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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.

Model 302 Tube Squaring Machine

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

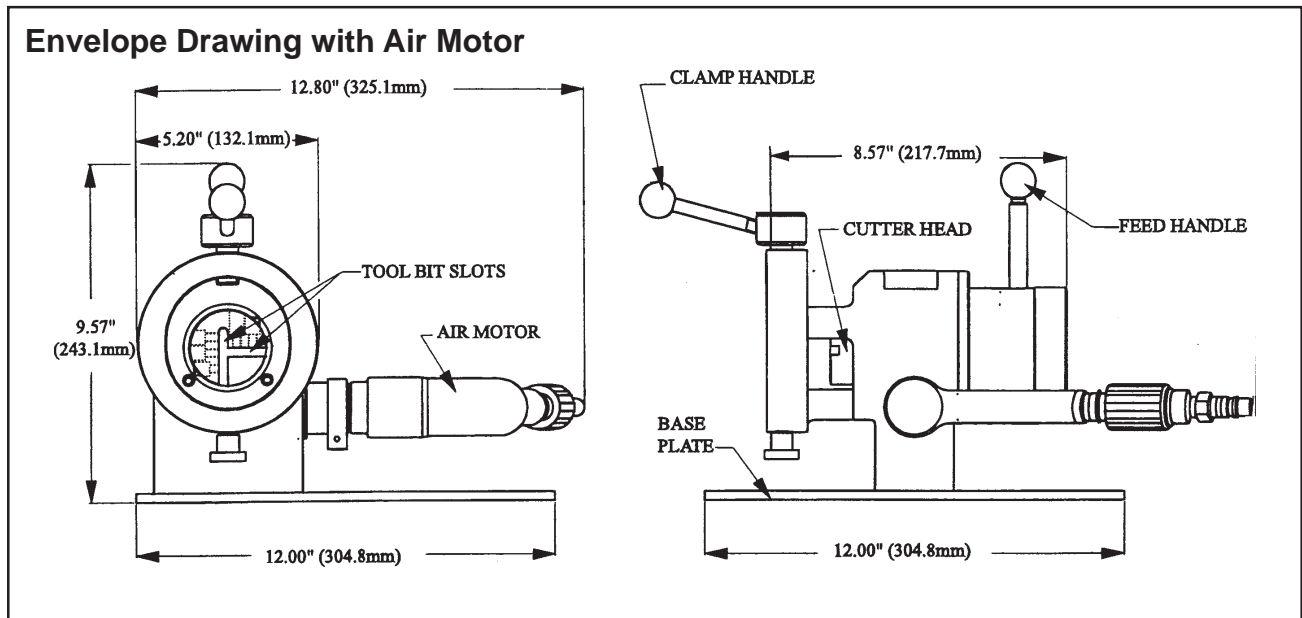
The Model 302 Tube Squaring Tool is a bench mounted machine designed specifically to prepare tubes for autogenous welding. The 302 will face (square) .188" to 2.375" (4.8 mm to 60.3 mm) outside diameter tubing with a wall thickness up to .200" (5.1 mm). The 302 uses an OD Saddle Clamping System for holding and rounding the tube. The 302 accepts its own torque through the Saddle Clamping System. The standard Saddle Clamping System requires a straight length of tube .875" (22.2 mm) long. Automatic clamping can be provided using a pneumatic clamping system. Speed control is provided with a variable speed electric drive or a pneumatic drive motor. A microfeed system with a graduated feed of .001" (.025 mm), provides an accurate controlled feed alternative.

SPECIFICATIONS

Model 302A with an Air Motor (P/N 01-1271)

Weight: 18.5 lbs (8.4 kg) without saddles

Power Requirements: 26 cfm at 90 PSI (12 L/s at 621 kPa)



Model 302E with a 110 VAC, 60 Hz Electric Motor (P/N 01-1242)

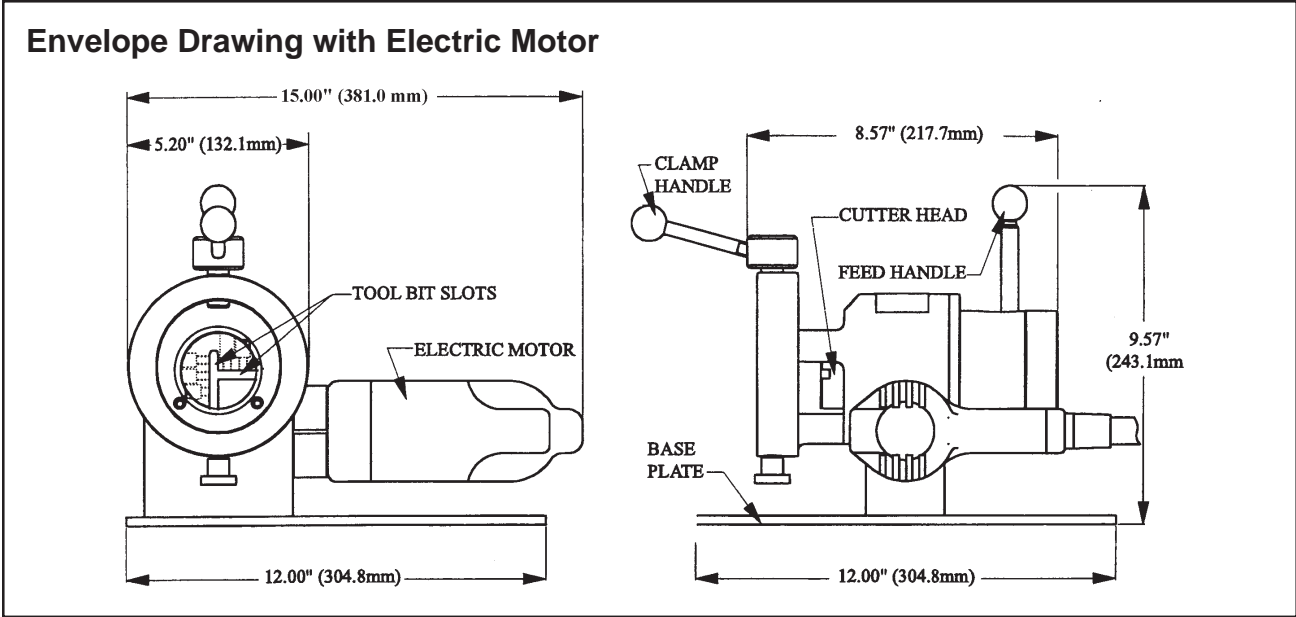
Weight: 20.6 lbs (9.3 kg) without saddles

Power Requirements: 110 VAC, 50/60 hz, 7.0 amp

Model 302E with a 220 VAC, 50 Hz electric motor (P/N 01-1770)

Weight: 20.6 lbs (9.3 kg) without saddles

Power Requirements: 220 VAC, 50/60 hz, 4.0 amp



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.

The air supply for the Model 302A with an air motor should include an adequate filter, regulator and lubricator (FRL).

NOTE: The Motor Warranty is void if damage occurs from contaminated air or lack of lubrication.

