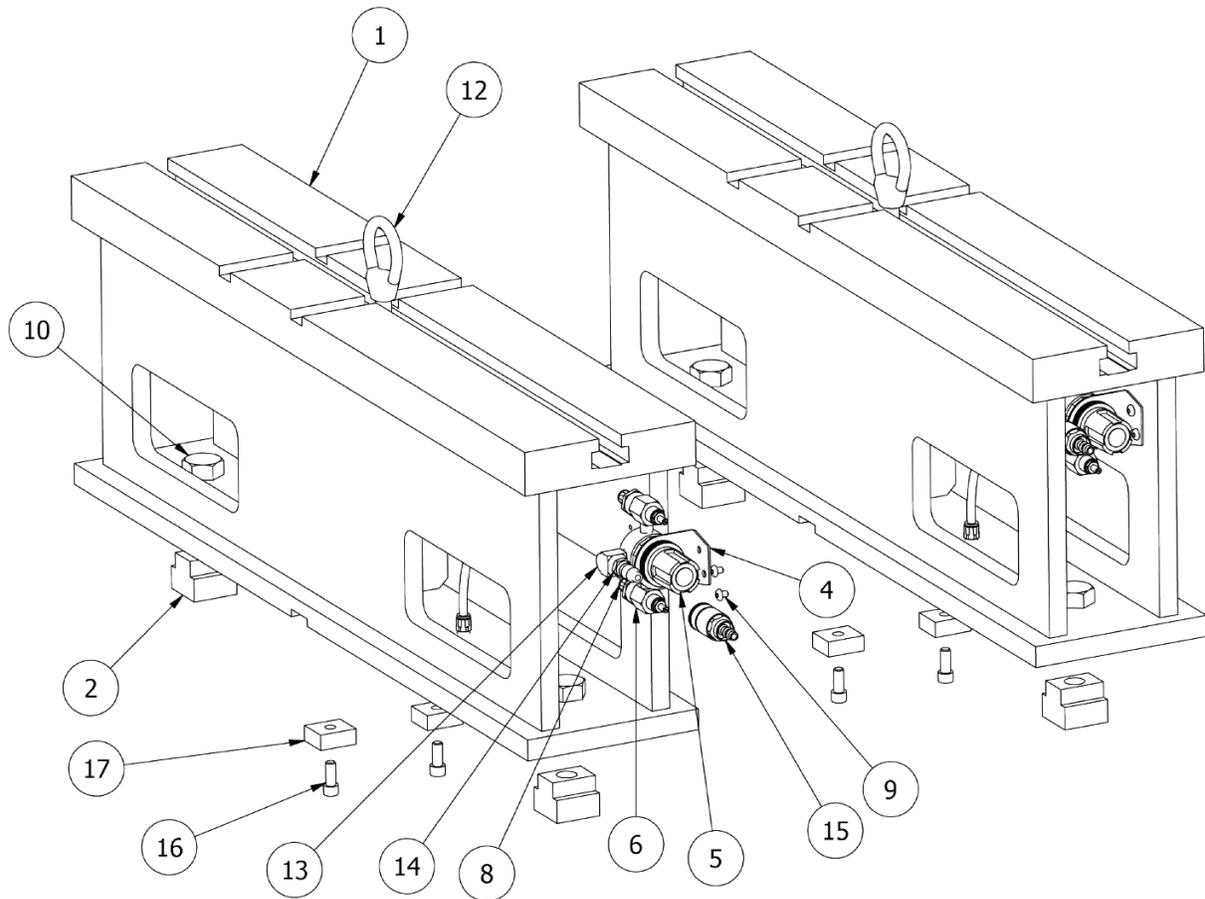
#### 6511 3/4" (19.05mm) Clamp Kit



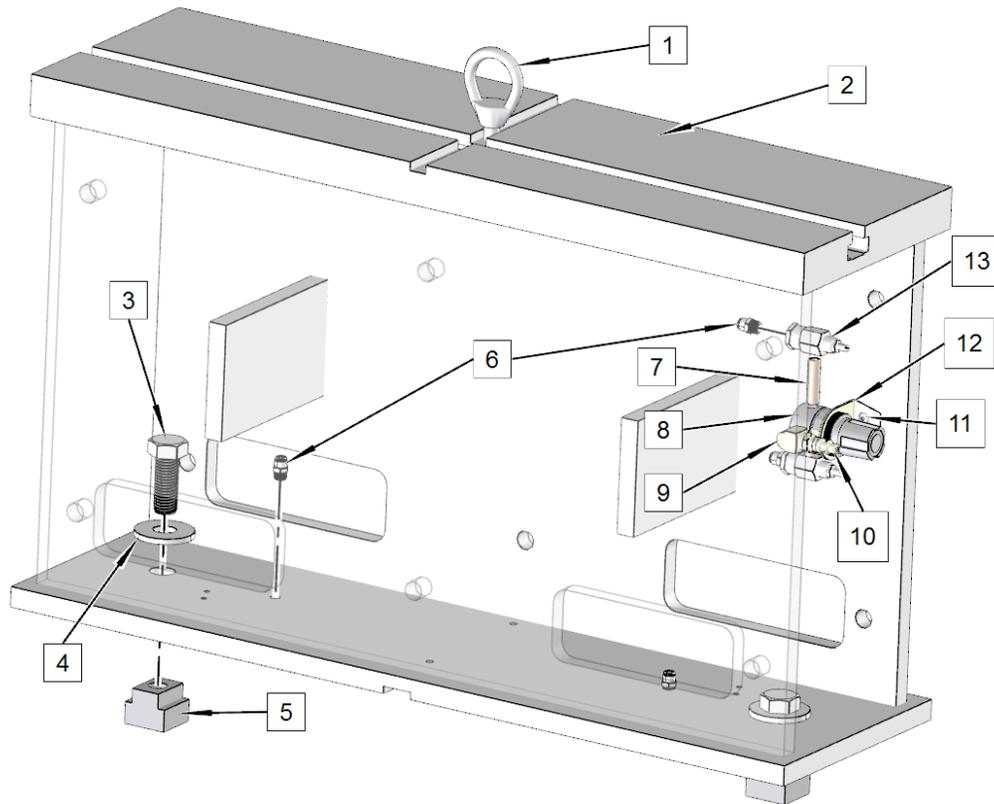
#### 11115 Parallels, 2" x 3" (51mm x 76mm)



## 6370Z Parallels, 10" (254mm)



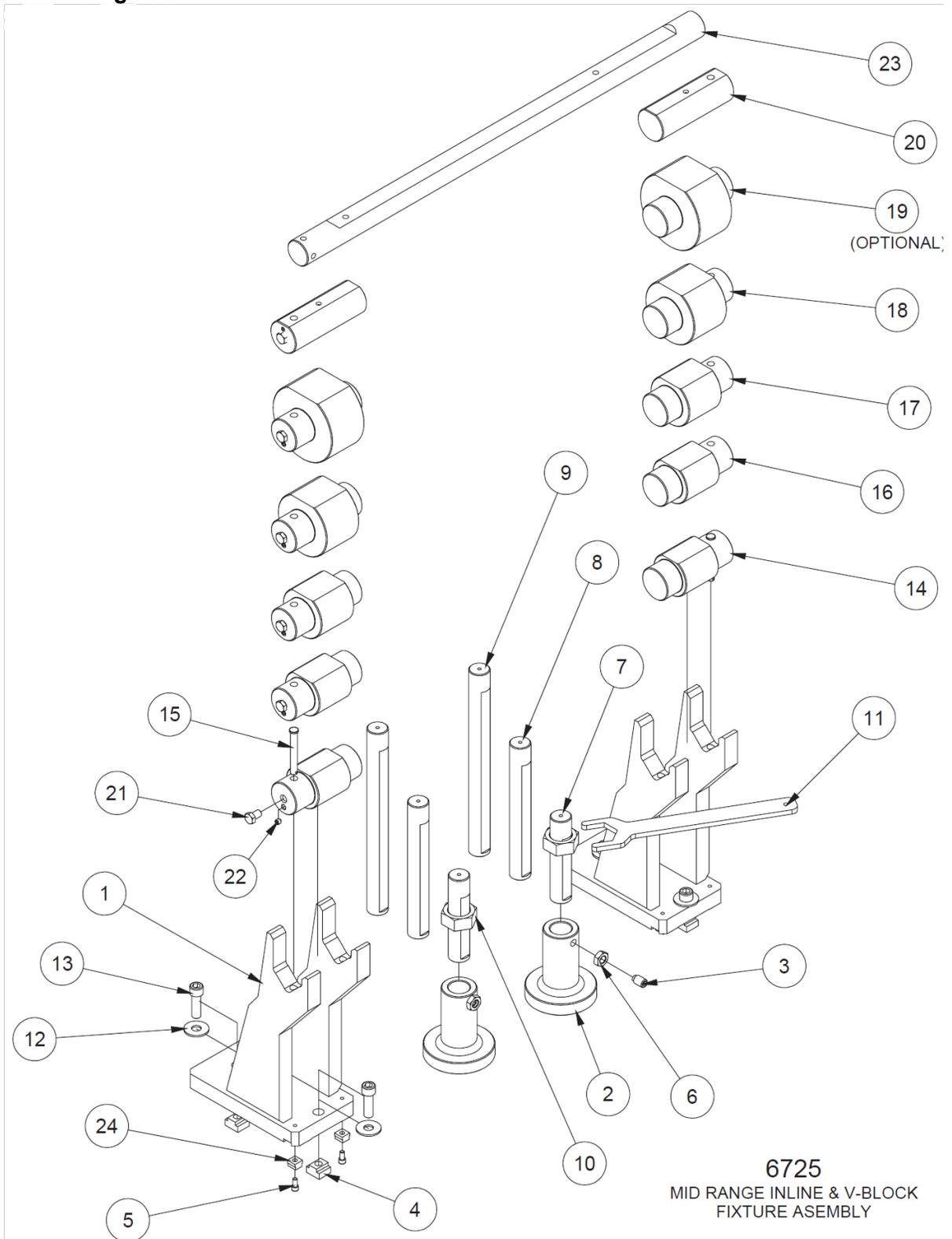
6370Z 10" PARALLELS ASSEMBLY			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	2	6370Y	10" PARALLEL MACHINING
2	4	6160	NUT, T – HARDENED
4	2	502-27-17A	REGULATOR BRACKET
5	2	502-27-17	REGULATOR 0-60 PSI
6	4	502-11-35A	VALVE, CONTROL – RFC FLOW
7	4	502-11-17J	CLOS NIPPLE
8	8	514-4-17W	LEGRIS STRAIGHT ¼ X ⅛ NPT
9	4	MF-87	SOCKET BUTTON HEAD SCREW #10-24 X ¼"
10	4	MF-154B	HEX BOLT, ¾-10 X 1 ¾"
12	2	502-3-13	LIFT EYE
13	2	502-11-17S	¼ STREET 'L'
14	2	502-11-16X	QUICK CONNECT AIR FITTING MALE
15	2	502-11-16W	QUICK CONNECT AIR FITTING FEMALE
16	4	MF-21	S.H.C.S. 5/16-18 X ⅝"
17	4	6553K	LOCATING KEY

**6370C Parallels, 18" (457mm)**

<b>6370C 18" PARALLELS ASSEMBLY</b>			
<b>ITEM</b>	<b>QTY</b>	<b>PART NUMBER</b>	<b>DESCRIPTION</b>
1	2	502-2-13	EYE, LIFTING
2	2	6370K	SUPPORT, PARALLEL
3	4	MF-154K	HEX BOLT $\frac{3}{4}$ -10 X 2"
4	4	MF-181A	FLAT WASHER, $\frac{3}{4}$ "
5	4	6160	NUT, "T" – HARDENED
6	6	514-4-17W	FITTING, $\frac{1}{8}$ NPT X $\frac{1}{4}$ POLY STRAIGHT
7	2	502-11-17J	NIPPLE, CLOSE $\frac{1}{8}$ " NPT
8	2	502-27-17	REGULATOR, AIR 0-60 PSI
9	2	502-11-17S	ELBOW, ST, $\frac{1}{4}$ NPTF X $\frac{1}{4}$ NPT
10	2	502-11-16X	CONNECTOR, MALE THREAD $\frac{1}{4}$ NPTF
11	4	MF-87	SOCKET BUTTON HEAD SCREW, #10-24 X $\frac{1}{4}$ "
12	2	502-27-17A	BRACKET, MOUNTING – REGULATOR
13	2	502-11-35A	VALVE, CONTROL – RFC FLOW

### Main Bore Locating Fixtures

#### 6725 Small- to Mid-Range In-Line and V-Block Fixture Kit, 2"-7" (50.8-177.8mm) Main Bearing Diameter



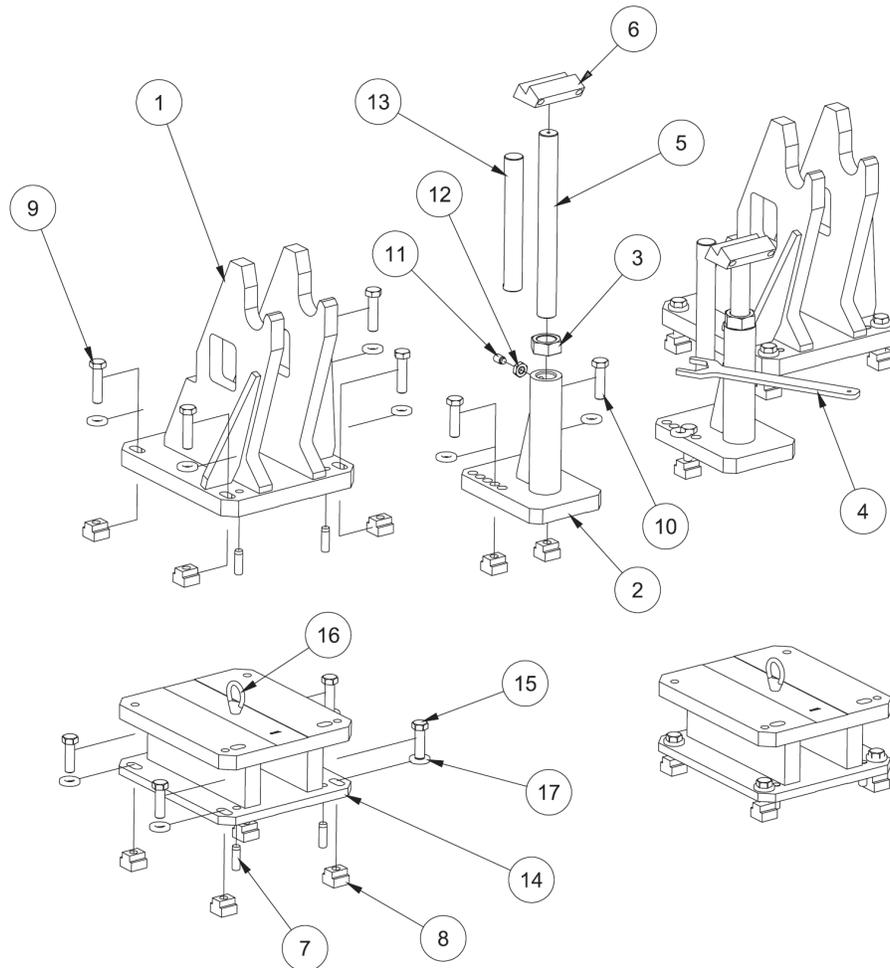
**6725**  
MID RANGE INLINE & V-BLOCK  
FIXTURE ASSEMBLY



6725 MID RANGE INLINE & V-BLOCK FIXTURE ASSEMBLY			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	2	6553F	MACHINING, MAIN BEARING SUPPORT
2	2	6395D	JACK BODY
3	2	6395B	SET SCREW, HALF DOG, 5/8-11 X 1"
4	4	502-1-11A	"T"-NUT 3/4"
5	4	MF-21	S.H.C.S. 5/16-18 X 5/8"
6	2	MF-173	HEX JAM NUT, 5/8-11
7	2	6396	JACKING SCREW, 7" LG
8	2	6396A	JACKING SCREW, 11 1/4" LG
9	2	6396B	JACKING SCREW, 15 1/2" LG
10	2	6566H	JACKING NUT
11	1	6566K	WRENCH, JACKING NUT – DIESEL FIXTURING
12	4	MF-181	FLAT WASHER, 5/8"
13	4	MF-46D	S.H.C.S. 5/8-11 X 2"
14	2	6787C	LOCATOR, MAIN BEARING, 3.22 TO 3.50 DIA
15	2	6553H	PIN, LOCATION – DIESEL FIXTURE
16	2	6787D	LOCATOR, MAIN BEARING, 3.50 TO 4.00 DIA
17	2	6787E	LOCATOR, MAIN BEARING, 4.00 TO 5.00 DIA
18	2	6787F	LOCATOR, MAIN BEARING, 5.00 TO 6.00 DIA
19	2	6787G	LOCATOR, MAIN BEARING, 6.00 TO 7.00 DIA (OPT.)
20	2	6787M	LOCATOR, MAIN BEARING, 2 1/2 TO 3 DIA
21	10	MF-137E	HEX BOLT, 1/2-13 X 3/4"
22	10	6788Q	SET SCREW, BRASS TIPPED, 3/8-16 X 5/16"
23	1	7241E	LOCATOR BAR, ECONOMY HEAD AND BLOCK FIXTURE
24	4	6869A	STEP KEY 3/4" – 5/8"

### 6405F Large V-Block Fixture Kit

(For use with 6407 series locators)

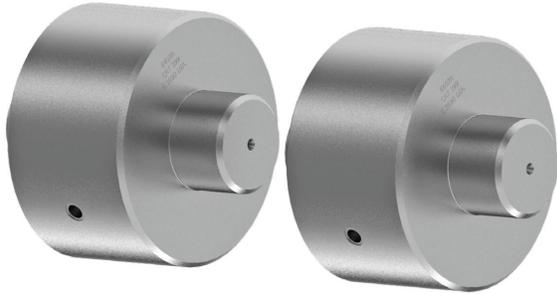


6405F LARGE V-BLOCK FIXTURE KIT			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	2	6405G	SUPPORT (MACHINING), LARGE V-BLOCK
2	2	6412A	JACK BODY (MACHINING) – 399 CAT BLOCK
3	2	6566H	JACKING NUT
4	1	6599K	WRENCH, JACKING NUT – DIESEL FIXTURING
5	2	6396B	JACKING SCREW, 15.5"
6	2	6413	JACKING BLOCK
7	8	502-11-60	DOWEL PIN $\frac{5}{8}$ " X 2"
8	20	6160	NUT, T – HARDENED
9	8	MF-154J	HEX BOLT $\frac{3}{4}$ -10 X 3"
10	4	MF-154H	HEX BOLT $\frac{3}{4}$ -10 X 2 $\frac{3}{4}$ "
11	2	6395B	SET SCREW, HALF DOG, $\frac{5}{8}$ -11 X 1"
12	2	MF-173	HEX JAM NUT, $\frac{5}{8}$ -11
13	2	6396A	JACKING SCREW – V-BLOCK FIXTURE, 11.3" LG
14	2	6405K	6" RISER
15	8	MF-154C	HEX BOLT $\frac{3}{4}$ -10 X 2 $\frac{1}{2}$ "
16	2	502-3-13	LIFT EYE
17	20	6287	WASHER, THRUST $\frac{3}{4}$ "

### Main Bearing Bore Locator Sets for 6405F Block Fixture

If the Customer requires a size other than those available from stock, Rottler will manufacture the required size. Customer must provide the size, including the tolerance of the main bearing bore.

**6407A Locator Assembly, Main, CAT 399  
(Matched Pair), 6.3690" (161.773mm) Dia.**



**6407C Locator Assembly, Main, CAT 3500  
(Matched Pair), 6.6789" (169.644mm) Dia.**



**6407E Locator Assembly, Main, Cummins 170  
(Matched Pair), 6.0920" (154.737mm) Dia.**



**6407G Locator Assembly, Main, Cummins K50  
(Matched Pair), 6.8420" (173.787mm) Dia.**



**6407J Locator Assembly, Main, Cummins QSK  
(Matched Pair), 7.5915" (192.824mm) Dia.**



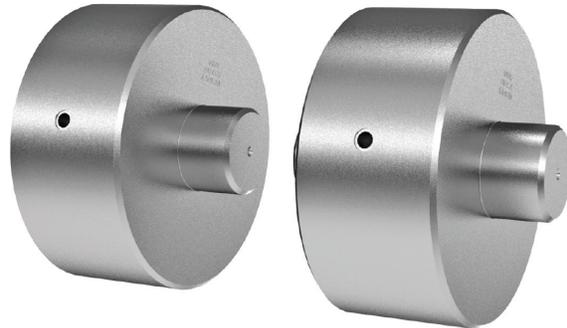
**6407L Locator Assembly, Main, Waukesha  
7042 (Matched Pair), 6.6585" (169.126mm) Dia.**



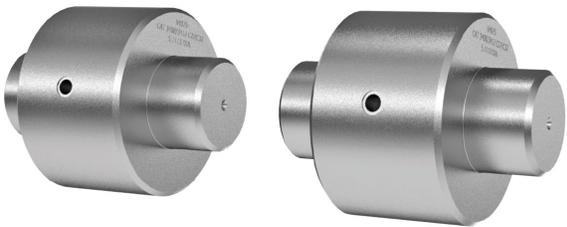
**6407N Locator Assembly, Main, MTU 4000  
(Matched Pair), 6.7292" (170.922mm) Dia.**



**6407Q Locator Assembly, Main, CAT C175  
(Matched Pair), 8.2640" (209.906mm) Dia.**



**6407S Locator Assembly, Main, (Matched Pair),  
5.1113" (129.827mm) Dia.**



**6407U Locator Assembly, Main, (Matched Pair),  
5.1373" (130.487mm) Dia.**



**6407W Locator Assembly, Main, MTU 396  
(Matched Pair), 5.9010" (149.885mm) Dia.**

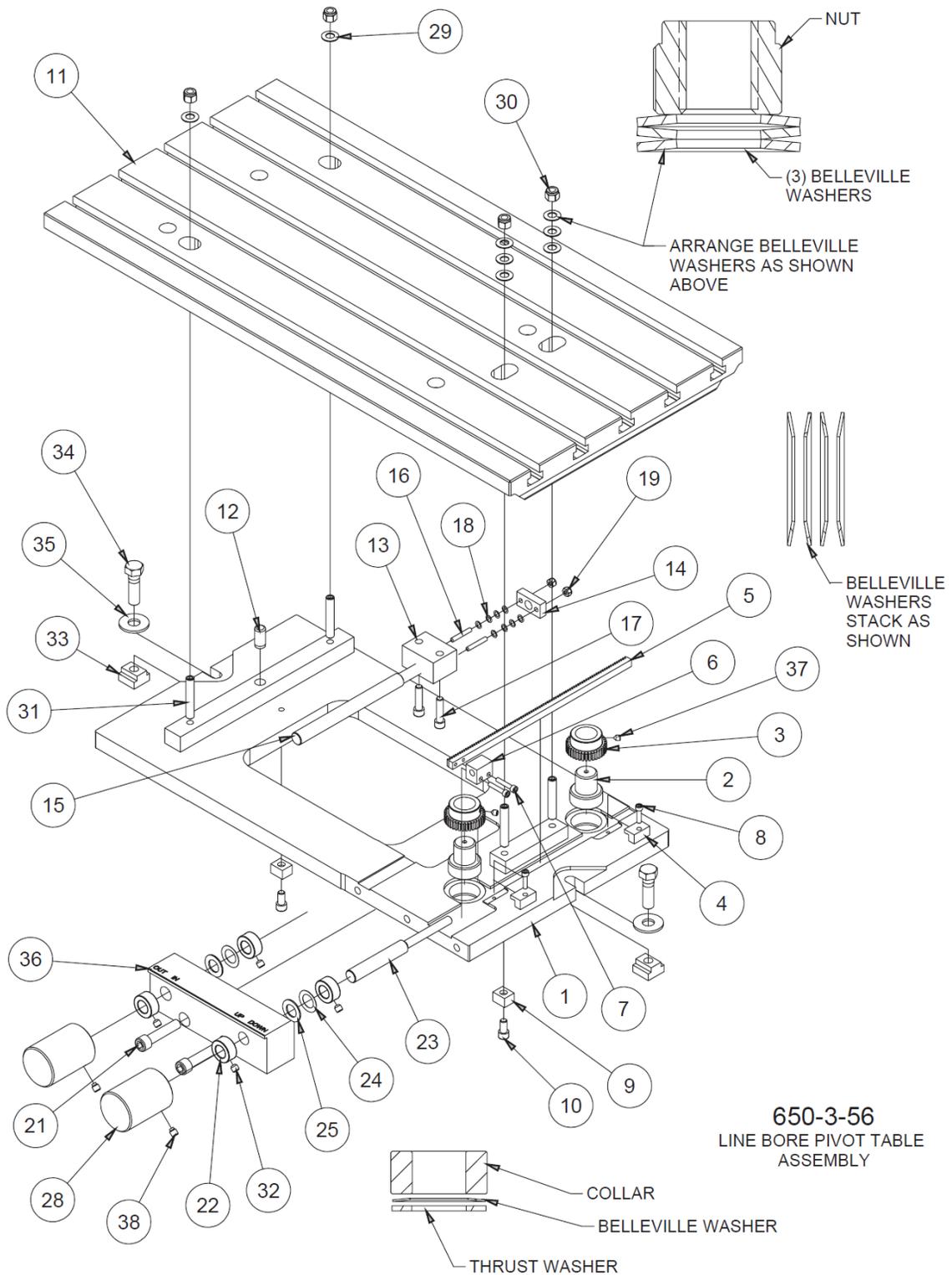


**6419 Locator Assembly, Main, Jenbacher 3,  
(Matched Pair), 4.2095" (106.921mm) Dia.**



# Line Bore Fixturing

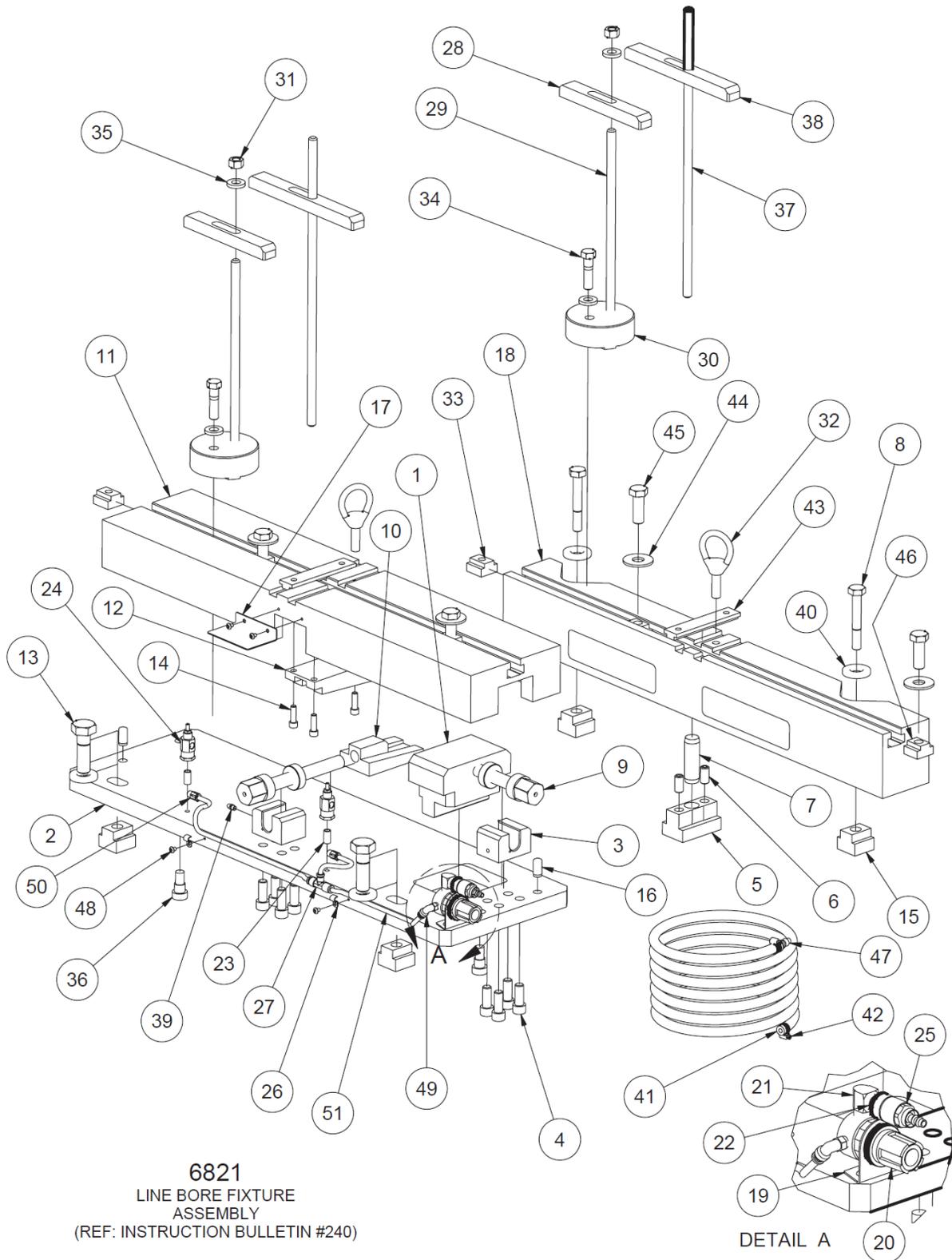
## 650-3-56 Line Bore Pivot Table Fixture Kit





