

OPERATION MANUAL

92-0746 Rev. 220713
Model 306 Tube Squaring Machine



ABOUT TRI TOOL TECHNOLOGIES



At Tri Tool, we are committed to your success through relentless innovation and powerful partnership. We insist on developing tools and equipment that exceed your expectations of performance, precision, safety, and durability. As a full-service engineering firm, we are here to support you every step of the way.

For more information on engineered solutions, products, and trainings, visit tritool.com or contact our engineers at +1(916) 288-6100.

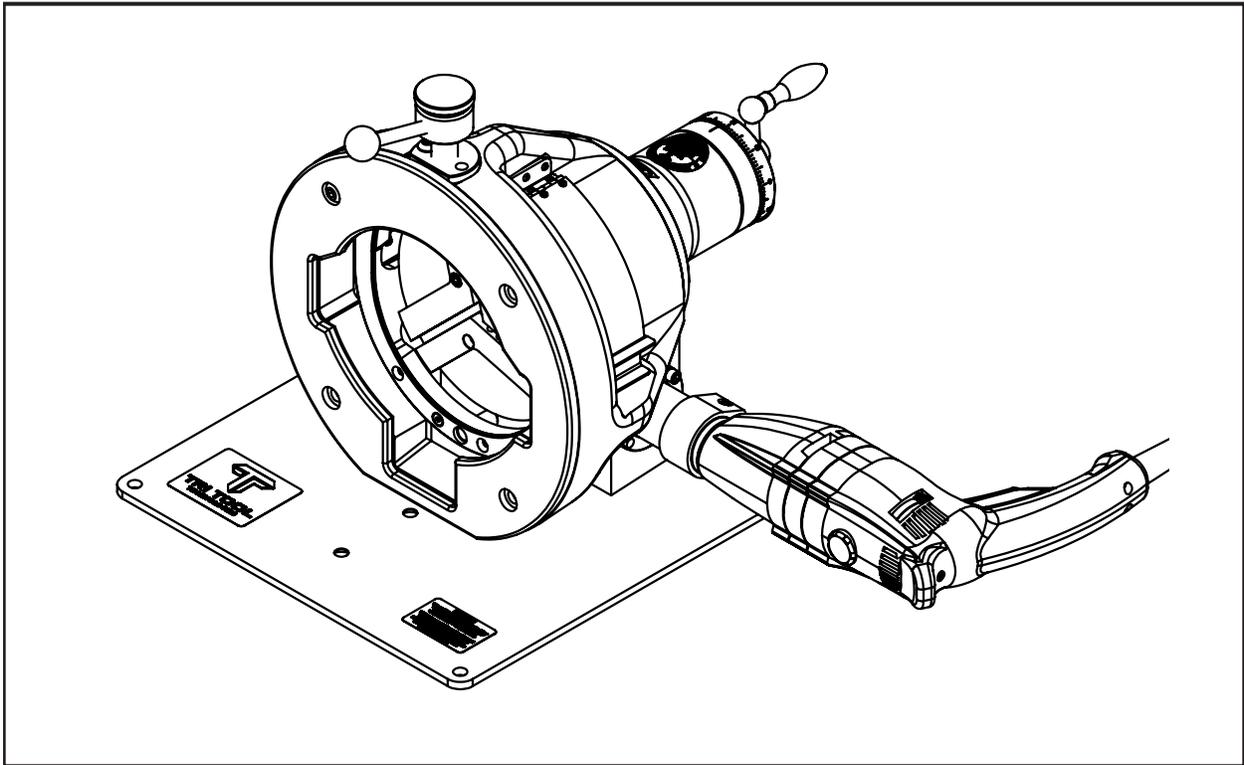


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TRI TOOL INC. Warranty

LIMITED WARRANTY: All products manufactured by Seller are warranted to be free from defects in materials and workmanship under normal use. The period of this warranty shall be three years from the date of shipment for all products, except for welding and Non-Standard Products which shall be one year from the date of shipment. The Buyer shall bear all shipping, packing and insurance costs and all other costs to and from a designated repair service center. All return goods must be authorized in advance and communicated upon issuance of a Return Material Authorization (RMA) by Seller. The product will be returned to the Seller accompanied by a RMA number and associated paperwork, freight prepaid and billed to the Buyer. This warranty is not transferable and will not apply to tool bits or other consumables, or to any Goods to have been (i) mishandled, misused, abused or damaged by Buyer or any third party; (ii) altered without the express permission in writing by Seller, (iii) repaired by a party other than Seller without Seller's prior written approval; or (iv) improperly stored, installed, operated, or maintained in a manner inconsistent with Seller's instructions. This warranty does not apply to defects attributed to (i) normal wear and tear or (ii) failure to comply with Seller's safety warnings.

No warranty for any parts or other supplies provided to seller by buyer, whether or not they are incorporated into goods. Goods supplied by seller which are designed or manufactured by a third party are subject strictly to the third party's warranty for those goods. Seller makes no warranty and disclaims all statutory or implied warranties for these goods, including the implied warranties of merchantability, freedom from patent infringement and fitness for a particular purpose.

Neither this warranty nor any other warranty, expressed or implied, including implied warranties of mechanical ability, fitness for a particular use, or merchantability, shall extend beyond the warranty period. No responsibility is assumed for any incidental or consequential damages. Some states do not allow limitations on how long an implied warranty lasts and some states do not allow the exclusion or limitations incidental or consequential damages, so the above limitation of exclusion does not apply to all Buyers. This warranty gives the Buyer specific legal rights. Other rights vary from state to state.

Warranty Claims and Remedies

Buyer must promptly notify Seller in writing during the applicable warranty period, of any defective Goods covered by Seller's warranties under the Limited Warranty section herein, and no later than fifteen (15) calendar days after discovery of the defect. Seller has no obligation to honor any warranty claim made after the expiration of the warranty period. However, despite the expiration of the warranty period, Seller, at its reasonable discretion, may accept warranty claims submitted up to fifteen (15) calendar days after the expiration of the warranty period provided that Buyer provides Seller with credible and persuasive documentary evidence that the defect was discovered during the warranty period. No warranty claims submitted after this fifteen (15) day calendar period will be considered by Seller.

