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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 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 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 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 CBM-3 Counterboring Module Kit is a mechanical accessory for the Models 616SB through 636SB Clamshells and for the Models 614RBL through 636RBL Clamshells.

The Model CBM-3 provides the capability to counterbore pipe after an in-line spool, valve or fitting has been removed.

The Model CBM-3 is mounted directly to the Tool Block via the appropriate Adapter Plate.

No repositioning or modification of the Clamshell is necessary after the in-line spool has been removed.

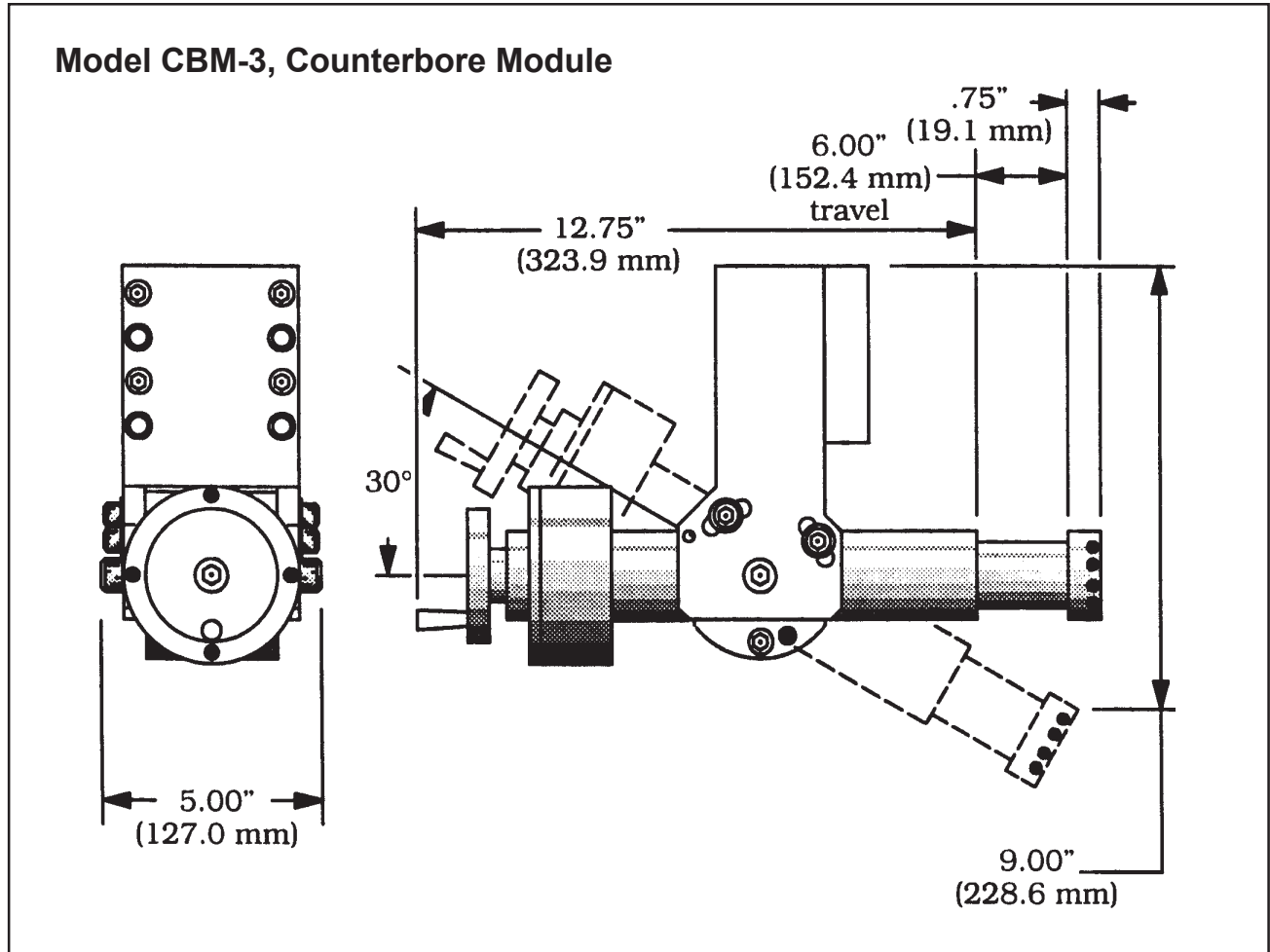
The Model CBM-3 features a manual “easy grip” axial feed and infinitely adjustable radial positioning.