650-3-56 LINE BORE PIVOT TABLE ASSEMBLY			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	650-3-56C	LINE BORE PIVOT TABLE ASSEMBLY
2	2	650-3-56D	JACK SCREW – PIVOT TABLE
3	2	650-3-56F	GEAR, JACK SCREW – PIVOT TABLE
4	2	650-3-56K	RETAINER, RACK – PIVOT TABLE
5	1	650-3-65V	RACK – PIVOT TABLE
6	1	650-3-65W	THREADED BLOCK – PIVOT TABLE
7	2	MF-6A	S.H.C.S. #10-24 X 1"
8	2	MF-6	S.H.C.S. #10-24 X 3/4"
9	2	650-3-9	KEY
10	2	MF-21	S.H.C.S. 5/16-18 X 5/8"
11	1	650-3-56A	TABLE TOP – PIVOT TABLE
12	1	MF-213B	DOWEL PIN, 1/2" X 1"
13	1	650-3-56N	THREAD BLOCK, PIVOT – PIVOT TABLE
14	1	650-3-56R	LOCK PLATE – PIVOT TABLE
15	1	650-2-29D	SHAFT, ROTATE ADJUST – PIVOT TABLE
16	2	MF-57A	SOCKET SET SCREW, #10-24 X 1 1/4"
17	2	MF-24	S.H.C.S. 5/16-18 X 1 1/4"
18	8	650-3-56Q	BELLEVILLE SPRING
19	2	MF-186B	NYLOCK NUT #10-24
21	2	MF-40A	S.H.C.S. 7/16-14 X 2"
22	4	7199E	COLLAR 1/2"
23	1	650-3-56U	LIFT ADJUSTMENT SHAFT
24	2	650-3-56S	BELLEVILLE SPRING, REID BDB-65
25	2	514-7-20	THRUST WASHER
28	2	650-2-29E	HANDLE
29	8	650-2-28P	BELLEVILLE WASHER
30	4	MF-187B	NYLOCK NUT 3/8-16
31	4	MF-75B	SOCKET SET SCREW, 3/8-16 X 2 1/4"
32	4	6863	SET SCREW, CONE POINT, 5/16-18 X 5/16"
33	2	650-3-10	TN-5 T-NUT
34	2	MF-137F	HEX BOLT 1/2-13 X 1 3/4"
35	2	MF-180	FLAT WASHER 1/2"
36	1	650-3-56L	CONTROL BLOCK – PIVOT TABLE
37	2	MF-59B	SET SCREW, CONE POINT, 1/4-20 X 5/16"
38	2	504-29-36	SOCKET SET SCREW, HALF DOG, 5/16-18 X 5/8"

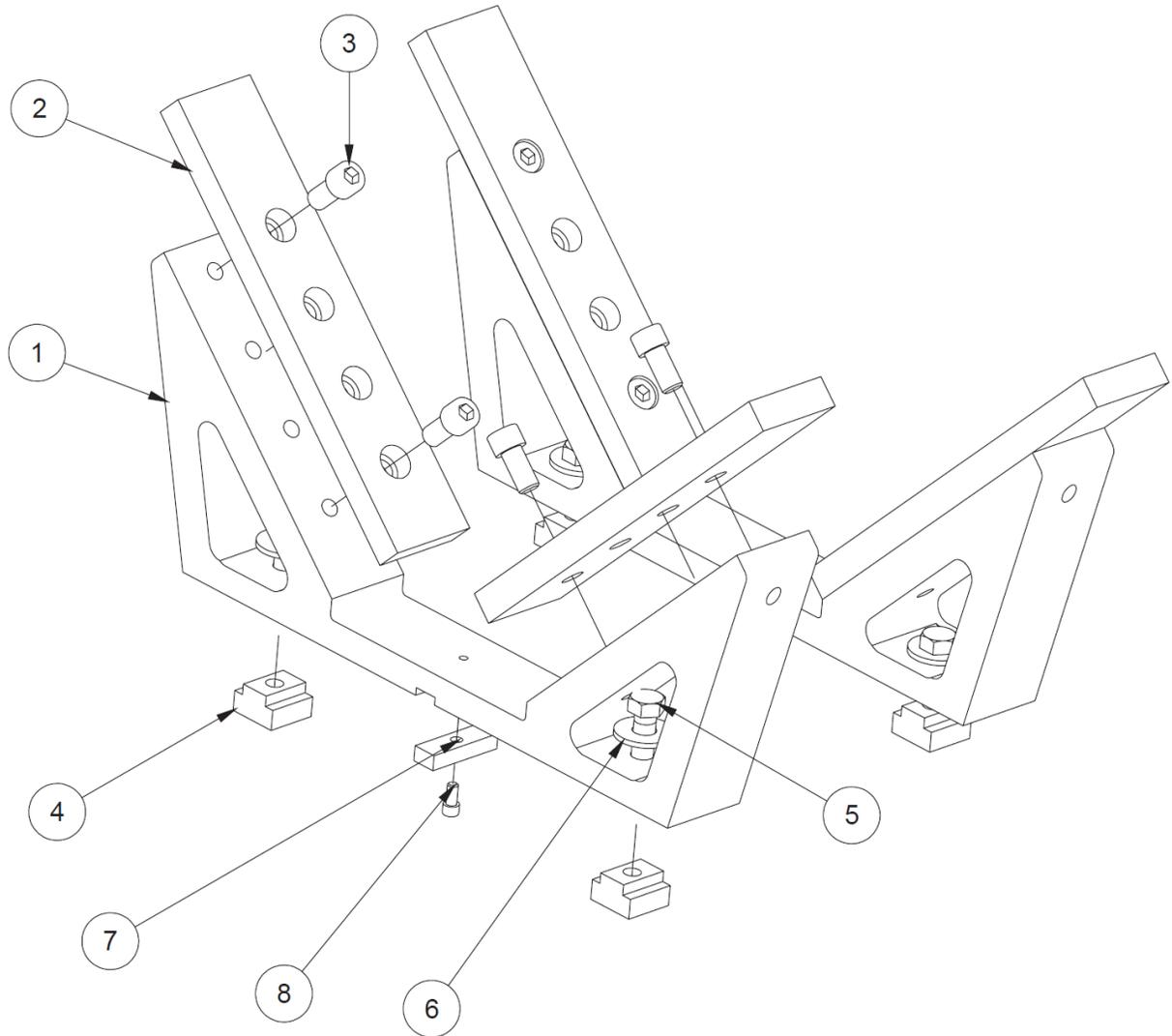
## 6821 Adjustable Universal Line Boring Fixture Kit



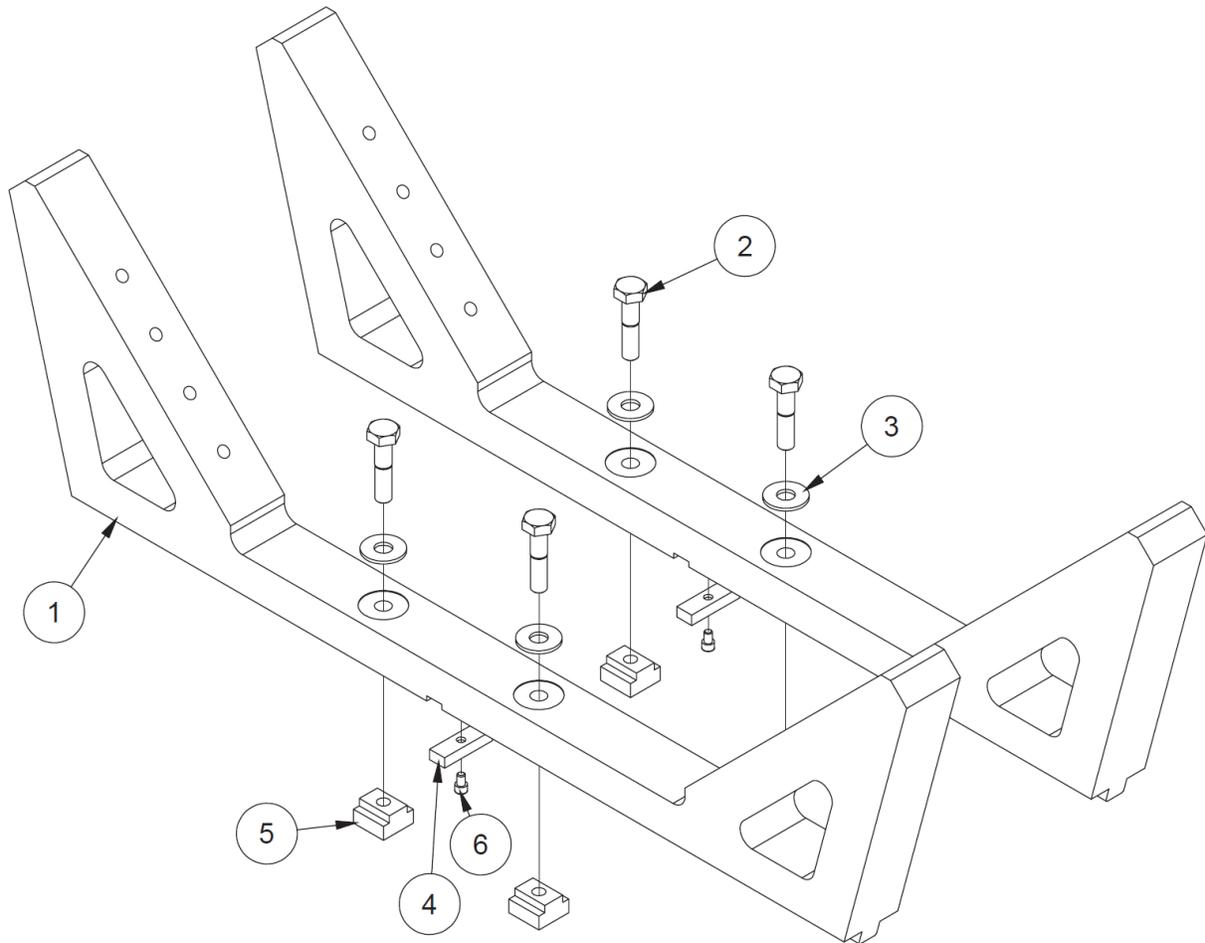


6821 LINE BORE FIXTURE ASSEMBLY – F90			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	6830	ADJUSTING BLOCK, ADJUSTABLE PARALLEL
2	1	6825A	PLATE, LOWER ADJUSTABLE
3	2	6829	BRACKET, SCREW – ADJUSTABLE PARALLEL – F88 LINE BORE FIXTURE
4	8	MF-43	S.H.C.S. ½-13 X 1”
5	1	6820	LOCATING PIVOT KEY, WAUKESHA 7042/CAT 399
6	2	MF-72	SET SCREW, FLAT POINT, ½-13 X 1”
7	1	6819	LOCATING, PIVOT PIN
8	2	6822B	HEX BOLT, ¾-10 X 2 ½”
9	2	6828	SCREW, ADJUSTABLE PARALLEL, F-8 LINE BORE FIXTURE
10	1	6827 **	LOWER WEDGE – ADJUSTABLE PARALLEL, F88 LINE BORE FIXTURE
11	1	6824A	UPPER PAD (MACH.) ADJ. PARALLEL F88 LINE BORE FIXTURE
12	1	6826 **	UPPER WEDGE – ADJUSTABLE PARALLEL F88 LINE BORE FIXTURE
13	2	MF-154C	HEX BOLT ¾-10 X 2 ½”
14	3	MF-23	S.H.C.S. 5/16-18 X 1”
15	4	6160	NUT, “T”-HARDENED
16	2	MF-213B	DOWEL PIN ½” X 1”
17	1	6834	CHIP SHIELD, UPPER PAD F88 LINE BORE FIXTURE
18	1	6822A	PARALLEL (STATIONARY) F90 LINE BORE FIXTURE
19	1	502-27-17A	REGULATOR BRACKET
20	1	502-27-17	REGULATOR 0-60 PSI
21	1	502-11-17S	STREET ELL, ¼ NPT
22	1	502-11-16X	CONNECTOR, MALE THREAD ¼ NPT, V6/V8 FIXTURE
23	2	502-11-17J	NIPPLE, CLOSE, ⅛” NPT
24	2	502-11-35A	FLOW CONTROLLER
25	1	502-11-16W	QUICK CONNECT AIR FITTING, FEMALE
26	2	502-12-16	WIRE CLIP
27	1	514-4-17N	TEE, UNION, ¼ TUBE
28	2	6833A	CLAMP BAR ( 7” LG), INLINE BLOCK F88 LINE BORE FIXTURE
29	2	6833B	CLAMP ROD (12”), INLINE BLOCK F88 LINE BORE FIXTURE
30	2	6833	LOCATOR, INLINE BLOCK
31	2	MF-165	HEX NUT, ½-13
32	2	502-3-13	LIFT EYE
33	2	502-1-11B	T-NUT, ¾”
34	2	MF-149C	HEX BOLT, ½-13 X 2”
35	4	MF-180	FLAT WASHER, ½”
36	2	514-7-22	SCREW, SHOULDER
37	2	6833D	CLAMP ROD (18”) INLINE BLOCK, F88 LINE BORE FIXTURE
38	2	6833E	CLAMP ROD (9”) INLINE BLOCK, F88 LINE BORE FIXTURE
39	1	MF-189	¼-28 STRAIGHT LUBE GREASE FITTINGS
40	4	6287	WASHER, THRUST, ¾”
41	2	502-1-98	AIR HOSE, ¼”
42	2	502-1-97	CLAMP, ¼” I.D. HOSE
43	4	6372	KEY, LOCATION – 10” PARALLEL, F90
44	4	MF-181	FLAT WASHER, ⅝”
45	4	MF-154F	HEX BOLT, ⅝-11 X 1 ¾”
46	1	502-1-11A	T-NUT, ¾”
47	4	502-11-16Y	CONNECTOR, MALE, AIR ¼ NPT
48	1	MF-87	SOCKET BUTTON HEAD SCREW, #10-24 X ⅝”
49	1	514-4-17E	ELBOW, 90 DEGREE MALE – ¼ TUBE X ⅛ NPT
50	2	514-4-17W	FITTING ⅝ NPT X ¼ POLY STRAIGHT
51	2.5 ft	502-11-15	BLACK POLY TUBING, ¼”

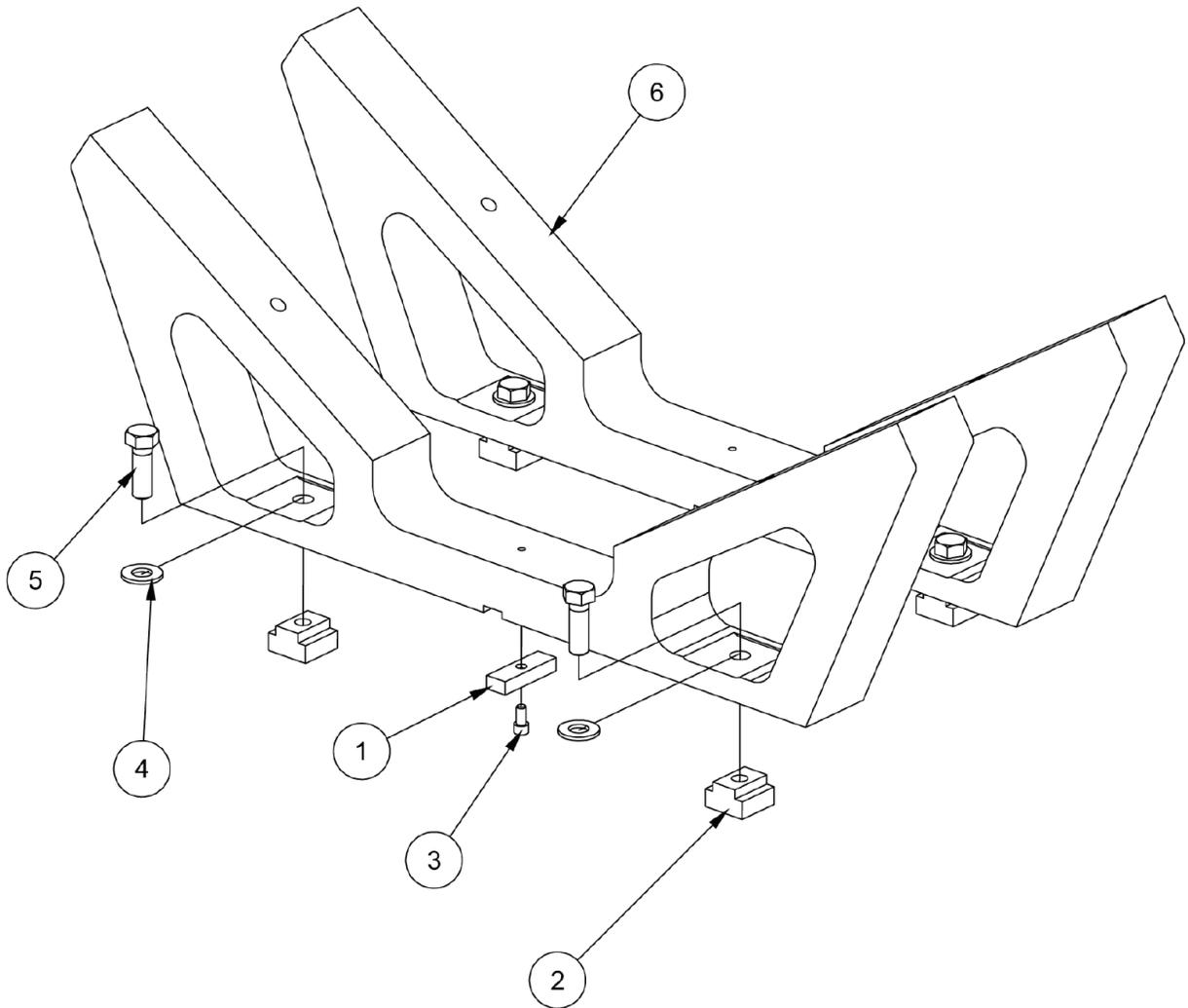
\*\*NOTE: ONLY SOLD IN A MATCHED SET

**6843 90° V-Block Support Kit, Small Blocks**

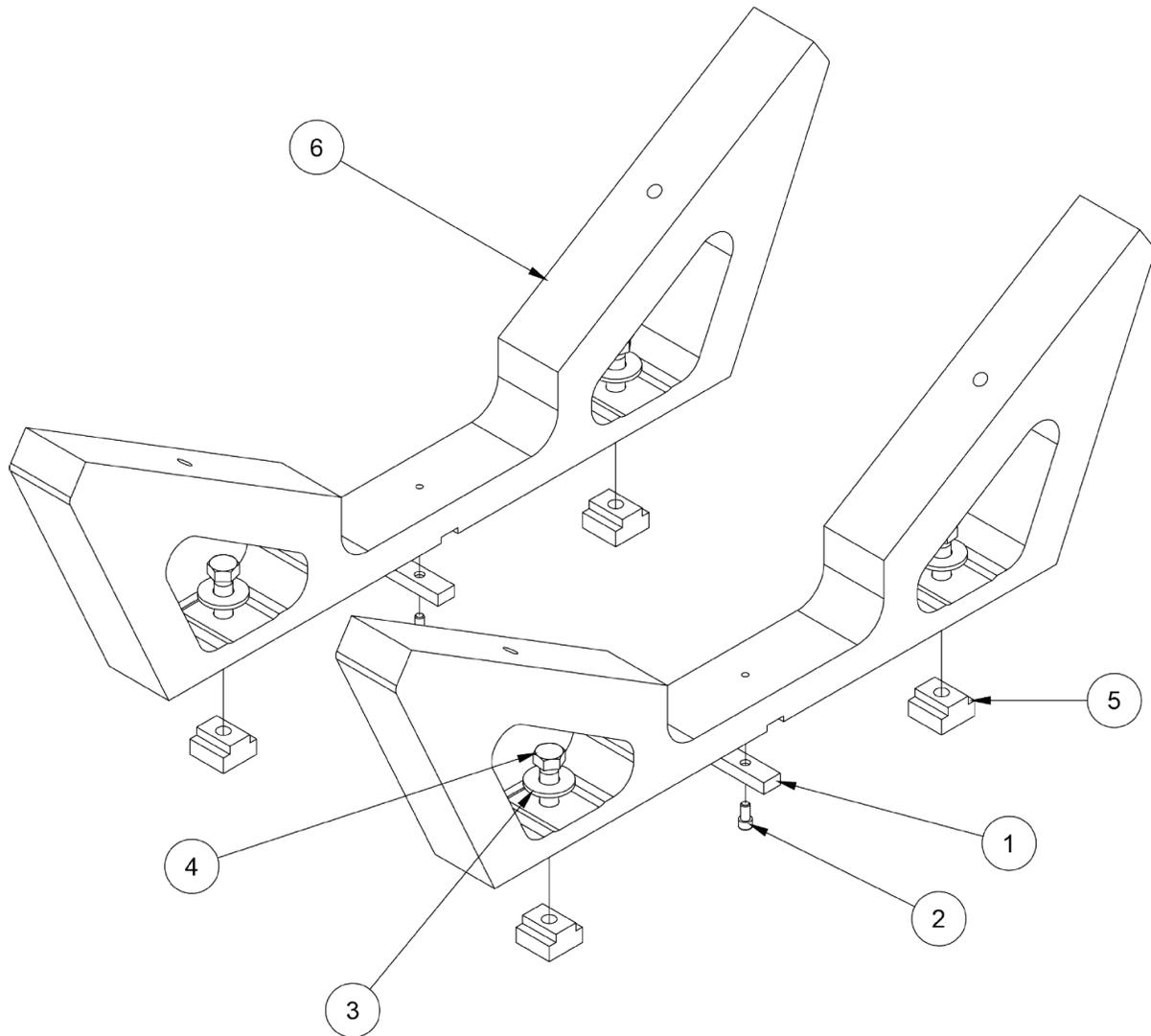
<b>6843 90 DEG V-BLOCK CRADLE ASSEMBLY</b>			
<b>ITEM</b>	<b>QTY</b>	<b>PART NUMBER</b>	<b>DESCRIPTION</b>
1	2	6843A	CRADLE, RIGHT AND LEFT, V-BLOCK
2	4	6789D	ADAPTER PLATE, V-BLOCK CRADLE
3	8	MF-42	S.H.C.S. 1/2-13 X 1"
4	4	502-1-11B	T-NUT, 3/4"
5	4	MF-15A	HEX BOLT, 1/2-13 X 1 1/2"
6	4	MF-180	FLAT WASHER, 1/2"
7	2	6831	KEY
8	2	MF-12	S.H.C.S. 1/4-20 X 1/2"

