

ROTTLER

F79A 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 don't 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. Send e-mail requests to:
parts@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

F79A OPTIONAL EQUIPMENT CATALOG

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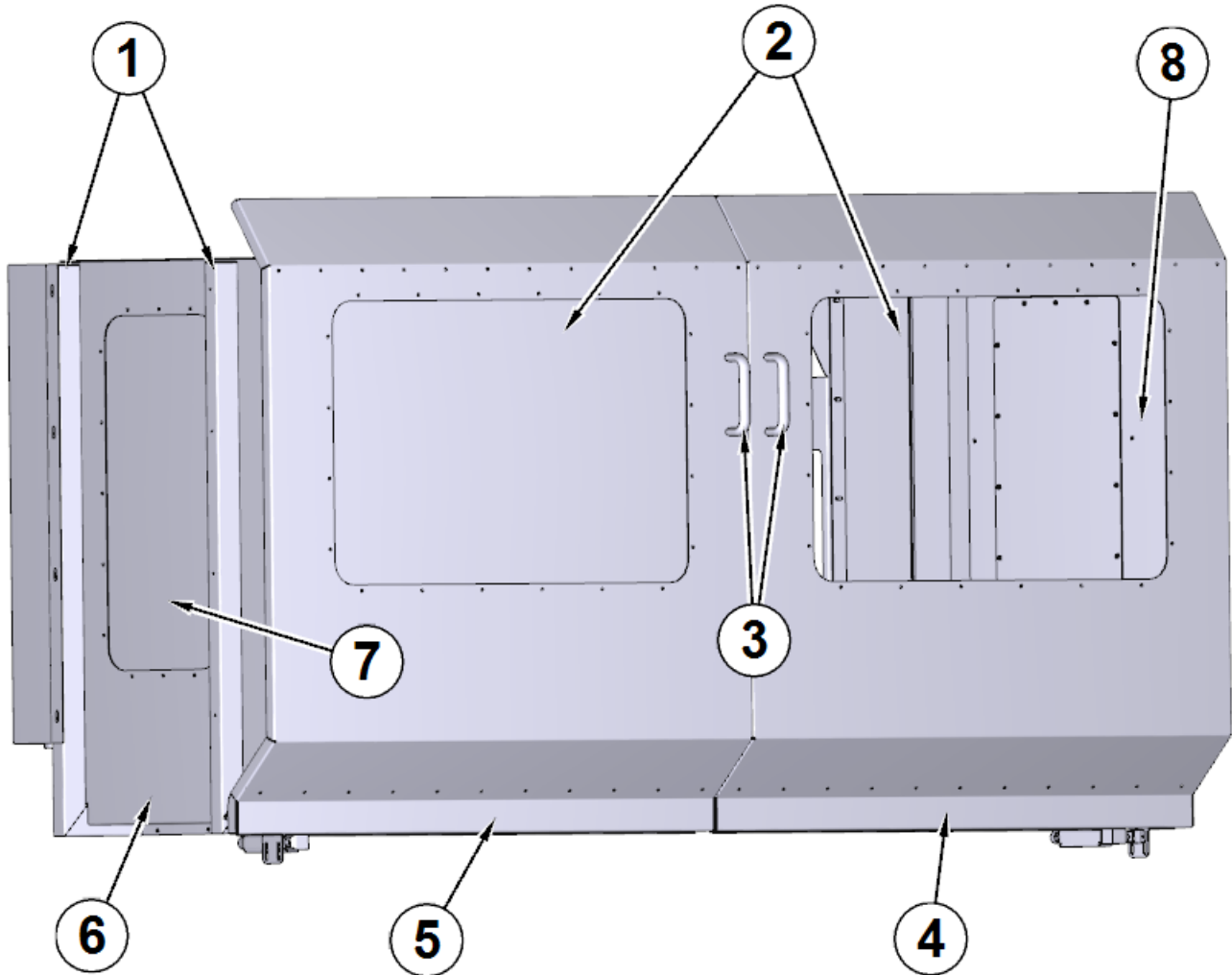
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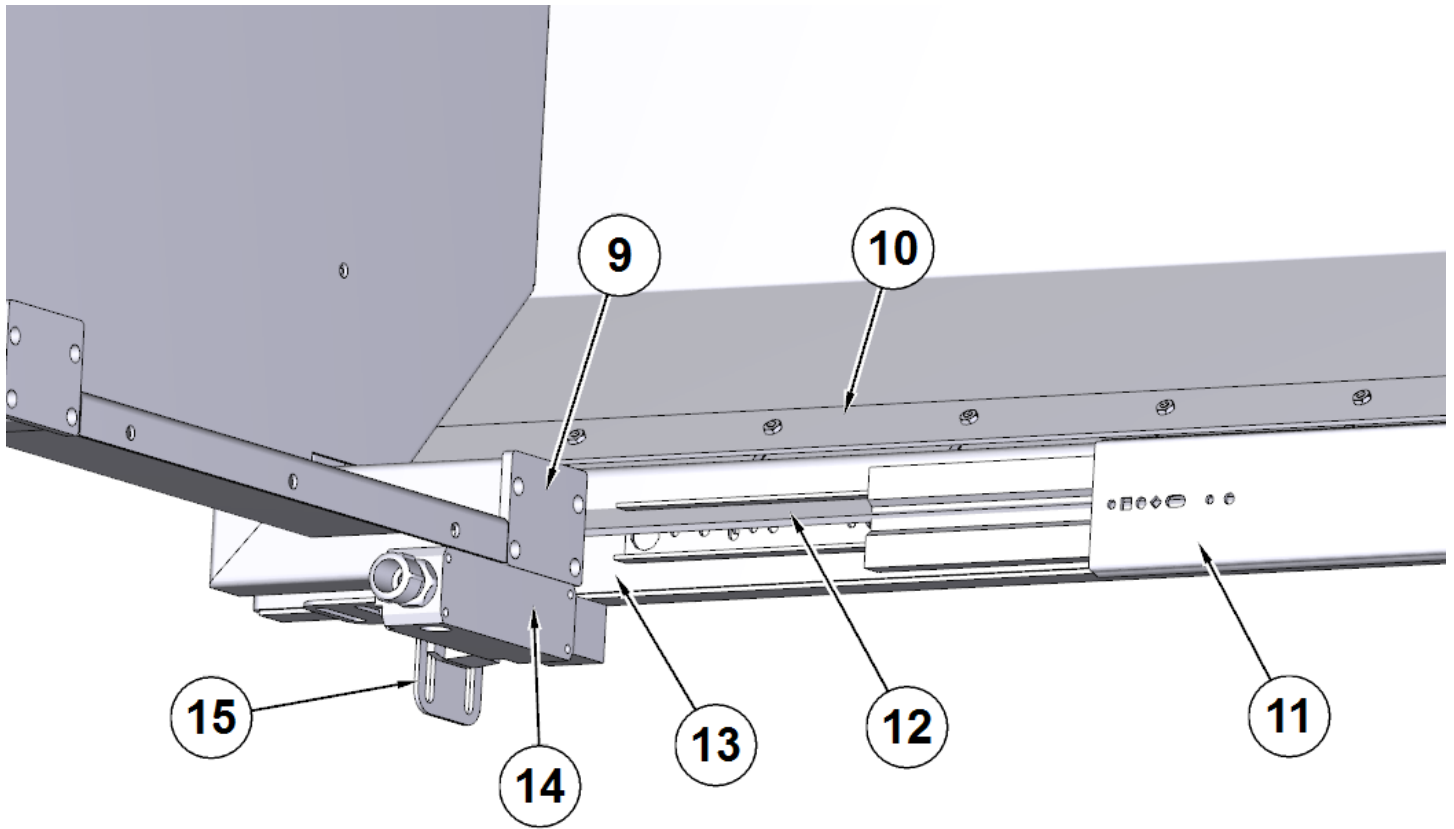
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Enclosure

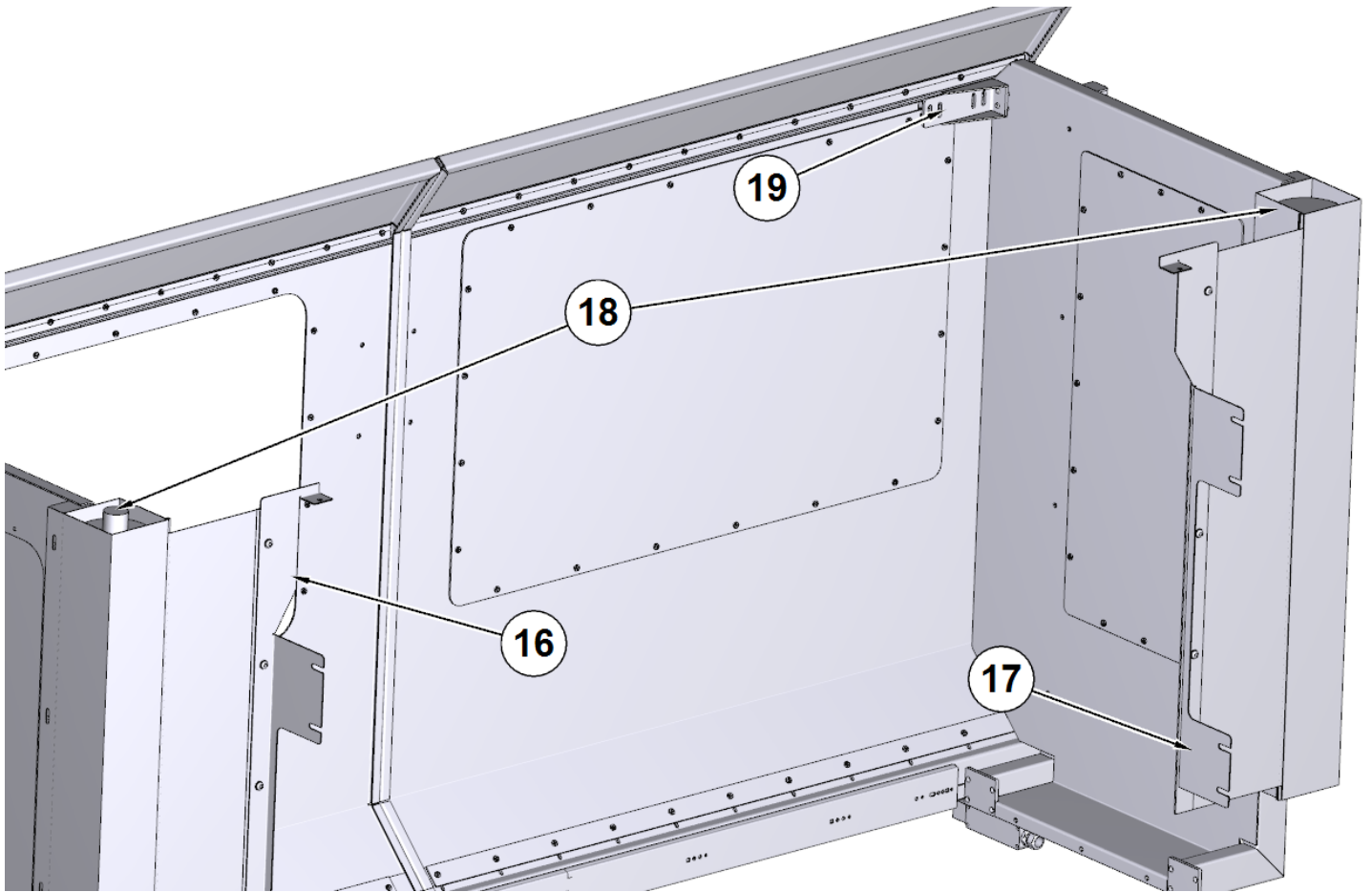
11038 Optional Full Enclosure Parts



ITEM	PART #	DESCRIPTION
1	11038Q	MOUNT, FABRIC
2	11038G	WINDOW, LEXAN FRONT
3	650-1-29G	HANDLE
4	11038A	DOOR, RIGHT FRONT
5	11038B	DOOR, LEFT FRONT
6	11038N	LEFT SIDE
7	11038H	WINDOW, LEXAN SIDE
8	11038M	RIGHT SIDE



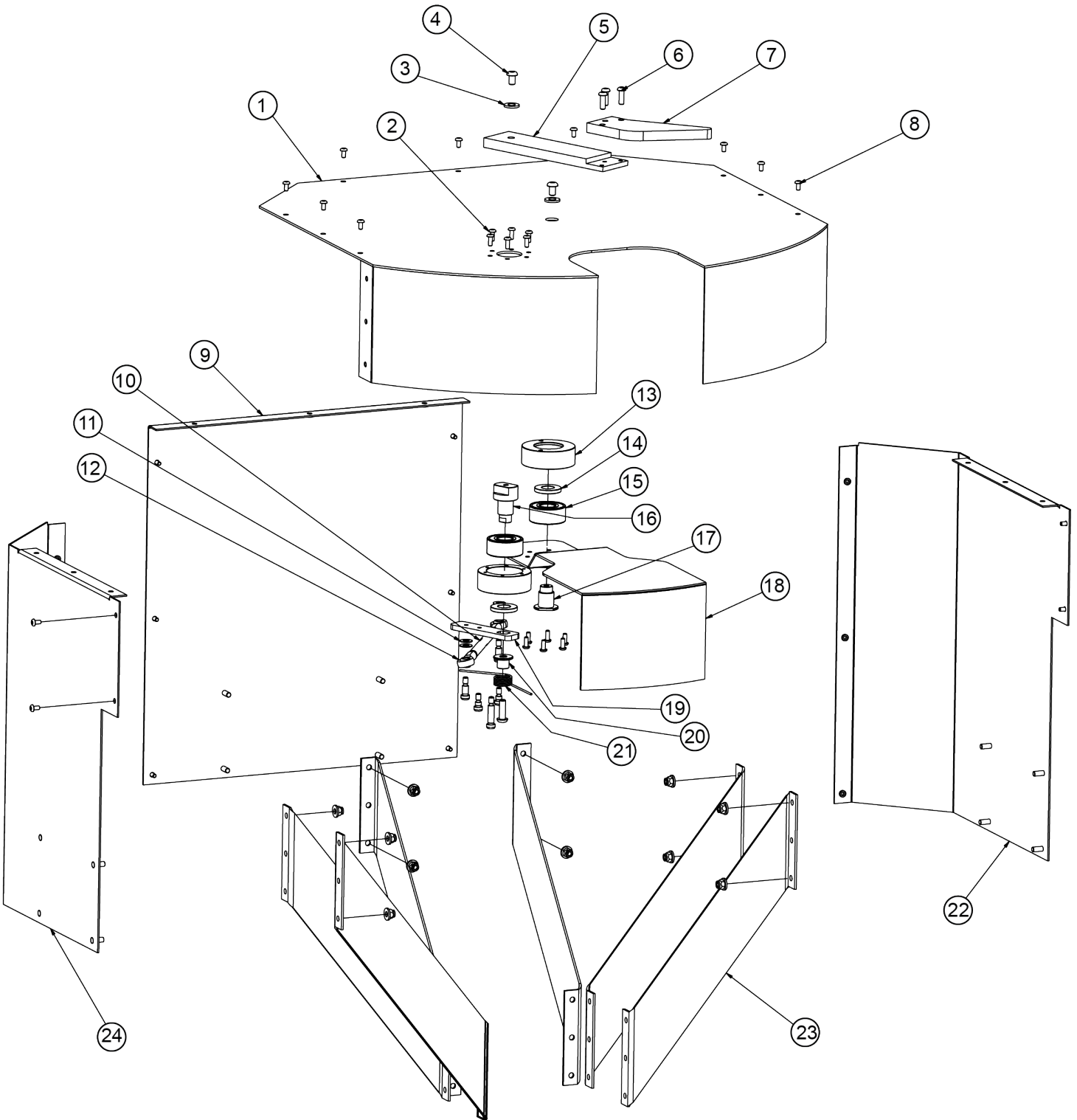
ITEM	PART #	DESCRIPTION
9	11038Q	MOUNT, FABRIC
10	11038X	PLATE, RUBBER FASTENER
11	11038F	ROLLERS, EXTENDA (PAIR)
12	11038Y	RUBBER
13	11038A	DOOR, RIGHT FRONT
14	11039M	INTERLOCK BODY
15	11039P	LOCK PLUNGER MOUNT



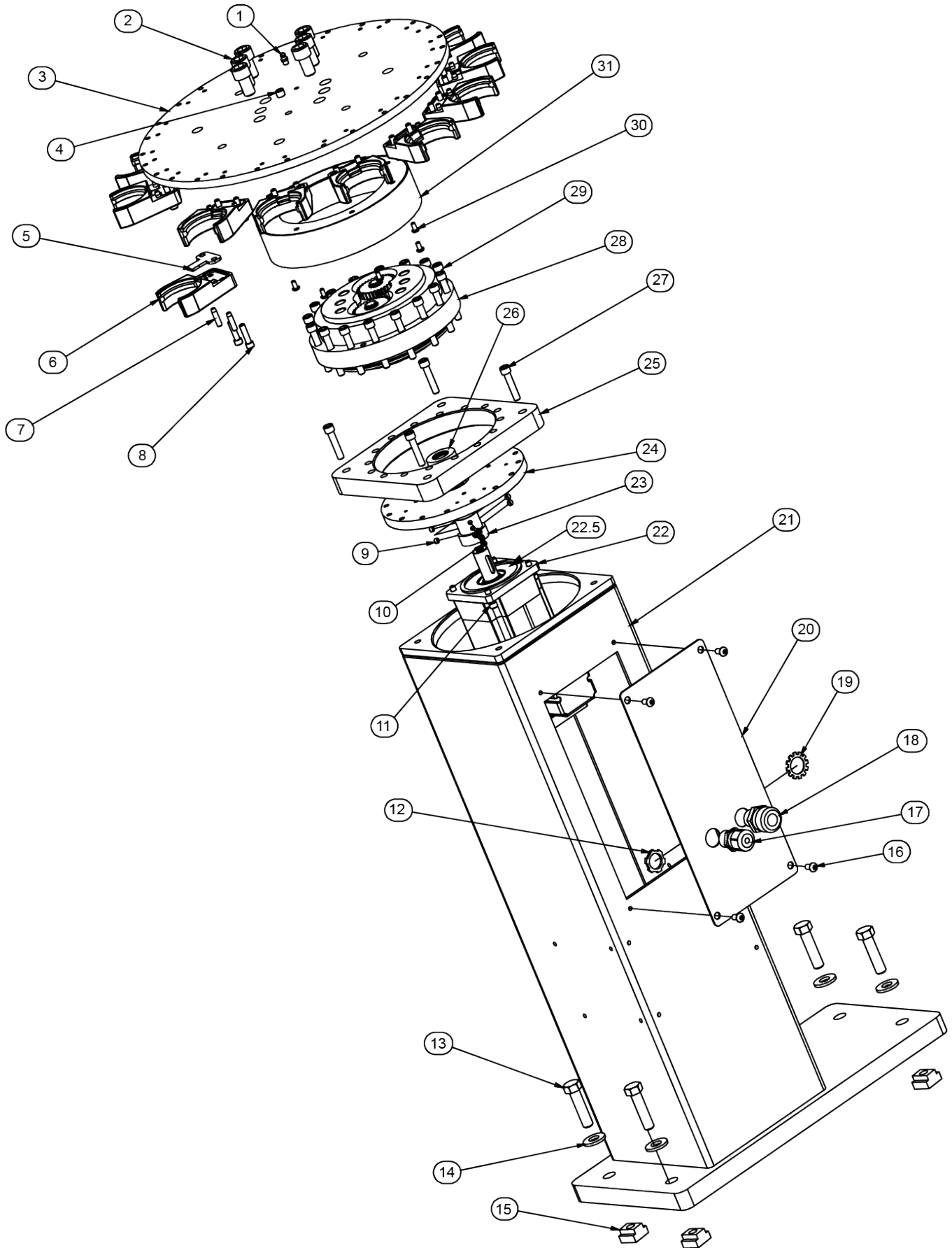
ITEM	PART #	DESCRIPTION
16	11039K	FABRIC MOUNT, RIGHT
17	11039J	FABRIC MOUNT, LEFT
18	11038L	FABRIC ROLLER
19	11038P	SUPPORT, TOP BEARING

Automatic Tool Changer

11042 Automatic Rotary Tool Changer Parts

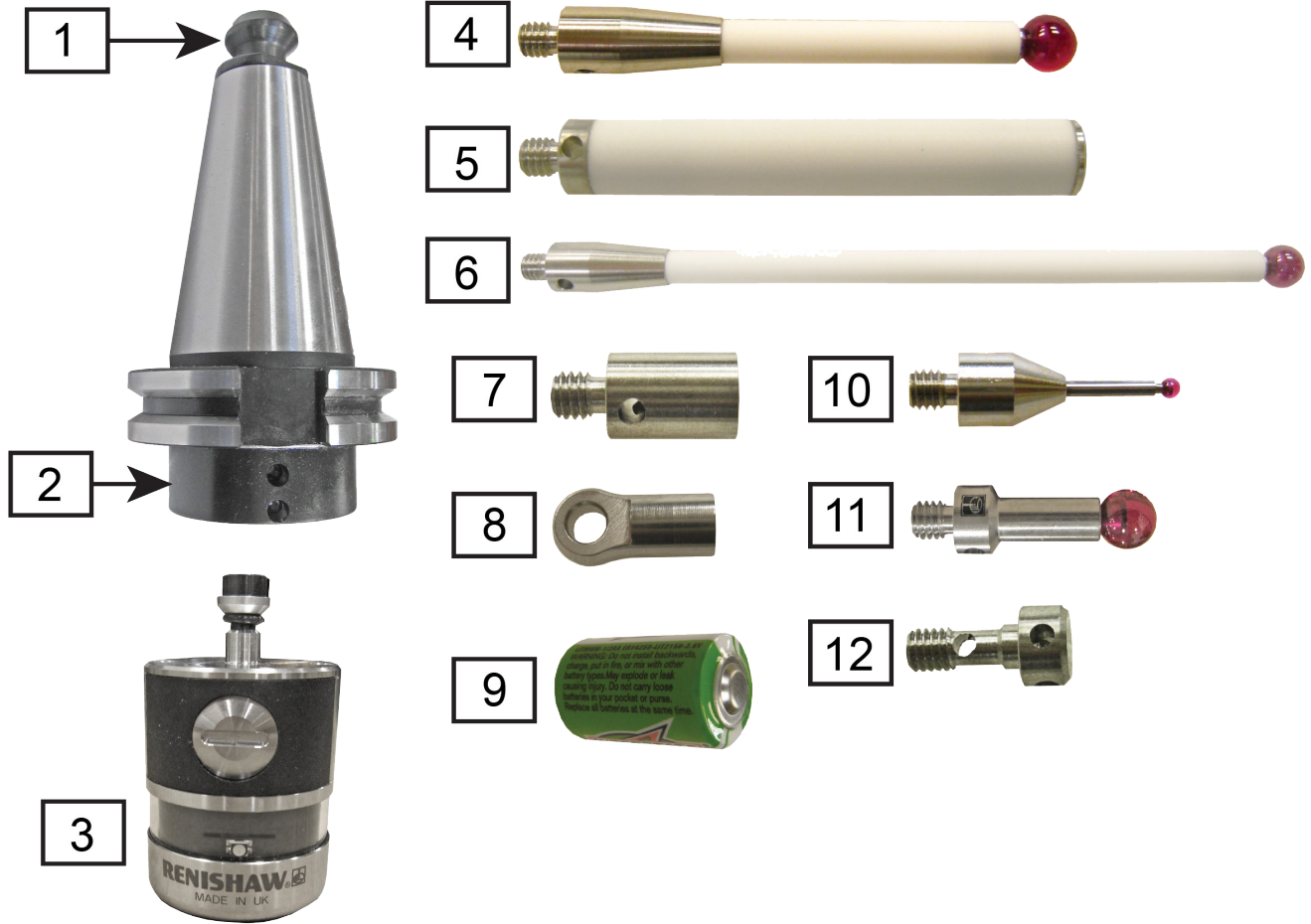


ITEM	PART #	DESCRIPTION
1	11046C	COVER, TOOL CHANGER TOP PLATE ASSEMBLY
2	MF-88A	SOCKET BUTTON HEAD SCREW 10-24 X 1/2"
3	100-28-32	WASHER, 3/32" THICK
4	MF-93A	SOCKET BUTTON HEAD SCREW 5/16-18 X 1/2"
5	11042T	DOOR, TOOL CHANGER ACTUATOR
6	MF-92	SOCKET BUTTON HEAD SCREW 1/4-20 X 3/4"
7	11042U	TIP, ACTUATOR DOOR
8	MF-88A	SOCKET BUTTON HEAD SCREW 10-24 X 1/2"
9	11046	COVER, TOOL CHANGER BACK PANEL
10	11046G	COVER, TOOL CHANGER LINKAGE ROD
11	100-19A	WASHER, HARDENED 17/32" ID
12	11042V	ROD END, TOOL CHANGER COVER
13	11046H	COVER, TOOL CHANGER BEARING HOUSING
14	502-1-16	WASHER, HARDENED
15	500-74	BEARING, FEED SLEEVE
16	11046J	ACTUATOR, TOOL CHANGER PIVOT SHAFT
17	11046K	COVER, TOOL CHANGER SHAFT DOOR
18	11046E	COVER, TOOL CHANGER DOOR ASSEMBLY
19	11046F	COVER, ACTUATOR ARM
20	11046M	COVER, TOOL CHANGER SPRING SPINDLE
21	11046N	COVER, TOOL CHANGER SPRING DOOR
22	11046B	COVER, TOOL CHANGER RIGHT SIDE
23	11046L	COVER, TOOL CHANGER SUPPORT ARM
24	11046A	COVER, TOOL CHANGER LEFT



ITEM	PART #	DESCRIPTION
1	MF-189	1/4-28 STRAIGHT LUBE GREASE FITTING
2		M14X2 X 25 SHCS
3	11042N	PLATE, TOOL CHANGER TURRET
4	MF-233	MALE SOCKET PIPE PLUG 1/8-27
5	11042R	INDEXER, CAT 40 TOOL
6	11042Q	GRIPPER, CAT 40 TOOL
7	10360J	PIN, GRIPPER LOCATOR HSK 80
8	MF-15	SOCKET HEAD CAP SCREW 1/4-20 X 1"
9	5506Q	FLAT POINT SET SCREW-1/4-20 X 3/16" LONG
10	5506G	SET SCREW
11	MF-14	SOCKET HEAD CAP SCREW 1/4-20 X 3/4"
12	502-2-26A	NUT
13	MF-149C	HEX BOLT 1/2-13 X 2"
14	100-19A	WASHER, HARDENED 17/32" ID
15	650-3-10	T-NUT, 1/2-13 WITH 5/8" TABLE SLOT
16	MF-90	SOCKET BUTTON HEAD SCREW 1/4-20 X 1/2"
17	6354D	STRAIN RELIEF-1/2" (1/8 TO 1/4")
18	400-7-7	CONNECTOR, STRAIN RELIEF 5/8
19	502-2-26A	NUT
20	11042C	PLATE, TOOL CHANGER ACCESS
21	11042A	TOWER, TOOL CHANGER
22	9020N	MOTOR WITH BISS ENCODER
22.5	650-3-61N	SEAL
23	5506D	INPUT SHAFT-GEARBOX ASSEMBLY
24	514-13-14J	ADAPTOR, MOTOR GEAR BOX
25	11042D	PLATE, TOOL CHANGER GEARBOX MOUNTING
26	650-3-61N	OIL SEAL-MOTOR
27	MF-25	SOCKET HEAD CAP SCREW 5/16-18 X 1 1/2"
28	5506C	GEARBOX ASSEMBLY
29	MF-38B	SOCKET HEAD CAP SCREW 5/16-18 X 2 1/4"
30	MF-88	SOCKET BUTTON HEAD SCREW 10-24 X 3/8"
31	514-13-14K	COVER, GEAR BOX

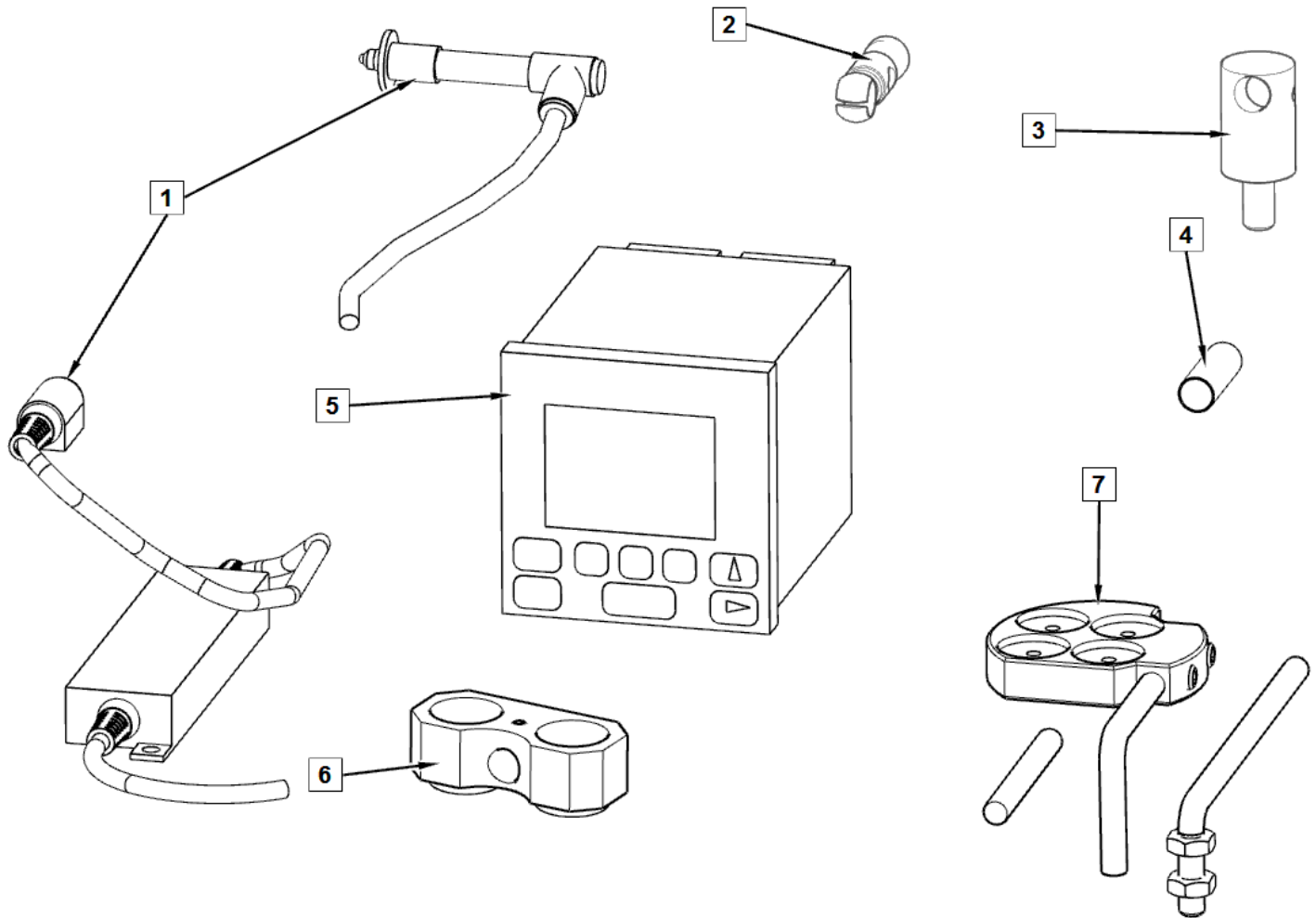
Cylinder Bore and Main Line Bore Centering
Automatic Centering
650-3-59Y Renishaw Wireless Probing System Parts



ITEM	PART #	DESCRIPTION
1	650-2-44L	CAT 40 RETENTION KNOB
2	6648P	CAT 40 SHANK
3	650-3-59Z	PROBE RMP40
4	650-3-59C	50MM LONG X 6MM DIA. STYLUS PROBE
5	650-3-59K	STYLUS EXTENSION (50MM)
6	650-3-59D	100MM LONG X 6MM DIA. STYLUS PROBE
7	6648T	STYLUS EXTENSION
8	6648R	SWIVEL ADAPTER FOR STYLUS
9	6648U	LITHIUM BATTERY
10	650-3-59E	20MM LONG X 2MM DIA. STYLUS PROBE
11	6648Q	17.5MM LONG X 6MM DIA. STYLUS PROBE
12	6648S	CRASH PROTECTION DEVICE FOR STYLUS

Manual Centering

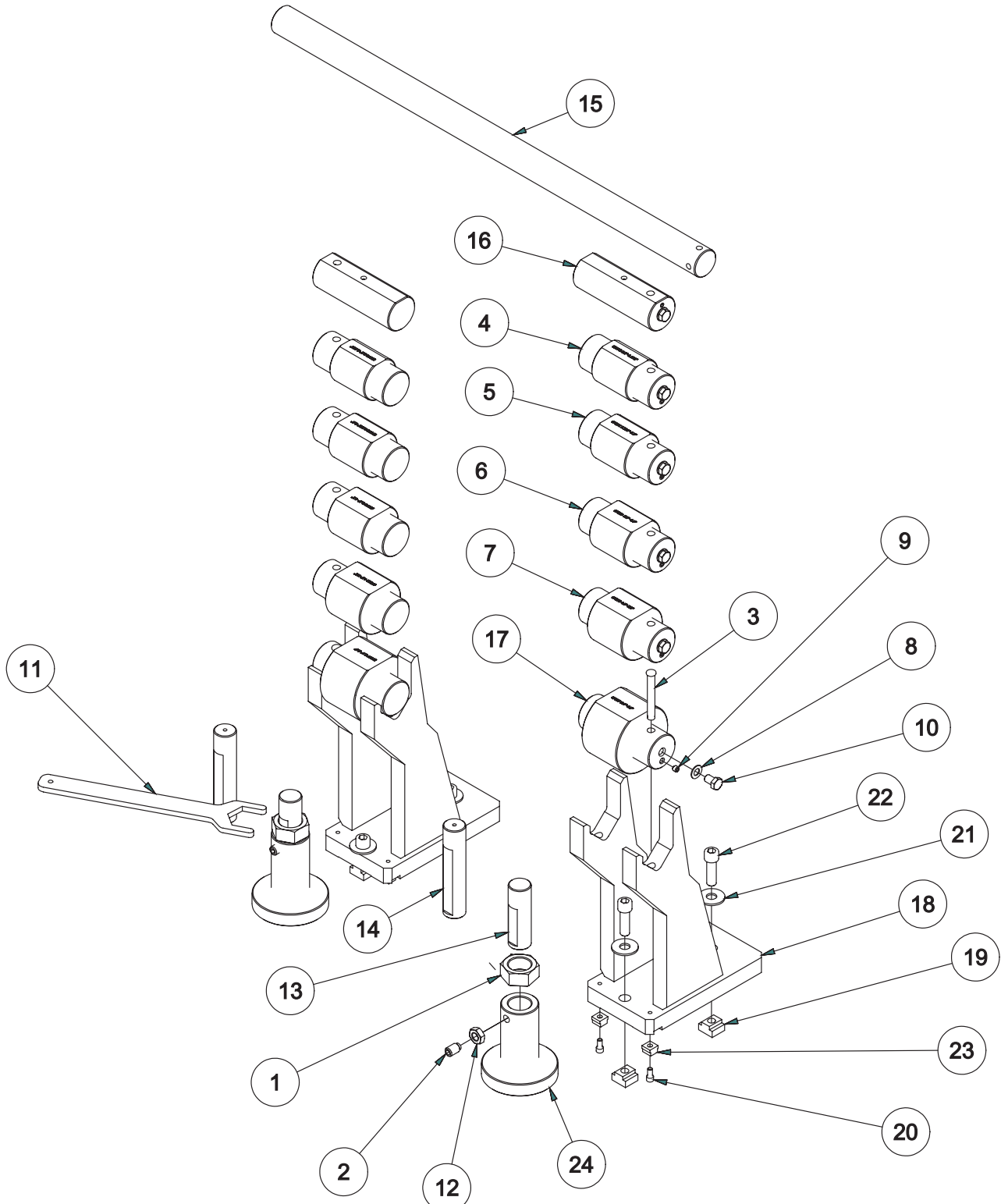
502-12-7B Digital Runout Probe and Readout Parts



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

Universal Fixtures for In-Line and V-Blocks

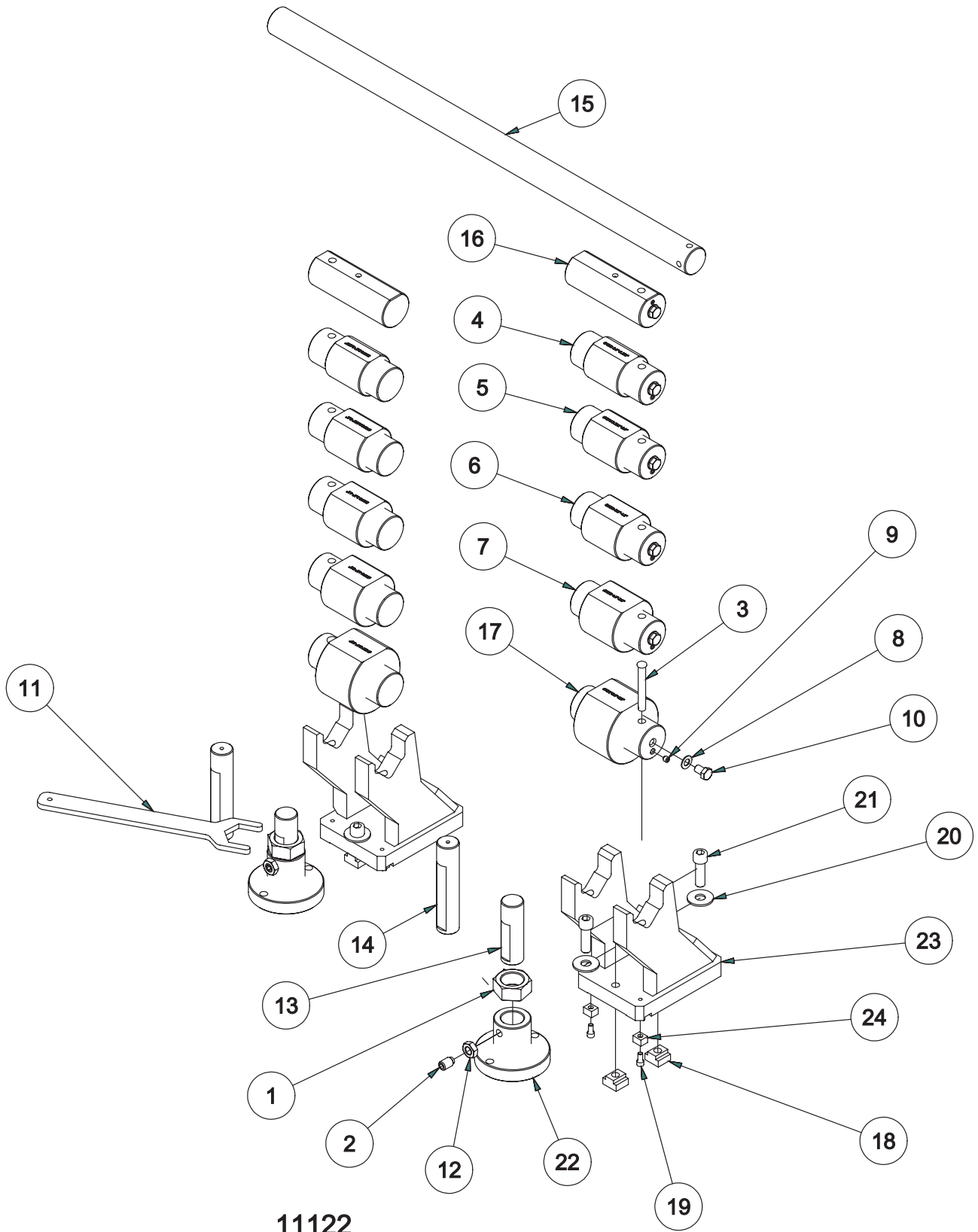
11121 Mid Range Universal Fixture Parts



11121
DIESEL FIXTURE ASSEMBLY (TALL VERSION)
INLINE AND MID RANGE V-BLOCK
F79

11121 DIESEL FIXTURE ASSY (TALL VERSION), INLINE AND MID RANGE V BLOCK - F79			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	2	6566H	Jacking Nut
2	2	6395B	5/8-11 Half Dog 1" long
3	2	6553H	PIN, LOCATION - DIESEL FIXTURE
4	2	6787B	LOCATOR, MAIN BEARING 3.0" TO 3.225" DIA., DIESEL FIXTURE
5	2	6787C	LOCATOR, MAIN BEARING 3.225" TO 3.5" DIA.
6	2	6787D	LOCATOR - MAIN BRG. 3.5" - 4.0" DIA. DIESEL FIXTURE - F80/F90
7	2	6787E	LOCATOR - MAIN BRG. 4.00" TO 5.00" DIA. DIESEL FIXTURE F80/F90
8	12	100-19	Washer
9	12	6788Q	SCREW, SET - BRASS TIPPED 3/8-16UNC x 5/16"
10	12	MF-137E	1/2-13UNC x 3/4" LG. HEX BOLT
11	1	6566K	WRENCH, JACKING NUT - DIESEL FIXTURING
12	2	MF-173	5/8-11UNC JAM NUT
13	2	7241N	JACKING SCREW 4-3/4" LG.
14	2	6396	JACKING SCREW 7" LG.
15	1	7241E	LOCATOR BAR, ECONOMY HEAD AND BLOCK FIXTURE
16	2	6787M	Locator, Main Bearing 2-1/2-3" dia.
17	2	6787F	LOCATOR - MAIN BRG. 5.00" TO 6.00" DIA. DIESEL FIXTURE F80/F90
18	2	6553F	Machining, Main Bearing Support
19	4	502-1-11A	3/4" T-Nut
20	4	MF-21	S.H.C.S.5/16 - 18 UNC - 5/8
21	4	MF-181	5/8" FLAT WASHER
22	4	MF-46D	S.H.C.S. 5/8 - 11 UNC - 2
23	4	6869A	STEP KEY 3/4" - 5/8"
24	2	6395D	JACK BODY

11122 Diesel Fixture Assembly Parts

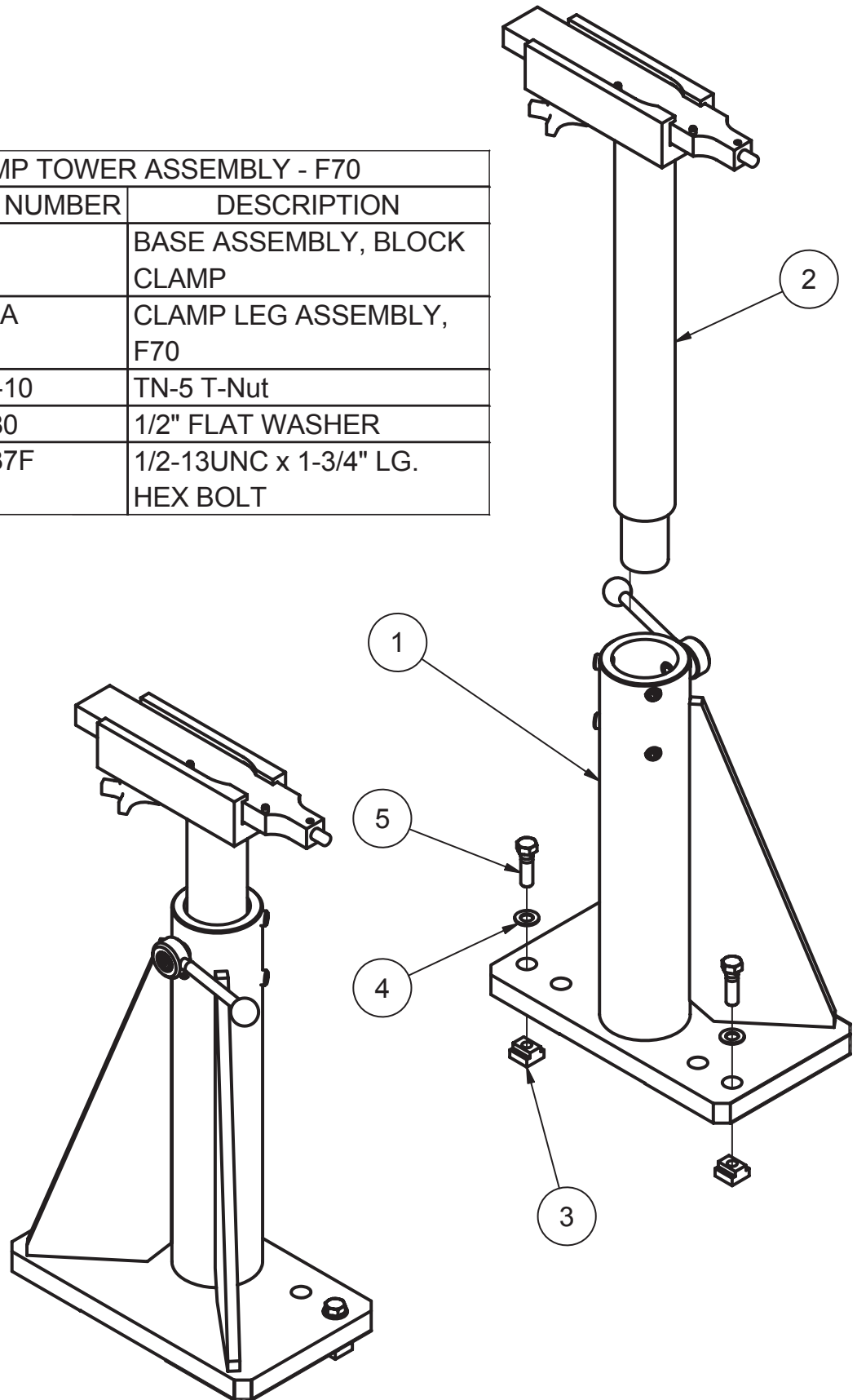


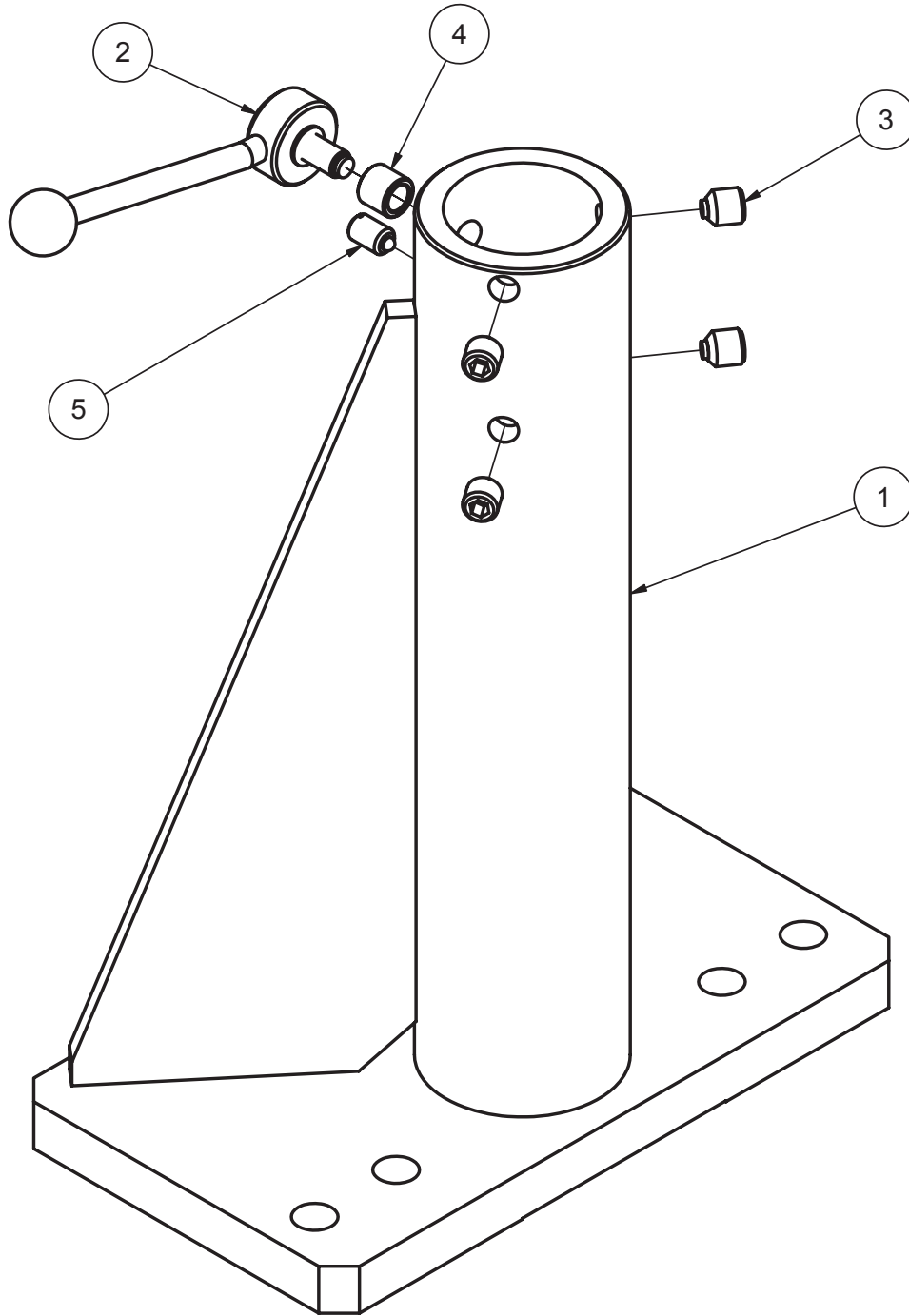
11122
DIESEL FIXTURE ASSEMBLY (SHORT VERSION),
INLINE AND MID RANGE V-BLOCK
F79

11122 DIESEL FIXTURE ASSY (SHORT VERSION), INLINE AND MID RANGE V BLOCK - F79			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	2	6566H	Jacking Nut
2	2	6395B	5/8-11 Half Dog 1" long
3	2	6553H	PIN, LOCATION - DIESEL FIXTURE
4	2	6787B	LOCATOR, MAIN BEARING 3.0" TO 3.225" DIA., DIESEL FIXTURE
5	2	6787C	LOCATOR, MAIN BEARING 3.225" TO 3.5" DIA.
6	2	6787D	LOCATOR - MAIN BRG. 3.5" - 4.0" DIA. DIESEL FIXTURE - F80/F90
7	2	6787E	LOCATOR - MAIN BRG. 4.00" TO 5.00" DIA. DIESEL FIXTURE F80/F90
8	12	100-19	Washer
9	12	6788Q	SCREW, SET - BRASS TIPPED 3/8-16UNC x 5/16"
10	12	MF-137E	1/2-13UNC x 3/4" LG. HEX BOLT
11	1	6566K	WRENCH, JACKING NUT - DIESEL FIXTURING
12	2	MF-173	5/8-11UNC JAM NUT
13	2	7241N	JACKING SCREW 4-3/4" LG.
14	2	6396	JACKING SCREW 7" LG.
15	1	7241E	LOCATOR BAR, ECONOMY HEAD AND BLOCK FIXTURE
16	2	6787M	Locator, Main Bearing 2-1/2-3" dia.
17	2	6787F	LOCATOR - MAIN BRG. 5.00" TO 6.00" DIA. DIESEL FIXTURE F80/F90
18	4	502-1-11A	3/4" T-Nut
19	4	MF-21	S.H.C.S.5/16 - 18 UNC - 5/8
20	4	MF-181	5/8" FLAT WASHER
21	4	MF-46D	S.H.C.S. 5/8 - 11 UNC - 2
22	2	7241Q	JACK BODY, ECONOMY FIXTURE F60 SERIES
23	2	6553M	SUPPORT, MAIN BEARING FIXTURE (MACHINING) - F5
24	4	650-3-9	Key

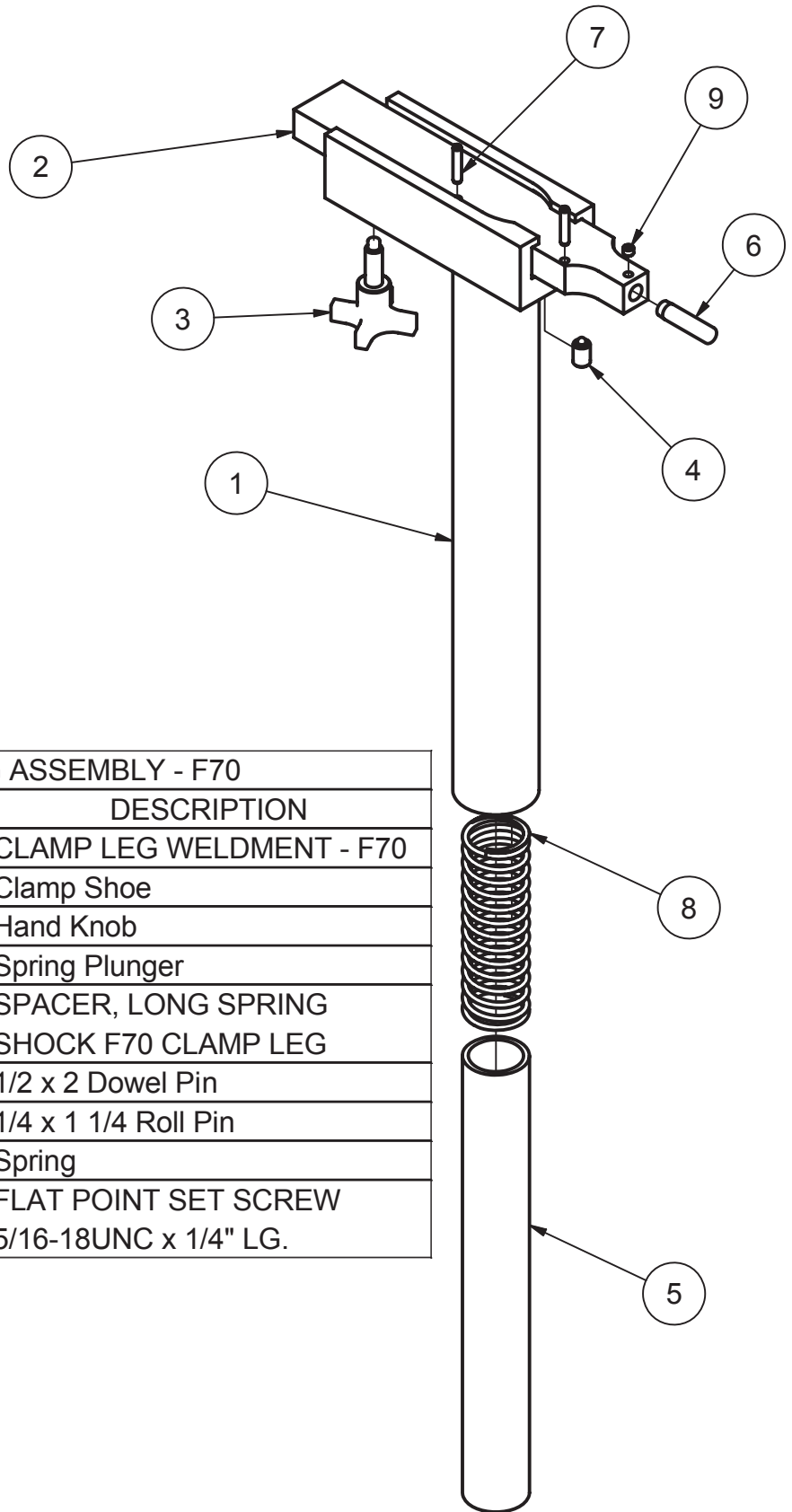
11111 Clamp Tower Assembly Parts

11111 CLAMP TOWER ASSEMBLY - F70			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	2	6309J	BASE ASSEMBLY, BLOCK CLAMP
2	2	11111A	CLAMP LEG ASSEMBLY, F70
3	4	650-3-10	TN-5 T-Nut
4	4	MF-180	1/2" FLAT WASHER
5	4	MF-137F	1/2-13UNC x 1-3/4" LG. HEX BOLT





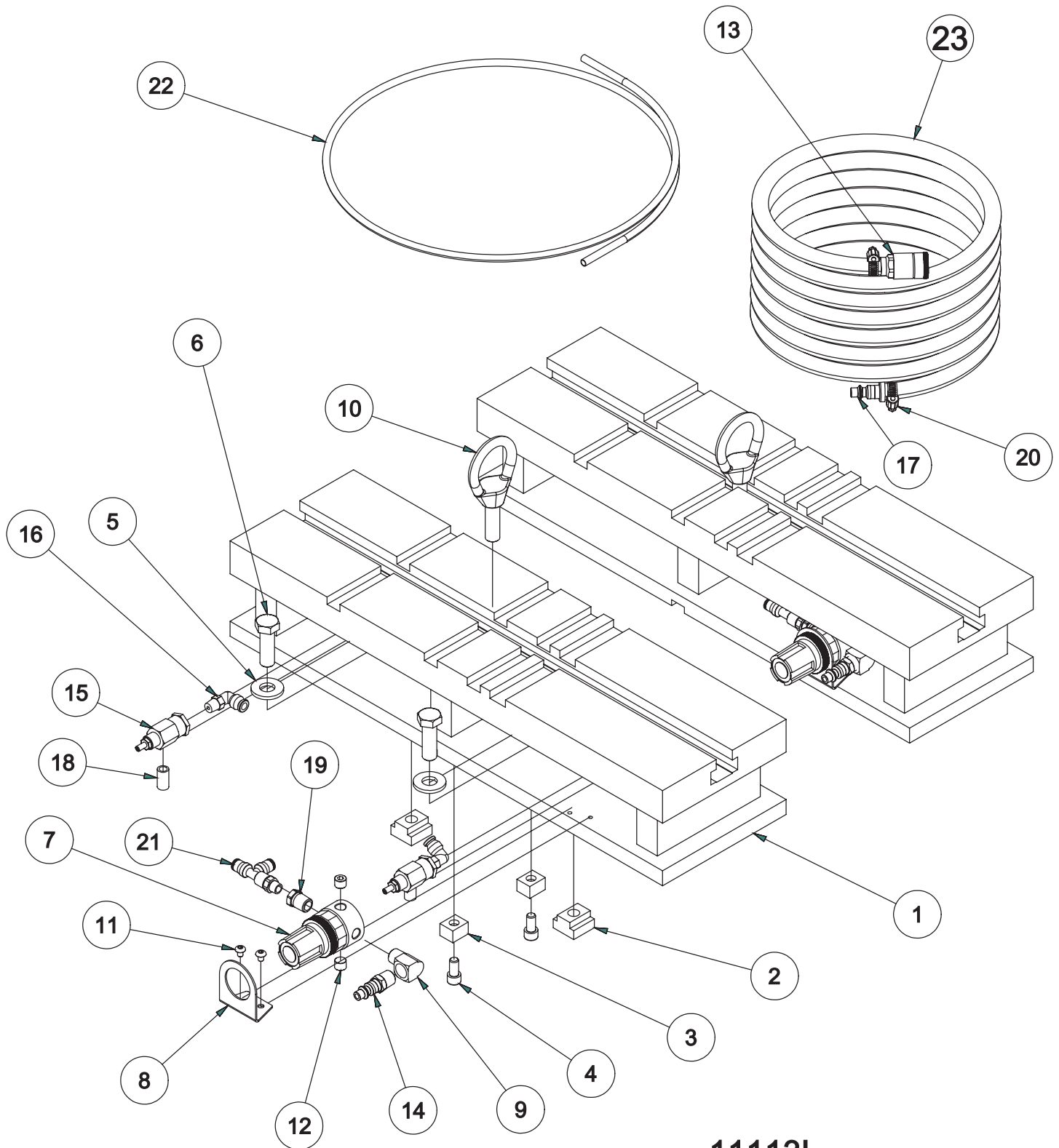
6309J CLAMP TOWER BASE ASSEMBLY - F70/F90			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	6309L	Block Clamp Base
2	1	6310N	HANDLE ASSEMBLY, CLAMP TOWER - F80
3	4	6310Y	Brass Tipped Set Screw
4	1	6310R	Thread Insert
5	1	502-8-52C	Spring Plunger



11111A CLAMP LEG ASSEMBLY - F70			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	11111B	CLAMP LEG WELDMENT - F70
2	1	6310H	Clamp Shoe
3	1	6310K	Hand Knob
4	1	502-8-52C	Spring Plunger
5	1	11111C	SPACER, LONG SPRING SHOCK F70 CLAMP LEG
6	1	MF-214	1/2 x 2 Dowel Pin
7	2	MF-227	1/4 x 1 1/4 Roll Pin
8	1	6310S	Spring
9	1	MF-67	FLAT POINT SET SCREW 5/16-18UNC x 1/4" LG.

