

# ROTTLER

## EM69HP 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@rottlermfg.com](mailto:parts@rottlermfg.com) or [intlparts@rottlermfg.com](mailto:intlparts@rottlermfg.com)

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

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

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



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## Optional Digitizing and Probing System

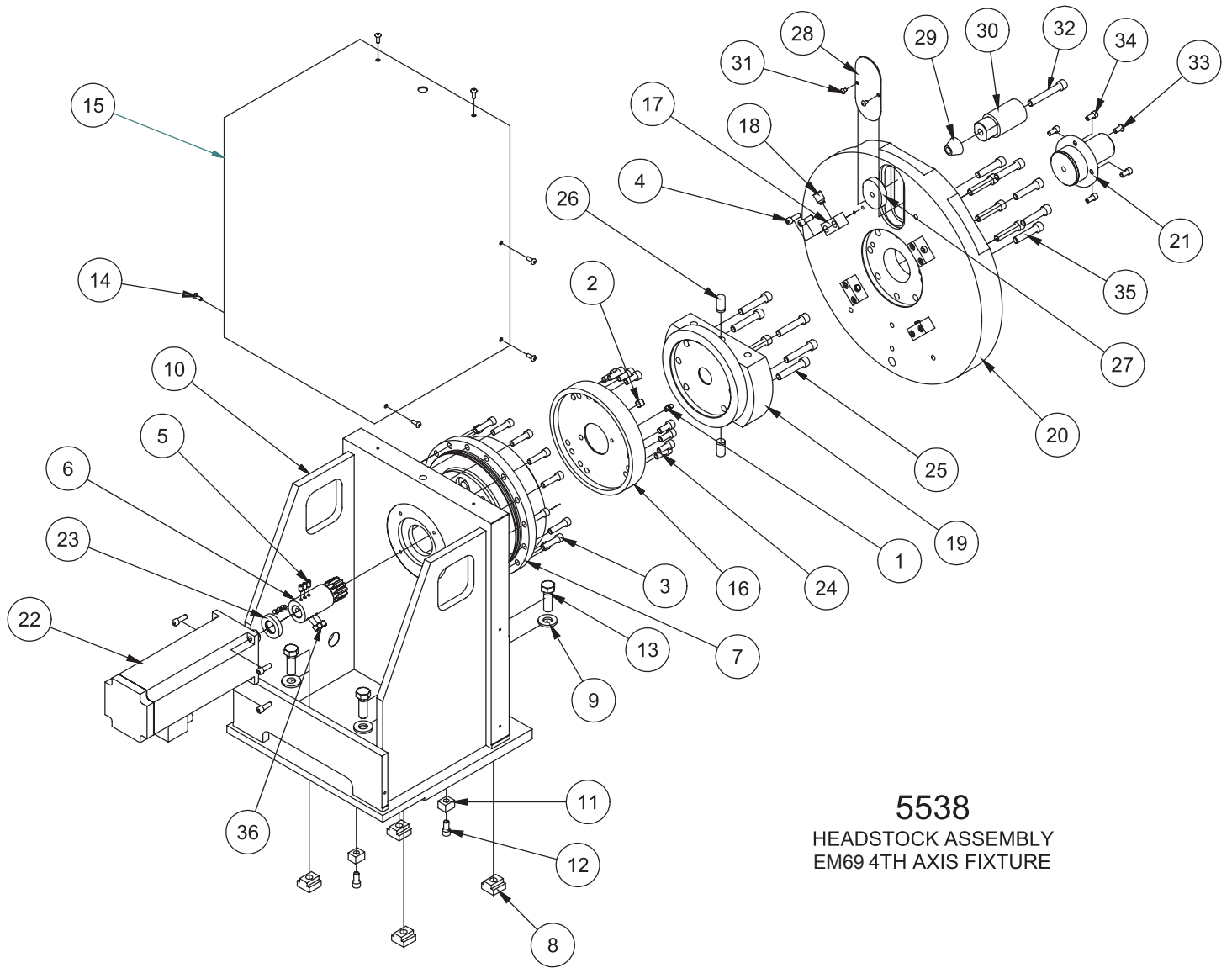
## APD-PROBE4 Components



ITEM	PART #	DESCRIPTION
1	6648P	CAT 40 SHANK FOR RMP40 PROBE ASSEMBLY
2	650-3-59Z	PROBE ONLY-RMP40
3	650-3-59D	100MM LONG X 6MM DIA. STYLUS PROBE ASSEMBLY
4	650-3-59C	50MM LONG X 6MM DIA. STYLUS PROBE ASSEMBLY
5	650-3-59K	STYLUS EXTENSION, RENISHAW PROBE ASSEMBLY(50MM)

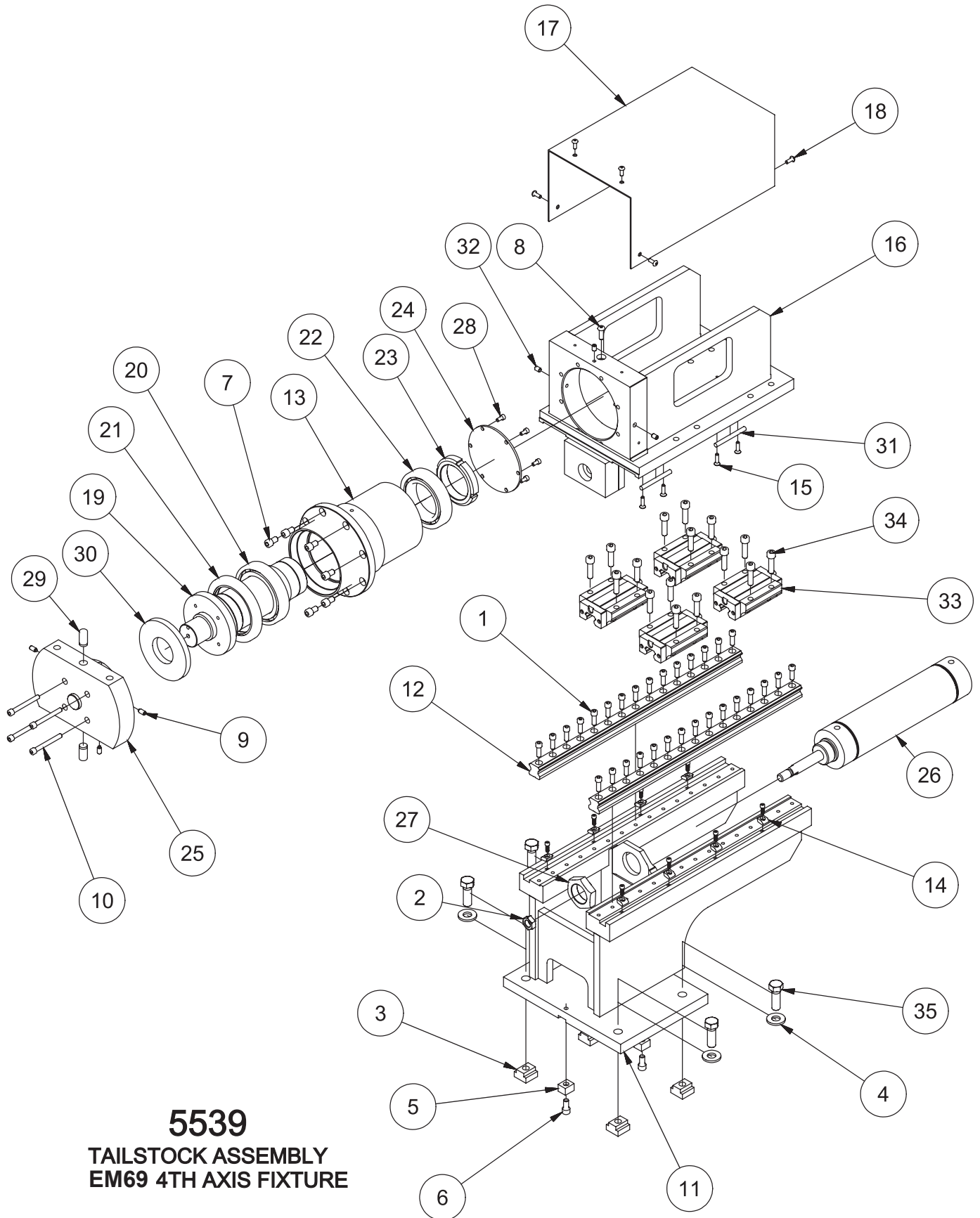
## Optional 4th Axis Fixture for Cylinder Heads and Engine Blocks

### 5537 Automatic 4th Axis Fixture Headstock Parts



5538 HEADSTOCK ASSEMBLY - 4TH AXIS FIXTURE			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	MF-189	STRAIGHT GREASE FITTING
2	1	MF-233	Countersunk Hex-Head Plug 1/8
3	16	MF-24	S.H.C.S.5/16 - 18 UNC - 1 1/4
4	12	MF-14	S.H.C.S.1/4 - 20 UNC - 3/4
5	3	5538L	M6x1 x 10MM LG. FLAT POINT SET SCREW
6	1	5538B	INPUT GEAR, RV80E GEARBOX, 4TH AXIS FIXTURE
7	1	5538A	GEAR REDUCTION, HEADSTOCK
8	4	650-3-10	TN-5 T-Nut
9	4	100-19A	Hardened washer 17/32 I.D.
10	1	5538C	HEADSTOCK HOUSING (MACHINING) 4TH AXIS
11	2	650-3-9	Key
12	2	MF-21	S.H.C.S.5/16 - 18 UNC - 5/8
13	4	MF-150A	1/2-13UNC x 1-1/2" LONG HEX BOLT
14	8	MF-88A	Socket Button Head10 - 24 x 1/2
15	1	5538E	COVER, HEADSTOCK - 4TH AXIS
16	1	5538F	SUB PLATE, HEADSTOCK - 4TH AXIS FIXTURE
17	4	650-3-93	PUSHER BLOCK, FACEPLATE - 4TH AXIS FIXTURE
18	4	6310L	1/2-13UNC x 5/8" LONG SET SCREW, BRASS TIPPED
19	1	5538G	PORTING MOUNT, HEADSTOCK - 4TH AXIS FIXTURE
20	1	5538H	FACEPLATE (MACHINING), BLOCK MOUNT, HEADSTOCK - 4TH AXIS FIXTURE
21	1	5538J	PINION, FACEPLATE, HEADSTOCK - 4TH AXIS FIXTURE
22	1	650-3-93B	SERVO MOTOR, TILT - HEAD PORTING FIXTURE
23	1	650-3-61N	OIL SEAL
24	12	650-4-27	M8x1.25 x 20
25	6	MF-34	S.H.C.S.3/8 - 16 UNC - 2
26	2	MF-213B	1/2 x 1 Dowel Pin
27	1	650-3-62V	NUT, EXPANDING CAM LOCATOR - AUTO PERFORMANCE FIXTURE
28	1	650-3-62G	COVER, CAM LOCATOR NUT - AUTO PERFORMANCE FIXTURE
29	1	650-3-70D	CONE WASHER, EXPANDING CAM LOCATOR - AUTO PERFORMANCE FIXTURE
30	1	650-3-62D	CAM LOCATION SET-UP TOOL - AUTO PERFORMANCE FIXTURE
31	2	MF-86	8-32UNC x 1/4" LG. SOCKET BUTTONHEAD SCREW
32	1	MF-36	3/8-16UNC x 2-1/2" LG. S.H.C.S.
33	1	MF-90	Socket Button Head1/4 - 20 x 1/2
34	4	MF-12	S.H.C.S.1/4 - 20 UNC - 1/2
35	8	MF-33A	3/8-16UNC x 1-3/4" LG. S.H.C.S.
36	6	5538K	M6x1 x 8MM LG. FLAT POINT SET SCREW

## 5537 Automatic 4th Axis Fixture Tailstock Parts



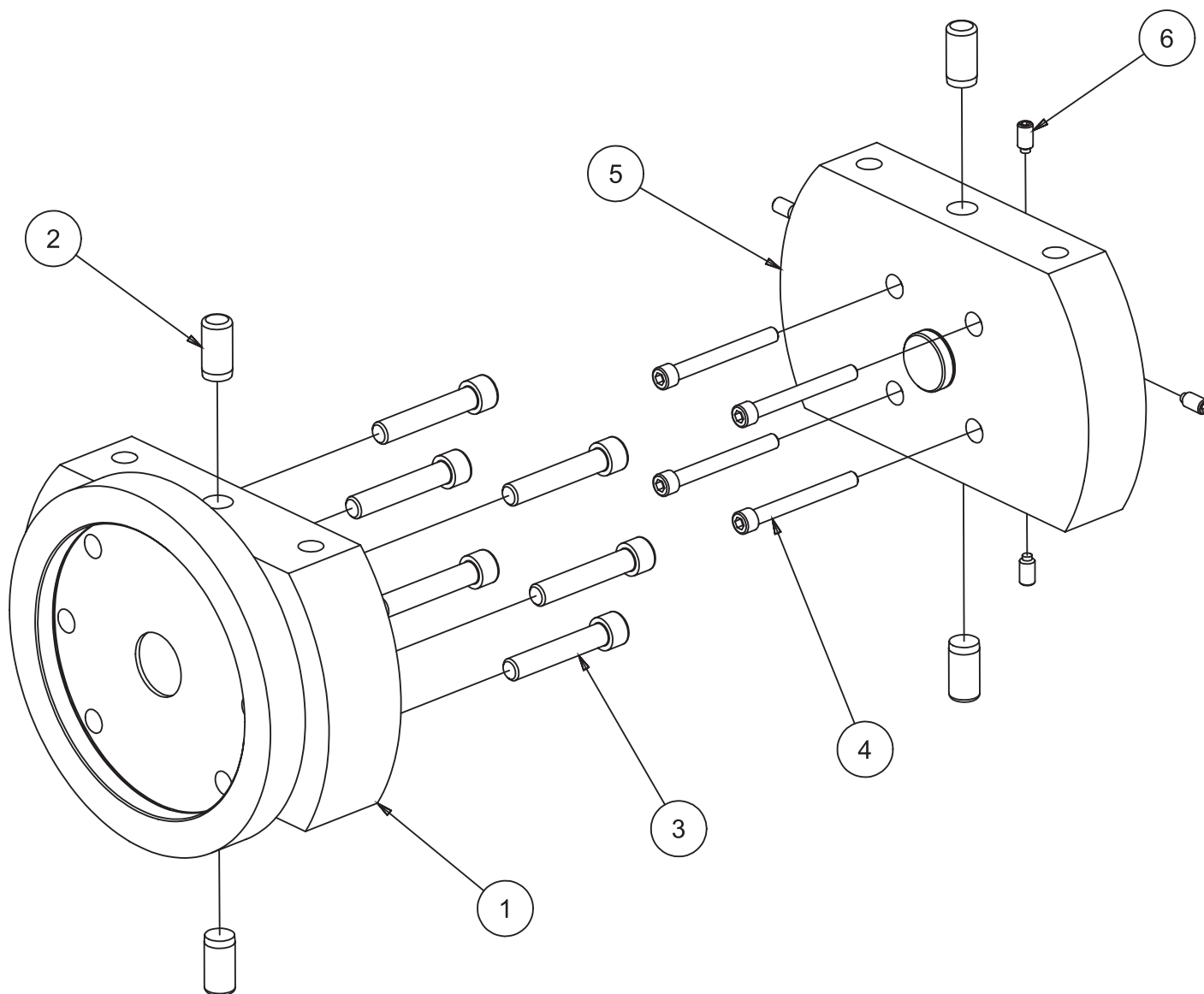
**5539**  
**TAILSTOCK ASSEMBLY**  
**EM69 4TH AXIS FIXTURE**

## 5539 TAILSTOCK ASSEMBLY - 4TH AXIS FIXTURE

ITEM	QTY	PART NUMBER	DESCRIPTION
1	30	MF-14	S.H.C.S.1/4 - 20 UNC - 3/4
2	1	MF-172	1/2-20UNF HEX JAM NUT
3	4	650-3-10	TN-5 T-Nut
4	4	100-19A	Hardened washer 17/32 I.D.
5	2	650-3-9	Key
6	2	MF-21	S.H.C.S.5/16 - 18 UNC - 5/8
7	8	MF21A	S.H.C.S.5/16 - 18 UNC - 1/2
8	1	Mf-92	Socket Button Head1/4 - 20 x 3/4
9	4	5539T	1/4-28UNF x 1/2" LG. BRASS TIP SET SCREW
10	4	MF-19A	S.H.C.S.1/4 - 20 UNC - 2 1/4
11	1	5539A	TAIL STOCK HOUSING (MACHINING)
12	2	5539H RAIL	LINEAR RAIL UNIT OF LINEAR RAIL SYSTEM
13	1	5539E	NOSE HOUSING
14	8	7314A	Linear Rail Clamp
15	4	MF-80	Hexagon Socket Flat Countersunk Head Cap Screw
16	1	5539C	UPPER BODY - TAILSTOCK (MACHINING) - 4TH AXIS FIXTURE
17	1	5539F	COVER, TAILSTOCK - 4TH AXIS FIXTURE
18	6	MF-88A	Socket Button Head10 - 24 x 1/2
19	1	5539G	NOSE SHAFT
20	1	5539J	ANGULAR CONTACT BEARING
21	1	5539K	OIL SEAL
22	1	5539L	ANGULAR CONTACT BEARING
23	1	5539M	BH12 BEARING NUT
24	1	5539N	BACK COVER, NOSE CAP, TAILSTOCK, 4TH AXIS FIXTURE
25	1	5539P	MOUNTING BLOCK, PORTING, TAILSTOCK, FIXTURE
26	1	5539Q	STROKING CYLINDER
27	1	504-37-8A	NUT, MOUNTING, CYLINDER
28	6	MF-4	S.H.C.S. 10 - 24 UNC - 3/8
29	2	MF-213B	1/2 x 1 Dowel Pin
30	1	650-3-61K	CUSHION, TAILSTOCK - AUTO PERFORMANCE FIXTURE
31	2	5539S	ROD, CLAMP, LINEAR RAIL CARRIAGE, TAILSTOCK - 4TH AXIS FIXTURE
32	3	MF-59	Flat Point 1/4-20 UNC x 0.38
33	4	7314B carriage	CAR UNIT OF LINEAR RAIL SYSTEM
34	16	650-4-24	M8x1.25 x 30 LG. S.H.C.S.

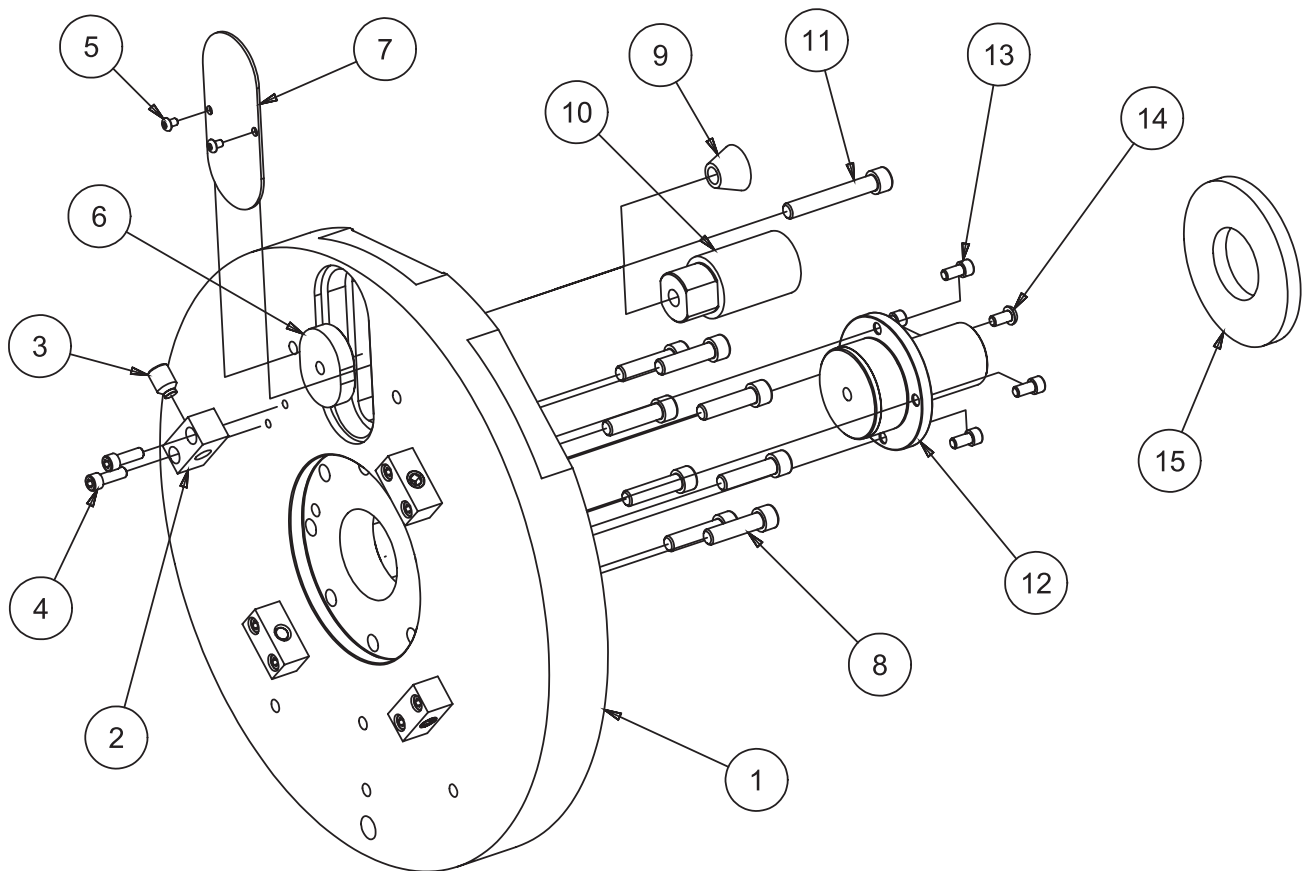


## 5537B Universal Cylinder Head Mounting System Parts



5537B HEAD PORTING TOOLING SET - 5537A 4TH AXIS FIXTURE			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	5538G	PORTING MOUNT, HEADSTOCK - 4TH AXIS FIXTURE
2	4	MF-213B	1/2 x 1 Dowel Pin
3	6	MF-34	S.H.C.S.3/8 - 16 UNC - 2
4	4	MF-19A	S.H.C.S.1/4 - 20 UNC - 2 1/4
5	1	5539P	MOUNTING BLOCK, PORTING, TAILSTOCK, P69AHD FIXTURE
6	4	5539T	1/4-28UNF x 1/2" LG. BRASS TIP SET SCREW

## 5537C Universal Engine Block Mounting System Parts

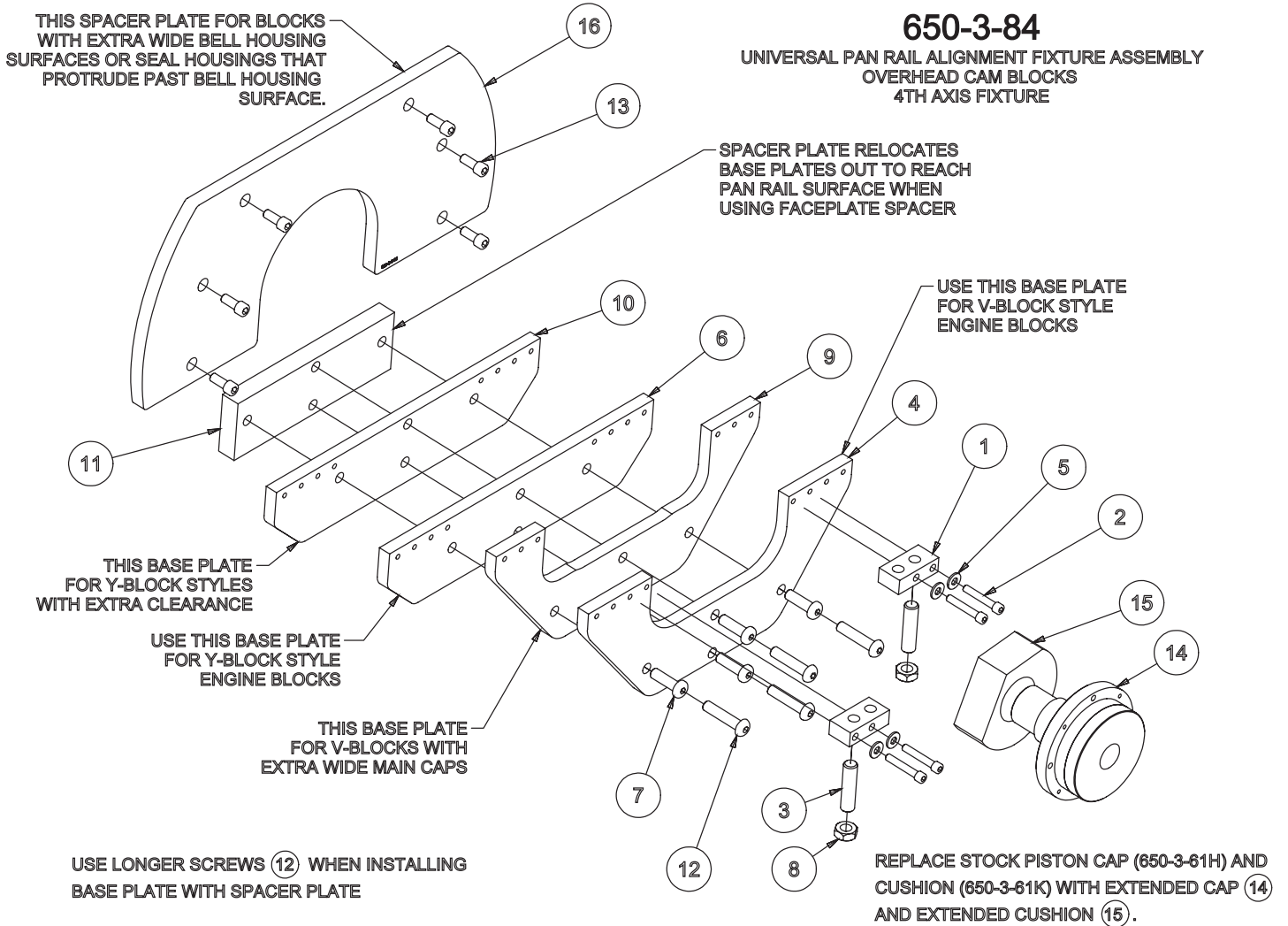


5537C BLOCK FIXTURING TOOLING SET - 5537A 4TH AXIS FIXTURE			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	5538H	FACEPLATE (MACHINING), BLOCK MOUNT, HEADSTOCK 4TH AXIS FIXTURE
2	4	650-3-93	PUSHER BLOCK, FACEPLATE - 4TH AXIS FIXTURE
3	4	6310L	1/2-13UNC x 5/8" LONG SET SCREW, BRASS TIPPED
4	8	MF-14	S.H.C.S. 1/4 - 20 UNC - 3/4
5	2	MF-86	Socket Button Head 8 - 32 x 1/4
6	1	650-3-62V	NUT, EXPANDING CAM LOCATOR - AUTO PERFORMANCE FIXTURE
7	1	650-3-62G	COVER, CAM LOCATOR NUT - AUTO PERFORMANCE FIXTURE
8	8	MF-33	Hexagon Socket Head Cap Screw
9	1	650-3-70D	CONE WASHER, EXPANDING CAM LOCATOR - AUTO PERFORMANCE FIXTURE
10	1	650-3-62D	CAM LOCATION SET-UP TOOL - AUTO PERFORMANCE FIXTURE
11	1	Mf-36	S.H.C.S. 3/8 - 16 UNC - 2 1/2
12	1	5538J	PINION, FACEPLATE, HEADSTOCK - P69AHD 4TH AXIS FIXTURE
13	4	MF-12	S.H.C.S. 1/4 - 20 UNC - 1/2
14	1	MF-90	Socket Button Head 1/4 - 20 x 1/2
15	1	650-3-61K	CUSHION, TAILSTOCK - AUTO PERFORMANCE FIXTURE

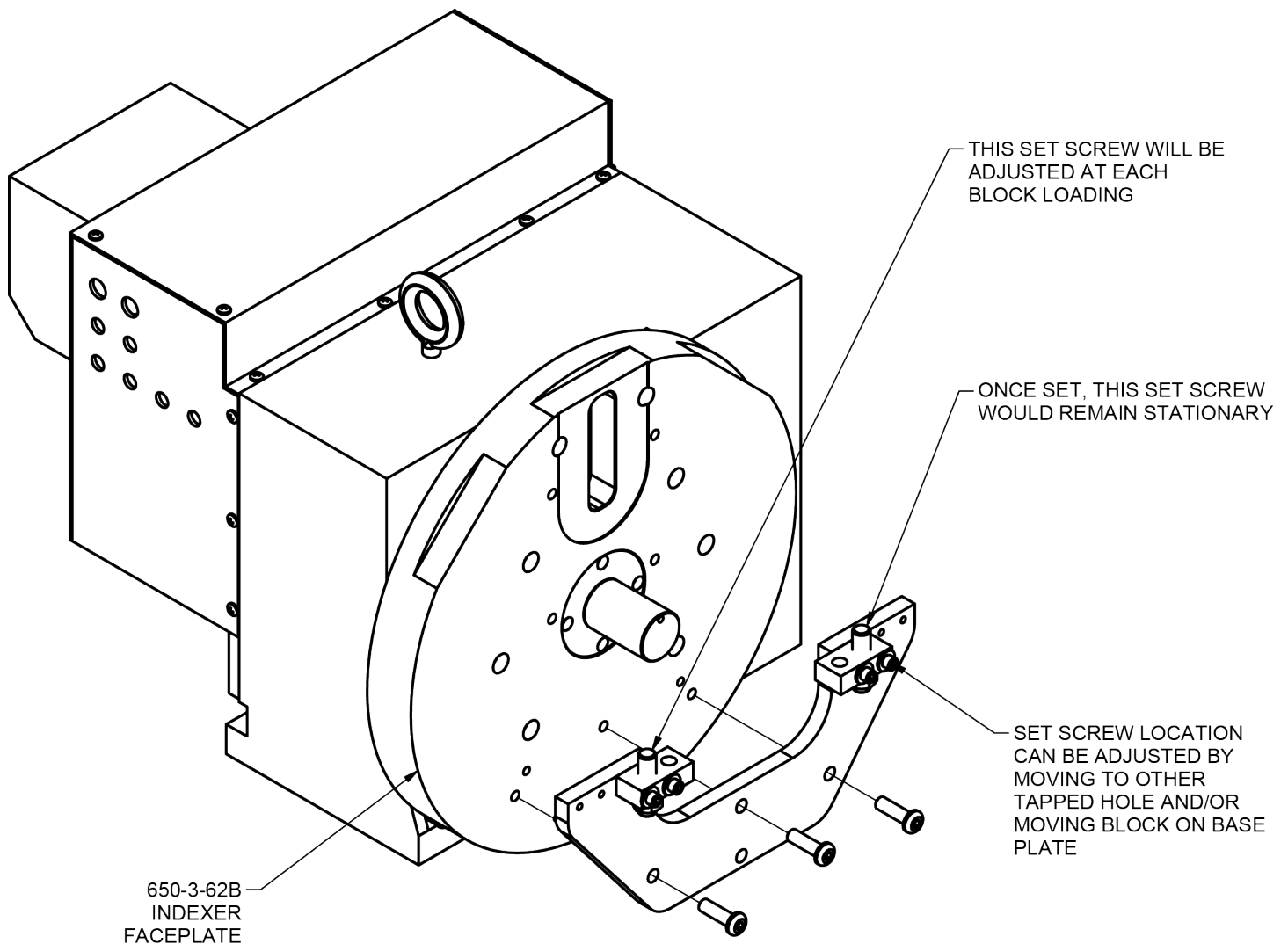
**650-3-84 Overhead Camshaft Block Fixture Parts**

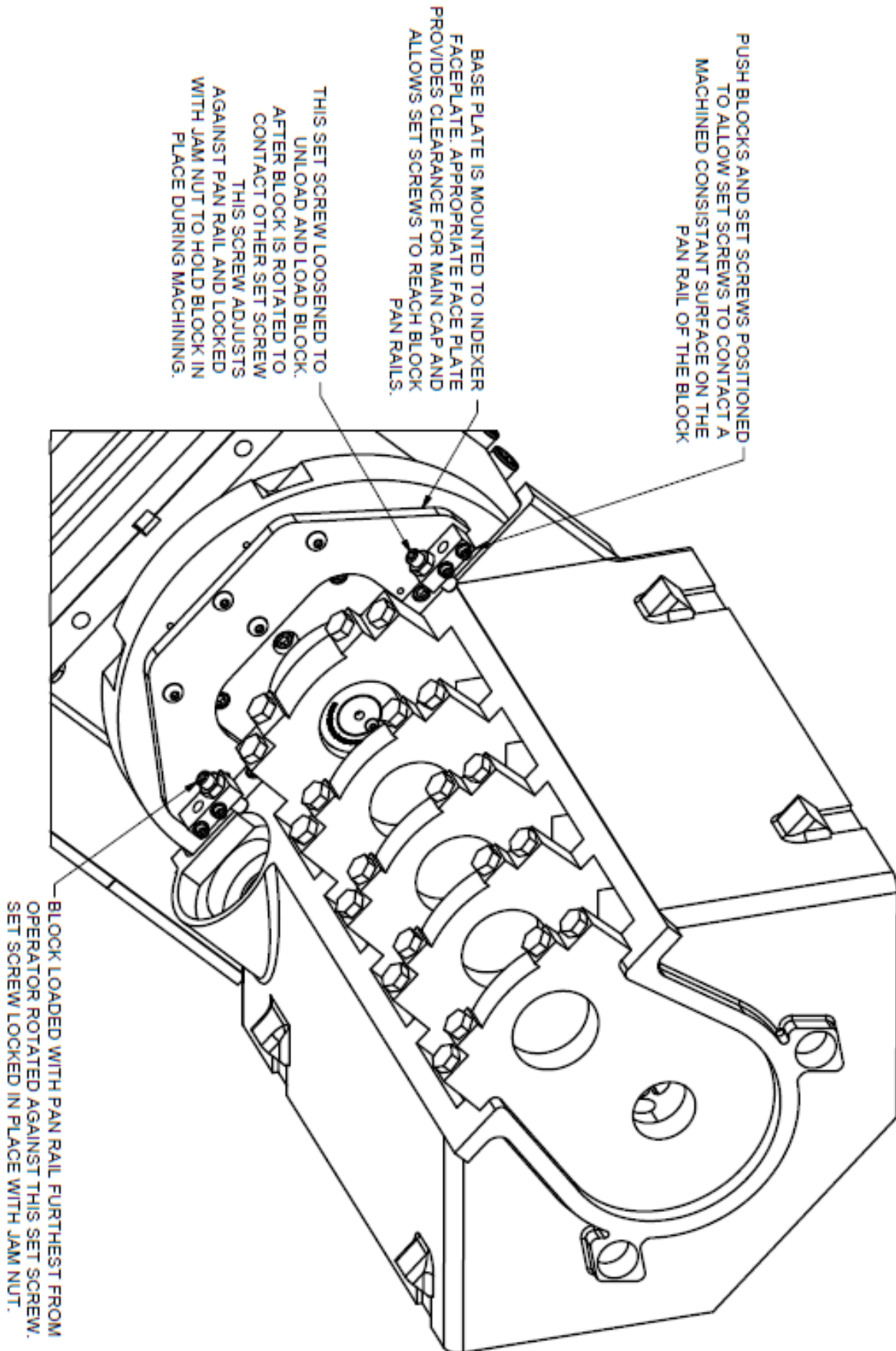
**650-3-84**

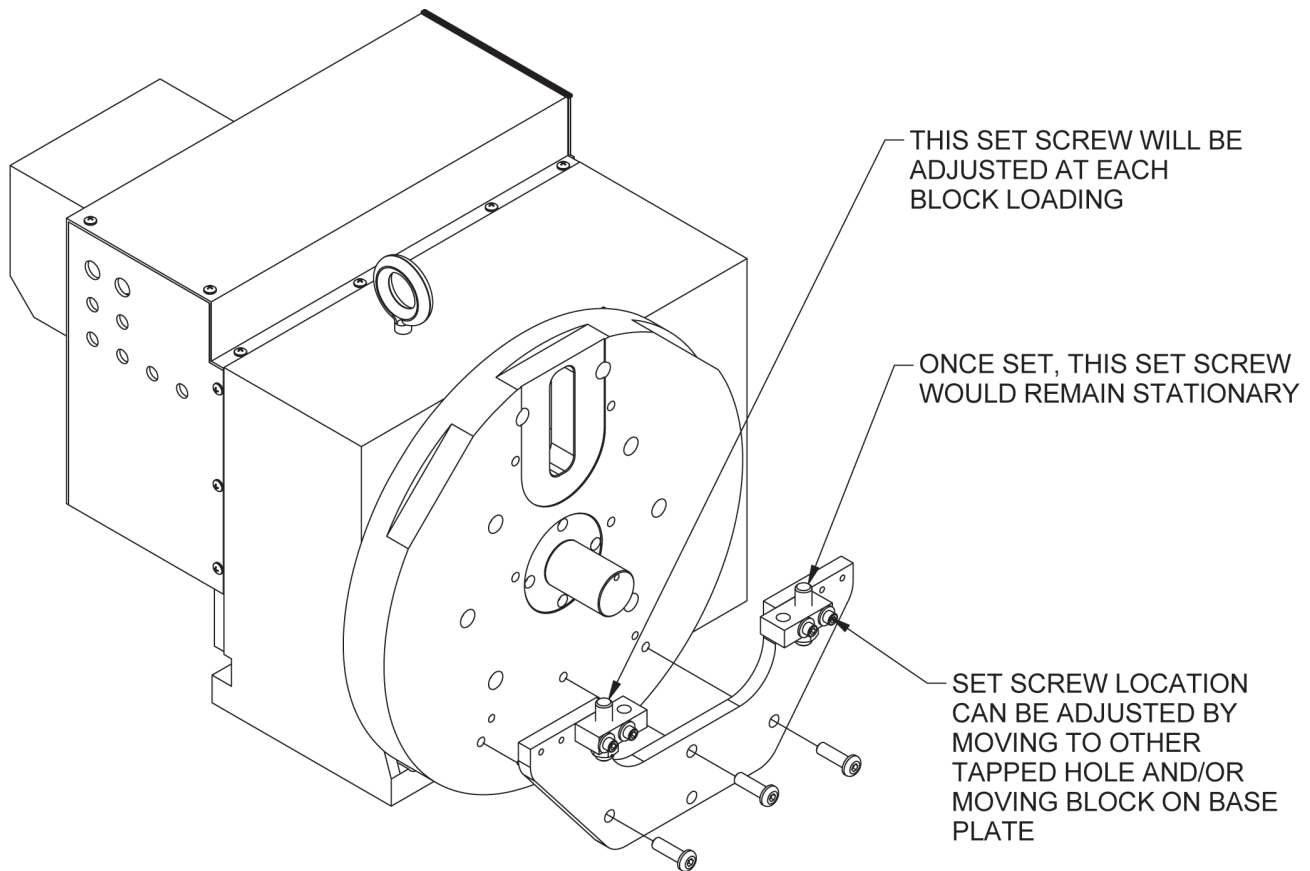
**UNIVERSAL PAN RAIL ALIGNMENT FIXTURE ASSEMBLY  
OVERHEAD CAM BLOCKS  
4TH AXIS FIXTURE**



650-3-84 OVERHEAD CAM BLOCK FIXTURE ASSEMBLY			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	2	650-3-84C	PUSH BLOCK
2	4	MF-17	1/4-20UNC x 1-1/2" LG. S.H.C.S.
3	2	650-3-84D	1/2-13UNC x 2" LG. SOCKET FLAT POINT SET SCREW
4	1	650-3-84A	FRAME (MACHINING), V-BLOCK STYLE (STANDARD WIDTH) PAN RAIL ALIGNMENT FIXTURE
5	4	MF-176	1/4" FLAT WASHER
6	1	650-3-84E	FRAME, Y-BLOCK STYLE (STANDARD), PAN RAIL ALIGNMENT FIXTURE
7	4	MF-97C	3/8-16UNC x 1-1/4" LG. Hexagon Socket Button Head Cap Screw
8	2	MF-171	1/2-13UNC HEX JAM NUT
9	1	650-3-84F	FRAME (MACHINING), V-BLOCK STYLE (WIDE CLEARANCE) PAN RAIL ALIGNMENT FIXTURE
10	1	650-3-84G	FRAME, Y-BLOCK STYLE (EXTENDED), PAN RAIL ALIGNMENT FIXTURE
11	1	650-3-84p	SPACER, PAN RAIL FIXTURE - 4TH AXIS FIXTURE
12	4	650-3-84T	3/8-16UNC x 1-3/4" LG. SOCKET BUTTON HEAD CAPSCREW
13	6	MF-22	S.H.C.S. 5/16 - 18 UNC - 3/4
14	1	650-3-84Q	PISTON CAP, SPECIAL 1" EXTENDED, TAILSTOCK - 4TH AXIS FIXTURE
15	1	650-3-84R	CUSHION, SPECIAL EXTENDED, TAILSTOCK - 4TH AXIS FIXTURE
16	1	650-3-84M	SPACER PLATE (MACHINING), HEADSTOCK, LKQ BLOCK SELECTION - 4TH AXIS FIXTURE







### 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.

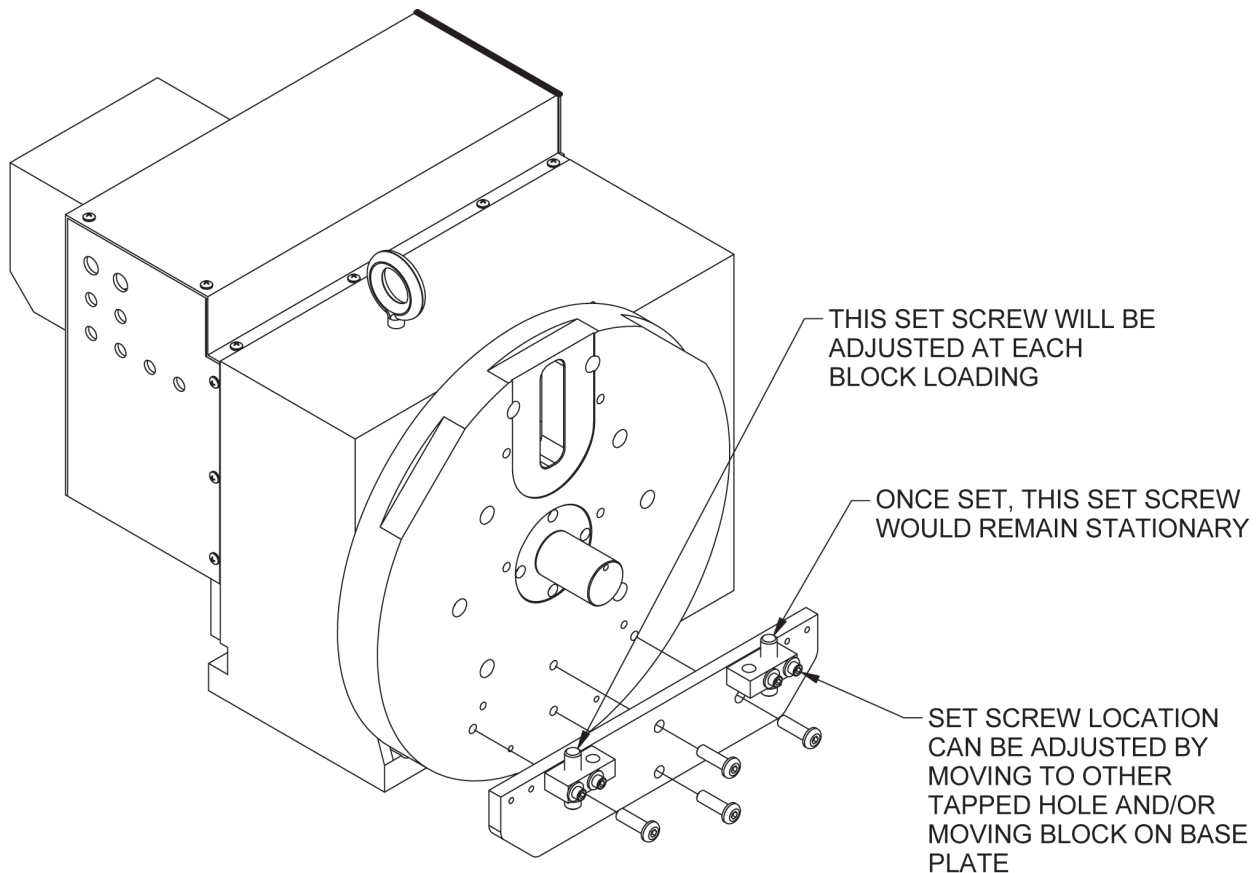
**OPERATING:** THIS FIXTURE LOCATES THE PAN RAILS OF V-STYLE OVERHEAD CAM BLOCK USING (2) 650-3-84D FLAT POINT SET SCREWS TO LEVEL THE BLOCK.

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.



### 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.

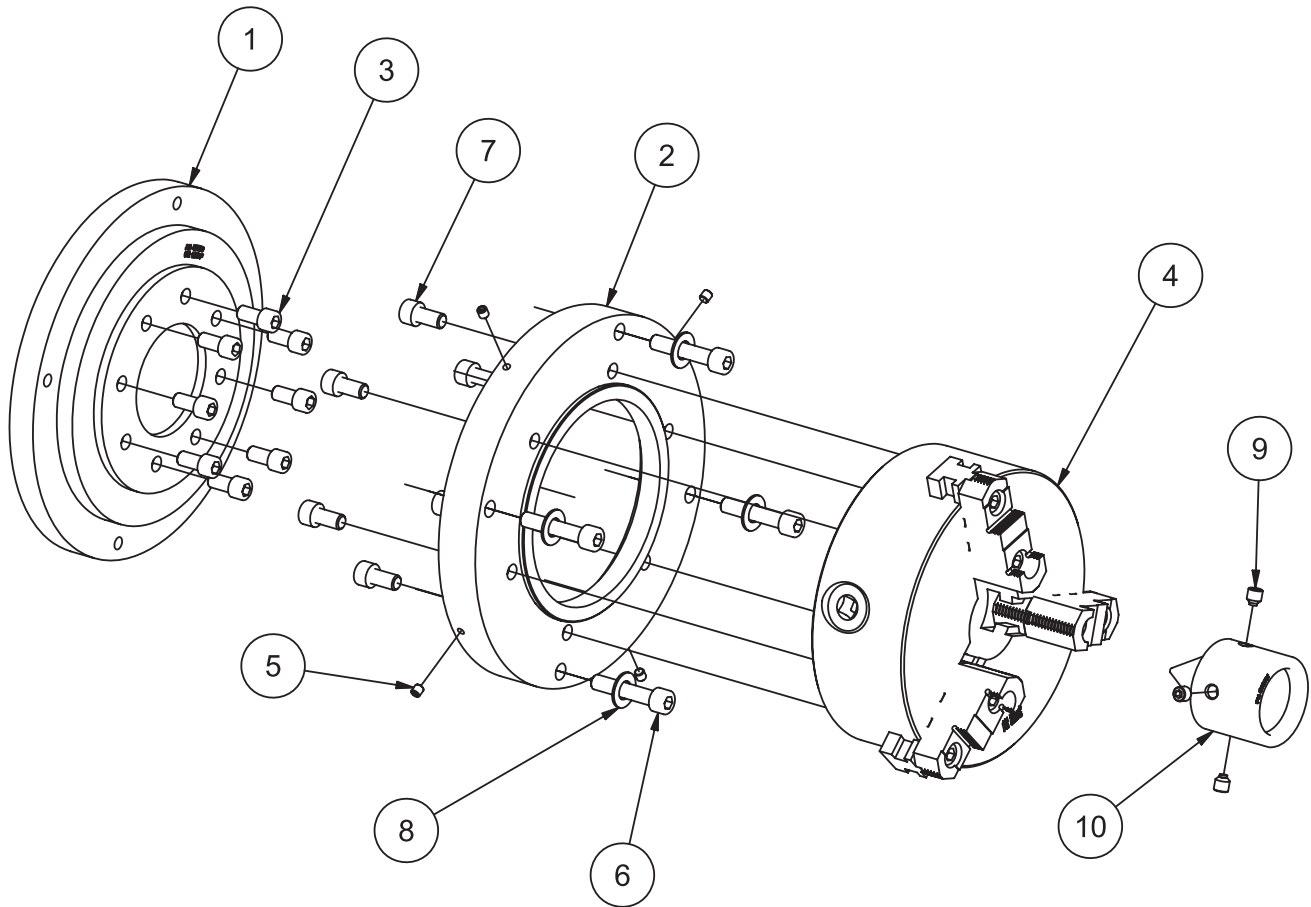
INSTALL THE BLOCK USING THE APPROPRIATE MAIN LOCATORS WITH THE INDEXER SET AT 0 DEGREES.

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.