**6823E 90° V-Block Support Kit, Large Blocks**

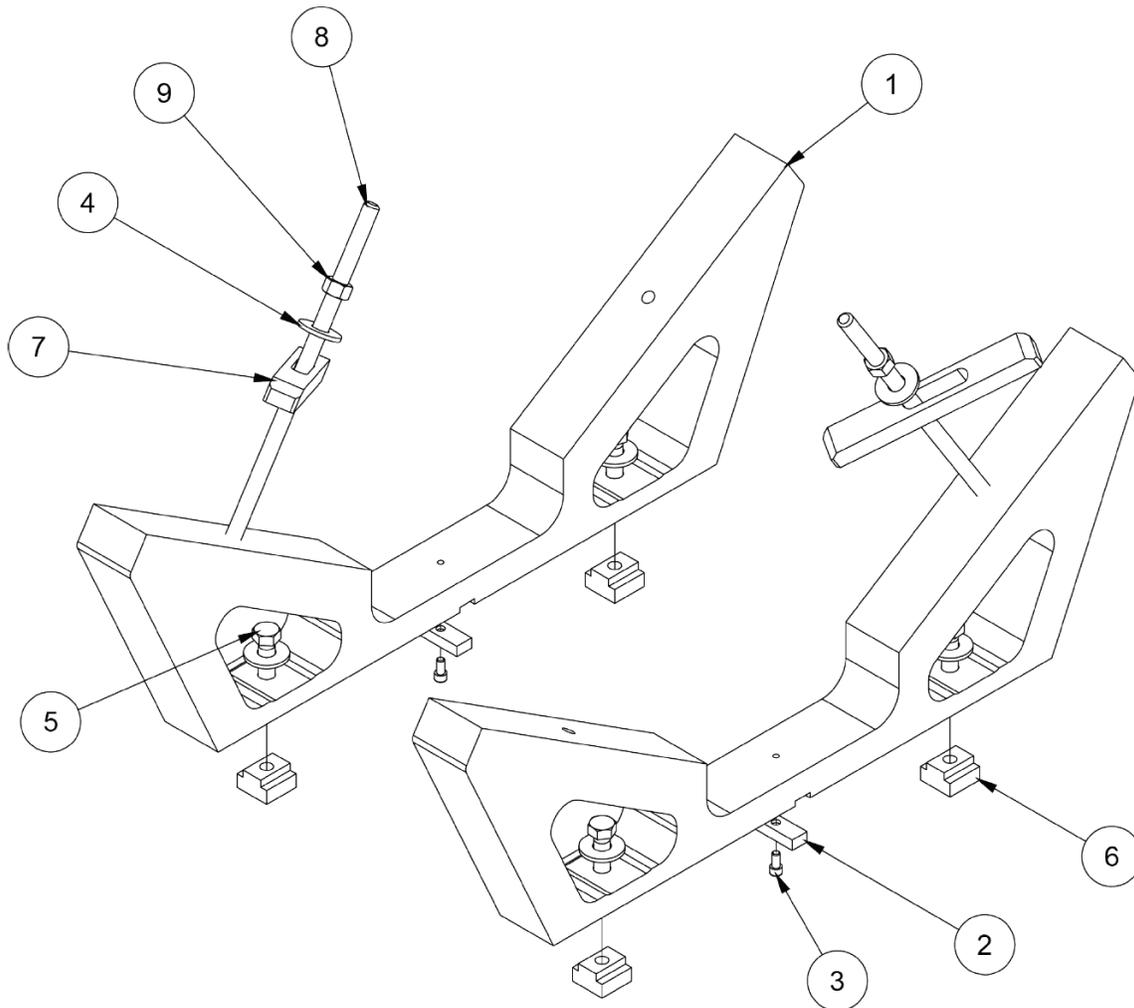
6823E LARGE 90 DEG V-BLOCK CRADLE ASSEMBLY			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	2	6823D	CRADLE, LARGE 90 DEGREE V-BLOCK
2	4	MF-149A	HEX BOLT, 1/2-13 X 2 1/4"
3	4	MF-180	FLAT WASHER, 1/2"
4	2	6831	KEY, FIXTURE
5	4	502-1-11B	T-NUT, 3/4"
6	2	MF-149A	S.H.C.S. 1/4-20 X 3/8"

**6789L 113° V-Block Support Kit**

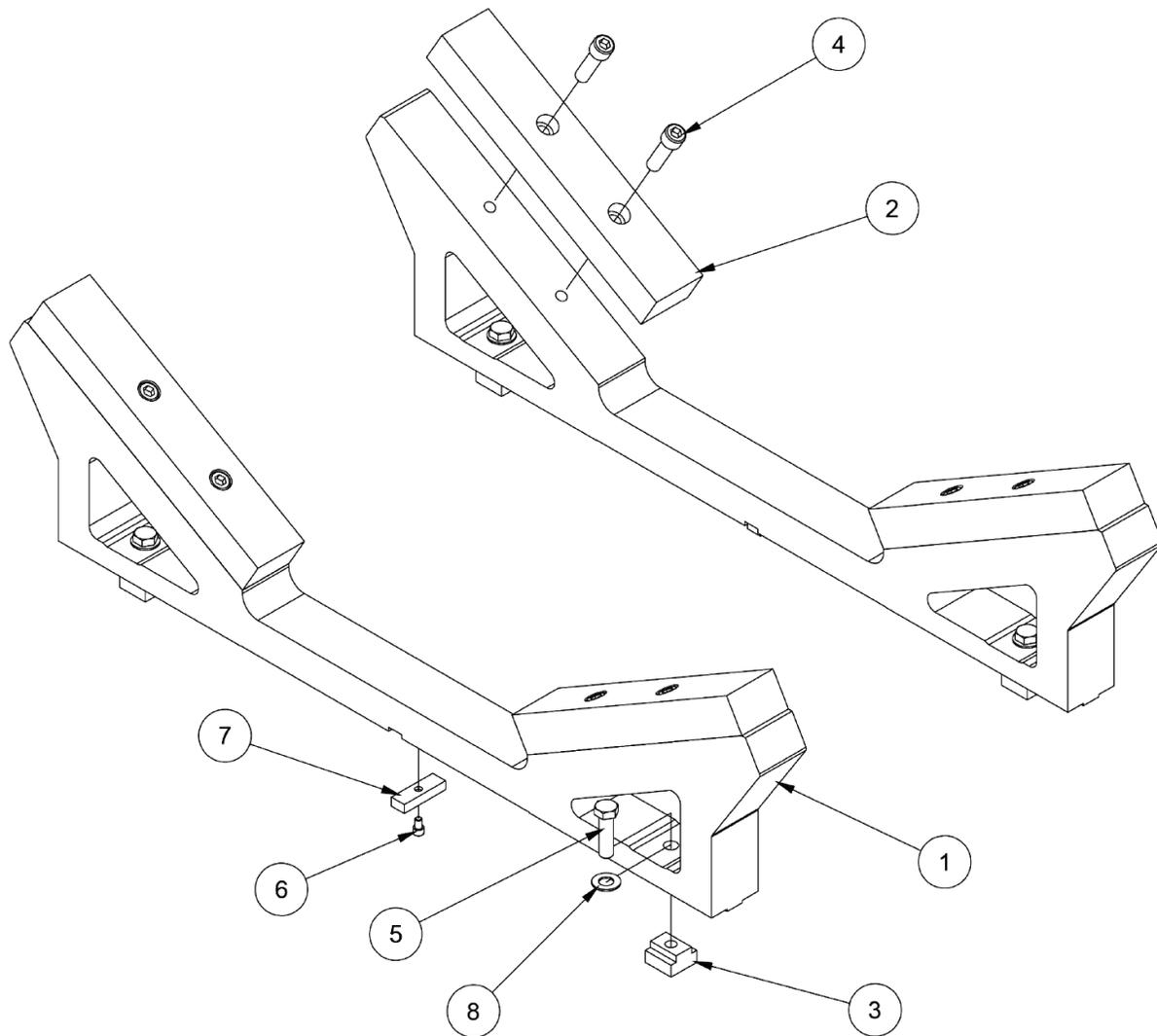
6789L 113 DEG V-BLOCK CRADLE ASSEMBLY			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	2	6831	KEY, FIXTURE
2	4	502-1-11B	T-NUT, $\frac{3}{4}$ "
3	2	MF-12	S.H.C.S. $\frac{1}{4}$ -20 X $\frac{1}{2}$ "
4	4	MF-180	FLAT WASHER, $\frac{1}{2}$ "
5	4	MF-150A	HEX BOLT, $\frac{1}{2}$ -13 X $1 \frac{1}{2}$ "
6	2	6789M	CRADLE, DETROIT DIESEL V53 BLOCK, 113 DEG. 11'

**6789N 116° V-Block Support Kit**

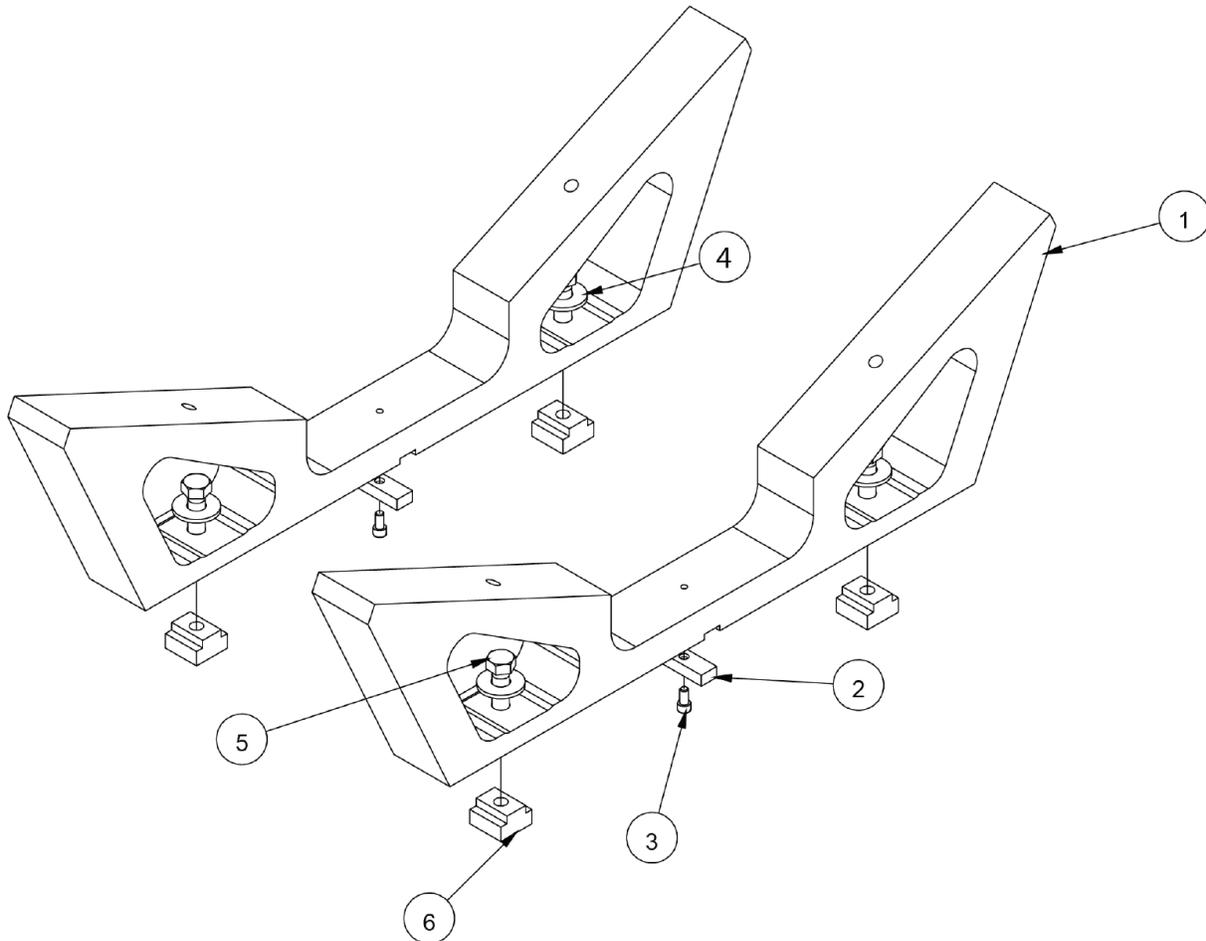
6789N 116 DEG 12 MIN V-BLOCK CRADLE ASSEMBLY			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	2	6831	KEY, FIXTURE
2	2	MF-12	S.H.C.S. 1/4-20 X 1/2"
3	4	MF-180	FLAT WASHER, 1/2"
4	4	MF-150A	HEX BOLT, 1/2-13 X 1 1/2"
5	4	502-1-11B	T-NUT, 1/2-13
6	2	6789P	116 DEG 12' V-BLOCK CRADLE

**6789E 115° V-Block Support Kit**

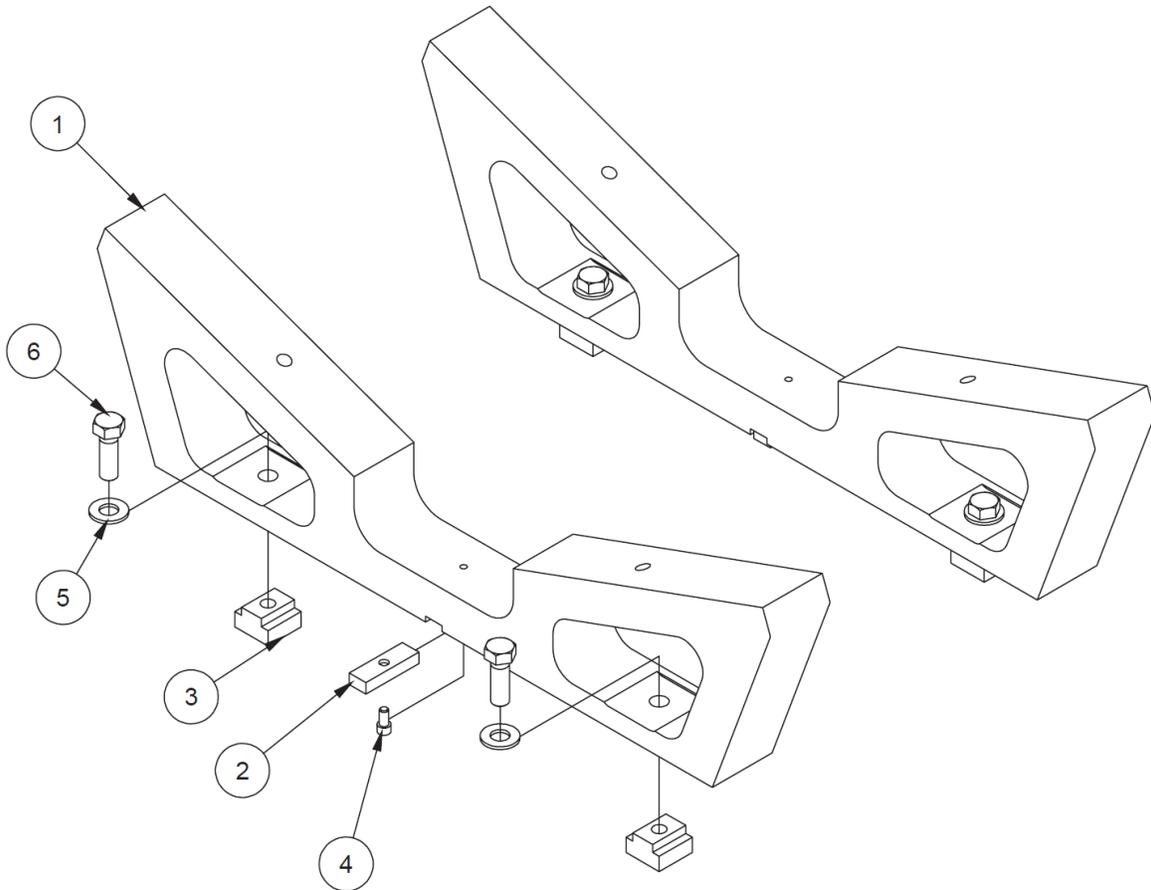
6789N 116 DEG 12 MIN V-BLOCK CRADLE ASSEMBLY			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	2	6789F	115 DEG V-BLOCK CRADLE
2	2	6831	KEY, FIXTURE
3	2	MF-12	S.H.C.S. 1/4-20 X 1/2"
4	4	MF-180	FLAT WASHER, 1/2"
5	4	MF-150A	HEX BOLT, 1/2-13 X 1 1/2"
6	4	502-1-11B	T-NUT, 1/2-13
7		6833A	CLAMP BAR
8		6833B	CLAMP ROD
9		MF-165	HEX NUT, 1/2-13

**6823B 120° V-Block Support Kit**

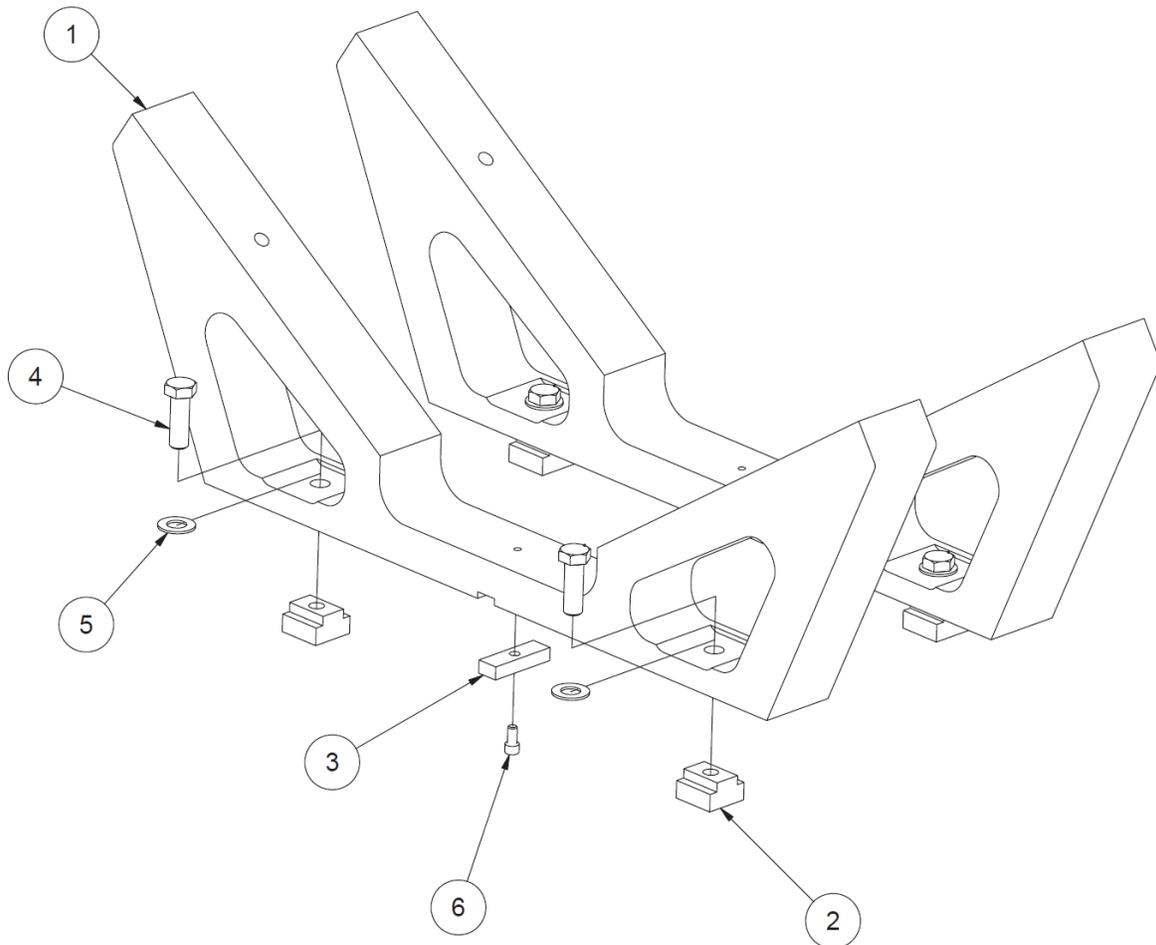
<b>6823B CAT 3500 120 DEGREE V-BLOCK CRADLE ASSEMBLY</b>			
<b>ITEM</b>	<b>QTY</b>	<b>PART NUMBER</b>	<b>DESCRIPTION</b>
1	2	6823A	CAT 3500 CRADLE
2	4	6789H	ADAPTER PLATE 1.5"
3	4	502-1-11B	T-NUT, 1/2-13
4	8	MF-44A	S.H.C.S. 1/2-13 X 1 3/4"
5	4	MF-149B	HEX BOLT, 1/2-13 X 1 3/4"
6	2	MF-11	S.H.C.S. 1/4-20 X 3/8"
7	2	6831	KEY, FIXTURE
8	4	MF-180	FLAT WASHER, 1/2"

**6789K 130° V-Block Support Kit**

<b>6789K 130 DEGREE V-BLOCK CRADLE ASSEMBLY</b>			
<b>ITEM</b>	<b>QTY</b>	<b>PART NUMBER</b>	<b>DESCRIPTION</b>
1	2	6789J	130 DEG V-BLOCK CRADLE
2	2	6831	KEY, FIXTURE
3	2	MF-12	S.H.C.S. 1/4-20 X 1/2"
4	4	MF-180	FLAT WASHER, 1/2"
5	4	MF-150A	HEX BOLT, 1/2-13 X 1 1/2"
6	4	502-1-11B	T-NUT, 1/2-13

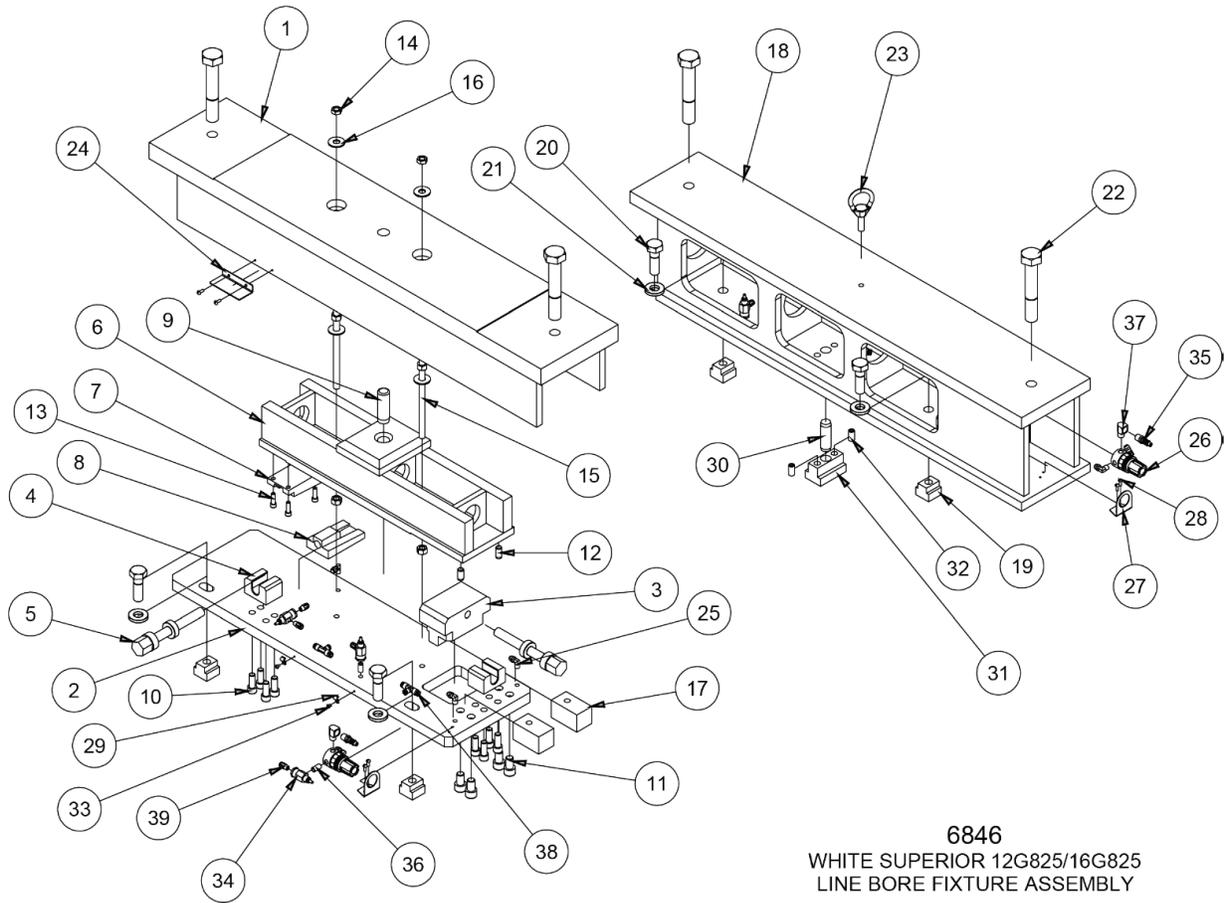
**6789Q 140° V-Block Support Kit**

<b>6789Q 140 DEGREE V-BLOCK CRADLE ASSEMBLY</b>			
<b>ITEM</b>	<b>QTY</b>	<b>PART NUMBER</b>	<b>DESCRIPTION</b>
1	2	6789J	140 DEG V-BLOCK CRADLE
2	2	6831	KEY, FIXTURE
3	4	502-1-11B	T-NUT, 1/2-13
4	2	MF-12	S.H.C.S. 1/4-20 X 1/2"
5	4	MF-180	FLAT WASHER, 1/2"
6	4	MF-150A	HEX BOLT, 1/2-13 X 1 1/2"