Miscellaneous Accessories and Parallels

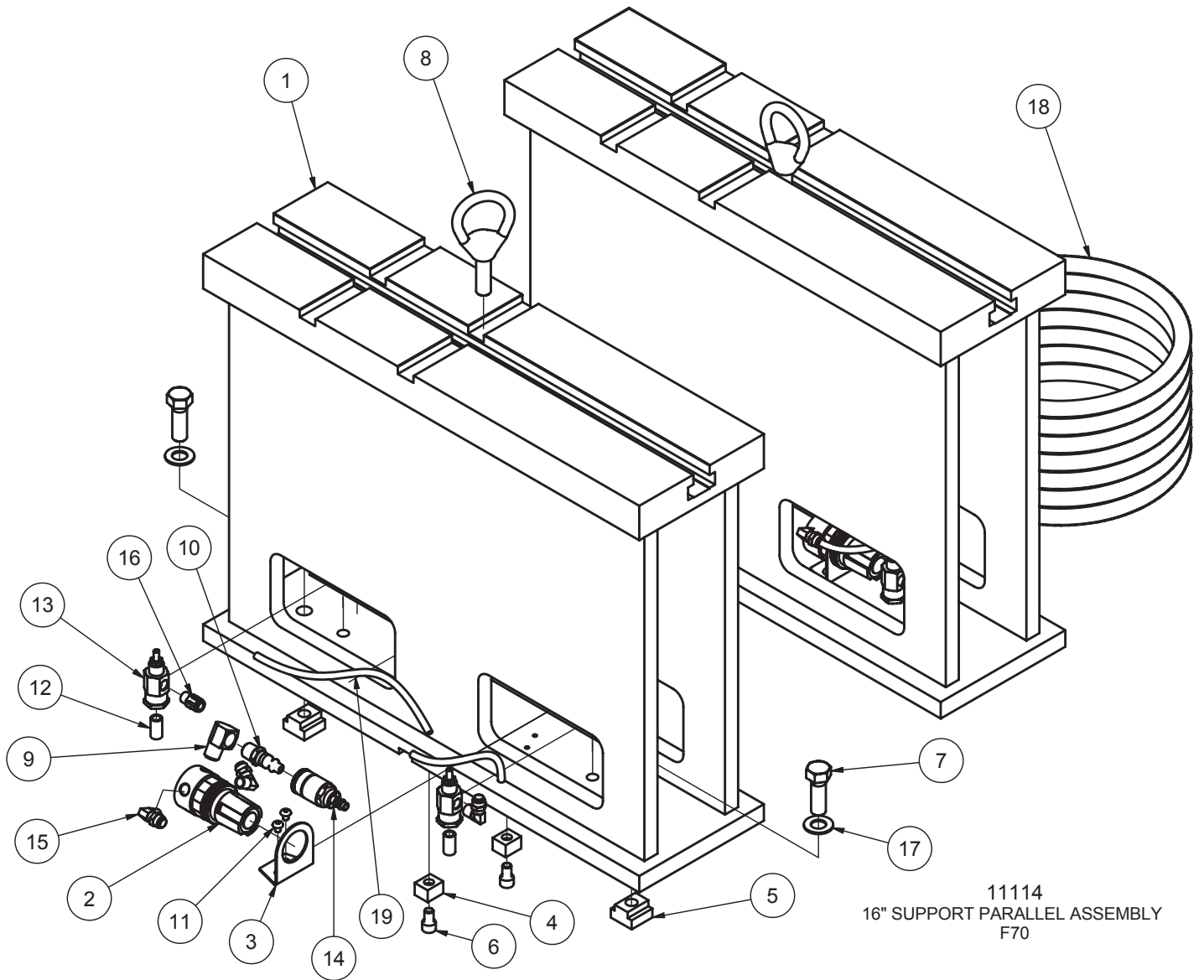
11113L Universal 4" (102mm) Heavy Duty T-Slot Parallels Parts



11113L
4" PARALLEL ASSEMBLY
F-79

11113L 4" PARALLEL ASSEMBLY - F79			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	11113K	4" PARALLEL MATCHED SET - F70
2	4	650-3-10	TN-5 T-Nut
3	4	650-3-9	Key
4	4	MF-21	S.H.C.S. 5/16 - 18 UNC - 5/8
5	4	100-19A	Hardened washer 17/32 I.D.
6	4	MF-150A	1/2-13UNC x 1-1/2" LG. Hex Cap Screw
7	2	502-27-17	Regulator 0 - 60 PSI
8	2	502-27-17A	Regulator Bracket
9	2	502-11-17S	1/4 STREET ELL
10	2	502-3-13	Lift Eye
11	4	MF-87	Hexagon Socket Button Head Cap Screw
12	4	502-11-17F	Countersunk Hex-Head Plug 1/8
13	1	502-11-16W	Quick connect air fitting female
14	2	502-11-16X	Quick Connect air Fitting Male
15	4	502-11-35A	Flo Control
16	4	514-4-17E	ELBOW, MALE - 1/4" x 1/8"
17	1	502-11-16Y	CONNECTOR, MALE AIR 1/4 NPTF
18	4	502-11-17J	Nipple, Close 1/8" NPT
19	2	502-11-17H	BUSHING, PIPE, 1/4NPT x 1/8NPT
20	2	502-1-97	CLAMP, 1/4" I.D. HOSE
21	2	514-4-17X	TEE, RUNNING 1/8NPT x 1/4" POLY
22	1	502-11-15	4 ft. HOSE COIL
23	1	502-1-98	15 ft. 1/4" AIR HOSE

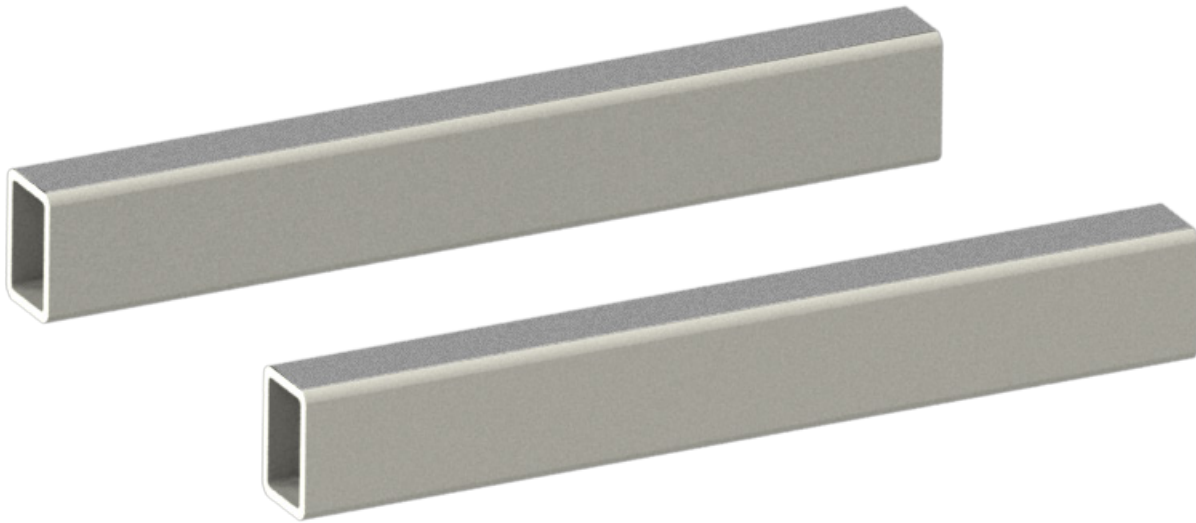
11114 Universal 16" (406mm) Heavy Duty T-Slot Parallels Parts



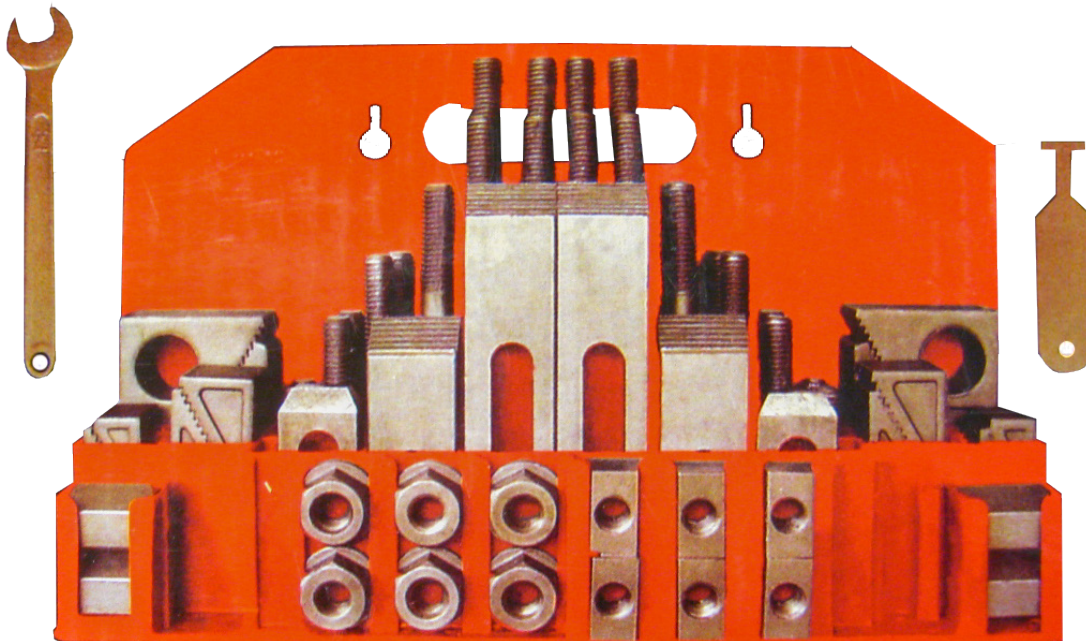
11114 SUPPORT PARALLEL ASSEMBLY 16" - F70			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	2	11114A	SUPPORT PARALLEL 16" (MACHINING) - F70
2	2	502-27-17	Regulator 0 - 60 PSI
3	2	502-27-17A	Regulator Bracket
4	4	650-3-9	Key
5	4	650-3-10	TN-5 T-Nut
6	4	MF-21A	5/16-18UNC x 1/2" LG. S.H.C.S.
7	4	MF-137A	1/2-13UNC x 1-1/2" LG. HEX BOLT
8	2	502-3-13	Lift Eye
9	2	502-11-17S	1/4 STREET ELL
10	2	502-11-16X	Quick Connect air Fitting Male
11	4	MF-87	10-24UNC x 1/4" LG. SOCKET BUTTONHEAD SCREW
12	4	502-11-17J	Nipple, Close 1/8" NPT
13	4	502-11-35A	Flo Control
14	1	502-11-16W	Quick connect air fitting female
15	6	502-11-16I	Elbow, Male 1/4 FPT x 1/8 PT
16	2	514-4-17W	FITTING 1/8NPT x 1/4" POLY STRAIGHT
17	4	MF-180	1/2" FLAT WASHER
18	15 FT.	502-1-98	1/4" AIR HOSE
19	3 FT.	502-11-15	1/4" OD BLACK POLYFLO

11115 2" (50mm) X 3" (75mm) Parallels

Sold in as complete set.

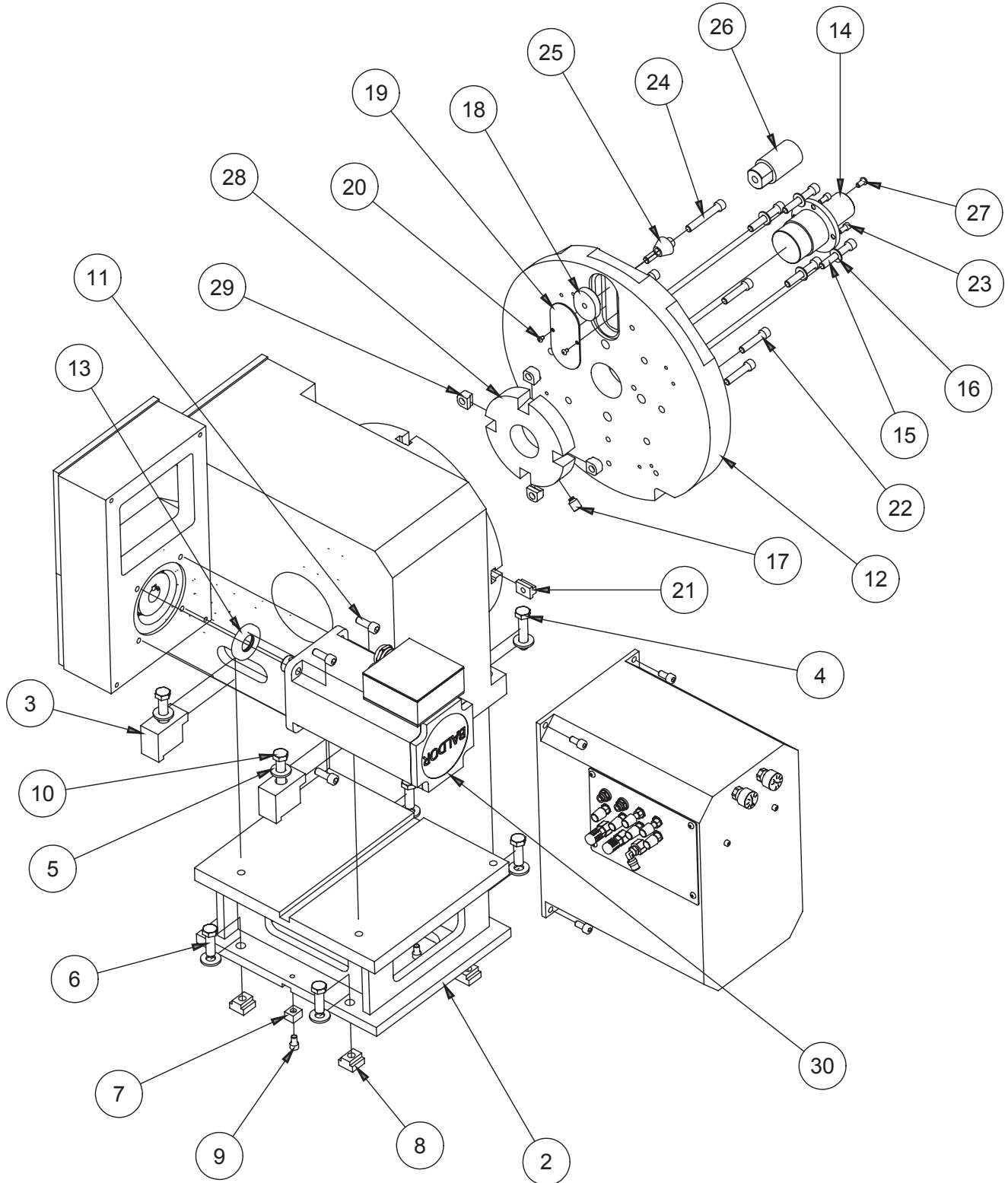
**650-3-37 1/2" (12.7mm) Universal Clamping Kit**

Sold only as a complete kit.



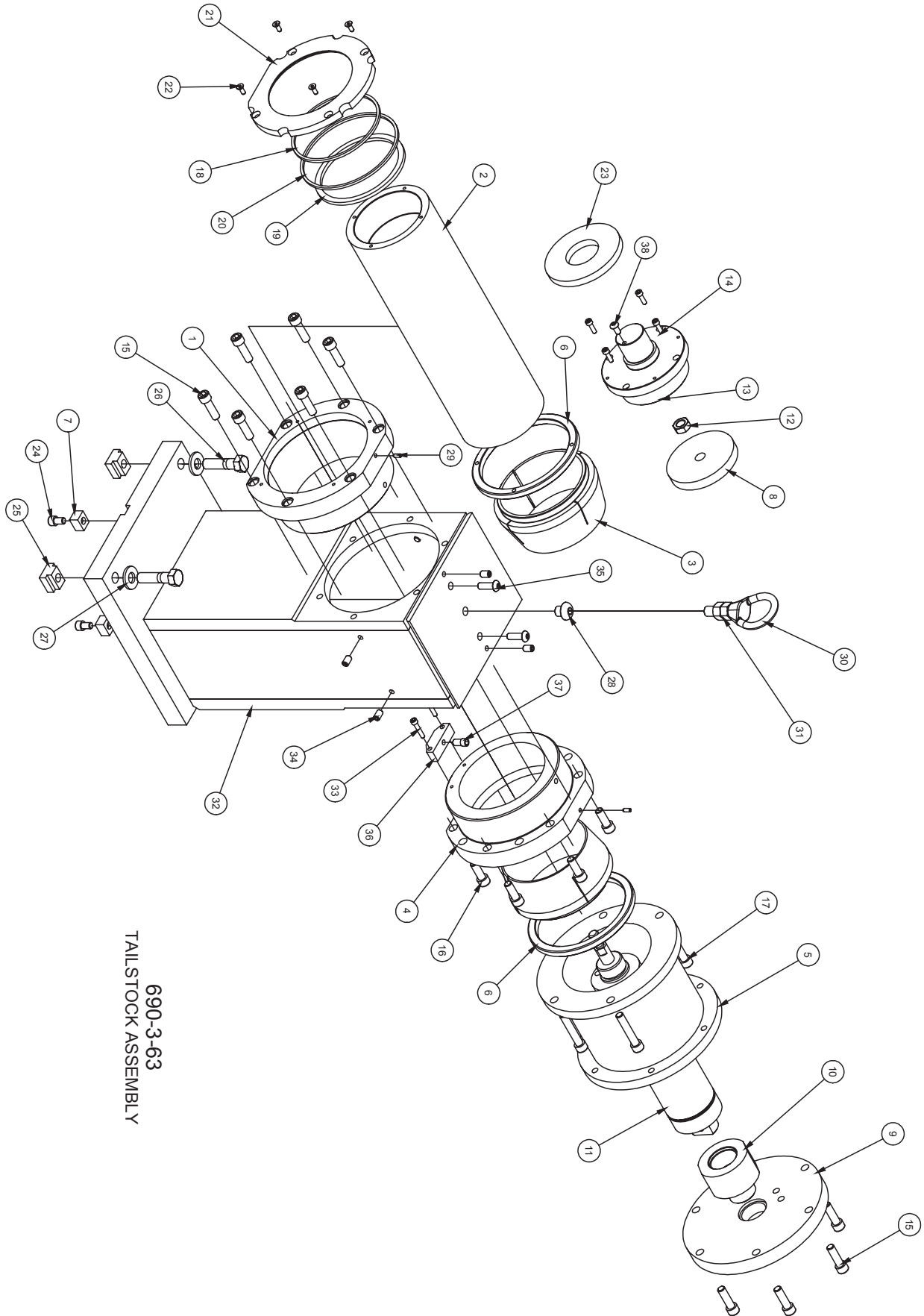
Fixtures for Performance Blocks

690-3-63 Automatic 4Th Axis Block Roll Over Fixture Parts



690-3-63
HEADSTOCK ASSEMBLY

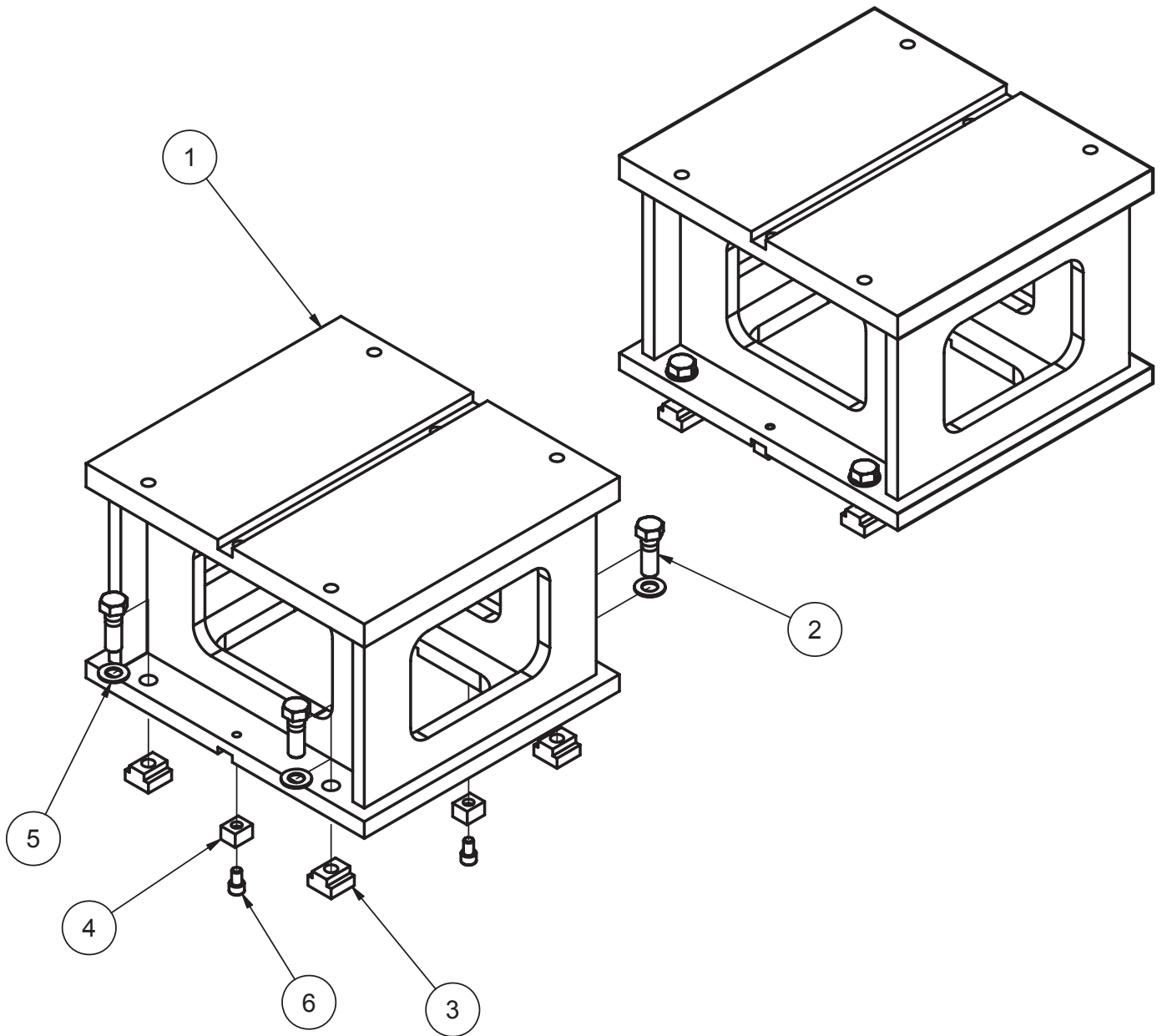
690-3-63 4TH AXIS FIXTURE HEADSTOCK ASSEMBLY			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	690-3-96 body	INDEXER, 4TH AXIS FIXTURE
2	1	650-3-85C	RISER, MACHINING, - 4TH AXIS INDEXER
3	2	650-3-85D	CLAMP, INDEXER - 4TH AXIS FIXTURE
4	2	MF-49A	1/2-13UNC x 2-1/4" LG. HEX BOLT
5	8	100-19A	Hardened washer 17/32 I.D.
6	4	MF-137A	1/2-13UNC x 1-1/2" LG. HEX BOLT
7	2	650-3-9	Key
8	4	650-3-10	TN-5 T-Nut
9	2	MF-21A	5/16-18UNC x 1/2" LG. S.H.C.S.
10	2	MF-150C	1/2-13UNC x 2-3/4" HEX BOLT
11	4	MF-143	3/8-16UNC x 1" LG. S.H.C.S.
12	1	650-3-62B	FACEPLATE - AUTO PERFORMANCE FIXTURE
13	1	6481H	Seal
14	1	650-3-62H	PINION, FACEPLATE - AUTO PERFORMANCE FIXTURE
15	4	MF-35	3/8-16UNC x 2-1/4" LG. S.H.C.S.
16	4	MF-178	3/8" FLAT WASHER
17	1	6310L	1/2-13UNC x 5/8" LONG SET SCREW, BRASS TIPPED
18	1	650-3-62V	NUT, EXPANDING CAM LOCATOR - AUTO PERFORMANCE FIXTURE
19	1	650-3-62G	COVER, CAM LOCATOR NUT - AUTO PERFORMANCE FIXTURE
20	2	MF-86	8-32UNC x 1/4" LG. SOCKET BUTTON HEAD CAPSCREW
21	6	650-3-61P	T-NUT, FACEPLATE - AUTO PERF. FIXTURE
22	6	MF-33A	3/8-16UNC x 1-3/4" LG. S.H.C.S.
23	4	MF-12	1/4-20UNC x 1/2" LG. S.H.C.S.
24	1	MF-36	3/8-16UNC x 2-1/2" LG. S.H.C.S.
25	1	650-3-70D	CONE WASHER, EXPANDING CAM LOCATOR - AUTO PERFORMANCE FIXTURE
26	1	650-3-62D	CAM LOCATION SET-UP TOOL - AUTO PERFORMANCE FIXTURE
27	1	MF-90	1/4-20UNC x 1/2" LG. SOCKET BUTTON HEAD CAPSCREW
28	1	650-3-96A	CENTERING RING, FACEPLATE, 4TH AXIS FIXTURE
29	4	650-3-96B	CENTERING WEDGE, FACEPLATE, 4TH AXIS FIXTURE
30	1	9020H	BSM90C-3250AB2 MOTOR



690-3-63
TAILSTOCK ASSEMBLY

690-3-63 4th AXIS FIXTURE TAILSTOCK ASSEMBLY			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	6225A	Lower Bearing Carrier
2	1	650-3-61G	PISTON TUBE, TAILSTOCK ASSEMBLY - 4TH AXIS FIXTURE
3	2	6222B	BUSHING, TAILSTOCK SPINDLE, 4TH AXIS FIXTURE
4	1	650-3-74	REAR BEARING CARRIER, TAILSTOCK - 4TH AXIS FIXTURE
5	1	650-3-61C	EXTENSION, TAIL STOCK - AUTO PERFORMANCE FIXTURE
6	2	6223	Outer Spindle Nut
7	2	650-3-9	Key
8	1	650-3-61J	NOSE PLATE, TAILSTOCK - AUTO PERFORMANCE FIXTURE
9	1	650-3-61L	ENDCAP, TAILSTOCK - AUTO PERFORMANCE FIXTURE
10	1	650-3-61M	SPACER, AIR CYLINDER, TAILSTOCK - AUTO PERFORMANCE FIXTURE
11	1	650-3-61E	STROKING CYLINDER, TAILSTOCK - AUTO PERFORMANCE FIXTURE
12	1	MF-172	1/2-20UNF HEX JAM NUT
13	1	650-3-61H	PISTON CAP, TAILSTOCK - AUTO PERFORMANCE FIXTURE
14	4	Mf-5	Socket Head Cap screw No. 10 - 24 UNC - 5/8
15	12	Mf-32	Socket Head Cap screw 3/8 - 16 UNC - 1 1/4
16	6	Mf-31	Socket Head Cap screw 3/8 - 16 UNC - 1
17	4	Mf-34	Socket Head Cap screw 3/8 - 16 UNC - 2
18	1	6248	Square Ring
19	1	6249	Felt Oiler
20	1	6251	Square Ring
21	1	6247A	Retainer Machining
22	4	Mf-79	Hexagon Socket Flat Countersunk Head Cap Screw
23	1	650-3-61K	CUSHION, TAILSTOCK - AUTO PERFORMANCE FIXTURE
24	2	Mf-21A	Socket Head Cap screw 5/16 - 18 UNC - 1/2
25	3	650-3-10	TN-5 T-Nut
26	3	MF-149C	1/2-13UNC x 2" LG. HEX BOLT
27	3	100-19A	Hardened washer 17/32 I.D.
28	1	650-3-61S	1/2-13UNC x 5/8" LG. SOCKET BUTTON HEAD SCREW
29	2	100-82-2B	Brassed Tipped Set Screw
30	1	502-3-13	Lift Eye
31	2	MF-171	1/2-13UNC HEX JAM NUT
32	1	650-3-61X	TAILSTOCK HOUSING (MACHINING) 4TH AXIS FIXTURE
33	2	MF-6A	S.H.C.S. 10 - 24 UNC - 1
34	6	MF-68D	5/16-18UNC x 1/2" LG. FLAT POINT SET SCREW
35	2	MF-95	5/16-18UNC x 1" SOCKET BUTTON HEAD SCREW
36	1	650-3-74A	KEY BLOCK
37	1	650-3-74B	KEY BOLT
38	1	MF-90	1/4-20UNC x 1/2" LG. Hexagon Socket Button Head Cap Screw

11110 Parallels/Risers Parts



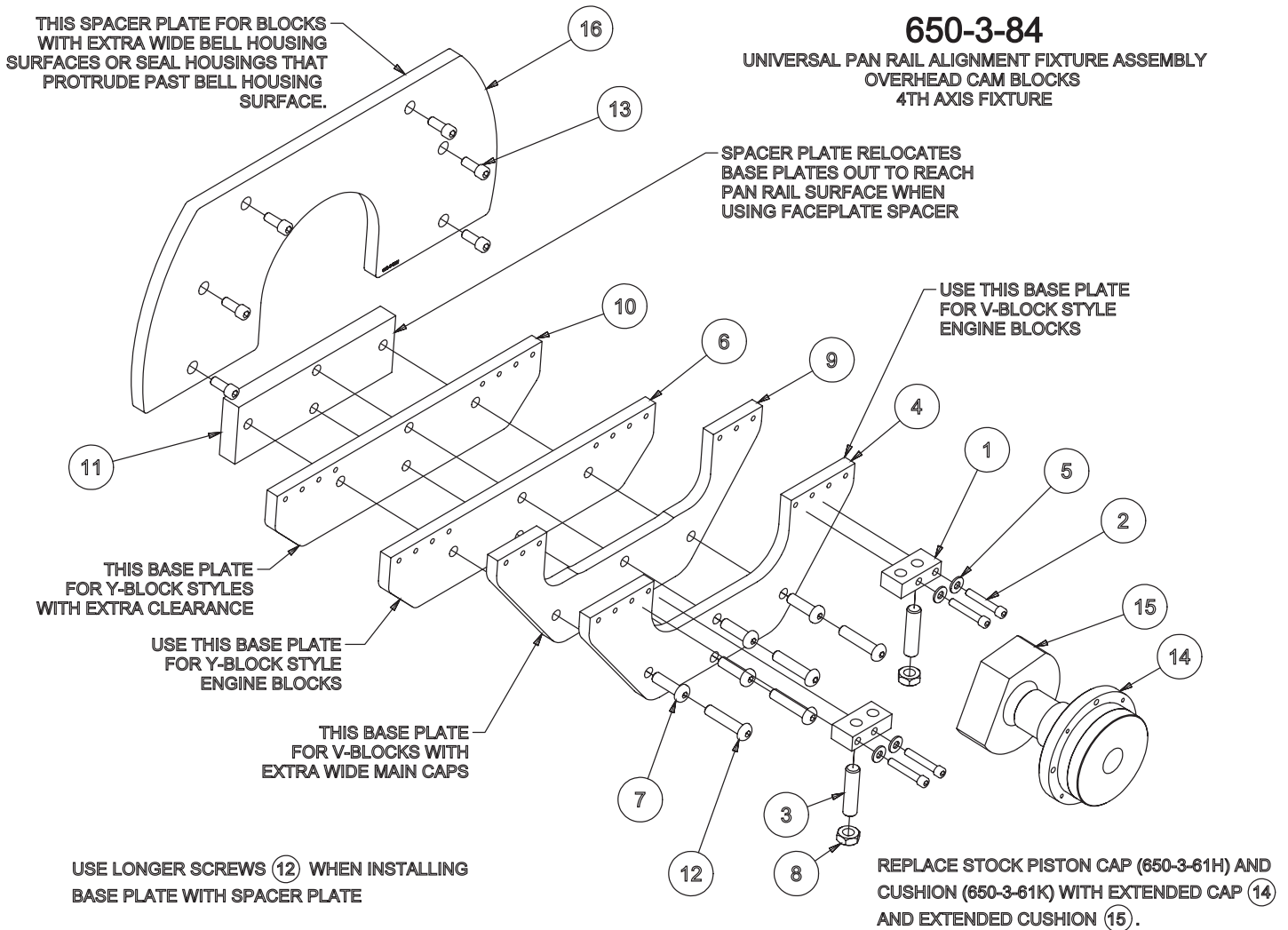
11110 8" RISER ASSEMBLY, 4TH AXIS/DUAL AXIS/PIVOT FIXTURE - F70			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	11110C	8" RISER SET (MATCHED) - F70
2	8	MF-137A	1/2-13UNC x 1.5" LG. HEX BOLT
3	8	650-3-10	TN-5 T-Nut
4	4	650-3-9	Key
5	8	100-19	Washer
6	4	MF-21A	5/16-18UNC x 1/2" LG. S.H.C.S.

Overhead Cam Block Fixturing

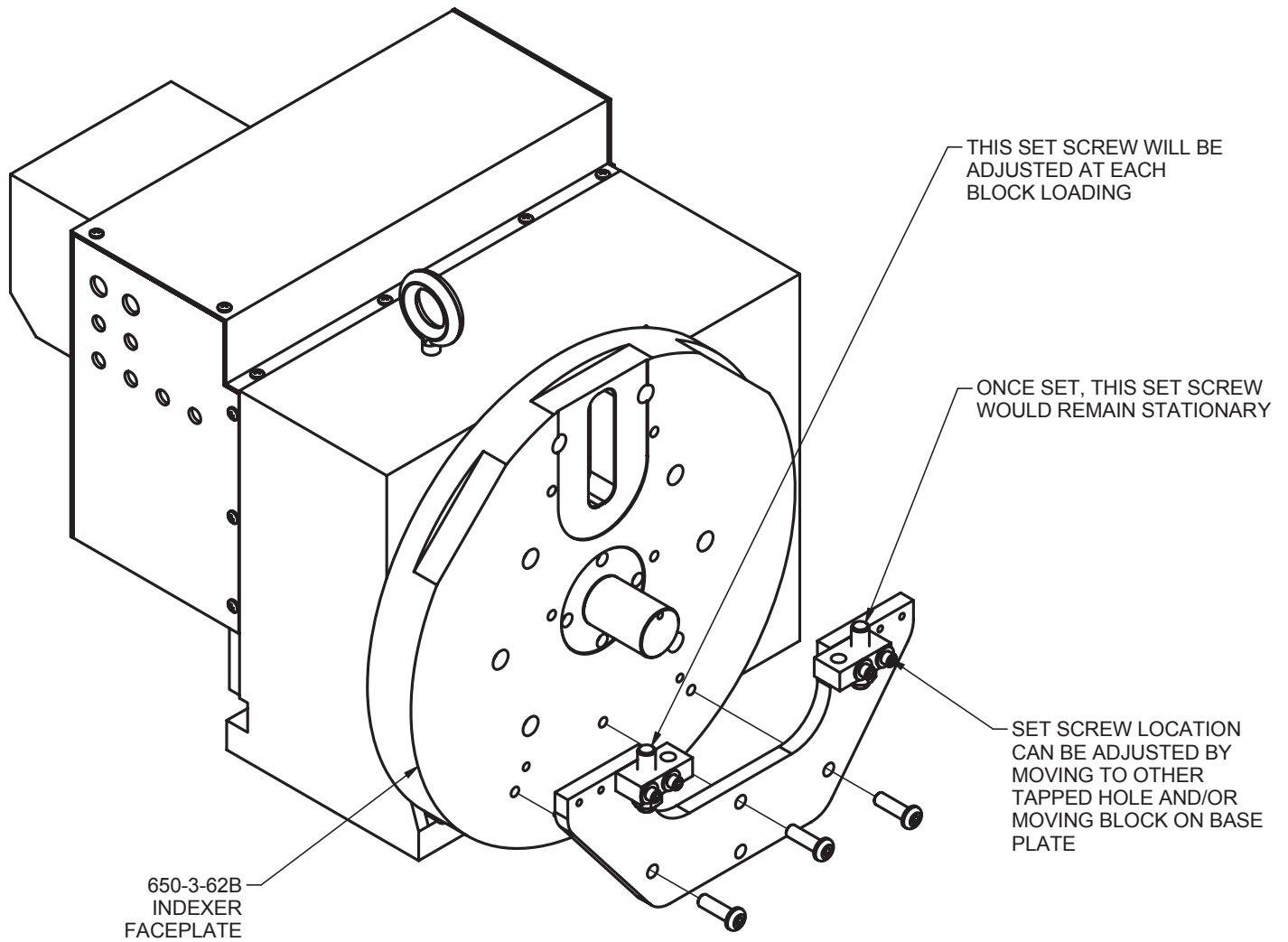
650-3-84 Overhead Cam Block Fixture Parts

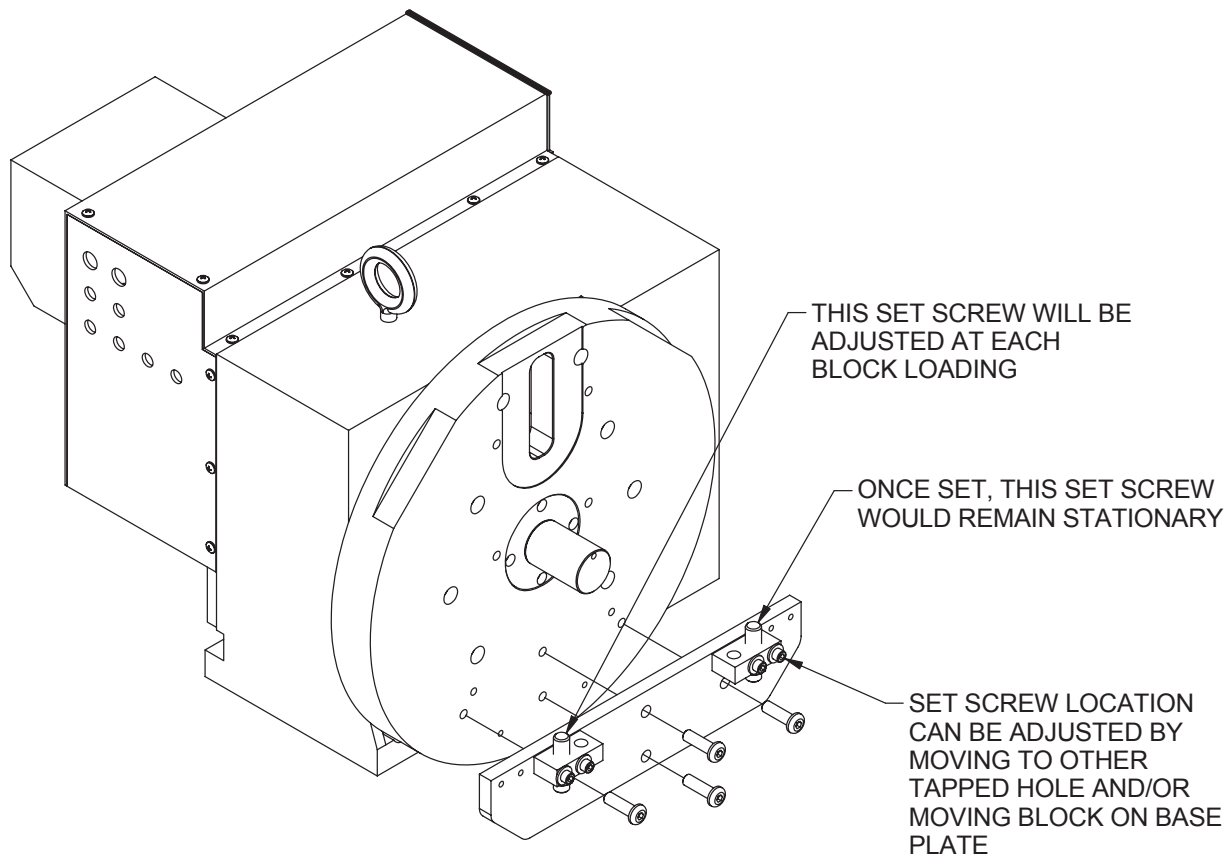
650-3-84

UNIVERSAL PAN RAIL ALIGNMENT FIXTURE ASSEMBLY OVERHEAD CAM BLOCKS 4TH AXIS FIXTURE



650-3-84 Overhead Cam Block Fixture Setup





650-3-84 OVERHEAD CAM BLOCK FIXTURE INSTALLATION AND OPERATING INSTRUCTIONS Y-BLOCK APPLICATIONS

INSTALLATION: LOCATE THE 650-3-84E BASE PLATE ONTO THE 650-3-62B INDEXER FACEPLATE USING (4) EXISTING 3/8-16UNC TAPPED HOLES IN FACEPLATE. FASTEN BASE PLATE USING (4) MF-97C SOCKET BUTTONHEAD SCREWS.

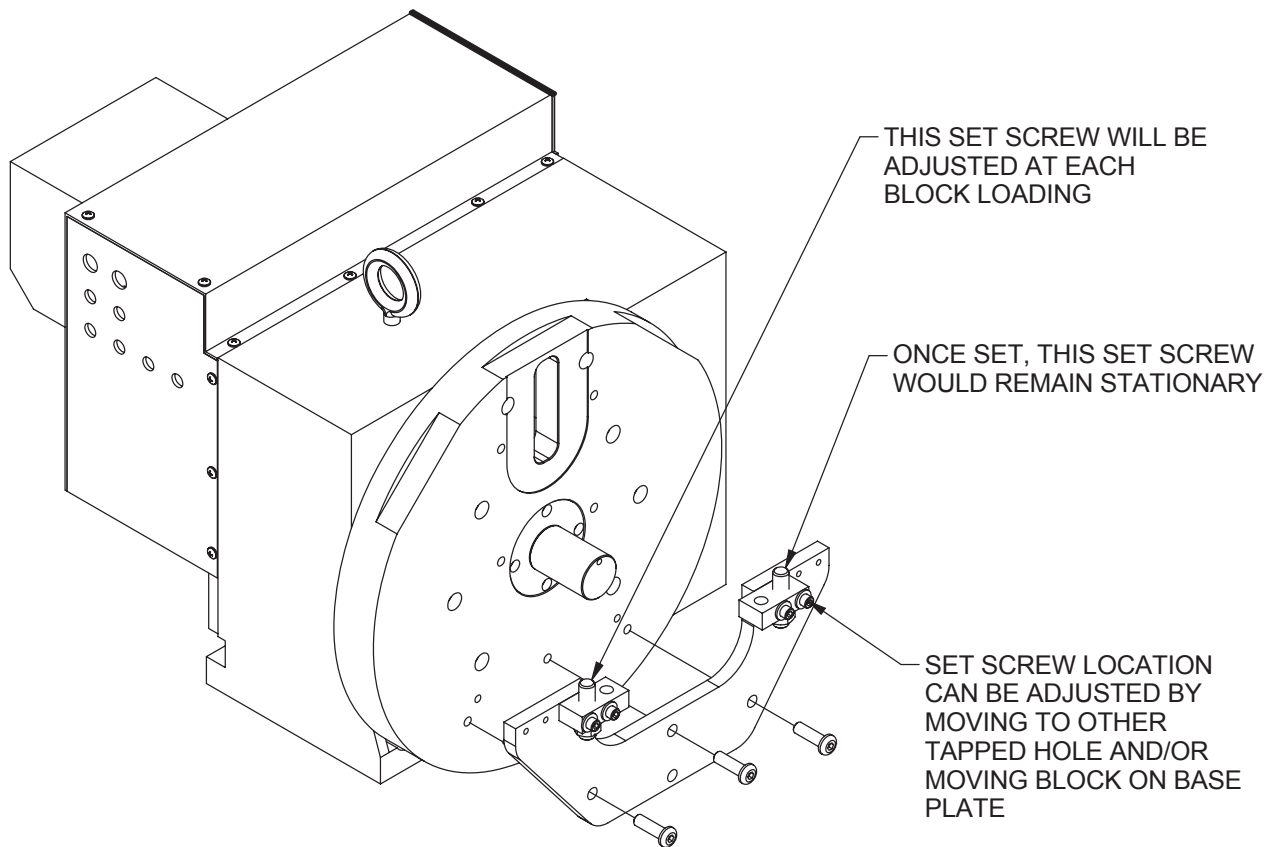
OPERATING: THIS FIXTURE LOCATES THE PAN RAILS OF OVERHEAD CAM BLOCKS USING (2) 650-3-84D FLAT POINT SET SCREWS TO LEVEL THE BLOCK.

INSTALL THE BLOCK USING THE APPROPRIATE MAIN LOCATORS WITH THE INDEXER SET AT 0 DEGREES.

WITH THE MF-171 HEX NUTS LOOSE, ADJUST THE 650-3-84D SET SCREWS TO CONTACT THE PAN RAIL OF THE BLOCK. MULTIPLE MOUNTING HOLES ARE PROVIDED TO ALTER THE LOCATION OF THE 650-3-84C PUSH BLOCKS AND THE SET SCREWS CAN BE MOVED TO EITHER HOLE TO FIT DIFFERENT BLOCKS.

ONCE THE BLOCK IS LEVEL AND THE SET SCREWS ARE BOTH CONTACTING THE PAN RAILS, TIGHTEN THE MF-171 HEX NUTS, CHECK THE BLOCK FOR LEVEL, AND MACHINE.

TO UNLOAD THIS BLOCK AND LOAD ANOTHER BLOCK OF THE SAME STYLE:
LOOSEN THE HEX NUT AND SET SCREW NEAREST TO THE OPERATOR. REMOVE THE BLOCK AND INSTALL THE NEXT BLOCK. ROTATE THIS BLOCK TO CONTACT THE SET SCREW TO THE REAR OF THE FACEPLATE (FURTHEST FROM THE OPERATOR). ADJUST FRONT SET SCREW TO CONTACT THE BLOCK AND TIGHTEN THE HEX NUT. IT IS ADVISABLE TO CHECK THE BLOCK FOR LEVEL DUE TO THE POSSIBILITY OF VARIATION BETWEEN BLOCKS.



650-3-84 OVERHEAD CAM BLOCK FIXTURE INSTALLATION AND OPERATING INSTRUCTIONS V-BLOCK APPLICATIONS

INSTALLATION: LOCATE THE 650-3-84A BASE PLATE ONTO THE 650-3-62B INDEXER FACEPLATE USING (4) EXISTING 3/8-16UNC TAPPED HOLES IN FACEPLATE. FASTEN BASE PLATE USING (4) MF-97C SOCKET BUTTONHEAD SCREWS.

OPERATING: THIS FIXTURE LOCATES THE PAN RAILS OF V-STYLE OVERHEAD CAM BLOCK USING (2) 650-3-84D FLAT POINT SET SCREWS TO LEVEL THE BLOCK.

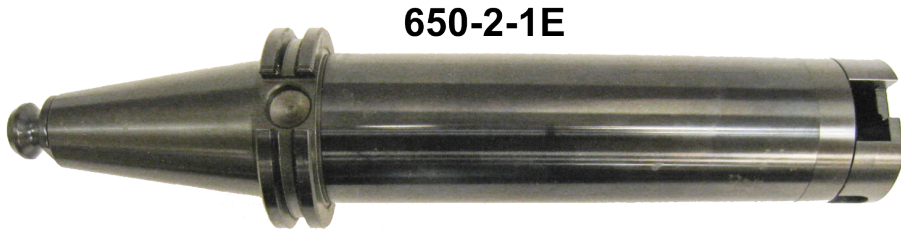
INSTALL THE BLOCK USING THE APPROPRIATE MAIN LOCATORS WITH THE INDEXER SET AT 0 DEGREES.

WITH THE MF-171 HEX NUTS LOOSE, ADJUST THE 650-3-84D SET SCREWS TO CONTACT THE PAN RAIL OF THE BLOCK. MULTIPLE MOUNTING HOLES ARE PROVIDED TO ALTER THE LOCATION OF THE 650-3-84C PUSH BLOCKS AND THE SET SCREWS CAN BE MOVED TO EITHER HOLE TO FIT DIFFERENT BLOCKS.

ONCE THE BLOCK IS LEVEL AND THE SET SCREWS ARE BOTH CONTACTING THE PAN RAILS, TIGHTEN THE MF-171 HEX NUTS, CHECK THE BLOCK FOR LEVEL, AND MACHINE.

TO UNLOAD THIS BLOCK AND LOAD ANOTHER BLOCK OF THE SAME STYLE:
LOOSEN THE HEX NUT AND SET SCREW NEAREST TO THE OPERATOR. REMOVE THE BLOCK AND INSTALL THE NEXT BLOCK. ROTATE THIS BLOCK TO CONTACT THE SET SCREW TO THE REAR OF THE FACEPLATE (FURTHEST FROM THE OPERATOR). ADJUST FRONT SET SCREW TO CONTACT THE BLOCK AND TIGHTEN THE HEX NUT. IT IS ADVISABLE TO CHECK THE BLOCK FOR LEVEL DUE TO THE POSSIBILITY OF VARIATION BETWEEN BLOCKS.

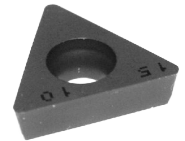
Tooling for Engine Block Boring and Resleeving Boring/Sleeving/Chamfering/O-Ring Tooling 650-2-1D Cutterhead Package Components



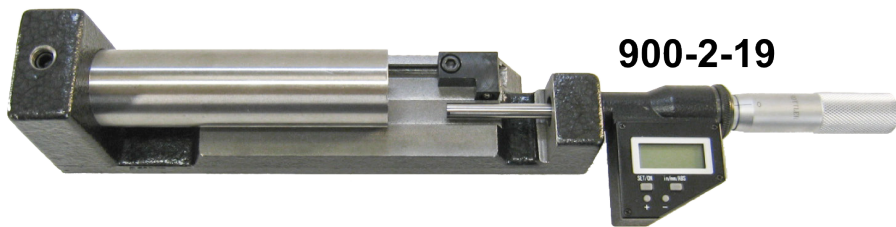
650-2-1E



RT321



RT322



900-2-19

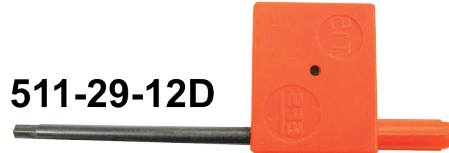
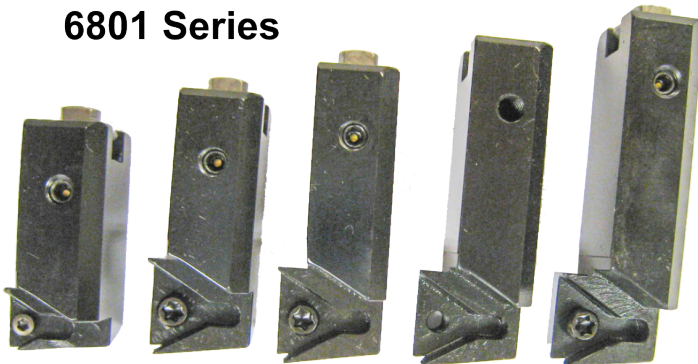


RT211

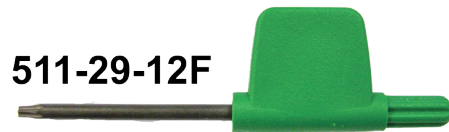


RT212

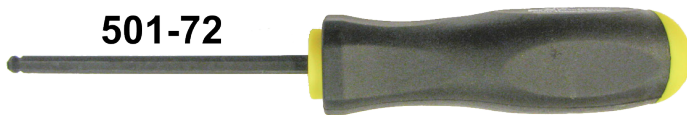
6801 Series



511-29-12D



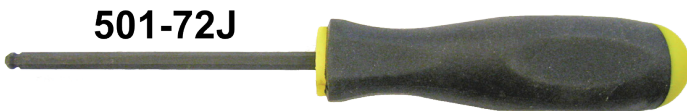
511-29-12F



501-72

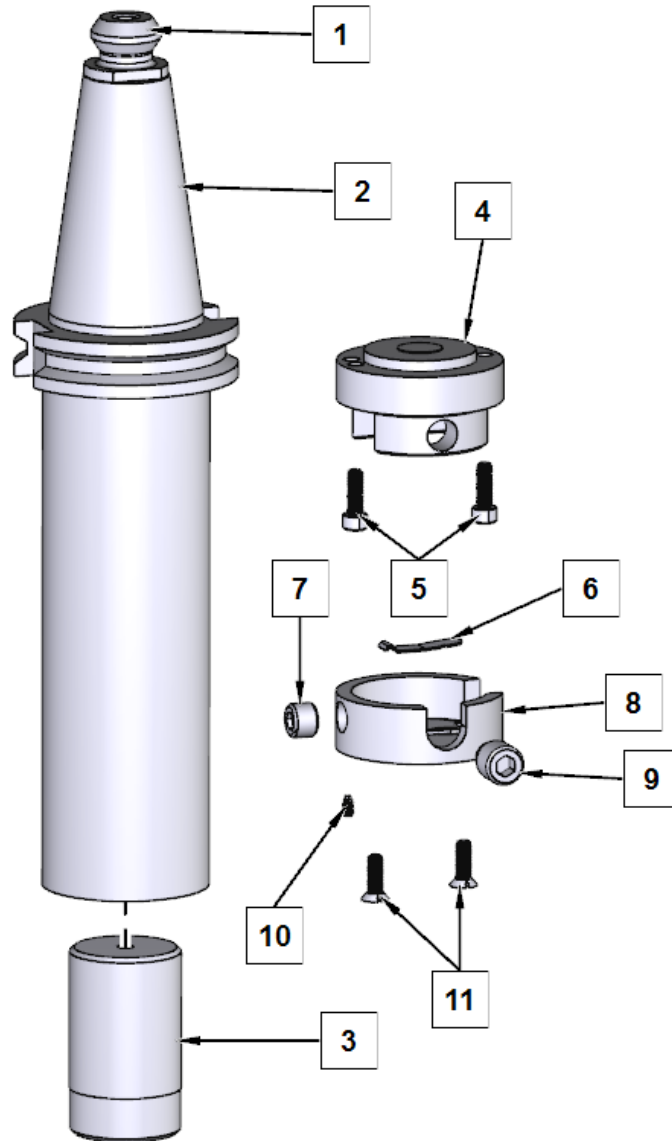


T8D



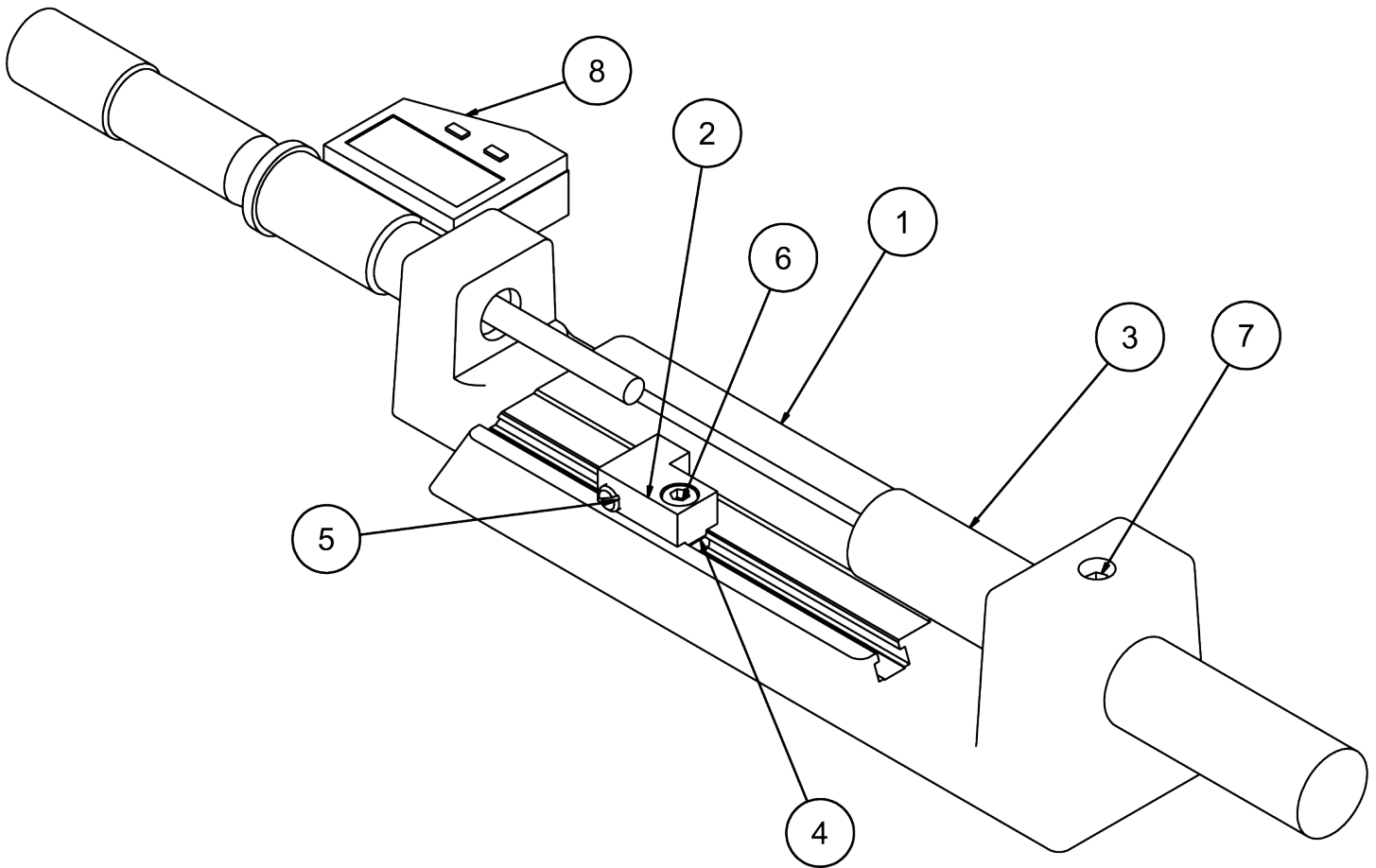
501-72J

650-2-1E Cutterhead Assembly Parts



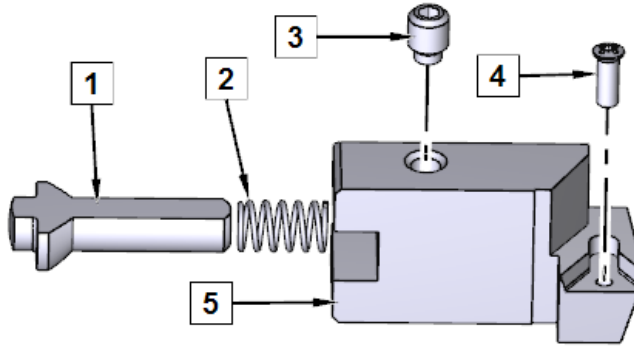
ITEM	PART #	DESCRIPTION
1	650-2-44L	CAT 40 RETENTION KNOB
2	650-2-3N	ADAPTER, 2.0" STUB BAR CAT 40 TAPER (INCH)
3	650-2-5	COUNTERWEIGHT 2.0" STUB BAR
4	650-2-4	BODY, 2.0" STUB BAR
5	650-2-4A	SOCKET HEAD CAP SCREW 8-32 X 1/2"
6	100-1B	SPRING, TOOL LOCK 15/16"
7	502-2-85B	SCREW, SET-INDEX 3/8-40 FINE THREAD
8	650-2-6	CAP, 2.0" STUB BAR
9	501-70C	SCREW, TOOL HOLDER LOCK
10	650-2-6A	SOCKET SET SCREW BRASS TIPPED 4-40 X 3/16"
11	MF-123	FLAT HEAD MACHINE SCREW 8-32 X 1/2"

900-2-19 Micrometer Parts



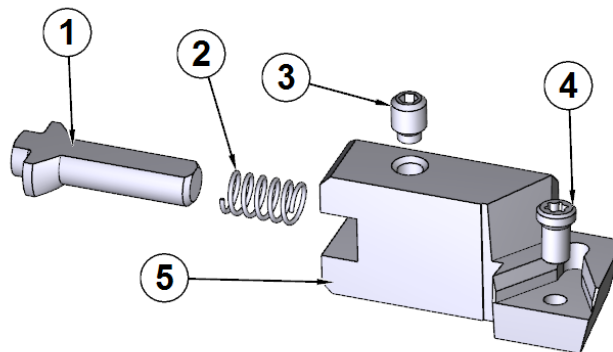
900-2-19 Micrometer Assembly			
ITEM	QTY	PART NUMBE	DESCRIPTION
1	1	502-30-10B	Frame
2	1	502-30-10M	Clamp Block
3	1	502-31-10A	Anvil
4	1	502-30-10J	Square Nut
5	1	502-30-10K	Ball Plunger
6	1	ANSI B18.3 - No. 10 - 24 UNC - 3/8	Hexagon Socket Head Cap Screw
7	1	502-30-10L	Brass Tipped Set Screw
8	1	501-34-2R	Digital Micrometer Head

6801B Insert Holder Parts



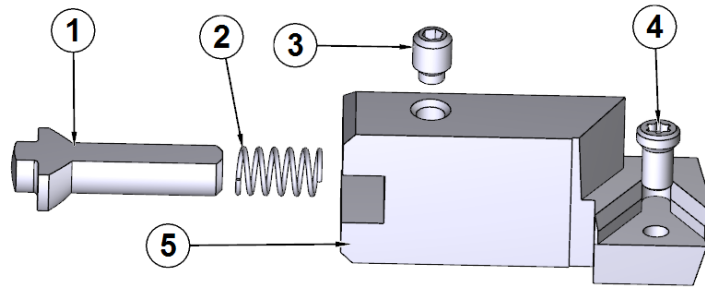
ITEM	PART #	DESCRIPTION
1	100-82-3B	PIN, ADJUSTING LONG
2	100-82-1	SPRING, ADJUSTING PIN
3	100-82-2	SCREW, SET-BRASS GIB - 3/16" LONG
4	511-29-12C	SCREW, TORX M4 X .7 X .315" LONG
5	6800B	TOOLHOLDER, INDEXABLE INSERT- 1/4" TRIANGLE, OFFSET, POSITIVE RAKE

6801C Insert Holder Parts



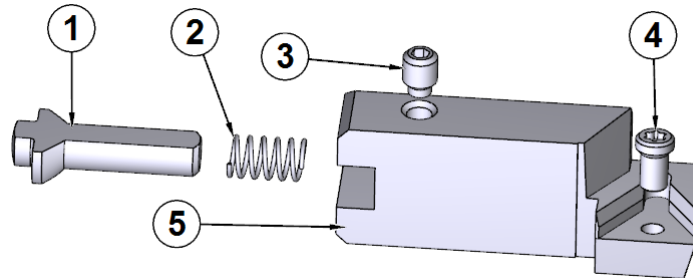
ITEM	PART #	DESCRIPTION
1	100-82-3B	PIN ADJUSTING LONG INDEXABLE INSERT TOOLHOLDER
2	100-82-1	SPRING, ADJUSTING PIN
3	100-82-2	SCREW, SET-BRASS GIB - 3/16" LONG
4	511-29-12C	SCREW, TORX M4 X .7 X .315" LONG
5	6800C	TOOLHOLDER, INDEXABLE INSERT- 3/8" IC TRIANGLE, OFFSET POSITIVE RAKE

6801D Insert Holder Parts



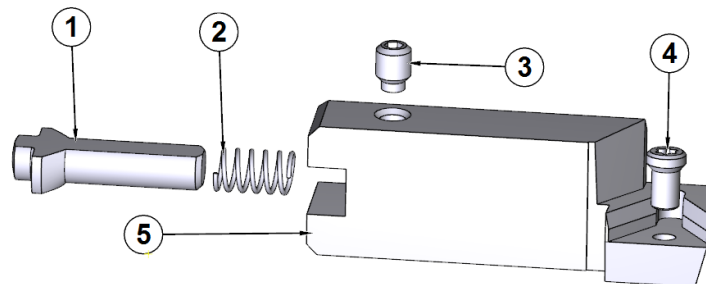
ITEM	PART #	DESCRIPTION
1	100-82-3B	PIN ADJUSTING LONG INDEXABLE INSERT TOOLHOLDER
2	100-82-1	SPRING, ADJUSTING PIN
3	100-82-2	SCREW, SET-BRASS GIB - 3/16" LONG
4	511-29-12C	SCREW, TORX M4 X .7 X .315" LONG
5	6800D	TOOLHOLDER, INDEXABLE INSERT- 3/8" IC TRIANGLE, OFFSET POSITIVE RAKE

6801E Insert Holder Parts



ITEM	PART #	DESCRIPTION
1	100-82-3B	PIN ADJUSTING LONG INDEXABLE INSERT TOOLHOLDER
2	100-82-1	SPRING, ADJUSTING PIN
3	100-82-2	SCREW, SET-BRASS GIB - 3/16" LONG
4	511-29-12C	SCREW, TORX M4 X .7 X .315" LONG
5	6800E	TOOLHOLDER, INDEXABLE INSERT- 3/8" IC TRIANGLE, OFFSET POSITIVE RAKE

6801F Insert Holder Parts

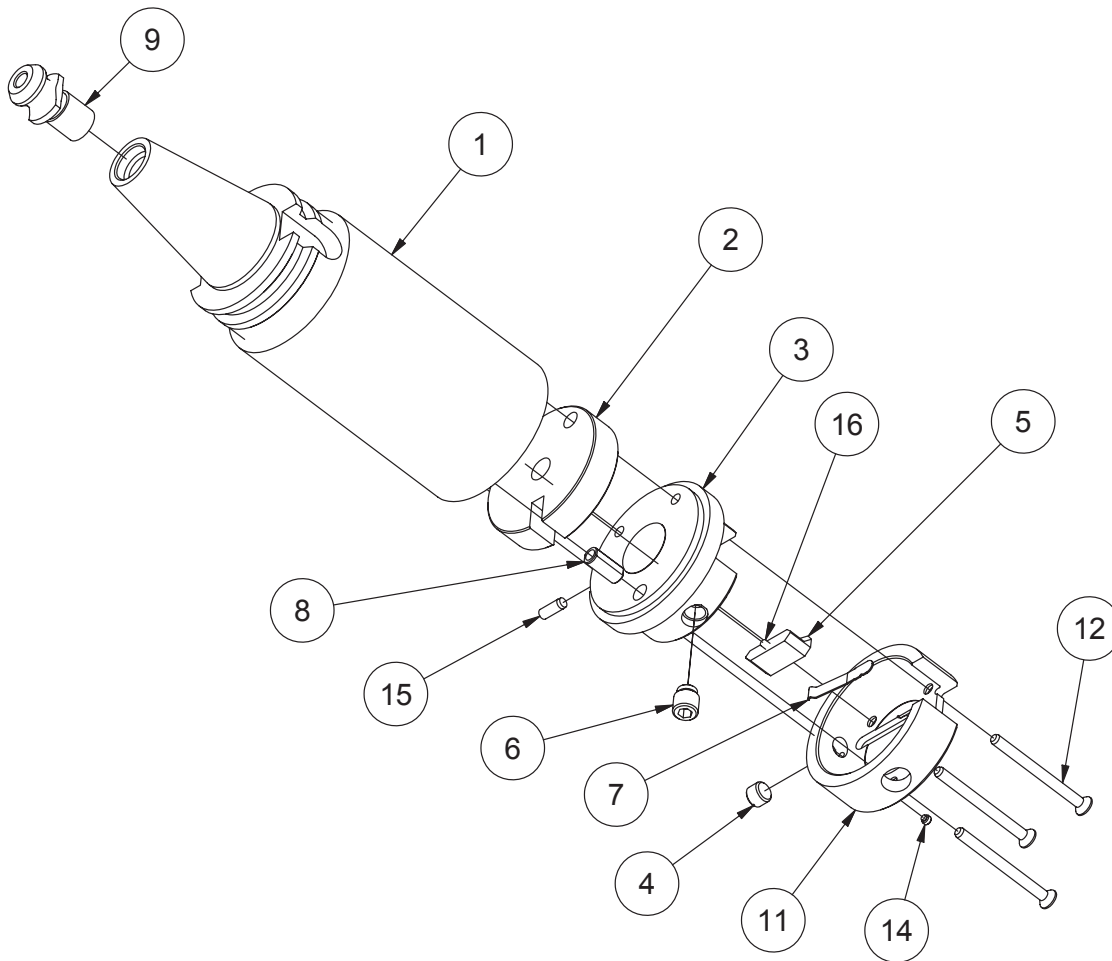


ITEM	PART #	DESCRIPTION
1	100-82-3B	PIN ADJUSTING LONG INDEXABLE INSERT TOOLHOLDER
2	100-82-1	SPRING, ADJUSTING PIN
3	100-82-2	SCREW, SET-BRASS GIB - 3/16" LONG
4	511-29-12C	SCREW, TORX M4 X .7 X .315" LONG
5	6800F	TOOLHOLDER, INDEXABLE INSERT- 3/8" IC TRIANGLE, OFFSET POSITIVE RAKE