Buyer's notice of a defective Goods must identify the specific Goods affected, and the nature of the defect. It is required when returning the defective Goods, that it is suitably packed, fully insured, and transportation and insurance prepaid in accordance with instructions issued by Seller. Seller, at its sole option, will either repair or replace any Goods authorized for return to Seller. Such repair, replacement, or credit shall be Buyer's sole remedy for defective Goods. Buyer must promptly provide Seller with all information requested regarding the identified defect.

If the defect claimed by Buyer cannot be reproduced or otherwise verified by Seller, the Goods will be returned to Buyer unmodified at Buyer's expense.

The warranty period for repaired or replaced Goods shall be (i) ninety (90) days or (ii) the unexpired portion of the original warranty period. Under no circumstances is Seller liable for recall, retrieval, removal, dismantling, re-installation, redeployment, or re-commissioning of any defective Goods or any costs associated therewith.

Tool Bit Resharpener Policy

Buyer is required to check all tool bits prior to returning and ensure they are packaged well for shipment. The price structure is available from the Seller's sales coordinator. Seller cannot resharpen badly gouged, chipped, or broken tool bits. Seller will return tool bits that are not suitable for resharpening with the tool bits that were resharpened, unless Seller is instructed otherwise. Buyer is responsible for all shipping charges to and from Seller.



1. ABOUT THE MANUAL

1.1 Copyright

©Copyright Tri Tool Inc. Proprietary property of Tri Tool Inc. No reproduction, use, or duplication of the information shown hereon is permitted without the express written consent of Tri Tool Inc.

1.2 Disclaimer

The instructions and descriptions in this manual were accurate when the manual was written. However, the information in the manual is subject to change without notice. Check for updated information before you start any job. The Tri Tool Inc. web site has the most current information.

Do not operate or work on this equipment unless you have read and understood the instructions in this Manual. Failure to follow the instructions or follow the safety instructions could result in serious injury or death. This manual describes conditions and hazards that are common and anticipated during equipment operation. No manual can address all conditions which may occur.

1.3 Safety Symbols

The manual may contain one or more safety symbols. These symbols and the associated text warn you of potentially hazardous conditions. Examples of the safety symbols and the associated text follow:

 DANGER	DANGER: Indicates a hazardous situation that, if not avoided, will result in serious injury or death.
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 WARNING	WARNING: Indicates a hazardous situation that, if not avoided, could result in serious injury or death.
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 CAUTION	CAUTION: Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury, or cause property damage.
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2. SAFETY PRECAUTIONS

2.1 In General

Use standard safety equipment such as: hard hats, safety shoes, safety harnesses, protective clothes, and other safety devices when appropriate.

Operate this tool only in accordance with specific operating instructions.



WARNING: Do not override the dead-man switch on the power unit. Locking down, obstructing, or in any way defeating the dead-man switch on the power drive unit may result in serious injury.

2.2 Personal Protective Equipment

Use standard safety equipment such as: hard hats, safety shoes, safety harnesses, protective clothes, and other safety devices when appropriate.

Wear safety glasses.

Do not wear loose clothing or jewelry.

Wear nonskid footwear.

Put long hair in a cap or a net to make sure hair does not get tangled in equipment.

2.3 Personnel

Only personnel who are trained or are being trained may operate the equipment.

Keep the operation manual available where the equipment is used.

The operator must read the operation manual before using the equipment.

The equipment must be operated in accordance with the manual information.

The operator must follow the safety precautions in this manual and good engineering practices to reduce the risk of injury.

Before using the equipment, the operator must ensure that all safety messages on the equipment are legible.

2.4 Work Area

Keep the work area clean.

Keep the area well lit.

Keep items such as electrical cords, cables, rags, rigging straps, away from rotating equipment.

Do not use power-cutting tools in the presence of flammable liquids and gases.

Do not let visitors or untrained personnel near tools that are in use.

Ensure all observers wear eye protection.

Keep proper footing at all times.

2.5 Area Equipment

Secure the pipe with clamps, vises, chains or straps.

Ensure that both sides of the pipe at the cut site is fully supported so that the pipe will not move after the cut is completed. Long lengths of pipe may be under load and the separation of the pipe can release pressure. This pressure can cause both sides of the pipe to move.

2.6 Tool Care

Keep tools in good operating condition. Sharp tool bits perform better and are safer than dull tool bits.

Do not use damaged tools. Always check your tools for damage especially if a tool has malfunctioned, been dropped or hit, check it for damage.

Before you start operating the equipment, do no-load tests and feed function checks.

2.7 Tool Use

Use the right tool and tool bit for the job. Contact Tri Tool to help with your application.

Keep the tool bits fully engaged in the tool bit holders. Loose bits are sharp and can cause cuts or punctures.

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. Check 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 recommended speeds.

Do not reach into rotating equipment.

Do not reach into the rotating head stock to remove chips, to make adjustments, or to check the surface finish.