The Model CBM-3 utilizes form Tool Bits that are available in various standard configurations.

## SPECIFICATIONS

Weight

22 lbs. (10 kg)



### Basic Pipe Sizes

Equal to the full range of the Clamshell to which the Counterbore Module is mounted.

### Pipe Schedules

The Model CBM-3 fits all pipe schedules from 12" through 36" pipe.

### Counterbore Depth

Up to 6.00" (152.4 mm) plus lead-out.

### Clearance

The rotating parts diameter is equal to the rotating parts diameter of the Clamshell on which the Model CBM-3 Counterbore Module is mounted.

### Length

14.60" (370.8 mm) from the face of the Clamshell.

### Taper Boring Adjustment

Up to 30° chamfers or up to 30° lead-out angles following a counterbore (Max. of 2.00" [50.8 mm] deep).

### Feed Length

6.00" (52.4 mm)

### Axial Feed Rate

.010" (.25 mm) per revolution

### Counterbore Run-Out

.005" per inch (.13 mm per 25.4 mm)



## MAINTENANCE

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

When the Counterbore Module is operated in such a way that the Module collects chips or debris near the Tool Holder, the Counterbore Module should be cleaned after each cutting operation.

### DAILY

Wipe the unit down and spray with rust preventative under severe humidity conditions.

Visually inspect for loose Screws, missing Bolts, or damage due to impact.

Contact TRI TOOL INC. if major repair is required.

Tighten or replace Screws or other parts as required.

### MONTHLY

Thoroughly clean and lubricate the Feed Tube and Boring Bar.

Feed the Boring Bar out of the Feed Tube.

With a clean, dry rag, thoroughly wipe down the Boring Bar and the Feed Tube.

Be sure that all of the old lubrication, chips, and dirt are completely removed.

Lubricate the Feed Tube, Feed Nut, and Boring Bar with a light machine oil.

Reassemble the Boring Bar into the Feed Tube.