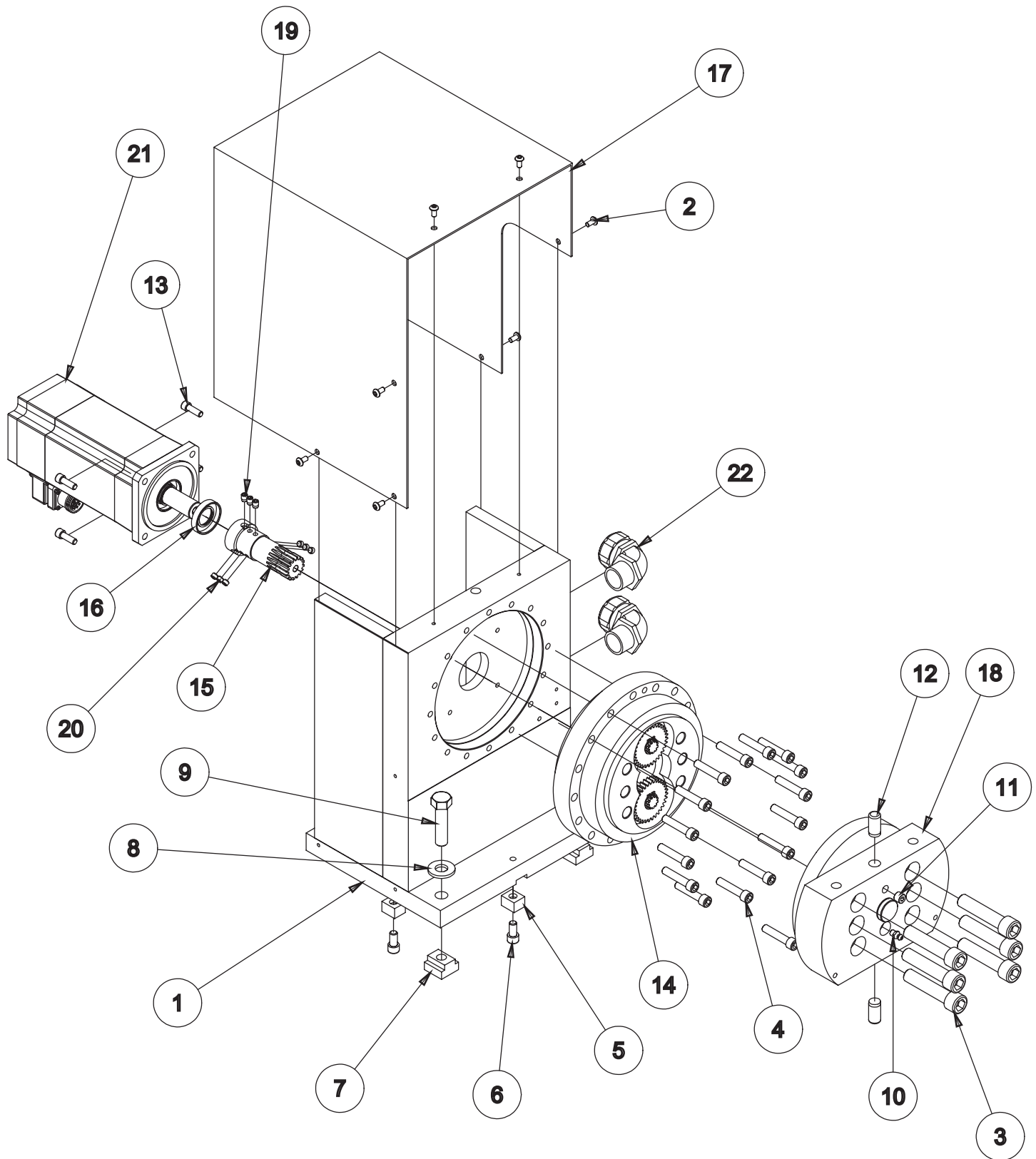
## 5537D Universal 3 Jaw Chuck and Center Parts



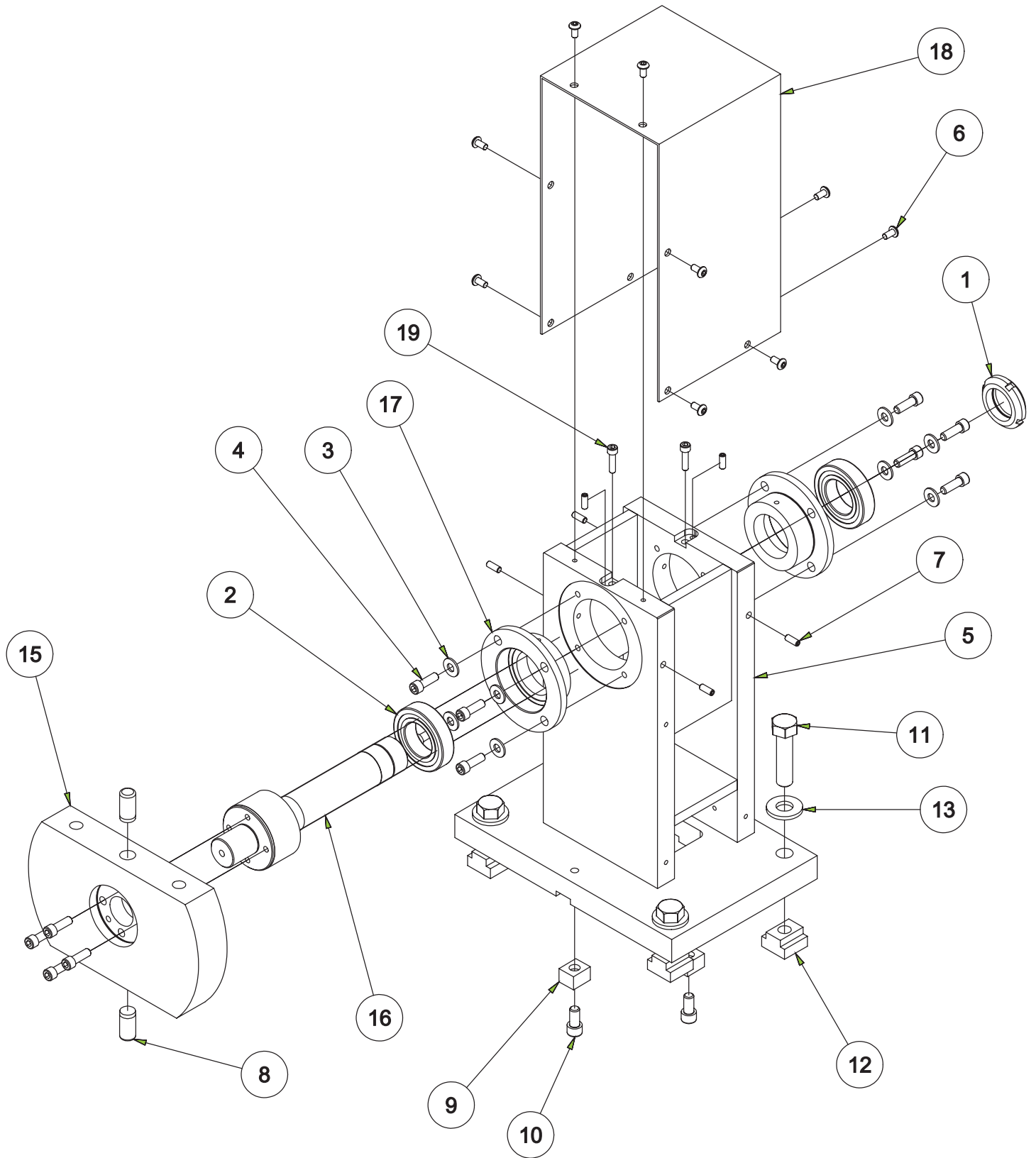
5537D - ROTARY CHUCK FIXTURE ASSEMBLY - 4TH AXIS FIXTURE			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	5537F	BASE PLATE, ADAPTER, ROTARY CHUCK FIXTURE, 4TH AXIS FIXTURE
2	1	5537G	FRONT PLATE, ADAPTER, ROTARY CHUCK FIXTURE, 4TH AXIS FIXTURE
3	8	MF-30	S.H.C.S. 3/8-16UNC x 3/4" LONG
4	1	5537E	CHUCK, ROTARY CHUCK FIXTURE, 4TH AXIS
5	4	NEED #	HEX SOCKET FLAT POINT SET SCREW 1/4-28UNF x 1/4" LONG
6	4	NEED #	S.H.C.S. M10x1.5 x 50mm LONG
7	6	NEED #	S.H.C.S. M10x1.5 x 20mm LONG
8	4	100-19	Washer
9	4	502-30-10L	HEX BRASS TIPPED SET SCREW 3/8-24UNF x 3/8" LONG
10	1	5537H	TAILSTOCK ADAPTER, ROTARY CHUCK FIXTURE - 4TH AXIS FIXTURE



## 5511 Automatic 4th Axis Cylinder Head Fixture Parts



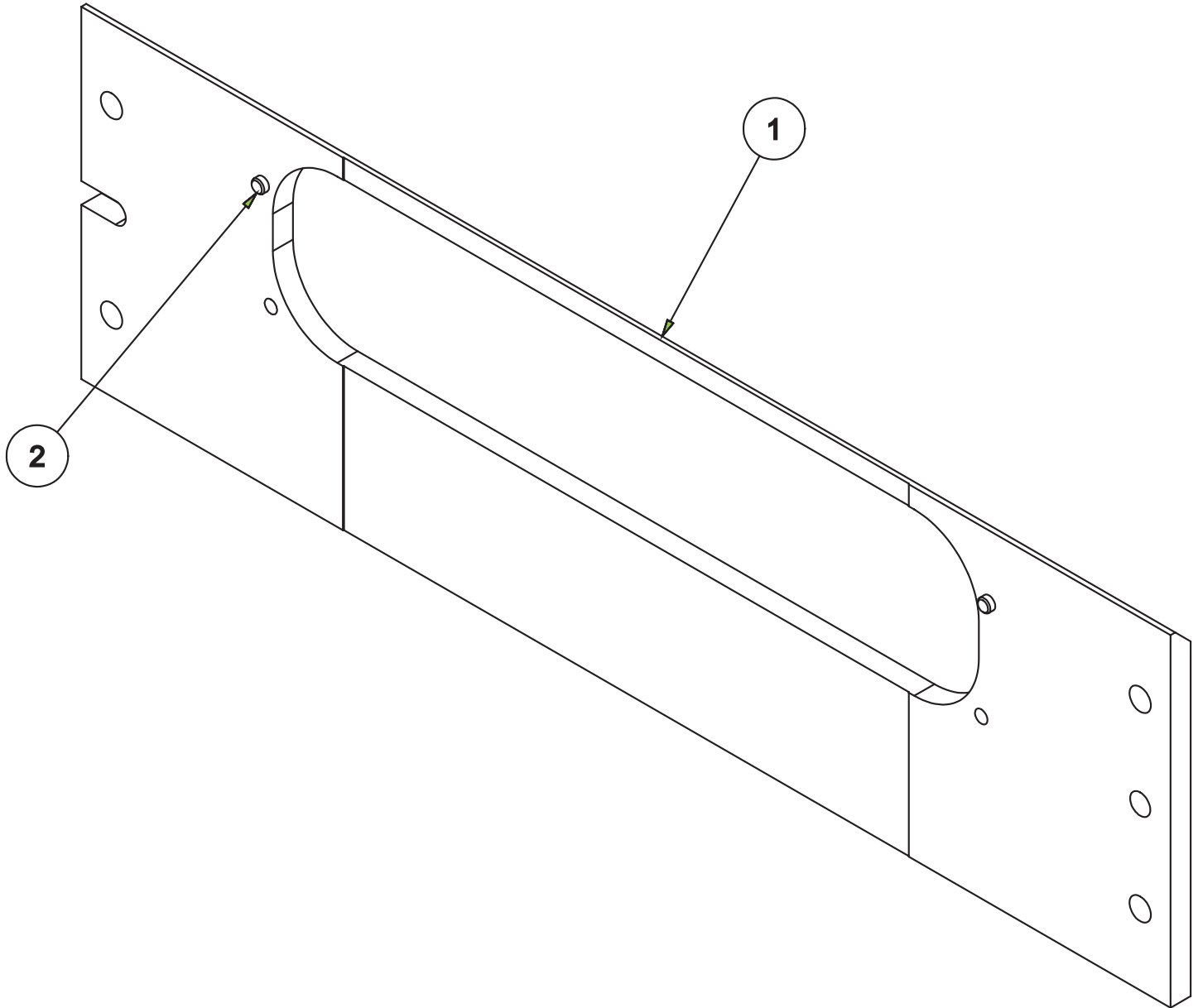
5509 INDEXER HEAD STOCK ASSEMBLY			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	5509A	HEAD STOCK (MACHINING)
2	7	MF-88	BUTTON HEAD SCREW 10-24UNC x 5/8" LG.
3	6	650-4-50	M14x2 x 65mm LG. S.H.C.S.
4	16	MF-25	S.H.C.S. 5/16 - 18 UNC - 1 1/2
5	2	650-3-9	Key
6	2	MF-21	S.H.C.S. 5/16 - 18 UNC - 5/8
7	3	650-3-10	TN-5 T-Nut
8	3	100-19A	Hardened washer 17/32 I.D.
9	3	MF-149C	Hex Bolt 1/2-13 x 2
10	1	MF-189	STRAIGHT GREASE FITTING
11	1	MF-233	1/8-27NPT PIPE PLUG
12	2	MF-213B	1/2 x 1 Dowel Pin
13	4	MF-14	S.H.C.S. 1/4 - 20 UNC - 3/4
14	1	5506C	REDUCTION GEARBOX
15	1	5506D	INPUT GEAR (REWORK) - REDUCTION GEARBOX
16	1	650-3-61N	OIL SEAL
17	1	5509C	COVER, HEAD STOCK, INDEXER
18	1	5509D	MOUNT BLOCK, HEAD STOCK END
19	3	5506G	SET SCREW REWORK 1/4-20
20	6	5506Q	1/4-20UNC x 3/16" LG. SOCKET FLAT POINT SET SCREW
21	1	9020N	SERVO MOTOR
22	2	502-6-8	ELBOW, 90 DEG. 3/4"



5510 INDEXER TAIL STOCK			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	6777B	LOCKNUT
2	2	502-9-72B	Ball Bearing,
3	8	MF-176	SAE FLAT WASHER 1/4"
4	12	MF-14	S.H.C.S. 1/4 - 20 UNC - 3/4
5	1	5510A	TAILSTOCK HOUSING (MACHINING)
6	10	MF-88	BUTTON HEAD SCREW 10-24UNC x 5/8" LG.
7	6	MF-56B	SOCKET FLAT POINT SET SCREW 10-32UNF x 1/2" LG.
8	2	MF-213B	1/2 x 1 Dowel Pin
9	2	650-3-9	Key
10	2	MF-21	S.H.C.S. 5/16 - 18 UNC - 5/8
11	4	MF-149C	Hex Bolt 1/2-13 x 2
12	4	650-3-10	TN-5 T-Nut
13	4	100-19A	Hardened washer 17/32 I.D.
15	1	5510D	MOUNTING BLOCK, FIXTURE - TAILSTOCK
16	1	5510E	CENTER SHAFT, TAILSTOCK
17	2	5510F	REAR BEARING CUP, TAILSTOCK -
18	1	5510C	COVER, TAIL STOCK, INDEXER
19	2	MF-6	Hexagon Socket Head Cap Screw

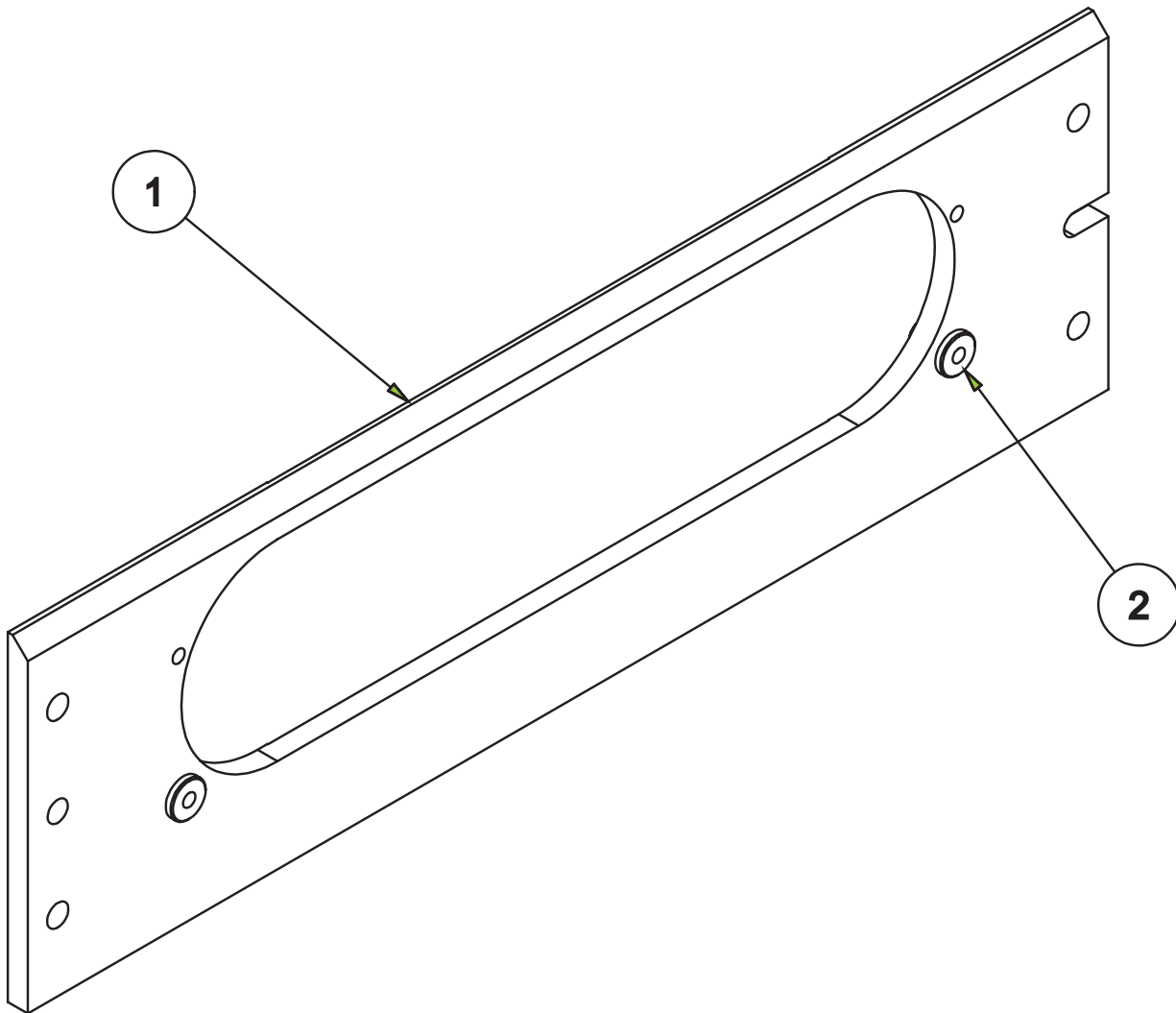
**Cylinder Head Digitizing and Porting Fixture Plates:**

**PFIX-SBC Porting Fixture Parts**



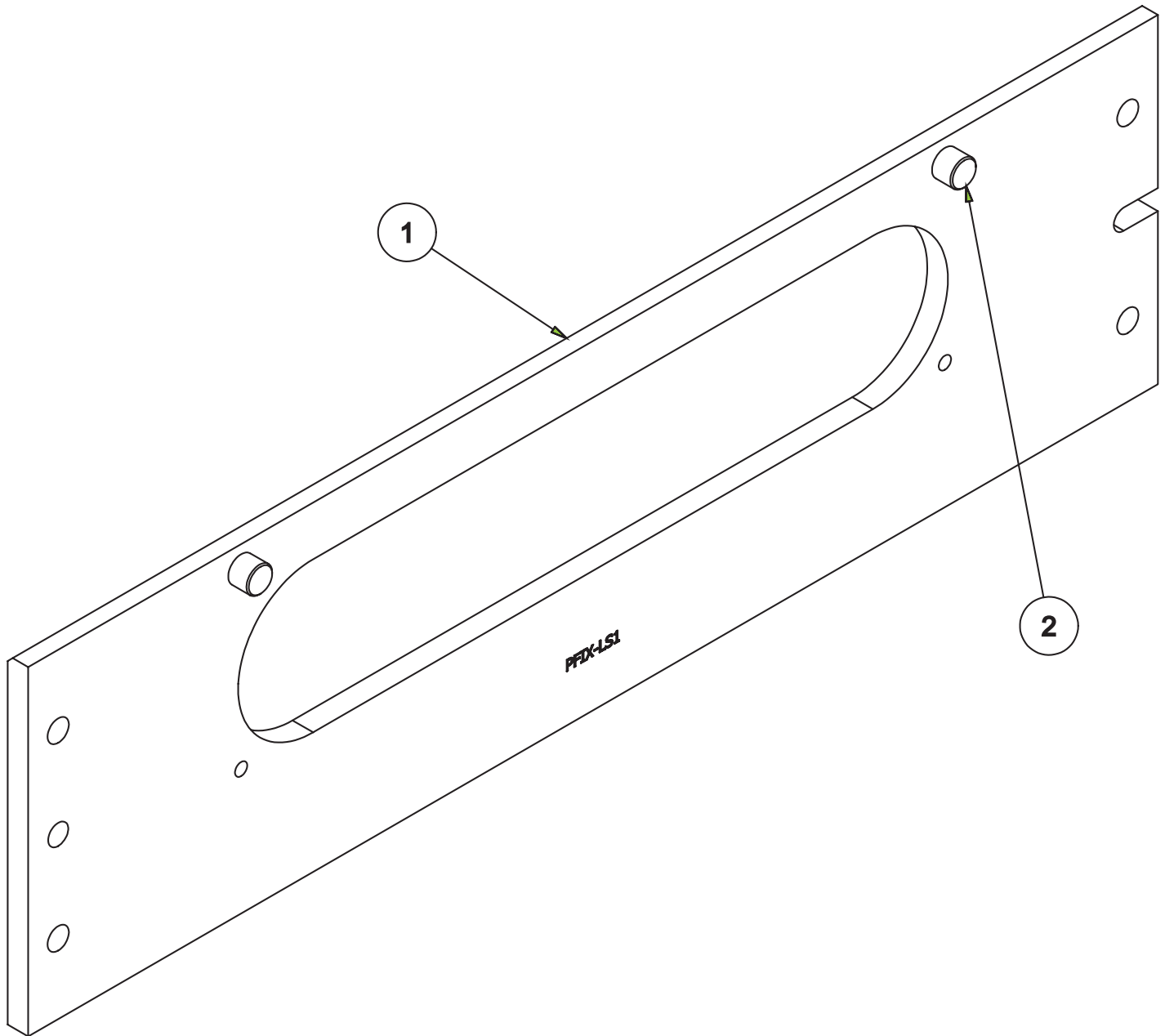
PFIX-SBC SMALL BLOCK CHEVROLET FIXTURE ASSEMBLY			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	5504G	FIXTURE PLATE (MACHINING) SMALL BLOCK CHEVROLET
2	2	5505C	LOCATING PIN, SMALL BLOCK CHEVROLET HEAD FIXTURE

**PFIX-BBC Porting Fixture Parts**

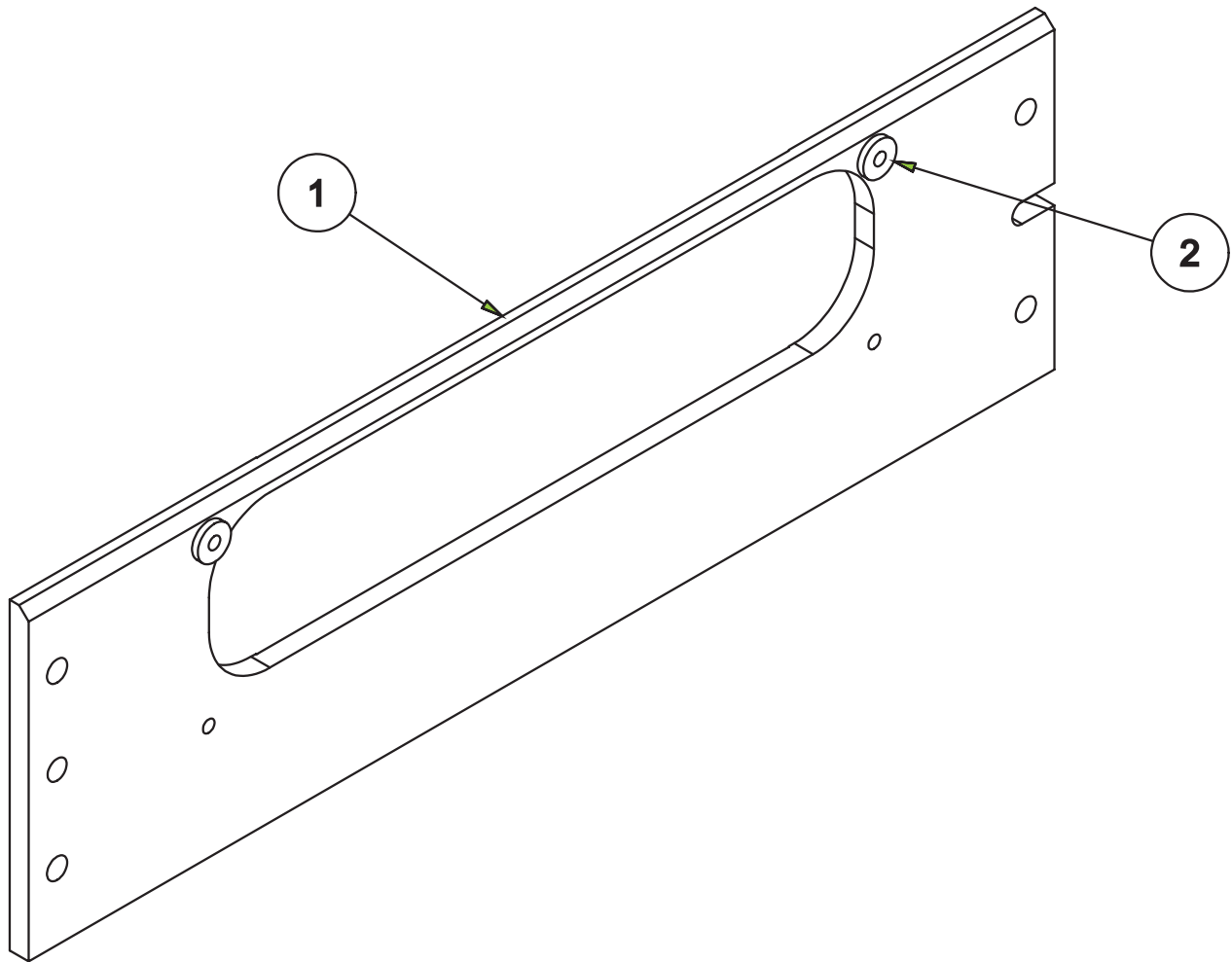


PFX-BBC CHEVROLET BIG BLOCK FIXTURE ASSEMBLY			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	5504	FIXTURE PLATE, CHEVROLET BIG BLOCK
2	2	5505	LOCATING PIN, BB CHEV HEAD FIXTURE

**PFIX-LS1 Porting Fixture Parts**

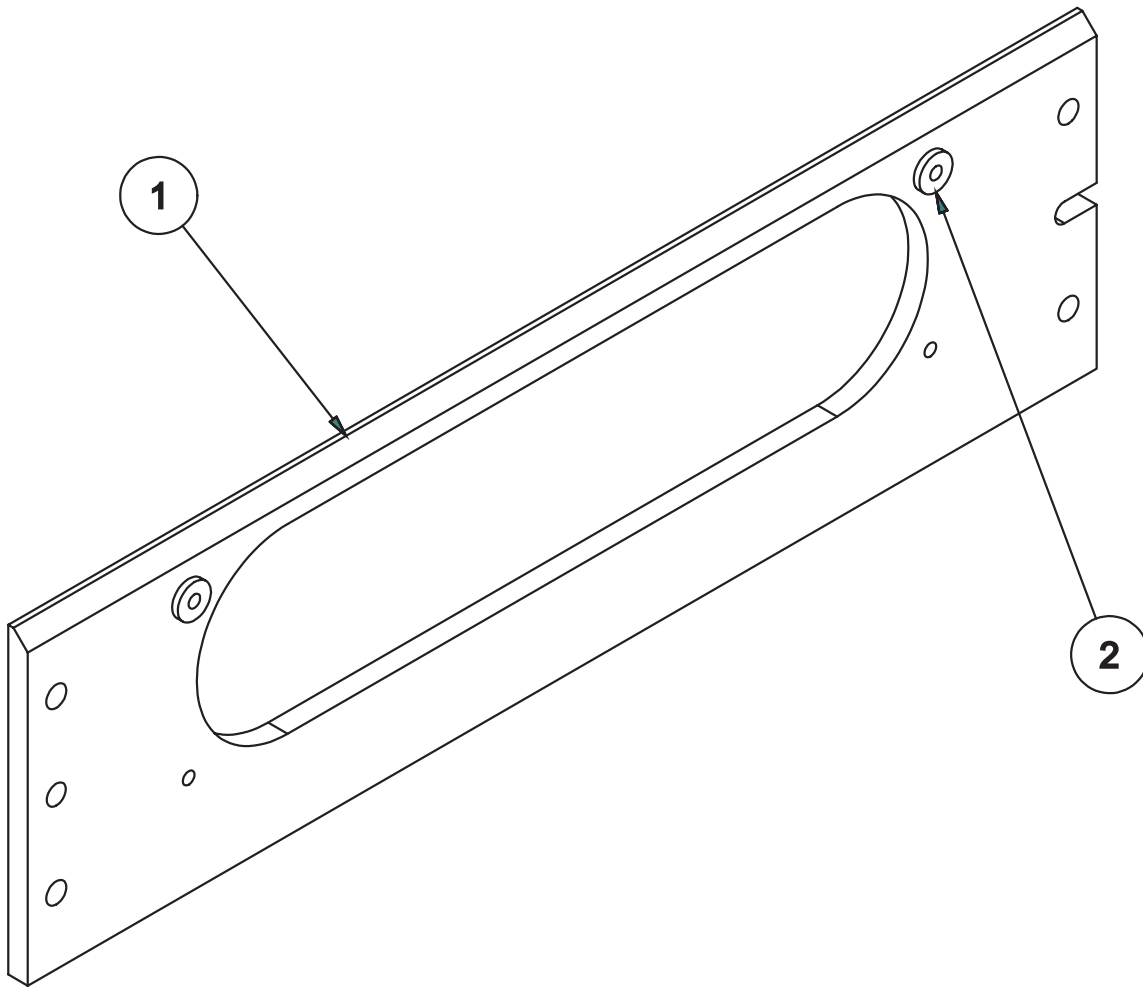


PFIX-LS1 LS1 CHEVROLET FIXTURE ASSEMBLY			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	5504J	FIXTURE PLATE, LS1 CHEVROLET HEAD
2	2	5505B	LOCATING PIN, LS1 CHEVROLET HEAD FIXTURE

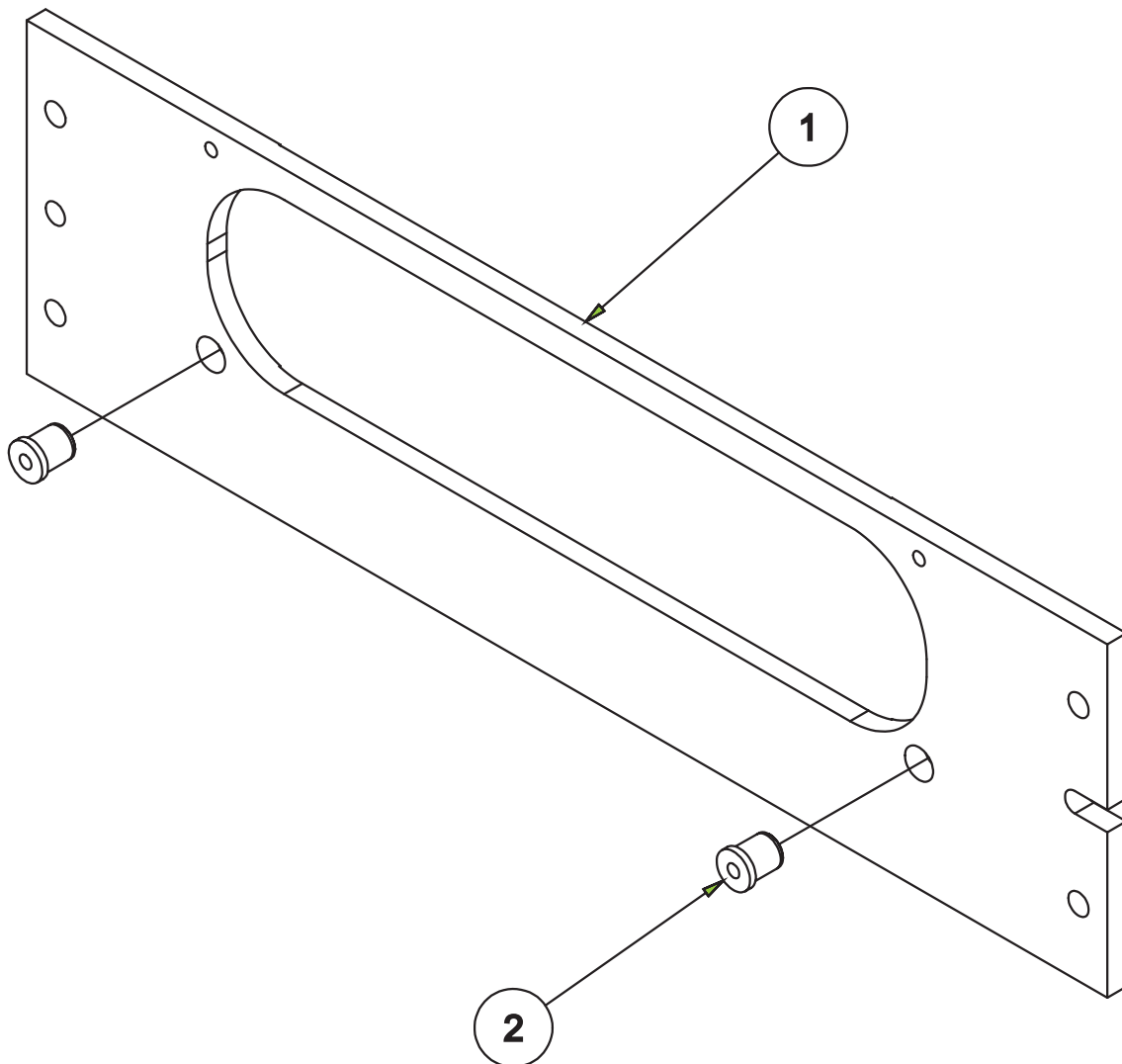
**PFIX-SBF Porting Fixture Parts**


PFX-SBF SMALL BLOCK FORD HEAD FIXTURE ASSEMBLY			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	5504N	FIXTURE PLATE (MACHINING) SMALL BLOCK FORD
2	2	5505G	LOCATING PIN, SB FORD HEAD FIXTURE



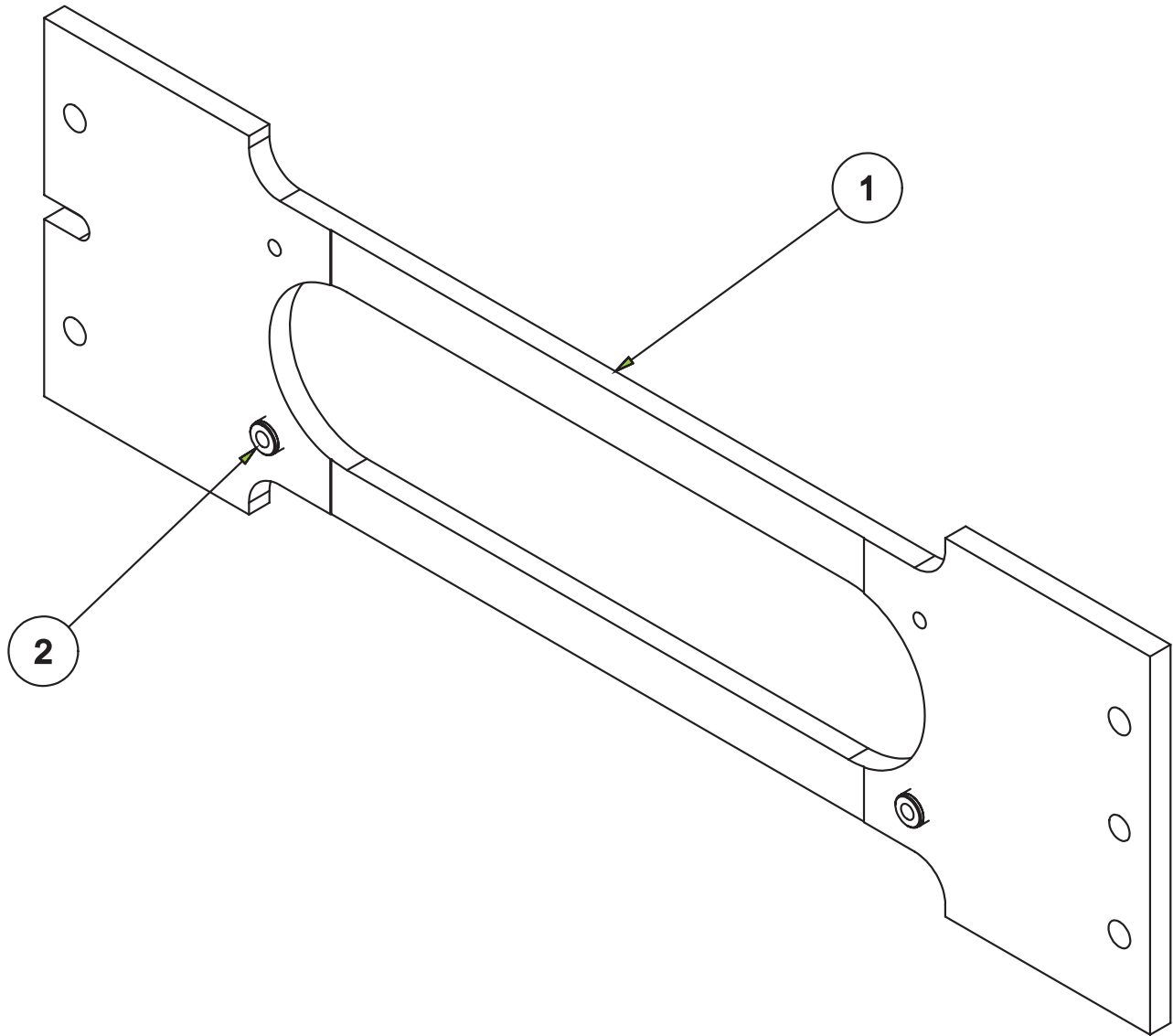
**PFIX-BBF Porting Fixture Parts**


PFIX-BBF FORD BIG BLOCK (429/460) HEAD FIXTURE ASSEMBLY			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	5504Q	FIXTURE PLATE, BIG BLOCK FORD (429/460)
2	2	5505J	LOCATING PIN - FORD BIG BLOCK, HEAD FIXTURE

**PFIX-BBF1 Porting Fixture Parts**


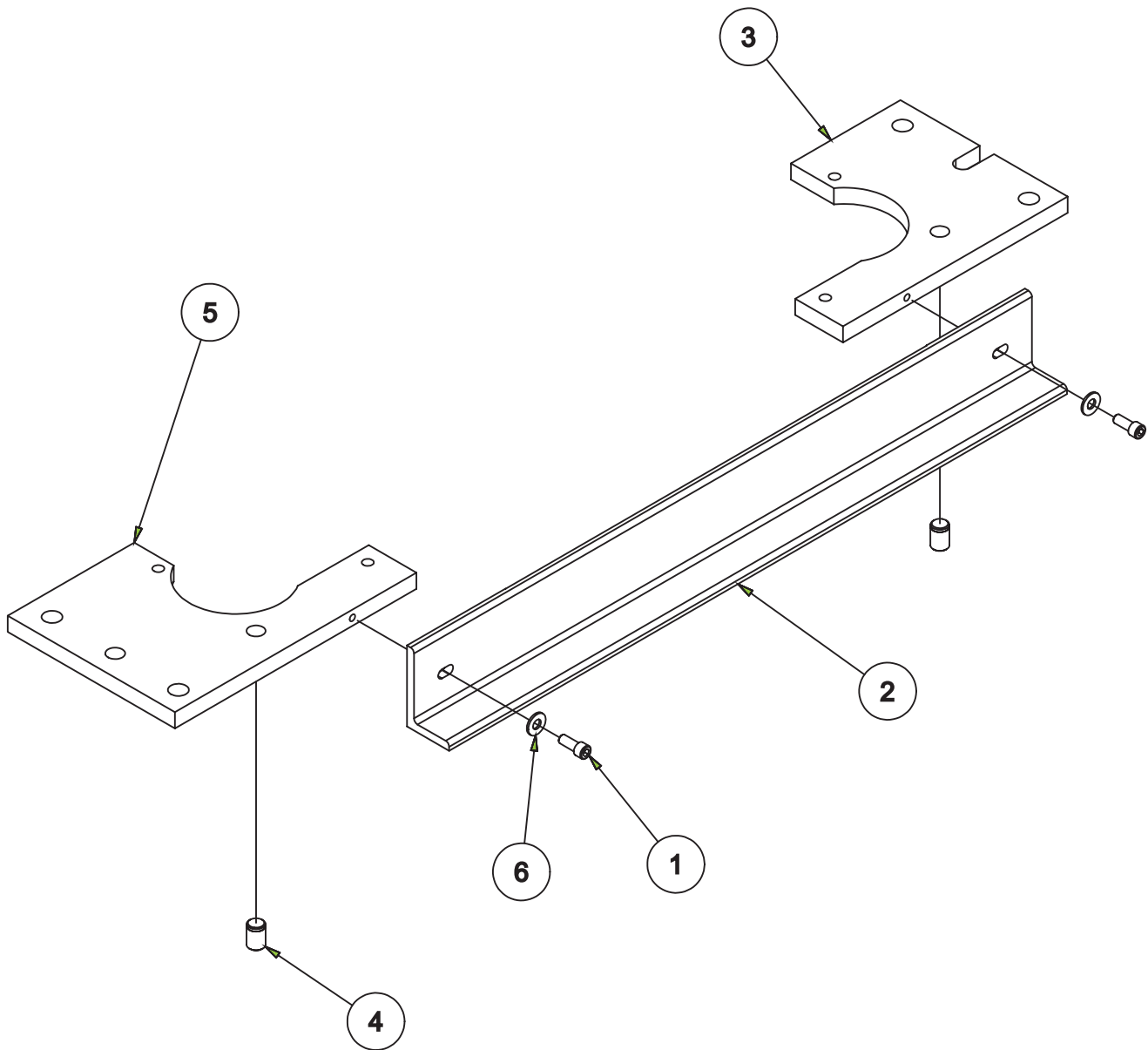
PFIX-BBF1 FIXTURE PLATE ASSY, FORD FE BIG BLOCK (390/427/428)			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	5514L	ADAPTER PLATE (MACHINING) FE BIG BLOCK FORD (390, 427, 428)
2	2	5505J	LOCATING PIN - FORD BIG BLOCK, HEAD FIXTURE

## PFI-X-FORD1 Porting Fixture Parts



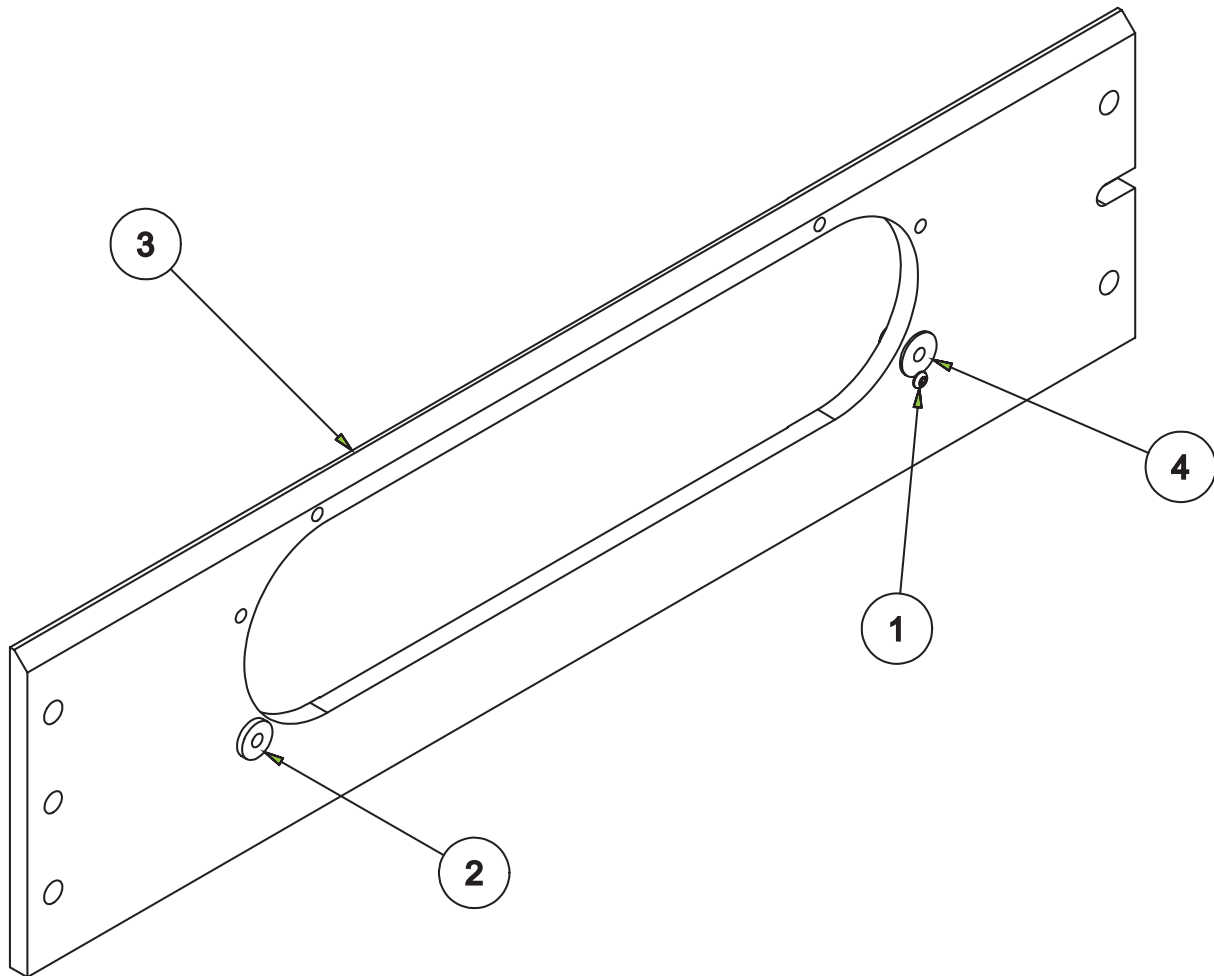
PFI-X-FORD1 FIXTURE ASSEMBLY - FORD 5.4L			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	5504U	FIXTURE PLATE (MACHINING) FORD 5.4L HEAD
2	2	5505L	LOCATING PIN, FORD 5.4L HEAD FIXTURE

## PFI-X- FORD2 Porting Fixture Parts



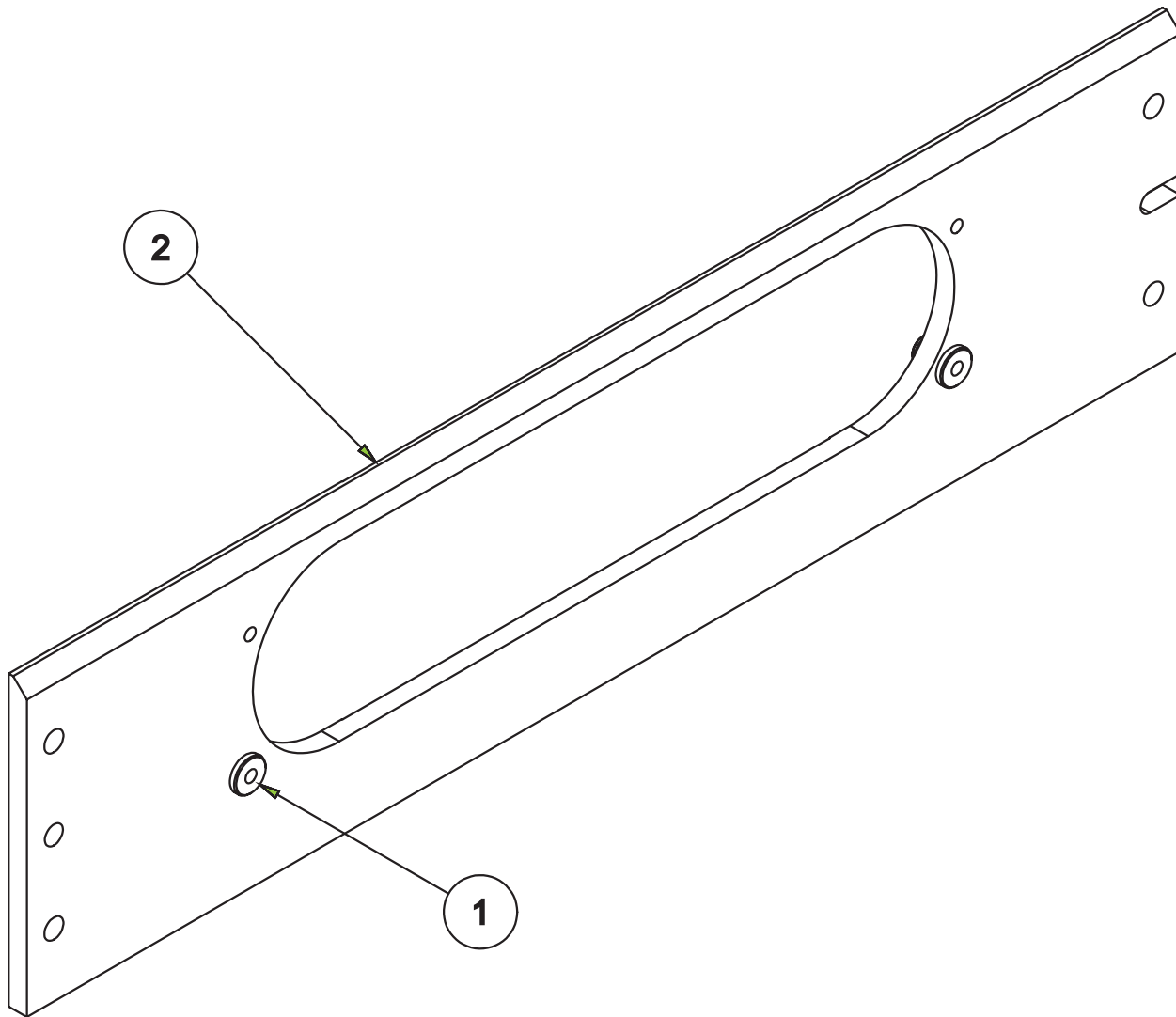
PFI-X-FORD2 FORD INLINE 6 (ARGENTINA) FIXTURE ASSEMBLY			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	2	MF-14	1/4-20UNC x 3/4" LG. S.H.C.S.
2	1	5505N	ALIGNMENT BAR
3	1	5504W	FIXTURE PLATE TAIL STOCK END
4	2	5505P	LOCATING PIN, FORD (ARGENTINA) INLINE 6 HEAD FIXTURE
5	1	5504V	FIXTURE PLATE HEAD STOCK END
6	2	MF-176	SAE FLAT WASHER 1/4"