If the Model 302 is operated in the vertical position (cutting head up), it should be turned upside down and the chips and/or other debris removed after each bevel has been completed.

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

Bearing and gears are to be lubricated using a high string utility grease (P/N 68-0020).

AIR MOTOR LUBRICATION

WARNING: Disassembly of a power unit voids warranty, except when performed by a TRI TOOL designated repair technician. (Letter of designation is required.)

No direct maintenance is normally required on the Air Motor.

However, the air supply must flow through a filter/regulator/lubricator (FRL) unit or separate units before arriving at the air motor.

The FRL unit must be maintained as required (frequency dependent on the basic air supply) to keep the water trap drained, filter cleaned and the lubricator oil reservoir filled so that a drop of oil every two (2) to five (5) seconds is flowing.

If the Model 302A is to be left idle for 24 hours or more after being run on 'wet' air, it is advisable to squirt oil directly into the air motor inlet and run the motor for two (2) to three (3) seconds.

This will prevent rusting and 'freezing' of the rotor vanes.

Lubricant Recommendations:

The air motor requires a 'Class 2' lubricant, viscosity of 100 to 200 SSU at 100° F (38° C).

- 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
- Exxon – Nuto H32
- Shell – Tellus Oil 32

NOTE:

The bearings in either the air motor or the electric motor are sealed and do not require any lubrication.

OPERATION

GENERAL

The handle of the motor may be rotated to another position as necessary to fit into some situations.

Loosen the cap screw in the clamp bracket and rotate the motor handle to the desired position.

Tighten the cap screw before turning the motor on.

Select the Tool Bit required to machine the tube ends square and flat as required for an autogenous weld joint.

WARNING: The 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 void the Tri Tool Inc. factory warranty.

General Guide Lines for Selecting a Tool Bit

Selection of the Tool Bit should be based on tubing material, the tubing size, and how critical is it to have a near burr free end. The DURABIT 1, DURABIT 2 and DURABIT 3 Tool bits provide near burr free ends (measured burrs less than 0.004" or 0.1mm) on most materials.

The DURABIT 1, DURABIT 2 and DURABIT 3 were developed specifically for optimum burr conditions on electropolished austenitic Stainless Steel tubing such as 316L and to run at higher speeds than other tube squaring tool bits. Electro-polished stainless steels have a micro-thin surface on the ID, which is high in Cr and Ni. This surface is soft, but tough and difficult to cut without a burr.

NOTE: The Part Number for a DURABIT 1 is "DURBIT1", DURABIT 2 is "DURBIT2" and DURABIT 3 is "DURBIT3".

For carbon steel tube with a wall thickness greater than 0.083" (2.24mm). Contact your Tri Tool representative for Tool Bit recommendations.

M-42 Tool Bits are available for use with the exotic alloys where the high heat resistance is required to avoid burning the cutting edge of the Tool Bit. Call your Tri Tool representative for recommendations.

M-42 can improve the life expectancy of the Tool Bit under some conditions but it should be noted that M-42 Tool Bits are more brittle than the M-2 Tool Bits. Therefore, there is a much greater risk of damaging the Tool Bit when installing the tubing in the Tube Squaring Machine. Loss of Tool Bits from damaged edges may not offset the improved cutting life expected from M-42 tool steel.

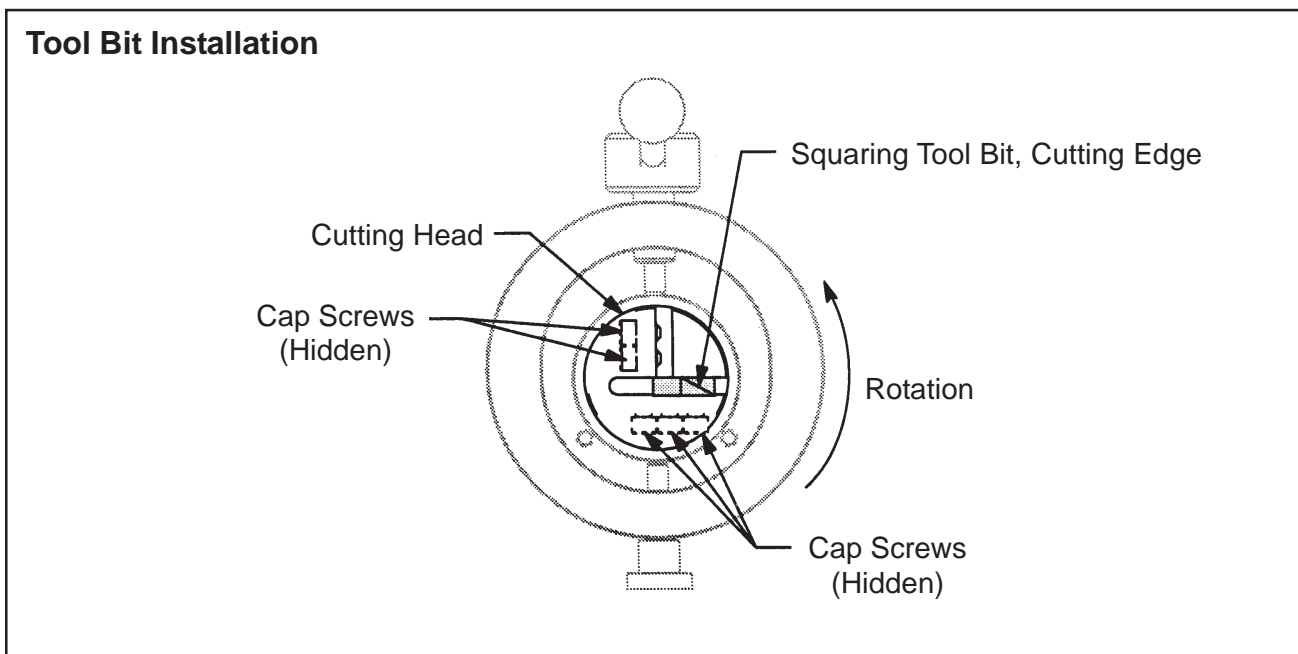
Tool Bits made from M-42 tool steel with its high heat resistance, may provide longer life on some exotic alloys. Be aware that the cutting speeds to obtain a burr FREE end is slower for all tool bits other than the DURABIT Series Bits. The cost impact of the slower running speeds may not offset the increase in life expectancy.

