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## SAFETY PRECAUTIONS

### IN GENERAL

When using rotating head cutting equipment, basic safety precautions should always be followed to reduce the risk of personal injury.

Operate this tool only in accordance with specific operating instructions.

#### **WARNING:**

Do not override the deadman switch on the power unit. Locking down, obstructing, or in any way defeating the deadman switch on the power drive unit may result in serious injury.

### DRESS CONSIDERATIONS

Use standard safety equipment. Hard hats, safety shoes, safety harnesses, protective clothes, and other safety devices should always be used when appropriate.

Use safety glasses. Do not operate cutting tools without eye protection.

Dress properly. Do not wear loose clothing or jewelry. They can be caught in rotating and moving parts. Avoid slippery floors or wear nonskid footwear. If you have long hair, wear protective hair covering to contain it.

### WORK AREA

Keep the work area clean. Cluttered work areas and benches invite injuries.

Consider the work area environment. Keep the area well lit. Keep electrical cords, cables, rags, rigging straps, and etc. clear of rotating equipment. Do not use power-cutting tools in the presence of flammable liquids and gasses.

Keep visitors away. Do not let visitors or untrained personnel at or near operating tools. Enforce eye protection requirements for all observers.

Do not over reach. Keep proper footing at all times.

Stay alert. Watch what you are doing. Use common sense. Do not operate tools when you are tired.

### **TOOL CARE**

Maintain tools with care. Keep tools in good operating condition. Sharp tool bits perform better and safer than dull tool bits. Well maintained tools function properly when needed.

Check for damaged parts. If a tool has malfunctioned, been dropped or hit, it must be checked for damage. Run no-load tests and feed function checks. Do a complete visual inspection.

Electric motors. Use only with proper AC voltage power sources and observe all normal electric shock hazard procedures.

Do not abuse power and control cords. Pulling or running over cords and cables can result in electrical shock hazards and malfunctions. Keep control and power cords out of all cutting fluids and water.

Hydraulic drives. Observe proper procedures for electrically driven power sources. Avoid damage to hydraulic lines. Keep quick-disconnects clean. Grit contamination causes malfunctions.

Air tools. Check the exhaust muffler. Broken or damaged mufflers can restrict air flow or cause excessive noise. Use air motors only with a filtered, lubricated and regulated air supply. Dirty air, low-pressure air or over pressure air will cause malfunctions, including delayed starting.

### **AREA EQUIPMENT**

Secure work. Whenever possible use clamps, vises, chains and straps to secure pipe.

Make sure the tool is secured; it is safer to have both hands free to operate the tool.

### **TOOL USE**

Use the right tool and tool bit for the job. Do not use a tool, which is incorrect for the job you are doing.

Keep the tool bits fully engaged in the tool bit holders. Loose bits are a safety hazard.

Disconnect power supply during setup and maintenance. Use all 'Stop' or Shut off' features available when changing or adjusting tool bits, maintaining the tool, or when the tool is not in use.

Remove adjusting keys and wrenches before applying power to the equipment. Develop a habit of checking the tool before turning it on to make sure that all keys and wrenches have been removed.

Do not force tools. Tools and tool bits function better and safer when used at the feed and speed rate for which they were designed.

Do not reach into rotating equipment. Do not reach into the rotating head stock to clear chips, to make adjustments, or to check surface finish. A machine designed to cut steel will not stop for a hand or an arm.

Handle chips with care. Chips have very sharp edges and are hot. Do not try to pull chips apart with your hands; they are very tough.

Avoid unintentional starts. Do not carry or handle tools with your hand on the operating switches or levers. Do not lay the tool down in a manner that will start the drive. Do not allow the tool to flip around or move when adjusting or changing tool bits.

Store idle tools properly. Disconnect tools from the power source and store in a safe place. Remove tool bits for safe handling of the tool.

## GENERAL DESCRIPTION

The Model 442F FLANGEMASTER™ is a Portable Flange Facer designed for on-site flange maintenance.

The Model 442F FLANGEMASTER™ is secured to the ID of a flange by using eight individually adjusted jackscrews in two separate rows.

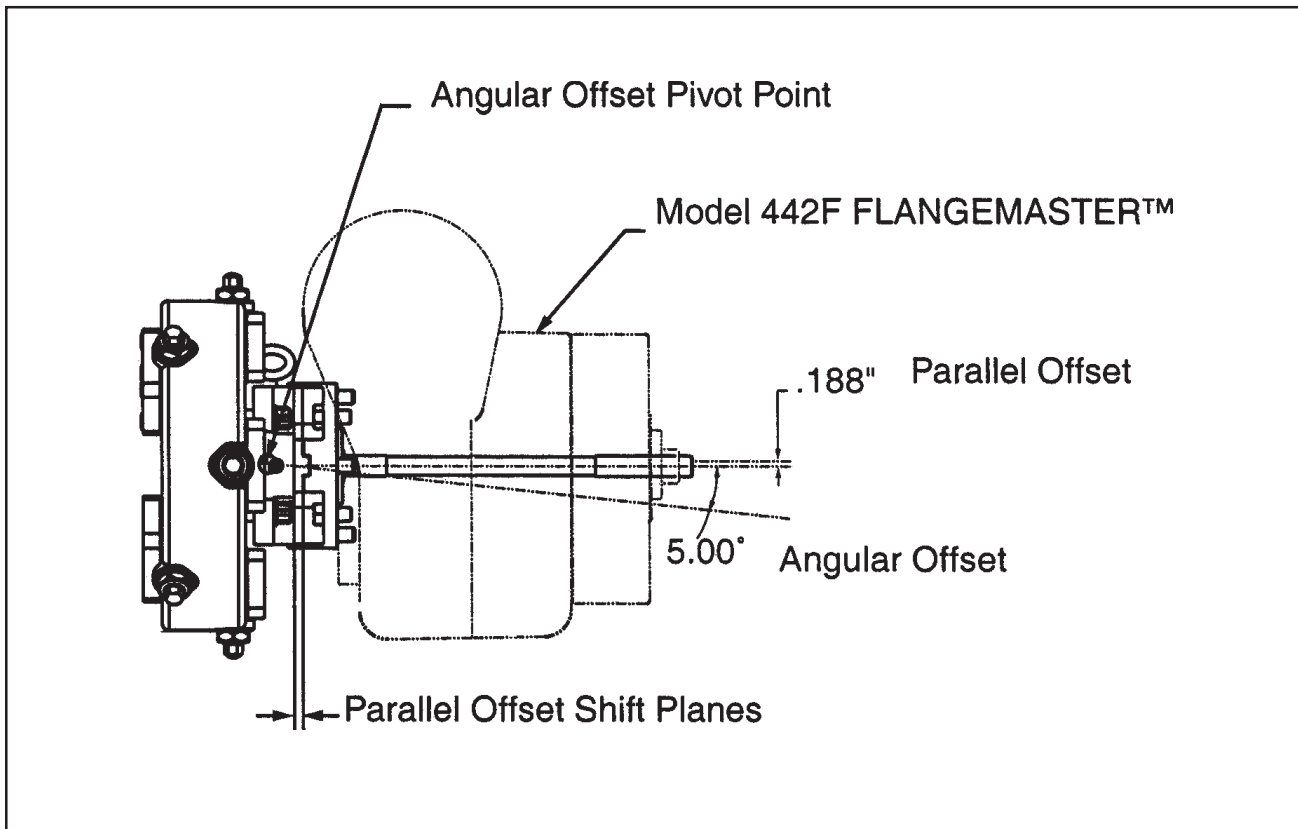
The Model 442F is also used to reface heat exchangers and other vessels.

The machine is used also to reface fiberglass flanges, mill round and elliptical openings and trepan.

By rotating the tool head, chamfers can be machined without additional setup time.

Other uses include, counterboring seal areas, resurfacing faces of large bull gears, and machining shoulders inside pipes.

Once secured, two distinct type of adjustments are easily performed, angular offset and parallel offset.



With the angular offset adjustment, the miter head can be precisely aligned with the workpiece (even though the ID of the workpiece might be irregular) or it may be adjusted up to 5° from the centerline in any direction desired.

The parallel offset adjustment accurately re-centers the miterhead after the angular offset adjustment has been made.

Both adjustments are accomplished with the aid of an “Indicating Sleeve” and Dial Indicator Kit.

## **SPECIFICATIONS**

### **CUTTING CAPACITIES**

14.0" (355.6 mm) ID through 42.0" (1066.8 mm) OD with Standard Tool Bar and Mounting Head Kit.

The extended Tool Bar and Mounting Head Extension Kit brings the cutting capacity to 73.0" (1854.2 mm) OD and the mounting capacity to 72.0" (1828.8 mm).

### **MATERIALS**

Material include but are not limited to : carbon steel, low alloy steel, chrome steel (20% max), chrome/molly alloys (Rc 32 max), austenitic stainless steels, Inconel, copper, aluminum and copper nickel alloys.

### **CLEARANCES**

See Referenced Drawing.

### **DRIVE OPTIONS**

Pneumatically driven only. Consumption 44 scfm (21 lt./sec).

### **TOOL HOLDER ASSEMBLY**

Infinitely adjustable angle and depth of cut compound type tool slide and totally adjustable tool post in all directions.

### **MOUNTING**

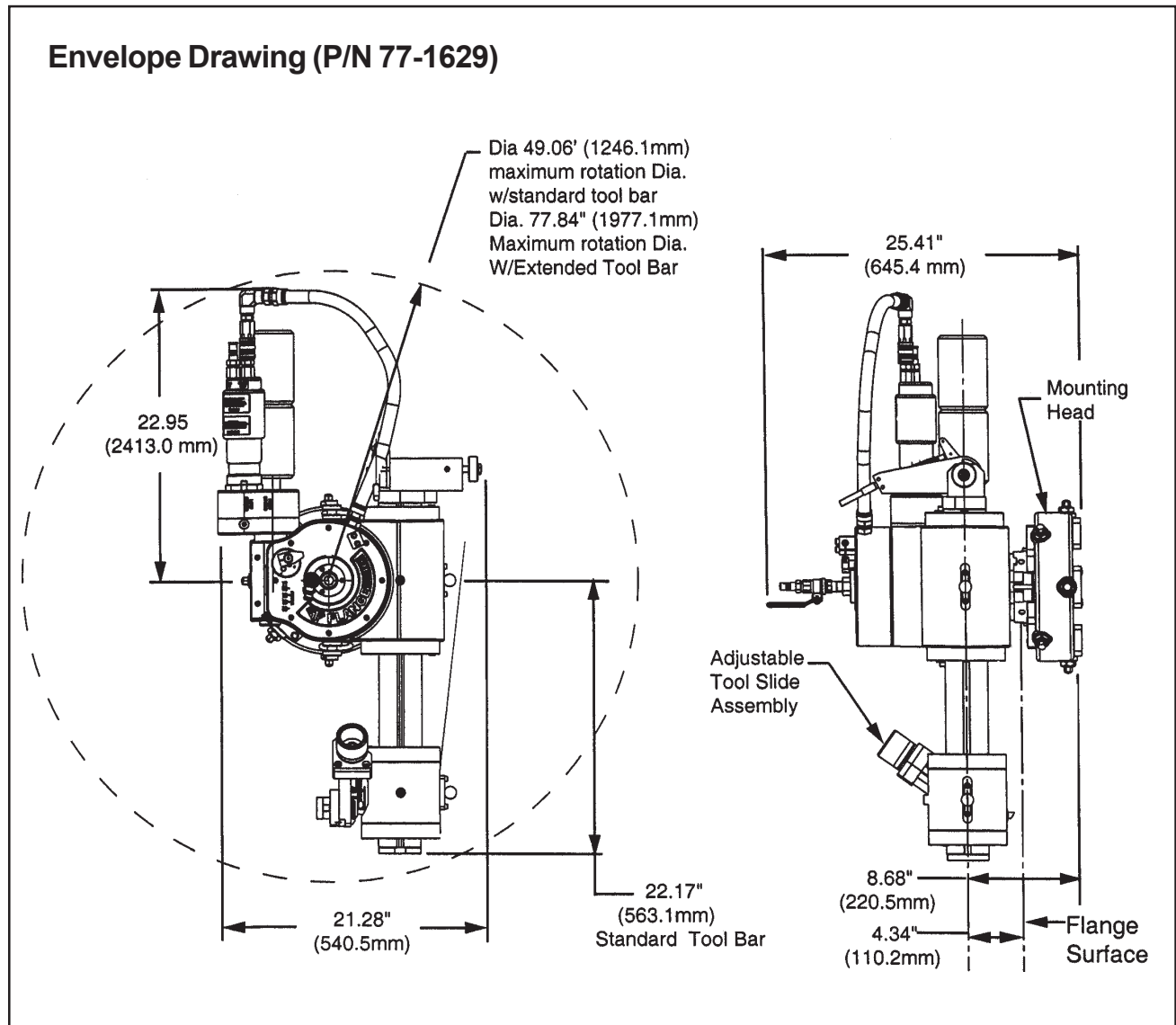
Adjustable mitering head with up to 5 degrees of adjustment in every direction and up to .118" (4.77 mm) of offset adjustment in every direction.

### **WEIGHT**

Model 442F Main Drive Assembly	200 lbs. (90.7 kg)/ea.
Standard Tool Bar Assembly	75 lbs. (34.0 kg)/ea.
Extended Tool Bar Assembly	118 lbs. (53.5 kg)/ea.
Tool Slide Assembly	36 lbs. (16.3 kg)/ ea.
Standard Mounting Head Assembly	60 lbs. (27.2 kg)/ea.

**WEIGHT Continued**

Large Mounting Head Assembly	112 lbs. (50.8 kg)/ea.
Mounting Extension Block Assembly	(8 ea.): 10 lbs. (4.5 kg)/ea.
Standard Counterweight Bar	16 lbs. (7.3 kg)/ea.
Large Counterweight Bar	24 lbs. (10.9 kg)/ea.
Counterweight	17 lbs. (7.7 kg)/ea.



## MAINTENANCE

All components should be cleaned and coated with a light film of oil prior to use.

If the Model 442F is operated in the vertical position (Main Housing facing up), the chips and/or other debris should be removed after each cut has been completed.

Tool life may be severely shortened, unless chips and/or other debris that have been deposited on or around the Tool Slide Assembly during the machining operation are removed.

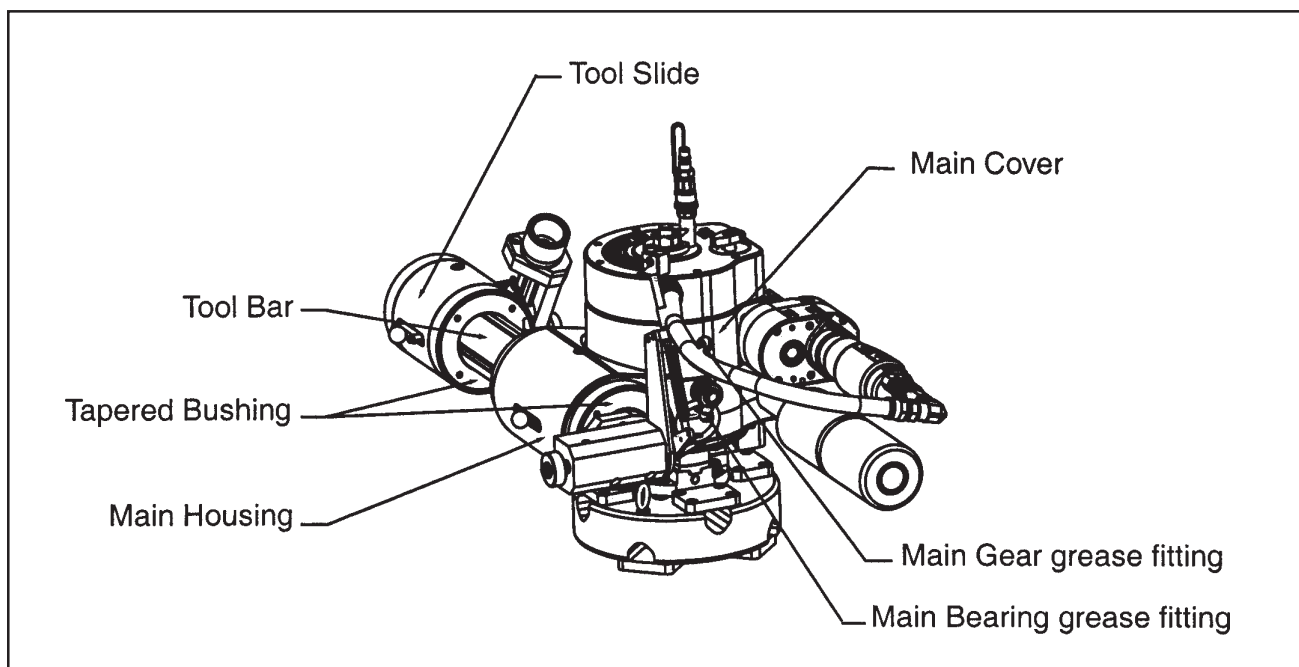
Daily maintenance should include a visual inspection of all parts for damage due to chips, impact or improper use.

Repair or replace broken or damaged parts as necessary.

Wipe the machine clean of cutting fluids, dirt and grime and then coat it with a light film of oil.

Weekly maintenance should include checking the tool bar and wiping the oil and grime from the surface and then re-lubricating it with a light film of oil.

If the tool bar or tool slide is loose, the tapered bushings can be tightened.



**STANDARD HEAD MOUNTING RANGE**

**14.00" THROUGH 42"**

<b>442F Miter Head Assembly (P/N 06-0451)</b>				
<b>ID Range</b>	<b>Jackscrews P/N</b>	<b>Spacers P/N</b>	<b>Spacer Length</b>	<b>Jackscrew Length</b>
14.00" to 15.00" 355.6 mm to 381.0 mm	33-2209	26-1529	3.00" 76.2 mm	3.00" 76.2 mm
15.00" to 18.00" 381.0 mm to 458.2 mm	33-2210	26-1529	3.00" 76.2 mm	4.5" 114.3 mm
18.00" to 22.00" 457.2 mm to 558.8 mm	33-2211	26-1530	5.00" 127.0 mm	6.00" 152.4 mm
22.00" to 26.00" 558.8 mm to 660.4 mm	33-2211	26-1531	7.00" 177.8 mm	6.00" 152.4 mm
26.00" to 30.00" 660.4 mm to 762.0 mm	33-2211	26-1532	9.00" 228.6 mm	6.00" 152.4 mm
30.00" to 34.00" 762.0 mm to 863.6 mm	33-2211	26-1533	11.00" 279.4 mm	6.00" 152.4 mm
34.00" to 38.00" 863.6 mm to 965.2 mm	33-2211	26-1534	13.00 " 330.2 mm	6.00" 152.4 mm
38.00" to 42.00" 952.0 mm to 1066.85 mm	33-2211	26-1535	15.00" 381.0 mm	6.00" 152.4 mm

**EXTENSION HEAD MOUNTING RANGE**

**39.5" THROUGH 75.3"**

<b>Large Mounting Head Assembly, 25.50" (P/N 21-0553)</b>			
<b>ID Range</b>	<b>Spacers Length</b>	<b>Jackscrew Length</b>	<b>Extension Head Standoff</b>
39.5" to 43.5" 1003.3 mm to 1104.9 mm	9.00" 228.6 mm	6.00" 152.4 mm	-
43.5" to 47.5" 1104.9 mm to 1206.5 mm	11.00" 279.4 mm	6.00" 152.4 mm	-
47.5" to 51.5" 1206.5 mm to 1308.1 mm	13.00" 330.2 mm	6.00" 152.4 mm	-
51.5" to 55.5" 1308.1 mm to 1409.7 mm	15.00" 381.0 mm	6.00" 152.4 mm	-
53.5" to 57.5" 1258.9 mm to 1460.5 mm	7.00" 177.8 mm	6.00" 152.4 mm	48-1262
57.5" to 61.5" 1460.5 mm to 1562.1 mm	9.00" 228.6 mm	6.00" 152.4 mm	48-1262
61.5" to 65.5" 1562.1 mm to 1663.7 mm	11.00" 279.4 mm	6.00" 152.4 mm	48-1262
65.5" to 69.5" 1663.7 mm to 1765.3 mm	13.00" 330.2 mm	6.00" 152.4 mm	48-1262
69.5" to 73.5" 1765.3 mm to 1866.9 mm	15.00" 381.0 mm	6.00" 152.4 mm	48-1262

## INSTALLATION

**CAUTION:** Never attempt to manually lift the Mounting Head with the FLANGEMASTER™ mounted in the pipe.

Inspection of the mounting surface is important to assure a sound mounting into the flange or pipe to be faced.