## PFIX-PRO1 Porting Fixture Parts



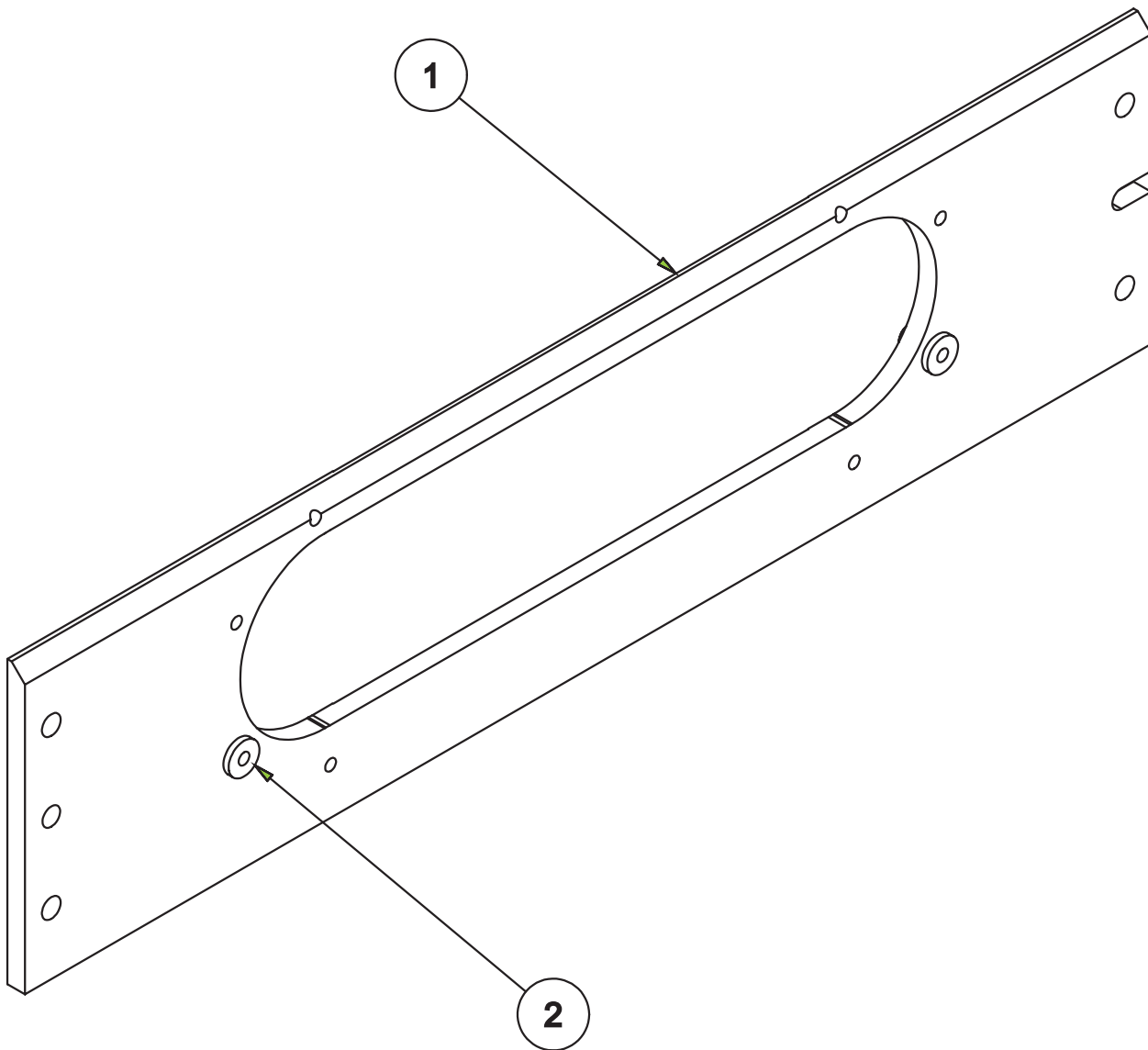
PFX-PRO1		PRO STOCK BIG BLOCK GM FIXTURE ASSEMBLY	
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	MF-88A	BUTTON HEAD SCREW 10-24UNC x 5/8" LG.
2	1	5505	LOCATING PIN, BB CHEV HEAD FIXTURE
3	1	5504D	FIXTURE PLATE (MACHINING), PRO STOCK BIG BLOCK GM
4	1	5505A	LOCATING PIN (MOVABLE), PRO STOCK BIG BLOCK GM CYLINDER HEAD

## PFI-X-PRO2 Porting Fixture Parts



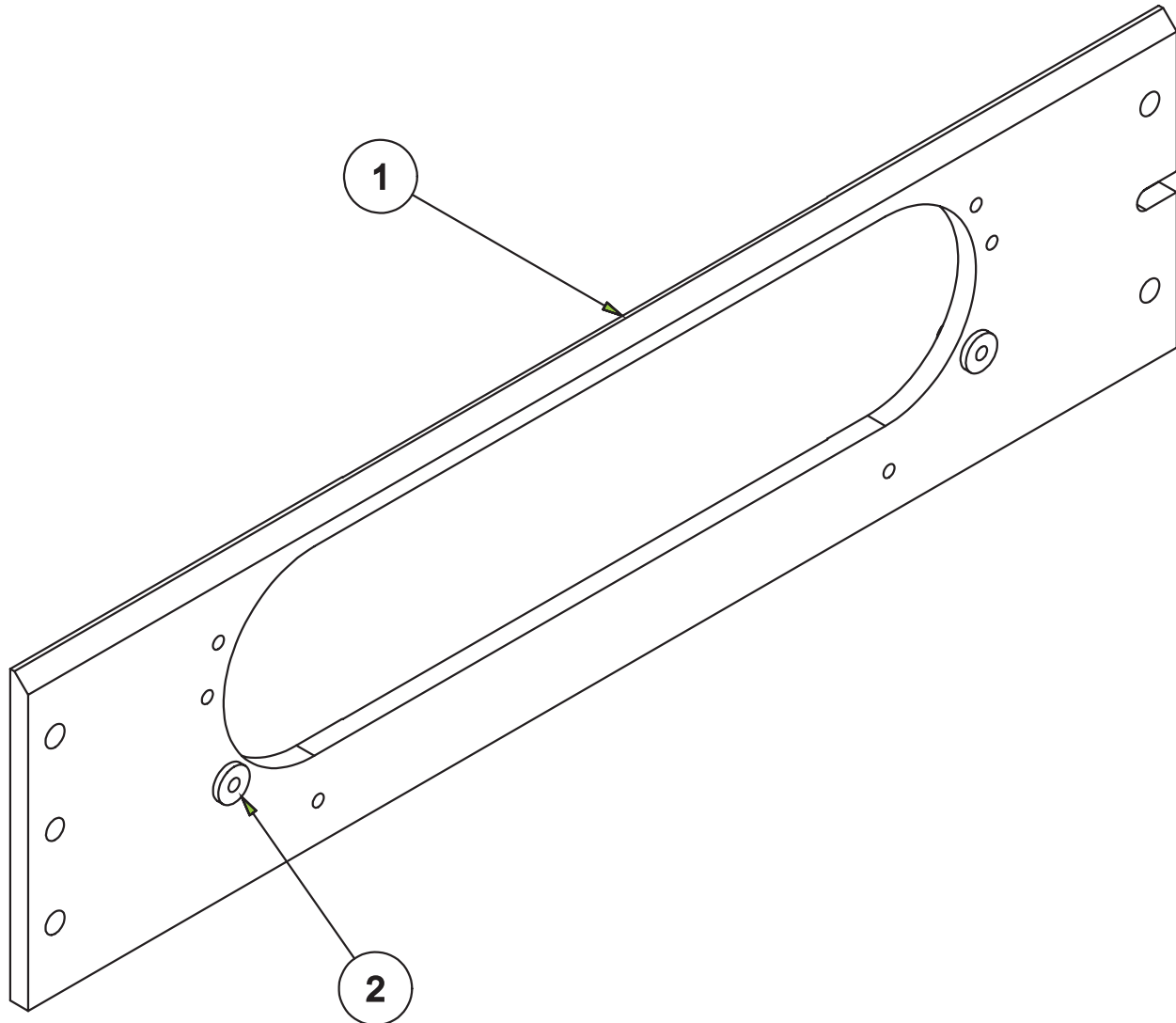
PFI-X-PRO2 PRO STOCK OLDSMOBILE DRCE FIXTURE ASSEMBLY			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	2	5505E	LOCATING PIN - OLDSMOBILE DRCE BIG BLOCK HEAD FIXTURE
2	1	5504M	FIXTURE PLATE (MACHINING), PRO STOCK BIG BLOCK GM

**PFIX-PRO3 Porting Fixture Parts**



PFIX-PRO3 BBC 5.0" BORE SPACING HEAD FIXTURE ASSEMBLY			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	5514J	FIXTURE PLATE (MACHINING)- PROSTOCK BIG BLOCK CHEVY 5.0" SPACING CYLINDER HEAD
2	2	5505	LOCATING PIN, BB CHEV HEAD FIXTURE

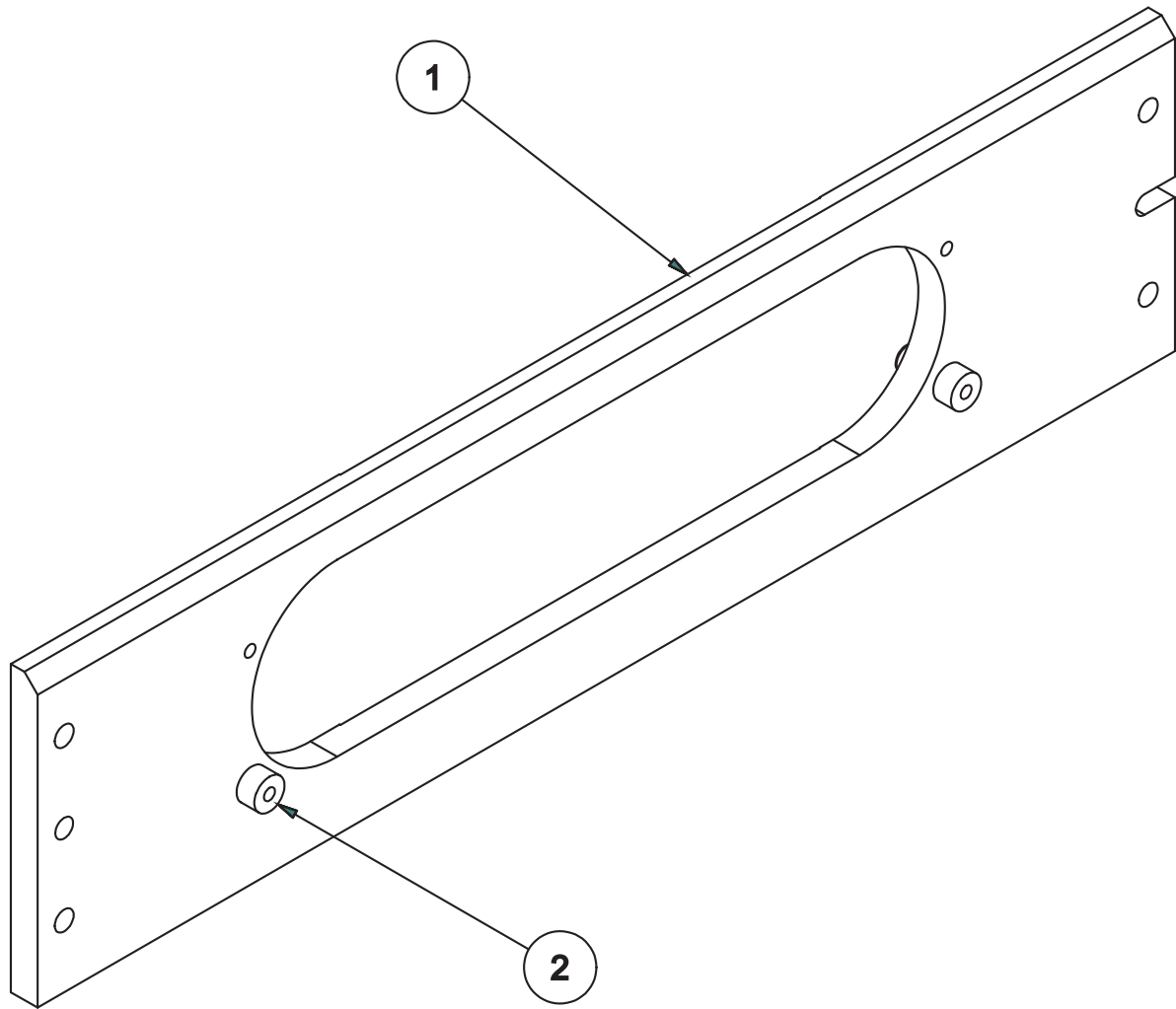
**PFIX-PRO4 Porting Fixture Parts**



PFI-X-PRO4 FIXTURE PLATE ASSEMBLY- PROSTOCK BIG BLOCK CHEVY 5.3" SP			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	5514K	FIXTURE PLATE (MACHINING)- PROSTOCK BIG BLOCK CHEVY 5.0" SPACING CYLINDER HEAD
2	2	5505	LOCATING PIN, BB CHEV HEAD FIXTURE

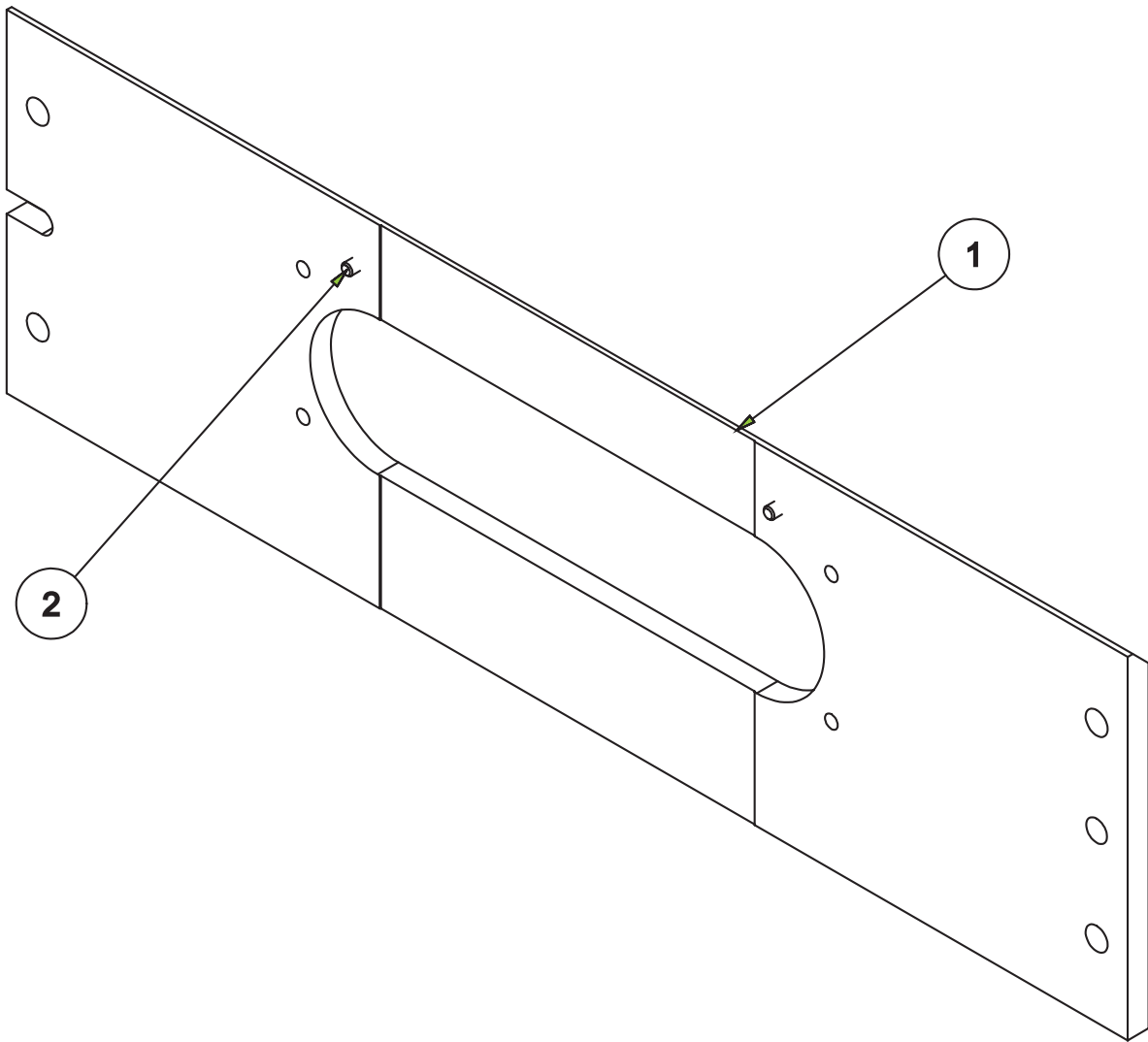


**PFIX-PRO5 Porting Fixture Parts**



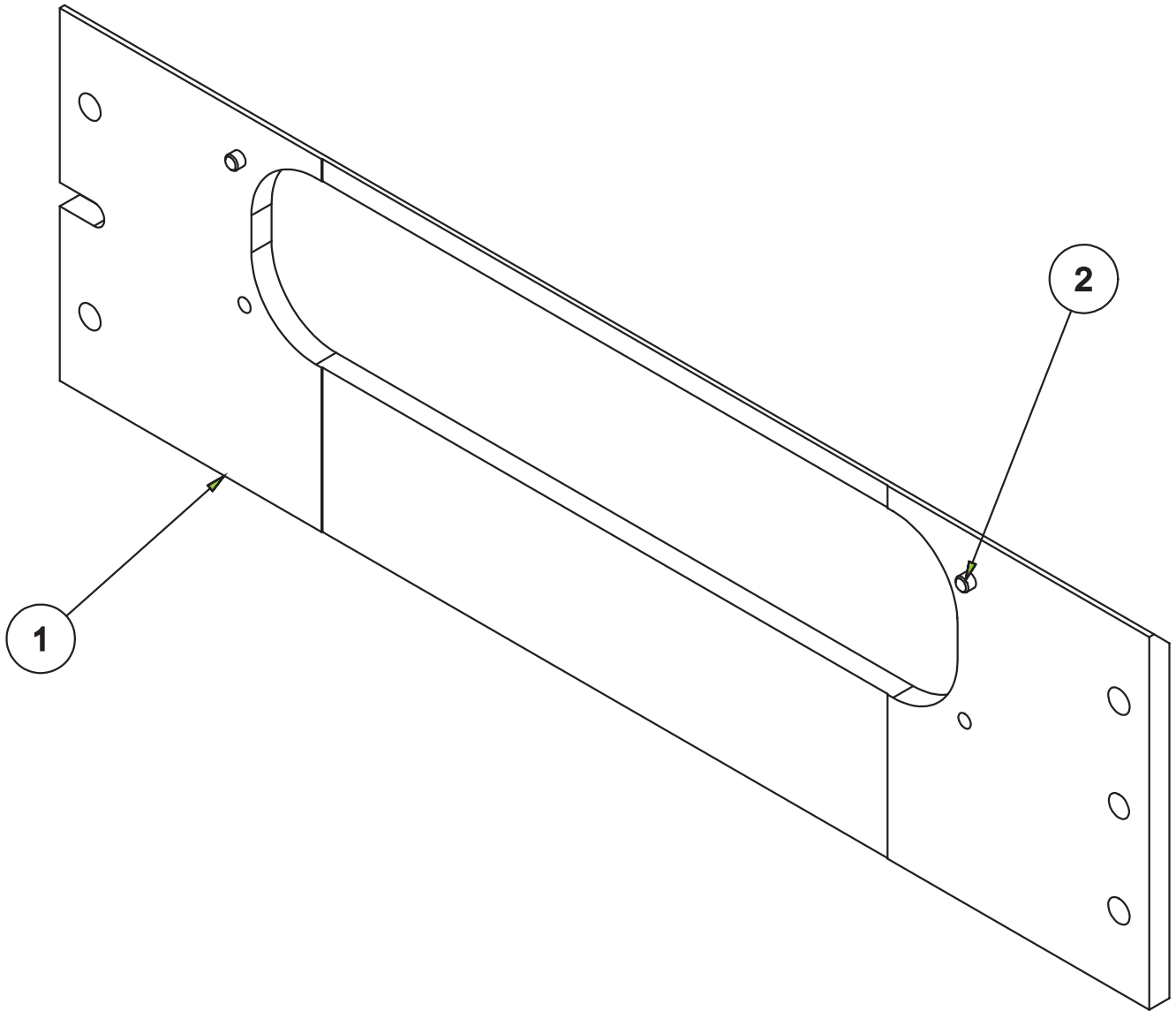
<b>PFIX-PRO5 SPECIAL PRO STOCK OLDS DRCE FIXTURE ASSEMBLY</b>			
<b>ITEM</b>	<b>QTY</b>	<b>PART NUMBER</b>	<b>DESCRIPTION</b>
<b>1</b>	<b>1</b>	<b>5517J</b>	<b>FIXTURE PLATE (MACHINING) SPECIAL PRO STOCK OLDS DRCE</b>
<b>2</b>	<b>2</b>	<b>5517K</b>	<b>LOCATING PIN - SPECIAL OLDS DRCE HEAD FIXTURE</b>

**PFIX-BUICK Porting Fixture Parts**



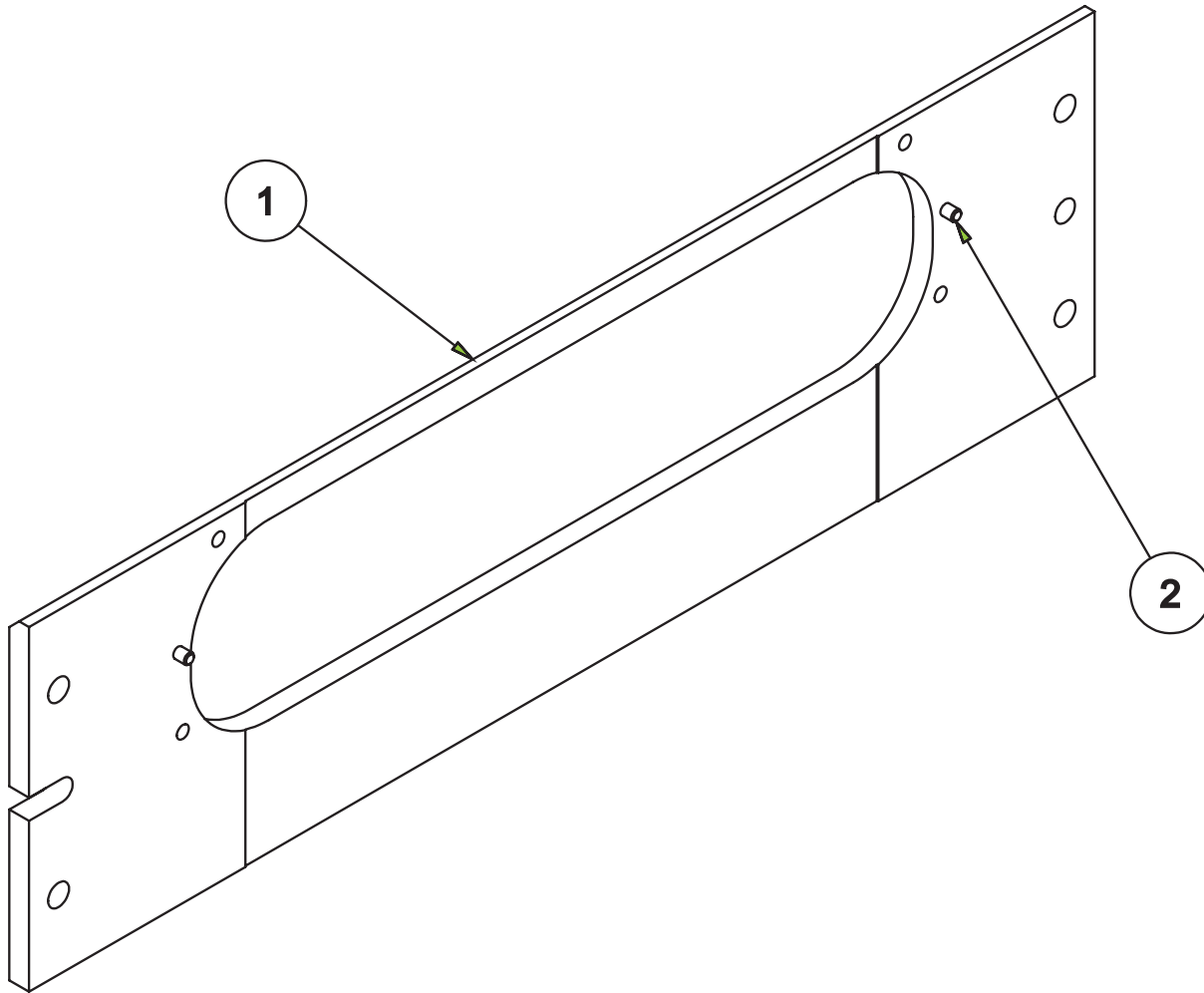
PFX-BUICK BUICK V6 HEAD FIXTURE ASSEMBLY			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	5504S	FIXTURE PLATE (MACHINING) SMALL BLOCK CHEVROLET
2	2	5505K	LOCATING PIN, BIG BLOCK MOPAR - HEAD FIXTURE

**PFIX-SBM Porting Fixture Parts**



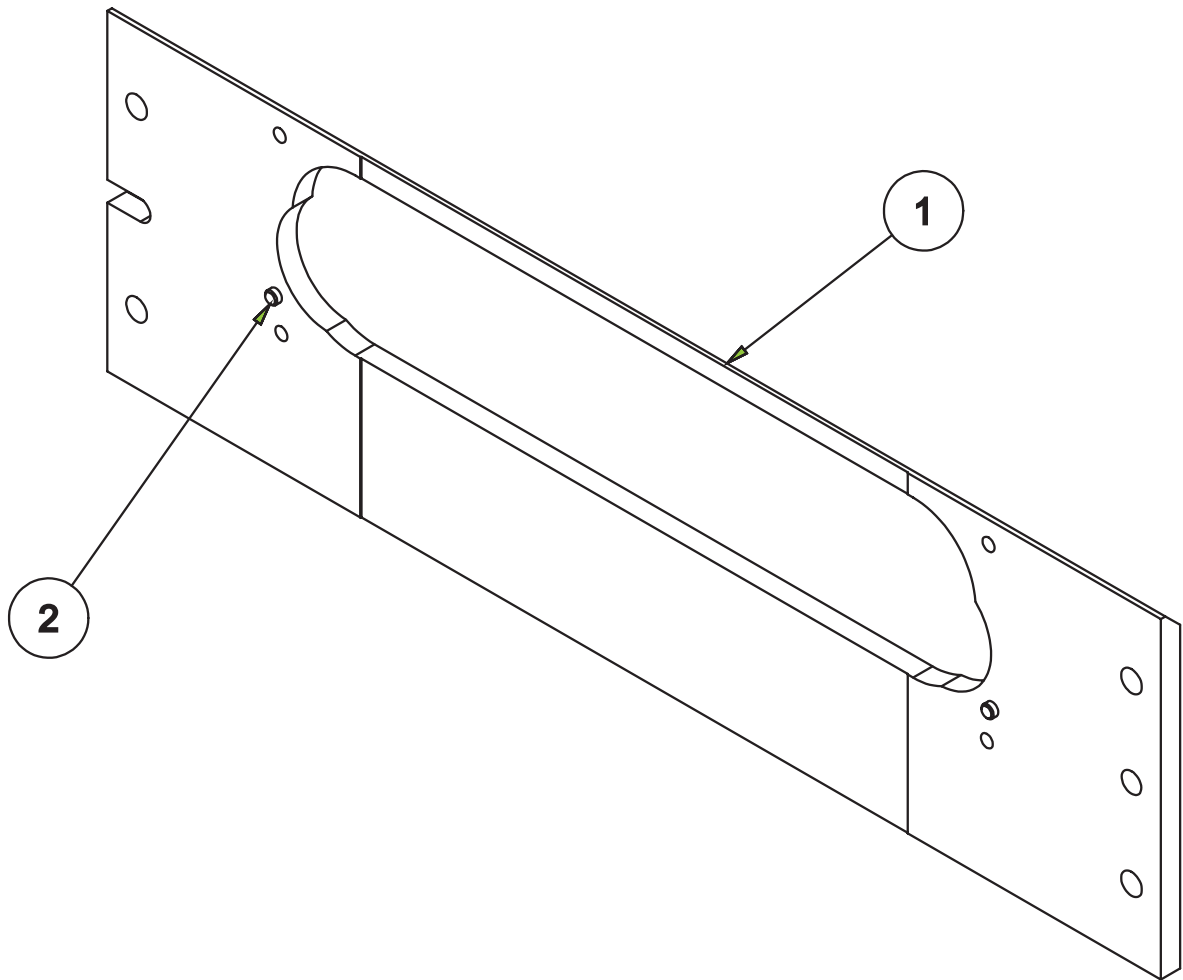
PFIX-SBM SMALL BLOCK MOPAR FIXTURE ASSEMBLY			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	5504L	FIXTURE PLATE (MACHINING) SMALL BLOCK MOPAR
2	2	5505D	LOCATING PIN, SMALL BLOCK MOPAR HEAD FIXTURE

**PFIX-BBM Porting Fixture Parts**



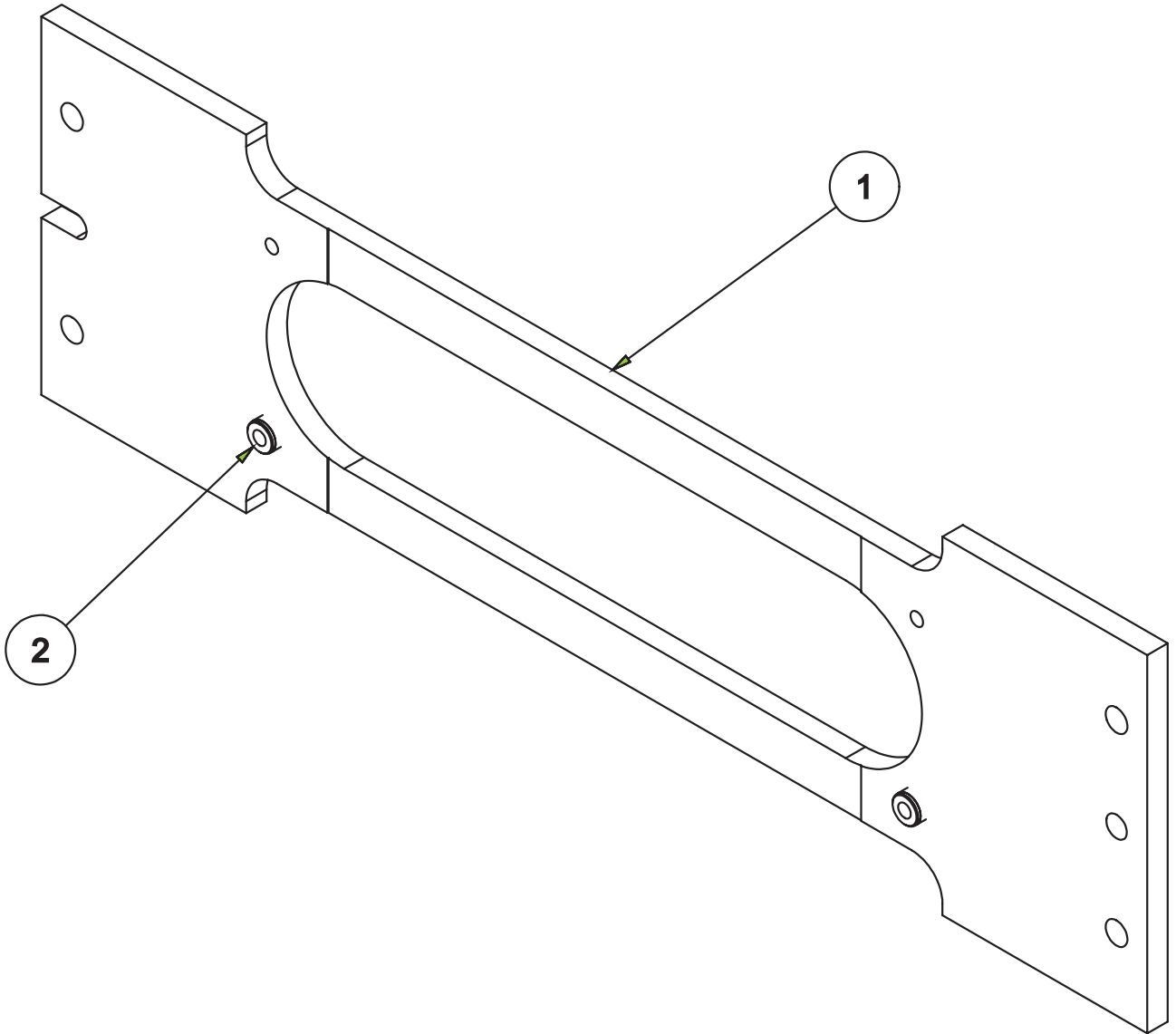
PFIX-BBM BIG BLOCK MOPAR CYLINDER HEAD FIXTURE ASSEMBLY			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	5504E	BIG BLOCK MOPAR CYLINDER HEAD FIXTURE
2	2	5505F	LOCATING PIN, BIG BLOCK MOPAR - HEAD FIXTURE

**PFIX-PONT Porting Fixture Parts**



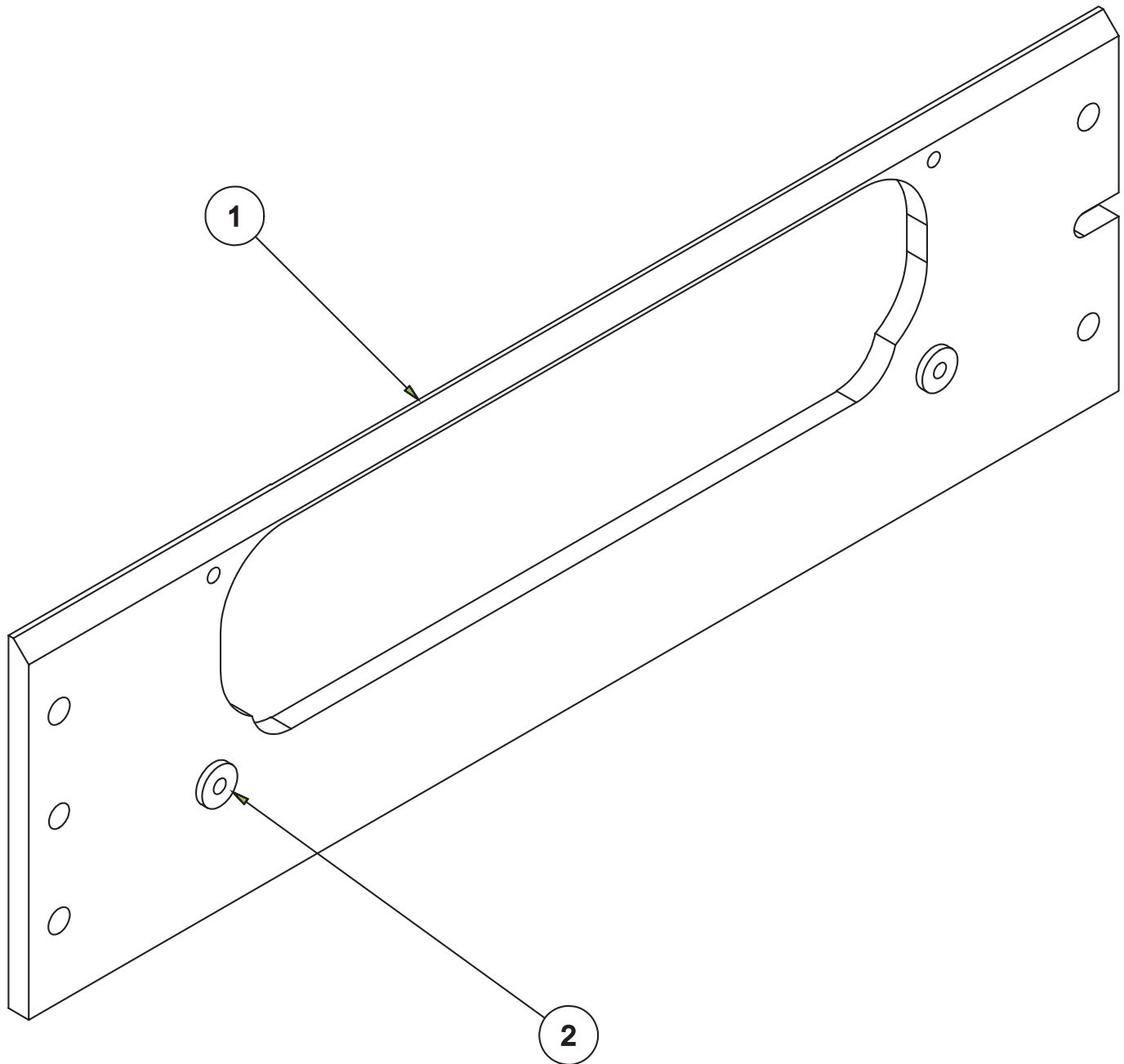
PFX-PONT FIXTURE PLATE ASSEMBLY PONTIAC CYLINDER HEAD			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	5504P	FIXTURE PLATE (MACHINING) PONTIAC CYLINDER HEAD
2	2	5505H	LOCATING PIN, PONTIAC CYLILNDER HEAD FIXTURE

**PFIX-FORD1 Porting Fixture - Ford (Modular)**

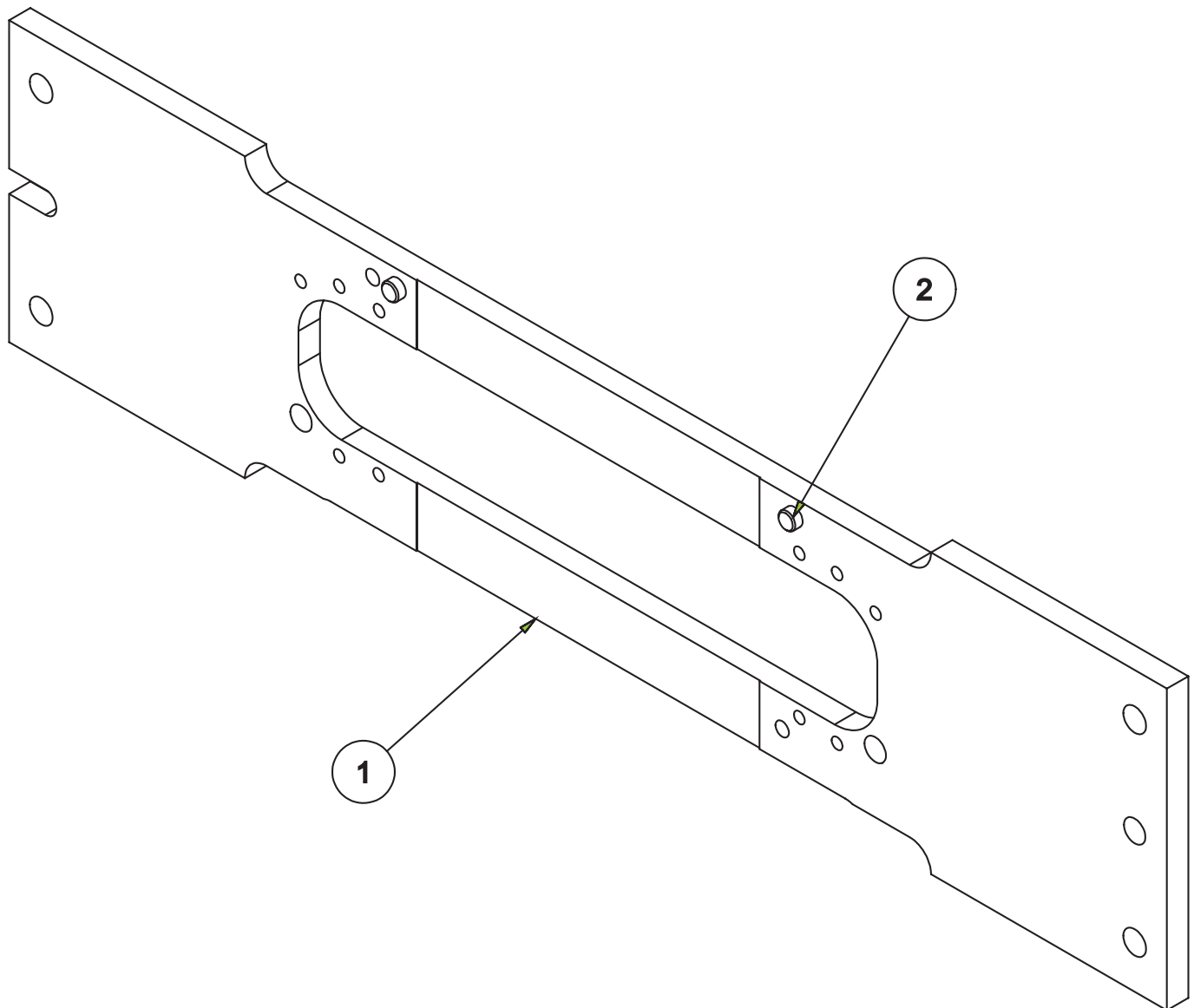


PFI-FORD1 FIXTURE ASSEMBLY - FORD 5.4L			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	5504U	FIXTURE PLATE (MACHINING) FORD 5.4L HEAD
2	2	5505L	LOCATING PIN, FORD 5.4L HEAD FIXTURE

**PFIX-HEMI Porting Fixture Parts**

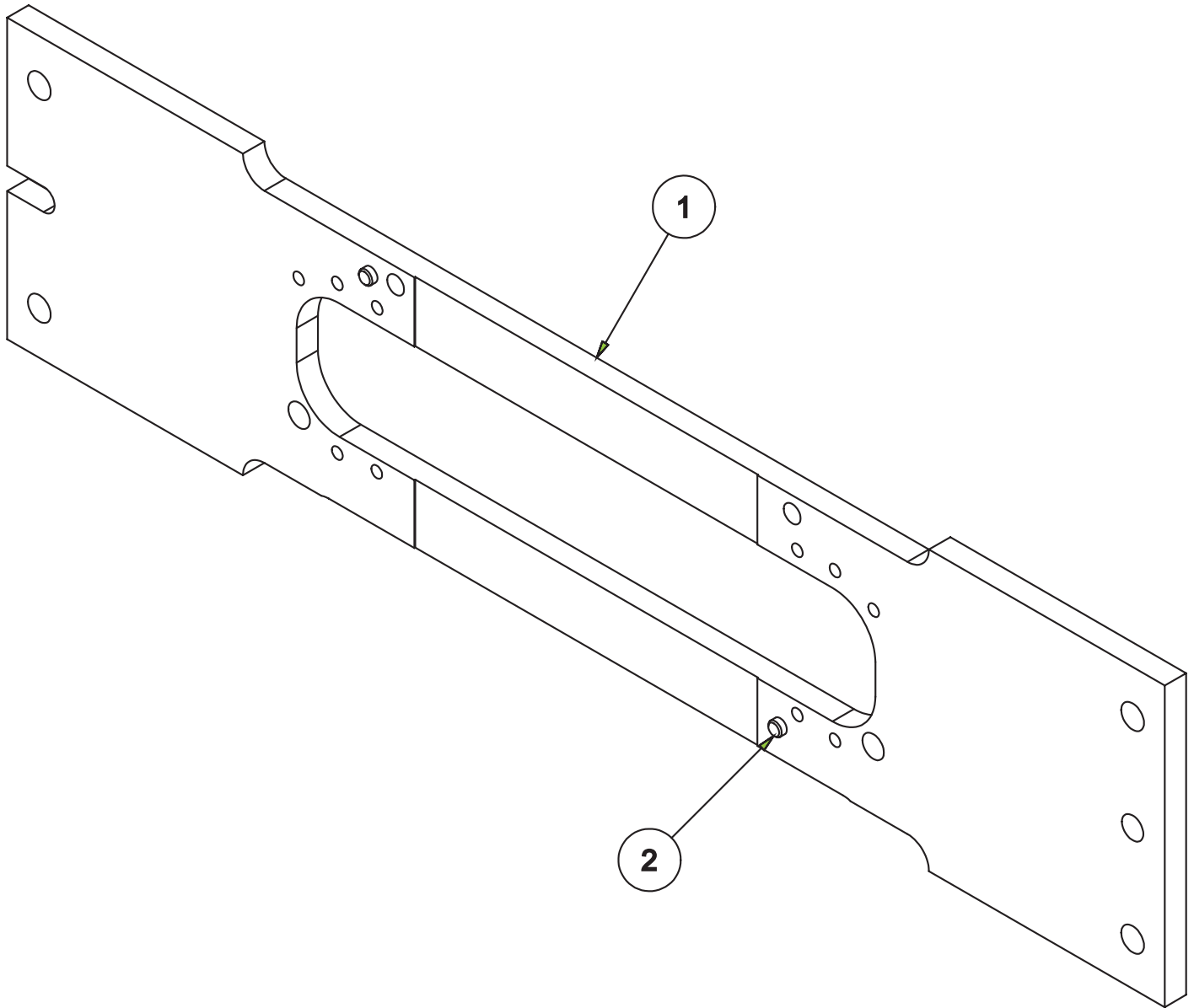


PFIX-HEMI MOPAR 5.7L HEMI FIXTURE ASSEMBLY			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	5514F	FIXTURE PLATE (MACHINING) MOPAR 5.7 HEMI
2	2	5505Y	LOCATING PIN, MOPAR 5.7 HEMI HEAD FIXTURE

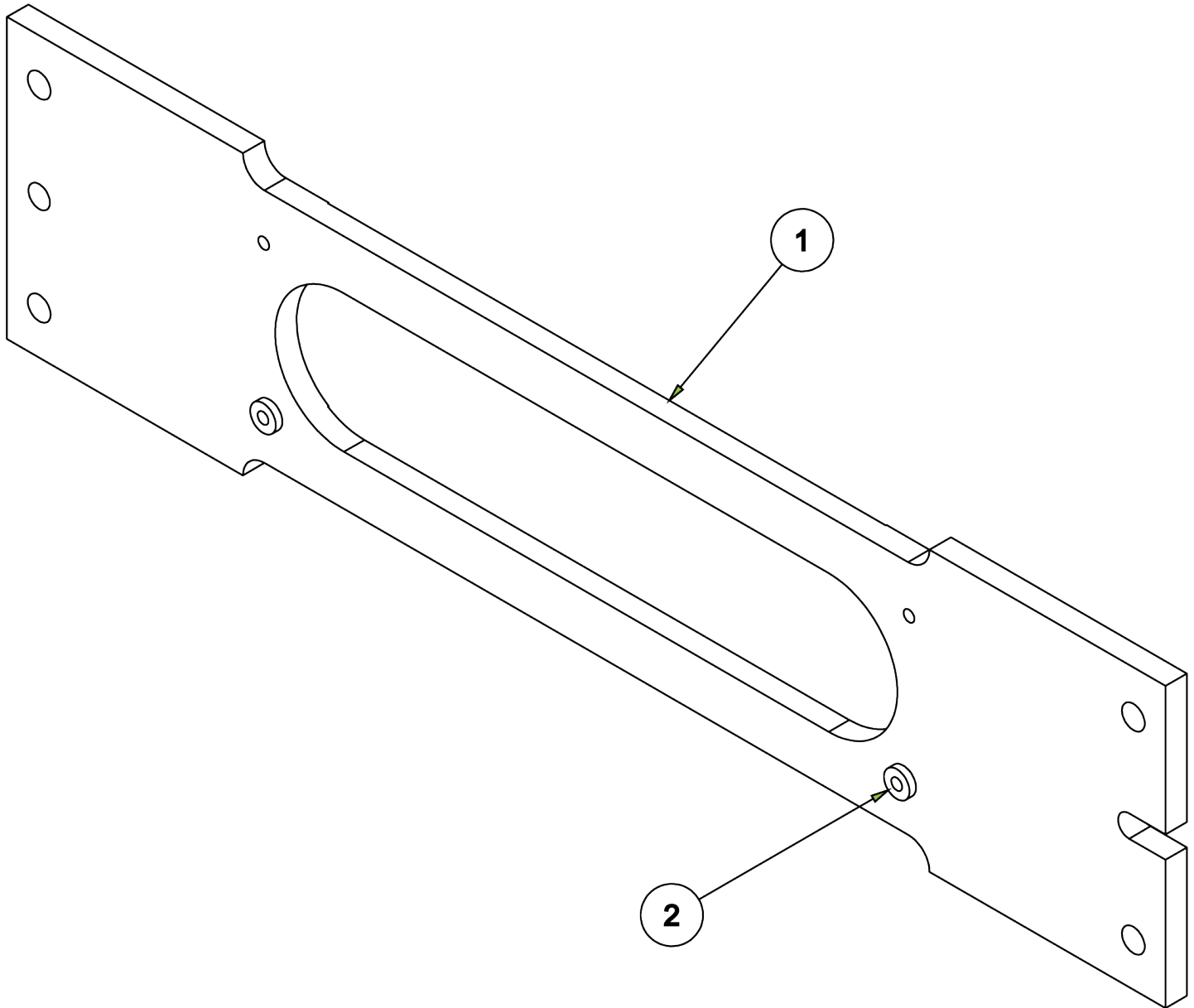
**PFIX-CYCLE Porting Fixture Parts**


PFX-CYCLE FIXTURE ASSEMBLY, HONDA INLINE 4 HEAD			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	5514	FIXTURE PLATE, HONDA INLINE 4/ TRIUMPH INLINE 3 HEADS
2	2	5505S	LOCATING PIN, HONDA INLINE 4 HEAD



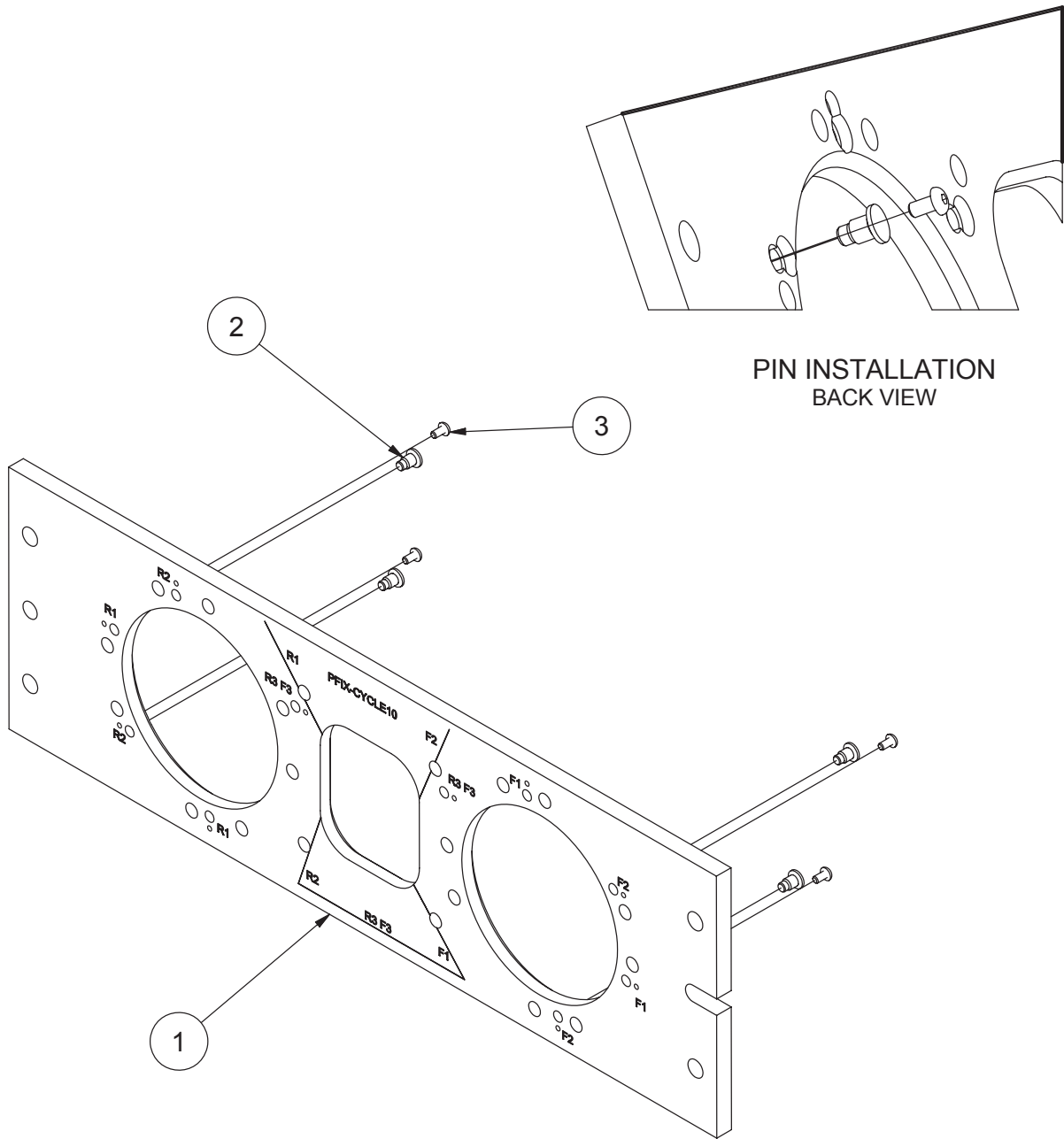
**PFIX-CYCLE1 Porting Fixture Parts**


PFIX-CYCLE1 FIXTURE ASSEMBLY, TRIUMPH INLINE 3			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	5514	FIXTURE PLATE, HONDA INLINE 4/ TRIUMPH INLINE 3 HEADS
2	2	5505C	LOCATING PIN, SMALL BLOCK CHEVROLET HEAD FIXTURE