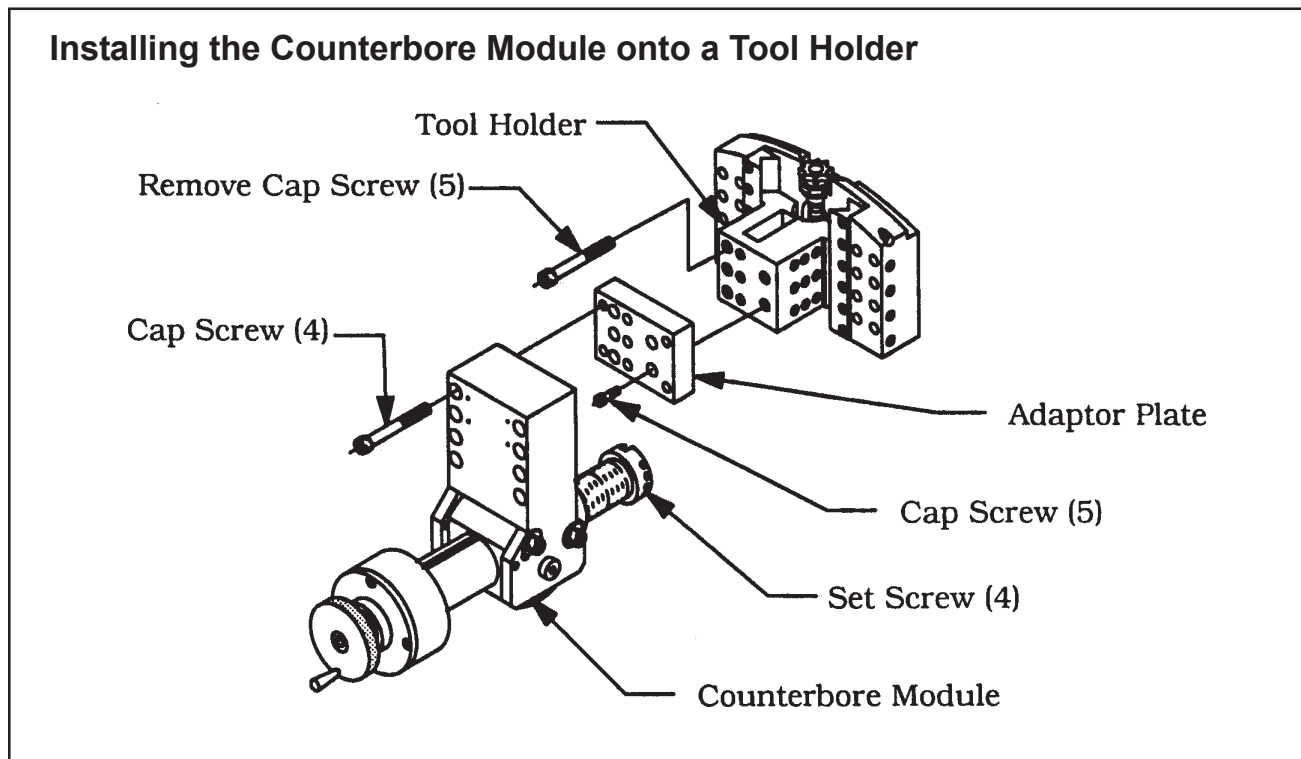
## OPERATION

Read the operating instructions carefully before attempting to operate the Model CBM-3 Counterbore Module.

Always wear adequate eye protection when operating power tools.

## INSTALLATION

Remove the five (5) Cap Screws from the front of the Tool Holder on the 600SB or 600RBL Clamshell.



Place the Adapter Plate (P/N 24-0634 for the SB's or P/N 24-1281 for the RBL's) on the top of the Tool Holder and tighten it down with the longer Cap Screws (P/N 33-0066 for the SB's or P/N 33-0081 for the RBL's).

Place the Support block and Counterbore Assembly on top of the Adapter Plate and tighten these down with the Cap Screws (P/N 33-0079).

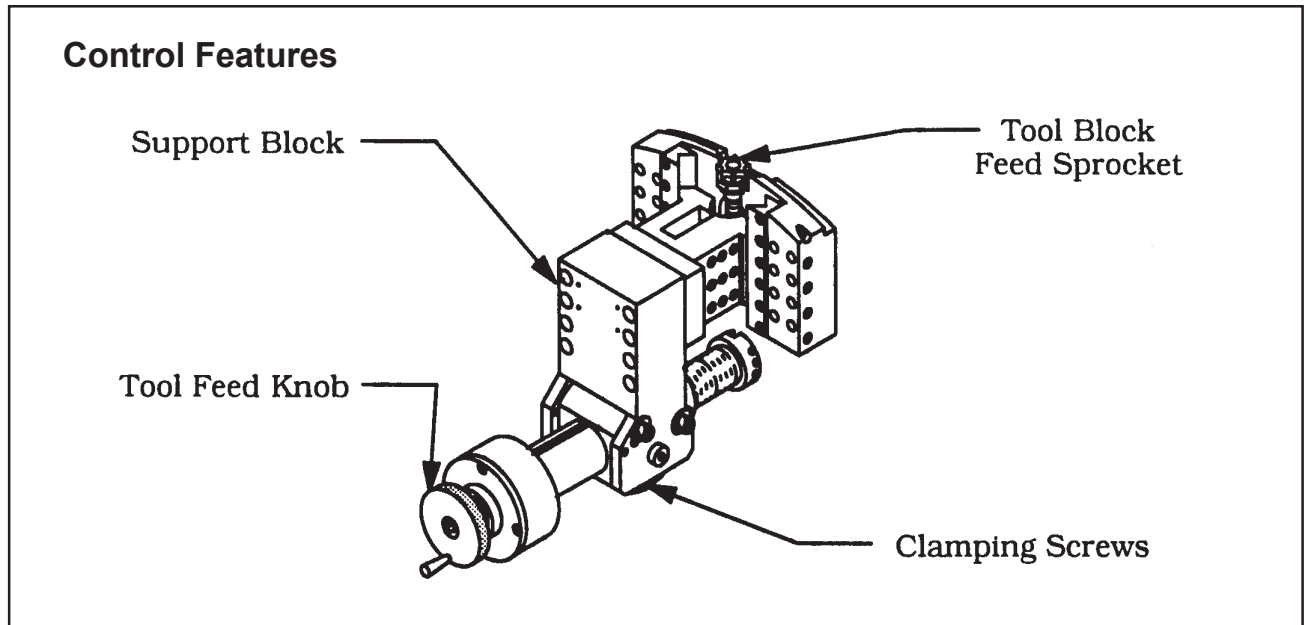
Place the Counterbore Tool Bit in the Tool Holder Slot on the Boring Bar and tighten it by using the Set Screws on the side of the slot.

