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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 224B BEVELMASTER™ is a Portable I.D. Mount Machine Tool for beveling, facing and/or counterboring 8" through 24" pipe. The tool is configured with an in line Feed Knob and Pneumatic or Hydraulic Drive Motor at right angle to the Lathe Head.

## SPECIFICATIONS

The Model 224B BEVELMASTER™ is designed for facing, beveling and/or counterboring the ends of pipe or tubing in preparation for welding.

These machining operations may be performed either simultaneously or separately.

Pipe weld preparations that meet all existing conventional codes including the more stringent nuclear codes may be machined using the Model 224B BEVELMASTER™.

The various interchangeable Jaw Blocks, Ramps and Spacers will secure the Model 224B BEVELMASTER™ to pipe and tubing having an inside diameter of 6.813" (173.0 mm) minimum, with a maximum outside diameter of 24.00" (609.6 mm).

The expanding Mandrel provides fast, accurate self-centering and alignment to the pipe or tubing to be machined.

The Lathe accepts it's own torque through the Mandrel generated by machining operations. No additional torque restraining devices are required.

The Model 224B is provided with a Lathe Lifting Frame Assembly.

Various attachments are available to further enhance the capabilities of the Machine.

### Weight

420 lbs (190 kg) [Complete with Mandrel, Drive Motor and Lifting Frame.]

### Power Requirements

Pneumatic Motor	95 cfm at 90 psi (44.8 L/s at 621 kPa)
Hydraulic Motor	20 GPM at 1250 psi (1.3 L/s at 8619 kPa)

Feed Rate	.083" (2.1 mm) per rev of the Feed Handle
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Feed Travel	5.38" (136.7 mm)
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Rotating DIA	27.00" (685.8 mm)
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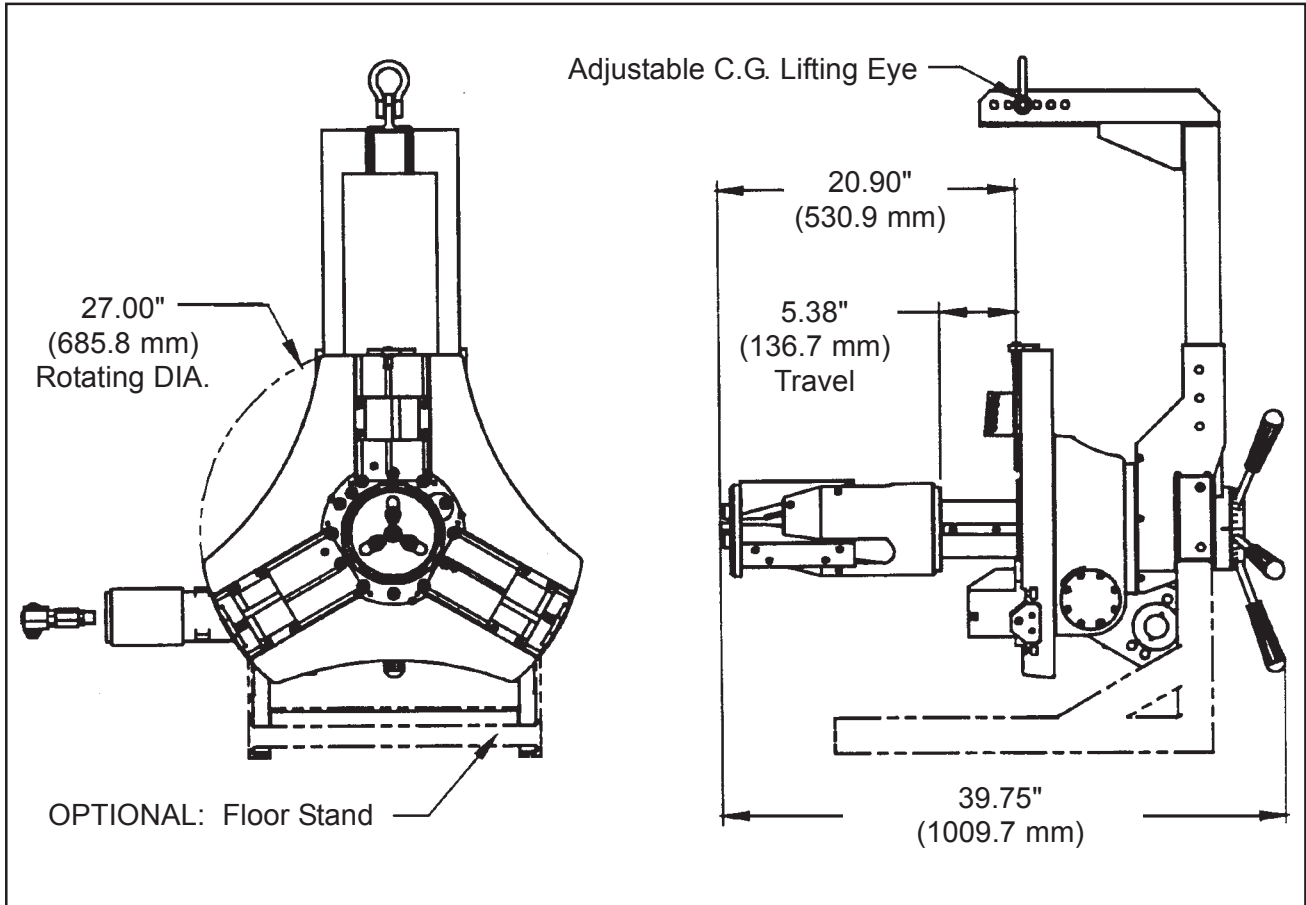
**CUTTING HEAD SPEEDS**

High Speed Socket

Maximum Cutting Head Speed	18 rpm
Cutting Head Speed @ Maximum H.P.	9 rpm
Functional Speed Range	6 to 18 rpm

Low Speed Socket

Maximum Cutting Head Speed	9 rpm
Cutting Head Speed @ Maximum H.P.	4.5 rpm
Functional Speed Range	3 to 9 rpm



**CUTTING CAPACITIES**

Basic Pipe Sizes

All schedules of 8" through 24" pipe.



### Basic Tube Sizes

Up to 2.34" (59.4 mm) wall tubing with a maximum O.D. of 24.00" (609.6 mm) and a minimum I.D. of 6.813" (173.0 mm) may be beveled with the Standard Mandrel.

### Wall Thickness Capacity

Wall thickness of all standard pipe schedules 2.34" (59.4 mm) maximum in the range listed. Tubing or pipe with a greater wall thickness may be handled provided the I.D. is greater than 6.813" (173.0 mm) and the O.D. is less than 24.00" (609.6 mm). Contact TRI TOOL Inc. for heavier wall procedures.

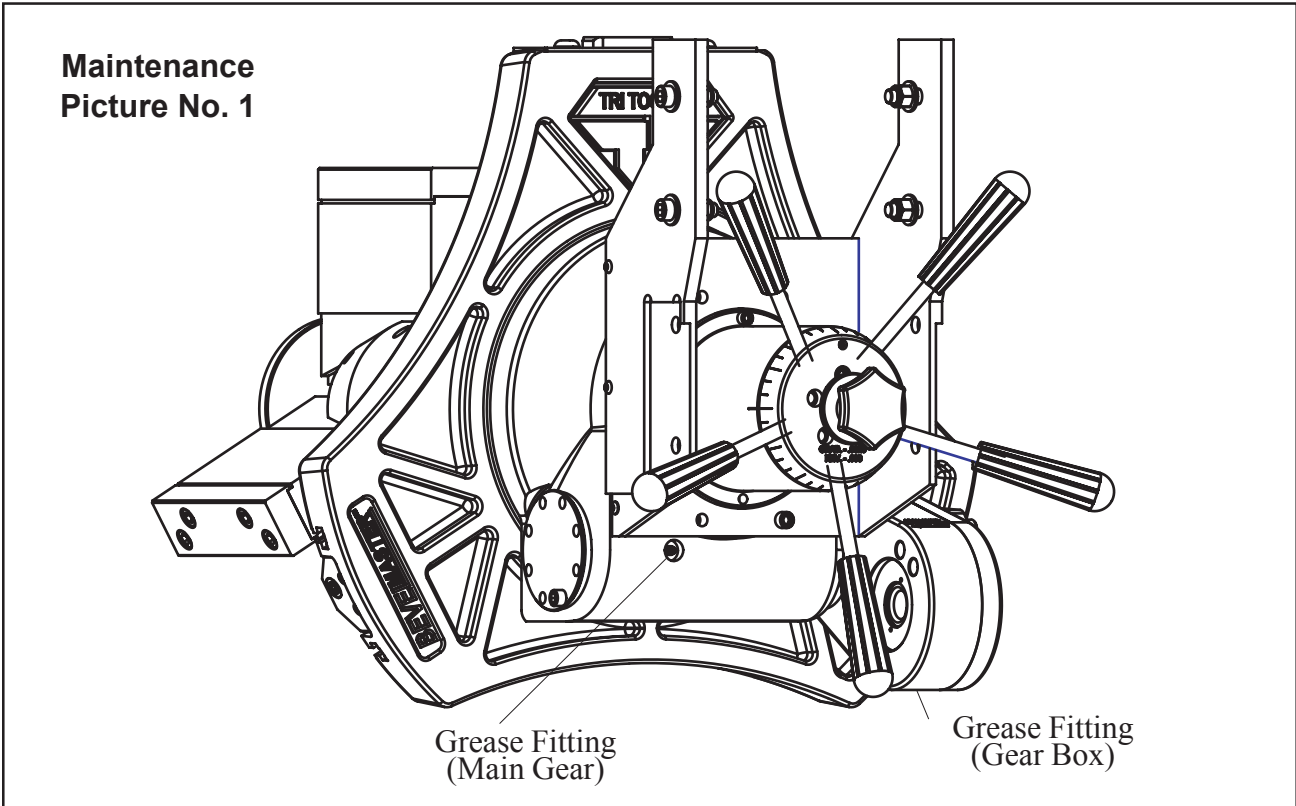
### Counterboring Operations

The tool will counterbore pipe and tubing with an I.D. range of 8.500" (216.0 mm) to 24.00" (609.6 mm).

