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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, etc. clear of rotating equipment. Do not use power cutting 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.

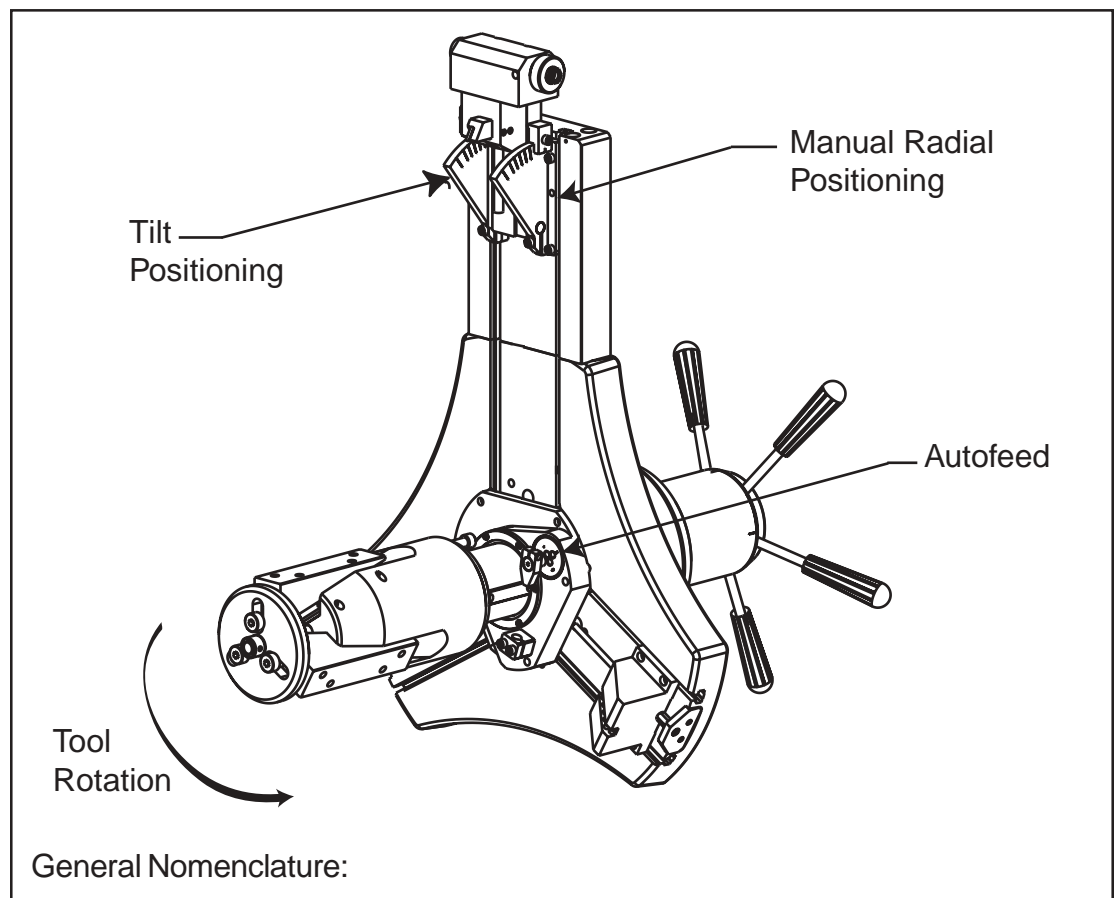
Handle chips with care. Chips have very sharp edges and are hot. Do not try to pull chips apart with bare hands; they are very tough.

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 which 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 Single Point is supplied as a kit with modular components assembled onto the face of the 224B BEVELMASTER™. The 224B then mounts on the flange or pipe I.D. When used in conjunction with the 224B Miter Mandrel, the 224B Single Point / Flange Facer Kit miters to align to the flange face.



SPECIFICATIONS

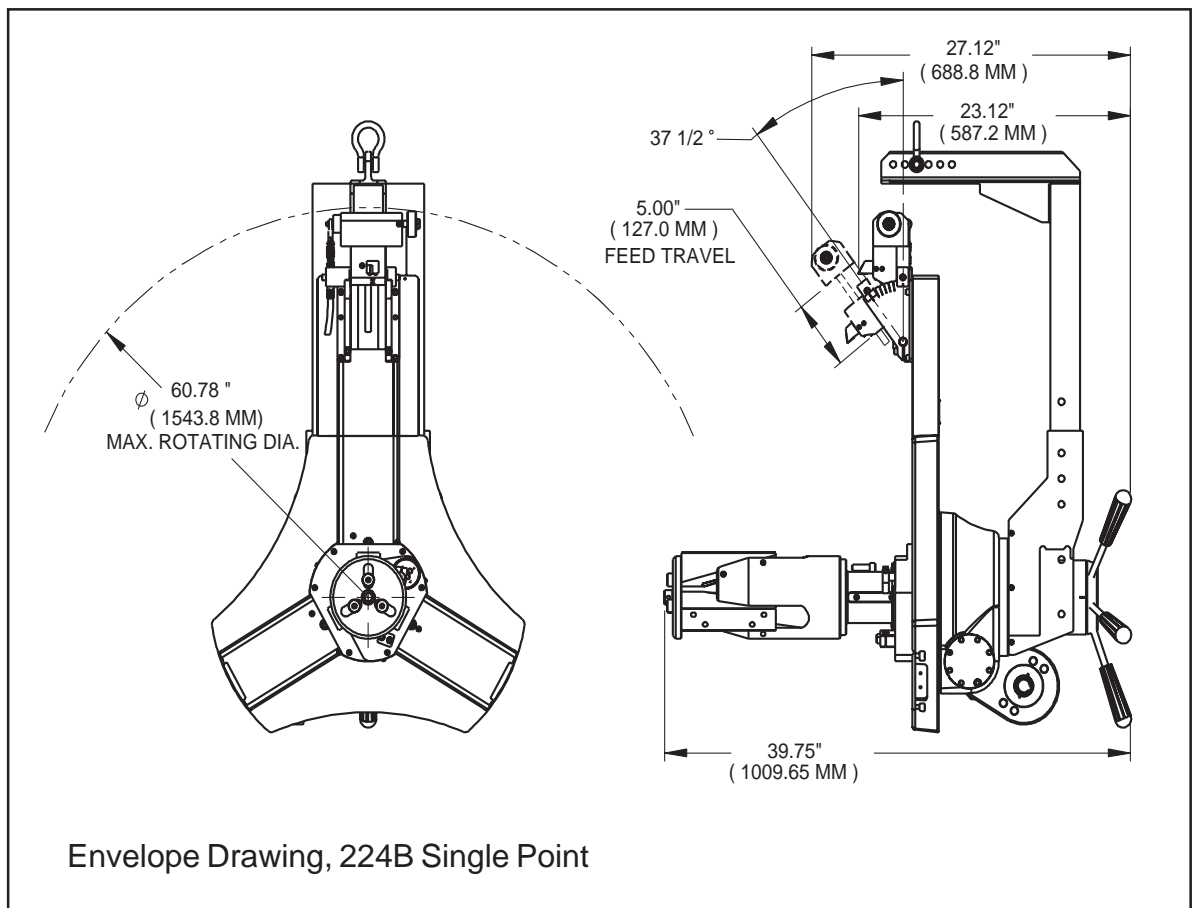
IN GENERAL:

Easy to assemble 224B SP Kit bolts directly to the face of the 224B without any modification to the machine.