**6789T 110° V-Block Support Kit**

<b>6789T CRADLE ASSEMBLY, GE JENBACHER 3 BLOCK (110 DEG) – LINE BORE FIXTURE – F105</b>			
<b>ITEM</b>	<b>QTY</b>	<b>PART NUMBER</b>	<b>DESCRIPTION</b>
1	2	6789J	140 DEG V-BLOCK CRADLE
2	4	502-1-11B	T-NUT, 1/2-13
3	2	6831	KEY, FIXTURE
4	4	MF-150A	HEX BOLT, 1/2-13 X 1 1/2"
5	4	MF-180	FLAT WASHER, 1/2"
6	2	MF-12	S.H.C.S. 1/4-20 X 1/2"

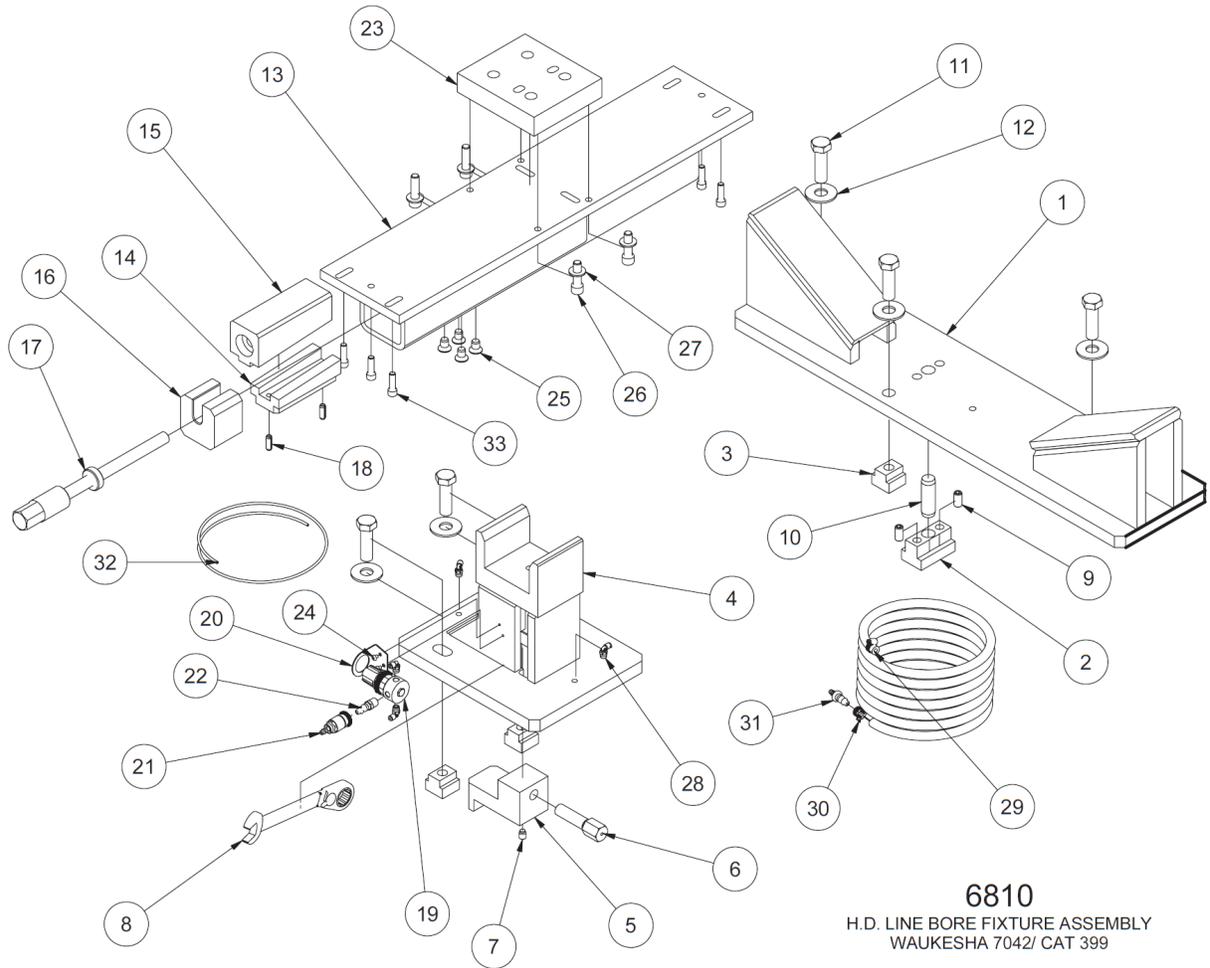
### 6846 White Superior 12 & 16 G825 Line Boring Fixture Kit





6821 LINE BORE FIXTURE ASSEMBLY – F90			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	6848A	ADAPTER (MACH.)
2	1	6852	LOWER PLATE REWORK
3	1	6830	ADJUSTING BLOCK, ADJUSTABLE PARALLEL
4	2	6829	BRACKET, SCREW ADJUSTABLE
5	2	6828	SCREW, ADJUSTABLE PARALLEL
6	1	6849A	TILT ARM (MACH.)
7	1	6826	WEDGE, UPPER ADJUSTABLE PARALLEL
8	1	6827	WEDGE, LOWER ADJUSTABLE PARALLEL
9	1	6853	LOCATING PIN
10	8	MF-43	S.H.C.S. 1/2-13 X 1 1/4"
11	4	MF-46F	S.H.C.S. 5/8-11 X 1"
12	2	MF-213B	DOWEL PIN, 1/2" DIA X 1"
13	3	MF-23	S.H.C.S. 5/16-18 X 1"
14	6	MF-165	HEX NUT, 1/2-13
15	2	6848B	CLAMP STUD, ADJUSTABLE PARALLEL, WHITE SUPERIOR LINE BORE FIXTURE – F90
16	4	MF-180	FLAT WASHER, 1/2"
17	2	6850	LIFT BLOCK
18	1	6847A	STATIONARY PARALLEL
19	4	6160	NUT, "T", HARDENED
20	4	MF-154C	HEX BOLT, 3/4-10 X 2 1/2"
21	4	6287	WASHER, THRUST 3/4"
22	4	6854	HEX BOLT, 1-8 X 6"
23	1	502-3-13	LIFT EYE
24	1	6851	CHIP SHILED, UPPER PAD ADJUSTABLE PARALLEL
25	6	502-11-16I	ELBOW, MALE 1/4 NPT X 1/8
26	2	502-27-17	REGULATOR, 0-60 PSI
27	2	502-27-17A	REGULATOR BRACKET
28	6	MF-111	SLOTTED ROUND HEAD SCREW, #10-24 X 1/2"
29	2	502-12-16	WIRE CLIP
30	1	6819	LOCATING, PIVOT PIN
31	1	6820	LOCATING, PIVOT KEY, WAUKESHA 7042/CAT 399
32	2	MF-72	SOCKET SET SCREW, FLAT POINT, 1/2-13 X 1"
33	2	MF-86	SOCKET BUTTON HEAD, #8-32 X 1/4"
34	6	502-11-35A	FLOW CONTROLLER
35	2	502-11-16X	QUICK CONNECT AIR FITTING, MALE
36	5	502-11-17J	NIPPLE, CLOSE, 1/8" NPT
37	2	502-11-17S	1/4 STREET ELL
38	3	514-4-17N	TEE, UNION, 1/4 TUBE
39	7	514-4-17W	FITTING, 1/8 NPT X 1/4 POLY TUBE

## 6810 Waukesha 7042, 9390 and CAT 379, 398, 399 Line Boring Fixture Kit



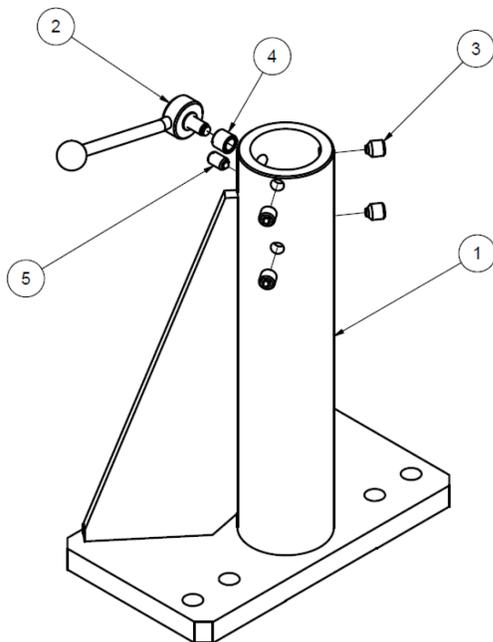
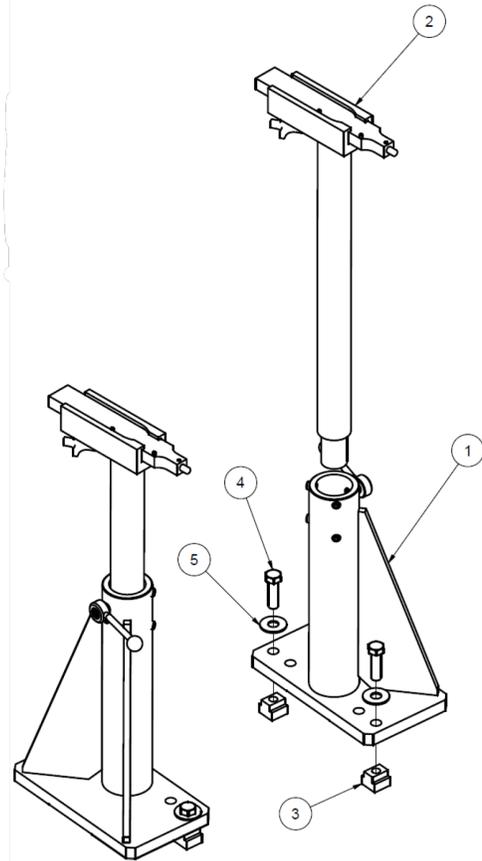


<b>6810 HEAVY DUTY LINE BORE FIXTURE ASSEMBLY FOR WAUKESHA 7042/CAT 399</b>			
<b>ITEM</b>	<b>QTY</b>	<b>PART NUMBER</b>	<b>DESCRIPTION</b>
1	1	6811B	CRADLE (MACHINING) L.H. ADJUSTING, WAUKESHA 7042 LINE BORE FIXTURE
2	1	6820	LOCATING PIVOT KEY, DIESEL LINE BORE FIXTURE
3	5	6160	NUT, "T", HARDENED
4	1	6812C	SUPPORT (MACHINING) WAUKESHA 7042/CAT 399 LINE BORE FIXTURE
5	1	6814A	ADJUSTING BLOCK – WAUKESHA 7042/CAT 399 LINE BORE FIXTURE
6	1	6812E	SCREW, ADJUSTING SUPPORT, WAUKESHA 7042/CAT 399 LINE BORE FIXTURE
7	1	500-96-3C	SET SCREW, BRASS TIPPED, 7/16-14 X 1/2"
8	1	6812F	1" REVERSIBLE RATCHETING WRENCH
9	2	MF-72	SET SCREW, FLAT POINT, 1/2-13 X 1"
10	1	6819	LOCATING, PIVOT PIN
11	5	MF-154C	HEX BOLT, 3/4-10 X 2 1/2"
12	5	MF-181A	FLAT WASHER, 3/4"
13	1	6813	TUBE ASSEMBLY, ADJUSTABLE, WAUKESHA 7042/CAT 399 LINE BORE FIXTURE
14	1	6411	LOWER LEVELING PAD
15	1	6410	UPPER LEVELING PAD
16	1	6409	BRACKET, LEVELING SCREW (CAT 399)
17	1	6408	LEVELING SCREW
18	2	MF-229B	PIN – SLOTTED SPRING
19	1	502-27-17	REGULATOR, 0-60 PSI
20	1	502-27-17A	REGULATOR BRACKET
21	1	502-11-16W	QUICK CONNECT AIR FITTING, FEMALE
22	1	502-11-16X	QUICK CONNECT AIR FITTING, MALE
23	1	6813C	ADAPTER, CAT 399 – WAUKESHA 7042/CAT 399 LINE BORE FIXTURE
24	2	MF-87	SOCKET BUTTON HEAD, #10-24 X 1/4"
25	4	6409A	SOCKET FLAT HEAD SCREW, 1/2-13 X 3/4"
26	4	MF-44A	SOCKET HEAD CAP SCREW, 1/2-13 X 1 3/4"
27	4	MF-180	FLAT WASHER, 1/2"
28	4	514-4-18	ELBOW, 1/8 NPT X 1/8 POLY
29	1	502-1-98	1/4" AIR HOSE
30	2	502-1-97	CLAMP, 1/4" I.D. HOSE
31	1	502-11-16Y	CONNECTOR, MALE, AIR 1/4 NPT
32	1	514-4-24	1/4" AIR HOSE – 2 FEET
33	6	MF-32	S.H.C.S. 3/8-16 X 1 1/4"

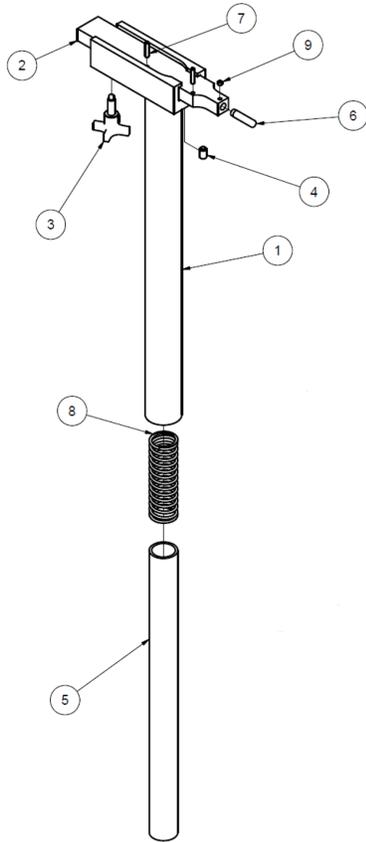
## Miscellaneous Fixtures/Accessories

### 6309N Tower Type Block Hold-down Clamp Kit

6309N CLAMP TOWER ASSEMBLY			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	2	6309J	BASE ASSEMBLY, BLOCK CLAMP
2	2	6310D	CLAMP LEG ASSEMBLY
3	4	6160	NUT, "T", HARDENED
4	4	MF-154C	HEX BOLT, 3/4-10 X 2 1/2"
5	4	MF-181A	FLAT WASHER, 3/4"

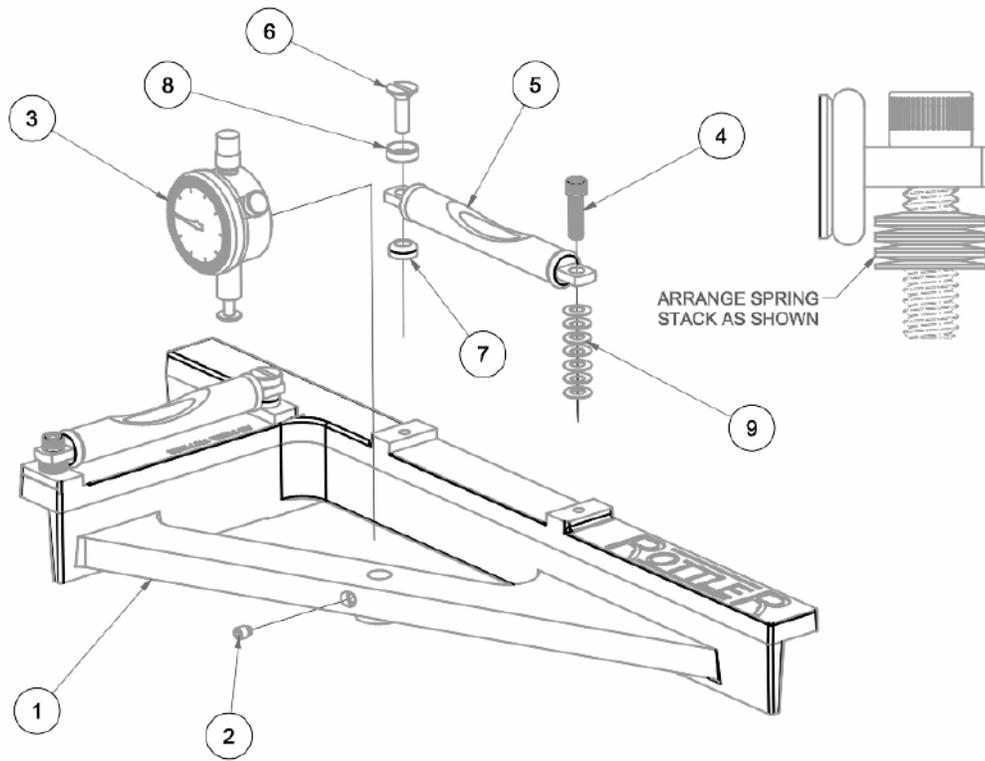


6309J CLAMP TOWER BASE ASSEMBLY			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	6309L	BLOCK CLAMP BASE
2	1	6310N	HANDLE ASSEMBLY, CLAMP TOWER
3	4	6310Y	SET SCREW, BRASS TIPPED
4	1	6310R	THREAD INSERT
5	1	502-8-52C	SPRING PLUNGER



6310 CLAMP LEG ASSEMBLY			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	6310T	CLAMP LEG WELDMENT
2	1	6310H	CLAMP SHOE
3	1	6310K	HAND KNOB
4	1	502-8-52C	SPRING PLUNGER
5	1	6310P	SPACER, LONG SPRING SHOCK, F90 CLAMP LEG
6	1	MF-214	DOWEL PIN, 1/2" X 2"
7	2	MF-227	ROLL PIN, 1/4" X 1 1/4"
8	1	6310S	SPRING
9	1	MF-67	SET SCREW, FLAT POINT, 5/16-18 X 1/4"

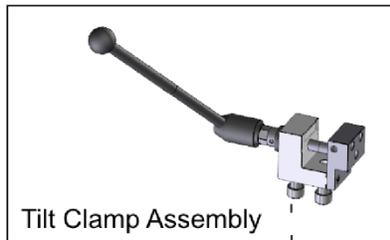
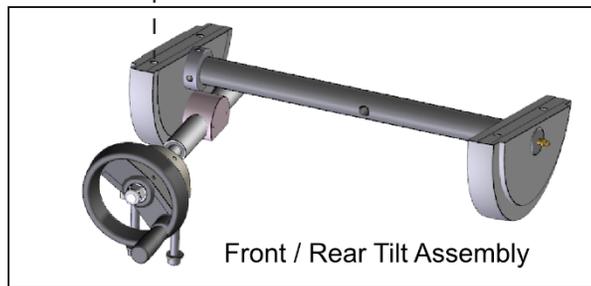
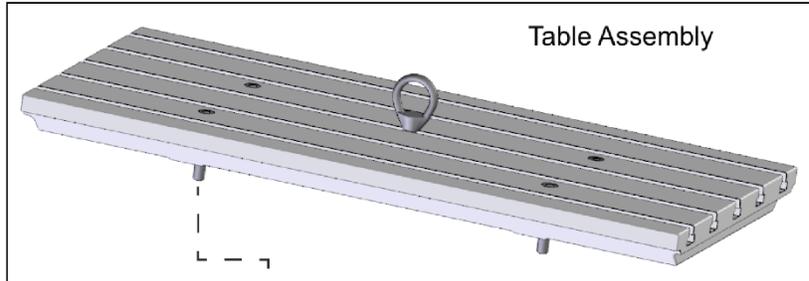
## 7152Q Dual Axis Level



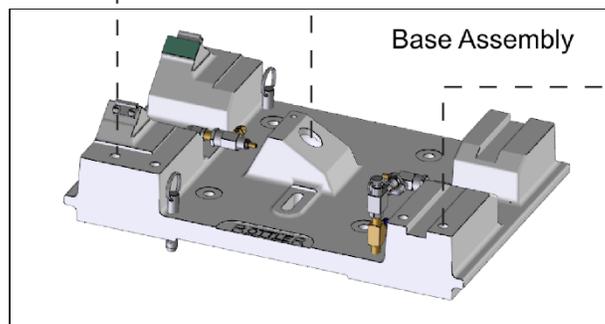
7152Q HEAD LEVEL ASSEMBLY			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	7152R	BODY, (MACHINING) - HEAD SURFACE LEVEL
2	1	100-82-2	Set Screw, brass tipped
3	1	7038Y (OPTIONAL)	INDICATOR, DIAL (FLATNESS PROBE DUAL AXIS LEVEL ASSY)
4	2	7152U	ADJUSTING SCREW, LEVEL VIAL - DUAL AXIS LEVEL ASSEMBLY
5	2	7152C	LEVEL VIAL - DUAL AXIS LEVEL ASSEMBLY
6	2	7153G	SCREW, FLAT HEAD 12-24UNC HEAD SURFACING LEVEL
7	2	7153V	WASHER, LEVEL MOUNTING (RADIUS HEAD)
8	2	7153Z	WASHER, LEVEL MOUNTING (COUNTERSUNK HEAD)
9	14	7152V	BELLEVILLE SPRING - LEVEL VIAL

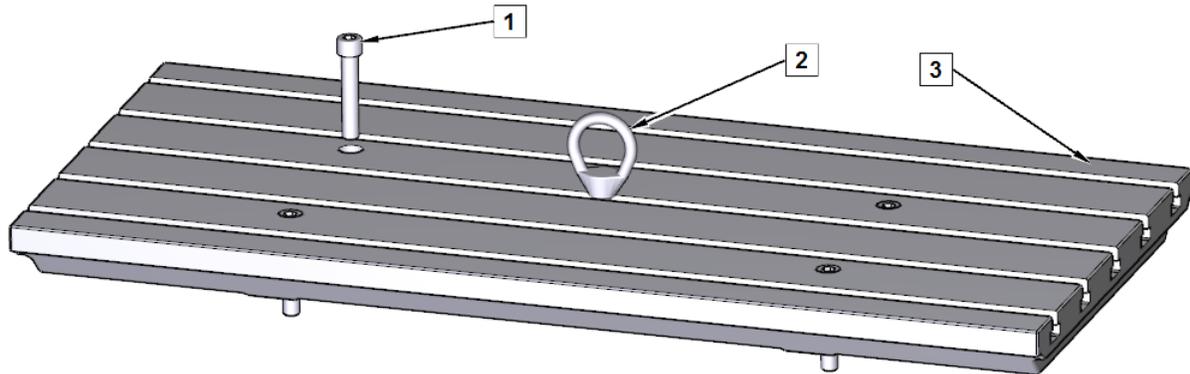
### 7209M Dual Axis Leveling Table

#### 7209M Leveling Table Sections

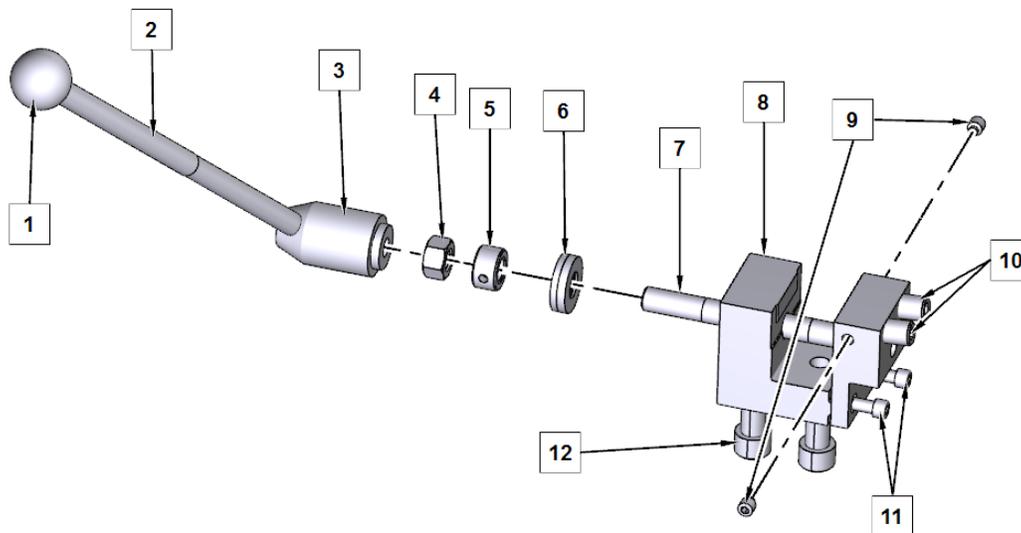


#### Tensioner Assembly

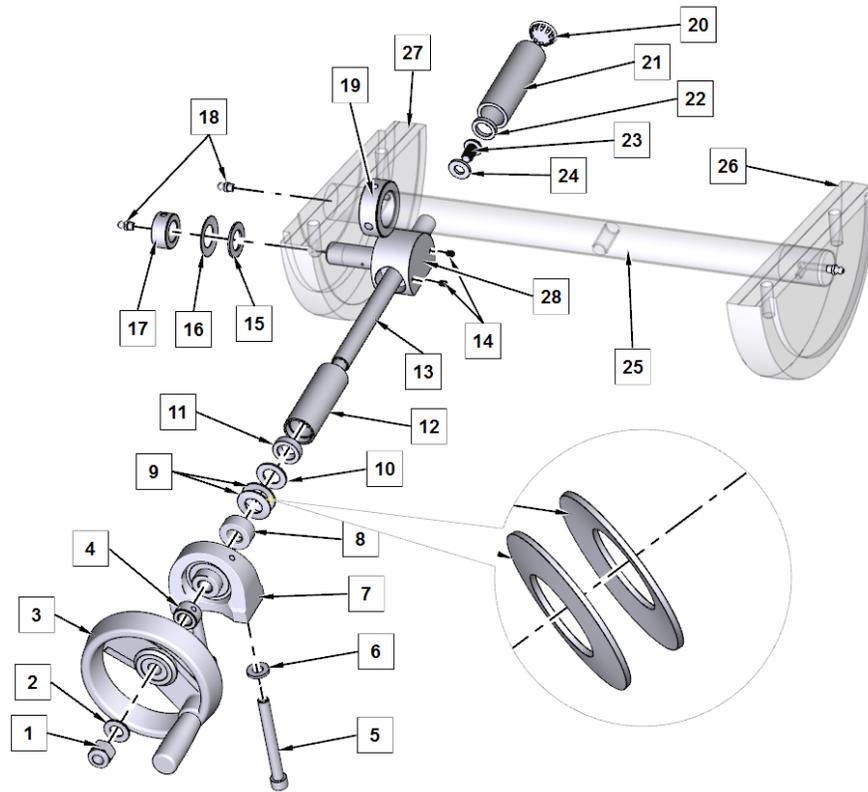




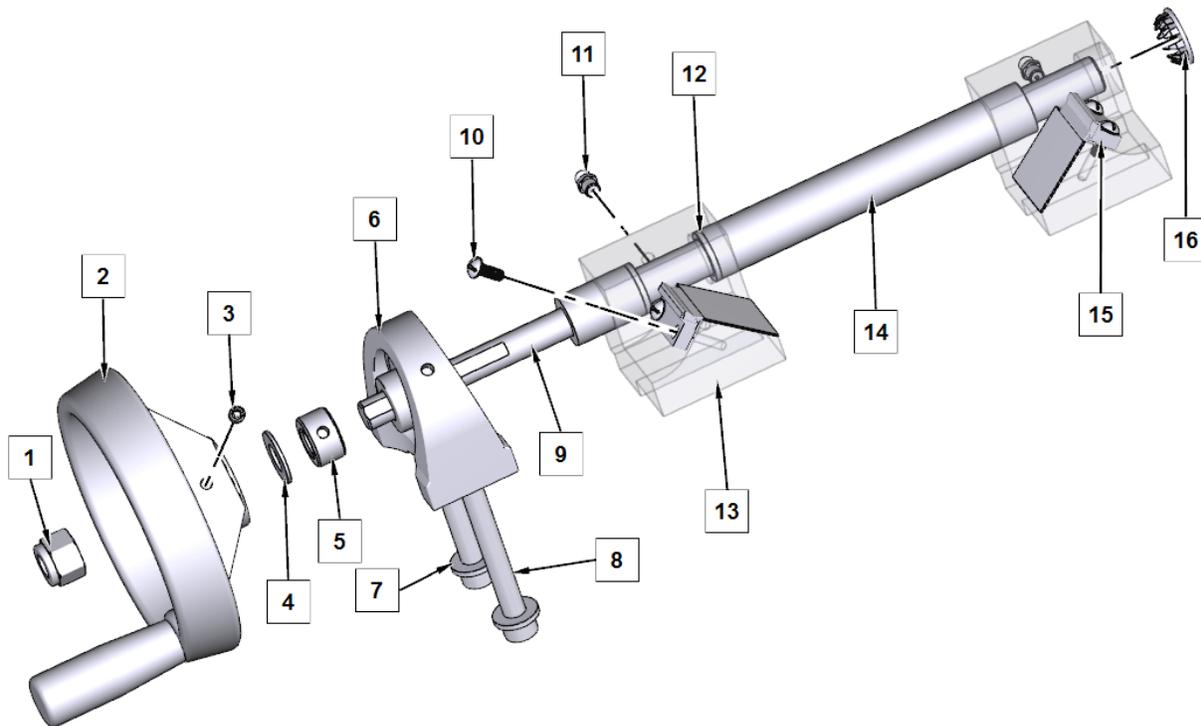
ITEM	QTY	PART NUMBER	DESCRIPTION
1	4	MF-45	SOCKET HEAD CAPSCREW, 1/2-13 X 2"
2	1	502-3-13	EYE, LIFTING
3	1	7207C	TABLE, DUAL AXIS HEAD FIXTURE