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

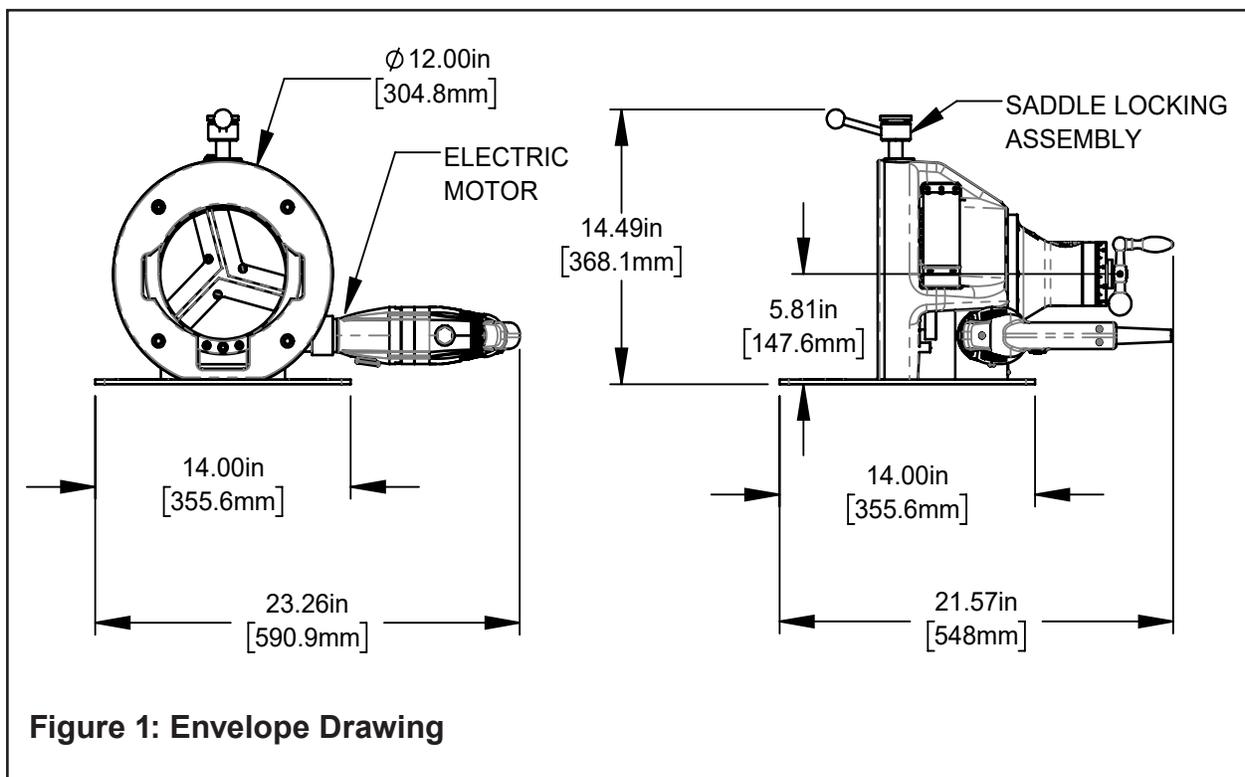
Store tools properly. Disconnect tools from the power source, remove the tool bits, and store in a safe place.

3. GENERAL DESCRIPTION

The Model 306 Tube Squaring Machine is a lightweight, portable machine designed for facing and squaring 1.00" (25.4mm) to 6.63" (168.3mm) outside diameter tubing up to .25" (6.35mm) wall thickness. The Model 306 is available with an integral, variable speed 110 VAC or 220 VAC electric drive motor. The Model 306 features quick-change aluminum Saddle Sets (no tools required for installation) and a .001" (.025mm) graduated feed dial. The precision inside diameter Saddles hold the tubing round to accurately square and face the tubing with minimum to no burr. The machine accepts its own torque through the Saddle Clamping System. The Cutting Head allows installation up to three Tool Bits for squaring, beveling or special preps. A set of transparent chip guards cover the machine's top window openings and allow for safe and clear line-of-sight vision to the workpiece during use and open access to the Cutting Head to changing Tool Bits.

4. SPECIFICATIONS

Weight	70 lbs. (31.8 kg) with saddle set installed.
Height	14.49" (368.1mm)
Width	23.26" (590.9mm)
Length	21.57" (548.0mm)
Tube Size	1.0" (25.4mm) to 6.63" (168.3mm)
Pipe Size	1" sch 80 to 6"sch 40
Feed	1.00" (25.4mm)
Power	110 VAC, 50/60 Hz, 9.6 A 220 VAC, 50/60 HZ, 5.7 A



MATERIALS

Mild steel, Chrome steel (Rc 35 max.), Stainless steel, Copper-nickel and Aluminum. Inconel and some other high temperature alloys may require special procedures as a function of wall thickness and type of end preparation.

Contact Tri Tool's Engineering Department for details.

5. MAINTENANCE

All components should be clean 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 air motor.

If the Model 306E 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 cut is completed.



CAUTION

CAUTION: 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.

Bearings and gears are to be lubricated using a lithium-based grease.



CAUTION

CAUTION: Disassembly of the power unit voids warranty, except when performed by a Tri Tool Inc. designated repair technician. (Letter of designation is required.)

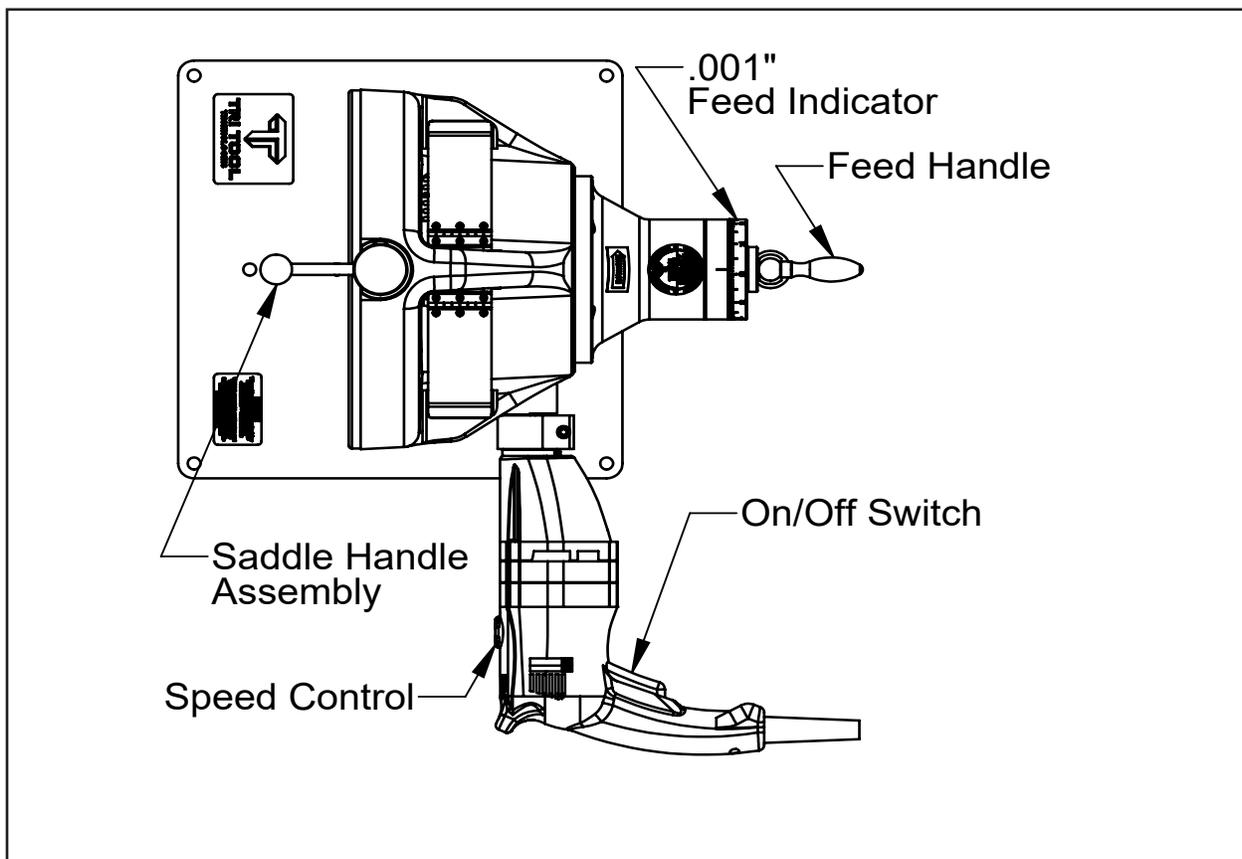
6. OPERATION

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 one of three Cutting Head slots.