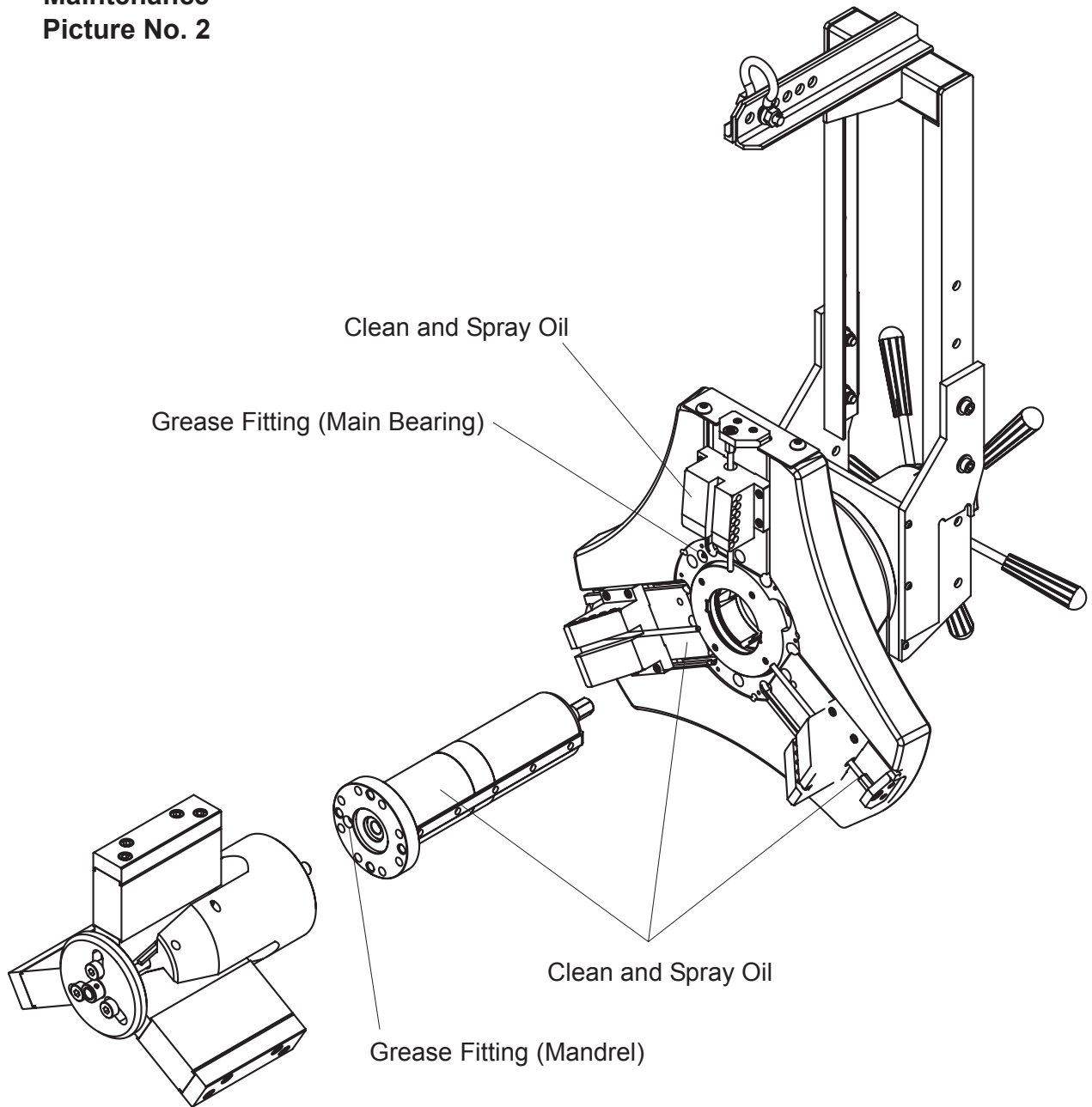
# MAINTENANCE

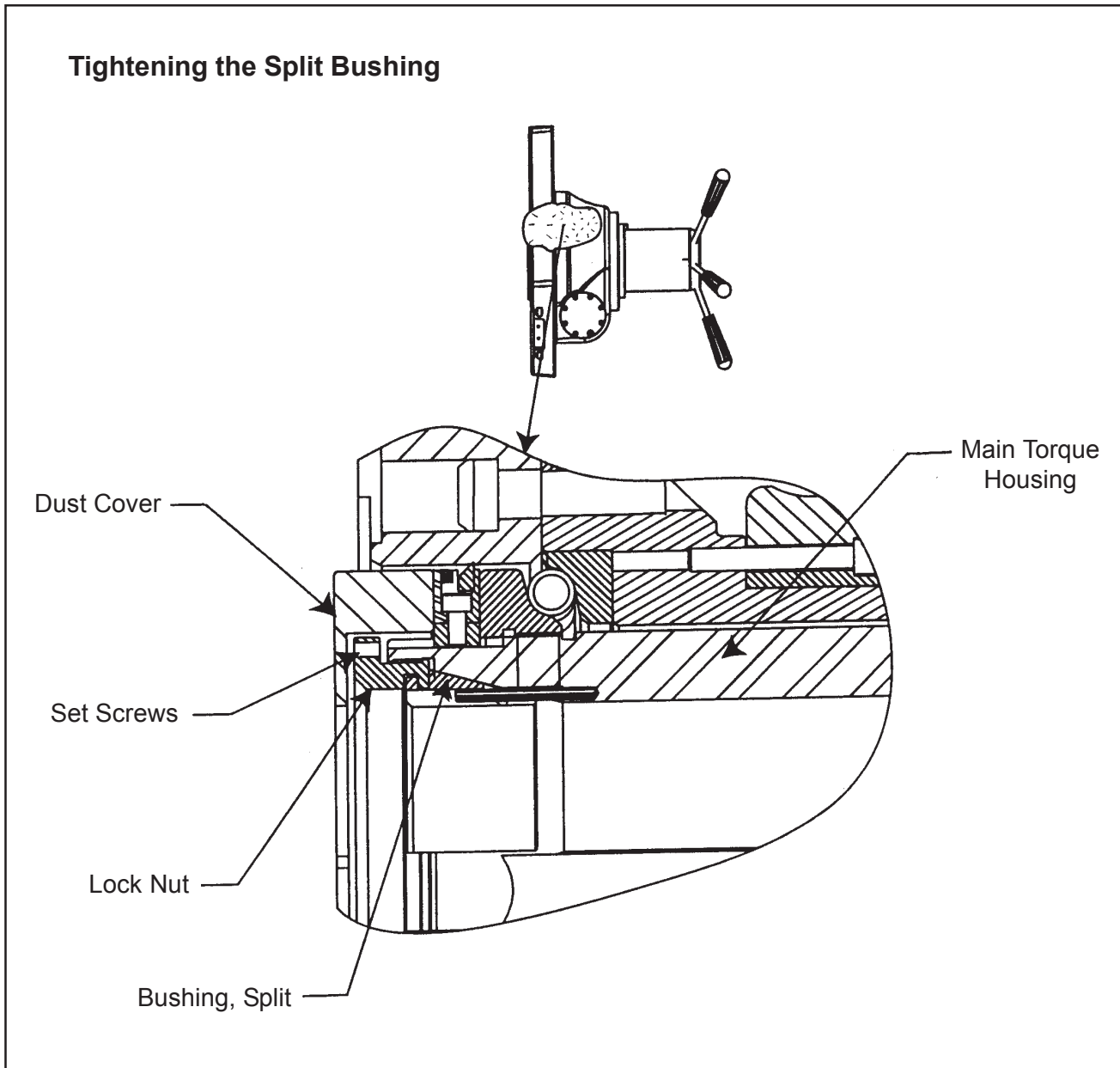
<b>Model 224B Maintenance Schedule</b>				
Step	Hours of Operation	Maintenance Activity	Note No.	Maintenance Picture No.
1	2	Clean all debris from tool.		2
2	8	Spray all bare metal with light oil.	A	2
3	50	Grease Mandrel. (As required)	B	2
4	50	Grease Main Bearing. (As required)	B	2
5	50	Grease Main Gear. (As required)	B	1
6	50	Grease Gearbox Assembly. (As required)	B	1

NOTES:  
 A Use SAE 10W light machine oil.  
 B Use Chevron ultra-duty grease "EP NLG12". (TRI TOOL INC. P/N 68-0024)



Maintenance  
Picture No. 2





## TIGHTENING THE FRONT BUSHING

When the Mandrel Shaft is loose, the Tapered Split Bushing can be tightened.

Rotate the Feed Handle to extend the Mandrel outward to the limit line.

Unbolt the Dust Cover and slide it down the Mandrel to provide access to the Locknut and Bushing.

Loosen the eight (8) Set Screws in the Locknut on the front of the Main Torque Housing.

Tighten the Locknut on the front of the Main Torque Housing, using the Spanner Wrench provided, approximately 75 ft-lbs (102 N m).

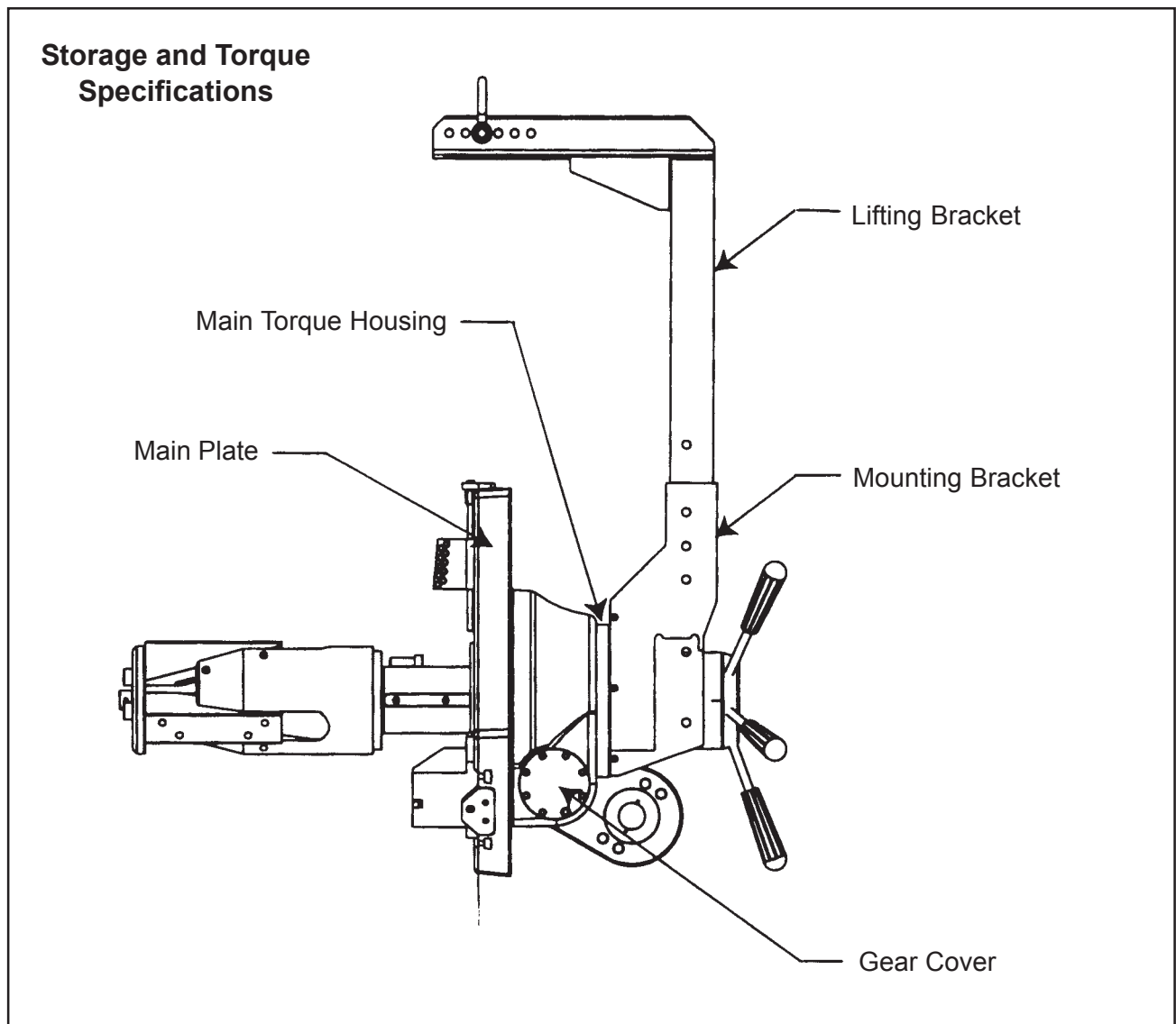
Tighten the eight (8) Set Screws in the Lock Nut, approximately 1 ft-lbs (1.36 N m).

## **STORAGE AND TORQUE SPECIFICATIONS**

Remove the Tool Bits from the Tool Holders before storing the machine.

When the Model 224B is to be stored or if it will remain out of service for a significant period of time, 30 days or more, it should be thoroughly cleaned, lubricated and sprayed with a rust preventative prior to storage.

The twelve (12) Cap Screws that hold the Main Plate to the Main Shaft are torqued to 100 ft-lbs (136 N m).



The eight (8) Cap Screws that hold the Main Torque Housing to the Main Housing are torqued to 25 ft-lbs (34 N m).

The eight (8) Cap Screws that hold the Model 224B BEVELMASTER™ to the Mounting Bracket are torqued to 45 ft-lbs (61 N m).

The eight (8) Cap Screws that hold the Gear Cover to the Main Housing are torqued to 45 ft-lbs (61 N m).

## LUBRICATION

The Drive Gears require a grease such as “Chevron Ultra-Duty Grease EP NLGI 2” (P/N 68-0024).

The T-Slot Plates and Tool Blocks require a light oil such as SAE 10 light machine oil.

The Feed Screw for the Tool Blocks require a SAE 10 light machine oil for normal conditions and under dusty conditions a silicone, graphite or molybdenum disulfide ‘dry’ lubricant.

**NOTE:**

A light film of all purpose grease may be used, but it must be checked for grit contamination frequently.

The Air Motor requires a Class 2 lubricant, viscosity of 100 to 200 SSU at 100° F (38° C) minimum aniline point of 200° F (93° C).

**NOTE:**

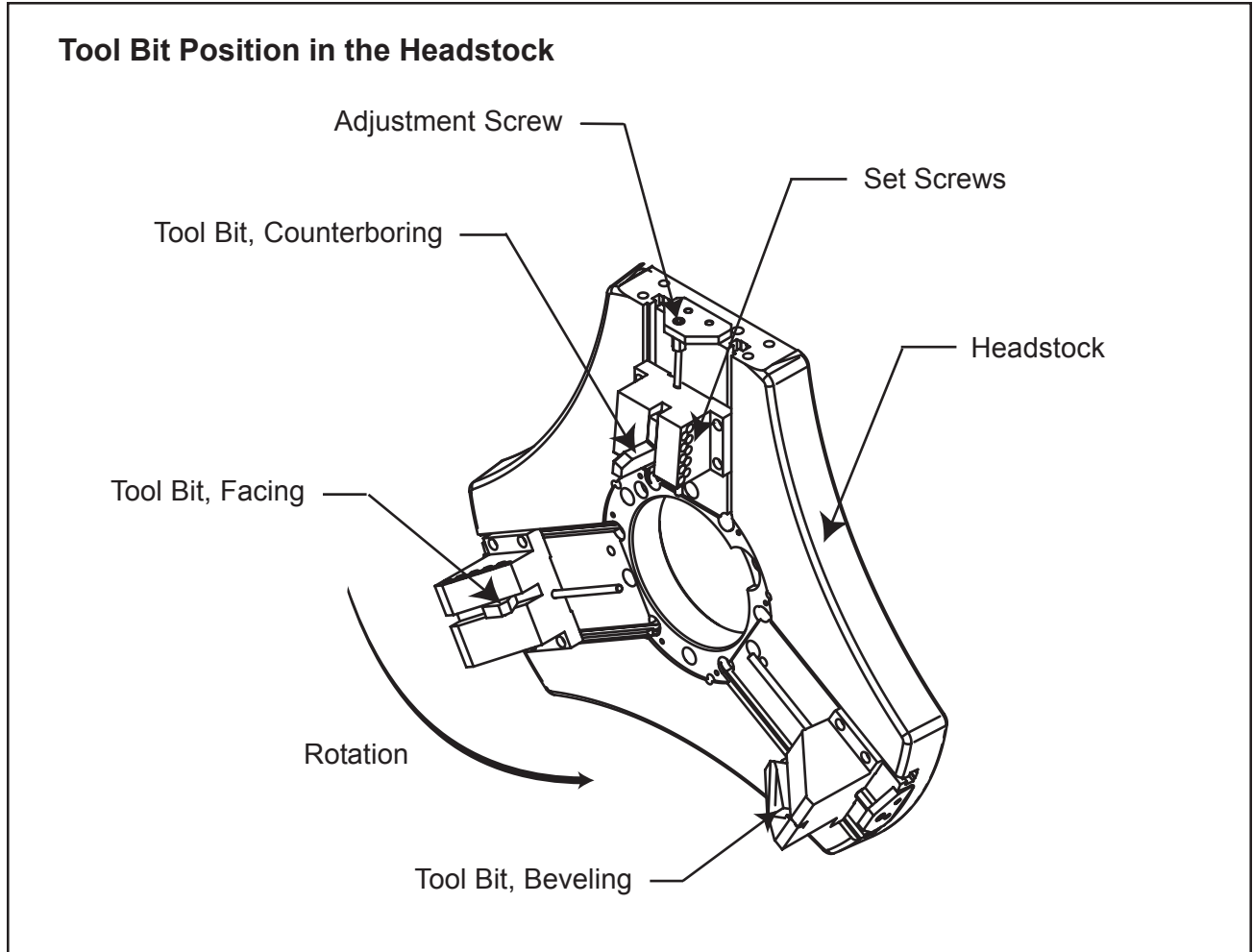
When using a Pneumatic Drive Assembly, use an adequate in line filter, regulator, and lubricator (FRL).