Any debris or corrosion should be removed to avoid performance problems.

Measure the mounting diameter to choose the right mounting head and the right spacers and jackscrews for the job.

Using the table on Standard Head Mounting, select the right mounting accessories according to the table.

**NOTE:** The TRI TOOL Model 442F basic kit capacity is to cut from a diameter of 14" up to a diameter of 44" and has the capacity to mount into a diameter of 14" up to a diameter of 42"

**NOTE:** An optional extension kit for the Model 442F is available from TRI TOOL to reach to a cutting diameter of 73" and a mounting diameter of 72". See the Extension Head Mounting table for more details and for the kit part number.

(3) Three lengths of jackscrews and (7) seven lengths of spacers are provided.

Combinations of spacers and jackscrews will extend the ID range.

Turn the jackscrews to a diameter slightly smaller than the bore of the workpiece.

Before the mounting head is mounted to the workpiece, both the Angular offset and the Parallel Offset Adjustments should be approximately centered.

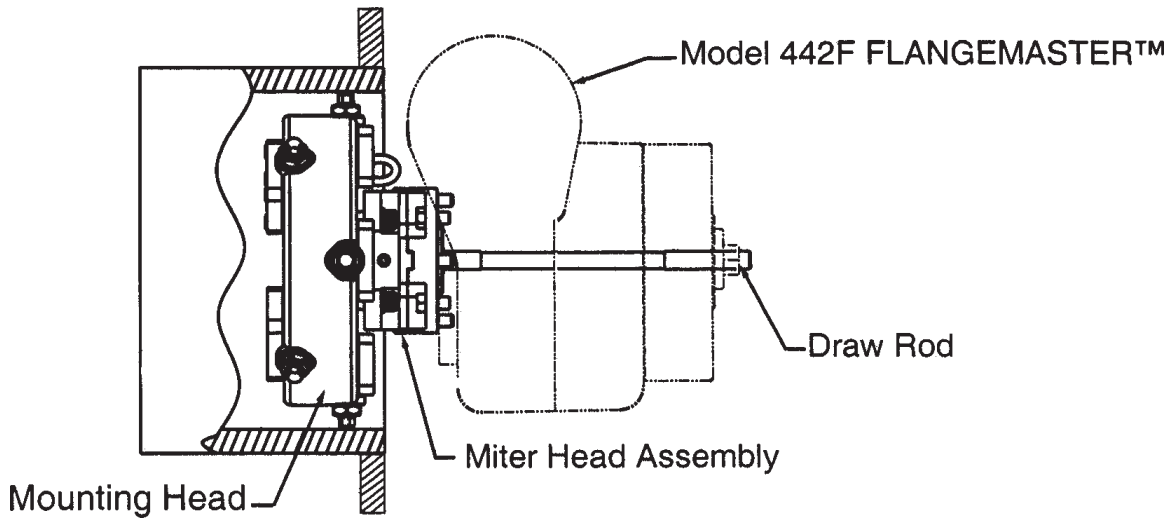
This will permit a maximum range of adjustment for final settings after the miter head has been mounted.

**NOTE:** To make the Parallel Offset Adjustment, all (4) four screws must be slightly snug.

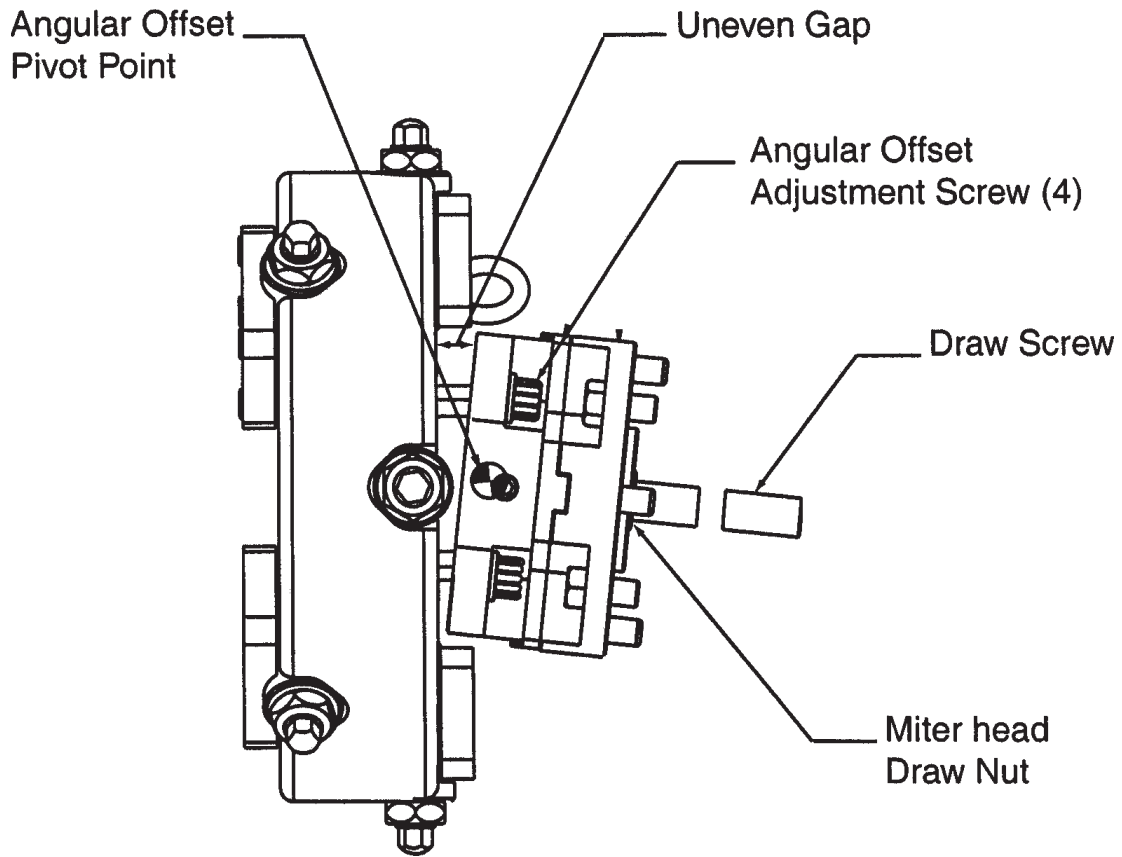
Check the gap between the Gimbal Plate and the Mounting Head to see that it is approximately even all around.

If it is not, then loosen the angular offset adjustment screw(s) where the gap is small and tighten the angular offset adjustment screw(s) where the gap is wide.

Miterhead Assembly, FLANGEMASTER™ and Draw rod locations



Angular Offset Adjustment



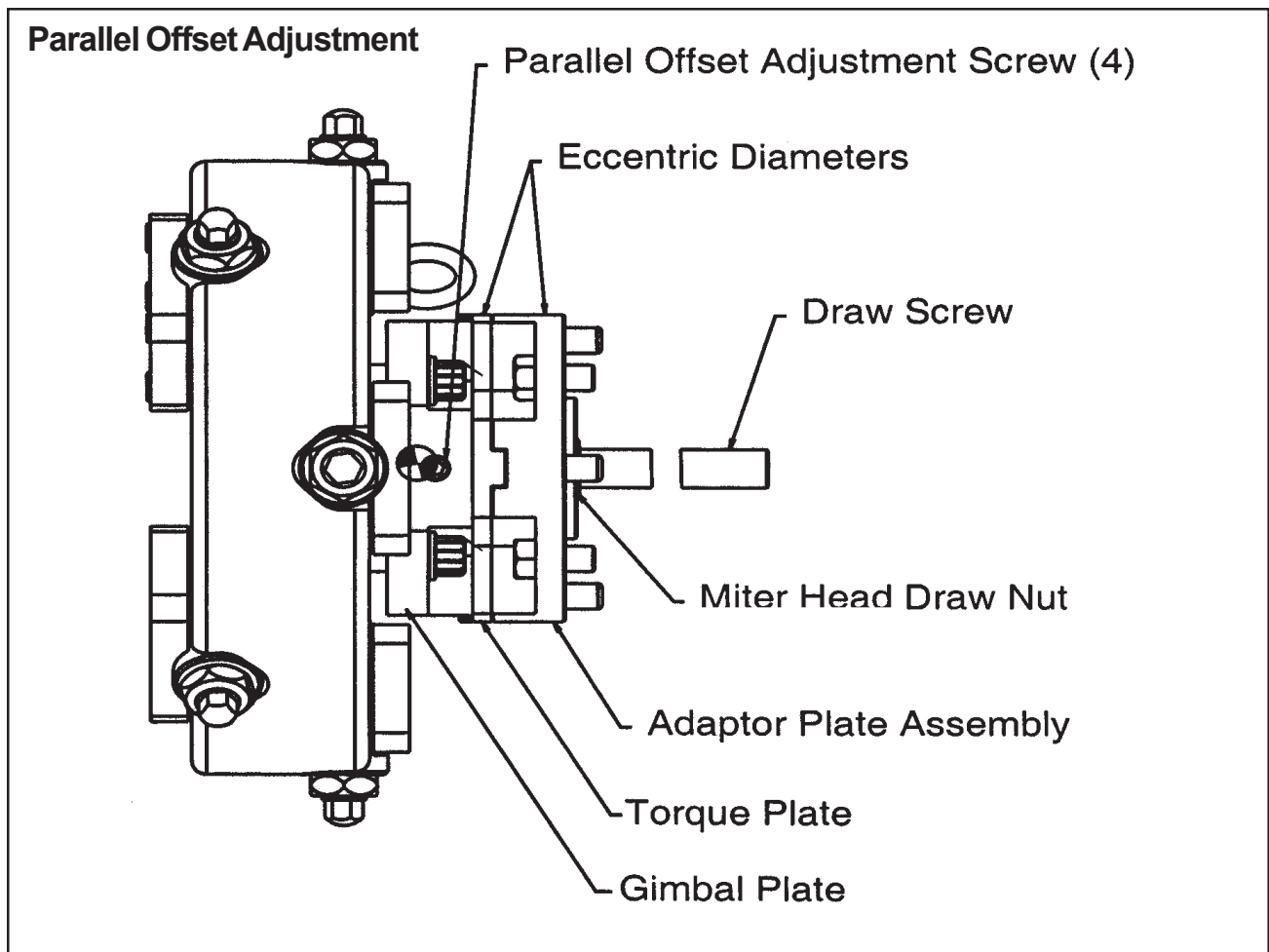
Lightly tighten the miter head draw nut.

**NOTE:**

All four of the angular offset adjustment screws must be used in conjunction with each other.

All screws must be at least slightly snug to allow movement.

If the Miter Head is to be drawn directly toward one screw, the opposite screw must be loosened far enough to allow for the take up near where screw is tightened.



Leave the draw nut slightly snug during and after the angular offset adjustment.

Check to see that the Adapter Plate Assembly is centered to the gimbal plate.

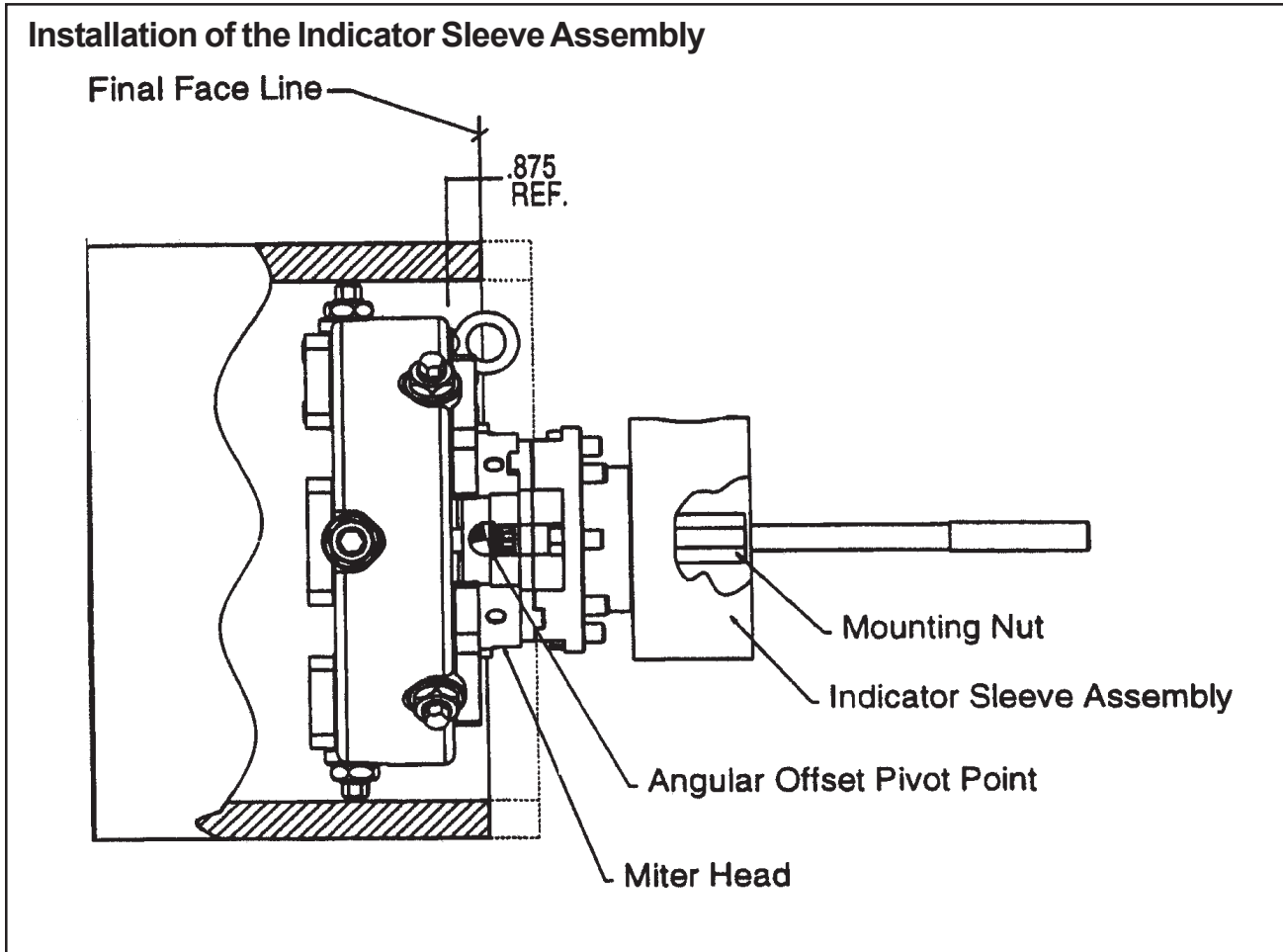
If not, locate all four parallel offset adjustment screws and back off one or two screws where the Adapter Plate Assembly is "in".

Tighten to opposite one or two screws will bring the Adapter Plate Assembly toward the center.

**NOTE:** To make parallel offset adjustment, all (4) four screws must be slightly snug.

Once the Adapter Plate Assembly has been roughly aligned and centered, temporarily snug all of the adjustment screws and the draw nut.

Insert the miter head into the workpiece.



**NOTE:** It is recommended that the miter head side mounted so that the angular offset pivot point is on the same plane with the proposed finished wall preparation. Always position the angular bolts at 12, 6, 3 and 9 O'clock positions. This will diminish the amount of parallel offset required after the angular adjustment has been made.

Using a tape measure or steel rule, keep the rear flange of the gimbal plate roughly centered while turning the jackscrews to tighten them against the ID of the workpiece.

Measure the bore and adjust 4 of the jackscrews to half of the measured diameter on one half of the head to center the head within 1/16", then tighten the remaining 4 jackscrews.

Tighten all jackscrews firmly approximately 50 to 55 lb./ft (68 to 75 N.m) then tighten the jackscrew jam nuts to the same torque.

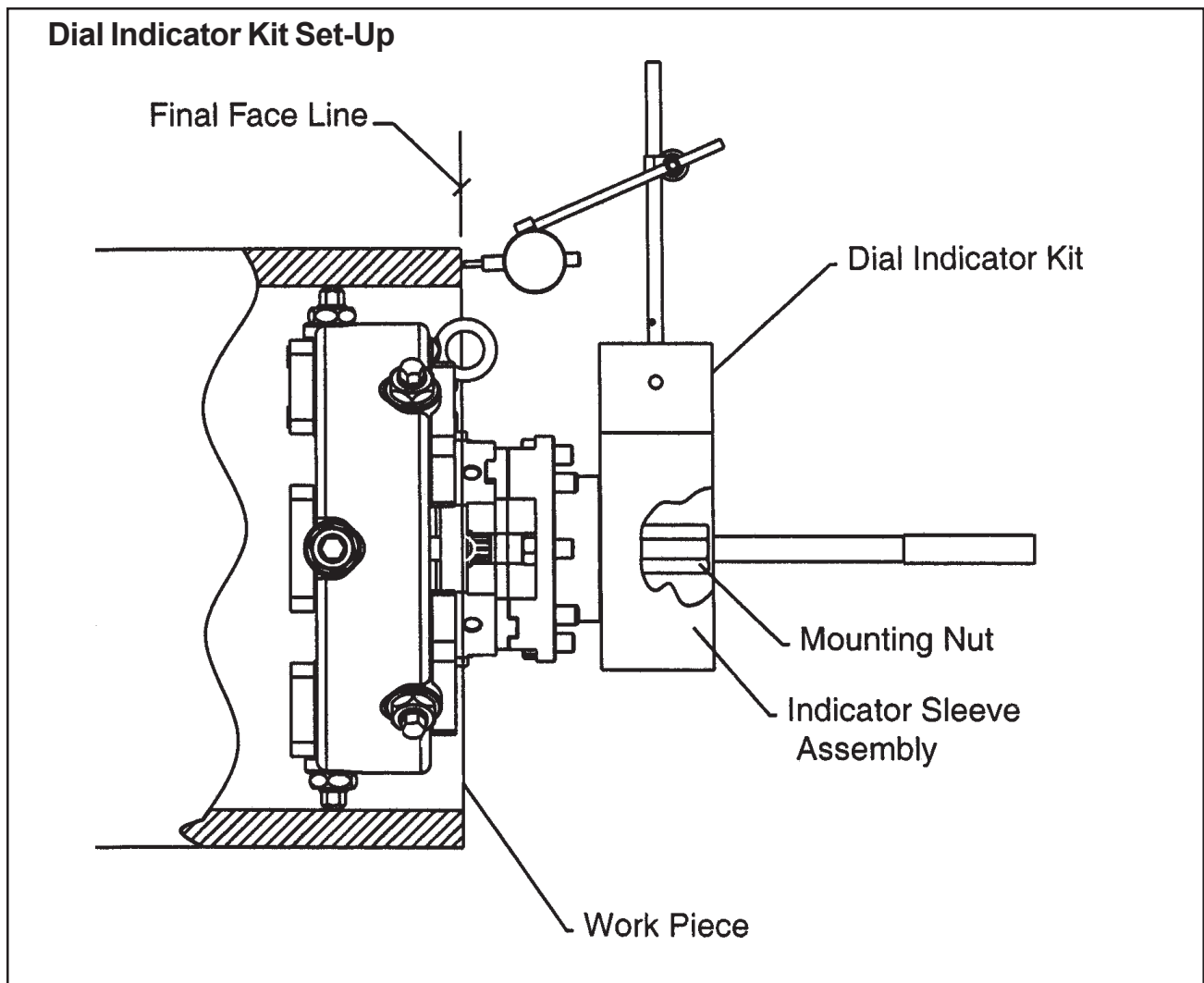
Use a wrench on the jackscrews to react the torque when tightening the jam nuts to avoid loosening the jackscrews.