The 224B SP is equipped with 5" (127mm) of feed length for heavy wall pipe and flange faces.

The slide assembly has infinitely variable bevel angle adjustments between 0 and 37 1/2°.

The 224B SP has a total radial travel of 18.23" (463.0mm) and adjustment for large pipe and flange cutting ranges.



Range, Beveling:	7.00" (177.8mm) diameter to 42.00" (1066.8mm) diameter cutting range at 37.1/2°.
Bevel Angles:	0° to 37 1/2° graduated bevel angle adjustment.
Range, Flange Facing:	12.00" (304.8mm) diameter to 50.00" (1,270.0mm) diameter cutting range.
Feed Travel:	5.0" (127.0mm) nominal (radial).
Alignment:	When used in conjunction with the 224B Miter Mandrel Head: Angular - plus or minus 5° Off set - plus or minus .19" (4.83mm)
Feed:	8 selectable positions between .005" (.127mm) rev. and .032" (.803mm) / rev. inclusive
Cutting:	.200 max. cut depth / pass. 63 RMS finish may be obtained depending on material. Spiral grooves as coarse as 31 grooves per inch when grooving. Machines stainless and carbon.

MAINTENANCE

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

If the Model 224B is operated in the vertical position (headstock facing Up), the chips and/or other debris should be removed after each bevel cut has been completed.

Tool life may be severely shortened, unless chips and/or other debris that have been deposited on or around the headstock 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.

For complete weekly maintenance procedures, see the Model 224B BEVELMASTER™ manual.

OPERATION

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

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

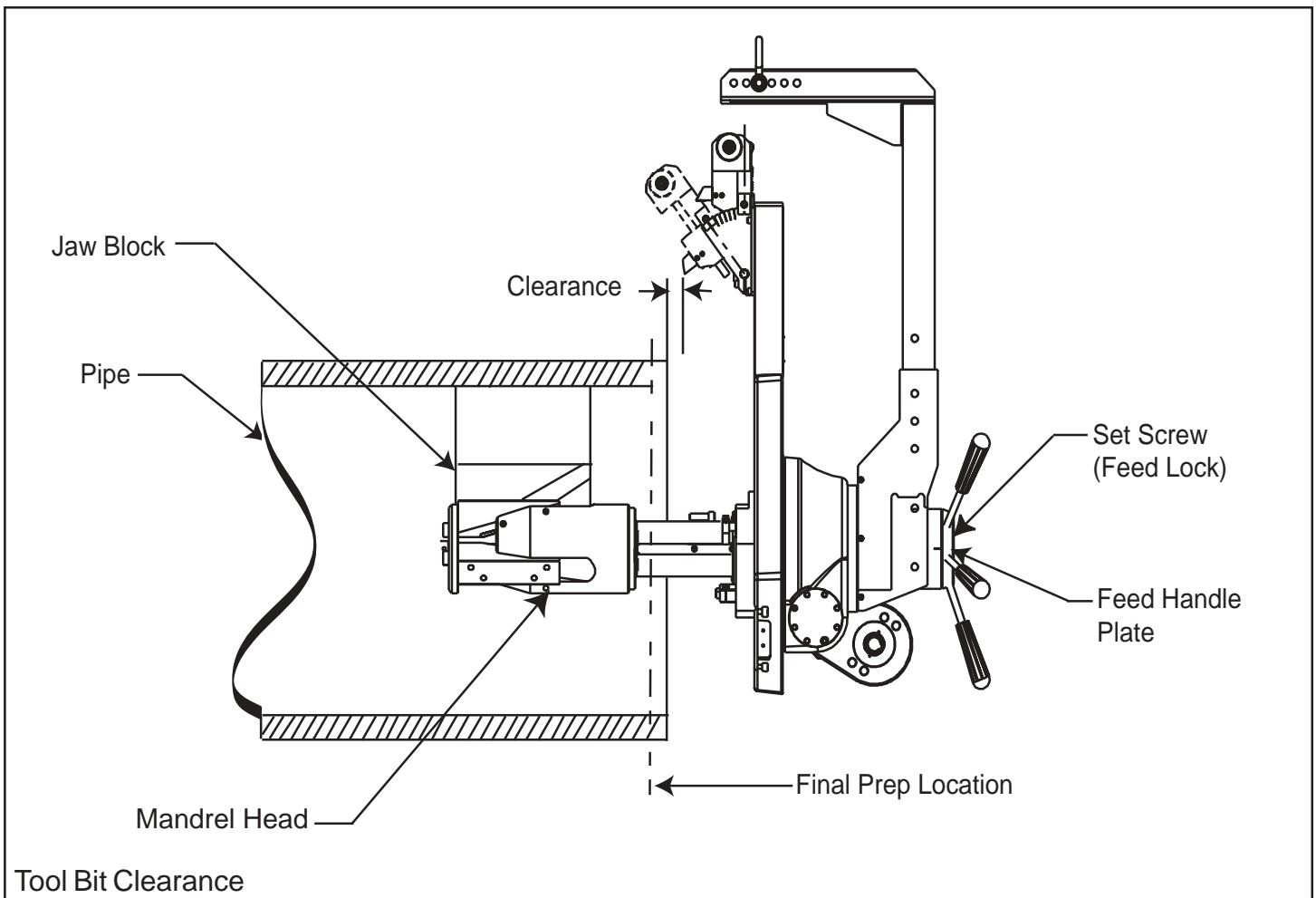
Configure the machine for the proper mounting diameter. (Refer to the Model 224B Operator's manual)

Attach the Model 224B SP to the Model 224B. (Refer to Installation section.)

Install the mandrel inside the pipe and tighten the draw nut to force the jaw blocks out against the inside diameter of the pipe.

NOTE:

In order to avoid cutting the jaw blocks during the machining operation, the mandrel must be installed beyond the final end preparation location.



NOTE:

If a miter mandrel is to be used, please refer to the Operator's Manual for that miter mandrel installation.

