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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 are 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

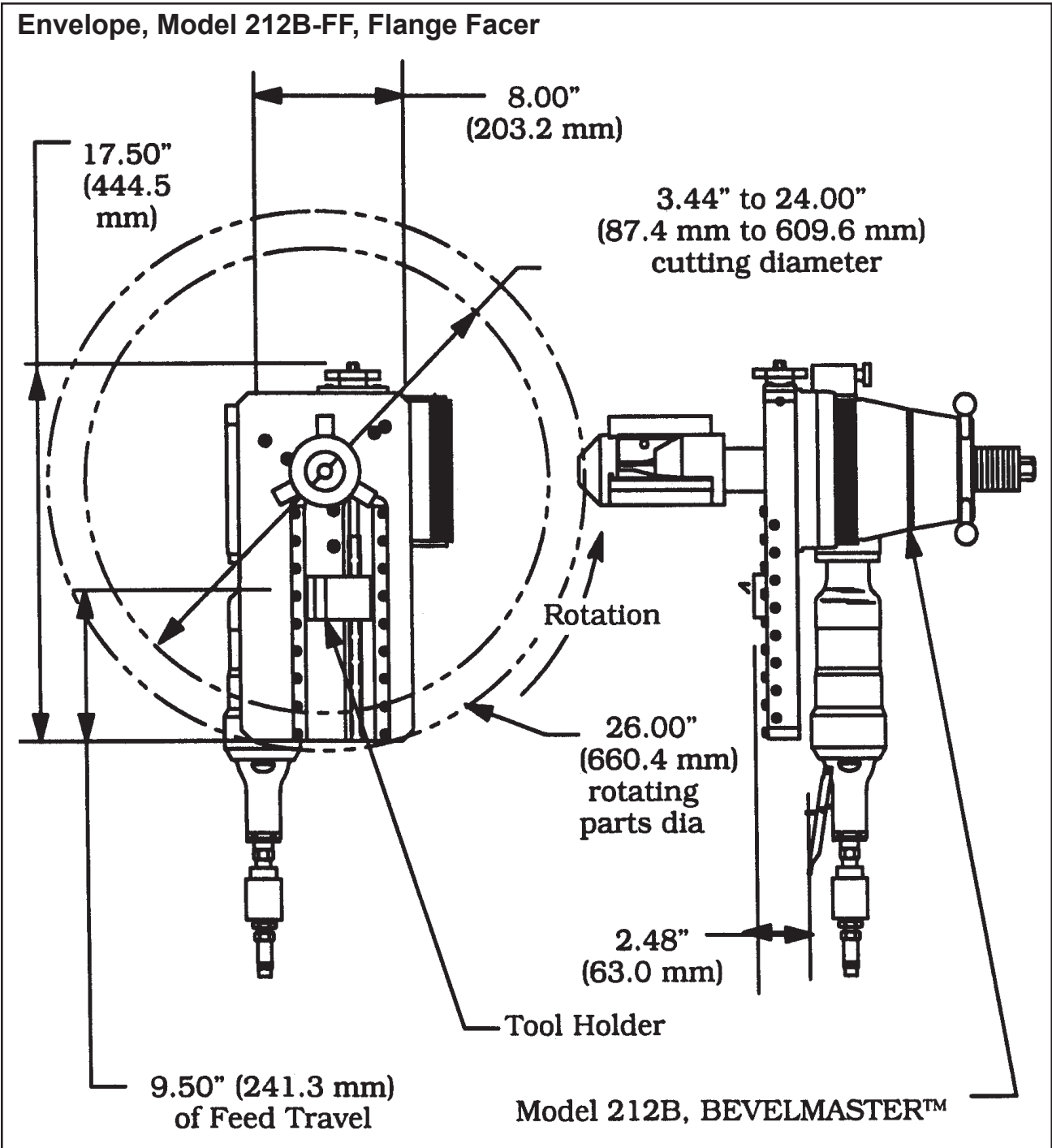
The Model 212B-FF, Flange Facer Kit (P/N 05-1283) has been designed to provide the Model 212B BEVELMASTER™ with flange facing capabilities over a cutting range of 3.44" (87.4 mm) to 24" (609.6 mm) diameters.

This kit allows a quick, easy field conversion of the Model 212B BEVELMASTER™ from a beveling configuration to a flange facer configuration and back again as required.

# SPECIFICATIONS

Model 212B-FF Flange Facer

Weight: 19 lbs. (9 kg)



<b>CUTTING CAPACITIES</b>	
Range	3.44" to 24.00" dia (87.4 mm to 609.6 mm dia)
Auto Feed Travel	9.50" (241.3 mm)
Feed Rate	.013" or .026" per revolution (.33 mm or .66 mm per revolution)
Maximum chip width	.200" (5.1 mm)

Materials: Most stainless steels, carbon steels, inconels, etc., provided the Rockwell hardness is less than Rc 35.

The Mandrel for the Model 212B is used to provide a mounting range from 3.31" to 13.09" (84.1 mm to 332.5 mm) inside diameter.

