92-1984 Rev. 241017
Model SUREFIRE 8

Operation Manual

TRI TOOL TECHNOLOGIES

ABOUT TRI TOOL TECHNOLOGIES

At Tri Tool Technologies, 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.

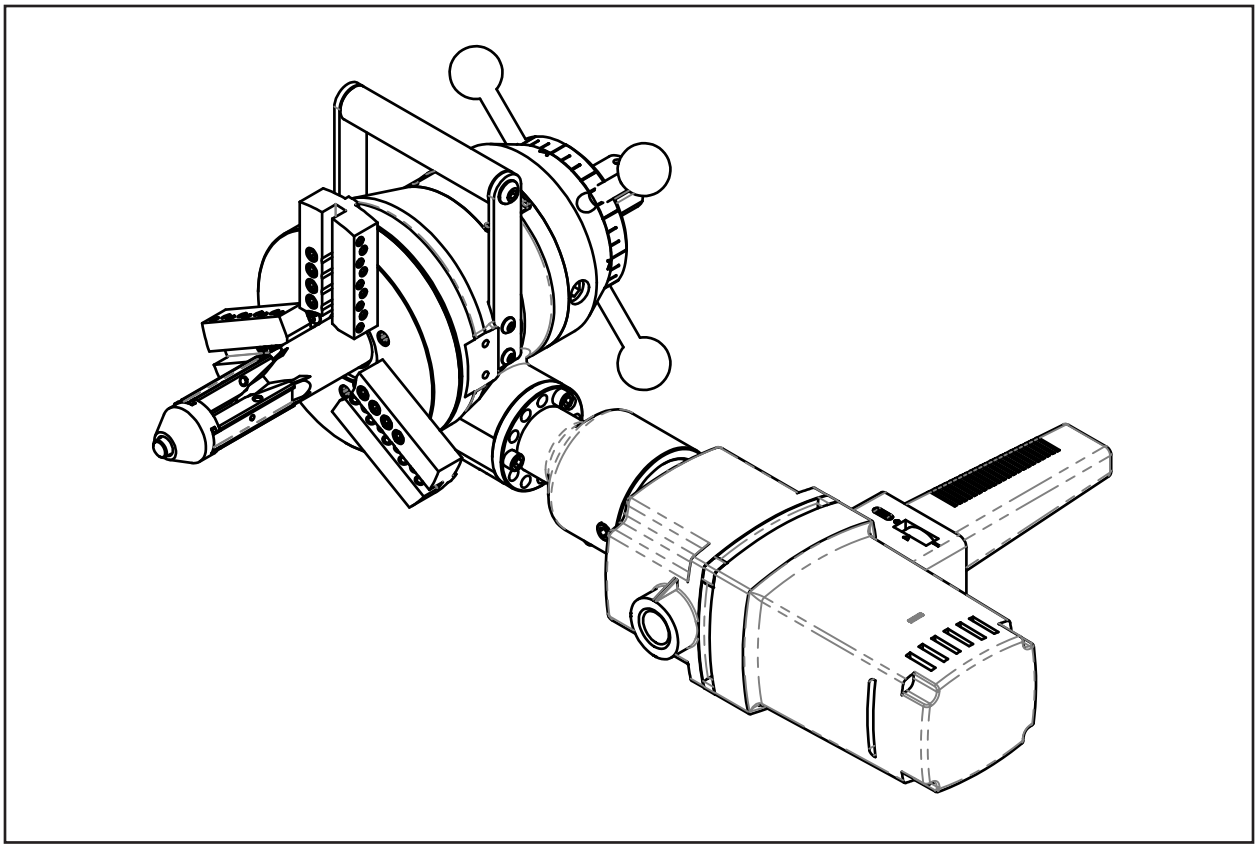


TABLE OF CONTENTS

Tri Tool Technologies 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 Resharpening 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 upon Buyer's request. Buyer is responsible for all shipping charges to and from Seller.

1. ABOUT THE MANUAL

Copyright

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 Technologies 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.

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.

WARNING

WARNING: Indicates a hazardous situation that, if not avoided, could result in serious injury or death.

CAUTION

CAUTION: Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury, or cause property damage.

 GLASSES	**SAFETY GLASSES: Indicates a hazardous situation that requires the use of safety glasses.**
 HOT SURFACE	**HOT SURFACE: Indicates a hazardous situation that hot surfaces may be present.**
 GLOVES	**GLOVES: Indicates a hazardous situation that requires gloves.**
 SHOCK HAZARD	**ARC FLASH & SHOCK HAZARD: High voltage. Entry by authorized personnel only. Appropriate PPE and tools required when working on this equipment.**
 READ MANUAL	**READ MANUAL: Read manual before use, refer to manual for Tri Tool Technologies machine being used.**
 DISCONNECT FROM POWER	**DISCONNECT FROM POWER: Disconnect main plug from electrical outlet before performing all maintenance.**

2. SAFETY PRECAUTIONS

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 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.

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.

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.

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.

Area Equipment

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

Ensure that both sides of the pipe at the cut site are 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.

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.

Tool Use

Use the right tool and Tool Bit for the job. Contact Tri Tool Technologies 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 SUREFIRE 8 is a portable full support ID mounting machine tool specifically designed for facing thin wall pipe weld end preparations.

Pipe weld end preparations that meet all existing conventional codes including the more stringent nuclear codes may be machined using the SUREFIRE 8.

Design and Operating Procedures

The Surefire Pads secure the Model Surefire 8 to pipe from sizes 3”- 8” schedules 5S-10S.

The expanding Mandrel provides fast, accurate self-centering and alignment to the pipe or tubing to be machined.

The SUREFIRE 8 accepts the reaction torque generated by the machining operations through the Mandrel.

No additional restraining devices are required.

Intended Use

The equipment is intended for professional use.

The equipment is intended to be used by a person with knowledge and experience in the use of a machine of this type, without limitations in the physical abilities of the upper limbs and without visual impairment.

The machine is intended to be used with the operator in the upright position while operating in a variety of stances as required by the application.

Reasonably Foreseeable Misuse

Do not use the System on tools other than those explicitly specified by Tri Tool Technologies.

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.

4. TRAINING LEVELS

Operators

Operators must be familiar with industry standard practices and must have read all manuals associated with the product, Operators may also be expected to do routine maintenance as instructed in the user manual.

General Public/Bystanders

Those in the vicinity of the operation of the system must be aware of appropriate safety precautions such, as Personal Protection Equipment (PPE) for the work environment.