Mount the Indicator Sleeve to the Adapter Plate Assembly and tighten the mounting nut to 15 to 20 lb./ft (20 to 27 N.m).

Place the magnetic based indicator holder onto the sleeve and energize the magnet.

If the existing surface of the workpiece is to be used for alignment and centering references, use the dial indicator and hardware provided.

If punch marks, scribe lines or other references are to be used, simply select required hardware from the Indicator Kit to be used as a pointer.



The first adjustment to be made after mounting is always the angular offset.

**NOTE:** Changing the Angular Offset will always change the Parallel Offset, but changing the Parallel Offset will not change the Angular Offset.

To move the Adapter Plate Assembly in a give direction, one or two Angular Offset Adjustment Screw(s) opposite the direction of the movement must be loosened enough to allow the amount of movement anticipated.

Then the screw(s) directly across must be retightened to draw the Adapter Plate Assembly in the desired direction.

**NOTE:** Never exceed 40 ft/lbs. (54 N.m) of torque on the angular offset adjustment screws.

Repeat the indicating procedure and angular offset procedure as many times as necessary to achieve the accuracy desired.

Evenly tighten (4) four angular offset adjustment screws.

Now the parallel offset adjustment may be made.

As before, use the Indicator Kit to determine how much the Adapter Plate Assembly must move, and in what direction.

To move the Adapter Plate Assembly in a given direction, first loosen one or two parallel offset adjustment screw(s) on the side of the Adapter Plate Assembly, which you wish to move toward.

Now tighten the screw(s) on the side of the Adapter Plate Assembly, which you wish to move away from in order to push the Adapter Plate Assembly in a give direction.

**NOTE:** Never exceed 30 ft/lbs. (41 N.m) of torque on the parallel offset adjustment screws.

Repeat the indicating procedure and the parallel offset adjusting procedure as many times as necessary to achieve the accuracy desired.

Once the accuracy requirements have been satisfied, evenly tighten all four parallel offset adjustment screws.

Recheck the adjustment with the indicator sleeve.

Remove the indicator items and the indicator sleeve from the miter head.

Tighten the draw rod nut securely.

Torque should be 90 to 95 ft/lbs. (122 to 129 N.m).

At this time, the miter mandrel should feel absolutely tight and rigid.

Before installing the 442F FLANGEMASTER™, be sure to read the Operator's Manual carefully, giving special attention to all safety cautions and warnings.

**CAUTION:**

When rigging the machine for lifting, always use both lifting rings simultaneously with the help of lifting straps or the like. Center the tool bar into the machine to balance the tool and secure it by tightening one of the main housing tapered bushings to avoid slippage of the bar. The tool can be lifted in a horizontal mode or vertical mode and remain balanced because of the position of the lifting rings.

**NOTE:**

Before sliding the machine onto the draw rod, make certain that the dowel pins in the miter mandrel, and the dowel pins holes in the machine spindle, are in the right orientation. If not in the right orientation, connect the air supply to the air motor, and pre-align the orientation of the dowel pins holes of the machine by turning on the air motor momentarily. After alignment, disconnect the air supply from the motor.

Slide the Model 442F FLANGEMASTER™ on to the draw rod carefully not to damage the threads or to bend it.

Rotate the main housing draw nut to engage the threads on the draw rod.

Rotate the machine gently, until the dowel pins clearance holes of the machine spindle line up with the dowel pins of the miter head.

**CAUTION:**

Do not engage the dowel pins with the threaded holes in the machine spindle, this could damage the threads.

It should be easy to turn the draw nut if engaged into the right holes.

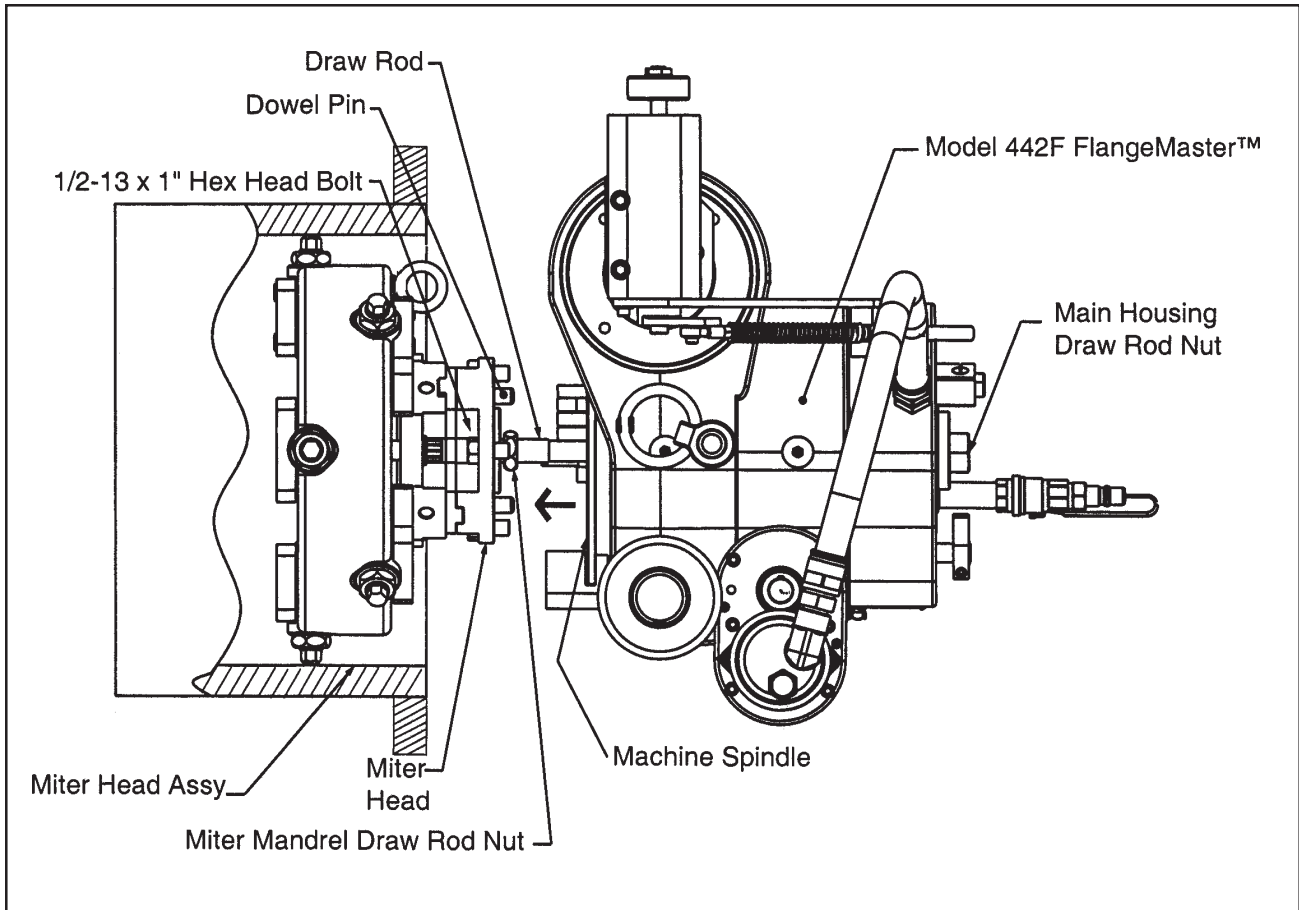
Rotate the draw nut until the mating surface of the machine spindle comes in contact with the mating surface of the miter head.

Tighten the main housing draw nut to 90/95 lb./ft (125/129 N.m).

Install the four (4) one inch long by 1/2 inch diameter hex head bolts through the flange of the miter head into the machine spindle.

Tighten to 40/45 lb./ft (54/61 N.m).

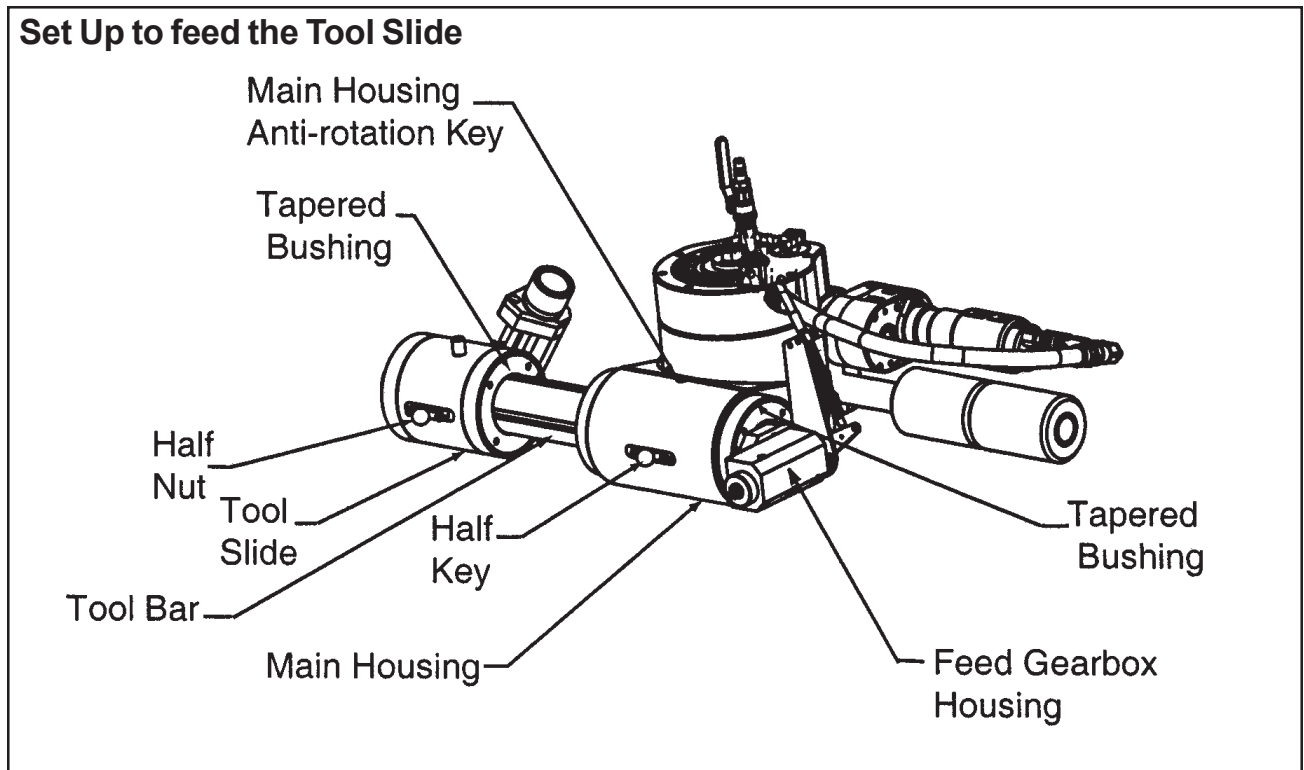
Adjust the height of the tool bar about flush to the outside diameter of the flange to be cut.



# OPERATION

## SET UP TO FEED THE TOOL SLIDE

To feed the tool slide, the tool bar tapered bushing into the main housing must be tightened tightly (70/80 lb/ft (95/108 N.m) and the half nut has to be in the tool slide and the half key into the main housing.



## SET UP TO FEED THE TOOL BAR AND TOOL SLIDE SIMULTANEOUSLY

To feed the tool bar, the tool bar tapered bushing into the main housing must be tightened snugly only, and half key has to be into the tool slide and the half nut into the main housing.

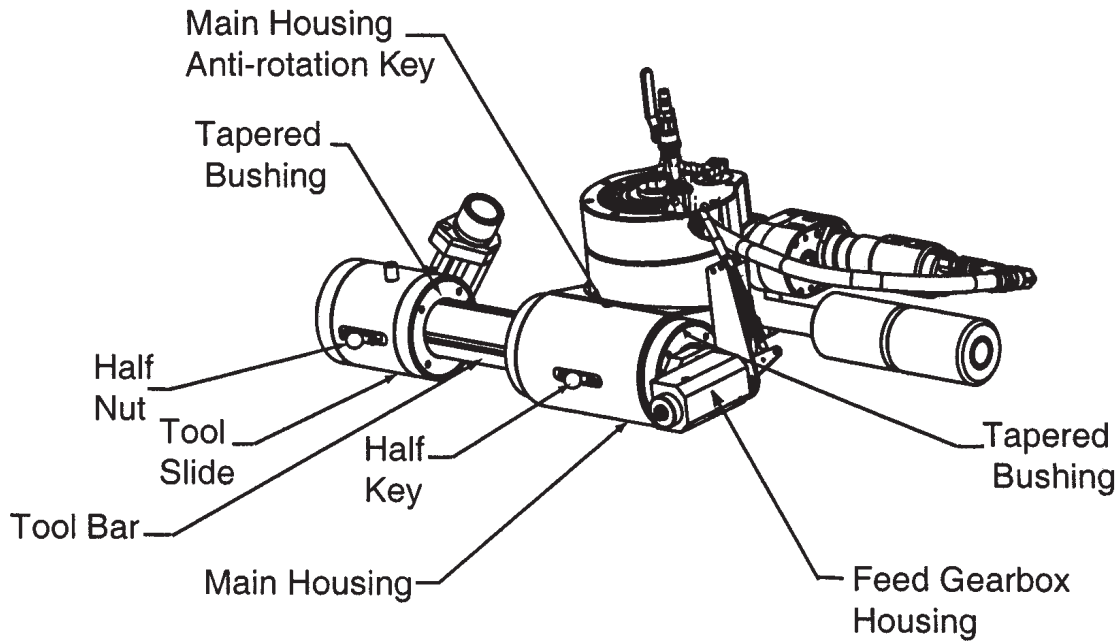
**NOTE:** The tool slide tapered bushings should be snug only, they do not need to be tightened firmly at any time.

On the front of the main housing and on the front of the tool slide, there is an anti-rotation key adjustment screw.

These screws have to be snug to 8 to 10 lb/ft.

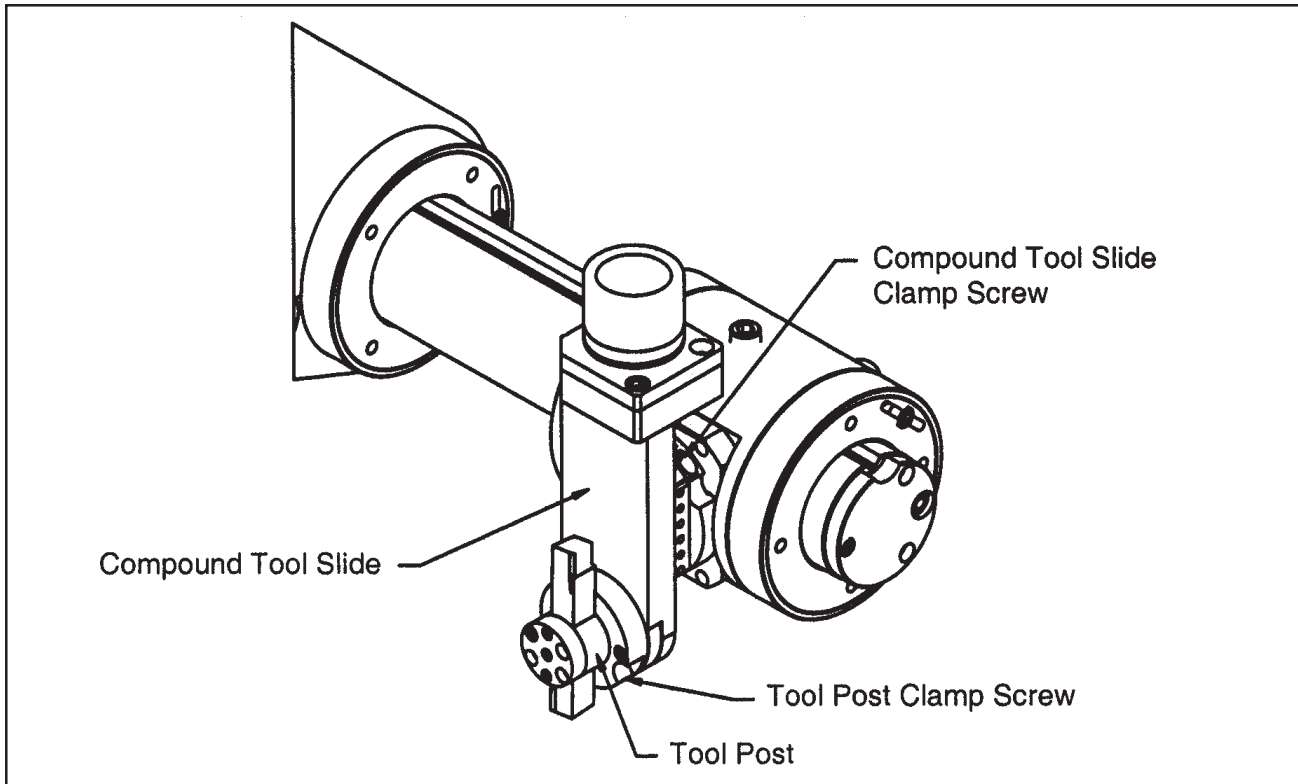
Then tighten the cap screw inside the hex hole of these screws to lock the assembly.

**Set Up to feed the Tool Bar and Tool slide**



You can adjust the compound tool slide to any desired angle simply by loosening a single clamp screw and adjust the rotation of the slide.

The tool bit post is also adjusted in this manner to any desired angle.



**SETUP FOR CUTTING R.T.J. GROOVES**

For cutting R.T.J. grooves, adjust the compound tool slide to the specified angle.