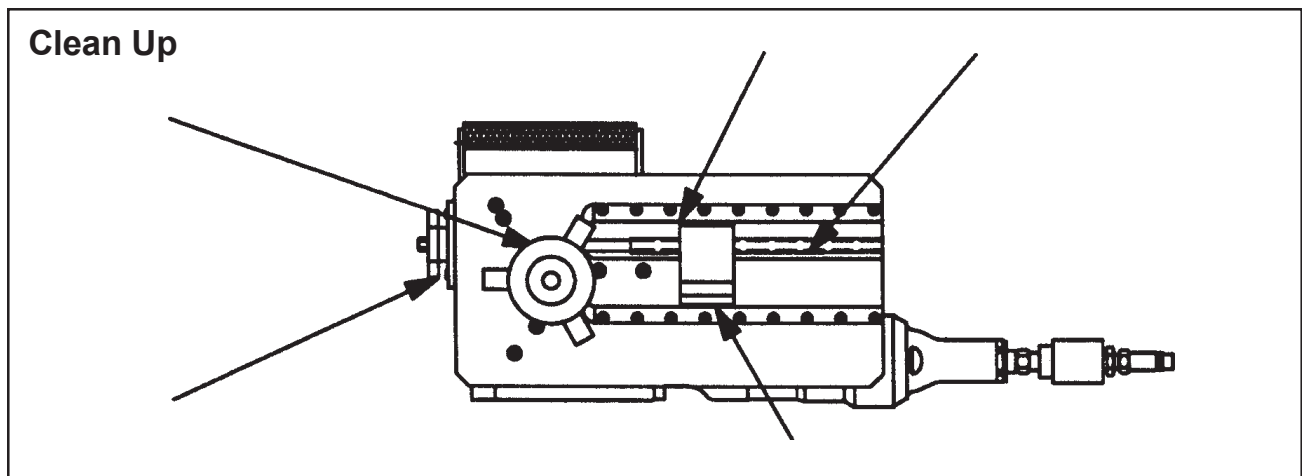
<b>CLEARANCES (with the Model 212B attached)</b>	
Radial	13.00" (330.2 mm) maximum from the centerline of the pipe or tube
Rotating Parts Diameter	26.00" (660.4 mm)

## MAINTENANCE

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

Use a clean, non-detergent oil, preferably SAE 10 (90 SSU or lighter) or oil which is specified for the air motor.

If the Model 212B BEVELMASTER™ with the Model 212B-FF Flange Facer is operated in the vertical position (cutting head up), the chips and/or other debris should be removed after each pass has been completed.



**NOTE:**

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

### DAILY MAINTENANCE

Visually inspect 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.

## OPERATION

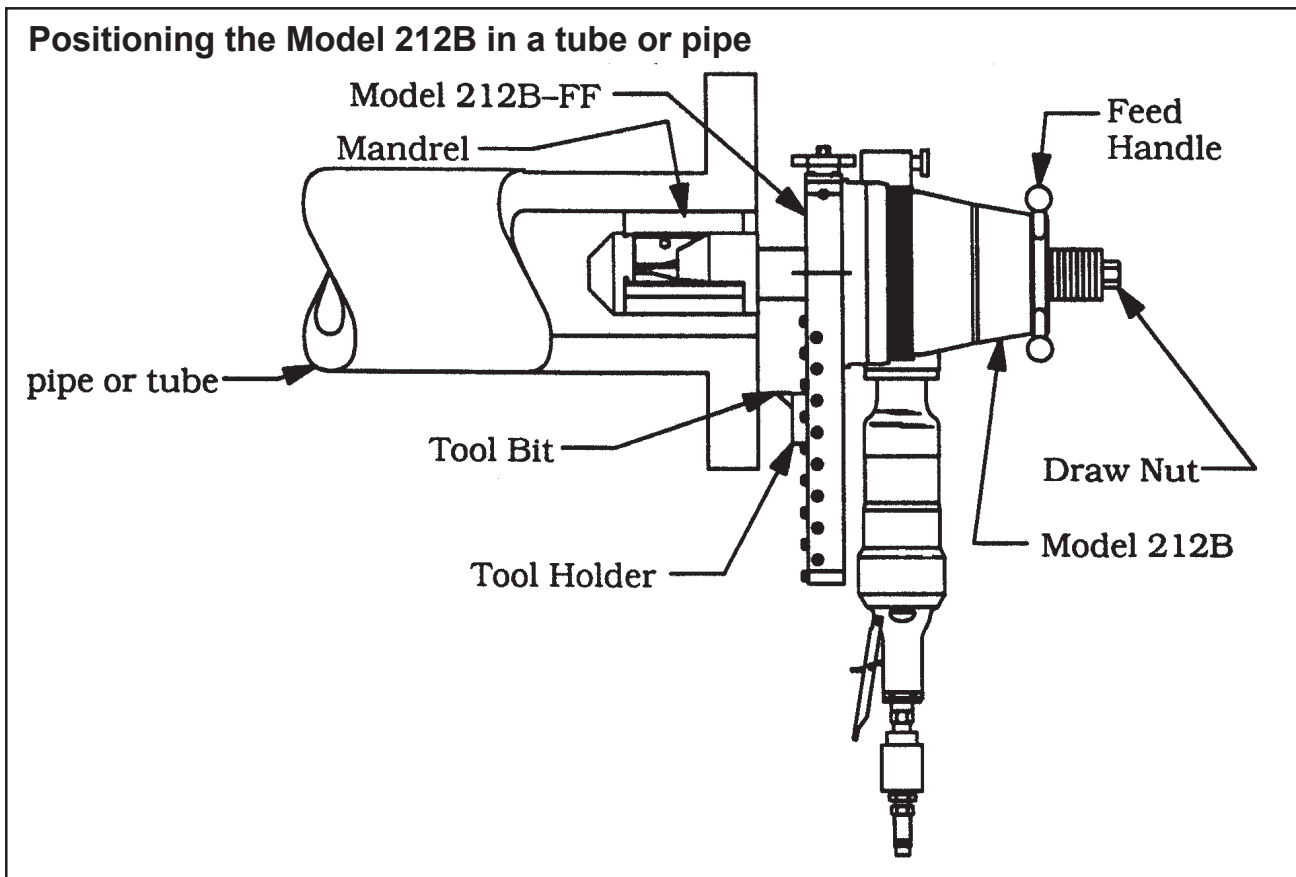
Read the operating instructions carefully before attempting to operate the Model 212B-FF.