Install the Model 224B with the Model 224B SP attached onto the installed mandrel.

Check for correct angle of the slide.

Set the cam follower in the proper hole on the index plate for the required feed rate.

Check for proper setting of the feed direction.

Move the Model 224B with the Model 224B SP into position to begin the cut by rotating the feed knob clockwise.

Verify a minimum clearance of .125" (3.2mm) between the tool bit and the pipe OD at the highest point.

Lock the BEVELMASTER™ in place to prevent axial movement by tightening the set screw on the back of the Feed Handle Plate until it is tightened securely.

NOTE:

Attach the proper power supply line to the drive assembly. If 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.

Turn the motor on.

Let the machine rotate very slowly for one revolution to verify that the tool bit clears the OD of the pipe.

Adjust the cutting speed by opening the Flow Control Valve at the power supply connection.

CAUTION:

The actual machining operation will begin when the tool bit contacts 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.

After the cut is finished, turn the motor off to stop the cutting head rotation.

Loosen the feed lock set screw.

Rotate the feed knob counter-clockwise to separate the headstock from the pipe.

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.

Damaged or worn tool bits are evidenced by increased feed pressure, visual observations, poor surface finish, etc.

If the next bevel is to be the same end preparation as the previous bevel, install the machine and mandrel in the pipe and follow the sequence starting on page 9.

If the next bevel is to be different than the previous bevel, follow the sequence in Adjustment of the Block Assembly section.

For changing the tool bit, follow the sequence in the Counter Boring Function section.

Adjustment of the Tool Block Assembly:

While holding the tool block slide assembly, loosen the (6) screws on the base of the slide.

Reposition the slide assembly and tighten the (6) screws. This will hold the slide firmly against the plate.

To adjust the bevel angle of the slide, loosen the locking screws on the sides of the slide, pull the slide up to the required angle and tighten the screws, maximum angle is 37° 30'.

Installation of the Tool Holder and Insert:

To select the appropriate tool holder and Insert, see section on cutting speeds.

Use of a dull Insert or Inserts 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.

Slide the assembled tool holder with Insert into the tool holder slot on the tool block.

Install the tool holder with the Insert with the cutting edge toward the mandrel .

Lock the tool holder into position with the set screws on the side of the tool holder.

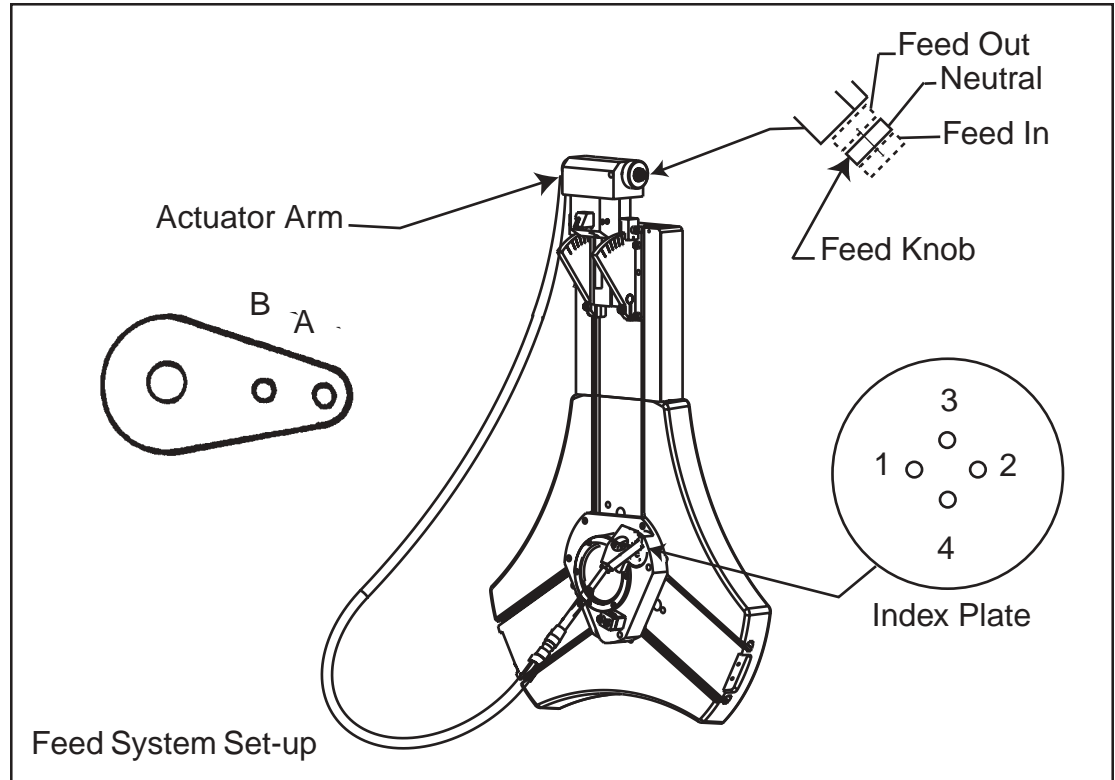
Adjustment of the Feed:

Put the gearbox into neutral.

Setting Feed Direction:

Select the proper hole location on the position index plate and the actuator arm for the required feed.

Set the feed direction by pulling out the knob (for feeding toward the mandrel), in the center position (for neutral or no feed) or by pushing in the knob (for feeding away from the mandrel).



Counterboring Function:

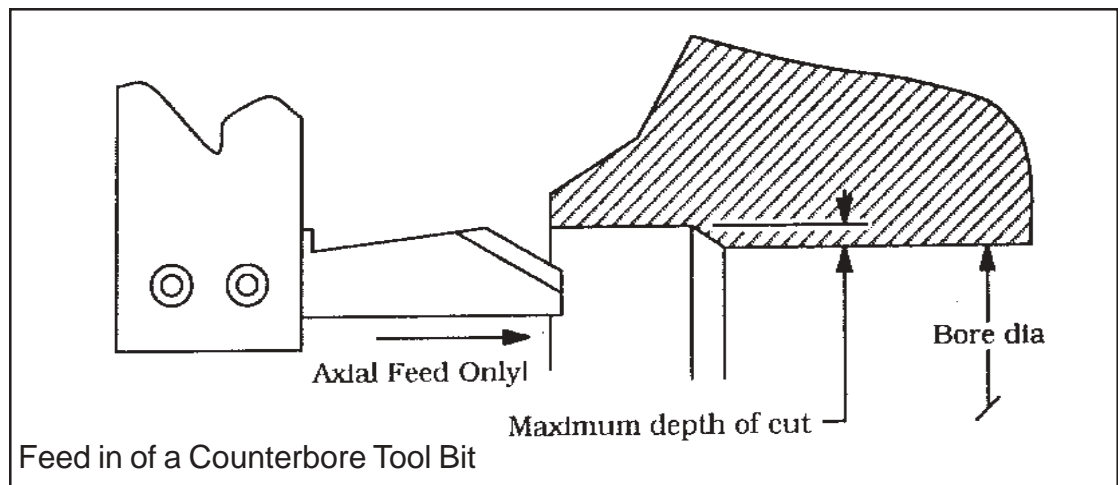
Lock the tool slide in the flat position.