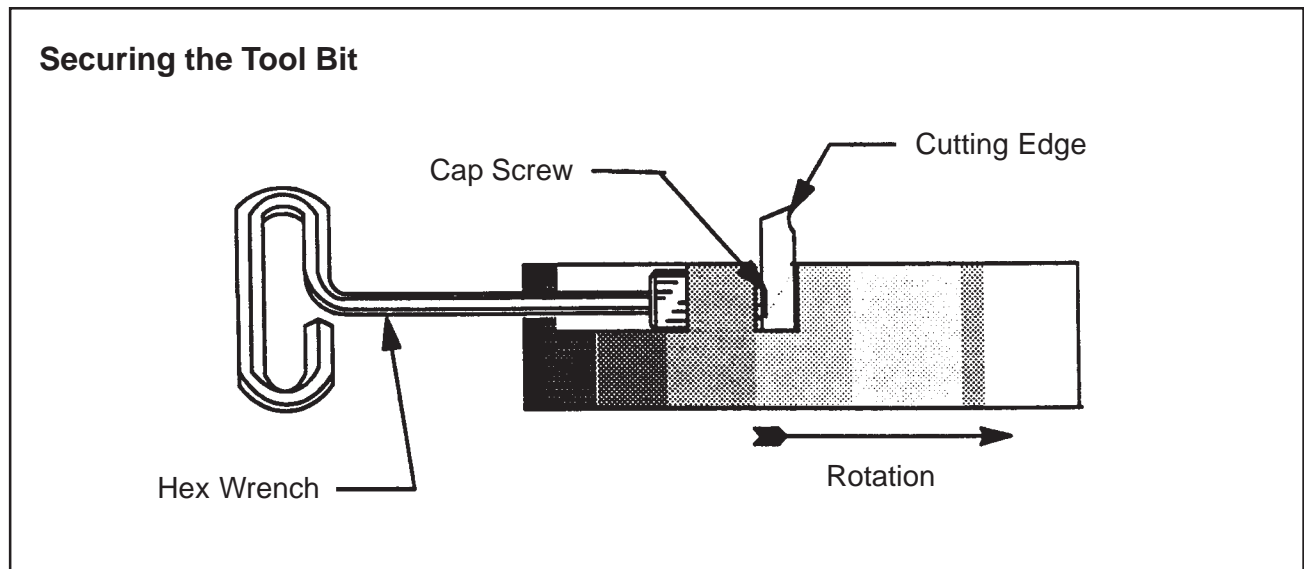
Select the tool bit(s) required to machine the end configuration desired.

When performing a tube squaring operation the tool bit may be placed in any slot.

When performing separate machining operations such as facing or beveling, the tool bit(s) may be installed in any one of the two cutting head slots.

When performing two machining operations such as facing and beveling, the tool bits should be installed with one in each slot.





INSTALLING A TOOL BIT INTO THE TOOL

CAUTION: Insure that the Model 302 Tube Squaring Machine is disconnected from the power source before installing a Tool Bit.

Insert the Tool Bit into the slot in the Cutting Head.

CAUTION: The cutting edge of the Tool Bit must be located on the radial centerline.

NOTE: Do NOT install the Tool Bit backwards.

Position the tip of the tool bit to be just inside the inside of the tube wall. The tip must always be inside of the tube bore to achieve a flat end. The tip location is critical on .50" to 1.00" tube because when tip is too close to the center of the tube the chip may roll into the tube and scratch the ID.

Tighten the cap screws to secure the tool bit(s) to the cutting head.

CUTTING PROCEDURES

DURABIT 1 Tool Bit

The DURABIT 1 is designed to run at the maximum available RPM from the tool which makes the cutting procedure different relative to the other Tube Facing Bits with 99-xxxx part numbers.

Visually verify that the tool bit will clear the end of the tube with the feed fully retracted (normal return position). A tube end that is cut at an angle (not

square) can be set such that the tool bit clears the end, but when the tool bit is rotated it will engage the tube with a very heavy cut.

Using the maximum speed available from the motor, turn the machine on and advance the tool bit into the end.

NOTE:

Be careful not to “dive” into the work and risk damage to the tool bit from an excessive cut.

On interrupted or out of square ends, advance the bit slowly with light feed pressure (torque applied to the feed handle) until a continuous cut is achieved (the tool bit is cutting all the way around the end).

Once a full cut is achieved use moderate feed pressure to finish the cut (either to just achieve a quality end or to cut to a scribe line).

When the desired length is achieved, let the machine make one or two revolutions without feeding the machine (i.e. while holding the feed handle in a fixed position). If the feed backed out before making the finish revolutions the end will not be square. This effect will be most noticeable on larger diameter tubes.

Back the tool bit away from the end with the machine running.

NOTE:

Never stop the machine with the tool bit in the cut as this can chip the tool bit

99-xxxx Series TUBE SQUARING Tool Bits

The 99-xxxx series tool bit achieves the best end results when run at slow speed. This is especially true with electropolished tube. Electropolished austenitic stainless steel tube alloys are very soft and tend to “mush” away from the cutting edge. If the tube or the tool bit get warm, this tendency is increased. Further, the cutting speed must be kept very slow to avoid heat at the tool bit. If the tool bit to tube interface is allowed to get hot then it is like a dull knife to cut warm butter. The material just flows away from the bit forming large burrs. The DURABIT Series tool bits have a unique cutting edge design and proprietary coating, which work best at high cutting speeds and are the most commonly recommended tool bits for tube squaring application. However, for some applications the 99 series tool bits still find a home and the following cutting procedures apply.

Visually verify that the tube bit will clear the end of the tube with the feed fully retracted (normal return position). A tube end that is cut at an angle (not

square) can be set such that the tool bit clears the end, but when the tool bit is rotated it will engage the tube with a very heavy cut.

Turn the machine on, and using the speed control of the motor, set the RPM between 30 and 50 then advance the tool bit into the end. Use the low end of the speed range (30 RPM) for 0.50 and larger tube and the high end (50 RPM) of the range for smaller tube.

NOTE:

Be careful not to “dive” into the work and risk damage to the tool bit from an excessive cut.

On interrupted or out of square ends, advance the bit slowly with light feed pressure (torque applied to the feed handle) until a continuous cut is achieved (the tool bit is cutting all the way around the end). The operator must increase the speed control position to maintain the cutting speed as the load increases.

Once a full cut is achieved use moderate feed pressure to finish the cut (either to just achieve a quality end or to cut to a scribe line). The operator should strive to achieve a loose but continuous chip. The chip should be a loose curl, not a tight spiral that looks like an ice cycle.

When the desired length is achieved, let the machine make one or two revolutions without feeding the machine (i.e. while holding the feed handle in a fixed position). If the feed is backed out before making the finishing revolutions the end will not be square. This effect will be most noticeable on larger diameter tubes.

Back the tool bit away from the end with the machine running.

Never stop the machine with the tool bit in the cut as this can chip the tool bit.

Adjust the bevel tool bit radially to control the land width to the bevel relationship.

SADDLE INSTALLATION

Select the desired saddle size for the pipe or tube to be worked on.

Insert the lower saddle half into the lower front of the main housing.

Then thread the adjust knob in through the bottom of the main housing and into the lower saddle half.

Slide the two (2) cap screws through the front of the lower saddle half and into front of the main housing and tighten.

Place the upper saddle half into the front of the main housing.

Thread the shoulder screw into the top of the upper saddle half.