The Tri Tool Air Caddy, a portable combination filter, regulator, and lubricator (FRL) unit is recommended. (P/N 75-0114)

- TRI TOOL Inc. - Air Tool Lubricant (P/N 68-0022)
- AMOCO - American Industrial Oil No. 32
- Atlantic Richfield - Duro Oil S-150
- Chevron - A.W. Machine Oil 32
- Shell - Tellus Oil 32

The bearings in the Air Motor are sealed and do not require any lubrication.

## OPERATION



## PREPARATION

Read the operating instructions carefully before attempting to operate the Model 224B BEVELMASTER™.

Use eye protection at all times when operating the Model 224B.

## TOOL HOLDERS

The Tool Holders may be positioned in various locations on the Headstock in order to accommodate any particular pipe size and prep geometry.

## **TOOL BLOCK SET**

In general the Counterbore Tool Block should lead the Bevel Tool Block.

## **INSTALLATION OF THE TOOL BITS**

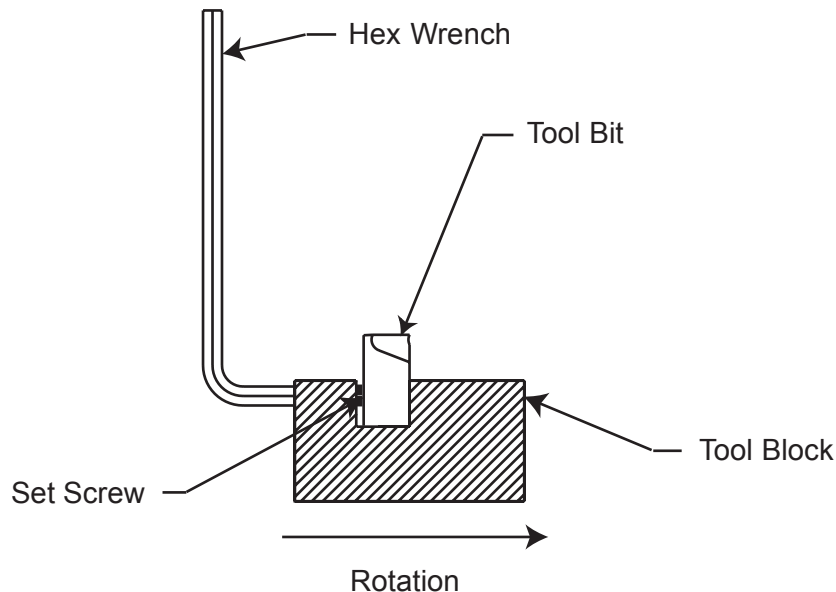
To select the appropriate Tool Bits refer to the 'Tool Bits' section of this manual to help with your choice.

**CAUTION:**

Use of a dull Tool Bit(s) or Tool Bit(s) not manufactured by TRI TOOL Inc. may result in poor performance and may constitute abuse of this machine and therefore voids the TRI TOOL Inc. factory warranty.

The three (3) Tool Blocks have been optimized for the various operations and to reduce Tool Bit wear, thus the Tool Bit(s) must be installed in the correct Tool Block(s).

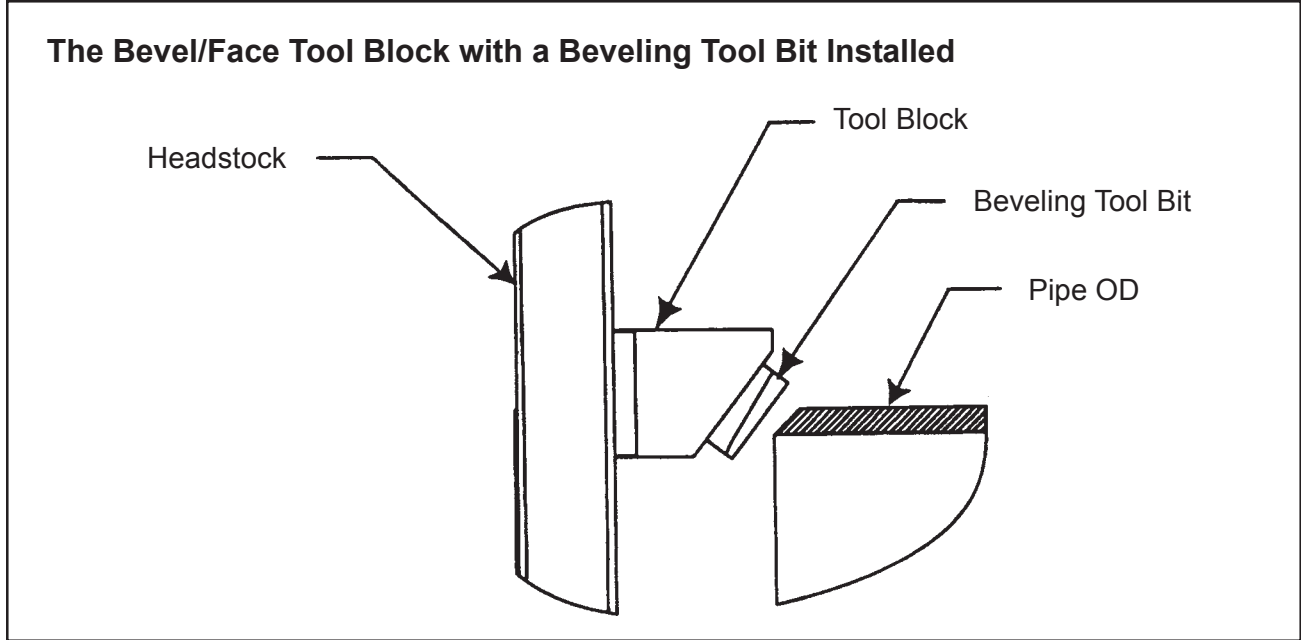
### **Position the Tool Bit in the Slot**



Be sure that the Tool Bit(s) sits flush against the Slot and then tighten the Locking Set Screws.

Be sure that the cutting edge of the Beveling Tool Bit is along the Radial Centerline of the Headstock, advance into the cut.

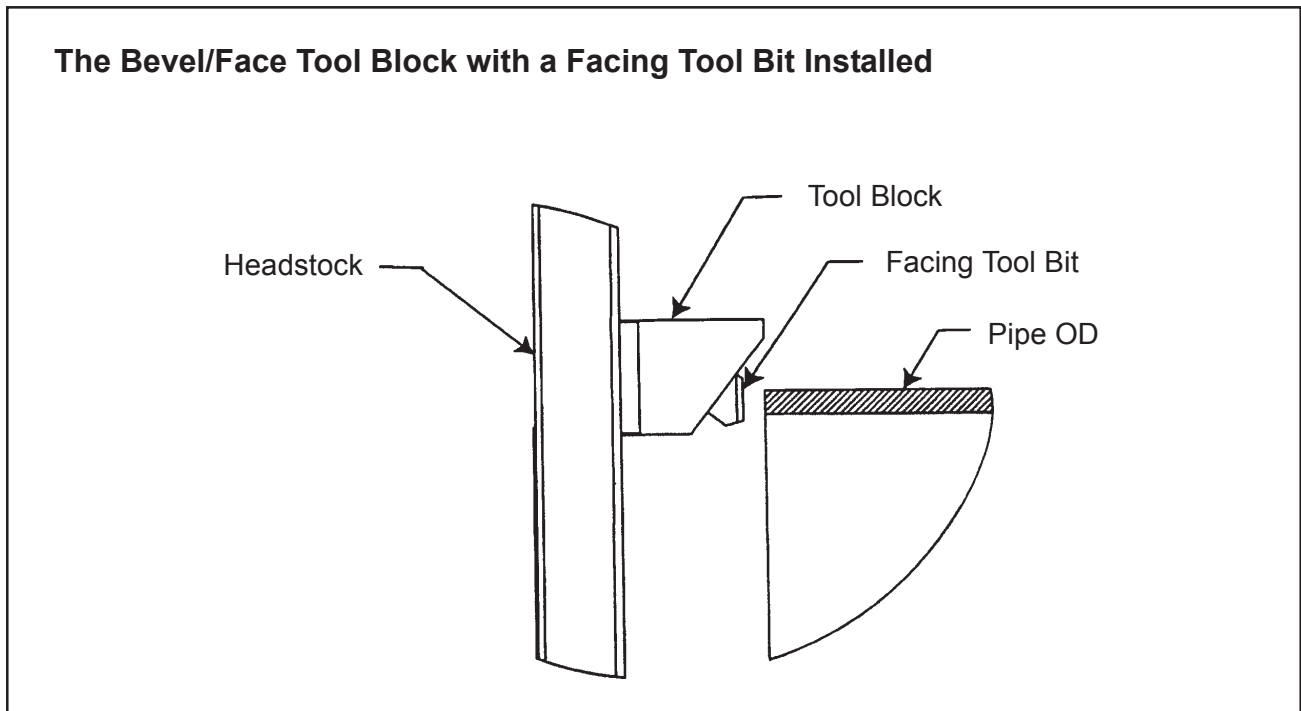




## BEVEL/FACE TOOL BLOCK

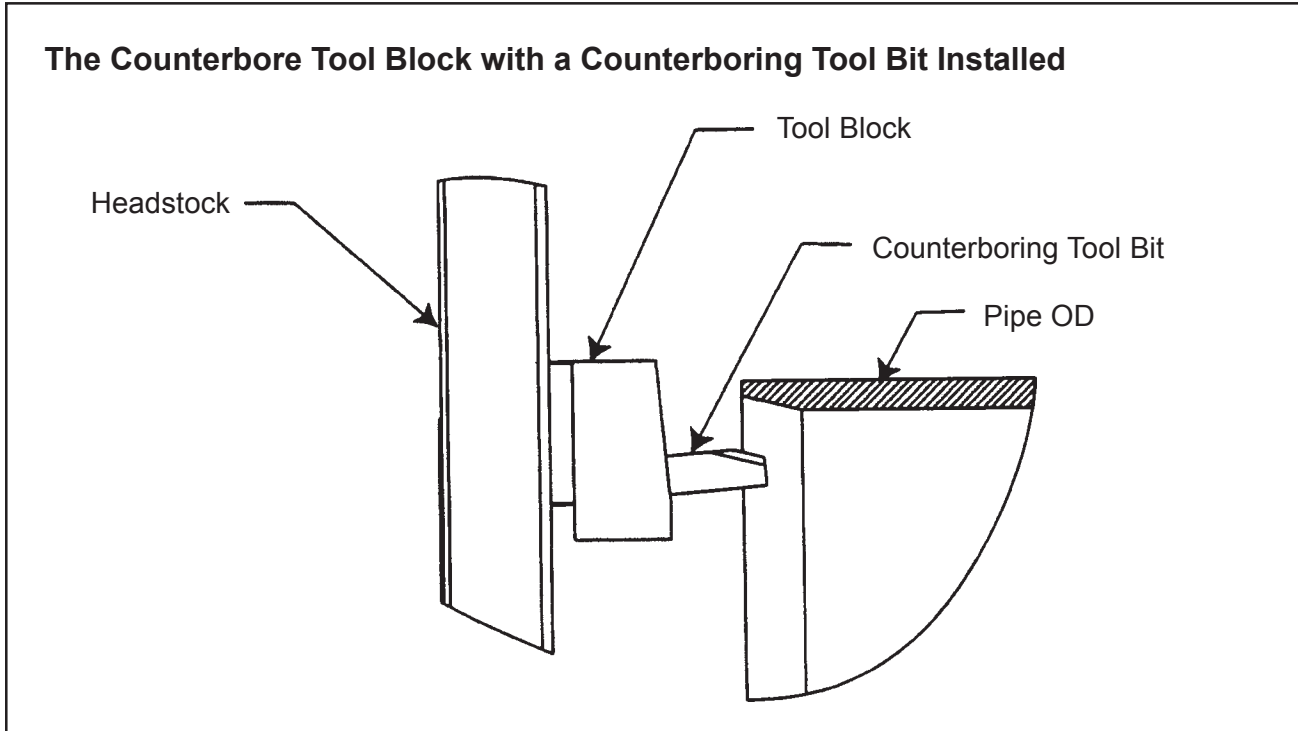
The Bevel/Face Tool Block is designed with a 37.5° angle so that a Straight Tool Bit may be used for beveling and so that when using the 37.5° Facing Tool Bit, the Tool Bit height is adjustable.

Compound Bevel Tool Bits, or J-Bevel Tool Bits, if used, should also be installed in these Tool Block's.



## COUNTERBORE TOOL BLOCK

The Counterbore Tool Block is designed with a 5° back angle to provide Tool Bit clearance.



## INSTALL JAW BLOCKS

To select the proper Jaw Blocks, refer to the 'Jaw Blocks, Ramps and Spacers' section on this manual to help with your choice.

Set the Jaw Blocks into the Ramp Blocks and tighten them.

If the Jaw Blocks do not fit smoothly, check for burrs and remove them with a file.