Use eye protection at all times when operating the Model 212B-FF.

Configure the machine for the proper task. (Refer to the Model 212B Operator's Manual.)

Attach the Model 212B-FF to the Model 212B. (Refer to the chapter "Attaching the Flange Facer.")

Position and clamp the Model 212B to the I.D. of the pipe.



Check for the proper position of the Tool Holder. (Refer to "Positioning of the Tool Holder" later in this chapter.)

Check for the proper position of the Tool Bit to the flange. (Refer to "To Adjust the Depth of cut of the Tool Bit.." later in this chapter.)

Check the position of the Tripper Shaft for feed rate. (Refer to "Feed Rate" later in this chapter.)

Attach the proper power supply line to the Model 212B.

**NOTE:** Check that the air supply filter/regulator/lubricator (FRL) is installed and set properly.

Turn the Motor on. (Refer to the chapter "Cutting Speeds and Feeds".)

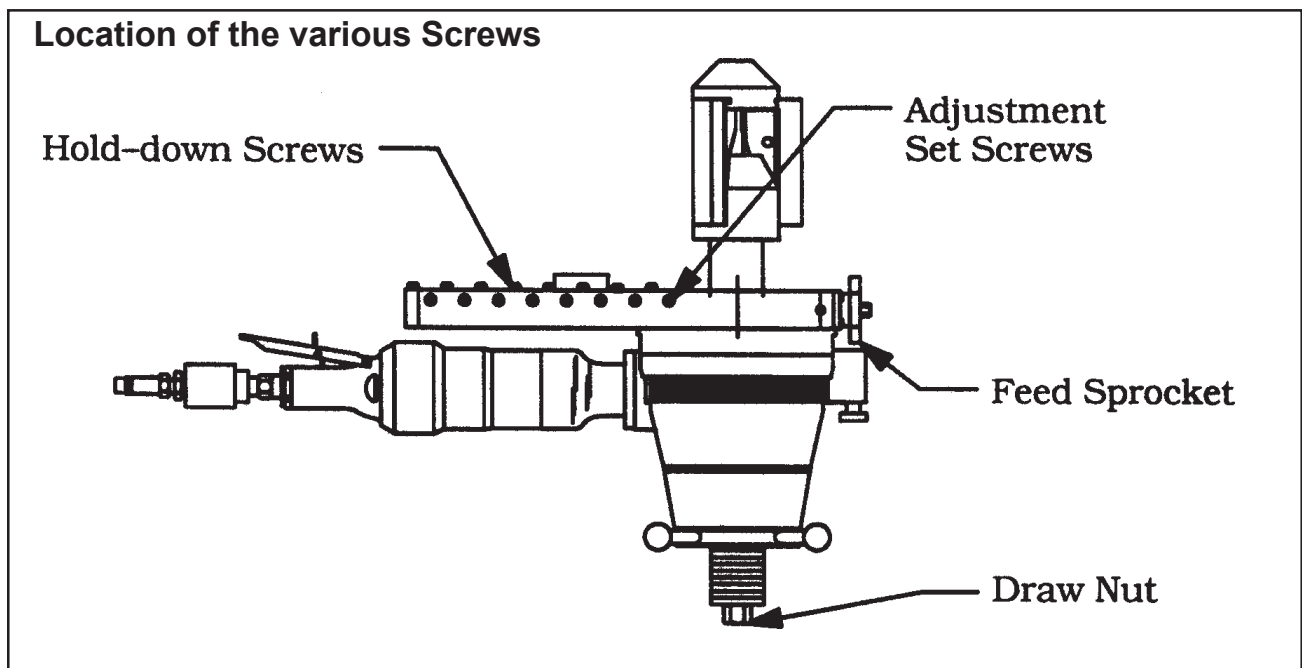
**CAUTION:** The actual machining operation will begin when the cutting surface of the Tool Bit comes in contact with the flange.

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

To avoid Tool Bit damage, the Tool Bit must clear the highest point of the flange on the first revolution.

After the cut is finished, release the Air Motor Lever to stop the Cutting Head rotation.

Loosen the Mandrel Draw Nut and remove the BEVELMASTER™ from the pipe.



If the next flange is the same as the previous flange, install the machine on the pipe and follow the sequence starting with "Position and clamp the Model 212B...."

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

Replace as per "Installation of the Tool Bits" later in this chapter.

If the next flange is different than the previous flange then follow the sequence earlier in this section starting with "Configure the machine..."

For changing the Tool Bit refer to the paragraph later in this section "Installation of the Tool Bits".

### POSITIONING OF THE TOOL HOLDER

Turn the Feed Sprocket clockwise to feed the Tool Holder in.

Tool Holder feed travel is from O.D. to I.D.

### ADJUSTMENT OF THE TOOL BLOCK

Loosen the hold-down screws on the Adjustable Slide Rail.

Run the Tool Holder to the most outward position.

Using the Adjustment Set Screws, apply a light force to the side of the Adjustable Slide Rail so that it is in positive contact with the Tool Holder.

Adjust only those screws that bear directly in line with the Tool Holder.

Tighten the Hold Down Screws to about 12 to 24 in-lbs. (1.4 to 2.7 N-m). Finger tight using a hex key.

Using the 1/4" Drive Ratchet, run the Tool Holder to the inward most position.

Note any changes in the feed pressure.

Some drag from the Slide Rails should be felt, but only a very light torque should be required to move the Tool Holder.