The feed gearbox can be installed to the end of the compound tool module to have auto feed capability.

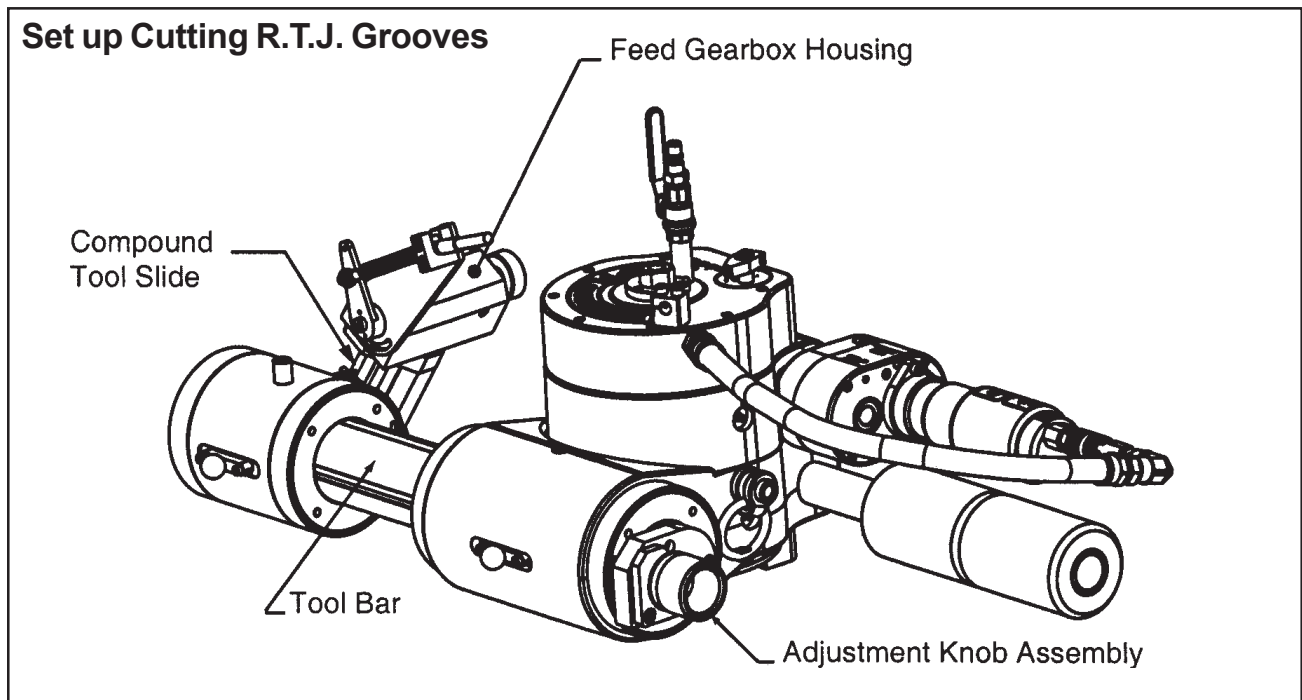
Remove the 2 cap screws that retain the adjustable knob assembly and install the feed gearbox at its place.

Install the adjustable knob assembly to the end of the tool bar for accurate radial positioning of the tool bar.

The graduations of the knob are in one thousands of an inch.

One revolution will move the bar 0.100”.

Adjust the depth of cut by rotating the adjustment knob.

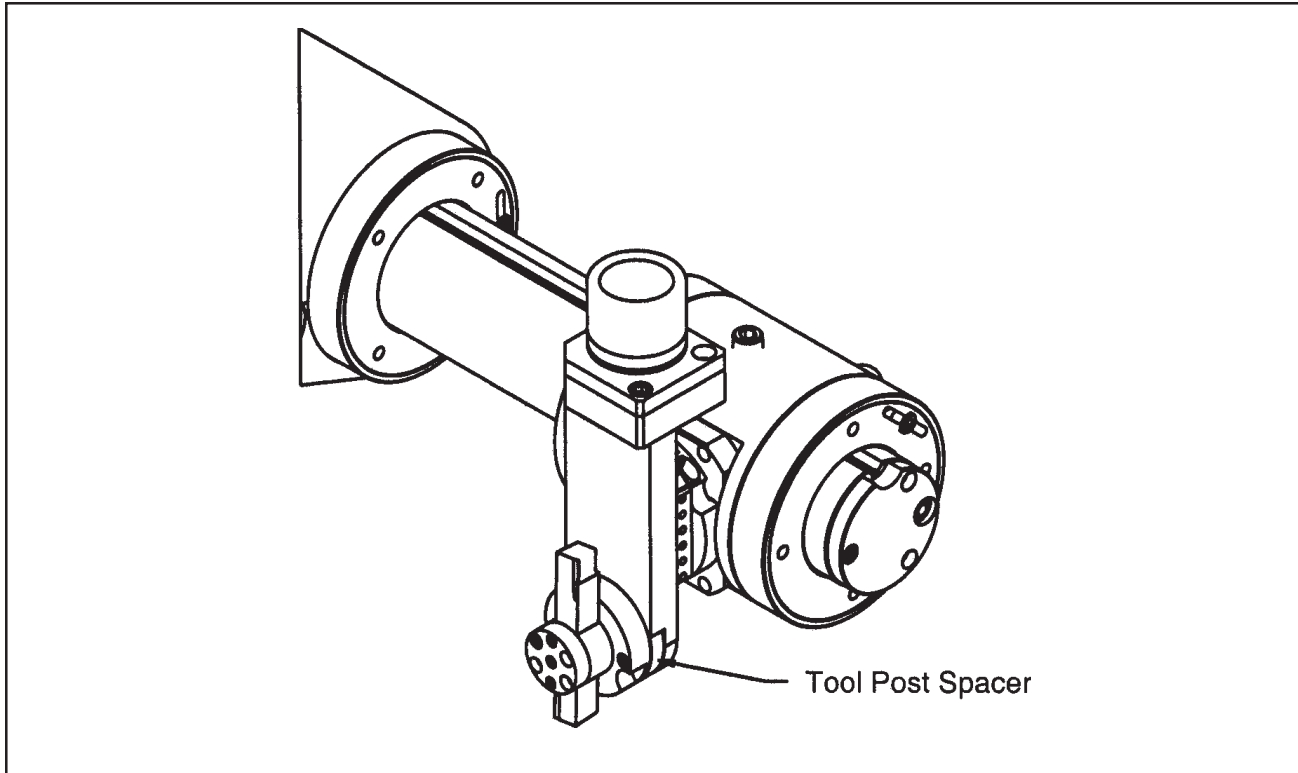


Attach the proper supply line to the Drive Motor.

When using an Air Motor, use an adequate in-line Filter, Regulator, Lubricator (FRL).

Turn the power on.

Adjust the cutting speed by opening the Flow Control Valve at the Power Supply connection.



The rotation of the tool for best results should be counterclockwise (pulling the tool bit).

If desired, in certain cases it is possible to cut clockwise (pushing the tool bit).

If pushing the tool bit, the tool post spacer should be removed to put the cutting edge of the tool bit back on to the centerline of the tool.

Monitor the cutting operation.

Do not take an excessive chip load.

In normal conditions, .015" to .025" for a roughing depth of cut is optimum for diameters greater than 36", and a little heavier on smaller diameters.

If what we call "roping" effect is observed into the finish of the cut, then a lighter cut load will be appropriate to rid of the bad finish.

A very light cut is recommended for a smooth finish.

Adjust the feed rate accordingly to the type of surface finish required.

To create a smooth finish TRI TOOL Inc. recommends a low rotation speed, and a light feed rate, for example, a feed rate of .003" to .008" per revolution and a depth of cut of .005" to .010" will normally produce a very good surface finish.

There is a balance to observe between feed rate, rotational speed and depth of cut.

With a light feed rate, the depth of cut can be augmented and the rotational speed must be adjusted to peak performance by experimentation.

With a heavy feed rate, the depth of cut must be shallow, and the rotational speed must be adjusted accordingly.

Different material and conditions can produce other results.

These figures are given as a guideline only, adjustment maybe necessary.

If a record finish is required, then a shallow depth of cut, with a heavy feed rate will be advised.

A maximum feed rate of .032" per revolution is achievable with the TRI TOOL's Model 442F.

**FEED RATE SET-UP**

The feed actuator cam follower can be positioned into 4 different locations on the index plate.

These locations are numbered as follows, 1,2,3,4, the number "1" being the lighter feed rate and the number "4" being the heaviest feed rate.

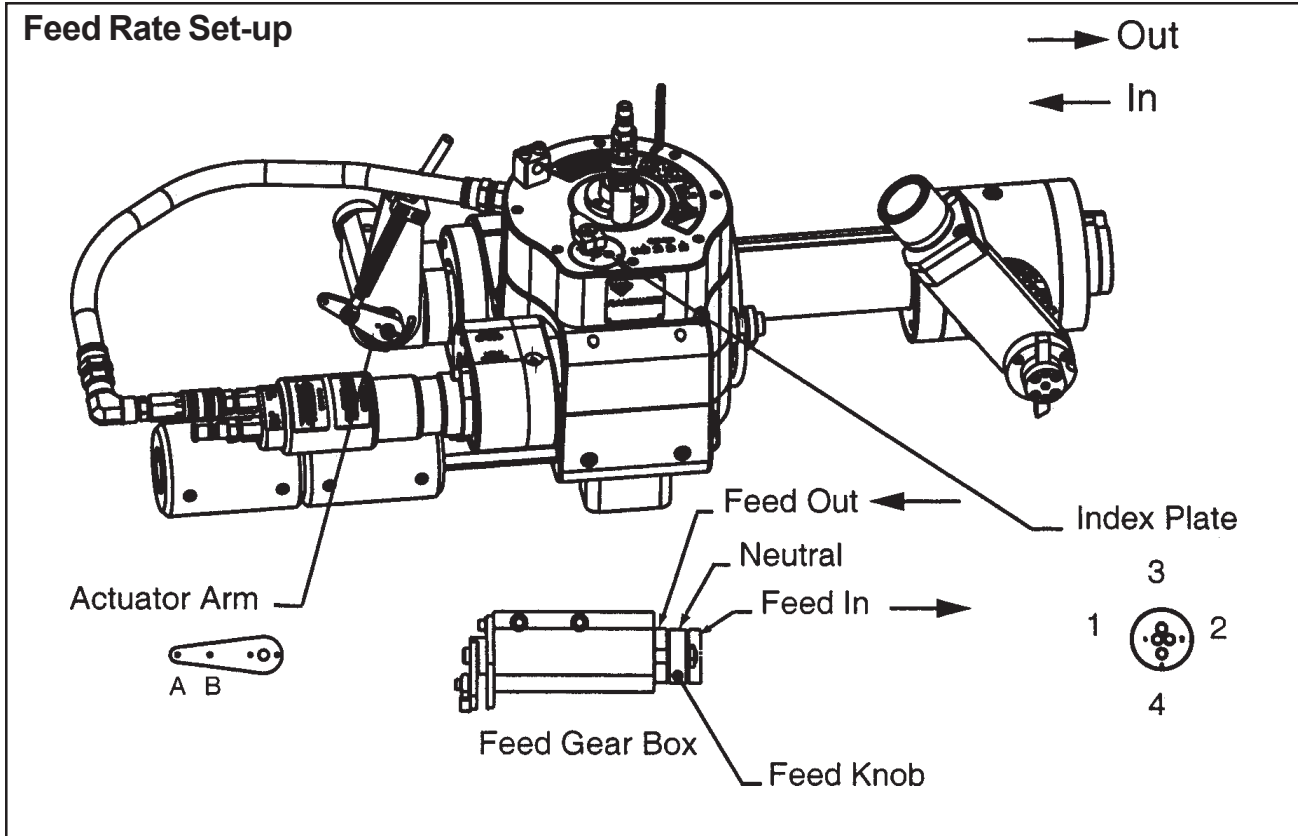
The other end of the feed cable has 2 locations on the feed actuating lever at the feed gearbox, A and B.

The "A" position being the lightest feed rate and the "B" position being the heaviest feed rate position.

Refer to table below to get the appropriate feed rate settings.

Set the feed direction to neutral by moving the feed knob to the center position.

<b>Feed Rates</b>					
		<b>Index Plate Positions</b>			
		<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
<b>Actuator Arm Position</b>	<b>A</b>	.005"/rev (.13 mm/rev)	.010"/rev (.25 mm/rev)	.014"/rev (.36 mm/rev)	.019"/rev (.48 mm/rev)
	<b>B</b>	.009"/rev (.23 mm/rev)	.016"/rev (.41 mm/rev)	.025"/rev (.61 mm/rev)	.032"/rev (.81 mm/rev)



OPERATION OF THE 2-SPEED GEARBOX

The 2-Speed Gearbox for the Model 442F is equipped with a high and low speed.

The high speed, 5.4 RPM, is used for flanges **under** 36" (914.4 mm) OD.

The low speed, 2.7 RPM is used for flanges **above** 36" (914.4 mm) OD.

The gearbox is marked with high and low.

The air hose has to be switched as marked on the motor accordingly to keep the same rotational direction.

## TROUBLE SHOOTING

### **Problem: The Tool Bit Chatters**

- The tool bit is loose or overextended.
- The tool bit is damaged.
- The tool holder is too loose in the slides.
- The cutting speed is too fast.
- The clamping pads are loose on the pipe or tube.
- Cutting fluid is required.
- The main bearing pre-load is loose.

### **Problem: There's Excessive Tool Bit Wear**

- The pipe or tube material is too hard or abrasive.
- The cutting speed is too fast.
- Cutting fluid is required.
- A dull Tool Bit is causing surface hardening conditions (Stainless pipe or tubing).
- There is scale or other foreign matter on the pipe or tube, which is dulling the tool bit at the start of the cut.
- The tool bit is incorrect for the material being cut.

### **Problem: The Surface Finish is Rough**

- The tool bit is dull, chipped, etc.
- Metal build-up on the cutting edge of the tool bit is creating a false cutting edge.
- Cutting fluid is required.

### **Problem: The Tool Holder is Not Feeding**

- The feed pin is broken or out of position.
- The feed sprocket shear pin is broken.
- The feed screw is stripped.
- The feed nut is stripped.
- The slide rails are too tight.

**Problem: There's a Loss of Air Power**

The air supply pressure is too low.  
The air filter is plugged.  
The air line size is insufficient.  
The air line is too long.

**Problem: There's a Loss of Hydraulic Power**

The hydraulic supply pressure is too low.  
The hydraulic filter is plugged.  
The hydraulic line size is insufficient.  
The hydraulic line is too long.

**Problem: The Tool Bit Will Not Reach the Work**

Incorrect tool blocks are installed for the size of the pipe or tube being worked on.  
Incorrect tool bit is installed.

**Problem: The Air Motor Will Not Start**

The air power supply is shut off.  
The air motor is damaged and will not run free.  
The air motor needs lubrication.  
Add lubrication and do not run the air motor for a few minutes, then try running the motor.  
Tap on the side of the air motor casing lightly with a piece of wood or with a soft rubber mallet just in case the vanes may be sticking.  
Sand or other foreign material may be in the vanes of the air motor.

**Problem: The Hydraulic Motor Will Not Start**

The hydraulic power supply is shut off.  
The hydraulic motor is damaged and will not run free.

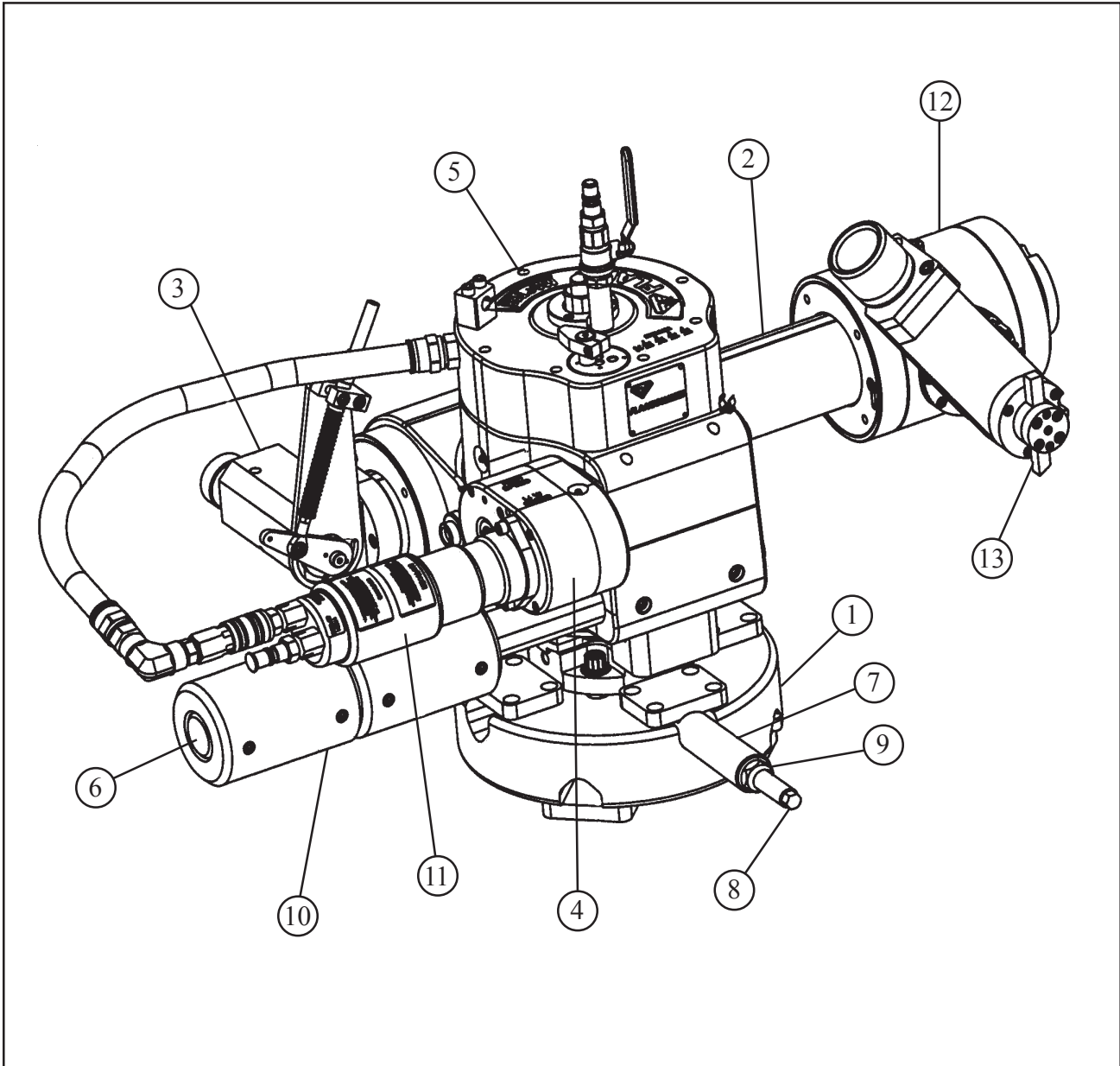
## **ACCESSORIES**

The following accessories are recommended for use with the Model 442F and is available from TRI TOOL INC.