## Model CBM-3 Counterbore Module

The Tool Bit to be installed should always provide a 1/4" (6 mm) minimum chip clearance against the Tool Holder.

Loosen the Clamping Screws and slide the Sleeve Assembly in toward the pipe until the Tool Bit Shaft is just outside of the pipe face.

Adjust the position of the Tool Bit to the pipe bore by using a combination of:



The different hole patterns provided on the Support Block.  
The radial feed mechanism of the Tool Block.  
Positioning the Tool Bit in the Tool Bit slot.

The Tool Bit should not be extended out of the Tool Bit slot by more than 5/8" (15.9 mm) on the cutting side of the Tool Bit Holder.

Lock the Feed Tube into position with the Clamping Screw.

Check to insure that the Tool Bit is clear of the pipe and that the Feed Pin is retracted.

## OPERATION

Slowly rotate the Clamshell to insure that the Counterbore Tool Bit clears the pipe.

Increase the Clamshell RPM to cutting speed. Reference the "Cutting Speeds and Feed" section of this manual.

To feed the Tool Bit in, hold the Feed Knob.

Do not use a wrench or lever to obtain extra holding strength.

Do not force the feed, if the feed pressure builds up too high, release the Knob for 2 or 3 revolutions.

**NOTE:**

The feed rate is .010" (.25 mm) per revolution, if the Feed Knob is held continuously.

For a lighter feed rate, hold and release the Feed Knob as the Clamshell revolves.

## CUTTING SPEEDS

The chart shows RPM to obtain specified Tool Bit surface cutting speed on the surface of the pipe.

Diameter	RPM for 200 in/min (5080 mm/min)	RPM for 250 in/min (6350 mm/min)	RPM for 300 in/min (7620 mm/min)
36.00" (914.0 mm)	2	2	3
34.00" (864.0 mm)	2	2	3
32.00" (813.0 mm)	2	3	3
30.00" (762.0 mm)	2	3	3
28.00" (711.0 mm)	2	3	3
26.00" (660.0 mm)	3	3	4
24.00" (610.0 mm)	3	3	4
22.00" (559.0 mm)	3	4	4
20.00" (508.0 mm)	3	4	5
18.00" (457.2 mm)	4	4	5
16.00" (406.4 mm)	4	5	6
14.00" (355.6 mm)	5	6	7
12.00" (304.8 mm)	5	7	8
10.00" (254.0 mm)	5	8	10

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.