When performing any separate machining operation such as facing, beveling or counter-boring, the Tool Bit(s) may be installed in any one of three Cutting Head slots.

When performing any multiple machining operation such as facing, beveling or counterboring, the Tool Bit(s) should be installed with one in each slots.



CAUTION

CAUTION: The use of dull 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.

Insert the Tool Bit(s) into the slot(s) in the Cutting Head.



CAUTION

CAUTION: The cutting edge of the Tool Bit(s) must be located on the radial centerline. Do not install the Tool Bit(s) backwards.

Tighten the Set Screws to secure the Tool Bit(s) to the Cutting Head.

Adjust the counterbore Tool Bit radially to control counterbore diameter.

Adjust the Bevel Tool Bit radially to control counterbore depth to the bevel relationship.

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

Insert the upper Saddle half into the machine and thread the Saddle Locking Screw into the Saddle.

Raise the top Saddle using the Saddle Handle Assembly.

Insert the lower Saddle half and snap into place.

Place the pipe or tube into the Saddle.

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

Tighten the Saddle using the Saddle Handle Assembly to secure the pipe or tube once the proper clearance has been verified.



CAUTION

CAUTION: Be sure that there is a light film of grease on the Saddle Handle Assembly threads at all times to prevent them from galling or freezing during use.

Connect electrical line to 120 VAC, 60 Hz.

Adjust the cutting speed.

Rotate the Feed Knob clockwise to bring the Cutting Head and pipe closer together.



CAUTION

CAUTION: The actual machining operation will begin when the Tool Bit contacts the tube or pipe.

If the pipe end is not square to 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 is contacting the pipe continually during at least one revolution.

Continue rotating the Feed Knob clockwise until the end of the pipe is completely machined.



CAUTION

CAUTION: Be careful not to let the Tool Bit(s) cut into the Saddles or the Saddle.

Discontinue feed and allow the Cutting Head to rotate one to three revolutions to improve the finish of the prep surface.

Rotate the Feed Knob counter-clockwise to separate the Cutting Head and the pipe.

Stop the tool rotation by releasing the Trigger Switch.

Rotate the Feed Knob counter-clockwise until the Cutting Head clears the tube or pipe by at least 1/8" (3mm) or more.

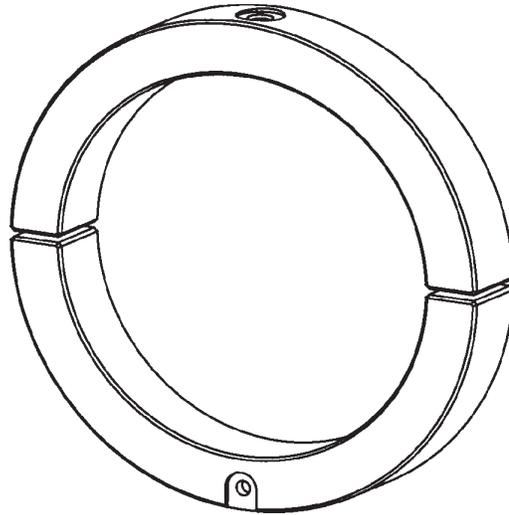
Loosen the Saddle by rotating Saddle Handle Assembly to release the pipe.

7. TOOL BIT



DURABIT 1®
Squaring Tool Bit

8. SADDLE SETS



Part No.	Inch	(mm)
67-4577	1.000	25.4
67-4578	1.071	27.2
67-4666	1.250	31.8
67-4627	1.260	32.0
67-4176	1.339	34.0
67-5028	1.375	34.9
67-4570	1.500	38.1
67-4177	1.681	42.7
67-4634	1.750	44.5
67-4178	1.913	48.6
67-4628	1.968	50.0
67-4150	2.000	50.8
67-4151	2.250	57.2
67-4152	2.375	60.3
67-4179	2.382	60.5
67-4153	2.500	63.5
67-4154	2.750	69.9
67-4155	2.875	73.0
67-4156	3.000	76.2
67-4180	3.004	76.3
67-4157	3.250	82.6

Part No.	Inch	(mm)
67-4158	3.500	88.9
67-4181	3.508	89.1
67-4159	3.750	95.3
67-4160	4.000	101.6
67-4625	4.095	104.0
67-4161	4.250	108.0
67-4162	4.500	114.3
67-4163	4.750	120.7
67-4164	5.000	127.0
67-4165	5.250	133.4
67-4166	5.500	139.7
67-4182	5.504	139.8
67-4167	5.563	141.3
67-4635	5.720	145.3
67-4168	5.750	146.1
67-4169	6.000	152.4
67-4626	6.063	154.0
67-4170	6.250	158.8
67-4171	6.500	165.1
67-5154	6.512	165.4
67-4172	6.625	168.3

9. CUTTING SPEED AND FEED

Pipe Size	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)
2"	2.375" (60.3 mm)	27	34	40
3"	3.500" (88.9 mm)	18	23	27
4"	4.500" (114.3 mm)	14	18	21
5"	5.563" (141.3 mm)	11	14	17
6"	6.625" (168.3 mm)	10	14	14
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 some thin-wall mild steel and tube with coolants.