650-2-14B Cutterhead Package Components

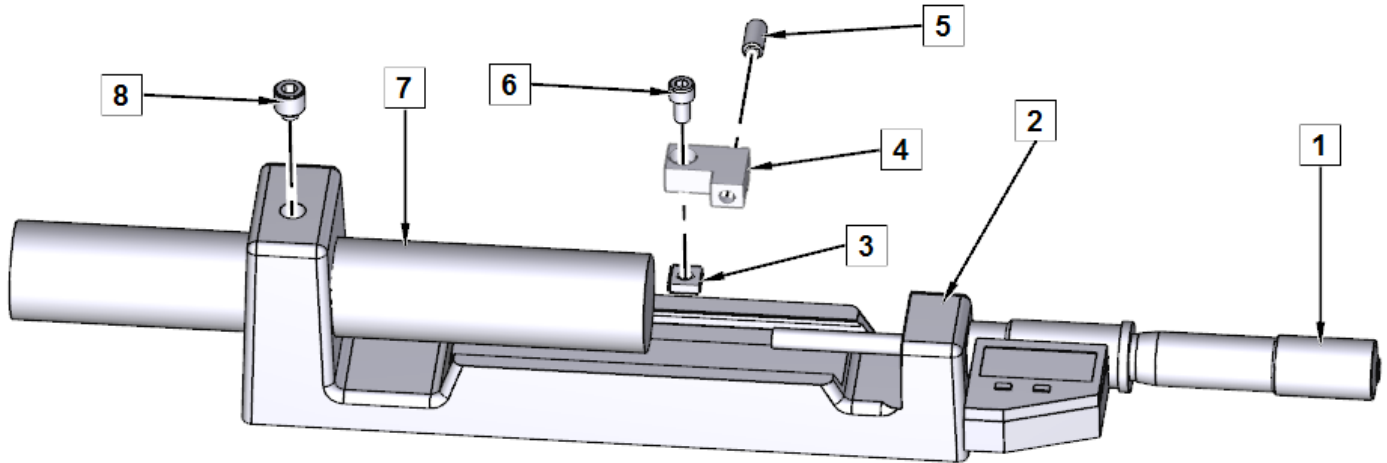


650-2-14C Cutterhead Assembly Parts



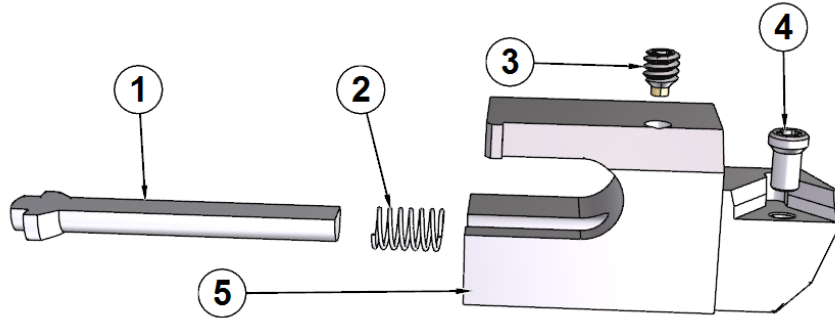
CUTTERHEAD ASSEMBLY W/O TOOLING 2.9" TO 5.0" x 7.0"			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	650-2-15E	ADAPTER, 2.9" STUB BAR CAT 40 TAPER (INCH) F68A
2	1	6521	Counter Weight
3	1	650-2-16	BODY, 2.9" STUB BAR F60
4	1	502-2-85B	Index Screw
5	1	6263A	Tool Holder Clamp Screw
6	1	501-70A	Tool Holder Lock Screw ass'y
7	1	100-1A	Tool Lock Spring
8	1	502-2-45B	Bushing - Counterweight
9	1	650-2-44L	CAT40 RETENTION KNOB
11	1	650-2-17	Cap, 2.9" Stub Bar
12	3	MF-81C	Socket Flat Head 10-24 UNC x 2.25
14	1	502-12-4D	SOCKET SET SCREW, BRASS TIPPED 8-32 X 1//8
15	1	MF-196	3/16 x 1/2 Dowel Pin
16	1	MF-193C	1/8 x 3/8 Dowel Pin

900-2-20 Micrometer Parts



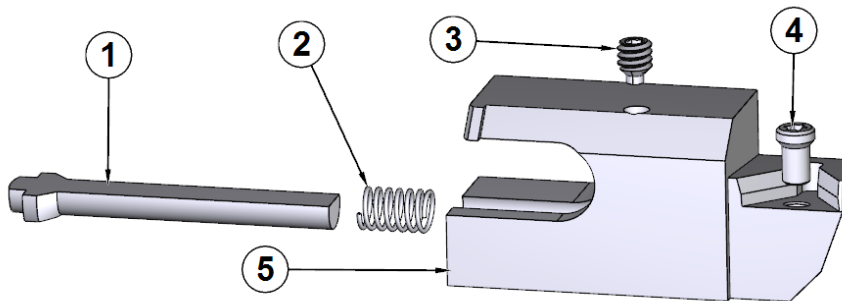
ITEM	PART #	DESCRIPTION
1	501-34-2R	HEAD, MICROMETER UNIVERSAL MIC HEAD DIGITAL READING INCH AND METRIC
2	502-30-10C	FRAME, MICROMETER
3	502-30-10J	SQUARE NUT-#10-24 MICROMETER FRAME
4	502-30-10M	CLAMP, MICROMETER
5	502-30-10K	BALL PLUNGER, 1/4-20 MICROMETER FRAME
6	MF-9A	SOCKET HEAD CAPSCREW 10-32 X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

6593C Insert Holder Parts



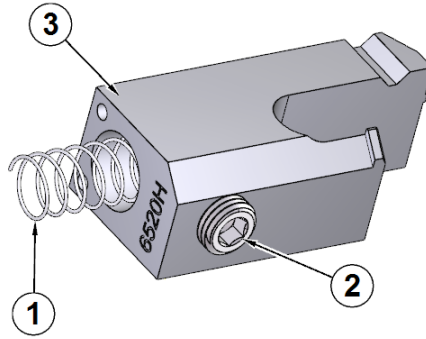
ITEM	PART #	DESCRIPTION
1	6593Q	PIN, ADJUSTING - TOOLHOLDER
2	100-82-4	SPRING, ADJUSTING PIN
3	100-82-2	SCREW, SET-BRASS GIB - 3/16" LONG
4	511-29-12C	SCREW, TORX M4 X .7 X .315" LONG
5	6593E	CARTRIDGE/TOOL HOLDER - INDEX. INSERT, TRIANGULAR-POSITIVE RAKE (2.90- 3.40 DIA)

6593D Insert Holder Parts



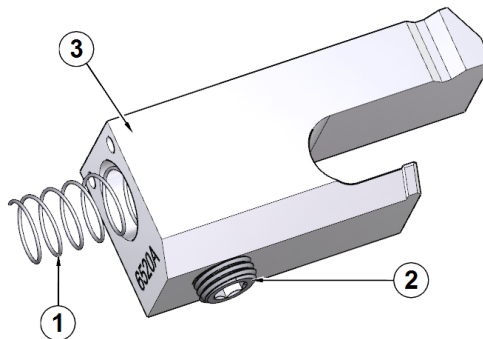
ITEM	PART #	DESCRIPTION
1	6593Q	PIN, ADJUSTING - TOOLHOLDER
2	100-82-4	SPRING, ADJUSTING PIN
3	100-82-2	SCREW, SET-BRASS GIB - 3/16" LONG
4	511-29-12C	SCREW, TORX M4 X .7 X .315" LONG
5	6593F	CARTRIDGE/TOOL HOLDER - INDEX. INSERT, TRIANGULAR-POSITIVE RAKE (3.40 TO 3.90)

6520H Tool Holder Parts



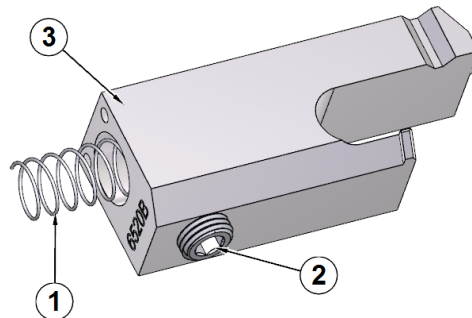
ITEM	PART #	DESCRIPTION
1	6300B	SPRING, COMPRESSION-TOOLHOLDER (1 7/16")
2	502-2-85	SCREW, SET-TOOLHOLDER INDEX
3	6520H	TOOL HOLDER, 2 1/4" LONG

6520A Tool Holder Parts



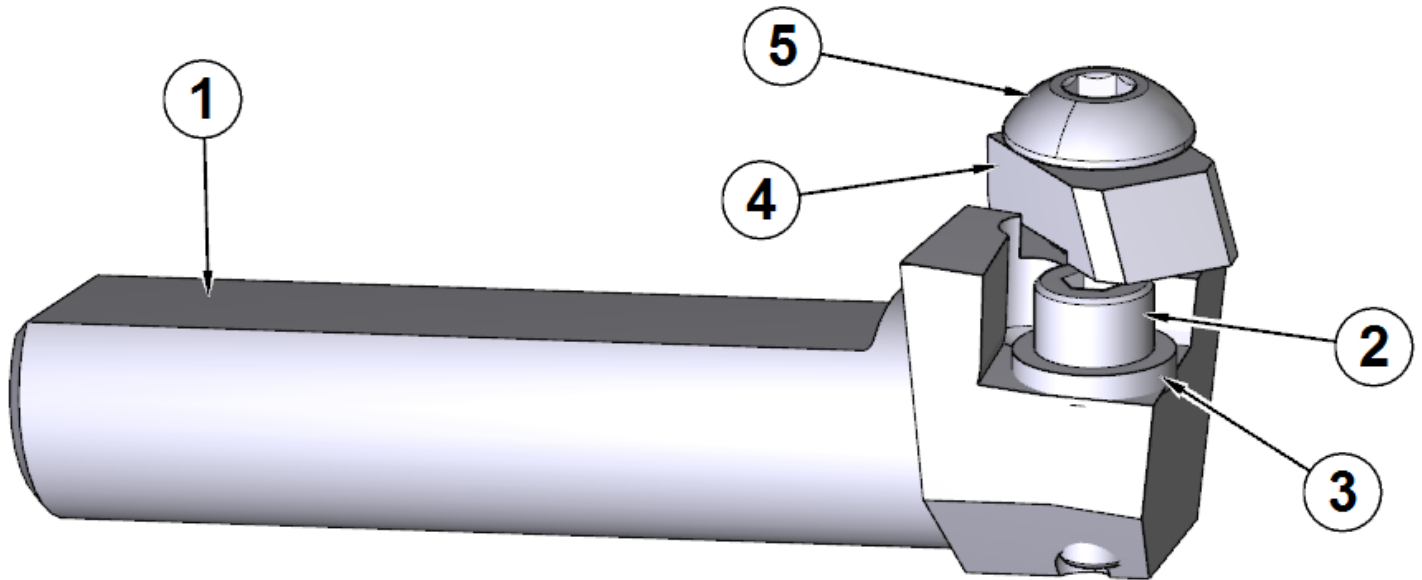
ITEM	PART #	DESCRIPTION
1	6300B	SPRING, COMPRESSION-TOOLHOLDER (1 7/16")
2	502-2-85	SCREW, SET-TOOLHOLDER INDEX
3	6520A	TOOL HOLDER, 2 3/8" LONG

6520B Tool Holder Parts



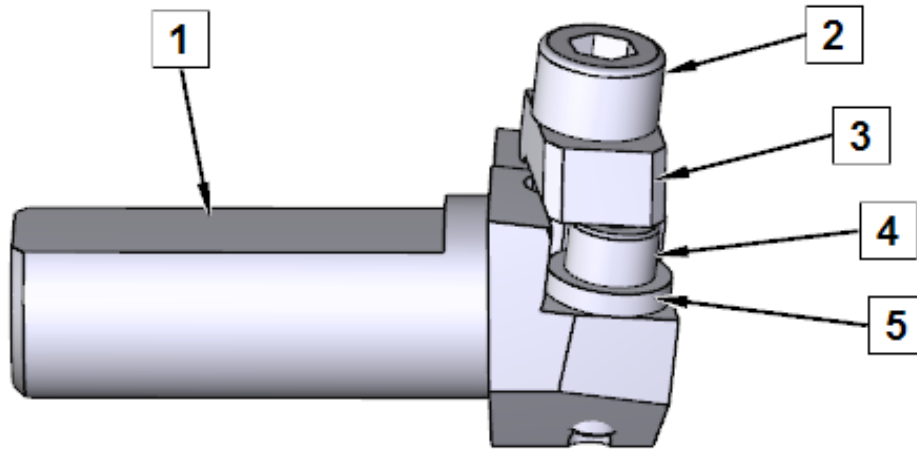
ITEM	PART #	DESCRIPTION
1	6300B	SPRING, COMPRESSION-TOOLHOLDER (1 7/16")
2	502-2-85	SCREW, SET-TOOLHOLDER INDEX
3	6520B	TOOL HOLDER, 2 5/8" LONG

6260L Insert Cartridge Parts



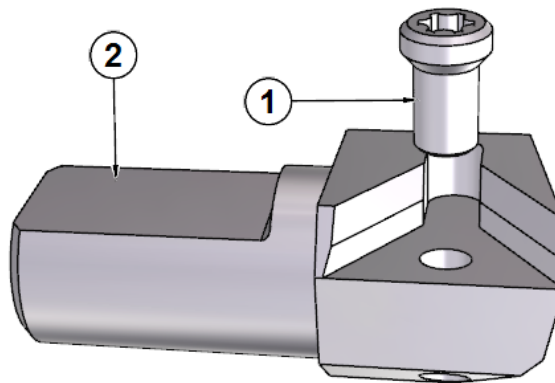
6260L CARTRIDGE ASSEMBLY - SQUARE INSERT NEG. RAKE INDEXABLE - 1.88" SHANK			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	6594G	CARTRIDGE - SQUARE INSERT NEG. RAKE INDEXABLE - 1.88" SHANK
2	1	511-29-12	Screw
3	1	511-29-12B	Washer
4	1	6594K	Insert Clamp
5	1	MF-89A	10-32UNF x 5/8" LG. SOCKET BUTTON HEAD CAPSCREW

6260W Insert Cartridge Parts



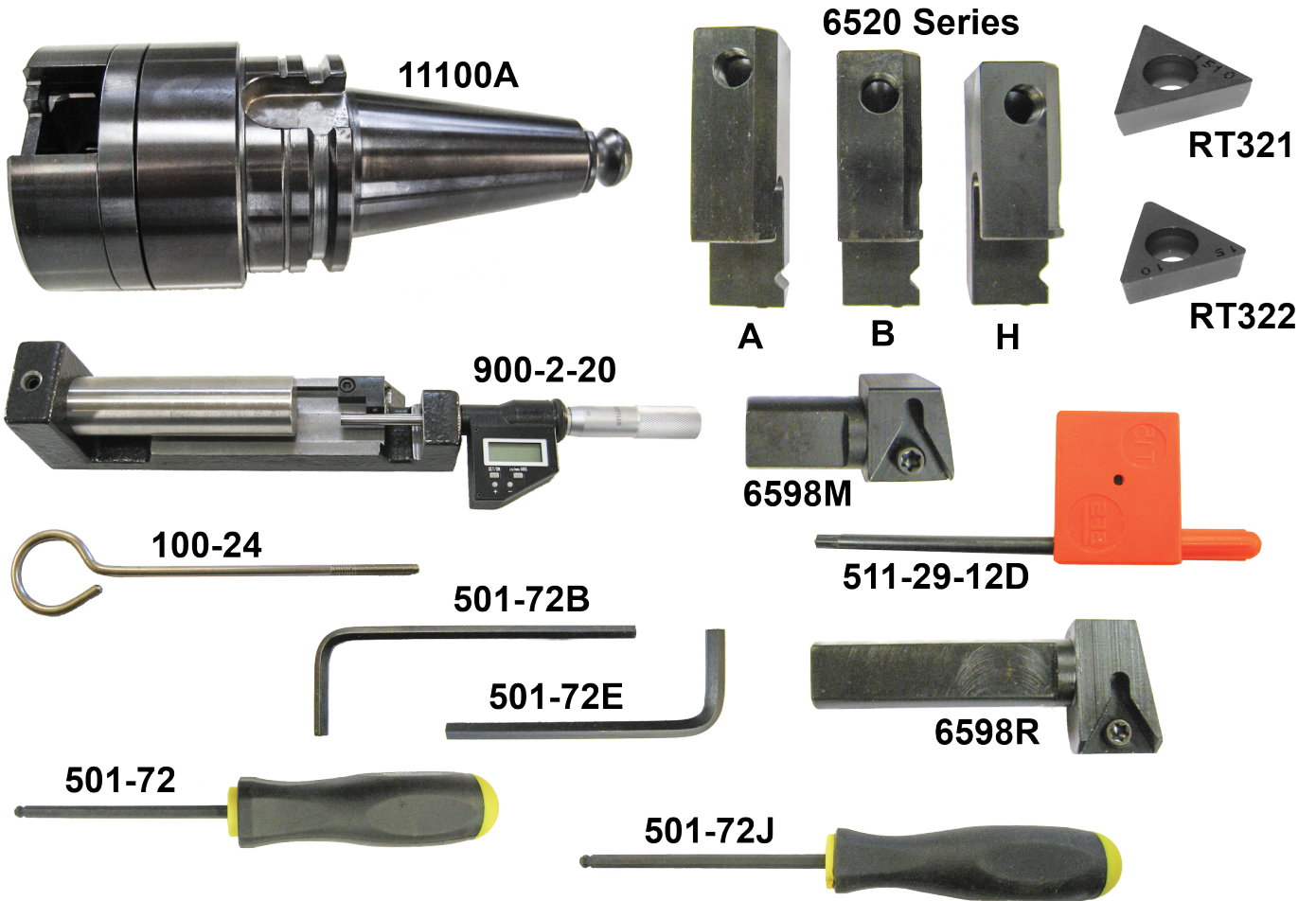
ITEM	PART #	DESCRIPTION
1	6594J	CARTRIDGE, OFFSET 3/8" SQUARE, NEGATIVE RAKE
2	MF-9	SOCKET HEAD CAP SCREW 10-32 X 5/8"
3	6594K	CLAMP, TOOL SQUARE INSERT
4	511-29-12	SCREW, SOCKET HEAD CAP 6/32 X 7/16" LONG
5	511-29-12B	WASHER, PRECISION-HOLDING SCREW

6598M Insert Cartridge Parts

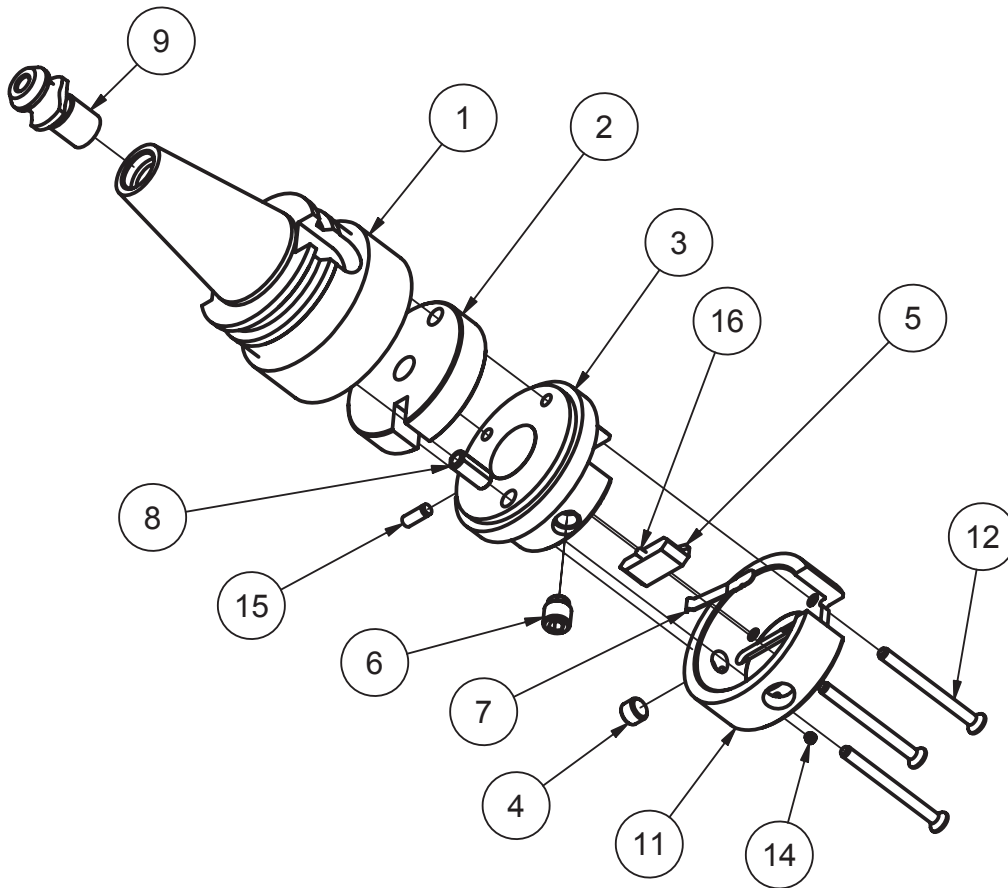


ITEM	PART #	DESCRIPTION
1	511-29-12C	SCREW, TORX M4 X .7 X .315" LONG
2	6598L	CARTRIDGE, INDEXABLE INSERT, 13/16" FOR TRIANGULAR POSITIVE RAKE INSERTS

11100 Cutterhead Package Components

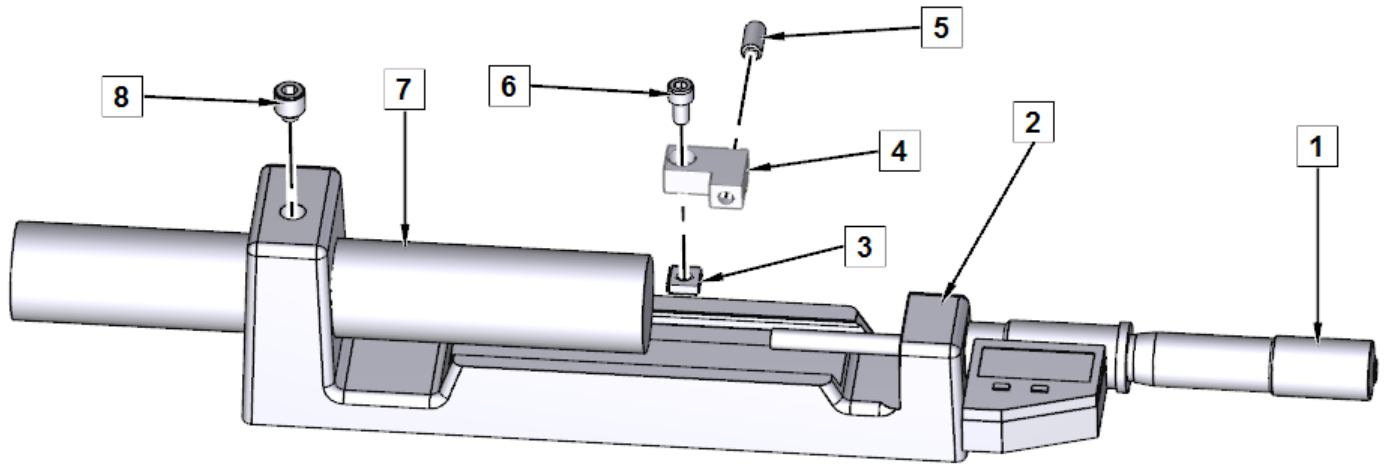


11100A Cutterhead Assembly Parts



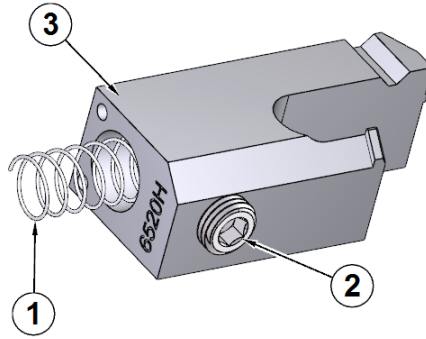
11100A CUTTERHEAD ASSEMBLY W/O TOOLING 3.8" TO 5.0" F70			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	11100B	ADAPTER, 3.8" CUTTERHEAD CAT 40 TAPER F70
2	1	6521	Counter Weight
3	1	650-2-16	BODY, 2.9" STUB BAR F60
4	1	502-2-85B	Index Screw
5	1	6263A	Tool Holder Clamp Screw
6	1	501-70A	Tool Holder Lock Screw ass'y
7	1	100-1A	Tool Lock Spring
8	1	502-2-45B	Bushing - Counterweight
9	1	650-2-44L	CAT40 RETENTION KNOB
11	1	650-2-17	Cap, 2.9" Stub Bar
12	3	MF-81C	Socket Flat Head 10-24 UNC x 2.25
14	1	502-12-4D	SOCKET SET SCREW, BRASS TIPPED 8-32 X 1/8
15	1	MF-196	3/16 x 1/2 Dowel Pin
16	1	MF-193C	1/8 x 3/8 Dowel Pin

900-2-20 Micrometer Parts



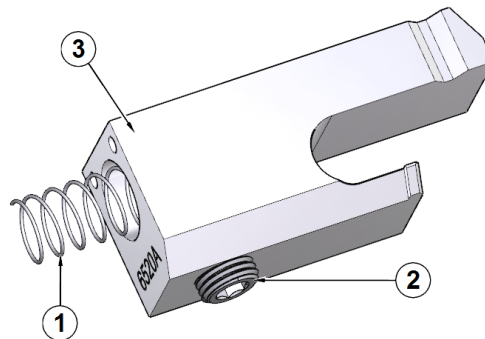
ITEM	PART #	DESCRIPTION
1	501-34-2R	HEAD, MICROMETER UNIVERSAL MIC HEAD DIGITAL READING INCH AND METRIC
2	502-30-10C	FRAME, MICROMETER
3	502-30-10J	SQUARE NUT-#10-24 MICROMETER FRAME
4	502-30-10M	CLAMP, MICROMETER
5	502-30-10K	BALL PLUNGER, 1/4-20 MICROMETER FRAME
6	MF-9A	SOCKET HEAD CAPSCREW 10-32 X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

6520H Tool Holder Parts



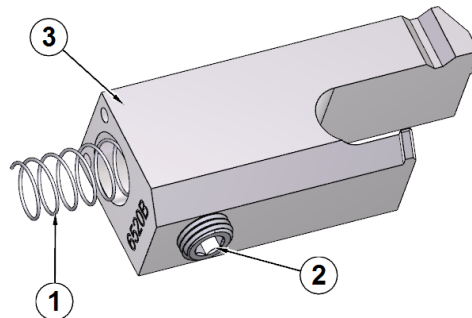
ITEM	PART #	DESCRIPTION
1	6300B	SPRING, COMPRESSION-TOOLHOLDER (1 7/16")
2	502-2-85	SCREW, SET-TOOLHOLDER INDEX
3	6520H	TOOL HOLDER, 2 1/4" LONG

6520A Tool Holder Parts



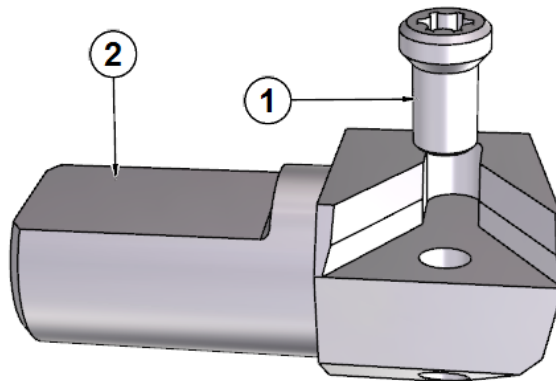
ITEM	PART #	DESCRIPTION
1	6300B	SPRING, COMPRESSION-TOOLHOLDER (1 7/16")
2	502-2-85	SCREW, SET-TOOLHOLDER INDEX
3	6520A	TOOL HOLDER, 2 3/8" LONG

6520B Tool Holder Parts



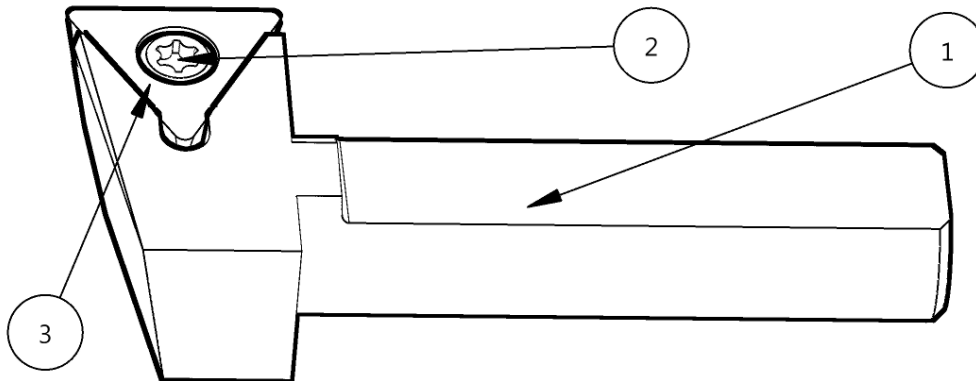
ITEM	PART #	DESCRIPTION
1	6300B	SPRING, COMPRESSION-TOOLHOLDER (1 7/16")
2	502-2-85	SCREW, SET-TOOLHOLDER INDEX
3	6520B	TOOL HOLDER, 2 5/8" LONG

6598M Insert Cartridge Parts



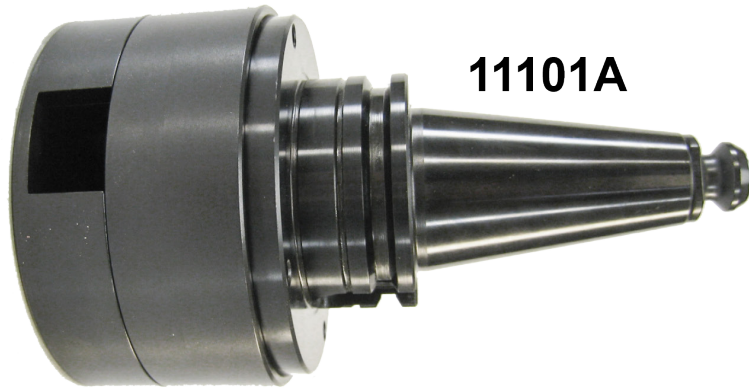
ITEM	PART #	DESCRIPTION
1	511-29-12C	SCREW, TORX M4 X .7 X .315" LONG
2	6598L	CARTRIDGE, INDEXABLE INSERT, 13/16" FOR TRIANGULAR POSITIVE RAKE INSERTS

6598R Insert Cartridge Parts

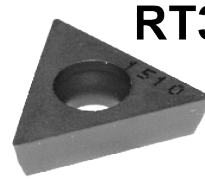


Item	Part Number	Description	Item QTY
1	6598Q	TRIANGLE POS. RAKE OFFSET CARTRIDGE	1
2	511-29-12C	TORX SCREW M4x.7	1
3	RT322	INSERT, TRIANGULAR 3/8" I.C.	1

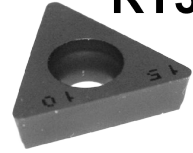
11101 Heavy Duty Cutter Head Package Components



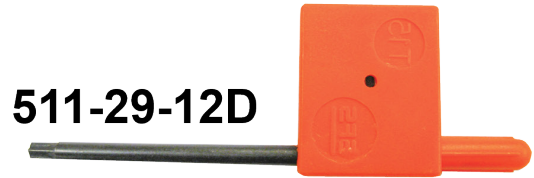
11101A



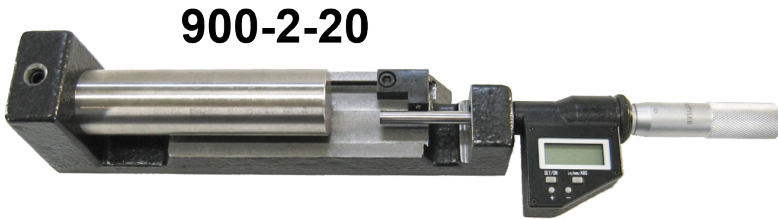
RT321



RT322



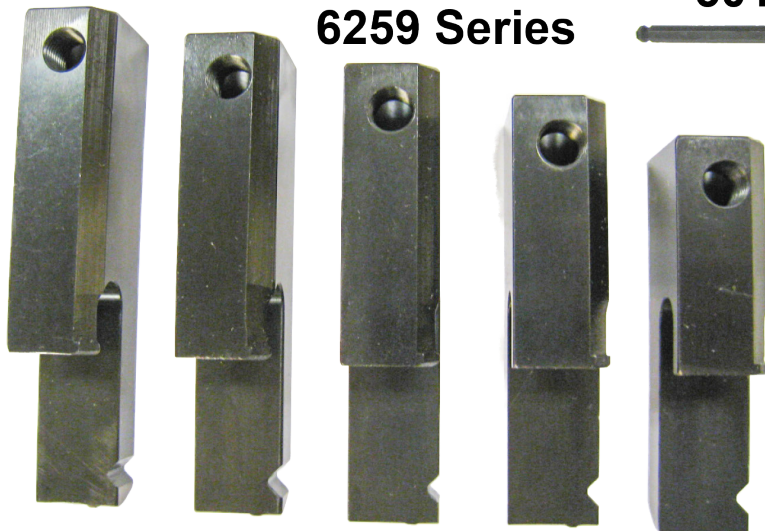
511-29-12D



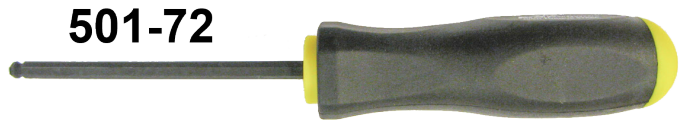
900-2-20



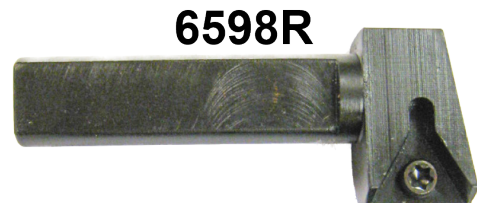
6598K



6259 Series



501-72

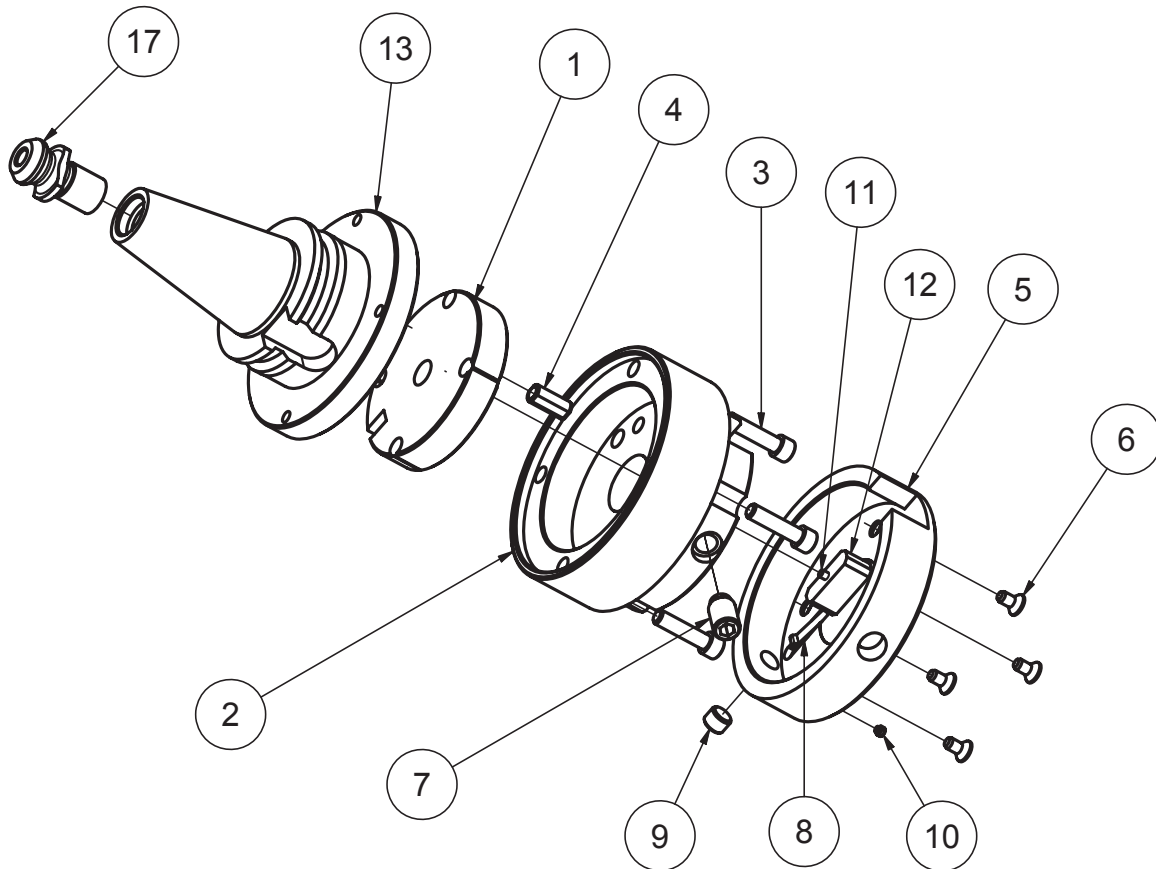


6598R



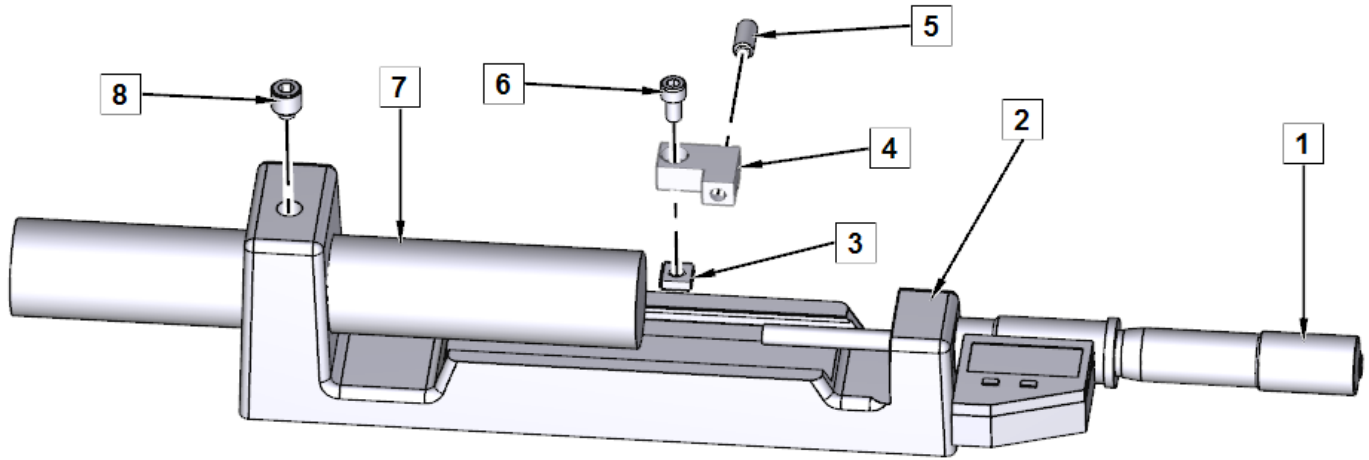
6598M

11101A Cutterhead Assembly Parts



11101A CUTTERHEAD ASSEMBLY W/O TOOLING 4.5" TO 9.0" F70			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	600-20-11	Counter Weight
2	1	6256L	BODY, CUTTERHEAD 4.50" (NO CENTERING)
3	4	MF-15	S.H.C.S. 1/4 - 20 UNC - 1
4	1	502-2-45B	Bushing - Counterweight
5	1	6256N	Cap, Cutterhead 4.50" (No Centering)
6	4	MF-78	Socket Flat Head 10-24 UNC x 0.375
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	11101B	ADAPTER 4-1/2" CUTTERHEAD F-70 CAT40
17	1	650-2-44L	CAT40 RETENTION KNOB

900-2-20 Micrometer Parts



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

Extender for 650-2-14B Cutterhead Assembly

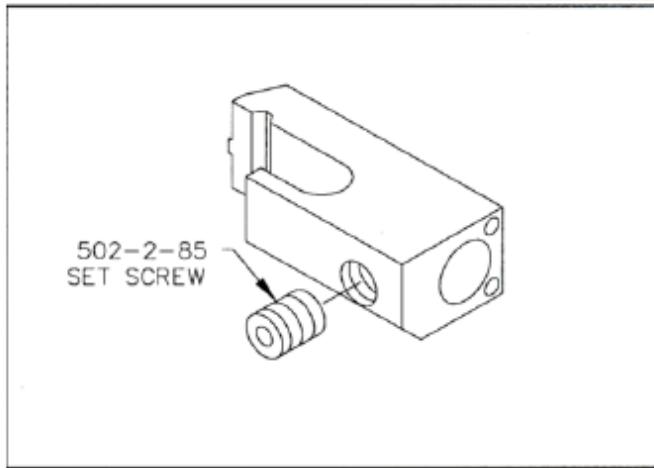
650-2-16D 1.400" (35.5mm) Spacer (Extension)

Sold only as complete assembly.



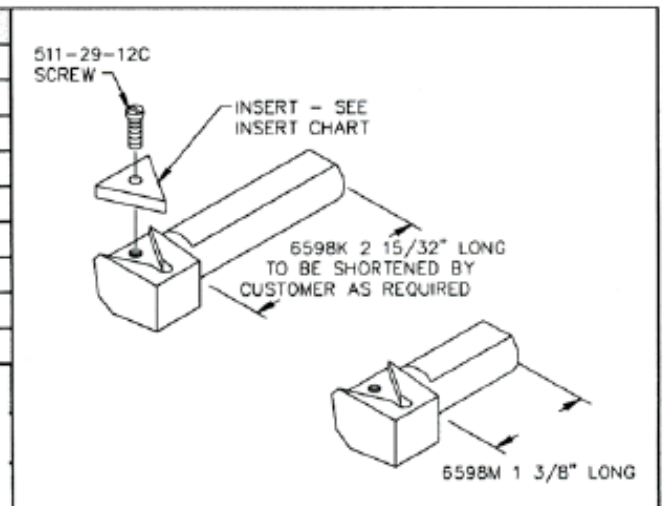
6259 Series Toolholder Parts and Size Chart

6259 Series Tool Holders			
Tool Holder	Length	Bore Range mm	Bore Range inches
6259P	3.13"	114.3mm-120.65mm	4.5"-4.75"
6259C	3.37"	120.65mm-127.0mm	4.75"-5.0"
6259D	3.62"	127.0mm-139.7mm	5.0"-5.5"
6259I	3.87"	139.7mm-152.4mm	5.5"-6.0"
6259E	4.13"	152.4mm-177.8mm	6.0"-7.0"
6259F	4.62"	177.88mm-203.2mm	7.0"-8.0"
6259G	5.13"	203.2mm-228.6mm	8.0"-9.0"

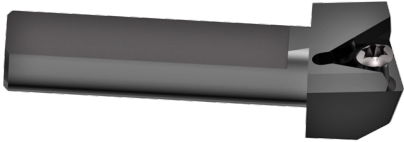
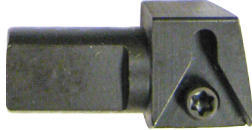

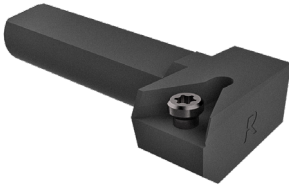








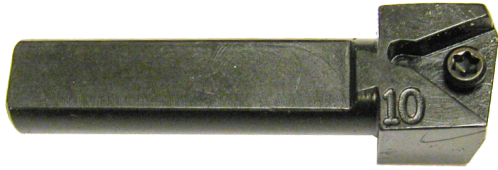
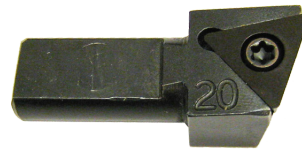
6598 Series Insert Cartridge Parts and Size Chart

6598 Series Tool Bit when used with 6520 Holders		
Tool Bit	Tool Holder	Bore Range
6598M	6520H	3.75" – 4.00"
6598M	6520A	4.00" – 4.50"
6598K	6520B	4.50" – 5.00"
6598K	6520C	5.00" – 5.50"
6598K	6520D	5.50" – 6.00"
6598K	6520E	6.00" – 6.50"
6598K	6520F	6.50" – 7.00"
6598K	6520G	7.00" – 8.00"

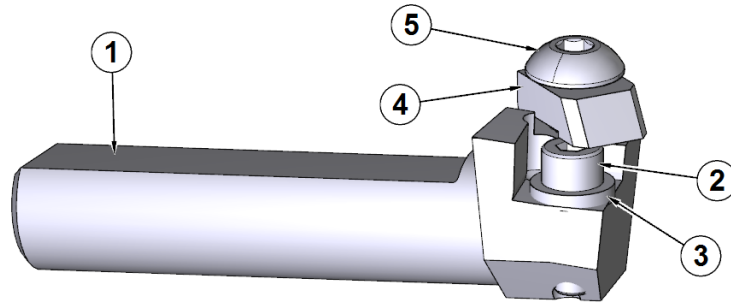


Miscellaneous Tooling for 11100, 11101, 650-2-14 Cutterheads

<p>6593S Cartridge, Triangular For Circular Interpolation Counterbore Facing</p> 	<p>6598M Cartridge, Triangular, 13/16" (20mm) length For Counterboring</p> 
<p>6598K Cartridge, Triangular, 1-7/8" (48mm) length For Counterboring</p> 	<p>6598R Cartridge, Triangular Offset .250 (6.4mm) For Blind Holes</p> 
<p>6513J Tool bit, Brazed Carbide - .037" (.940mm) Wide O Ring Grooving</p> 	<p>6513L Tool bit, Brazed Carbide - .039" (.991mm) Wide O Ring Grooving</p> 
<p>6513N Tool bit, Brazed Carbide - .060" (1.524mm) Wide O Ring Grooving</p> 	<p>6513Q Tool bit, Brazed Carbide - .120" (3.048mm) Wide O Ring Grooving</p> 
<p>6513P Tool bit, Brazed Carbide - .085" (2.159mm) Wide O Ring Grooving</p> 	<p>6747K Cartridge, Triangular - 5 Degree Chamfer</p> 

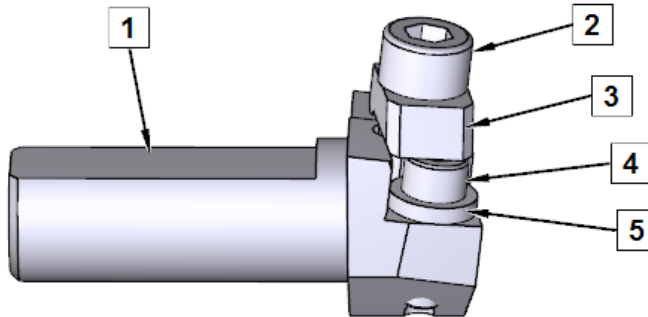
6747P Cartridge, Triangular - 10 Degree Chamfer**6747G Cartridge, Triangular - 15 Degree Chamfer****6747F Cartridge, Triangular- 20 Degree Chamfer****6747M Cartridge, Triangular - 20 Degree Chamfer
(Special Application Only)****6747H Cartridge, Triangular - 30 Degree Chamfer**

6260L Insert Cartridge Parts




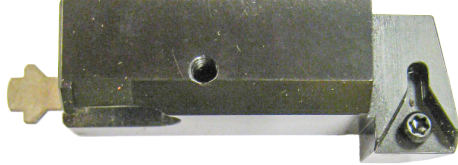


6260L CARTRIDGE ASSEMBLY - SQUARE INSERT NEG. RAKE INDEXABLE - 1.88" SHANK			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	6594G	CARTRIDGE - SQUARE INSERT NEG. RAKE INDEXABLE - 1.88" SHANK
2	1	511-29-12	Screw
3	1	511-29-12B	Washer
4	1	6594K	Insert Clamp
5	1	MF-89A	10-32UNF x 5/8" LG. SOCKET BUTTON HEAD CAPSCREW

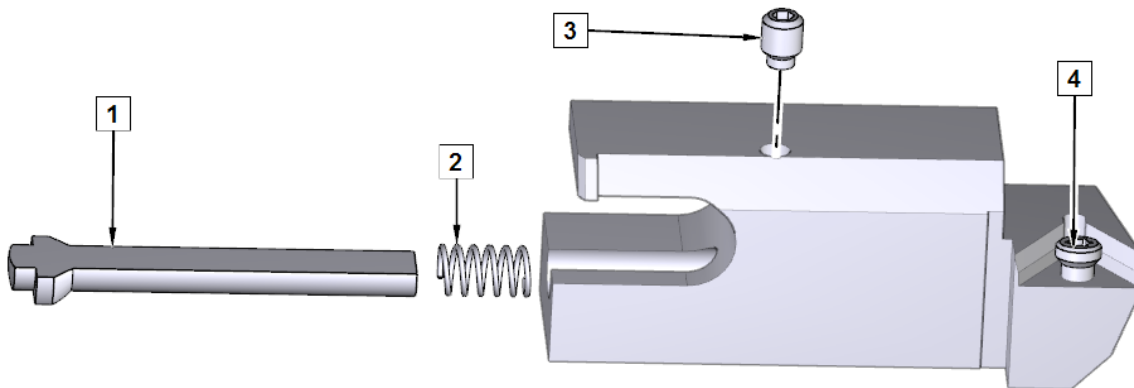
6260W Insert Cartridge Parts



ITEM	PART #	DESCRIPTION
1	6594J	CARTRIDGE, OFFSET 3/8" SQUARE, NEGATIVE RAKE
2	MF-9	SOCKET HEAD CAP SCREW 10-32 X 5/8"
3	6594K	CLAMP, TOOL SQUARE INSERT
4	511-29-12	SCREW, SOCKET HEAD CAP 6/32 X 7/16" LONG
5	511-29-12B	WASHER, PRECISION-HOLDING SCREW

<p>6593L Cartridge, Triangular, Offset Indexable Insert, 3.14 - 3.40" (79.756 - 86.36mm) diameter</p> 	<p>6593M Cartridge, Triangular, Offset Indexable Insert, 3.40 - 3.90" (86.36 - 99.06mm) diameter</p> 
<p>6593N Cartridge, Triangular, Offset Indexable Insert, 3.90 - 4.40" (99.06 - 111.76mm) diameter</p> 	<p>6593P Cartridge, Triangular, Offset Indexable Insert, 4.40 - 4.90" (111.76 - 124.46mm) diameter</p> 

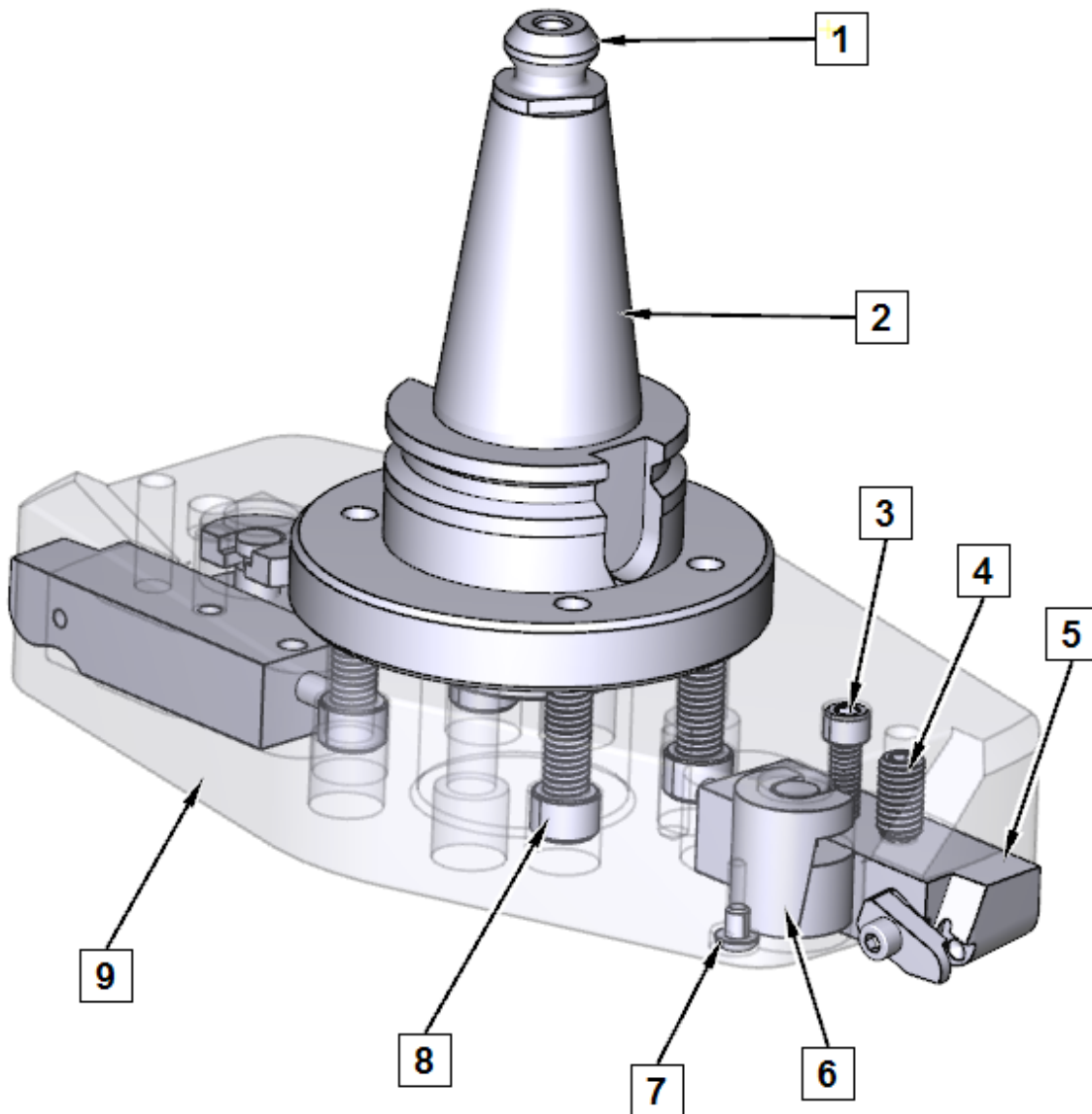
6593 Series Insert Holder Parts



ITEM	PART #	DESCRIPTION
1	6593Q	PIN, ADJUSTING - TOOLHOLDER #6593C AND D ONLY
2	100-82-4	SPRING, ADJUSTING PIN
3	100-82-2	SCREW, SET-BRASS GIB - 3/16" LONG
4	511-29-12C	SCREW, TORX M4 X .7 X .315" LONG

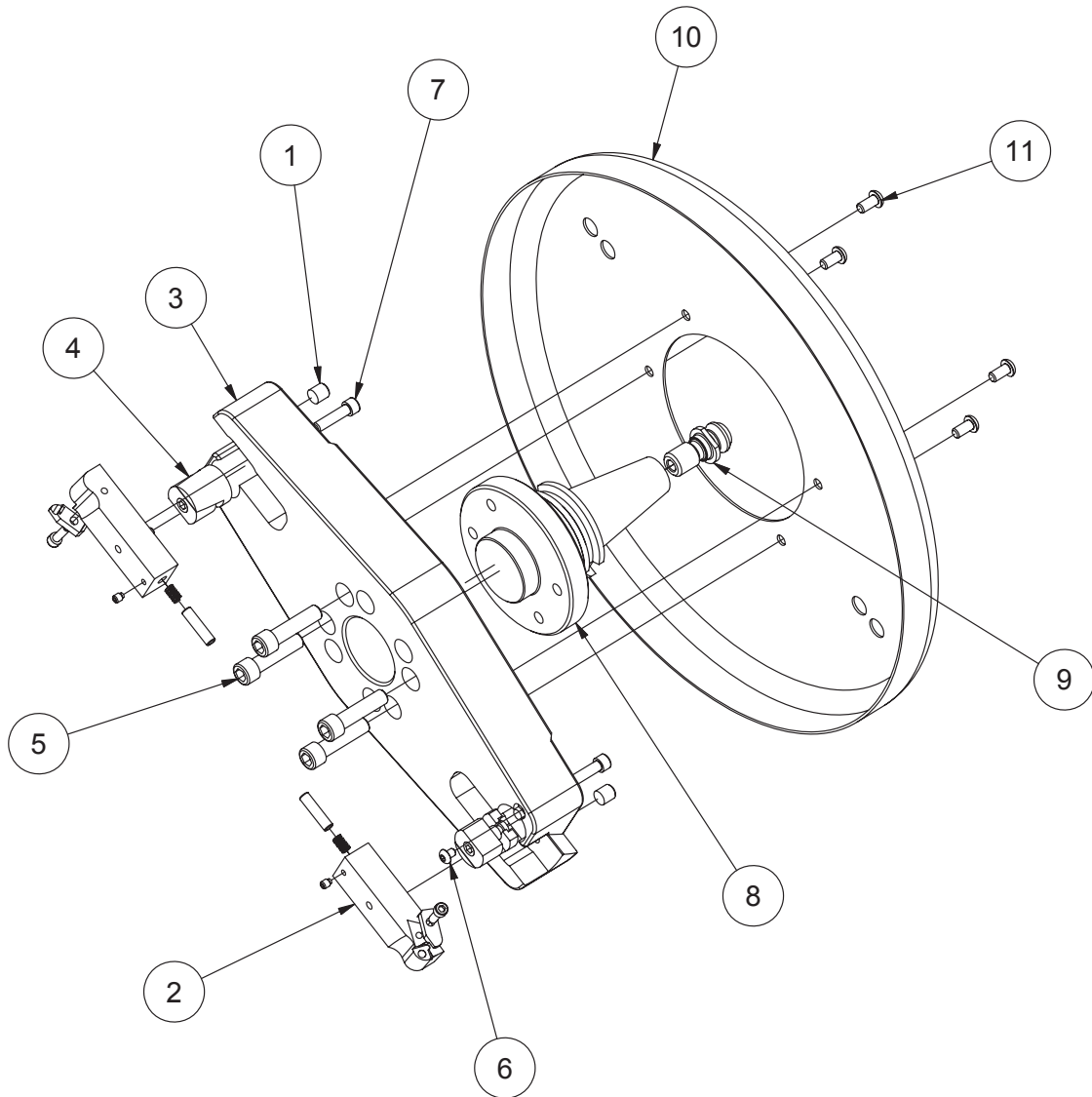
Surfacing Tooling

650-2-8E Surfacing Cutterhead, 10" (254mm) Diameter Parts



ITEM	PART #	DESCRIPTION
1	650-2-44L	CAT 40 RETENTION KNOB
2	650-2-7E	ADAPTER, 10 AND 14" FLYCUTTER CAT 40 TAPER (INCH)
3	MF-15	SOCKET HEAD CAPSCREW 1/4-20 X 1"
4	7202C	SCREW, ADJUSTING SURFACING CUTTERHEAD 3/8-16NC X 3/8" OVAL POINT SET SCREW
5	7207W	BAR, CLAMP ASSEMBLY
6	7206K	"L" LOCK-SURFACING CUTTERHEAD
7	MF-87	SOCKET BUTTON HEAD SCREW 10-24 X 1/4"
8	MF-33	SOCKET HEAD CAPSCREW 3/8-16 X 1 1/2"
9	7206L	CUTTERHEAD , SURFACING 10 1/4"

650-2-8F Surfacing Cutterhead, 14" (356mm) Diameter Parts



650-2-8F 14" FLYCUTTER ASSEMBLY - F68A			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	2	7202C	Hexagon Socket Set Screw - Oval Point
2	2	7202W	TOOL HOLDER ASSEMBLY, FLY CUTTER
3	1	7206G	MILLING CUTTERHEAD, 14" DIA. WITH 3/4 x 1 TOOL HOLDER
4	2	7206K	L' LOCK
5	4	Mf-33	Socket Head Cap screw 3/8 - 16 UNC - 1 1/2
6	2	Mf-87	Socket Button Head Cap Screw 10 - 24 x 1/4
7	2	MF-15	S.H.C.S. 1/4 - 20 UNC - 1
8	1	650-2-7E	ADAPTER, 10 & 14 INCH FLYCUTTER - CAT 40 - F69
9	1	650-2-44L	CAT40 RETENTION KNOB
10	1	650-2-8D	Shroud, surfacing cutterhead
11	4	MF-90	Socket Button Head 1/4 - 20 x 1/2

6303B CBN Insert, Round
Double-Sided, 3/8" (9.525mm) IC, for
Cutting Cast Iron



6303M PCD Insert, Round
3/8" (9.525mm) IC, for Cutting
Aluminum



6303S CBN Insert, Round
3/8" (9.525mm) IC, for Cutting
Aluminum Blocks With Liners



6303U CBN Round Insert
Single Sided, 3/8" IC. For hard cast
iron



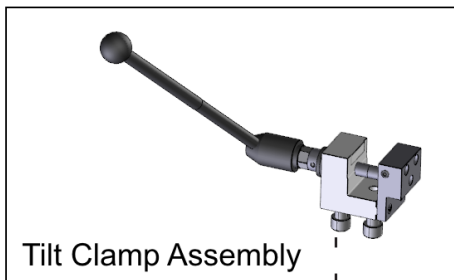
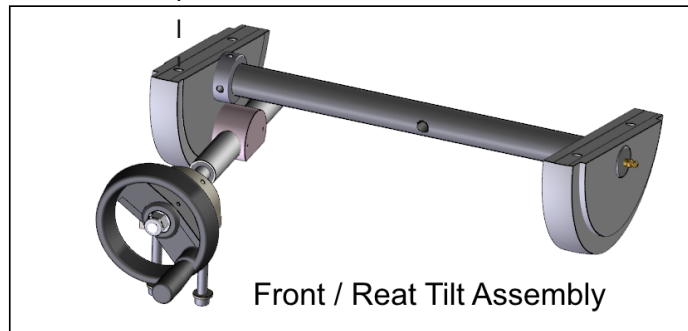
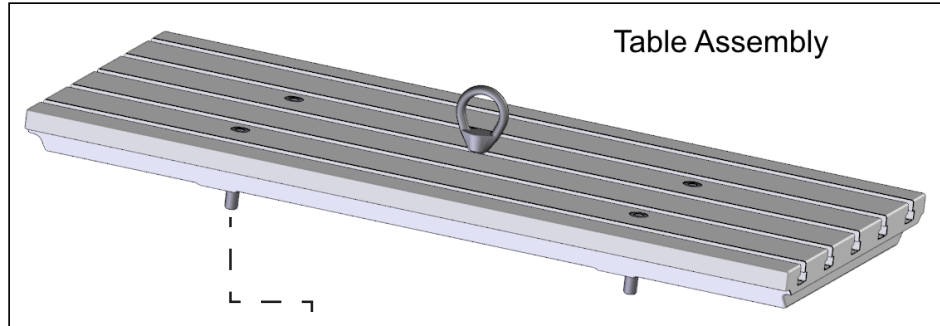
6303V CBN Insert, Octagonal
(16-Cutting Corners) for surfacing
large diesel blocks