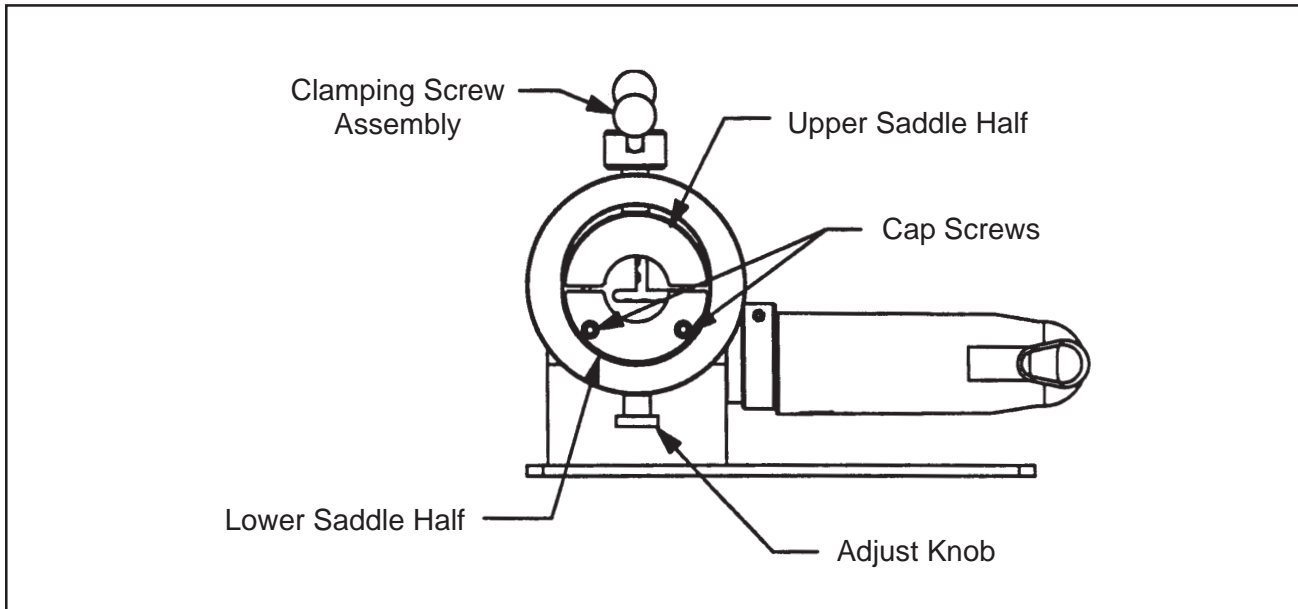
Back the adjustment screw assy out until the upper half of the saddle comes in contact with the main housing.

MACHINING SEQUENCE

Place the pipe or tube into the saddles.

Verify a clearance of 1/8" (3 mm) between the tool bit(s) and the pipe or tube face as held by the saddles.

Tighten the upper saddle by turning the adjustment screw assy to secure the pipe or tube once the proper clearance has been verified.



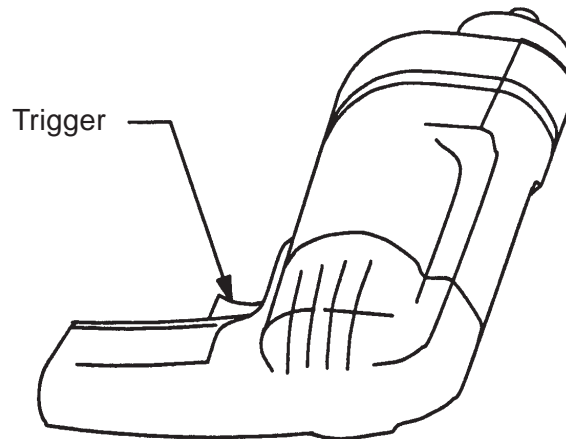
POWER REQUIREMENTS

Connect the proper power supply.

Depress the motor trigger.

Control and maintain constant cutting speed.

Trigger Location



Refer to 'Cutting Speeds and Feeds' located in this manual for cutting speeds.

Rotate the feed knob clockwise to bring the cutting head and end of the tube or pipe closer together.

Each line on the cover represents .001" (.025 mm) of feed travel.

CAUTION: The actual machining operation will begin when the tool bit contacts the tube or pipe.

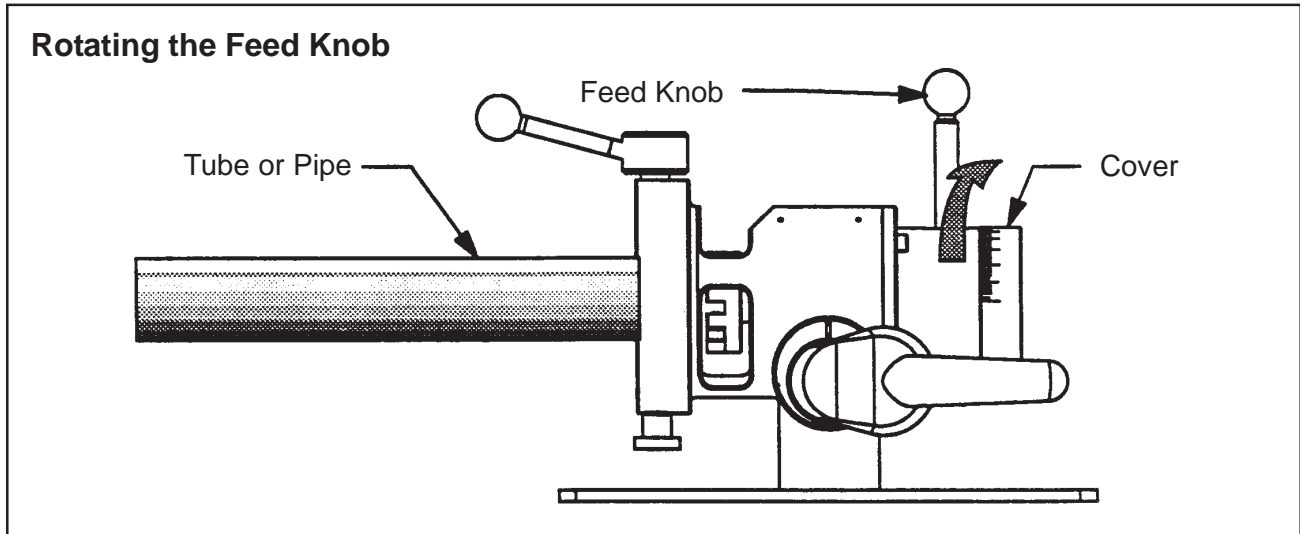
If the tube or pipe end is not square to the tube or pipe axis, the tool bit will contact only a small segment of the tube or pipe during each revolution.

To avoid tool bit damage, the feed rate should be very slow until the tool bit is contacting the tube or pipe continually during at least one revolution.

Continue rotating the feed knob clockwise until the end of the tube or pipe is completely machined.

CAUTION: Be careful not to let the tool bit(s) cut into the saddle.

Discontinue feed and allow the cutting head to rotate one (1) to three (3) revolutions to improve the finish of the prep surface.



Rotate the feed knob counterclockwise to separate the cutting head and the tube or pipe.

Stop the tool rotation.

Release the trigger on the motor.

Rotate the feed knob counterclockwise until the cutting head clears the tube or pipe by at least 1/8" (3 mm) or more.

Loosen the upper saddle to release the tube or pipe.