5. SPECIFICATIONS

Clearance and Dimensions

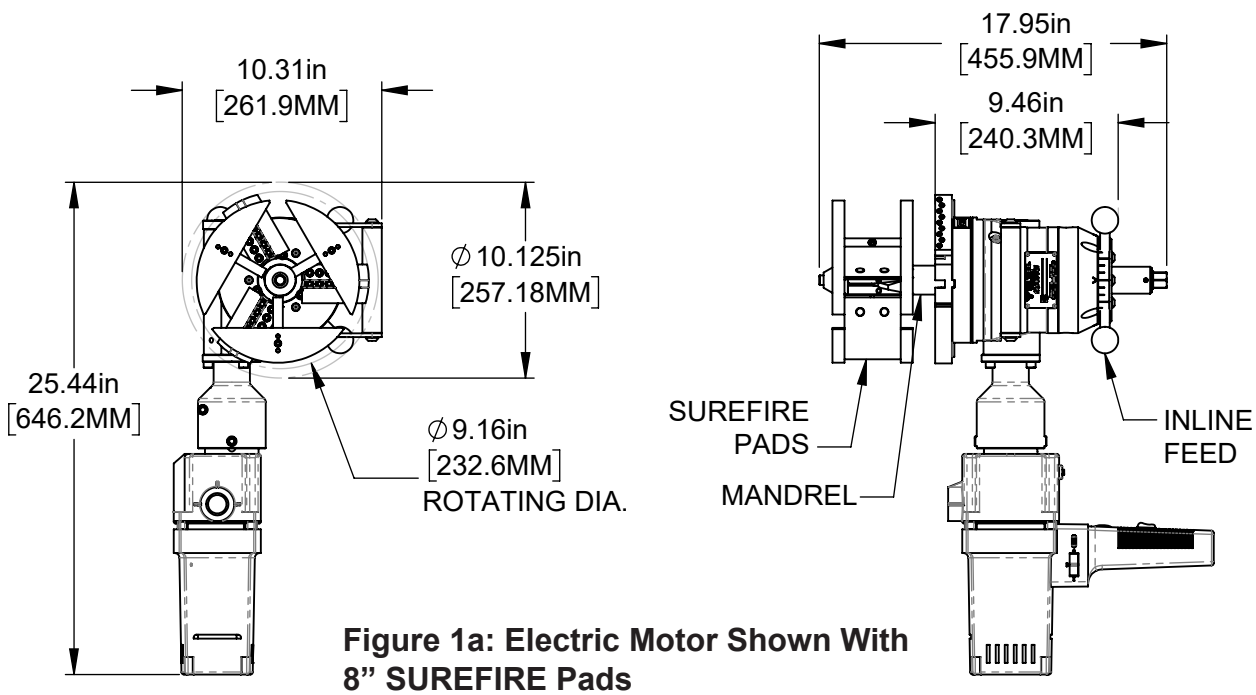


Figure 1a: Electric Motor Shown With 8” SUREFIRE Pads

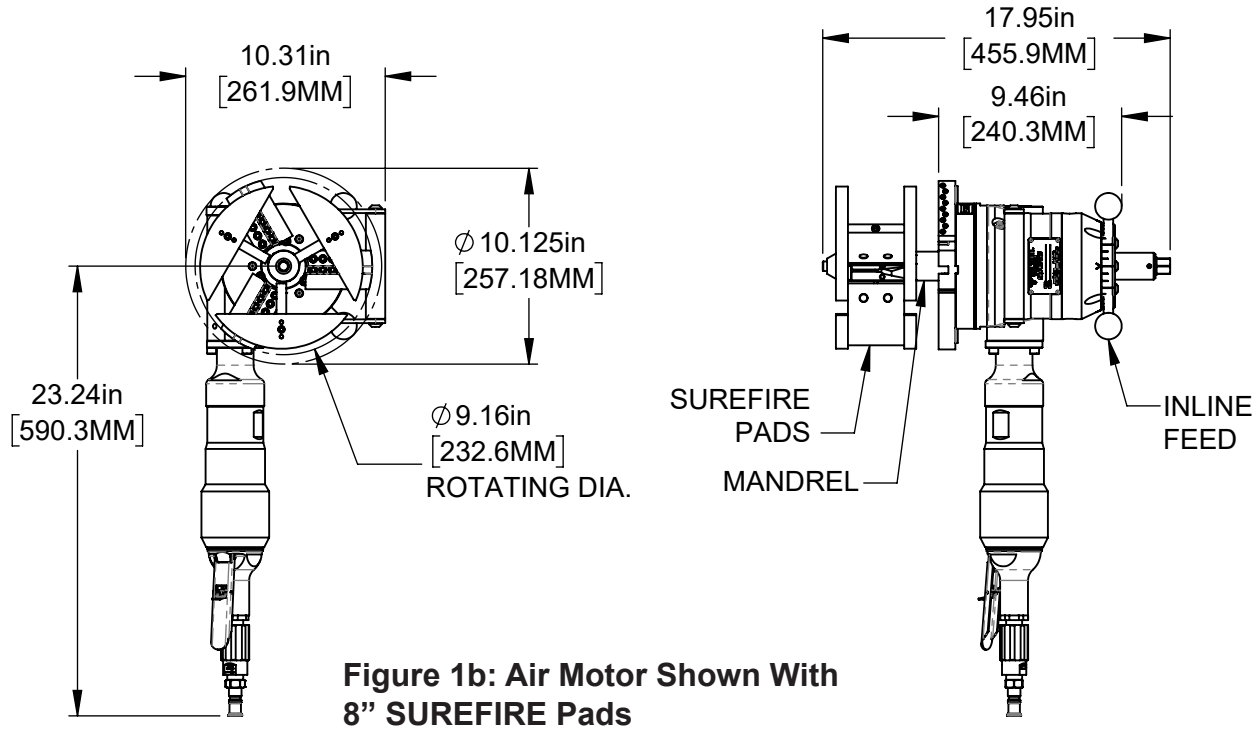


Figure 1b: Air Motor Shown With 8” SUREFIRE Pads

Pipe Cutting Capacities

Basic Pipe Sizes (Schedules 5S & 10S to all sizes)

- 3” pipe
- 4” pipe
- 5” pipe
- 6” pipe
- 8” pipe

NOTE: Custom Surefire pad sizes available on request

Wall Thickness Capacity (Limitations)

Wall thickness of schedules listed, .148” (3.8mm) maximum, in the range listed can be machined without limitations.

Material Cutting Capabilities

Mild steels, chrome steels (Rc 35 max.), stainless steel, copper-nickel and aluminum without limitations other than size and wall thickness as specified.

Inconel and some other high-temperature alloys may require special procedures as a function of wall thickness and type of end preparation. Contact the Tri Tool Technologies Engineering Department for details.

Weight

Mandrel Assembly (without pads)	7.5 lbs (3.4 kg)
Tool and Electric Motor	48 lbs (21.8 kg)
Tool and Air Motor	41 lbs (18.5 kg)

Drive System

Final Drive	
Gear Driven	5:1 Gear Reduction
Cutting Head Speeds	
Electric (Low/High)	12-28/40-94 RPM
Air	10-50 RPM

Power Requirements

Electric Motor	110 VAC, 50/60 Hz, 16.3A 220 VAC, 50/60 Hz, 8.2A
Air Motor	85 CFM @ 90 PSI

Speed Control

Electric	On/Off trigger control with variable speed
Air	On/Off safety lever valve and twist-type air flow control valve

Mounting

Manually-actuated draw rod expands mandrel ramps and jaw blocks.

Feed

Manual Feed Handle is inline at the back of the machine. Feed rate is .83” (2.1mm per revolution of the feed handle.

Maximum available feed travel is 2.00” (50.8mm)

6. MAINTENANCE

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

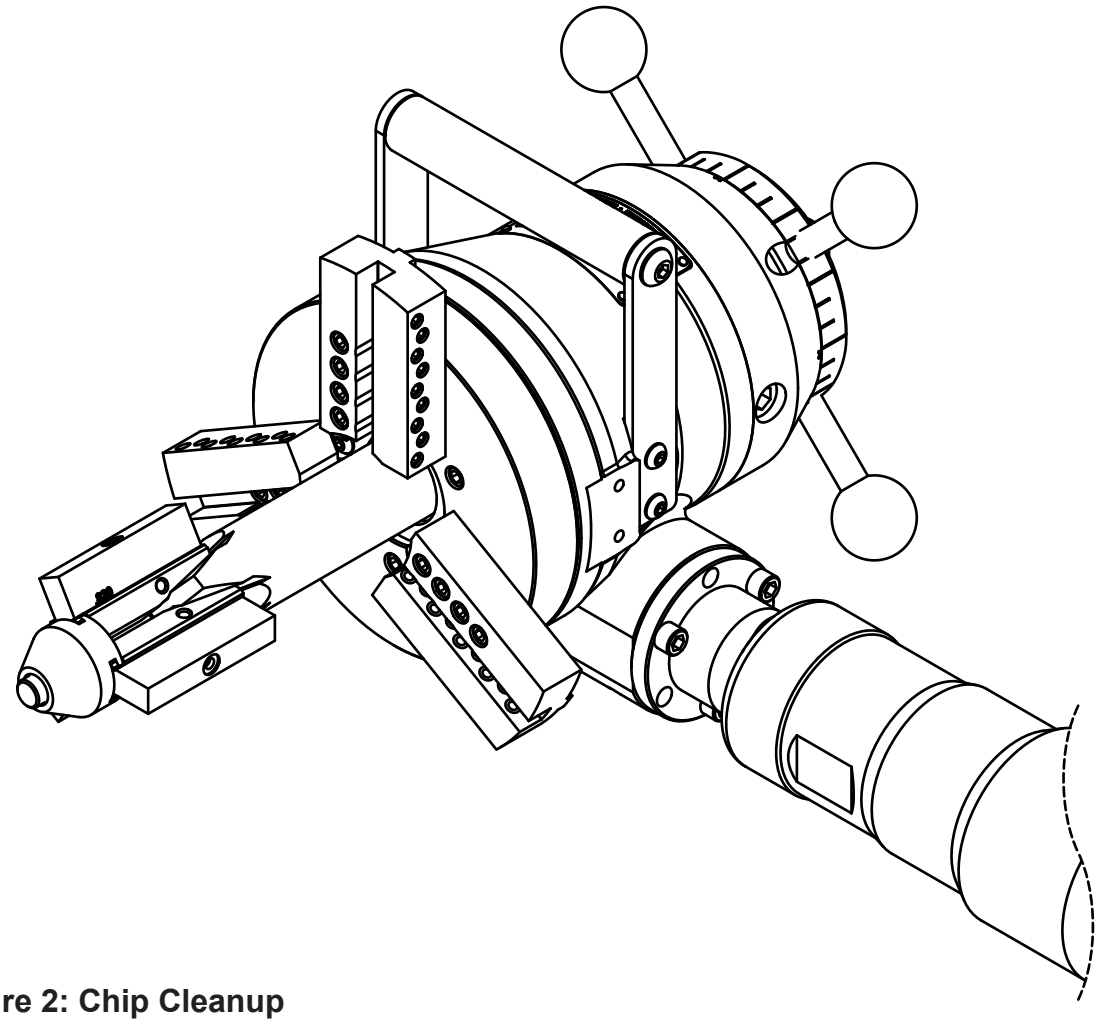


Figure 2: Chip Cleanup

When the SUREFIRE 8 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.

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

Verify that there is adequate grease in the gear box. Gears and bearings are to be lubricated using a lithium-based grease (P/N 68-0024).

Disassembly of a power unit voids warranty, except when performed by a Tri Tool Technologies-designated repair technician. A letter of designation is required.

7. TRANSPORTATION

Use Case to transport entire machine.

Machine exceeds 50 lbs., use two (2) people to pick up case at all times.

Disconnect motor when cables present a tripping hazard during transport.

8. OPERATION

Always read the operating instructions before you operate the SUREFIRE 8.

Use eye protection at all times when operating the SUREFIRE 8.

Installation

1. Select the recommended SUREFIRE Pad Set for the pipe size to be machined. Assemble the pads onto the Jaw Blocks by aligning and tightening the integrated screw.
2. Install the Mandrel Assembly into the pipe.

CAUTION

CAUTION: To avoid cutting the Jaw Blocks, install the Mandrel beyond the location of the final end preparation.

3. Tighten the Draw Nut (refer to Fig. 3) to force the Jaw Blocks out to the inside diameter of the pipe or tube.

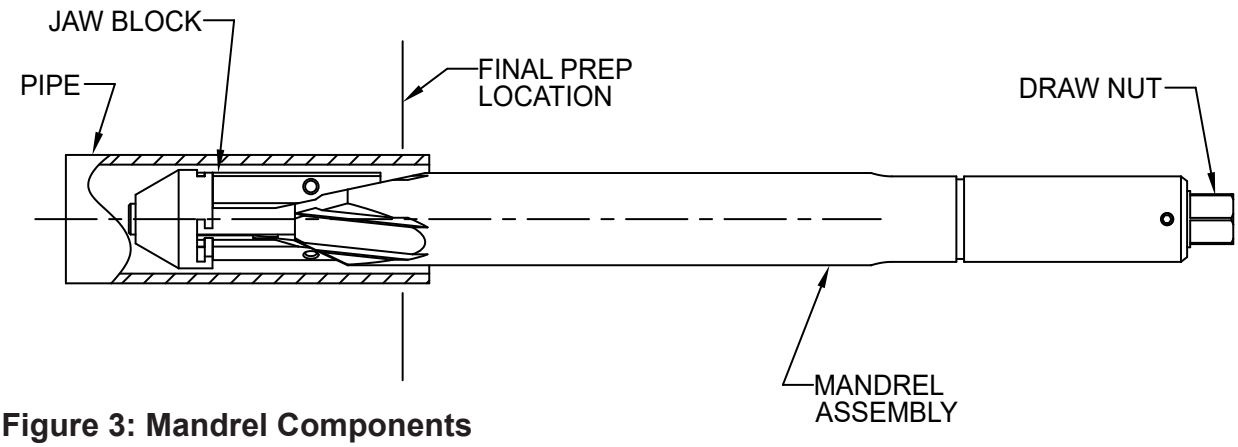


Figure 3: Mandrel Components

4. Select the Tool Bit(s) required to machine the pipe to the configuration desired. Use of dull or improperly designed Tool Bits or Tool Bits not manufactured by Tri Tool Technologies may result in poor performance and may constitute abuse of this machine and therefore voids the Tri Tool Technologies factory warranty.