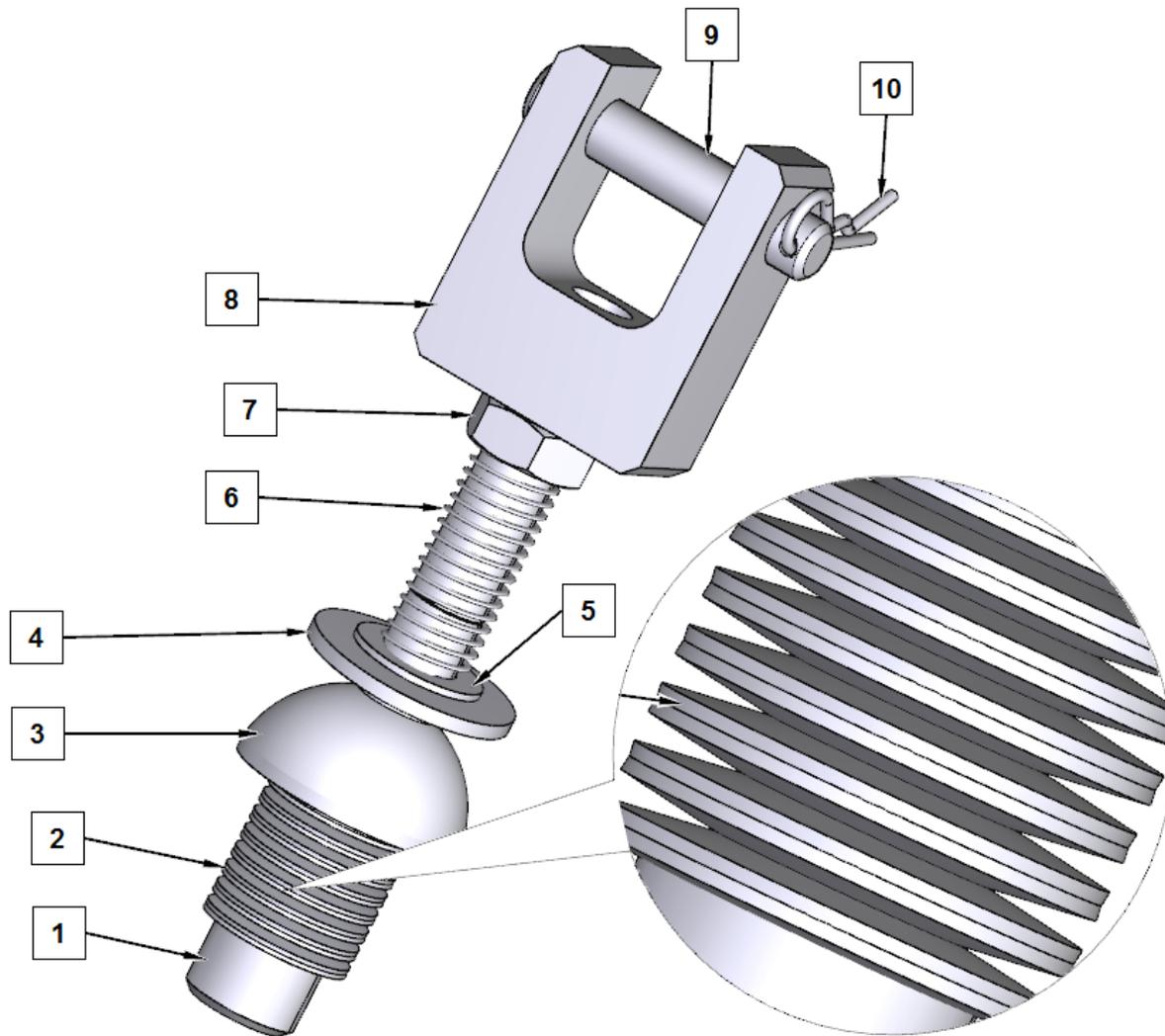
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	514-2-39E	KNOB, ADJUSTABLE HANDLE
2	1	514-2-39B	EXTENDER, ADJUSTABLE HANDLE
3	1	514-2-39D	HANDLE, ADJUSTABLE - CLAMP STOP
4	1	MF-165	HEX NUT, 1/2-13
5	1	7209J	COLLAR, 1/2" SHAFT
6	1	7209E	WASHER, SPHERICAL
7	1	7207Z	SHAFT, JOURNAL CLAMP
8	1	7210J	CLAMP BLOCK, JOURNAL CLAMP
9	2	504-29-36	SCREW, SET - BRASS TIPPED 5/16-18 X 5/16"
10	2	7209B	SCREW, SET - BRASS TIPPED 1/2-20 X 3/4"
11	2	MF-12	SOCKET HEAD CAP SCREW, 1/4-20 X 1/2"
12	2	MF-45	SOCKET HEAD CAP SCREW, 1/2-13 X 2"



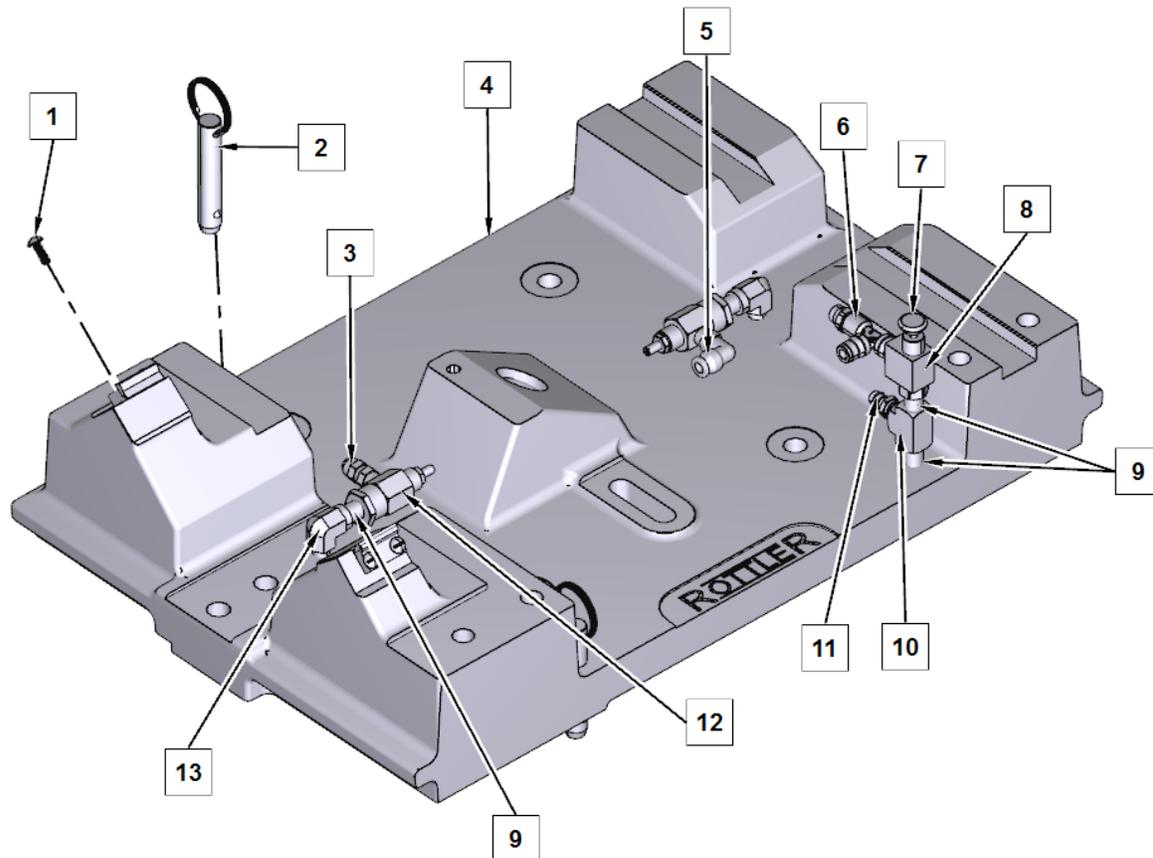
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	MF-186	NYLOCK NUT, 1/2-13
2	1	100-19	WASHER, THRUST
3	1	7201M	HANDWHEEL
4	1	7209J	COLLAR, 1/2" SHAFT
5	2	MF-36A	SOCKET HEAD CAPSCREW, 3/8-16 X 3 1/2"
6	2	100-28-32	WASHER, 3/32" THICK
7	1	7201D	BLOCK, PILLOW, LEVEL ADJUST
8	1	7199E	COLLAR, SUPPORT BLOCK (5/8" DIA)
9	2	514-7-21	WASHER, BELLEVILLE
10	1	514-7-20	WASHER, THRUST
11	1	7209F	SEAL, PIVOT NUT TUBE
12	1	7201Y	TUBE, SEALED – PIVOT NUT
13	1	7209Q	SHAFT, FRONT/REAR TABLE TILT
14	2	MF-52	SOCKET SET SCREW, CUP POINT, #10-24 X 1/4"
15	1	514-2-90	WASHER, THRUST
16	1	7209K	WASHER, BELLEVILLE – PIVOT NUT
17	1	7201X	COLLAR, PIVOT NUT
18	2	MF-189	1/4-28 STRAIGHT LUBE GREASE FITTING
19	1	7207X	COLLAR, CLAMP BAR – 1 1/4"
20	1	506-3-1	PLUG, SNAP-IN HOLE – 7/8"
21	1	7201T	TUBE, CAPPED – PIVOT NUT
22	1	514-7-35	O-RING, LEVELING TABLE
23	1	MF-97	SOCKET BUTTON HEAD SCREW 3/8-16 X 5/8"
24	1	100-28-32	WASHER, 3/32"
25	1	7207V	BAR, CLAMP
26	1	7207J	JOURNAL, RIGHT
27	1	7207H	JOURNAL, LEFT



ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	MF-186	NYLOCK NUT, 1/2-13
2	1	7201M	HANDWHEEL
3	1	MF-60	SOCKET SET SCREW, CUP POINT, 1/4-20 X 1/4"
4	1	100-19	WASHER, THRUST
5	1	7209J	COLLAR, 1/2" SHAFT
6	1	7201D	BLOCK, PILLOW, LEVEL ADJUST
7	2	100-28-32	WASHER, 3/32" THICK
8	2	MF-36A	SOCKET HEAD CAPSCREW, 3/8-16 X 3 1/2"
9	1	7207M	SHAFT, LEFT/RIGHT TILT
10	1	MF-111	ROUND HEAD MACHINE SCREW, #10-24 X 1/2"
11	1	MF-189	1/4-28 STRAIGHT LUBE GREASE FITTING
12	1	7209H	BUMPER, LEFT/RIGHT PIVOT
13	1	7222	BLOCK, FRONT BEARING
14	1	7207N	COVER, LEFT/RIGHT TILT SHAFT
15	1	7198Y	WIPER, JOURNAL
16	1	506-3-1	PLUG, SNAP-IN HOLE - 7/8"

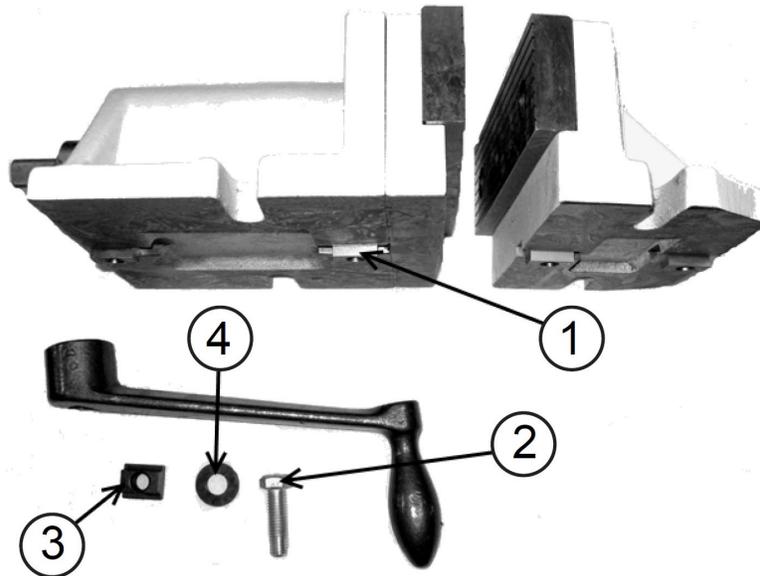


ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	7209W	SCREW, CLAMP BAR
2	16	514-7-21	WASHER, BELLEVILLE
3	1	7209U	WASHER, SPHERICAL – HOLD DOWN
4	1	MF-181	FLAT WASHER, $\frac{5}{8}$ "
5	1	514-7-20	WASHER, THRUST
6	1	100-28-20C	SPRING, HOLD DOWN
7	1	MF-173	HEX JAM NUT, $\frac{5}{8}$ -11
8	1	7209S	ROD END, CLAMP BAR
9	1	7210B	PIN, CLEVIS
10	1	7232K	HITCH PIN CLIP



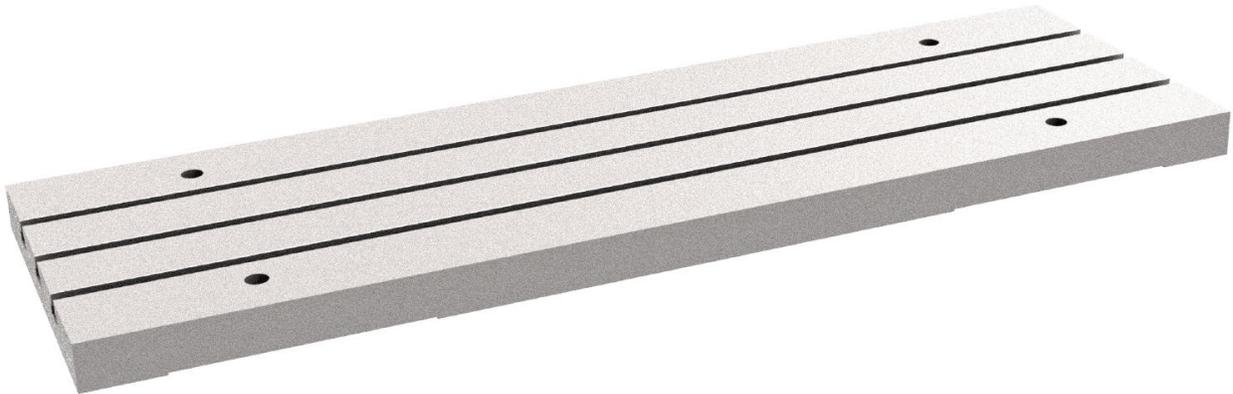
ITEM	QTY	PART NUMBER	DESCRIPTION
1	4	MF-11	ROUND HEAD MACHINE SCREW, #10-24 X 1/2"
2	1	7201C	PIN, GUIDE, ROTTLER LEVELING TABLE
3	1	502-11-16E	CONNECTOR, MALE, 1/4 X 1/8" NPT
4	1	7233	FRAME, TABLE
5	1	514-4-17E	ELBOW, 90 DEGREE MALE - 1/4 X 1/8" NPT
6	1	514-4-17X	TEE, RUNNING 1/8" NPT X 1/4"
7	1	502-1-56	PUSHBUTTON
8	1	514-2-65	VALVE, AIR - LIMIT & STOP
9	2	502-11-17J	NIPPLE, CLOSE 1/8" NPT
10	1	502-11-17C	TEE, 1/8" X 1/8"
11	1	502-1-96A	INSERT, BARBED - HOSE
12	2	502-11-35A	VALVE, CONTROL - RFC FLOW
13	2	502-11-17R	ELBOW, ST, 1/8" NPTF X 1/8" NPTM

### 7209N 2-Piece Vise

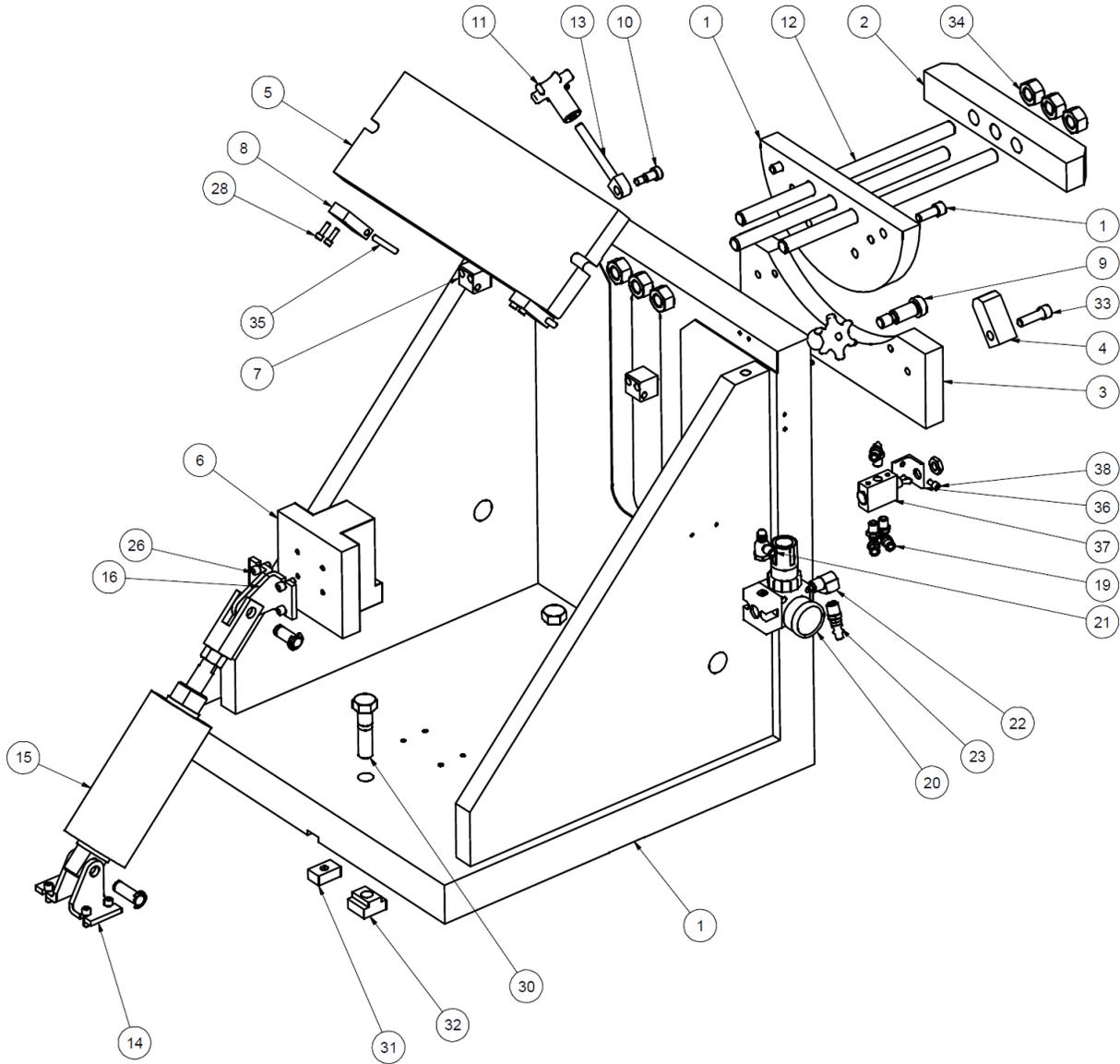


ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	7210E	KEY, STEPPED
2	1	MF-137F	HEX BOLT, 1/2-13 X 1 3/4"
3	1	7137B	NUT, "T"
4	1	100-19A	WASHER, HARDENED 17/32" I.D.