CUTTING SPEEDS AND FEEDS

Pipe DIA	True DIA	RPM for 200 in/min (5080 mm/min)	RPM for 250 in/min (6350 mm/min)	RPM for 300 in/min (7620 mm/min)
	.250" (6.4 mm)	255	318	382
	.375" (9.5 mm)	170	212	255
	.500" (12.7 mm)	127	159	191
	.750" (19.1 mm)	85	106	127
	1.00" (25.4 mm)	64	80	95
	1.25" (31.8 mm)	51	64	76
	1.50" (38.1 mm)	42	53	64
	2.00" (50.8 mm)	32	40	48
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.

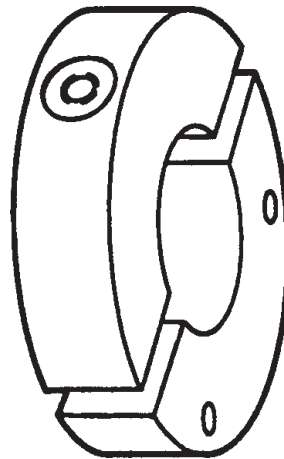
Use 250 surface inches per minute (6350 surface millimeters per minute) for:

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 thin-wall mild steel and tube with coolants.

SADDLE SETS

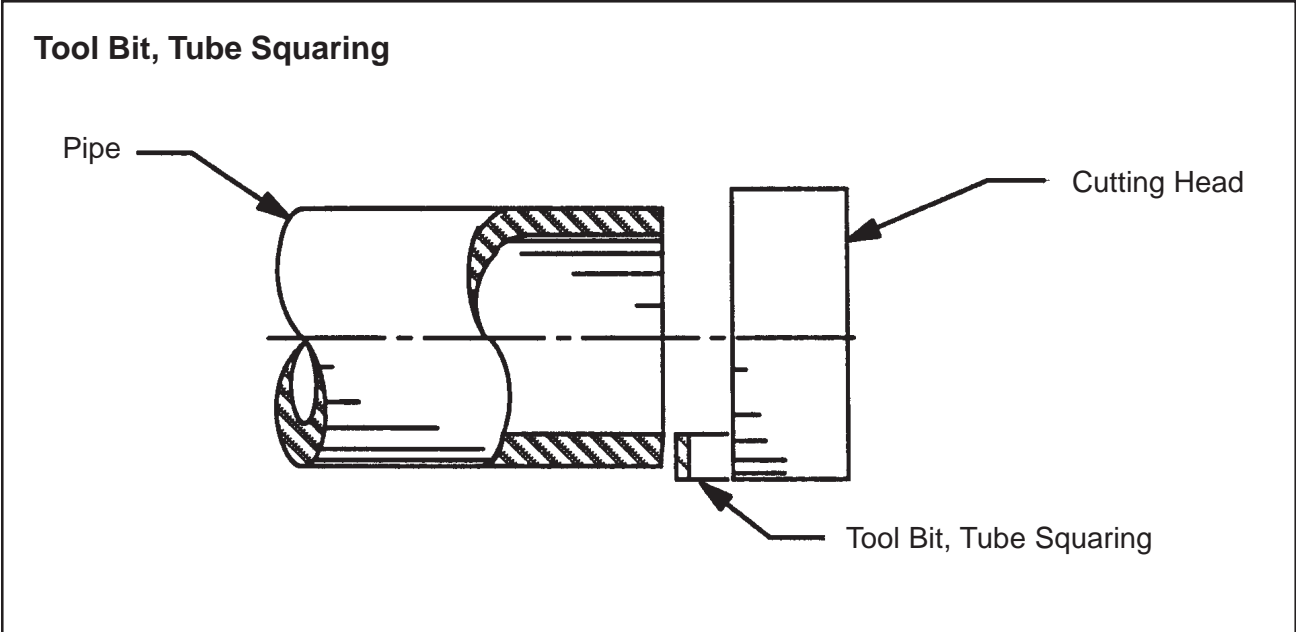


Pipe Size	Fraction	Decimal	Metric	Saddle P/N
	1/4"	.250"	6.4 mm	67-3523
	3/8"	.375"	9.5 mm	67-3532
	1/2"	.500"	12.7 mm	67-3545
	3/4"	.750"	19.1 mm	67-3567
	1"	1.000"	25.4 mm	67-3582
	1 1/4"	1.250"	31.8 mm	67-3589
	1 1/2"	1.500"	38.1 mm	67-3598
	2"	2.000"	50.8 mm	67-3612
	2 3/8"	2.375"	60.3 mm	67-3619

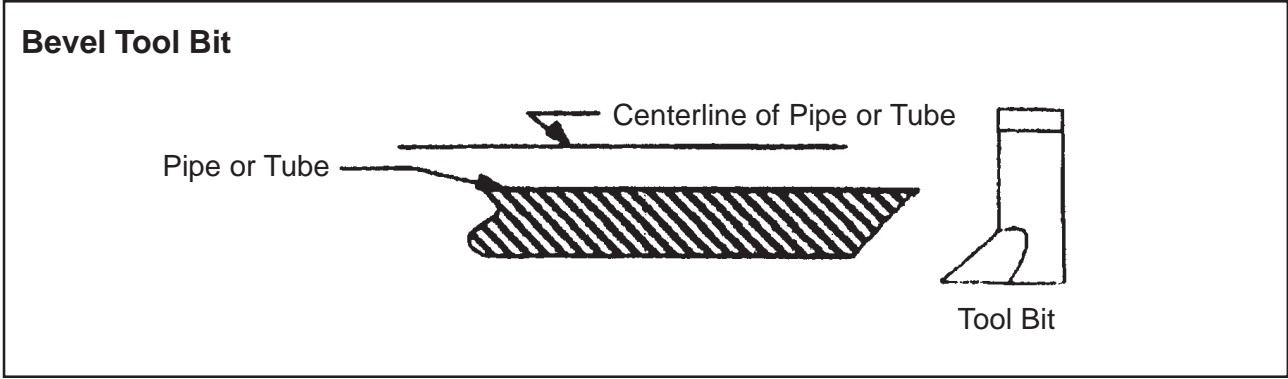
Saddles are made of Stainless Steel.

Contact TRI TOOL Inc. for sizes not listed.