5. When performing any multiple machining operation such as facing, beveling, and/or counterboring, install the counterbore Tool Bit to ‘lead’ the bevel Tool Bit.
6. Attach the Tool Holders to the SUREFIRE 8.
7. Insert the Tool Bit(s) into the slot(s) in the Tool Holder(s).
8. The cutting edge of the Tool Bit(s) must be located on the radial centerline.
9. Ensure that none of the Tool Bits are installed backwards.
10. Tighten the set screws to secure the Tool Bit(s) to the Tool Holder(s).
11. Slide the SUREFIRE 8 gently onto the Mandrel Assembly until it comes to a solid stop against the torque acceptance keys. The SUREFIRE 8 with the Mandrel Assembly installed may be mounted to the pipe as one unit.

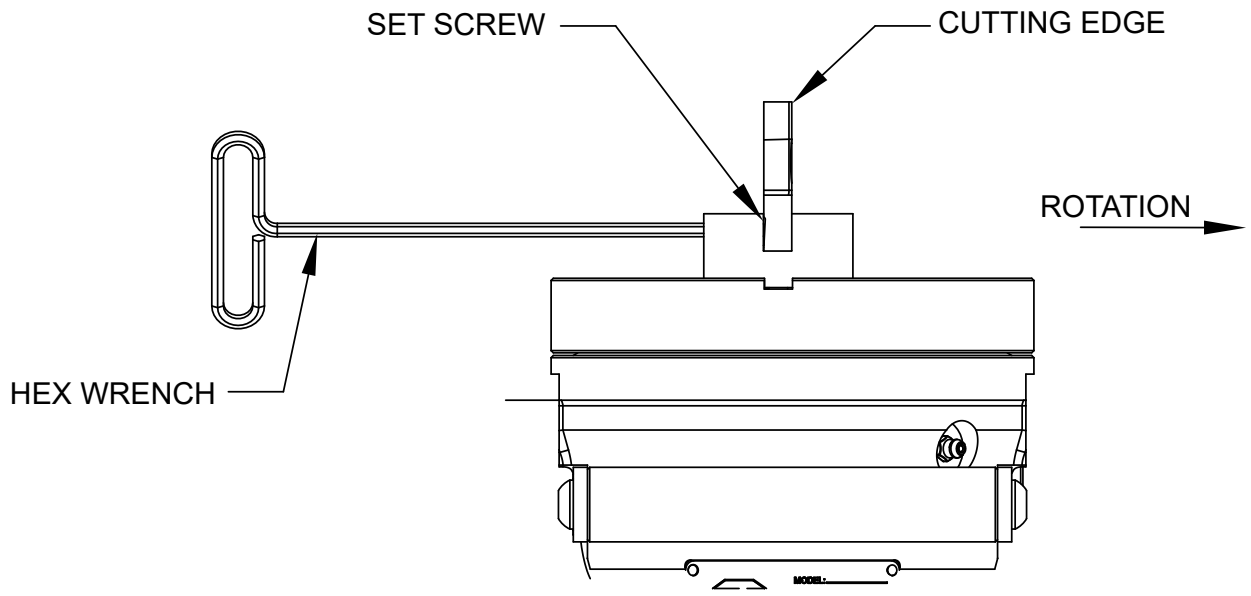


Figure 4: Tool Bit Installation

12. Rotate the SUREFIRE 8 as required to engage the torque acceptance keys with the slots in the Mandrel Shaft.

CAUTION

CAUTION: To avoid damaging equipment, do not allow the machine to impact the lead threads of the Feed Nut with the lead threads of the Mandrel. This may happen since the Mandrel Shaft will contact the torque acceptance keys before the Feed Nut engages the Mandrel Shaft threads.

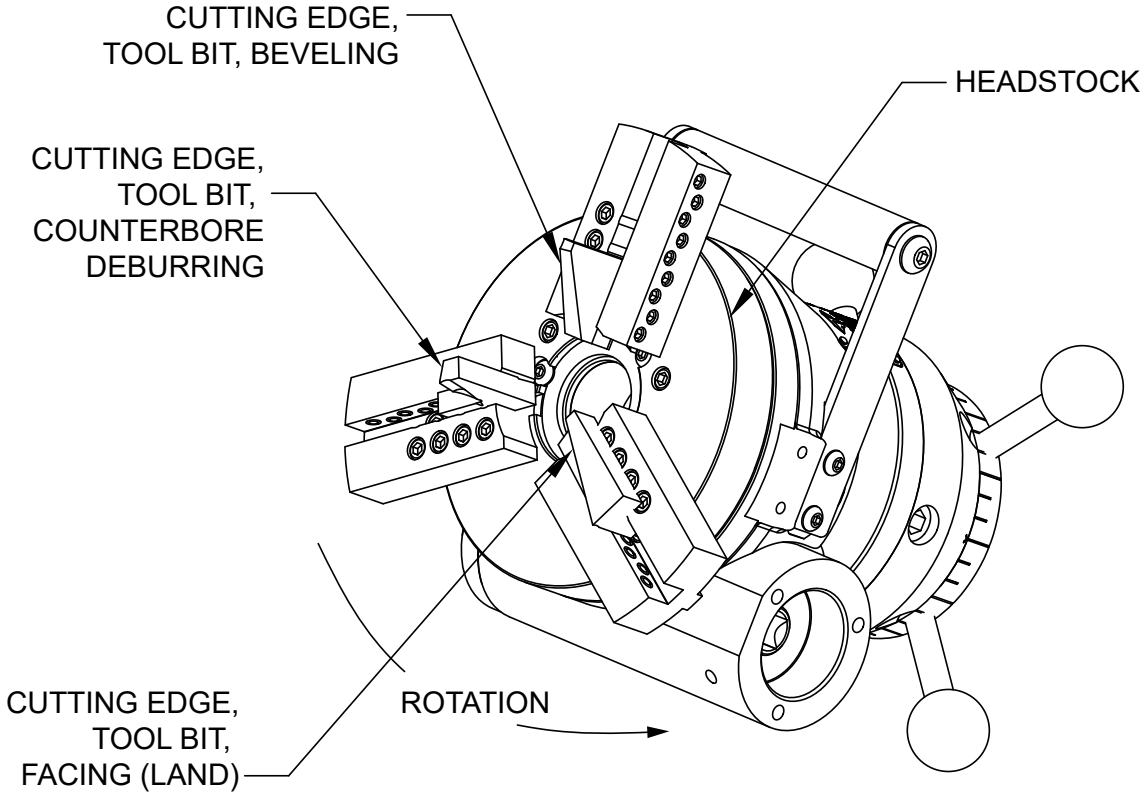


Figure 5: Engaging the Torque Acceptance Keys

Adjustment of the Torque Acceptance Keys

1. Adjusting the torque acceptance keys is required if the unit is loose radially on the Mandrel Shaft. This may appear as chatter in the Tool Bit.
2. Loosen the cap screws in both torque acceptance keys.
3. Rotate the set screw as required until the torque acceptance keys are riding snugly in the slots in the Mandrel Shaft.
4. Run the feed in and out to ensure that the torque acceptance keys are not so tight that the feed is impaired.
5. Re-tighten the cap screws to retain the new settings.
6. Rotate the Feed Handle clockwise to engage the Feed Nut with the thread on the Mandrel Shaft.
7. A minimum of ten (10) threads must be engaged to prevent the thread from being stripped during the machining operation.