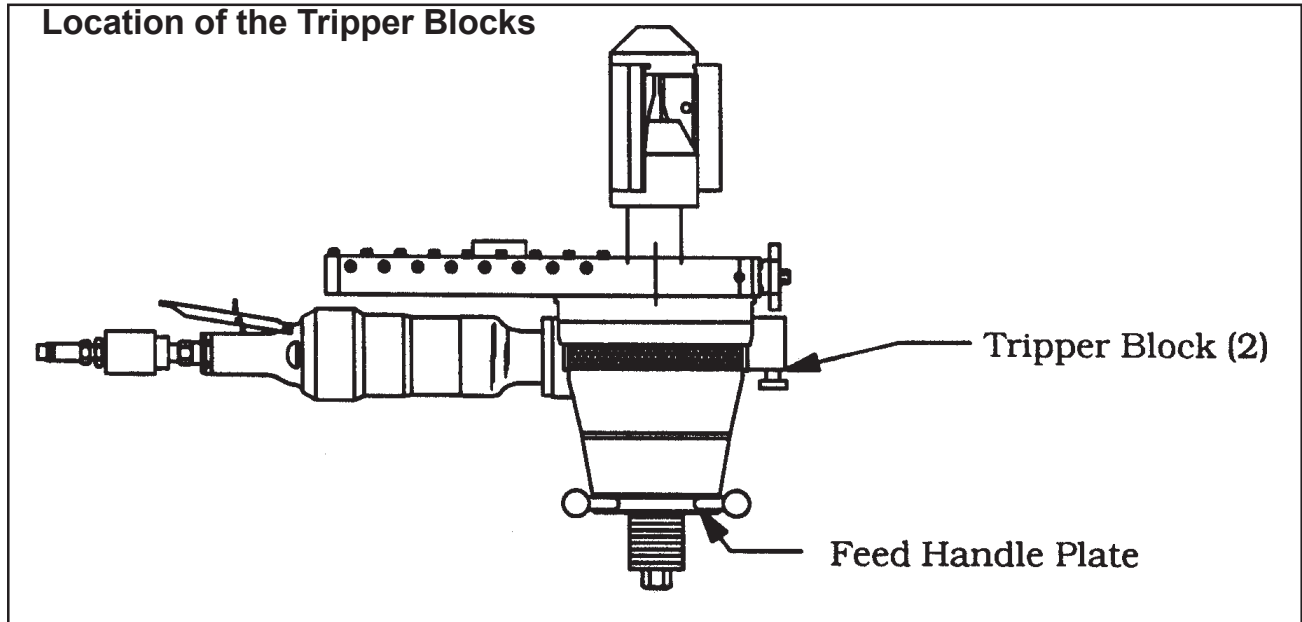
Adjust the remaining Adjustment Set Screws so that the Tool Holder has a smooth, even feel.

Run the Tool Holder the full length of the Slide Rail.

Tightly lock the Adjustable Slide Rail in place with the hold-down screws and fully snug the Adjustment Set Screws.

Check that the Tool Holder runs smoothly and evenly for the full length of travel.

Re-adjust as necessary.



To adjust the depth of cut of the Tool Bit to flange, rotate the Feed Knob on the Model 212B until the desired position is achieved.

Depth of the cut for roughing should not exceed .030" (.76 mm).

Finish cut for optimum finishes should be .005" to .015" (.13 to .38 mm).

Lock the Mandrel in place using the Mandrel Lock Set Screw. Located in the back of the Feed Handle Plate.

### FEED RATE

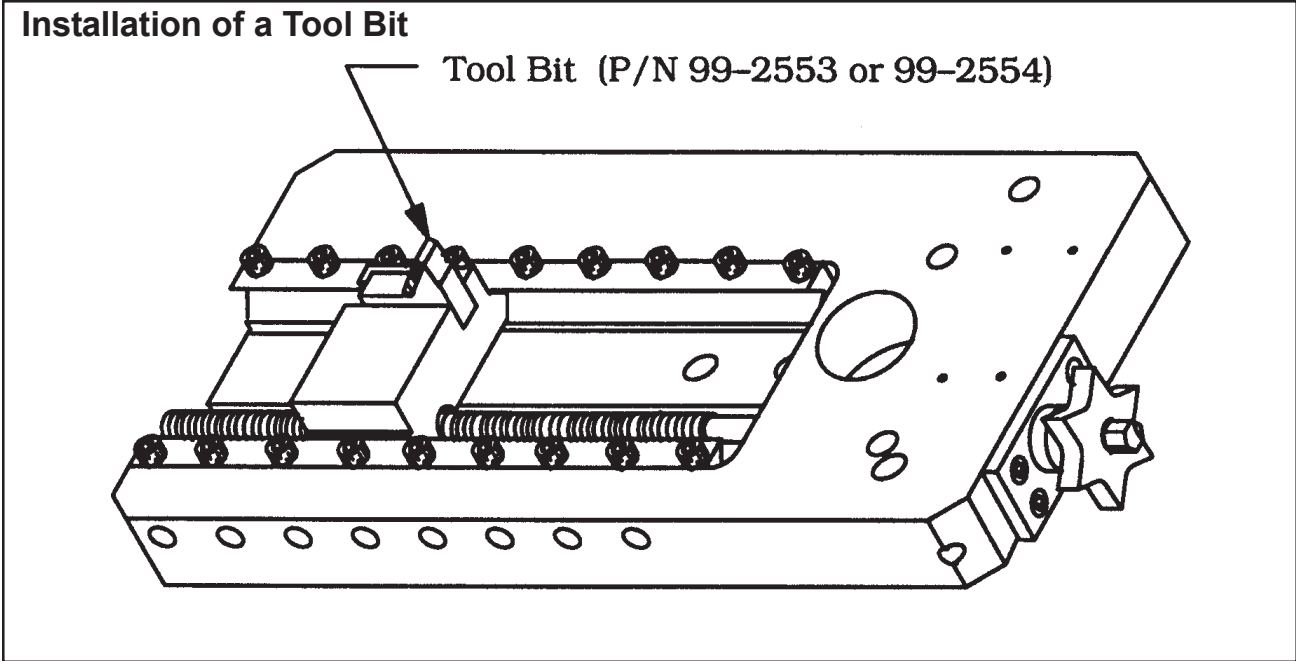
The feed rate is .013" (.33 mm) per revolution per Tripper Block.