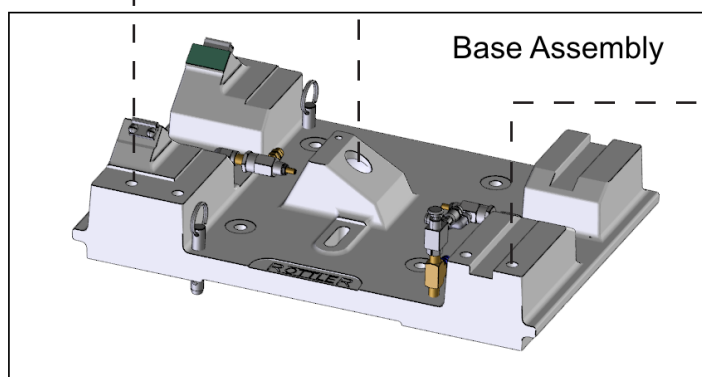
Cylinder Head Surfacing Fixture

7209M Leveling Table Sections

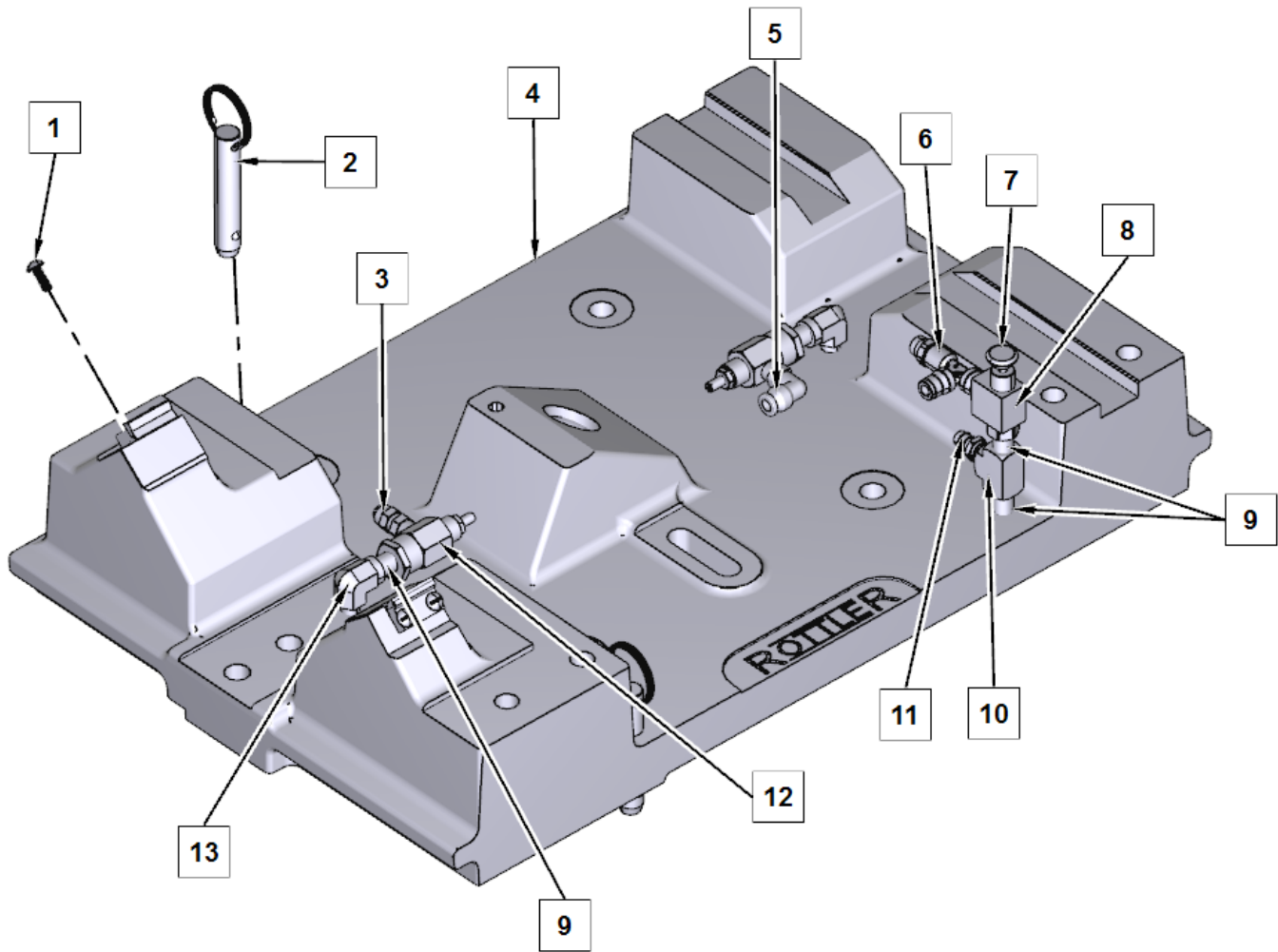
7209M Leveling Table Sections



Tensioner Assembly

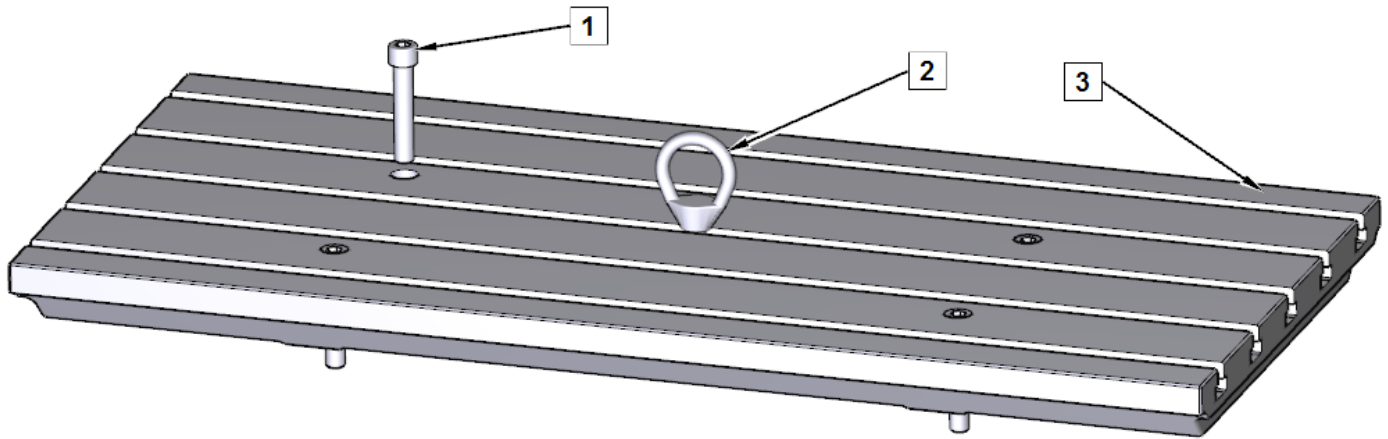


Base Assembly Section Parts



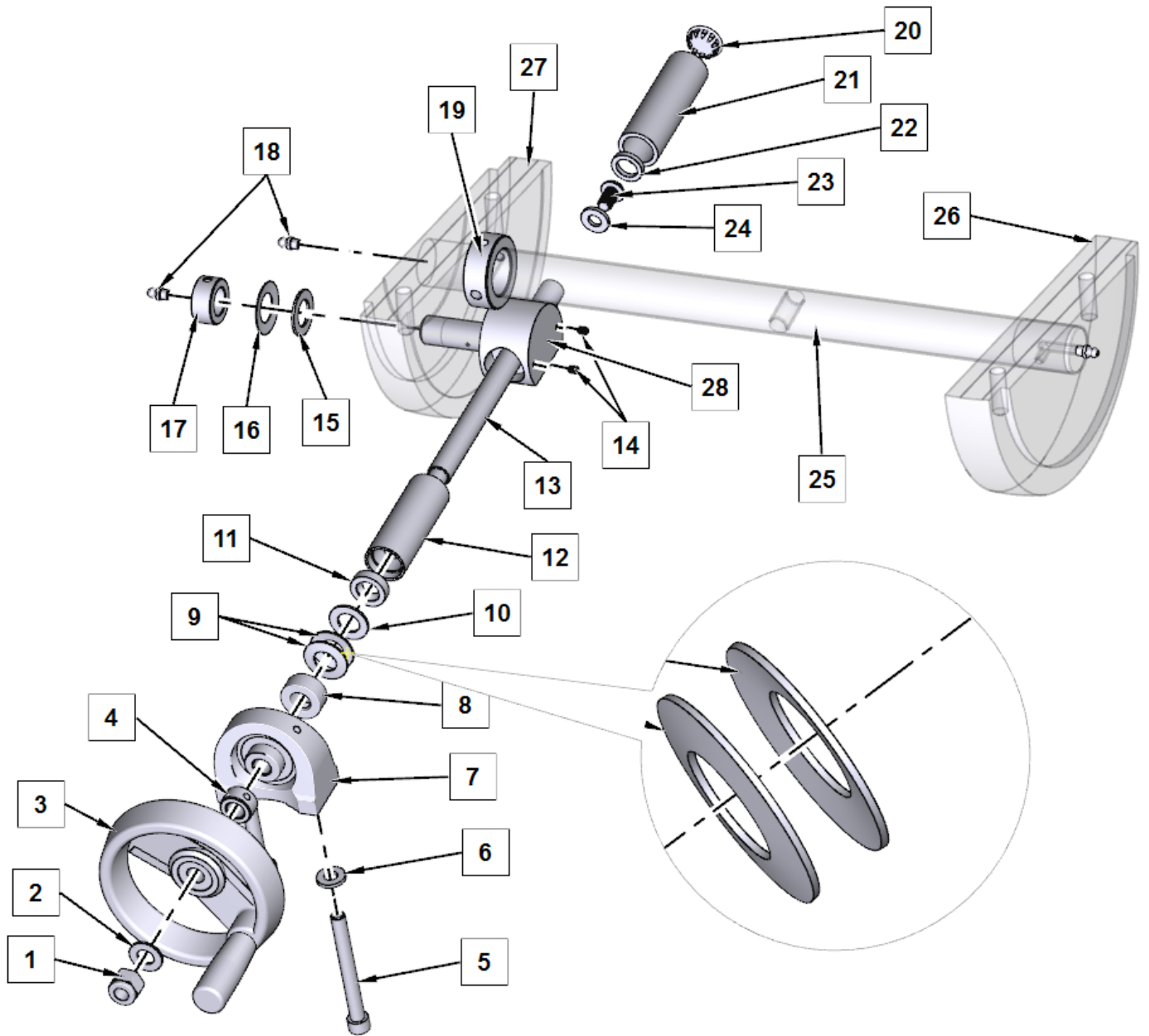
ITEM	PART #	DESCRIPTION
1	MF-111	ROUND HEAD MACHINE SCREW 10-24 X 1/2"
2	7210C	PIN, GUIDE ROTTLER LEVELING TABLE
3	502-11-16E	CONNECTOR, MALE, 1/4 X 1/8" PT
4	7233	FRAME, TABLE
5	514-4-17E	ELBOW, 90 DEGREE MALE - 1/4" X 1/8" NPT
6	514-4-17X	TEE, RUNNING 1/8-NPT X 1/4
7	502-1-56	PUSHBUTTON
8	514-2-65	VALVE, AIR - LIMIT & STOP
9	502-11-17J	NIPPLE,CLOSE 1/8" MPT
10	502-11-17C	TEE, 1/8 X 1/8"
11	502-1-96A	INSERT, BARBED - HOSE
12	502-11-35A	VALVE, CONTROL - RFC FLO
13	502-11-17R	ELBOW, ST, 1/8 FPT X 1/8 MPT

Table Assembly Section Parts



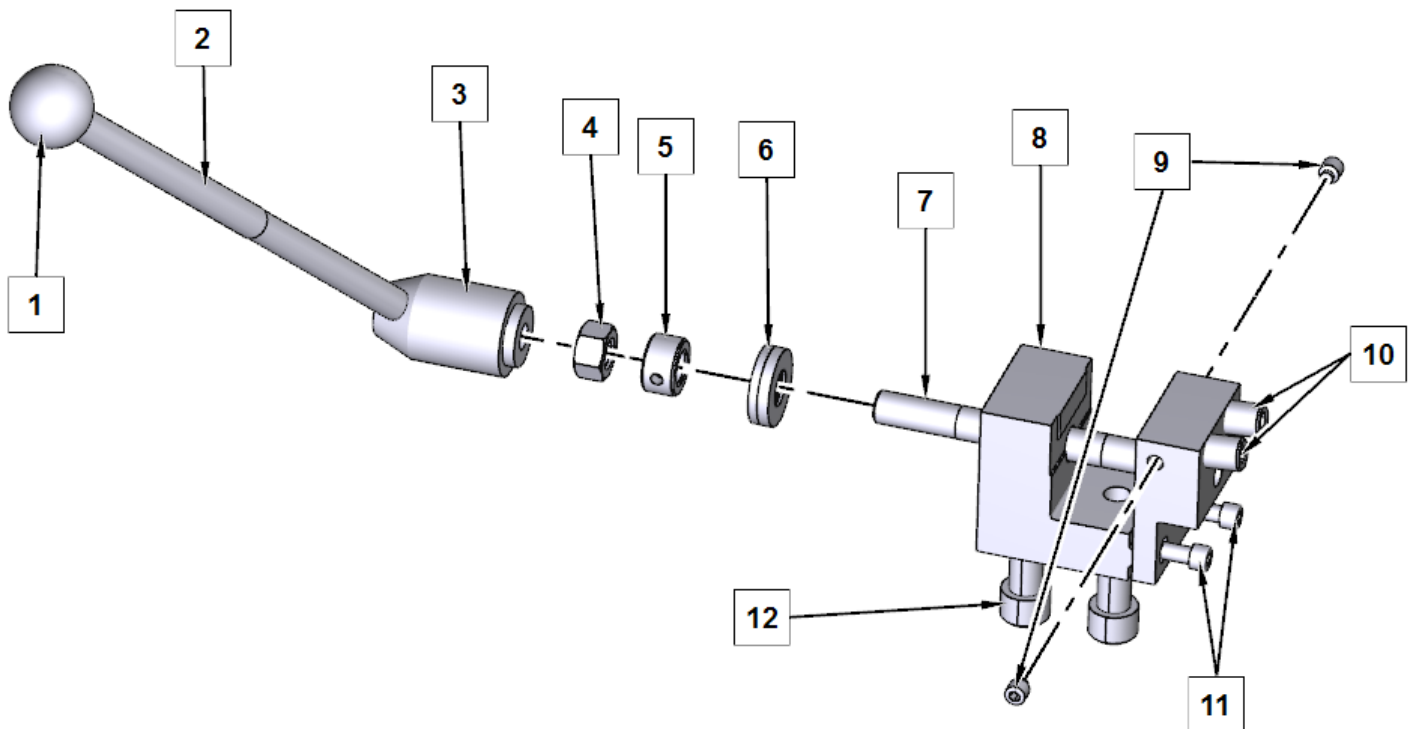
ITEM	PART #	DESCRIPTION
1	MF-45	SOCKET HEAD CAPSCREW 1/2-13 X 2"
2	502-3-13	EYE, LIFTING
3	7207C	TABLE, DUAL AXIS HEAD FIXTURE

Front / Rear Tilt Assembly Section Parts



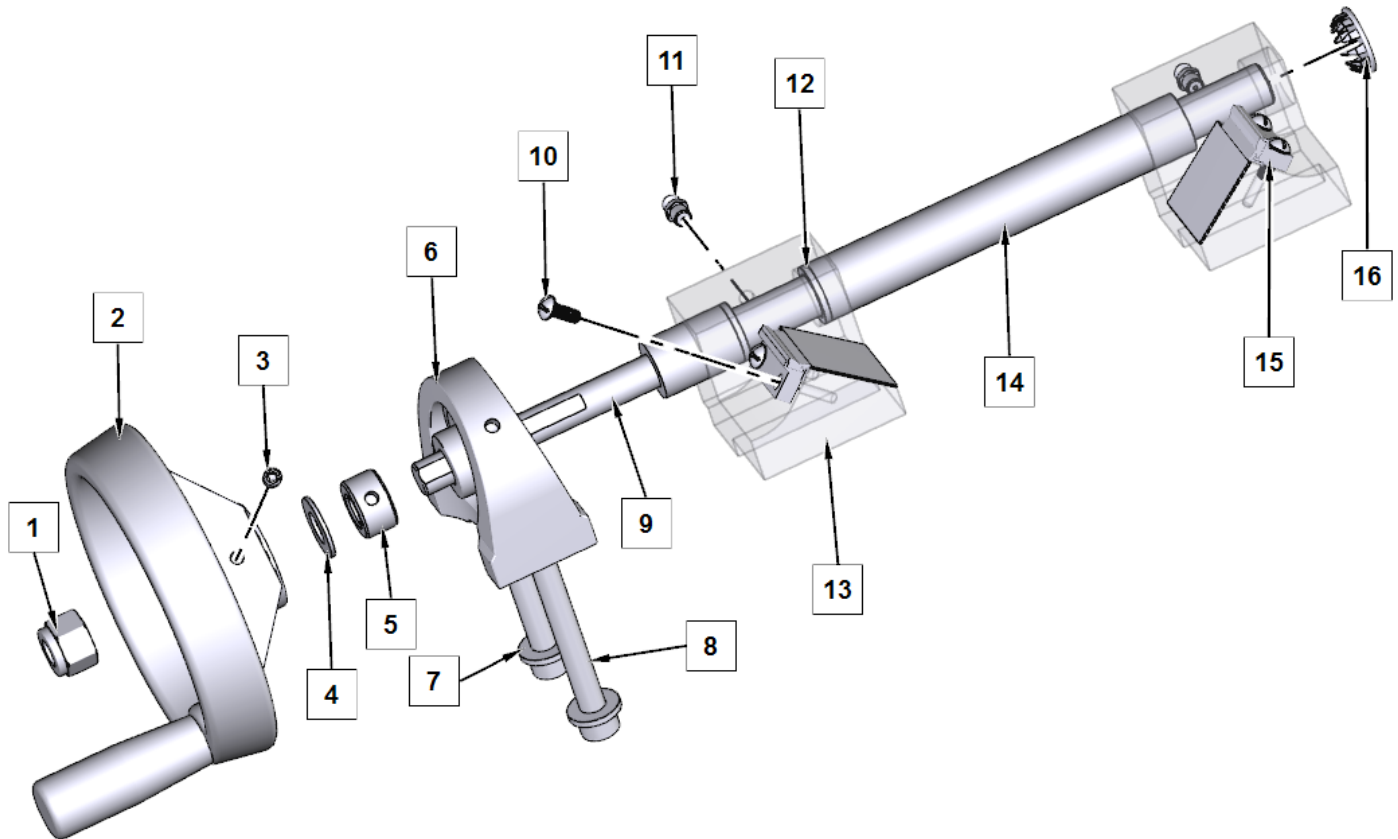
ITEM	PART #	DESCRIPTION
1	MF-186	NYLOCK NUT 1/2-13 NC
2	100-19	WASHER, THRUST
3	7201M	HANDWHEEL
4	7209J	COLLAR, 1/2" SHAFT
5	MF-36A	SOCKET HEAD CAP SCREW 3/8-16 X 3 1/2"
6	100-28-32	WASHER, 3/32" THICK
7	7201D	BLOCK, PILLOW LEVEL ADJUST
8	7199E	COLLAR, SUPPORT BLOCK (5/8" DIA)
9	514-7-21	WASHER, BELLEVILLE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

Tilt Clamp Assembly Section Parts



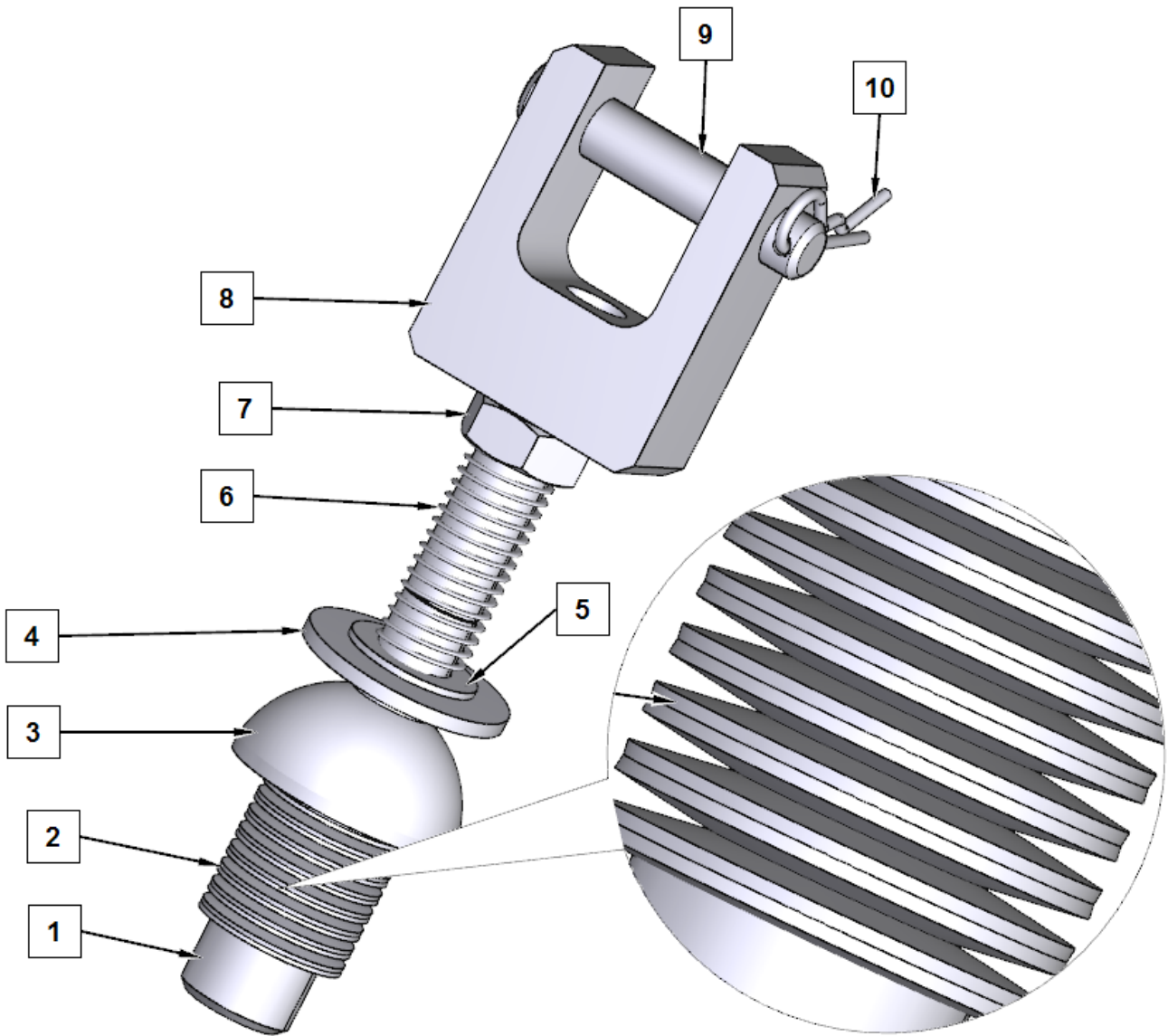
ITEM	PART #	DESCRIPTION
1	514-2-39E	KNOB, ADJUSTABLE HANDLE
2	514-2-39B	EXTENDER, ADJUSTABLE HANDLE
3	514-2-39D	HANDLE, ADJUSTABLE-CLAMP STOP
4	MF-165	HEX NUT 1/2-13 NC
5	7209J	COLLAR, 1/2" SHAFT
6	7209E	WASHER, SPHERICAL
7	7207Z	SHAFT, JOURNAL CLAMP
8	7210J	CLAMP BLOCK, JOURNAL CLAMP
9	504-29-36	SCREW,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

Left / Right Tilt Assembly Section Parts



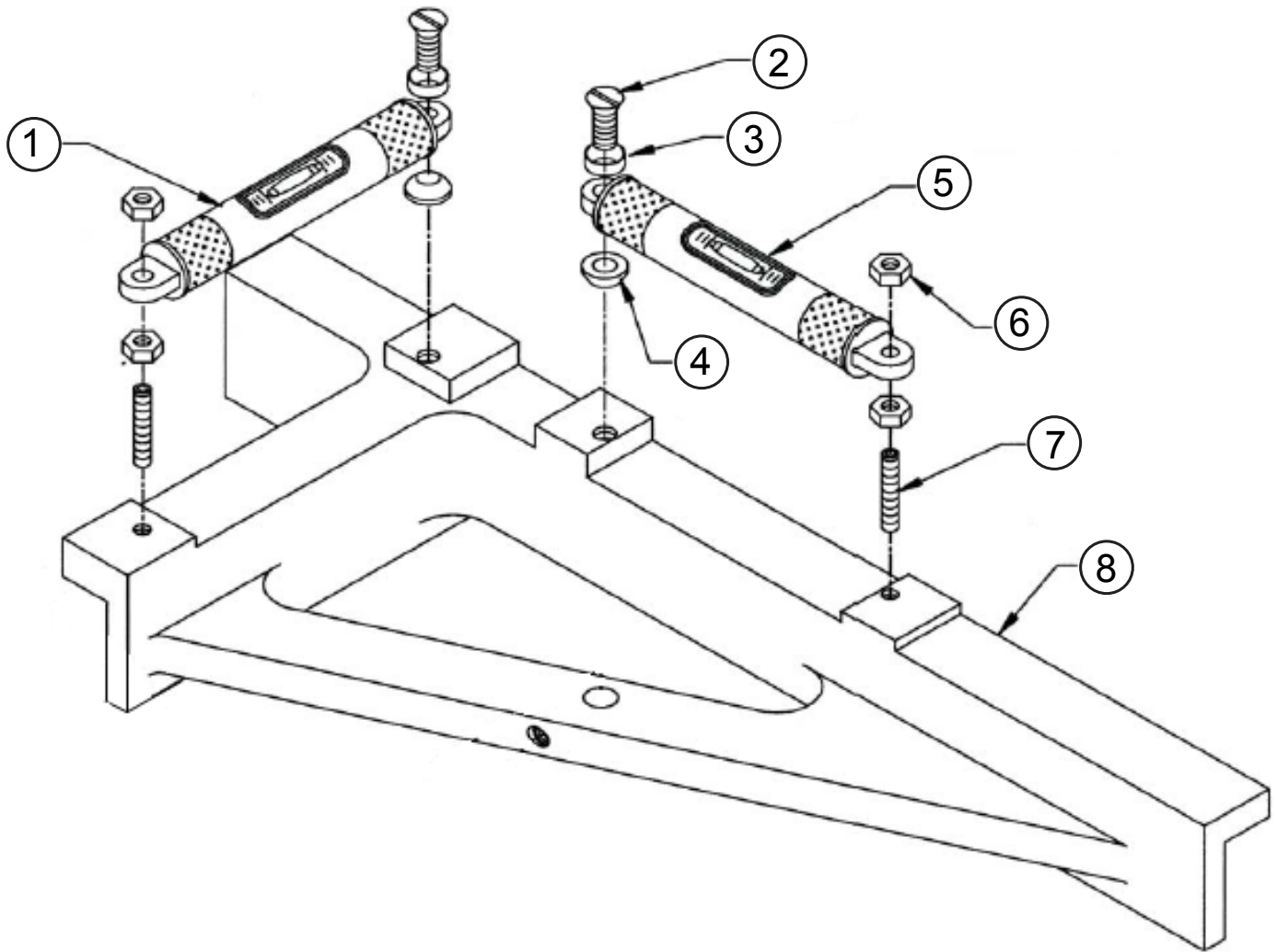
ITEM	PART #	DESCRIPTION
1	MF-186	NYLOCK NUT 1/2-13 NC
2	7201M	HANDWHEEL
3	MF-60	SOCKET SET SCREW CUP POINT 1/4-20 X 1/4"
4	100-19	WASHER, THRUST
5	7209J	COLLAR, 1/2" SHAFT
6	7201D	BLOCK, PILLOW LEVEL ADJUST
7	100-28-32	WASHER, 3/32"
8	MF-36A	SOCKET HEAD CAP SCREW 3/8-16 X 3 1/2"
9	7207M	SHAFT, LEFT/RIGHT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

Tensioner Assembly Section Parts



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

7152A Dual Axis Level Assembly Parts

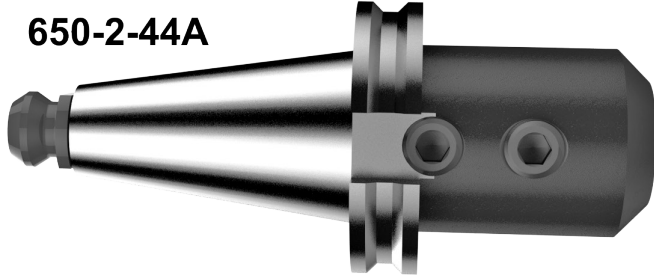


ITEM	PART #	DESCRIPTION
1	7152	VIAL ONLY LEVEL SF
2	7153G	SCREW,FLAT HEAD,12-24 HEAD SURFACING LEVEL
3	7153Z	WASHER, LEVEL MOUNTING (COUNTERSUNK HEAD)
4	7153V	WASHER, LEVEL MOUNTING (RADIUS HEAD)
5	7152C	COMPLETED VIAL LONGITUDINAL SF LEVEL ASSEMBLY
6	7153H	NUT,12-24 HEAD SURFACING LEVEL
7	7153J	SCREW,SOCKET SET 12-24 X 1" HEAD SURFACING LEVEL
8	7153S	BASE,HEAD SURFACE LEVEL

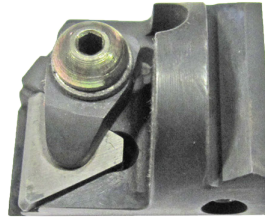
General Purpose Tooling

6648W Cat 3400 Series Tappet Bore Repair Tooling Package Components

650-2-44A



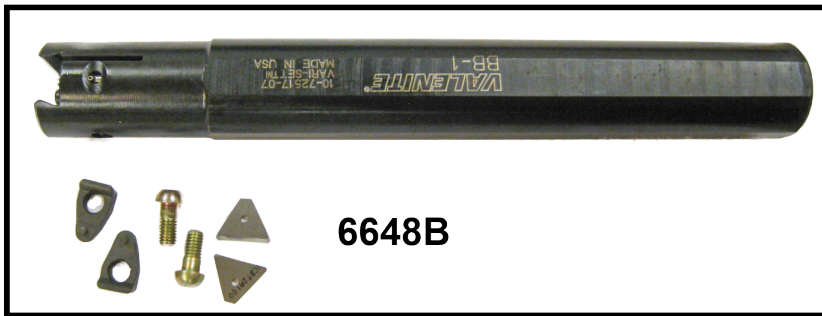
6648C



6648D



6648B



6648F



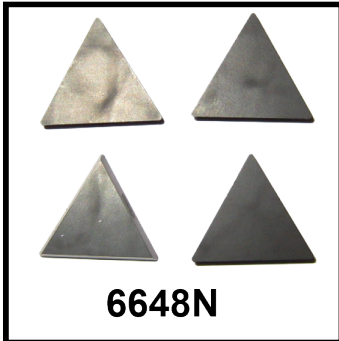
502-11-39F



MF-71D



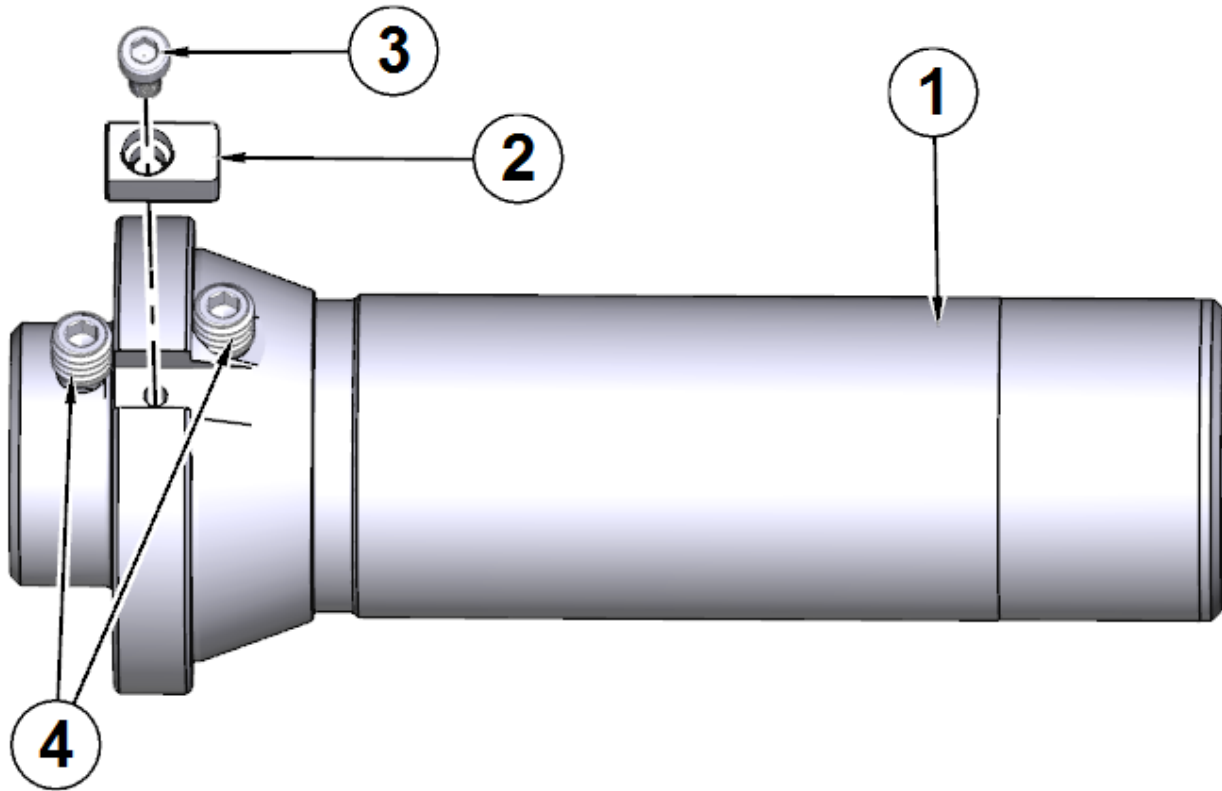
6648N



650-2-34D

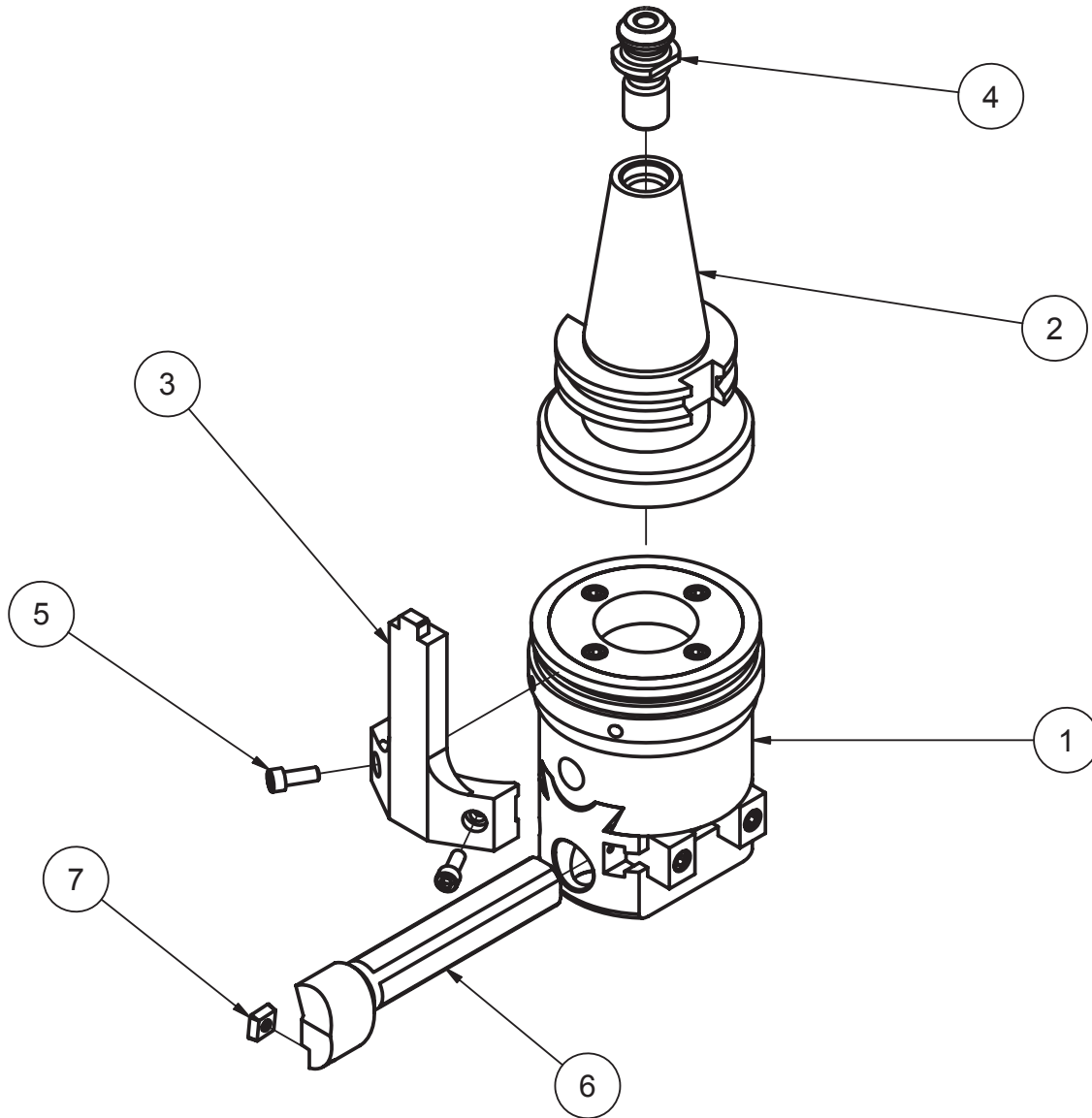


6648M Cutter Head Parts



ITEM	PART #	DESCRIPTION
1	6648A	SPINDLE ADAPTER-1" (25.4MM) FOR DRIVING 1" DIAMETER SHANK TOOLING
2	6181	KEY,CUTTERHEAD DRIVE
3	MF-5A	SOCKET HEAD CAP SCREW 10-24 X 1/2"
4	MF-71D	SOCKET SET SCREW FLAT POINT 3/8-16 X 3/8"

11116 Cross Feed Head Assembly Parts



11116 CRITERION CROSS FEED HEAD ASSEMBLY - F70			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	11116A	BODY, CRITERION CROSS FEED HEAD
2	1	650-2-34W	ADAPTER, CROSSFEED HEAD 40 TAPER F69/F70
3	1	11116C	DRIVE KEY, CRITERION CROSS FEED HEAD - F70
4	1	650-2-44L	CAT40 RETENTION KNOB
5	2	SCREW	10-32UNC x 1/2" S.H.C.S. PROVIDED WITH 11116A HEAD
6	1	650-2-34U	FACING BAR - PRECISION BORING HEAD ASSEMBLY
7	1	650-2-34V	INSERT, DIAMOND SHAPE 1/32" R.

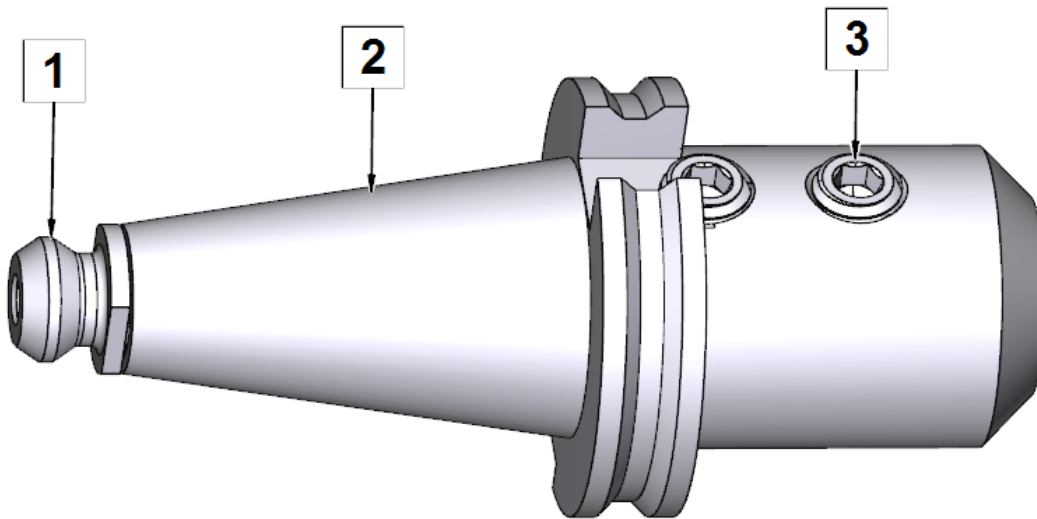
Tooling for Crankshaft Stroker Clearancing/Notching

650-2-45H Roughing End Mill

1" (25.4mm) diameter X 8 1/2" (216mm) long for block stroker clearance



650-2-44A End Mill Adapter Parts



ITEM	PART #	DESCRIPTION
1	650-2-44L	CAT 40 RETENTION KNOB
2	650-2-44A	END MILL ADAPTER-1" COMPLETE WITH 650-2-44L RETENTION KNOB CAT 40 TAPER
3	MF-85	SOCKET FLAT HEAD SCREW 3/8-16 X 3/4"

Tooling for Splayed 4 Bolt Main Cap Machining

650-2-53 Splayed 4 Bolt Main Cap Machining Tooling Package Components



650-2-44J



650-2-11F



650-2-53B



650-2-11K



650-2-44M



650-2-44N



650-2-53C

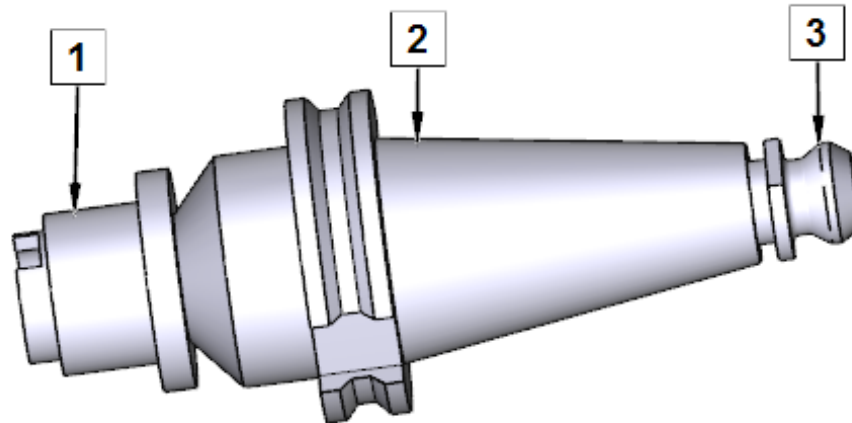


650-2-53A



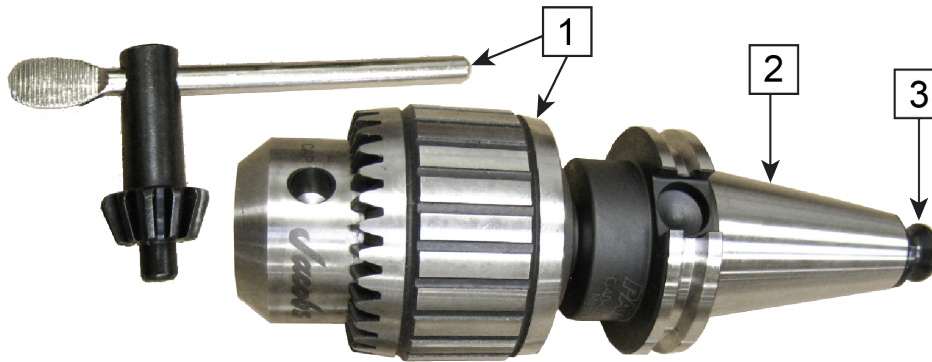
650-2-53D

650-2-11K Tap Driver Parts



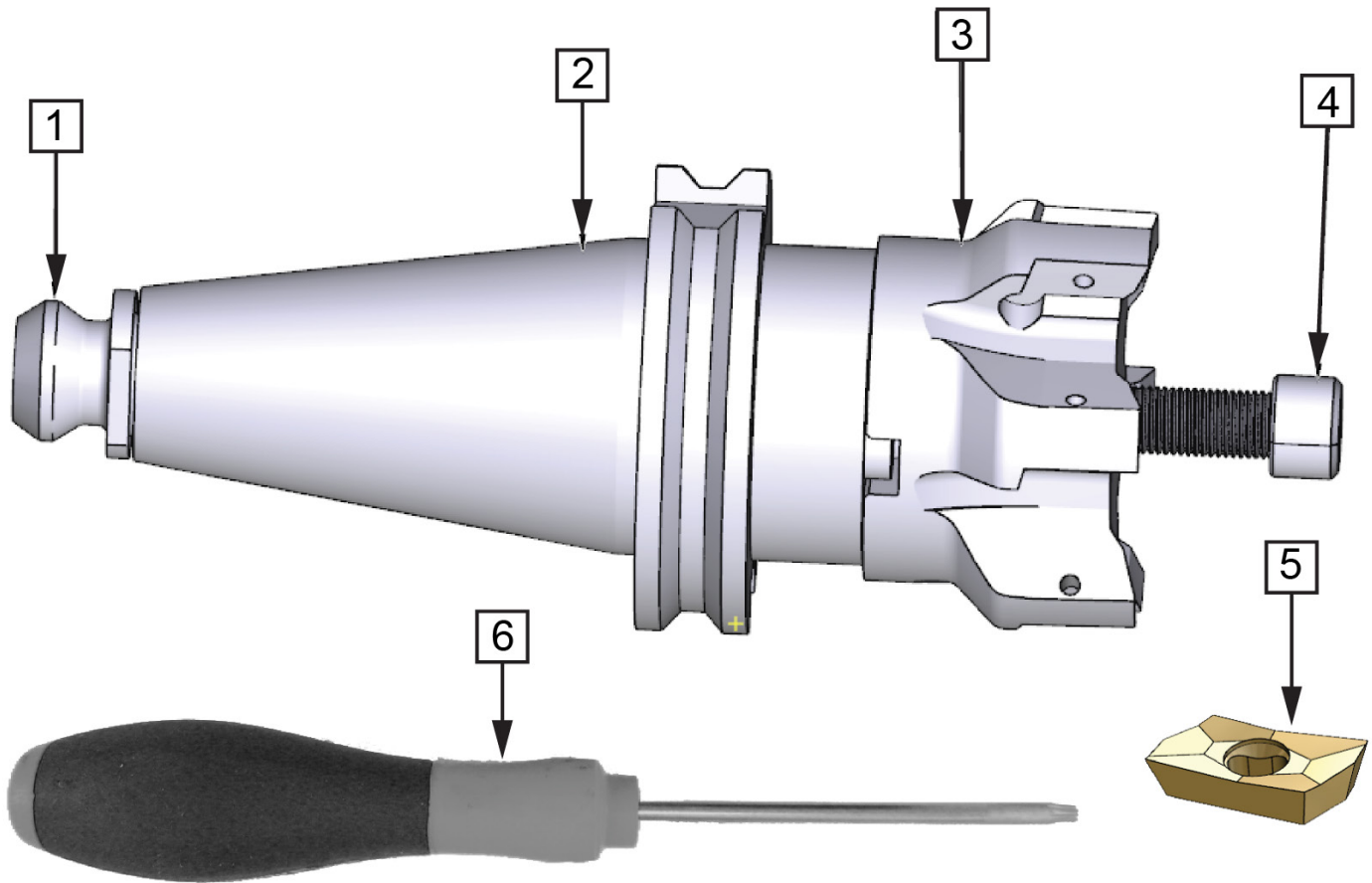
ITEM	PART #	DESCRIPTION
1	650-2-11B	TAP HOLDER CARTRIDGE-QUICK CHANGE STRAIGHT SHANK (3/4" SHANK)
2	650-2-44C	END MILL ADAPTER-3/4" COMPLETE WITH 650-2-44L RETENTION KNOB CAT 40 TAPER
3	650-2-44L	CAT 40 RETENTION KNOB

650-2-44M Drill Head Parts



ITEM	PART #	DESCRIPTION
1	650-2-9B	DRILL CHUCK-1/8-5/8 WITH KEY
2	650-2-44	DRILL CHUCK ADAPTOR CAT 40 TAPER
3	650-2-44L	CAT 40 RETENTION KNOB

650-2-44N Shell Mill Parts



ITEM	PART #	DESCRIPTION
1	650-2-44L	CAT 40 RETENTION KNOB
2	650-2-44G	ADAPTER FOR SHELL MILLS WITH 3/4" BORE COMPETE WITH 650-2-44L RETENTION KNOB CAT 40 TAPER
3	7224E	SHELL MILL 2 1/2"
4	7224D	SCREW, SOCKET HEAD CAP 3/8-24NF X 1" 2 1/2"
5	6514T	INSERT, SHELL MILLS 18MM .03 (0.8MM)
6	T15D	T15 TORX TIP HOLDING SCREW DRIVER

Tooling for Lifter Bore Machining

650-2-60B Lifter Bore Tooling Kit Components

650-2-60C



650-2-60D



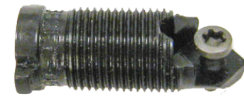
650-2-60K



650-2-60J



650-2-60E



650-2-60F



650-2-60H



650-2-60G



650-2-20C



650-2-20L

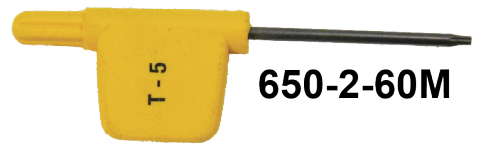
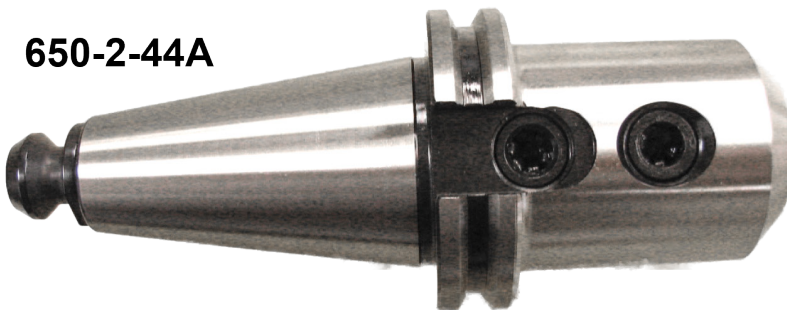


650-2-44L



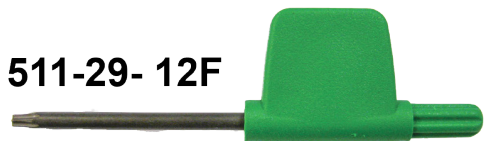
650-2-60L

650-2-44A

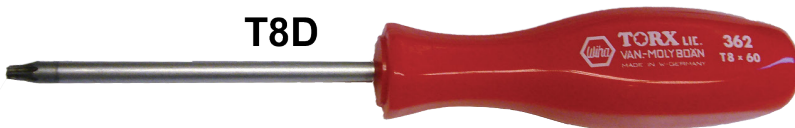


650-2-60M

511-29-12F



T8D



650-2-60N Setting Fixture for 650-2-60B Lifter Tooling Package

Sold only as complete package.



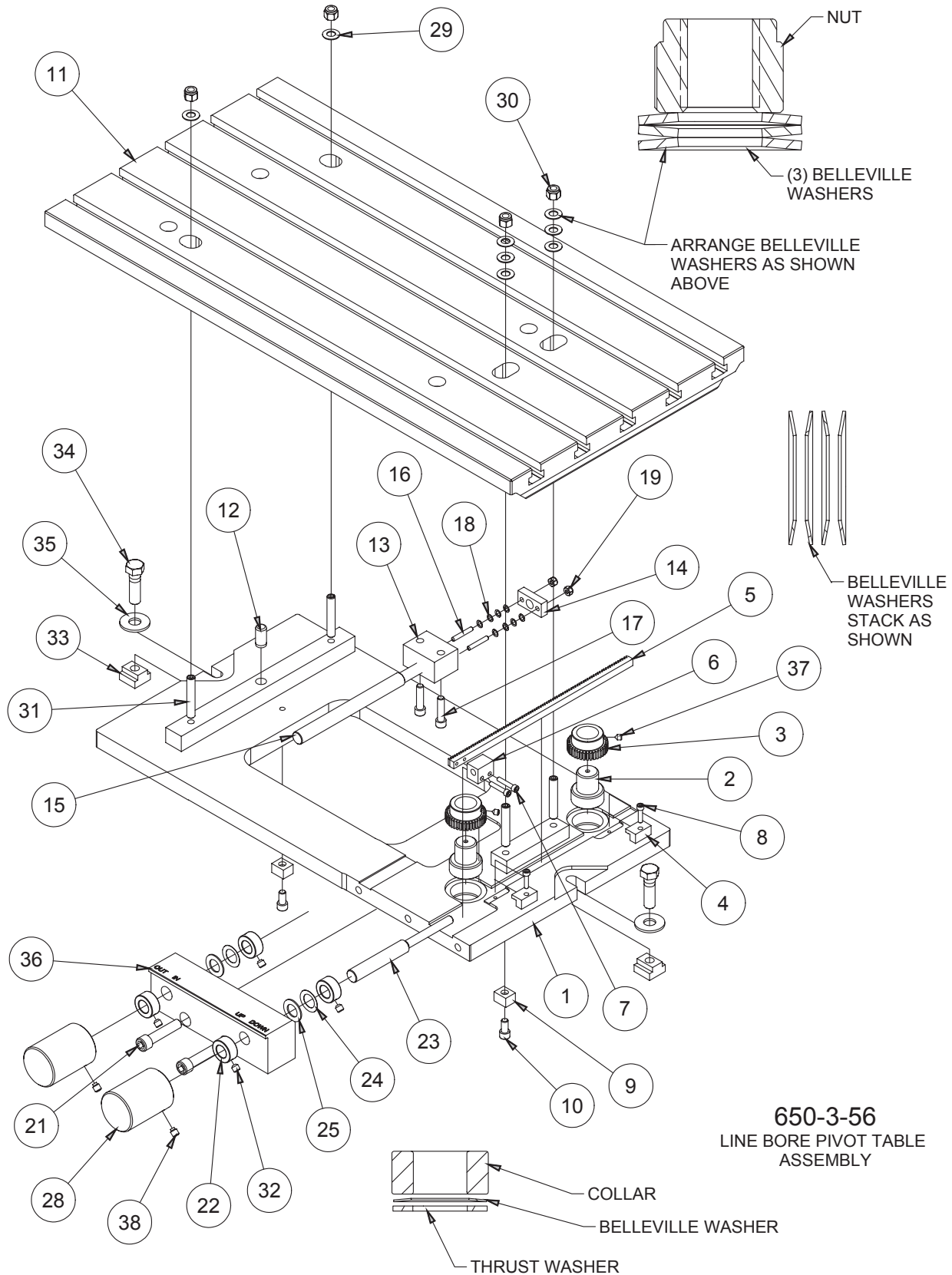
650-2-60G Insert for 0.750 - 0.900 diameter cartridge



650-2-60H Insert for 0.920 - 1.180 diameter cartridge

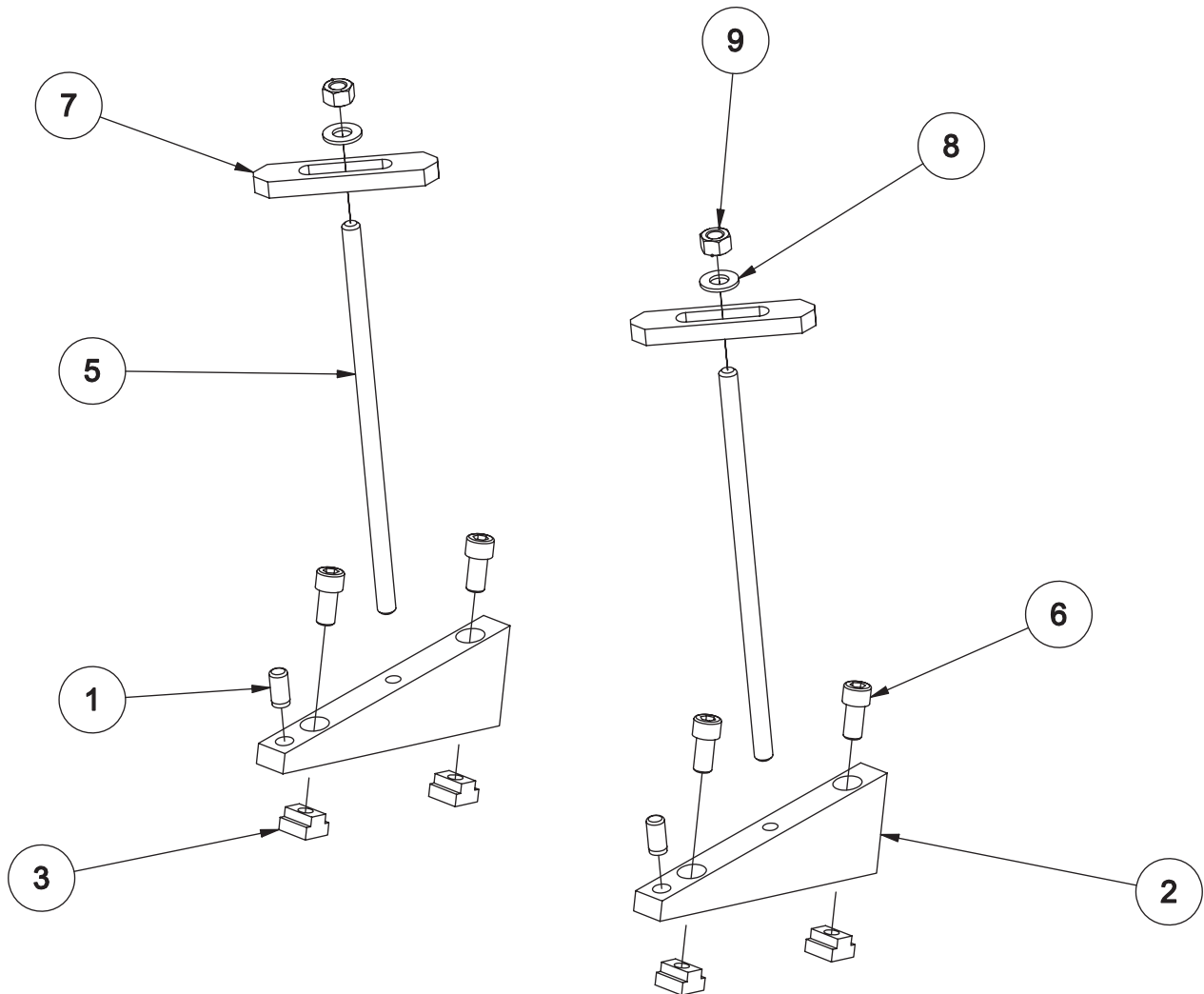


Main Line Boring and Cam Boring Fixtures 650-3-56 Line Bore Pivot Table Parts



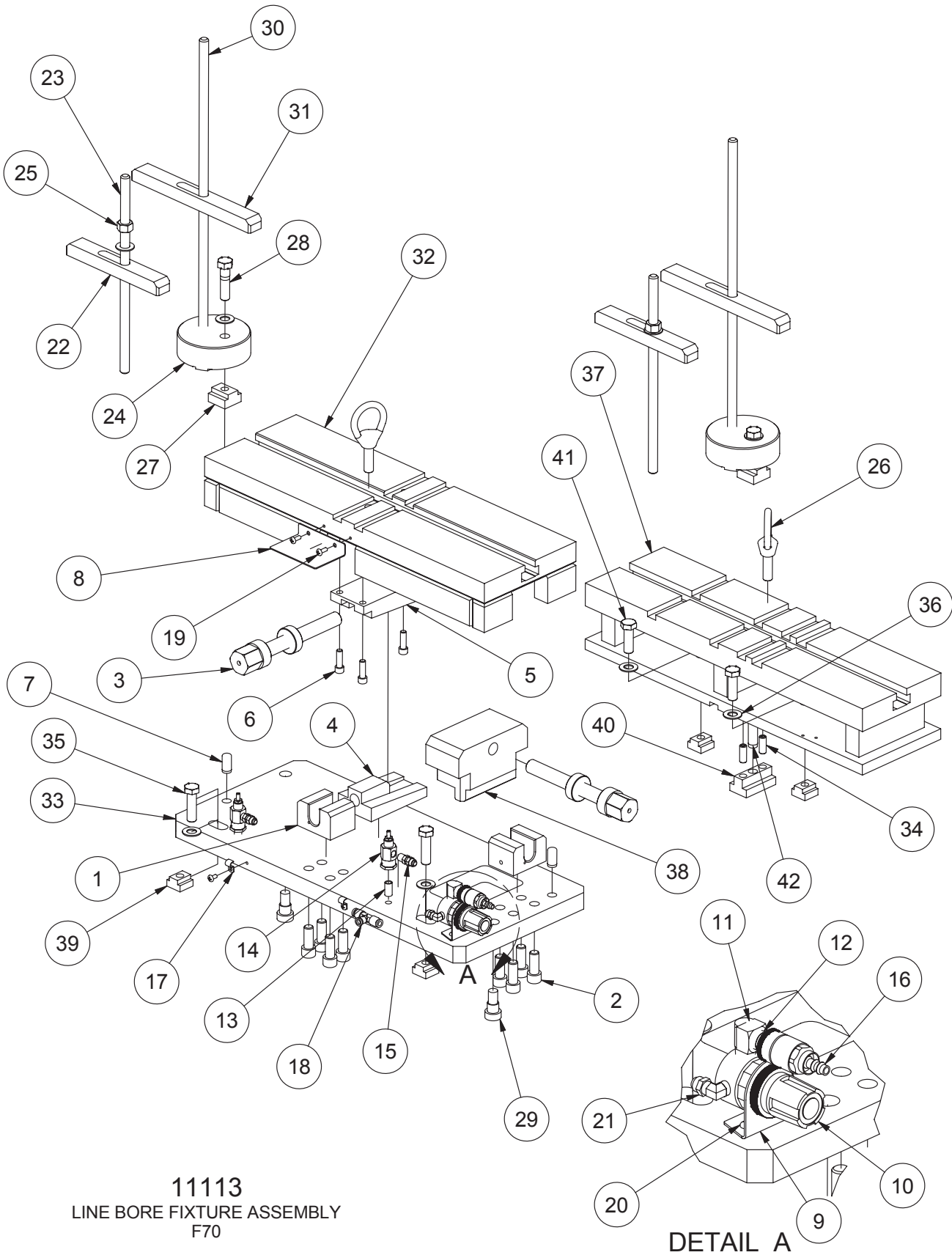
650-3-56 LINE BORE PIVOT TABLE ASSEMBLY			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	650-3-56C	LINE BORE PIVOT TABLE ASSEMBLY
2	2	650-3-56D	JACK SCREW - PIVOT TABLE
3	2	650-3-56F	GEAR, JACK SCREW - PIVOT TABLE
4	2	650-3-56K	RETAINER, RACK - PIVOT TABLE
5	1	650-3-56V	RACK - PIVOT TABLE
6	1	650-3-56W	THREADED BLOCK - PIVOT TABLE
7	2	MF-6A	10-24UNC x 1" LG. S.H.C.S.
8	2	MF-6	10-24UNC x 3/4" LG. S.H.C.S.
9	2	650-3-9	Key
10	2	MF-21	5/16-18UNC x 5/8" LG. S.H.C.S.
11	1	650-3-56A	TABLE TOP - PIVOT TABLE
12	1	MF-213B	1/2" x 1" LG. DOWEL PIN
13	1	650-3-56N	THREADED 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	10-24UNC x 1-1/4" LG. SOCKET SET SCREW
17	2	MF-24	5/16-18UNC x 1-1/4" LG. S.H.C.S.
18	8	650-3-56Q	BELLEVILLE SPRING
19	2	MF-186B	10-24UNC HEX NYLOCK NUT
21	2	MF-40A	7/16-14UNC x 2" LG. S.H.C.S.
22	4	7199E	COLLAR 1/2"
23	1	650-3-56U	lift Adjust 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	3/8-16UNC NYLOCK NUT
31	4	MF-75B	3/8-16UNC x 2-1/4" LG. SOCKET SET SCREW
32	4	6863	5/16-18 x 5/16" LG. CONE POINT SET SCREW
33	2	650-3-10	TN-5 T-Nut
34	2	MF-137F	1/2-13UNC x 1-3/4" LG. HEX BOLT
35	2	MF-180	1/2" FLAT WASHER
36	1	650-3-56L	CONTROL BLOCK - PIVOT TABLE
37	2	MF-59B	1/4-20UNC x 5/16" CONE POINT SET SCREW
38	2	504-29-36	5/16-18UNC x 5/8" LG. SOCKET HALF DOG SET SCREW

6866 Wedge for Cummins 5.9liter Camshaft Line Boring Parts



6866 15 DEG. WEDGE ASSEMBLY			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	2	MF-213B	1/2 x 1 Dowel Pin
2	2	6866A	15 DEGREE WEDGE CUMMINS DIESEL CAM BORING FIXTURE
3	4	7137B	T-Nut
5	2	6833B	CLAMP ROD 12"
6	4	MF-42	S.H.C.S. 1/2 - 13 UNC - 1
7	2	650-3-57B	CLAMP BAR
8	2	MF-180	1/2" FLAT WASHER
9	2	MF-165	1/2-13UNC HEX NUT