Replace the tool holder and the Insert with the counterbore tool bit.

Insure that the cutting edge is facing out from the center.

		Index Plate Positions			
		1	2	3	4
Actuator Arm Position	A	.005" / rev (.13mm / rev)	.010" / rev (.25mm / rev)	.014" / rev (.36mm / rev)	.019" / rev (.48mm / rev)
	B*	.009" / rev (.23mm / rev)	.016" / rev (.41mm / rev)	.025" / rev (.61mm / rev)	.032" / rev (.81mm / rev)
*Position B should be used for flange facing only					
Feed rates					

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



Install the mandrel inside the pipe and tighten the draw nut to force the jaw blocks out against the inside diameter of the pipe.

NOTE:

In order to avoid cutting the jaw blocks during the machining operation, the mandrel must be installed beyond the final end preparation location.

Advance the machine by turning the feed knob clockwise until the tool bit is slightly inside the pipe.

Move the tool slide out until the tool bit contacts the ID of the pipe and tighten the slide.

Turn the manual feed knob on the tool slide so that the tool bit clears the bore ID and back the machine out of the pipe.

Securely lock the tool slide in position by tightening all (6) of the radial adjust screws on the slide assembly.

Turn the motor on.

Let the machine rotate very slowly for one revolution to verify that the tool bit clears the ID of the pipe.

Adjust the tool bit into the cutting position, use the manual feed knob on the tool slide.

Tighten the dovetail slide lock screw in the tool block when desired tool bit position has been achieved.

This screw must be loosened and re-tightened whenever the dovetail slide requires repositioning.

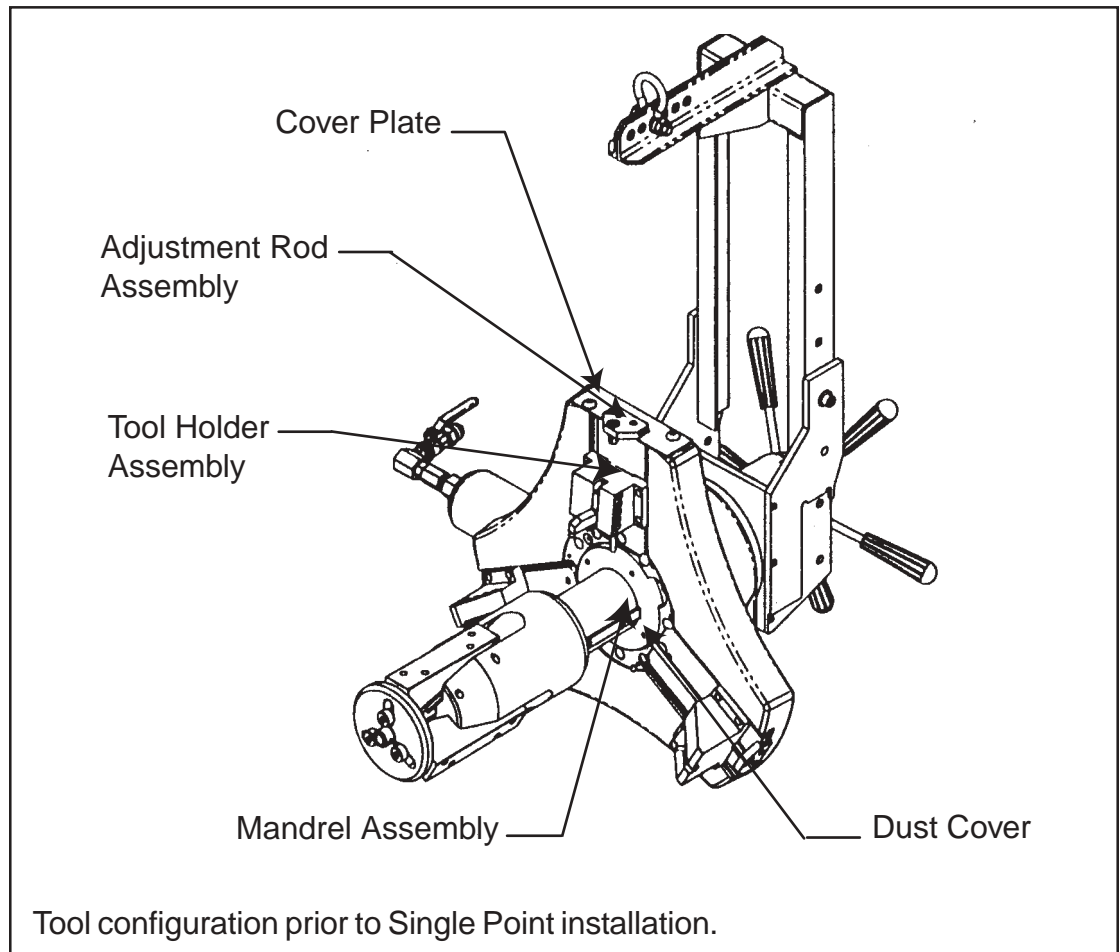
If it is not securely tightened, the tool bit may walk out of the cut.

Plunge cut to desired depth.

INSTALLATION

Attaching the Model 224B SP Kit to the Model 224B.

Remove the Mandrel Assembly, Dust Cover, Tool Holder Assembly, Adjustment Rod Assembly and the Cover Plate from the Model 224B Machine.