### 9111A T-Slot Plate for F60 Model Fixtures



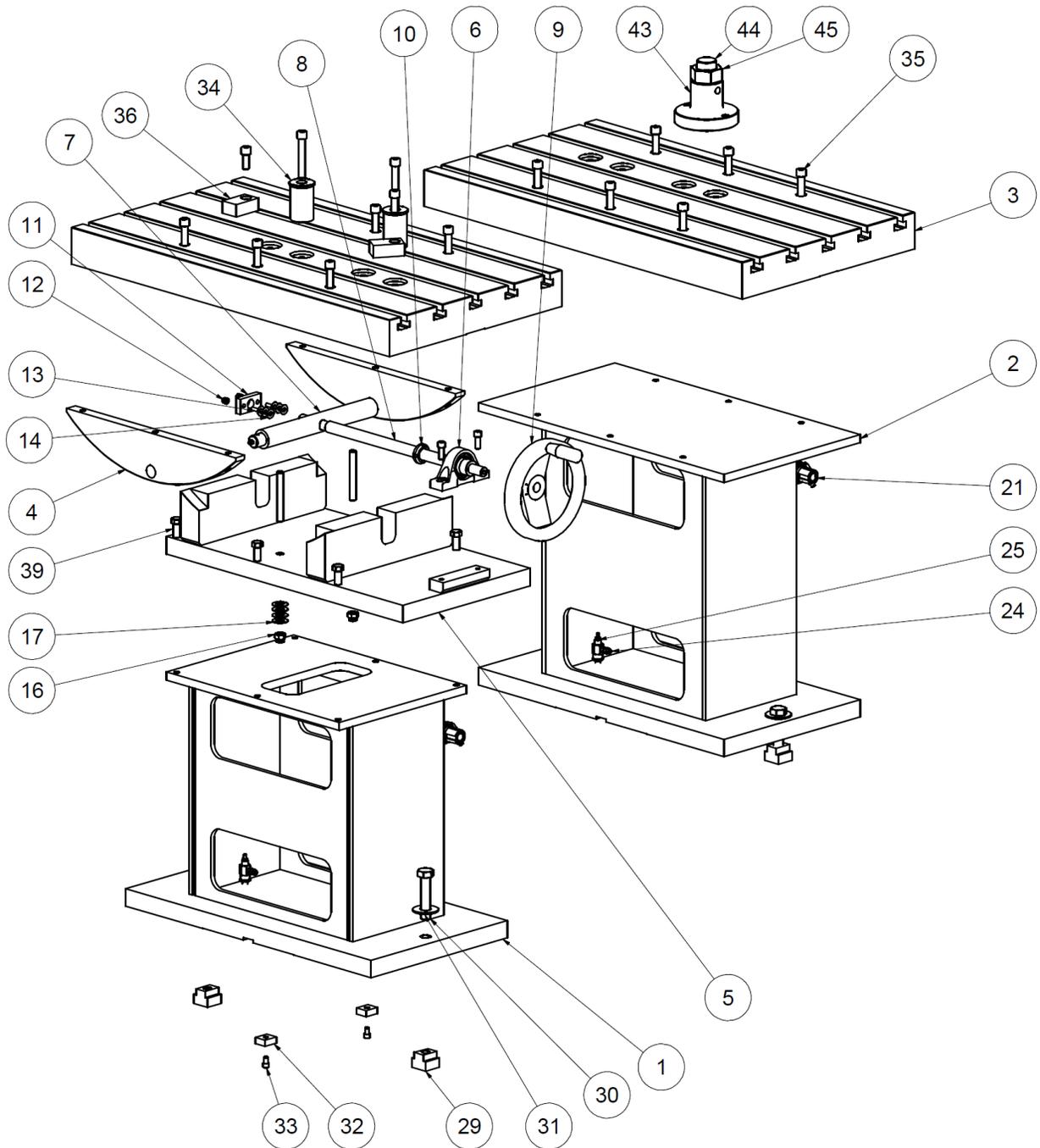
## 650-3-66 Compressor Conrod Cap Surfacing Fixture Kit





<b>650-3-66 COMPRESSOR CONROD CAP SURFACING FIXTURE ASSEMBLY</b>			
<b>ITEM</b>	<b>QTY</b>	<b>PART NUMBER</b>	<b>DESCRIPTION</b>
1	1	650-3-66K	MAIN FRAME ASSEMBLY
2	1	650-3-66B	CLAMP BAR
3	1	650-3-66C	CARRIAGE, CAP CUTTING FIXTURE
4	2	650-3-66E	LIFT ARM
5	1	650-3-66D	LOCATE PLATE
6	1	650-3-66G	SLIDE ASS'Y (TURCITE)
7	2	650-3-66H	LOWER HINGE
8	2	650-3-66J	UPPER HINGE
9	1	650-3-66Q	SHOULDER SCREW $\frac{5}{8}$ X 1 $\frac{1}{4}$ "
10	2	650-3-66R	SHOULDER SCREW, CONROD CAP FIXTURE ASS'Y, F88S
11	2	650-3-66N	KNOB – REID TC2A
12	3	650-3-66M	CLAMP STUD
13	2	650-3-66P	EYE BOLT
14	1	650-3-45H	PIVOT BRACKET, BIMBA #D-13512-A
15	2	650-3-45G	LOCATE CYLINDER, CONROD
16	1	650-3-45H	PIVOT BRACKET, BIMBA #D-13512-A
19	3	514-4-17V	FITTING $\frac{1}{8}$ NPT X $\frac{1}{4}$ POLY – 90 DEGREE
20	1	514-2-70K	REGULATOR ASS'Y
21	1		FLOW CONTROLLER
22	1	502-11-17S	$\frac{1}{4}$ STREET ELL
23	1	502-11-16X	CONNECTOR, MALE THREAD $\frac{1}{4}$ NPT, V6/V8 FIXTURE
26	8	MF-13	SOCKET HEAD CAPSCREW $\frac{1}{4}$ -20 X $\frac{5}{8}$ "
27	4	MF-6	SOCKET HEAD CAPSCREW #10-24 X $\frac{3}{4}$ "
28	4	MF-5	SOCKET HEAD CAPSCREW #10-24 X $\frac{5}{8}$ "
30	3	MF-152A	HEX BOLT $\frac{5}{8}$ -11 X 2 $\frac{1}{2}$ "
31	2	6553J	GUIDE KEY
32	3	502-1-11A	T-NUT $\frac{3}{4}$ TABLE, $\frac{5}{8}$ -11 THREAD
33	1	MF-32	SOCKET HEAD CAPSCREW $\frac{3}{8}$ -16 X 1 $\frac{1}{4}$ "
34	6	MF-166	HEX NUT $\frac{5}{8}$ -11
35	2	MF-207	DOWEL PIN $\frac{1}{4}$ " X 1 $\frac{1}{2}$ "
36	1	502-1-55A	AIR SWITCH MOUNT BRACKET
37	1	502-1-55	AIR SWITCH, CLIPPARD #MJTU-4
38	2	MF-4	SOCKET HEAD CAPSCREW #10-24 X $\frac{3}{8}$ "

## 6870 Precision Large Connecting Rod Fixture Kit

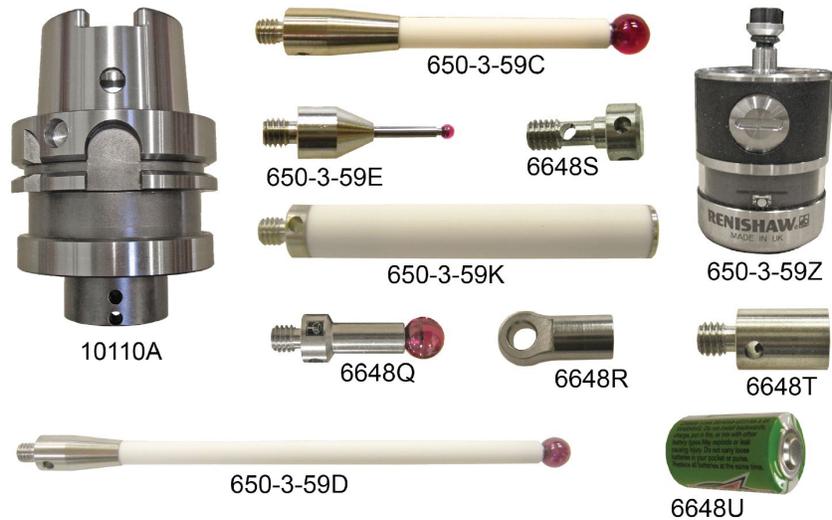




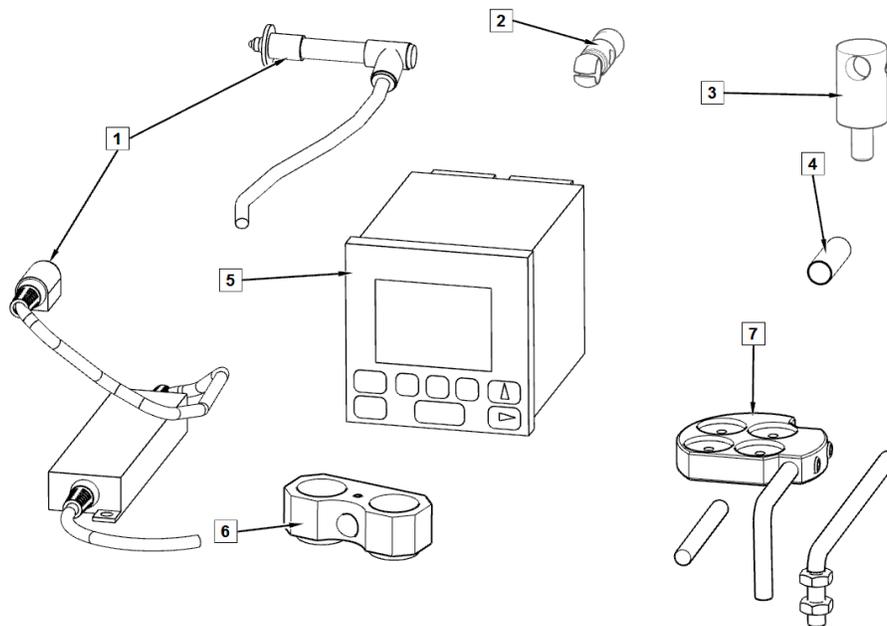
<b>6870 Precision Large Connecting Rod Fixture Kit</b>			
<b>ITEM</b>	<b>QTY</b>	<b>PART NUMBER</b>	<b>DESCRIPTION</b>
1	1	6872B	PIVOT TABLE SUPPORT, EXTRA LARGE CONROD FIXTURE
2	1	6871C	TABLE SUPORT, EXTRA LARGE CONROD FIXTURE
3	2	6871D	TABLE TOP
4	2	6874C	PIVOT ARC
5	1	6872E	CRADLE, MACHINING
6	1	6871B	PILLOW BLOCK
7	1	6874D	PIVOT SHAFT
8	1	6874	PIVOT SCREW
9	1	6874A	HANDWHEEL
10	1	504-34-54	LOCKNUT BEARING (BH-05) F5 SERIES
11	1	6874B	BACKLASH PLATE
12	2	MF-186A	NYLOCK NUT, ¼-20
13	2	MF-66	SOCKET SET SCREW, CUP POINT, ¼-20 X 1 ½"
14	6	9024E	SPRING, BELLEVILLE – GIB F90 SERIES
15	2	6874F	SET-UP STUD
16	2	MF-186	NYLOCK NUT, ½-13
17	8	514-7-21	BELLVILLE SPRING
18	1	6396	JACKING SCREW, 7" LG
19	1	6395E	JACK BODY
20	2	502-27-17A	REGULATOR BRACKET
21	2	502-27-17	REGULATOR, 0-60 PSI
22	2	502-11-17S	¼ STREET ELL
23	2	502-11-16X	CONNECTOR, MALE THREAD, ¼ NPT, V6/V8 FIXTURE
24	4	502-11-16E	CONNECTOR, MALE ¼ X ⅛ PT
25	4	502-11-35A	FLOW CONTROLLER
26	4	502-11-17J	NIPPLE, CLOSE, ⅛" NPT
27	4	6870D	SUPPORT TUBE ASSEMBLY
29	4	6160	NUT, "T", HARDENED
30	4	MF-154E	HEX BOLT ¾-10 X 3 ½"
31	4	MF-181A	FLAT WASHER, ¾"
32	4	6553K	LOCATING KEY
33	4	MF-21A	SOCKET HEAD CAPSCREW 5/16-18 X ½"
34	2	6874E	LOCATOR
35	14	MF-41D	SOCKET HEAD CAPSCREW ½-13 X 3 ¼"
36	2	6874G	PARALLEL
37	4	650-3-10	TN-5 T-NUT
38	2	MF-43	SOCKET HEAD CAPSCREW ½-13 X 1 ¼"
39	8	MF-149C	HEX BOLT ½-13 X 2"
40	2	100-19A	WASHER, HARDENED, 17/32" I.D.
41	2	MF-31	SOCKET HEAD CAPSCREW ⅜-16 X 1"
42	2	MF-189	¼-28 STRAIGHT LUBE GREASE FITTING
43	1	7241Q	JACK BODY, ECONOMY FIXTURE, F60 SERIES
44	1	7241N	JACKING SCREW, 4 ¾" LG. – F60 ECONOMY FIXTURE
45	2	6566H	JACKING NUT

## Auxiliary Equipment

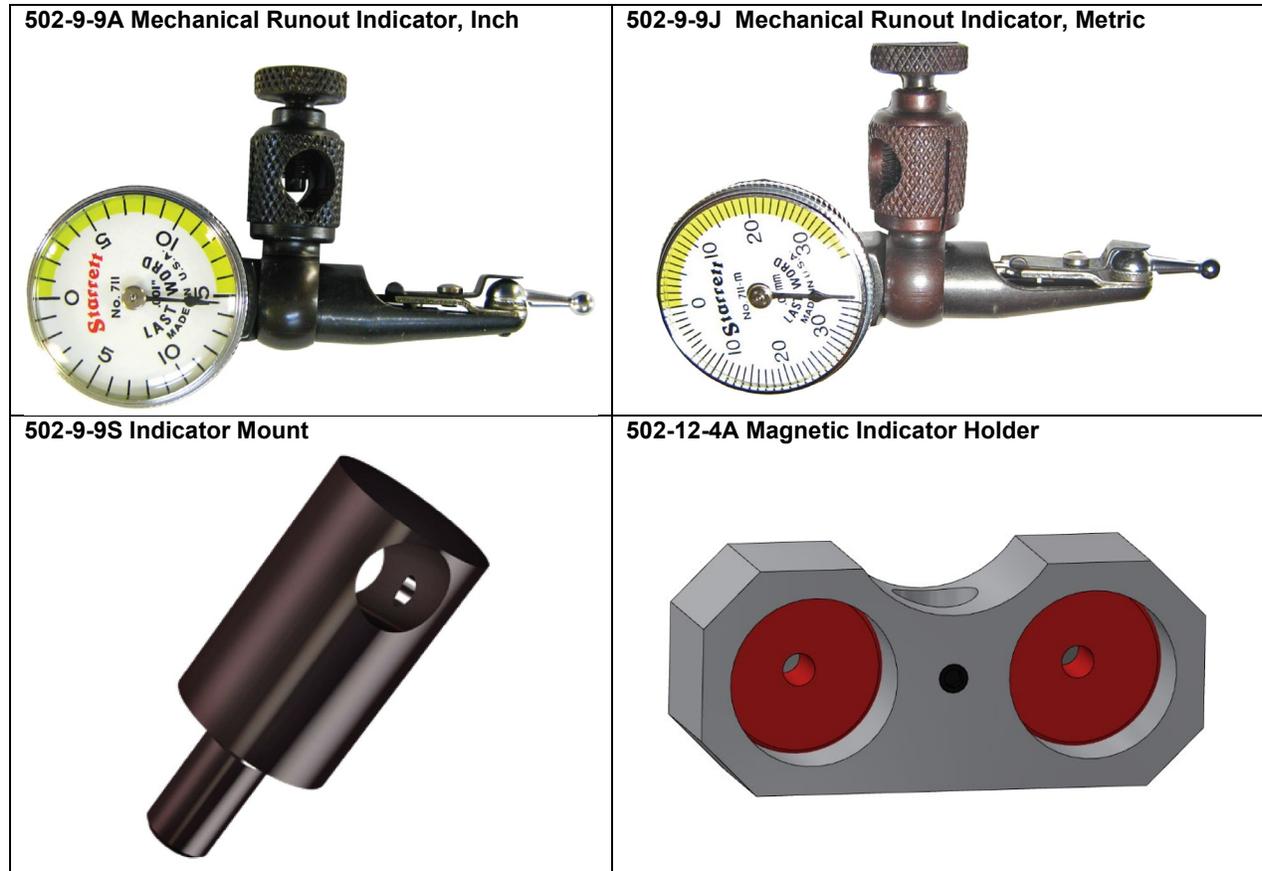
### 10110 Renishaw Wireless Radio Probing System Kit



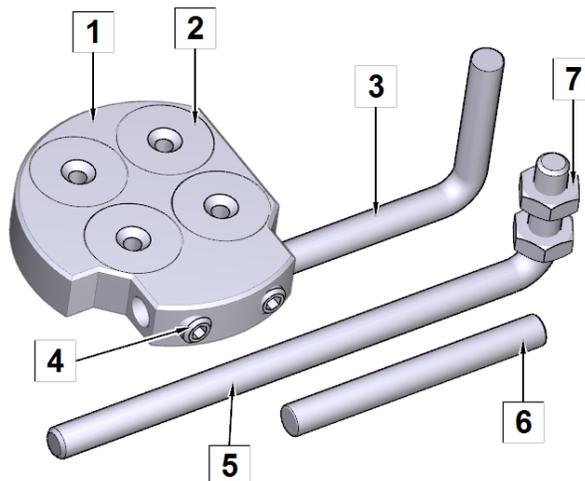
### 502-12-7B Digital Runout Probe and Readout Kit



ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	502-12-7C	DIGITAL GAUGE
2	1	502-11-40	CLAMP BODY
3	1	502-9-9S	INDICATOR MOUNT, RIGHT ANGLE DRIVE
4	1	502-12-7E	GAUGE ADAPTER SLEEVE
5	1	502-12-7D	1-AXIS GAGING DISPLAY – DIGITAL RUNOUT GAUGE
6	1	502-12-4A	MAGNETIC HOLDER ASSEMBLY
7	1	502-12-4	MAGNETIC HOLDER ASSEMBLY

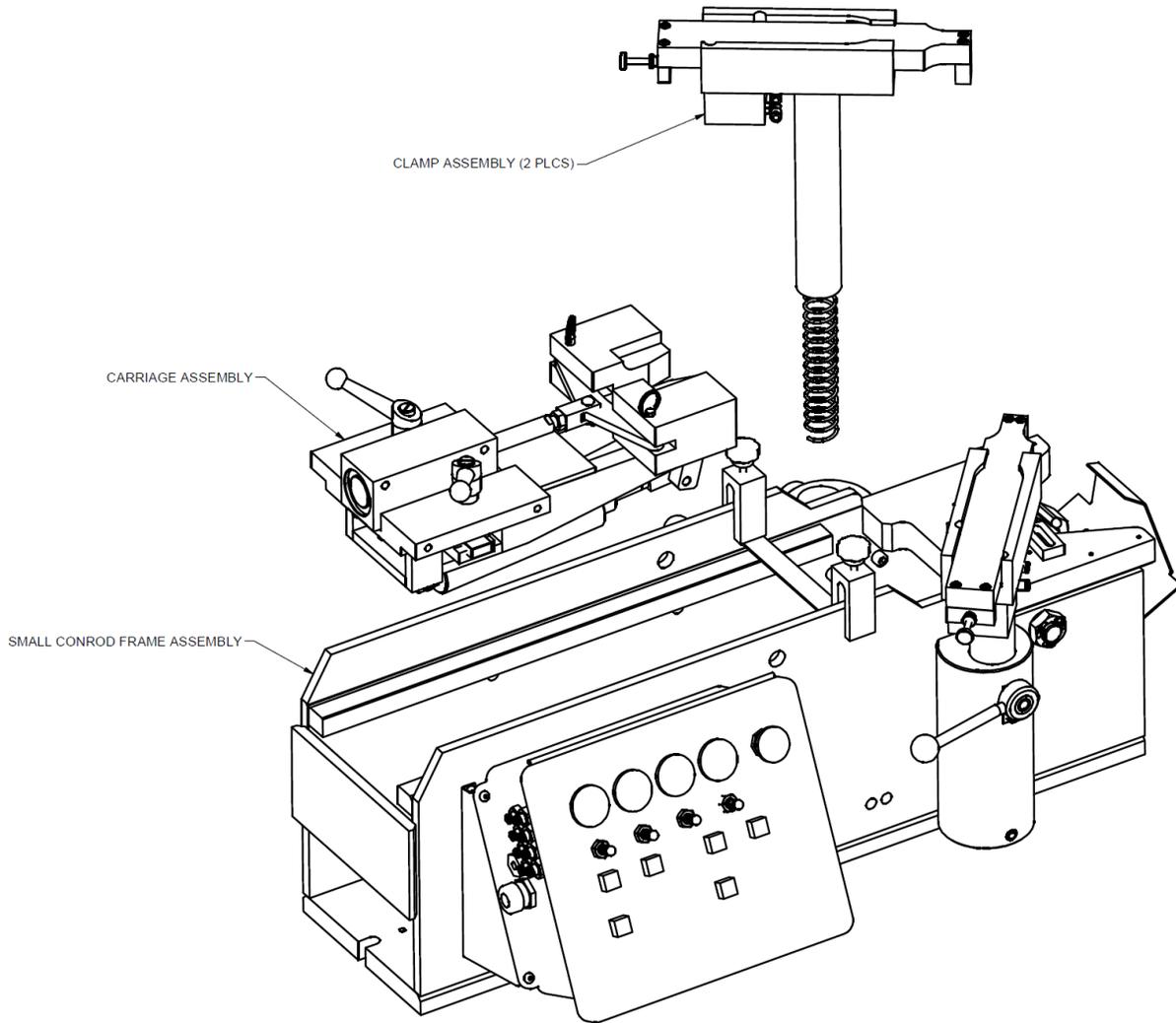


### 502-12-4 General Purpose Magnetic Indicator Holder

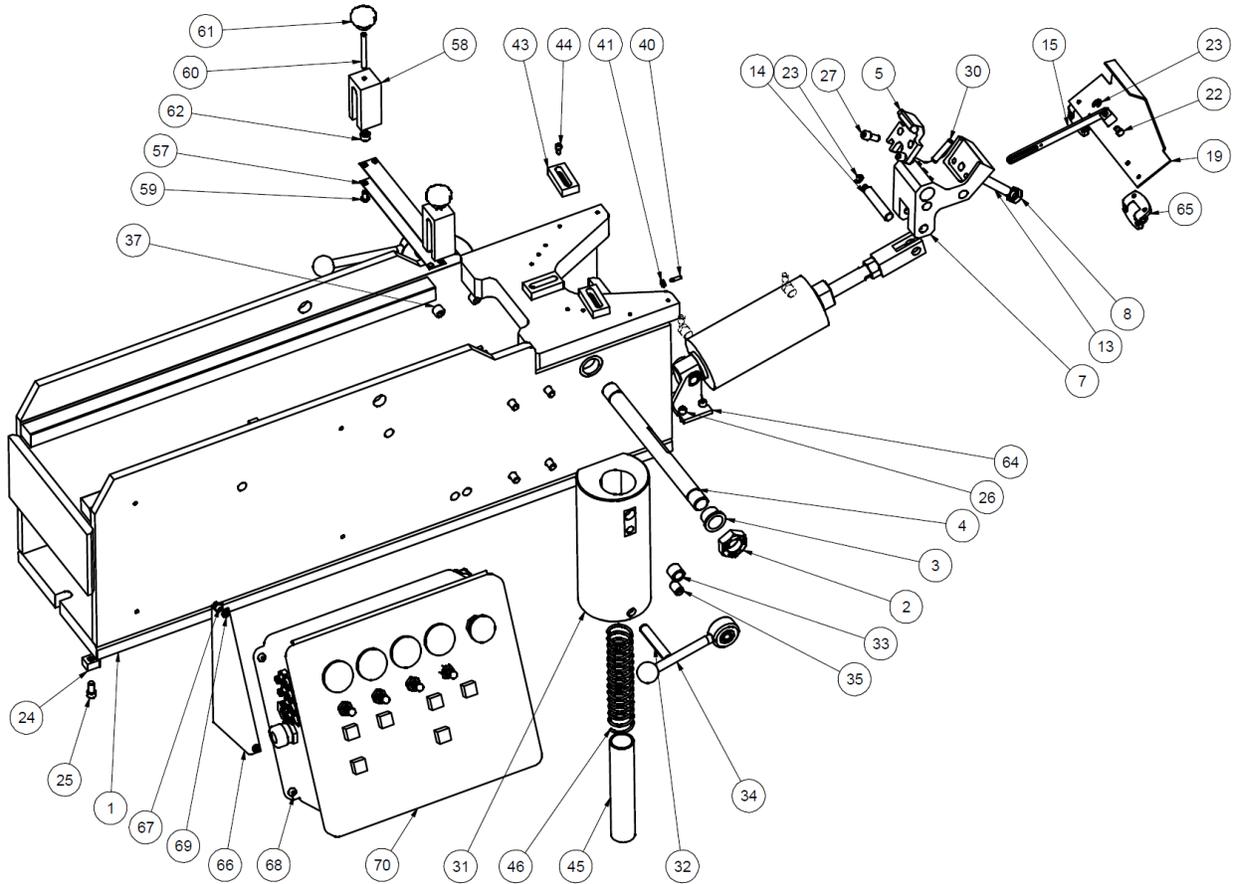


ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	502-11-39A	HOLDER, MAGNET
2	4	502-11-39	MAGNETS, SHALLOW POT
3	1	502-11-39B	ROD, ADAPTER, RIGHT ANGLE – SHORT
4	2	MF-58	SOCKET SET SCREW, FLAT POINT, 1/4-20 X 1/4"
5	1	502-11-39Q	ROD, ADAPTER, RIGHT ANGLE – LONG
6	1	MF-208	DOWEL PIN 1/4" X 2 1/4"
7	2	MF-163	HEX NUT 1/4-20