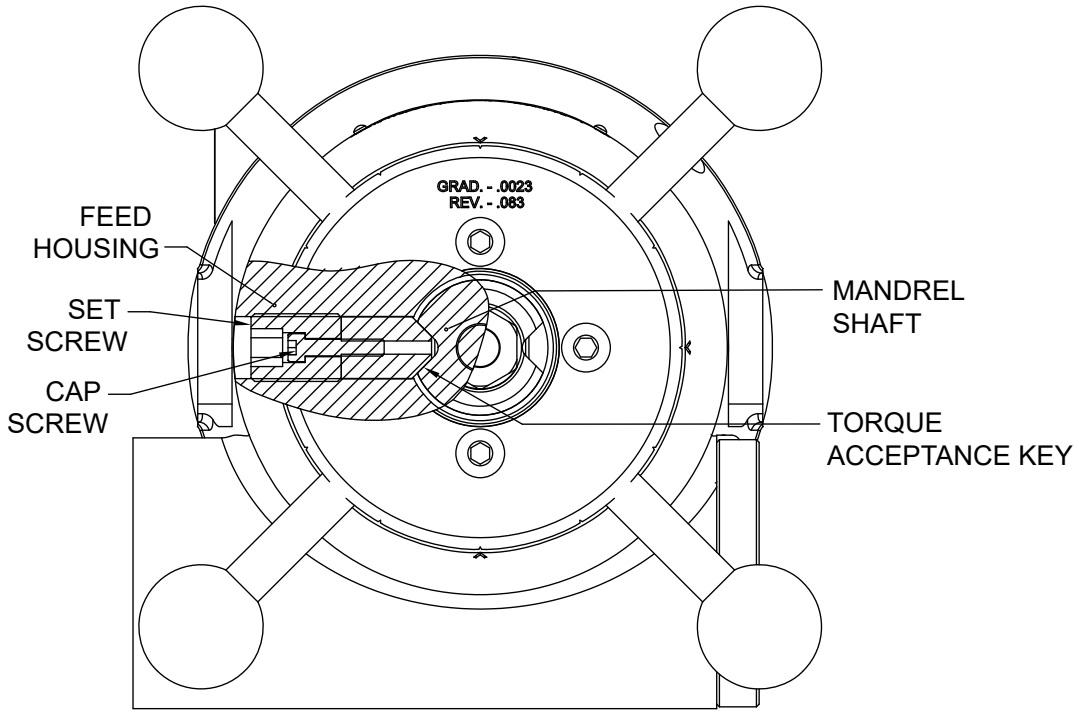


Figure 6: Adjusting the Torque Acceptance Keys

8. Verify that there is a clearance of 1/8” (3mm) minimum between the Tool Bit and the pipe face.

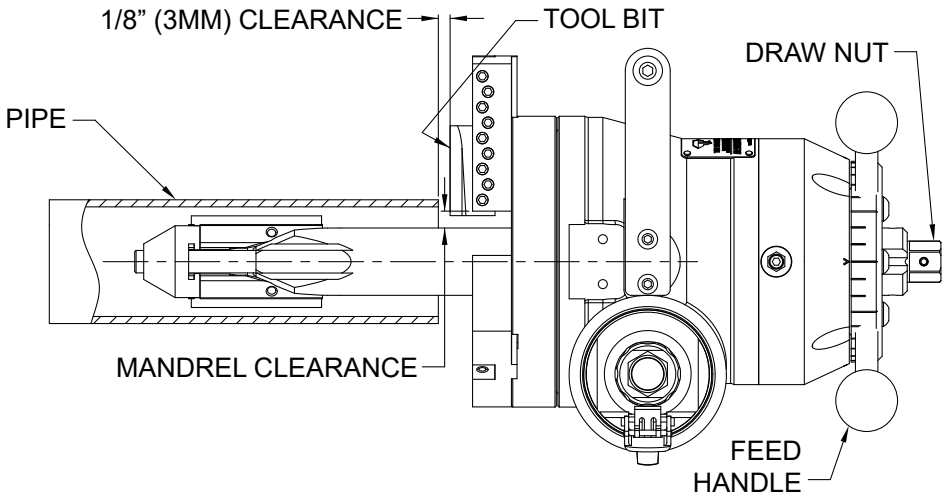


Figure 7: Clearance Between the Tool Bit and Pipe Face

9. Make sure that there is a clearance between the Tool Bit(s) and the Mandrel.

10. Attach the electric motor to the SUREFIRE 8 by inserting the motor into the adapter until it bottoms out, then secure the adapter by tightening the integrated screws.

9. MACHINING OPERATION

1. Select between gear 1 or 2 and adjust the RPM speed for the correct pipe size cutting speed.
2. Rotate the Feed Handle clockwise to bring the Tool Bit(s) and pipe closer together.
3. The machining operation begins when the first Tool Bit contacts the pipe.
4. When the pipe end is not square to the pipe axis, the Tool Bit contacts only a small segment of the pipe during each revolution.
5. To avoid Tool Bit damage, use a slow feed rate until the Tool Bit(s) is in contact with the pipe for at least one full revolution.
6. Continue rotating the Feed Handle clockwise until the end of the pipe is completely machined.
7. The axial feed rate of the Tool Bit is .0023” (.06mm) for each graduation or .083” (2.11mm) for each complete revolution of the feed handle.
8. Discontinue feed and allow the head to rotate one to three revolutions to improve the finish of the prep surface.
9. Release the trigger to stop the head rotation.

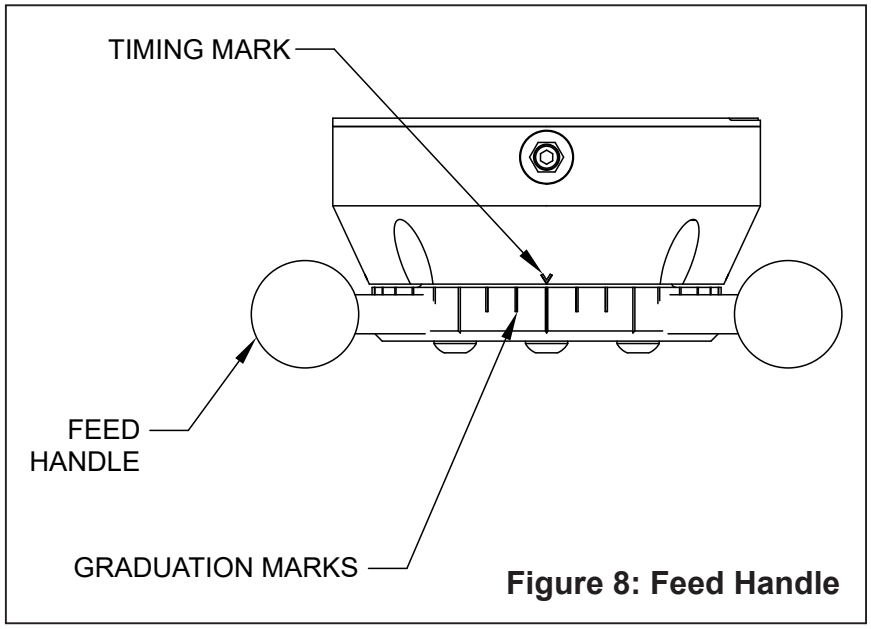


Figure 8: Feed Handle

10. Rotate the Feed Handle counterclockwise to separate the Tool Bit(s) from the pipe.
11. Rotate the Feed Handle counterclockwise until the Tool Bit is 1/8” (3mm) minimum from the end of the pipe or tube.
12. Loosen the draw nut on the Mandrel to release the Mandrel from the pipe.
13. The Mandrel Assembly may be left in the SUREFIRE 8 and installed as a complete assembly.

10. CUTTING SPEEDS AND FEEDS

Pipe Size OD		RPM for 200 in/min (5080 mm/min)	RPM for 250 in/min (6350 mm/min)	RPM for 300 in/min (7620 mm/min)
3.50”	(88.9mm)	18	23	27
4.50”	(114.3mm)	14	18	21
5.50”	(139.7mm)	12	15	17
6.63”	(168.3mm)	10	12	15
8.63”	(219.1mm)	8	10	12

Cutting Speed (approximate)

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.

Feed Recommendation

Use very light feed for initially 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.

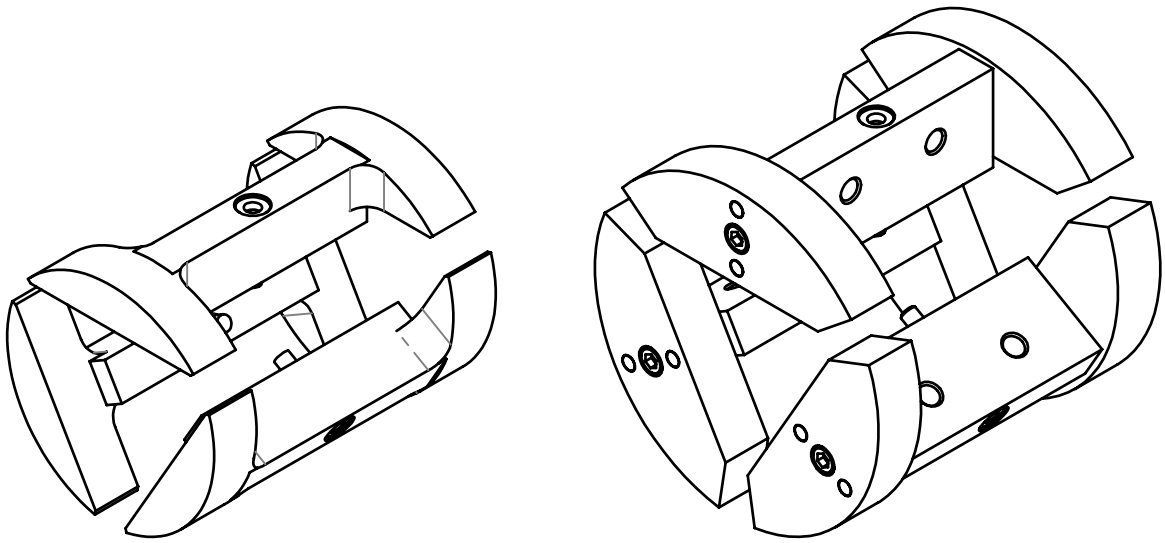
- If the feed is too light, only light stringer chips will be removed.
- If the feed is too heavy the drive will start to overload and the chip will start to have a rough or torn appearance.

Stainless steel, which work hardens, must be worked with 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.

Reducing the feeds and speeds may minimize chatter problems.

11. SUREFIRE 8 PAD KITS



3" PIPE

4"- 8" PIPE

Figure 9: SUREFIRE 8 Pad Assembly

Pipe ID	SUREFIRE Kit P/N
3” SCH 5S	05-1618
3” SCH 10S	05-1619
4” SCH 5S	05-1620
4” SCH 10S	05-1621
5” SCH 5S	05-1622
5” SCH 10S	05-1623
6” SCH 5S	05-1624
6” SCH 10S	05-1625
8” SCH 5S	05-1626
8” SCH 10S	05-1627

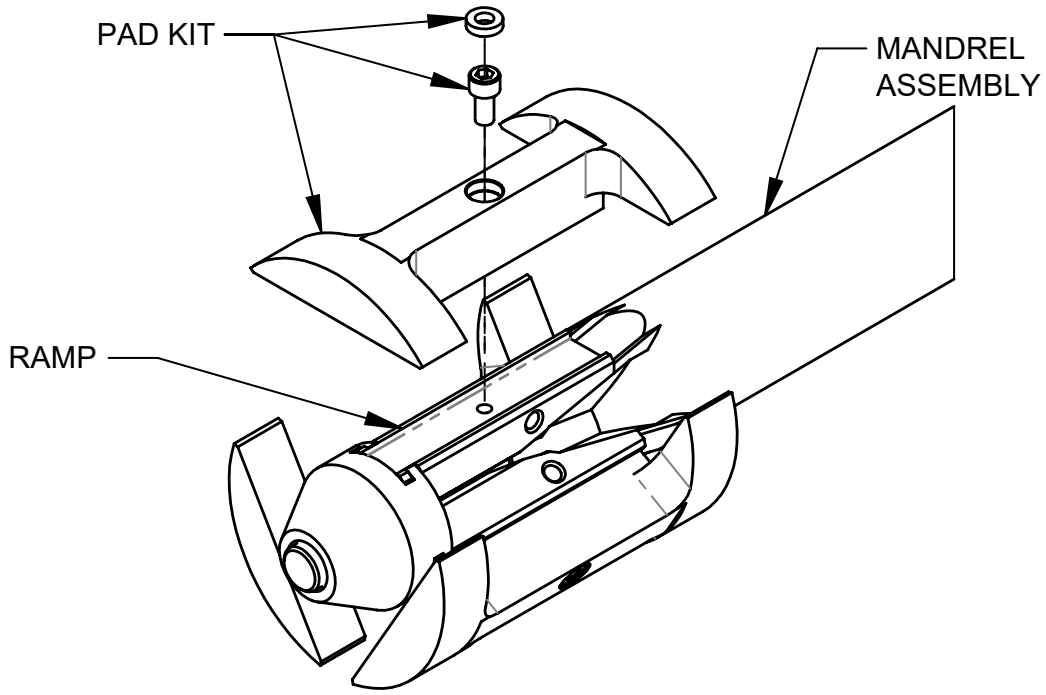


Figure 10: Pad Assembly 05-1618 and 05-1619

Mounting Instructions for SUREFIRE Pad Kits 05-1618 and 05-1619

For Pad Assembly sets 05-1618 and 05-1619, mount the pad directly to the ramp and secure with its designated screw.