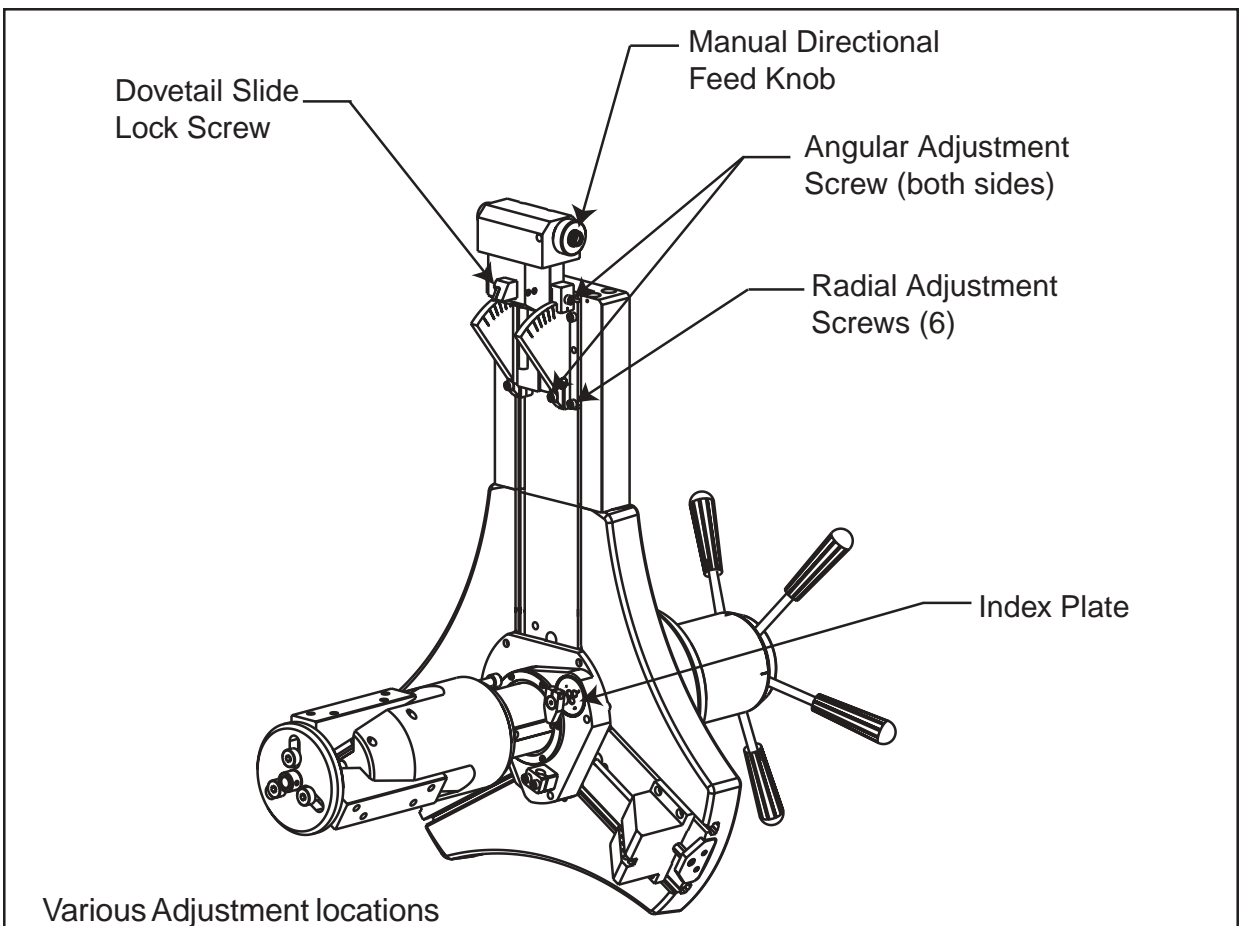
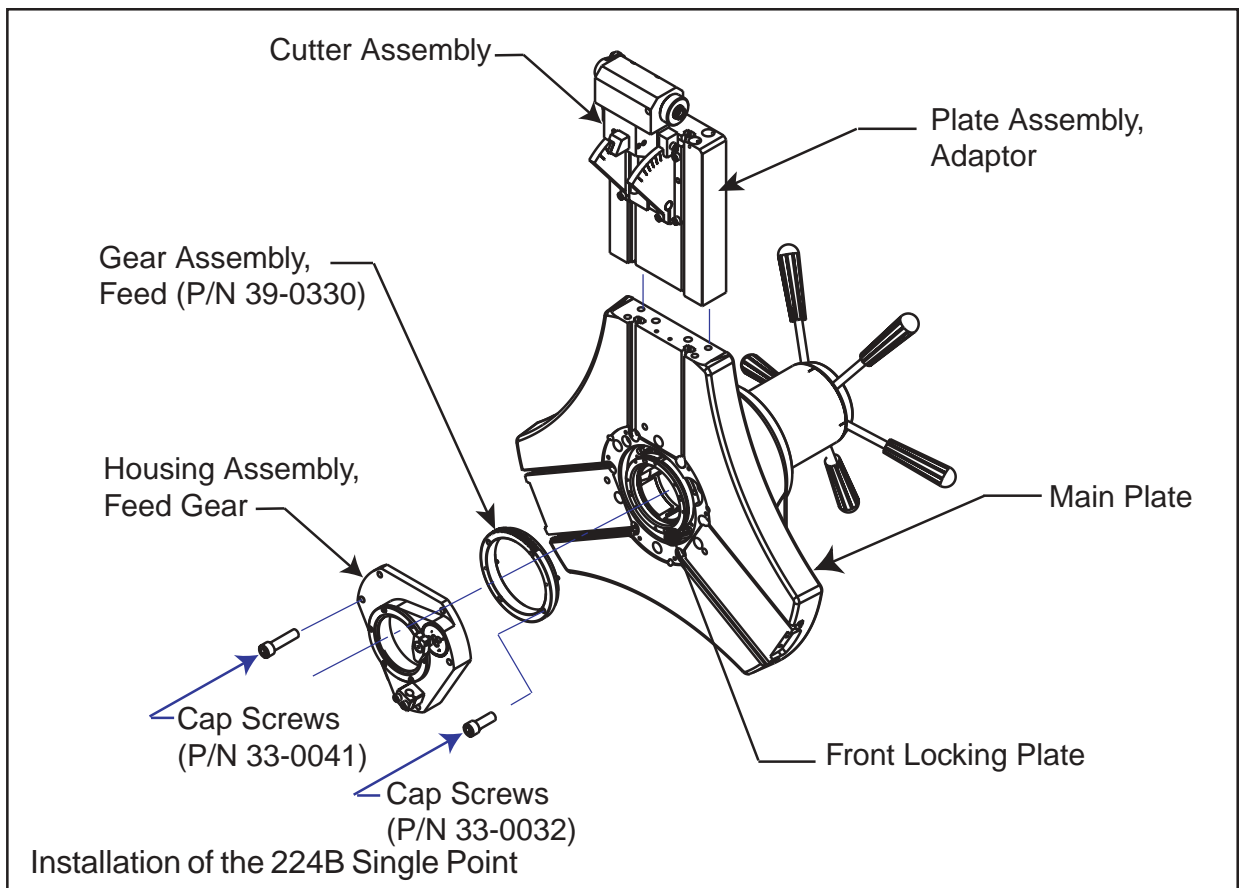


Secure the Gear Assembly, Feed (P/N 33-0330) to the Front Locking Plate using supplied cap screws (P/N 33-0032).