BASIC FEED RECOMMENDATION

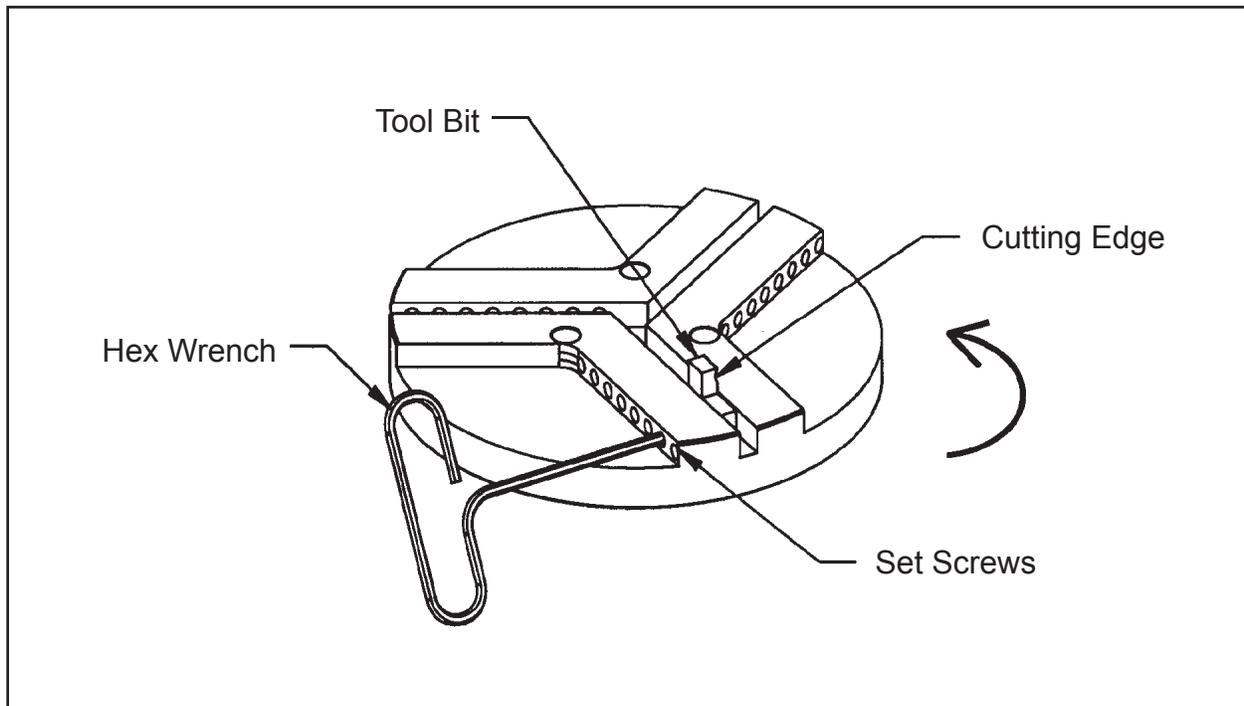
Use very light feed for initial beveling or until a continuous cut is established.

This is very important for longer tool bit life when cutting through flame cut or out of square pipe ends.

Use adequate feed, .003" (.08mm) to .006" (.15mm) per revolution thereafter, to establish a continuous chip cut.

If the feed is too light, only light 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, which work hardens, must be worked with a heavy enough feed to stay under the work hardened surface, .003" (.08mm) to .006" (.15mm) feed.

Never allow the Tool Bit to burnish the surface.

A good rule of thumb for calculation purposes is a .0025" (.064mm) thick chip per revolution. Actual measurements will show a pseudo thickness of .006" (.15mm) unless a pin micrometer is used for measure.

One revolution of the feed handle advances the Cutting Head .100" (2.5mm).

10. TROUBLESHOOTING

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's 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's 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's 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

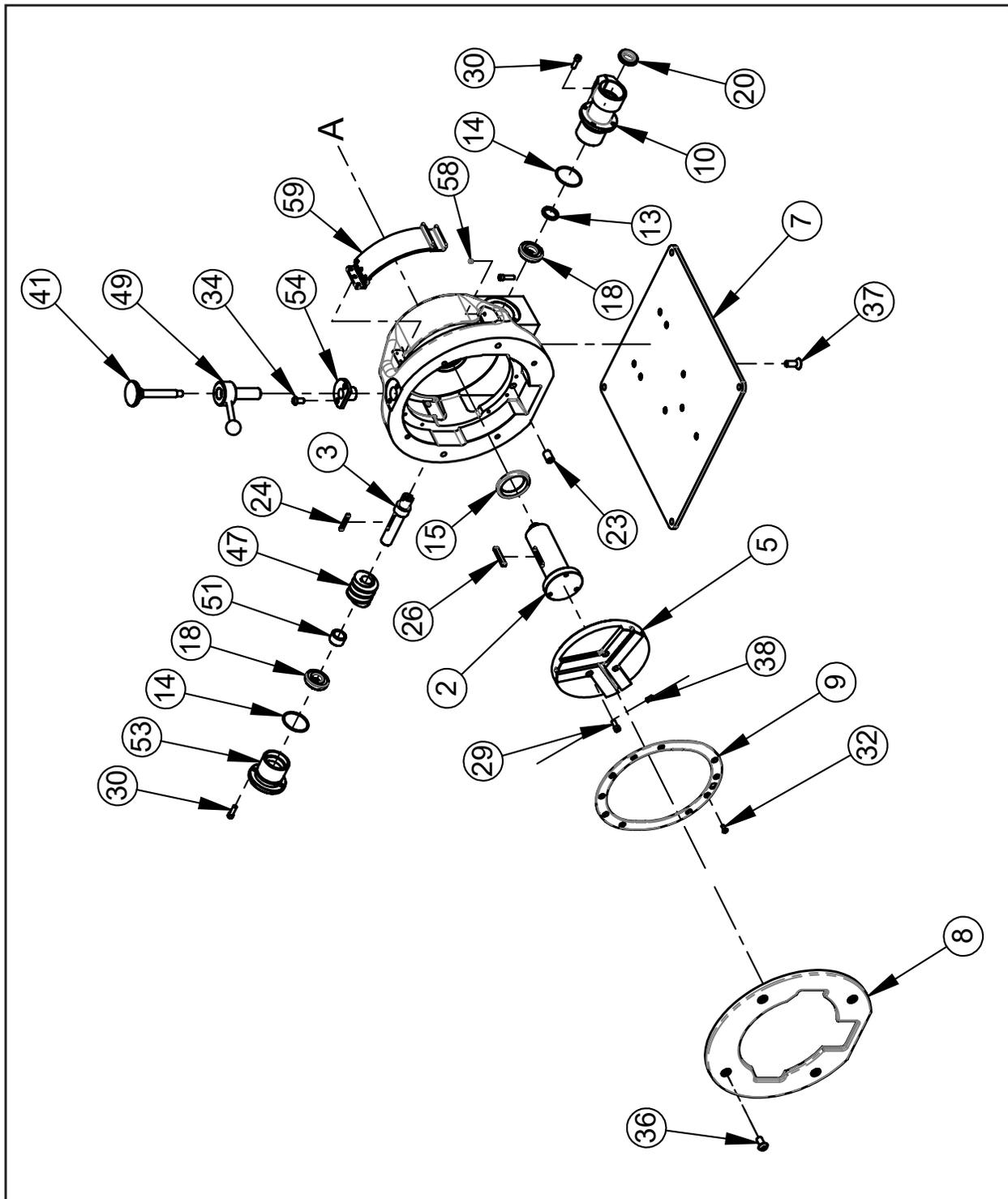
The air power supply is shut off.
The air motor is damaged and will not run free.
The air motor needs lubrication.
Add lubrication and do not run the air motor for a few minutes, then try running the motor.
Tap on the side of the air motor casing lightly with a piece of wood or with a soft rubber mallet 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

