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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

### IN GENERAL

Elbow Mandrels have been designed to expand the versatility of the Model 204B BEVELMASTER™.

These mandrels, when used in conjunction with the Model 204B, allow machining of pipe elbows, weld neck flanges, and pipe, that have a very short perch length.

## MAINTENANCE

### IN GENERAL

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

If the mandrel is operated in such a way that the mandrel collects chips or debris near the head, the head should be cleaned after each cutting operation.

### DAILY MAINTENANCE

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













Visually inspect for loose screws, missing bolts, or damage due to impact.

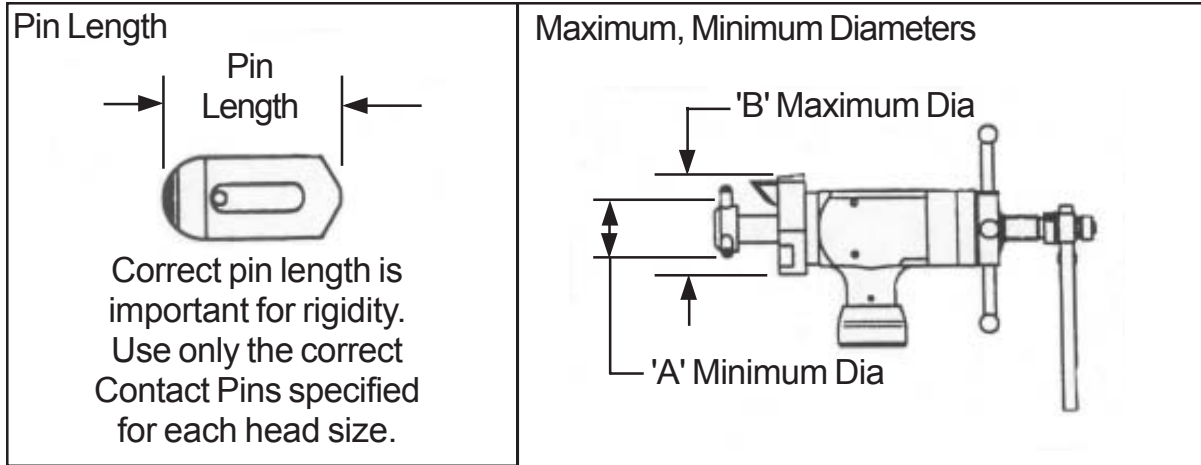
Contact TRI TOOL Inc. if major repair is required.

Tighten or replace screws or other parts as required.

# OPERATION

<b>ELBOW MANDREL KIT RANGE</b>				
<b>ID Mounting Ranges</b>				
<b>Head Assy P/N</b>	<b>Contact Pin P/N</b>	<b>ID Mounting Range</b>		<b>Pin Length</b>
		<b>"A" dia minimum</b>	<b>"B" dia maximum</b>	
06-0417	32-0370	1.00" (25.4 mm)	1.28" (32.5 mm)	.458" (11.6 mm)
	32-0371	1.27" (32.3 mm)	1.56" (39.6 mm)	.600" (15.2 mm)
*21-0332	32-0372	1.55" (39.4 mm)	1.85" (47.0 mm)	.743" (18.9 mm)
	32-0373	1.84" (46.7 mm)	2.13" (54.1 mm)	.885" (22.5 mm)
	32-0374	2.12" (53.8 mm)	2.42" (61.5 mm)	1.028" (26.1 mm)
	32-0375	2.41" (61.2 mm)	2.70" (68.6 mm)	1.170" (29.7 mm)
*21-0479	32-0376	2.69" (68.3 mm)	2.99" (75.9 mm)	1.313" (33.4 mm)
	32-0377	2.98" (75.7 mm)	3.27" (83.1 mm)	1.455" (37.0 mm)
	32-0378	3.26" (82.8 mm)	3.56" (90.4 mm)	1.598" (40.6 mm)
	32-0379	3.55" (90.2 mm)	3.87" (98.3 mm)	1.740" (44.2 mm)
	32-0498	3.88" (98.6 mm)	4.18" (106.2 mm)	1.893" (48.1 mm)
	32-0499	4.19" (106.4 mm)	4.50" (114.3 mm)	2.045" (51.9 mm)
* These two mandrel assemblies make up the elbow mandrel kit (P/N 05-0293)				