Secure the Housing Assembly, Feed Gear (P/N 19-0839) to the Main Plate, using supplied cap screws (P/N 33-0041).

Install Plate Assembly, Adaptor (P/N 24-0721) onto Main Plate (flat), secure in place with retained cap screws.

Slide the Cutter Assembly into T-slots on Adaptor Plate Assembly to position desired and secure the (6) cap screws on the base.



CUTTING SPEEDS

The chart shows RPM to obtain specified tool bit surface cutting speed on the surface of the pipe.

Pipe Size	True Dia		RPM for 200 in / min (508cm / min)	RPM for 250 in / min (635cm / min)	RPM for 300 in / min (762cm / min)
42"	42.00"	1067 mm	2	2	2
40"	40.00"	1016 mm	2	2	2
38"	38.00"	965 mm	2	2	3
36"	36.00"	914 mm	2	2	3
34"	34.00"	854 mm	2	2	3
32"	32.00"	813 mm	2	2	3
30"	30.00"	762 mm	2	3	3
28"	28.00"	711 mm	2	3	3
26"	26.00"	660 mm	2	3	4
24"	24.00"	610 mm	3	3	4
22"	22.00"	559 mm	3	4	4
20"	20.00"	508 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"	356.6 mm	5	6	7
12"	12.75"	324.9 mm	5	6	7
10"	10.75"	273.1 mm	6	7	9
8"	8.63"	219.1 mm	7	9	11
Cutting Speed (approximately)					

Use 200 surface inches per minute (508 surface centimeters per minute) for: Stainless steels in general when no coolant is allowed, all heavy-wall tube and some of the chrome/molybdenum steels.

Use 250 surface inches per minute (635 surface centimeters per minute) for: Mild steels and some thin-wall stainless steels when coolants are permitted and applied.

Use 300 surface inches per minute (762 surface centimeters per minute) for: Aluminum and some thin-wall mild steel and tube with coolants.

Basic Feed Recommendations are:

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

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

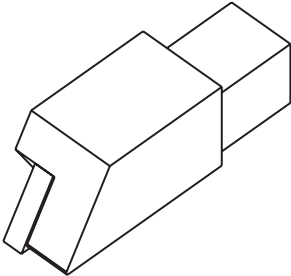

If the feed is too heavy the drive will start to overload and the chip will start to have a rough or torn appearance.

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

Reduced feeds and speeds will normally minimize chatter problems.

TOOL BITS

Standard Selection

49-0060	Tool Holder	
30-0554	Insert, Triangular, .030 R	
30-2822	Insert, Traingular, .015 R	
99-1666	Tool Bit, Counterbore	

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 Jaw blocks are loose on the pipe or tube.
Cutting fluid is required.
The main bearing pre-load is loose.

Problem: There is 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.
The cutting speed is incorrect.

Problem: The tool holder is not feeding.

The feed screw is stripped.
The feed nut is stripped.
The slide rails are too tight.

Problem: There is 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 is 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.

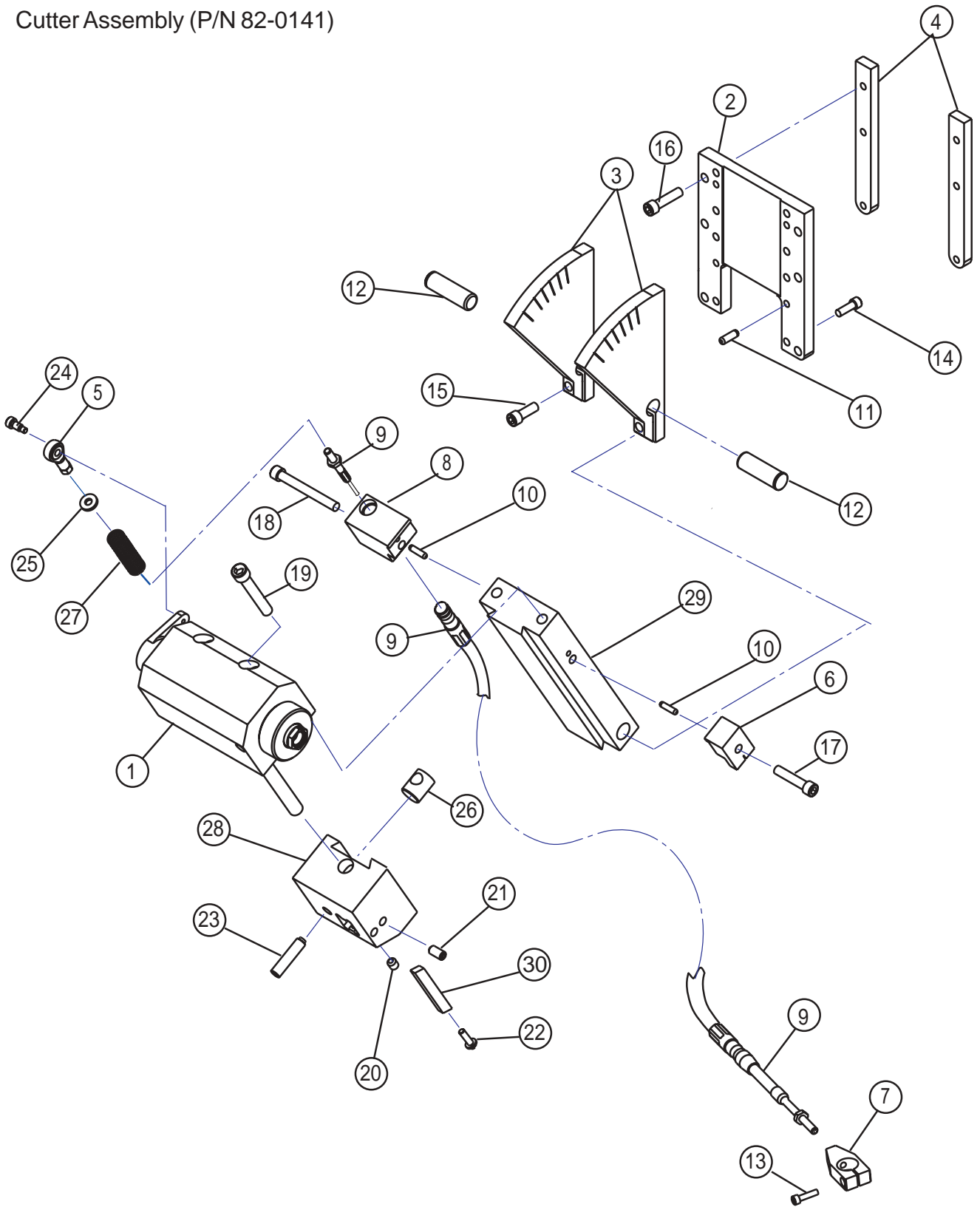
SPARE PARTS LIST

Suggested spare parts for the Model 224B SP

Item No.	Part No.	Description	Qty
1.	29-0219	Cam Follower	1
2.	30-0554	Insert,Tool (.030 R)	10
3.	30-2822	Insert,Tool (.015 R)	10
4.	33-0955	Screw,Gib	1
5.	35-0270	Nut, Feed	1
6.	49-0060	Tool,Holder	1
7.	66-0079	Gib,Tapered	1