Two Tripper Blocks are supplied with the kit.

### INSTALLATION OF THE TOOL BITS

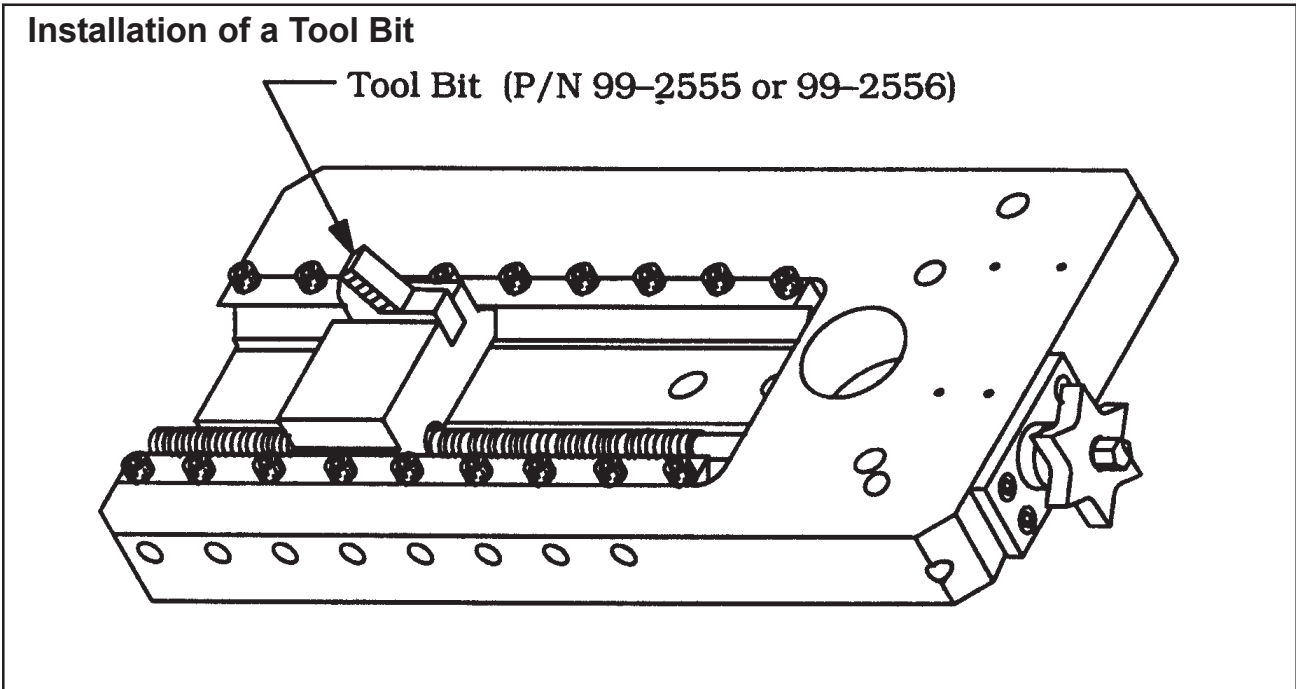
To select the appropriate Tool Bits refer to the section "Tool Bits".

**WARNING:** Use of dull or improperly designed Tool Bits or Tool Bits 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 Tool Bit into the Tool Bit Holder Slot on the Tool Holder.

Lock the Tool Bit into position with the set screws on the side of the Tool Holder.