**650-3-44R Precision Connecting Rod Fixturing System**  
For 8-24" (203-610mm) Long Rods



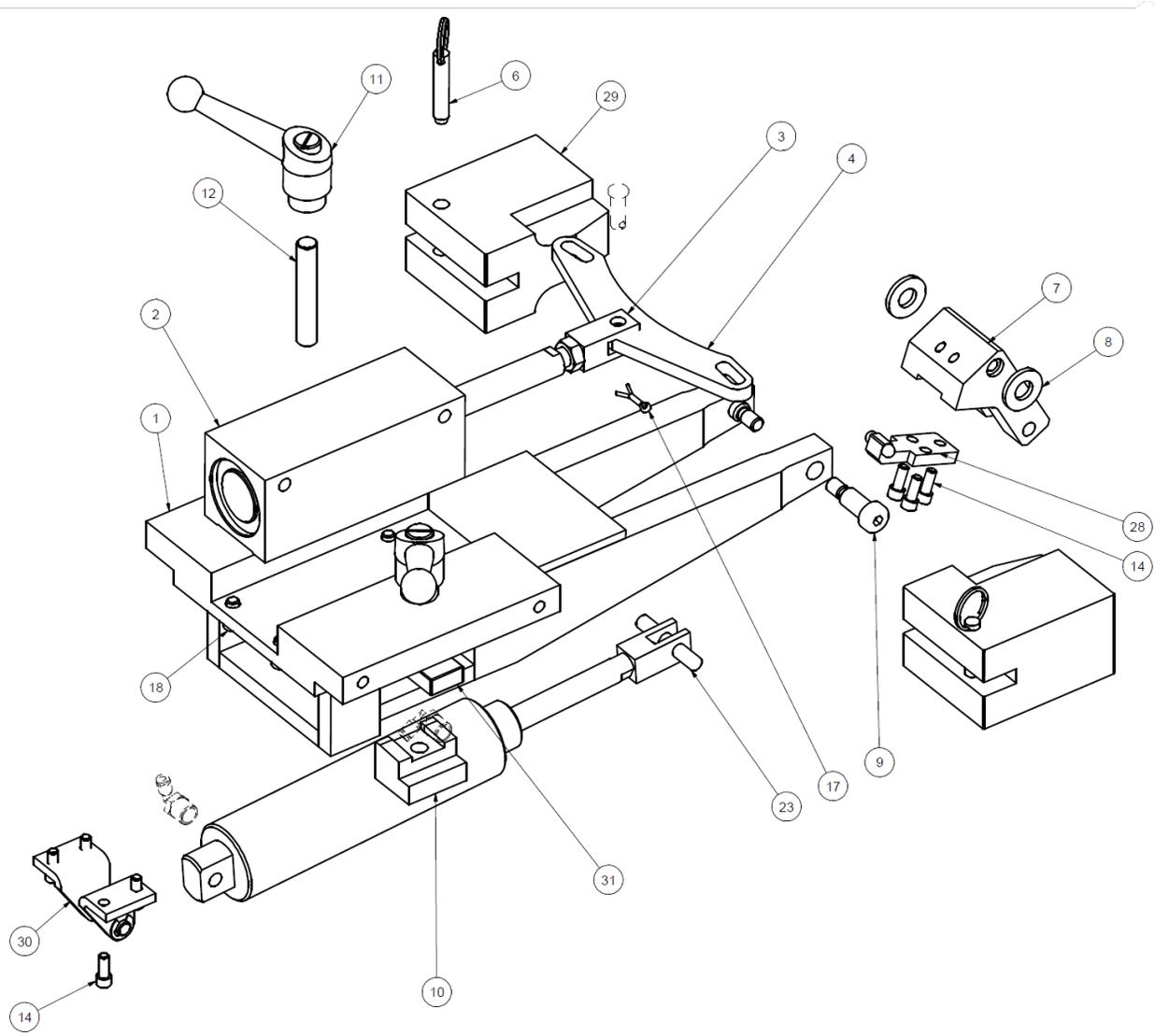
### Conrod Frame Assembly





CONROD FRAME ASSEMBLY			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	650-3-6-67B	BASE, FRAME
2	2	650-3-46T	LOCK NUT, REID BLN-105
3	2	650-3-46U	FLANGE BEARING, SYMMCO SF-2832-12
4	1	650-3-46G	PIVOT SHAFT
5	1	650-3-46V	LOCATOR 2.50
7	1	650-3-46J	LOCATOR HOLDER
8	1	MF-171	HEX JAM NUT, 1/2-13
13	1	650-3-47K	STOP SCREW
14	1	650-3-46K	PIVOT PIN
15	1	650-3-46L	LINKAGE ARM
19	1	650-3-46Q	LOCATOR COVER CONROD FIXTURE
22	1	650-3-46H	LINKAGE PIN
23	2	650-3-46R	E-CLIP – TRUEARC E-RING #RE-25ST
24	2	650-3-9	KEY
25	2	MF-21	SOCKET HEAD CAPSCREW, 5/16-18 X 5/8"
26	4	MF-13	SOCKET HEAD CAPSCREW, 1/4-20 X 5/8"
27	2	MF-22	SOCKET HEAD CAPSCREW, 5/16-18 X 3/4"
28	2	MF-53	SOCKET SET SCREW, CUP POINT, #10-24 X 3/8"
29	2	MF-60	SOCKET SET SCREW, CUP POINT, 1/4-20 X 1/4"
30	1	MF-228	ROLL PIN 5/16" X 1 1/2"
31	2	650-3-49Q	CLAMP BASE, CONROD CLAMP ARMS
32	2	MF-230B	ROLL PIN 1/2" X 3"
33	2	6310R	THREAD INSERT
34	2	6310J	CLAMP HANDLE
35	2	502-8-52C	SPRING PLUNGER
37	8	MF-31	SOCKET HEAD CAPSCREW, 3/8-16 X 1"
40	1	650-3-48P	SPRING ANCHOR, REID CSA-50
41	1	MF-160	HEX NUT, #8-32
42	1	514-7-83N	EXTENSION SPRING
43	3	650-3-48L	SUPPORT PARALLEL
44	3	MF-4	SOCKET HEAD CAPSCREW, #10-24 X 3/8"
45	2	650-3-49G	CLAMP LEG SPACER TUBE
46	2	650-3-49M	SPRING
57	2	650-3-47B	SUPPORT STRAP
58	2	650-3-47C	SUPPORT STRAP HOLDER
59	4	MF-90	SOCKET BUTTON HEAD SCREW, 1/4-20 X 1/2"
60	2	MF-74	SET SCREW, 1/4-20 X 2 1/2"
61	2	514-6-86	PLASTIC KNOB
62	2	650-3-47L	FOOT, SUPPORT STRAP
63	1	650-3-45G	CENTERING CYLINDER, CONROD FIXTURE ASSEMBLY
64	1	650-3-45H	PIVOT BRACKET, BIMBA #D-13512-A
65	2	650-3-46S	HINGE, LOCATOR COVER, CONROD FIXTURE ASSEMBLY
66	2	650-3-65D	BRACKET, CONTROL BOX, CONROD FIXTURE
67	4	MF-248	SOCKET BUTTON HEAD SCREW, 1/4-20 X 3/8"
68	4	MF-91	SOCKET BUTTON HEAD SCREW, 1/4-20 X 5/8"
69	4	650-3-47W	RIVET NUT, REID ALC-47850
70	1	650-3-47T	CONTROL BOX, CONROD FIXTURE ASSEMBLY

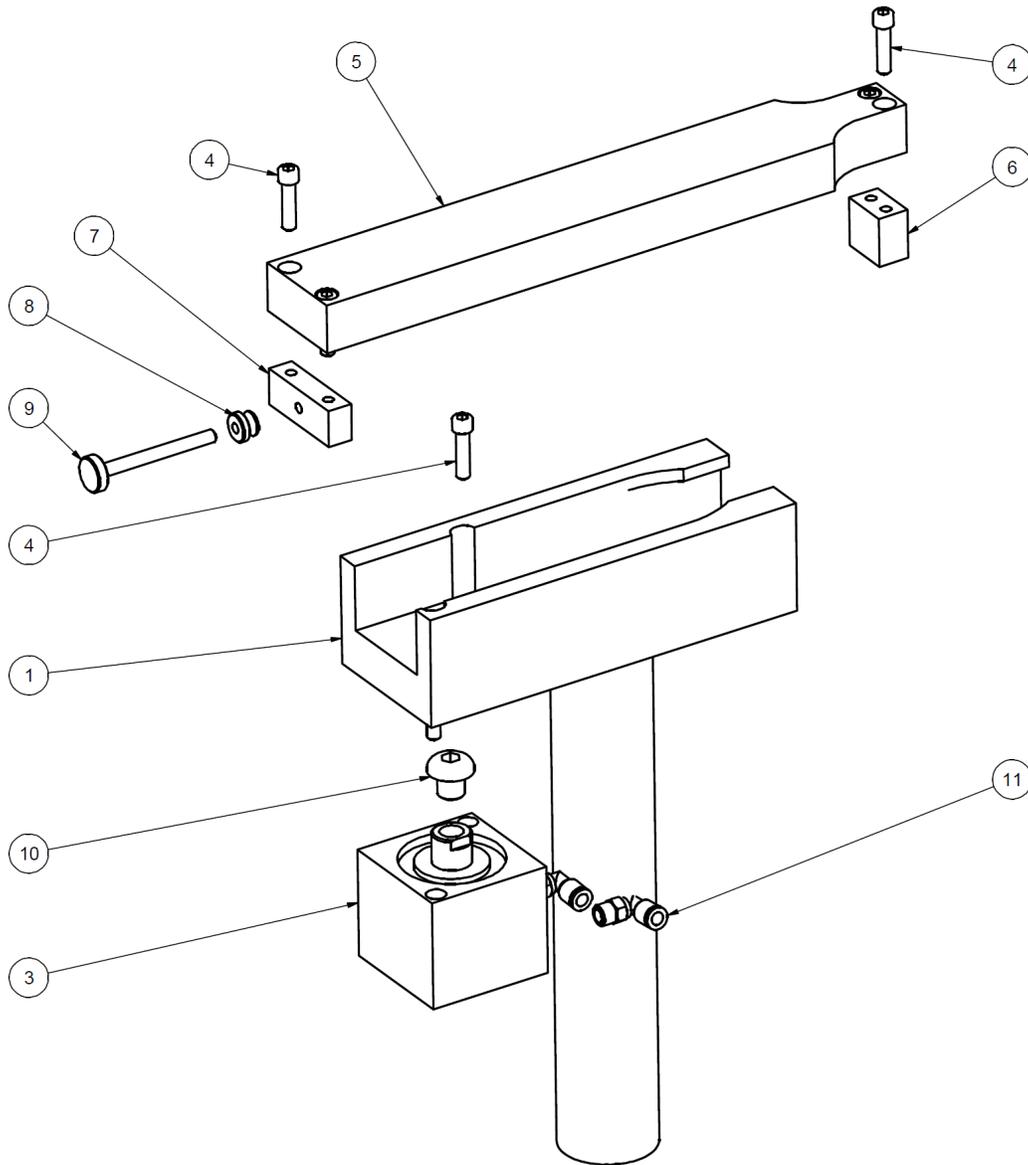
### Conrod Carriage Assembly





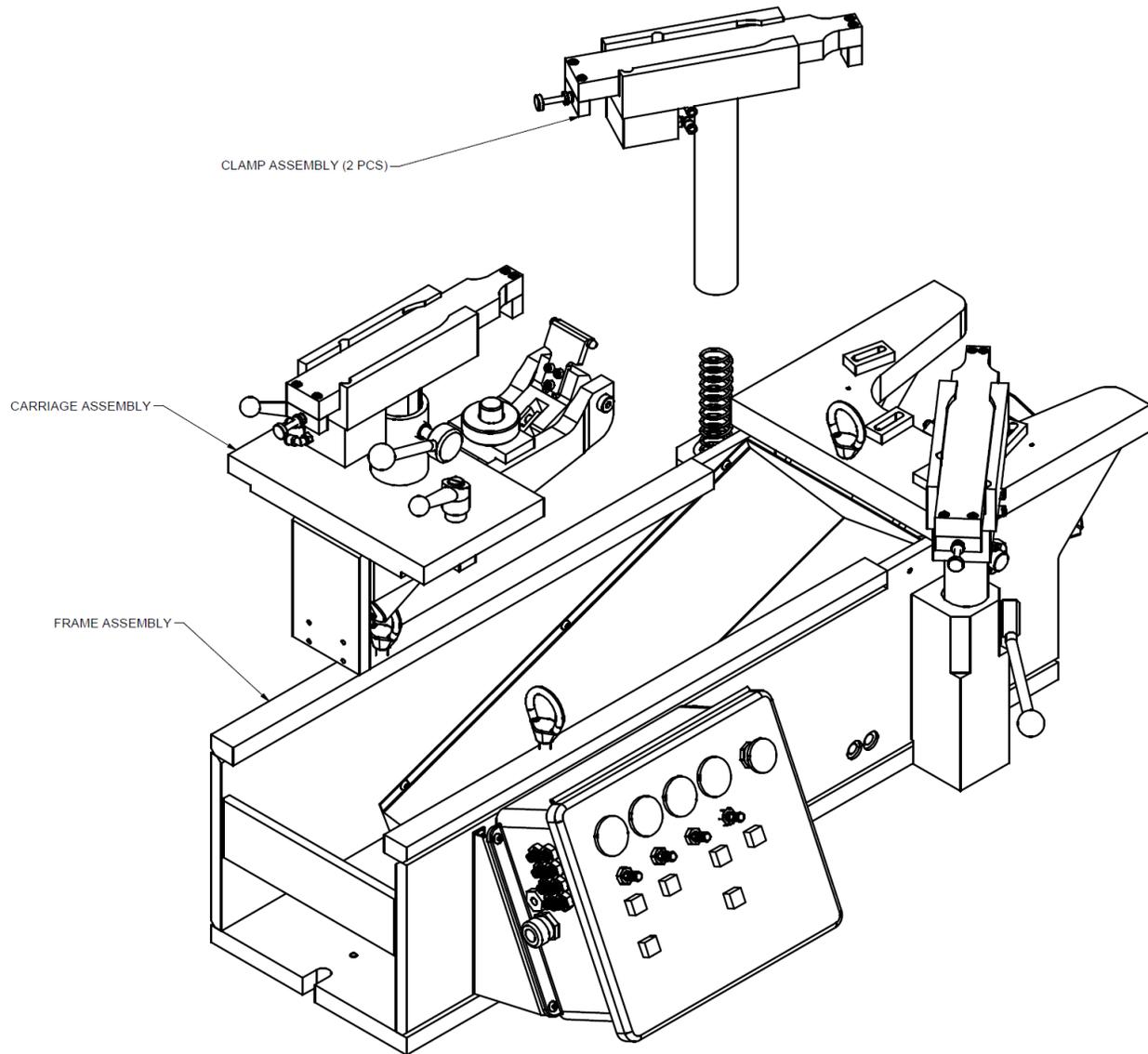
CONROD CARRIAGE ASSEMBLY			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	650-3-67	CARRIAGE, MACHINING
2	1	650-3-45D	WEDGE CYLINDER
3	2	650-3-45L	CLEVIS
4	1	650-3-48J	LINKAGE, WEDGE
6	2	650-3-48K	RELEASE PIN, CLAMP WEDGE
7	1	650-3-47D	CENTERING LEVER
8	2	100-19A	WASHER, HARDENED 17/32" I.D.
9	2	650-4-45	SOCKET HEAD SHOULDER SCREW 1/2" X 1"
10	2	650-3-48	CLAMP SHOE
11	2	514-2-39	HANDLE
12	2	514-4-5B	STUD
14	7	MF-13	SOCKET HEAD CAPSCREW 1/4-20 X 5/8"
15	1	MF-172	HEX NUT 1/2-20
17	1	MF-231	PIN, COTTER, 1/16" DIA X 3/4"
18	4	MF-21A	SOCKET HEAD CAPSCREW 5/16-18 X 1/2"
23	1	MF-212A	DOWEL PIN 3/8" X 2 1/4"
24	1	MF-60	SOCKET SET SCREW, CUP POINT, 1/4-20 X 1/4"
28	1	650-3-47H	CENTERING BLOCK – SMALL CONROD FIXTURE ASSEMBLY
29	2	650-3-48T	WEDGE CLAMP, SPECIAL SMALL CONROD FIXTURE
30	1	5531B	LOWER CYLINDER MOUNT
31	1	650-3-48Q	CLAMP BAR, CARRIAGE, SMALL CONROD FIXTURE
32	1	650-3-45F	CENTERING CYLINDER

## Conrod Clamp Assembly



CONROD CARRIAGE ASSEMBLY			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	650-3-49H	CLAMP LEG
2	1	502-8-52C	SPRING PLUNGER
3	1	650-3-45E	CLAMP ARM CYLINDER
4	6	MF-15	SOCKET HEAD CAPSCREW 1/4-20 X 1"
5	1	650-3-49K	CLAMP ARM
6	1	650-3-49L	CLAMP ARM EXTENSION
7	1	650-3-49N	STOP BLOCK
8	1	650-3-34J	THUMB KNOB, REID AJ-721
9	1	650-3-34S	CLAMP SCREW
10	1	650-3-61S	SOCKET BUTTON HEAD SCREW, 1/2-13 X 5/8"
11	2	-	1/8" NPT X 1/4" PTL 90 DEG FITTING

**650-3-64 Heavy Duty Precision Connecting Rod Fixturing System**  
For large blocks, such as CAT 3500, Waukesha 7042, White Superior 825

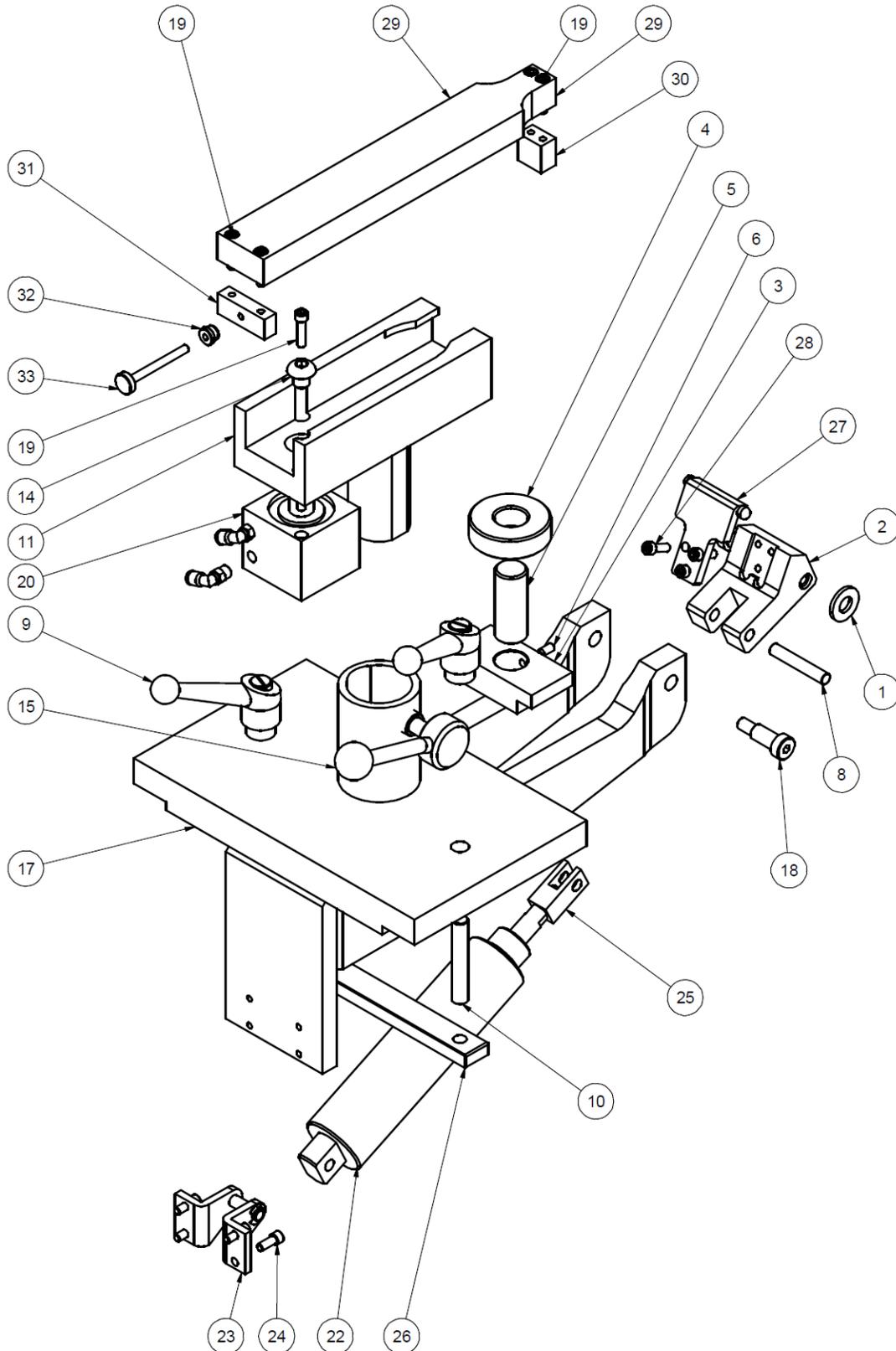






CONROD FRAME ASSEMBLY			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	650-3-64A	MAIN FRAME (MACHINING)
5	1	650-3-49E	CLAMP BASE – RIGHT SIDE
6	1	650-3-49F	CLAMP BASE – LEFT SIDE
8	2	6310R	THREAD INSERT
9	2	6310J	CLAMP HANDLE
10	2	502-8-52C	SPRING PLUNGER
13	2	650-3-46U	FLANGE BEARING, SYMMCO SF-2832-12
14	2	650-3-64M	SHAFT-LOCATING BLOCK HEAVY DUTY CONROD FIXTURE ASS'Y
15	2	650-3-46T	LOCK NUT, REID BLN-105
19	1	650-3-64G	LOCATOR HOLDER
22	1	650-3-46K	PIVOT PIN
24	1	650-3-65G	LINKAGE ARM
25	2	650-3-46R	E-CLIP – TRUEARC #RE-25ST
26	1	650-3-47K	STOP SCREW
27	1	MF-165	HEX NUT, 1/2-13
28	1	650-3-64J	LOCATOR – 3.83" HEAVY DUTY CONROD FIXTURE ASS'Y
30	1	650-3-45H	PIVOT BRACKET, BIMBA #D-13512-A
31	1	650-3-45G	CENTERING CYLINDER, CONROD FIXTURE ASS'Y
32	3	650-3-48L	SUPPORT PARALLEL
33	1	650-3-48M	SUPPORT PARALLEL, +.002
35	3	502-3-13	LIFT EYE
36	2	650-3-49M	SPRING
37	2	650-3-49G	CLAMP LEG SPACER TUBE
39	2	650-3-9	KEY
43	1	650-3-64H	LOCATOR – 4.95" HEAVY DUTY CONROD FIXTURE
46	1	650-3-65F	DUST COVER
48	1	650-3-46H	LINKAGE PIN
51	2	650-3-65D	BRACKET, CONTROL BOX, CON-ROD FIXTURE
54	4	650-3-47W	RIVET NUT, REID ALC-47850
55	1	650-3-47T	CONTROL BOX, CONROD FIXTURE ASS'Y
56	1	650-3-65E	CHIP CHUTE
57	2	650-3-46S	HINGE, LOCATOR COVER CONROD FIXTURE ASS'Y
58	1	MF-162	HEX NUT #10-24
59	6	MF-15	SOCKET HEAD CAPSCREW 1/4-20 X 1"
60	8	MF-32	SOCKET HEAD CAPSCREW 3/8-16 X 1 1/4"
61	3	MF-78	SOCKET HEAD CAPSCREW #10-24 X 3/8"
62	8	MF-3D	SOCKET HEAD CAPSCREW #8-32 X 3/8"
63	3	MF-160	HEX NUT #8-32
64	2	MF-21C	SOCKET HEAD CAPSCREW 5/16-18 X 7/8"
66	2	MF-59	SOCKET SET SCREW, FLAT POINT, 1/4-20 X 3/8"
67	14	MF-90	SOCKET BUTTON HEAD SCREW 1/4-20 X 1/2"