1. Extension Kit, 42" - 73" (P/N 05-0351)

ILLUSTRATED PARTS BREAKDOWN

Model 442F FLANGEMASTER™ (P/N 01-1741)



Parts List, Model 442 FLANGEMASTER™ (P/N 01-1741)

<b>Item No.</b>	<b>Part No.</b>	<b>Description</b>	<b>Qty</b>
1.	06-0451	MITER HEAD, ASSEMBLY, 442F	1
2.	14-0086	FEED SCREW	1
3.	19-0881	GEARBOX, FEED	1
4.	19-0883	GEARBOX ASSEMBLY	1
5.	19-0886	HOUSING ASSEMBLY	1
6.	20-0762	SHAFT	1
7.	26-1529	BAR, MOUNTING, EXT. 3" (76.2 mm)	8
	26-1530	BAR, MOUNTING, EXT. 5" (127.0 mm)	8
	26-1531	BAR, MOUNTING, EXT. 7" (177.8 mm)	8
	26-1532	BAR, MOUNTING, EXT. 9" (228.6 mm)	8
	26-1533	BAR, MOUNTING, EXT. 11" (279.4 mm)	8
	26-1534	BAR, MOUNTING, EXT. 13" (330.5 mm)	8
	26-1535	BAR, MOUNTING, EXT. 15" (381.0 mm)	8
	8.	33-2209	JACKSCREW, 3/4-16 X 3"
33-2210		JACKSCREW, 3/4-16 X 4 1/2"	8
33-2211		JACKSCREW, 3/4-16 UNF X 6"	8
9.	35-0177	NUT, JAM, 3/14-16 X 27/64"	8
10.	48-1258	BLOCK, COUNTERWEIGHT	2
11.	57-0252	MOTOR ASSEMBLY, AIR, IN-LINE, 442F	1
12.	82-0142	TOOL SLIDE ASSEMBLY	1
13.	99-6384	TOOL BIT, FLANGE FACE	1
NOT SHOWN			
	27-0676	ADAPTER ASSEMBLY, EXT. INDICATOR	1
	46-0508	SLEEVE ASSEMBLY	1
	50-0015	DIAL ASSEMBLY	1
	53-0080	VALVE ASSEMBLY	1
	05-1350	WRENCH KIT, 442F	1
	36-0005	WRENCH, L, 1/8" HEX	1
	36-0007	WRENCH, L, 5/32" HEX	1
	36-0008	WRENCH, L, 3/16" HEX	1
	36-0010	WRENCH, L, 1/4" HEX	1
	36-0011	WRENCH, L, 5/16" HEX	1
	36-0012	WRENCH, L, 3/8" HEX	1

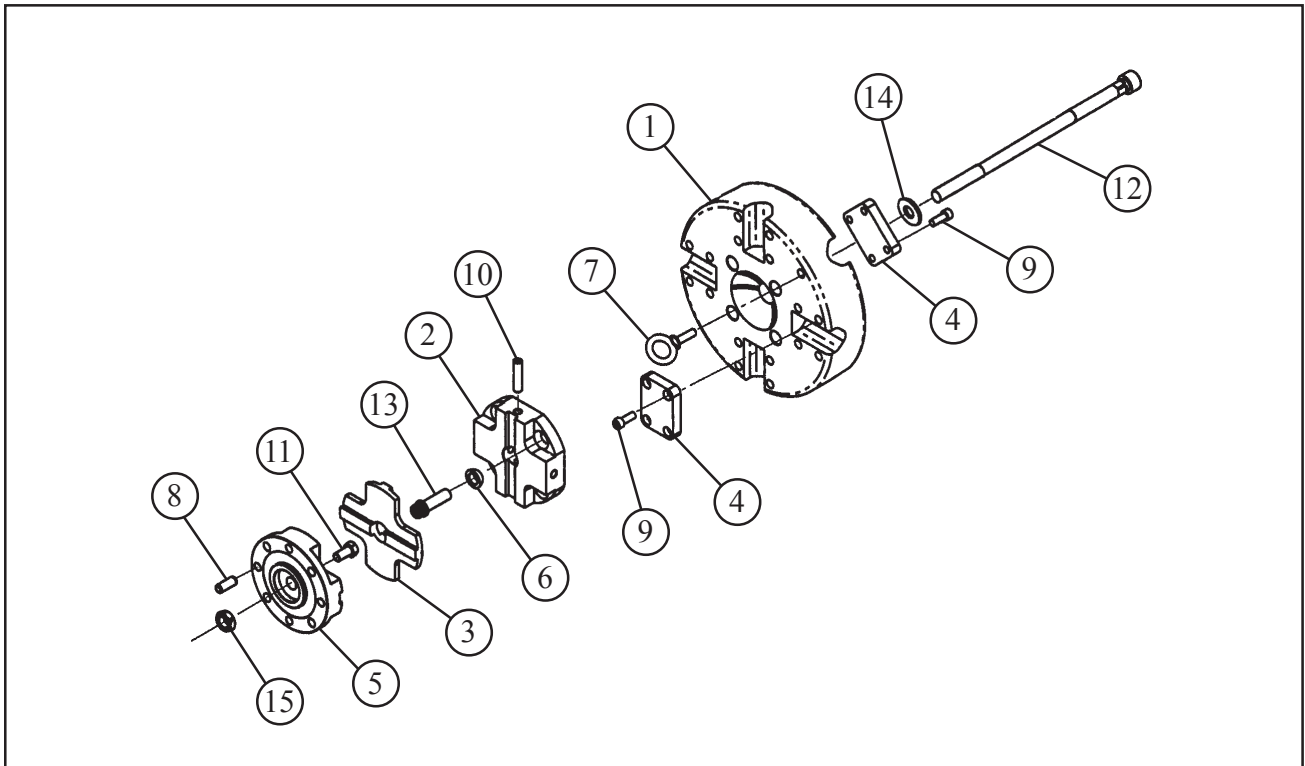
**TRI TOOL INC.**

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Parts List, Model 442 FLANGEMASTER™ Continued (P/N 01-1741)

<b>Item No.</b>	<b>Part No.</b>	<b>Description</b>	<b>Qty</b>
NOT SHOWN Continued			
	36-0059	WRENCH, COMBINATION, 1 1/4"	1
	36-0060	WRENCH, COMBINATION, 1 1/8"	1
	36-0063	WRENCH, COMBINATION, 3/4"	1
	36-0076	WRENCH, COMBINATION, 9/16"	1
	36-0132	WRENCH, ASSEMBLY, SPANNER	1
	36-0244	WRENCH, 12 PT COMBINATION, 5/8" HEX	1

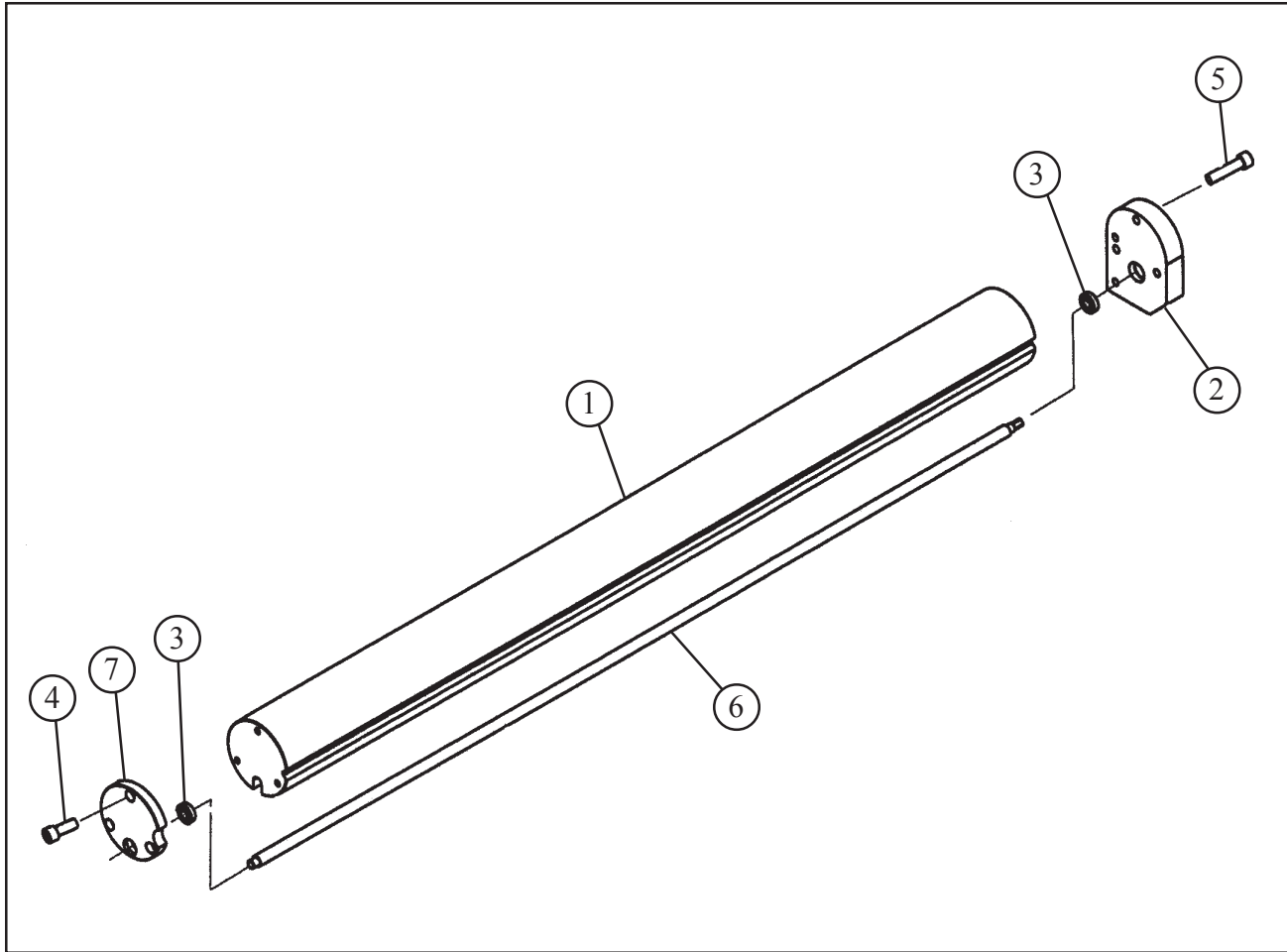
MITER HEAD ASSEMBLY (P/N 06-0451)



Parts List, Miter Head Assembly (P/N 06-0451)

Item No.	Part No.	Description	Qty
1.	21-0550	HEAD, MOUNTING, SMALL	1
2.	24-1630	PLATE, GIMBAL	1
3.	24-1631	PLATE, TORQUE	1
4.	24-1719	PLATE, RETAINING	8
5.	24-1744	PLATE, ADAPTER	1
6.	29-0374	BEARING, SPHERICAL	4
7.	30-0108	EYEBOLT, SHOULDER, 3/8-16 X 1 1/4"	1
8.	32-0315	PIN, DOWEL, 1/2 DIA X 1 1/4"	1
9.	33-0071	SCREW, CAP, 3/8-16 X 1"	32
10.	33-0560	SCREW, SET, 1/2-13 X 2", CUP PT	4
11.	33-1967	SCREW, HEX HD, GRD 8, 1/2-13 X 1"	4
12.	33-2187	SCREW, DRAW	1
13.	33-2190	SCREW, HI-TORQUE, 5/8-11 X 2"	4
14.	34-0142	WASHER, FLAT	1
15.	35-0177	NUT, JAM, 3/4-16 X 27/64"	1

EXTENSION FEED SCREW SHAFT ASSEMBLY (P/N 14-0086)



Parts List, Extension Feed Screw Shaft Assembly (P/N 14-0086)

Item No.	Part No.	Description	Qty
1.	20-0765	SHAFT, TOOL SLIDE	1
2.	27-0665	ADAPTER, FEED GEARBOX	1
3.	29-0084	BEARING, BALL	2
4.	33-0054	SCREW, CAP, 5/16-18 X 3/4"	3
5.	33-0057	SCREW, CAP, 5/16-18 X 1 1/4"	3
6.	33-2183	SCREW, FEED, 1/2-10 X 29.18"	1
7.	43-0560	COVER, SHAFT	1



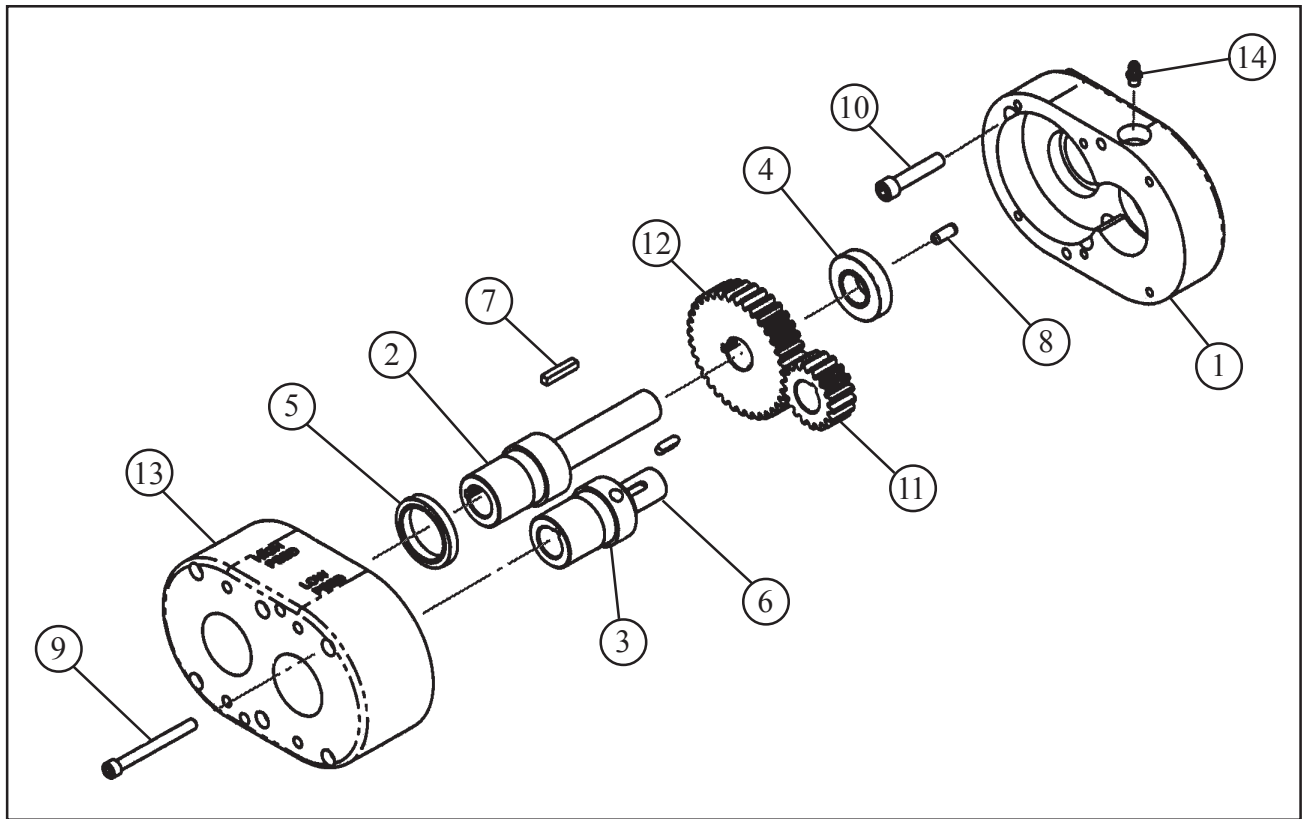
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## Parts List, Housing Assembly, Feed Gearbox (P/N 19-0881)

<b>Item No.</b>	<b>Part No.</b>	<b>Description</b>	<b>Qty</b>
1.	19-0887	HOUSING, GEARBOX	1
2.	20-0776	SHAFT, MAIN	1
3.	29-0029	BEARING, BALL	2
4.	29-0133	ROD, END	1
5.	30-0489	RING, RETAINING, INTERNAL	2
6.	30-0507	MOUNT, KEYLESS, SHAFT	1
7.	30-0910	RING, RETAINING, INTERNAL 1	1
8.	30-0911	PLUNGER, BALL	2
9.	30-0912	CLUTCH, ROLLER	1
10.	30-2490	CLUTCH, ROLLER	1
11.	30-2844	CADLE, PUSH, PULL	1
12.	32-0305	PIN, MOD, DOWEL, 3/16 X 3/4"	2
13.	33-0041	SCREW, CAP, 1/4-20 X 7/8"	1
14.	33-0052	SCREW, CAP, 5/16-18 X 1/2"	1
15.	33-0058	SCREW, CAP, 5/16-18 X 1 1/2"	2
16.	33-0076	SCREW, CAP, 3/8-16 X 2 1/4"	2
17.	33-1535	SCREW, MOD, SHOULDER, 1/4 X 3/8"	1
18.	33-1536	SCREW, MOD, SHOULDER, 3/8 X 1/4"	1
19.	34-0016	WASHER, FLAT	1
20.	39-0482	GEAR, MOD, BEVEL	2
	39-0906	GEAR, ASSEMBLY, FEED	1
21.	20-0780	SHAFT, GEAR	1
22.	29-0005	BEARING, BALL	1
23.	32-0221	PIN, DOWEL, 1/8 DIA X 1 1/2"	1
24.	39-0481	GEAR, MOD, BEVEL	1
25.	42-0104	KNOB, FEED	1
26.	44-0275	SPACER, GEAR	1
27.	47-1285	BRACKET, CABLE	1
28.	47-1286	BRACKET, FEED ACTUATOR	1
29.	63-0175	ARM, ACTUATOR	1
30.	34-0026	WASHER, FLAT	1
31.	40-0279	SPRING, COMPRESSION	1