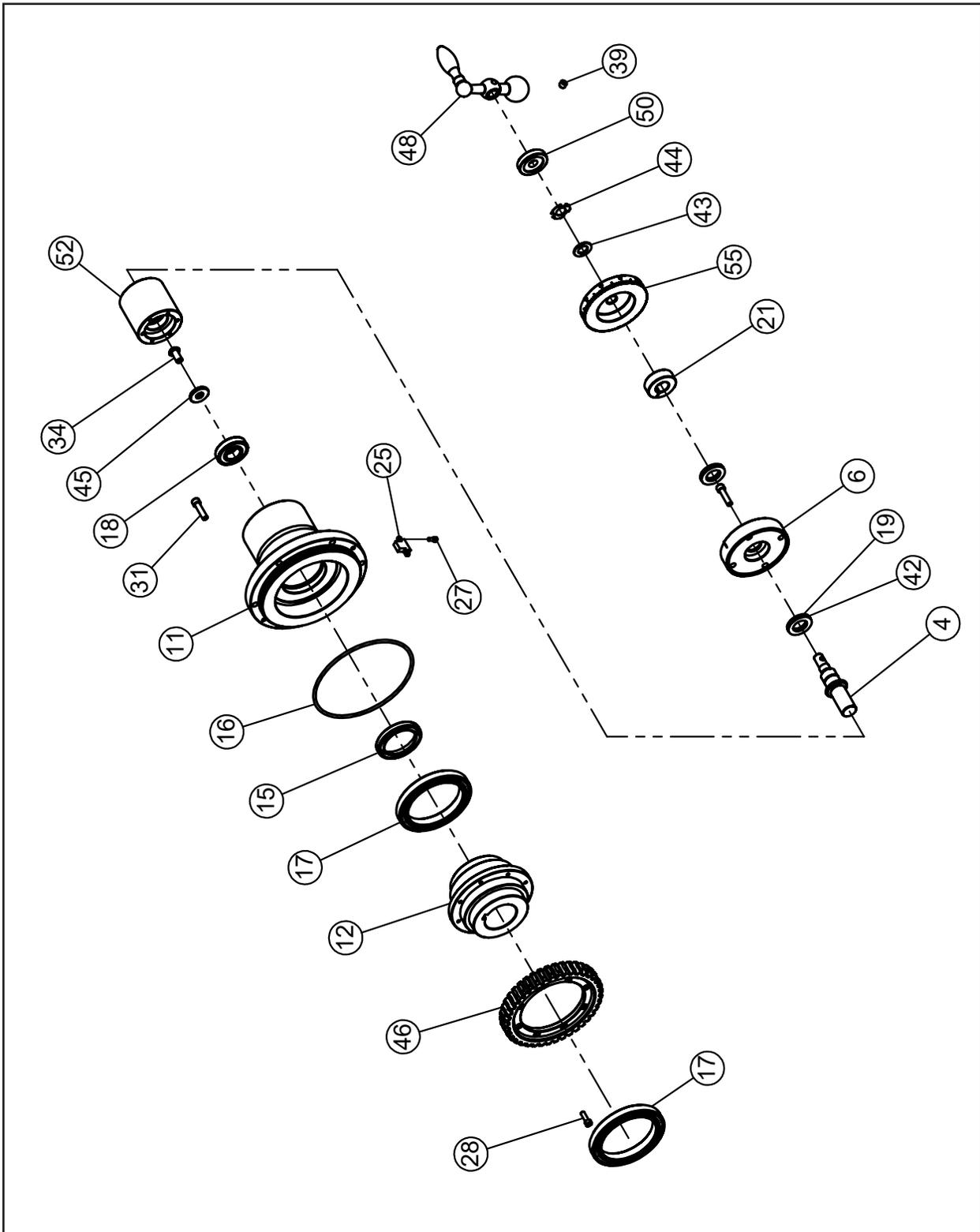
The hydraulic power supply is shut off.
The hydraulic motor is damaged and will not run free.

11. ILLUSTRATED PARTS BREAKDOWN

TUBE SQUARING MACHINE (P/N 02-2507) (1 OF 2)



TUBE SQUARING MACHINE (P/N 02-2507) (2 OF 2)