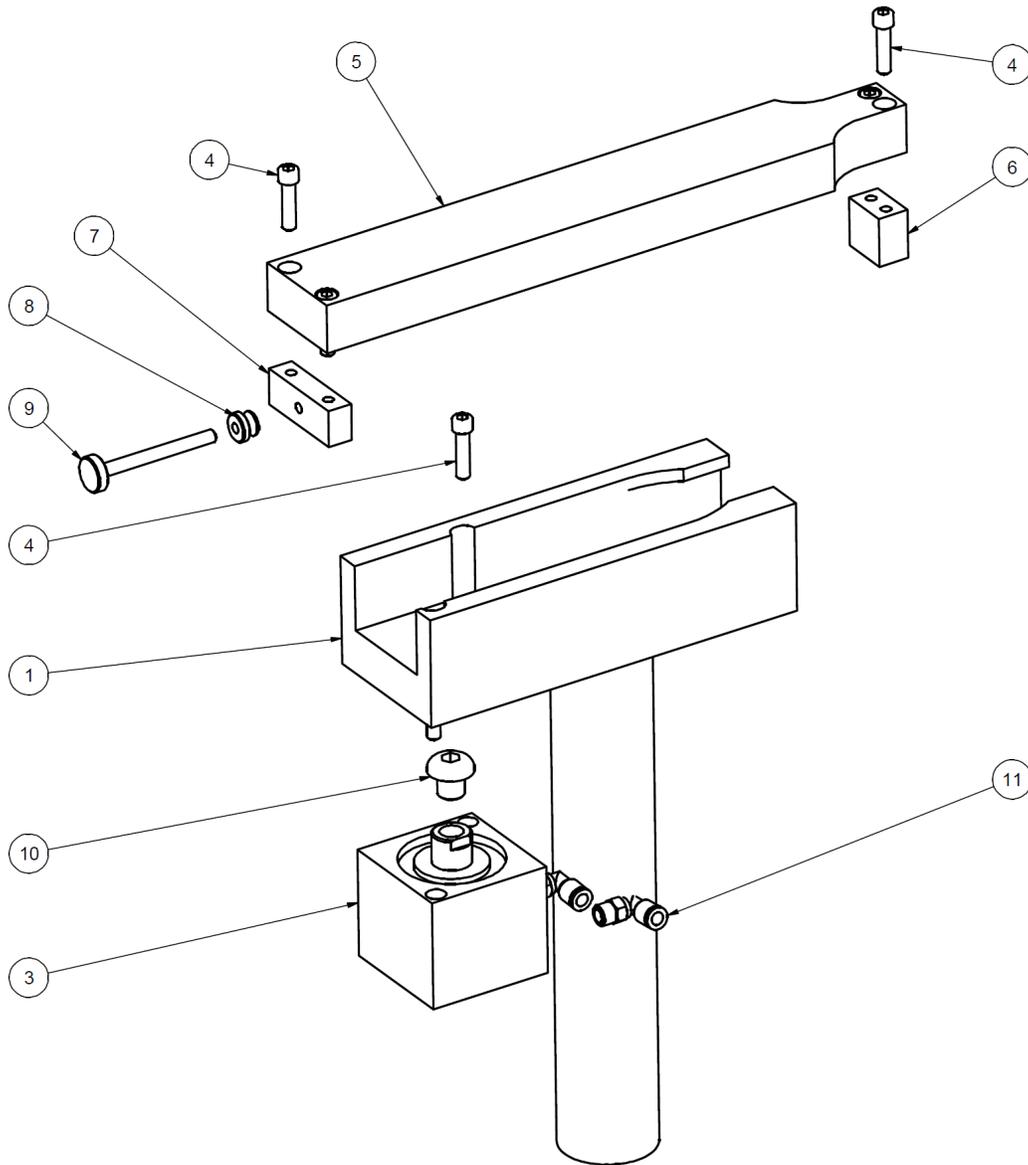
## Conrod Carriage Assembly





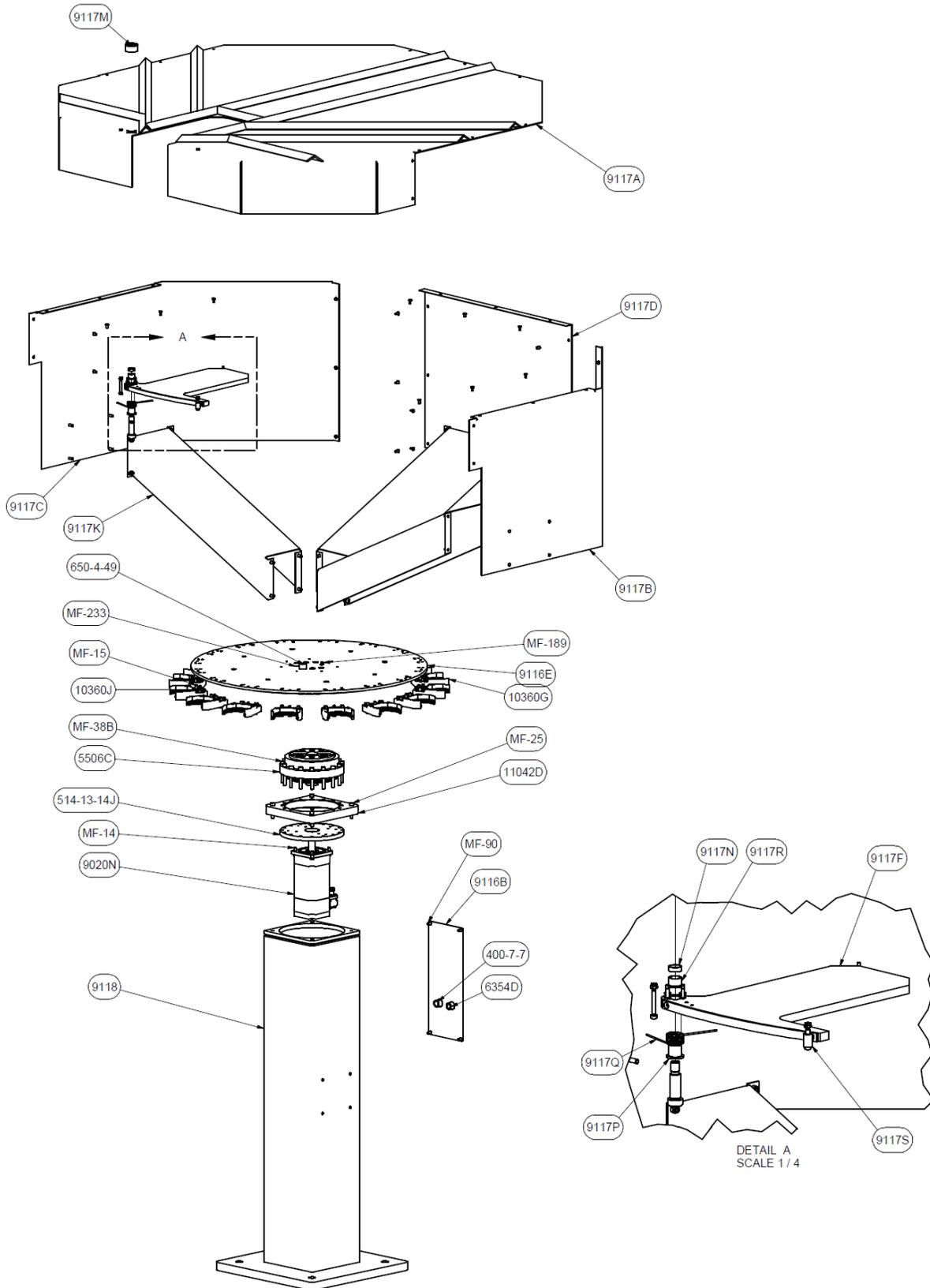
<b>CONROD CARRIAGE ASSEMBLY</b>			
<b>ITEM</b>	<b>QTY</b>	<b>PART NUMBER</b>	<b>DESCRIPTION</b>
1	2	100-19A	WASHER, HARDENED, 17/32" I.D.
2	1	650-3-47D	CENTERING LEVER
3	1	650-3-65A	JACK BODY
4	1	650-3-65B	JACKING NUT
5	1	650-3-65C	JACKING SCREW
6	1	MF-61	SOCKET SET SCREW, CUP POINT, 1/4-20 X 1/2"
7	1	MF-59	SOCKET SET SCREW, CUP POINT, 1/4-20 X 3/8"
8	1	MF-212A	DOWEL PIN, 3/8" X 2 1/4"
9	2	514-2-39	HANDLE
10	2	514-4-5B	STUD
11	1	650-3-64F	SHORT CLAMP ARM
14	1	650-3-61S	SOCKET BUTTON HEAD SCREW 1/2-13 X 5/8"
15	1	6310J	CLAMP HANDLE
16	1	6310R	THREAD INSERT
17	1	650-3-64C	CARRIAGE
18	2	650-4-18A	SHOULDER SCREW, 1/2" X 1"
19	6	MF-15	SOCKET HEAD CAPSCREW, 1/4-20 X 1"
20	1	650-3-45E	CLAMP ARM CYLINDER
22	1	650-3-45F	CENTERING CYLINDER
23	1	5531B	LOWER CYLINDER MOUNT
24	4	MF-82A	SOCKET HEAD CAPSCREW 1/4-20 X 5/8"
25	1	650-3-45L	CLEVIS
26	1	650-3-48R	CLAMP BAR, CARRIAGE, LARGE CONROD FIXTURE
27	1	650-3-64L	CENTERING BLOCK – 2.68 HEAVY DUTY CONROD FIXTURE ASS'Y
28	3	MF-14	SOCKET HEAD CAPSCREW 1/4-20 X 3/4"
29	1	650-3-49K	CLAMP ARM
30	1	650-3-49L	CLAMP ARM EXTENSION
31	1	650-3-49N	STOP BLOCK
32	1	650-3-34J	THUMBKNOB – REID AJ-721
33	1	350-3-34S	CLAMP SCREW

## Conrod Clamp Assembly

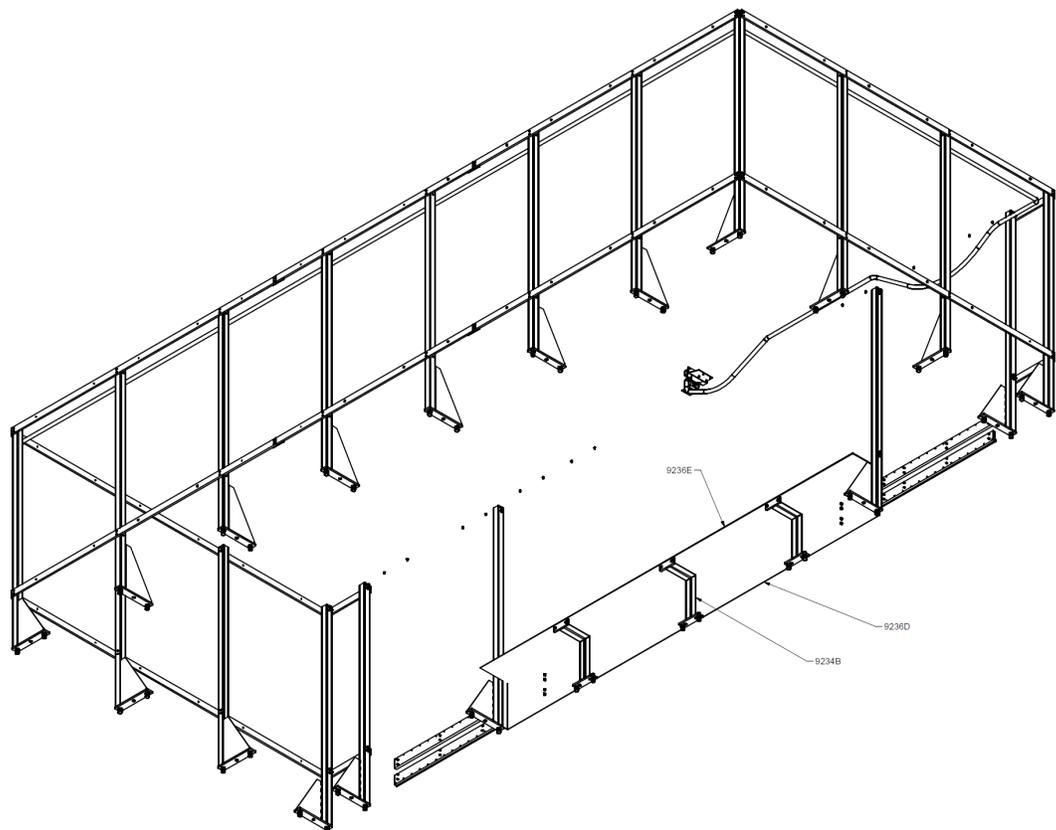
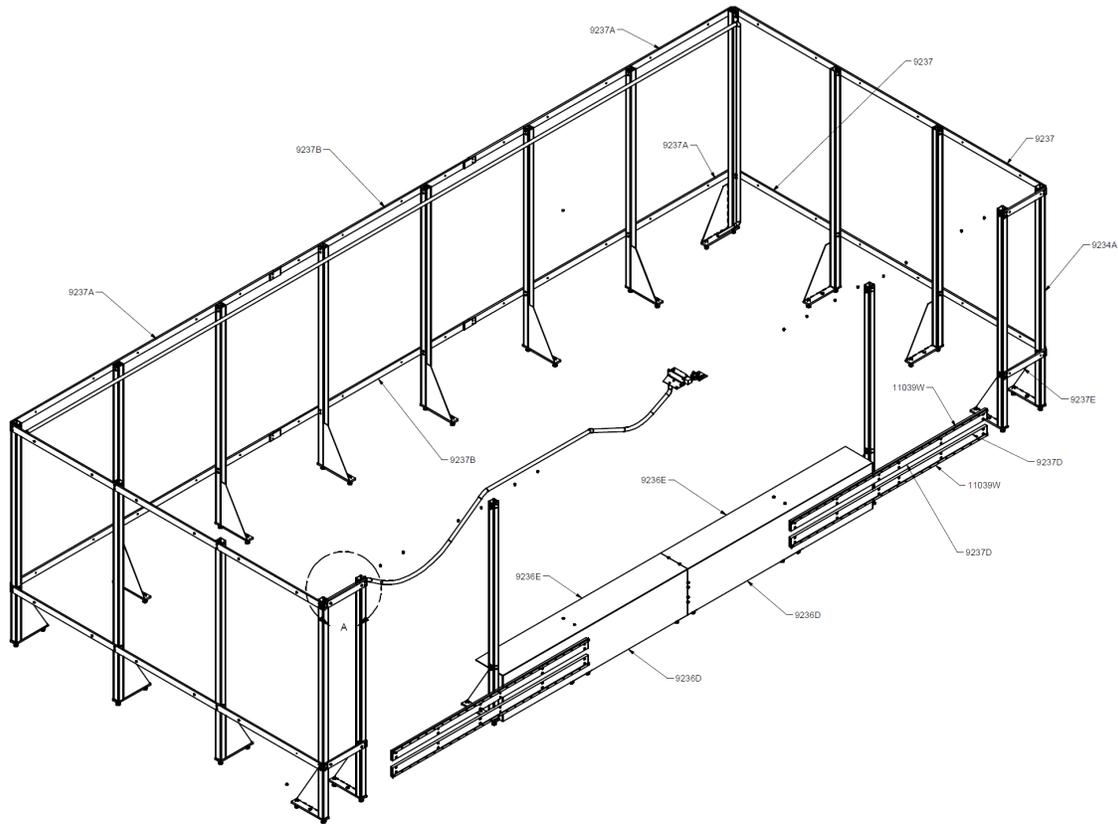


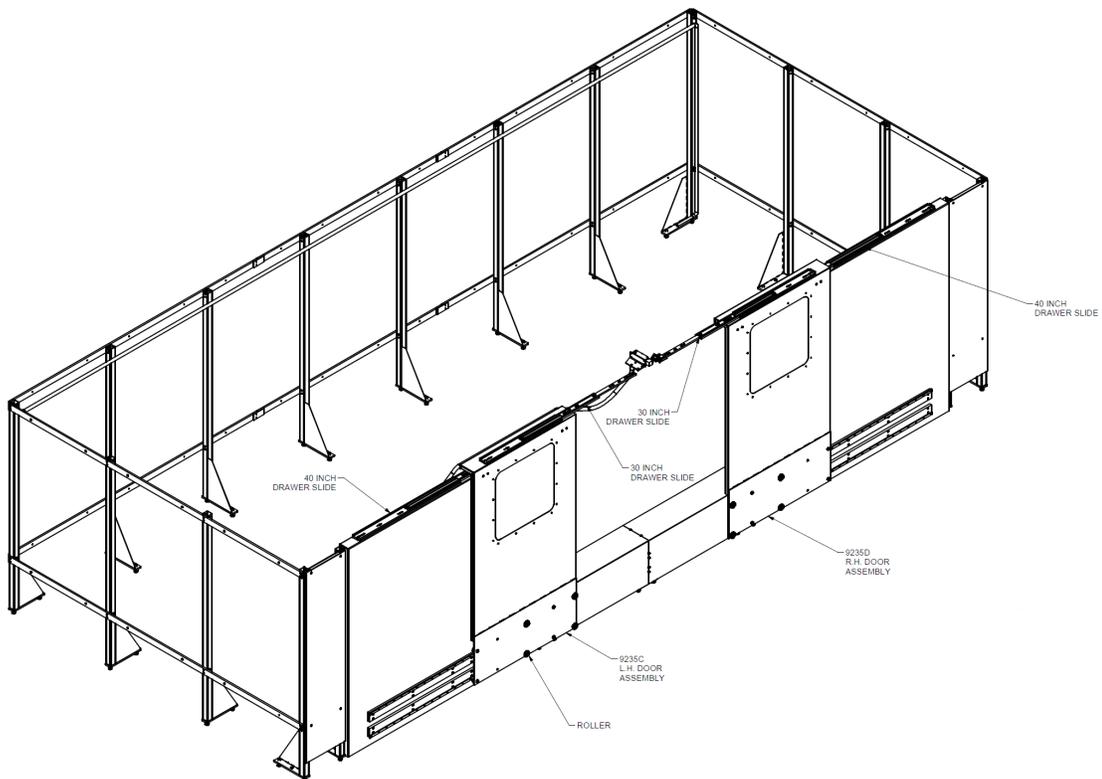
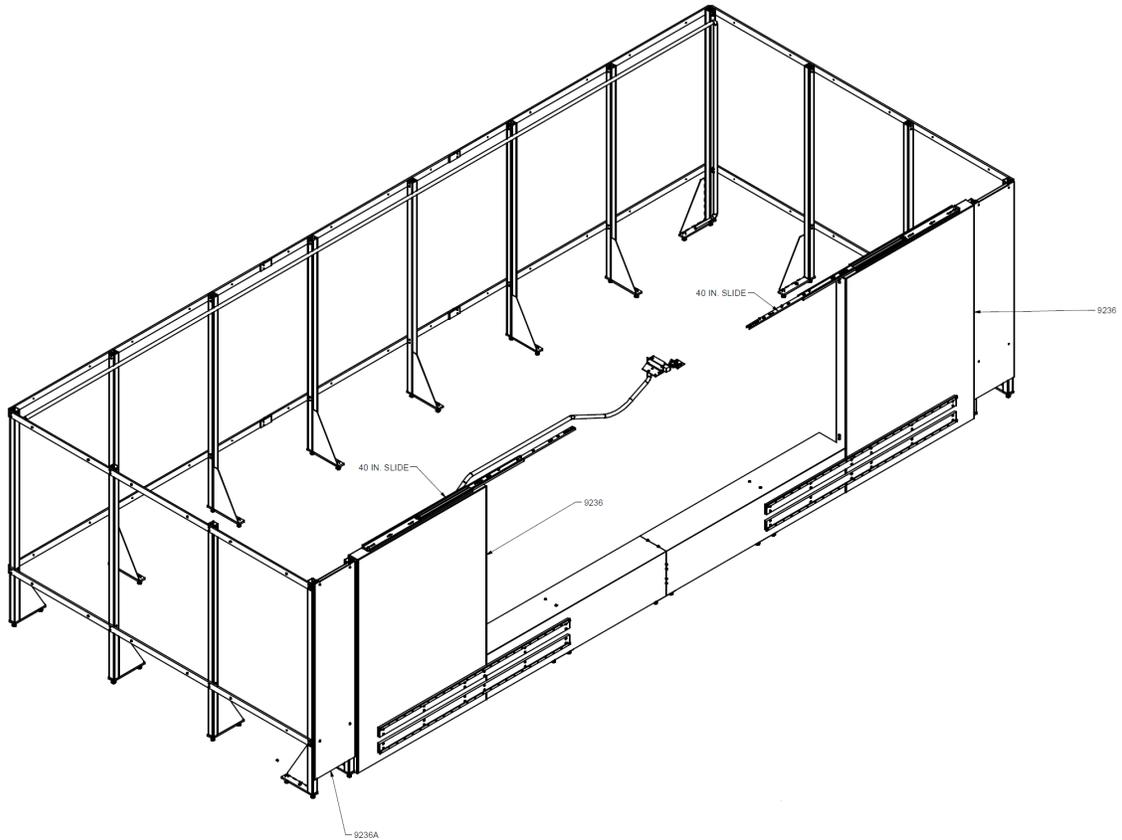
CONROD CARRIAGE ASSEMBLY			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	650-3-49H	CLAMP LEG
2	1	502-8-52C	SPRING PLUNGER
3	1	650-3-45E	CLAMP ARM CYLINDER
4	6	MF-15	SOCKET HEAD CAPSCREW ¼-20 X 1"
5	1	650-3-49K	CLAMP ARM
6	1	650-3-49L	CLAMP ARM EXTENSION
7	1	650-3-49N	STOP BLOCK
8	1	650-3-34J	THUMB KNOB, REID AJ-721
9	1	650-3-34S	CLAMP SCREW
10	1	650-3-61S	SOCKET BUTTON HEAD SCREW, ½-13 X ⅝"
11	2	-	⅜" NPT X ¼" PTL 90 DEG FITTING

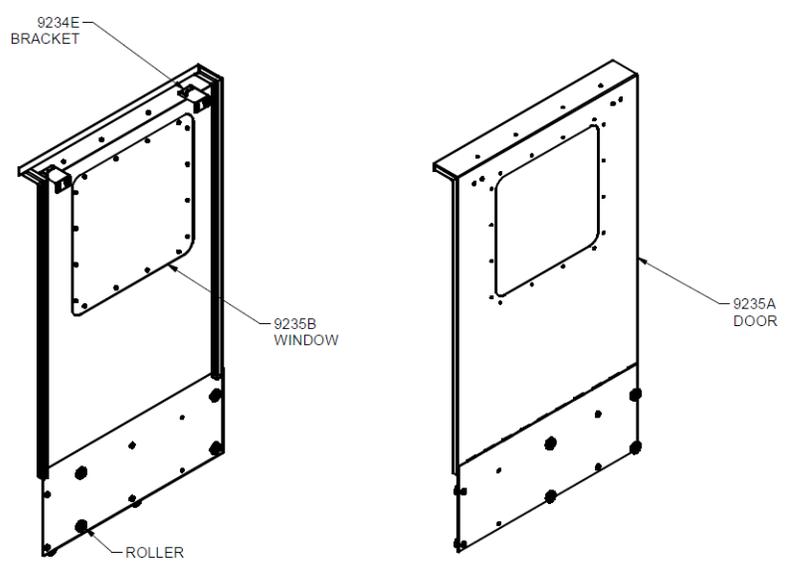
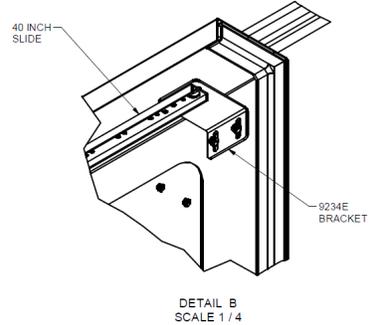
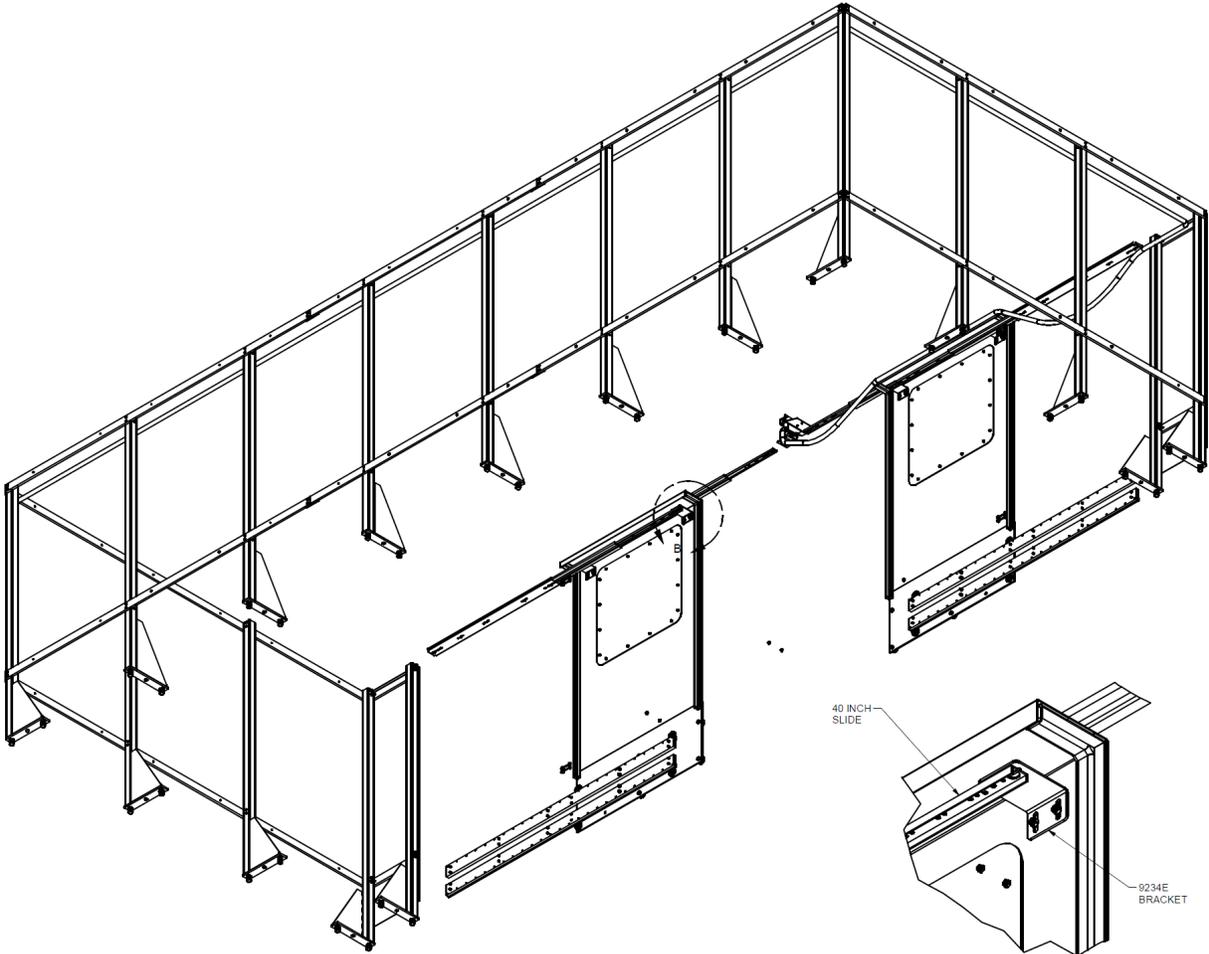
## 9116 Automatic Rotary Tool Changer



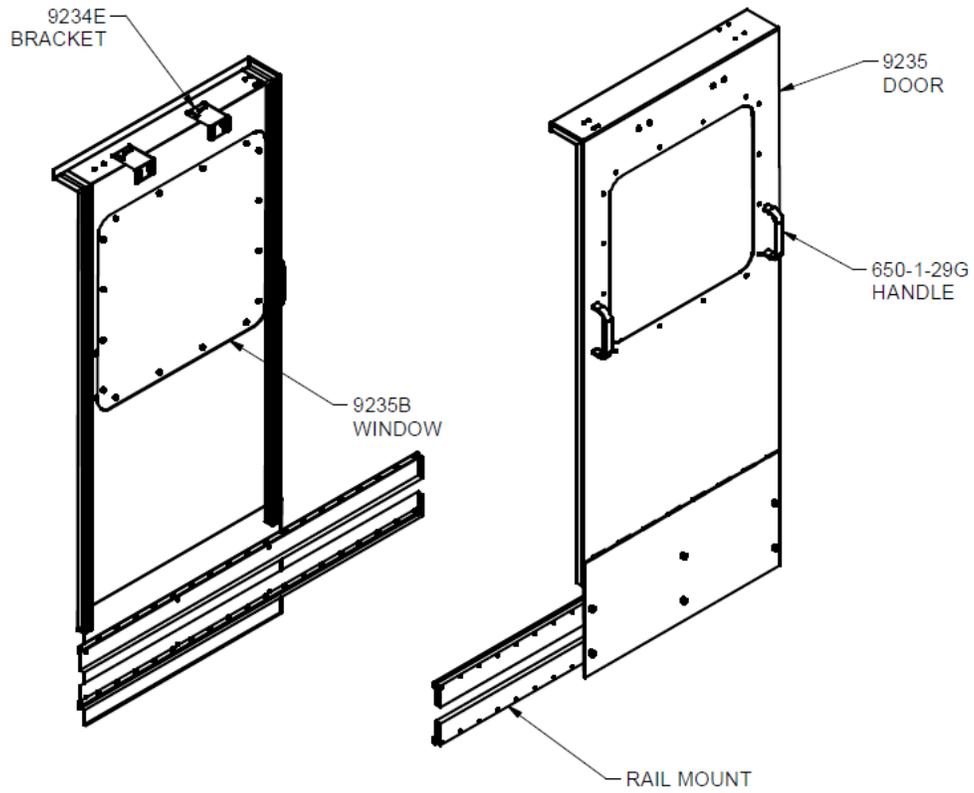
### 9234 EM105 Safety Enclosure







9235C DOOR ASSY  
SCALE 0.06 : 1



9235E DOOR ASSY  
SCALE 0.06 : 1