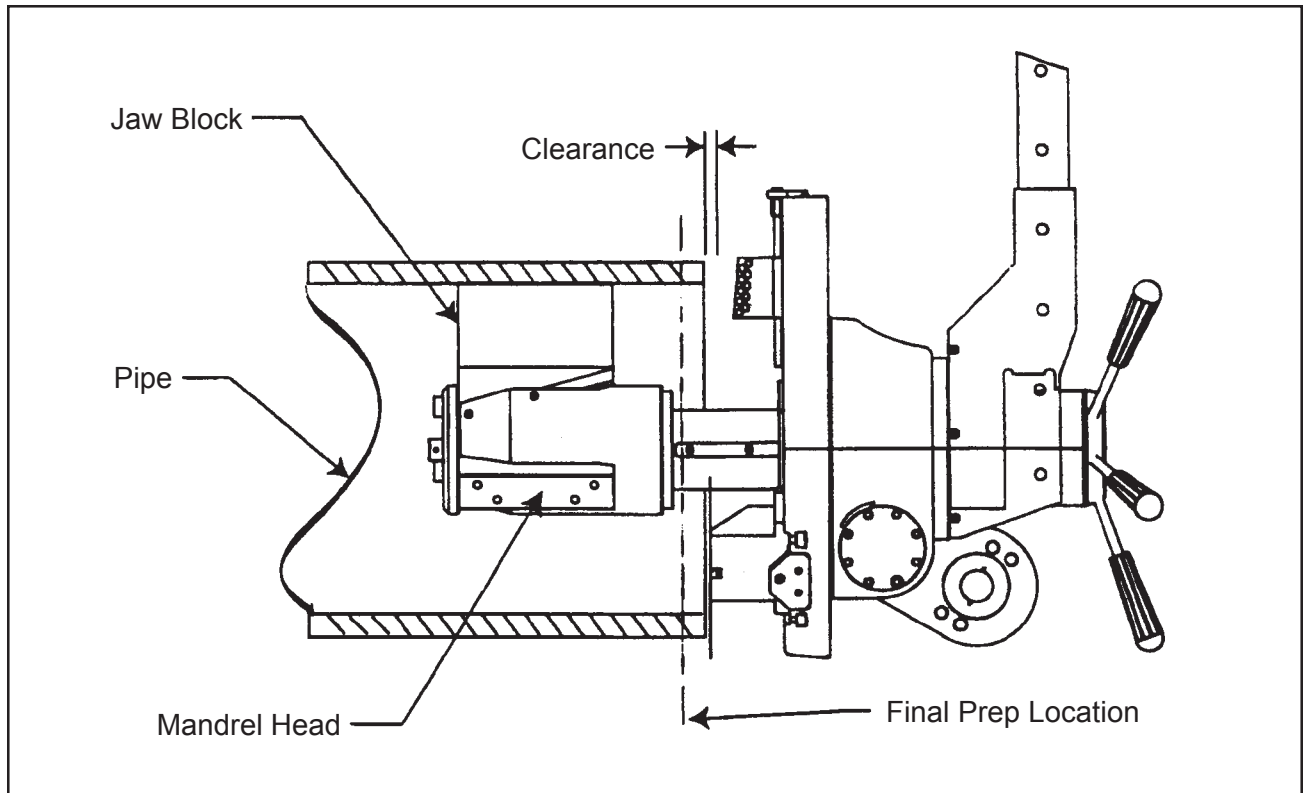
Install the machine into the pipe.

**NOTE:**

In order to avoid cutting the Jaw Blocks with the tool bits during the machining operation, the Jaw Blocks on the Mandrel Head must be installed beyond the final end preparation location.

Tighten the Draw Rod clockwise to force the Jaw Blocks out against the inside diameter of the pipe.

Verify a minimum clearance of 1/8" (3 mm) between the Tool Bit(s) and the pipe face as held by the Mandrel.



Attach the proper supply line to the Drive Motor.

**NOTE:**

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.

Rotate the Feed Knob clockwise to bring the Headstock and pipe closer together.

**CAUTION:**

The actual machining operation will begin when the first Tool Bit makes contact with the pipe.

If the pipe end is not square with the pipe axis, the Tool Bit will contact only a small segment of the pipe during each revolution.

To avoid Tool Bit damage, the feed rate should be very slow until the Tool Bit has contacted the pipe continually for at least one full revolution.

Continue rotating the Feed Knob clockwise until the end of the pipe is completely machined.

Discontinue feed and allow the Headstock to rotate one (1) to three (3) revolutions at low rpm to improve the finish of the prep surface.

Rotate the Feed Knob counterclockwise to separate the Headstock from the pipe.

Turn the Hydraulic Motor off to stop the Headstock rotation.

Loosen the Draw Nut on the Mandrel counter-clockwise to release the pipe.

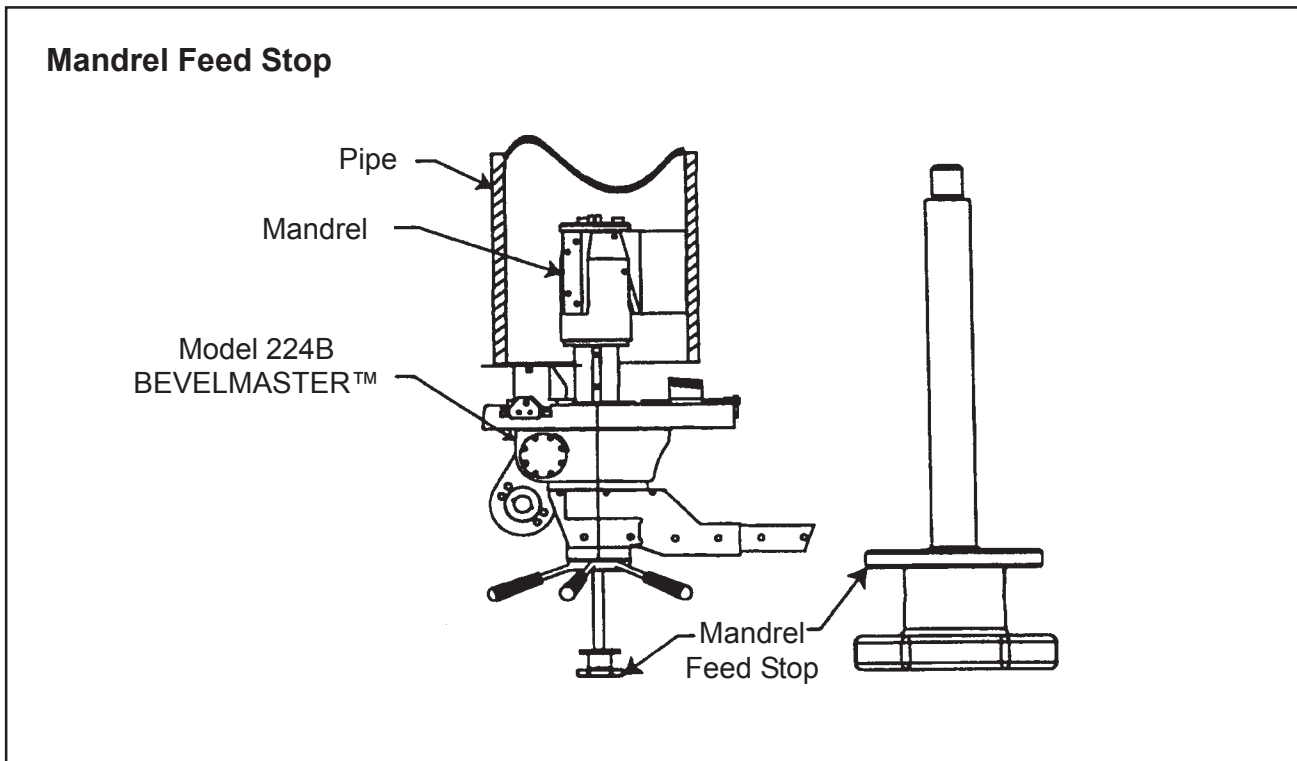
Remove the machine from the pipe.

Check to see if any of the Tool Bits are dull or broken.

Damage or worn Tool Bits are evidenced by increased feed pressure, visual observations, poor surface finish, etc.

**WARNING:** When the Model 224B BEVELMASTER™ Pipe Lathe is mounted for a vertical up cut, the Mandrel Feed Stop must be installed to prevent the machine from falling off of the Mandrel if the Feed Nut is retracted beyond the feed threads.

With the Mandrel Feed Stop installed the feed cannot be retracted to the point of disengaging from the threads.



## USE OF THE MANDREL FEED STOP

When installing the Machine and the Mandrel as a unit, the Mandrel Feed Stop is simply engaged in the Mandrel Actuation Nut after the Mandrel has been secured in the pipe.

When the Mandrel is to be pre-installed by itself, the Mandrel Feed Stop is installed after the Machine has been fitted over the Mandrel.

The Mandrel Feed Travel 5.38" (136.65 mm) is not limited by the Mandrel Feed Stop.

**NOTE:**

The use of the Mandrel Feed Stop does not relieve the Operator(s) from the responsibility of providing safety rigging to prevent the Machine and Mandrel together from falling in the event that the Mandrel is inadvertently release.

## OPERATION OF THE 2-SPEED GEAR BOX

The 2-Speed Gearbox for the Model 224B is equipped with a high and low speed.

The high speed is used for Single Point and the low speed is used for Form Tool.

The motor will be placed on one side of the Gear Box or the opposite side, depending upon the speed to be used.

The Drive Cover is removed by loosening the two (2) Cap Screws and turning the cover clockwise.

The speeds are marked on the side of the Gear Box Housing which will determine the side of the Gear Box to be used.

The motor is placed in the appropriate side by turning counter-clockwise and removed by turning clockwise.

The Drive Cover is placed on the side of the Gearbox not in use.

**CUTTING SPEEDS AND FEEDS**

<b>Pipe Size</b>	<b>True DIA</b>	<b>RPM for 200 in/min (5080 mm/min)</b>	<b>RPM for 250 in/min (6350 mm/min)</b>	<b>RPM for 300 in/min (7620 mm/min)</b>
24"	24.00" (609.6 mm)	3	3	4
20"	20.00" (508.0 mm)	3	4	5
18"	18.00" (457.2 mm)	4	4	5
16"	16.00" (406.4 mm)	4	5	6
14"	14.00" (355.6 mm)	5	6	7
12"	12.75" (323.9 mm)	5	6	7
10"	10.75" (273.1 mm)	6	7	9
8"	8.625" (219.1 mm)	7	9	11
Cutting Speed (approximately)				

Use 200 surface inches per minute (5080 surface millimeters per minute) for:

Stainless steels in general when no coolant is allowed, all heavy-wall tube and some chrome/molybdenum steels.

Use 250 surface inches per minute (6350 surface millimeters per minute) for:

Mild steels and some thin-wall stainless steels when coolants are permitted and applied.

Use 300 surface inches per minute (7620 surface millimeters per minute) for:

Aluminum and some thin-wall mild steel and tube with coolants.

**BASIC FEED RECOMMENDATION**

Use very light feed for initial beveling or until a continuous cut is established.

This is very important for longer tool bit life when cutting through flame cut or out of square pipe ends.

Use adequate feed, .003" (.08 mm) to .006" (.15 mm) per revolution thereafter, to establish a continuous chip cut.

If the feed is too light, only light stringer chips will be removed.

If the feed is too heavy the drive will start to overload and the chip will start to have a rough or torn appearance.

Stainless steel, which work hardens, must be worked with a heavy enough feed to stay under the work hardened surface .003" (.08 mm) to .006" (.15 mm) feed. Never allow the Tool Bit to burnish the surface.

Reduced feed and speeds will normally minimize chatter problems.

**STANDARD  
JAW BLOCKS, RAMPS AND SPACERS  
(8" THROUGH 24" PIPE)**

<b>ID Mounting Range</b>	<b>Standard Ramp (3 Req'd)</b>	<b>Jaw Block Assembly (3 Req'd)</b>	<b>Spacer Assembly (3 Req'd)</b>
6.813" thru 8.900" 173.1 mm thru 226.1 mm	48-1250		
8.700" thru 10.750" 221.0 mm thru 273.1 mm	48-1250	08-0561	
10.650" thru 12.700" 270.5 mm thru 322.6 mm	48-1250	08-0562	
12.600" thru 14.700" 320.0 mm thru 373.4 mm	48-1250	08-0563	
14.600" thru 16.680" 370.8 mm thru 423.7 mm	48-1250	08-0564	
16.580" thru 18.660" 421.1 mm thru 474.0 mm	48-1250	08-0561	08-0566
18.560" thru 20.660" 471.4 mm thru 524.5 mm	48-1250	08-0562	08-0566
20.550" thru 22.650" 522.0 mm thru 575.3 mm	48-1250	08-0563	08-0566
22.550" thru 24.630" 572.7 mm thru 625.6 mm	48-1250	08-0564	08-0566
Standard Jaw Block Assembly Ranges			

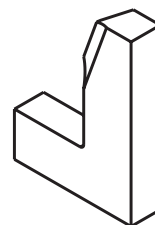


**EXTENSION KIT  
(24" THROUGH 42" PIPE)**

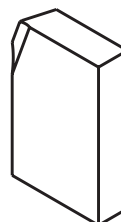
<b>ID Mounting Range</b>	<b>Standard Ramp (3 Req'd)</b>	<b>Jaw Block Assembly (3 Req'd)</b>	<b>Spacer Assembly (3 Req'd)</b>
24.530" thru 26.630" 623.1 mm thru 676.4 mm	48-1250	08-0561	08-0567
26.530" thru 28.620" 673.8 mm thru 726.9 mm	48-1250	08-0562	08-0567
28.520" thru 30.620" 724.4 mm thru 777.7 mm	48-1250	08-0563	08-0567
30.520" thru 32.610" 775.2 mm thru 828.3 mm	48-1250	08-0564	08-0567
32.510" thru 34.610" 825.8 mm thru 879.1 mm	48-1250	08-0561	08-0566 08-0567
34.510" thru 36.610" 876.6 mm thru 929.9 mm	48-1250	08-0562	08-0566 08-0567
36.510" thru 38.600" 927.4 mm thru 980.4 mm	48-1250	08-0563	08-0566 08-0567
38.500" thru 40.6000" 977.9 mm thru 1031.2 mm	48-1250	08-0564	08-0566 08-0567
40.500" thru 42.000" 1028.7 mm thru 1066.8 mm	48-1250	08-0569	08-0566 08-0567
Standard Jaw Block Assembly Ranges			

## STANDARD TOOL BITS

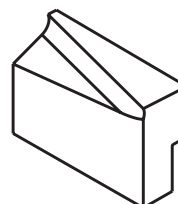
Tool Bit, Counterbore, 4:1  
(P/N 99-1939)  
8.50" to 24.00"  
(216.0mm to 609.6mm) DIA Range



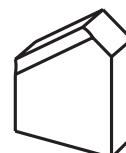
Tool Bit, Counterbore, 4:1  
(P/N 99-2090)  
24.00" to 42.00"  
(609.6mm to 1066.8mm) DIA Range



Tool Bit, Beveling, 37.5°  
(P/N 99-0009)



Tool Bit, Facing  
(P/N 99-0016)



Tool Bits for special applications are quoted upon request.