11113 Adjustable Universal Line Boring Parallel Assembly Parts

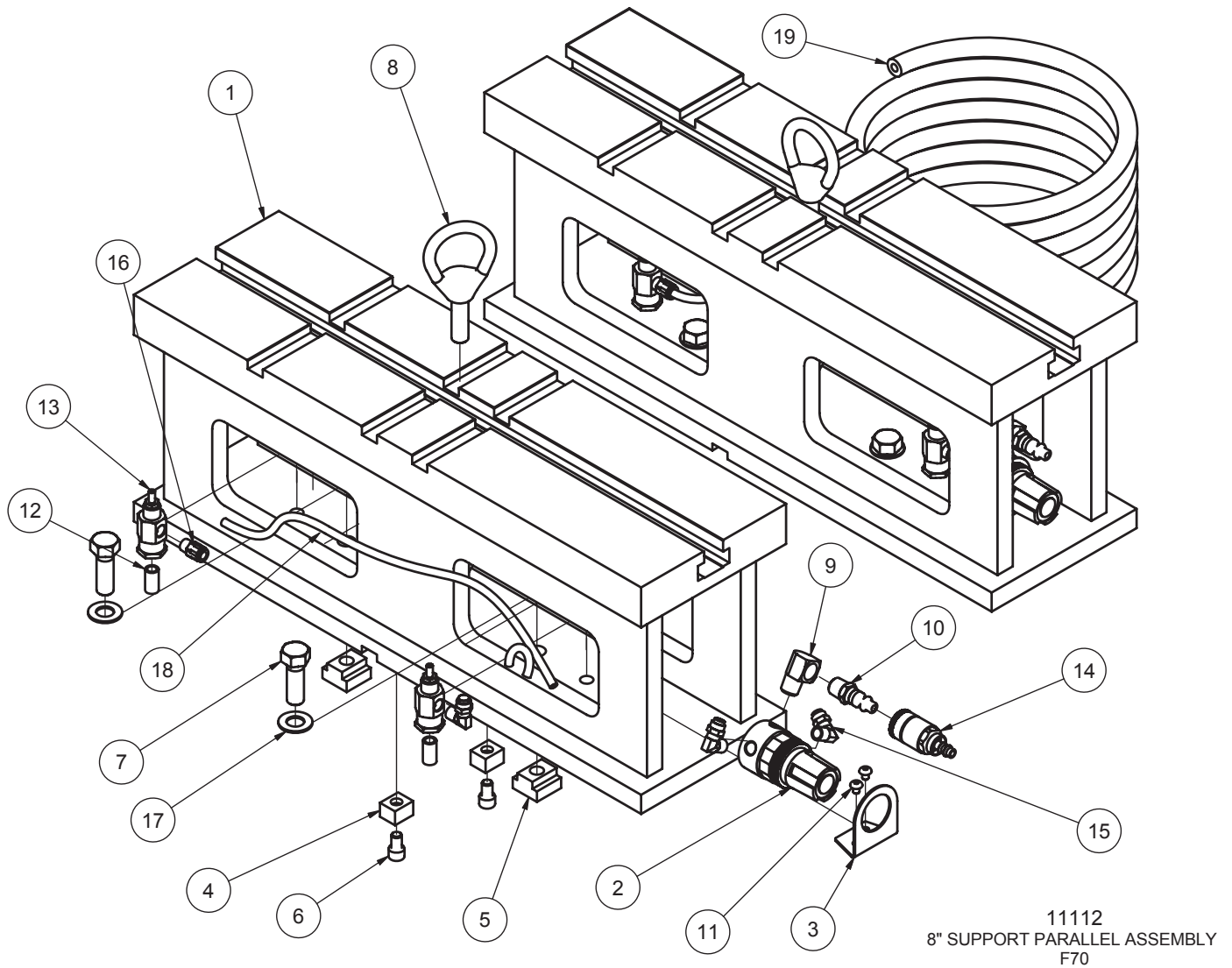


11113
LINE BORE FIXTURE ASSEMBLY
F70

DETAIL A

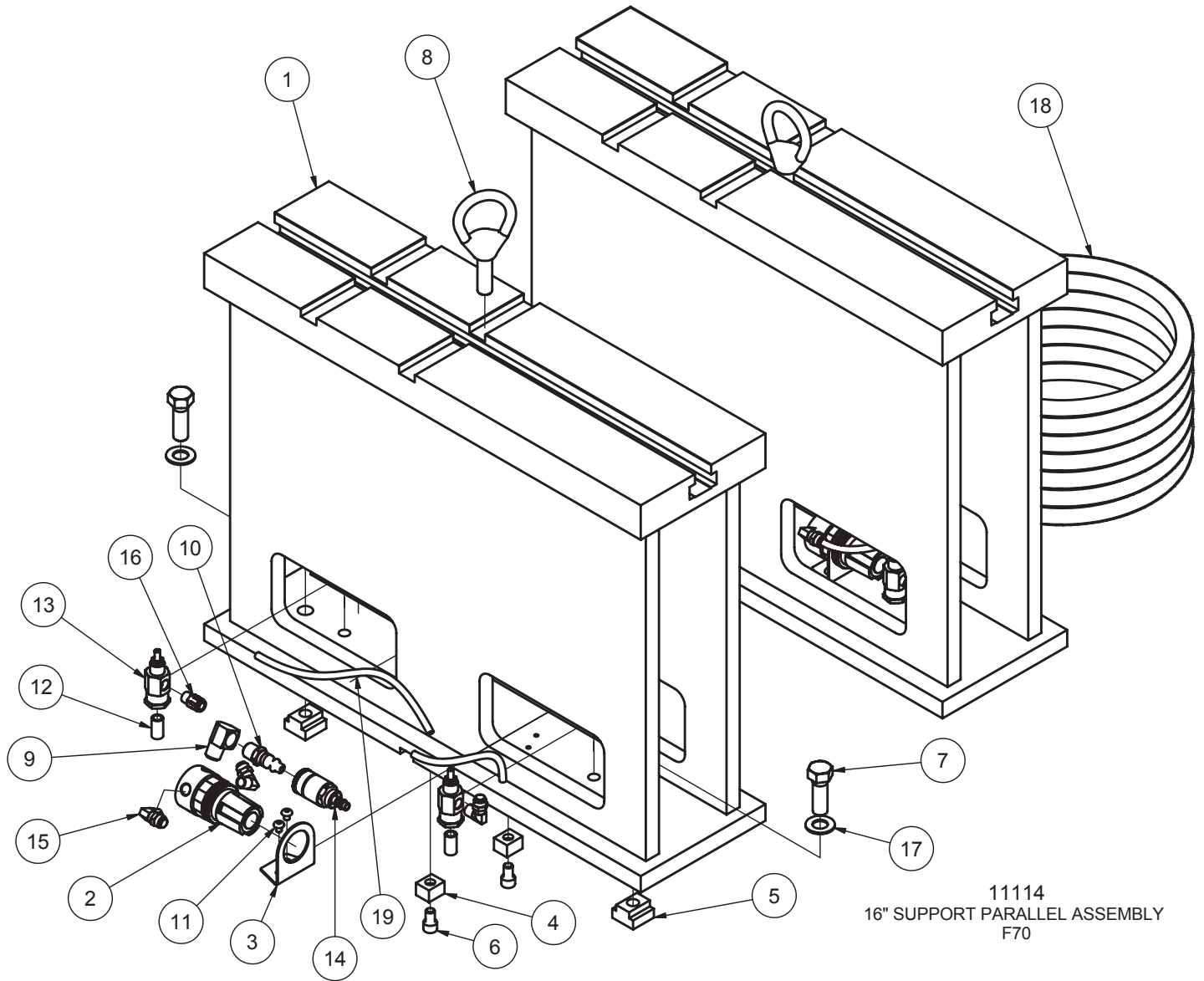
11113 LINE BORE FIXTURE ASSEMBLY - F70			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	2	6829	BRACKET, SCREW - ADJUSTABLE PARALLEL - F88 LINE BORE FIXTURE
2	8	MF-43	1/2-13UNC x 1-1/4" LG. S.H.C.S.
3	2	6828	SCREW, ADJUSTABLE PARALLEL F-8 LINE BORE FIXTURE
4	1	6827	Wedge, Lower Adjustable Parallel
5	1	6826	Wedge, Upper Adjustable Parallel
6	3	MF-23	5/16-18UNC x 1" S.H.C.S.
7	2	MF-213B	1/2" x 1" LG. DOWEL PIN
8	1	6834	Chip Shield, Upper Pad Adjustable Parallel
9	1	502-27-17A	Regulator Bracket
10	1	502-27-17	Regulator 0 - 60 PSI
11	1	502-11-17S	1/4 STREET ELL
12	1	502-11-16X	Quick Connect air Fitting Male
13	2	502-11-17J	Nipple, Close 1/8" NPT
14	2	502-11-35A	Flo Control
15	2	502-11-16E	Connector, Male 1/4 x 1/8 PT
16	1	502-11-16W	Quick connect air fitting female
17	2	502-12-16	Wire Clip
18	1	514-4-17N	Tee, Union 1/4 Tube
19	2	MF-110	10-24UNC x 1/2" LG. PAN HEAD SCREW
20	4	MF-111	10-24UNC x 3/8" LG. PAN HEAD SCREW
21	1	502-11-16I	Elbow, Male 1/4 FPT x 1/8 PT
22	2	6833A	CLAMP BAR (7" LG), INLINE BLOCK F-88 LINE BORE FIXTURE
23	2	6833B	CLAMP ROD, (12") INLINE BLOCK F-88 LINE BORE FIXTURE
24	2	6833	Locator, In-Line Block
25	2	MF-165	1/2-13UNC HEX NUT
26	2	502-3-13	Lift Eye
27	2	502-1-11B	T-Nut 3/4"
28	2	MF-149C	1/2-13UNC x 2" LG. HEX BOLT
29	2	514-7-22	Screw, Shoulder
30	2	6833D	CLAMP ROD, (18") INLINE BLOCK F-88 LINE BORE FIXTURE
31	2	6833E	CLAMP BAR, INLINE BLOCK F-88 LINE BORE FIXTURE
32	1	11113G	UPPER PAD (MACHINING) - LINE BORE FIXTURE - F70
33	1	11113B	LOWER PLATE (MACHINING) ADJUSTABLE PARALLEL - F84 LINE BORE FIXTURE
34	2	MF-70	Hexagon Socket Set Screw - Flat Point
35	2	MF-137F	1/2-13UNC x 1-3/4" LG. HEX BOLT
36	8	MF-180	1/2" FLAT WASHER
37	1	11113E	SUPPORT PARALLEL (MACHINING) 4" x 6" - F70
38	1	11113D	BLOCK, ADJUSTING, ADJUSTABLE PARALLEL - LINE BORE FIXTURE - F70
39	4	650-3-10	TN-5 T-Nut
40	1	11113A	LOCATING PIVOT KEY, LINE BORE FIXTURE - F70
41	2	MF-150A	1/2-13UNC x 1-1/2" LG. S.H.C.S.
42	1	11113M	1/2" X 1-1/2" LG. DOWEL PIN

11112 Universal 8" (203mm) Heavy Duty T-Slot Parallels Parts



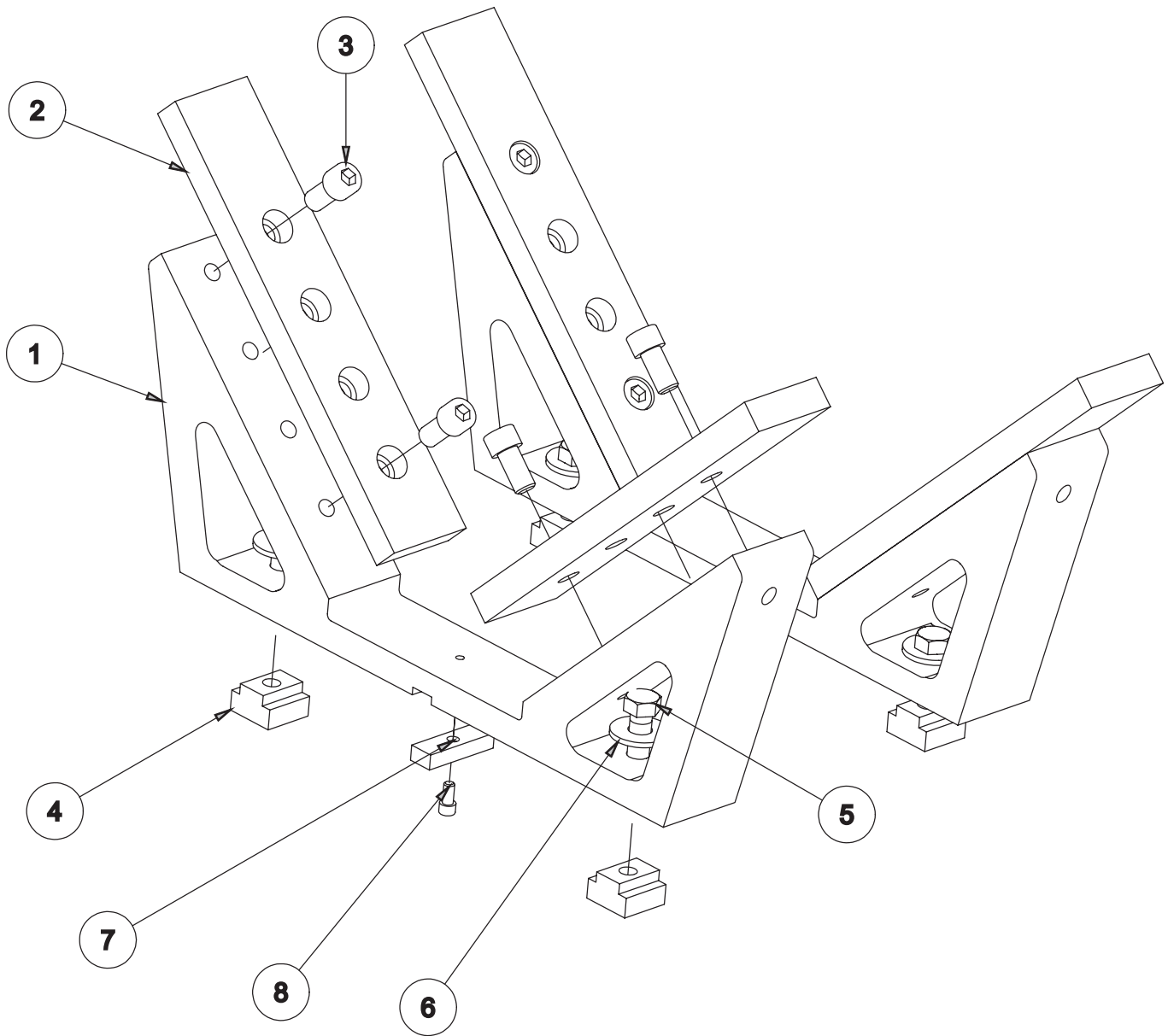
11112 SUPPORT PARALLEL ASSEMBLY 8" - F70			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	2	11112A	SUPPORT PARALLEL 8" (MACHINING) - F70
2	2	502-27-17	Regulator 0 - 60 PSI
3	2	502-27-17A	Regulator Bracket
4	4	650-3-9	Key
5	4	650-3-10	TN-5 T-Nut
6	4	MF-21A	5/16-18UNC x 1/2" LG. S.H.C.S.
7	4	MF-137A	1/2-13UNC x 1-1/2" LG. HEX BOLT
8	2	502-3-13	Lift Eye
9	2	502-11-17S	1/4 STREET ELL
10	2	502-11-16X	Quick Connect air Fitting Male
11	4	MF-87	10-24UNC x 1/4" LG. SOCKET BUTTONHEAD SCREW
12	4	502-11-17J	Nipple, Close 1/8" NPT
13	4	502-11-35A	Flo Control
14	1	502-11-16W	Quick connect air fitting female
15	6	502-11-16I	Elbow, Male 1/4 FPT x 1/8 PT
16	2	514-4-17W	FITTING 1/8NPT x 1/4" POLY STRAIGHT
17	4	MF-180	1/2" FLAT WASHER
18	3 FT.	502-11-15	1/4" OD BLACK POLYFLO
19	15 FT.	502-1-98	1/4" AIR HOSE

11114 Universal 16" (406mm) Heavy Duty T-Slot Parallels Parts



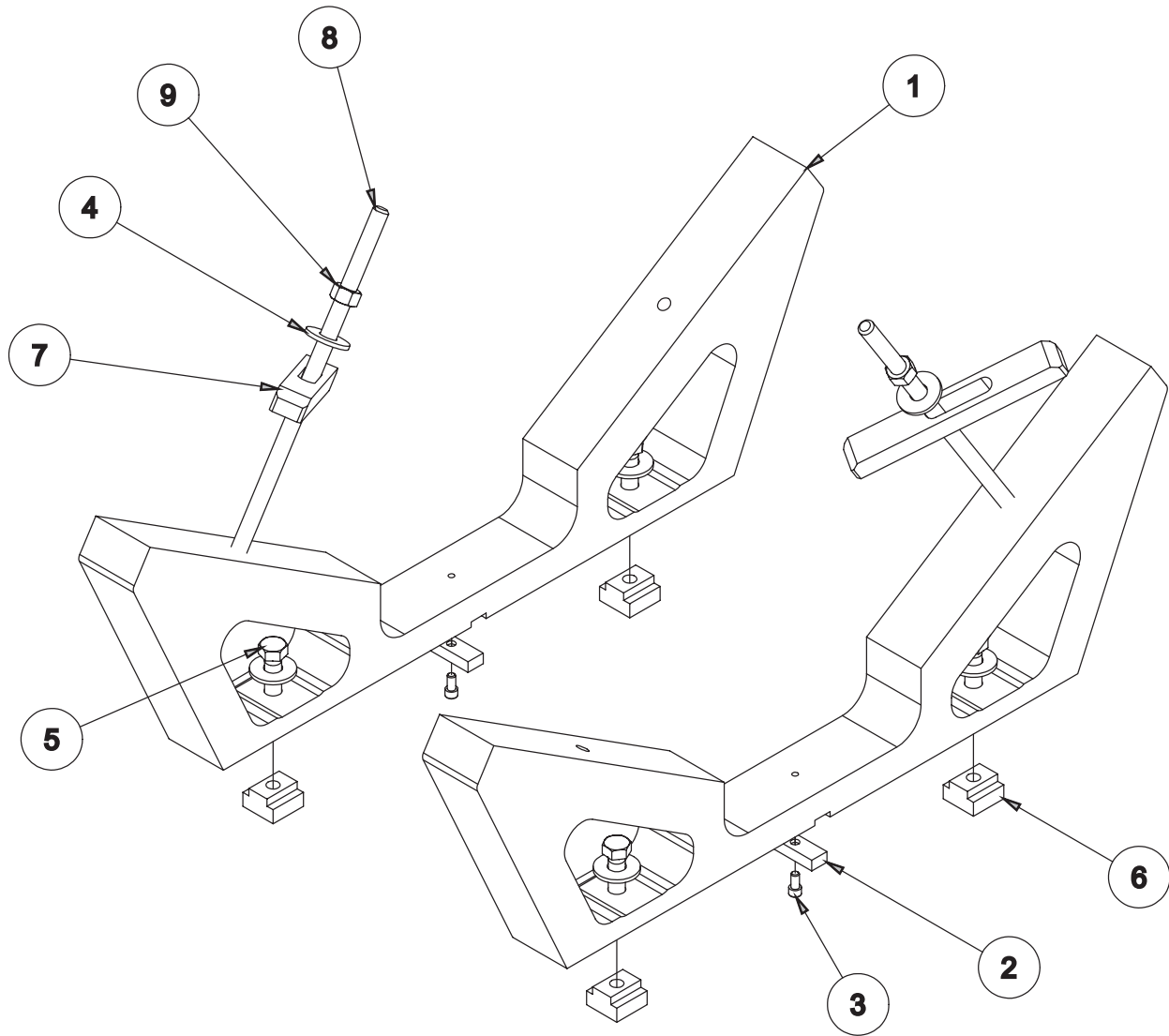
11114 SUPPORT PARALLEL ASSEMBLY 16" - F70			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	2	11114A	SUPPORT PARALLEL 16" (MACHINING) - F70
2	2	502-27-17	Regulator 0 - 60 PSI
3	2	502-27-17A	Regulator Bracket
4	4	650-3-9	Key
5	4	650-3-10	TN-5 T-Nut
6	4	MF-21A	5/16-18UNC x 1/2" LG. S.H.C.S.
7	4	MF-137A	1/2-13UNC x 1-1/2" LG. HEX BOLT
8	2	502-3-13	Lift Eye
9	2	502-11-17S	1/4 STREET ELL
10	2	502-11-16X	Quick Connect air Fitting Male
11	4	MF-87	10-24UNC x 1/4" LG. SOCKET BUTTONHEAD SCREW
12	4	502-11-17J	Nipple, Close 1/8" NPT
13	4	502-11-35A	Flo Control
14	1	502-11-16W	Quick connect air fitting female
15	6	502-11-16I	Elbow, Male 1/4 FPT x 1/8 PT
16	2	514-4-17W	FITTING 1/8NPT x 1/4" POLY STRAIGHT
17	4	MF-180	1/2" FLAT WASHER
18	15 FT.	502-1-98	1/4" AIR HOSE
19	3 FT.	502-11-15	1/4" OD BLACK POLYFLO

6843 90 Degree V Block Supports Parts



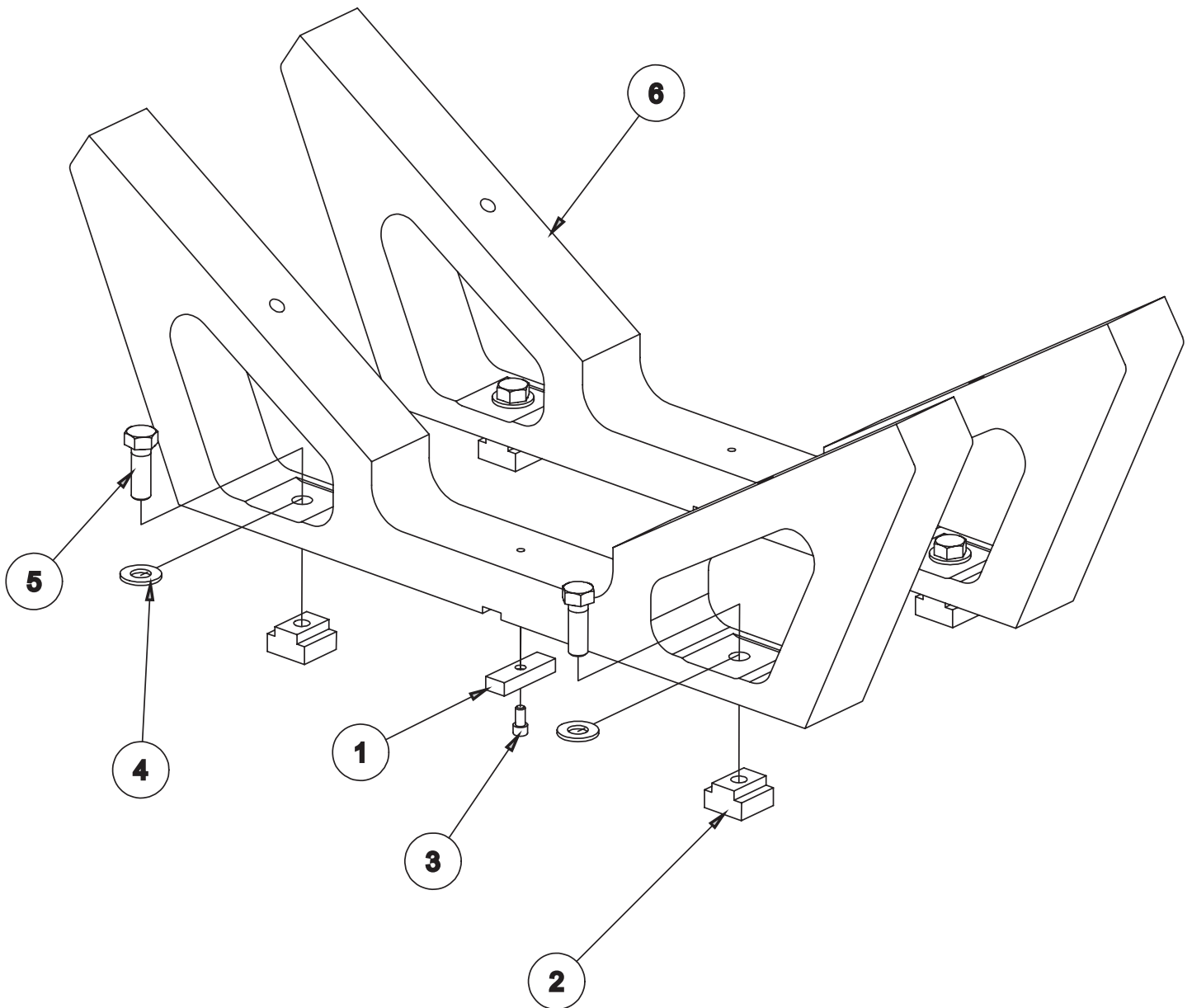
6843 90 DEG. V-BLOCK CRADLE ASSEMBLY			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	2	6843A	Cradle, Right and Left V Block
2	4	6789D	ADAPTER PLATE, V-BLOCK CRADLE
3	8	MF-42	1/2-13UNC x 1" S.H.C.S.
4	4	502-1-11B	T-Nut 3/4"
5	4	MF-150A	1/2-13UNC x 1-1/2" HEX BOLT
6	4	MF-180	1/2" FLAT WASHER
7	2	6831	KEY
8	2	MF-12	1/4-20UNC x 1/2" S.H.C.S.

6789E 115 Degree V Block Supports for CAT 3400 Parts



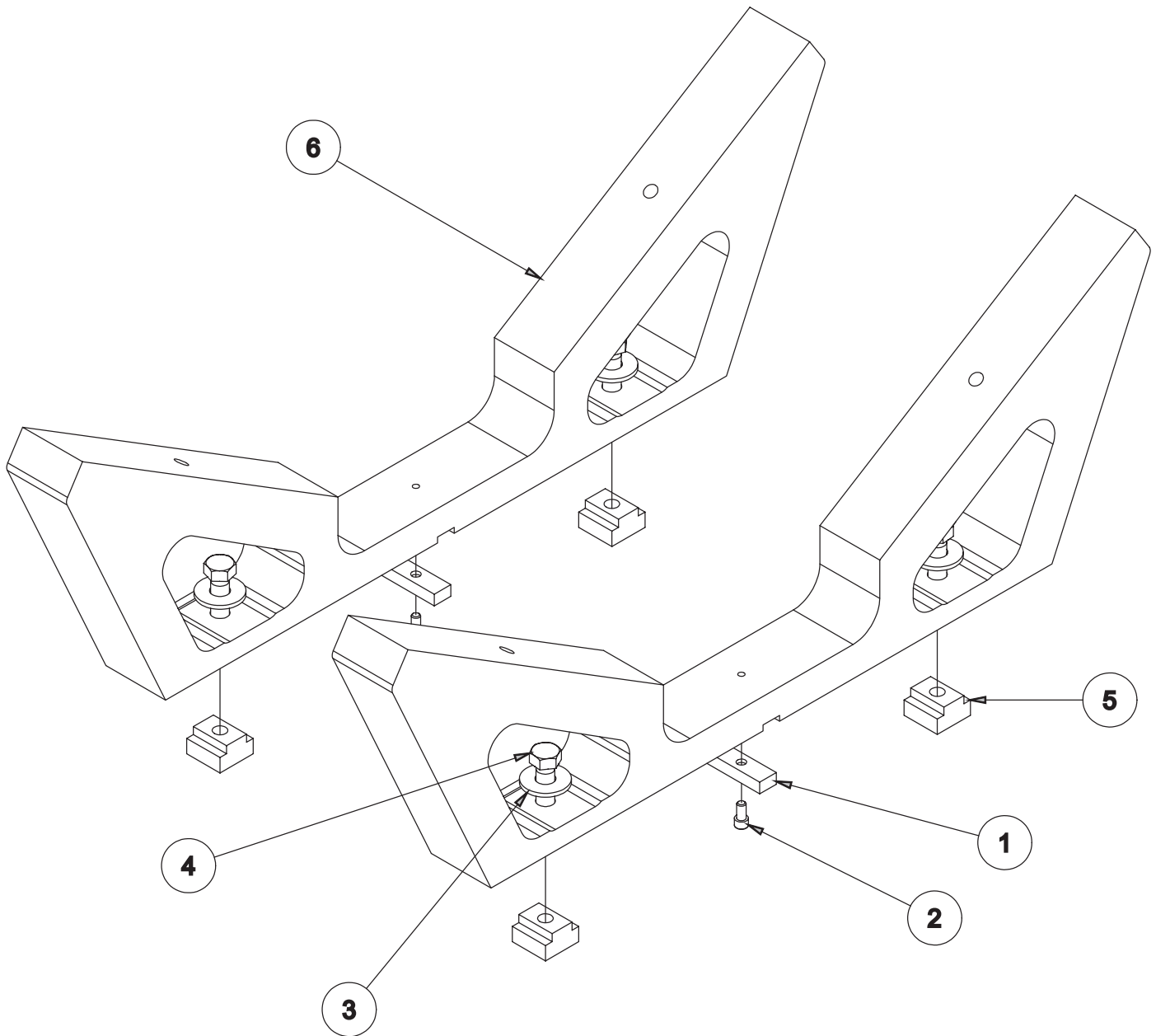
6789E CAT 3400 SERIES V-BLOCK CRADLE ASSEMBLY			
ITEM	QTY	RMC PART NO.	DESCRIPTION
1	2	6789F	115 DEG. V-BLOCK CRADLE
2	2	6831	KEY
3	2	MF-12	1/4-20UNC x 1/2" S.H.C.S.
4	6	MF-180	1/2" FLAT WASHER
5	4	MF-150A	1/2-13UNC x 1-1/2" HEX BOLT
6	4	502-1-11B	1/2-13UNC T-NUT
7	2	6833A	CLAMP BAR
8	2	6833B	CLAMP ROD
9	2	MF-165	1/2-13UNC HEX NUT

6789L 113 Degree V Block Supports for Detroit Diesel V53



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

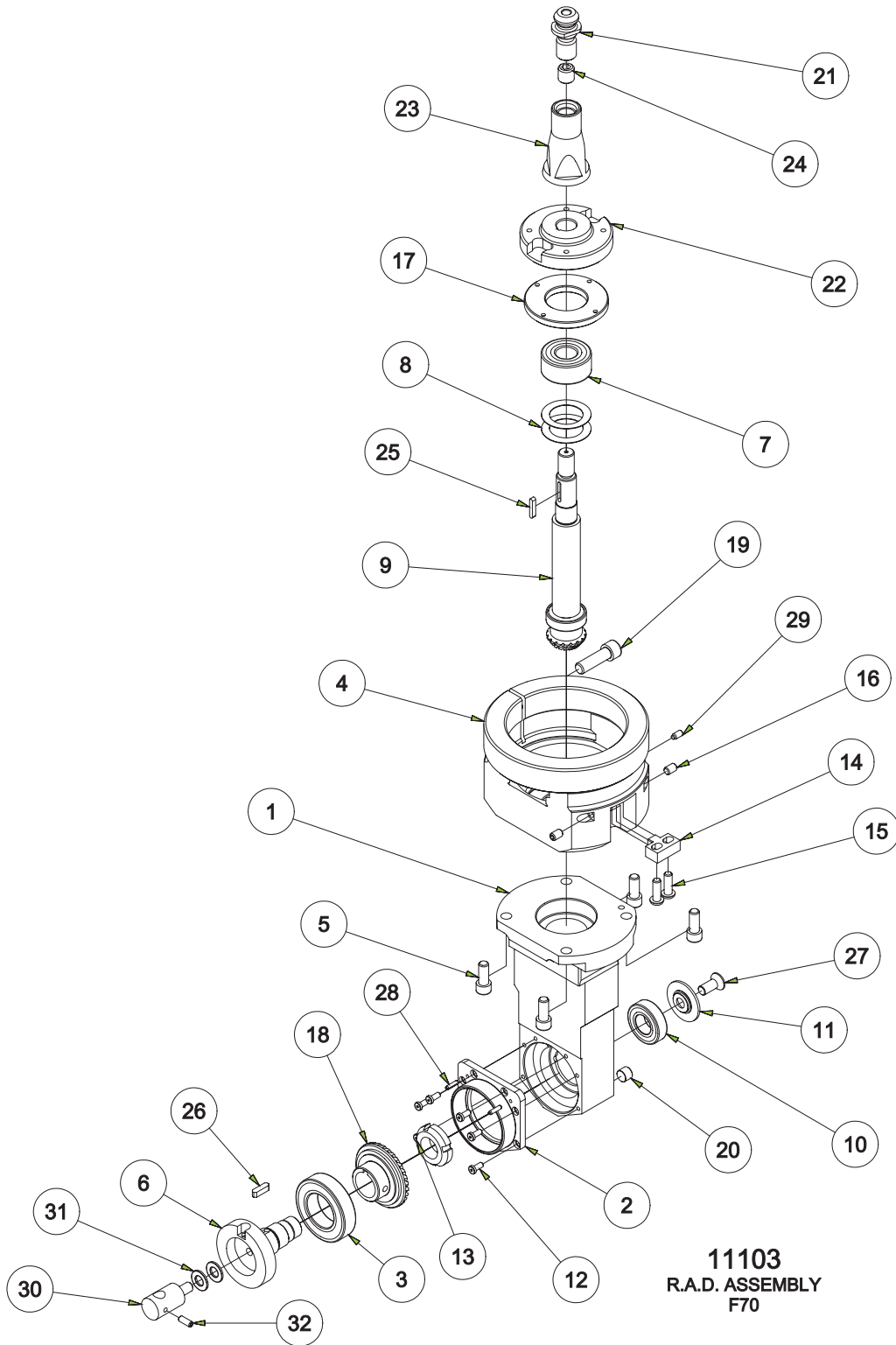
6789N 116 Degree V Block Supports for Detroit Diesel V71 & V92 Parts



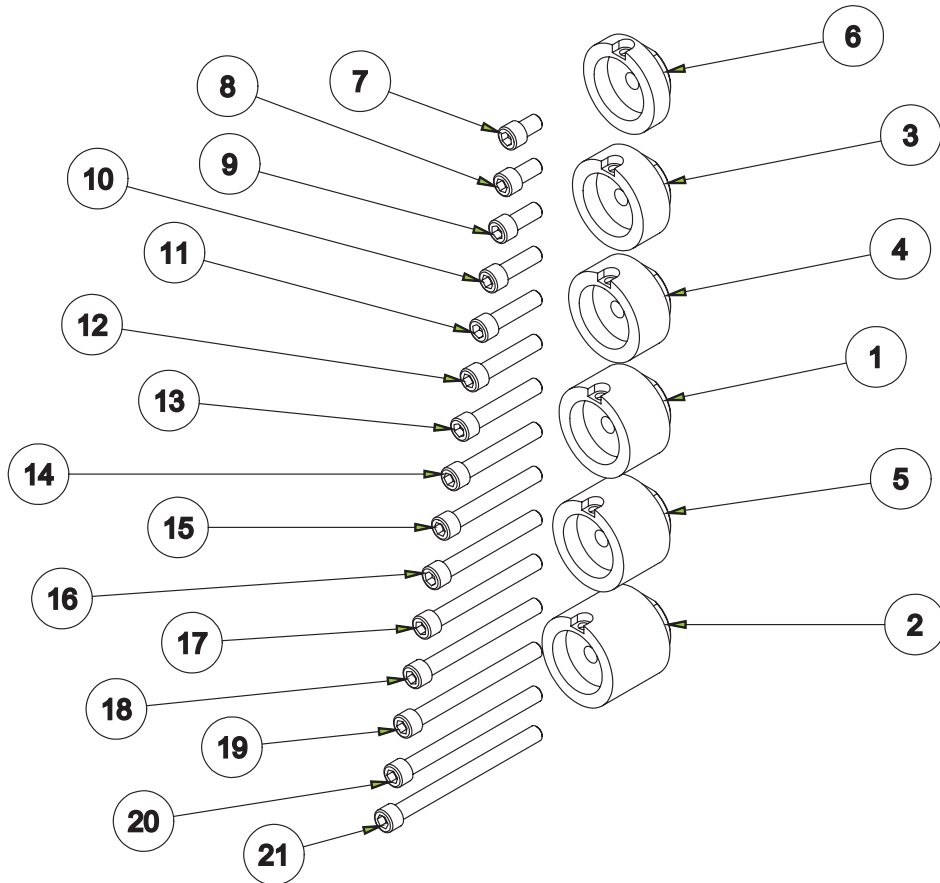
6789N 116DEG. 12 MIN. V-BLOCK CRADLE ASSEMBLY			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	2	6831	KEY, FIXTURE
2	2	MF-12	1/4-20UNC x 1/2" S.H.C.S.
3	4	MF-180	1/2" FLAT WASHER
4	4	MF-150A	1/2-13UNC x 1-1/2" HEX BOLT
5	4	502-1-11B	1/2-13UNC T-NUT
6	2	6789P	116 DEG. 12' V-BLOCK CRADLE

Main Line Boring and Cam Boring Tooling

11103 Main Line Bore 90 Degree Right Angle Drive Assembly Parts

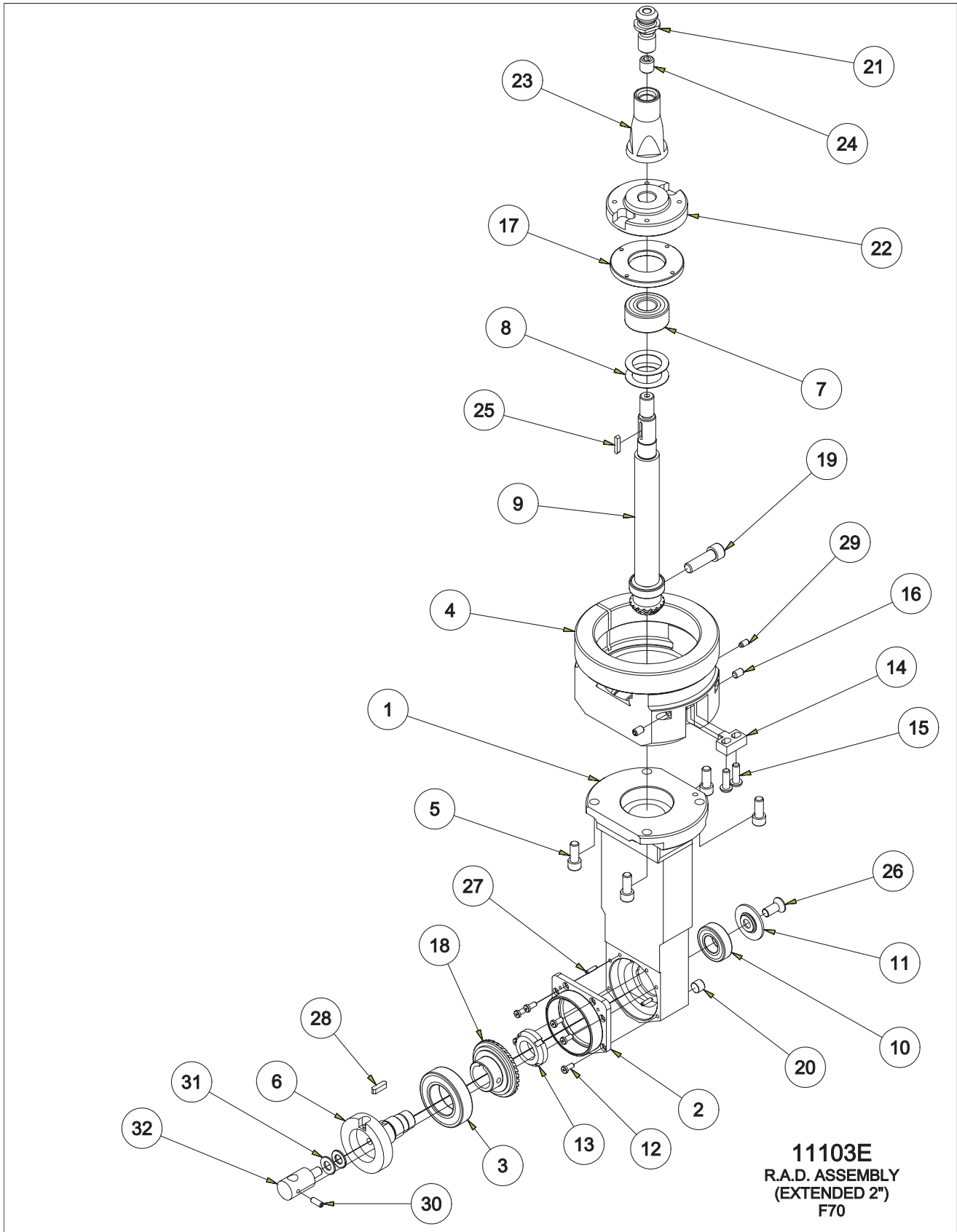


11103 RIGHT ANGLE DRIVE ASSEMBLY - F70			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	6773C	HOUSING, GEAR LINE BORE HEAD F-65/F-80
2	1	6774	COVER, BEARING RETAINER - F80/90 R.A.D.
3	1	502-9-72B	BALL BEARING
4	1	11103A	HUB, MOUNTING, R.A.D. ASSEMBLY - F70
5	4	MF-22	5/16-18UNC x 3/4" LG. S.H.C.S.
6	1	650-2-42A	SHAFT, HORIZONTAL - INTERMEDIATE PRECISION LINE BORE HEAD
7	1	502-9-32	BALL BEARING
8	2	6007A	Bellville Spring, BS203
9	1	6775A	PINION AND SHAFT ASSEMBLY LINE BORE HEAD
10	1	6753E	BALL BEARING
11	1	6766F	End Cap
12	6	6774E	Hexagon Socket Head Cap Screw
13	1	6705B	BEARING LOCK NUT
14	1	6750K	Key, Location 90 Degree Head
15	2	MF-92	1/4-20UNC x 3/4" SOCKET BUTTON HEAD CAPSCREW
16	2	MF-59	1/4-20UNC x 3/8" LG. SOCKET FLAT POINT SET SCREW
17	1	6772A	Nut, Bearing Line Bore Head
18	1	6766H	RING GEAR REWORK - SMALL 90 DEG. R.A.D.
19	1	MF-32	S.H.C.S.3/8 - 16 UNC - 1 1/4
20	1	MF-233	Countersunk Hex-Head Plug 1/8
21	1	650-2-44L	CAT40 RETENTION KNOB
22	1	11103B	DRIVER, F70 LINE BORE HEAD
23	1	11103C	MOUNT, RETENTION KNOB, R.A.D. - F70
24	1	11103D	LOCKING SET SCREW 1/2-13UNC x .5" LG.
25	1	6753V	KEY (MICARTA), PINION - 90 DEGREE HEAD
26	1	7088A	KEY, PULLEY SF-1
27	1	6774K	5/16-24UNF x 3/4" LG. HEX SOCKET FLAT HEAD SCREW
28	2	MF-217	1/8 x 1/2 Roll Pin
29	1	100-82-2A	Brass tipped 10-24 Socket Set Screw
30	1	502-9-9S	INDICATOR MOUNT, R.A.D.
31	2	MF-177	SAE FLAT WASHER 5/16"
32	1	MF-58A	10-24UNC x 1/2" LG. HEX SOCKET FLAT POINT SET SCREW

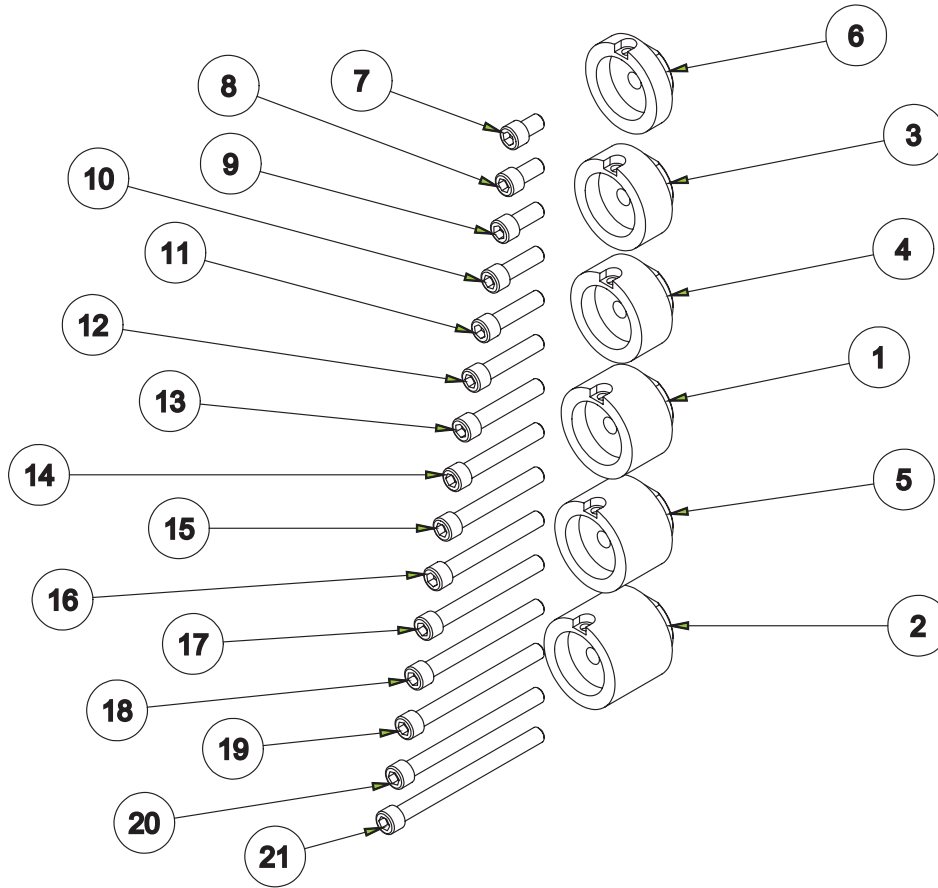


SPACER SET - 11103 R.A.D. ASSEMBLY F70			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	650-2-43	SPACER (1.05" LG.) PRECISION LINE BORE HEAD
2	1	650-2-43A	SPACER (1.50" LG.) PRECISION LINE BORE HEAD
3	1	650-2-43B	SPACER (.70" LG.) PRECISION LINE BORE HEAD
4	1	650-2-43G	SPACER (.80" LG.) PRECISION LINE BORE HEAD
5	1	650-2-43D	SPACER (1.215" LG.) PRECISION LINE BORE HEAD
6	1	650-2-43E	SPACER (.41" LG.) PRECISION LINE BORE HEAD
7	1	MF21A	S.H.C.S.5/16 - 18 UNC - 1/2
8	1	MF-21	S.H.C.S.5/16 - 18 UNC - 5/8
9	1	MF-22	S.H.C.S.5/16 - 18 UNC - 3/4
10	1	MF-23	S.H.C.S. 5/16 - 18UNC - 1
11	1	MF-24	S.H.C.S. 5/16 - 18UNC - 1-1/4
12	1	MF-25	S.H.C.S.5/16 - 18 UNC - 1 1/2
13	1	Mf-26	S.H.C.S. 5/16 - 18UNC - 1-3/4
14	1	MF-27	S.H.C.S.5/16 - 18 UNC - 2
15	1	MF-27C	S.H.C.S. 5/16 - 18UNC - 2-1/4
16	1	MF-27A	S.H.C.S. 5/16 - 18 UNC - 2 1/2
17	1	MF-28	S.H.C.S. 5/16 - 18 UNC - 2 3/4
18	1	MF-28E	S.H.C.S. 5/16 - 18UNC - 3
19	1	MF-28F	S.H.C.S. 5/16 - 18UNC - 3-1/4
20	1	MF-28A	S.H.C.S. 5/16 - 18UNC - 3-1/2
21	1	MF-28G	S.H.C.S. 5/16 - 18UNC - 3-3/4

11103E Main Line Bore 90 Degree Right Angle Drive Assembly Parts

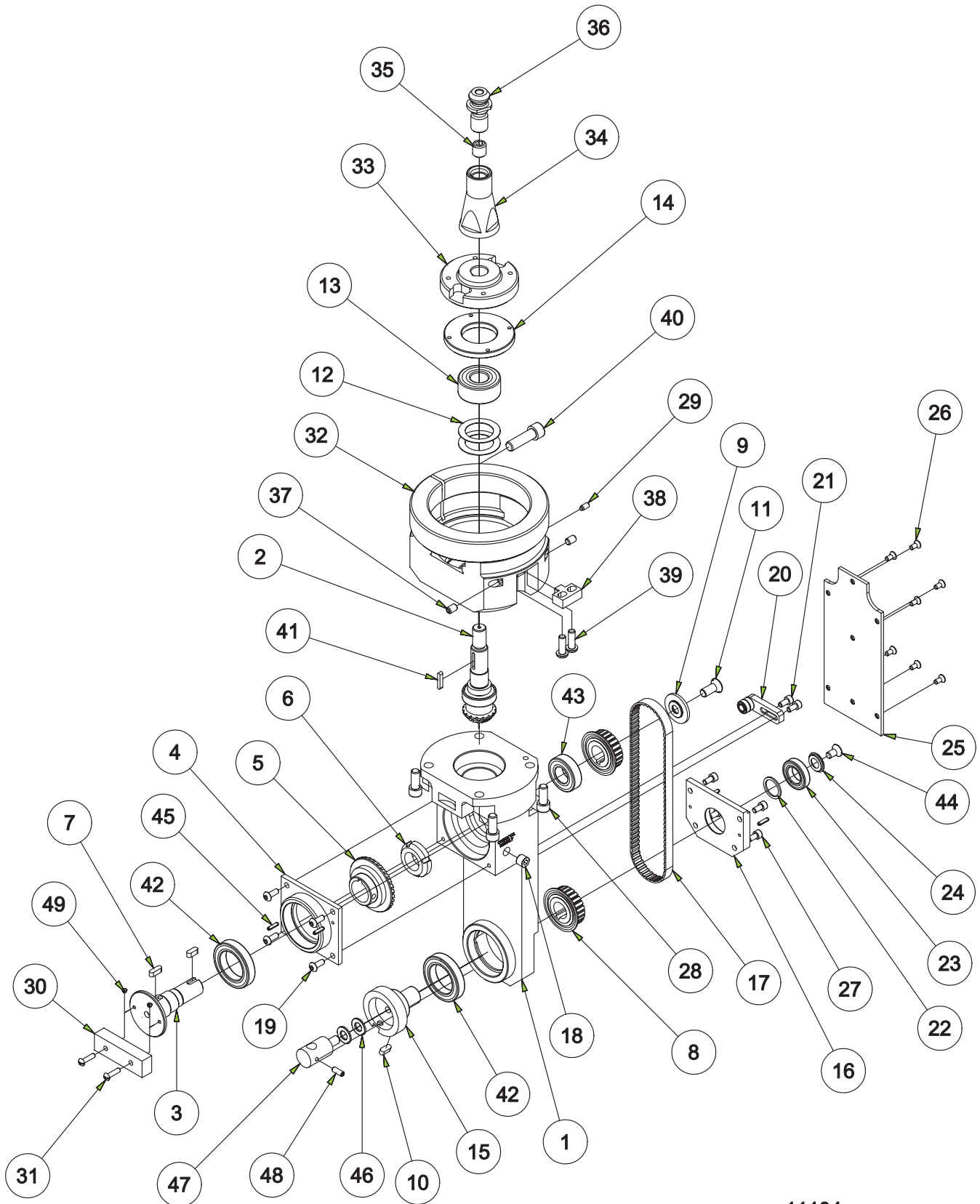


11103E RIGHT ANGLE DRIVE ASSEMBLY (EXTENDED 2") - F70			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	6773D	HOUSING, GEAR - RIGHT ANGLE DRIVE (EXTENDED)
2	1	6774	COVER, BEARING RETAINER - F80/90 R.A.D.
3	1	502-9-72B	BALL BEARING
4	1	11103A	HUB, MOUNTING, R.A.D. ASSEMBLY - F70
5	4	MF-22	5/16-18UNC x 3/4" LG. S.H.C.S.
6	1	650-2-42A	SHAFT, HORIZONTAL - INTERMEDIATE PRECISION LINE BORE HEAD
7	1	502-9-32	BALL BEARING
8	2	6007A	Bellville Spring, BS203
9	1	6775C	PINION AND SHAFT ASSEMBLY (2" EXTENDED) R.A.D.
10	1	6753E	BALL BEARING
11	1	6766F	End Cap
12	6	6774E	Hexagon Socket Head Cap Screw
13	1	6705B	BEARING LOCK NUT
14	1	6750K	Key, Location 90 Degree Head
15	2	MF-92	1/4-20UNC x 3/4" SOCKET BUTTON HEAD CAPSCREW
16	2	MF-59	1/4-20UNC x 3/8" LG. SOCKET FLAT POINT SET SCREW
17	1	6772A	Nut, Bearing Line Bore Head
18	1	6766H	RING GEAR REWORK - SMALL 90 DEG. R.A.D.
19	1	MF-32	S.H.C.S.3/8 - 16 UNC - 1 1/4
20	1	MF-233	Countersunk Hex-Head Plug 1/8
21	1	650-2-44L	CAT40 RETENTION KNOB
22	1	11103B	DRIVER, F70 LINE BORE HEAD
23	1	11103C	MOUNT, RETENTION KNOB, R.A.D. - F70
24	1	11103D	LOCKING SET SCREW 1/2-13UNC x .5" LG.
25	1	6753V	KEY (MICARTA), PINION - 90 DEGREE HEAD
26	1	6774K	5/16-24UNF x 3/4" LG. HEX SOCKET FLAT HEAD SCREW
27	2	MF-217	1/8 x 1/2 Roll Pin
28	1	7088A	KEY, PULLEY SF-1
29	1	100-82-2A	Brass tipped 10-24 Socket Set Screw
30	1	MF-58A	10-24UNC x 1/2" LG. HEX SOCKET FLAT POINT SET SCREW
31	2	MF-177	SAE FLAT WASHER 5/16"
32	1	502-9-9S	INDICATOR MOUNT, R.A.D.



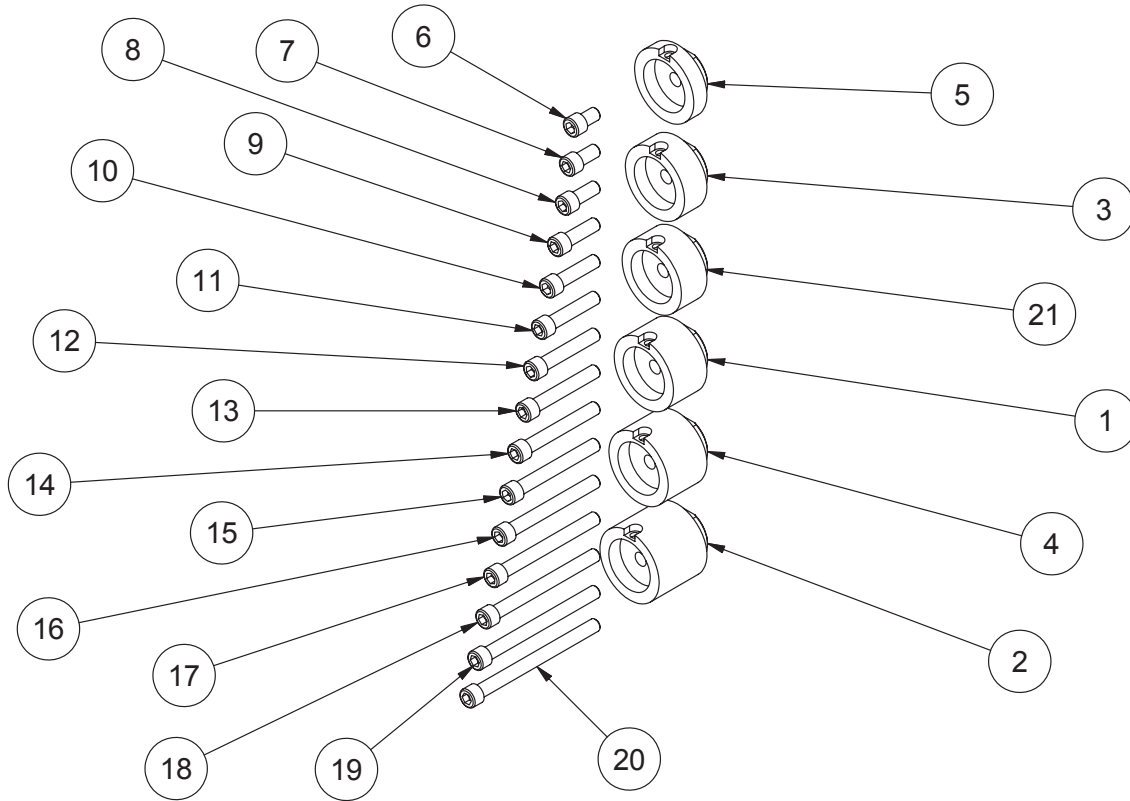
SPACER SET - 11103 R.A.D. ASSEMBLY F70			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	650-2-43	SPACER (1.05" LG.) PRECISION LINE BORE HEAD
2	1	650-2-43A	SPACER (1.50" LG.) PRECISION LINE BORE HEAD
3	1	650-2-43B	SPACER (.70" LG.) PRECISION LINE BORE HEAD
4	1	650-2-43G	SPACER (.80" LG.) PRECISION LINE BORE HEAD
5	1	650-2-43D	SPACER (1.215" LG.) PRECISION LINE BORE HEAD
6	1	650-2-43E	SPACER (.41" LG.) PRECISION LINE BORE HEAD
7	1	MF21A	S.H.C.S.5/16 - 18 UNC - 1/2
8	1	MF-21	S.H.C.S.5/16 - 18 UNC - 5/8
9	1	MF-22	S.H.C.S.5/16 - 18 UNC - 3/4
10	1	MF-23	S.H.C.S. 5/16 - 18UNC - 1
11	1	MF-24	S.H.C.S. 5/16 - 18UNC - 1-1/4
12	1	MF-25	S.H.C.S.5/16 - 18 UNC - 1 1/2
13	1	Mf-26	S.H.C.S. 5/16 - 18UNC - 1-3/4
14	1	MF-27	S.H.C.S.5/16 - 18 UNC - 2
15	1	MF-27C	S.H.C.S. 5/16 - 18UNC - 2-1/4
16	1	MF-27A	S.H.C.S. 5/16 - 18 UNC - 2 1/2
17	1	MF-28	S.H.C.S. 5/16 - 18 UNC - 2 3/4
18	1	MF-28E	S.H.C.S. 5/16 - 18UNC - 3
19	1	MF-28F	S.H.C.S. 5/16 - 18UNC - 3-1/4
20	1	MF-28A	S.H.C.S. 5/16 - 18UNC - 3-1/2
21	1	MF-28G	S.H.C.S. 5/16 - 18UNC - 3-3/4

11104 Special Belt Drive 90 Degree Right Angle Drive Assembly Parts



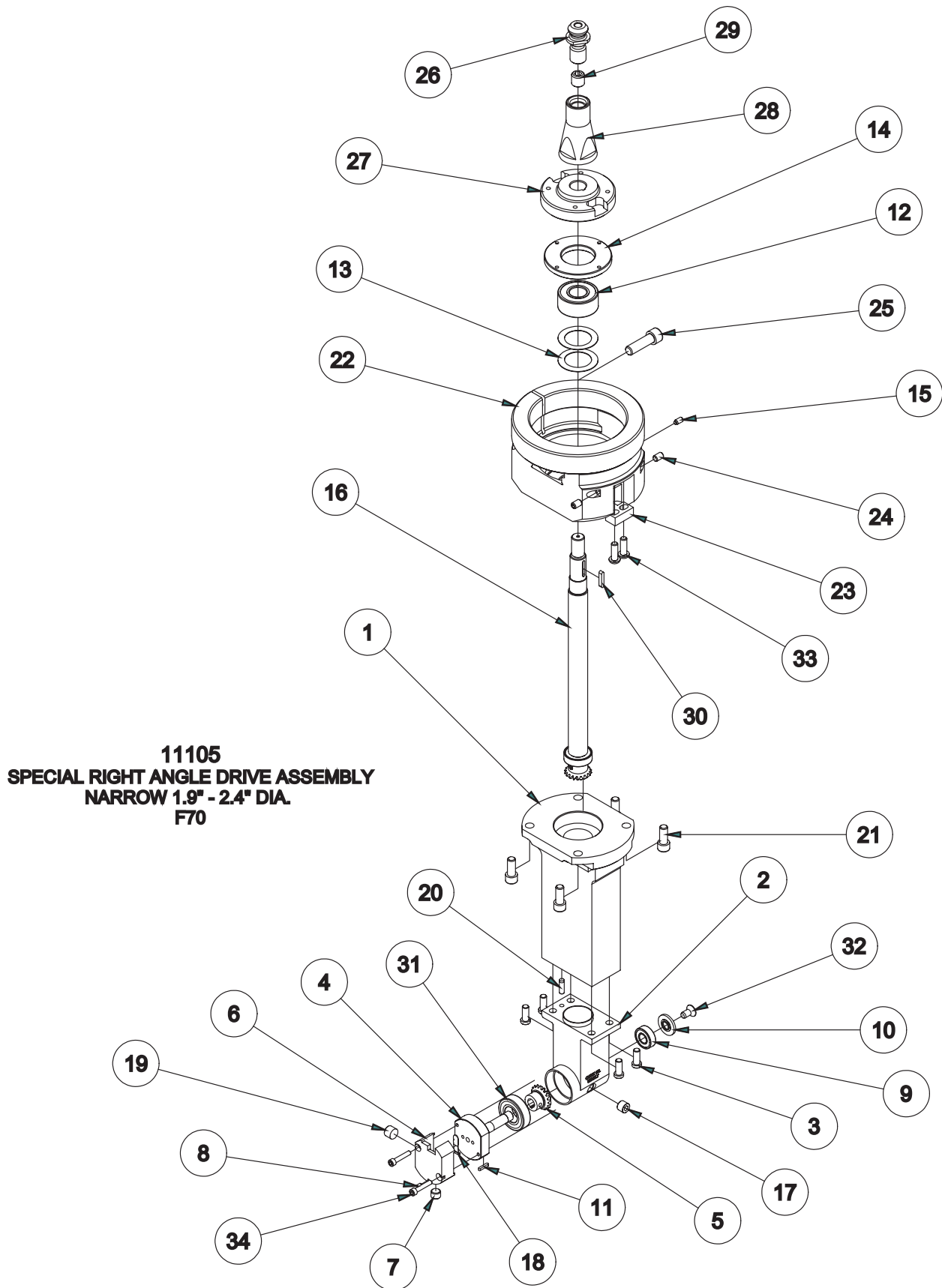
11104
BELT DRIVE LINE BORE HEAD
F70

11104 BELT DRIVE RIGHT ANGLE DRIVE - F70			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	650-2-38B	HOUSING, RIGHT ANGLE DRIVE BELT DRIVE - F65
2	1	650-2-37X	PINION & SHAFT ASSEMBLY BELT DRIVE LINE BORE HEAD
3	1	650-2-37D	SHAFT, HORIZONTAL UPPER - BELT DRIVE LINE BORE HEAD
4	1	650-2-37C	BEARING COVER, BELT DRIVE RIGHT ANGLE DRIVE - F-65
5	1	6766W	RING GEAR REWORK - F60 SMALL 90 DEG. R.A.D.
6	1	6705B	BEARING LOCK NUT
7	1	650-2-18M	KEY, HORIZONTAL SHAFT, R.A.D.
8	2	650-2-37G	PULLEY (REWORK), BELT DRIVE R.A.D. - F60
9	1	650-2-37E	ENDCAP, UPPER PULLEY RETAINER - BELT DRIVE R.A.D.
10	2	650-2-37U	MICARTA KEY, BELT DRIVE LINE BORE HEAD
11	1	6774K	HEX SOCKET FLATHEAD SCREW 5/16-24UNF x 3/4"
12	2	6007A	Bellville Spring, BS203
13	1	502-9-32	BALL BEARING
14	1	6772A	Nut, Bearing Line Bore Head
15	1	650-2-42B	Horizontal Shaft
16	1	650-2-37L	LOWER BEARING RETAINER - BELT DRIVE LINE BORE HEAD
17	1	650-2-38D	TIMING BELT, BELT DRIVE LINE BORE HEAD
18	1	MF-233	1/8-27NPT PIPE PLUG
19	4	Mf-88A	Socket Button Head Cap Screw 10 - 24 x 1/2
20	1	650-2-37P	BELT TENSIONER ASSY, BELT DRIVE LINE BORE HEAD
21	2	MF-4	10-24UNC x 3/8" LG. S.H.C.S.
22	1	650-2-37V	SPACER, LOWER PULLEY - BELT DRIVE LINE BORE HEAD
23	1	650-2-37J	BALL BEARING
24	1	650-2-37K	END CAP, LOWER - BELT DRIVE LINE BORE HEAD
25	1	650-2-38C	BELT COVER, BELT DRIVE LINE BORE HEAD
26	7	MF-76	Socket Flat Head 8-32 UNC x 0.375
27	4	MF-4	S.H.C.S. 10 - 24 UNC - 3/8
28	4	MF-22	S.H.C.S. 5/16 - 18 UNC - 3/4
29	1	100-82-2A	Brass tipped 10-24 Socket Set Screw
30	1	650-2-38A	RETAINING TOOL - BELT DRIVE R.A.D.
31	2	MF-105	ROUND HEAD MACHINE SCREW 8-32 x 5/8"
32	1	11103A	HUB, MOUNTING, R.A.D. ASSEMBLY - F70
33	1	11103B	DRIVER, F70 LINE BORE HEAD
34	1	11103C	MOUNT, RETENTION KNOB, R.A.D. - F70
35	1	11103D	LOCKING SET SCREW 1/2-13UNC x .5" LG.
36	1	650-2-44L	CAT40 RETENTION KNOB
37	2	MF-59	1/4-20UNC x 3/8" LG. SOCKET FLAT POINT SET SCREW
38	1	6750K	Key, Location 90 Degree Head
39	2	MF-92	1/4-20UNC x 3/4" LG. SOCKET BUTTONHEAD SCREW
40	1	MF-32	S.H.C.S. 3/8-16UNC x 1-1/4" LG.
41	1	6753V	KEY (MICARTA), PINION - 90 DEGREE HEAD
42	2	502-9-72C	BALL BEARING
43	1	6753E	BALL BEARING
44	1	650-2-37Z	1/4-28UNF x 1/2" LG. HEX SOCKET FLAT HEAD SCREW
45	4	MF-217	1/8 x 1/2 Roll Pin
46	2	MF-177	SAE FLAT WASHER 5/16"
47	1	502-9-9S	INDICATOR MOUNT, R.A.D.
48	1	MF-58A	10-24UNC x 1/2" LG. HEX SOCKET FLAT POINT SET SCREW
49	2	MF-49	8-32UNC x 1/8" LG. HEX SOCKET SET SCREW



CUTTERHEAD SPACER SET - BELT DRIVE LINE BORE HEAD - F70			
ITEM	QTY	PART NUMBER	DESCRIPTION
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	MF21A	S.H.C.S. 5/16 - 18 UNC - 1/2
7	1	MF-21	S.H.C.S. 5/16 - 18 UNC - 5/8
8	1	MF-22	S.H.C.S. 5/16 - 18 UNC - 3/4
9	1	MF-23	S.H.C.S. 5/16 - 18 UNC - 1
10	1	MF-24	S.H.C.S. 5/16 - 18 UNC - 1-1/4
11	1	MF-25	S.H.C.S. 5/16 - 18 UNC - 1 1/2
12	1	Mf-26	S.H.C.S. 5/16 - 18 UNC - 1-3/4
13	1	MF-27	S.H.C.S. 5/16 - 18 UNC - 2
14	1	MF-27C	S.H.C.S. 5/16 - 18 UNC - 2-1/4
15	1	MF-27A	S.H.C.S. 5/16 - 18 UNC - 2 1/2
16	1	MF-28	S.H.C.S. 5/16 - 18 UNC - 2 3/4
17	1	MF-28E	S.H.C.S. 5/16 - 18 UNC - 3
18	1	MF-28F	S.H.C.S. 5/16 - 18 UNC - 3-1/4
19	1	MF-28A	S.H.C.S. 5/16 - 18 UNC - 3-1/2
20	1	MF-28G	S.H.C.S. 5/16 - 18 UNC - 3-3/4
21	1	650-2-43G	SPACER (.80" LG.) PRECISION LINE BORE HEAD

11105 Narrow Right Angle Drive Parts



11105 SPECIAL RIGHT ANGLE DRIVE NARROW CUTTERHEAD 1.9"-2.4" DIA. F70

ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	650-2-19X	Upper Housing, Right Angle Drive Narrow
2	1	650-2-19Y	LOWER HOUSING - F-65 LINE BORE (NARROW)
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 (REWORK) F65 LINE BORE HEAD (NARROW)
6	1	650-2-19H	Cutter Head Cap
7	1	502-2-85B	Index Screw
8	1	650-2-6A	4-40 brass tipped set screw
9	1	650-2-19L	Bearing, MRC- R6-ZZ
10	1	650-2-19S	Cover Rear, End Cap
11	1	650-2-19W	Key
12	1	502-9-32	Bearing, Ball MRC 5203SBKFF
13	2	6007A	Bellville Spring, BS203
14	1	6772A	Nut, Bearing Line Bore Head
15	1	100-82-2A	Brass tipped 10-24 Socket Set Screw
16	1	650-2-19Z	Assembly, Vertical shaft
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
21	4	MF-22	S.H.C.S. 5/16 - 18 UNC - 3/4
22	1	11103A	HUB, MOUNTING, R.A.D. ASSEMBLY - F70
23	1	6750K	Key, Location 90 Degree Head
24	2	MF-59	Flat Point 1/4-20 UNC x 0.38
25	1	MF-32	3/8-16UNC x 1-1/4" LG. S.H.C.S.
26	1	650-2-44L	CAT40 RETENTION KNOB
27	1	11103B	DRIVER, F70 LINE BORE HEAD
28	1	11103C	MOUNT, RETENTION KNOB, R.A.D. - F70
29	1	11103D	LOCKING SET SCREW 1/2-13UNC x .5" LG.
30	1	6753V	KEY (MICARTA), PINION - 90 DEGREE HEAD
31	1	6753E	BALL BEARING
32	1	MF-82	1/4-20UNC x 1/2" LG. HEX SOCKET FLAT HEAD SCREW
33	2	Mf-92	Socket Button Head 1/4 - 20 x 3/4
34	2	MF-3E	8-32UNC x 7/8" LG. S.H.C.S.