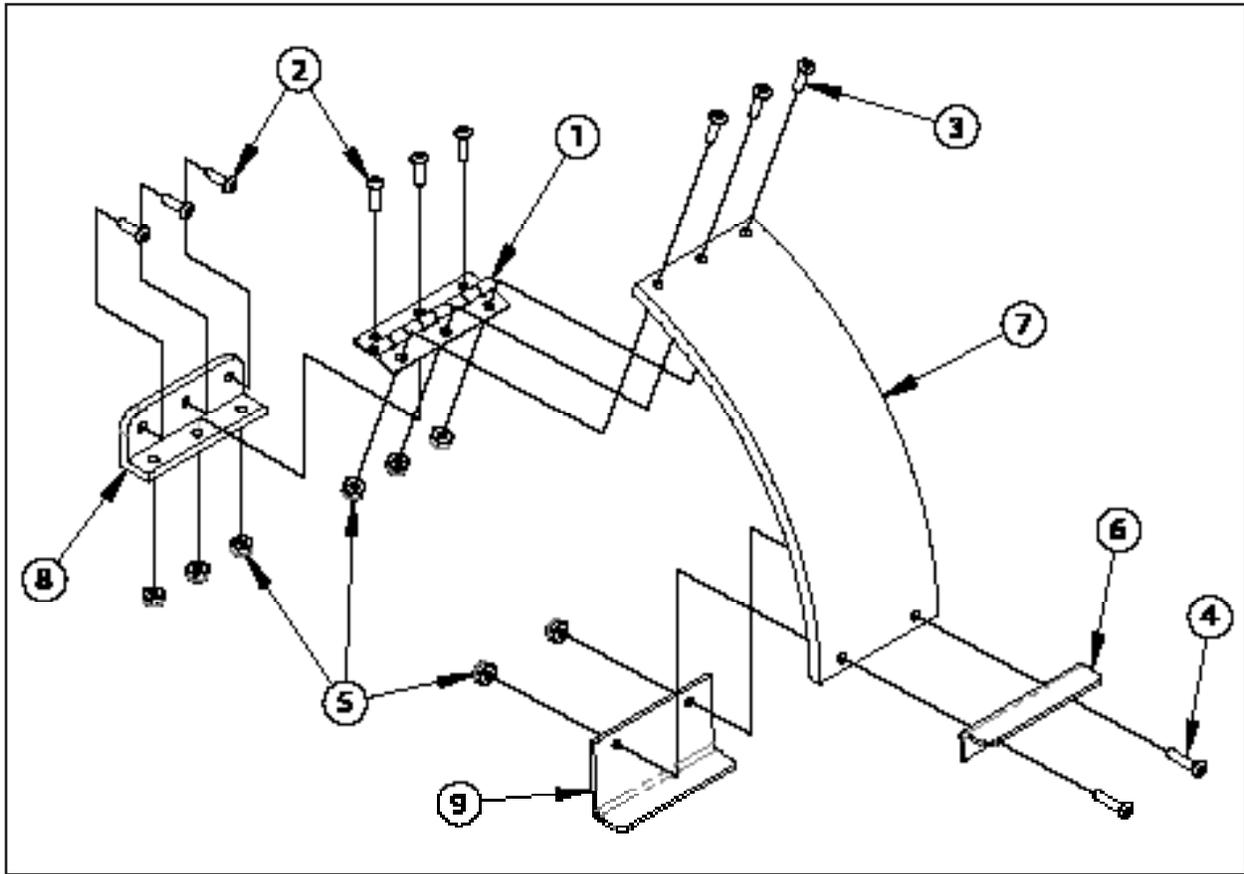
Parts List, Tube Squaring Machine (P/N 02-2507)

Item No.	Part No.	Description	Qty
1.	19-0841	HOUSING, MAIN	1
2.	20-0684	SHAFT, MAIN	1
3.	20-0685	SHAFT, DRIVE	1
4.	20-0687	SHAFT, FEED	1
5.	21-0498	HEAD	1
6.	24-4999	COVER, FEED	1
7.	24-1560	PLATE, BASE	1
8.	24-1605	PLATE, COVER, SADDLE	1
9.	24-1619	PLATE, SADDLE BACKING	1
10.	27-xtbd	ADAPTER, MOTOR	1
11.	27-0590	ADAPTER, FEED	1
12.	27-0594	ADAPTER, SLEEVE	1
13.	28-0245	SEAL, GREASE	1
14.	28-0264	O-RING, 1.688 ID x .094 THK	2
15.	28-0277	SEAL, GREASE	2
16.	28-0282	O-RING, 5.00 ID x .13 THK	1
17.	29-0002	BEARING, BALL	2
18.	29-0020	BEARING, BALL	3
19.	29-0067	BEARING, THRUST ROLLER	2
20.	29-0096	BEARING, BALL	1
21.	30-2544	COLLAR, SHAFT	1
22.	—		
23.	30-2745	PLUNGER, BALL, .50-13 x .75 LG	1
24.	31-0142	KEY, .188 x .188 x 1.50 LG	1
25.	31-0169	KEY, .25 Wide x .50 LG	1
26.	31-0173	KEY, .25 x .249 x 1.75 LG	1
27.	33-3718	SCREW, CAP, #6-32 x 5/16	2
28.	33-0029	SCREW, CAP, #10-24 UNC x .63 LG	8
29.	33-0039	SCREW, CAP, .25-20 UNC x .63 LG	3
30.	33-0040	SCREW, CAP, .25-20 UNC x .75 LG	4

Parts List, Tube Squaring Machine (P/N 02-2507) Continued

Item No.	Part No.	Description	Qty
31.	33-0042	SCREW, CAP, .25-20 UNC x 1.00 LG	10
32.	33-0298	SCREW, BTTN HD, .375-16 UNC x .75 LG	4
33.	33-0278	SCREW, BTTN HD, #10-24 UNC x .38 LG	6
34.	33-0292	SCREW, BTTN HD, 5/16-18 UNC x .63 LG	3
35.	—		
36.	33-0352	SCREW, FLAT, #10-24 X .50	10
37.	33-0380	SCREW, FLAT, .38-16 UNC x 1.00 LG	6
38.	33-0503	SCREW, SET, .25-20 UNC x .50 LG	24
39.	33-0513	SCREW, SET, 5/16-18 UNC x .31 LG, CUP PT.	1
40.	—		
41.	33-2108	SCREW, SADDLE LOCKING	1
42.	34-0106	WASHER, THRUST, .75 ID x 1.25 OD x .063 THK	4
43.	34-0163	WASHER, THRUST	1
44.	34-0325	WASHER, SPRING	1
45.	34-0344	WASHER, CAPTURE	1
46.	39-0838	GEAR, WORM	1
47.	39-0839	WORM	1
48.	41-0142	HANDLE, FEED	1
49.	41-0149	SADDLE HANDLE ASSEMBLY	1
50.	42-0172	KNOB, LOCK	1
51.	44-0478	SPACER, DRIVE	1
52.	44-0479	SPACER, FEED	1
53.	46-0446	SLEEVE, MOTOR	1
54.	46-0465	SLEEVE, FEED HANDLE	1
55.	50-0039	DIAL, INDICATOR	1
56.	67-xxxx	SADDLE SET	A/R
57.	54-0375	FITTING, GREASE	1
58.	30-6120	MAGNET, SMM DIA. X SMM	4
59.	43-1288	COVER ASSY., CHIP GUARD	2
	<i>NOT SHOWN</i>		
	36-0018	WRENCH, 'T' HEX	1