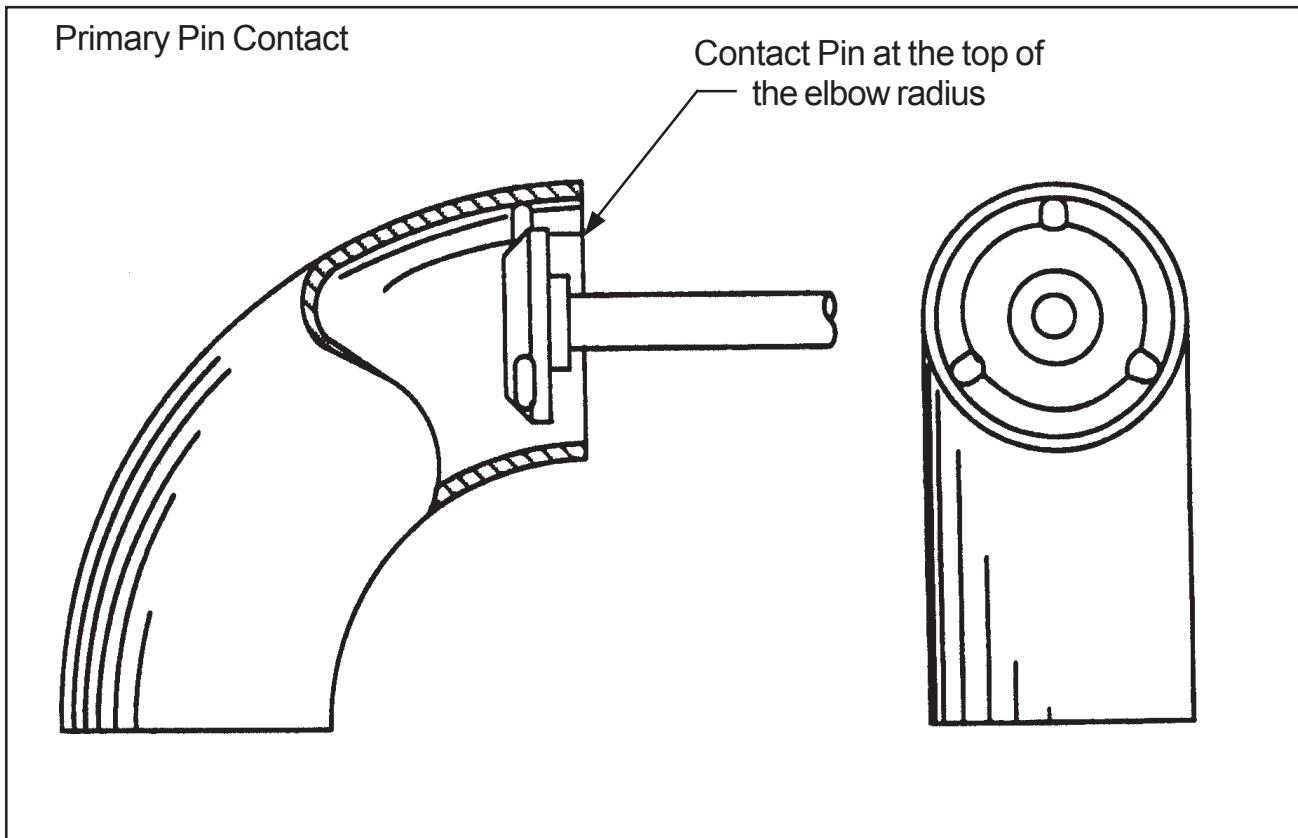
Pin Length Measuring Guide	
Contact Pin P/N	Pin Length
32-0370	 .458" (11.6 mm)
32-0371	 .600" (15.2 mm)
32-0372	 .743" (18.9 mm)
32-0373	 .885" (22.5 mm)
32-0374	 1.028" (26.1 mm)
32-0375	 1.170" (29.7 mm)
32-0376	 1.313" (33.4 mm)
32-0377	 1.455" (37.0 mm)
32-0378	 1.598" (40.6 mm)
32-0379	 1.740" (44.2 mm)
32-0498	 1.893" (48.1 mm)
32-0499	 2.045" (51.9 mm)



MANDREL SET-UP IN AN ELBOW

The Mandrel should be set-up in the elbow so that one pin contacts the inside diameter of the elbow at the top.

This will help center the Mandrel.