650-2-39B Line Boring Cutterhead Package Components

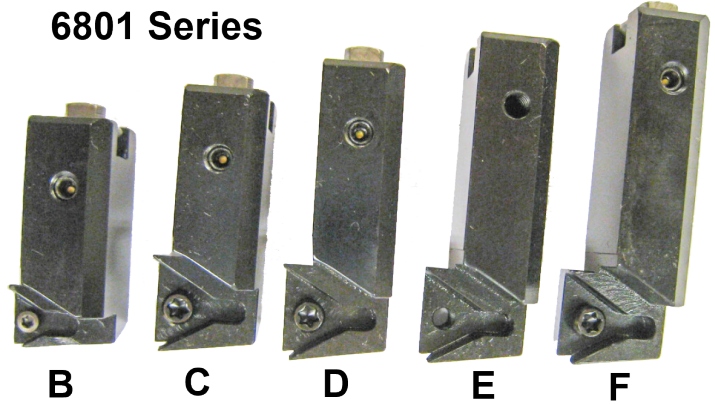


650-2-39F

RT321F



6801 Series



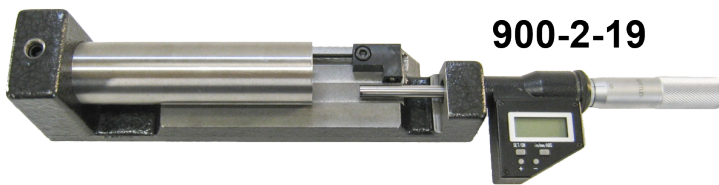
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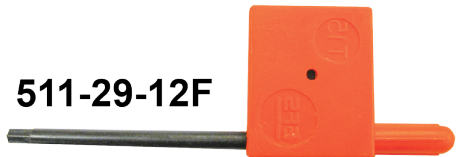
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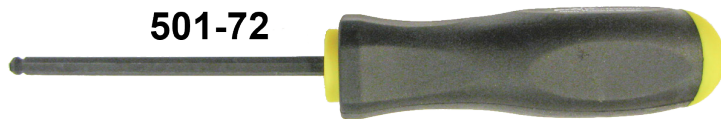
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900-2-19



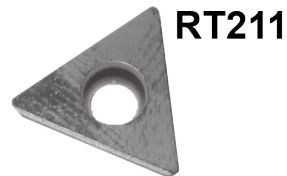
511-29-12F



501-72



T8D



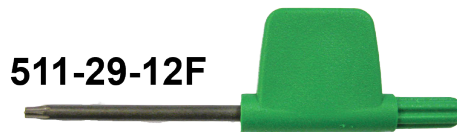
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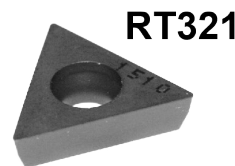
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RT322F



511-29-12F

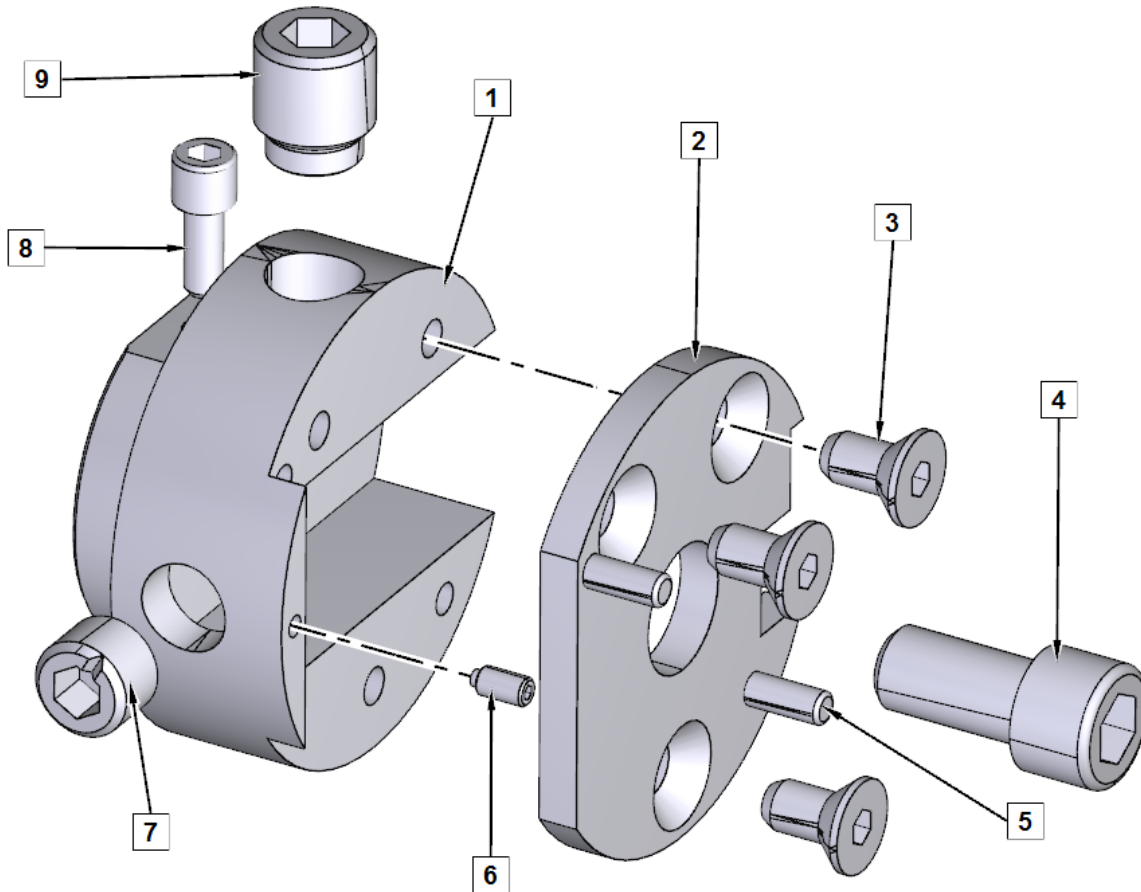


RT321



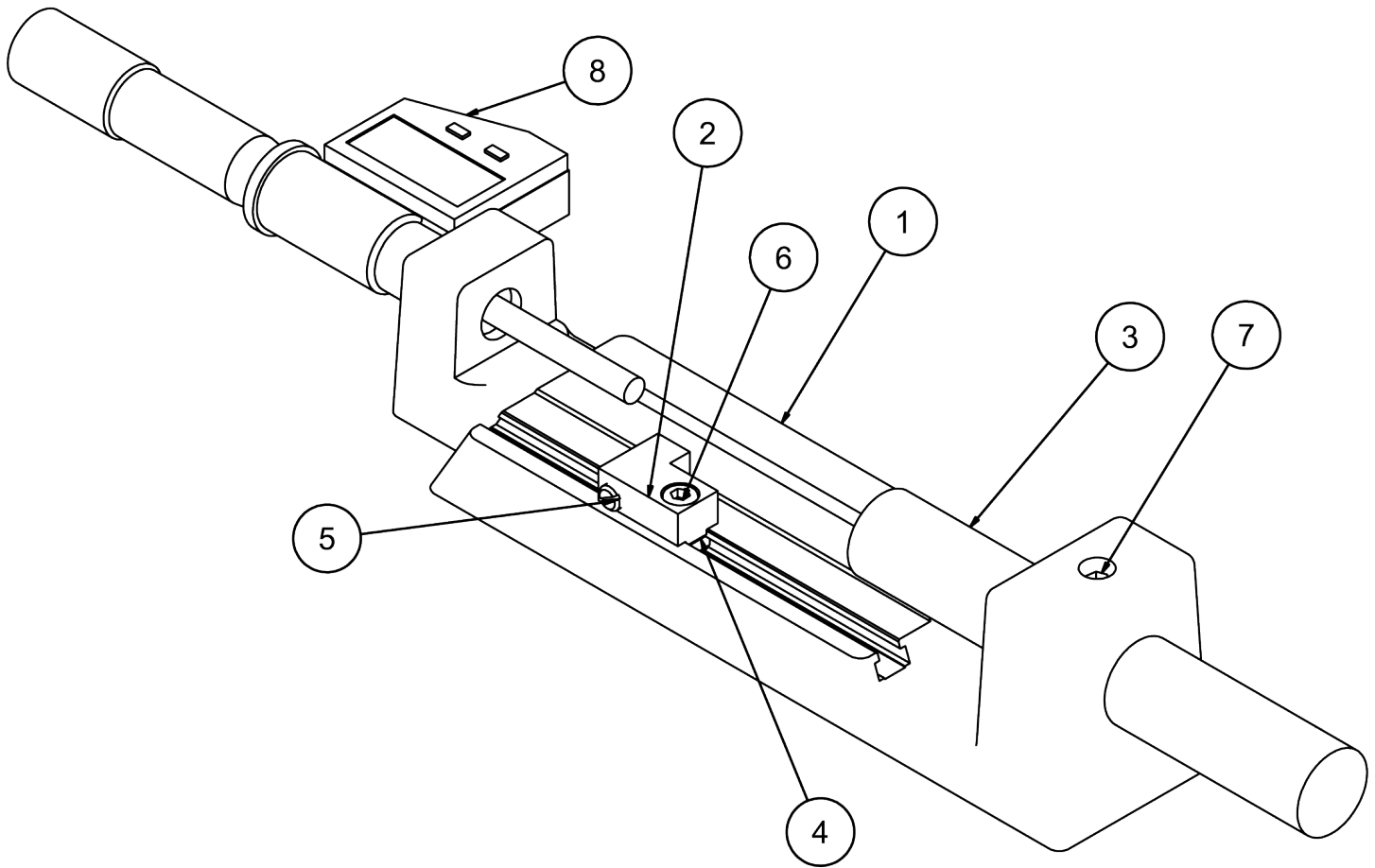
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650-2-39F Cutterhead Parts



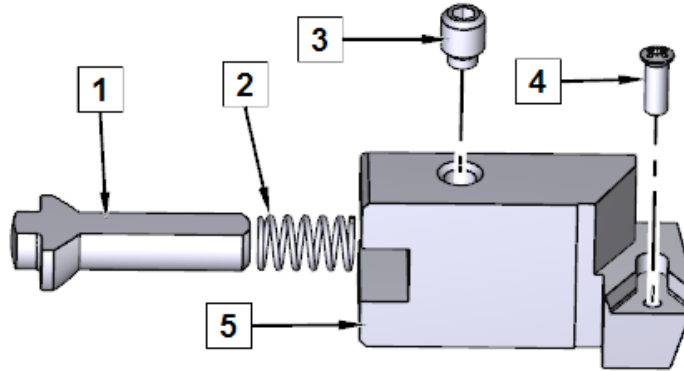
ITEM	PART #	DESCRIPTION
1	650-2-40A	BODY, 1.9" PRECISION LINE BORE CUTTERHEAD
2	650-2-41	CAP, 1.9" DIAMETER PRECISION LINE BORE HEAD
3	MF-78	SOCKET FLAT HEAD SCREW 10-24 X 3/8"
4	MF-21	SOCKET HEAD CAP SCREW 5/16-18 X 5/8"
5	MF-193C	DOWEL PINS 1/8 X 3/8"
6	650-2-6A	SOCKET SET SCREW BRASS TIPPED 4-40 X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

900-2-19 Micrometer Parts



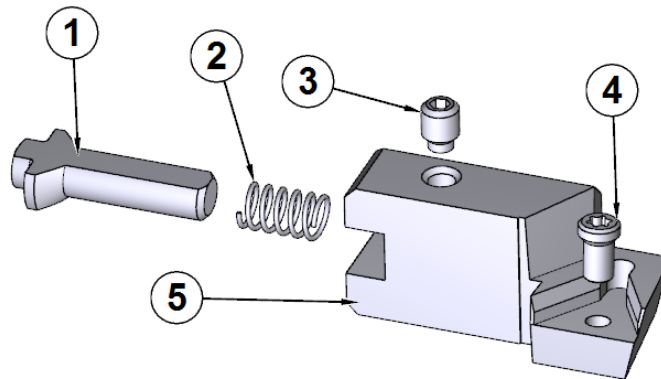
900-2-19 Micrometer Assembly			
ITEM	QTY	PART NUMBE	DESCRIPTION
1	1	502-30-10B	Frame
2	1	502-30-10M	Clamp Block
3	1	502-31-10A	Anvil
4	1	502-30-10J	Square Nut
5	1	502-30-10K	Ball Plunger
6	1	ANSI B18.3 - No. 10 - 24 UNC - 3/8	Hexagon Socket Head Cap Screw
7	1	502-30-10L	Brass Tipped Set Screw
8	1	501-34-2R	Digital Micrometer Head

6801B Insert Holder Parts



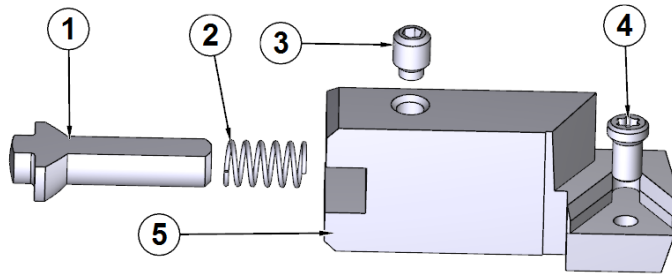
ITEM	PART #	DESCRIPTION
1	100-82-3B	PIN, ADJUSTING LONG
2	100-82-1	SPRING, ADJUSTING PIN
3	100-82-2	SCREW, SET-BRASS GIB - 3/16" LONG
4	511-29-12C	SCREW, TORX M4 X .7 X .315" LONG
5	6800B	TOOLHOLDER, INDEXABLE INSERT- 1/4" TRIANGLE, OFFSET, POSITIVE RAKE

6801C Insert Holder Parts



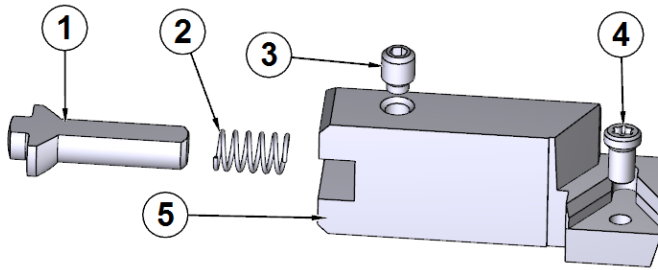
ITEM	PART #	DESCRIPTION
1	100-82-3B	PIN ADJUSTING LONG INDEXABLE INSERT TOOLHOLDER
2	100-82-1	SPRING, ADJUSTING PIN
3	100-82-2	SCREW, SET-BRASS GIB - 3/16" LONG
4	511-29-12C	SCREW, TORX M4 X .7 X .315" LONG
5	6800C	TOOLHOLDER, INDEXABLE INSERT- 3/8" IC TRIANGLE, OFFSET POSITIVE RAKE

6801D Insert Holder Parts



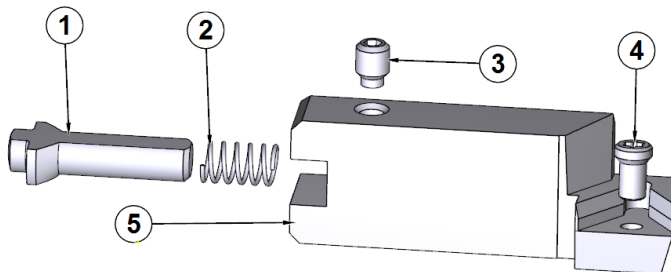
ITEM	PART #	DESCRIPTION
1	100-82-3B	PIN ADJUSTING LONG INDEXABLE INSERT TOOLHOLDER
2	100-82-1	SPRING, ADJUSTING PIN
3	100-82-2	SCREW, SET-BRASS GIB - 3/16" LONG
4	511-29-12C	SCREW, TORX M4 X .7 X .315" LONG
5	6800D	TOOLHOLDER, INDEXABLE INSERT- 3/8" IC TRIANGLE, OFFSET POSITIVE RAKE

6801E Insert Holder Parts



ITEM	PART #	DESCRIPTION
1	100-82-3B	PIN ADJUSTING LONG INDEXABLE INSERT TOOLHOLDER
2	100-82-1	SPRING, ADJUSTING PIN
3	100-82-2	SCREW, SET-BRASS GIB - 3/16" LONG
4	511-29-12C	SCREW, TORX M4 X .7 X .315" LONG
5	6800E	TOOLHOLDER, INDEXABLE INSERT- 3/8" IC TRIANGLE, OFFSET POSITIVE RAKE

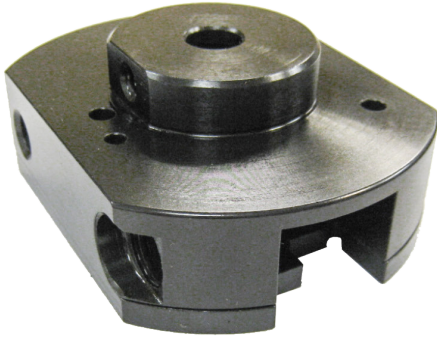
6801F Insert Holder Parts



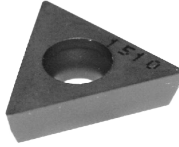
ITEM	PART #	DESCRIPTION
1	100-82-3B	PIN ADJUSTING LONG INDEXABLE INSERT TOOLHOLDER
2	100-82-1	SPRING, ADJUSTING PIN
3	100-82-2	SCREW, SET-BRASS GIB - 3/16" LONG
4	511-29-12C	SCREW, TORX M4 X .7 X .315" LONG
5	6800F	TOOLHOLDER, INDEXABLE INSERT- 3/8" IC TRIANGLE, OFFSET POSITIVE RAKE

650-2-39C Line Boring Cutterhead Package Components

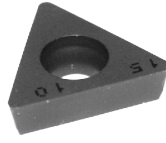
650-2-39G



RT321



RT322



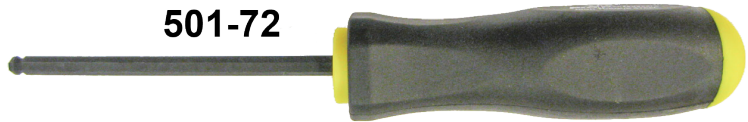
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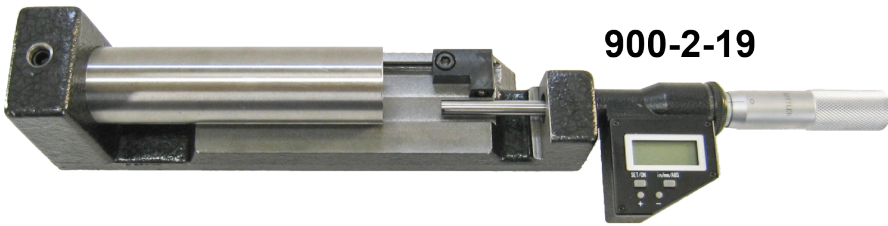
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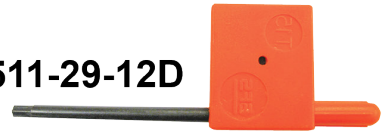
501-72



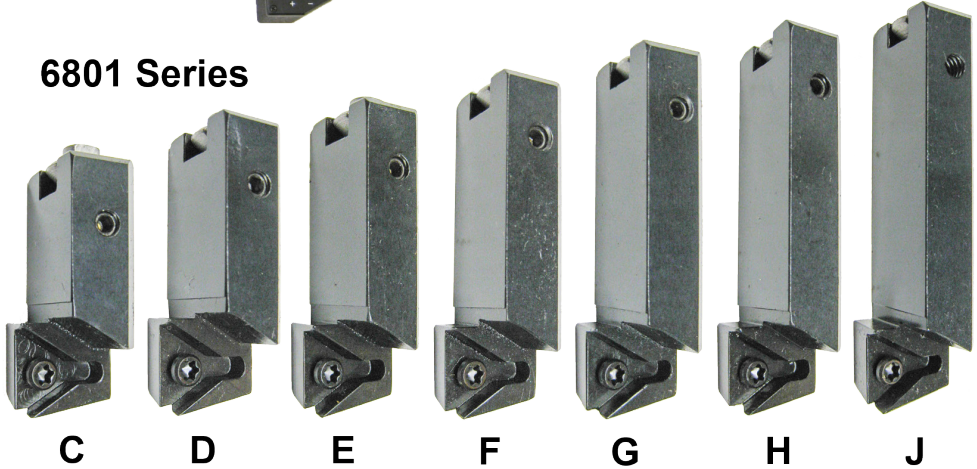
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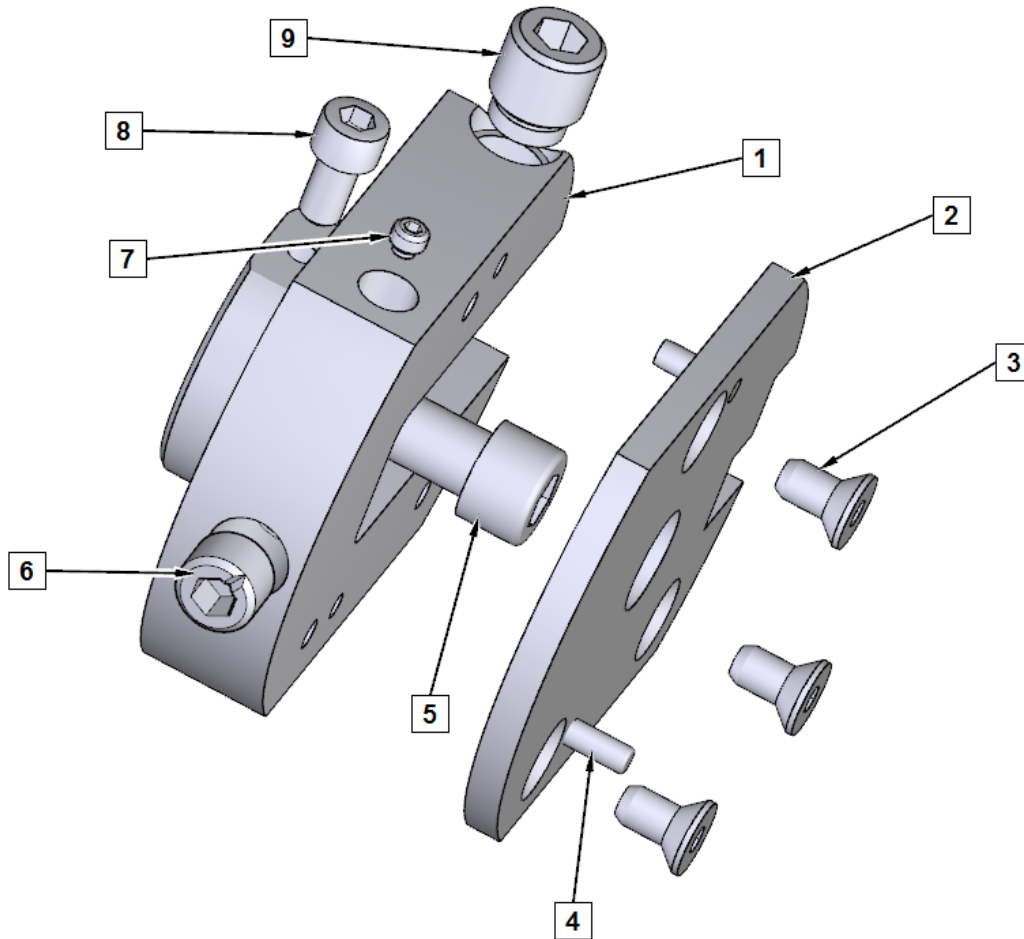
511-29-12D



6801 Series

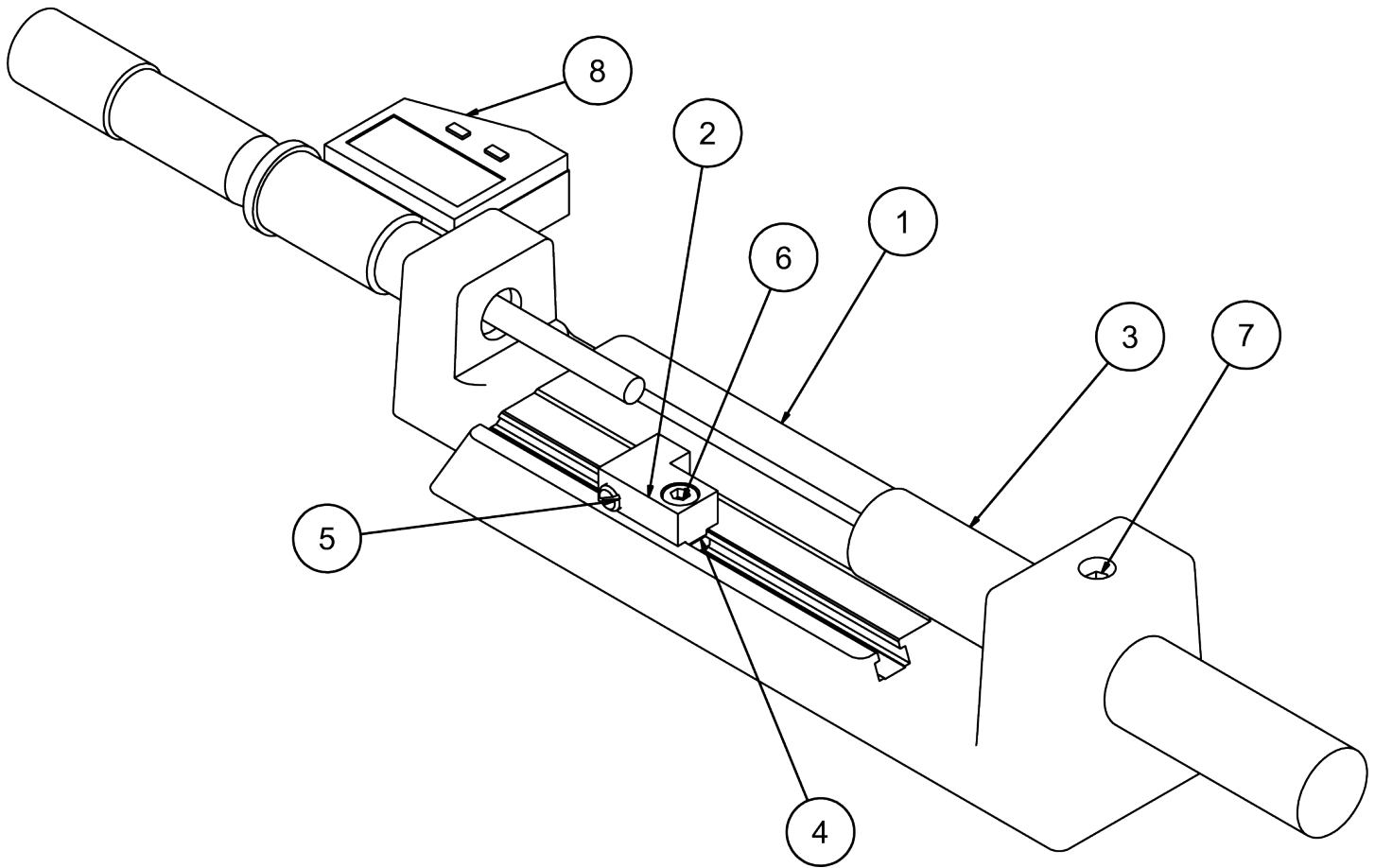


650-2-39G Cutterhead Parts



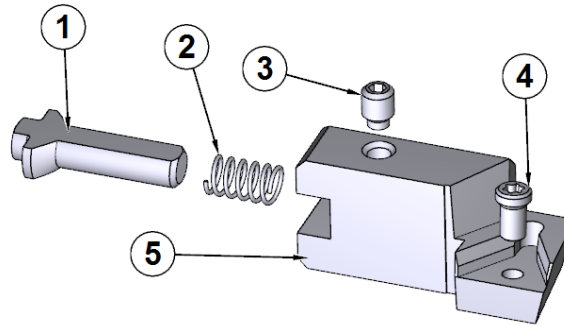
ITEM	PART #	DESCRIPTION
1	650-2-16E	BODY, 2.9" DIAMETER PRECISION LINE BORE CUTTERHEAD
2	650-2-17A	CAP, 2.9" DIAMETER PRECISION LINE BORE CUTTERHEAD
3	MF-78	SOCKET FLAT HEAD SCREW 10-24 X 3/8"
4	MF-193C	DOWEL PINS 1/8 X 3/8"
5	MF-21	SOCKET HEAD CAP SCREW 5/16-18 X 5/8"
6	502-2-85B	SCREW, SET-INDEX 3/8-40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

900-2-19 Micrometer Parts



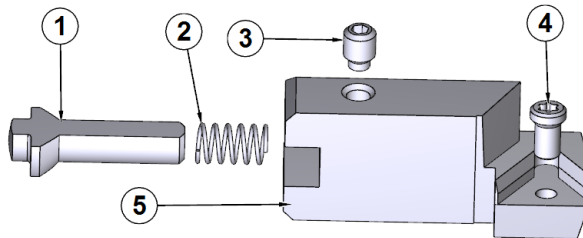
900-2-19 Micrometer Assembly			
ITEM	QTY	PART NUMBE	DESCRIPTION
1	1	502-30-10B	Frame
2	1	502-30-10M	Clamp Block
3	1	502-31-10A	Anvil
4	1	502-30-10J	Square Nut
5	1	502-30-10K	Ball Plunger
6	1	ANSI B18.3 - No. 10 - 24 UNC - 3/8	Hexagon Socket Head Cap Screw
7	1	502-30-10L	Brass Tipped Set Screw
8	1	501-34-2R	Digital Micrometer Head

6801C Insert Holder Parts



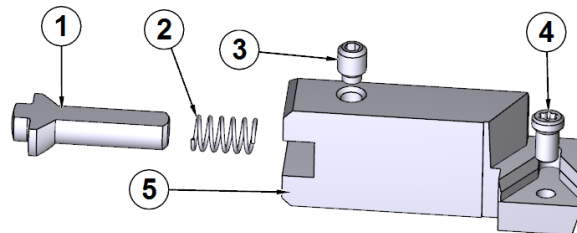
ITEM	PART #	DESCRIPTION
1	100-82-3B	PIN ADJUSTING LONG INDEXABLE INSERT TOOLHOLDER
2	100-82-1	SPRING, ADJUSTING PIN
3	100-82-2	SCREW,SET-BRASS GIB - 3/16" LONG
4	511-29-12C	SCREW, TORX M4 X .7 X .315" LONG
5	6800C	TOOLHOLDER, INDEXABLE INSERT- 3/8" IC TRIANGLE, OFFSET POSITIVE RAKE

6801D Insert Holder Parts



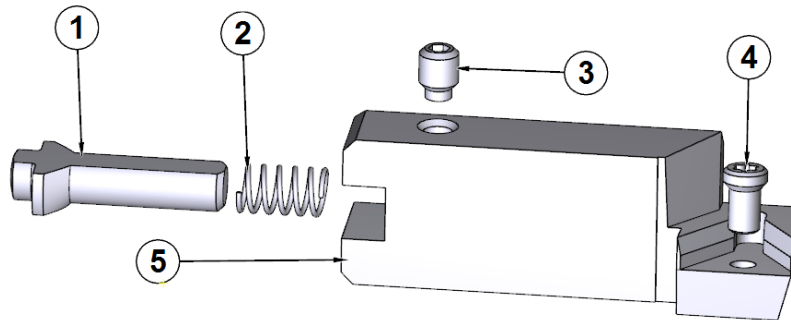
ITEM	PART #	DESCRIPTION
1	100-82-3B	PIN ADJUSTING LONG INDEXABLE INSERT TOOLHOLDER
2	100-82-1	SPRING, ADJUSTING PIN
3	100-82-2	SCREW,SET-BRASS GIB - 3/16" LONG
4	511-29-12C	SCREW, TORX M4 X .7 X .315" LONG
5	6800D	TOOLHOLDER, INDEXABLE INSERT- 3/8" IC TRIANGLE, OFFSET POSITIVE RAKE

6801E Insert Holder Parts



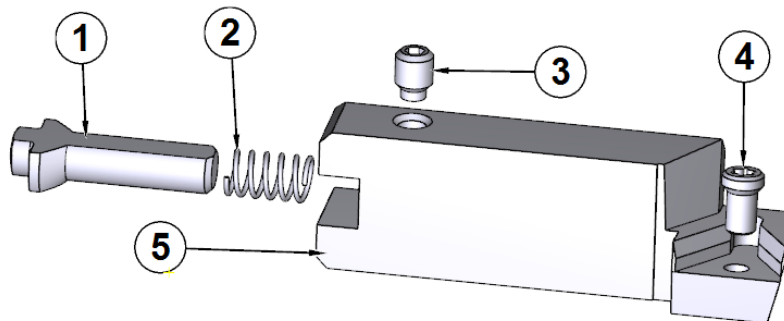
ITEM	PART #	DESCRIPTION
1	100-82-3B	PIN ADJUSTING LONG INDEXABLE INSERT TOOLHOLDER
2	100-82-1	SPRING, ADJUSTING PIN
3	100-82-2	SCREW,SET-BRASS GIB - 3/16" LONG
4	511-29-12C	SCREW, TORX M4 X .7 X .315" LONG
5	6800E	TOOLHOLDER, INDEXABLE INSERT- 3/8" IC TRIANGLE, OFFSET POSITIVE RAKE

6801F Insert Holder Parts



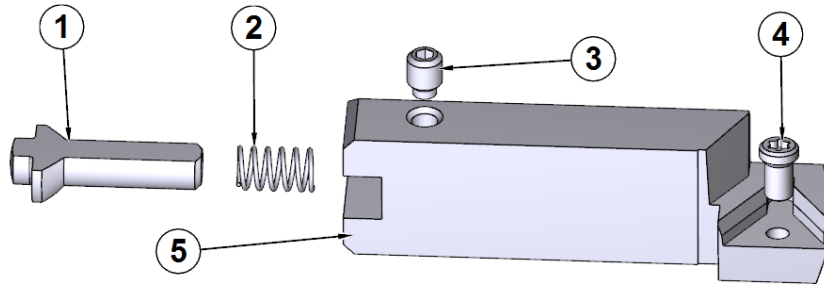
ITEM	PART #	DESCRIPTION
1	100-82-3B	PIN ADJUSTING LONG INDEXABLE INSERT TOOLHOLDER
2	100-82-1	SPRING, ADJUSTING PIN
3	100-82-2	SCREW, SET-BRASS GIB - 3/16" LONG
4	511-29-12C	SCREW, TORX M4 X .7 X .315" LONG
5	6800F	TOOLHOLDER, INDEXABLE INSERT- 3/8" IC TRIANGLE, OFFSET POSITIVE RAKE

6801G Insert Holder Parts



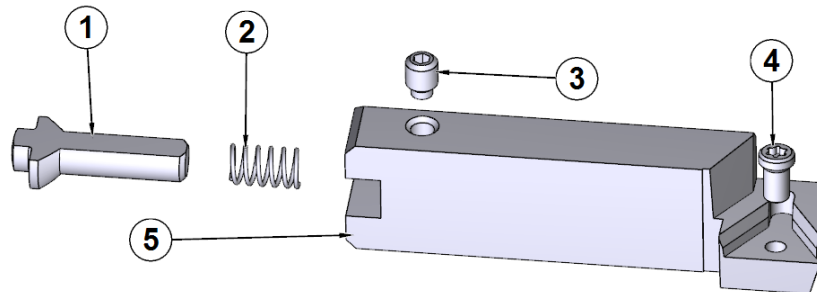
ITEM	PART #	DESCRIPTION
1	100-82-3B	PIN ADJUSTING LONG INDEXABLE INSERT TOOLHOLDER
2	100-82-1	SPRING, ADJUSTING PIN
3	100-82-2	SCREW, SET-BRASS GIB - 3/16" LONG
4	511-29-12C	SCREW, TORX M4 X .7 X .315" LONG
5	6800G	TOOLHOLDER, INDEXABLE INSERT- 3/8" IC TRIANGLE, OFFSET POSITIVE RAKE

6801H Insert Holder Parts



ITEM	PART #	DESCRIPTION
1	100-82-3B	PIN ADJUSTING LONG INDEXABLE INSERT TOOLHOLDER
2	100-82-1	SPRING, ADJUSTING PIN
3	100-82-2	SCREW,SET-BRASS GIB - 3/16" LONG
4	511-29-12C	SCREW, TORX M4 X .7 X .315" LONG
5	6800H	TOOLHOLDER, INDEXABLE INSERT- 3/8" IC TRIANGLE, OFFSET POSITIVE RAKE

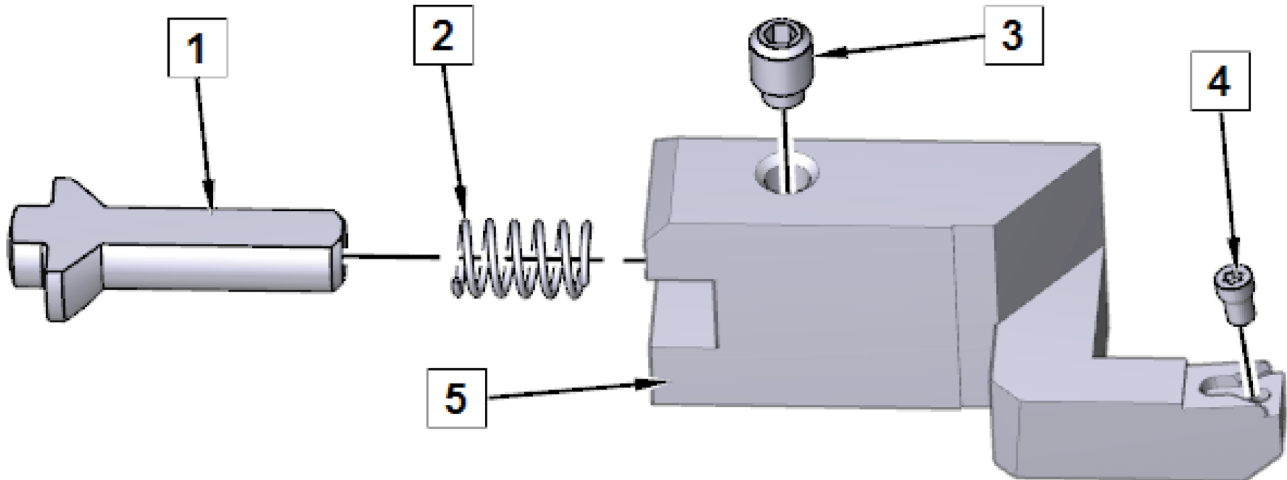
6801J Insert Holder Parts



ITEM	PART #	DESCRIPTION
1	100-82-3B	PIN ADJUSTING LONG INDEXABLE INSERT TOOLHOLDER
2	100-82-1	SPRING, ADJUSTING PIN
3	100-82-2	SCREW,SET-BRASS GIB - 3/16" LONG
4	511-29-12C	SCREW, TORX M4 X .7 X .315" LONG
5	6800J	TOOLHOLDER, INDEXABLE INSERT- 3/8" IC TRIANGLE, OFFSET POSITIVE RAKE

Special Main Line Boring Thrust Facing Tooling for Small Blocks

6801M Tool Holder Package Parts



ITEM	PART #	DESCRIPTION
1	100-82-3B	PIN ADJUSTING LONG
2	100-82-1	SPRING, ADJUSTING PIN
3	100-82-2	SCREW, SET-BRASS GIB - 3/16" LONG
4	501-29-6H	SCREW, INSERT THRUST FACING TOOLBIT
5	6800M	CARTRIDGE, INDEXABLE INSERT-THRUST FACING



501-29-6G INSERT, TRIANGLE-.160" IC 1/64 RADIUS



501-29-6H SCREW, INSERT THRUST FACING
TOOLBIT-.160" IC TRIANGLE

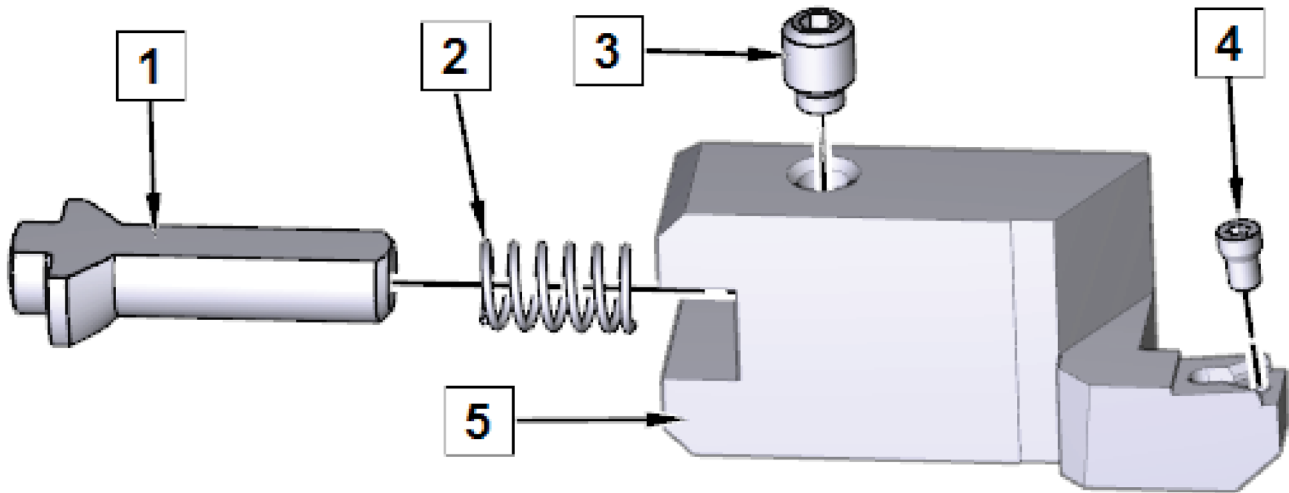


T7D T7 TORX TIP HOLDING SCREW DRIVER

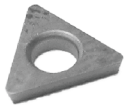


T8D T8 TORX TIP HOLDING SCREW DRIVER

6801P Tool Holder Package Parts



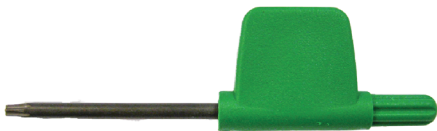
ITEM	PART #	DESCRIPTION
1	100-82-3B	PIN ADJUSTING LONG
2	100-82-1	SPRING, ADJUSTING PIN
3	100-82-2	SCREW,SET-BRASS GIB - 3/16" LONG
4	501-29-6H	SCREW, INSERT
5	6800P	CARTRIDGE, INDEXABLE INSERT



501-29-6G INSERT, TRIANGLE-.160" IC 1/64 RADIUS



501-29-6J INSERT, TRIANGLE-.160" IC 1/32 RADIUS



511-29-12F WRENCH, TORX



T8D T8 TORX TIP HOLDING SCREW DRIVER

<p>501-29-6G Insert, Triangular .160 IC 1/64" (.397mm) Radius</p> 	<p>501-29-6J Insert, Triangular .160 IC 1/32" (.787mm) Radius</p> 	<p>501-29-6H Insert Screw</p> 
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Special Main Line Boring Thrust Facing Tooling for Mid-Size Blocks

6855Q Thrust Facing Tooling Package Components



6855



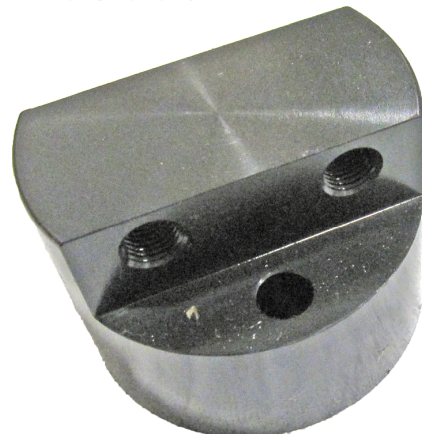
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6855J



6855A



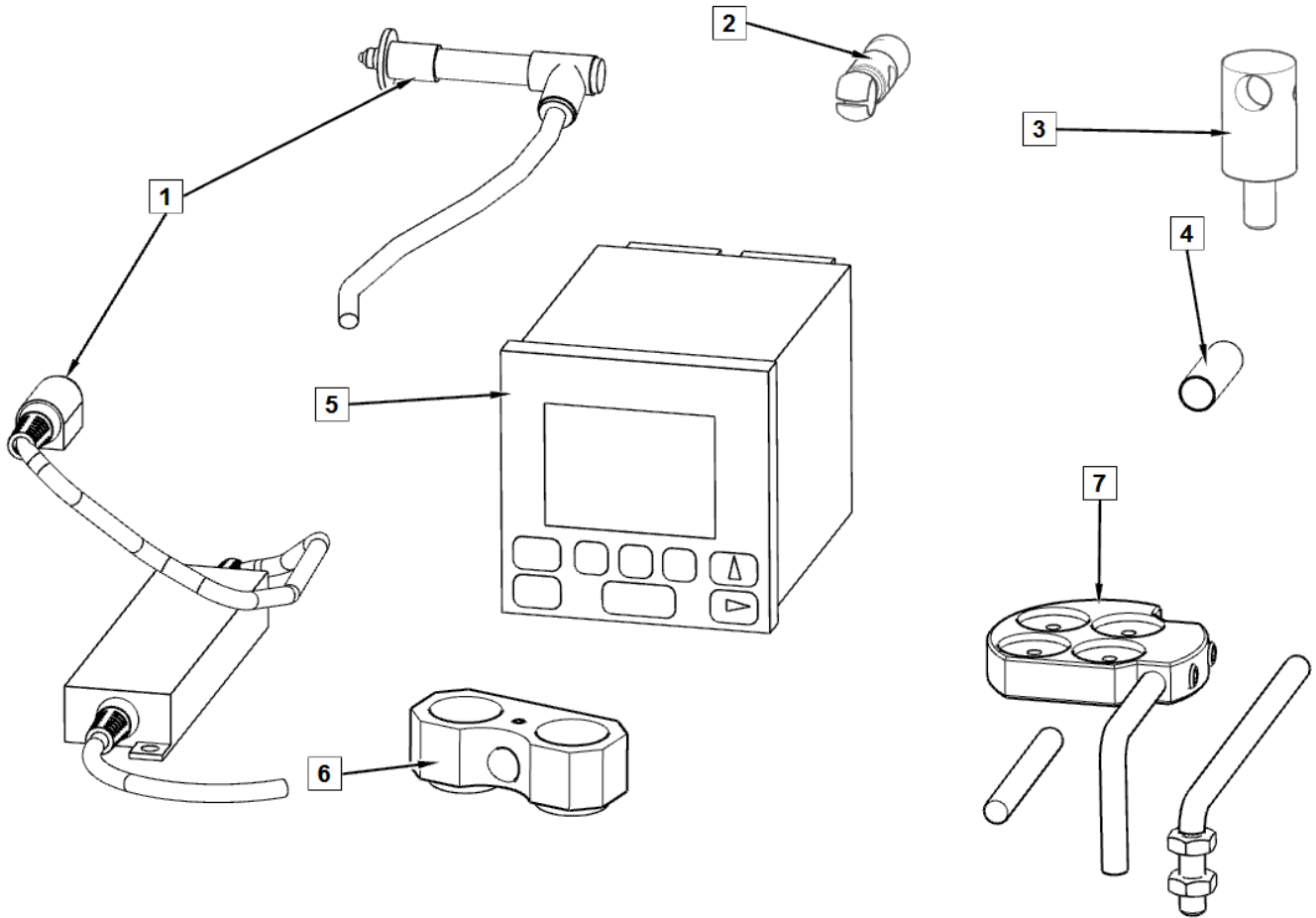
6855E

Special Main Line Boring Chamfering Tool

<p>199-90 Tool Holder, 2 - 3" (50.80 - 76.20mm)</p> 	<p>199-96 Tool holder, 3 - 4" (76.20 - 101.60mm)</p> 	<p>501-33E Tool Bit, 45-Degree Chamfer</p> 
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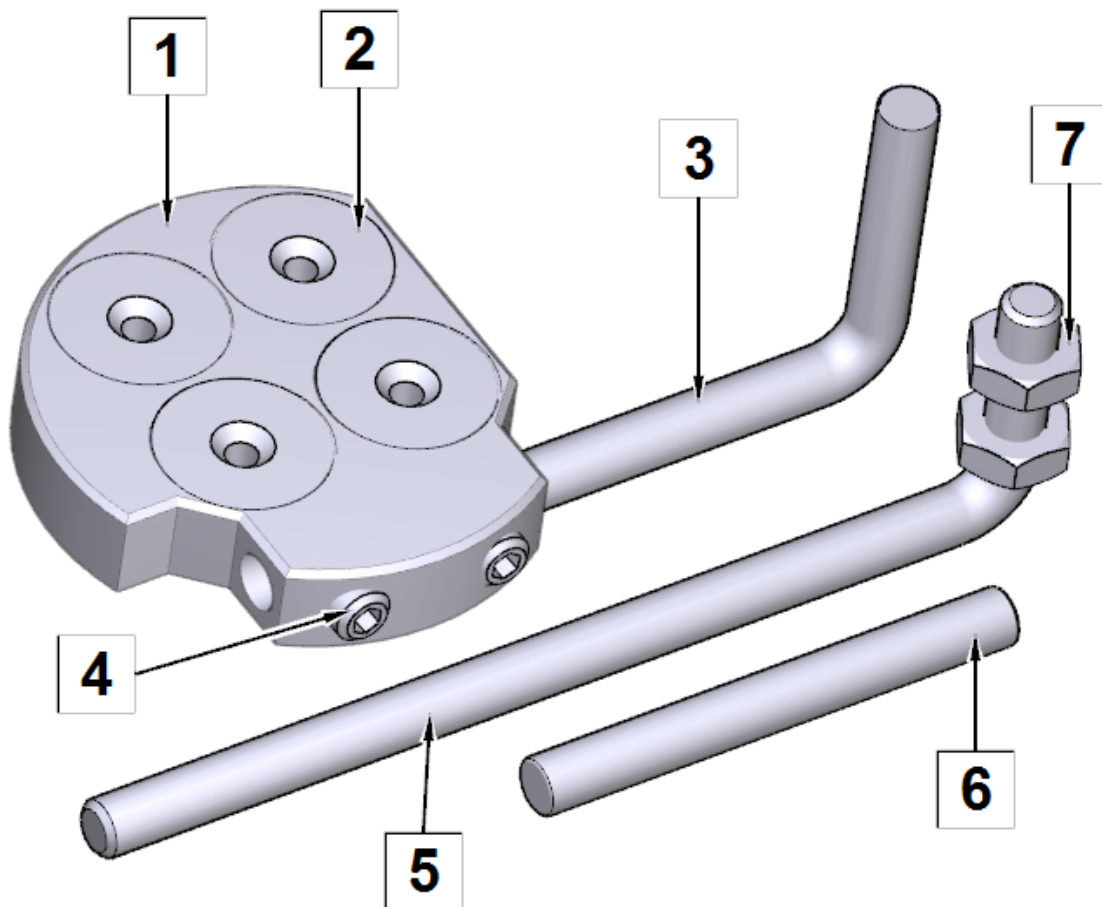
<p>502-9-9S Indicator Mount Angled for small diameter main line bores</p> 	<p>502-9-9A Mechanical Run Out Indicator General Purpose (.001" Inch Resolution)</p> 	<p>502-9-9J Mechanical Run Out Indicator General Purpose (.01mm Metric Resolution)</p> 
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Line Bore Set Up and Alignment Equipment
502-12-7B Digital Runout Probe and Readout Components



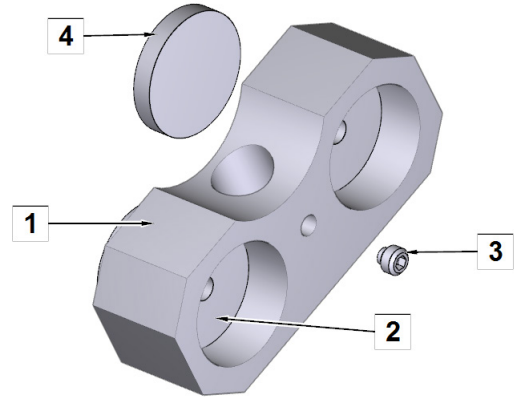
ITEM	PART #	DESCRIPTION
1	502-12-7C	DIGITAL GAUGE
2	502-11-40	CLAMP BODY
3	502-9-9S	INDICATOR MOUNT,RIGHT ANGLE DRIVE
4	502-12-7E	GAUGE ADAPTER SLEEVE
5	502-12-7D	1 AXIS GAGING DISPLAY-DIGITAL RUNOUT GAUGE
6	502-12-4A	MAGNETIC HOLDER ASSEMBLY
7	502-12-4	MAGNETIC HOLDER ASSEMBLY

502-12-4 General Purpose Magnetic Indicator Holder Parts



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

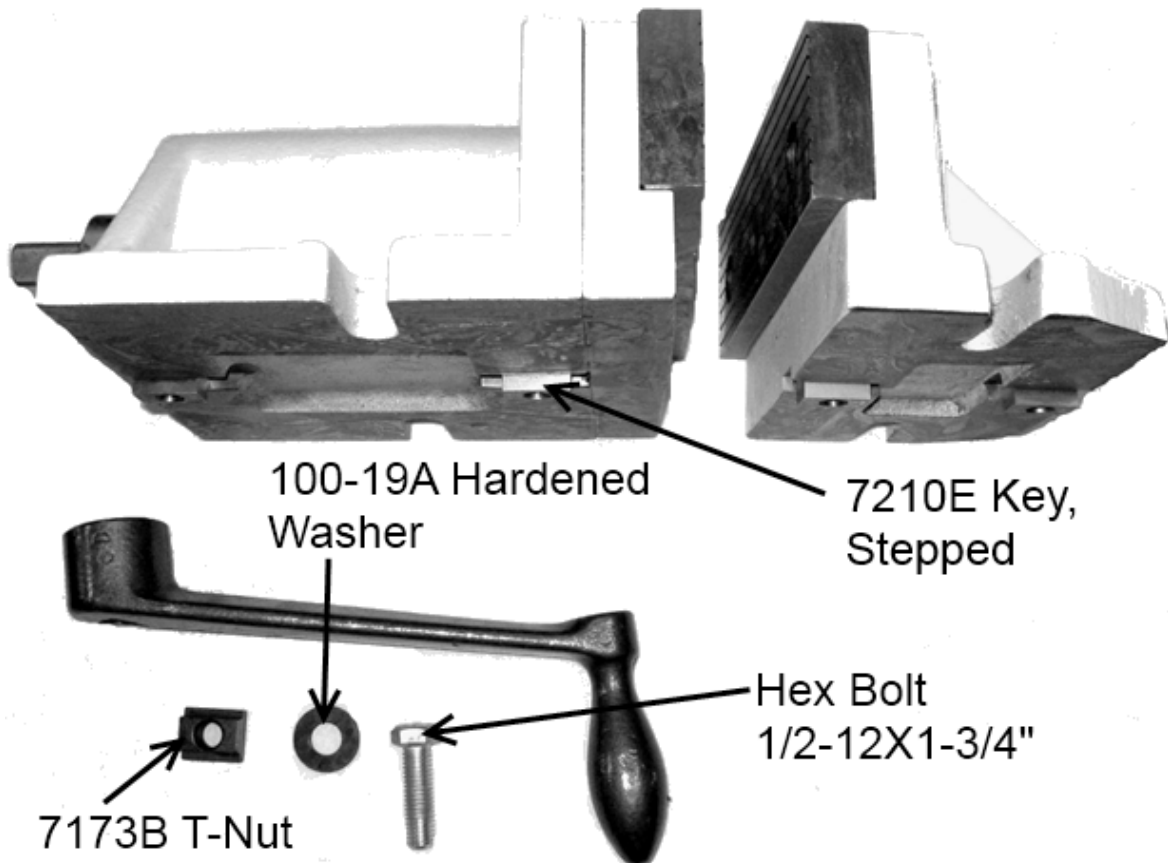
502-12-4A Magnetic Indicator Holder Parts



ITEM	PART #	DESCRIPTION
1	502-12-4B	MAGNETIC HOLDER INDICATOR LINE BORING
2	502-11-39	MAGNET, SHALLOW POT
3	502-12-4D	SOCKET SET SCREW 8-32 X 1/8" (BRASS TIPPED)
4		MAGNET WASHER

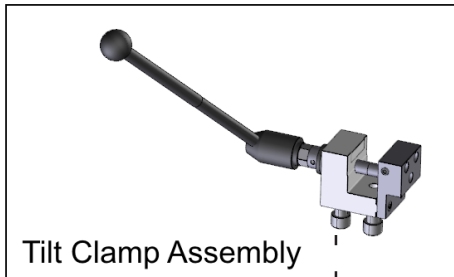
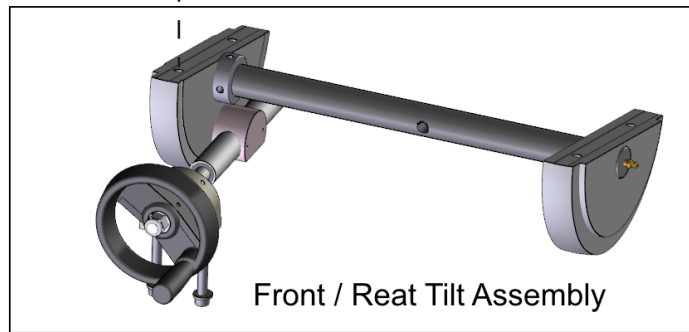
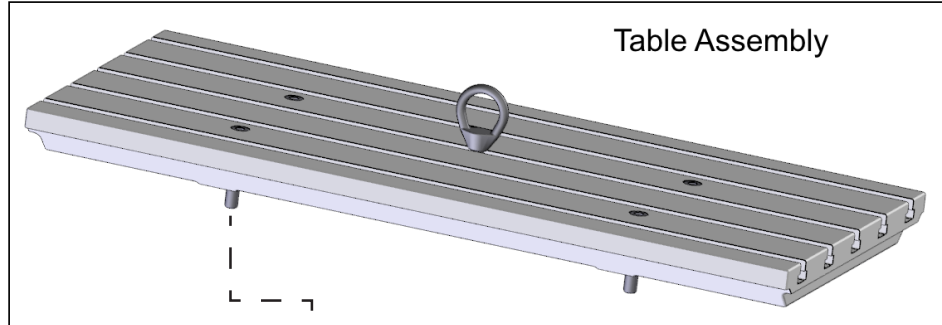
Equipment for Preparing Blocks for Line Boring

7209N 2-Piece Vise Parts

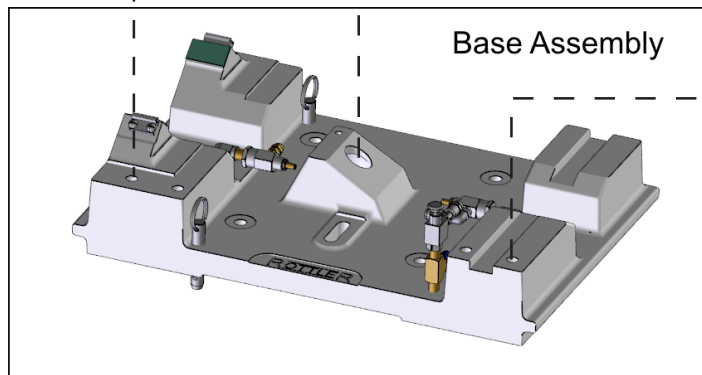
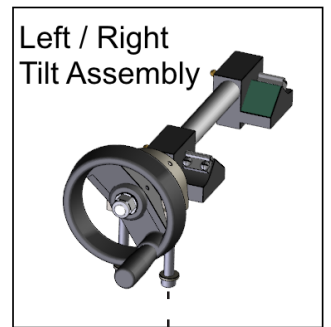