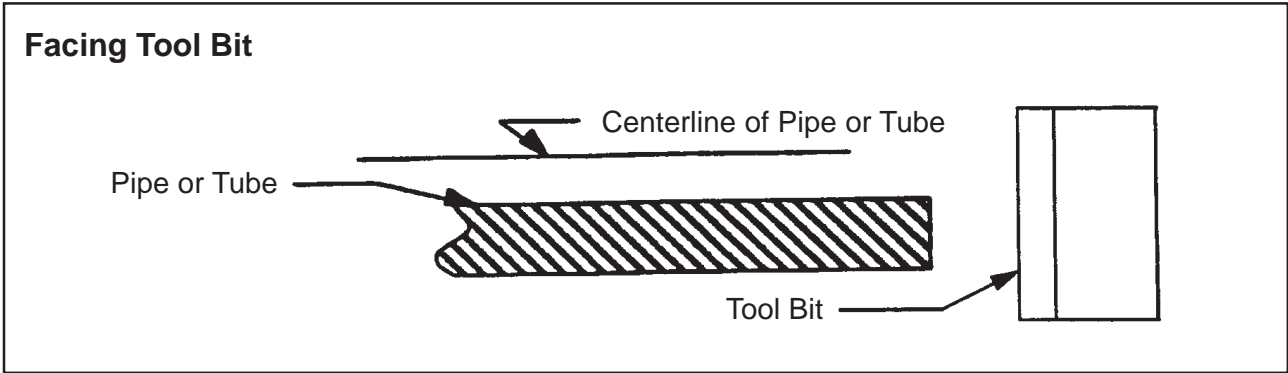
TOOL BITS



Range	Max Wall Thickness	Pipe or Tube Material	Tool Bit Height	Squaring Tool Bit P/N
.187" OD thru 2.00" OD (4.8 mm OD thru 50.8 mm OD)	.200" (5.1 mm)	CS	.750" (19.1 mm)	99-1480
.187" OD thru 2.00" OD (4.8 mm OD thru 50.8 mm OD)	.200" (5.1 mm)	SS	.750" (19.1 mm)	DURABIT 1
.187" OD thru 2.00" OD (4.8 mm OD thru 50.8 mm OD)	.200" (5.1 mm)	SS	.750" (19.1 mm)	DURABIT 1
.187" OD thru 2.00" OD (4.8 mm OD thru 50.8 mm OD)	.200" (5.1 mm)	Inconel	.750" (19.1 mm)	99-3650*
*M42				



Bevel Range	Max Wall Thickness	Pipe or Tube Material	Bevel Angle	Bevel Tool Bit P/N
.187" OD thru 1.00" OD (4.8 mm OD thru 25.4 mm OD)	.200" (5.1 mm)	SS	37.50°	99-0210
.100" OD thru 2.38" OD (25.4 mm OD thru 60.5 mm OD)	.200" (5.1 mm)	SS	37.50°	99-0276
.187" OD thru 1.00" OD (4.8 mm OD thru 25.4 mm OD)	.200" (5.1 mm)	CS	45°	99-5085
.100" OD thru 2.38" OD (25.4 mm OD thru 60.5 mm OD)	.200" (5.1 mm)	SS	45°	99-5994



Facing Range	Max Wall Thickness	Pipe or Tube Material	Tool Bit Height	Facing Tool Bit P/N
.187" OD thru 2.00" OD (4.8 mm OD thru 50.8 mm OD)	.200" (5.1 mm)	CS	.625" (15.9 mm)	99-1406
.187" OD thru 2.00" OD (4.8 mm OD thru 50.8 mm OD)	.200" (5.1 mm)	SS	.625" (15.9 mm)	99-1406

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.

NOTE:

Consult the factory for tool bit material recommendations for specialty pipe or tube materials.

Problem: The surface finish is rough.

The tool bit is dull, chipped, etc.
Metal buildup on the cutting edge of the tool bit is creating a false cutting edge.
Cutting fluid is required.
The cutting speed is incorrect.

Problem: There is a loss of power.

The motor is disconnected from the power supply.
The power cord or the air line is broken.
The power cord or air line is too long.

Problem: The electric motor will not start.

The power supply is shut off.

The electric motor is damaged and will not run free.

Problem: The air motor will not start.

The air power supply is shut off.

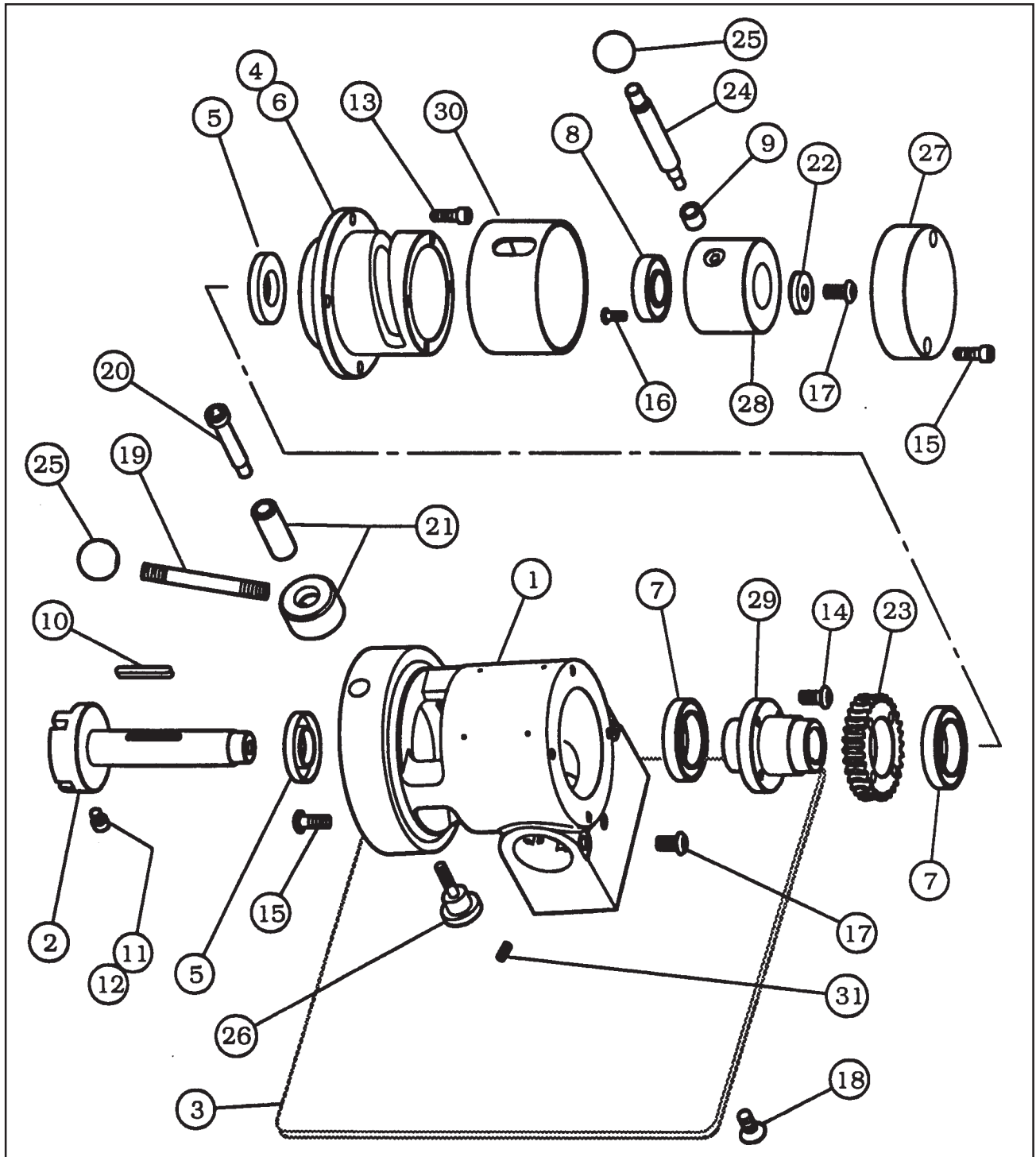
The air motor is damaged and will not run free. The air motor needs lubrication.