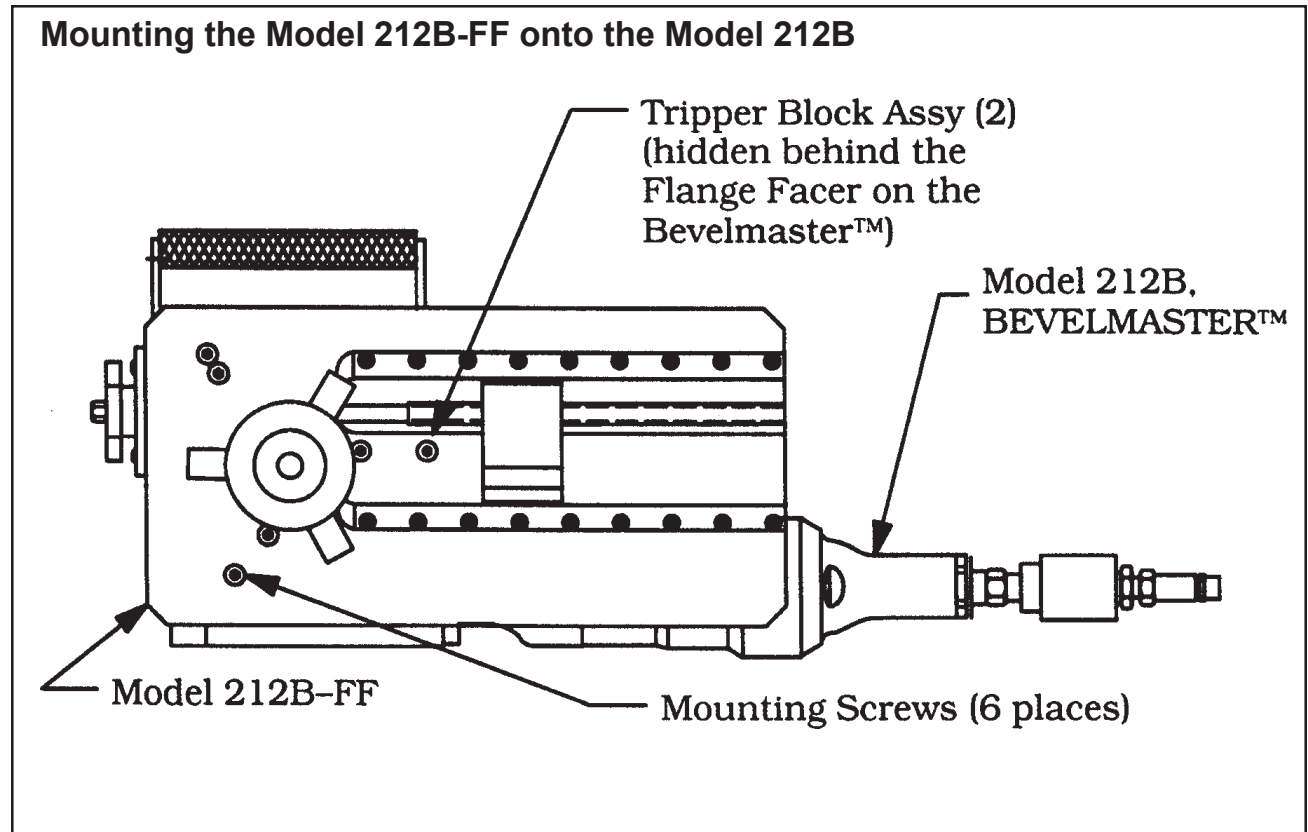
## ATTACHING THE FLANGE FACER

### ATTACHING THE MODEL 212B-FF TO THE MODEL 212B

Remove the three Tool Holders from the Model 212B BEVELMASTER™.

Mount the Model 212B-FF Flange Facer to the 212B BEVELMASTER™ and attach with the six Mounting Screws provided.

Attach the two Tripper Block Assemblies to the side of the 212B BEVELMASTER™.



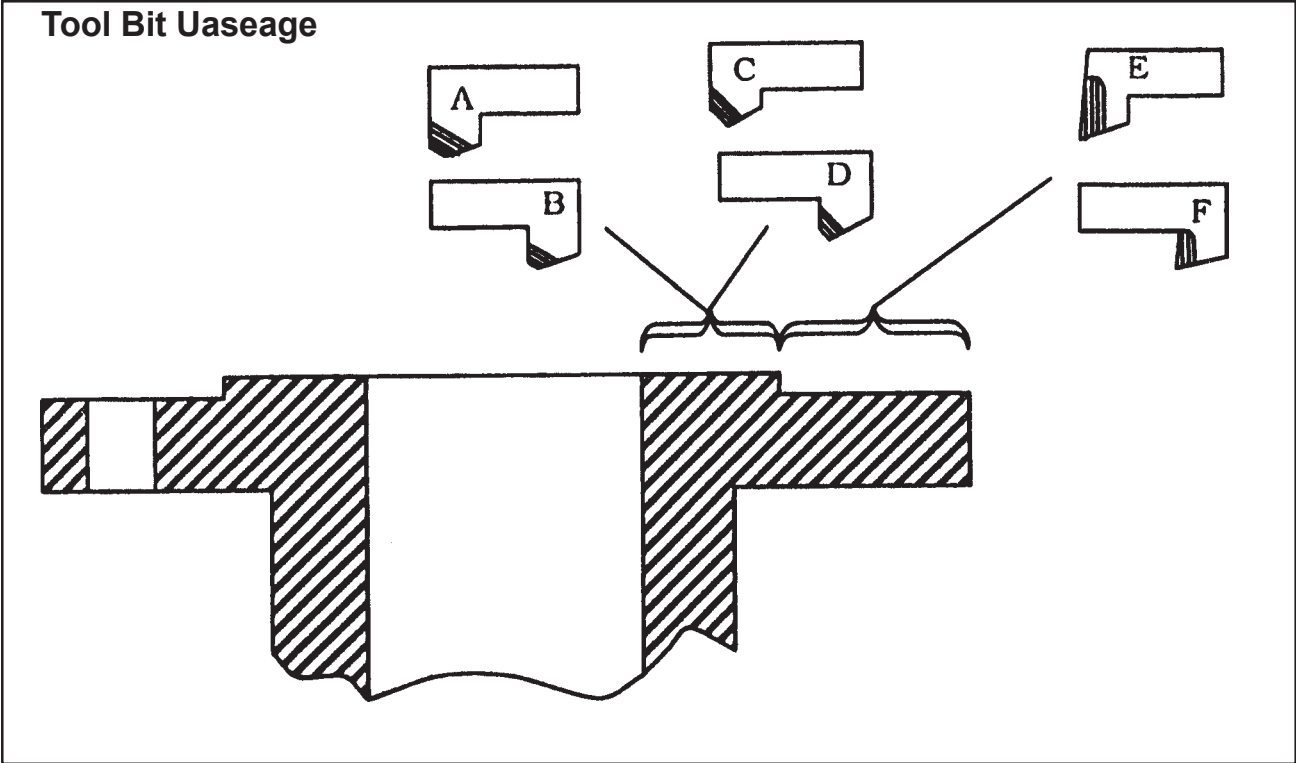
## CUTTING SPEEDS

The surface cutting speed will be dependent on the type of material being faced.

When facing over a mounting hole pattern in a flange, machine speed should be reduced to lessen the impact on the cutting edge of the Tool Bit and to prevent ripping the edge of the holes.