2 SPEED GEARBOX ASSEMBLY (P/N 19-0883)

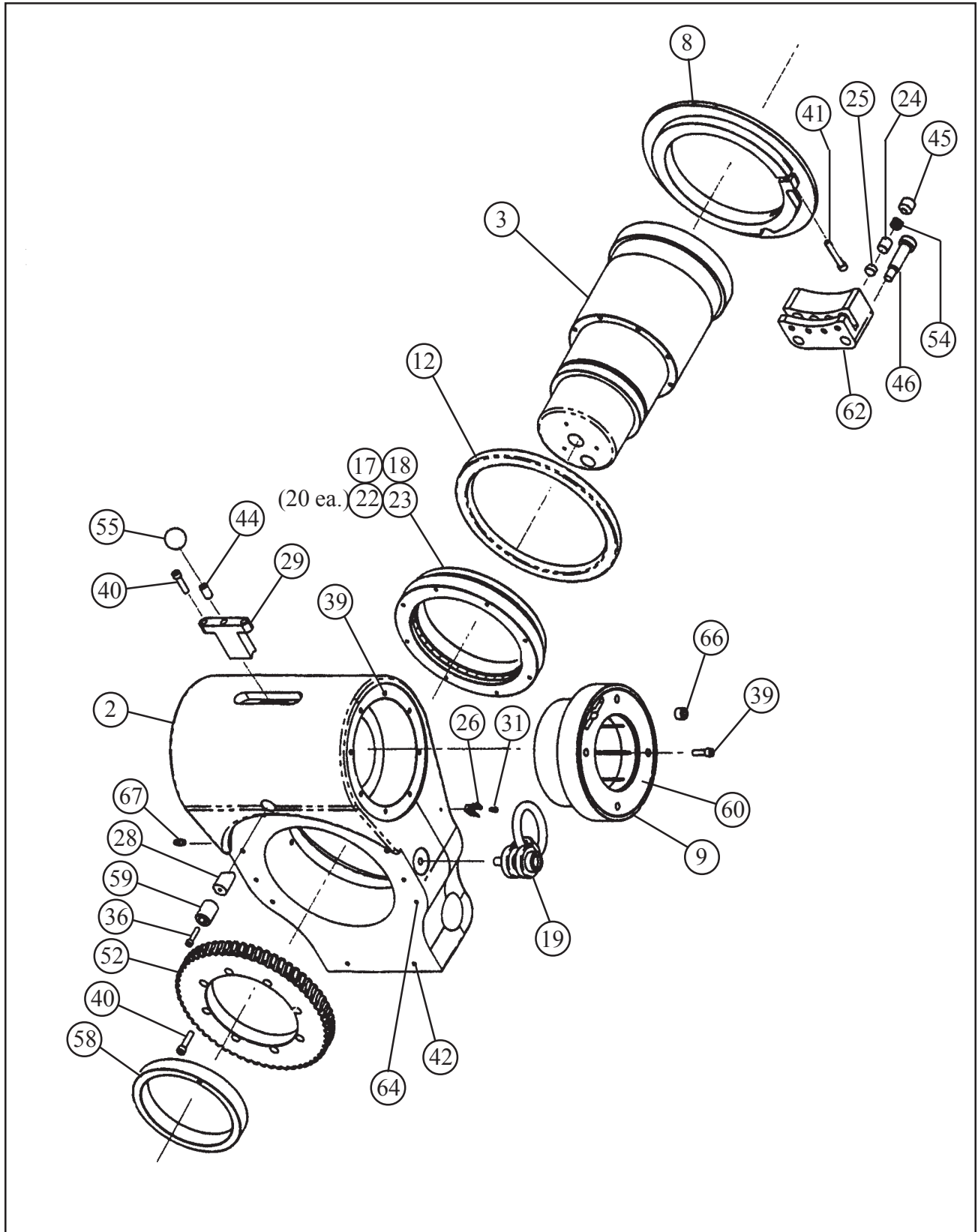


Parts List, Gearbox Assembly, 2 Speed (P/N 19-0883)

Item No.	Part No.	Description	Qty
1.	19-0882	HOUSING, GEARBOX	1
2.	20-0774	SHAFT, PINION	1
3.	20-0775	SHAFT, DRIVE	1
4.	29-0020	BEARING, BALL	2
5.	29-0093	BEARING, BALL	2
6.	31-0051	KEY	2
7.	31-0054	KEY	1
8.	32-0206	PIN, DOWEL, 1/4 DIA X 5/8"	2
9.	33-0048	SCREW, CAP, 1/4-20 X 2 1/2"	6
10.	33-0058	SCREW, CAP, 5/16-18 X 1 1/2"	2
11.	39-0898	GEAR, SPUR, PINION	1
12.	39-0899	GEAR, SPUR, DRIVE	1
13.	43-0566	COVER, GEARBOX	1
14.	54-0375	FITTING, GREASE	1



MAIN HOUSING ASSEMBLY (2 OF 2) (P/N 19-0886)



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## Parts List, Housing Assembly, Main (P/N 19-0886)

<b>Item No.</b>	<b>Part No.</b>	<b>Description</b>	<b>Qty</b>
1.	19-0872	HOUSING	1
2.	19-0875	HOUSING, MAIN	1
3.	20-0761	SHAFT, MAIN, SPINDLE	1
4.	20-0764	SHAFT, MOTOR	1
5.	24-0748	HUB, GEAR	1
6.	24-0753	PLATE, INDEX	1
7.	24-1742	PLATE, NUT RETAINING	1
8.	24-1743	PLATE, FRICTION	1
9.	27-0687	ADAPTER, BUSHING	2
10.	28-0057	SEAL, FELT	32
11.	28-0296	O-RING	2
12.	28-0297	SEAL, FELT	1
13.	29-0020	BEARING, BALL	1
14.	29-0104	BEARING, BALL	2
15.	29-0219	CAM FOLLOWER	1
16.	29-0320	BEARING, BALL	1
17.	29-0370	BEARING, RACE, FRONT, OUTER, SMALL	2
18.	29-0392	BEARING, INNER, RACE	2
19.	30-0222	RING, HOIST	2
20.	30-0907	CLEMP, CAM FOLLOWER	1
21.	30-0930	CLAMP, CABLE	1
22.	30-2824	BALL, STEEL, CHROME	40
23.	30-2825	BALL, TEFLON	40
24.	30-2845	PAD, FRICTION, FLOAT	4
25.	30-2846	PAD, FRICTION, FIXED	4
26.	30-2850	CLIP, HOLD DOWN	2
27.	31-0054	KEY	1
28.	31-0086	KEY, BRONZE	1
29.	31-0192	FEY, FEED	1
30.	32-0116	PIN, DOWEL, 1/4 DIA X 1/2"	2
31.	33-0006	SCREW, CAP, #5-40 X 1/4"	2
32.	33-0015	SCREW, CAP, #6-32 X 3/4"	3
33.	33-0017	SCREW, CAP, #6-32 X 1"	2

Parts List, Housing Assembly, Main (P/N 19-0886) Continued

<b>Item No.</b>	<b>Part No.</b>	<b>Description</b>	<b>Qty</b>
34.	33-0028	SCREW, CAP, #10-24 X 1/2"	3
35.	33-0030	SCREW, CAP, #10-24 X 3/4"	1
36.	33-0031	SCREW, CAP, #10-24 X 7/8"	1
37.	33-0032	SCREW, CAP, #10-24 X 1"	4
38.	33-0896	SCREW, CAP, 1/4-20 X 1/4"	8
39.	33-0040	SCREW, CAP, 1/4-20 X 3/4"	16
40.	33-0042	SCREW, CAP, 1/4-20 X 1"	10
41.	33-0044	SCREW, CAP, 1/4-20 X 1 1/2"	1
42.	33-0050	SCREW, CAP, 1/4-20 X 3"	16
43.	33-0059	SCREW, CAP, 5/16-18 X 1 3/4"	2
44.	33-0531	SCREW, SET, 3/8-16 X 3/4", CUP PT	1
45.	33-0664	SCREW, SET, 5/8-18 X 5/8", CUP PT	4
46.	33-1407	SCREW, SHOULDER, 1/2 X 1 1/2"	2
47.	33-1524	SETSCREW, LOCK, 3/4-16 X 1"	1
48.	35-0067	NUT, FLANGE, 3/4-16 X 1"	1
49.	35-0565	NUT, PRELOAD	1
50.	39-0323	GEAR	1
51.	39-0330	GEAR ASSEMBLY, FEED	1
52.	39-0896	GEAR, MAIN, WORM	1
53.	39-0904	WORM	1
54.	40-0278	SPRING	4
55.	42-0076	KNOB, BALL	1
56.	43-0561	COVER, MAIN	1
57.	44-0276	SPACER	1
58.	44-0525	SPACER	1
59.	44-0526	SPACER	1
60.	45-0314	BUSHING, TAPERED	1
61.	46-0519	SLEEVE, MAIN	2
62.	48-1271	BLOCK, CALIPER	1
63.	53-0016	VALVE, BALL SHUTOFF	1
64.	32-0140	PIN, DOWEL, 1/4" DIA X 3/4"	2
65.	54-0126	COUPLING, MALE, QD	1
66.	54-0374	PLUG, PRESSURE	2

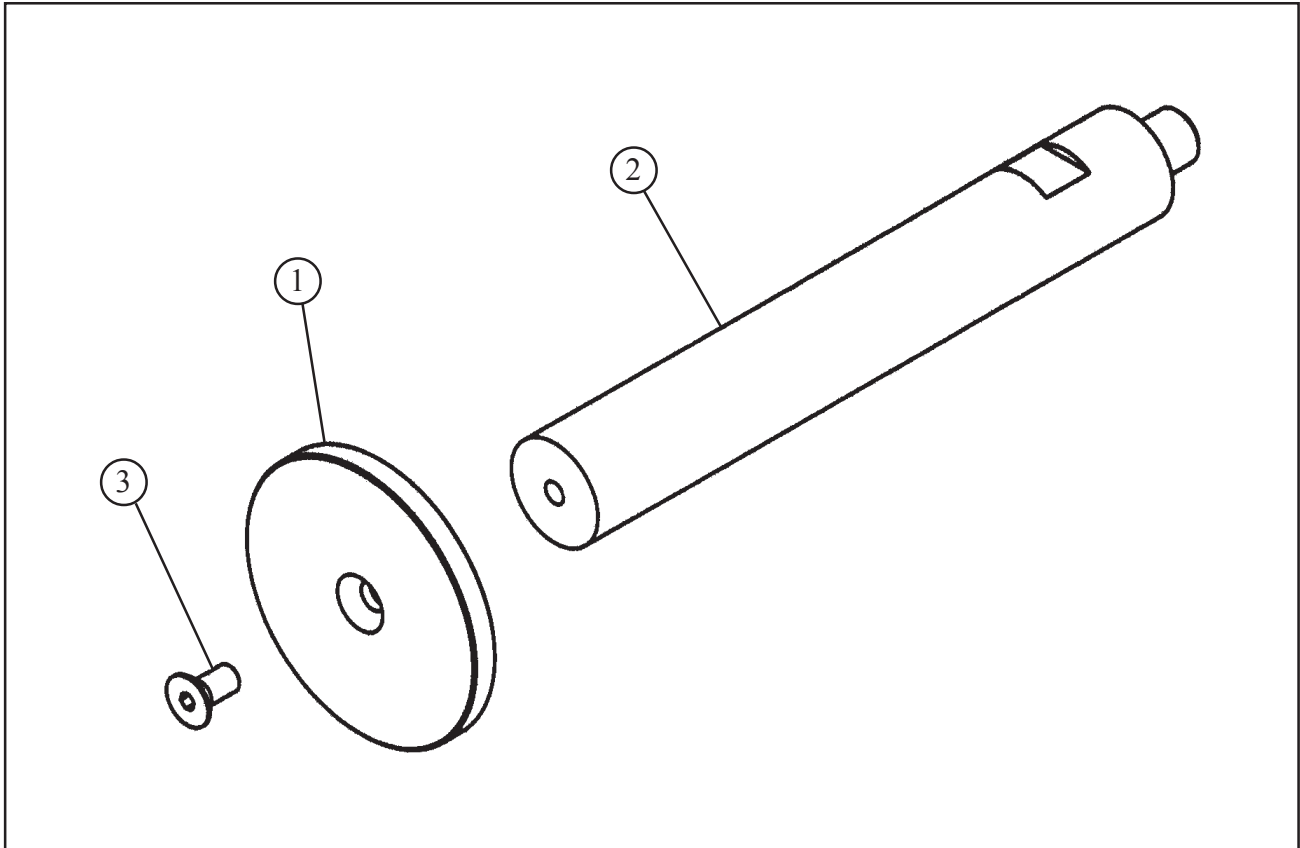
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## Parts List, Housing Assembly, Main (P/N 19-0886) Continued

<b>Item No.</b>	<b>Part No.</b>	<b>Description</b>	<b>Qty</b>
67.	54-0375	FITTING, GREASE	2
68.	55-0216	HOSE ASSEMBLY	1
69.	33-0553	SCREW, SET, 1/2-13 X 5/8", CUP PT	2
70.	30-2858	CLIP, SPRING	1
71.	33-1448	SCREW, BUTTON, #5-40 X 1/4"	1
72.	54-0084	NIPPLE	1"

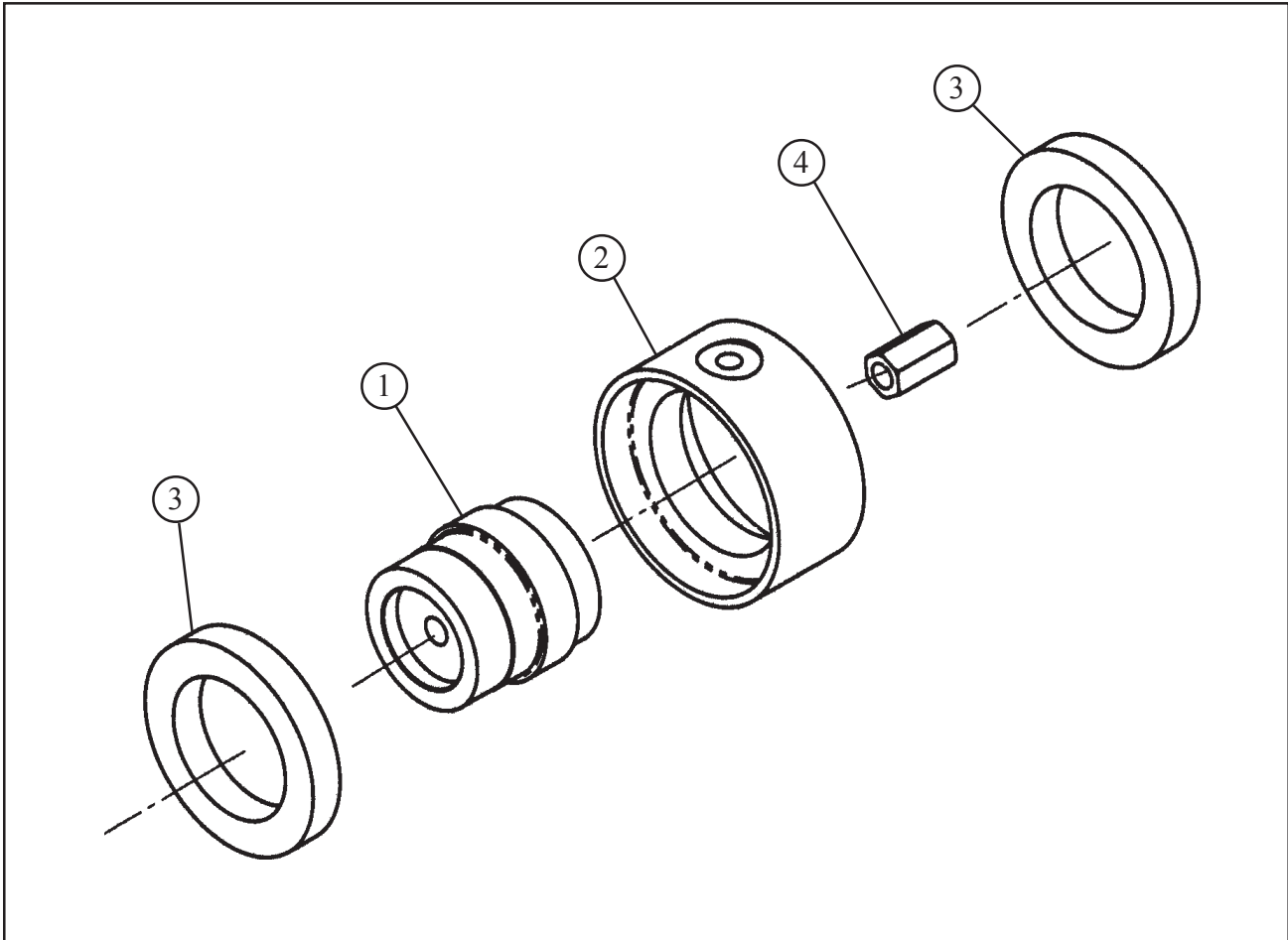
INDICATOR EXTENSION ADAPTER ASSEMBLY (P/N 27-0676)



Parts List, Adapter Assembly, Extension, Indicator (P/N 27-0676)

Item No.	Part No.	Description	Qty
1.	24-1740	PLATE, INDICATOR	1
2.	27-0675	ADAPTER, INDICATOR	1
3.	33-0379	SCREW, FLAT, 3/8-16 X 3/4"	1

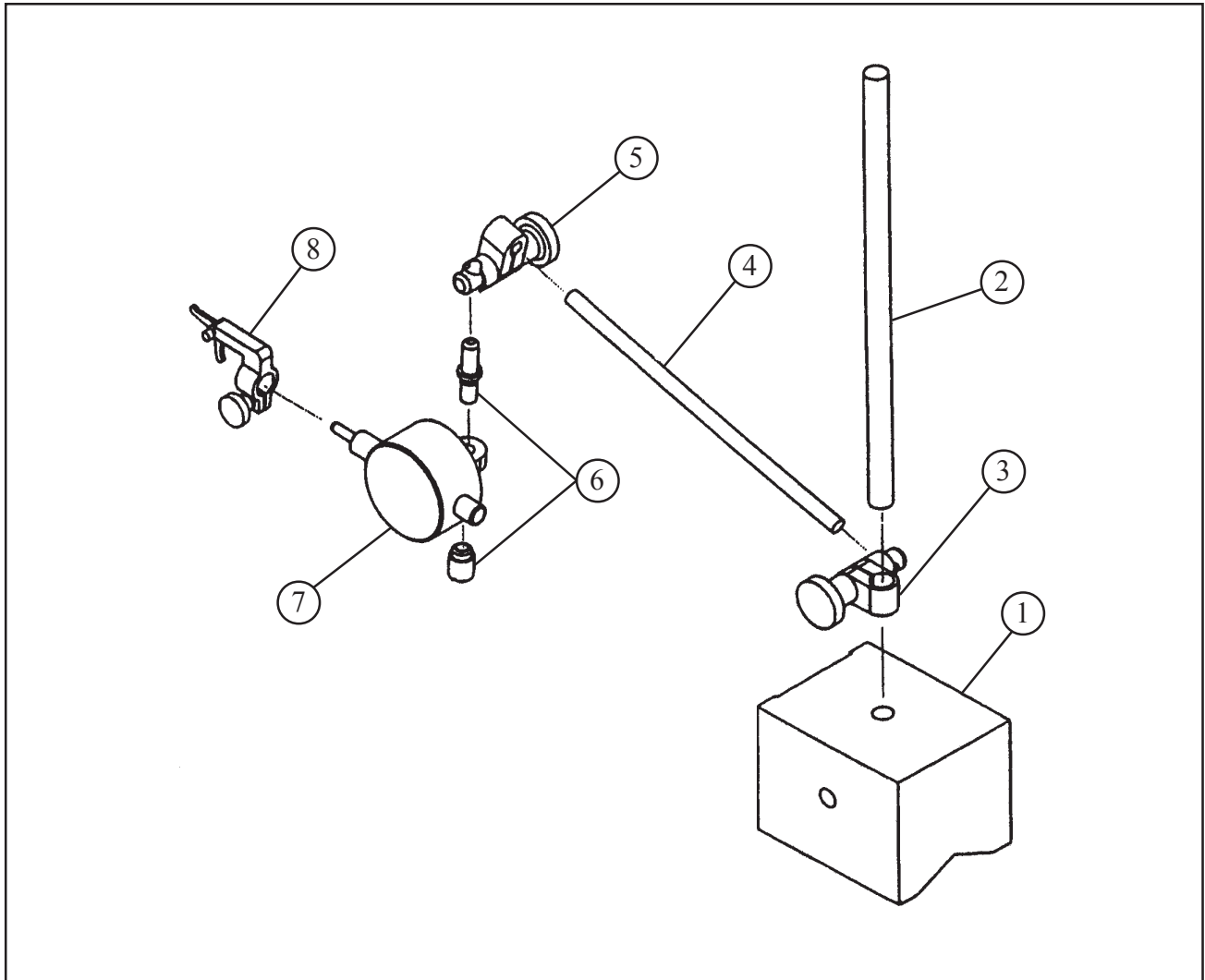
INDICATOR SLEEVE ASSEMBLY (P/N 46-0508)