7209M Leveling Table Sections

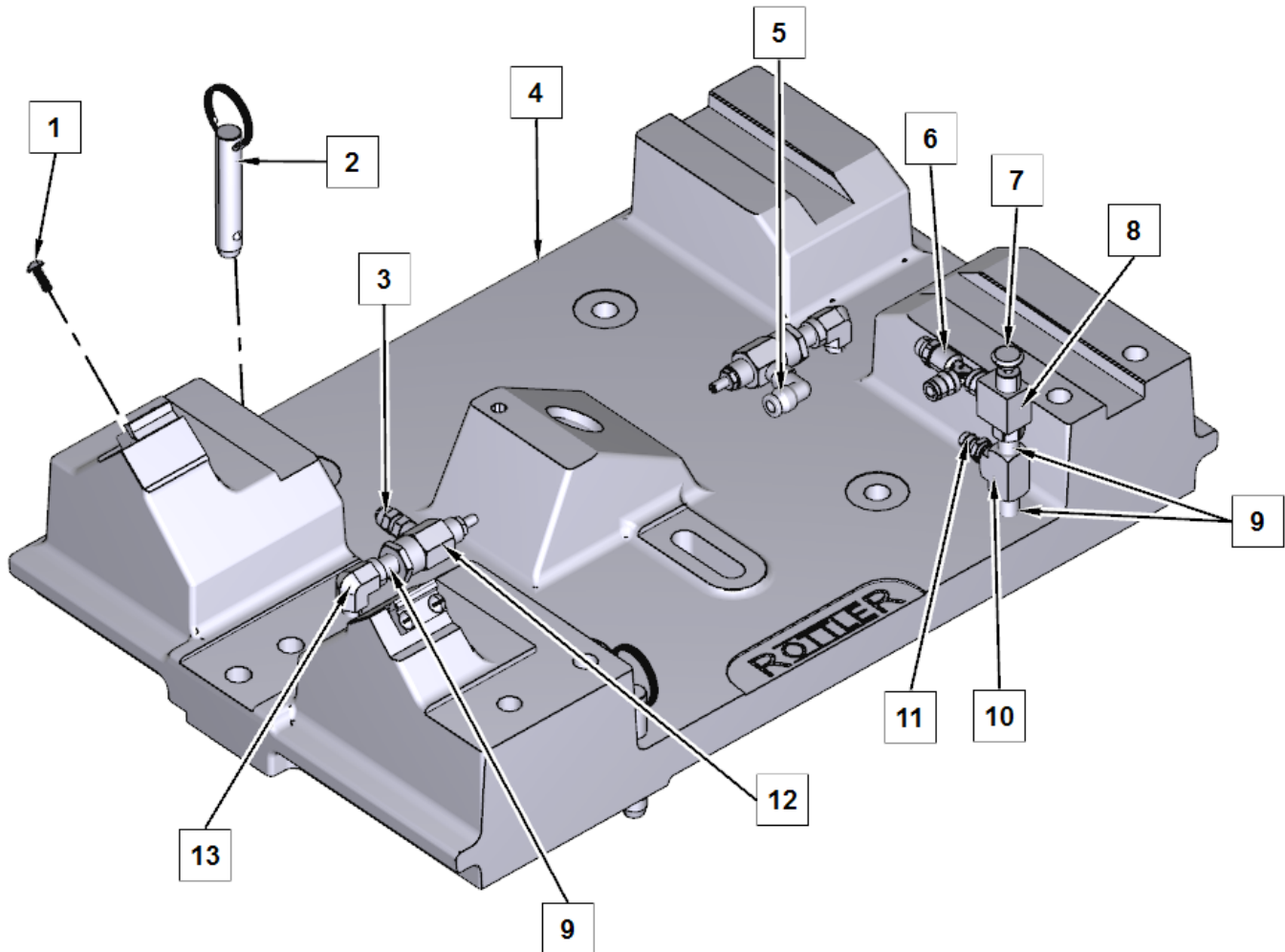
7209M Leveling Table Sections



Tensioner Assembly

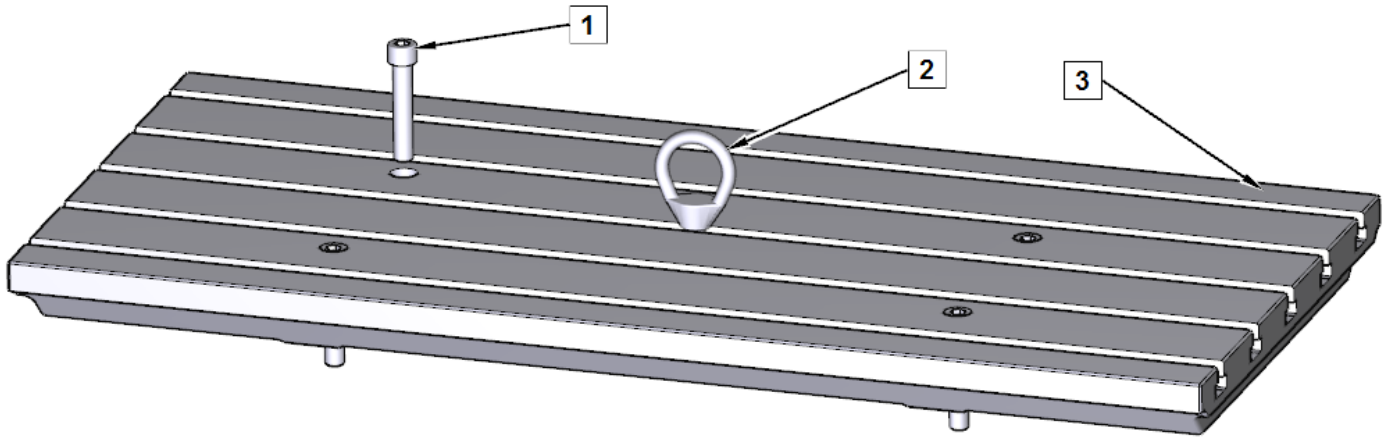


Base Assembly Section Parts



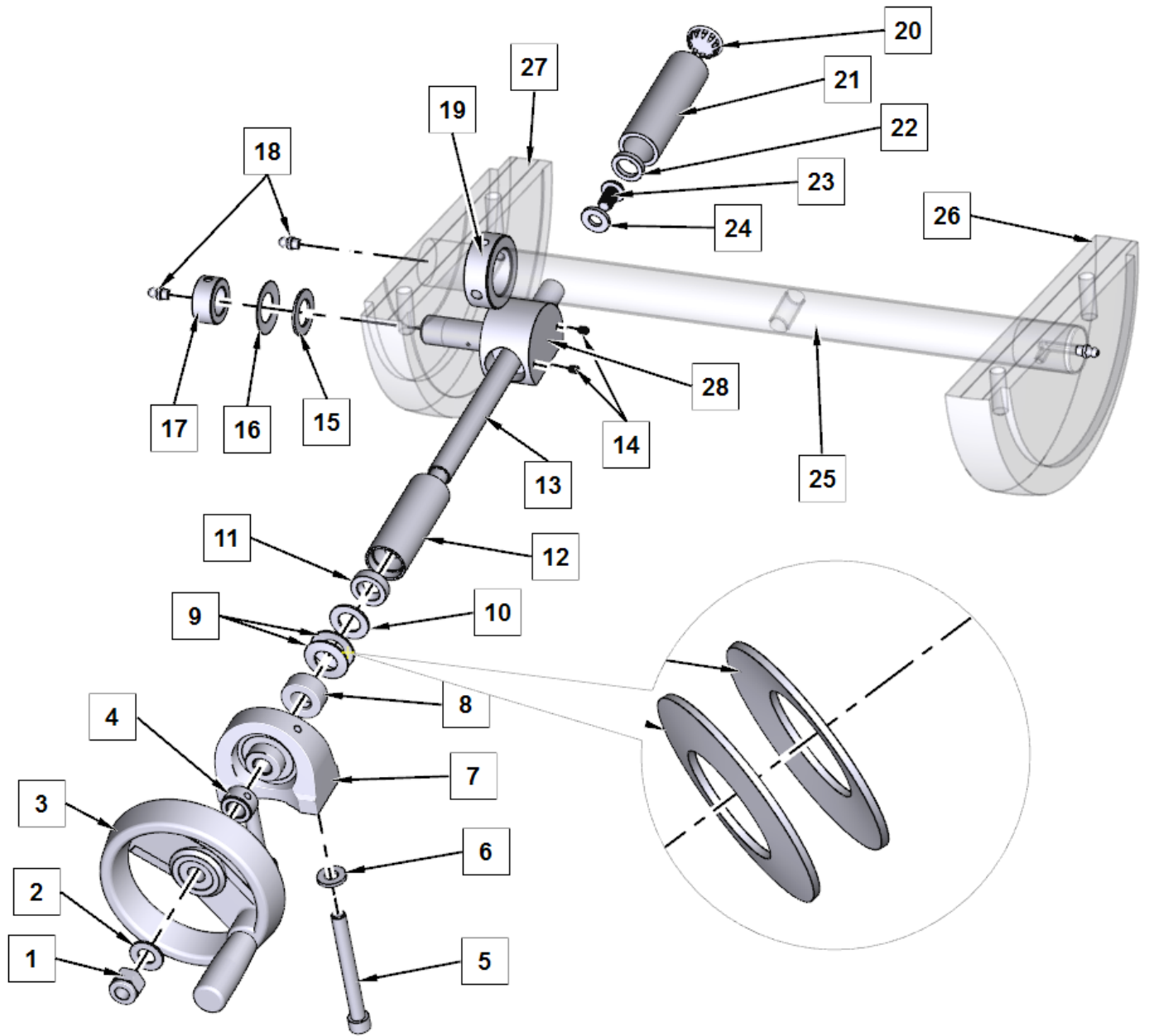
ITEM	PART #	DESCRIPTION
1	MF-111	ROUND HEAD MACHINE SCREW 10-24 X 1/2"
2	7210C	PIN, GUIDE ROTTLER LEVELING TABLE
3	502-11-16E	CONNECTOR, MALE, 1/4 X 1/8" PT
4	7233	FRAME, TABLE
5	514-4-17E	ELBOW, 90 DEGREE MALE - 1/4" X 1/8" NPT
6	514-4-17X	TEE, RUNNING 1/8-NPT X 1/4
7	502-1-56	PUSHBUTTON
8	514-2-65	VALVE, AIR - LIMIT & STOP
9	502-11-17J	NIPPLE,CLOSE 1/8" MPT
10	502-11-17C	TEE, 1/8 X 1/8"
11	502-1-96A	INSERT, BARBED - HOSE
12	502-11-35A	VALVE, CONTROL - RFC FLO
13	502-11-17R	ELBOW, ST, 1/8 FPT X 1/8 MPT

Table Assembly Section Parts



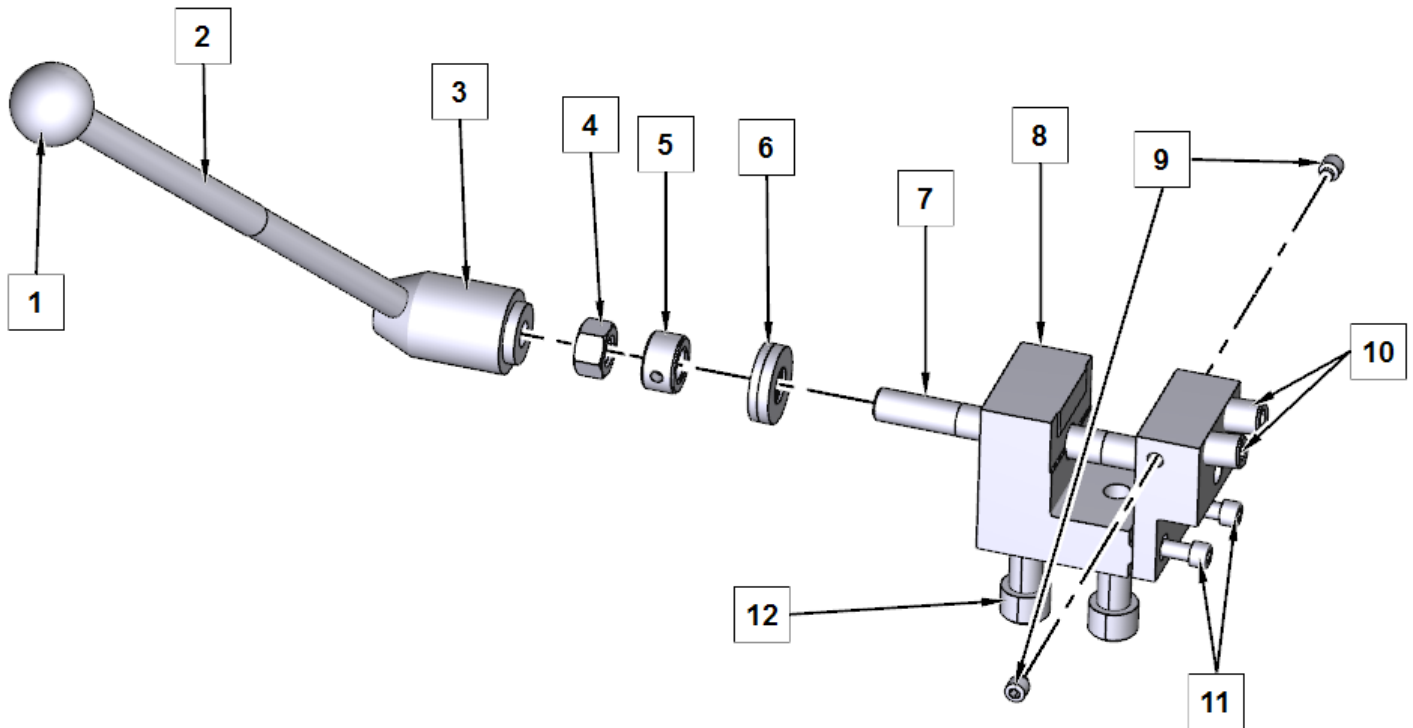
ITEM	PART #	DESCRIPTION
1	MF-45	SOCKET HEAD CAPSCREW 1/2-13 X 2"
2	502-3-13	EYE, LIFTING
3	7207C	TABLE, DUAL AXIS HEAD FIXTURE

Front / Rear Tilt Assembly Section Parts



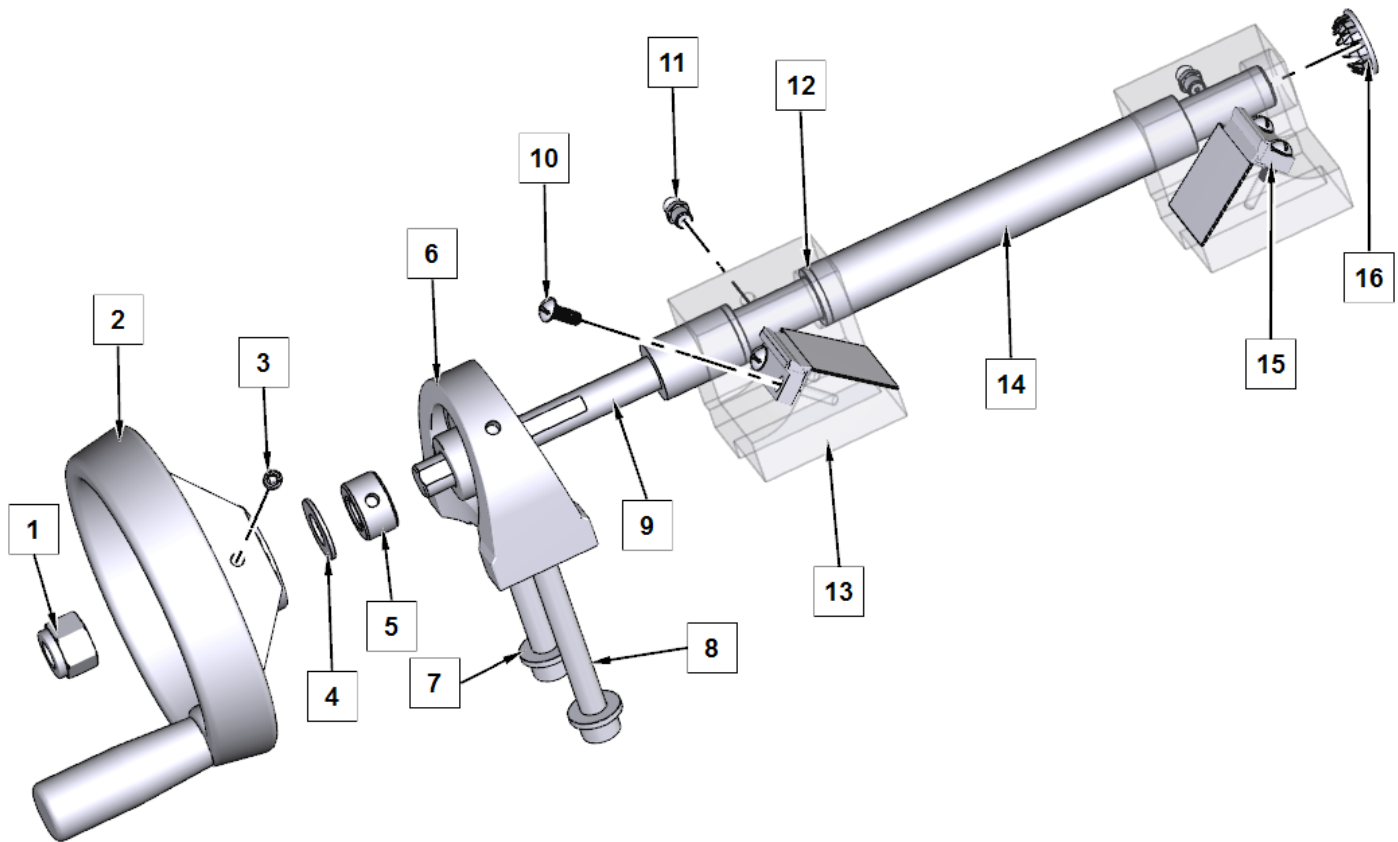
ITEM	PART #	DESCRIPTION
1	MF-186	NYLOCK NUT 1/2-13 NC
2	100-19	WASHER, THRUST
3	7201M	HANDWHEEL
4	7209J	COLLAR, 1/2" SHAFT
5	MF-36A	SOCKET HEAD CAP SCREW 3/8-16 X 3 1/2"
6	100-28-32	WASHER, 3/32" THICK
7	7201D	BLOCK, PILLOW LEVEL ADJUST
8	7199E	COLLAR, SUPPORT BLOCK (5/8" DIA)
9	514-7-21	WASHER, BELLEVILLE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

Tilt Clamp Assembly Section Parts



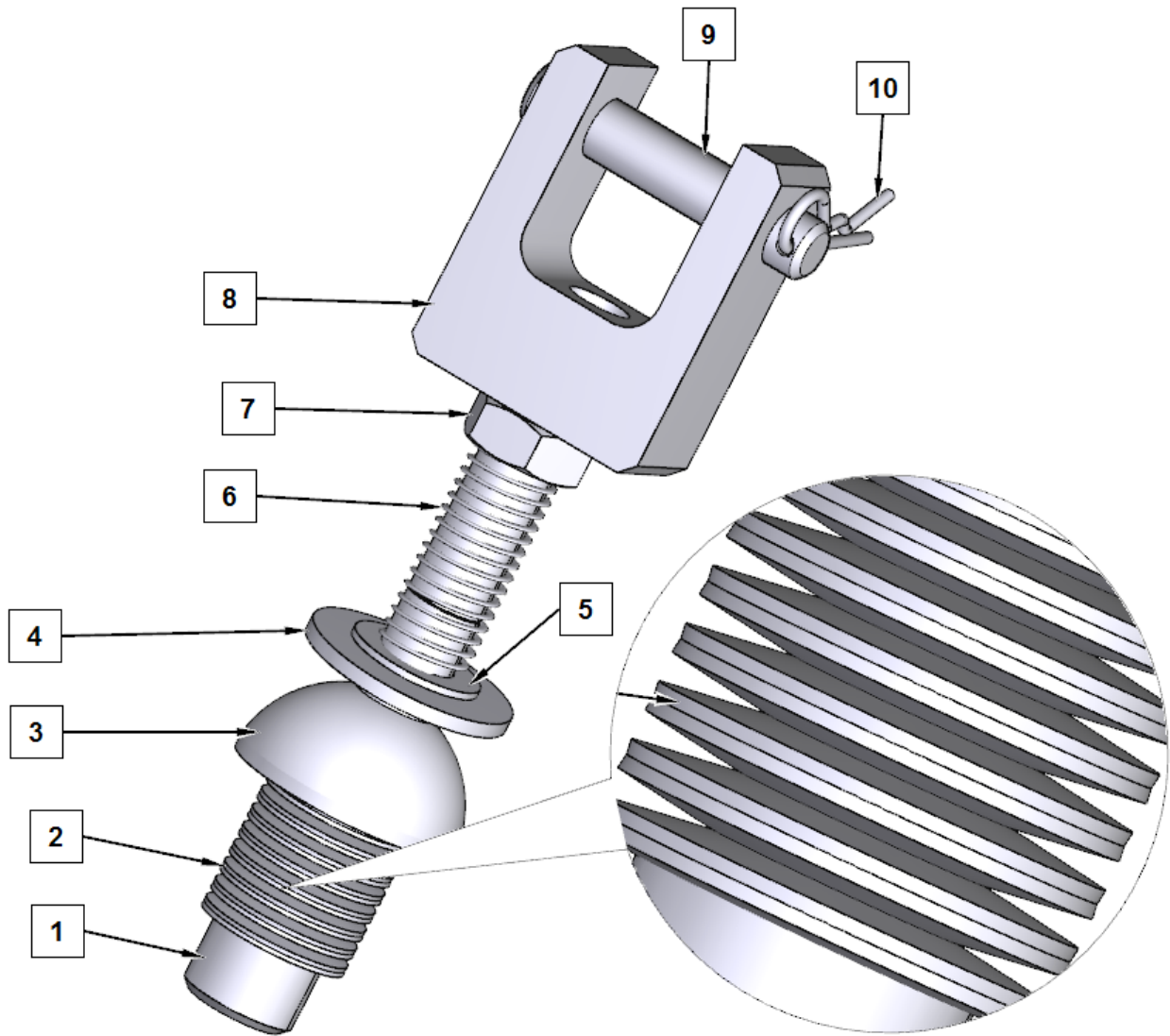
ITEM	PART #	DESCRIPTION
1	514-2-39E	KNOB, ADJUSTABLE HANDLE
2	514-2-39B	EXTENDER, ADJUSTABLE HANDLE
3	514-2-39D	HANDLE,ADJUSTABLE-CLAMP STOP
4	MF-165	HEX NUT 1/2-13 NC
5	7209J	COLLAR, 1/2" SHAFT
6	7209E	WASHER, SPHERICAL
7	7207Z	SHAFT, JOURNAL CLAMP
8	7210J	CLAMP BLOCK,JOURNAL CLAMP
9	504-29-36	SCREW,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

Left / Right Tilt Assembly Section Parts



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

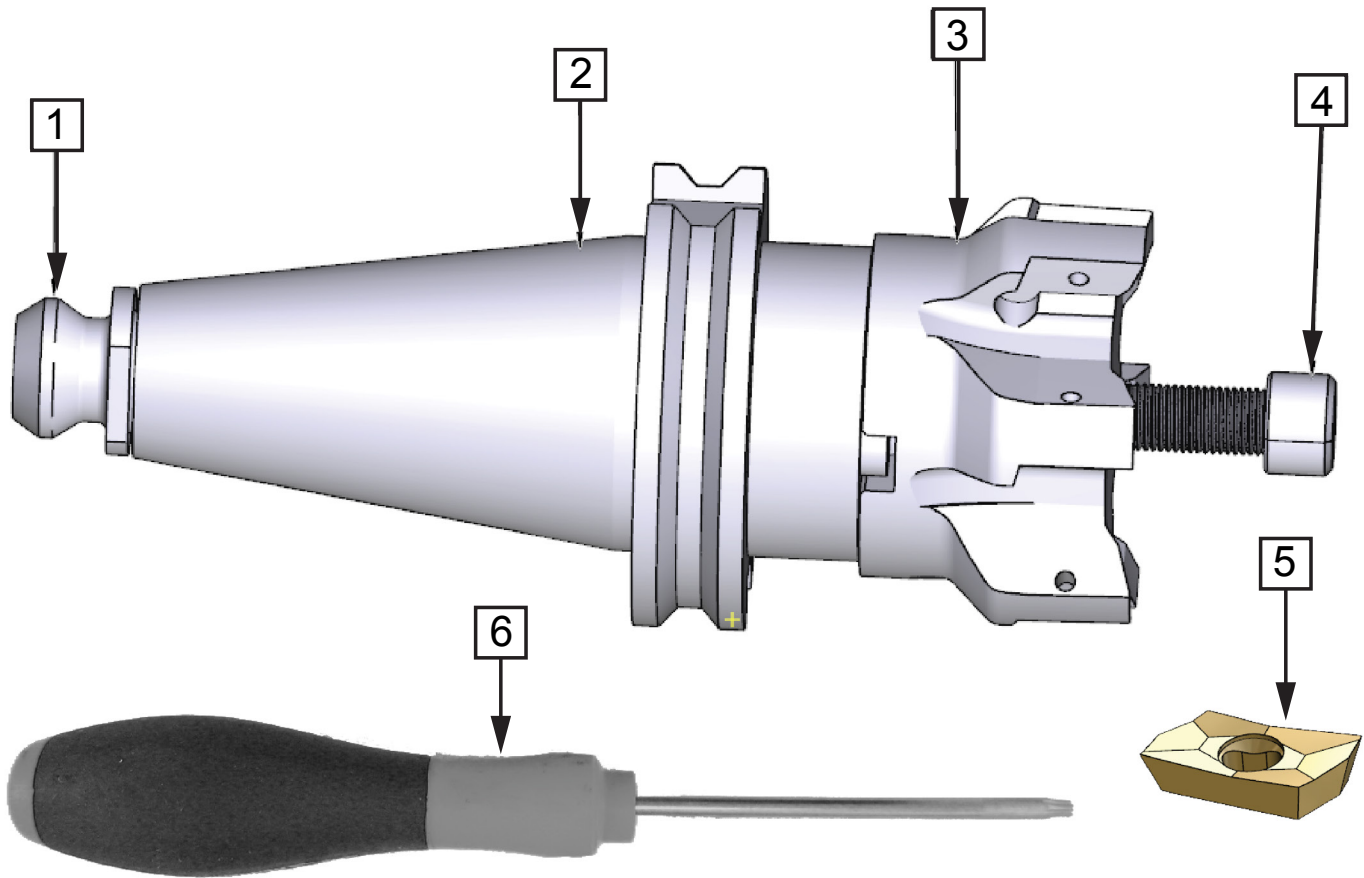
Tensioner Assembly Section Parts



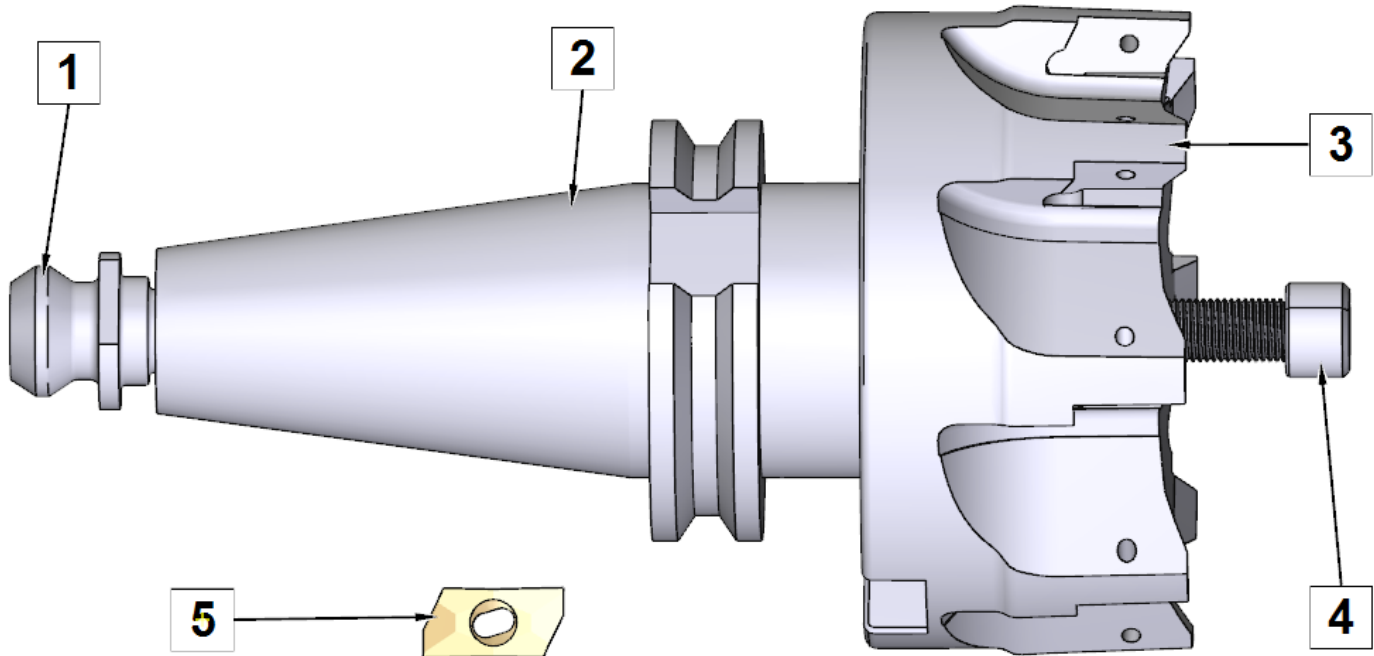
ITEM	PART #	DESCRIPTION
1	7209W	SCREW, CLAMP BAR
2	514-7-21	WASHER, BELLEVILLE
3	7209U	WASHER, SPHERICAL-HOLD DOWN
4	MF-181	FLAT WASHERS 5/8"
5	514-7-20	WASHER, THRUST
6	100-28-20C	SPRING,HOLD DOWN
7	MF-173	HEX JAM NUT 5/8-11 NC
8	7209S	ROD END, CLAMP BAR
9	7210B	PIN, CLEVIS
10	7232K	HITCH PIN CLIP

Shell Mill Assemblies

650-2-44N 2 1/2" (63.50mm) Shell Mill Assembly Parts



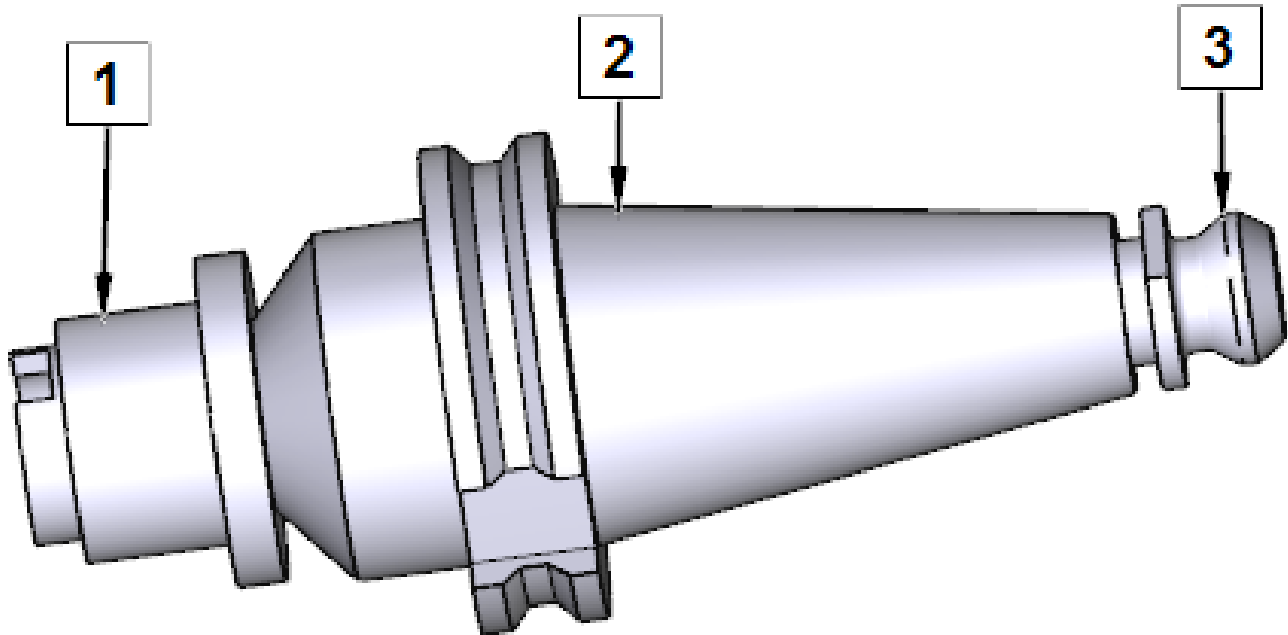
ITEM	PART #	DESCRIPTION
1	650-2-44L	CAT 40 RETENTION KNOB
2	650-2-44G	ADAPTER FOR SHELL MILLS WITH 3/4" BORE COMPETE WITH 650-2-44L RETENTION KNOB CAT 40 TAPER
3	7224E	SHELL MILL 2 1/2"
4	7224D	SCREW, SOCKET HEAD CAP 3/8-24NF X 1" 2 1/2"
5	6514T	INSERT, SHELL MILLS 18MM .03 (0.8MM)
6	T15D	T15 TORX TIP HOLDING SCREW DRIVER

650-2-44P 4" (101.60mm) Shell Mill Assembly Parts


ITEM	PART #	DESCRIPTION
1	650-2-44L	CAT 40 RETENTION KNOB
2	650-2-44F	ADAPTER FOR SHELL MILLS WITH 1 1/2" BORE COMPLETE WITH 650-2-44L RETENTION KNOB CAT 40 TAPER
3	7224F	SHELL MILL 4"
4	7224D	SCREW, SOCKET HEAD CAP 3/8-24NF X 1" 2 1/2"
5	6514T	INSERT, SHELL MILLS 18MM .03 (0.8MM)

Thread Tapping Tooling

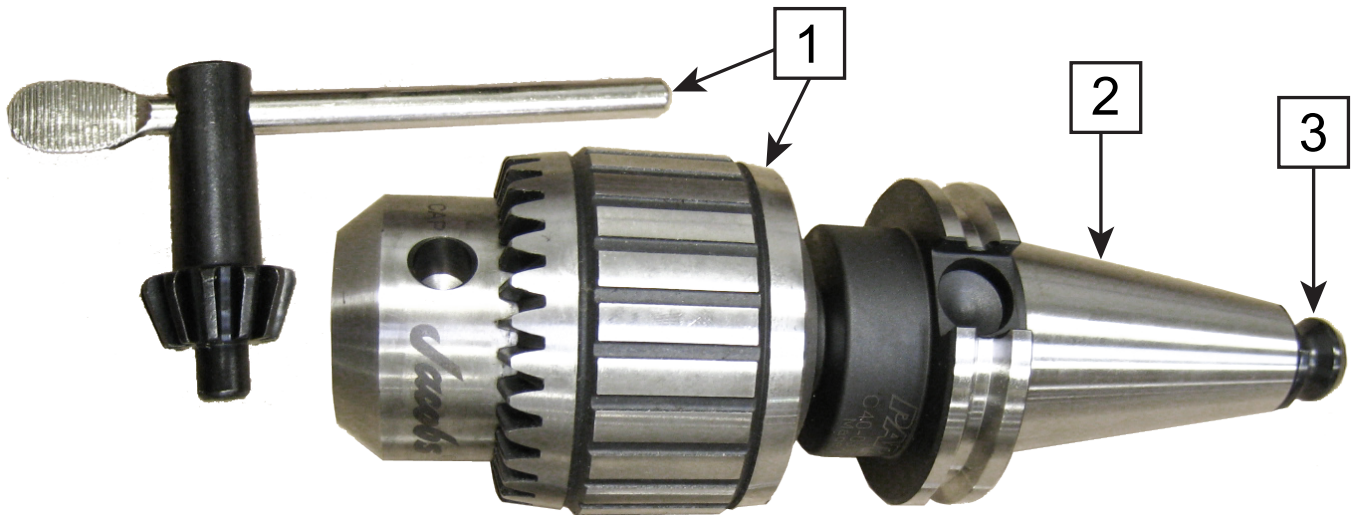
650-2-11K Quick Change Tap Holder Cartridge Assembly Parts



ITEM	PART #	DESCRIPTION
1	650-2-11B	TAP HOLDER CARTRIDGE-QUICK CHANGE STRAIGHT SHANK (3/4" SHANK)
2	650-2-44C	END MILL ADAPTER-3/4" COMPLETE WITH 650-2-44L RETENTION KNOB CAT 40 TAPER
3	650-2-44L	CAT 40 RETENTION KNOB

Drill Tooling

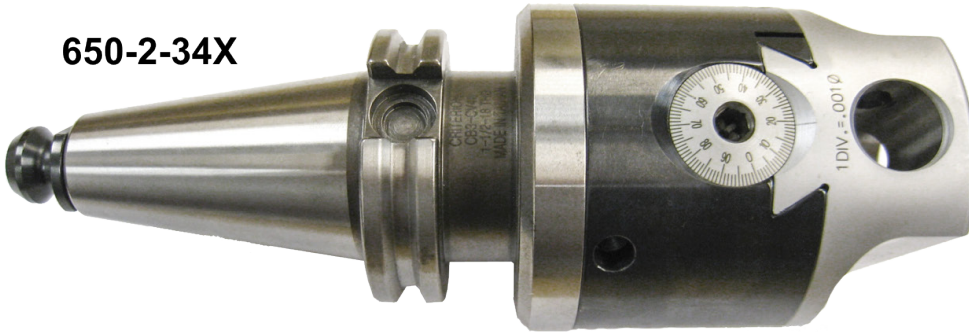
650-2-44M Precision Drill Chuck Assembly Parts



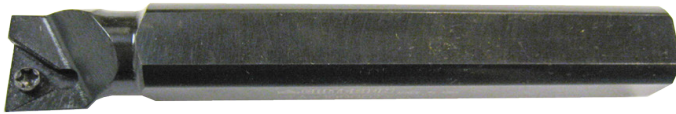
ITEM	PART #	DESCRIPTION
1	650-2-9B	DRILL CHUCK-1/8-5/8 WITH KEY
2	650-2-44	DRILL CHUCK ADAPTOR CAT 40 TAPER
3	650-2-44L	CAT 40 RETENTION KNOB

Connecting Rod Boring and Serrating Equipment 650-2-3S Cutterhead Package Components

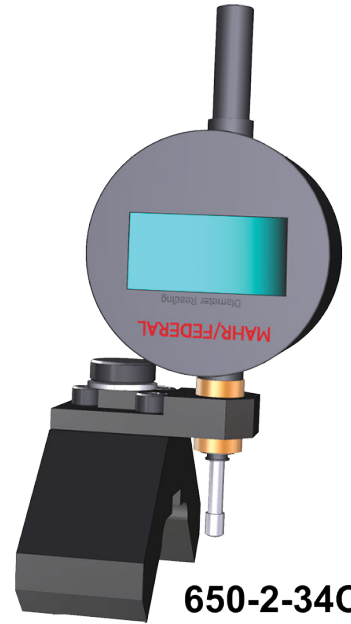
650-2-34X



650-2-34P



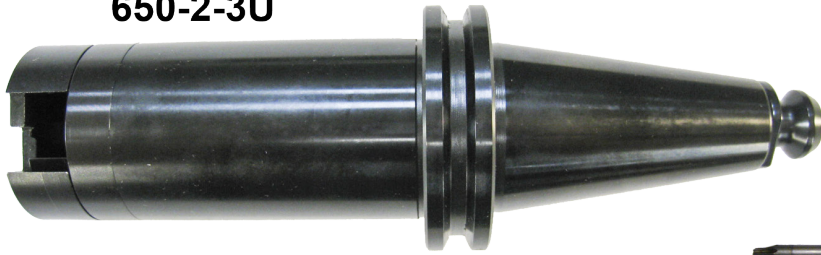
650-2-34R



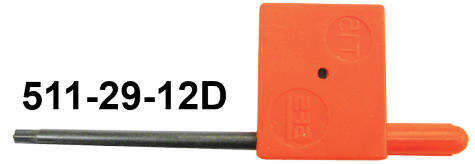
650-2-34C

650-2-3T Cutterhead Package Components

650-2-3U



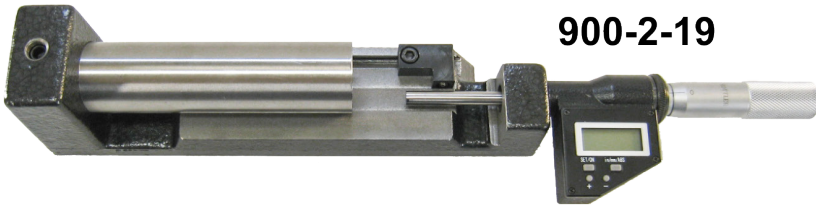
511-29-12D



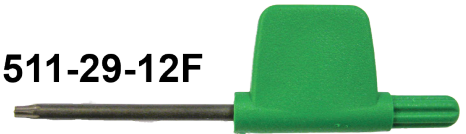
T8D



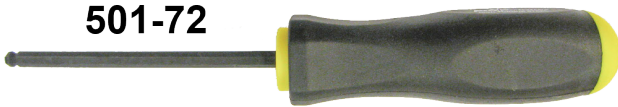
900-2-19



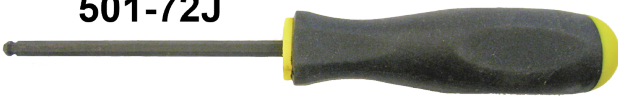
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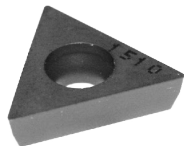
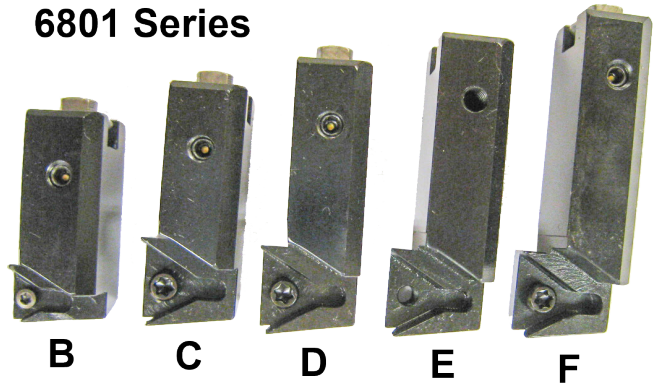
501-72



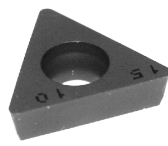
501-72J



6801 Series



RT321



RT322



RT211

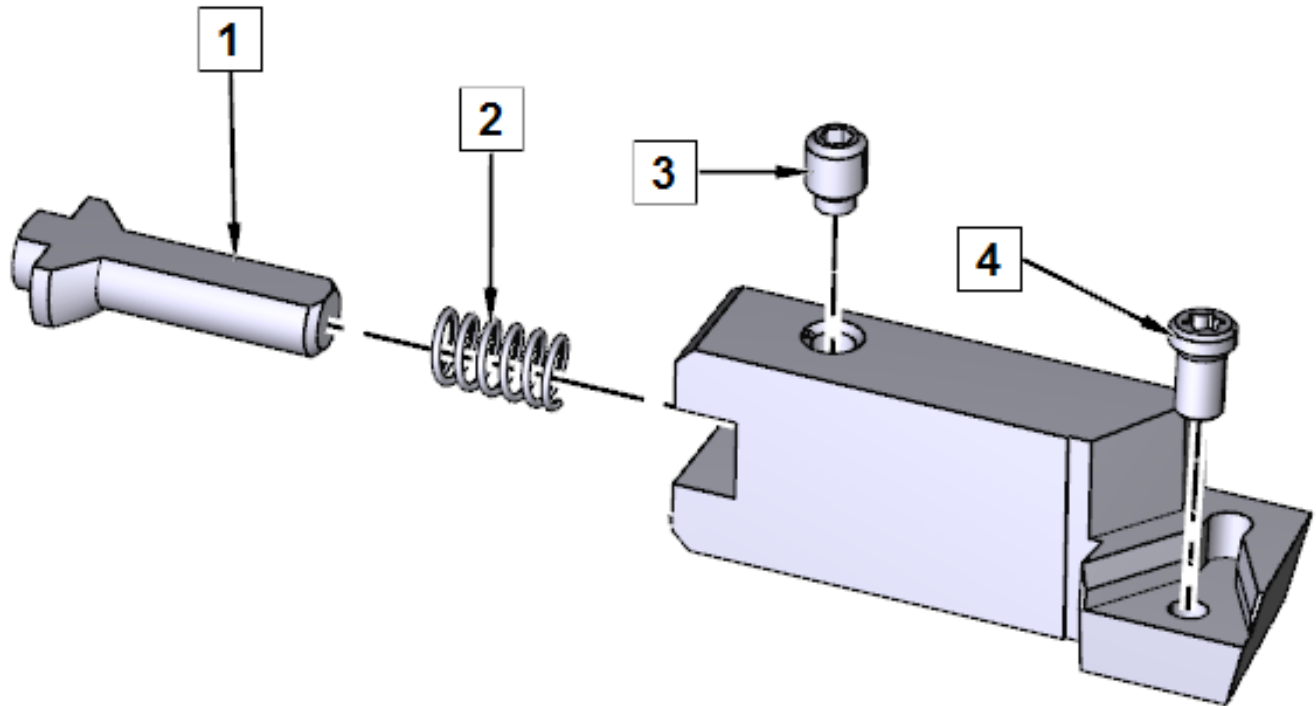


RT212



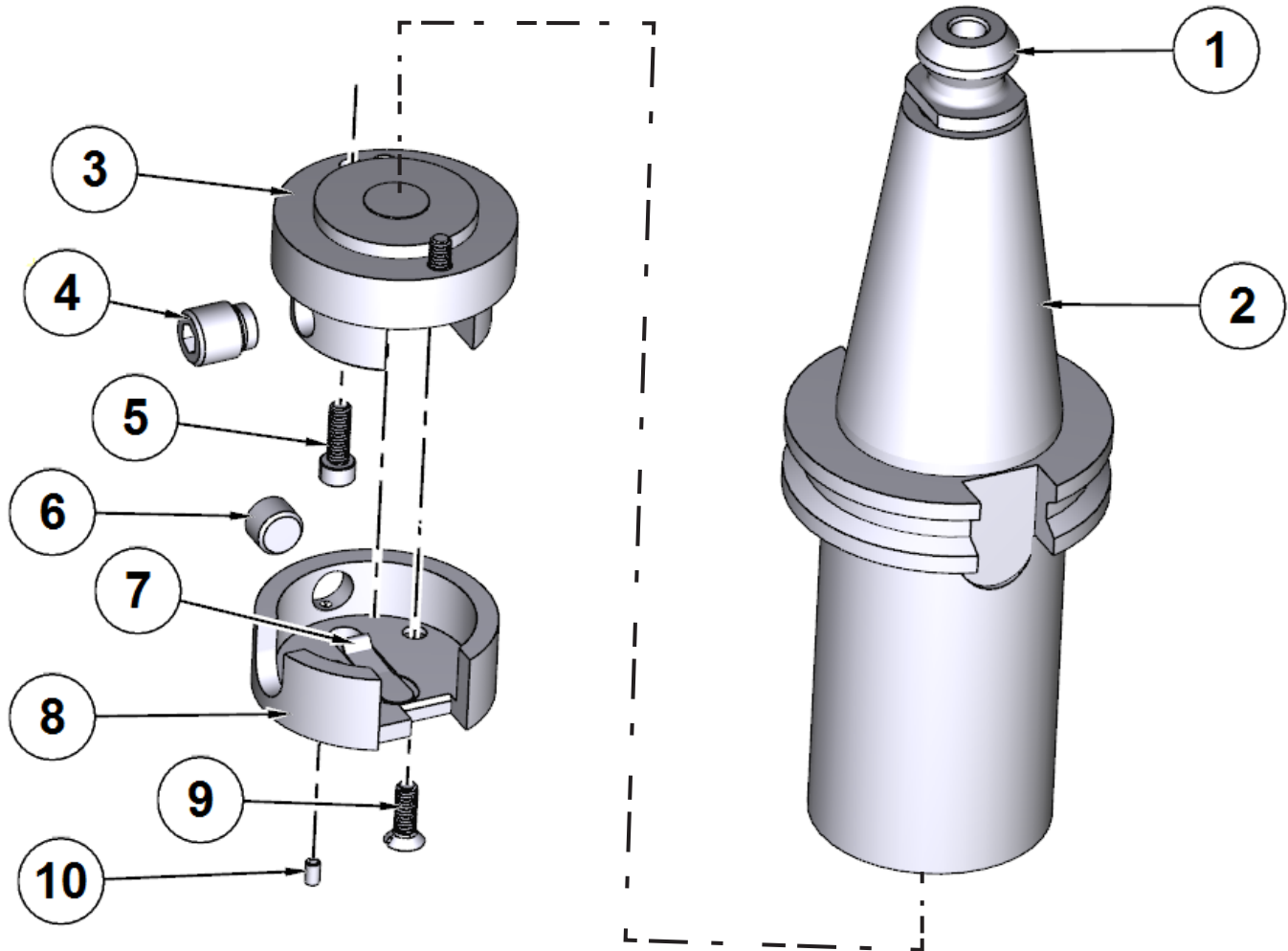
RTCR321

6801 Series Insert Holder Parts



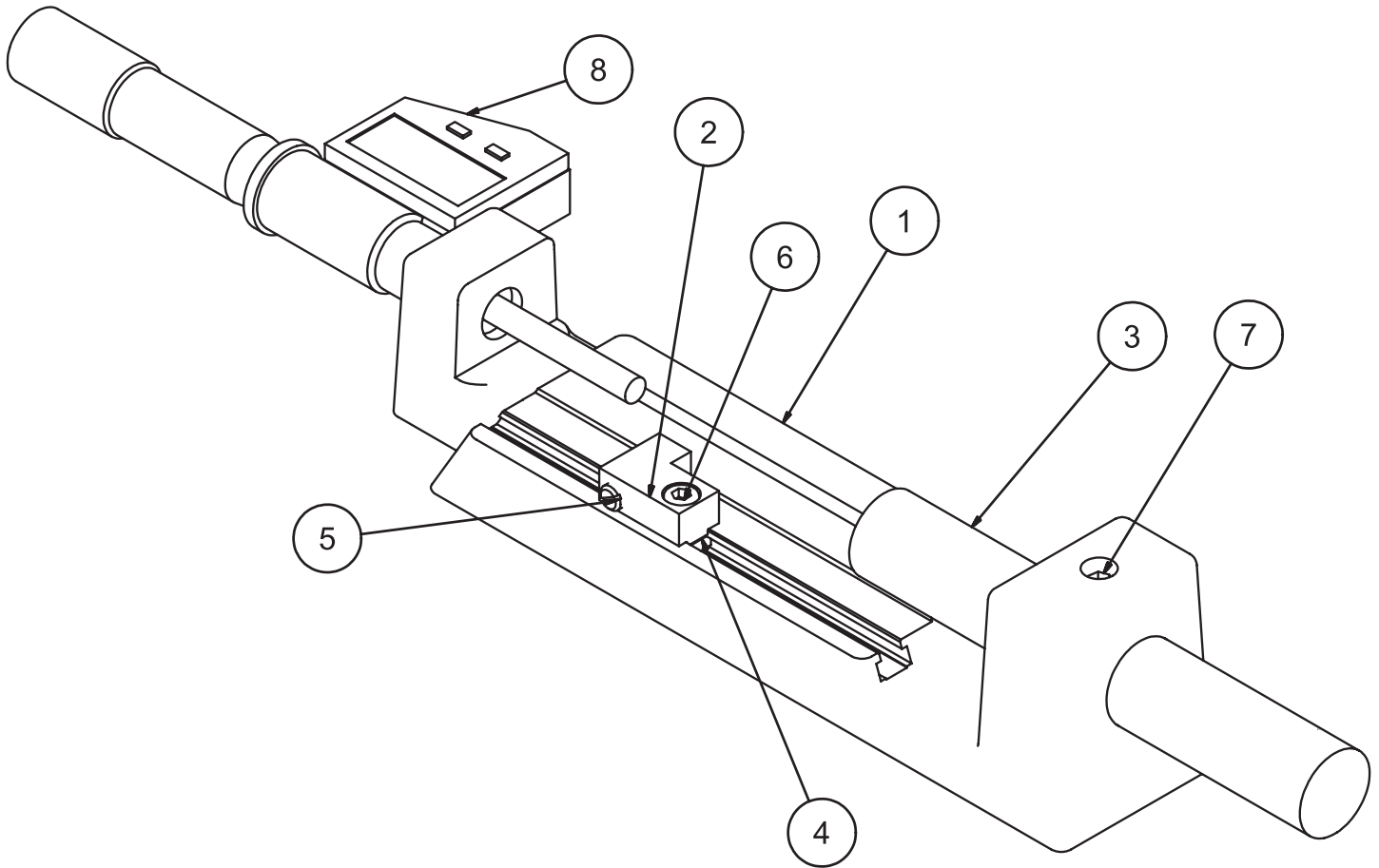
ITEM	PART #	DESCRIPTION
1	100-82-3B	PIN ADJUSTING LONG INDEXABLE INSERT TOOLHOLDER
2	100-82-1	SPRING, ADJUSTING PIN
3	100-82-2	SCREW, SET-BRASS GIB - 3/16" LONG
4	511-29-12C	SCREW, TORX M4 X .7 X .315" LONG

650-2-3U Cutterhead Parts



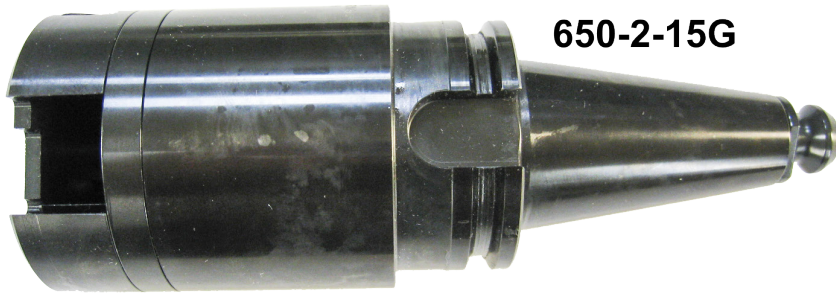
ITEM	PART #	DESCRIPTION
1	650-2-44L	CAT 40 RETENTION KNOB
2	650-2-3P	ADAPTER, 2.0" STUB BAR CAT 40 TAPER (INCH) 4 " LONG
3	650-2-4	BODY, 2.0" STUB BAR
4	501-70C	SCREW, TOOL HOLDER LOCK
5	650-2-4A	SOCKET HEAD CAP SCREW 8-32 X 1/2"
6	502-2-85B	SCREW, SET-INDEX 3/8-40 FINE THREAD
7	100-1B	SPRING, TOOL LOCK 15/16"
8	650-2-4	BODY, 2.0" STUB BAR
9	MF-123	FLAT HEAD MACHINE SCREW 8-32 X 1/2"
10	650-2-6A	SOCKET SET SCREW BRASS TIPPED 4-40 X 3/16" LONG

900-2-19 Micrometer Parts



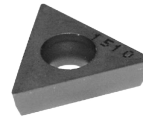
900-2-19 Micrometer Assembly			
ITEM	QTY	PART NUMBE	DESCRIPTION
1	1	502-30-10B	Frame
2	1	502-30-10M	Clamp Block
3	1	502-31-10A	Anvil
4	1	502-30-10J	Square Nut
5	1	502-30-10K	Ball Plunger
6	1	ANSI B18.3 - No. 10 - 24 UNC - 3/8	Hexagon Socket Head Cap Screw
7	1	502-30-10L	Brass Tipped Set Screw
8	1	501-34-2R	Digital Micrometer Head

650-2-15F Cutterhead Package Components

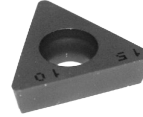


650-2-15G

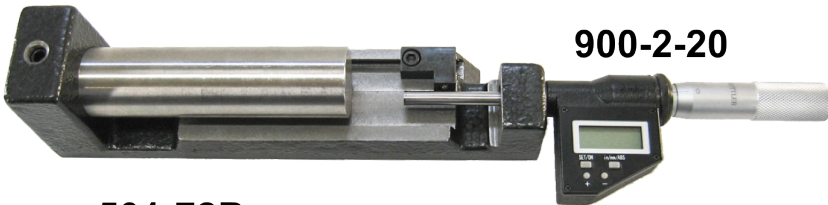
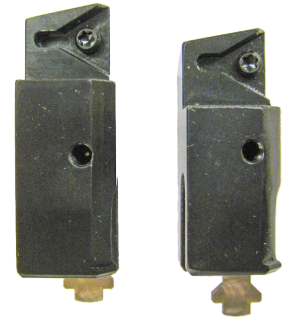
RT321



RT322



6593 Series

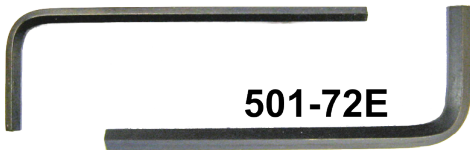


900-2-20

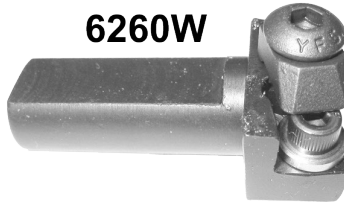
6598K



501-72B

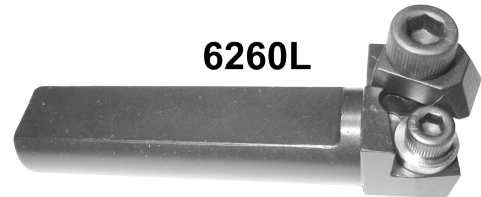
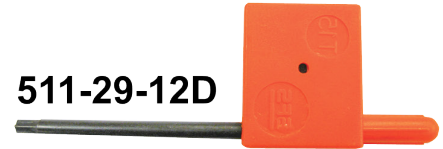


501-72E

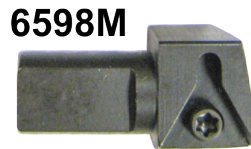


6260W

511-29-12D



6260L



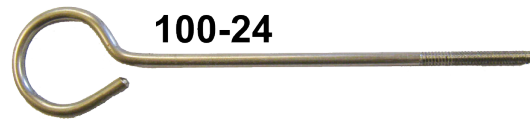
6598M



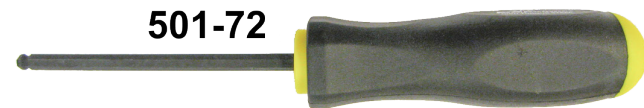
RS322



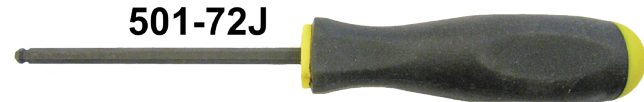
RTCR321



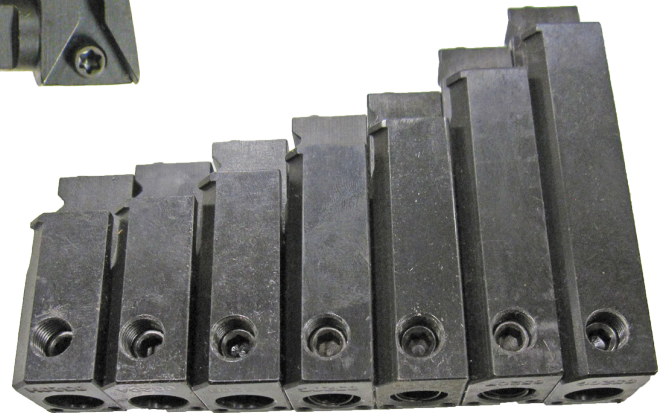
100-24



501-72

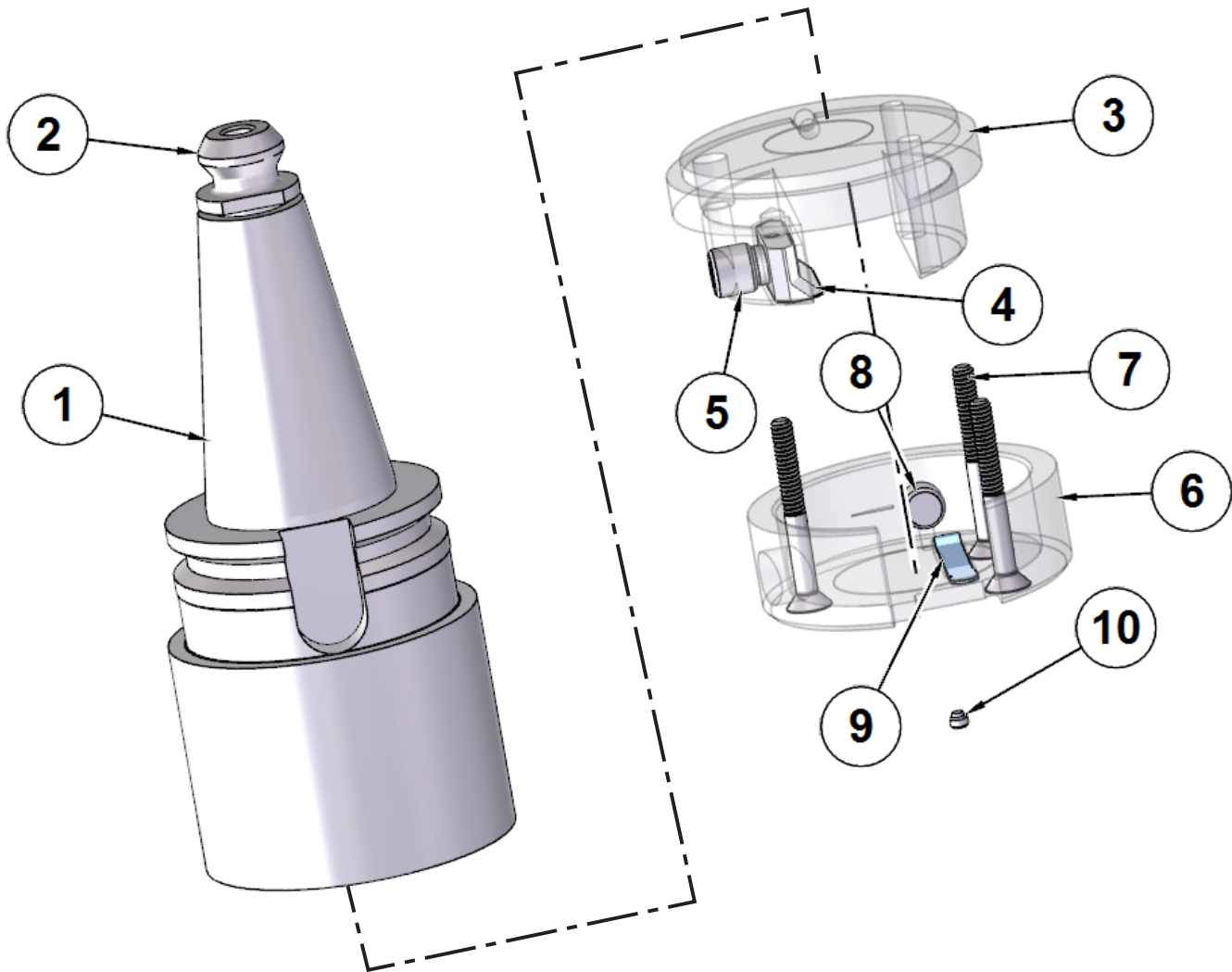


501-72J



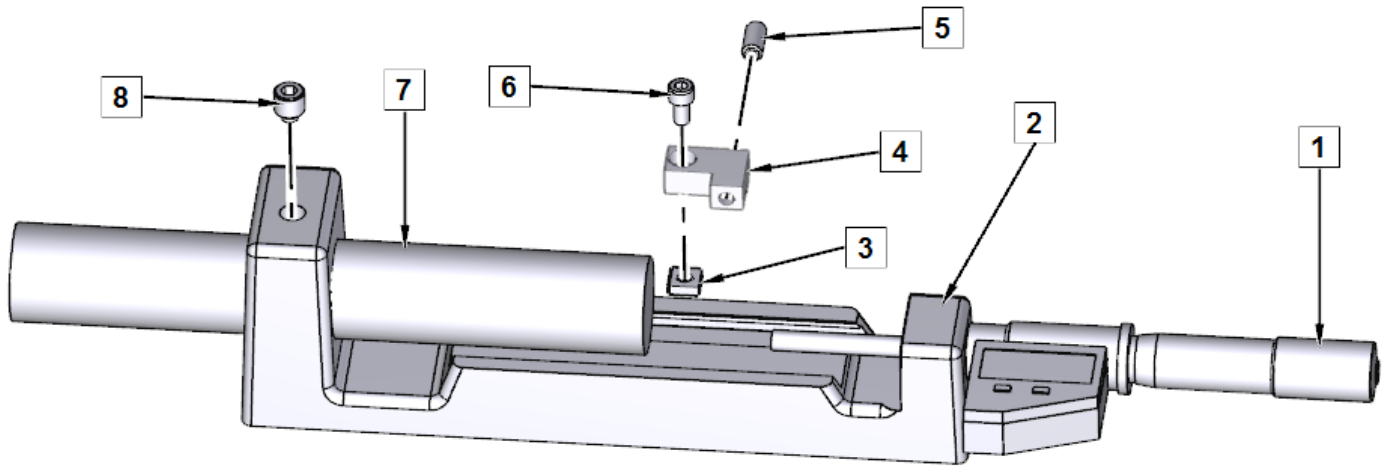
6520 Series

650-2-15G Cutterhead Parts



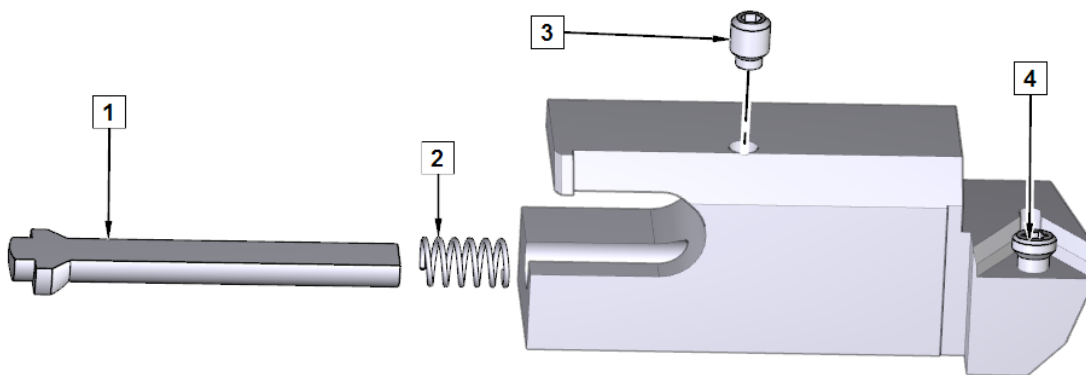
ITEM	PART #	DESCRIPTION
1	650-2-15H	ADAPTER, 2.9" STUB BAR CAT 40 TAPER (INCH) 4" LONG
2	650-2-44L	CAT 40 RETENTION KNOB
3	650-2-16	BODY, 2.9" STUB BAR
4	6263A	SHOE, CLAMP-TOOL HOLDER
5	501-70C	SCREW, TOOL HOLDER LOCK
6	650-2-17	CAP, 2.9" STUB BAR
7	MF-81D	SOCKET FLAT HEAD SCREW 10-24 X 1 3/4"
8	502-2-85B	SCREW, SET-INDEX 3/8-40 FINE THREAD
9	100-1A	SPRING, TOOL LOCK 1 13/32"
10	502-12-4D	SOCKET SET SCREW 8-32 X 1/8" (BRASS TIPPED)