Fully retract the SUREFIRE Pad Assembly by turning Mandrel Feed Nut counterclockwise before mounting inside the pipe.

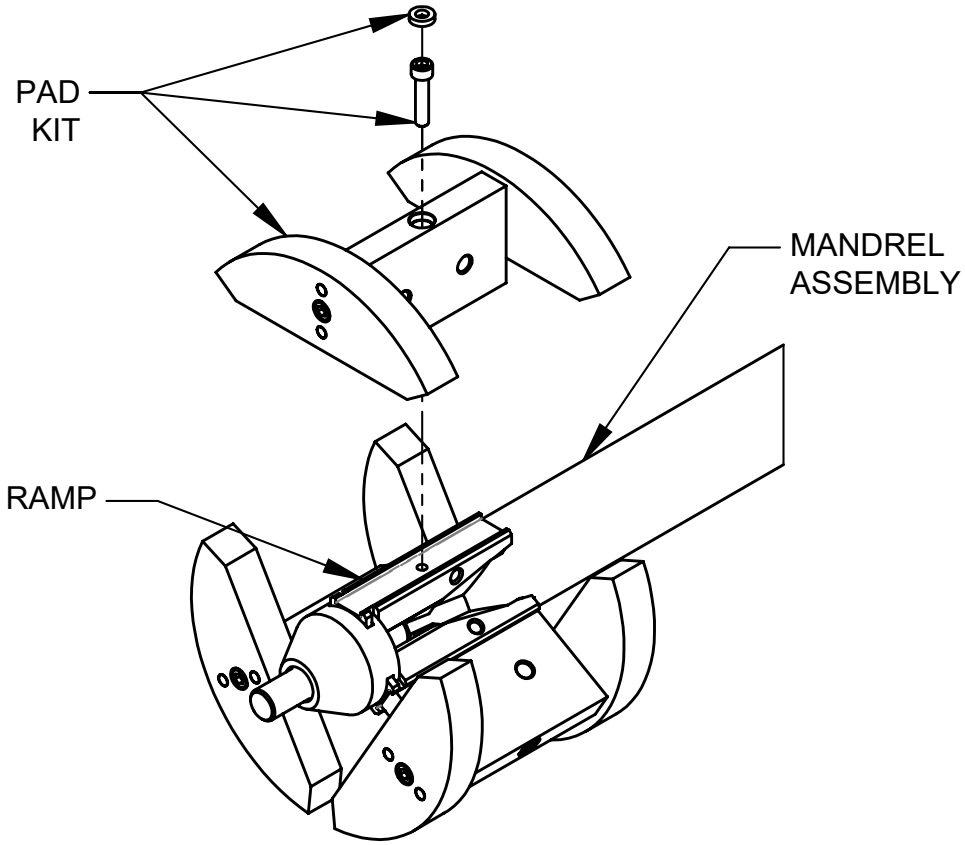


Figure 11: Pad Assembly 05-1620 through 05-1627

Mounting Instructions for SUREFIRE Pad Kits 05-1620 through 05-1627

Expand the SUREFIRE Pad Kit by stretching the springs until it can fit around the mandrel and each Support Pad is sitting on top of a ramp.

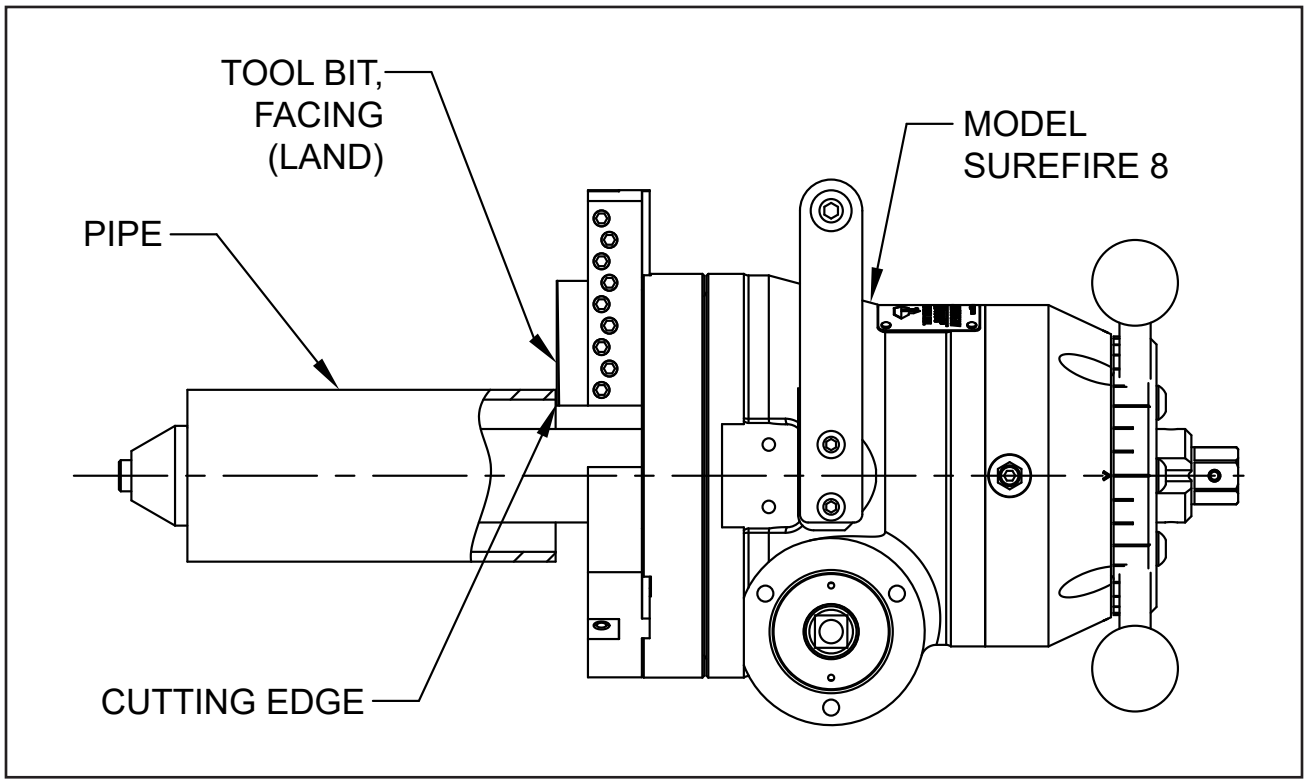
Secure the Pad Assembly to the ramp block with its designated screw that is retained inside the assembly.

Fully retract the SUREFIRE Pad Assembly by turning mandrel feed nut counterclockwise before mounting inside the pipe.

NOTE: Springs not shown in image are included in the kit.

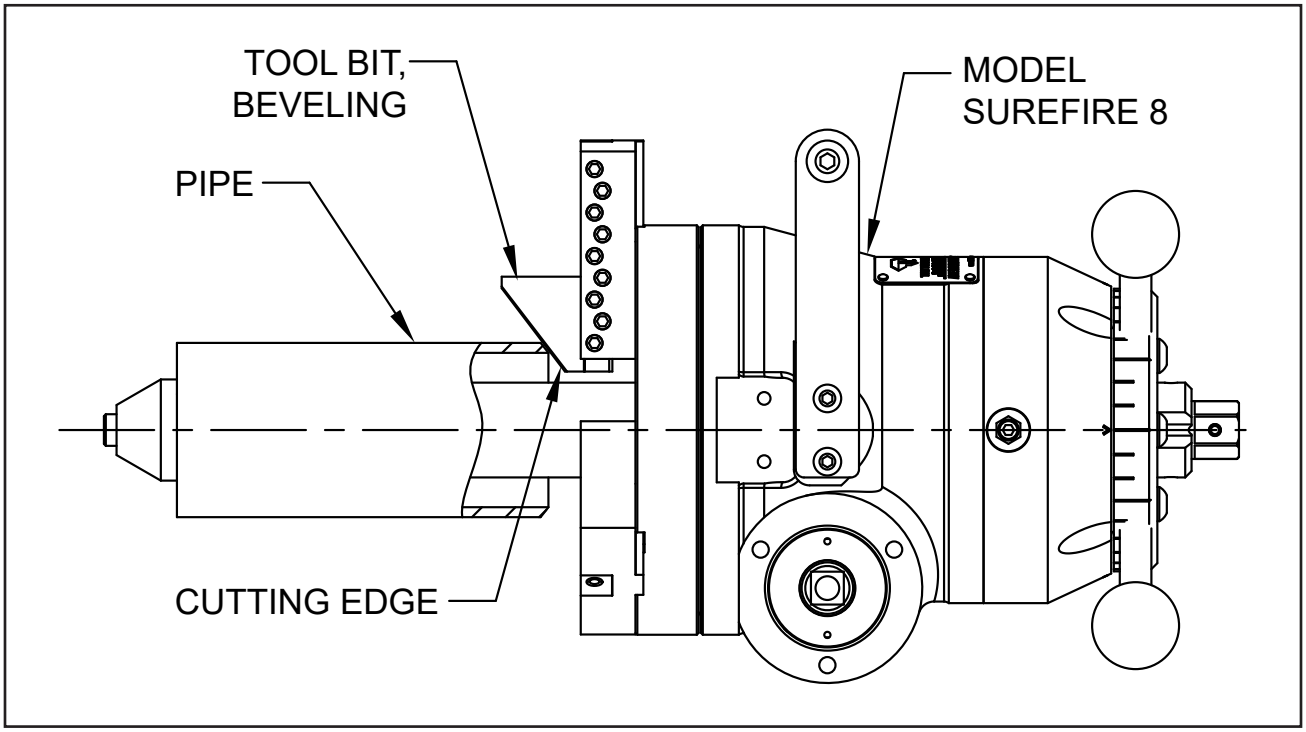
12. TOOL BITS

Facing Land Tool Bit



Range	Max. Wall Thickness	Pipe or Tube Material	Facing (Land) Tool Bit P/N
3” thru 8” pipe, sch 5 and 10	.148” (3.8mm)	CS	DURABIT® 4
		SS	99-5385

Beveling Tool Bit



37.5° Beveling Tool Bit

Range	Max. Wall Thickness	Pipe or Tube Material	37.5° Beveling Tool Bit P/N	Facing Tool Bit P/N
3” thru 8” pipe, sch 5 and 10	.148” (3.8mm)	CS	DURABIT® 6	DURABIT® 4
		SS	99-2919	99-5385

45° Beveling Tool Bit

Range	Max. Wall Thickness	Pipe or Tube Material	45° Beveling Tool Bit P/N	Facing Tool Bit P/N
3” thru 8” pipe, sch 5 and 10	.148” (3.8mm)	CS	99-2914	DURABIT® 4
		SS	99-2927	99-5385

13. TROUBLESHOOTING

Problem: 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: 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: Rough Surface Finish

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.