**TOOL BITS**

C'bore Angle	Pipe or Tube Mat'l	Tool Bit Length	Radius	C'bore Tool Bit P/N	Double End Tool Bit
0°	CS, SS	2.50" (63.5 mm)	.020" (.51 mm)/ .030" (.76 mm)	99-2357	Yes
14°		3.00" (76.2 mm)	.070" (1.78 mm)	99-2940	Yes
30°			.020" (.51 mm)/ .030" (.76 mm)	99-2378	Yes

0° to 30° lead out by changing the Bar angle

## 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 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.

### **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 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**

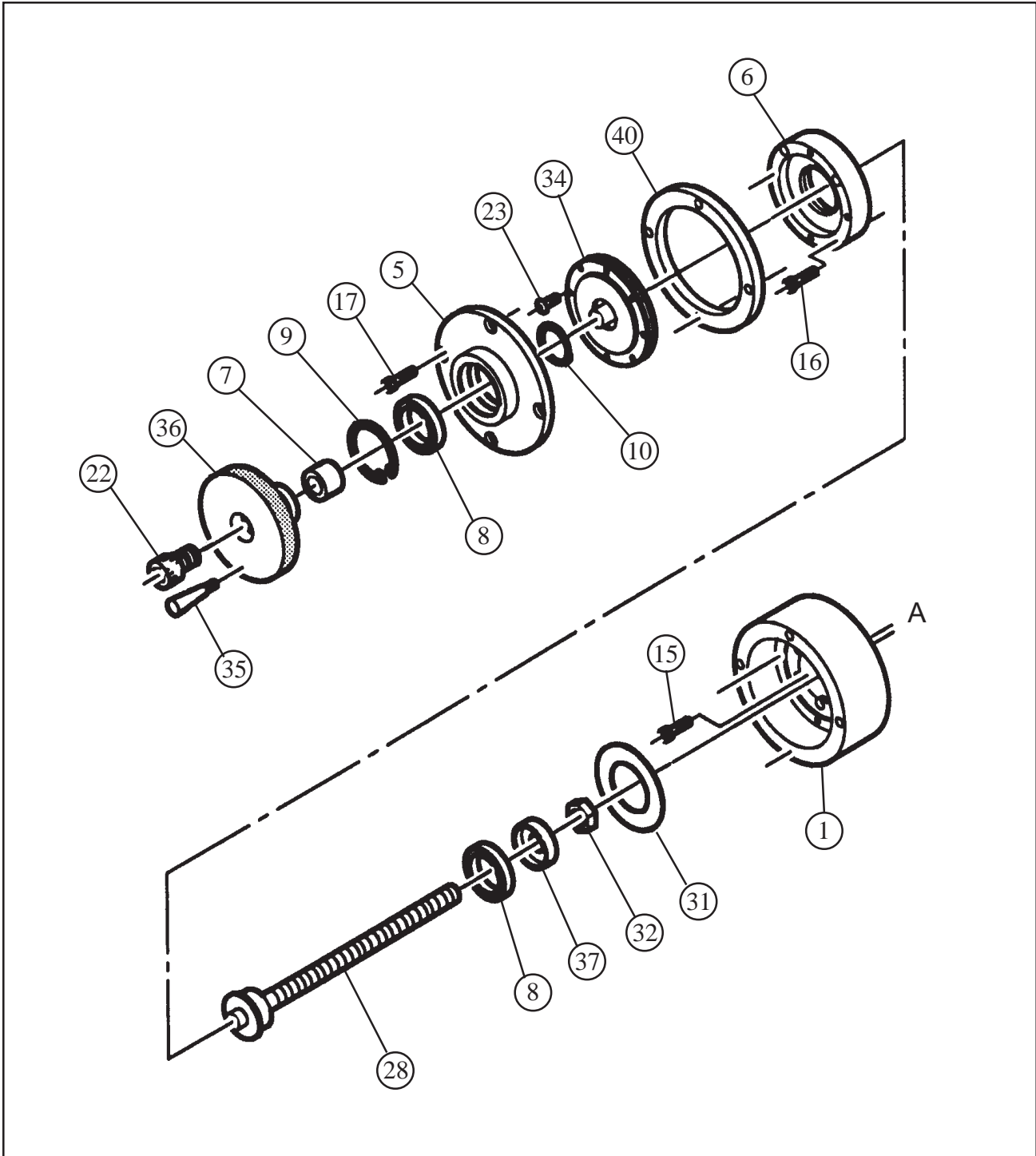
Incorrect tool blocks are installed for the size of the pipe or tube being worked on.  
Incorrect tool bit is installed.