900-2-20 Micrometer Parts



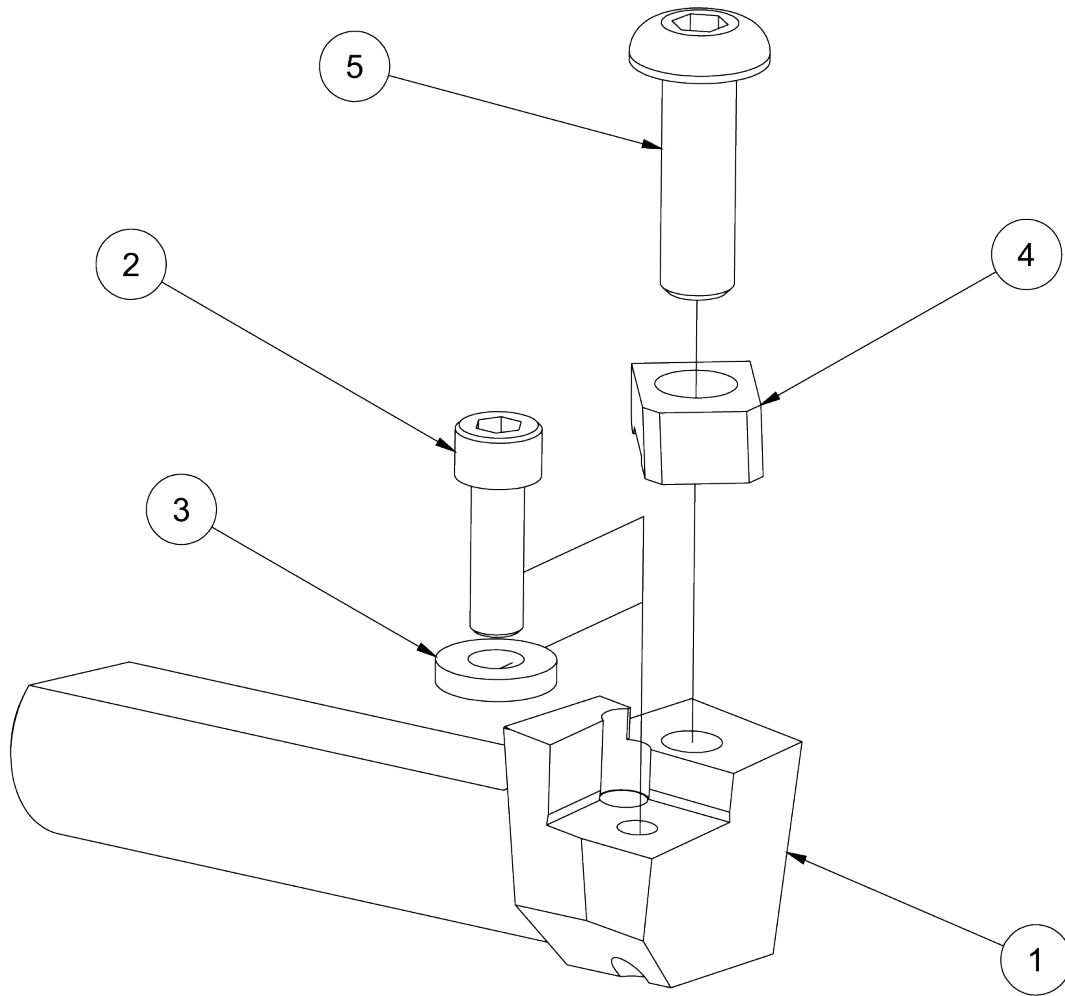
ITEM	PART #	DESCRIPTION
1	501-34-2R	HEAD, MICROMETER UNIVERSAL MIC HEAD DIGITAL READING INCH AND METRIC
2	502-30-10C	FRAME, MICROMETER
3	502-30-10J	SQUARE NUT-#10-24 MICROMETER FRAME
4	502-30-10M	CLAMP, MICROMETER
5	502-30-10K	BALL PLUNGER, 1/4-20 MICROMETER FRAME
6	MF-9A	SOCKET HEAD CAPSCREW 10-32 X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

6593 Series Insert Holder Parts



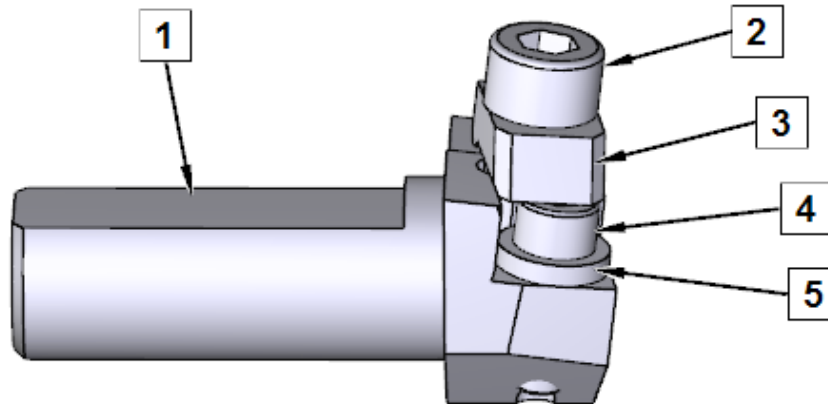
ITEM	PART #	DESCRIPTION
1	6593Q	PIN, ADJUSTING - TOOLHOLDER #6593C AND D ONLY
2	100-82-4	SPRING, ADJUSTING PIN
3	100-82-2	SCREW, SET-BRASS GIB - 3/16" LONG
4	511-29-12C	SCREW, TORX M4 X .7 X .315" LONG

6260L Insert Cartridge Parts



6260L CARTRIDGE ASSEMBLY - SQUARE INSERT NEG. RAKE INDEXABLE - 1.88" SHANK			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	6594G	CARTRIDGE - SQUARE INSERT NEG. RAKE INDEXABLE - 1.88" SHANK
2	1	511-29-12	Screw
3	1	511-29-12B	Washer
4	1	6594K	Insert Clamp
5	1	MF-89A	10-32UNF x 5/8" LG. SOCKET BUTTON HEAD CAPSCREW

6260W Insert Cartridge Parts



ITEM	PART #	DESCRIPTION
1	6594J	CARTRIDGE, OFFSET 3/8" SQUARE, NEGATIVE RAKE
2	MF-9	SOCKET HEAD CAP SCREW 10-32 X 5/8"
3	6594K	CLAMP, TOOL SQUARE INSERT
4	511-29-12	SCREW, SOCKET HEAD CAP 6/32 X 7/16" LONG
5	511-29-12B	WASHER, PRECISION-HOLDING SCREW

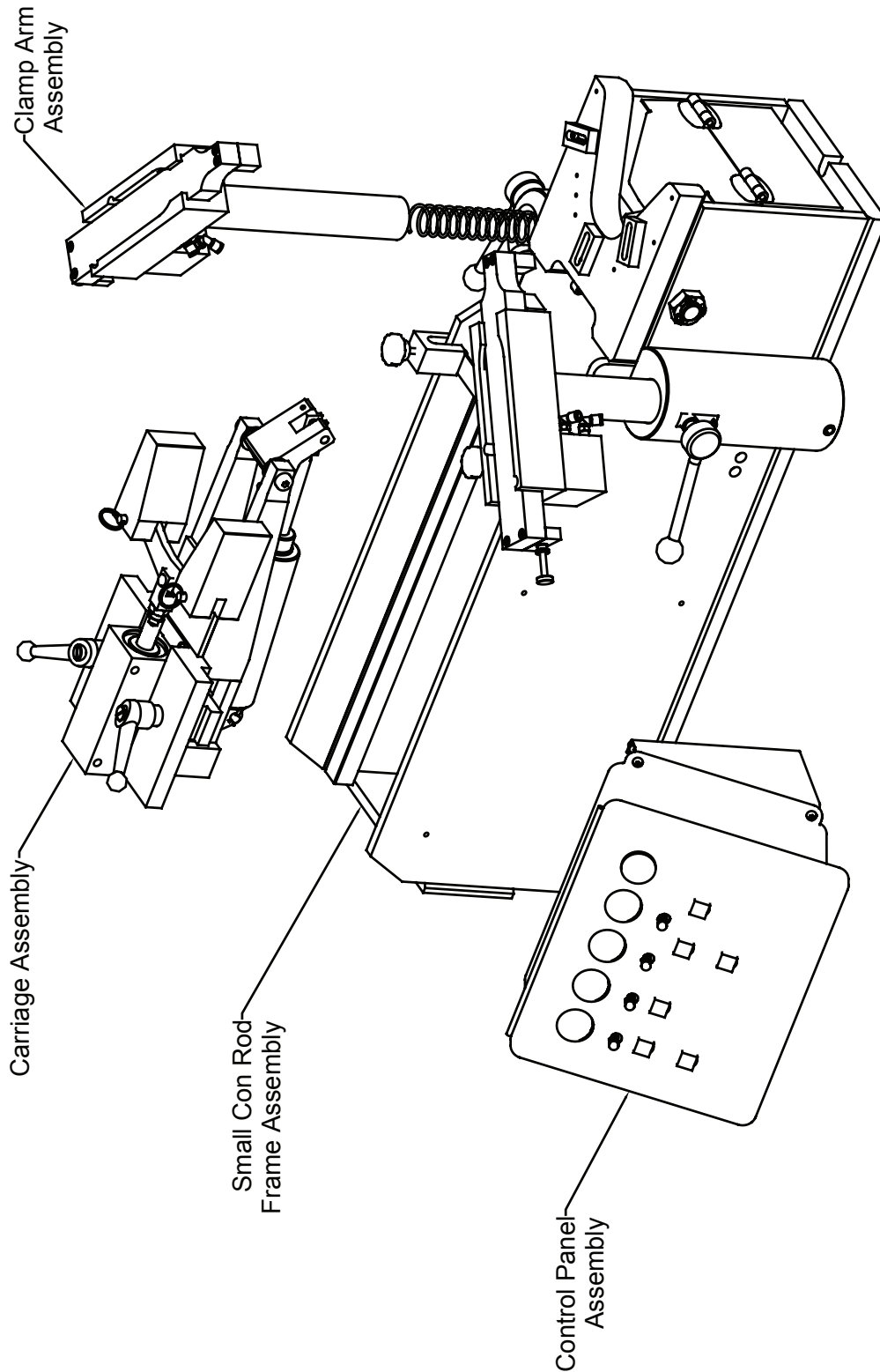
RTCR322 Insert, Triangular

Positive Rake, 3/8 IC 1/64" (9.397mm) Radius, for
Connecting Rod Steel Cutting Only

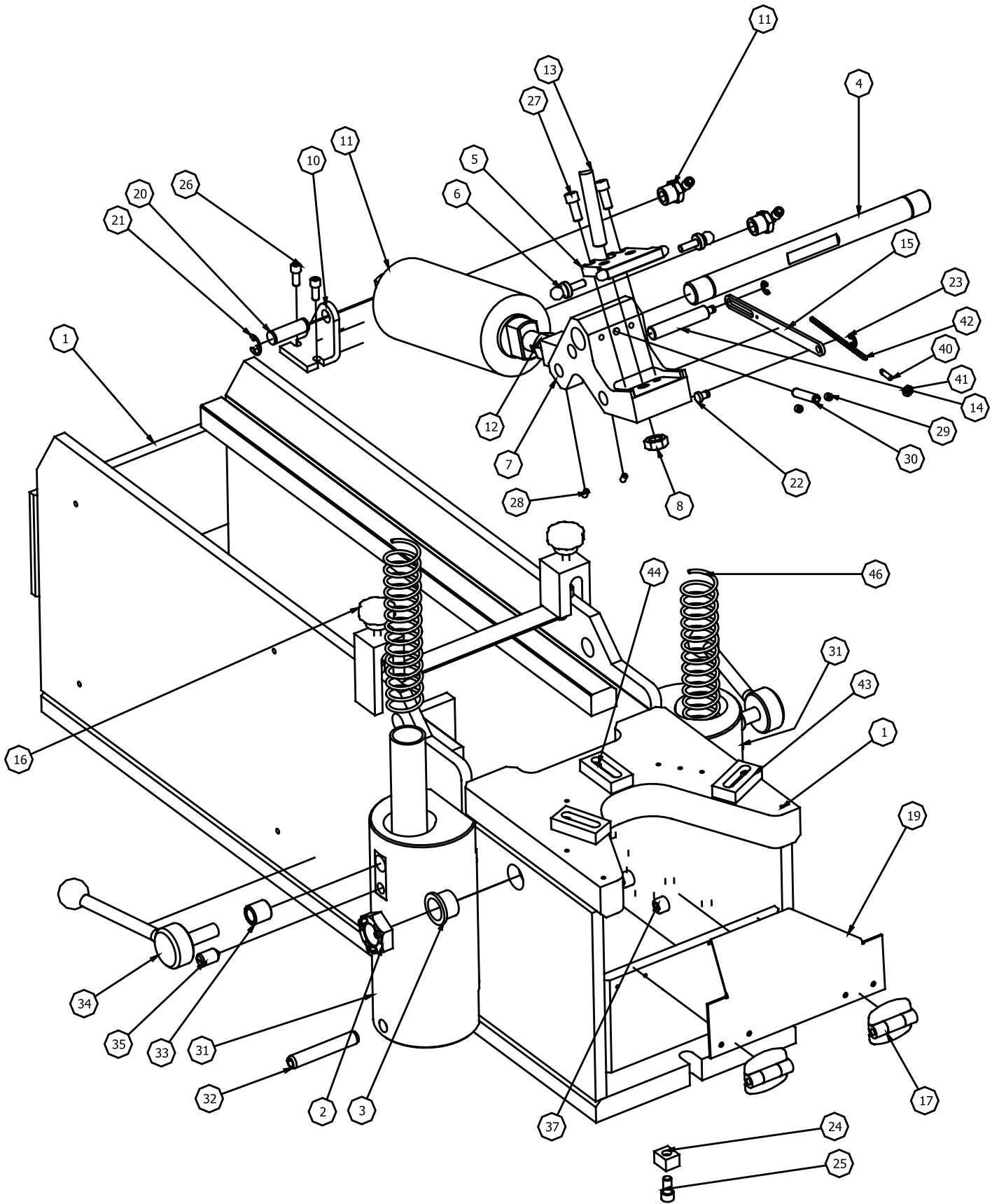


Connecting Rod Fixturing

650-3-44S Rottler Precision Connecting Rod Fixturing System Components

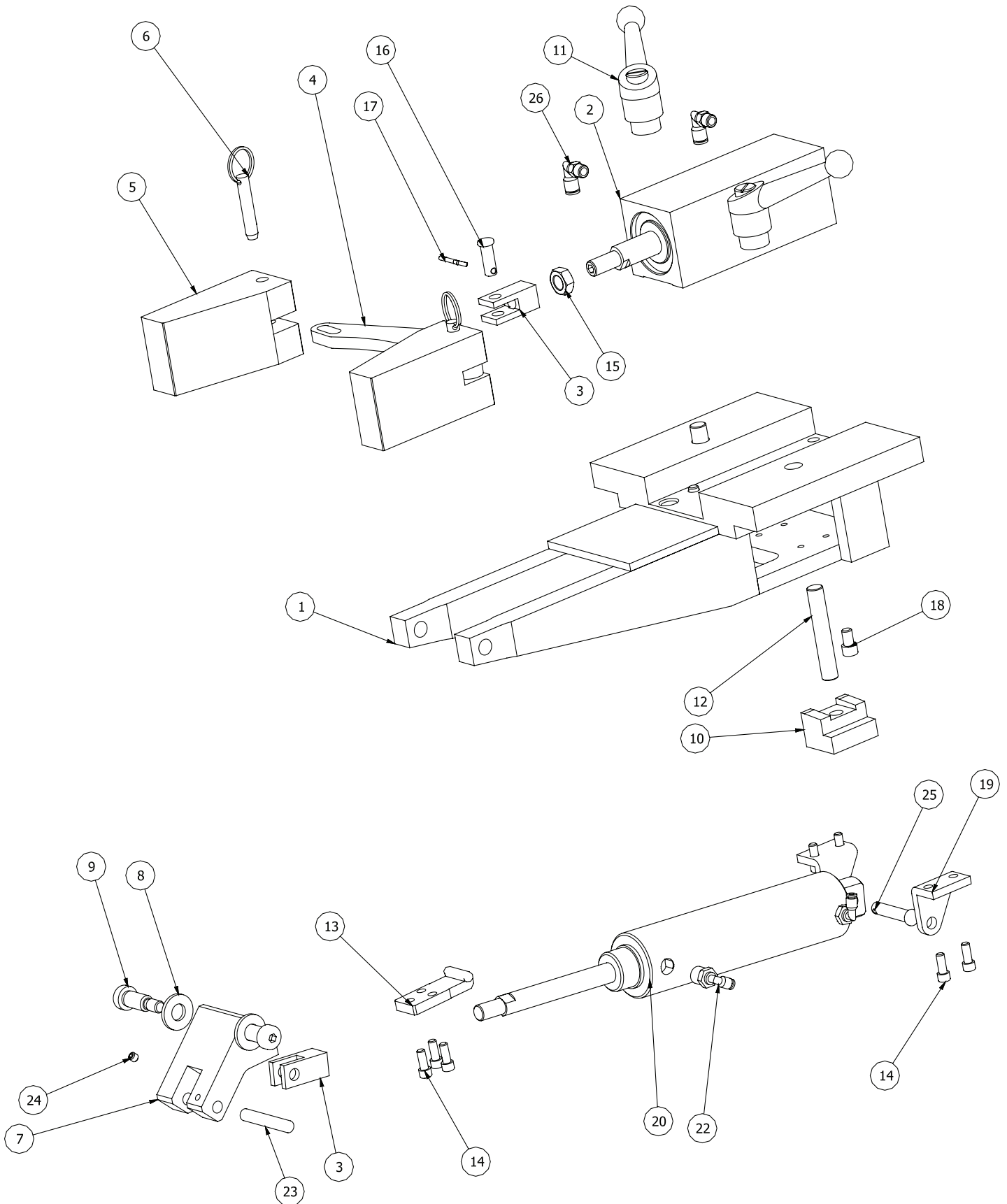


Frame Assembly Parts



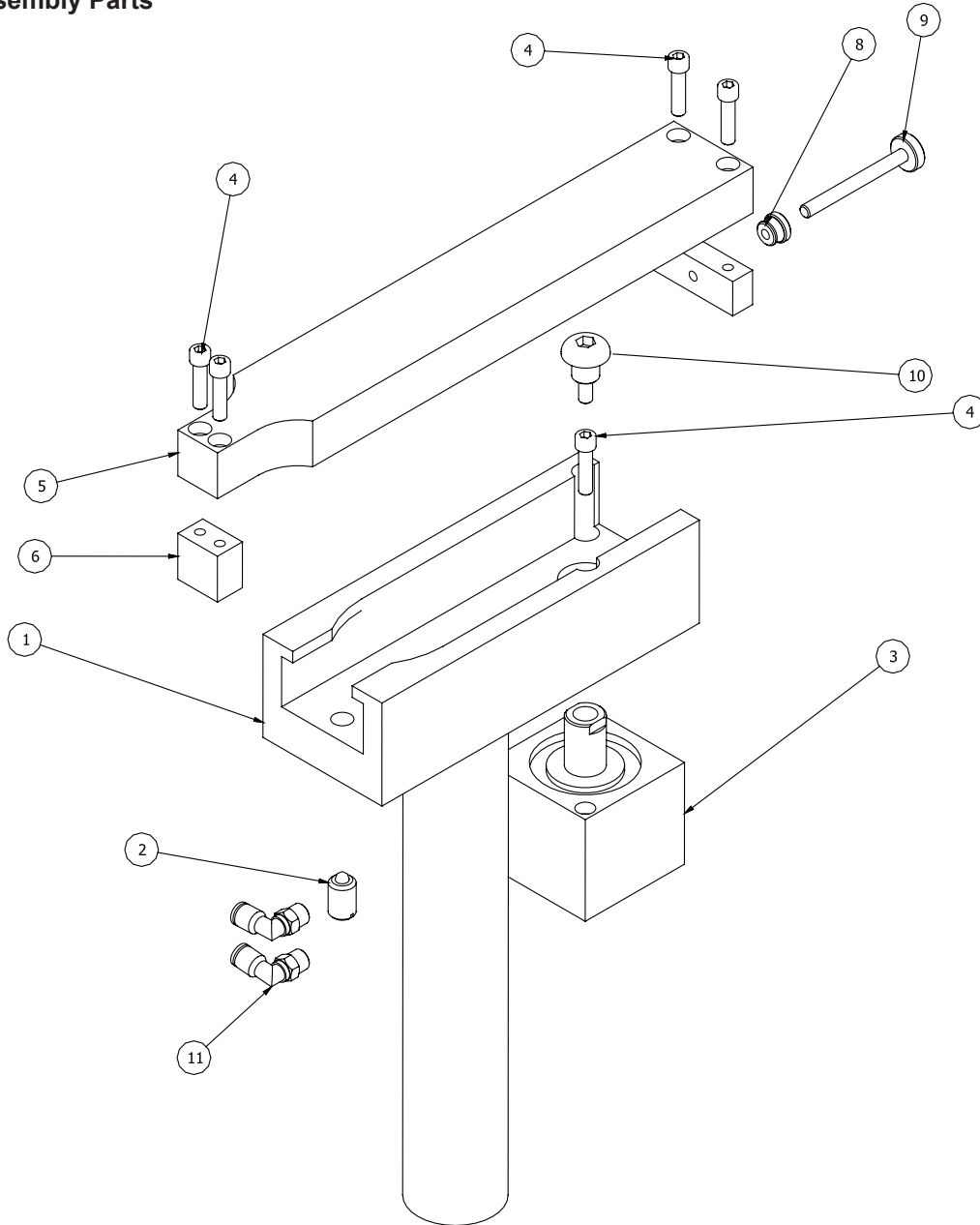
Small Precision Connecting Rod Fixture Parts List			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	650-3-67B	Small Frame
2	2	650-3-46T	Lock Nut REID BLN-105
3	2	650-3-46U	Flange Bearing Symmco SF-2832-12
4	1	650-3-46G	Pivot Shaft
5	1	650-3-46N	Locator 1.78
6	2	650-3-46C	Tooling Ball Reid #TCB-26820
7	1	650-3-46J	Locator Holder
8	1	ANSI B18.2.2 - 1/2 - 13	Hex Jam Nut
9	1	650-3-45H	Pivot Bracket Right
10	1	650-3-45K	Pivot Bracket Left
11	1	650-3-45G	Locating Cylinder
12	1	650-3-45J	Rod Clevis
13	1	650-3-47K	Stop Screw - Set 1/2-13 x 3
14	1	650-3-46K	Pivot Pin
15	1	650-3-46L	Linkage Arm
16	1	650-3-47B	Support Strap
17	2	650-3-46S	Hinge, Dust Cover
19	1	650-3-46Q	Locator Cover Con Rod Fixture
20	1	PIN1	Included in 650-3-47J
21	2	E_CLIP	Included in 650-3-47J
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 ANSI B18.3 - 5/16 - 18 - 5/8	Hexagon Socket Head Cap Screw
26	4	MF-13 ANSI B18.3 - 1/4 - 20 - 5/8	Hexagon Socket Head Cap Screw
27	2	MF-22 ANSI B18.3 - 5/16 - 18 - 3/4	Hexagon Socket Head Cap Screw
28	2	MF-53 ANSI B18.3 - 10-24 UNC - 0.375	Type B - Hexagon Socket Set Screw - Cup Point - UNC (Regular Thread - Inch)
29	2	MF-60 ANSI B18.3 - 1/4-20 UNC - 0.25	Type B - Hexagon Socket Set Screw - Cup Point - UNC (Regular Thread - Inch)
30	1	MF-210 ANSI B18.8.2 - 5/16 x 2.1/2	Pin - Slotted Spring
31	2	650-3-49Q	Clamp Base, ConRod Clamp arms
32	2	ANSI B18.8.2 - 1/2 x 3	Pin - Slotted Spring
33	2	6310R	Thread Insert
34	2	6310N	Handle
35	2	502-8-52C	Spring Plunger
37	8	ANSI B18.3 - 3/8 - 16 - 1	Hexagon Socket Head Cap Screw
40	1	650-3-48P	spring anchor Reid CSA-50
41	1	ANSI B18.6.3 - 8 - 32	Hex Machine Screw Nut UNC
42	1	514-7-83N	Extension Spring
43	3	650-3-48L	Support Parallel
44	3	ANSI B18.3 - No. 10 - 24 - 3/8	Hexagon Socket Head Cap Screw
45	2	650-3-49G	Support Tube
46	2	650-3-49M	Spring

Carriage Assembly Parts



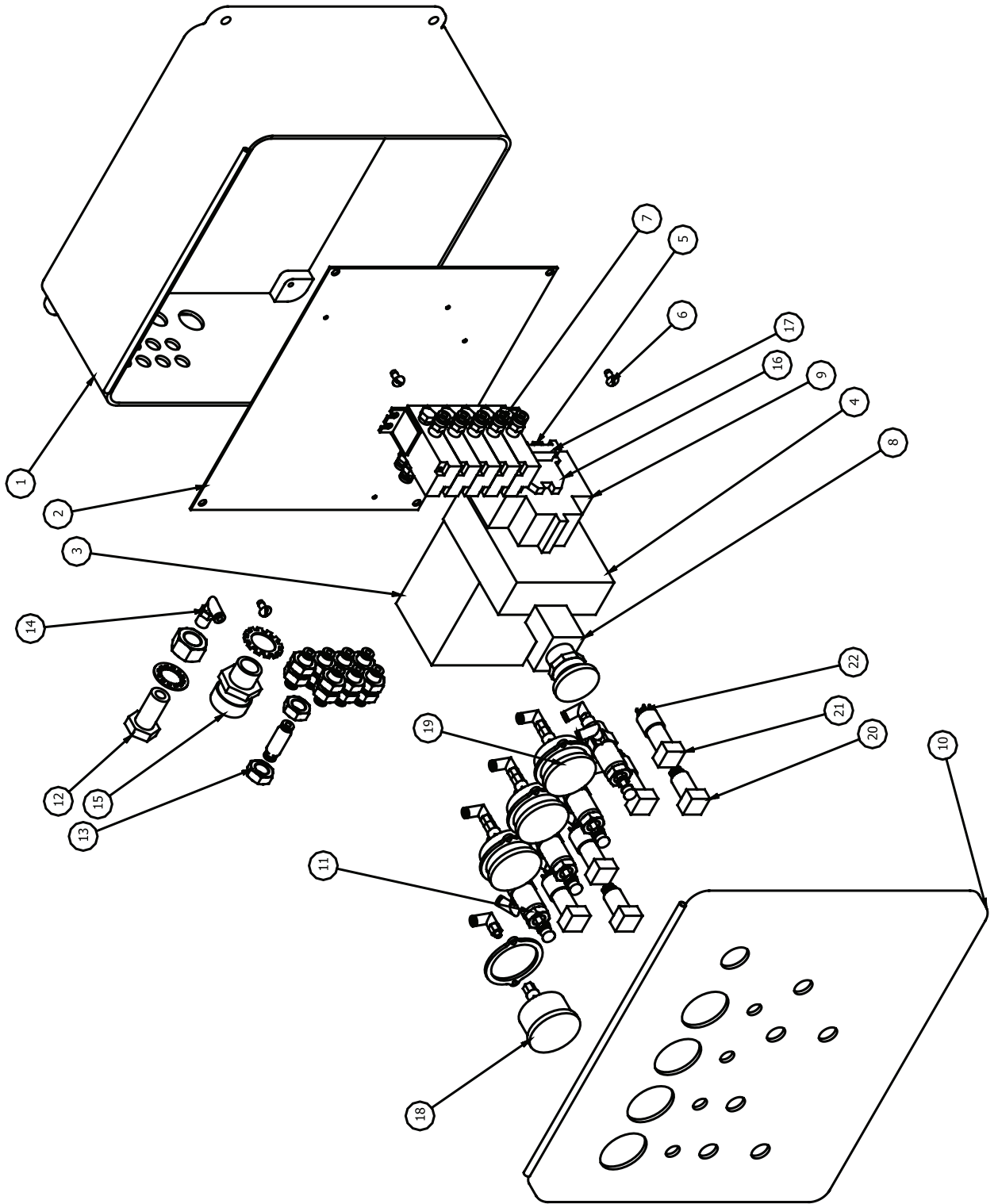
Small Precision Connecting Rod Fixture Carriage Assembly Parts List			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	650-3-67	Carriage, Machining
2	1	650-3-45D	Wedge Cylinder
3	2	650-3-45L	Clevis
4	1	650-3-48J	Linkage, Wedge
5	2	650-3-48G	Wedge Clamp - Medium Con-Rod Fixture ass'y
6	2	650-3-48K	Release Pin, Clamp Wedge
7	1	650-3-47D	Centering Lever
8	2	100-19A	Hardened washer 17/32 I.D.
9	2	650-4-45	Hexagon Socket Head Shoulder Screw 0.500 x 1
10	2	650-3-48	Clamp Shoe
11	2	514-2-39	Handle
12	2	514-4-5B	Stud
13	1	650-3-47S	Centering Block - Medium Long
14	7	MF-13 ANSI B18.3 - 1/4 - 20 - 5/8	Hexagon Socket Head Cap Screw
15	1	ANSI B18.2.2 - 1/2 - 20	Hex Jam Nut
16	1	Rod Clevis Pin RC-5	
17	2	ANSI B18.8.1 - 1/8 x 3/4 Extended Prong Square Cut Type	Pin - Cotter
18	4	ANSI B18.3 - 5/16 - 18 - 1/2	Hexagon Socket Head Cap Screw
19	2	650-3-45K	Pivot Bracket
20	1	650-3-45F	Norgren RLG04
22	2	legris angle 25x532	Legris Angle 25X532
23	1	MF-212A ANSI B18.8.2 - 3/8 x 2 1/4	Pin - Hardened Ground Production Dowel
24	1	MF-60 ANSI B18.3 - 1/4-20 UNC x 0.25	Hexagon Socket Set Screw - Cup Point
25	1	Pivot Pin Norgren cyl	
26	2		Legris Angle

Clamp Arm Assembly Parts



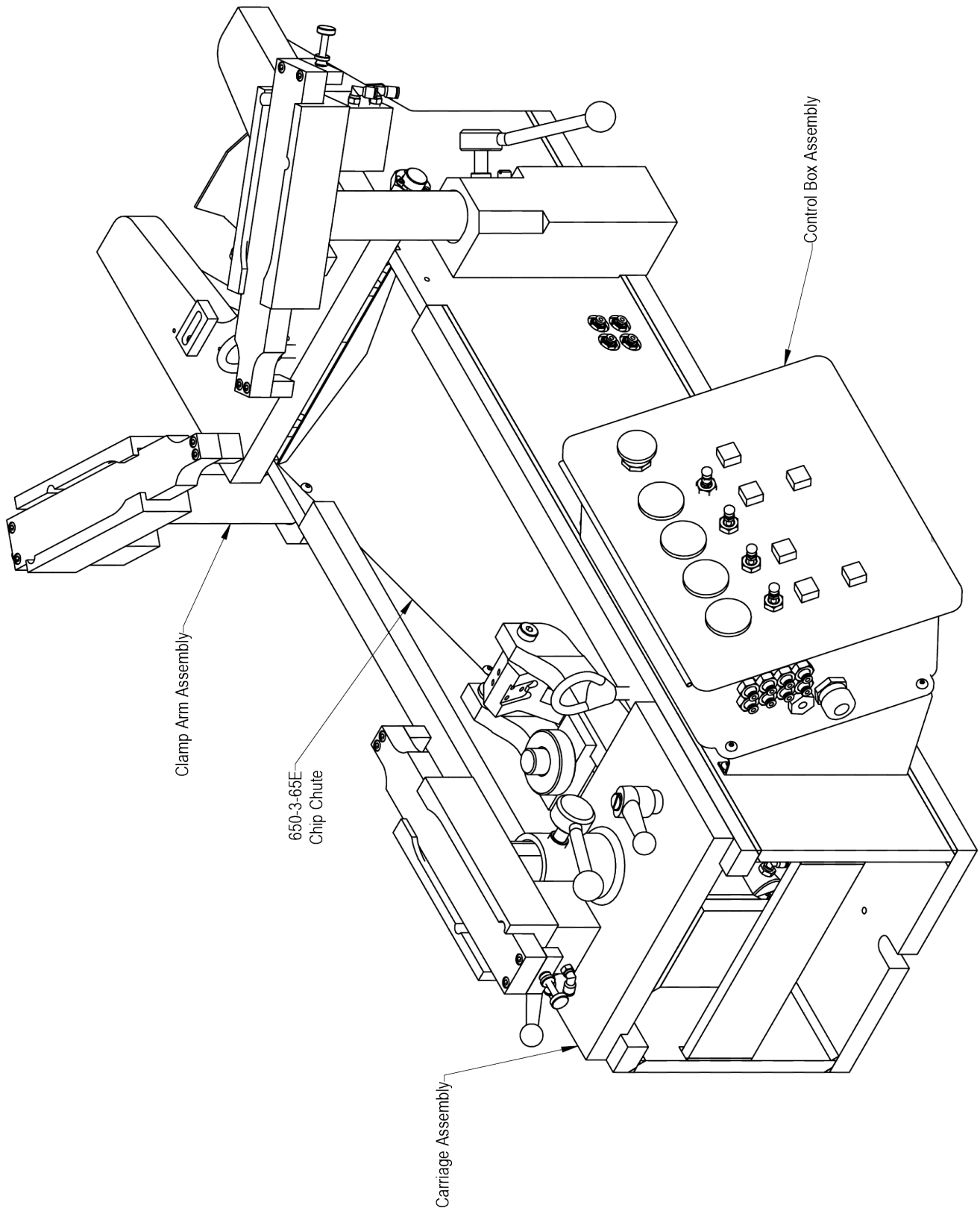
Small Precision Connecting Rod Fiture Clamp Arm Assembly Parts List			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	650-3-49H	Clamp Leg
2	1	502-8-52C	Spring Plunger
3	1	650-3-45E	Clamp Arm Cylinder
4	6	ANSI B18.3 - 1/4 - 20 UNC - 1	Hexagon Socket Head Cap Screw
5	1	650-3-49K	Clamp Arm
6	1	650-3-49L	Extension
7	1	650-3-49N	Stop Block
8	1	650-3-34J	Thumbknob Reid aj-721
9	1	650-3-34S	Clamp Screw
10	1	ANSI B18.3 - 1/2-20 - 5/8	Hexagon Socket Button Head Cap Screw
11	2	514-4-17Y	Legris Angle

Control Panel Assembly Parts

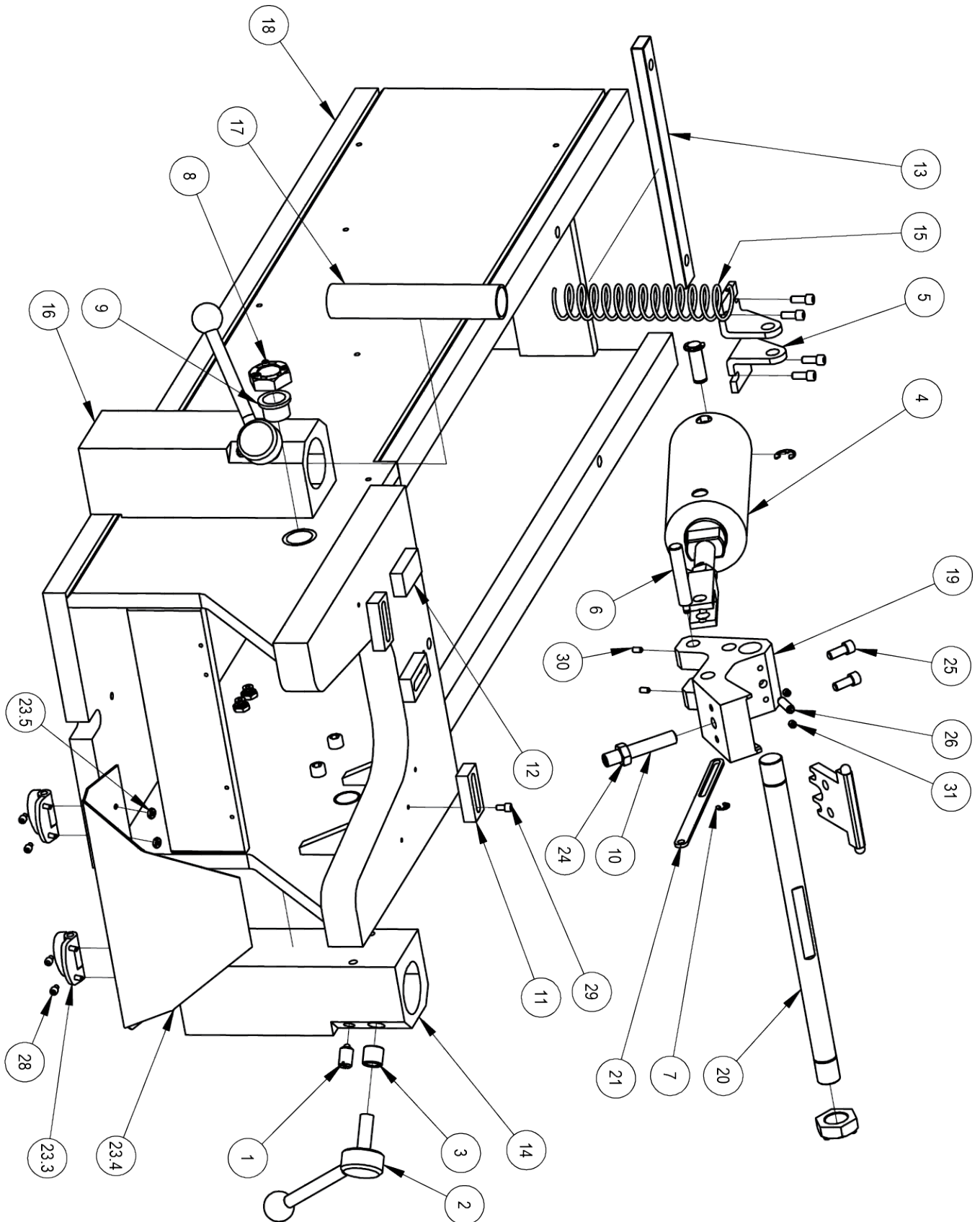


650-3-47T Parts List - Control Panel Complete w/ Air (Buchannan)			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	J1210HPL	Enclosure
2	1	BP1210AL	Enclosure Panel
3	1	PLC	Micro 3
4	1	650-3-47V	Power Supply
5	1	504-35-3F	Din Rail
6	4	ANSI B18.6.4 - 10-32 UNF - 0.375	Slotted Pan Head Tapping Screw - Type C
7	1	410-24vdc	Solenoid Assembly
8	1	6389	E-Stop Button
9	1	504-35-3	BREAKER, 2 AMP
10	1	Con Rod Lid1	
11	4	RSR	HUMPHREY, REGULATOR
12	1	PMF 532-N01U	NWH, BULKHEAD 1/4
13	8	C2029200	NORGREN, BULKHEAD 1/8
14	1	Air Fitting2	90 Degree
15	1	400-7-7	Strain Relief Assembly
16	1	514-7-74E	Ground Block
17	2	504-35-3M	End Cap
18	3	15.110.160PSI 1/8NPT 10/32PMC	NOSHOK,160 PSI GAUGE
19	1	15.110.60PSI 1/8NPT 10/31PMC	NOSHOK, 60 PSI GAUGE
20	2	6491U	PUSHBUTTON, WHITE
21	4	6491S	PUSHBUTTON, GREEN
22	4	502-37-59A	PUCHBUTTON, SOCKET

650-3-64 Rottler Precision Connecting Rod Fixturing System Components Heavy Duty ConRod Fixture

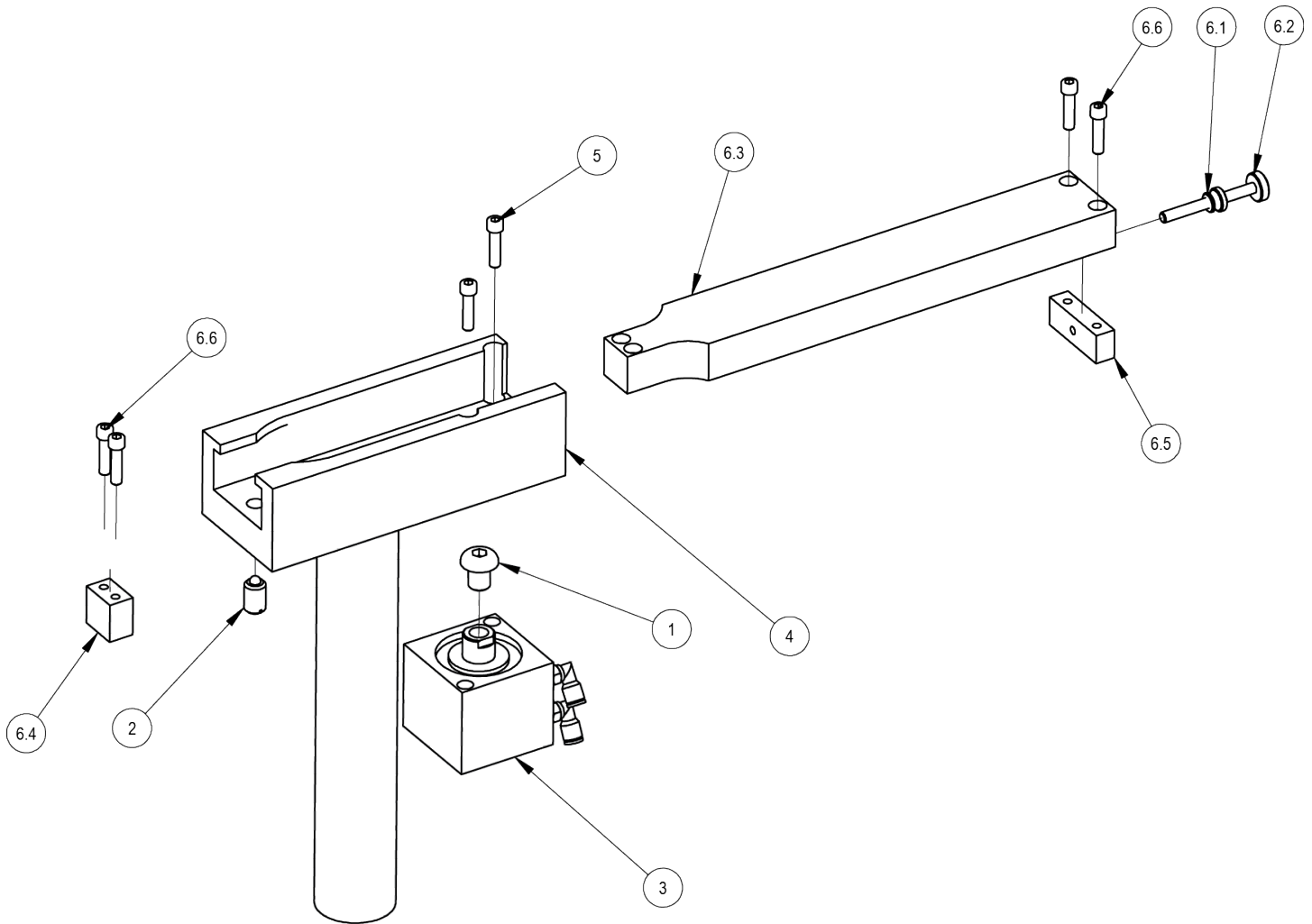


Carriage Assembly Parts



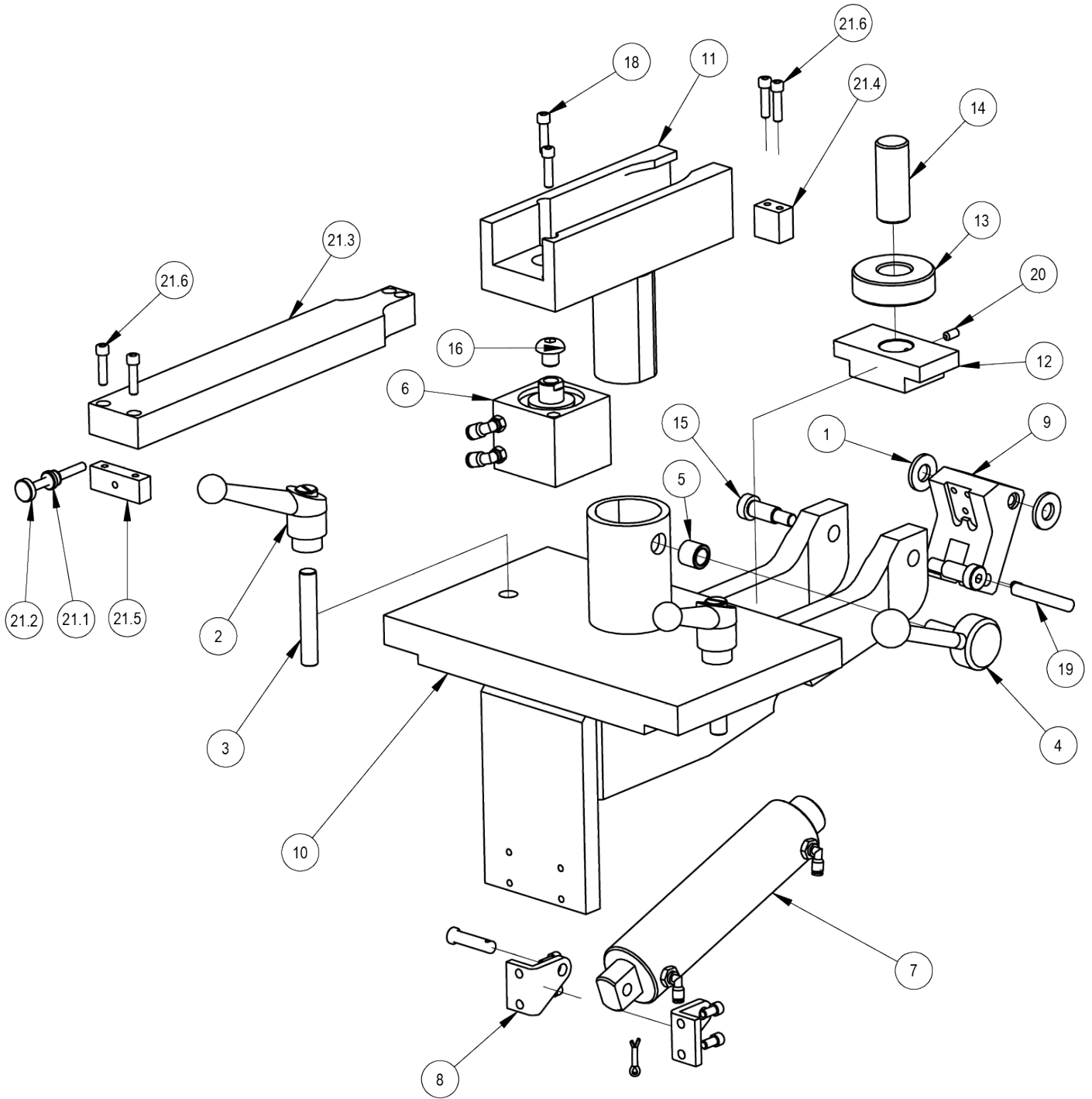
Carriage Assembly			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	2	100-19A	Hardened washer 17/32 I.D.
2	2	514-2-39	Handle
3	2	514-4-5B	Stud
4	1	6310J	Clamp Handle
5	1	6310R	Thread Insert
6	1	650-3-45E	Clamp Arm Cylinder
7	1	650-3-45F	Centering Cylinder
8	1	650-3-45K	Pivot Bracket
9	1	650-3-47D	Centering Lever
10	1	650-3-64C	Carriage
11	1	650-3-64F	Short Clamp Arm
12	1	650-3-65A	Jack Body
13	1	650-3-65B	Jacking Nut
14	1	650-3-65C	Jacking Screw
15	2	650-4-18A	Shoulder screw, 1/2" x 1" long
16	1	650-4-41	Socket Button Head Cap Screw
17	1	ANSI B18.3 - 1/4-20 UNC x 0.38	Hexagon Socket Set Screw - Cup Point
18	2	MF-15	S.H.C.S. 1/4 - 20 UNC - 1
19	1	MF-212A	Pin - Hardened Dowel
20	1	MF-61	Hexagon Socket Set Screw - Cup Point
21.1	1	650-3-34J	Thumbknob Reid aj-721
21.2	1	650-3-34S	Clamp Screw
21.3	1	650-3-49K	Clamp Arm
21.4	1	650-3-49L	Clamp Arm Extension
21.5	1	650-3-49N	Stop Block
21.6	4	MF-15	S.H.C.S. 1/4 - 20 UNC - 1

Clamp Arm Assembly Parts



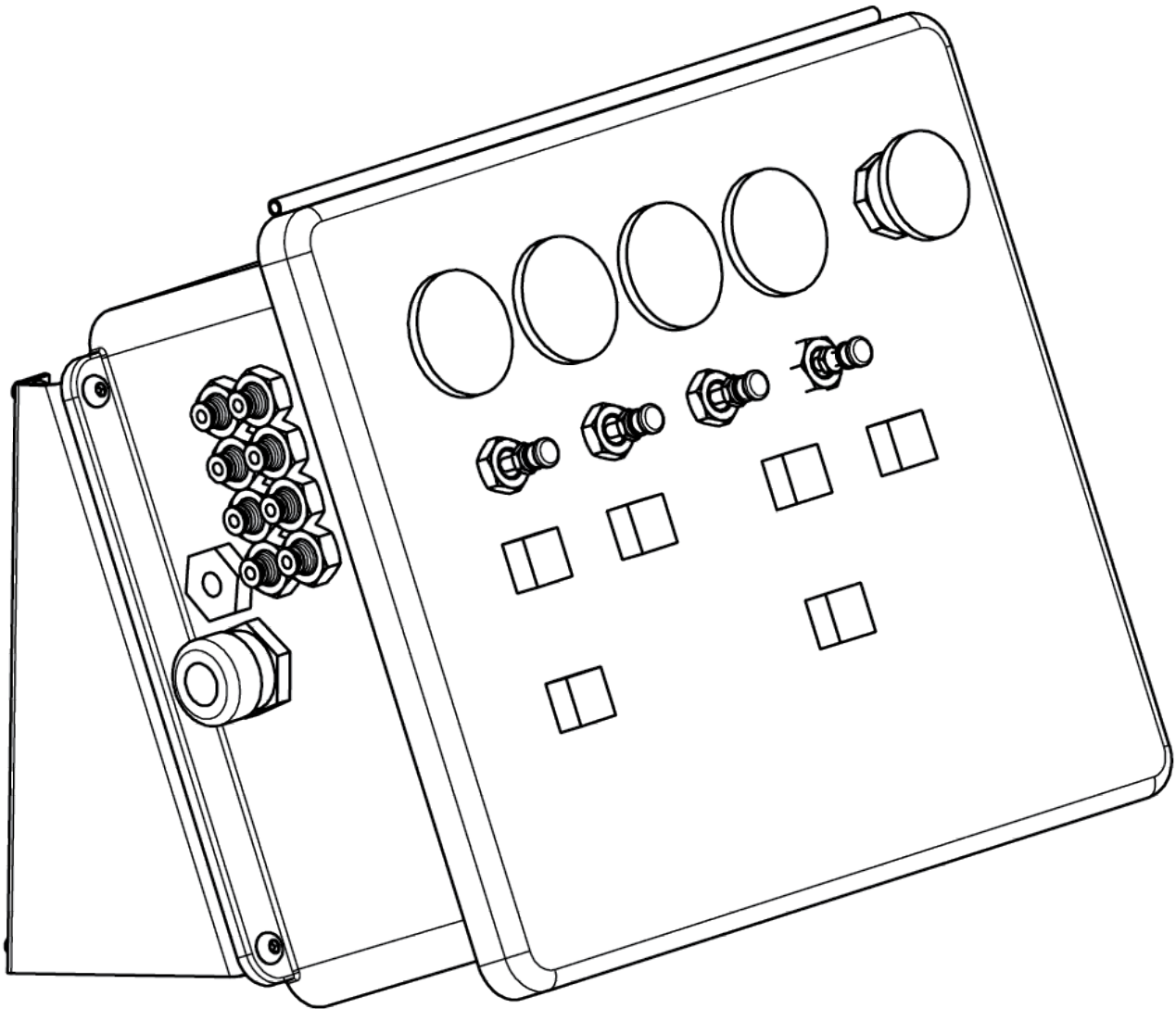
Clamp Arm Assembly			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	650-4-41	Socket Button Head
2	1	502-8-52C	Spring Plunger
3	1	650-3-45E	Clamp Arm Cylinder
4	1	650-3-49H	Clamp Leg
5	2	MF-15	S.H.C.S. 1/4 - 20 UNC - 1
6.1	1	650-3-34J	Thumbknob Reid aj-721
6.2	1	650-3-34S	Clamp Screw
6.3	1	650-3-49K	Clamp Arm
6.4	1	650-3-49L	Clamp Arm Extension
6.5	1	650-3-49N	Stop Block
6.6	4	MF-15	S.H.C.S. 1/4 - 20 UNC - 1

Centering Cylinder Assembly Parts



Conrod Centering Cylinder Assembly			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	2	502-8-52C	Spring Plunger
2	2	6310J	Clamp Handle
3	2	6310R	Thread Insert
4	2	650-3-45G	Locate Cylinder
5	1	650-3-45H	Pivot Bracket, Bimba #D-13512-A
6	1	650-3-46K	Pivot Pin
7	1	650-3-46R	E-clip - Truearc E-Ring #RE-25ST
8	2	650-3-46T	Lock Nut REID BLN-105
9	2	650-3-46U	Flange Bearing Symmco SF-2832-12
10	1	650-3-47K	Stop Screw
11	3	650-3-48L	Support Parallel
12	1	650-3-48M	Support Parallel, +.002
13	1	650-3-48R	Clamp Bar, Carriage, Large ConRod fixture
14	1	650-3-49F	Clamp Base - Left Side
15	2	650-3-49M	Spring
16	1	650-3-49e	Clamp Base - Right Side
17	2	650-3-49g	Clamp Leg Spacer Tube.
18	1	650-3-64A	Main Frame (Machining)
19	1	650-3-64G	Locator Holder
20	1	650-3-64M	Pivot Shaft
21	1	650-3-65G	Linkage Arm
22	2	650-3-9	Key
23.1	1	650-3-46H	Linkage Pin
23.2	1	650-3-46R	E-clip - Truearc E-Ring #RE-25ST
23.3	2	650-3-46S	Hinge
23.4	1	650-3-65F	Dust Cover
23.5	4	MF-160	Hex Machine Screw Nut 8-32
23.6	4	MF-3D	S.H.C.S. 8 - 32 UNC - 3/8
24	1	MF-165	Hex Jam Nut 1/2-13
25	2	MF-22	S.H.C.S. 5/16 - 18 UNC - 3/4
26	1	MF-227A	5/16 x 1-1/4 Roll Pin
27	8	MF-31	S.H.C.S. 3/8 - 16 UNC - 1
28	4	MF-3B	S.H.C.S. 8 - 32 UNC - 1/4
29	3	MF-4	S.H.C.S. 10 - 24 UNC - 3/8
30	2	MF-53	Cup Point Set Screw 10 - 24 x 3/8
31	2	MF-60	Cup Point Set Screw 1/4 - 20 x 1/4
32	2	MF21A	S.H.C.S. 5/16 - 18 UNC - 1/2

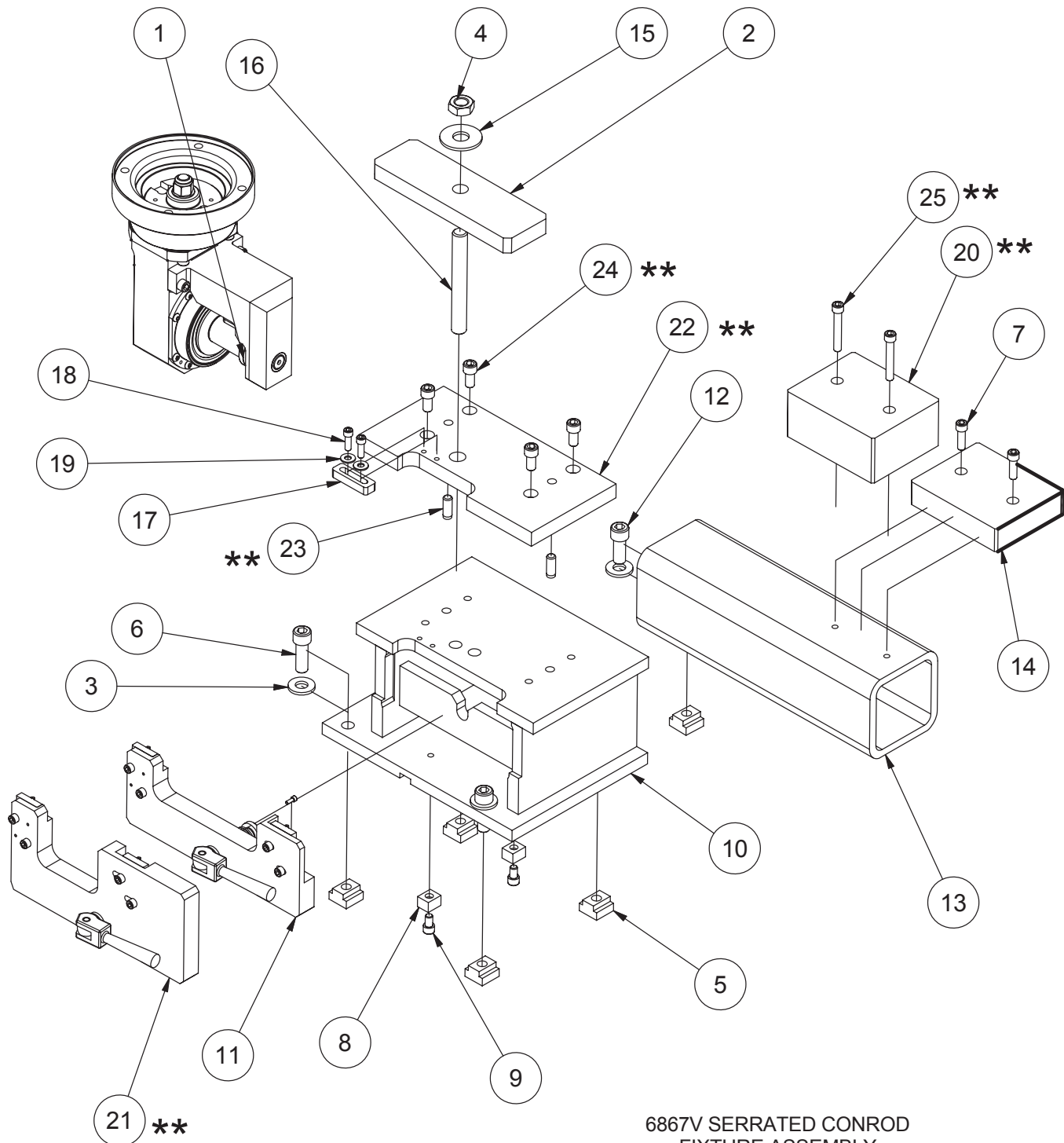
Control Box Assembly Parts



Control Box Assembly			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	650-3-47T	Conrod Control Box Assembly
2	4	650-3-47W	Rivet nut Reid ALC-47850
3	2	650-3-65D	Bracket, Control Box ConRod Fixture
4	4	ANSI B18.3 - 1/4 - 20 x 3/8	Button Head Cap Screw
5	4	MF-91	Button Head Cap Screw

System for Cutting Serrated Connecting Rods

6867V Serrated Rod Cutting Package Parts

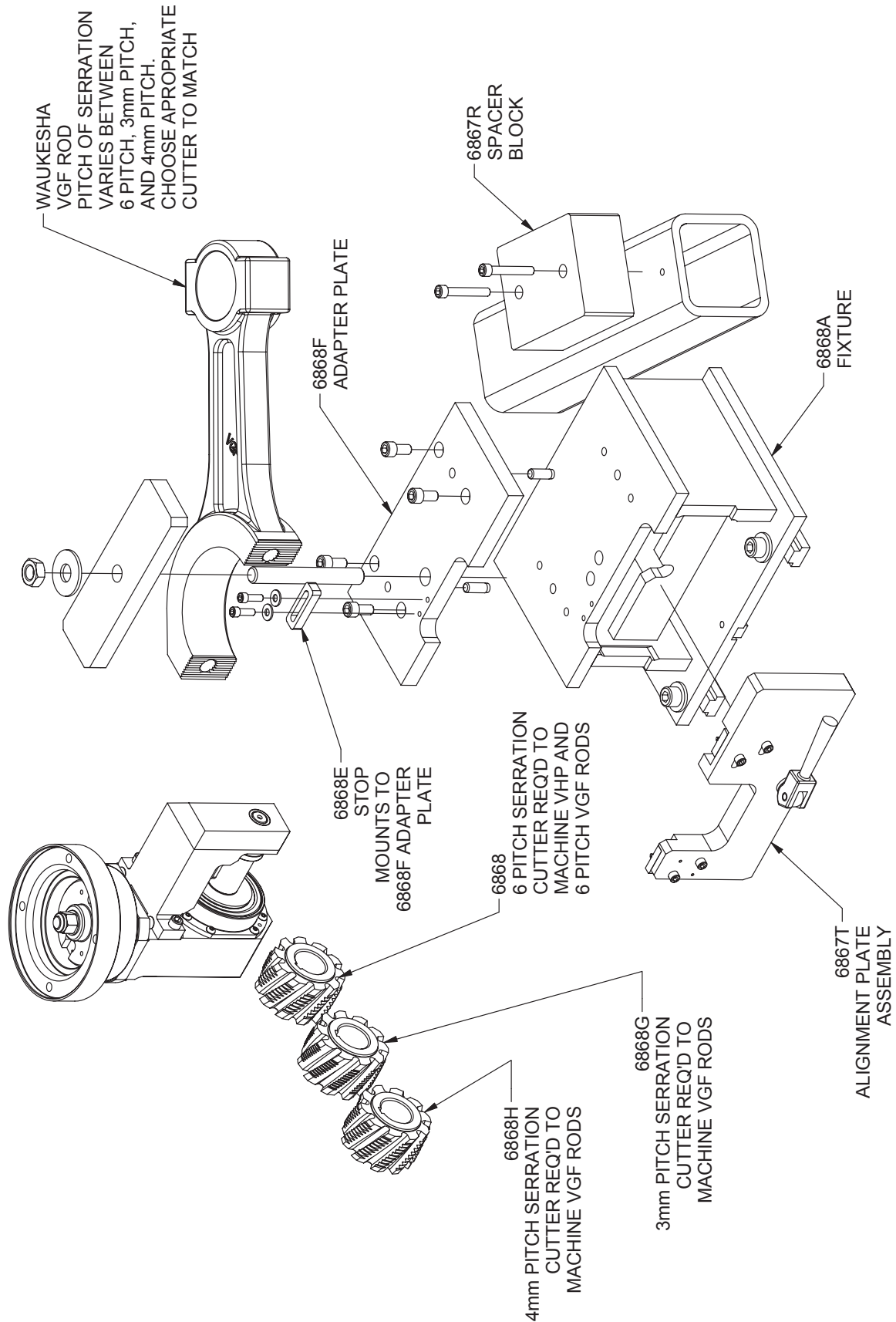


6867V SERRATED CONROD
FIXTURE ASSEMBLY
F69 APPLICATION

6867V SERRATED CONROD FIXTURE ASSEMBLY - F69			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	6856G	MID SIZE R.A.D. ASSEMBLY FOR SERRATION CUTTING FIXTURE F68
2	1	6867K	CLAMP BAR - SERRATED CONROD FIXTURE
3	5	100-19A	Hardened washer 17/32 I.D.
4	1	MF-166	5/8-11UNC HEX NUT
5	5	650-3-10	TN-5 T-Nut
6	4	MF-44	Hexagon Socket Head Cap Screw
7	2	MF-23	S.H.C.S. 5/16 - 18 UNC - 1
8	2	650-3-9	Key
9	2	MF21A	Hexagon Socket Head Cap Screw
10	1	6868A	FIXTURE (MACHINING) SERRATED CONROD FIXTURE
11	1	6867B	ALIGNMENT PLATE ASSY
12	1	MF-43	S.H.C.S. 1/2 - 13 UNC - 1 1/4
13	1	6867P	SMALL END SUPPORT - SERRATED CONROD FIXTURE
14	1	6867N	SPACER BLOCK, SMALL END SUPPORT, VHP ROD - SERRATED CONROD FIXTURE
15	1	MF-181	5/8" FLAT WASHER
16	1	6868D	CLAMP STUD - SERRATED CONROD FIXTURE
17	1	6868E	STOP, SERRATED CONROD FIXTURE
18	2	MF-14	Hexagon Socket Head Cap Screw
19	2	MF-176	SAE FLAT WASHER 1/4"
20	1	6867R **	SPACER BLOCK, SMALL END SUPPORT - SERRATED CONROD FIXTURE
21	1	6867S **	ALIGNMENT PLATE ASSY
22	1	6868F **	ADAPTER PLATE
23	2	MF-212 **	3/8" x 1" LG. DOWEL PIN
24	4	MF-30 **	3/8-16UNC x 3/4" LG. S.H.C.S.
25	2	MF-27 **	5/16-18UNC x 2" LG. S.H.C.S.

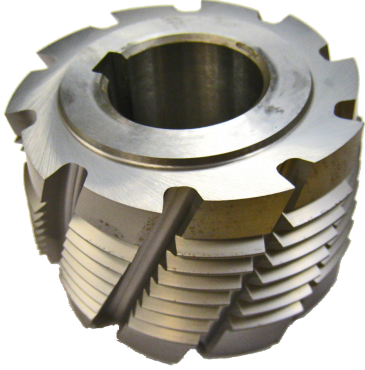
** THESE PARTS REQUIRED FOR MACHINING WAUKESHA VGF RODS AND CAPS ONLY.

6867V Setup



6867V
SERRATED CONROD FIXTURE ASSEMBLY
CONFIGURED FOR MACHINING WAUKESHA VGF RODS
F69 APPLICATION

6868 Six pitcher cutter used on the VHP rod and some CGF rods



6868G 3mm pitch cutter used on VGF rods



6868H 4mm pitch cutter used on some VGF rods