## 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

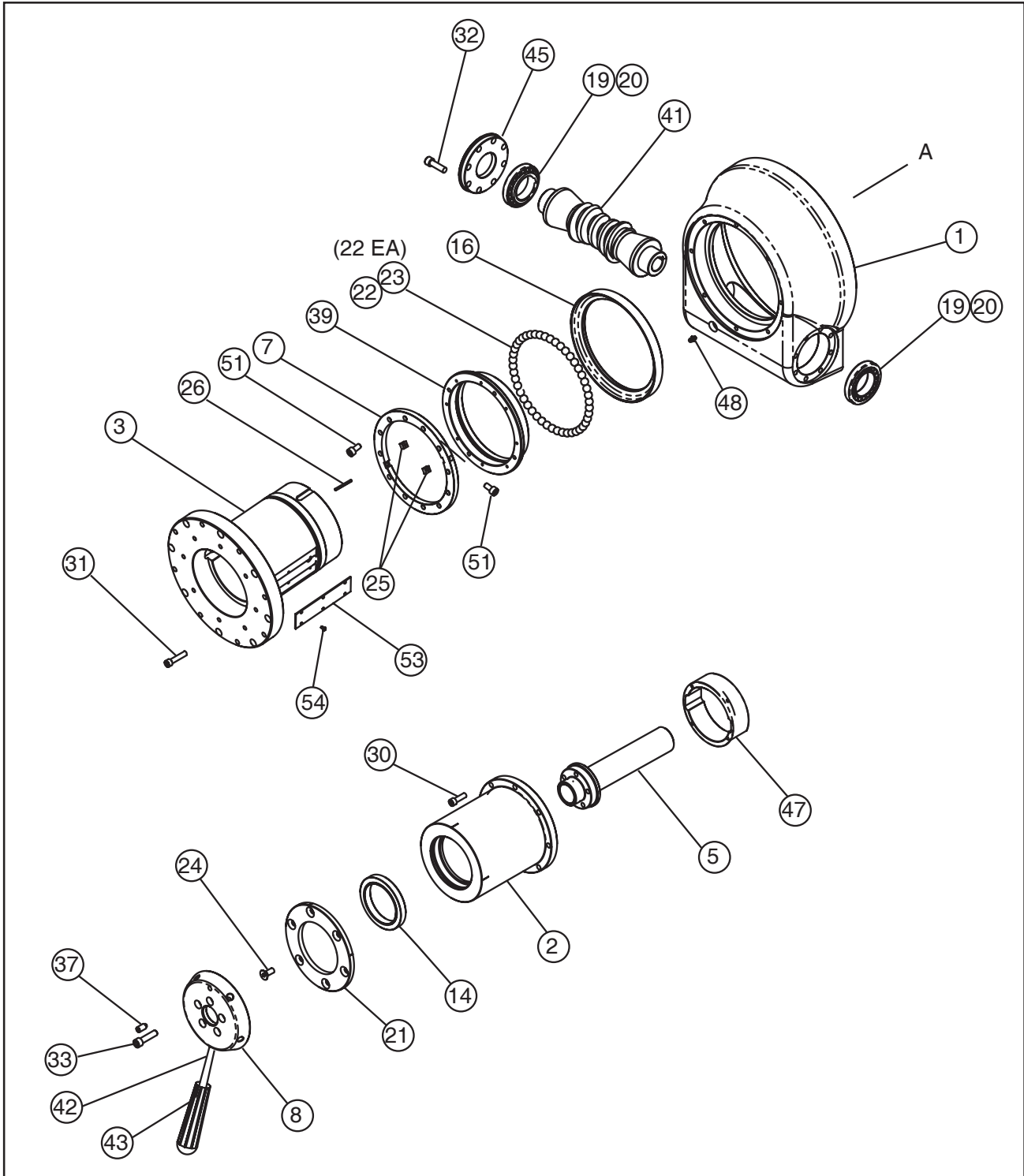
The following accessories are recommended for use with the Model 224B BEVELMASTER™ and are available from TRI TOOL INC.

1. Single Point Module Kit
2. ID Tracking Module Kit
3. Miter Mandrel Head Kit
4. Jaw Block Extension Kit, 24" - 42"
5. Miter Mandrel Extension Kit
6. Floor Stand
7. Air Caddy
8. Spring Hanger Assembly

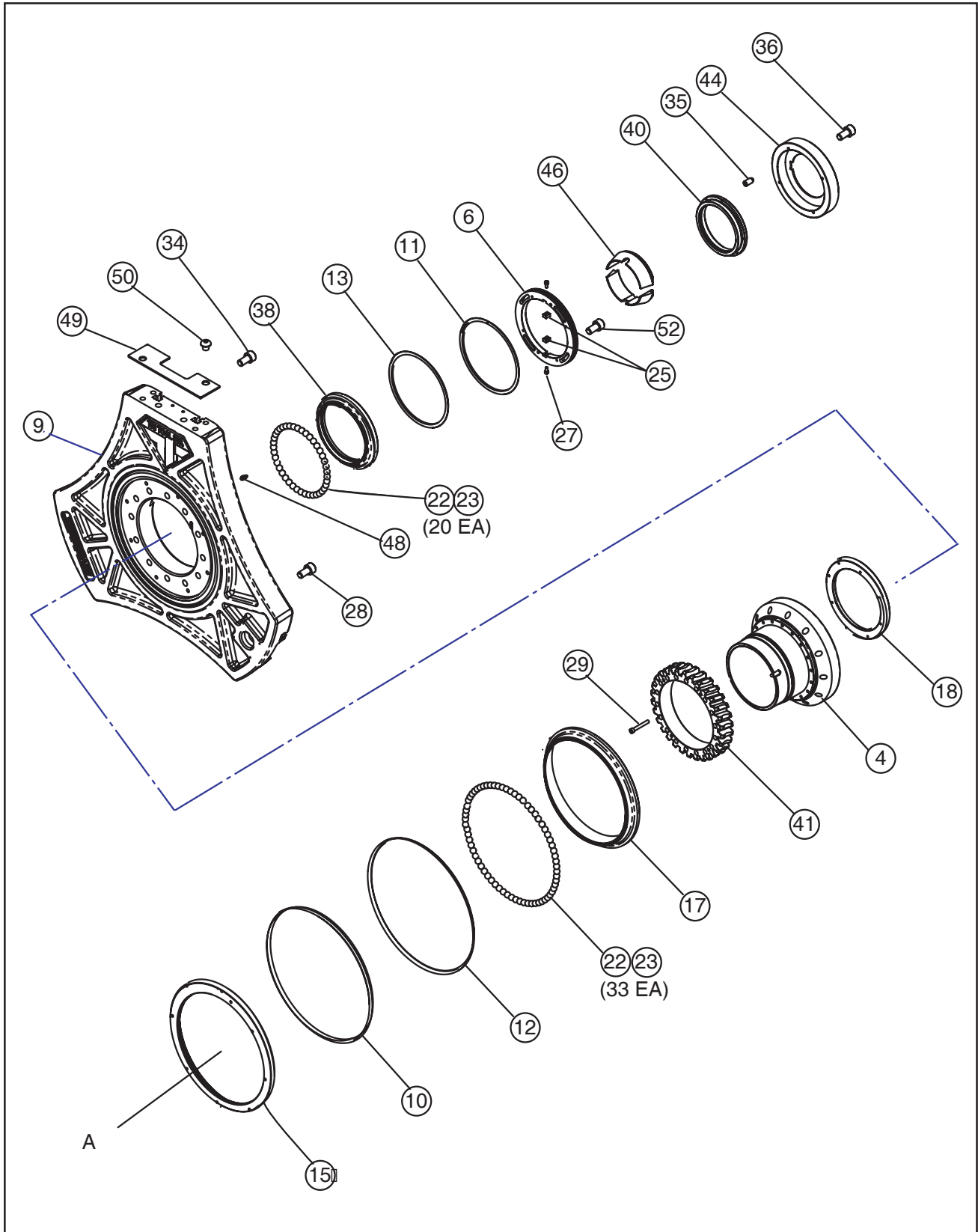
A portable Air Caddy (FRL) is required to protect the warranty on all TRI TOOL Inc. air driven tools.

# ILLUSTRATED PARTS BREAKDOWN

## MODEL 224B SUB-ASSEMBLY (1 of 2)



MODEL 224B SUB-ASSEMBLY (2 of 2)



**TRI TOOL INC.**

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## Parts List, Model 224B Sub-Assembly

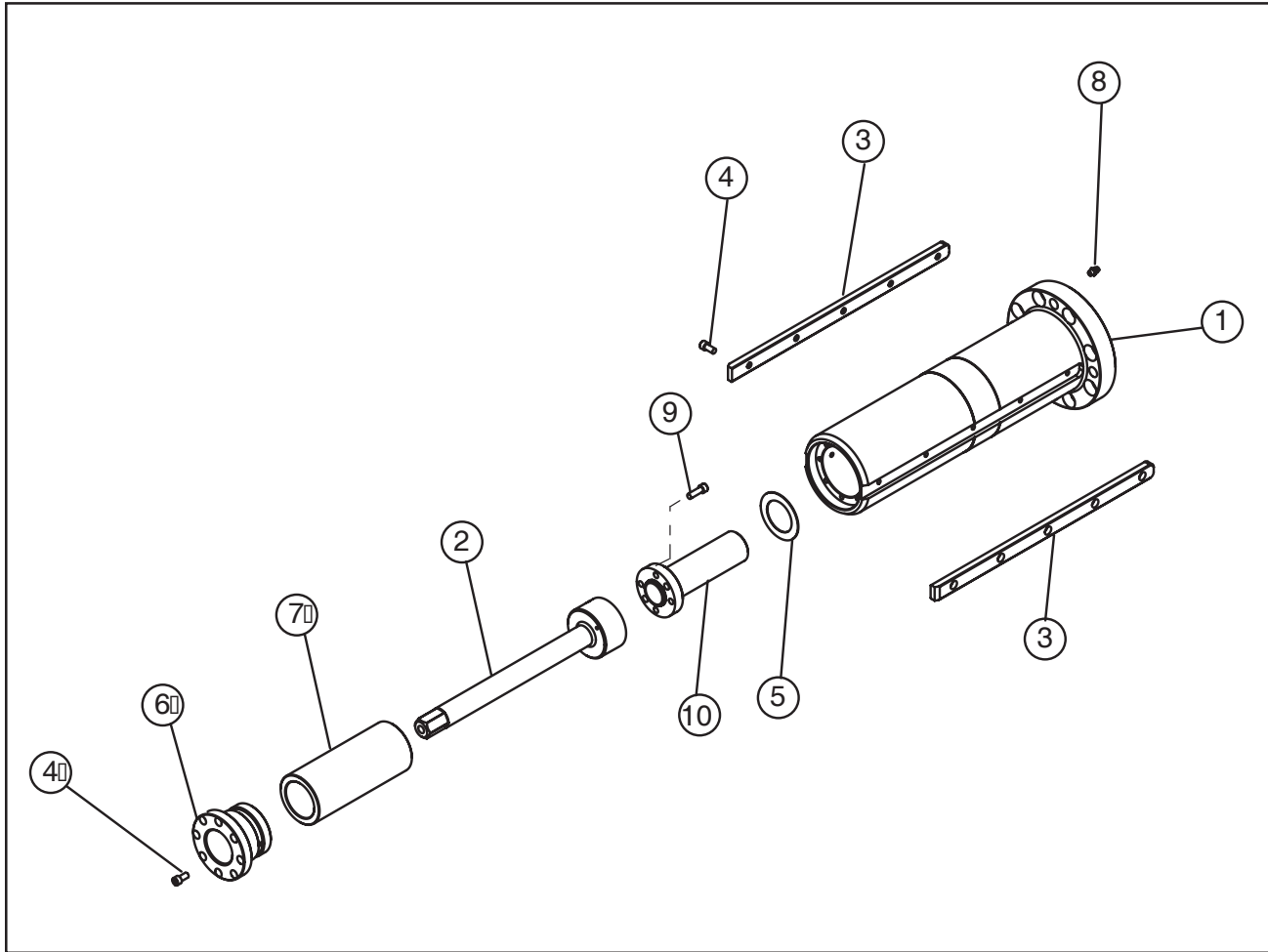
<b>Item No.</b>	<b>Part No.</b>	<b>Description</b>	<b>Qty</b>
1.	19-0835	HOUSING, MAIN	1
2.	19-0996	HOUSING, FEED	1
3.	19-0868	HOUSING, MAIN, TORQUE	1
4.	20-0716	SHAFT, MAIN	1
5.	20-0717	SHAFT, FEED	1
6.	24-1602	PLATE, LOCKING, FRONT	1
7.	24-1603	PLATE, LOCKING, REAR	1
8.	24-1610	PLATE, HANDLE	1
9.	24-1611	PLATE, MAIN	1
10.	28-0057	SEAL, FELT	41"
11.	28-0057	SEAL, FELT	22"
12.	28-0176	SEAL, EXTRUDED	40"
13.	28-0176	SEAL, EXTRUDED	22"
14.	29-0002	BEARING, BALL	1
15.	29-0367	BEARING, OUTER RACE, FRONT, LARGE	1
16.	29-0368	BEARING, OUTER RACE, REAR	1
17.	29-0369	BEARING, INNER RACE, FRONT, LARGE	1
18.	29-0370	BEARING, RACE, FRONT, OUTER, SMALL	1
19.	29-0388	BEARING, TAPER CUP	2
20.	29-0389	BEARING, TAPER CONE	2
21.	24-2112	PLATE, RETAINING	1
22.	30-2824	BALL, STEEL CHROME	75
23.	30-2825	BALL, TEFLON	75
24.	33-0369	SCREW, FLAT, 5/16-18 X 3/4"	6
25.	31-0191	KEY, 1/4" X 3/8" X 13/32"	4
26.	32-0030	PIN, ROLL, 1/8" DIA X 1 1/2"	2
27.	33-0027	SCREW, CAP, #10-24 X 3/8"	2
28.	33-0042	SCREW, CAP, 1/4-20 X 1"	8
29.	33-0045	SCREW, CAP, 1/4-20 X 1 3/4"	18
30.	33-0056	SCREW, CAP, 5/16-18 X 1"	8
31.	33-0058	SCREW, CAP, 5/16-18 X 1 1/2"	8
32.	33-0071	SCREW, CAP, 3/8-16 X 1"	8
33.	33-0073	SCREW, CAP, 3/8-16 X 1 1/2"	5