**PFIX-CYCLE3 Porting Fixture Parts**


PFX-CYCLE3 FIXTURE ASSEMBLY, YAMAHA YZF1000 HEAD			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	5514A	FIXTURE PLATE, MOTORCYCLE HEAD #4
2	2	5505U	LOCATING PIN, YAMAHA YZF1000 HEAD

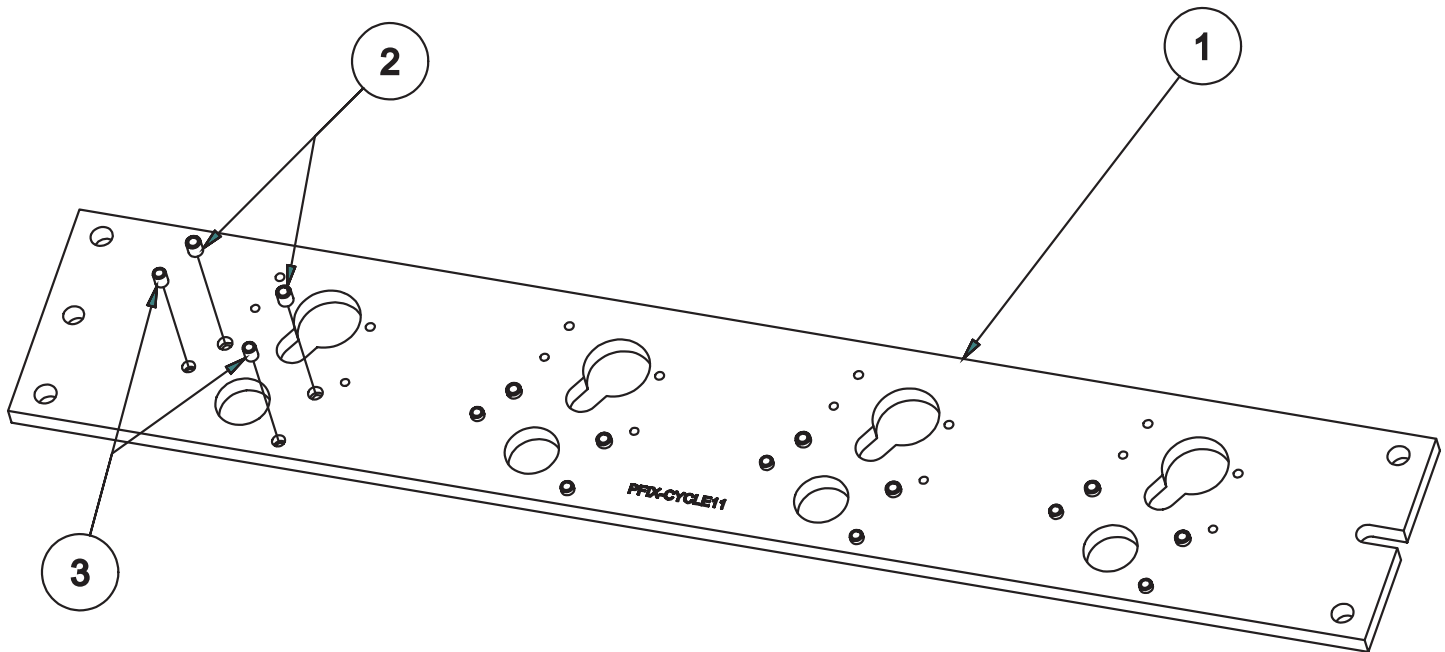
**PFIX-CYCLE10 Porting Fixture Parts**



**PIN INSTALLATION  
BACK VIEW**

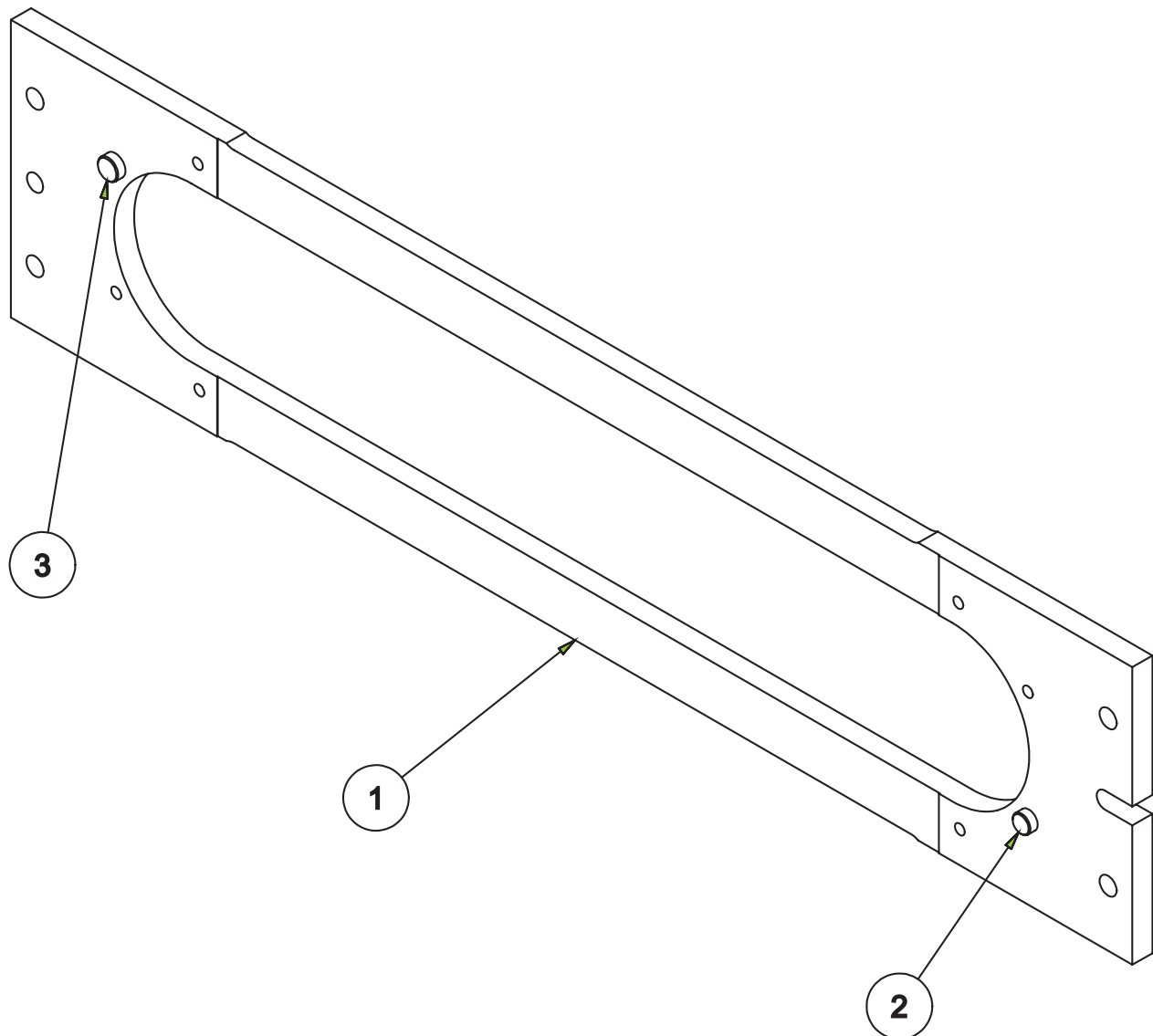
PFIX-CYCLE10 FIXTURE PLATE ASSEMBLY, HD PROSTOCK HEADS (CHAMBER MOUNT)			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	5524E	HEAD PLATE (MACHINING), HD PROSTOCK (CHAMBER MOUNT)
2	4	5524B	LOCATING PIN - HD PRO STOCK HEAD
3	4	MF-88	10-24UNC x 3/8" LG. Hexagon Socket Button Head Cap Screw

## PFI-CYCLE11 Porting Fixture Parts



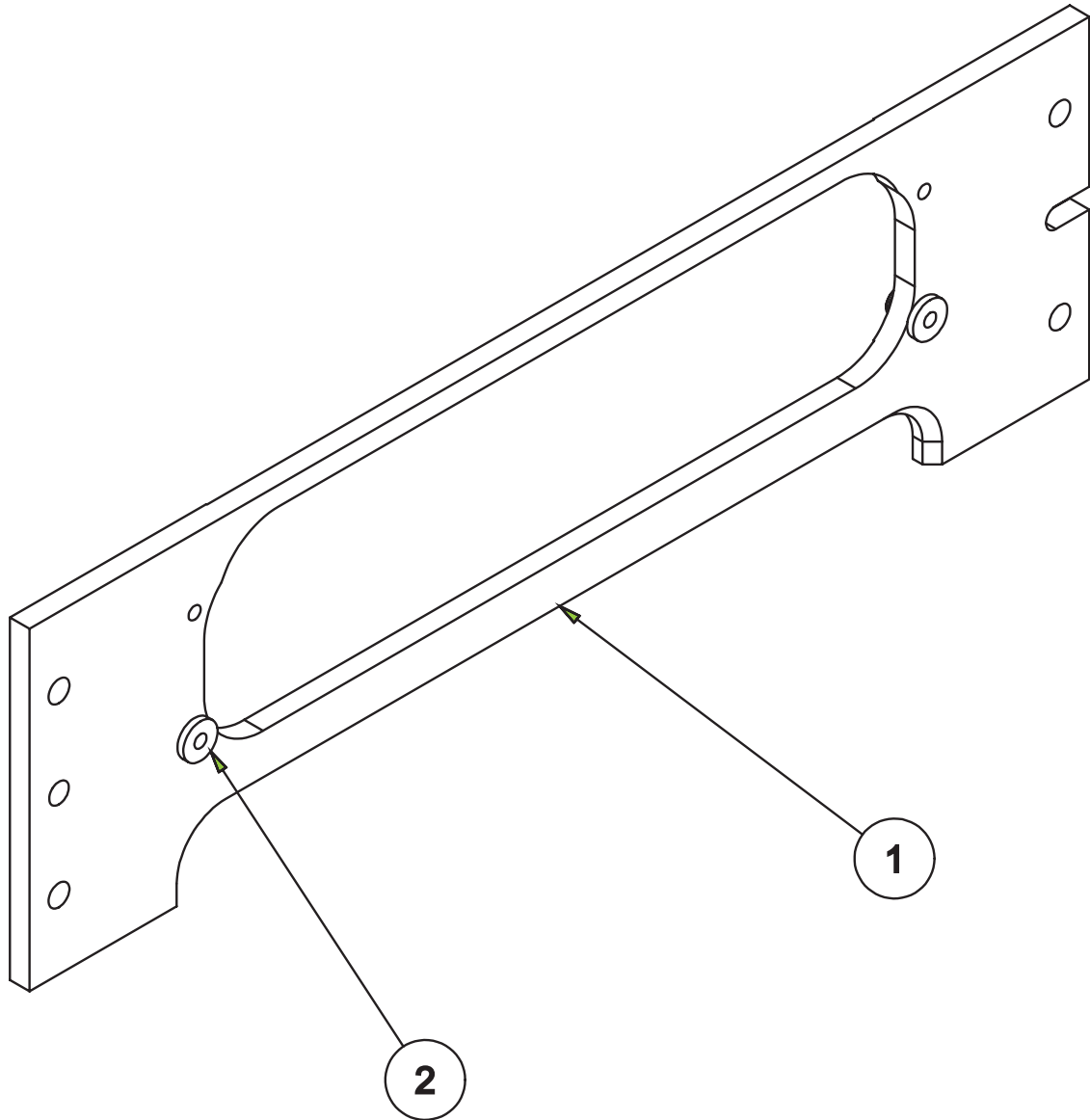
PFI-CYCLE11 FIXTURE PLATE ASSEMBLY, CR250/CR450 HEAD			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	5533	FIXTURE PLATE (MACHINING), CR250/CR450 HEAD FIXTURE
2	8	5533B	LOCATION SLEEVE, CR250, CR250/CR450 HEAD FIXTURE
3	8	5533C	LOCATION SLEEVE, CR450, CR250/CR450 HEAD FIXTURE

## PFI-X-DSL1 Porting Fixture Parts



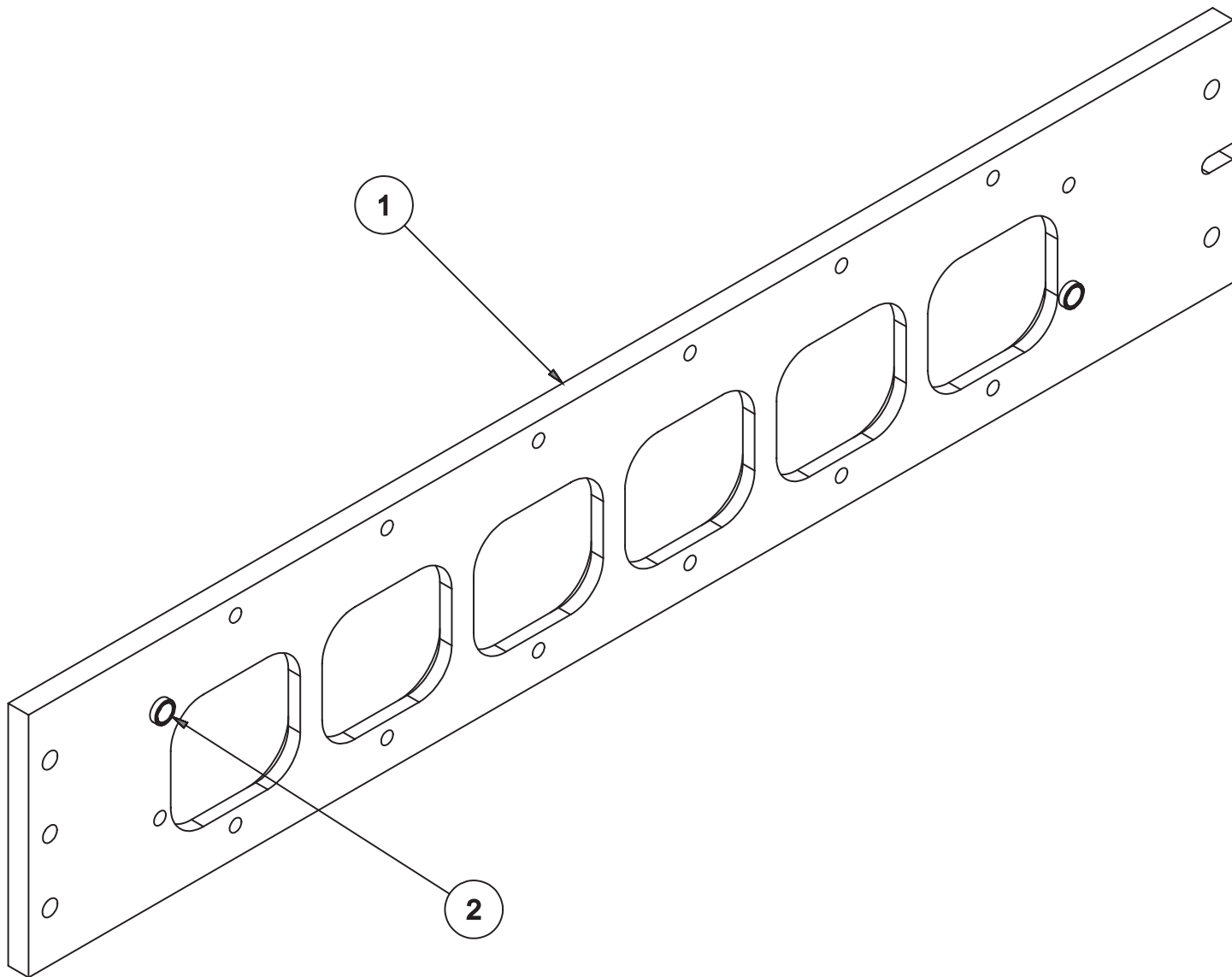
PFI-X-DSL1 FIXTURE PLATE ASSEMBLY, CUMMINS 5.9L			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	5514C	FIXTURE PLATE (MACHINING) 5.9L CUMMINS
2	1	5505W	LOCATING PIN #2, CUMMINS 5.9L CYLINDER HEAD
3	1	5505V	LOCATING PIN #1, CUMMINS 5.9L CYLINDER HEAD

**PFIX-DSL2 Porting Fixture Parts**



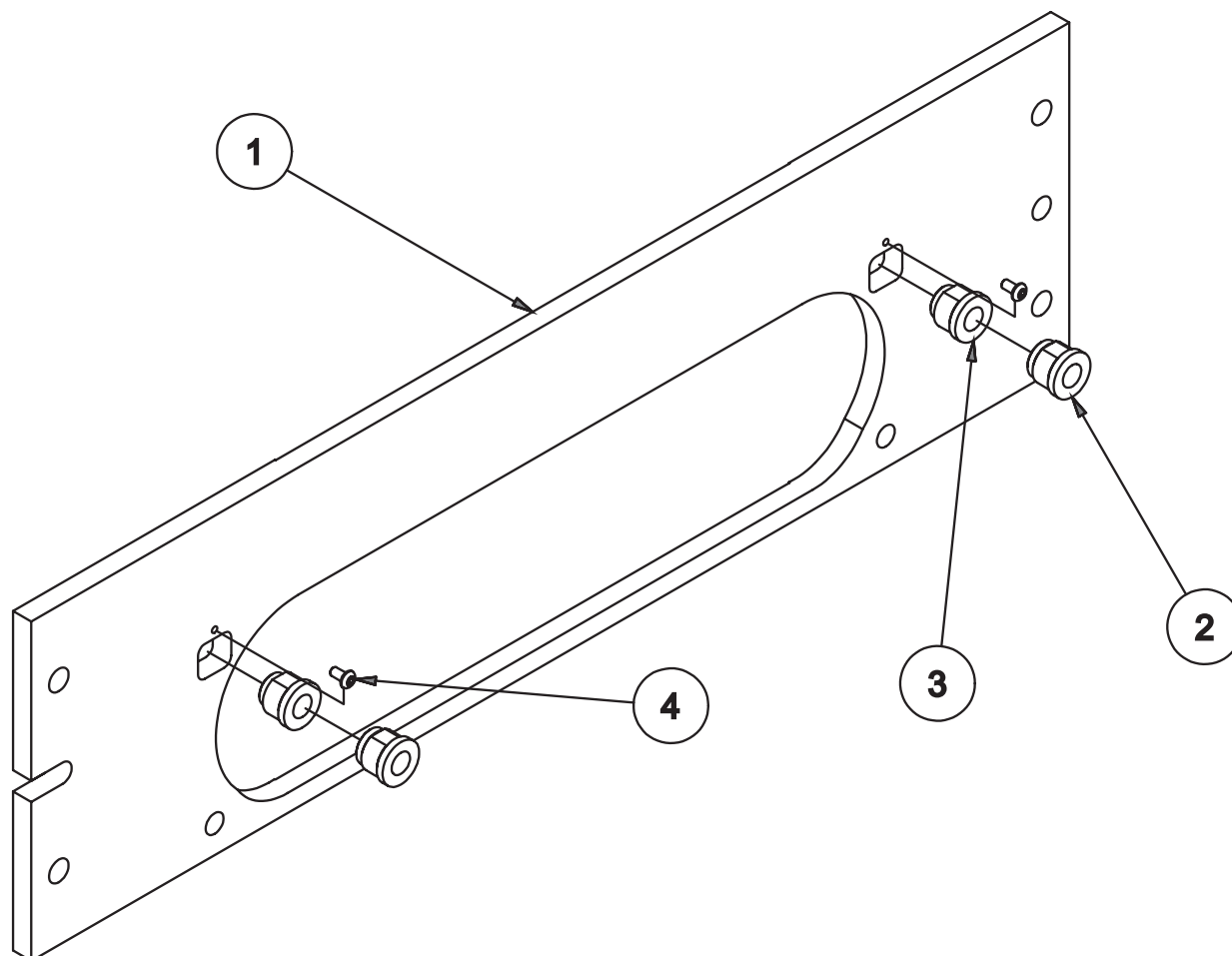
PFIX-DSL2 HEAD FIXTURE ASSEMBLY - DURAMAX DIESEL HEAD			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	5514D	FIXTURE (MACHINING) DURAMAX HEAD
2	2	5505X	LOCATING PIN - DURAMAX HEAD FIXTURE

**PFIX-DSL3 Porting Fixture Parts**



PFIX-DSL3 INTERNATIONAL INLINE 6 DIESEL FIXTURE PLATE ASSEMBLY			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	5523	INTERNATIONAL INLINE 6 HEAD PLATE (MACHINING)
2	2	5523B	LOCATION RING, INTERNATIONAL INLINE 6 HEAD FIXTURE

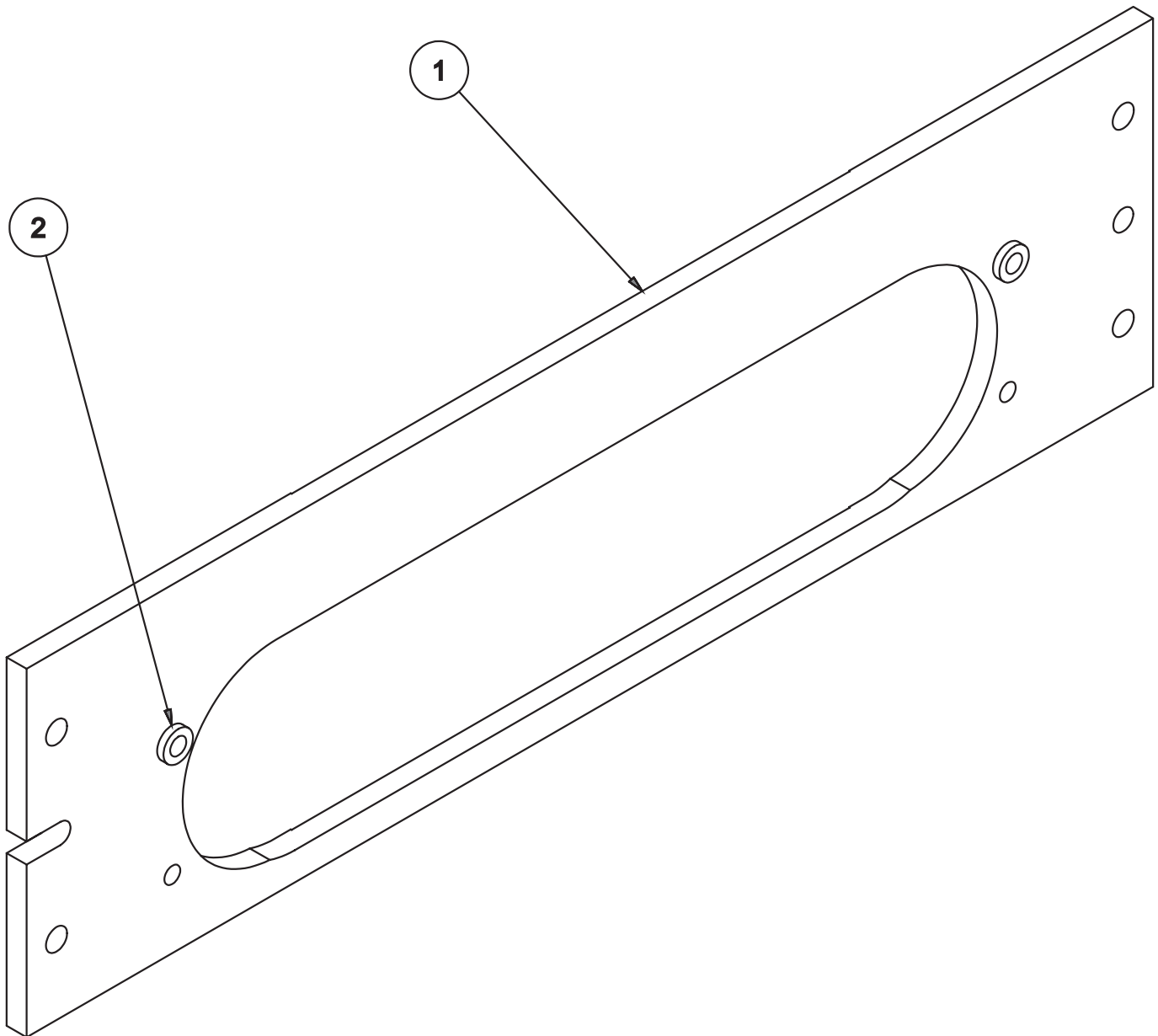
## PFI-X-DSL4 Porting Fixture Parts



PFI-X-DSL4 FORD 6.0/6.4L DIESEL FIXTURE ASSEMBLY			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	5514R	HEAD FIXTURE PLATE (MACHINING), FORD 6.0/6.4L DIESEL
2	2	5517P	LOCATING PIN, FORD 6.4 DIESEL, FIXTURE ASSEMBLY
3	2	5517R	LOCATING PIN, FORD 6.0 DIESEL, FIXTURE ASSEMBLY
4	2	MF-88	BUTTON HEAD SCREW 10-24UNC x 5/8" LG.

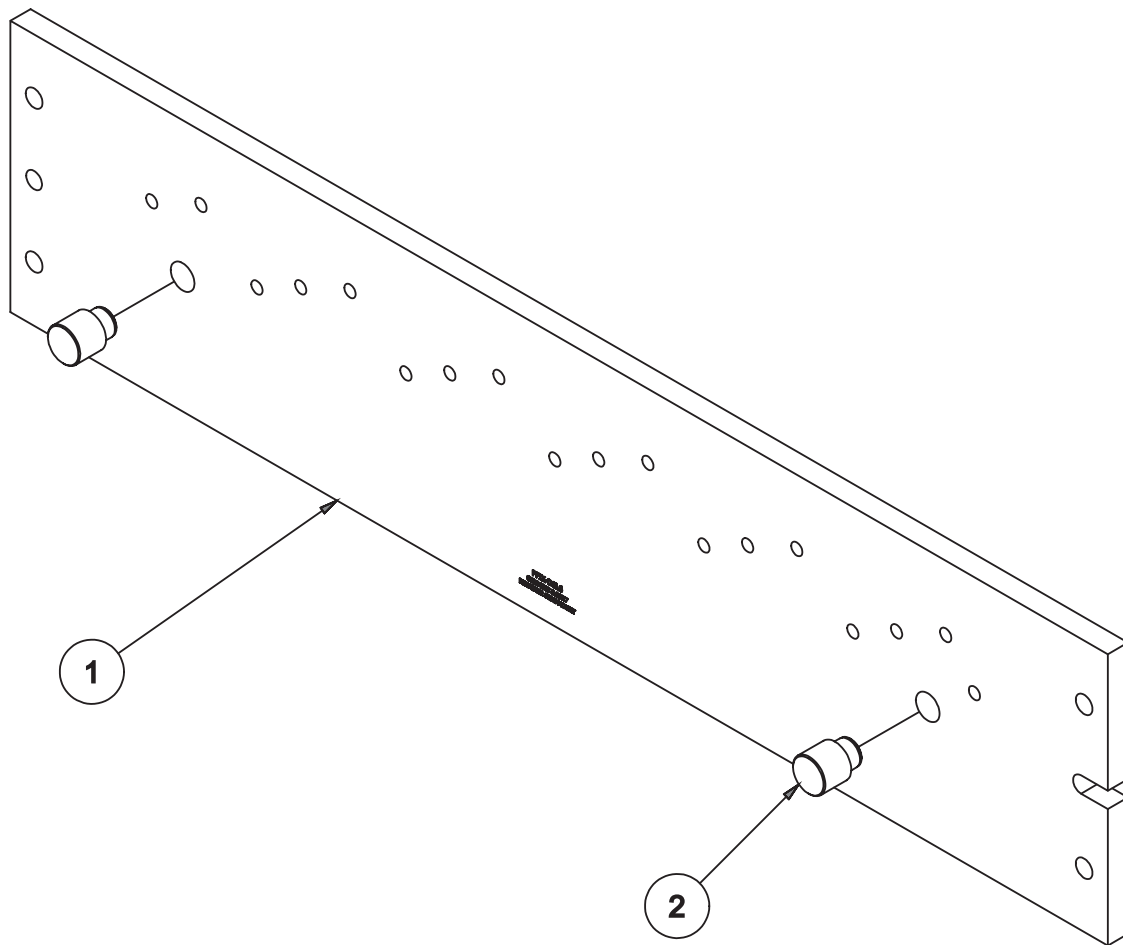


**PFIX-DSL5 Porting Fixture Parts**



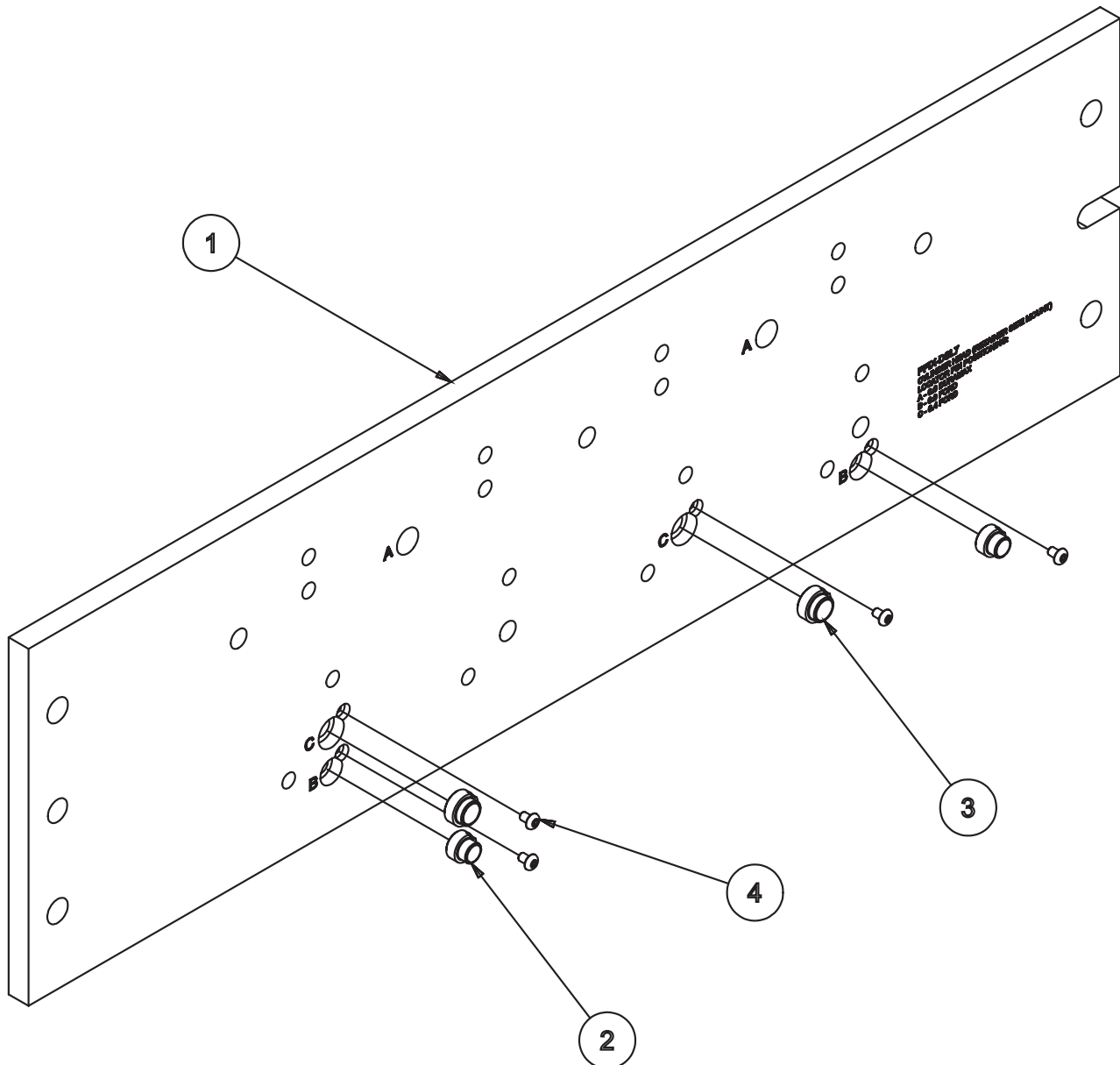
PFIX-DSL5 FORD 7.3L DIESEL FIXTURE ASSEMBLY			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	5514S	FIXTURE PLATE (MACHINING) - FORD 7.3L DIESEL CYLINDER HEAD
2	2	5517Q	LOCATING PIN - FORD 7.3L DIESEL HEAD FIXTURE

## PFI-X-DSL6 Porting Fixture Parts



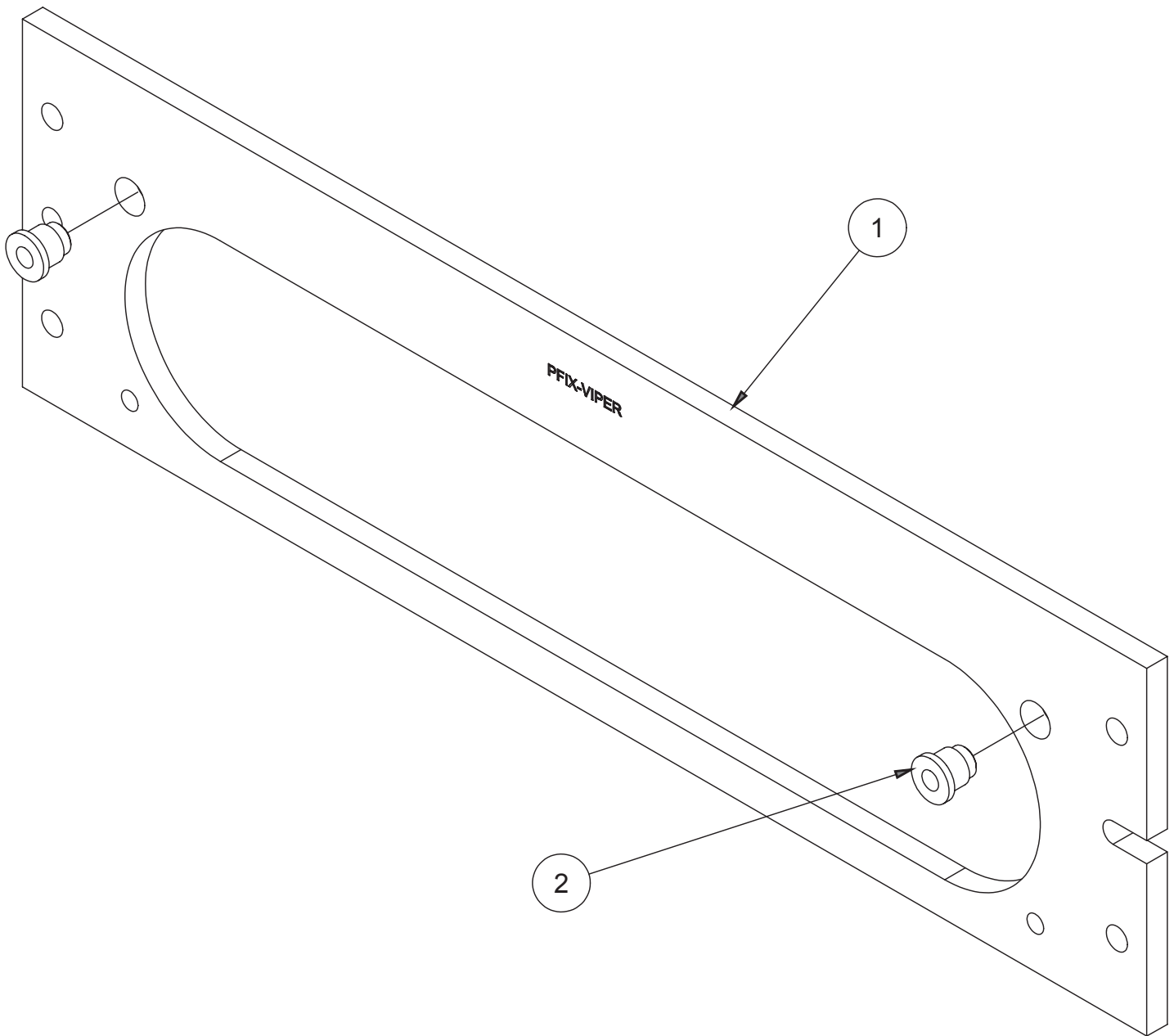
PFI-X-DSL6 FIXTURE PLATE ASSEMBLY, 5.9/6.7 CUMMINS HEAD (RETAINER SIDE MOUNT)			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	5528A	FIXTURE PLATE (MACHINING) INLINE DIESEL HEAD (RETAINER SIDE MOUNT)
2	2	5528B	LOCATING PIN, 5.9/6.7 CUMMINS HEAD FIXTURE (RETAINING SIDE MOUNT)

## PFI-X-DSL7 Porting Fixture Parts



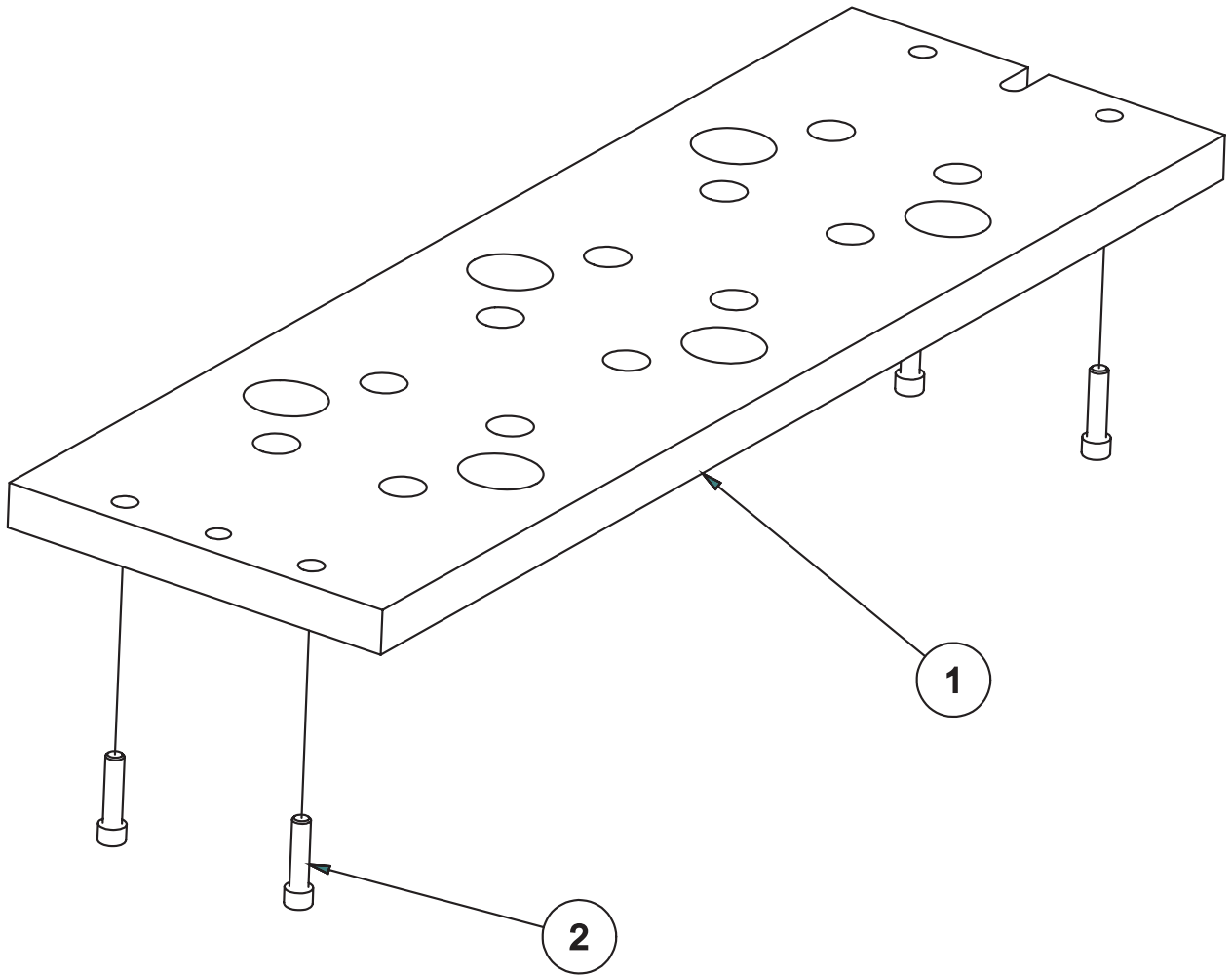
PFI-X-DSL7 FIXTURE PLATE ASSEMBLY, 5.9/6.7 CUMMINS (RETAINER SIDE MOUNT)			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	5527	FIXTURE PLATE (MACH.), SPECIAL RETAINER SIDE MOUNT - 6.6 DURAMAX, 6.4 FORD, 6.0 FORD
2	2	5527A	LOCATING PIN (.417 DIA.), 6.0L FORD HEAD (RETAINER SIDE MOUNT)
3	2	5527B	LOCATING PIN (.508 DIA.), 6.4L FORD HEAD (RETAINER SIDE MOUNT)
4	4	MF-86	Hexagon Socket Button Head Cap Screw

**PFIX-VIPER Porting Fixture Parts**



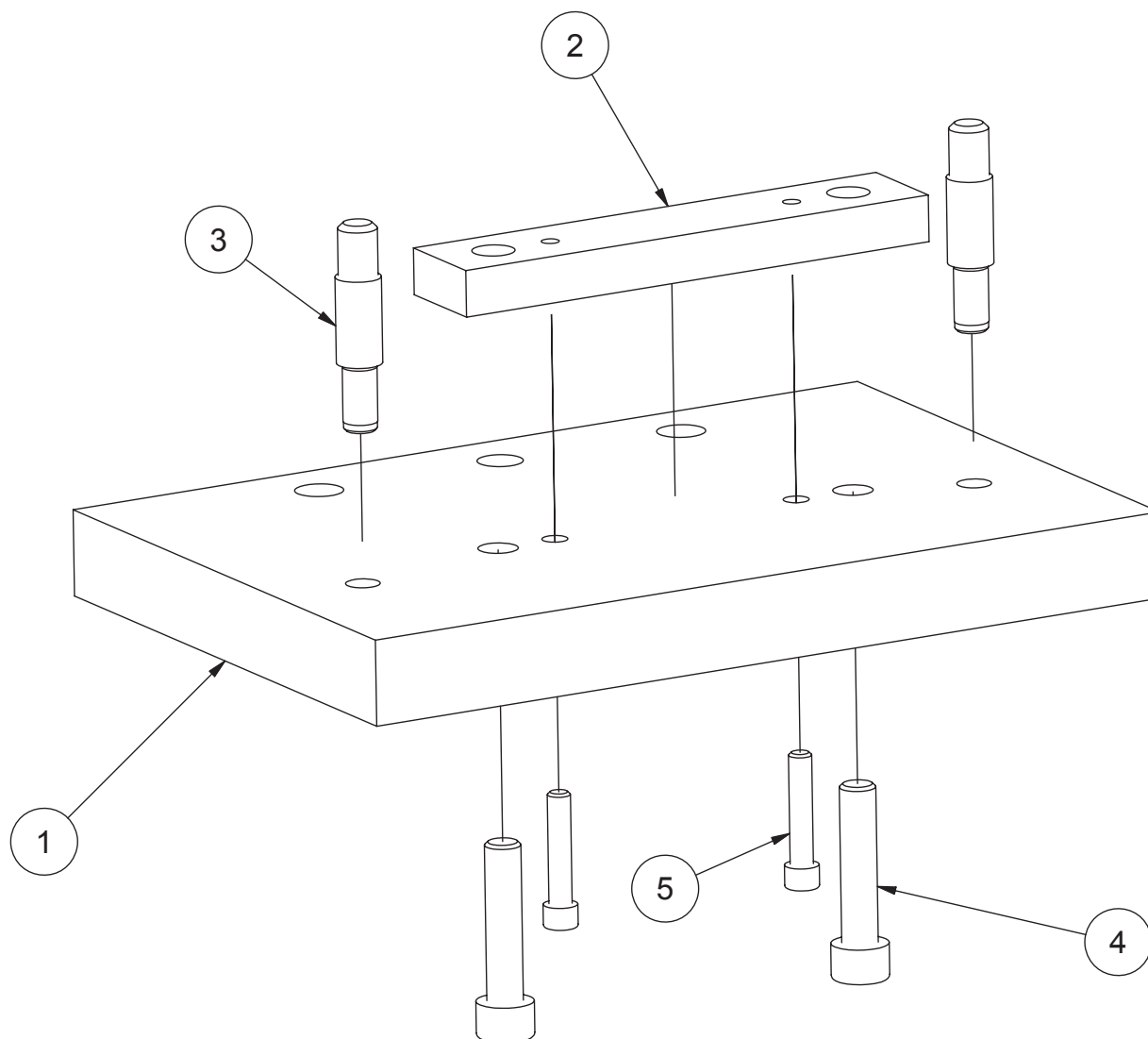
PFX-VIPER FIXTURE ASSEMBLY - DODGE VIPER V10 HEAD			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	5514T	FIXTURE PLATE (MACHINING) - DODGE VIPER V10 HEAD
2	2	5528C	LOCATOR PIN - DODGE VIPER V10 HEAD

**PFIX-PORSCHE Porting Fixture Parts**



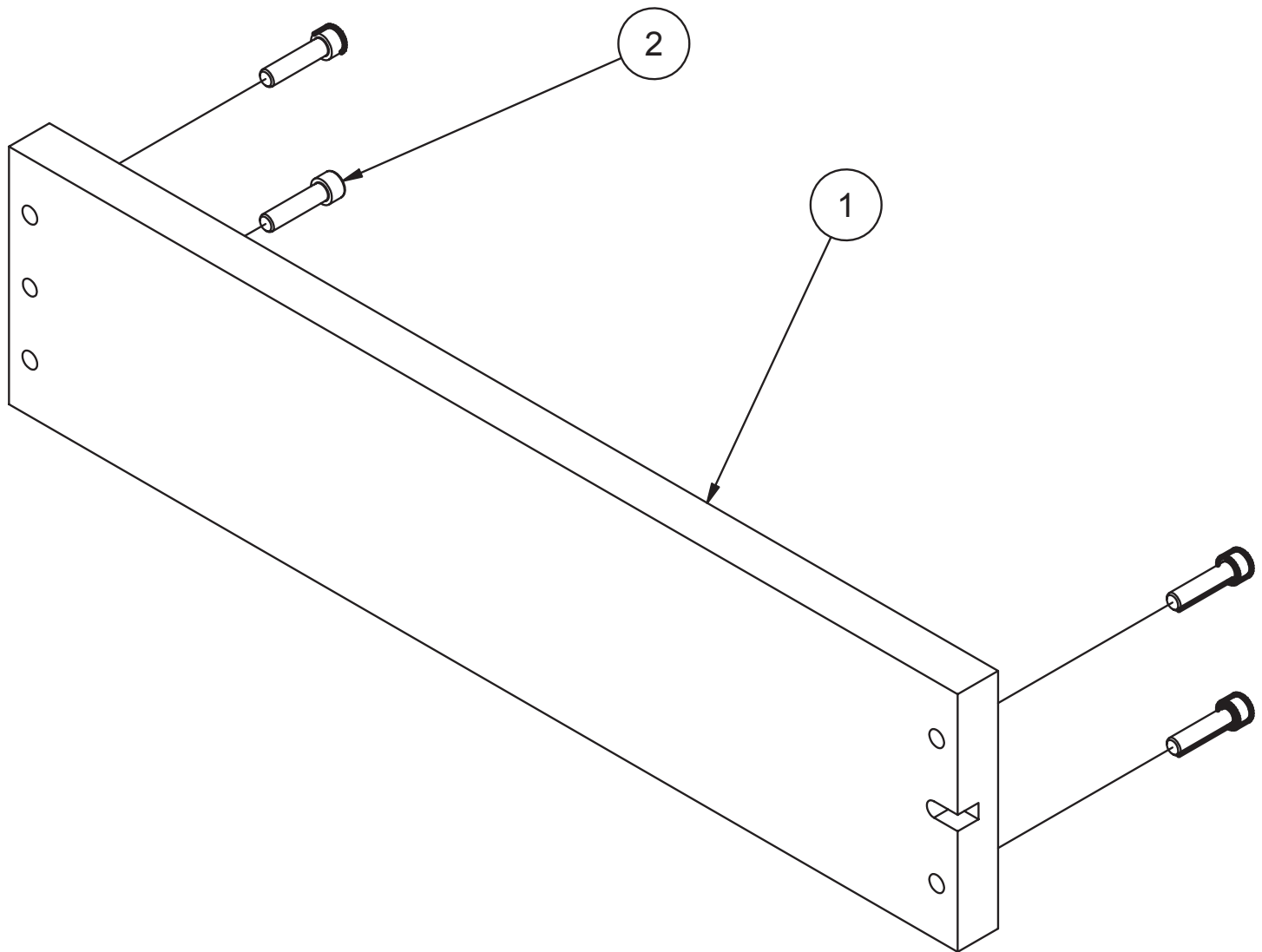
PFX-PORSCHE - HEAD MOUNT PLATE ASSEMBLY (SPECIAL PORSCHE 3 HEAD)			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	5514Q	HEAD MOUNT PLATE (SPECIAL PORSCHE 3 HEAD)
2	4	MF-33	3/8-16UNC x 1-1/2" LG. S.H.C.S.