Parts List, Sleeve Assembly, Indicator (P/N 46-0508)

Item No.	Part No.	Description	Qty
1.	46-0509	SLEEVE, INNER	1
2.	46-0510	SLEEVE, OUTER	1
3.	29-0393	BEARING, BALL	2
4.	35-0222	NUT	1

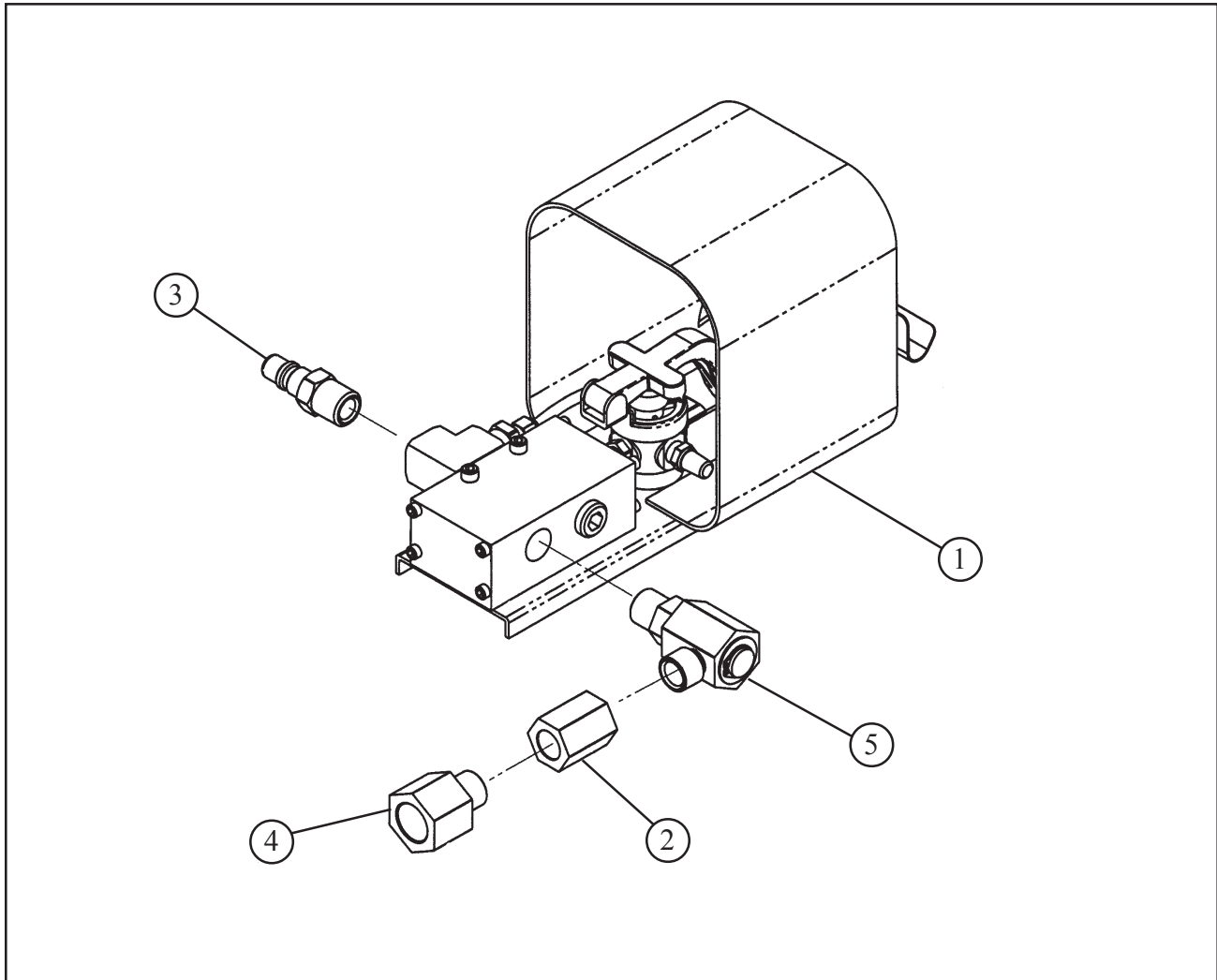
DIAL ASSEMBLY (P/N 50-0015)



Parts List, Dial Assembly (P/N 50-0015)

Item No.	Part No.	Description	Qty
1.	30-0334	BASE, MAGNETIC	1
2.	30-0335	POST, UPRIGHT BASE	1
3.	30-0336	SLEEVE	1
4.	30-0337	ROD	1
5.	30-0338	SLEEVE	1
6.	30-0339	ATTACHMENT, INDICATOR	1
7.	30-0340	INDICATOR, DIAL	1
8.	30-0341	ATTACHMENT, UNIVERSAL	1

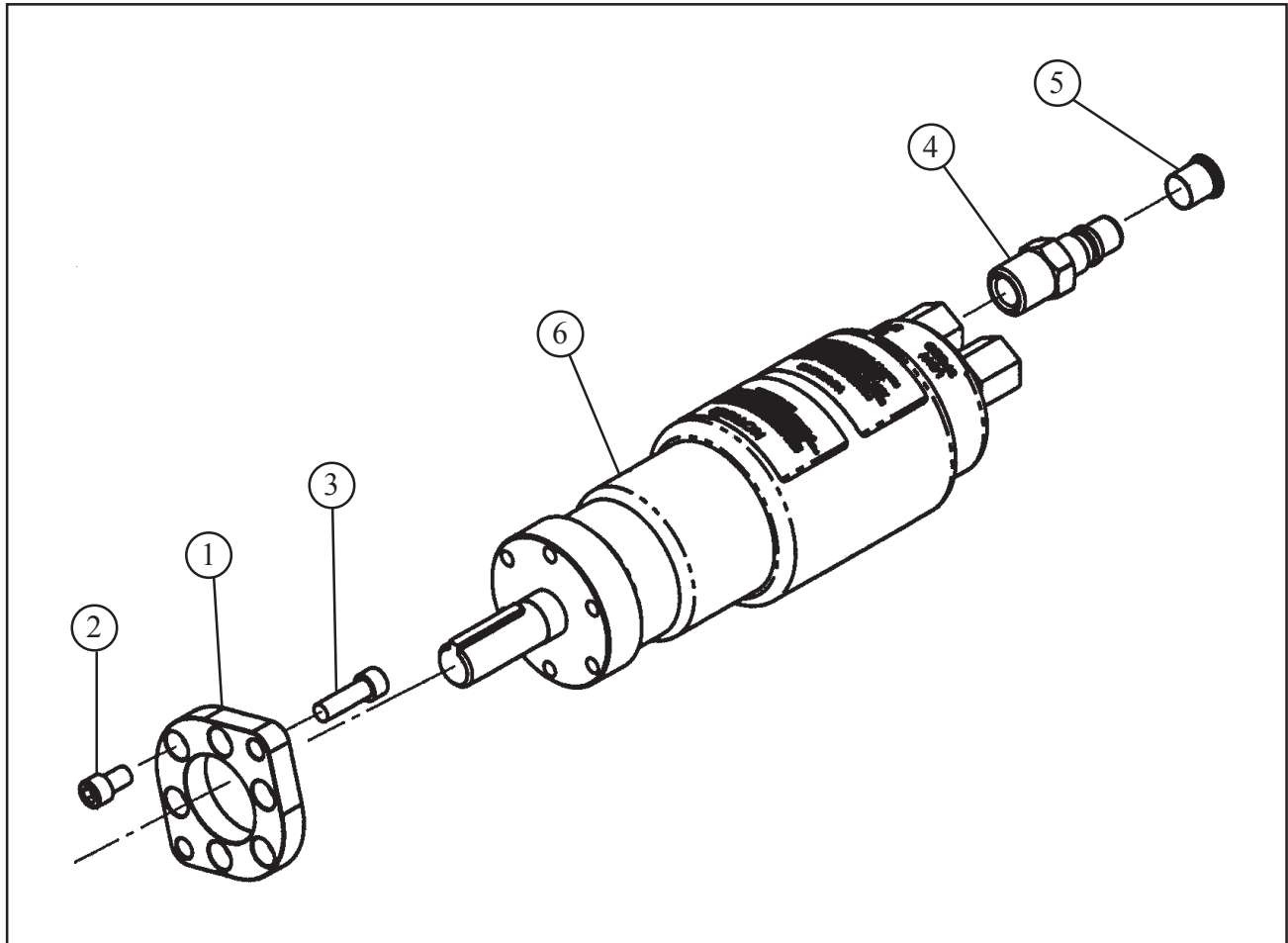
FOOT PEDAL VALVE ASSEMBLY (P/N 53-0080)



Parts List, Valve Assembly, Foot Pedal (P/N 53-0080)

Item No.	Part No.	Description	Qty
1.	53-0078	VALVE ASSEMBLY, FOOT PEDAL	1
2.	54-0093	COUPLING	1
3.	54-0126	COUPLING, MALE, QD	1
4.	54-0132	ADAPTER	1
5.	54-0204	SWIVEL JOINT	1
NOT SHOWN			
	55-0215	HOSE ASSEMBLY	1
	54-0201	CAP, YELLOW	1

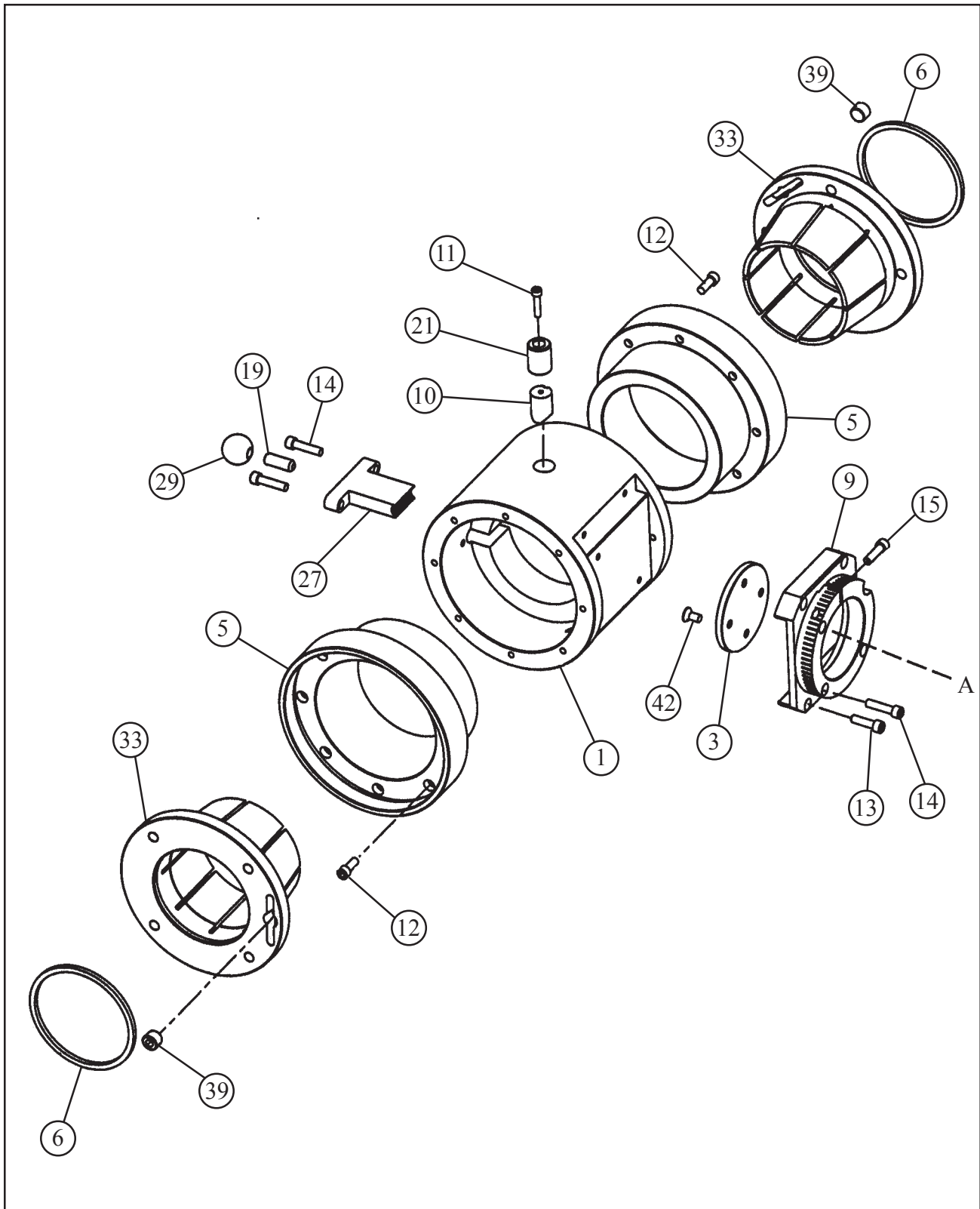
INLINE AIR MOTOR ASSEMBLY (P/N 57-0252)



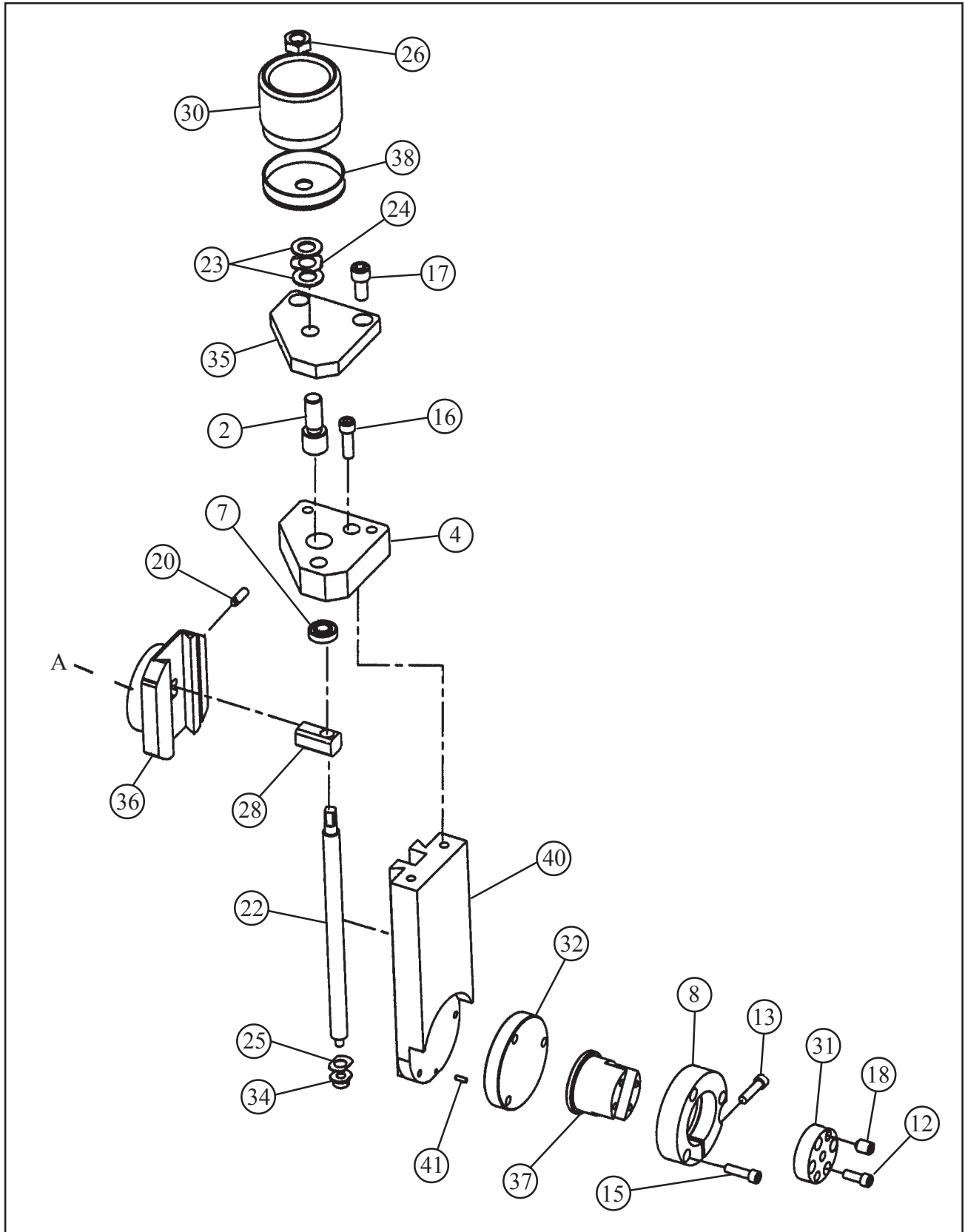
Parts List, Motor Assembly, Air. Inline (P/N 57-0252)

Item No.	Part No.	Description	Qty
1.	27-0666	ADAPTER, MOTOR	1
2.	33-0052	SCREW, CAP, 5/16-18 X 1/2"	6
3.	33-0057	SCREW, CAP, 5/16-18 X 1 1/4"	2
4.	54-0126	COUPLING, MALE, QD	2
5.	54-0201	CAP, YELLOW	2
6.	57-0251	MOTOR, AIR, INLINE	1

TOOL SLIDE ASSEMBLY (1 OF 2) (P/N 82-0142)



TOOL SLIDE ASSEMBLY (2 OF 2) (P/N 82-0142)