## Parts List, Model 224B Sub-Assembly Continued

<b>Item No.</b>	<b>Part No.</b>	<b>Description</b>	<b>Qty</b>
34.	33-0107	SCREW, CAP, 1/2-13 X 1 1/2"	12
35.	33-1335	SCREW, SET, HALF DOG, #10-24 X 3/8"	8
36.	33-1876	SCREW, BUTTON HEAD, #10-24 X 1 1/4"	4
37.	33-2179	SCREW, SET, HALF DOG, 3/8-16 X 3/4"	1
38.	35-0545	NUT, ADJUST, BEARING RACE, FRONT	1
39.	35-0546	NUT, ADJUST, BEARING RACE, REAR	1
40.	35-0547	NUT, LOCKING, FRONT	1
41.	39-0862	GEAR, SET	1
42.	41-0157	HANDLE, FEED	5
43.	42-0197	KNOB, RIBBED, TAPERED	5
44.	43-0549	COVER, DUST	1
45.	43-0554	COVER	1
46.	45-0292	BUSHING, SPLIT	1
47.	45-0293	BUSHING, REAR	1
48.	54-0375	FITTING, GREASE	2
49.	24-1736	PLATE, COVER	1
50.	33-2191	SCREW, BUTTON HEAD, 12-13 X 3/4"	2
51.	33-0028	SCREW, CAP, #10-24 X 1/2"	6
52.	33-0039	SCREW, CAP, 1/4-20 X 5/8"	4
53.	43-0743	COVER, MAIN, TORQUE	2
54.	33-1448	SCREW, BUTTON, #5-40 X 1/4"	12

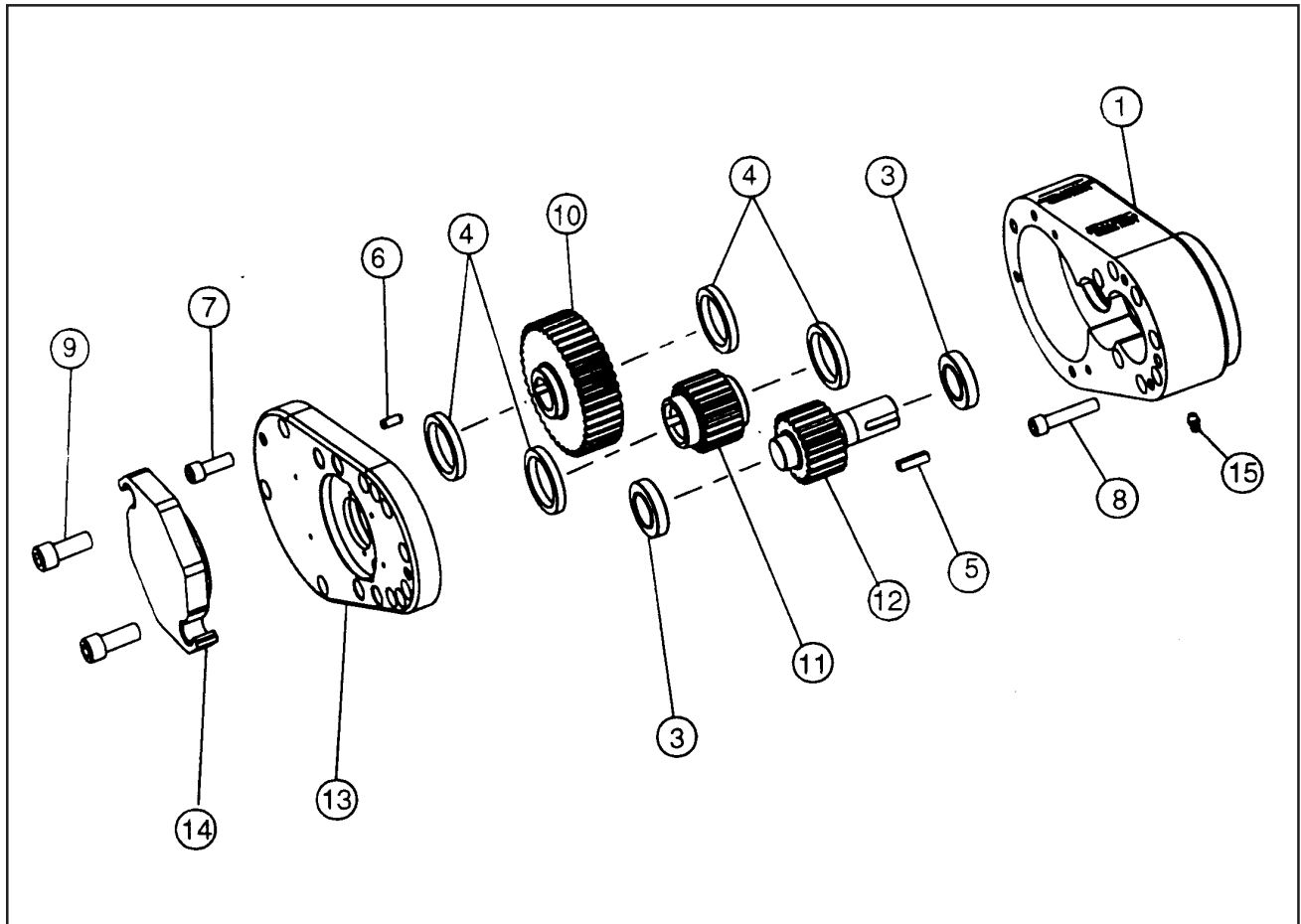
**MANDREL ASSEMBLY (P/N 06-0438)**



Parts List, Mandrel Assembly (P/N 06-0438)

Item No.	Part No.	Description	Qty
1.	13-0441	MANDREL	1
2.	20-0810	SHAFT, WRENCH	1
3.	31-0180	KEY, MANDREL	2
4.	33-0038	SCREW, CAP, 1/4-20 X 1/2"	18
5.	34-0367	WASHER, THRUST	1
6.	35-0548	NUT, DRIVE	1
7.	44-0501	SPACER, SHAFT	1
8.	54-0375	FITTING, GREASE	1
9.	33-0040	SCREW, CAP, 1/4-20 X 3/4"	4
10.	35-0599	NUT, DRAW	1

**GEARBOX HOUSING ASSEMBLY (P/N 19-0867)**



Parts List, Gearbox Housing Assembly (P/N 19-0867)

Item No.	Part No.	Description	Qty
1.	19-0866	HOUSING, GEARBOX	1
2.	----		
3.	29-0065	BEARING, BALL	2
4.	29-0386	BEARING, BALL	4
5.	31-0055	KEY	1
6.	32-0206	PIN, DOWEL, 1/4" DIA X 5/8"	2
7.	33-0071	SCREW, CAP, 3/8-16 X 1"	5
8.	33-0074	SCREW, CAP, 3/8-16 X 1 3/4"	7
9.	33-0105	SCREW, CAP, 1/2-13 X 1"	2
10.	39-0893	GEAR, INPUT #1	1
11.	39-0894	GEAR, INPUT #2	1

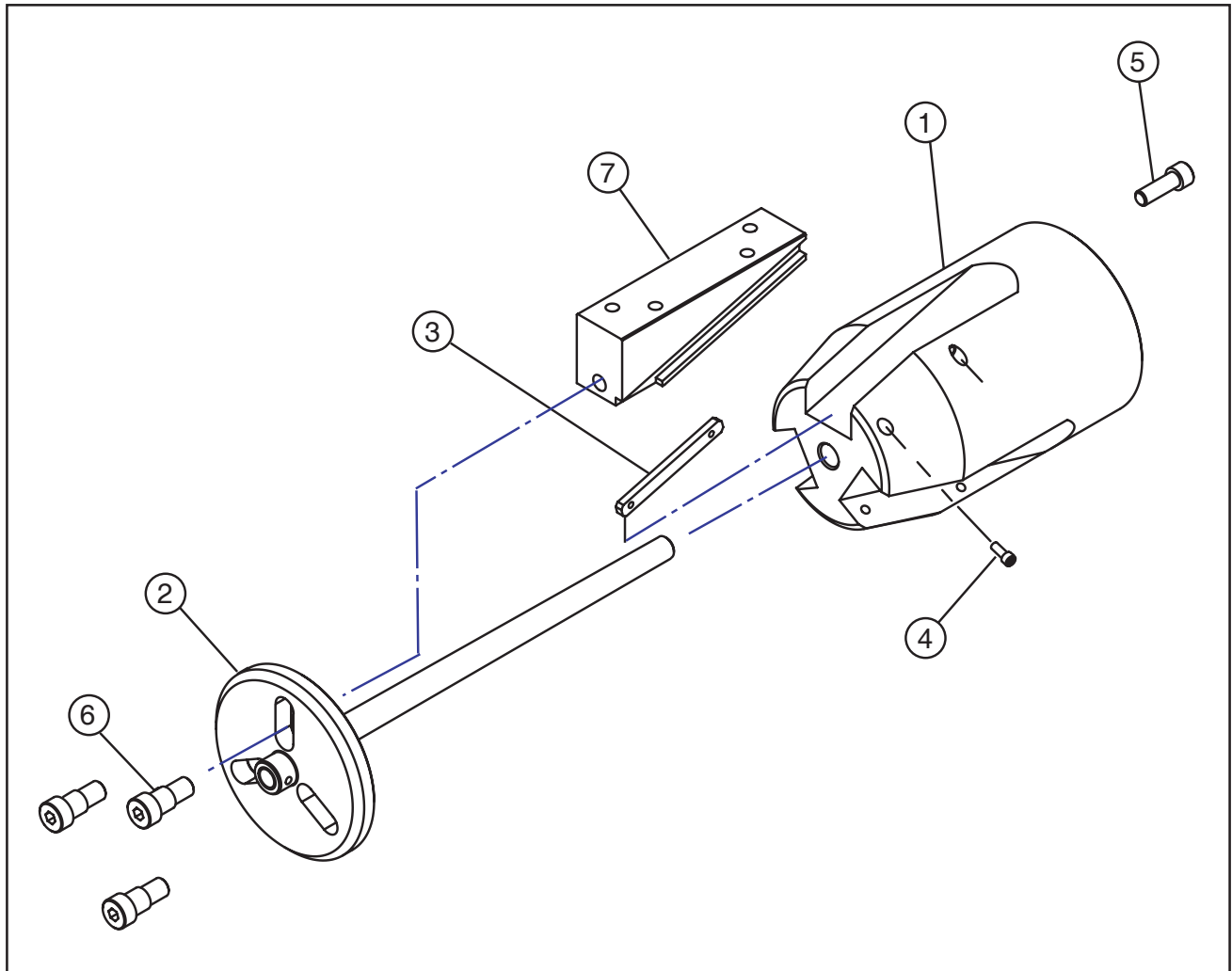
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## Parts List, Gearbox Housing Assembly (P/N 19-0867) Continued

<b>Item No.</b>	<b>Part No.</b>	<b>Description</b>	<b>Qty</b>
12.	39-0895	GEAR, OUTPUT	1
13.	43-0548	COVER, GEARBOX	1
14.	43-0556	COVER, DRIVE	1
15.	54-0375	FITTING, GREASE	1