**Problem: The Hydraulic Motor will not Start**

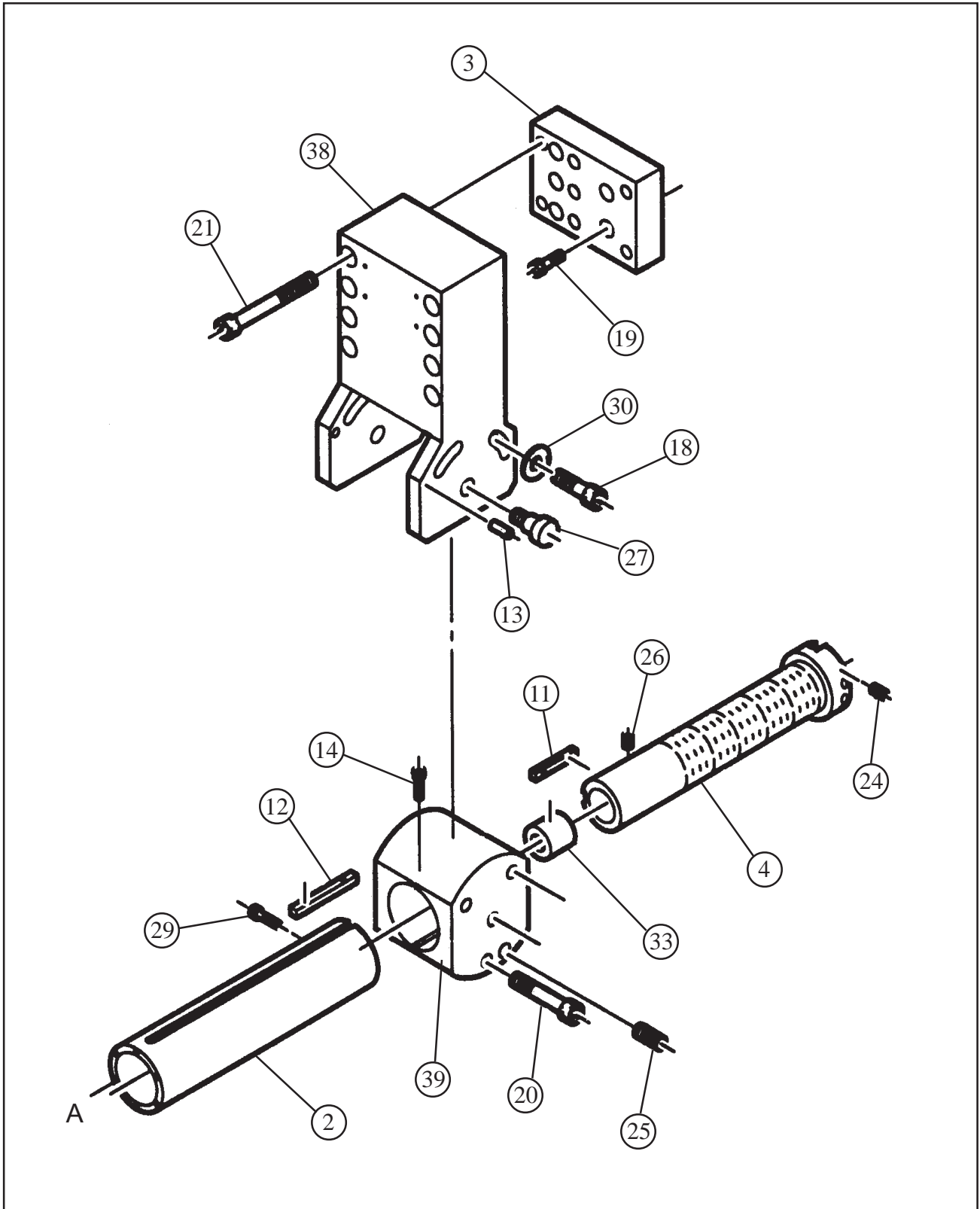
The hydraulic power supply is shut off.  
The hydraulic motor is damaged and will not run free.