The cutting speed is incorrect.

Problem: 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.

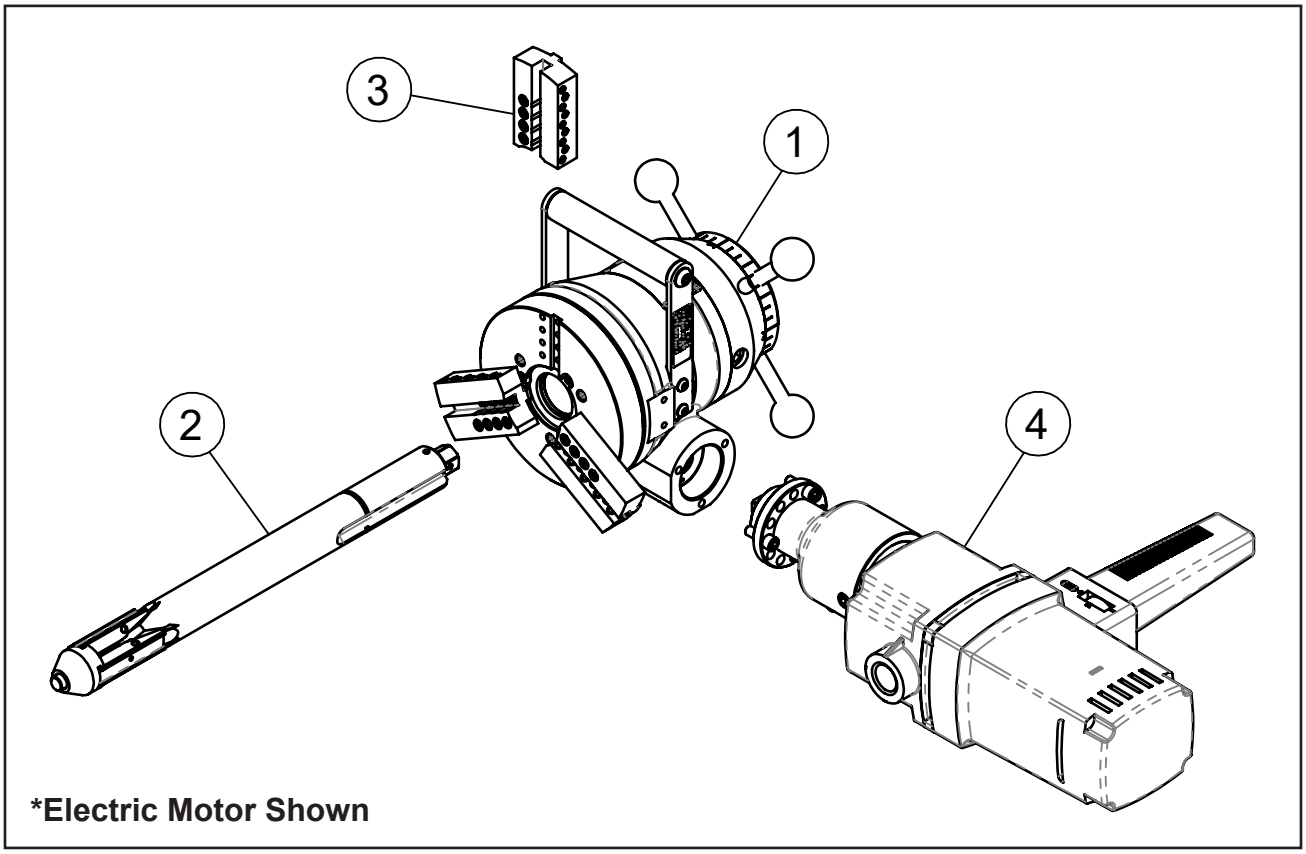
Problem: Tool Bit Does Not Reach Work

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

Incorrect Tool Bit is installed.

14. ILLUSTRATED PARTS BREAKDOWN

MODEL SUREFIRE 8 (P/N 01-2590 / 01-2593 / 01-2603)*

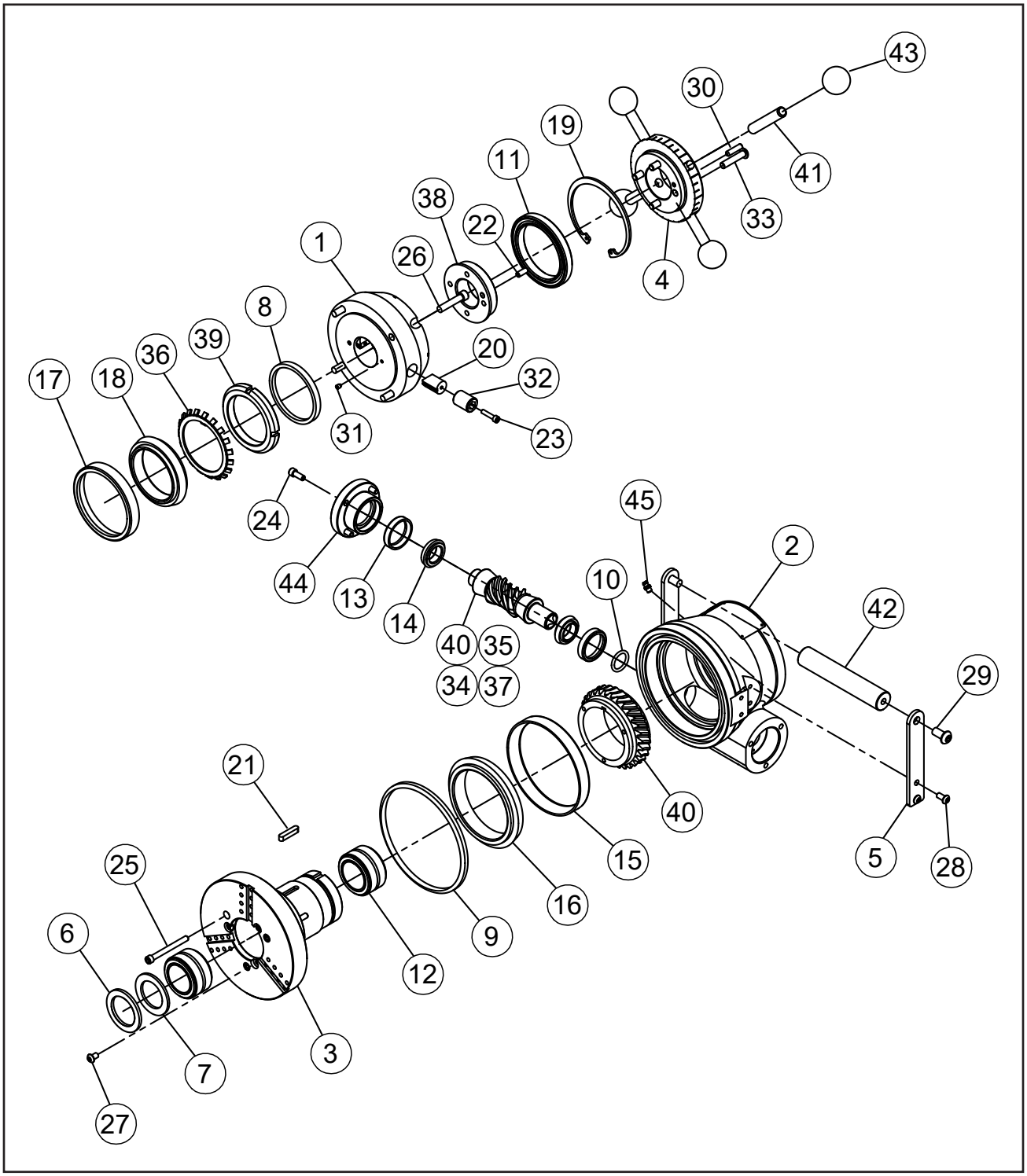


***Electric Motor Shown**

Parts List, Model SUREFIRE 8, 110V, 220V, AIR (P/N 01-2590 / 01-2593 / 01-2603)

Item No.	Part No.	Description	Qty
1	02-3174	SUB-ASSEMBLY, SUREFIRE 8, BLACK	1
2	06-0597	MANDREL ASSEMBLY, SUREFIRE 8	1
3	49-0872	HOLDER ASSEMBLY, TOOL	3
4	58-0408	MOTOR ASSEMBLY, 110V LOW RPM (01-2590)	1
	58-0411	MOTOR ASSEMBLY, 220V LOW RPM (01-2593)	1
	57-0168	MOTOR ASSEMBLY, AIR, INLINE, 310 RPM (01-2603)	1
	NOT SHOWN		
	05-1256	SHIPPING KIT	1
	36-0005	WRENCH, L, 1/8" HEX	1
	36-0007	WRENCH, L, 5/32" HEX	1
	36-0008	WRENCH, L, 3/16" HEX	1
	36-0010	WRENCH, L, 1/4" HEX	1
	36-0012	WRENCH, L, 3/8" HEX	1
	36-0020	WRENCH, T, 5/32" HEX	1
	36-0146	WRENCH, COMBINATION, 13/16"	1