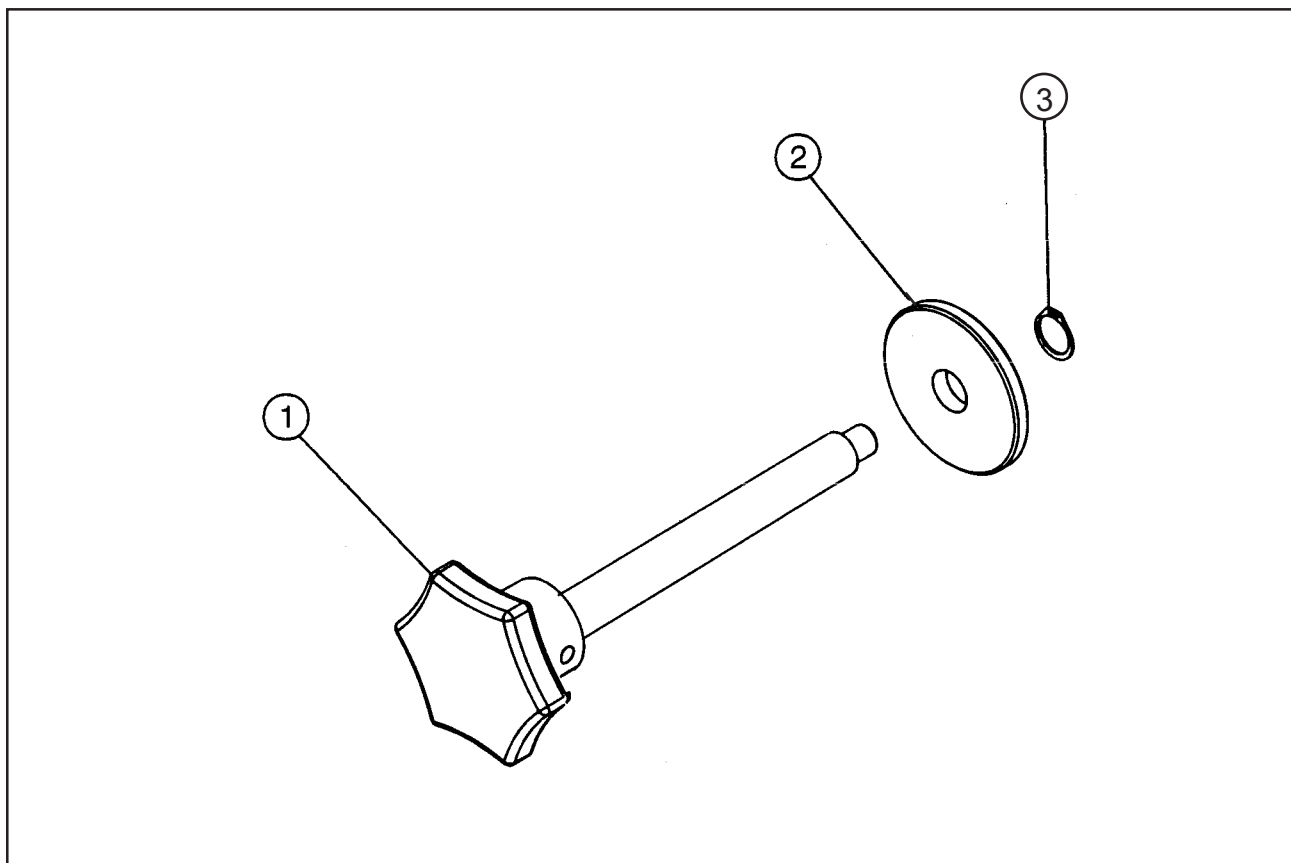
**MANDREL HEAD ASSEMBLY (P/N 21-0545)**



Parts List, Mandrel Head Assembly (P/N 21-0545)

Item No.	Part No.	Description	Qty
1.	21-0517	HEAD, MANDREL	1
2.	24-1706	PLATE ASSEMBLY, BUTT	1
3.	31-0181	KEY, RAMP BLOCK	1
4.	33-0039	SCREW, CAP, 1/4 - 20 X 5/8"	6
5.	33-0107	SCREW, CAP, 1/2 - 13 X 1 1/2"	8
6.	33-1912	SCREW, SHOULDER, 3/4" X 3/4"	3
7.	48-1250	BLOCK, RAMP	3

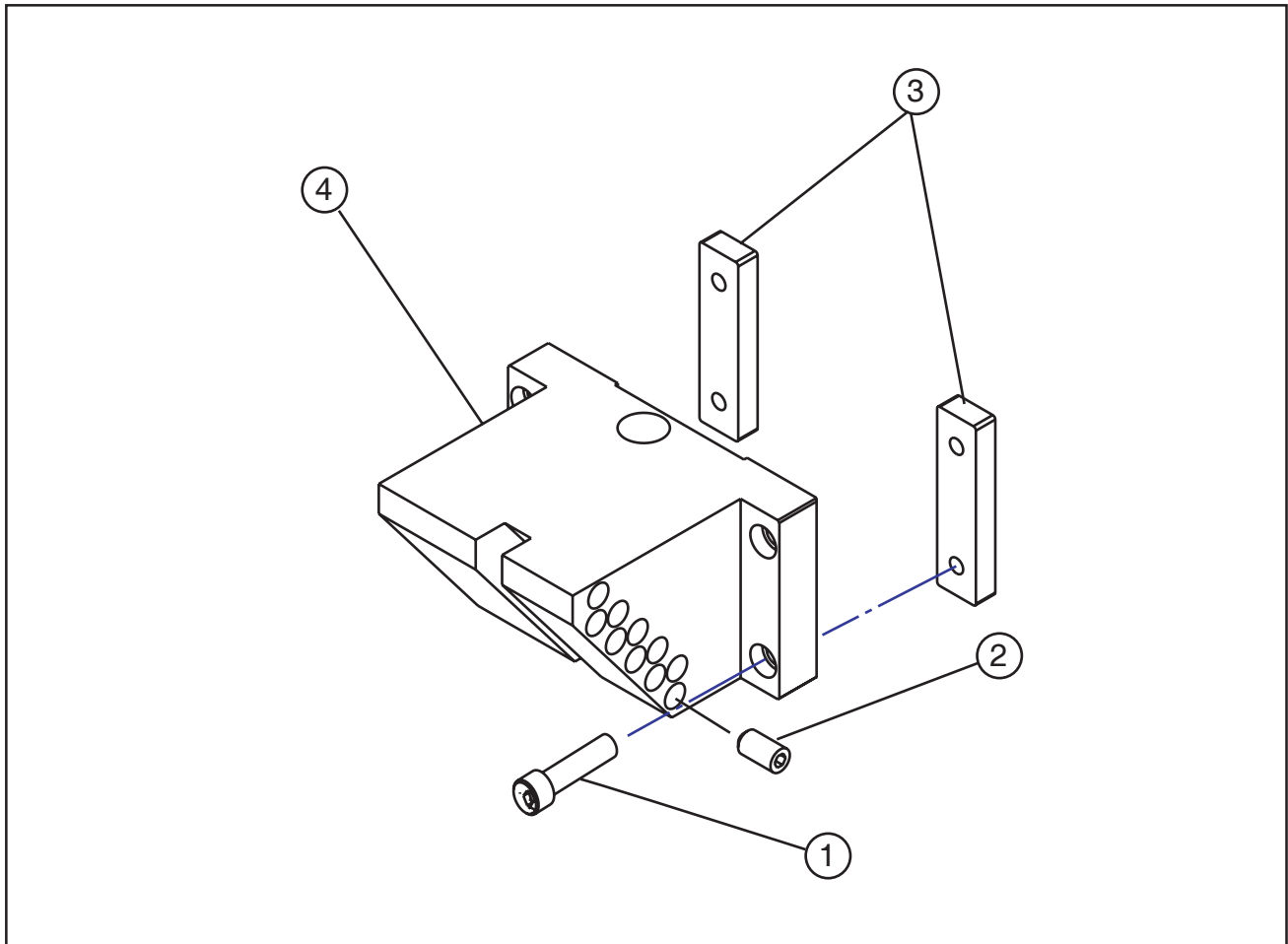
FEED STOP ASSEMBLY (P/N 42-0195)



Parts List, Feed Stop Assembly (P/N 42-0195)

Item No.	Part No.	Description	Qty
1.	42-0194	KNOB, ASSEMBLY	1
2.	34-0306	WASHER	1
3.	30-0011	RING, RETAINING, EXTERNAL	1

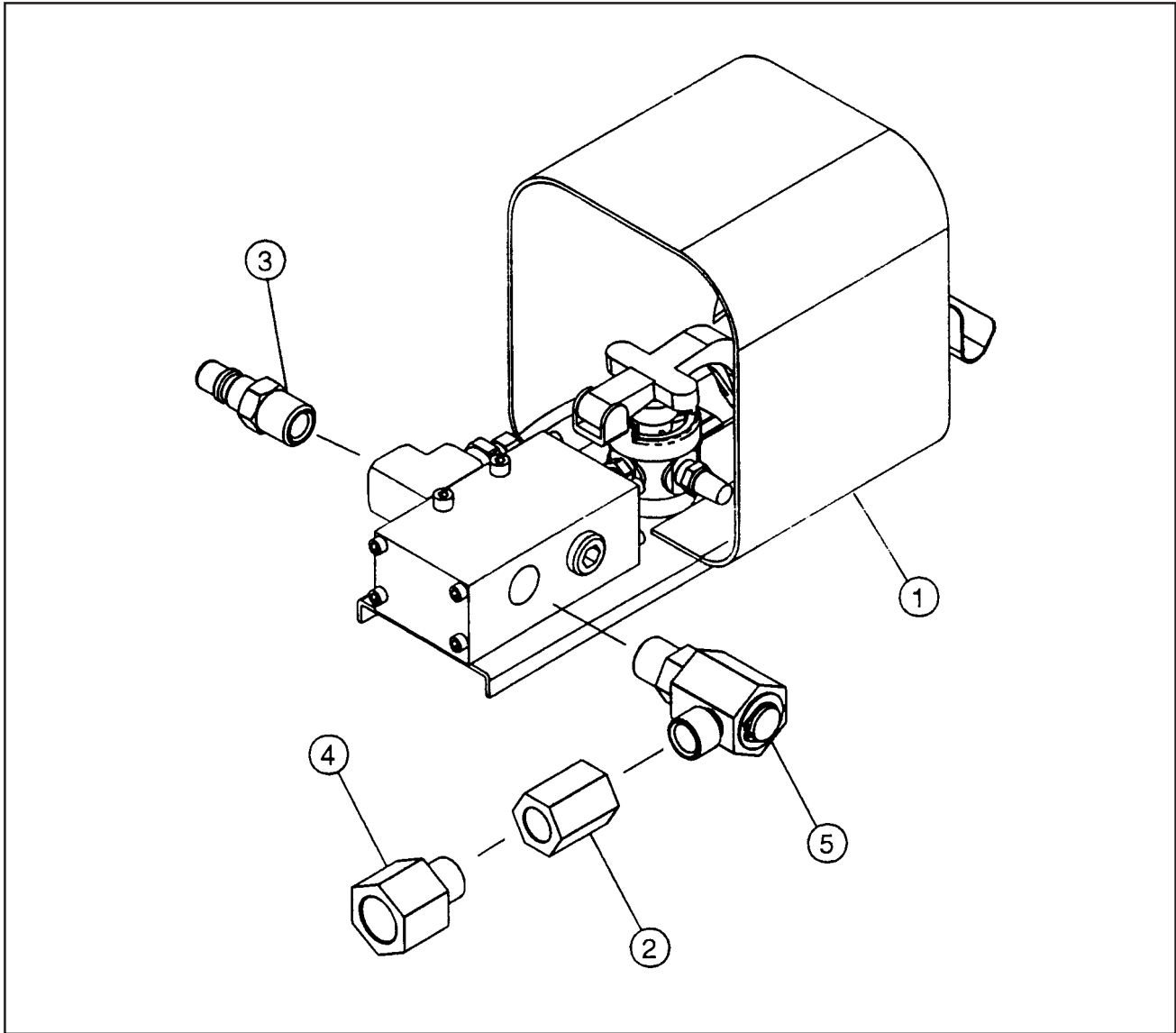
**TOOL HOLDER ASSEMBLY**



Parts List, Tool Holder Assembly

Item No.	Part No.	Description	Qty
TOOL HOLDER ASSEMBLY, BEVEL/FACE (P/N 49-0394)			
1.	33-0057	SCREW, CAP, 5/16-18 X 1 1/4"	4
2.	33-0530	SCREW, SET, CUP POINT, 3/8-16 X 5/8"	10
3.	35-0551	NUT, T-SLOT PLATE	2
4.	49-0365	HOLDER, TOOL, BEVEL/FACE	1
TOOL HOLDER ASSEMBLY, C'BORE (P/N 49-0395)			
1.	33-0057	SCREW, CAP, 5/16-18 X 1 1/4"	4
2.	33-0530	SCREW, SET, CUP POINT, 3/8-16 X 5/8"	10
3.	35-0551	NUT, T-SLOT PLATE	2
4.	49-0366	HOLDER, TOOL, C'BORE	1

FOOT PEDAL VALVE ASSEMBLY (P/N 53-0079)