## 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.

## **ACCESSORIES**

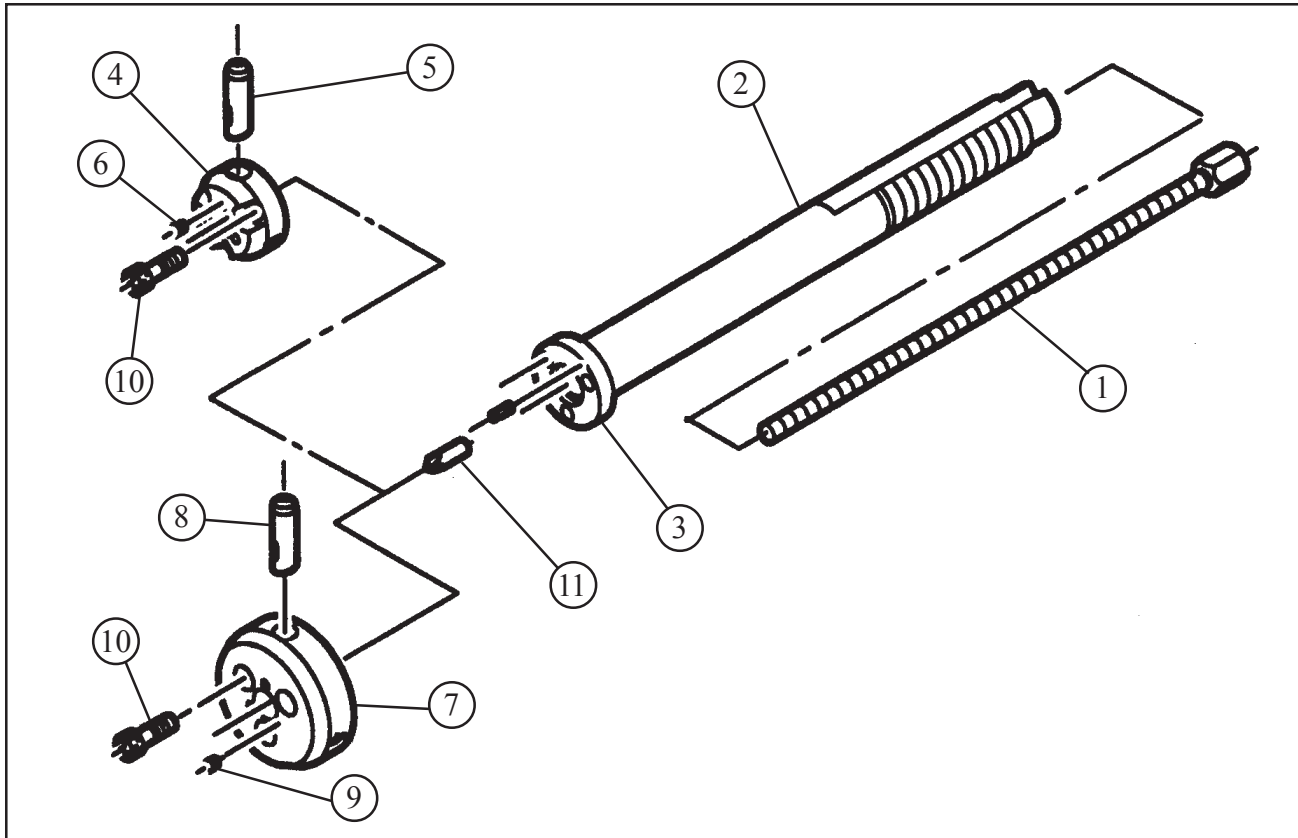
The following accessory is recommended for use with the Model 204B-EM, Elbow Mandrels and are available from TRI TOOL INC.

05-0355, Adjustable Centering Pin Kit

The Kit is used, with the Standard Centering Pins, for centerline adjustment of the Mandrel into the elbow.

**ILLUSTRATED PARTS BREAKDOWN**

**ELBOW MANDREL ASSEMBLY**



Parts List, Mandrel Assembly, Elbow (P/N 05-0293)