Add lubrication and do not run the air motor for a few minutes, then 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.

ILLUSTRATED PARTS BREAKDOWN

MODEL 302, TUBE SQUARING MACHINE
SUB-ASSY (REF. P/N 02-2174)

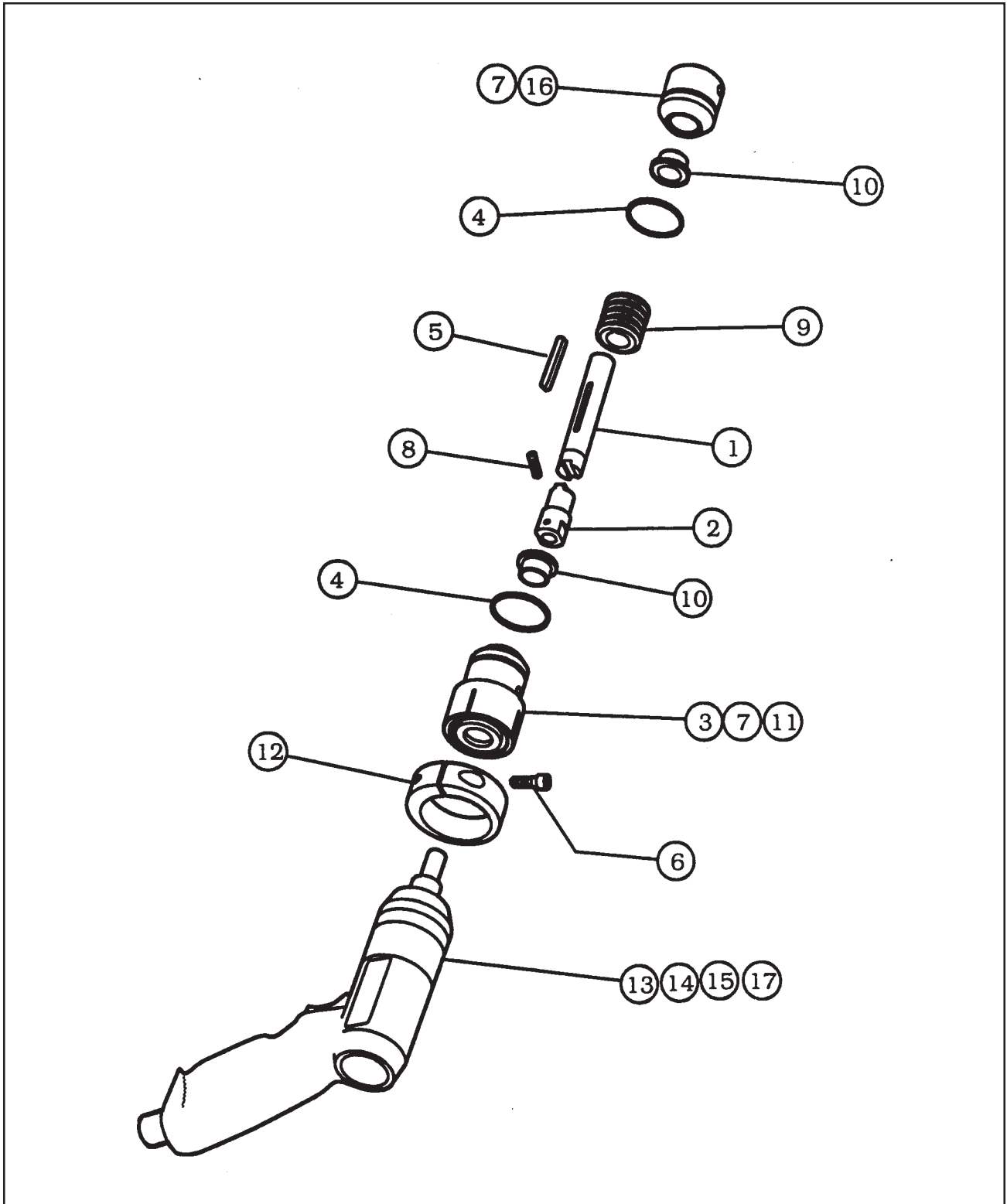


TRI TOOL INC.

Parts List, Model 302 Tube Squaring Machine Sub-Assy (Ref. P/N 02-2174)

Item No.	Part No.	Description	Qty
1.	19-0660	HOUSING, MAIN	1
2.	20-0561	SHAFT, FEED	1
3.	24-1256	PLATE, MOUNTING	1
4.	27-0455	ADAPTER, FEED	1
5.	28-0231	SEAL	2
6.	28-0234	O-RING	1
7.	29-0011	BEARING, BALL	2
8.	29-0020	BEARING, BALL	1
9.	29-0311	BEARING, ROLLER	1
10.	31-0142	KEY, ROUND ENDS	1
11.	33-0037	SCREW, CAP, 1/4-20 X 3/8"	1
12.	33-0038	SCREW, CAP, 1/4-20 X 1/2"	4
13.	33-0040	SCREW, CAP, 1/4-20 X 3/4"	4
14.	33-0041	SCREW, CAP, 1/4-20 X 7/8"	4
15.	33-0042	SCREW, CAP, 1/4-20 X 1"	4
16.	33-0278	SCREW, BUTTON, #10-24 X 3/8"	6
17.	33-0292	SCREW, BUTTON, 5/16-18 X 5/8"	3
18.	33-0369	SCREW, FLAT, 5/16-18 X 3/4"	4
19.	33-1424	STUD, HANDLE	1
20.	33-1440	SCREW, SHOULDER, 3/8" X 1 3/4"	1
21.	33-1839	SCREW ASSEMBLY, ADJUSTMENT	1
22.	34-0278	WASHER, CAPTURE	1
23.	39-0725	GEAR, WORM, BRONZE, 30 T	1
24.	41-0106	HANDLE, FEED	1
25.	42-0076	KNOB, BALL	2
26.	42-0143	KNOB, ADJUST	1
27.	43-0426	COVER	1
28.	44-0417	SPACER, FEED	1
29.	46-0384	SLEEVE, DRIVE	1
30.	46-0385	SLEEVE, FEED	1
31.	54-0374	PLUG, PRESSURE, FLUSH SKT, 1/4" NPT	1
NOT SHOWN			
	36-0021	WRENCH, T, 3/16" HEX	1
	86-0199	CASE, CARRYING	1

MOTOR ASSEMBLY, AIR, 302A (P/N 57-0213)