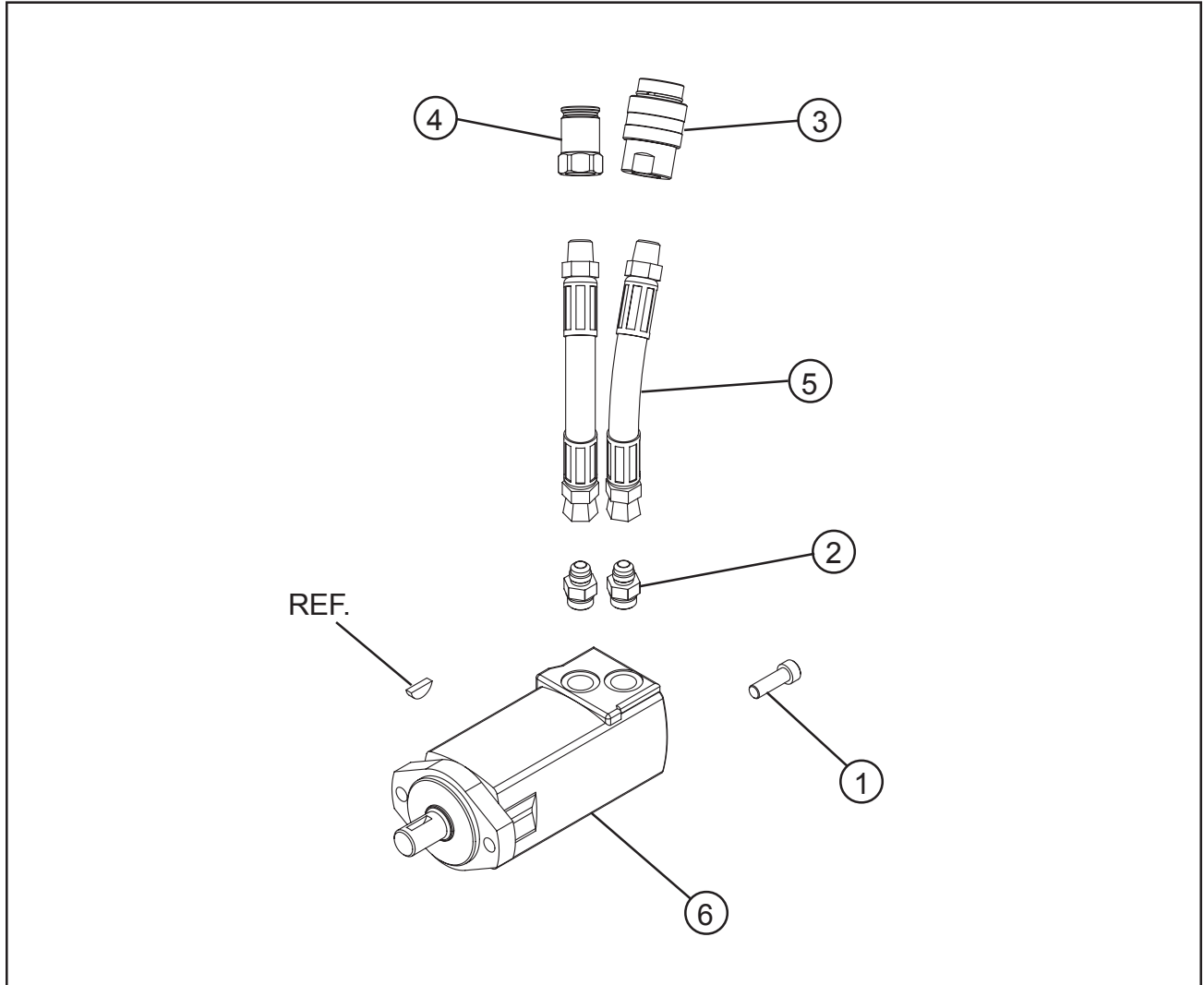


Parts List, Foot Pedal Valve Assembly (P/N 53-0079)

Item No.	Part No.	Description	Qty
1.	53-0078	VALVE ASSEMBLY, FOOT PEDAL	1
2.	54-0093	COUPLING, 1/2" IPIPE	1
3.	54-0126	COUPLING, MALE QD TO 1/2" EPIPE	1
4.	54-0132	ADAPTER, 1/2" EPIPE TO 3/4" IPIPE	1
5.	54-0204	SWIVEL JOINT, 1/2" EPIPE TO 1/2" EPIPE	1
NOT SHOWN			
	55-0213	HOSE ASSEMBLY, 3/4" ID X 10' LG	1



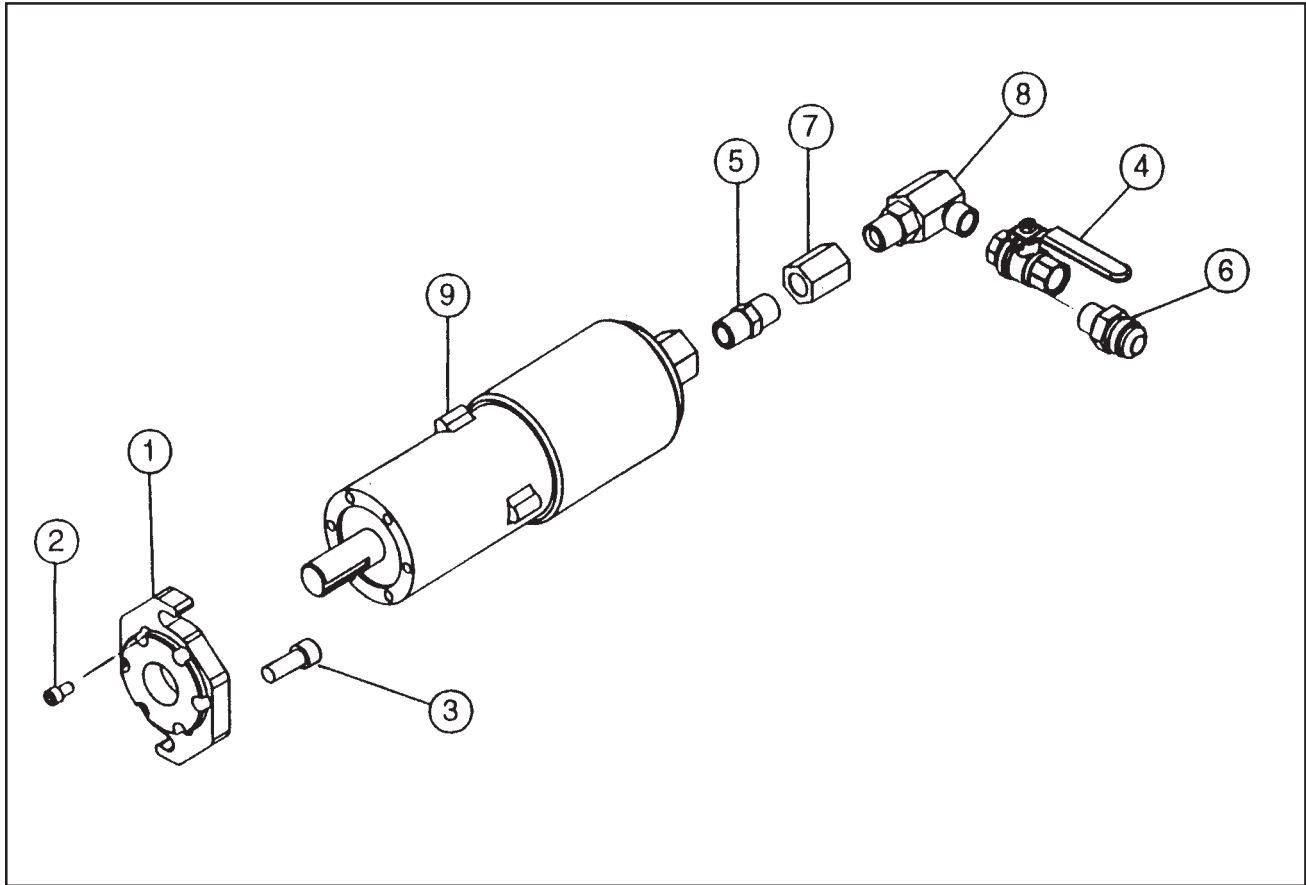
HYDRAULIC MOTOR ASSEMBLY (P/N 56-0061)



Parts List, Hydraulic Motor Assembly (P/N 56-0061)

Item No.	Part No.	Description	Qty
1.	33-0106	SCREW, CAP, 1/2-13 X 1 1/4"	2
2.	54-0002	ADAPTER	2
3.	54-0333	COUPLER, QD, HYD., DRIPLESS, FEMALE	1
4.	54-0334	COUPLER, QD, HYD., DRIPLESS, MALE	1
5.	55-0156	HOSE ASSEMBLY, HYDRAULIC	2
6.	56-0002	MOTOR, HYDRAULIC	1
REF.	31-0001	KEY, WOODRUFF, 1/4" X 1" DIA	1
NOT SHOWN			
	54-0335	DUST PLUG, DRIPLESS	2

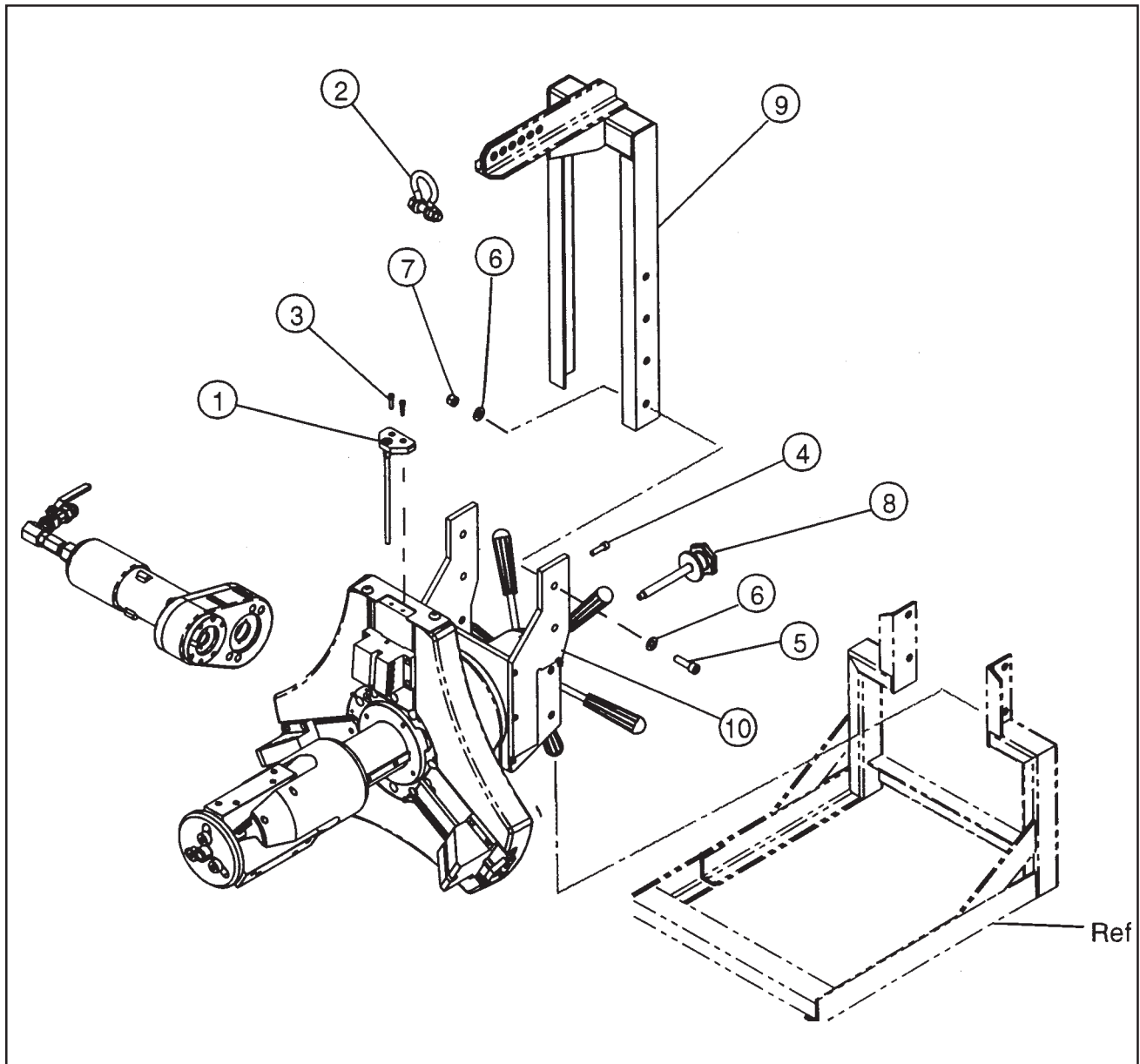
INLINE AIR MOTOR ASSEMBLY (P/N 57-0248)



Parts List, Inline Air Motor Assembly (P/N 57-0248)

Item No.	Part No.	Description	Qty
1.	27-0659	ADAPTER, MOTOR	1
2.	33-0052	SCREW, CAP, 5/16-18 X 1/2"	1
3.	33-0106	SCREW, CAP, 1/2-13 X 1 1/4"	2
4.	53-0016	VALVE, BALL, SHUTOFF	1
5.	54-0019	NIPPLE	1
6.	54-0046	ADAPTER	1
7.	54-0093	COUPLING	1
8.	54-0204	SWIVEL, JOINT	1
9.	57-0020	MOTOR, AIR	1

MODEL 224B BEVELMASTER™



Parts List, Model 224B BEVELMASTER™

Item No.	Part No.	Description	Qty
1.	14-0085	ROD ASSEMBLY, ADJUST	3
2.	30-2760	SHACKLE, ANCHOR	1
3.	33-0040	SCREW, CAP, 1/4-20 X 3/4"	6
4.	33-0072	SCREW, CAP, 3/8-16 X 1 1/4"	8
5.	33-0108	SCREW, CAP, 1/2-13 X 1 3/4"	4

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## Parts List, Model 224B BEVELMASTER™

<b>Item No.</b>	<b>Part No.</b>	<b>Description</b>	<b>Qty</b>
6.	34-0020	WASHER, FLAT	8
7.	35-0254	NUT	4
8.	42-0195	FEED STOP ASSEMBLY, MANDREL	1
9.	47-1282	BRACKET, LIFTING	1
10.	47-1283	BRACKET, MOUNTING	1
NOT SHOWN			
	05-1347	WRENCH KIT	1
	36-0003	WRENCH, L 3/32" HEX	1
	36-0005	WRENCH, L, 1/8" 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
	36-0021	WRENCH, T, 3/16" HEX	1
	36-0063	WRENCH, COMBINATION, 3/4"	1
	36-0109	T-HANDLE, SLIDING, 1/2" SQ	1
	36-0132	WRENCH ASSEMBLY, SPANNER	1
	36-0187	EXTENSION, DRIVE, 1/2" SQ X 10"	1
	36-0242	SOCKET, DP, 7/8" HEX, 1/2" DRIVE	1
	60-0090	FLOOR, STAND (OPTIONAL)	REF