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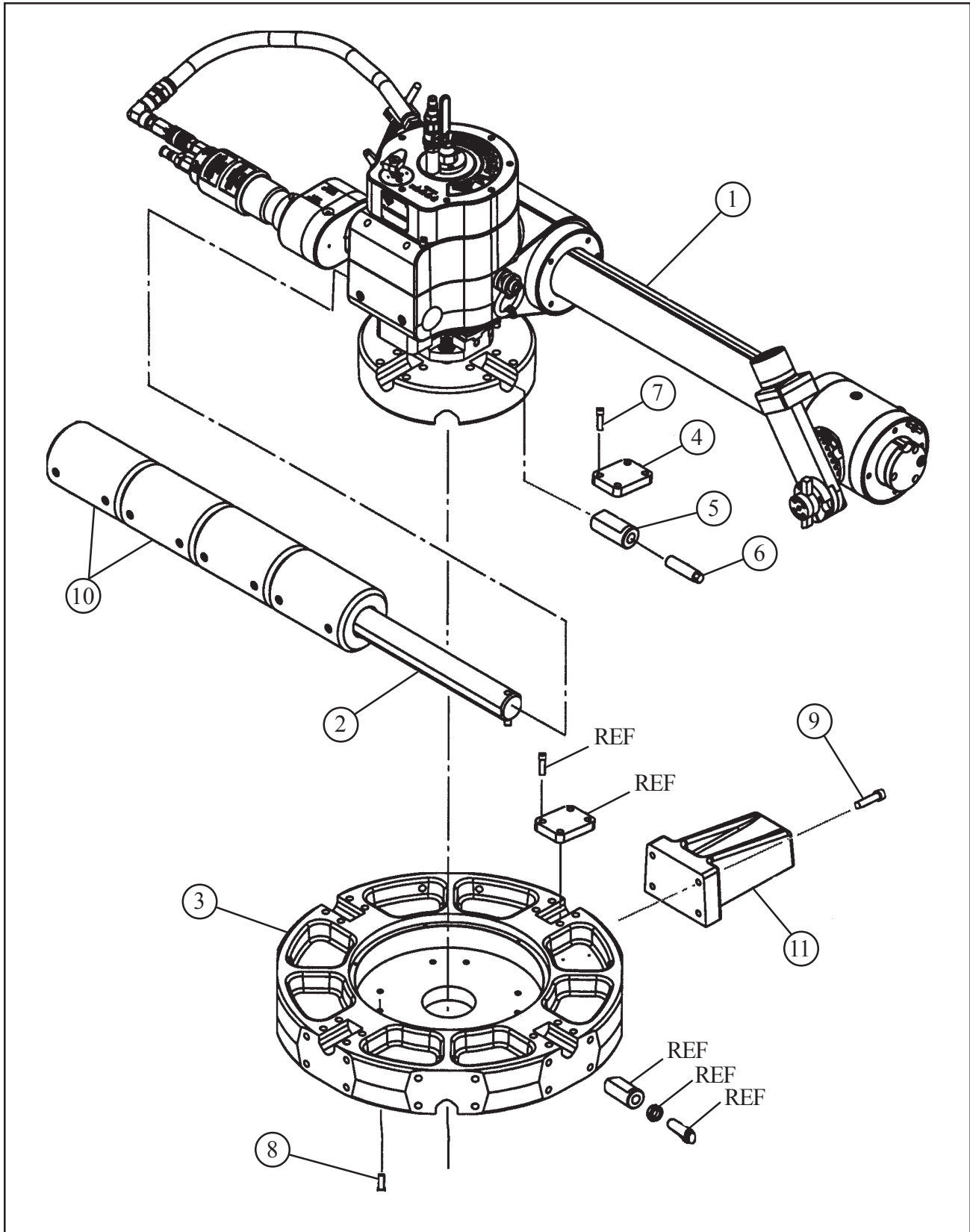
## Parts List, Slide Assembly, Tool (P/N 82-0142)

<b>Item No.</b>	<b>Part No.</b>	<b>Description</b>	<b>Qty</b>
1.	19-1051	HOUSING, TOOL SLIDE	1
2.	20-0766	SHAFT, FEED	1
3.	24-1714	PLATE, DOVETAIL RETAINING	1
4.	27-0667	ADAPTER, COMPOUND	1
5.	27-0687	ADAPTER, BUSHING	2
6.	28-0057	SEAL, FELT	25
7.	29-0084	BEARING, BALL	1
8.	30-2832	CLAMP, TOOL HOLDER	1
9.	30-3269	CLAMP, INDEX	1
10.	31-0086	KEY	1
11.	33-0031	SCREW, CAP, #10-24 X 7/8"	1
12.	33-0039	SCREW, CAP, 1/4-20 X 5/8"	20
13.	33-0041	SCREW, CAP, 1/4-20 X 7/8"	5
14.	33-0042	SCREW, CAP, 1/4-20 X 1"	5
15.	33-0043	SCREW, CAP, 1/4-20 X 1 1/4"	4
16.	33-0056	SCREW, CAP, 5/16-18 X 1"	2
17.	33-0069	SCREW, CAP, 3/8-16 X 3/4"	2
18.	33-0529	SCREW, SET, 3/8-16 X 1/2", CUP PT	3
19.	33-0531	SCREW, SET, 3/8-16 X 3/4", CUP PT	1
20.	33-0927	SCREW, SET, 1/4-20 X 1/2", HDOG	6
21.	33-1524	SETSCREW, LOCK, 3/4-16 X 1"	1
22.	33-2181	SCREW, FEED, 1/2-10 X 8.84"	1
23.	34-0163	WASHER, THRUST	2
24.	34-0325	WASHER, SPRING	1
25.	34-0375	WASHER, THRUST, FLAT	1
26.	35-0117	NUT, JAM	1
27.	35-0567	NUT, FEED	1
28.	35-0568	NUT, FEED	1
29.	42-0076	KNOB, BALL	1
30.	42-0196	KNOB, FEED	1
31.	43-0562	COVER, TOOL	1
32.	44-0530	SPACER, TOOL HOLDER	1
33.	45-0314	BUSHING, TAPERED	2

Parts List, Slide Assembly, Tool (P/N 82-0142) Continued

Item No.	Part No.	Description	Qty
34.	45-0322	BUSHING, FLANGE	1
35.	47-1279	BRACKET, FEED HANDLE	1
36.	48-1259	BLOCK, ROTARY COMPOUND	1
37.	49-0396	HOLDER, TOOL	1
38.	50-0027	DIAL, DRUM	1
39.	54-0374	PLUG, PRESSURE, FLUSH	2
40.	66-0187	BASE, SLIDE, COMPOUND	1
41.	32-0220	PIN, DOWEL, 1/8 DIA X 3/8"	1
42.	33-0359	SCREW, FLAT, 1/4-20 X 1/2"	4

442F EXTENSION KIT, 73"/1854.2 MM (P/N 05-0351)

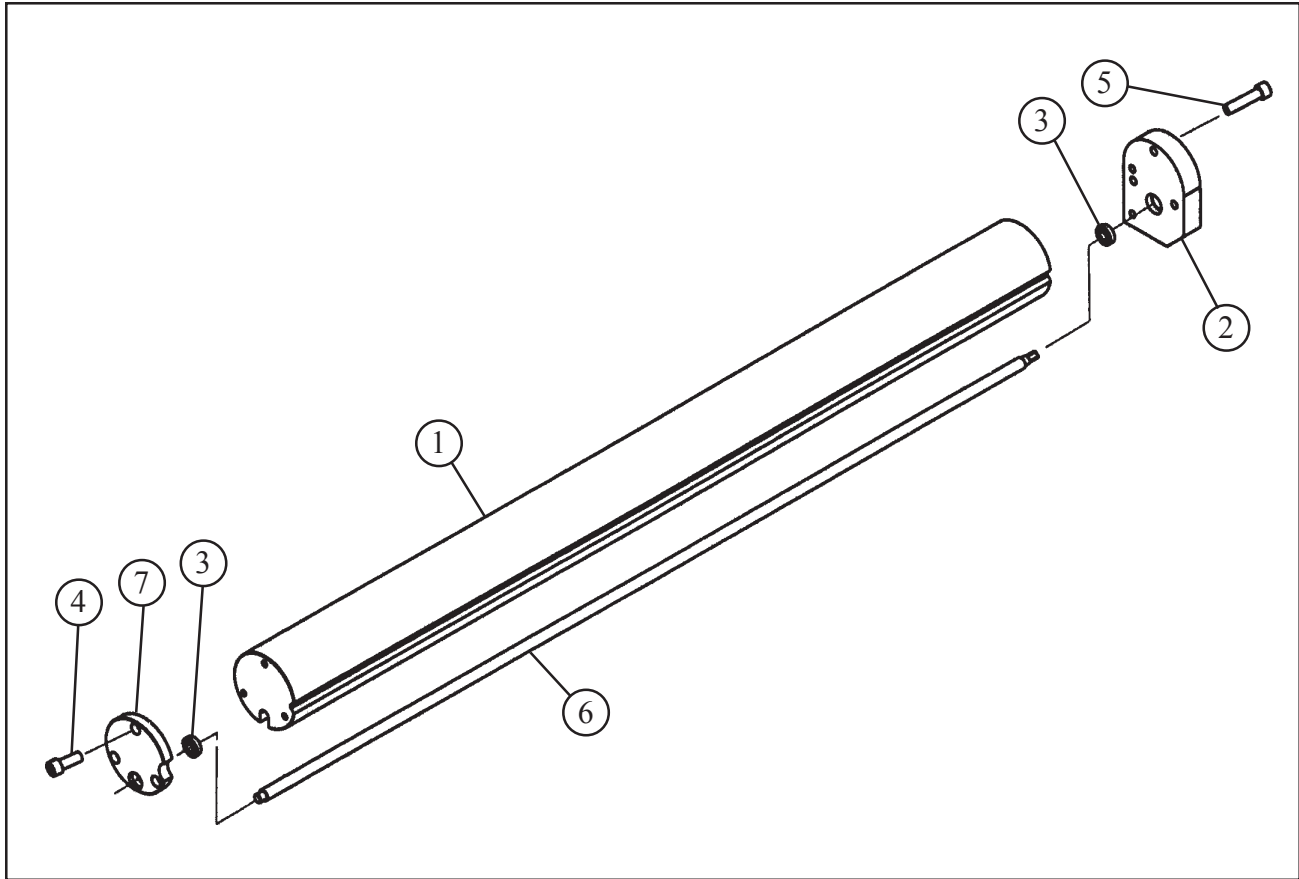


## Parts List, Extension Kit, 442F, 73"/1854.2 mm (P/N 05-0351)

<b>Item No.</b>	<b>Part No.</b>	<b>Description</b>	<b>Qty</b>
1.	14-0087	SHAFT ASSEMBLY	1
2.	20-0763	SHAFT, COUNTERWEIGHT, EXTENSION	1
3.	21-0553	HEAD ASSEMBLY	1
4.	24-1719	PLATE, RETAINING	4
5.	26-1529	BAR, MOUNTING	4
6.	33-2209	SCREW, JACK, 3/4-16 UNF X 3"	4
7.	33-0071	SCREW, CAP, 3/8-16 X 1"	16
8.	33-0073	SCREW, CAP, 3/8-16 X 1 1/2"	8
9.	33-0074	SCREW, CAP, 3/8-16 X 1 3/4"	32
10.	48-1258	BLOCK, COUNTERWEIGHT	2
11.	48-1262	BLOCK, EXTENSION	8
NOT SHOWN			
	27-0686	ADAPTER ASSEMBLY	1

REF. parts used from Standard Assembly.

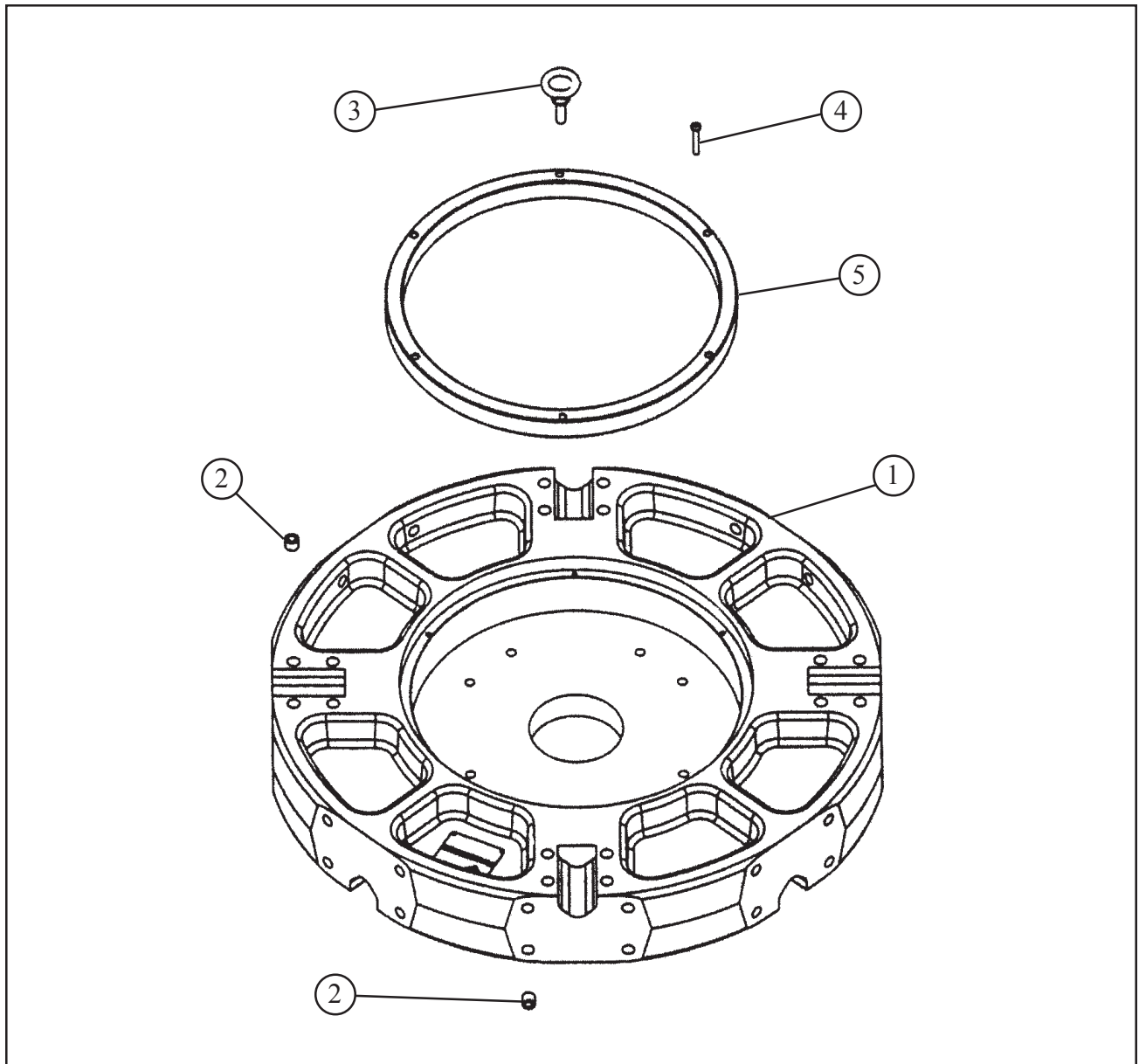
EXTENSION FEED SCREW SHAFT ASSEMBLY (P/N 14-0087)



Parts List, Shaft Assembly, Feed Screw, Extension (P/N 14-0087)

Item No.	Part No.	Description	Qty
1.	20-0760	SHAFT, TOOL SLIDE	1
2.	27-0665	ADAPTER, FEED GEARBOX	1
3.	29-0084	BEARING, BALL	2
4.	33-0054	SCREW, CAP, 5/16-18 X 3/4"	3
5.	33-0057	SCREW, CAP, 5/16-18 X 1 1/4"	3
6.	33-2182	SCREW, FEED, 1/2-10 X 45.18"	1
7.	43-0560	COVER, SHAFT	1

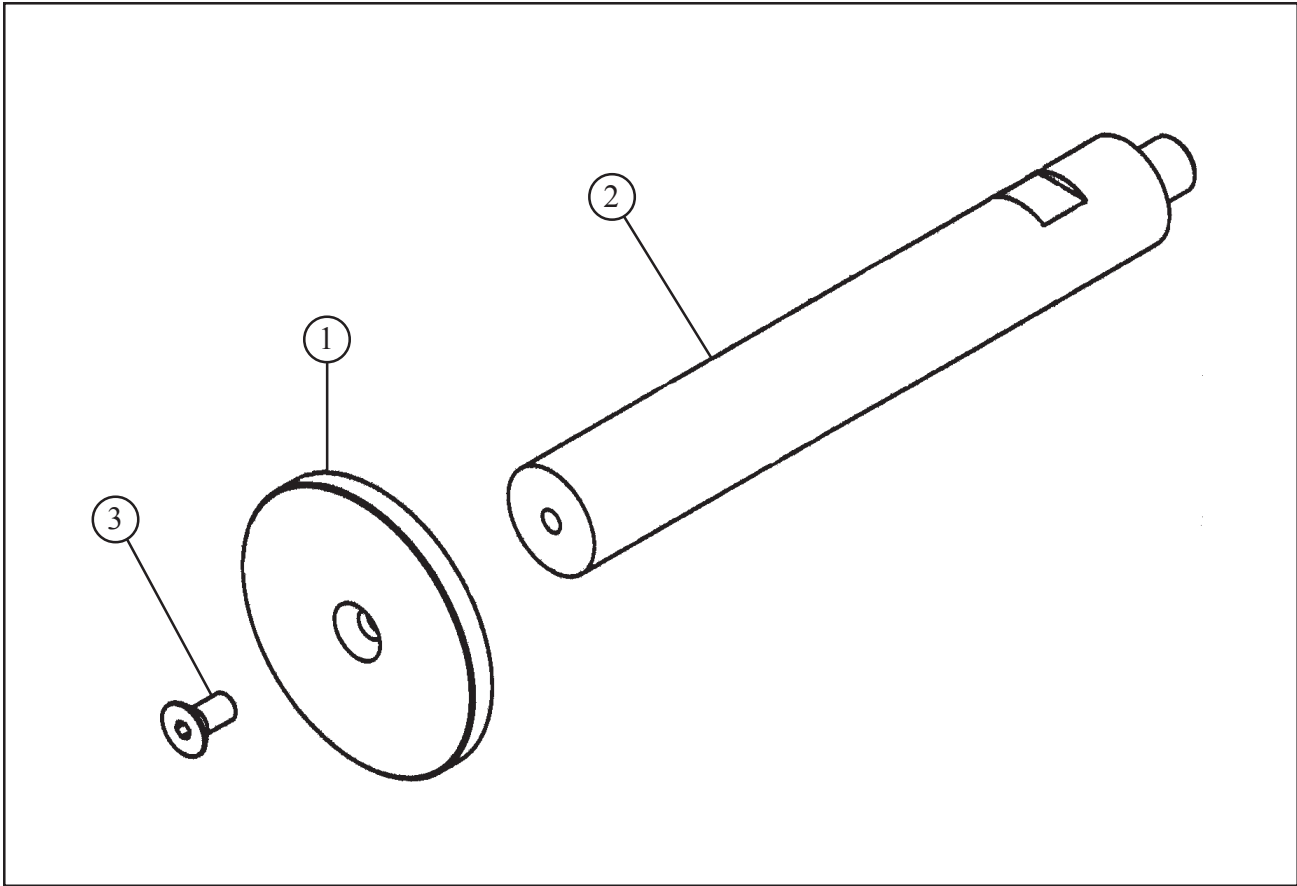
LARGE MOUNTING HEAD ASSEMBLY (P/N 21-0553)



Parts List, Heas Assembly, Mounting, Large (P/N 21-0553)

Item No.	Part No.	Description	Qty
1.	21-0551	HEAD, MOUNTING, LARGE	1
2.	30-0031	INSET, THREADED	64
3.	30-0108	EYEBOLT, SHOULDER	4
4.	33-0974	SCREW, BUTTON, 1/4-20 X 1 1/2"	6
5.	46-0516	SLEEVE, MOUNTING, INTERNAL	1

INDICATOR EXTENSION ADAPTER ASSEMBLY (P/N 27-0686)



Parts List, Adapter Assembly, Extension, Indicator (P/N 27-0686)

Item No.	Part No.	Description	Qty
1.	24-1740	PLATE, INDCATOR	1
2.	27-0685	ADAPTER, INDICATOR	1
3.	33-0379	SCREW, FLAT, 3/8-16 X 3/4"	1