ILLUSTRATED PARTS BREAKDOWN

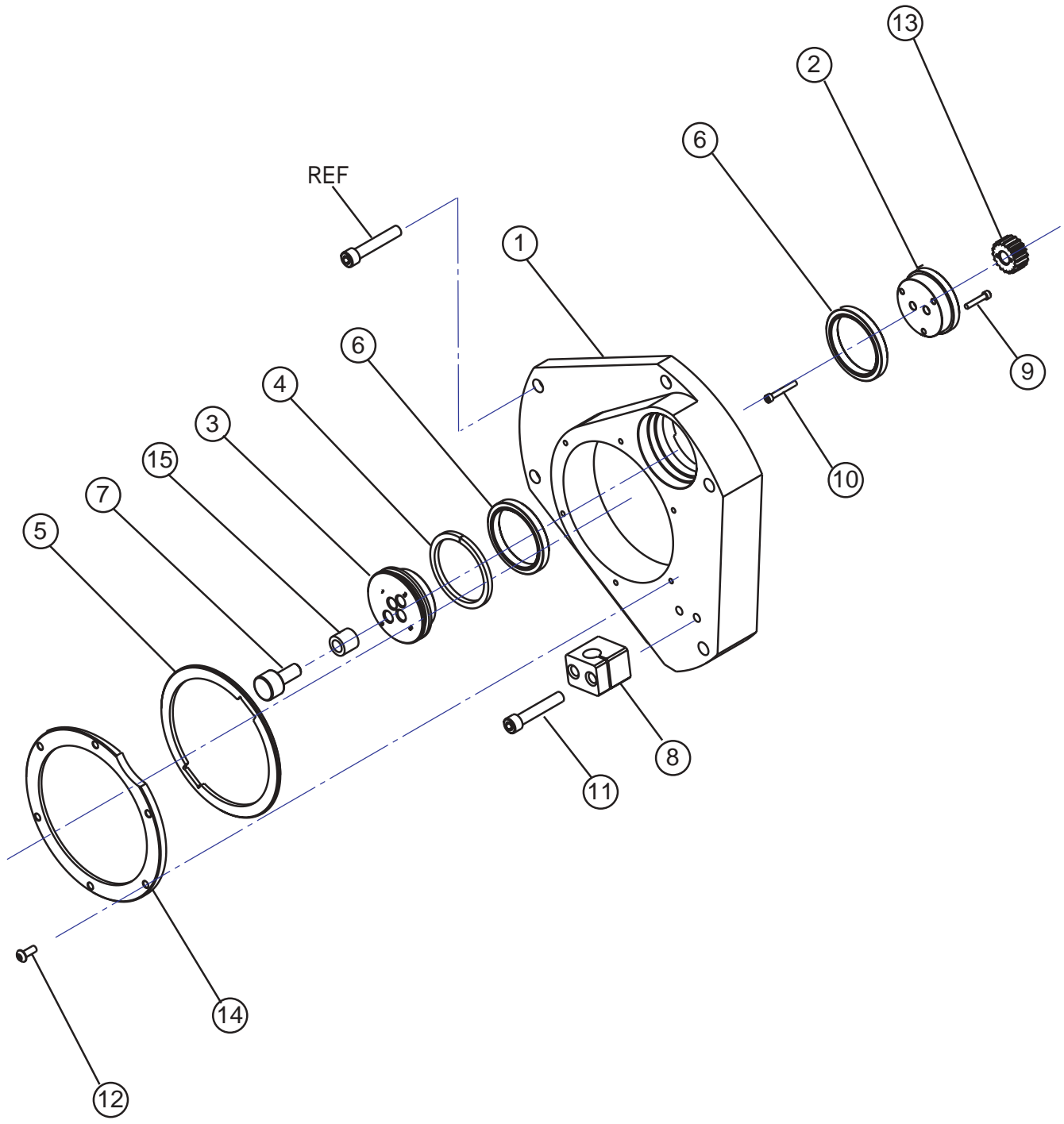
Cutter Assembly (P/N 82-0141)



Parts List, Cutter Assembly (P/N 82-0141)

Item No.	Part No.	Description	Qty
1.	19-0424	HOUSING,ASSY,GEARBOX	1
2.	24-0733	PLATE,SLIDE,BASE	1
3.	24-0734	PLATE,SIDE	2
4.	26-0828	BAR,RETAIN	2
5.	29-0133	ROD END (1/4 x 3/4 x 3/8")	1
6.	30-0904	CLAMP,SIDE,RIGHT	1
7.	30-0907	CLAMP,CAM FOLLOWER	1
8.	30-1080	CLAMP,SIDE,LEFT	1
9.	30-2836	CABLE,MOD, 64" LG.	1
10.	32-0081	PIN,DOWEL(3/16 DIA x 3/4")	2
11.	32-0140	PIN,DOWEL(1/4 DIA x 3/4")	4
12.	32-0161	PIN,DOWEL (5/8 DIA x 2")	2
13.	33-0030	SCREW,CAP(# 10-24 x 3/4")	1
14.	33-0040	SCREW,CAP (1/4-20 x 3/4")	8
15.	33-0055	SCREW,CAP (5/16-18 x 7/8")	2
16.	33-0057	SCREW,CAP (5/16-18 x 1 1/4")	6
17.	33-0058	SCREW,CAP (5/16-18 x 1 1/2")	1
18.	33-0063	SCREW,CAP (5/16-18 x 2 3/4")	1
19.	33-0077	SCREW,CAP(3/8-16 x 2 1/2")	2
20.	33-0514	SCREW,SET (5/16-18 x 3/8")	1
21.	33-0517	SCREW,SET (5/16-18 x 5/8")	3
22.	33-0955	SCREW,GIB	1
23.	33-1314	SCREW,SET, HALF DOG (3/8-16 x 1 1/2")	1
24.	33-1535	SCREW, SHLDR (1/4 x 3/8")	1
25.	34-0026	WASHER,FLAT	1
26.	35-0270	NUT,FEED,1/2 -20	1
27.	40-0045	SPRING,COMP (5/8 DIA x 4")	1
28.	49-0091	HOLDER,TOOL	1
29.	66-0078	BASE,SLIDE	1
30.	66-0079	GIB,TAPERED	1