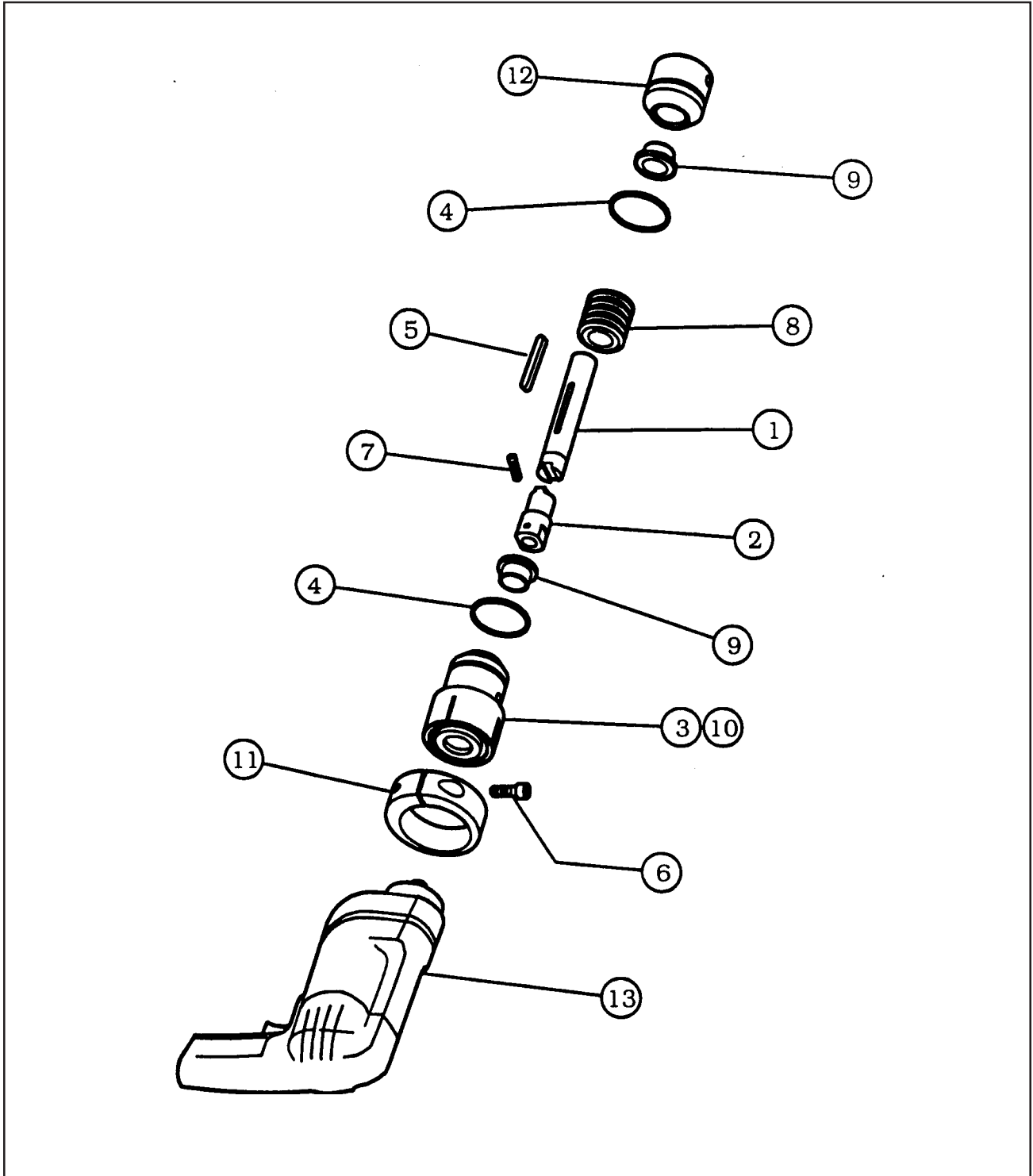


TRI TOOL INC.

Parts List, Motor Assembly, Air, 302A (P/N 57-0213)

Item No.	Part No.	Description	Qty
1.	20-0617	SHAFT, DRIVE	1
2.	20-0618	SHAFT, DRIVE, 3/8-24 UNF	1
3.	28-0218	SEAL, GREASE	1
4.	28-0233	O-RING	2
5.	31-0115	KEY, ROUND ENDS	1
6.	33-0041	SCREW, CAP, 1/4-20 X 7/8"	1
7.	33-0292	SCREW, BUTTON, 5/16-18 X 5/8"	2
8.	33-0619	SCREW, SET, #10-32 X 1/4", CUP PT	1
9.	39-0005	WORM	1
10.	45-0221	BUSHING, FLANGE, 5/8" ID	2
11.	46-0390	SLEEVE, MOTOR, AIR	1
12.	47-0919	BRACKET, CLAMP	1
13.	53-0045	VALVE, FLOW CONTROL, 1/4" NPT	1
14.	54-0149	COUPLING, MALE, QD, HOSE TO PIPE	1
15.	54-0201	CAP, YELLOW	1
16.	54-0347	PLUG	1
17.	57-0212	MOTOR, AIR, PISTOL GRIP	1

MOTOR ASSEMBLY, ELECTRIC 110V (P/N 58-0184)
AND 220V (P/N 58-0080)



TRI TOOL INC.

Parts List, Motor Assembly, Electric, 110 VAC (P/N 58-0184)

Item No.	Part No.	Description	Qty
1.	20-0617	SHAFT, DRIVE	1
2.	20-0619	SHAFT, DRIVE, 1/2-20 UNF	1
3.	28-0245	SEAL, GREASE	1
4.	28-0233	O-RING	2
5.	31-0115	KEY, ROUND ENDS	1
6.	33-0041	SCREW, CAP, 1/4-20 X 7/8"	1
7.	33-0619	SCREW, SET, #10-32 X 1/4", CUP PT	1
8.	39-0005	WORM	1
9.	45-0221	BUSHING, FLANGE, 5/8" ID	2
10.	46-0586	SLEEVE, MOTOR	1
11.	47-1111	BRACKET CLAMP	1
12.	54-0347	PLUG	1
13.	58-0183	MOTOR, ELECTRIC, MOD, 110 VAC (Milwaukee)	1
NOT SHOWN			
	33-0292	SCREW, BUTTON, 5/16-18 X 5/8"	REF

Model 302 Tube Squaring Machine

Parts List, Motor Assembly, Electric, 220 VAC (P/N 58-0080)

Item No.	Part No.	Description	Qty
1.	20-0617	SHAFT, DRIVE	1
2.	20-0619	SHAFT, DRIVE, 1/2-20 UNF	1
3.	28-0245	SEAL, GREASE	1
4.	28-0233	O-RING	2
5.	31-0115	KEY	1
6.	33-0041	SCREW, CAP, 1/4-20 X 7/8"	1
7.	33-0619	SCREW, SET, #10-32 X 1/4", CUP PT	2
8.	39-0005	WORM	1
9.	45-0258	BUSHING, FLANGE, 5/8" ID	2
10.	46-0411	SLEEVE, MOTOR	1
11.	47-1111	BRACKET, CLAMP	1
12.	54-0347	PLUG	1
13.	58-0232	MOTOR, MOD., ELECTRIC, 220 VAC (Bosch)	1
NOT SHOWN			
	33-0292	SCREW, BUTTON, 5/16-18 X 5/8"	REF