# ILLUSTRATED PARTS BREAKDOWN

## MODEL CBM-3 COUNTERBORE MODULE (P/N 82-0059)



MODEL CBM-3 COUNTERBORE MODULE (P/N 82-0059)



**TRI TOOL INC.**

## Parts List, Model CBM-3 Counterbore Module (P/N 82-0059)

<b>Item No.</b>	<b>Part No.</b>	<b>Description</b>	<b>Qty</b>
1.	19-0396	HOUSING, GEAR	1
2.	22-0076	TUBE, FEED	1
3.	24-0634	PLATE, ADAPTER (FOR THE SB'S)	REF.
	24-1281	PLATE, ADAPTER (FOR THE RBL'S)	REF.
4.	26-0794	BAR, BORING	1
5.	27-0228	ADAPTER, HOUSING	1
6.	27-0229	ADAPTER, GEAR	1
7.	27-0283	ADAPTER, SPLINED SHAFT	1
8.	29-0095	BEARING, BALL	2
9.	30-0759	RING, RETAINING, INTERNAL	1
10.	30-0878	RING, RETAINING, EXTERNAL	1
11.	31-0078	KEY, FEED TUBE	1
12.	31-0083	KEY, PIVOT BLOCK	1
13.	32-0206	PIN, DOWEL, 1/4" DIA X 5/8"	2
14.	33-0008	SCREW, CAP, #5-40 X 1/2"	2
15.	33-0020	SCREW, CAP, #8-32 X 1/2"	6
16.	33-0022	SCREW, CAP, #8-32 X 3/4"	4
17.	33-0039	SCREW, CAP, 1/4-20 X 5/8"	4
18.	33-0072	SCREW, CAP, 3/8-16 X 1 1/4"	4
19.	33-0066	SCREW, CAP, 5/16-18 X 3 1/2" (FOR THE SB'S)	REF.
	33-0081	SCREW, CAP, 3/8-16 X 3 1/2" (FOR THE RBL'S)	REF.
20.	33-0075	SCREW, CAP, 3/8-16 X 2"	1
21.	33-0079	SCREW, CAP, 3/8-16 X 3"	4
22.	33-0101	SCREW, CAP, 1/2-13 X 1/2"	1
23.	33-0275	SCREW, BUTTON, #8-32 X 5/8"	4
24.	33-0503	SCREW, SET, 1/4-20 X 1/2", CUP PT.	4
25.	33-0533	SCREW, SET, 3/8-16 X 1", CUP PT.	1
26.	33-0903	SCREW, SET, 1/4-20 X 5/16", HDOG	1
27.	33-1478	SCREW, SHOULDER	2
28.	33-1547	SCREW ASSY, FEED	1
29.	33-1549	SCREW, CAP, #5-40 X 3/16"	2
30.	34-0018	WASHER, FLAT	4
31.	34-0201	WASHER, RETAINING	1

## Model CBM-3, Counterbore Module

### Parts List, Model CBM-3 Counterbore Module (P/N 82-0059) Continued

Item No.	Part No.	Description	Qty
32.	35-0117	NUT, JAM	1
33.	35-0260	NUT, FEED	1
34.	39-0373	GEAR ASSY, PLANETARY	1
35.	41-0040	HANDLE	1
36.	42-0083	KNOB, FEED	1
37.	44-0237	SPACER	1
38.	48-0483	BLOCK, SUPPORT	1
39.	48-0484	BLOCK, PIVOT	1
40.	44-0404	SPACER	1
NOT SHOWN			
	05-1259	SHIPPING KIT	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
	36-0018	WRENCH, T, 1/8" HEX	1
	36-0021	WRENCH, T, 3/16" HEX	1
	36-0023	WRENCH, T, 1/4" HEX	1
	36-0024	WRENCH, T, 5/16" HEX	1