## 5536 Porting Fixture Parts



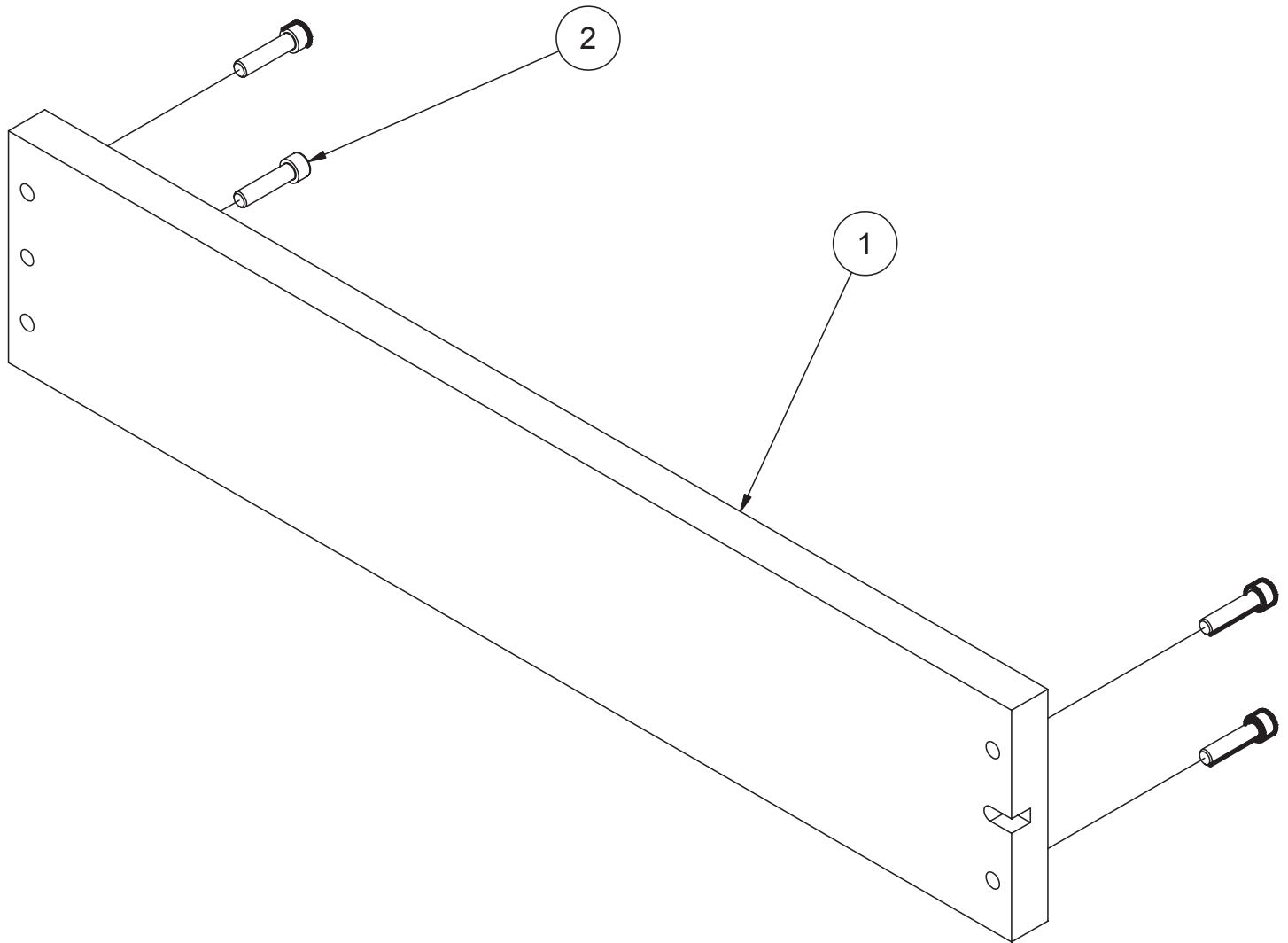
5536 VW AIR COOLED HEAD FIXTURE ASSEMBLY			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	5536A	FIXTURE PLATE, VW AIR COOLED HEAD FIXTURE ASSEMBLY
2	1	5536B	SPACER BAR, VW AIR COOLED HEAD FIXTURE
3	2	5536C	LOCATING PIN, VW AIR COOLED HEAD FIXTURE
4	2	5536D	S.H.C.S. M10x1.5 x 45mm LONG
5	2	MF-16	S.H.C.S. 1/4 - 20 UNC - 1 1/4

## 5517B Universal Semi-finished Fixture Plate Parts



5517B OVERHEAD CAM FIXTURE PLATE ASSEMBLY			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	5517A	OVERHEAD CAM FIXTURE PLATE
2	4	MF-45	S.H.C.S. 1/2 - 13 UNC X 2

**5517S Universal Semi-finished Fixture Plate Parts**

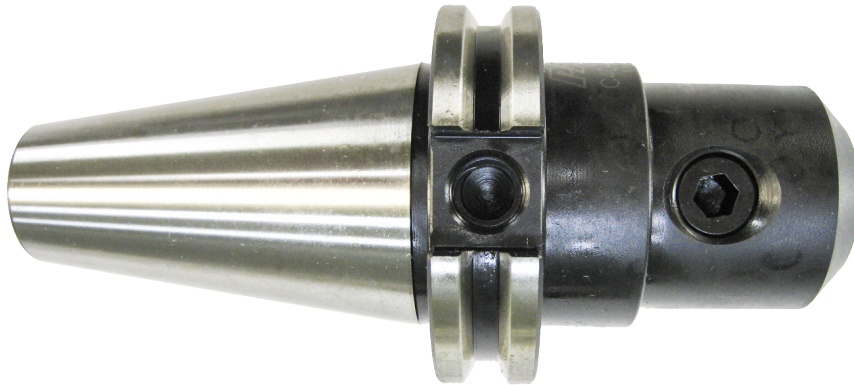


5517S OVERHEAD CAM FIXTURE PLATE ASSEMBLY (EXTRA LONG)			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	5517T	OVERHEAD CAM FIXTURE PLATE (EXTRA LONG)
2	4	MF-45	S.H.C.S. 1/2 - 13 UNC - 2



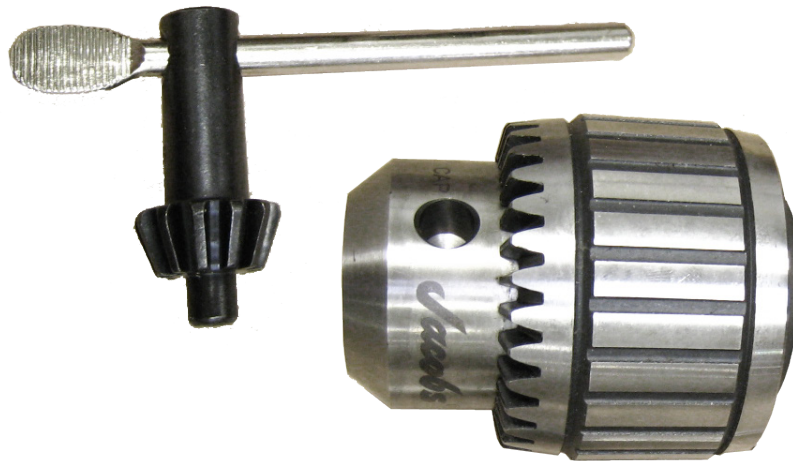
**650-2-44 Spindle Adapter CAT 40 for 650-2-9B Universal Chuck**

Sold only as complete assembly.

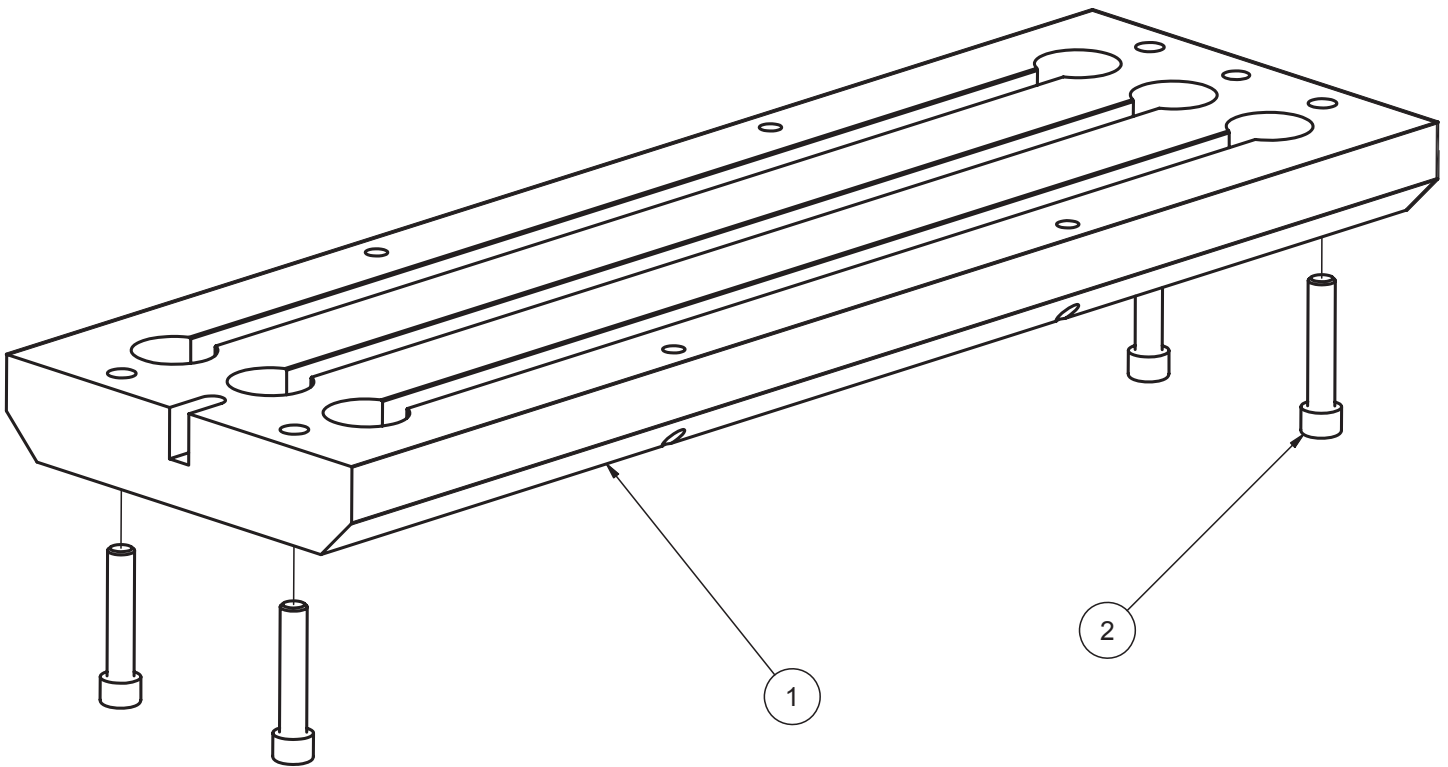


**650-2-9B Universal Chuck requires 650-2-44 Spindle Adapter**

Sold only as complete assembly



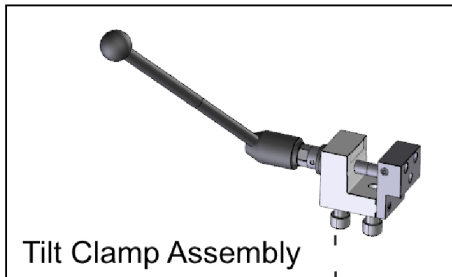
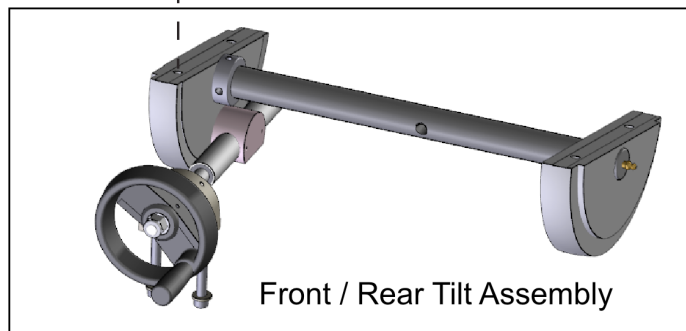
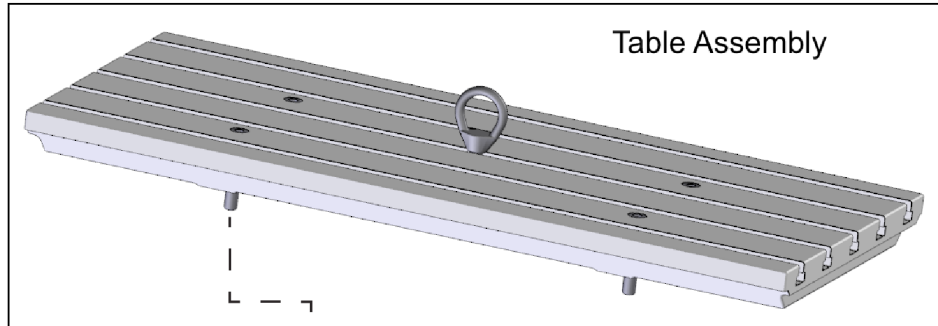
**5517F Universal T Slot Table Parts**



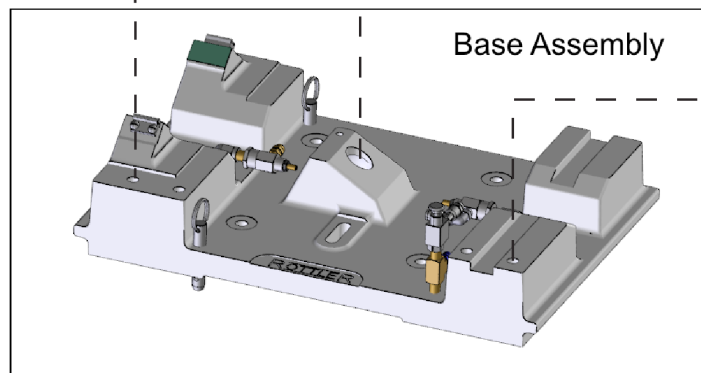
5517F T-SLOT TABLE ASSEMBLY, ROCK & ROLL FIXTURE			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	5517G	T-SLOT TABLE, ROCK & ROLL FIXTURE
2	4	MF-45A	1/2-13UNC x 2-1/2" LG. S.H.C.S.

## 7209M Leveling Table Sections

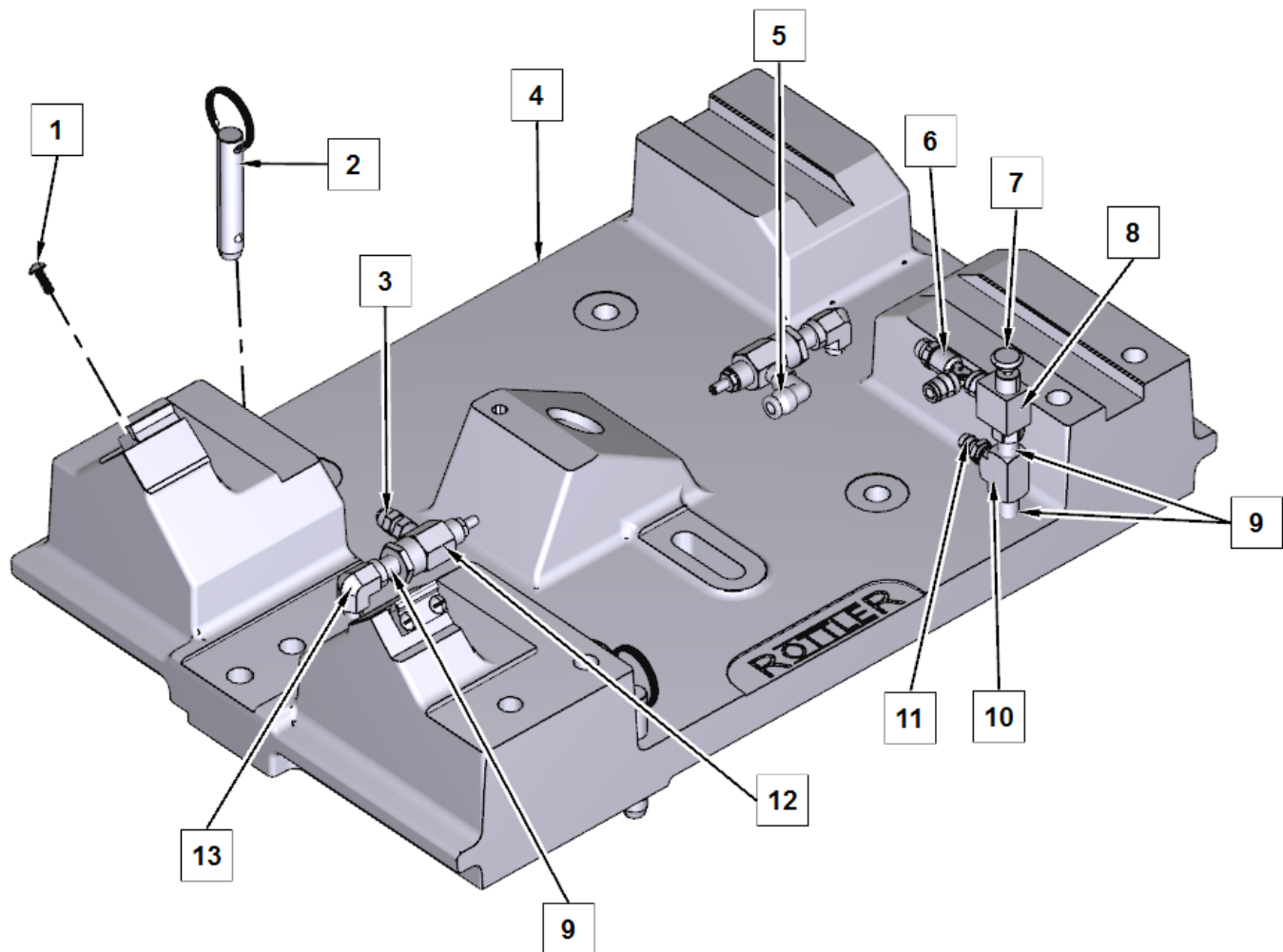
### 7209M Leveling Table Sections



#### Tensioner Assembly

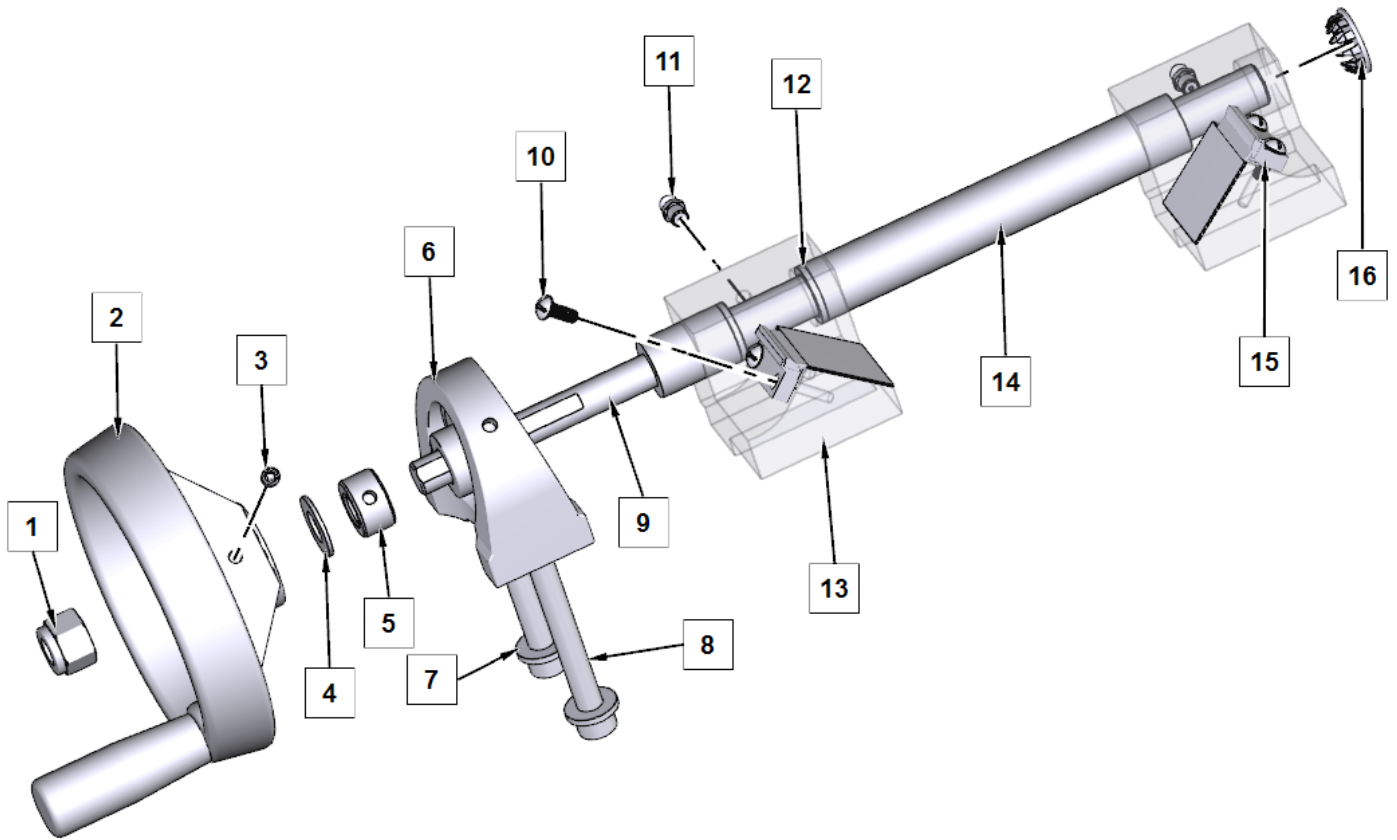


## Base Assembly Section Parts



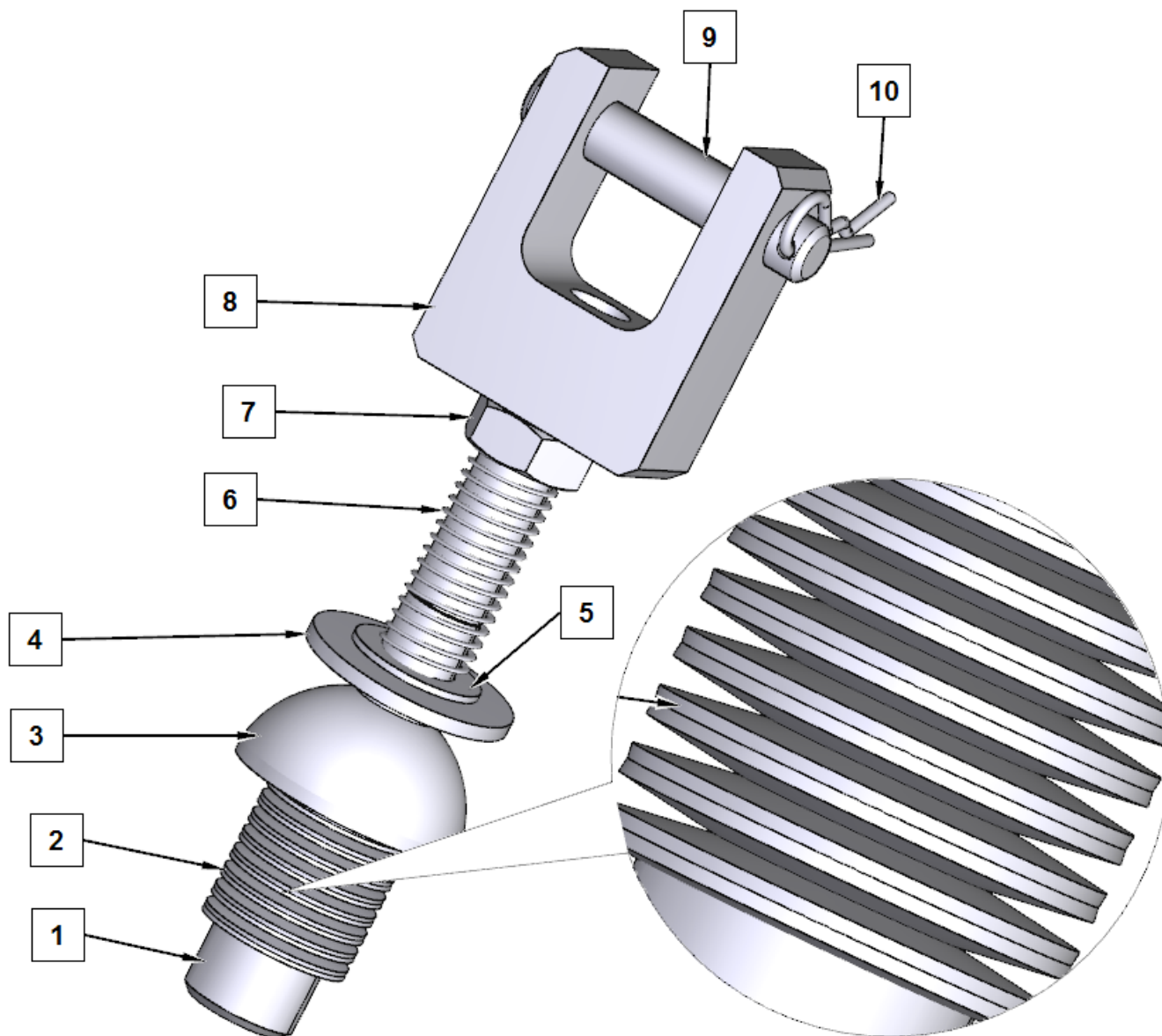
ITEM	PART #	DESCRIPTION
1	MF-111	ROUND HEAD MACHINE SCREW 10-24 X 1/2"
2	7210C	PIN, GUIDE ROTTLER LEVELING TABLE
3	502-11-16E	CONNECTOR, MALE, 1/4 X 1/8" PT
4	7233	FRAME, TABLE
5	514-4-17E	ELBOW, 90 DEGREE MALE - 1/4" X 1/8" NPT
6	514-4-17X	TEE, RUNNING 1/8-NPT X 1/4
7	502-1-56	PUSHBUTTON
8	514-2-65	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

## Left/ Right Tilt Assembly Section Parts



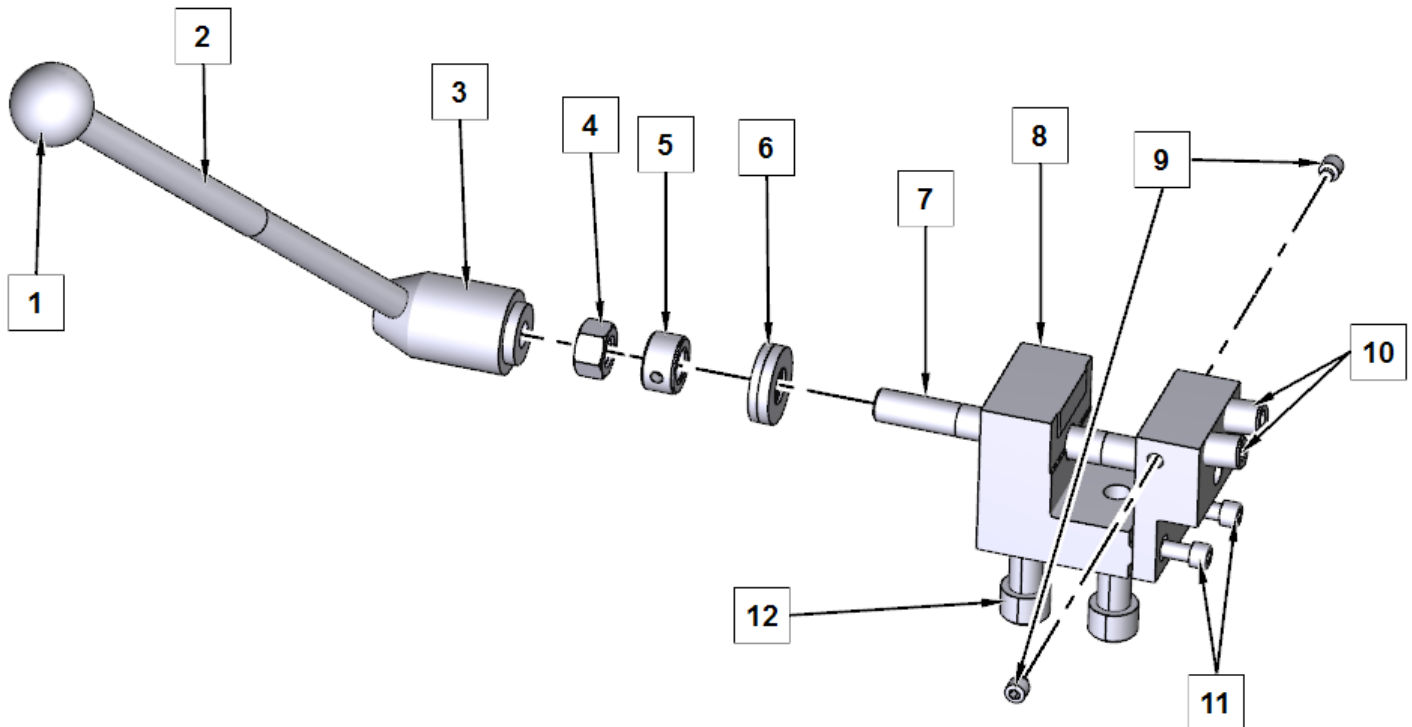
ITEM	PART #	DESCRIPTION
1	MF-186	NYLOCK NUT 1/2-13 NC
2	100-19	WASHER, THRUST
3	7201M	HANDWHEEL
4	7209J	COLLAR, 1/2" SHAFT
5	MF-36A	SOCKET HEAD CAP SCREW 3/8-16 X 3 1/2"
6	100-28-32	WASHER, 3/32" THICK
7	7201D	BLOCK, PILLOW LEVEL ADJUST
8	7199E	COLLAR, SUPPORT BLOCK (5/8" DIA)
9	514-7-21	WASHER, BELLEVILLE
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

## 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

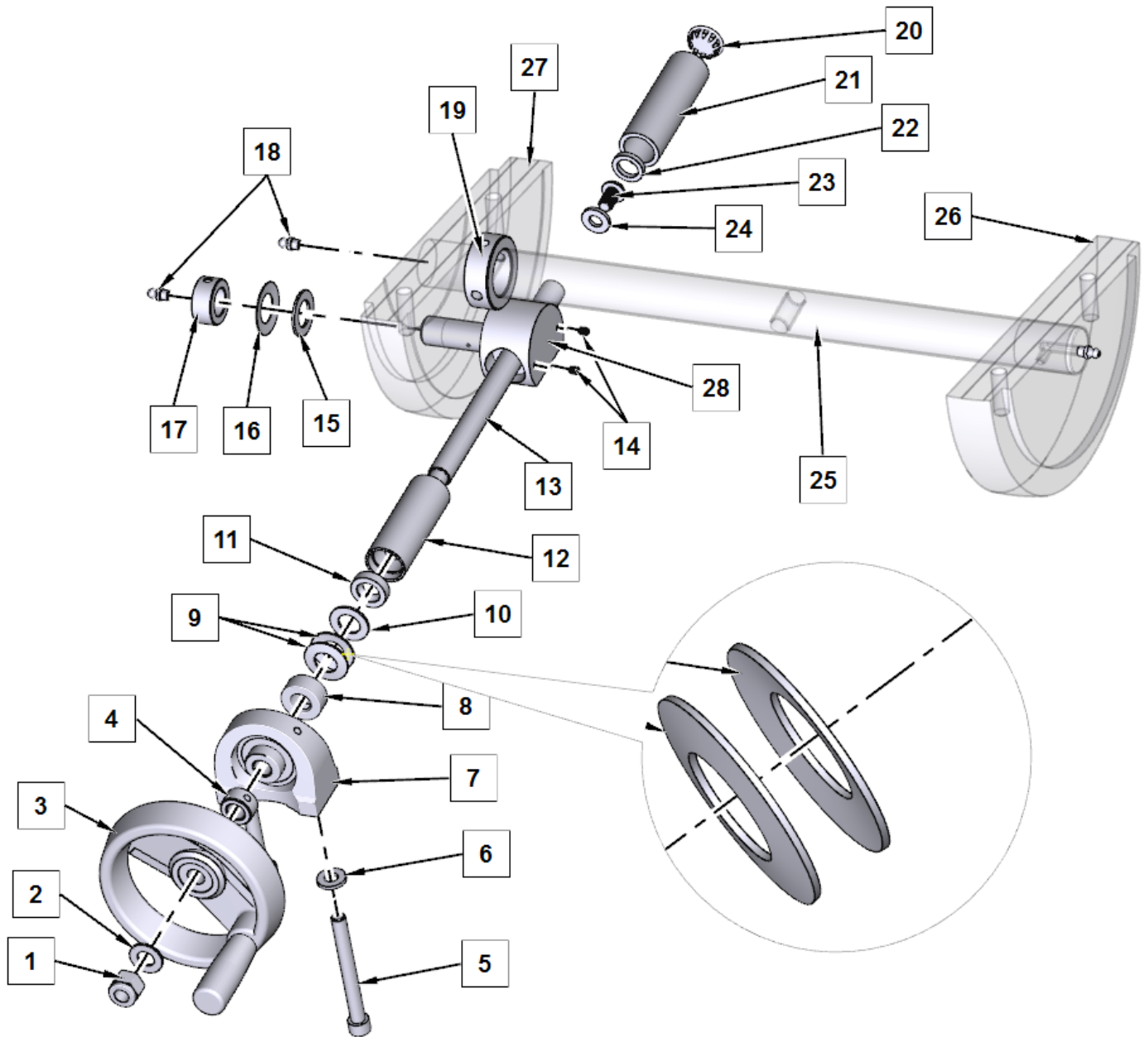
## Tilt Clamp Assembly Section Parts



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"

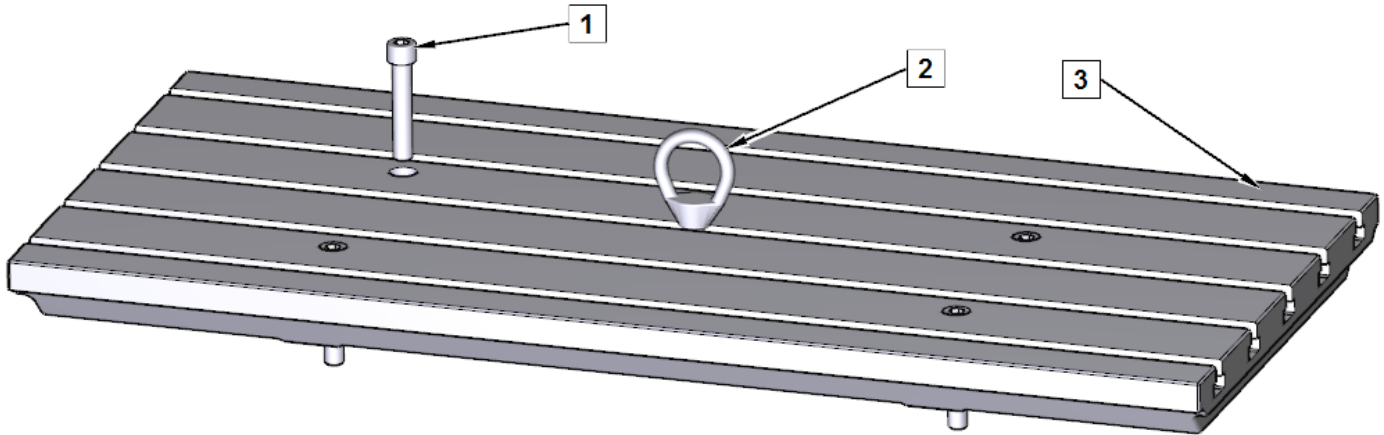


## Front/Rear Tilt Assembly Section Parts



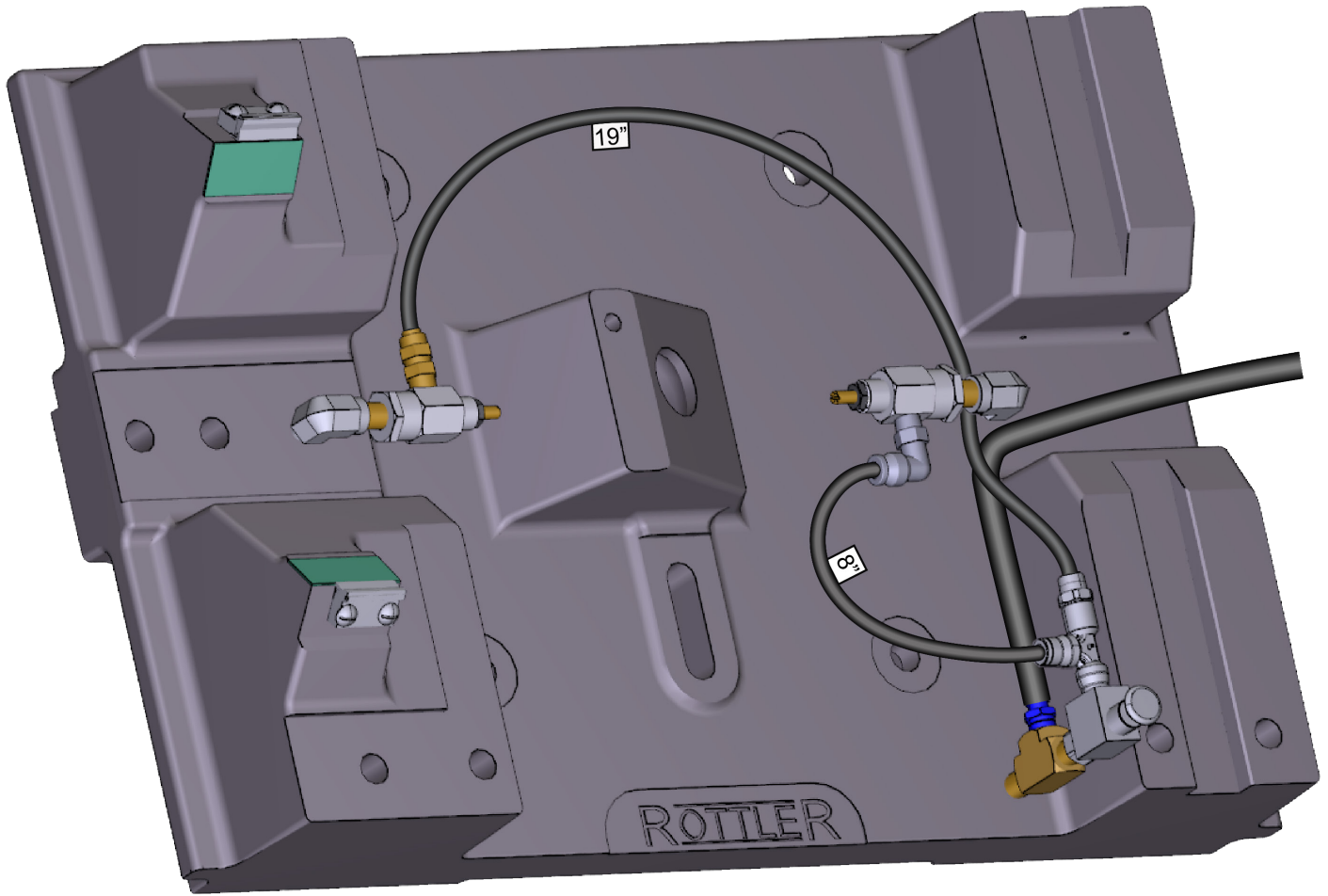
ITEM	PART #	DESCRIPTION
1	MF-186	NYLOCK NUT 1/2-13 NC
2	100-19	WASHER, THRUST
3	7201M	HANDWHEEL
4	7209J	COLLAR, 1/2" SHAFT
5	MF-36A	SOCKET HEAD CAP SCREW 3/8-16 X 3 1/2"
6	100-28-32	WASHER, 3/32" THICK
7	7201D	BLOCK, PILLOW LEVEL ADJUST
8	7199E	COLLAR, SUPPORT BLOCK (5/8" DIA)
9	514-7-21	WASHER, BELLEVILLE
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

## 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

## Air Hose Diagram

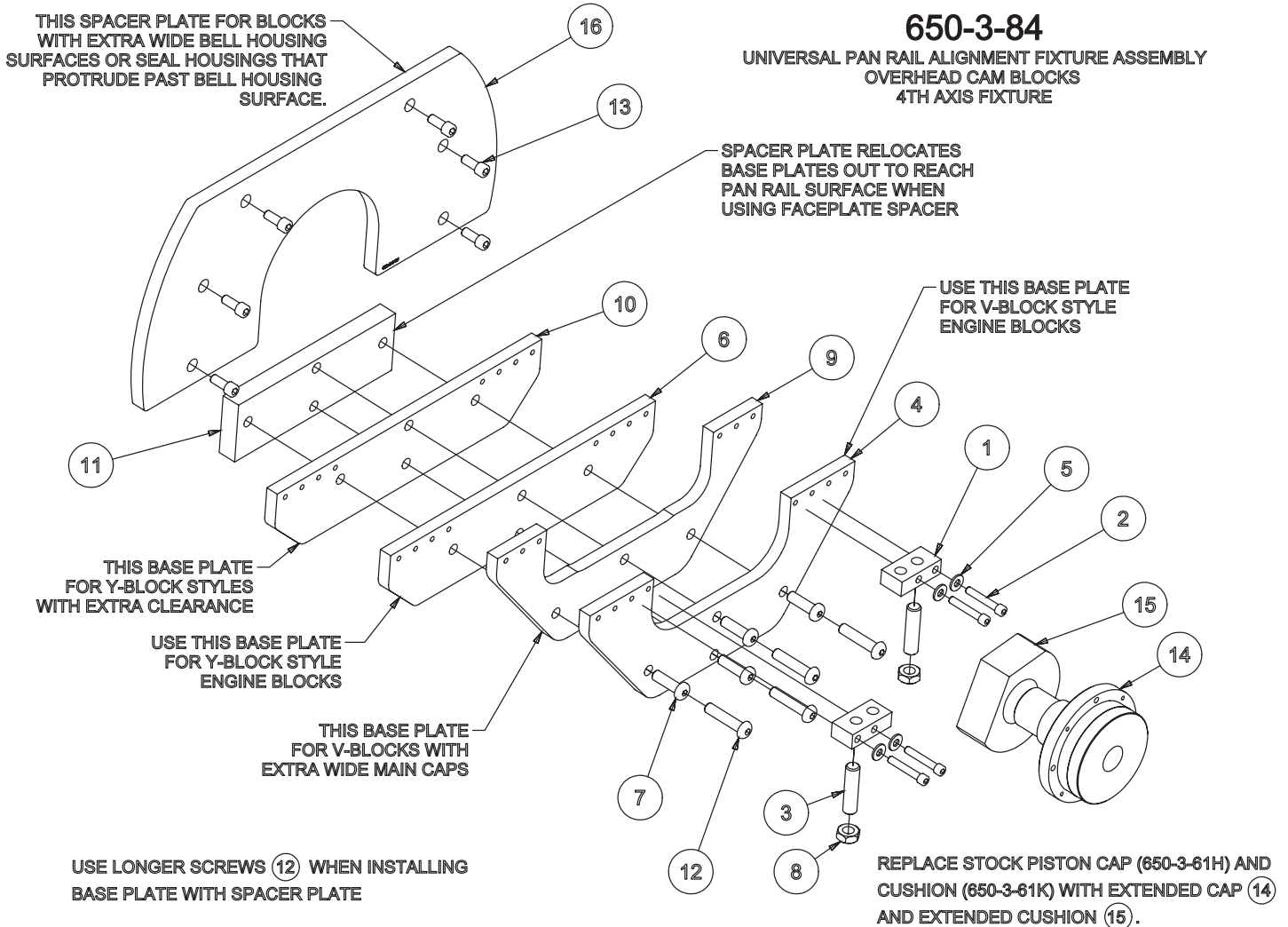


## Overhead Camshaft Engine Block Fixturing

### 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 ASSEMBLY

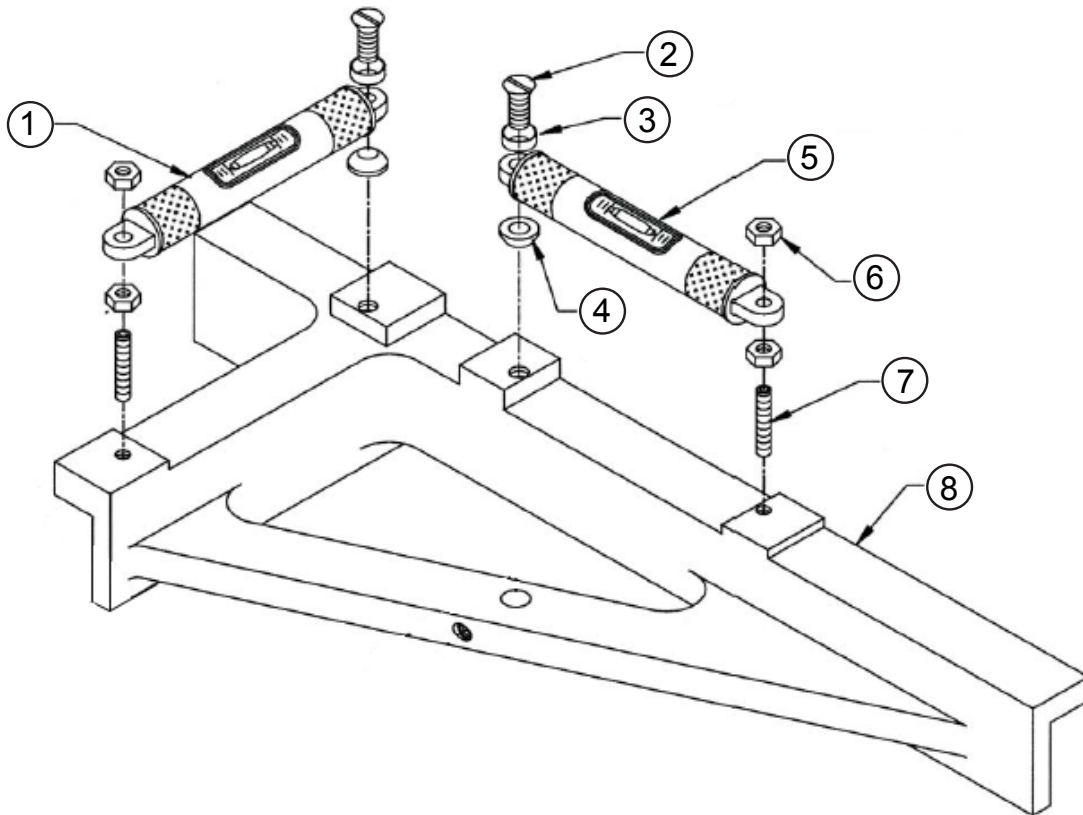
ITEM	QTY	PART NUMBER	DESCRIPTION
1	2	650-3-84C	PUSH BLOCK
2	4	MF-17	1/4-20UNC x 1-1/2" LG. S.H.C.S.
3	2	650-3-84D	1/2-13UNC x 2" LG. SOCKET FLAT POINT SET SCREW
4	1	650-3-84A	FRAME (MACHINING), V-BLOCK STYLE (STANDARD WIDTH) PAN RAIL ALIGNMENT FIXTURE
5	4	MF-176	1/4" FLAT WASHER
6	1	650-3-84E	FRAME, Y-BLOCK STYLE (STANDARD), PAN RAIL ALIGNMENT FIXTURE
7	4	MF-97C	3/8-16UNC x 1-1/4" LG. Hexagon Socket Button Head Cap Screw
8	2	MF-171	1/2-13UNC HEX JAM NUT
9	1	650-3-84F	FRAME (MACHINING), V-BLOCK STYLE (WIDE CLEARANCE) PAN RAIL ALIGNMENT FIXTURE
10	1	650-3-84G	FRAME, Y-BLOCK STYLE (EXTENDED), PAN RAIL ALIGNMENT FIXTURE
11	1	650-3-84p	SPACER, PAN RAIL FIXTURE - 4TH AXIS FIXTURE
12	4	650-3-84T	3/8-16UNC x 1-3/4" LG. SOCKET BUTTON HEAD CAPSCREW
13	6	MF-22	S.H.C.S.5/16 - 18 UNC - 3/4
14	1	650-3-84Q	PISTON CAP, SPECIAL 1" EXTENDED, TAILSTOCK - 4TH AXIS FIXTURE
15	1	650-3-84R	CUSHION, SPECIAL EXTENDED, TAILSTOCK - 4TH AXIS FIXTURE
16	1	650-3-84M	SPACER PLATE (MACHINING), HEADSTOCK, LKQ BLOCK SELECTION - 4TH AXIS FIXTURE

## 11115 Parallels

Sold only as a matched set.