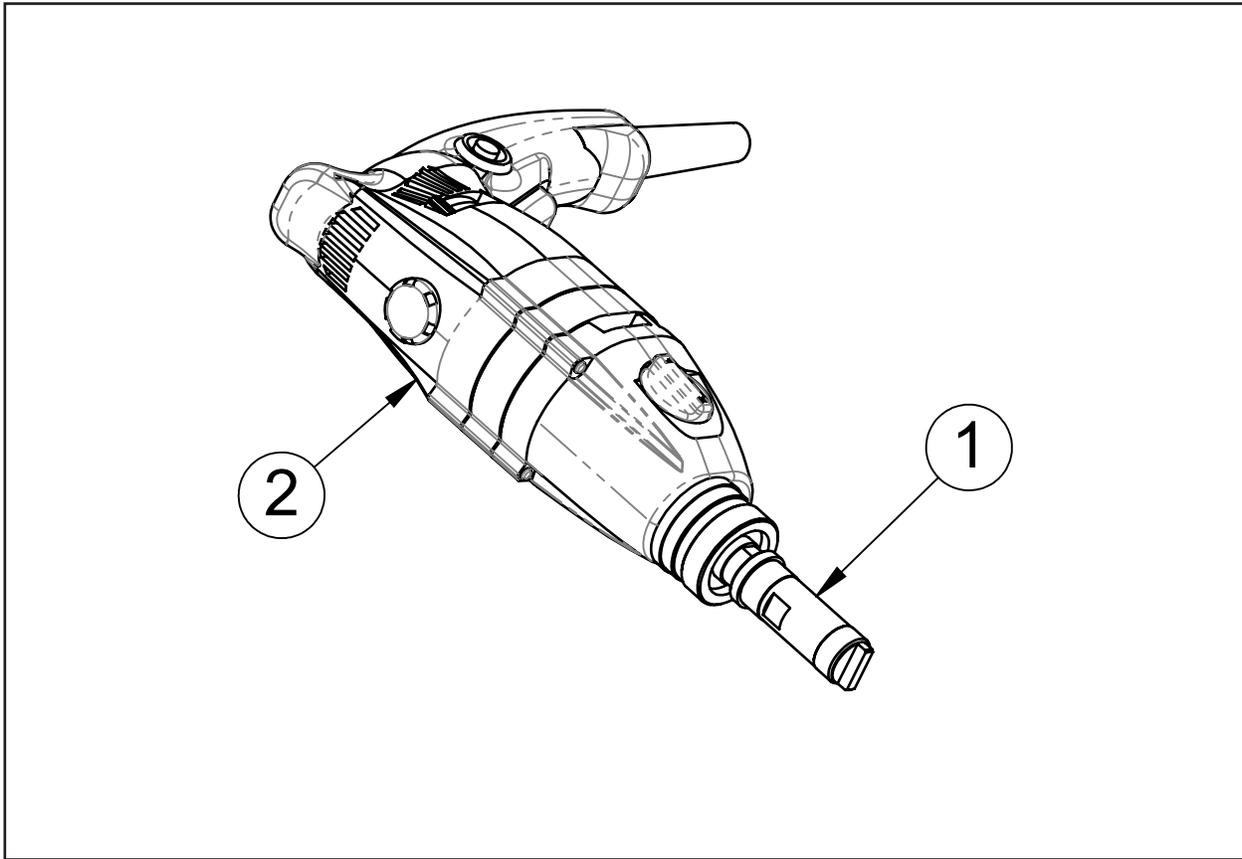
COVER ASSY., CHIP GUARD (P/N 43-1288)



Parts List, Cover Assy., Chip Guard (P/N 43-1288)

Item No.	Part No.	Description	Qty
1.	30-6698	HINGE, GUARD WINDOW	1
2.	33-0266	SCREW, BUTTON, #4 - 40 X 3/8"	6
3.	33-0267	SCREW, BUTTON, #4 - 40 X 7/16"	3
4.	33-4709	SCREW, BUTTON, #4 - 40 X 1/2"	2
5.	35-0253	NUT, LOCK, #4 - 40	8
6.	41-1150	HANDLE, GUARD	1
7.	43-1269	COVER, GUARD WINDOW	1
8.	47-2818	BRACKET, HINGE	1
9.	47-2819	BRACKET, MAGNET	1

MOTOR ASSEMBLY, ELECTRIC, 110V (P/N 58-0405, 58-0407)



Parts List, Electric Motor Assembly, 110V (P/N 58-0405)

Item No.	Part No.	Description	Qty
1.	27-1682	ADAPTER, DRIVE	1
2.	58-0277	MOTOR, ELECTRIC, 110 VAC	1

Parts List, Electric Motor Assembly, 220V (P/N 58-0407)

Item No.	Part No.	Description	Qty
1.	27-1682	ADAPTER, DRIVE	1
2.	58-0406	MOTOR, ELECTRIC, 220V	1



WARNING



Read the manual and be familiar with all safety precautions before operating equipment. The following are general warnings for industrial equipment with moving parts. Refer to the manual for specific warnings applicable to your equipment.



EYE HAZARD - Always wear appropriate eye protection while operating the equipment.



PINCH HAZARD - Keep your hands and clothing away from moving parts.



CRUSH HAZARD - The machinery, pipe, or work piece can shift, separate, lurch, or fall.



CHIP HAZARD - Metal chips may be hot and sharp. Be careful when you clear the tooling path or clean up chips.



TIE DOWN HAZARD - Deliberate overriding of safety triggers can result in serious injury. Never lock or tie down any safety triggers.



SHOCK HAZARD - Ensure that the equipment is properly installed and grounded. Ensure that the equipment is not damaged and that the power cord is intact.

OTHER HAZARDS

- Tool bits are sharp and can cause serious injury.
- Do not defeat or modify safety features.
- Disconnect power sources before servicing or moving the equipment.
- Remove all loose articles of clothing and jewelry before operating the equipment.

Be Safety Conscious!



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