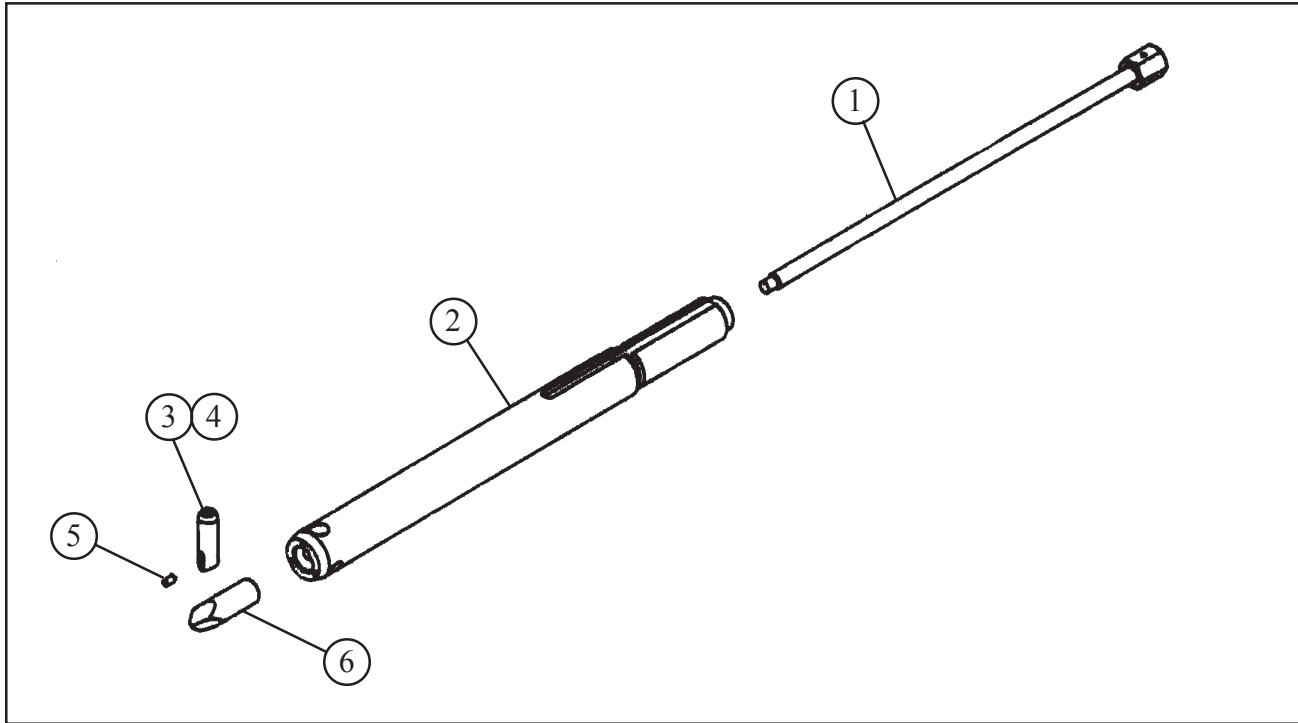
Item No.	Part No.	Description	Qty
	12-0126	MANDREL SUB-ASSY	1
1.	11-0105	ROD ASSY, PUSH	1
2.	13-0431	MANDREL SUB-ASSY	1
3.	32-0220	PIN, DOWEL, 1/8 DIA X 3/8"	1
	21-0332	HEAD ASSY, ELBOW MANDREL	1
4.	21-0321	HEAD, 1.45" DIA	1
5.	32-0372	PIN, CENTERING, .743"/18.9 mm	3
8.	32-0373	PIN, CENTERING, .885"/22.5 mm	3
	32-0374	PIN, CENTERING, 1.028"/26.1 mm	3
	32-0375	PIN, CENTERING, 1.170"/29.7 mm	3
6.	33-1660	SCREW, SET, #6-32 X 1/4", BRASS TIP	3

## Model 204B-EM Elbow Mandrels

Parts List, Mandrel Assembly, Elbow (P/N 05-0293), Continued

Item No.	Part No.	Description	Qty
	21-0479	HEAD ASSY, ELBOW MANDREL	1
7.	21-0322	HEAD, 2.31" DIA	1
8.	32-0376	PIN, CENTERING, 1.313"/33.4 mm	3
	32-0377	PIN, CENTERING, 1.455"/ 37.0 mm	3
	32-0378	PIN, CENTERING, 1.598"/40.6 mm	3
	32-0379	PIN, CENTERING, 1.740"/44.2 mm	3
	32-0498	PIN, CENTERING, 1.893"/48.08 mm	3
	32-0499	PIN, CENTERING, 2.045"/51.94 mm	3
9.	33-1660	SCREW, SET, BRASS TIP, #6-32 X 1/4"	3
10.	33-0038	SCREW, CAP, 1/4-20 X 1/2"	3
11.	54-0311	PLUG	1
NOT SHOWN:			
	36-0001	WRENCH, L, 1/16" HEX	1
	36-0008	WRENCH, L, 3/16" HEX	1
	36-0076	WRENCH, COMBINATION, 9/16"	1
	86-0169	CASE, CARRYING	1

SMALL ELBOW MANDREL ASSEMBLY



Parts List, Mandrel Assy, Elbow, Small (P/N 06-0417)

Item No.	Part No.	Description	Qty
1.	11-0105	ROD, ASSY, PUSH	1
2.	13-0432	MANDREL, ELBOW, SMALL, 204B	1
3.	32-0370	PIN, CENTERING, .458"/11.6 mm	3
4.	32-0371	PIN, CENTERING, .600"/15.2 mm	3
5.	33-1660	SCREW, SET, BRASS TIP, #6-32 X 1/4"	3
6.	54-0311	PLUG	1
<b>NOT SHOWN:</b>			
	36-0001	WRENCH, L, 1/16" HEX	1