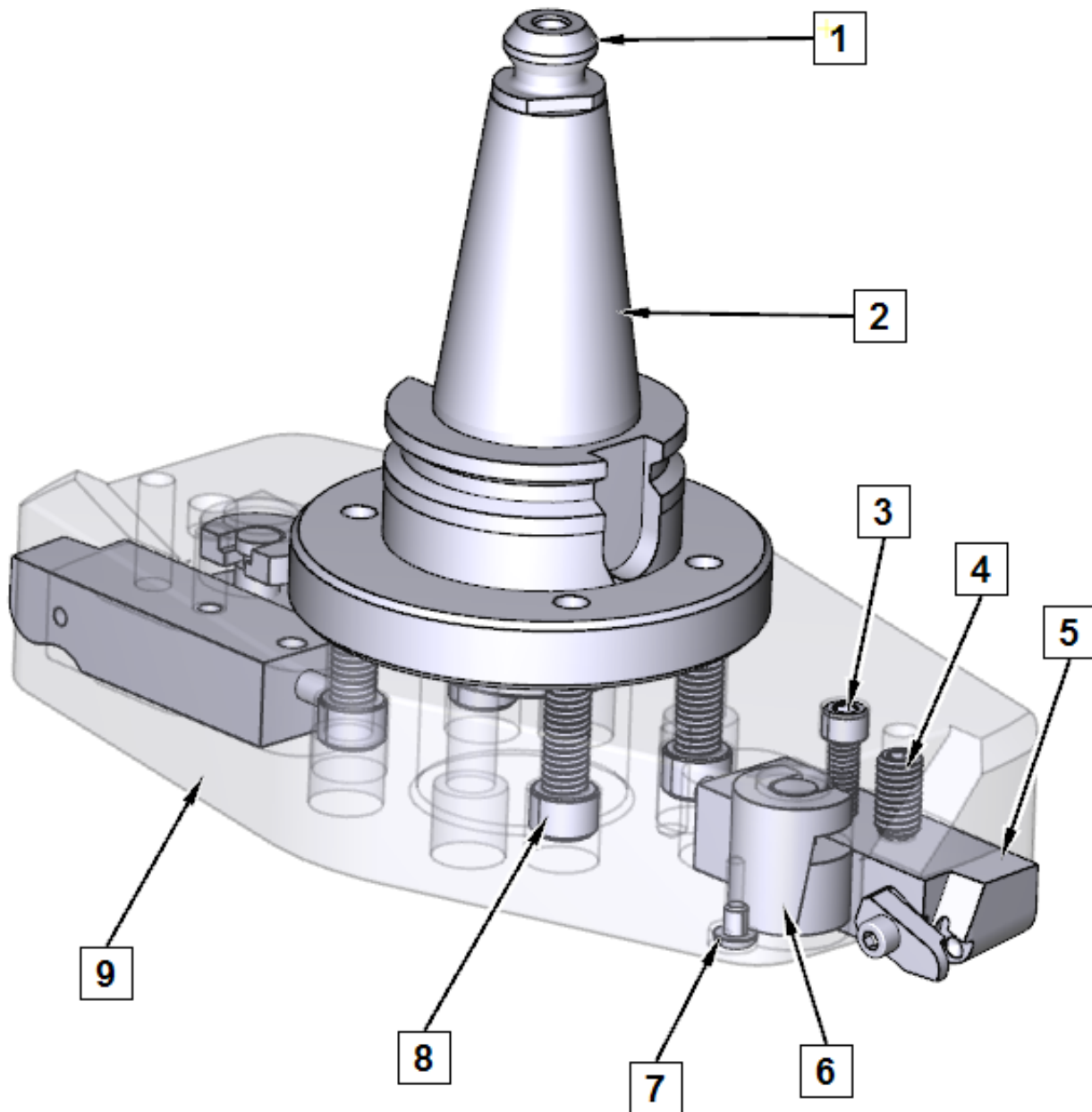


## 7152A Dual Axis Level Assembly Parts



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

## 650-2-8E Surfacing Cutterhead 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"

**6303B CBN Insert**

Round, Double-Sided, 3/8" (9.525mm) IC, for Cutting Cast Iron (15% Discount on orders of 10 or more)

**6303M PCD Insert**

Round, 3/8" (9.525mm) IC, for Cutting Aluminum (15% Discount on orders of 10 or more)

**6303K Coated Carbide Insert**

Round, 3/8" (9.525mm) IC, for General Purpose Use

**6303S CBN Insert**

Round, 3/8" (9.525mm) IC, for Cutting Aluminum Blocks with Liners (15% Discount on orders of 10 or more)

**6303U CBN Round Insert**

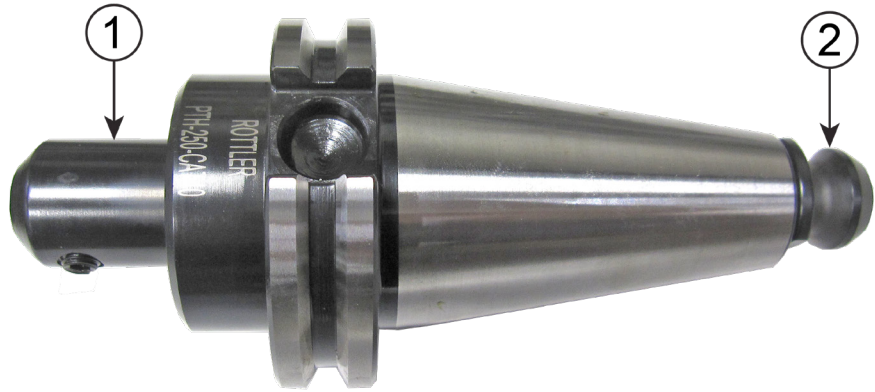
Single Sided, 3/8" IC. For hard cast iron (15% Discount on orders of 10 or more)





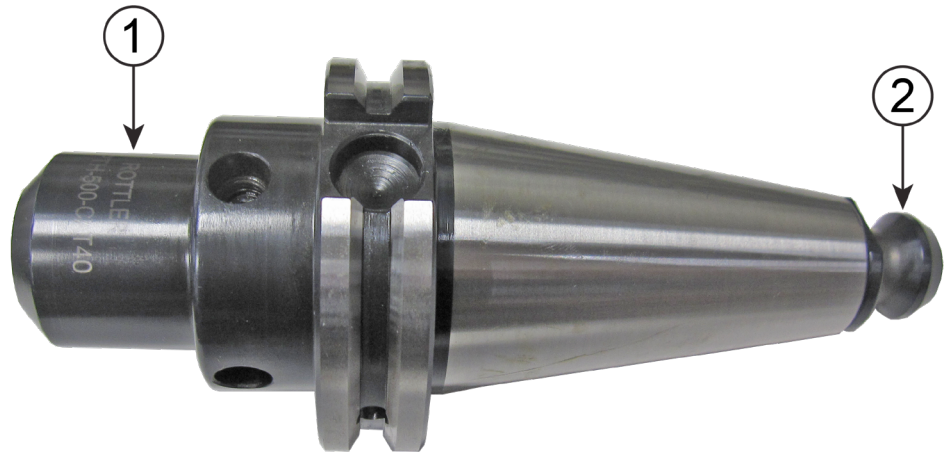
**Porting Tool Holders**

**PTH-250-CAT40 Parts**



ITEM	PART #	DESCRIPTION
1	PTH-250-CAT40	PORTING TOOL HOLDER - 1/4" DIAMETER
2	650-2-44L	CAT 40 RETENTION KNOB

**PTH-500-CAT40 Parts**



ITEM	PART #	DESCRIPTION
1	PTH-500-CAT40	PORTING TOOL HOLDER - 1/2" DIAMETER
2	650-2-44L	CAT 40 RETENTION KNOB

**PTH-625-CAT40 Parts**



ITEM	PART #	DESCRIPTION
1	PTH-6258-CAT40	PORTING TOOL HOLDER - 5/8" DIAMETER
2	650-2-44L	CAT 40 RETENTION KNOB

## Combustion Chamber Tooling

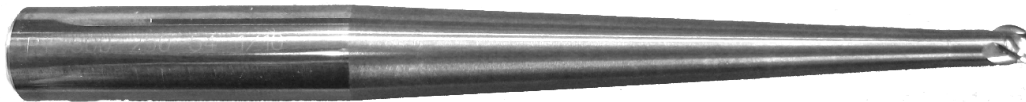
### EM-250 1/4" (19.05mm) Ballnose End Mill



## Porting Tools

### PT500-250-54

1/2 diameter shank X 1/4 diameter ball mill X 5.40" long (12.7 X 19.05 X 137.16mm)



### PT500-250-60

1/2 diameter shank X 1/4 diameter ball mill X 6.00" long (12.7 X 19.05 X 152.4mm)



### PT500-375-60

1/2 diameter shank X 3/8 diameter ball mill X 6.00" long (12.7 X 9.525 X 152.4mm)



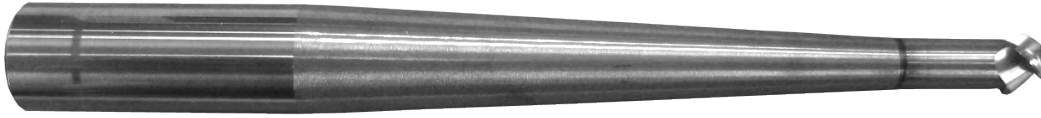
### PT625-375-54

5/8 diameter shank X 3/8 diameter ball mill X 5.40" long (15.875 X 9.525 X 137.16mm)

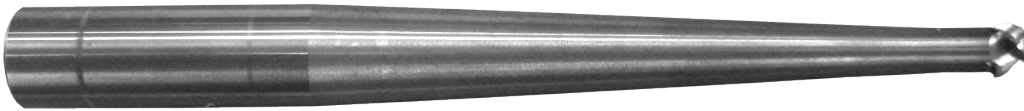


**PT625-375-60**

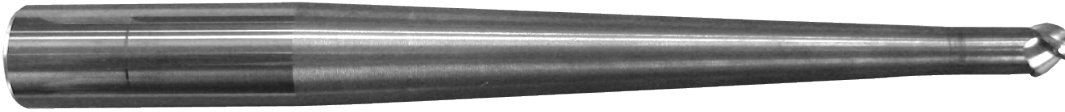
5/8 diameter shank X 3/8 diameter ball mill X 6.00" long (15.875 X 9.525 X 152.4mm)

**PT625-375-64**

5/8 diameter shank X 3/8 diameter ball mill X 6.40" long (15.875 X 9.525 X 165.56mm)

**PT625-375-65**

5/8 diameter shank X 3/8 diameter ball mill X 6.50" long (15.875 X 9.525 X 165.1mm)

**PT625-375-70**

5/8 diameter shank X 3/8 diameter ball mill X 7.00" long (15.875 X 9.525 X 177.8mm)

**PT625-375-75**

5/8 diameter shank X 3/8 diameter ball mill X 7.50" long (15.875 X 9.525 X 190.5mm)

**PT625-750-68**

5/8 diameter shank X 3/4 diameter ball mill X 6.80" long (15.875 X 19.05 X 172.72mm)



**Porting Tools for Cast Iron****PT500-250-54CI**

1/2 diameter shank X 1/4 diameter ball mill X 5.40" long (12.7 X 19.05 X 137.16mm)

**PT500-250-60CI**

1/2 diameter shank X 1/4 diameter ball mill X 6.00" long (12.7 X 19.05 X 152.4mm)

**PT500-375-60CI**

1/2 diameter shank X 3/8 diameter ball mill X 6.00" long (12.7 X 9.525 X 152.4mm)

**PT625-375-54CI**

5/8 diameter shank X 3/8 diameter ball mill X 5.40" long (15.875 X 9.525 X 137.16mm)

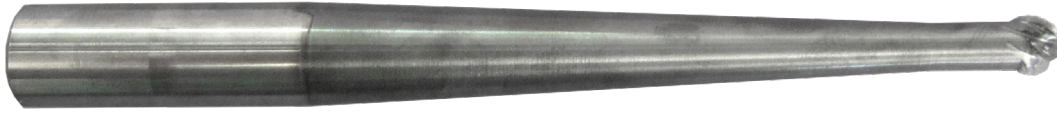
**PT625-375-60CI**

5/8 diameter shank X 3/8 diameter ball mill X 6.00" long (15.875 X 9.525 X 152.4mm)



**PT625-375-64CI**

5/8 diameter shank X 3/8 diameter ball mill X 6.40" long (15.875 X 9.525 X 165.56mm)



**PT625-375-65CI**

5/8 diameter shank X 3/8 diameter ball mill X 6.50" long (15.875 X 9.525 X 165.1mm)



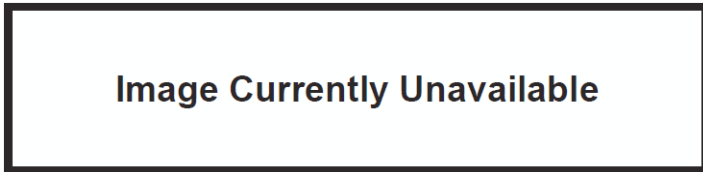
**PT625-375-70CI**

5/8 diameter shank X 3/8 diameter ball mill X 7.00" long (15.875 X 9.525 X 177.8mm)



**PT625-750-68CI**

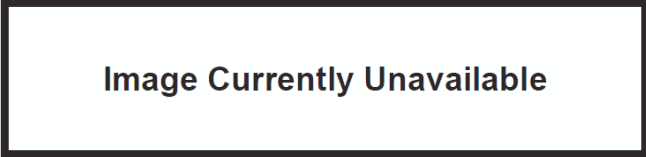
5/8 diameter shank X 3/4 diameter ball mill X 6.80" long (15.875 X 19.05 X 172.72mm)



## Porting Tools for Ductile Iron

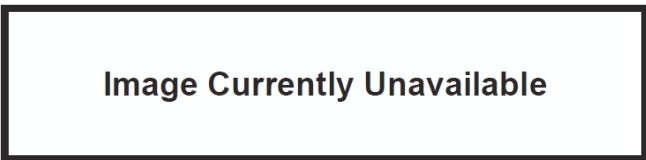
### PT625-375-65DI

5/8" shank - 3/8" ball - for ductile iron



### PT625-500-65DI

5/8" shank - 1/2" ball - for ductile iron



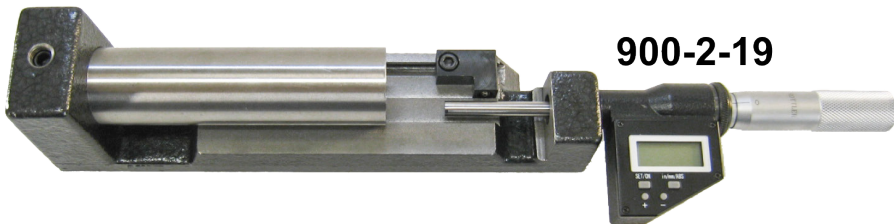
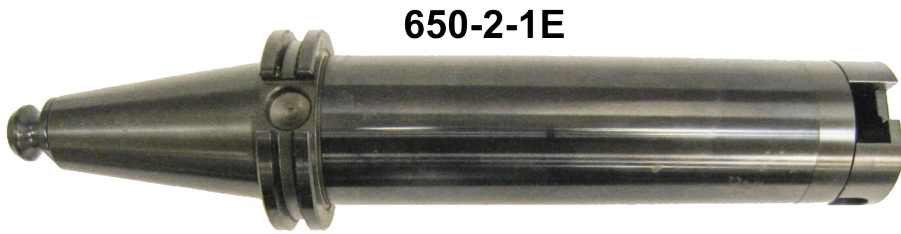
## DYNA-KOOL

Synthetic coolant concentrate - 5 gal (20 liter) (mix with water 20:1)

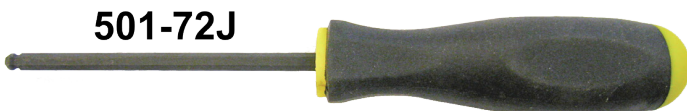
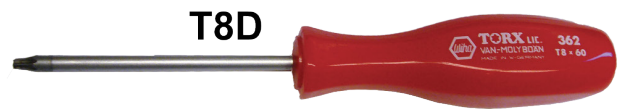
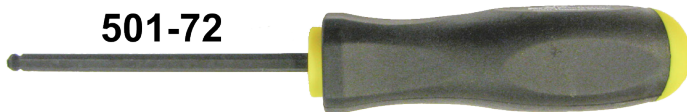
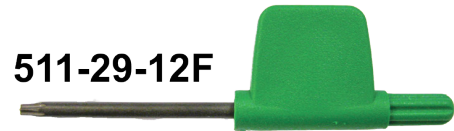
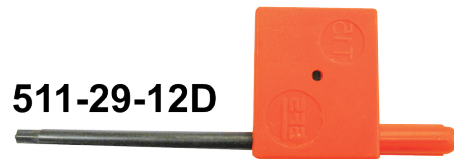
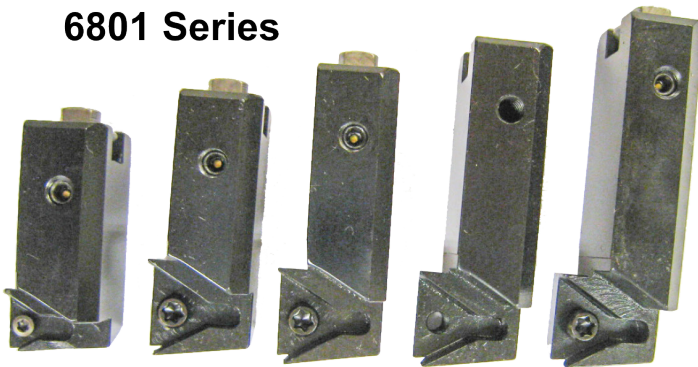


## Boring/Sleeving/Chamfering/O-Ring Tooling

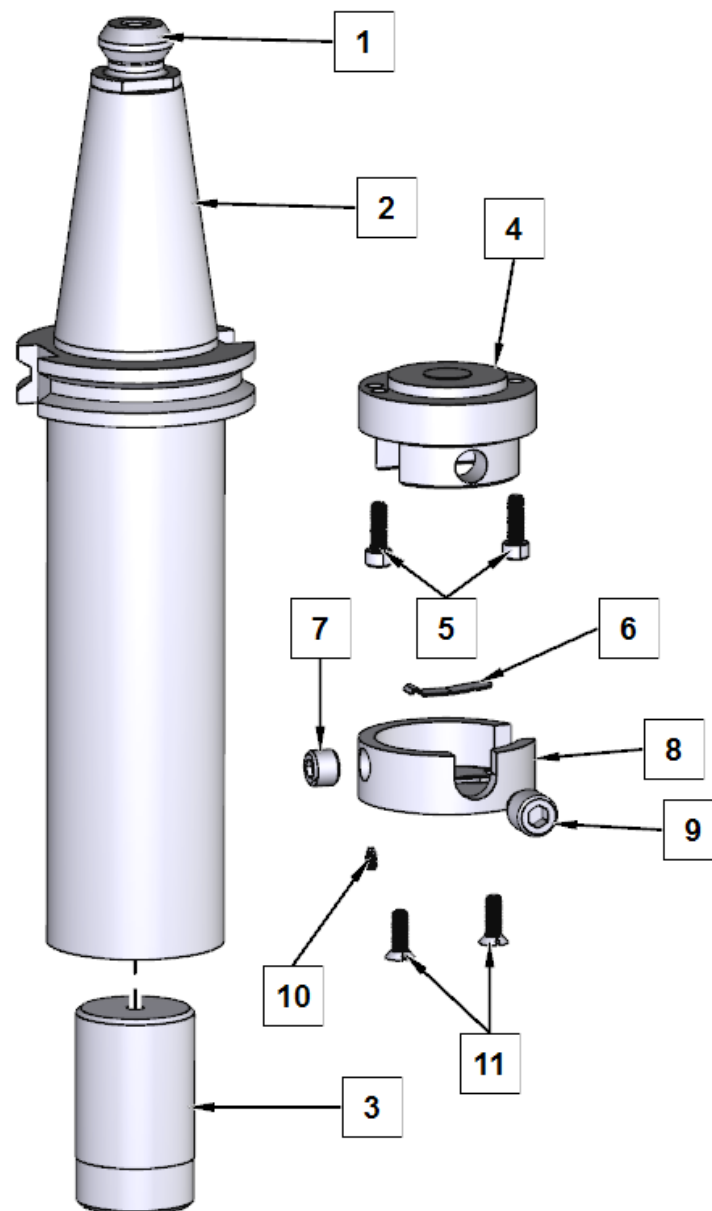
### 650-2-1D Cutterhead Package Components



### 6801 Series



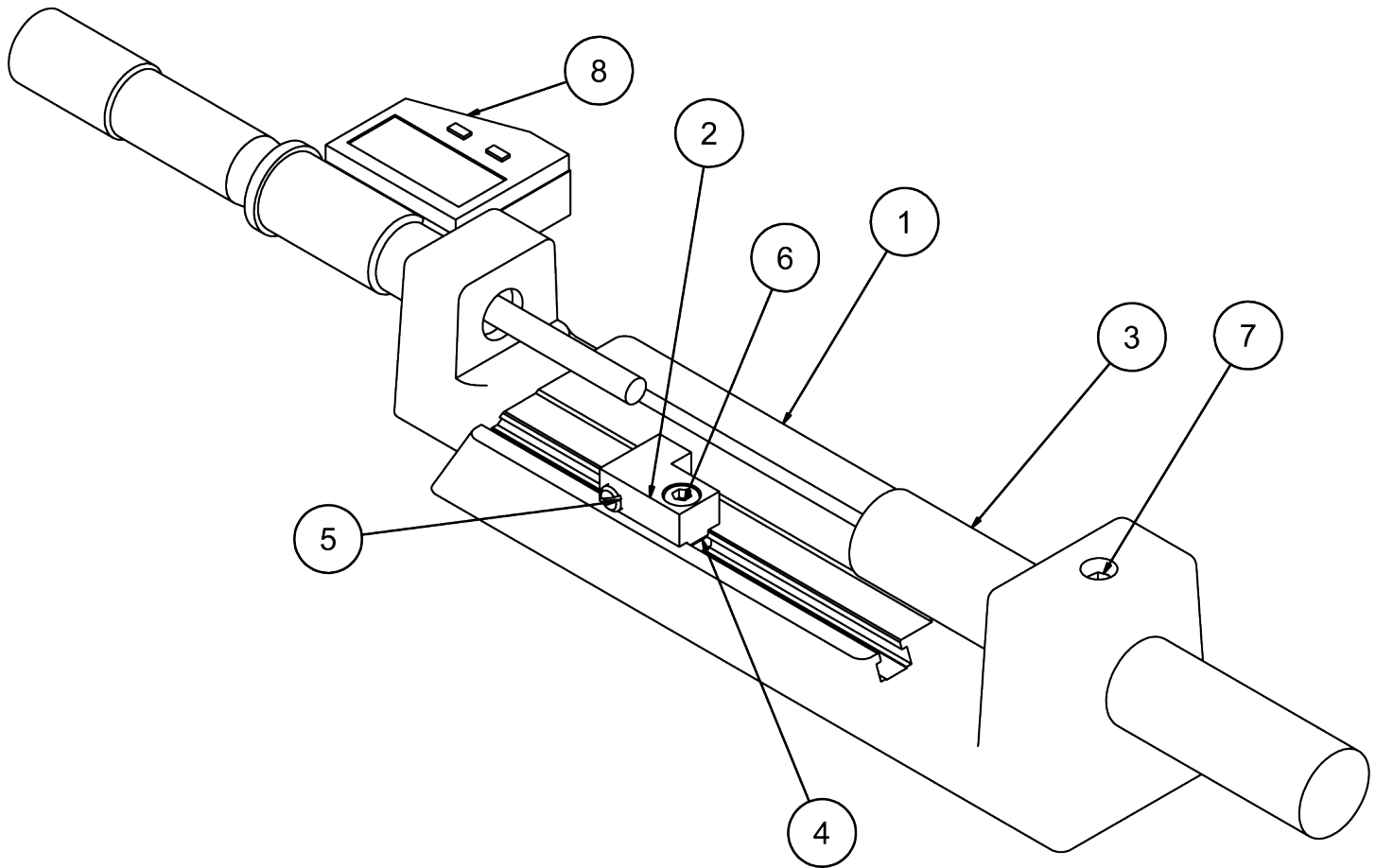
## 650-2-1E Cutterhead Assembly Parts



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"

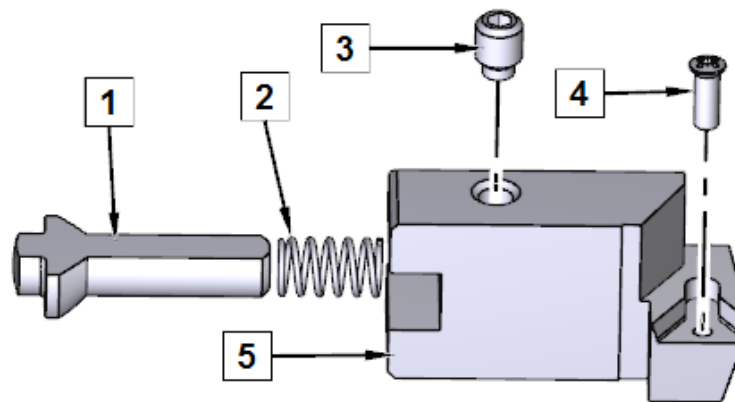


## 900-2-19 Micrometer Parts



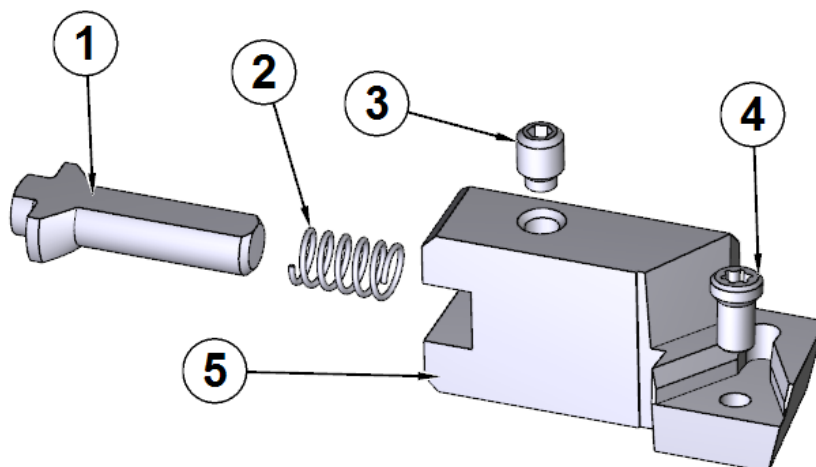
900-2-19 Micrometer Assembly			
ITEM	QTY	PART NUMBE	DESCRIPTION
1	1	502-30-10B	Frame
2	1	502-30-10M	Clamp Block
3	1	502-31-10A	Anvil
4	1	502-30-10J	Square Nut
5	1	502-30-10K	Ball Plunger
6	1	ANSI B18.3 - No. 10 - 24 UNC - 3/8	Hexagon Socket Head Cap Screw
7	1	502-30-10L	Brass Tipped Set Screw
8	1	501-34-2R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

## 6801B Insert Holder Parts



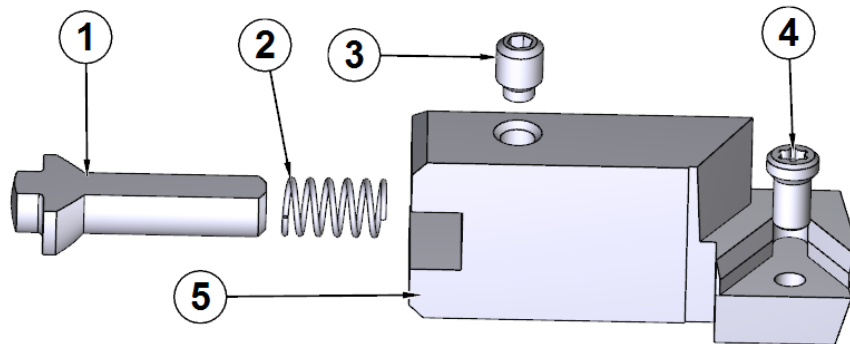
ITEM	PART #	DESCRIPTION
1	100-82-3B	PIN, ADJUSTING LONG
2	100-82-1	SPRING, ADJUSTING PIN
3	100-82-2	SCREW, SET-BRASS GIB - 3/16" LONG
4	511-29-12C	SCREW, TORX M4 X .7 X .315" LONG
5	6800B	TOOLHOLDER, INDEXABLE INSERT- 1/4" TRIANGLE, OFFSET, POSITIVE RAKE

## 6801C Insert Holder Parts



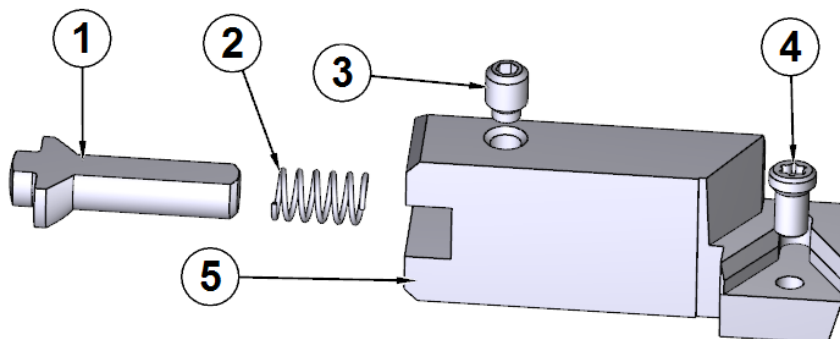
ITEM	PART #	DESCRIPTION
1	100-82-3B	PIN ADJUSTING LONG INDEXABLE INSERT TOOLHOLDER
2	100-82-1	SPRING, ADJUSTING PIN
3	100-82-2	SCREW, SET-BRASS GIB - 3/16" LONG
4	511-29-12C	SCREW, TORX M4 X .7 X .315" LONG
5	6800C	TOOLHOLDER, INDEXABLE INSERT- 3/8" IC TRIANGLE, OFFSET POSITIVE RAKE

## 6801D Insert Holder Parts



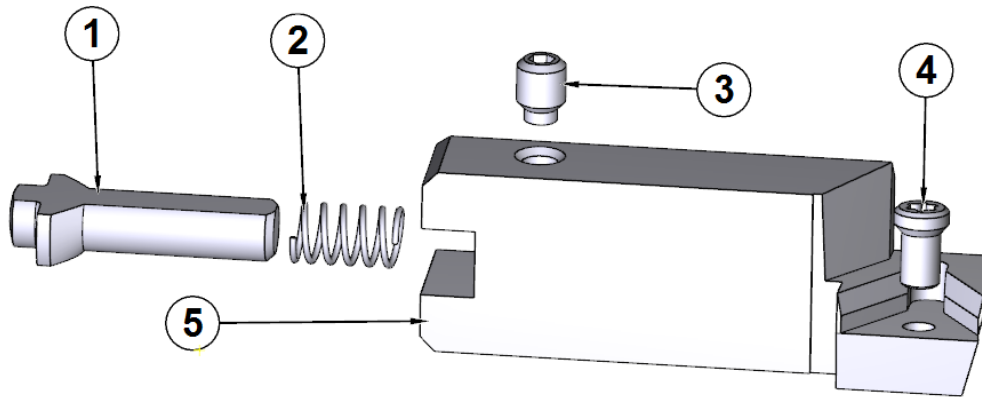
ITEM	PART #	DESCRIPTION
1	100-82-3B	PIN ADJUSTING LONG INDEXABLE INSERT TOOLHOLDER
2	100-82-1	SPRING, ADJUSTING PIN
3	100-82-2	SCREW, SET-BRASS GIB - 3/16" LONG
4	511-29-12C	SCREW, TORX M4 X .7 X .315" LONG
5	6800D	TOOLHOLDER, INDEXABLE INSERT- 3/8" IC TRIANGLE, OFFSET POSITIVE RAKE

## 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

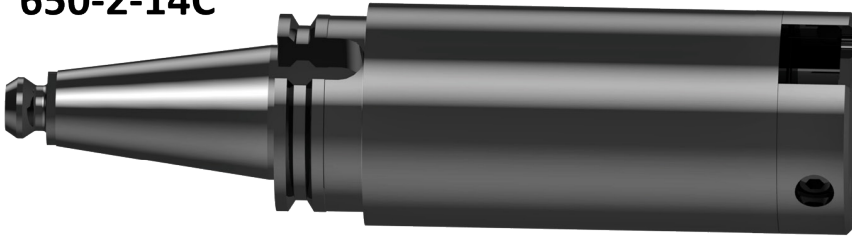
## 6801F Insert Holder Parts



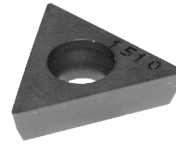
ITEM	PART #	DESCRIPTION
1	100-82-3B	PIN ADJUSTING LONG INDEXABLE INSERT TOOLHOLDER
2	100-82-1	SPRING, ADJUSTING PIN
3	100-82-2	SCREW, SET-BRASS GIB - 3/16" LONG
4	511-29-12C	SCREW, TORX M4 X .7 X .315" LONG
5	6800F	TOOLHOLDER, INDEXABLE INSERT- 3/8" IC TRIANGLE, OFFSET POSITIVE RAKE

## 650-2-14B Cutterhead Package Components

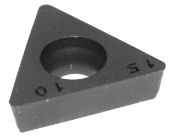
650-2-14C



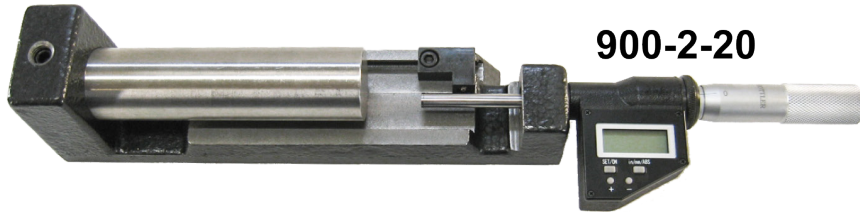
RT321



RT322



RS322

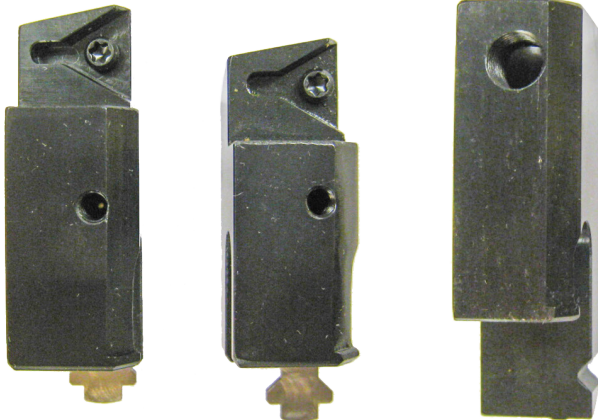


900-2-20

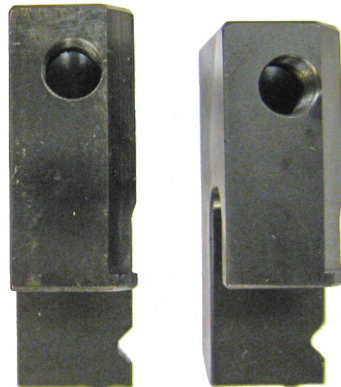


6260L

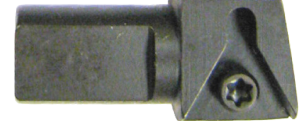
6593 Series



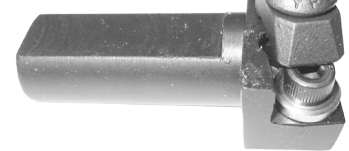
6520 Series



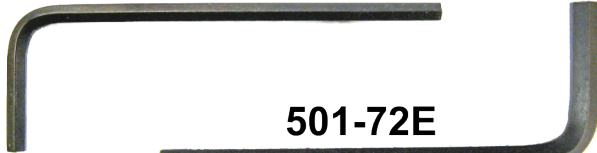
6598M



6260W



501-72B



501-72



501-72E



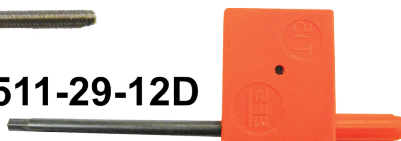
501-72J



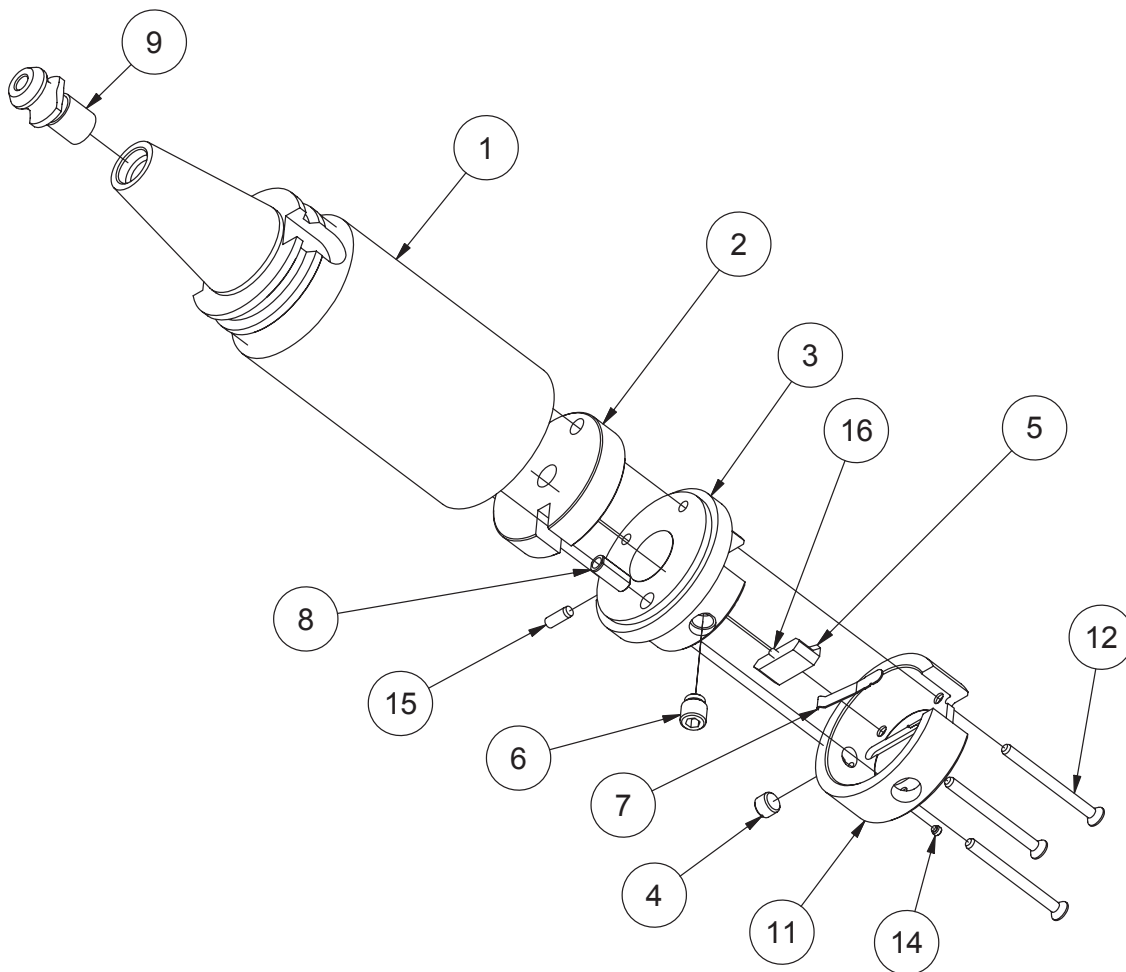
100-24



511-29-12D



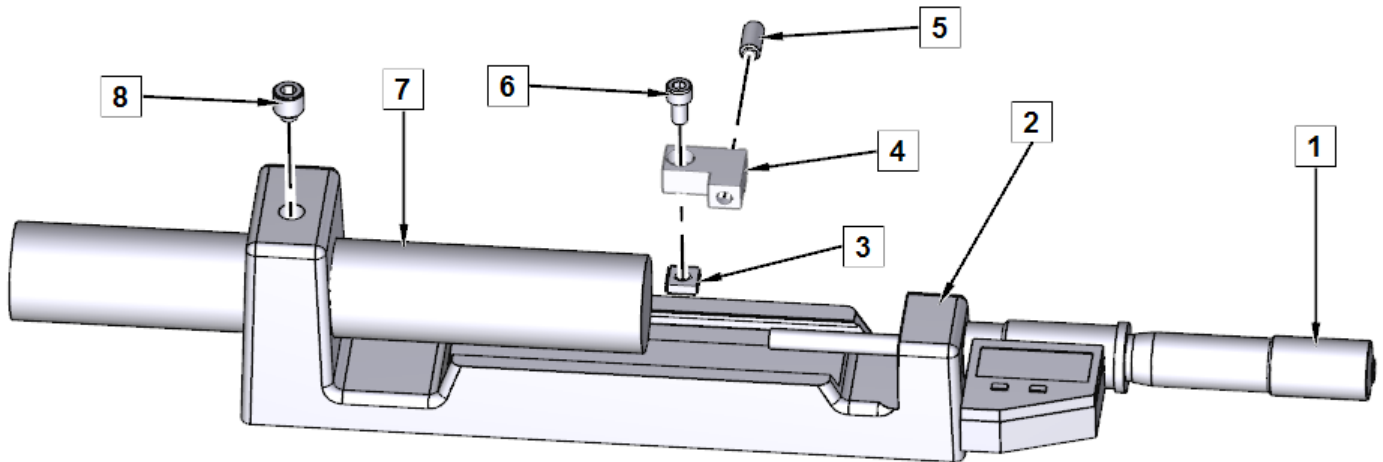
## 650-2-14C Cutterhead Parts



CUTTERHEAD ASSEMBLY W/O TOOLING 2.9" TO 5.0" x 7.0"

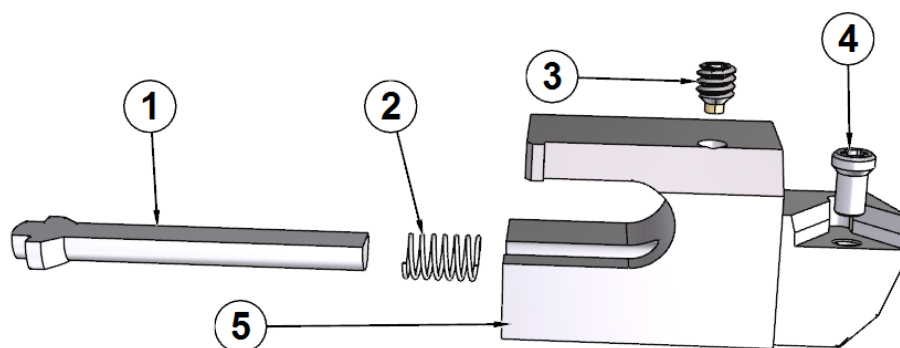
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	650-2-15E	ADAPTER, 2.9" STUB BAR CAT 40 TAPER (INCH)
2	1	6521	Counter Weight
3	1	650-2-16	BODY, 2.9" STUB BAR
4	1	502-2-85B	Index Screw
5	1	6263A	Tool Holder Clamp Screw
6	1	501-70A	Tool Holder Lock Screw ass'y
7	1	100-1A	Tool Lock Spring
8	1	502-2-45B	Bushing - Counterweight
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



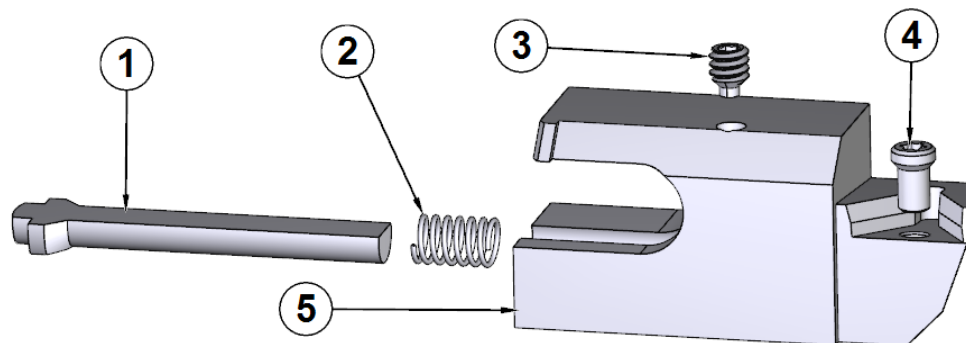
ITEM	PART #	DESCRIPTION
1	501-34-2R	HEAD, MICROMETER UNIVERSAL MIC HEAD DIGITAL READING INCH AND METRIC
2	502-30-10C	FRAME, MICROMETER
3	502-30-10J	SQUARE NUT-#10-24 MICROMETER FRAME
4	502-30-10M	CLAMP, MICROMETER
5	502-30-10K	BALL PLUNGER, 1/4-20 MICROMETER FRAME
6	MF-9A	SOCKET HEAD CAPSCREW 10-32 X 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)

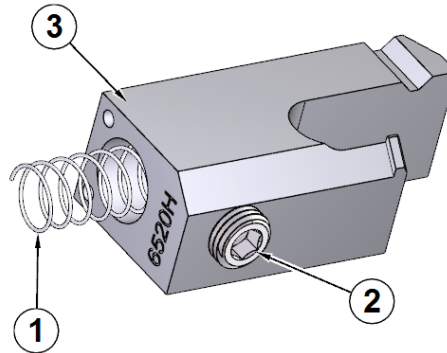
## 6593D Insert Holder Parts



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)

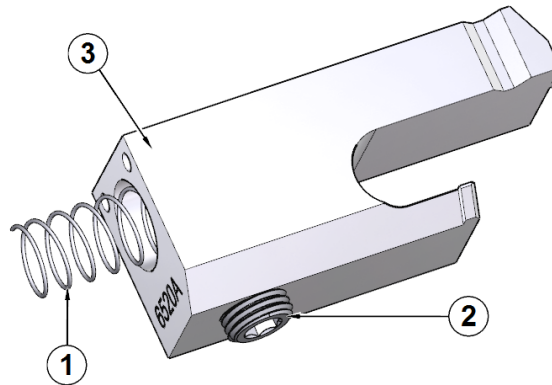


**6520H Tool Holder Parts**



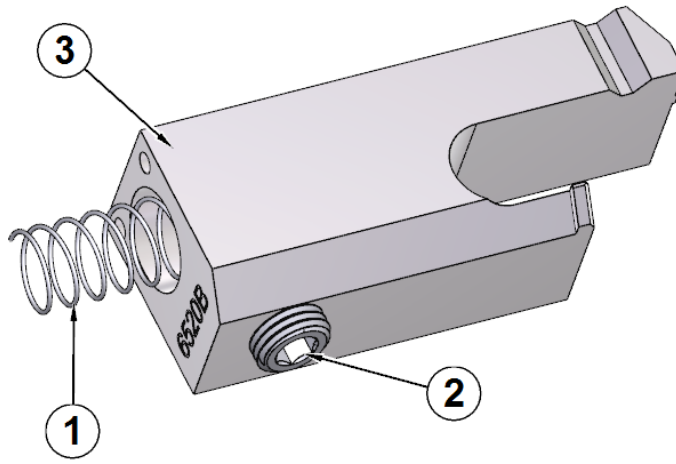
ITEM	PART #	DESCRIPTION
1	6300B	SPRING, COMPRESSION-TOOLHOLDER (1 7/16")
2	502-2-85	SCREW, SET-TOOLHOLDER INDEX
3	6520H	TOOL HOLDER, 2 1/4" LONG

**6520A Tool Holder Parts**



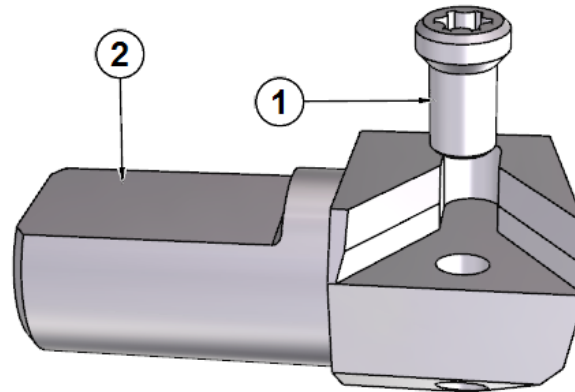
ITEM	PART #	DESCRIPTION
1	6300B	SPRING, COMPRESSION-TOOLHOLDER (1 7/16")
2	502-2-85	SCREW, SET-TOOLHOLDER INDEX
3	6520A	TOOL HOLDER, 2 3/8" LONG

## 6520B Tool Holder Parts



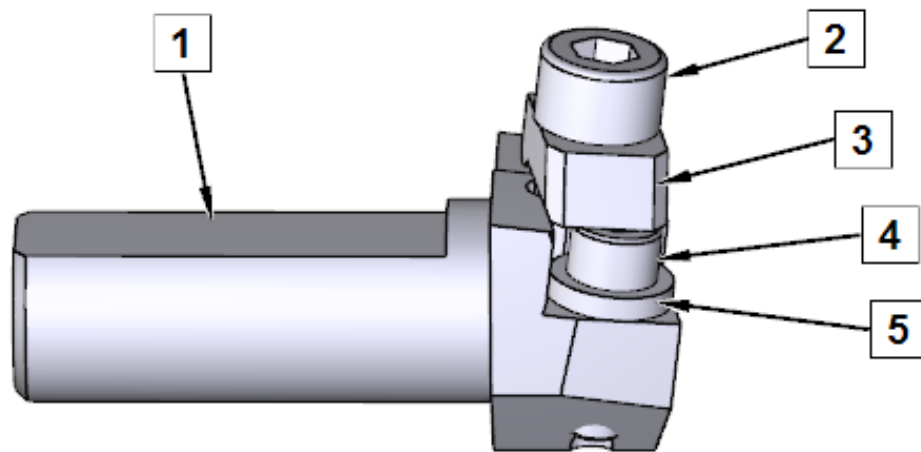
ITEM	PART #	DESCRIPTION
1	6300B	SPRING, COMPRESSION-TOOLHOLDER (1 7/16")
2	502-2-85	SCREW, SET-TOOLHOLDER INDEX
3	6520B	TOOL HOLDER, 2 5/8" LONG

## 6598M Insert Cartridge Parts



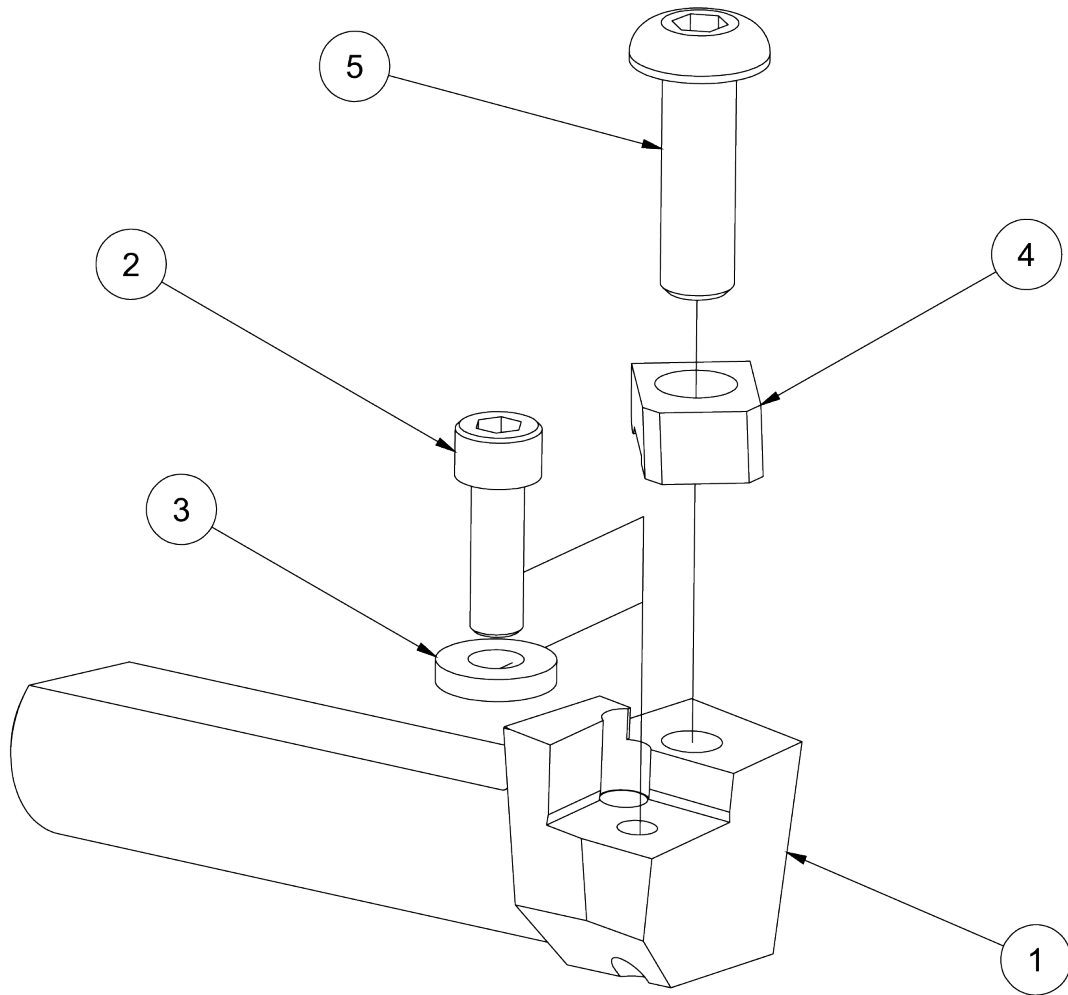
ITEM	PART #	DESCRIPTION
1	511-29-12C	SCREW, TORX M4 X .7 X .315" LONG
2	6598L	CARTRIDGE, INDEXABLE INSERT, 13/16" FOR TRIANGULAR POSITIVE RAKE INSERTS