MODEL SUREFIRE 8 SUB-ASSEMBLY (P/N 02-3174)



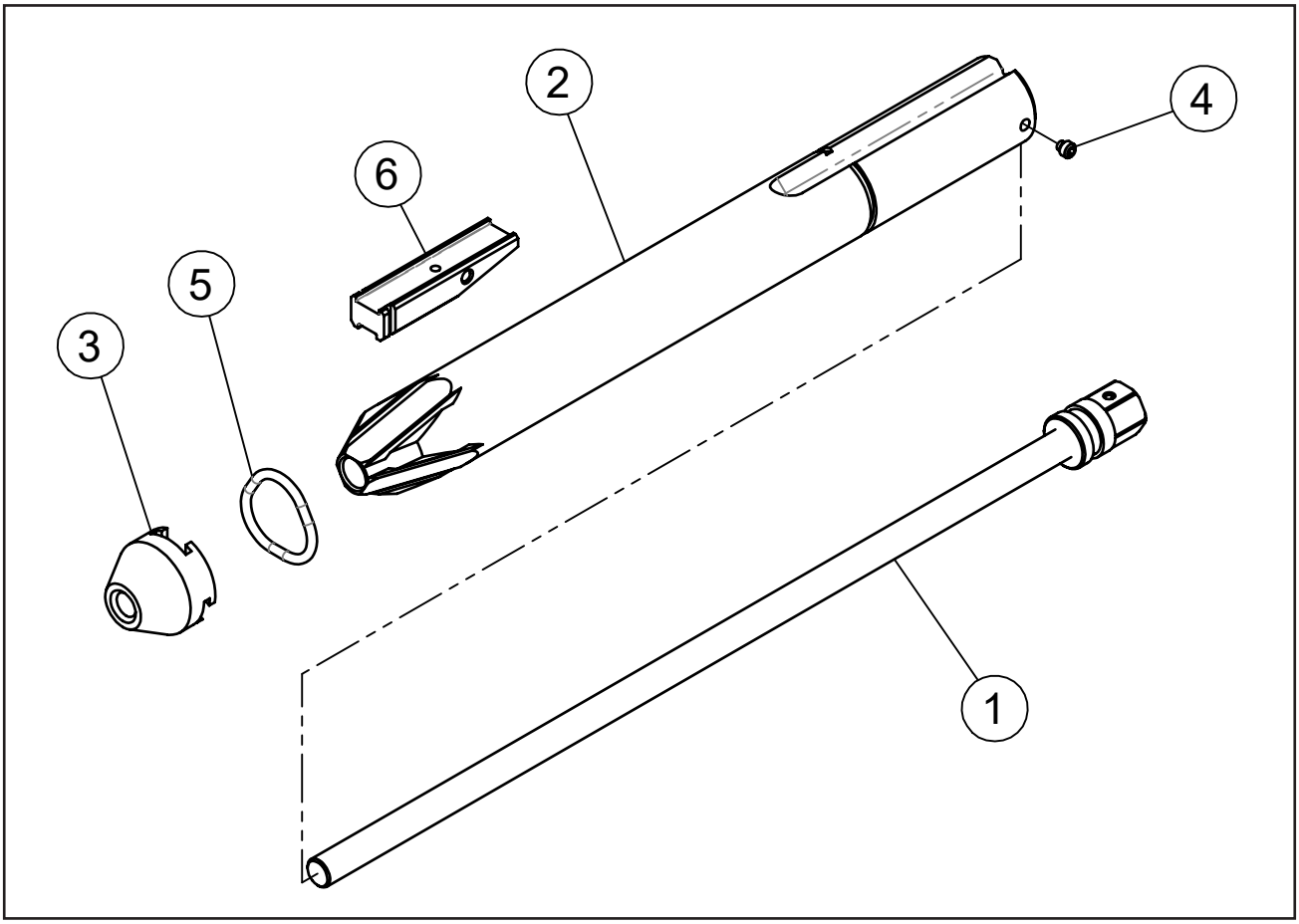
Parts List, Model SUREFIRE 8 Sub-Assembly (P/N 02-3174)

Item No.	Part No.	Description	Qty
1	19-1963	HOUSING, FEED	1
2	19-1964	HOUSING, MAIN	1
3	20-1216	SHAFT, MAIN	1
4	24-5239	PLATE, FEED	1
5	24-5240	PLATE, HANDLE	2
6	24-0831	PLATE, SEAL	1
7	28-0172	SEAL, SHAFT, 2-1/4" X 1-1/2" X 1/8"	1
8	28-0176	SEAL, EXTRUDED, 3/16" X BULK	9.75"
9	28-0176	SEAL, EXTRUDED, 3/16" X BULK	18.25"
10	28-0421	O-RING, .859" ID X .139" WIDE	1
11	29-0002	BEARING, BALL, #2-15/16 X 3-7/8" X 7/16"	1
12	29-0218	BEARING, ROLLER, #1-1/2 X 2-1/4" X 1-1/4"	2
13	29-0544	BEARING, TAPER CUP, 1.656" OD	2
14	29-0545	BEARING, TAPER CONE, .875" ID	2
15	29-0546	BEARING, TAPER CUP, 5.125" OD	1
16	29-0547	BEARING, TAPER CONE, .3.750" ID	1
17	29-0548	BEARING, TAPER CUP, 4.000" OD	1
18	29-0549	BEARING, TAPER CONE, 2.750" ID	1
19	30-0300	RING, RETAIN, INT, 3-7/8” ID	1
20	31-0086	KEY, BRONZE, 45°	2
21	31-0266	KEY, BRONZE, 45°	1
22	32-0304	PIN, LOCK	1
23	33-0031	SCREW, CAP, #10-24 X 7/8"	2
24	33-5144	SCREW, CAP, 1/4-20 X 5/8”, ZINC	4
25	33-3523	SCREW, CAP, 1/4-20 X 2-1/2", TORX	3
26	33-3109	SCREW, CAP, 5/16-18 X 1-1/2”, ZINC PLTD	4
27	33-5142	SCREW, BUTTON, 1/4-20 X 3/8”, ZINC	3
28	33-5143	SCREW, BUTTON, 1/4-20 X 1/2”, ZINC	4
29	33-5141	SCREW, BUTTON, 3/8-16 X 3/4”, ZINC	2
30	33-0507	SCREW, SET, 1/4-20 X 1", CUP PT	1
31	33-0954	SCREW, SET, #10-24 X 1/4", HDOG	2
32	33-5145	SCREW, BUTTON, 5/16-18 x 1-1/2”, ZINC	2
33	33-1526	SCREW, BUTTON, 5/16-18 X 1-1/2"	4
34	34-0559	SHIM, BEARING, .004"	2
35	34-0560	SHIM, BEARING, .005"	2

Parts List, Model SUREFIRE 8 Sub-Assembly (P/N 02-3174) *continued*

Item No.	Part No.	Description	Qty
36	34-0567	WASHER, LOCK, 2-3/4"	1
37	34-0568	SHIM, BEARING, .007"	2
38	35-0269	NUT, FEED, 206B	1
39	35-0849	NUT, LOCK, MOD.	1
40	39-1070	GEAR, SET, MOD.	1
41	41-0076	HANDLE, FEED	4
42	41-0211	HANDLE	1
43	42-0017	KNOB, SPHERICAL, 1-3/8" DIA	4
44	43-0785	COVER, GEAR	1
45	54-0375	FITTING, GREASE	1

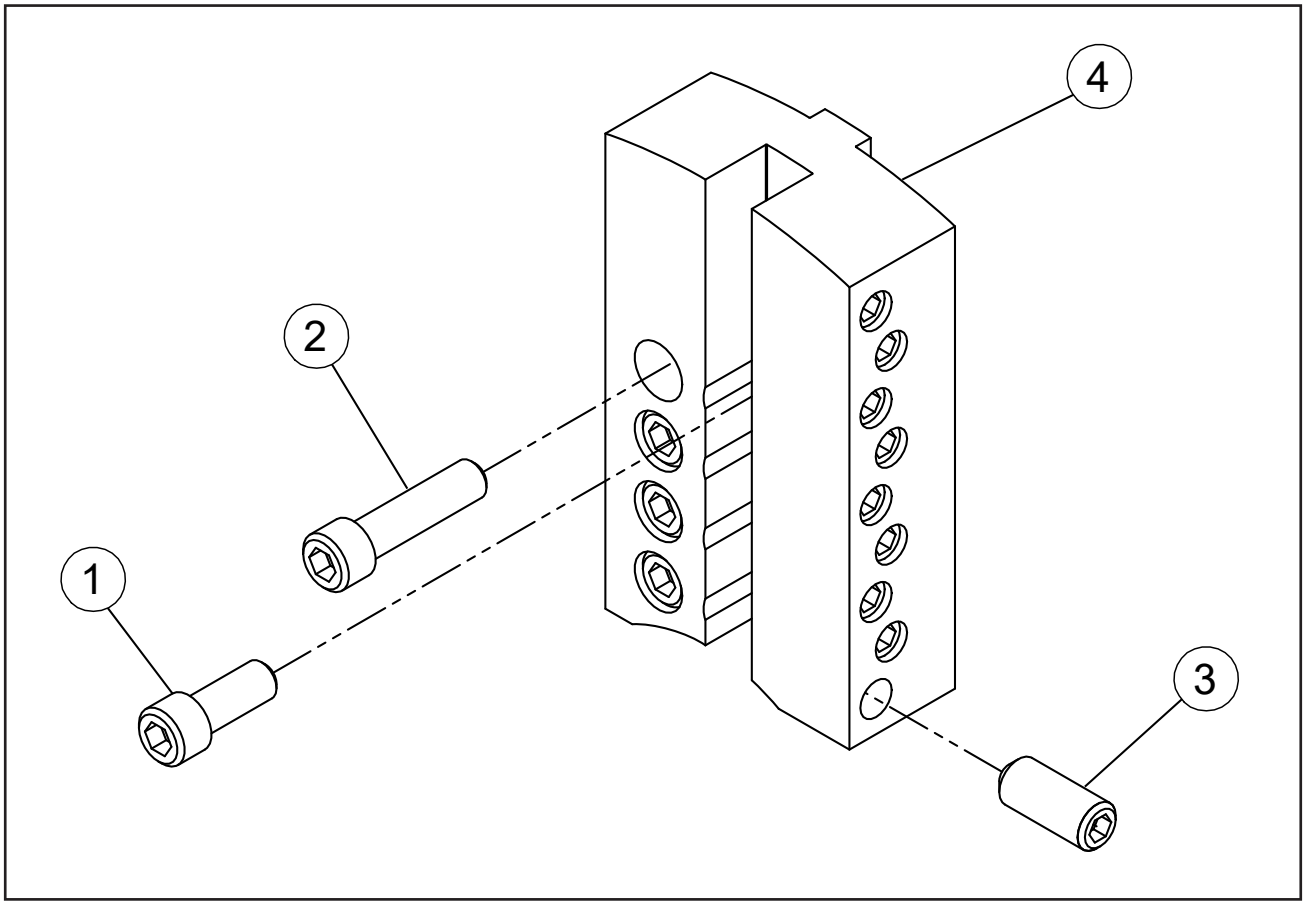
MANDREL ASSEMBLY, SUREFIRE 8 (P/N 06-0597)