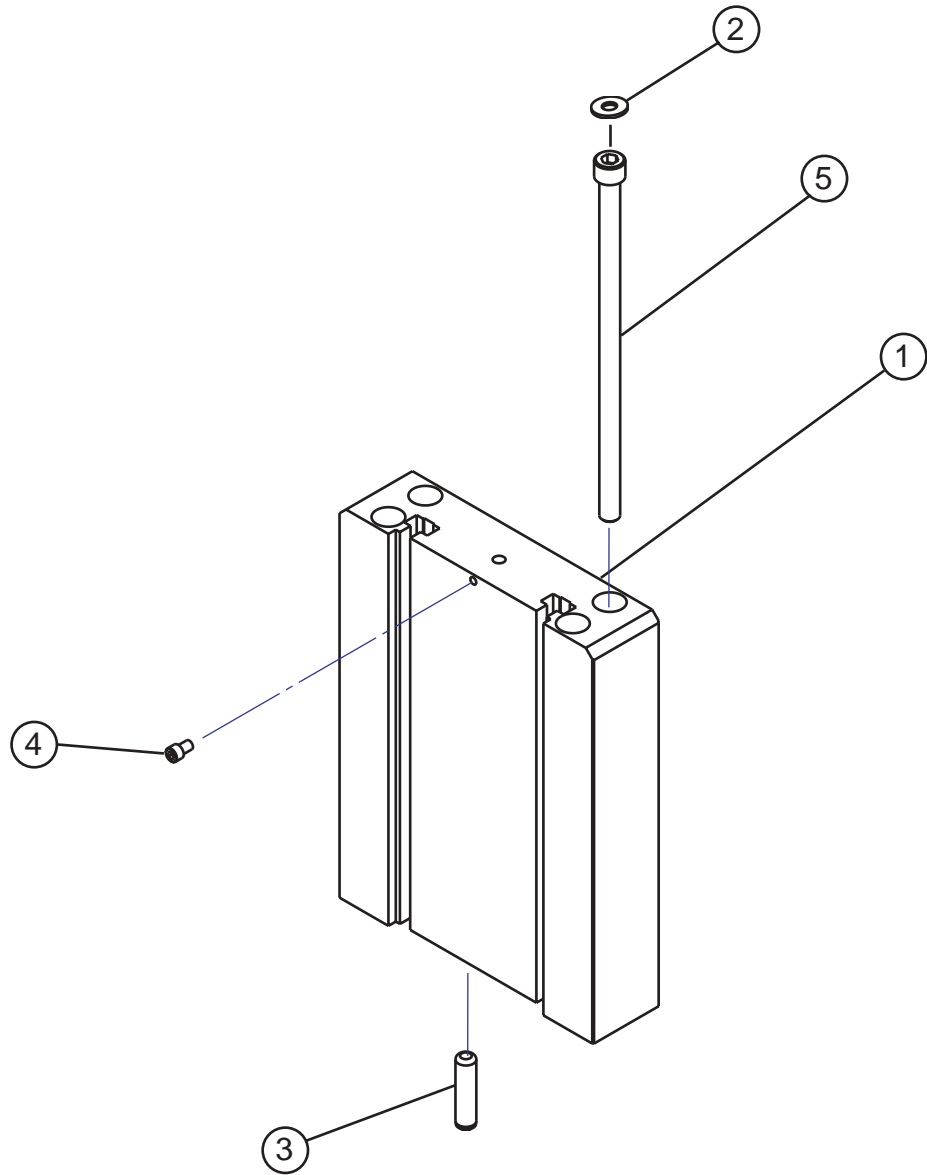
Housing Assembly, Feed Gear (P/N/ 19-0839)



Parts list, Housing Assembly, Feed Gear (P/N/ 19-0839)

Item No.	Part No.	Description	Qty
1.	19-0840	HOUSING, FEED GEAR	1
2.	24-0748	HUB, GEAR	1
3.	24-0753	PLATE, INDEX	1
4.	28-0057	SEAL, FELT	7
5.	28-0284	SEAL, MANDREL	1
6.	29-0104	BEARING, BALL	2
7.	29-0219	CAM FOLLOWER	1
8.	30-0930	CLAMP, CABLE	1
9.	33-0015	SCREW, CAP (#6-32 x 3/4")	3
10.	33-0017	SCREW, CAP (#6-32 x 1").	2
11.	33-0059	SCREW, CAP (5/16-18 x 1 3/4")	2
12.	33-0279	SCREW, BUTTON (# 10-24 x 1/2")	6
13.	39-0323	GEAR, SPUR	1
14.	43-0531	COVER PLATE, SEAL	1
15.	44-0276	SPACER	1
REF	33-0041	SCREW, CAP (1/4-20 X 7/8")	6

Plate Assembly, Adaptor (P/N 24-1721)



Parts List, Plate Assembly, Adaptor (P/N 24-1721)

Item No.	Part No.	Description	Qty
1.	24-1613	PLATE, ADAPTOR	1
2.	34-0382	WASHER, NYLON	4
3.	32-0160	PIN, DOWEL (1/2 DIA X 2")	2
4.	33-0037	SCREW, CAP (1/4-20 X 3/8")	1
5.	33-2188	SCREW, CAP (1/2-13 X 10")	4

Parts List, Single Point Kit, (P/N 05-0345)

Item No.	Part No.	Description	Qty
1.	19-0839	HOUSING ASSY, FEED GEAR	1
2.	24-1721	PLATE ASSY, ADAPTOR	1
3.	30-0554	INSERT, VALERON	1
4.	33-0032	SCREW, CAP, (10-24 x 1")	4
5.	33-0041	SCREW, CAP, (1/4-20 x 7/8")	6
6.	36-0003	WRENCH,L,3/32 HEX	1
7.	36-0005	WRENCH,L,1/8 HEX	1
8.	36-0006	WRENCH,L,9/64 HEX	1
9.	36-0007	WRENCH,L,5/32 HEX	1
10.	36-0008	WRENCH,L,3/16 HEX	1
11.	36-0010	WRENCH,L,1/4 HEX	1
12.	36-0012	WRENCH,L,3/8 HEX	1
13.	36-0025	WRENCH,T,3/8 HEX	1
14.	39-0330	GEAR ASSY, FEED	1
15.	49-0060	HOLDER,TOOL,R.H.	1
16.	82-0141	CUTTER ASSEMBLY	1
17.	86-0226	CASE	1