<b>DEPTH OF CUT RECOMMENDATIONS</b>	
Roughing Cut	.030" (.76 mm) maximum depth
Finish Cut	.010" (.25 mm) depth
<b>Tool Bit Feed Rate</b> dependent on the flange material and the type of finish required	
Roughing or Record Finish	.026" (.66 mm) Feed Both Trippers Engaged
Smooth Finish	.013" (.33 mm) Feed One Tripper Engaged

# TOOL BITS



TOOL BITS For Use With The Model 212B-FF Flange Facer			
P/N	Figure	Description	Cutting Range
99-2553	A	Tool Bit, Flange Facing, Inside Record Finish	3.44" to 22.00" dia (87.4 mm to 558.8 mm dia)
99-2554	C	Tool Bit, Flange Facing, Inside Smooth Finish	
99-2089	E	Tool Bit, Flange Facing, Inside Recessed Face	
99-2555*	B	Tool Bit, Flange Facing, Outside Record Finish	4.75" to 24.00" dia (120.7 mm to 609.6 mm dia)
99-2556*	D	Tool Bit, Flange Facing, Outside Smooth Finish	
99-2423	F	Tool Bit, Flange Facing, Outside Recessed Face	

\*Supplied with the kit

## TROUBLE SHOOTING

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

**Probable causes:**

- 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 is excessive Tool Bit wear**

**Probable causes:**

- 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**

**Probable causes:**

- 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**

**Probable causes:**

- 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 is a loss of air power**

**Probable causes:**

- 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**

**Probable causes:**

- 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**

**Probable causes:**

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

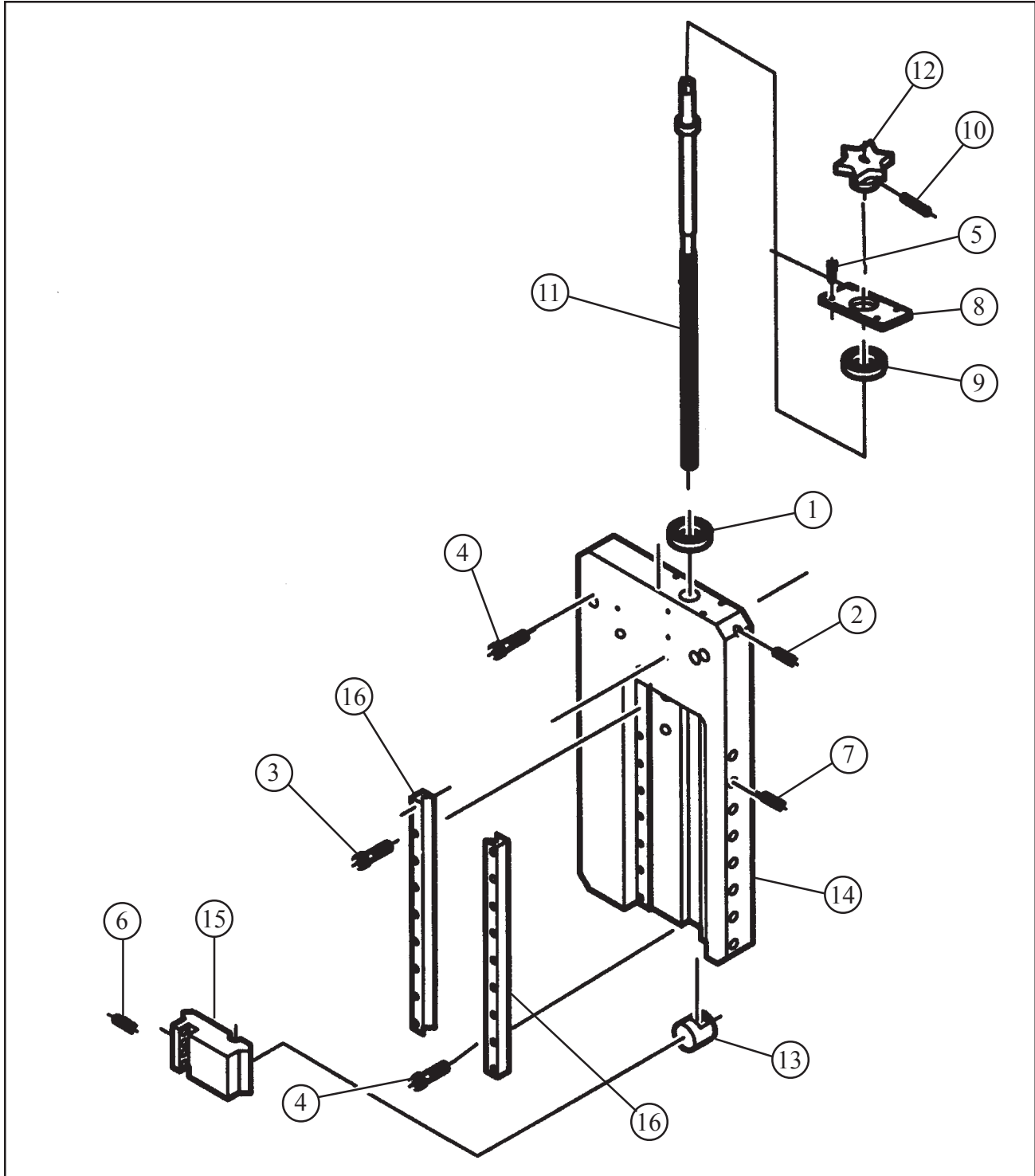
**Problem:      The hydraulic motor will not start**