## 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

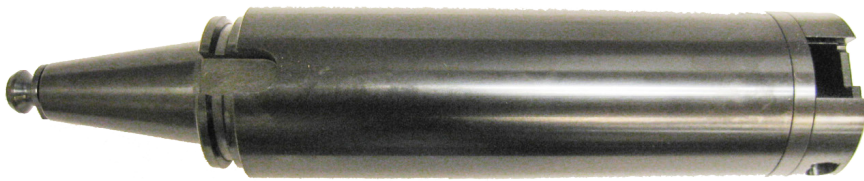
## 6260L Insert Cartridge Parts



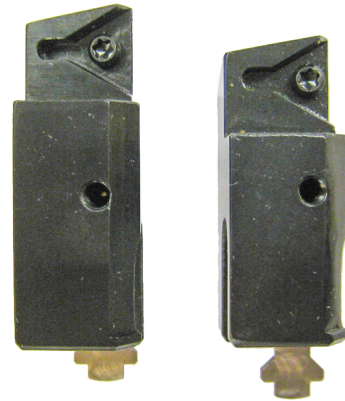
6260L CARTRIDGE ASSEMBLY - SQUARE INSERT NEG. RAKE INDEXABLE - 1.88" SHANK			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	6594G	CARTRIDGE - SQUARE INSERT NEG. RAKE INDEXABLE - 1.88" SHANK
2	1	511-29-12	Screw
3	1	511-29-12B	Washer
4	1	6594K	Insert Clamp
5	1	MF-89A	10-32UNF x 5/8" LG. SOCKET BUTTON HEAD CAPSCREW

## 650-2-14F Cutterhead Package Components

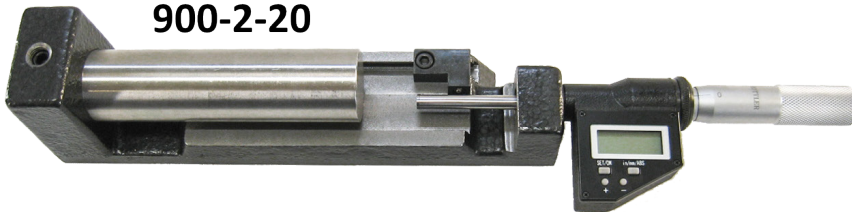
**650-2-14G**



**6593 Series**



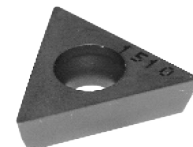
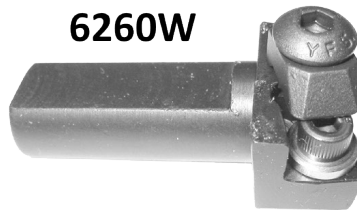
**900-2-20**



**6520 Series**

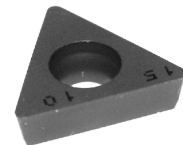
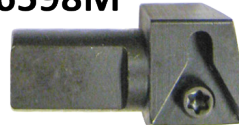


**6260W**



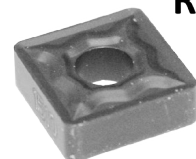
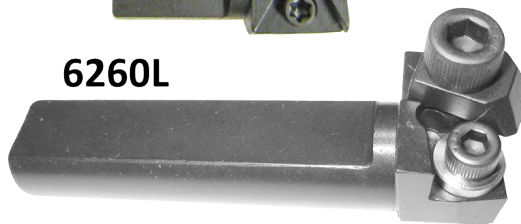
**RT321**

**6598M**



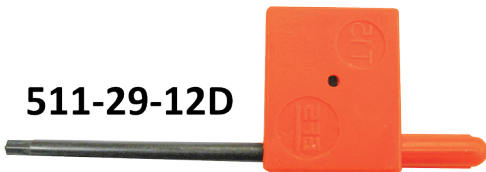
**RT322**

**6260L**

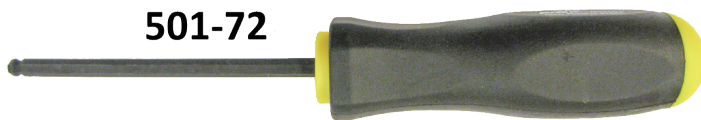


**RS322**

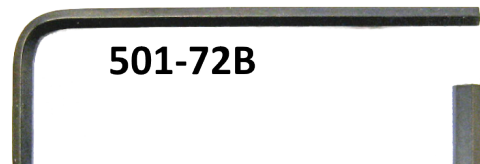
**511-29-12D**



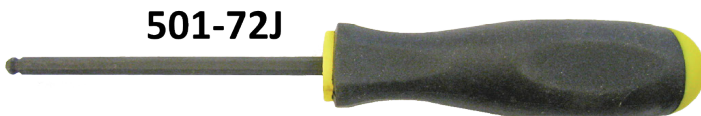
**501-72**



**501-72B**



**501-72J**



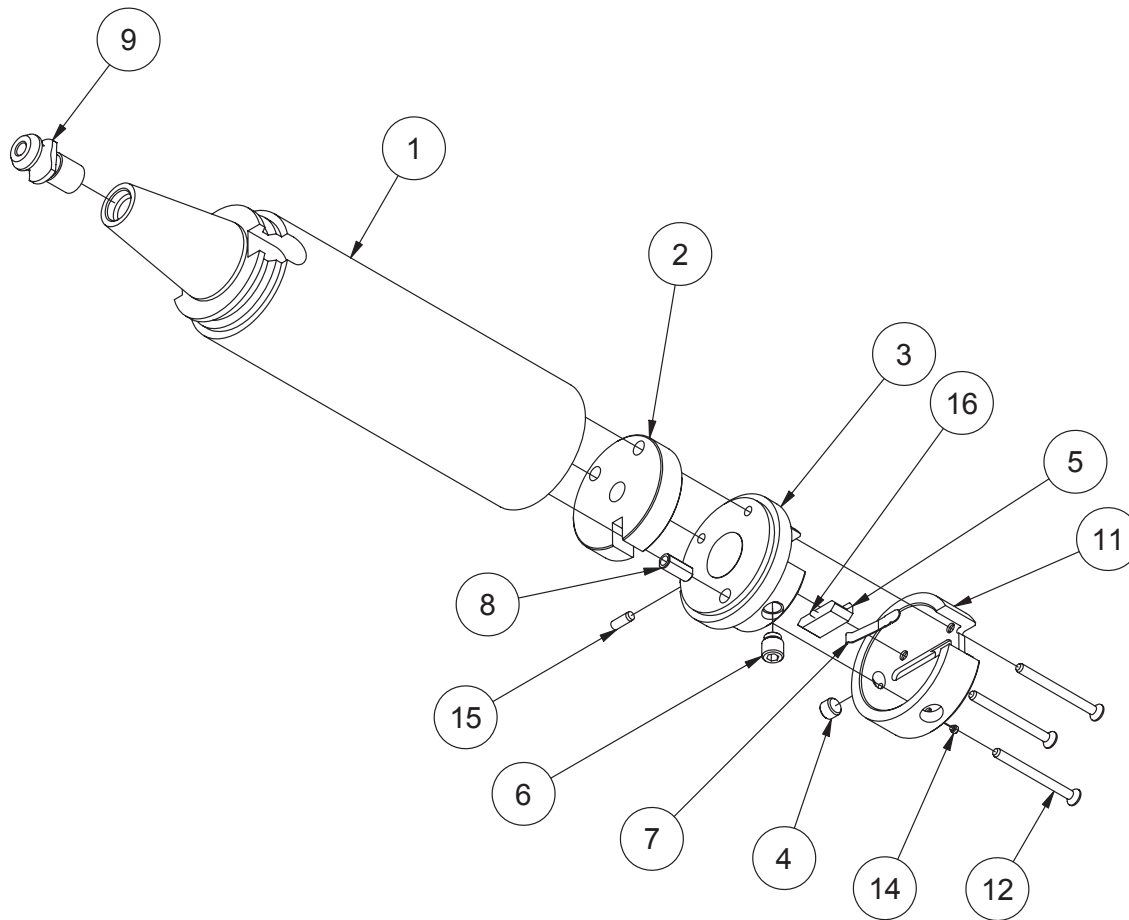
**501-72E**



**100-24**

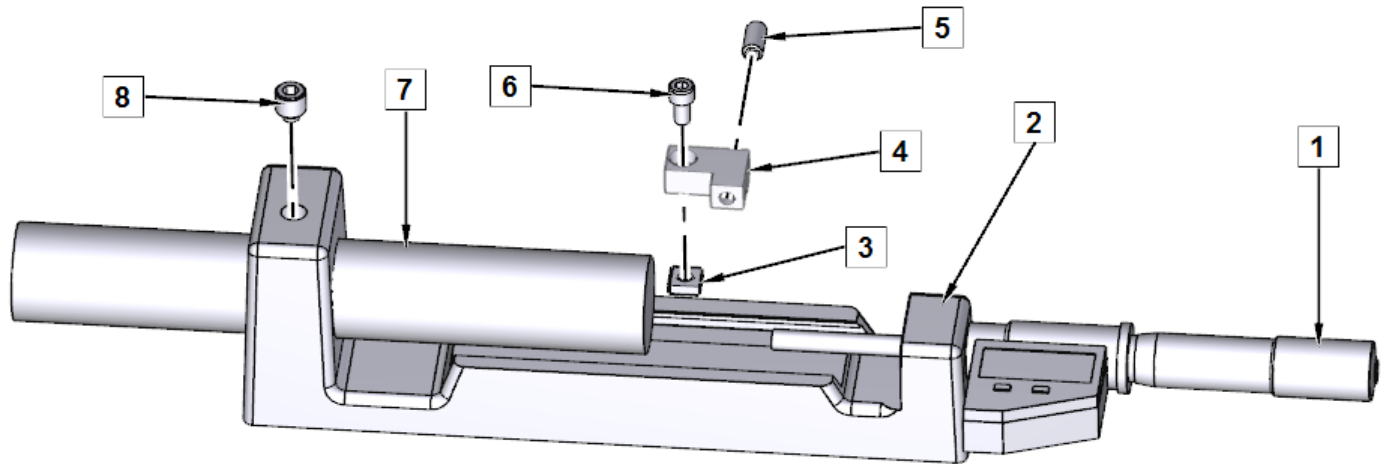


## 650-2-14G Cutterhead Parts



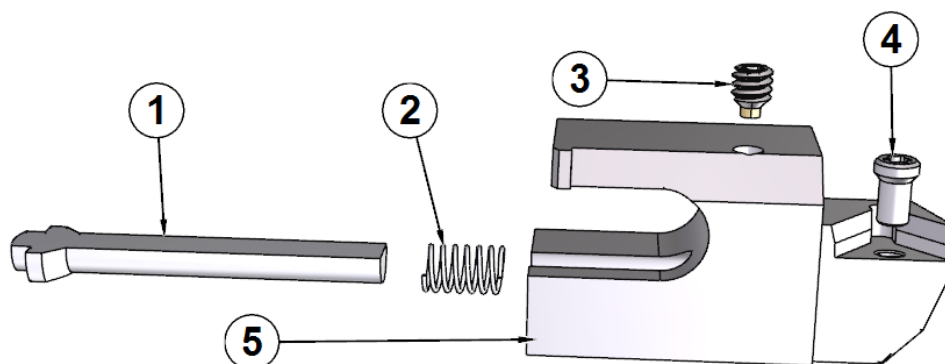
650-2-14G STUB BAR ASSEMBLY 2.9" TO 5.0" x 10" LG. CAT40(INCH)			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	650-2-15K	ADAPTER, 2.9" STUB BAR x 10" LG. CAT 40 TAPER (INCH)
2	1	6521	Counter Weight
3	1	650-2-16	BODY, 2.9" STUB BAR F60
4	1	502-2-85B	Index Screw
5	1	6263A	Tool Holder Clamp Screw
6	1	501-70A	Tool 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



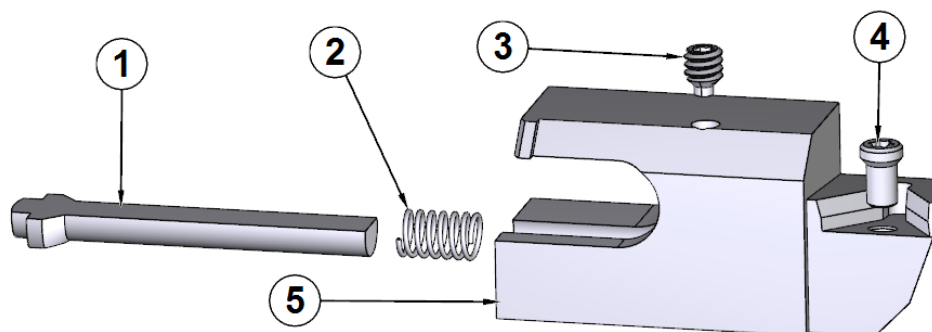
ITEM	PART #	DESCRIPTION
1	501-34-2R	HEAD, MICROMETER UNIVERSAL MIC HEAD DIGITAL READING INCH AND METRIC
2	502-30-10C	FRAME, MICROMETER
3	502-30-10J	SQUARE NUT-#10-24 MICROMETER FRAME
4	502-30-10M	CLAMP, MICROMETER
5	502-30-10K	BALL PLUNGER, 1/4-20 MICROMETER FRAME
6	MF-9A	SOCKET HEAD CAPSCREW 10-32 X 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)

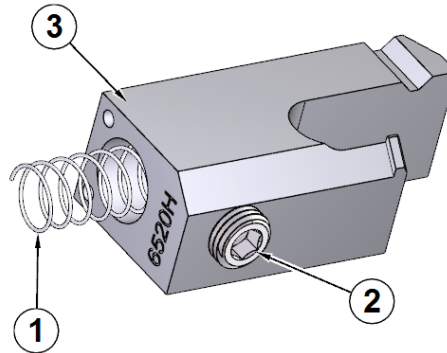
## 6593D Insert Holder Parts



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)

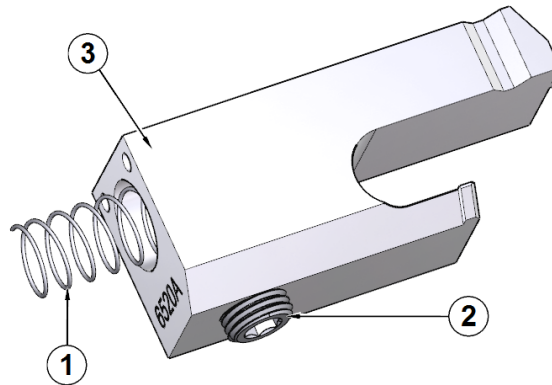


**6520H Tool Holder Parts**



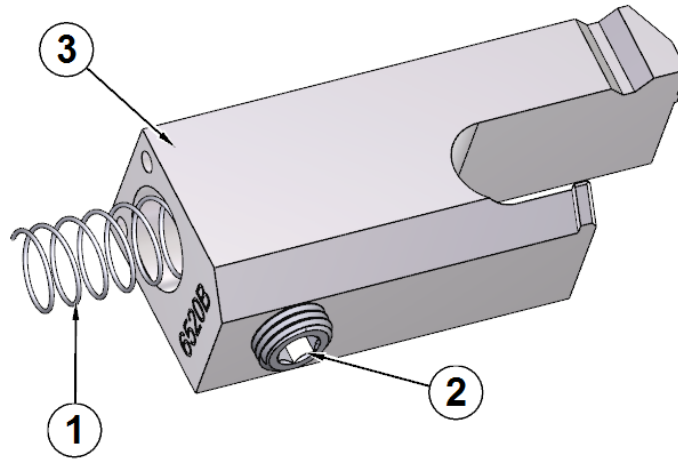
ITEM	PART #	DESCRIPTION
1	6300B	SPRING, COMPRESSION-TOOLHOLDER (1 7/16")
2	502-2-85	SCREW, SET-TOOLHOLDER INDEX
3	6520H	TOOL HOLDER, 2 1/4" LONG

**6520A Tool Holder Parts**



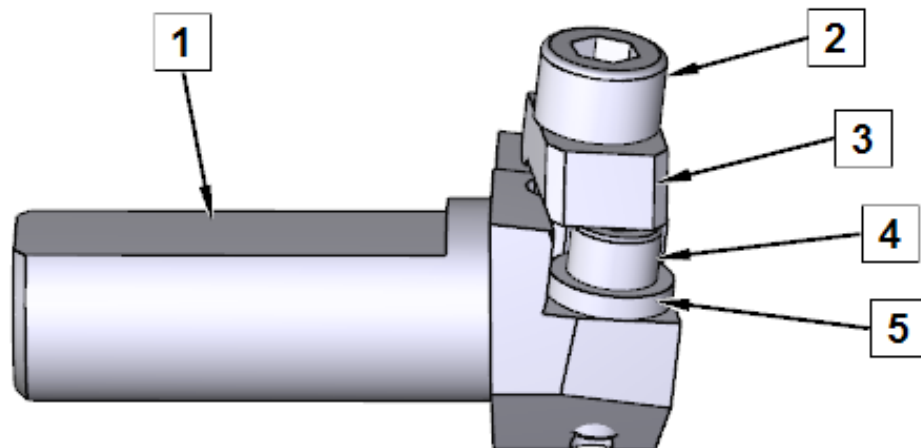
ITEM	PART #	DESCRIPTION
1	6300B	SPRING, COMPRESSION-TOOLHOLDER (1 7/16")
2	502-2-85	SCREW, SET-TOOLHOLDER INDEX
3	6520A	TOOL HOLDER, 2 3/8" LONG

## 6520B Tool Holder Parts



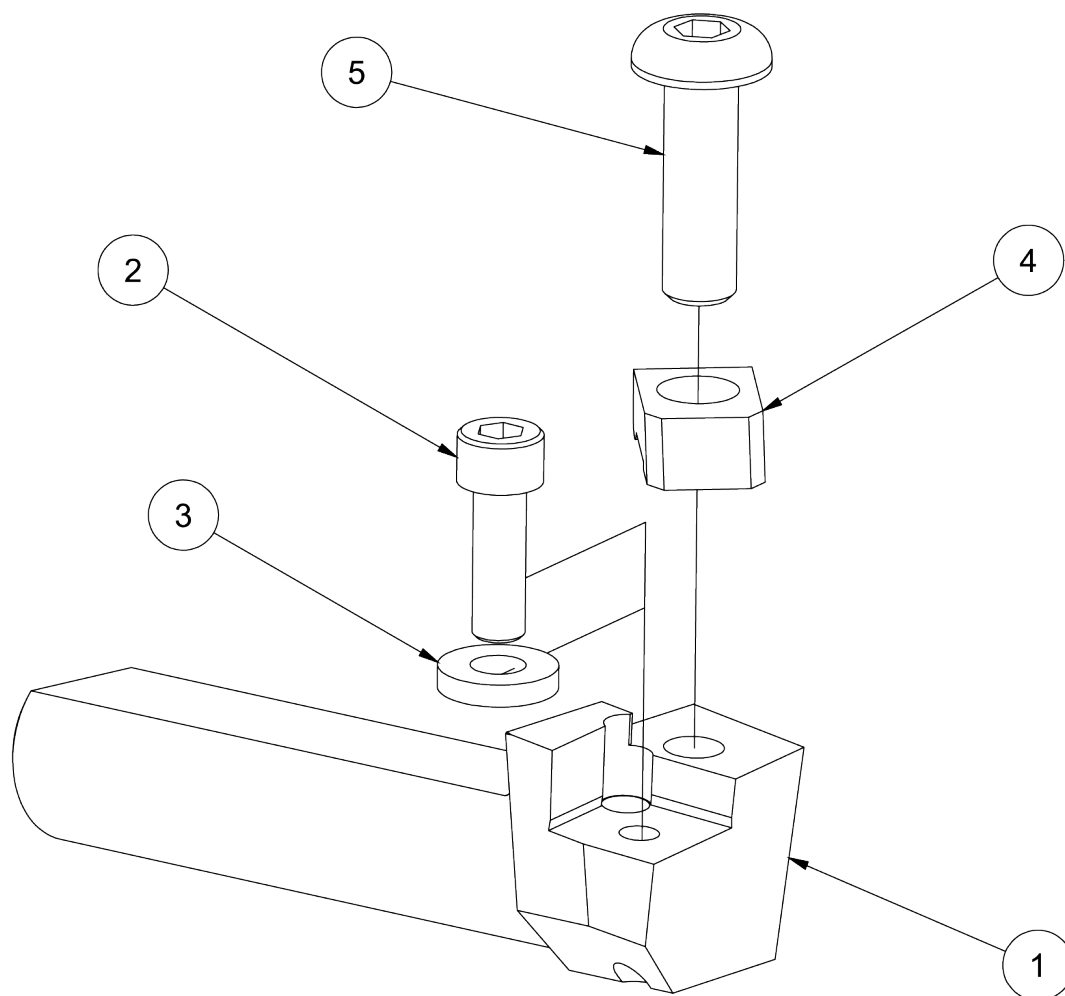
ITEM	PART #	DESCRIPTION
1	6300B	SPRING, COMPRESSION-TOOLHOLDER (1 7/16")
2	502-2-85	SCREW, SET-TOOLHOLDER INDEX
3	6520B	TOOL HOLDER, 2 5/8" LONG

## 6260W Insert Cartridge Parts



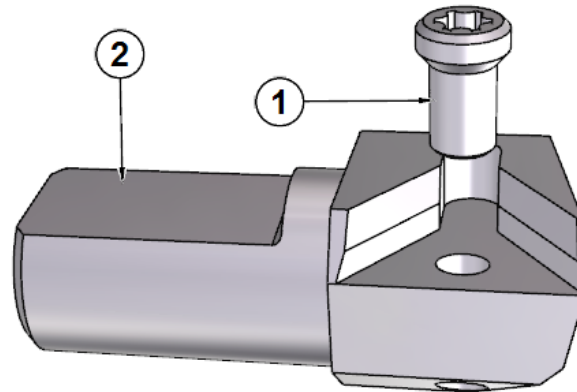
ITEM	PART #	DESCRIPTION
1	6594J	CARTRIDGE, OFFSET 3/8" SQUARE, NEGATIVE RAKE
2	MF-9	SOCKET HEAD CAP SCREW 10-32 X 5/8"
3	6594K	CLAMP, TOOL SQUARE INSERT
4	511-29-12	SCREW, SOCKET HEAD CAP 6/32 X 7/16" LONG
5	511-29-12B	WASHER, PRECISION-HOLDING SCREW

## 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

### 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

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

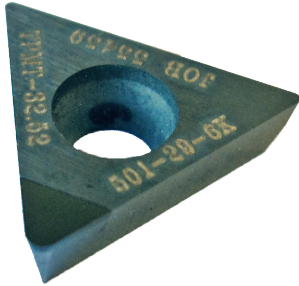
Sold only as complete assembly.



## Miscellaneous Tooling for 650-2-14B&F Cutterheads

### 501-29-6K PCD Tipped Triangular Insert

For Boring/Counterboring Aluminum



### 6513J Tool bit, Brazed Carbide

.037" Wide O Ring Grooving



### 6513L Tool bit, Brazed Carbide

.039" Wide O Ring Grooving



### 6513N Tool bit, Brazed Carbide

.060" Wide O Ring Grooving



### 6513P Tool bit, Brazed Carbide

.085" Wide O Ring Grooving

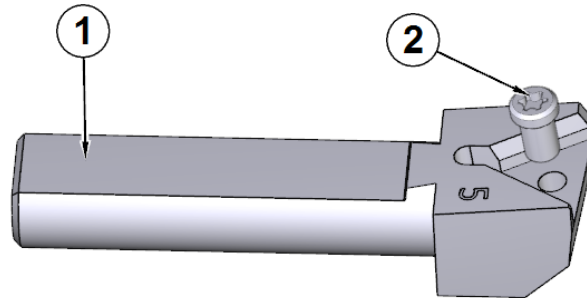


### 6513Q Tool bit, Brazed Carbide

.120" Wide O Ring Grooving

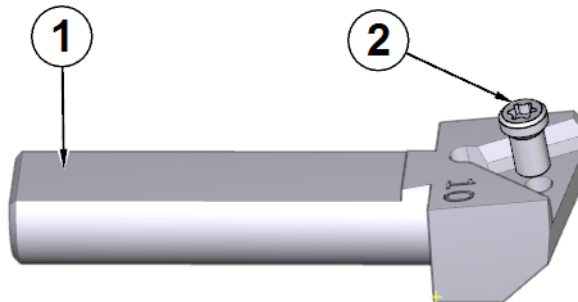


## 6747K Cartridge Assembly Parts



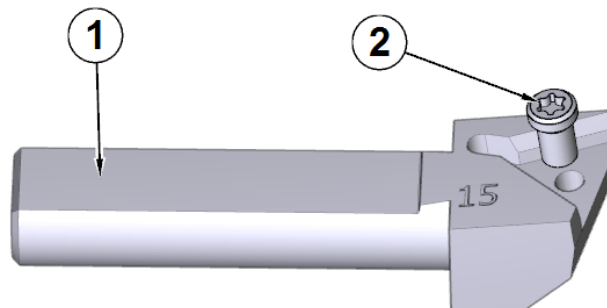
ITEM	PART #	DESCRIPTION
1	6747J	CARTRIDGE ONLY, 5 DEG. CHAMFER FOR TRIANGULAR POSITIVE RAKE INSERTS
2	511-29-12C	SCREW, TORX M4 X .7 X .315" LONG

## 6747P Cartridge Assembly Parts



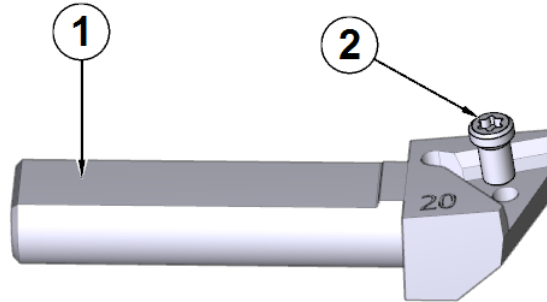
ITEM	PART #	DESCRIPTION
1	6747N	CARTRIDGE ONLY, 10 DEG. CHAMFER FOR TRIANGULAR POSITIVE RAKE INSERTS
2	511-29-12C	SCREW, TORX M4 X .7 X .315" LONG

## 6747G Cartridge Assembly Parts



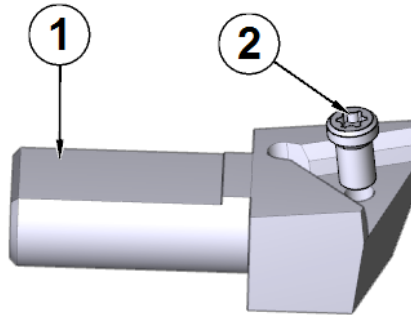
ITEM	PART #	DESCRIPTION
1	6747D	CARTRIDGE ONLY, 15 DEG. CHAMFER FOR TRIANGULAR POSITIVE RAKE INSERTS
2	511-29-12C	SCREW, TORX M4 X .7 X .315" LONG

## 6747F Cartridge Assembly Parts



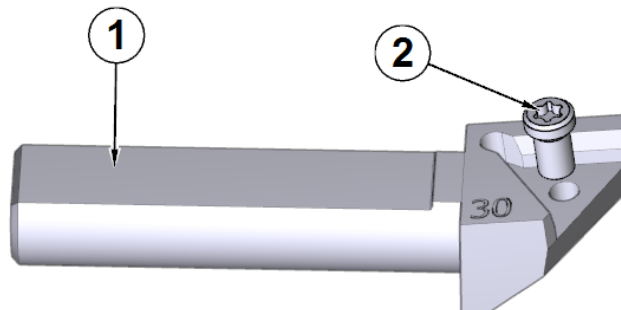
ITEM	PART #	DESCRIPTION
1	6747C	CARTRIDGE ONLY, 20 DEGREE CHAMFER FOR TRIANGULAR POSITIVE RAKE INSERTS
2	511-29-12C	SCREW, TORX M4 X .7 X .315" LONG

## 6747M Cartridge Assembly Parts



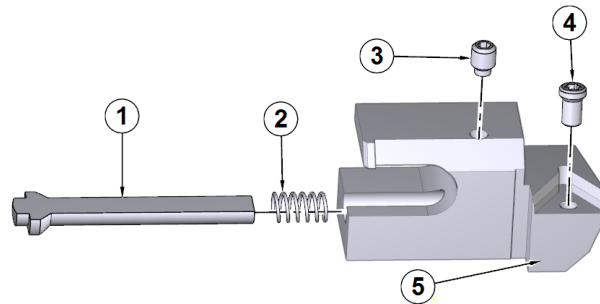
ITEM	PART #	DESCRIPTION
1	6747L	CARTRIDGE (SPECIAL ONLY), 20 DEGREE CHAMFER FOR TRIANGULAR POSITIVE RAKE INSERTS
2	511-29-12C	SCREW, TORX M4 X .7 X .315" LONG

## 6747H Cartridge Assembly Parts



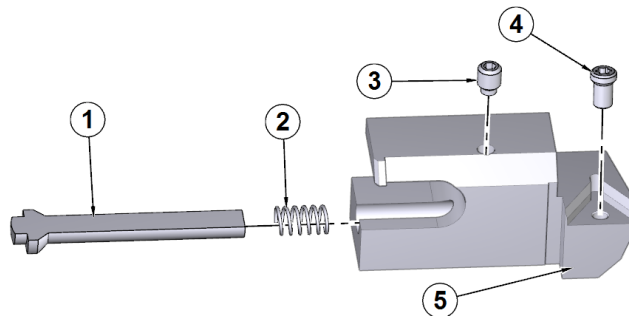
ITEM	PART #	DESCRIPTION
1	6747E	CARTRIDGE ONLY, 30 DEG. CHAMFER FOR TRIANGULAR POSITIVE RAKE INSERTS
2	511-29-12C	SCREW, TORX M4 X .7 X .315" LONG

## 6593L Insert Holder Parts



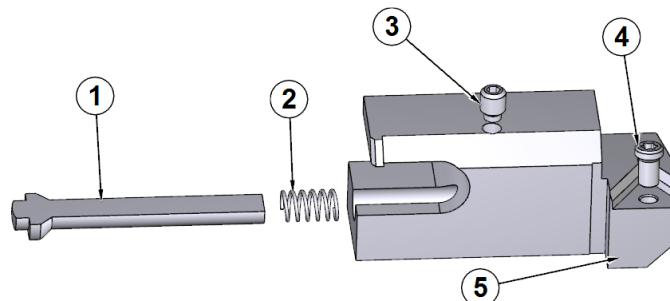
ITEM	PART #	DESCRIPTION
1	6593B	PIN, ADJUSTING-TOOLHOLDER
2	100-82-1	SPRING, ADJUSTING PIN
3	100-82-2	SCREW, SET-BRASS GIB - 3/16" LONG
4	511-29-12C	SCREW, TORX M4 X .7 X .315" LONG
5	6593G	CARTRIDGE/TOOL HOLDER - INDEX. INSERT, TRIANGULAR-POSITIVE RAKE (3.14-3.40)

## 6593M Insert Holder Parts



ITEM	PART #	DESCRIPTION
1	6593B	PIN, ADJUSTING-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	6593H	CARTRIDGE/TOOL HOLDER - INDEX. INSERT, TRIANGULAR-POSITIVE RAKE (3.14-3.40)

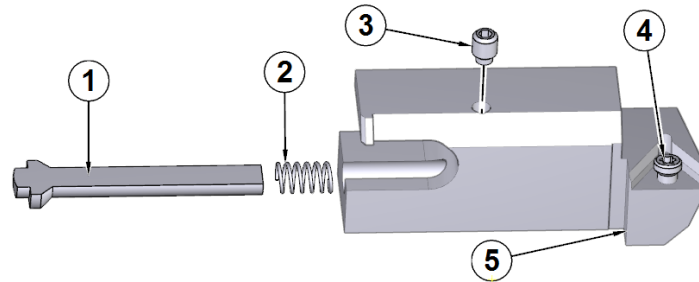
## 6593N Insert Holder Parts



ITEM	PART #	DESCRIPTION
1	6593B	PIN, ADJUSTING-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	6593J	CARTRIDGE/TOOL HOLDER - INDEX. INSERT, TRIANGULAR-POSITIVE RAKE (3.14-3.40)



## 6593P Insert Holder Parts



ITEM	PART #	DESCRIPTION
1	6593B	PIN, ADJUSTING-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	6593K	CARTRIDGE/TOOL HOLDER - INDEX. INSERT, TRIANGULAR-POSITIVE RAKE (3.14-3.40)

## Inserts

### RT211 Insert, Triangular

1/4" (6.35mm) 1/64" (.397mm) radius, 1/4" triangular Insert holders only, general purpose and sleeving (10% Discount on orders of 10-49, 20% Discount on orders of 50 or more)



### RT212 Insert, Triangular

1/4" (6.35mm) 1/32" (.787mm) radius, 1/4" triangular Insert holders only, general purpose and sleeving (10% Discount on orders of 10-49, 20% Discount on orders of 50 or more)



### RT321 Insert, Triangular

Positive rake, 3/8" (9.525mm) 1/64" (.397mm) radius, general purpose and sleeving (10% Discount on orders of 10-49, 20% Discount on orders of 50 or more)



### RT322 Insert, Triangular

Positive rake, 3/8" (9.525mm) 1/32" (.787mm) radius, general purpose and sleeving (10% Discount on orders of 10-49, 20% Discount on orders of 50 or more)



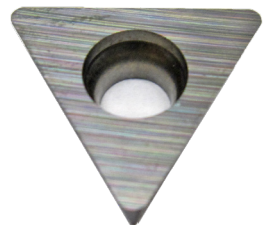
### RT321F Insert, Triangular

Positive rake, 3/8" 1/64" Radius, Precision Counterboring (10% Discount on orders of 10-49, 20% Discount on orders of 50 or more)



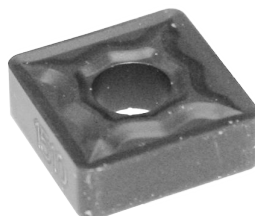
### RT322F Insert, Triangular

Positive rake, 3/8" 1/32" Radius, Precision Counterboring (10% Discount on orders of 10-49, 20% Discount on orders of 50 or more)

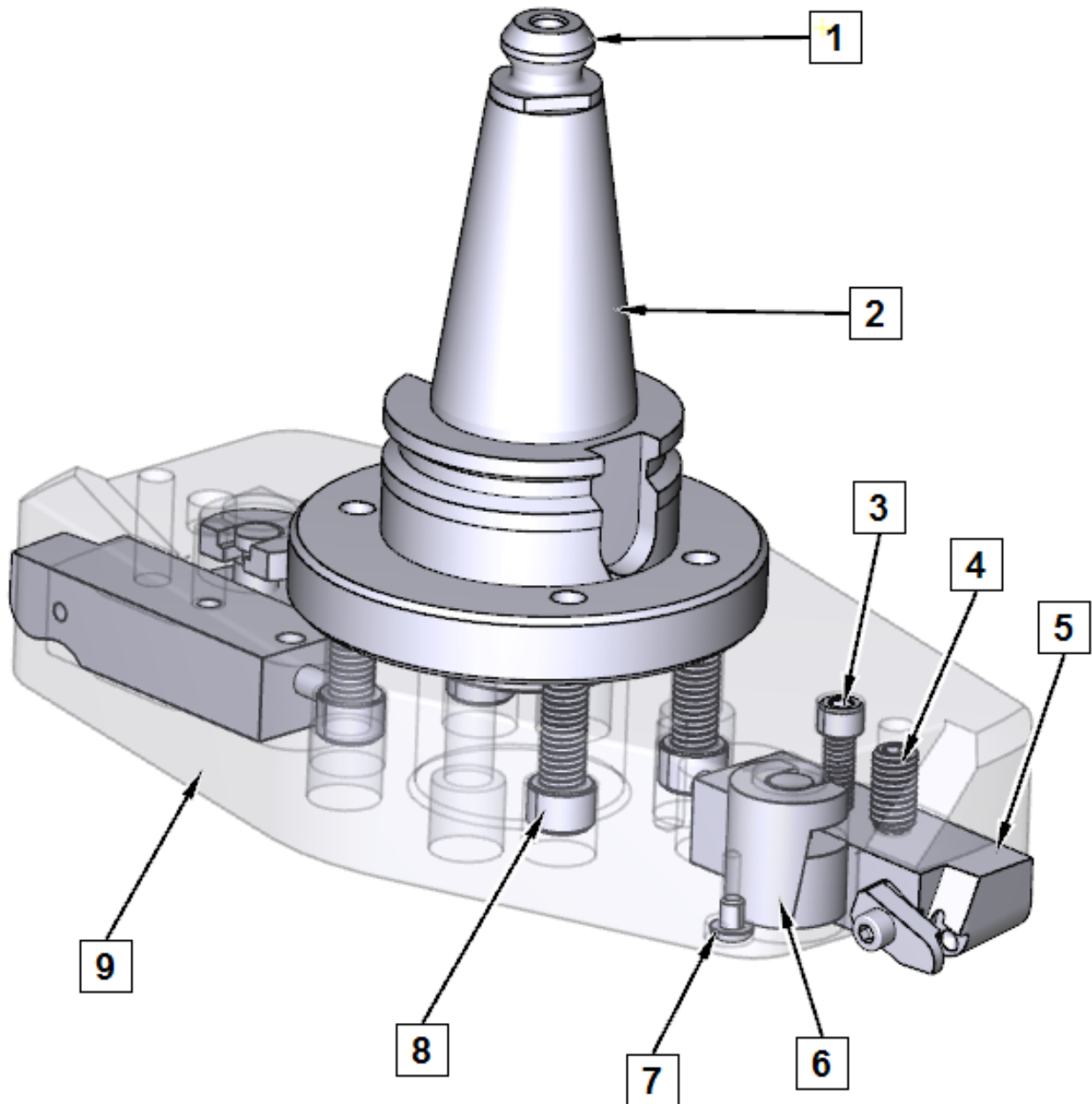


### RS322 Insert, Square

Negative rake, 1/32" (.787mm) radius, 3/8" (9.525mm) IC, black ceramic coated for high speed oversize thru boring (10% Discount on orders of 10-49, 20% Discount on orders of 50 or more)



## 650-2-8E Surfacing Flycutter 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"

<p><b>6303M PCD Insert, Round</b> 3/8" (9.525mm) IC, for Cutting Aluminum (15% Discount on orders of 10 or more)</p> 	<p><b>6303K Coated Carbide Insert, Round</b> 3/8" (9.525mm) IC, for General Purpose Use</p> 	<p><b>6303S CBN Insert, Round</b> 3/8" (9.525mm) IC, for Cutting Aluminum Blocks with Liners (15% Discount on orders of 10 or more)</p> 
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### 650-2-60N Setting Fixture for 650-2-60B Lifter Tooling Package Components

Assembly Image and Parts List are unavailable at this time.

Please visit the service tab of our web page at [Send a Service Request to www.rottlermfg.com](http://www.rottlermfg.com) or contact the Rottler Factory Service at [service@rottlermfg.com](mailto:service@rottlermfg.com) for assistance and your service request.

You may also call Rottler at 1-800-452-0534 or 1-253-872-7050

Please ensure you have the Machine Model and Serial Number available when contacting Rottler for Service

## 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**



**650-2-20C**



**650-2-20L**

**650-2-60H**



**650-2-60G**



**650-2-60L**



**650-2-44A**



**650-2-32U**



**511-29-12F**



**650-2-32J**

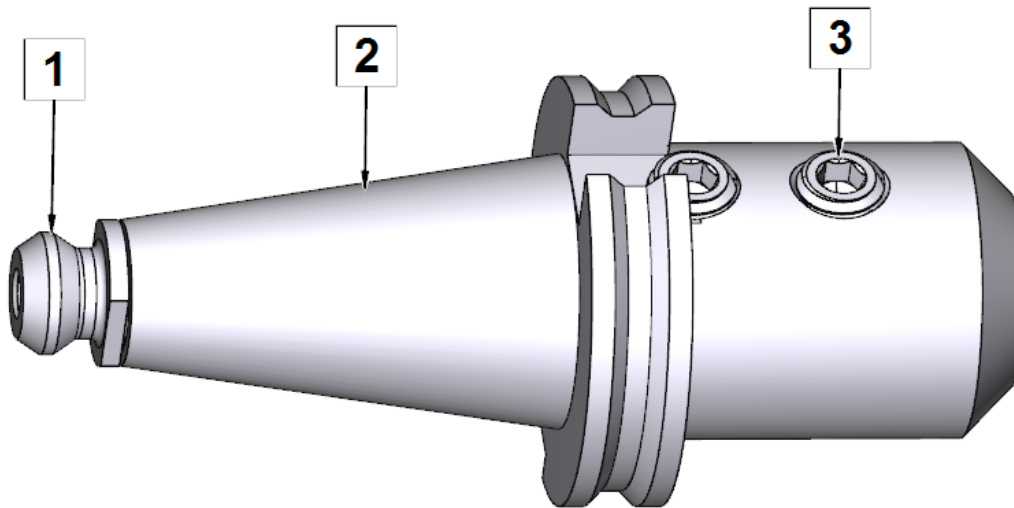
## Tooling for Stroker Clearancing/Notching

### 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"

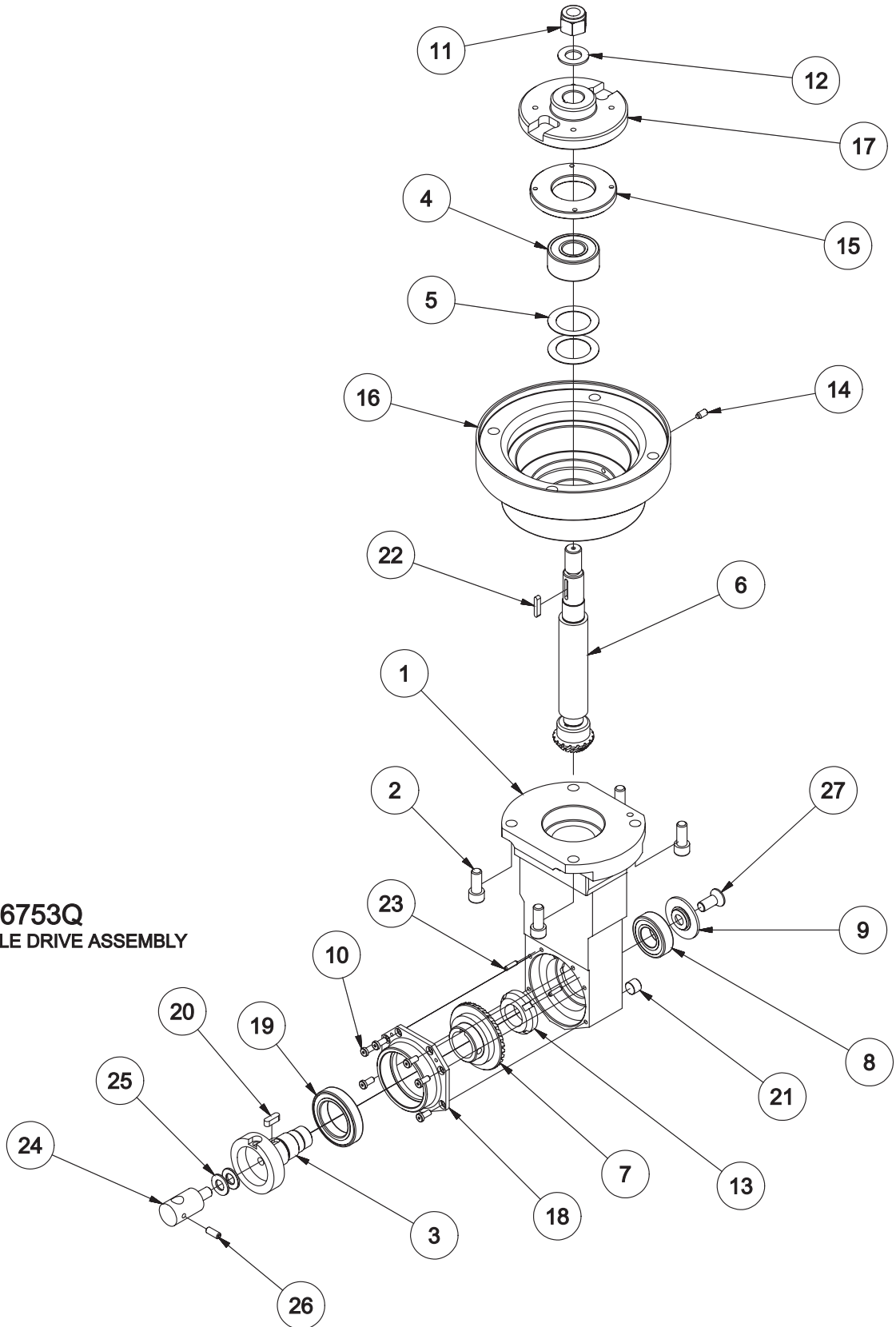
## 650-2-53 Splayed 4 Bolt Main Cap Machining Tooling Package Components



### Main Line Bore Tooling

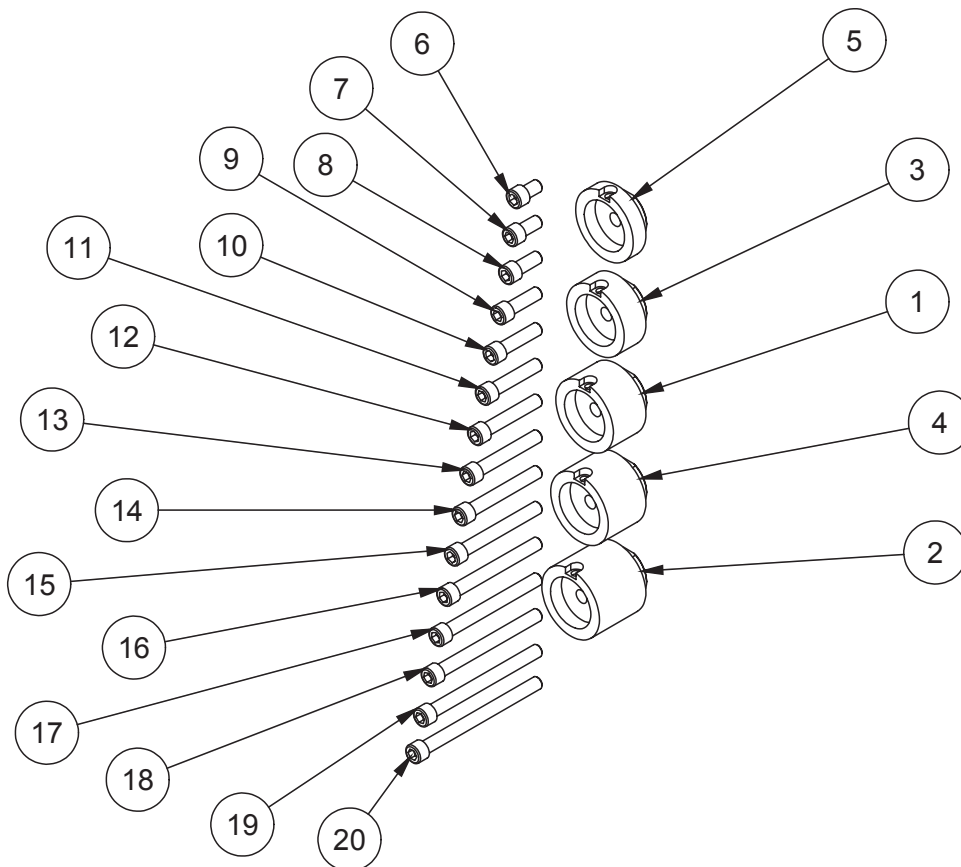
### 6753QX Main Line Bore 90 Degree Right Angle Drive Assembly Parts

**6753Q**  
RIGHT ANGLE DRIVE ASSEMBLY



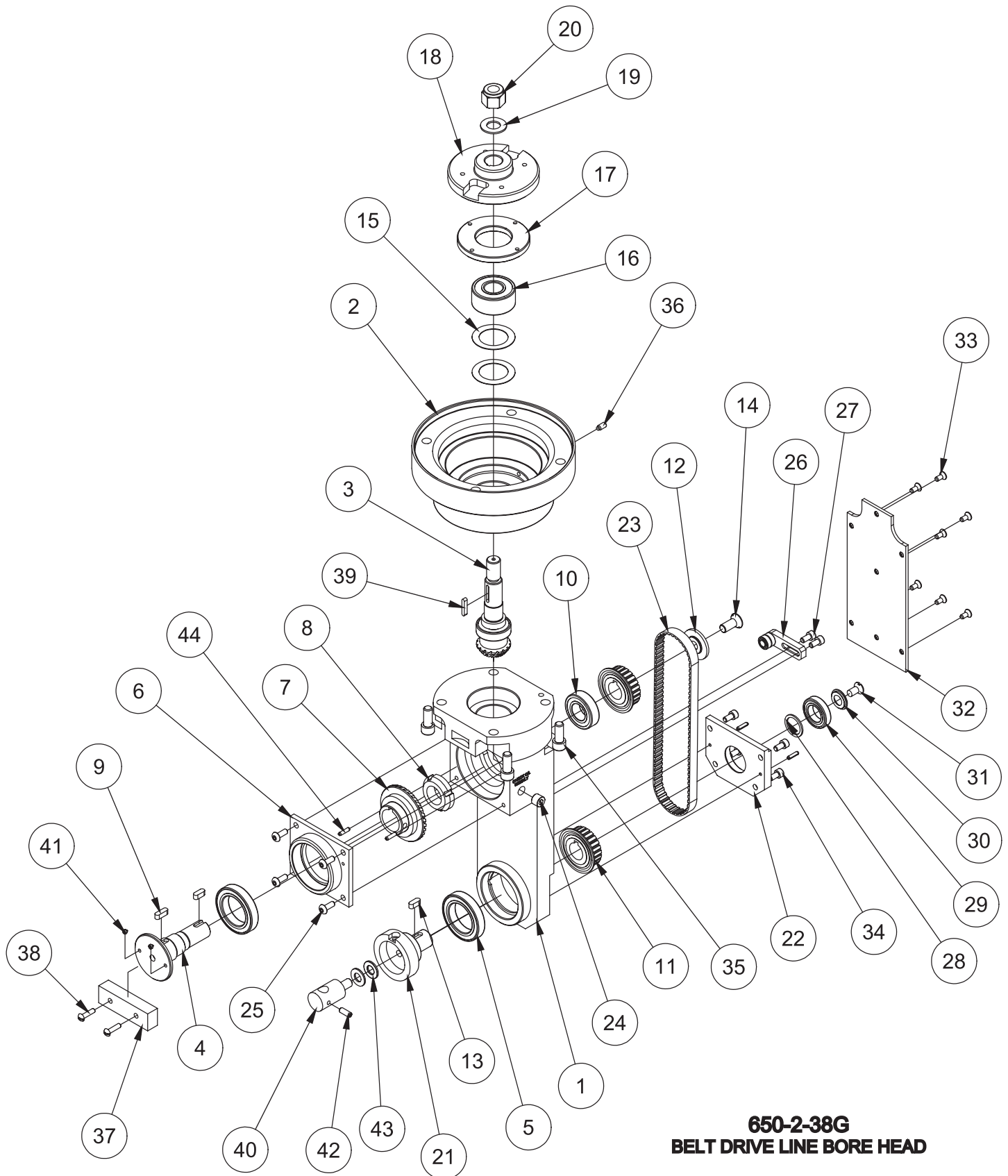
6753Q RIGHT ANGLE DRIVE ASSEMBLY			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	6773C	HOUSING, GEAR LINE BORE HEAD
2	4	MF-22	5/16-18UNC x 3/4" LG. S.H.C.S.
3	1	650-2-42	SHAFT, HORIZONTAL PRECISION R.A.D.
4	1	502-9-32	Bearing, Ball MRC 5203SBKFF
5	2	6007A	Bellville Spring, BS203
6	1	6775A	PINION AND SHAFT ASSEMBLY - R.A.D.
7	1	6766W	RING GEAR REWORK - F60 SMALL 90 DEG. R.A.D.
8	1	6753E	Bearing, NDH Z99L03
9	1	6766F	End Cap
10	6	6774E	Hexagon Socket Head Cap Screw
11	1	MF-186	1/2-13 Nylock Nut
12	1	100-19	Washer
13	1	6705B	BEARING LOCK NUT
14	1	100-82-2A	10-24UNC BRASS TIPPED SOCKET SET SCREW
15	1	6772A	Nut, Bearing Line Bore Head
16	1	6770G	HUB, MOUNTING
17	1	6771B	DRIVER, F60 LINE BORE HEAD
18	1	6774D	COVER, BEARING RETAINER - R.A.D.
19	1	502-9-72C	OUTER BALL BEARING, R.A.D.
20	1	650-2-18M	KEY, HORIZONTAL SHAFT, R.A.D.
21	1	MF-233	Countersunk Hex-Head Plug 1/8
22	1	6753V	KEY (MICARTA), PINION - 90 DEGREE HEAD
23	2	MF-217	1/8 x 1/2 Roll Pin
24	1	502-9-9S	INDICATOR MOUNT, R.A.D.
25	2	MF-177	SAE FLAT WASHER 5/16"
26	1	MF-58A	10-24UNC x 1/2" LG. SOCKET FLAT POINT SET SCREW
27	1	6774K	5/16-24UNF x 3/4" LG. HEX SOCKET FLAT HEAD SCREW