**Probable causes:**

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

# ILLUSTRATED PARTS BREAKDOWN

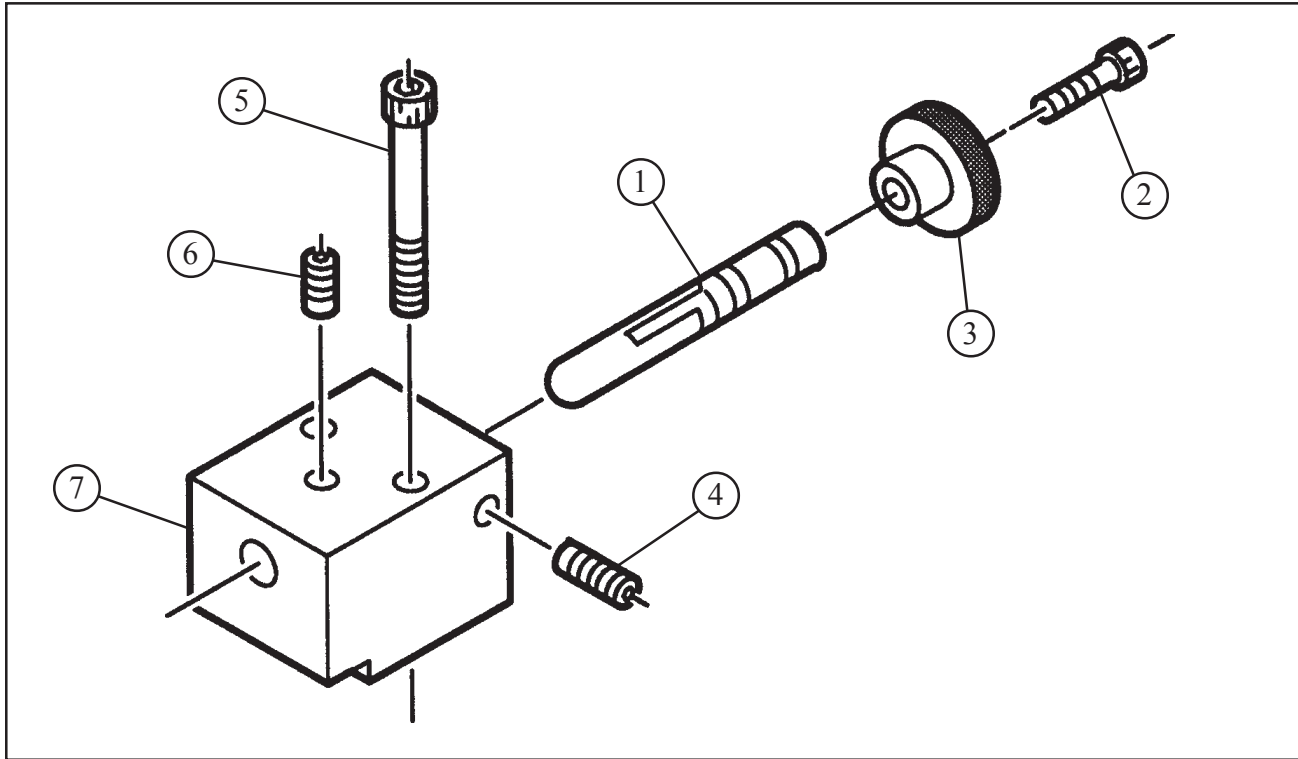
## MODEL 212B-FF, FLANGE FACER ASSEMBLY (Ref P/N 82-0070)



Parts List, Model 212B-FF, Flange Facer Assy (Ref P/N 82-0070)

Item No.	Part No.	Description	Qty
1	29-0182	BEARING, BALL	1
2	30-0464	PLUNGER, BALL	1
3	33-0043	SCREW, CAP, 1/4-20 X 1 1/4	18
4	33-0055	SCREW, CAP, 5/16-18 X 7/8	6
5	33-0280	SCREW, BUTTON, 10-24 X 5/8	4
6	33-0514	SCREW, SET, 5/16-18 X 3/8, CUP PT	4
7	33-1261	SCREW, SET, 3/8-24 X 3/4, HDOG	8
	33-1617	SCREW ASSY, FEED	1
8	24-0728	PLATE, RETAINING	1
9	29-0182	BEARING, BALL	1
10	32-0043	PIN, ROLL	1
11	33-1616	SCREW, FEED, 1/2-13	1
12	38-0080	SPROCKET, FEED	1
13	35-0266	NUT, FEED	1
14	47-0562	BRACKET, CARRIER	1
15	49-0141	HOLDER, TOOL	1
16	66-0100	RAIL, SLIDE	2
<b>NOT SHOWN:</b>			
	32-0304	PIN, LOCK	1
	33-0507	SCREW, SET, 1/4-20 X 1, CUP PT	1
	30-0514	BRUSH, CHIP	1
	36-0020	WRENCH, T, 5/32" HEX	1
	36-0021	WRENCH, T, 3/16" HEX	1
	36-0023	WRENCH, T, 1/4" HEX	1
	36-0091	WRENCH, RATCHET, 1/4" DRIVE	1
	36-0144	SOCKET, 1/4" DRIVE, 7/16" HEX	1
	86-0148	CASE, CARRYING	1

**BLOCK ASSEMBLY, TRIPPER (P/N 48-0478)**



Parts List, Block Assy, Tripper (P/N 48-0478)

Item No.	Part No.	Description	Qty
	14-0044	SHAFT ASSY, TRIPPER	1
1	20-0359	SHAFT, TRIPPER	1
2	33-0030	SCREW, CAP, 10-24 X 3/4	1
3	42-0023	KNOB, ROUND	1
4	30-0125	BALL PLUNGER	1
5	33-0045	SCREW, CAP, 1/4-20 X 1 3/4	2
6	33-0903	SCREW, SET, 1/4-20 X 5/16, HDOG	1
7	48-0479	BLOCK, TRIPPER	1