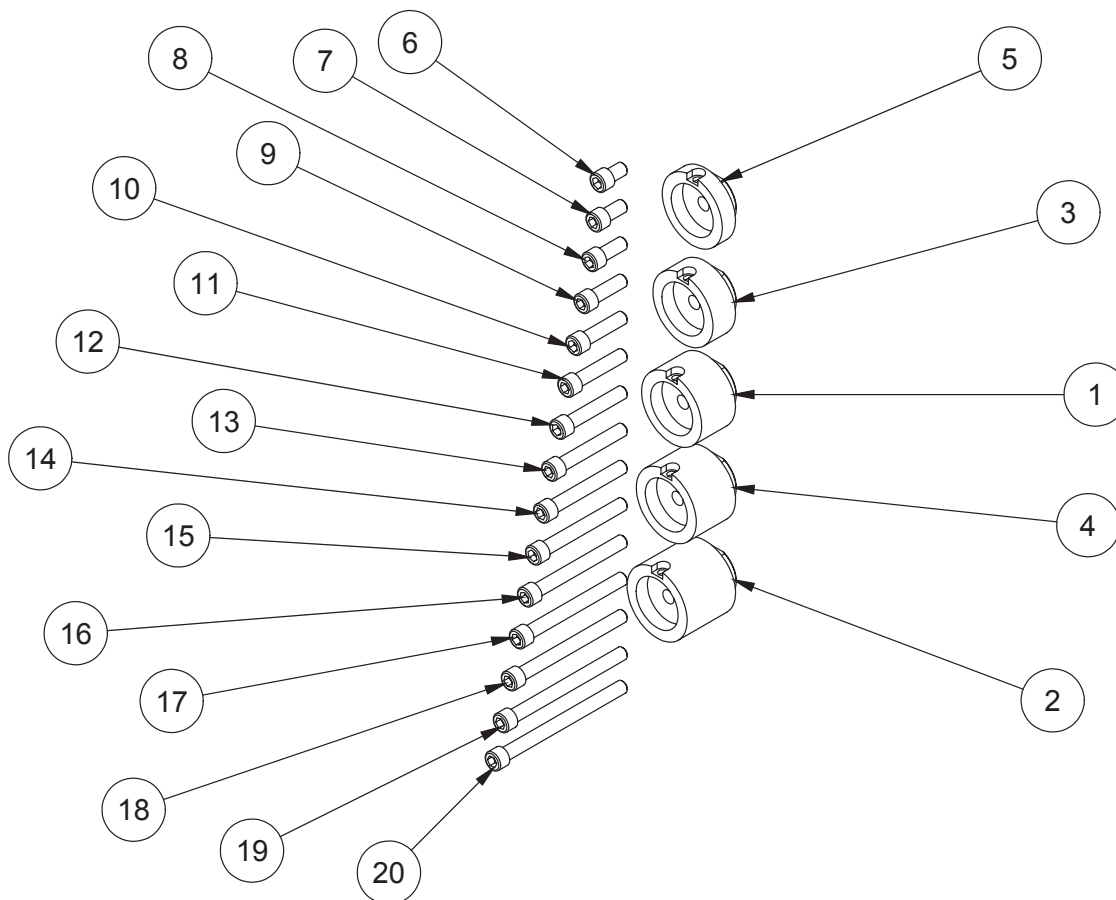
CUTTERHEAD SPACER SET - LINE BORE HEAD			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	650-2-43	1.05 SPACER
2	1	650-2-43A	SPACER - 1.50" LONG
3	1	650-2-43B	SPACER - .70" LONG
4	1	650-2-43D	SPACER - 1.215" LONG
5	1	650-2-43E	SPACER - .41" LONG
6	1	MF21A	S.H.C.S. 5/16 - 18 UNC - 1/2
7	1	MF-21	S.H.C.S. 5/16 - 18 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

## 650-2-38GX Special Belt Drive 90 Degree Right Angle Drive Assembly Parts



**650-2-38G  
BELT DRIVE LINE BORE HEAD**

650-2-38G BELT DRIVE RIGHT ANGLE DRIVE			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	650-2-38B	HOUSING, RIGHT ANGLE DRIVE BELT DRIVE
2	1	6770G	HUB, MOUNTING
3	1	650-2-37X	PINION & SHAFT ASSEMBLY BELT DRIVE LINE BORE HEAD
4	1	650-2-37D	SHAFT, HORIZONTAL UPPER - BELT DRIVE LINE BORE HEAD
5	2	502-9-72C	OUTER BALL BEARING, RIGHT ANGLE LINE BORING HEAD
6	1	650-2-37C	BEARING COVER, BELT DRIVE RIGHT ANGLE DRIVE
7	1	6766W	RING GEAR REWORK
8	1	6705B	BEARING LOCK NUT
9	1	650-2-18M	KEY, HORIZONTAL SHAFT, R.A.D.
10	1	6753E	Bearing, NDH Z99L03
11	2	650-2-37G	PULLEY (REWORK), BELT DRIVE R.A.D.
12	1	650-2-37E	ENDCAP, UPPER PULLEY RETAINER - BELT DRIVE LINE BORE HEAD
13	2	650-2-37U	MICARTA KEY, BELT DRIVE LINE BORE HEAD
14	1	6774K	HEX SOCKET FLATHEAD SCREW 5/16-24UNF x 3/4"
15	2	6007A	Bellville Spring, BS203
16	1	502-9-32	Bearing, Ball MRC 5203SBKFF
17	1	6772A	Nut, Bearing Line Bore Head
18	1	6771B	DRIVER, LINE BORE HEAD
19	1	100-19	Washer
20	1	MF-186	1/2-13 Nylock Nut
21	1	650-2-42B	Horizontal Shaft
22	1	650-2-37L	LOWER BEARING RETAINER - BELT DRIVE LINE BORE HEAD
23	1	650-2-38D	TIMING BELT, BELT DRIVE LINE BORE HEAD
24	1	MF-233	1/8-27NPT PIPE PLUG
25	4	Mf-88A	Socket Button Head Cap Screw 10 - 24 x 1/2
26	1	650-2-37P	BELT TENSIONER ASSY, BELT DRIVE LINE BORE HEAD
27	2	MF-4	10-24UNC x 3/8" LG. S.H.C.S.
28	1	650-2-37V	SPACER, LOWER PULLEY - BELT DRIVE LINE BORE HEAD
29	1	650-2-37J	BEARING, BELT DRIVE LINE BOER HEAD
30	1	650-2-37K	END CAP, LOWER - BELT DRIVE LINE BORE HEAD
31	1	650-2-37Z	1/4-28UNF x 1/2" SLOTTED FLATHEAD SCREW
32	1	650-2-38C	BELT COVER, BELT DRIVE LINE BORE HEAD
33	7	MF-76	Socket Flat Head 8-32 UNC x 0.375
34	4	MF-4	S.H.C.S. 10 - 24 UNC - 3/8
35	4	MF-22	S.H.C.S. 5/16 - 18 UNC - 3/4
36	1	100-82-2A	Brass tipped 10-24 Socket Set Screw
37	1	650-2-38a	RETAINING TOOL - BELT DRIVE R.A.D.
38	2	MF-105	ROUND HEAD MACHINE SCREW 8-32 x 5/8"
39	1	6753V	KEY (MICARTA), PINION - 90 DEGREE HEAD
40	1	502-9-9S	INDICATOR MOUNT, R.A.D.
41	2	MF-49	8-32UNC x 1/8" LONG SOCKET SET SCREW
42	1	MF-58A	10-24UNC x 1/2" LG. SOCKET FLAT POINT SET SCREW
43	2	MF-177	SAE FLAT WASHER 5/16"
44	4	MF-217	1/8 x 1/2 Roll Pin



CUTTERHEAD SPACER SET - BELT DRIVE LINE BORE HEAD			
ITEM	QTY	PART NUMBER	DESCRIPTION
1	1	650-2-43	1.05 SPACER
2	1	650-2-43A	SPACER - 1.50" LONG
3	1	650-2-43B	SPACER - .70" LONG
4	1	650-2-43D	SPACER - 1.215" LONG
5	1	650-2-43E	SPACER - .41" LONG
6	1	MF21A	Hexagon Socket Head Cap Screw
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	Hexagon Socket Head Cap Screw
10	1	MF-24	Hexagon Socket Head Cap Screw
11	1	MF-25	S.H.C.S. 5/16 - 18 UNC - 1 1/2
12	1	Mf-26	Hexagon Socket Head Cap Screw
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

## 650-2-39B Cutterhead Package Components

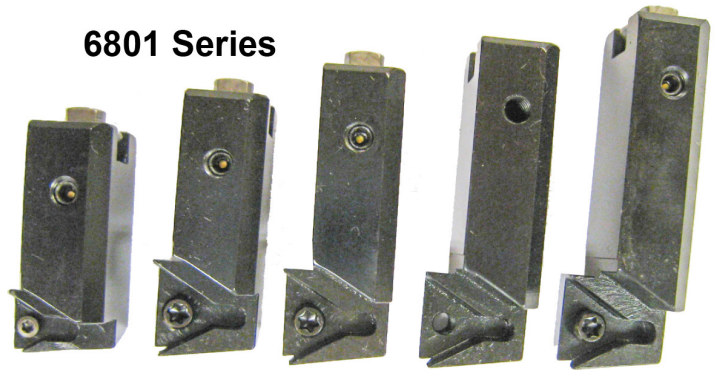


650-2-39F

RT321F



6801 Series



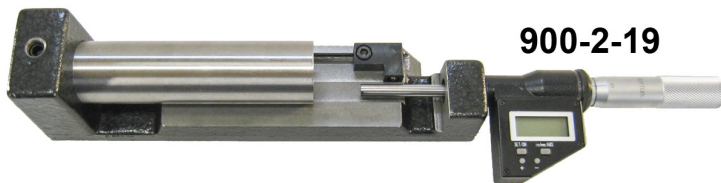
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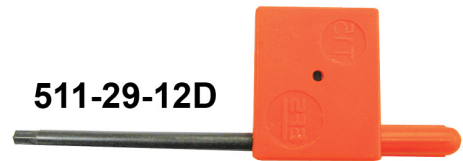
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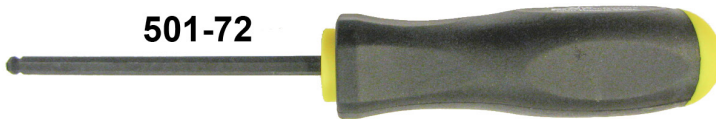


900-2-19

511-29-12D



501-72



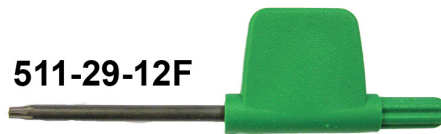
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RT322F



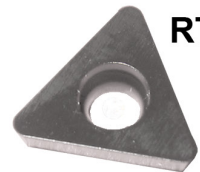
511-29-12F



RT211



RT212



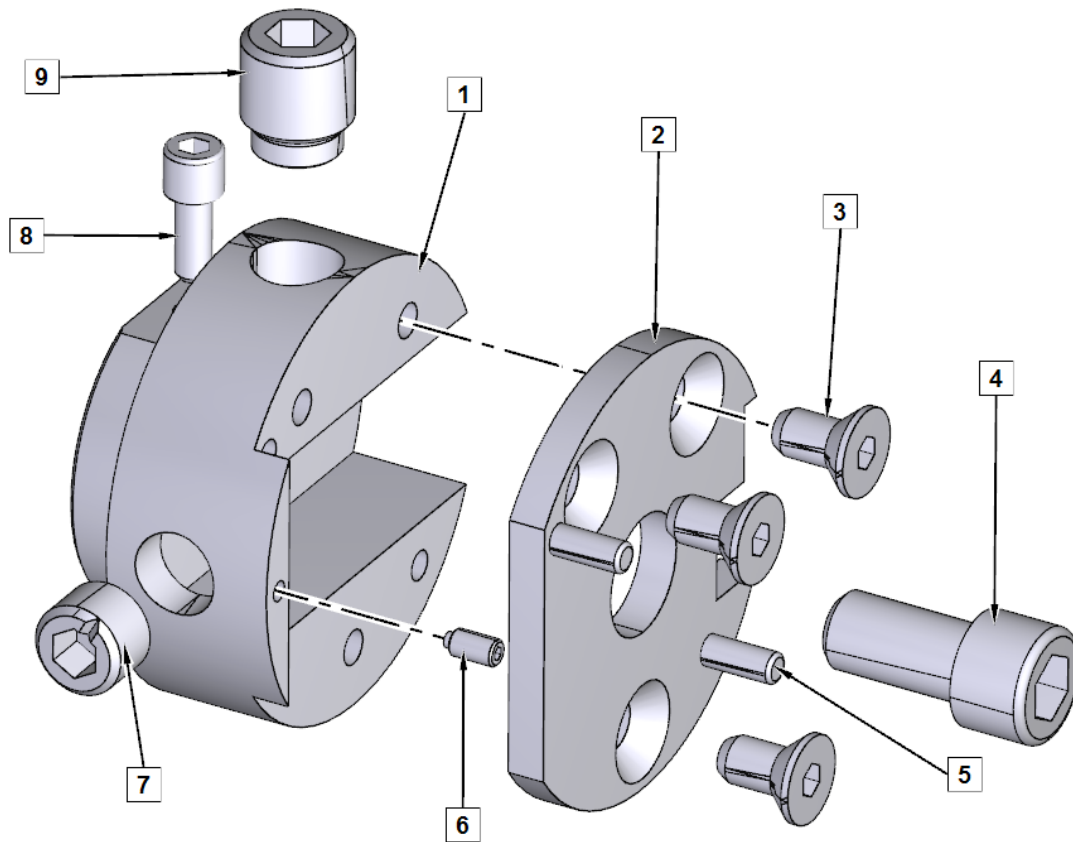
RT321



RT322

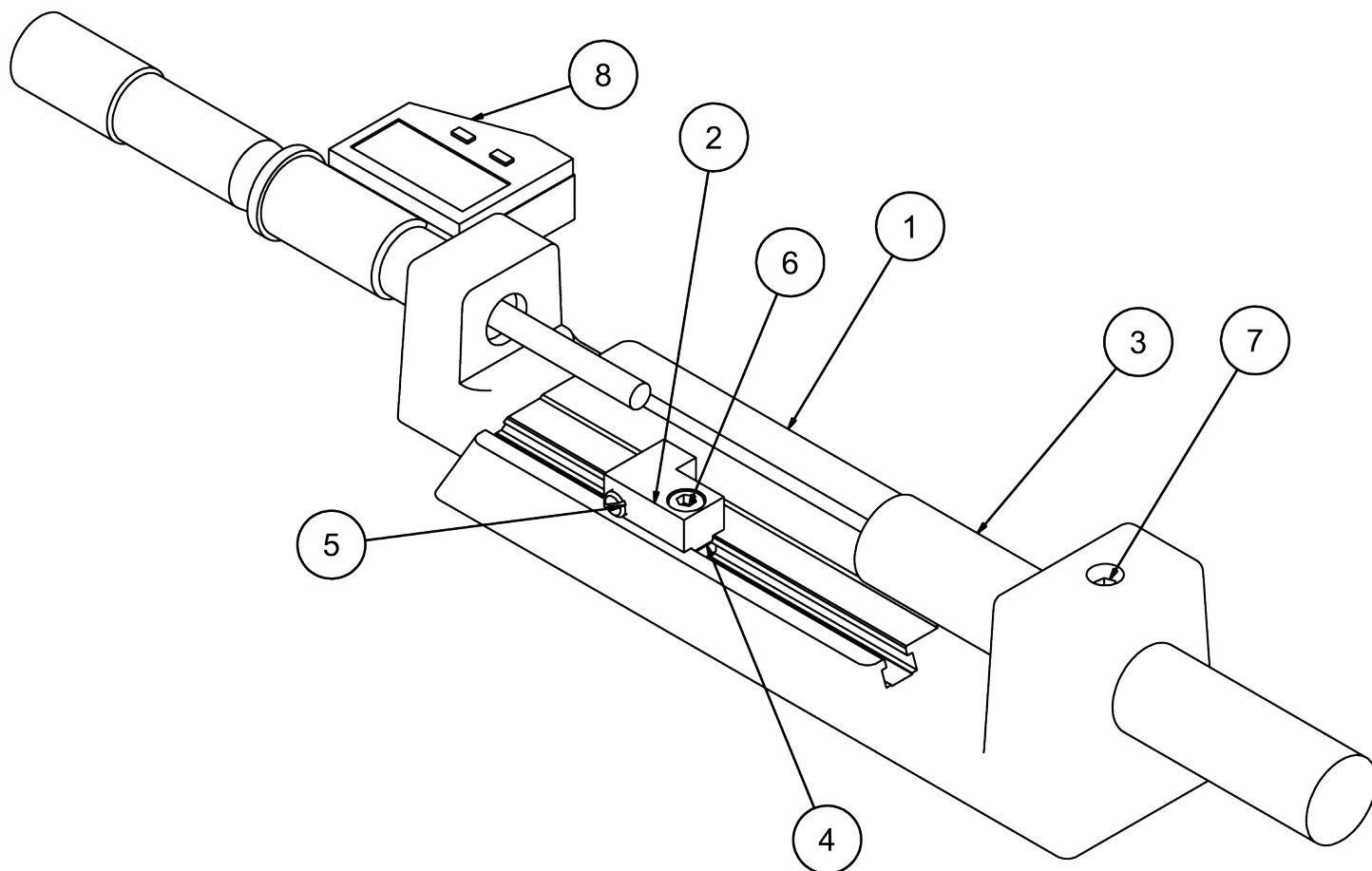


## 650-2-39F Cutterhead Parts



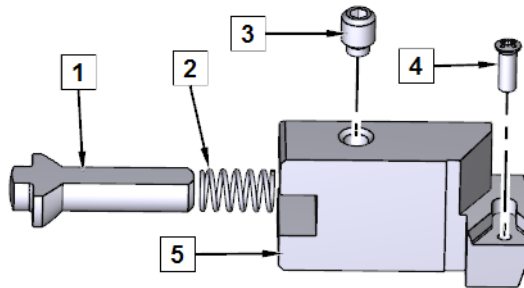
ITEM	PART #	DESCRIPTION
1	650-2-40A	BODY, 1.9" PRECISION LINE BORE CUTTERHEAD
2	650-2-41	CAP, 1.9" DIAMETER PRECISION LINE BORE HEAD
3	MF-78	SOCKET FLAT HEAD SCREW 10-24 X 3/8"
4	MF-21	SOCKET HEAD CAP SCREW 5/16-18 X 5/8"
5	MF-193C	DOWEL PINS 1/8 X 3/8"
6	650-2-6A	SOCKET SET SCREW BRASS TIPPED 4-40 X 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



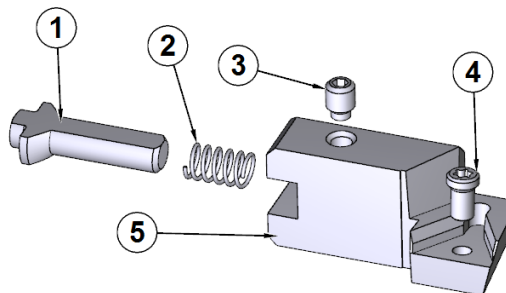
900-2-19 Micrometer Assembly			
ITEM	QTY	PART NUMBE	DESCRIPTION
1	1	502-30-10B	Frame
2	1	502-30-10M	Clamp Block
3	1	502-31-10A	Anvil
4	1	502-30-10J	Square Nut
5	1	502-30-10K	Ball Plunger
6	1	ANSI B18.3 - No. 10 - 24 UNC - 3/8	Hexagon Socket Head Cap Screw
7	1	502-30-10L	Brass Tipped Set Screw
8	1	501-34-2R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

**6801B Insert Holder Parts**



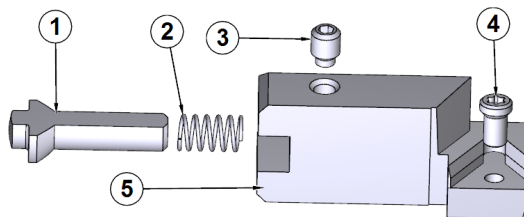
ITEM	PART #	DESCRIPTION
1	100-82-3B	PIN, ADJUSTING LONG
2	100-82-1	SPRING, ADJUSTING PIN
3	100-82-2	SCREW, SET-BRASS GIB - 3/16" LONG
4	511-29-12C	SCREW, TORX M4 X .7 X .315" LONG
5	6800B	TOOLHOLDER, INDEXABLE INSERT- 1/4" TRIANGLE, OFFSET, POSITIVE RAKE

**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

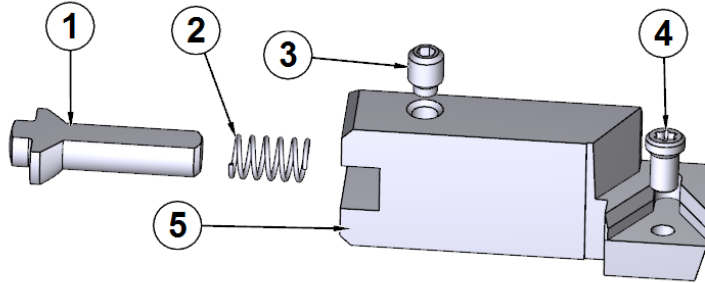
**6801D Insert Holder Parts**



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

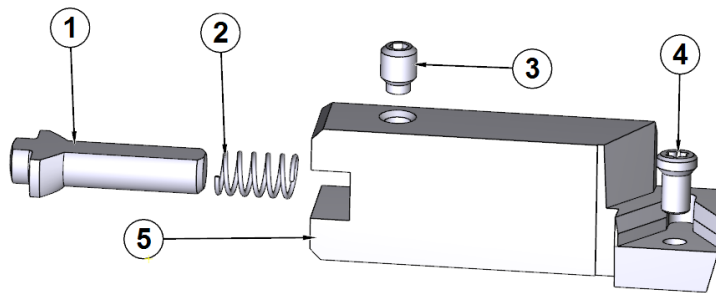


## 6801E Insert Holder Parts



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

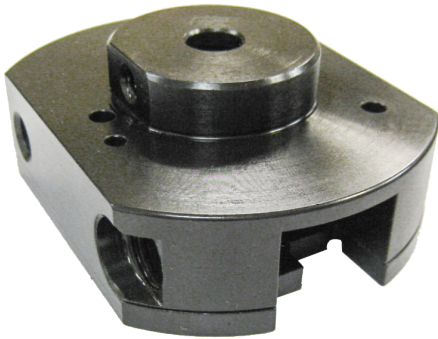
## 6801F Insert Holder Parts



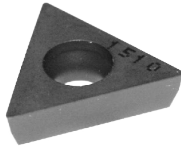
ITEM	PART #	DESCRIPTION
1	100-82-3B	PIN ADJUSTING LONG INDEXABLE INSERT TOOLHOLDER
2	100-82-1	SPRING, ADJUSTING PIN
3	100-82-2	SCREW, SET-BRASS GIB - 3/16" LONG
4	511-29-12C	SCREW, TORX M4 X .7 X .315" LONG
5	6800F	TOOLHOLDER, INDEXABLE INSERT- 3/8" IC TRIANGLE, OFFSET POSITIVE RAKE

## 650-2-39C Cutterhead Package Components

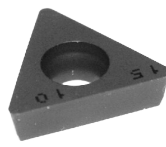
**650-2-39G**



**RT321**



**RT322**



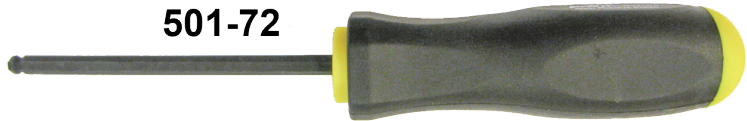
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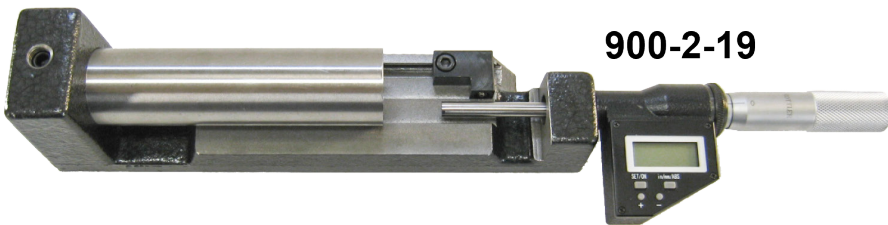
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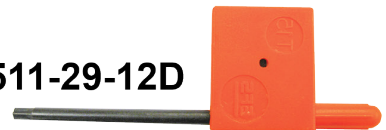
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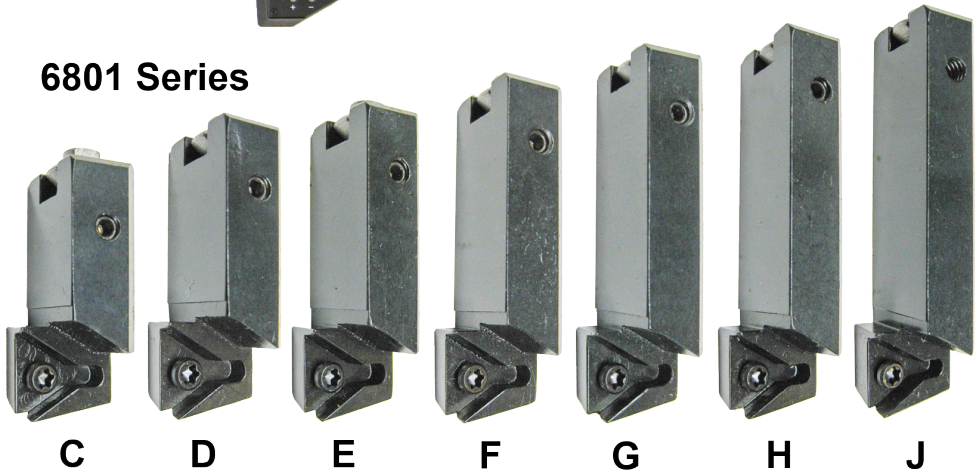
**900-2-19**



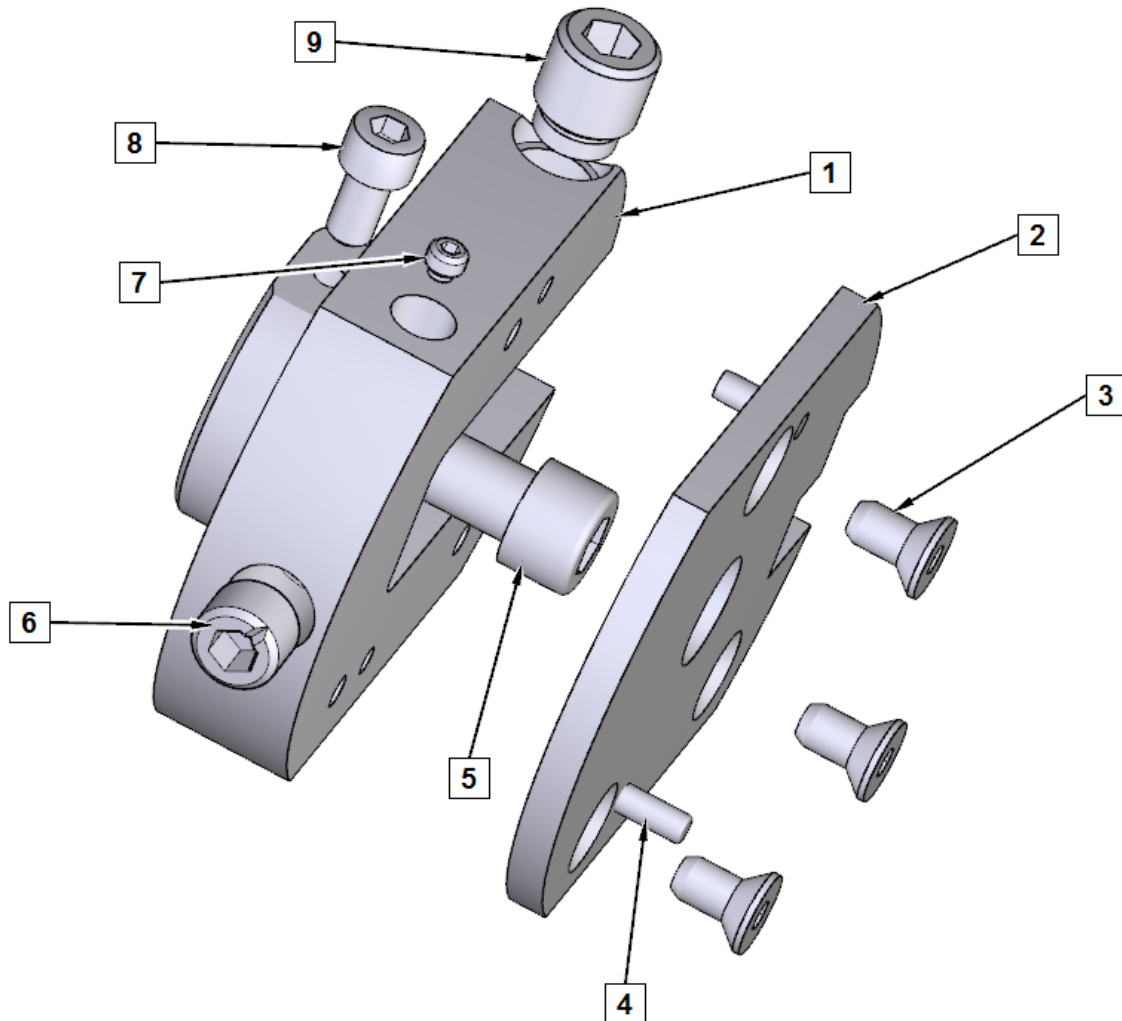
**511-29-12D**



**6801 Series**

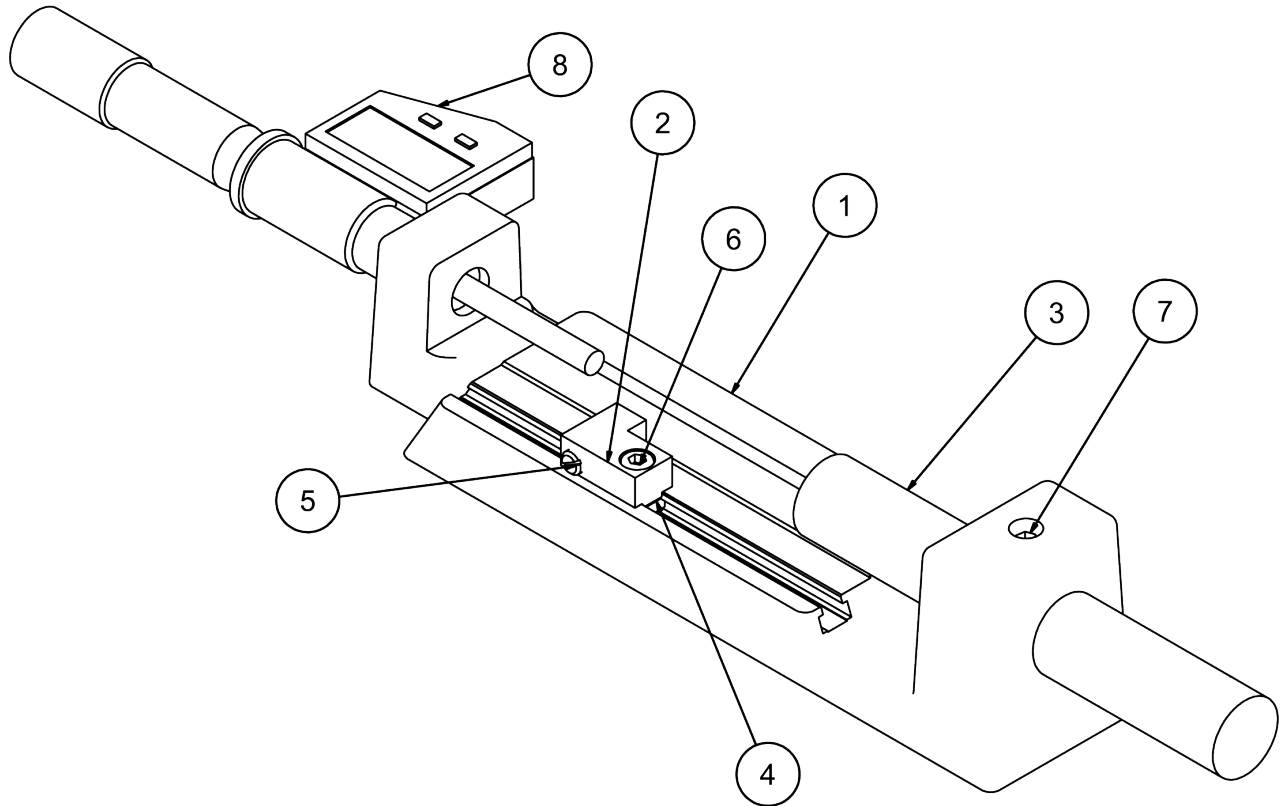


## 650-2-39G Cutterhead Parts



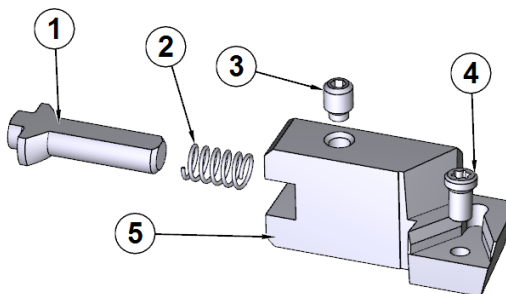
ITEM	PART #	DESCRIPTION
1	650-2-16E	BODY, 2.9" DIAMETER PRECISION LINE BORE CUTTERHEAD
2	650-2-17A	CAP, 2.9" DIAMETER PRECISION LINE BORE CUTTERHEAD
3	MF-78	SOCKET FLAT HEAD SCREW 10-24 X 3/8"
4	MF-193C	DOWEL PINS 1/8 X 3/8"
5	MF-21	SOCKET HEAD CAP SCREW 5/16-18 X 5/8"
6	502-2-85B	SCREW, SET-INDEX 3/8-40 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



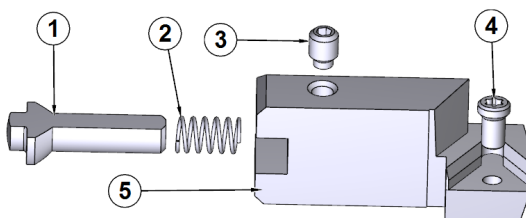
900-2-19 Micrometer Assembly			
ITEM	QTY	PART NUMBE	DESCRIPTION
1	1	502-30-10B	Frame
2	1	502-30-10M	Clamp Block
3	1	502-31-10A	Anvil
4	1	502-30-10J	Square Nut
5	1	502-30-10K	Ball Plunger
6	1	ANSI B18.3 - No. 10 - 24 UNC - 3/8	Hexagon Socket Head Cap Screw
7	1	502-30-10L	Brass Tipped Set Screw
8	1	501-34-2R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

## 6801C Insert Holder Parts



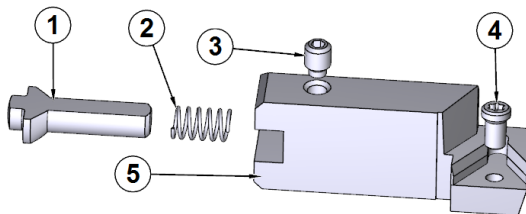
ITEM	PART #	DESCRIPTION
1	100-82-3B	PIN ADJUSTING LONG INDEXABLE INSERT TOOLHOLDER
2	100-82-1	SPRING, ADJUSTING PIN
3	100-82-2	SCREW, SET-BRASS GIB - 3/16" LONG
4	511-29-12C	SCREW, TORX M4 X .7 X .315" LONG
5	6800C	TOOLHOLDER, INDEXABLE INSERT- 3/8" IC TRIANGLE, OFFSET POSITIVE RAKE

## 6801D Insert Holder Parts



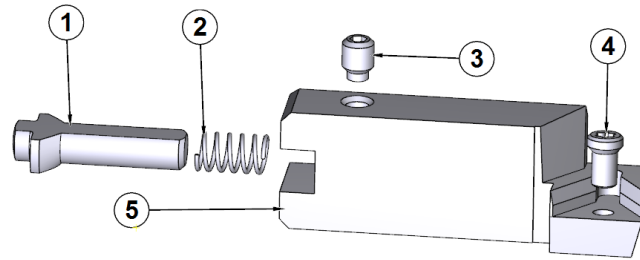
ITEM	PART #	DESCRIPTION
1	100-82-3B	PIN ADJUSTING LONG INDEXABLE INSERT TOOLHOLDER
2	100-82-1	SPRING, ADJUSTING PIN
3	100-82-2	SCREW, SET-BRASS GIB - 3/16" LONG
4	511-29-12C	SCREW, TORX M4 X .7 X .315" LONG
5	6800D	TOOLHOLDER, INDEXABLE INSERT- 3/8" IC TRIANGLE, OFFSET POSITIVE RAKE

## 6801E Insert Holder Parts



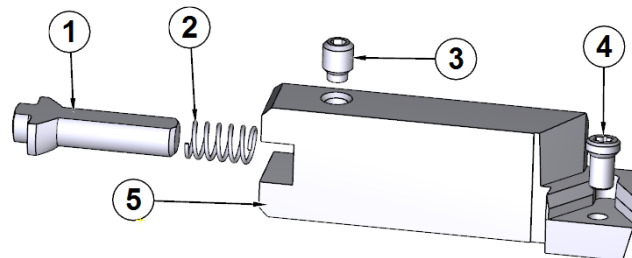
ITEM	PART #	DESCRIPTION
1	100-82-3B	PIN ADJUSTING LONG INDEXABLE INSERT TOOLHOLDER
2	100-82-1	SPRING, ADJUSTING PIN
3	100-82-2	SCREW, SET-BRASS GIB - 3/16" LONG
4	511-29-12C	SCREW, TORX M4 X .7 X .315" LONG
5	6800E	TOOLHOLDER, INDEXABLE INSERT- 3/8" IC TRIANGLE, OFFSET POSITIVE RAKE

## 6801F Insert Holder Parts



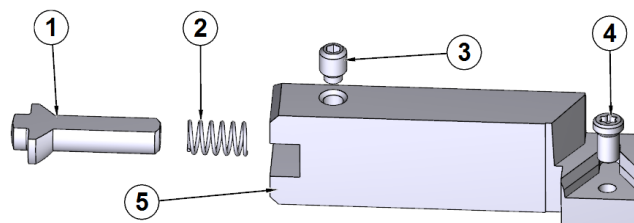
ITEM	PART #	DESCRIPTION
1	100-82-3B	PIN ADJUSTING LONG INDEXABLE INSERT TOOLHOLDER
2	100-82-1	SPRING, ADJUSTING PIN
3	100-82-2	SCREW, SET-BRASS GIB - 3/16" LONG
4	511-29-12C	SCREW, TORX M4 X .7 X .315" LONG
5	6800F	TOOLHOLDER, INDEXABLE INSERT- 3/8" IC TRIANGLE, OFFSET POSITIVE RAKE

## 6801G Insert Holder Parts



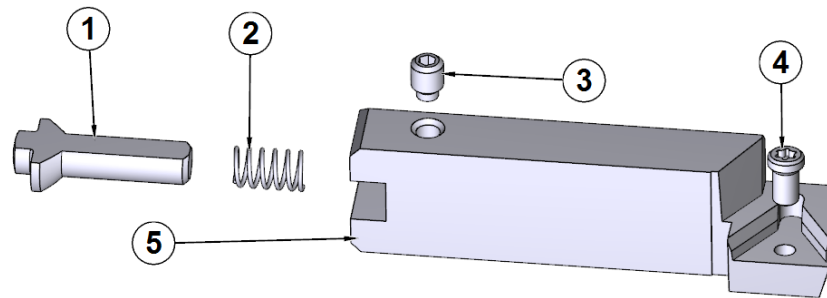
ITEM	PART #	DESCRIPTION
1	100-82-3B	PIN ADJUSTING LONG INDEXABLE INSERT TOOLHOLDER
2	100-82-1	SPRING, ADJUSTING PIN
3	100-82-2	SCREW, SET-BRASS GIB - 3/16" LONG
4	511-29-12C	SCREW, TORX M4 X .7 X .315" LONG
5	6800G	TOOLHOLDER, INDEXABLE INSERT- 3/8" IC TRIANGLE, OFFSET POSITIVE RAKE

## 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

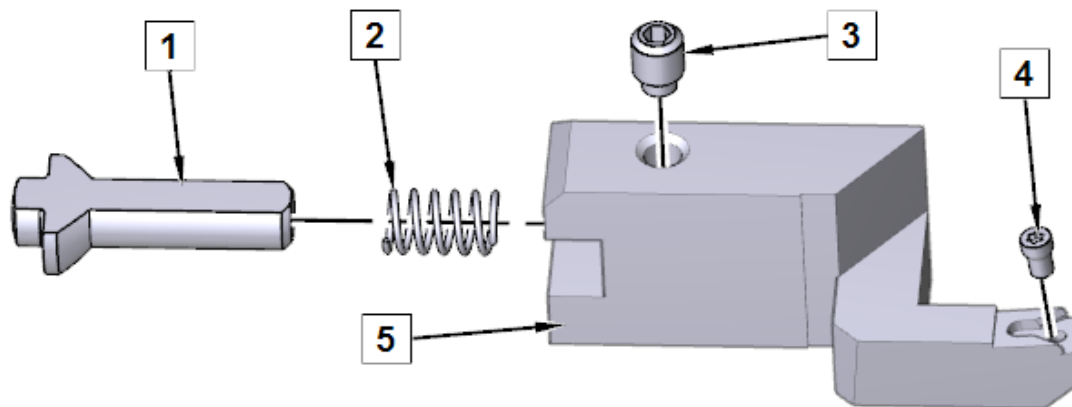
## 6801J Insert Holder Parts



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

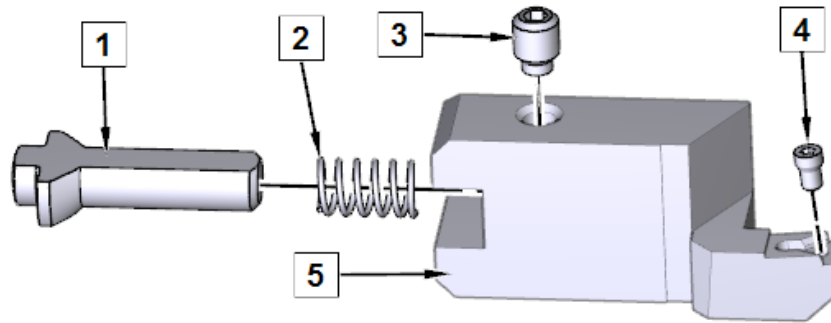
## Special Main Line Boring Thrust Facing Tooling

### 6801M Indexable Insert Tool 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	501-29-6H	SCREW, INSERT THRUST FACING TOOLBIT
5	6800M	CARTRIDGE, INDEXABLE INSERT-THRUST FACING

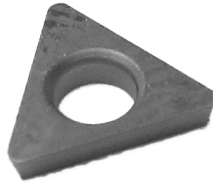
## 6801P Indexable Insert Tool Holder Parts



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	501-29-6H	SCREW, INSERT
5	6800P	CARTRIDGE, INDEXABLE INSERT

### 501-29-6G Insert, Triangular

.160 IC 1/64" (.397mm) Radius



### 501-29-6H Insert Screw

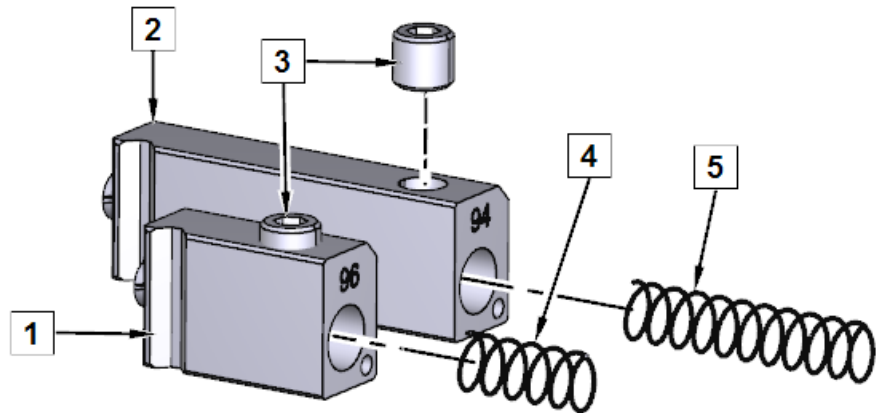




## Special Main Line Boring Chamfering Tooling

199-90 Tool holder Parts

199-96 Tool holder Parts

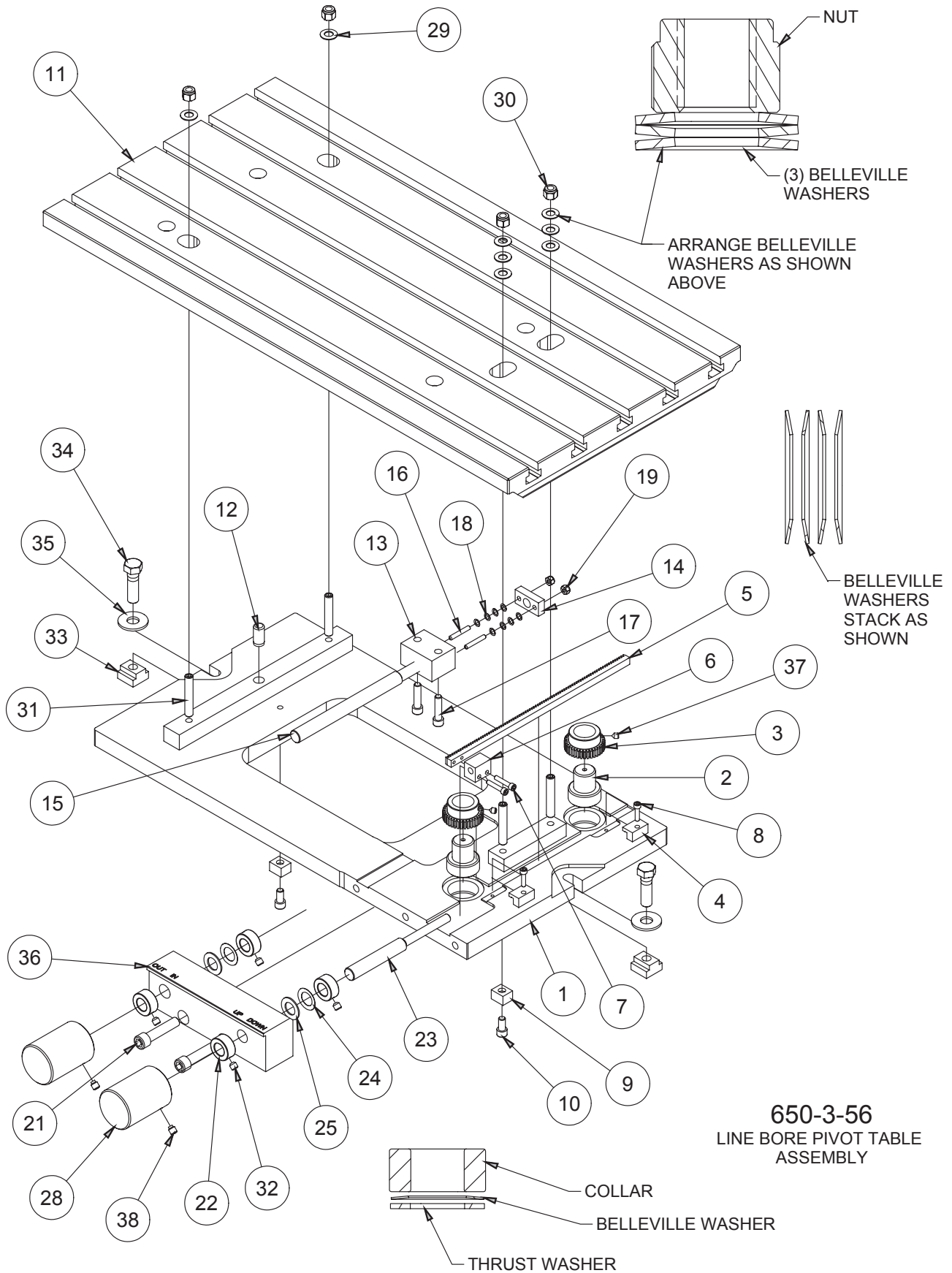


ITEM	PART #	DESCRIPTION
1	199-96	HOLDER, TOOL 1-1/4"
2	199-94	HOLDER, TOOL 2-1/4"
3	502-25-1	SCREW, SOCKET SET- 5/16-18 X 5/16" LONG
4	200-1-6D	SPRING, TOOL BIT 3/4"
5	200-1-6C	SPRING, TOOL BIT 1-7/16"

## 501-33E Tool bit, 45-Degree Chamfer



## 650-3-56 Line Bore Pivot Table Parts



**650-3-56**  
LINE BORE PIVOT TABLE  
ASSEMBLY

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