Parts List, Mandrel Assembly, SUREFIRE 8 (P/N 06-0597)

Item No.	Part No.	Description	Qty
1	11-0139	ROD ASSEMBLY, DRAW	1
2	13-0539	MANDREL, SUREFIRE 8	1
3	24-0722	PLATE, BUTT, SMALL	1
4	33-1527	SCREW, SET, 1/4-20 X 1/4", HDOG	2
5	40-0001	SPRING, EXT, 5/32 X 2-1/2"	1
6	48-0474	BLOCK, RAMP	3

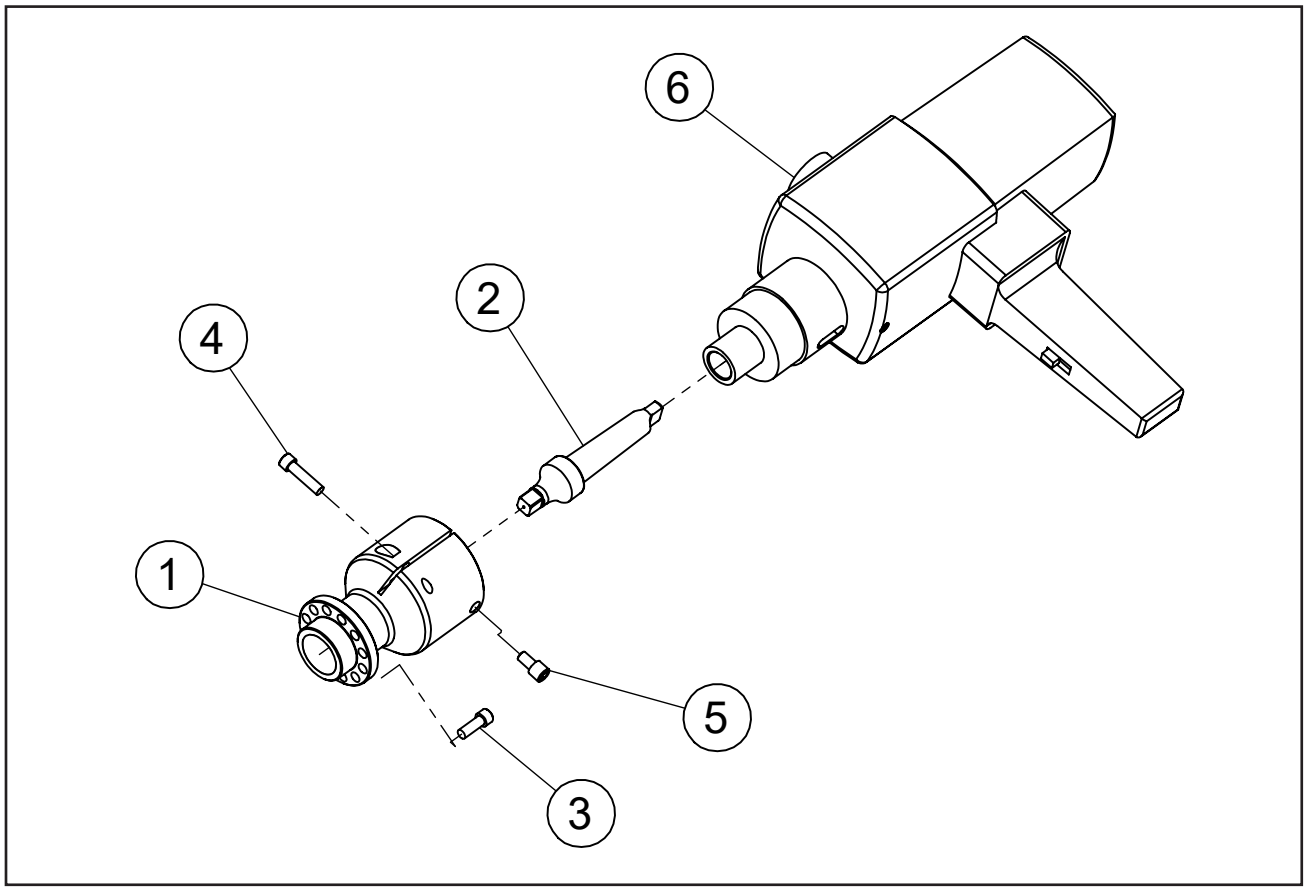
HOLDER ASSEMBLY, TOOL (P/N 49-0872)



Parts List, Tool Holder Assembly (P/N 49-0872)

Item No.	Part No.	Description	Qty
1	33-0039	SCREW, CAP, 1/4-20 X 5/8"	4
2	33-0042	SCREW, CAP, 1/4-20 X 1"	4
3	33-0518	SCREW, SET, 5/16-18 X 3/4", CUP PT	9
4	49-0871	HOLDER, TOOL	1

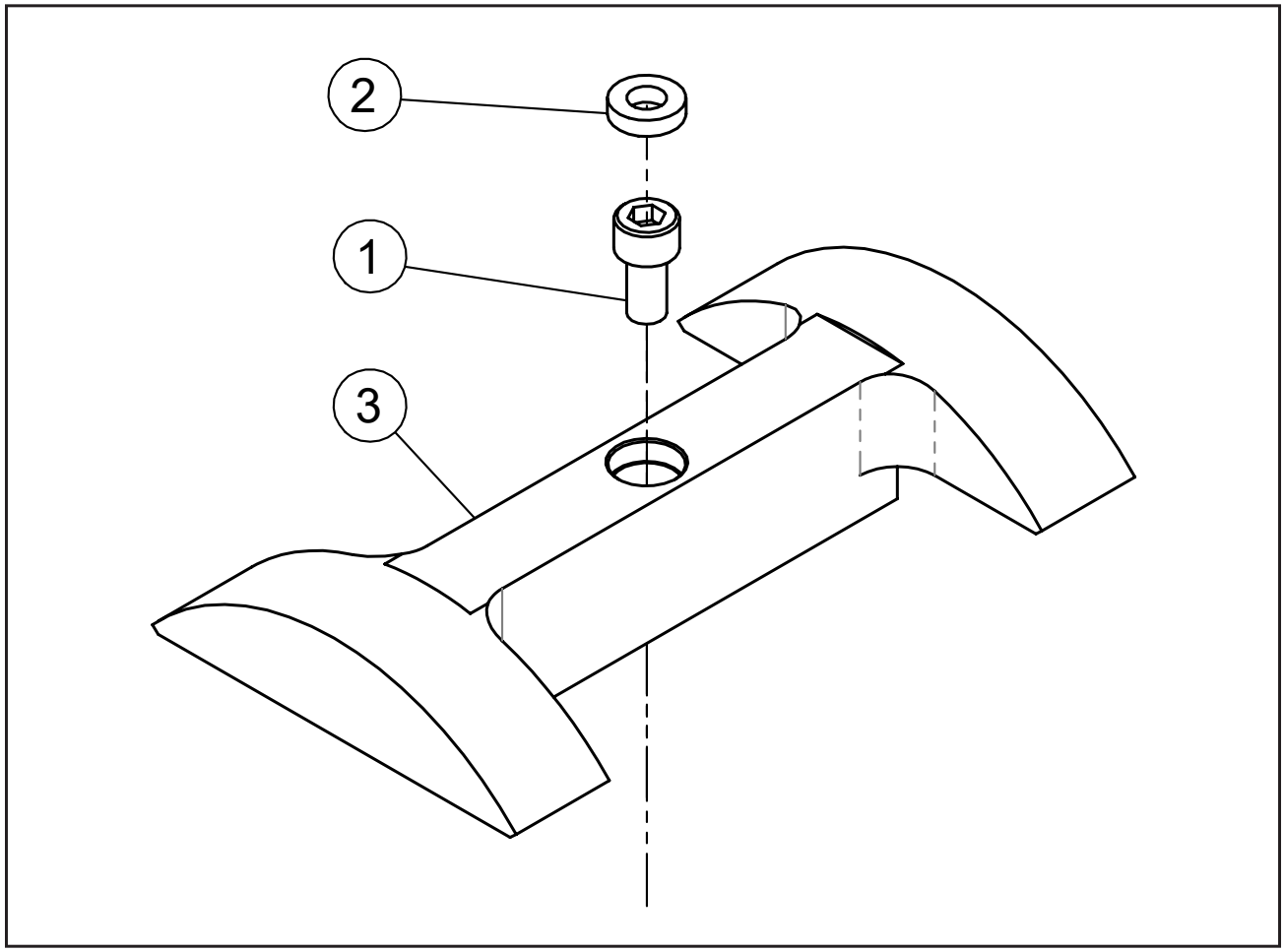
MOTOR ASSEMBLY, 110V, 220V LOW RPM (P/N 58-0408 / 58-0409)



Parts List, Motor Assembly, 110V, 220V Low RPM (P/N 58-0408 / 58-0409)

Item No.	Part No.	Description	Qty
1	27-0826	ADAPTER, DRIVE	1
2	30-3143	1/2" SQUARE DRIVE	1
3	33-0055	SCREW, CAP, 5/16-18 X 7/8" LG.	3
4	33-0057	SCREW, CAP, 5/16-18 X 1-1/4" LG.	1
5	33-1874	SCREW, ANTI-ROTATION	2
6	58-0406	MOTOR, 110V LOW RPM, MOD (58-0408)	1
	58-0411	MOTOR, 220V LOW RPM, MOD (58-0409)	1

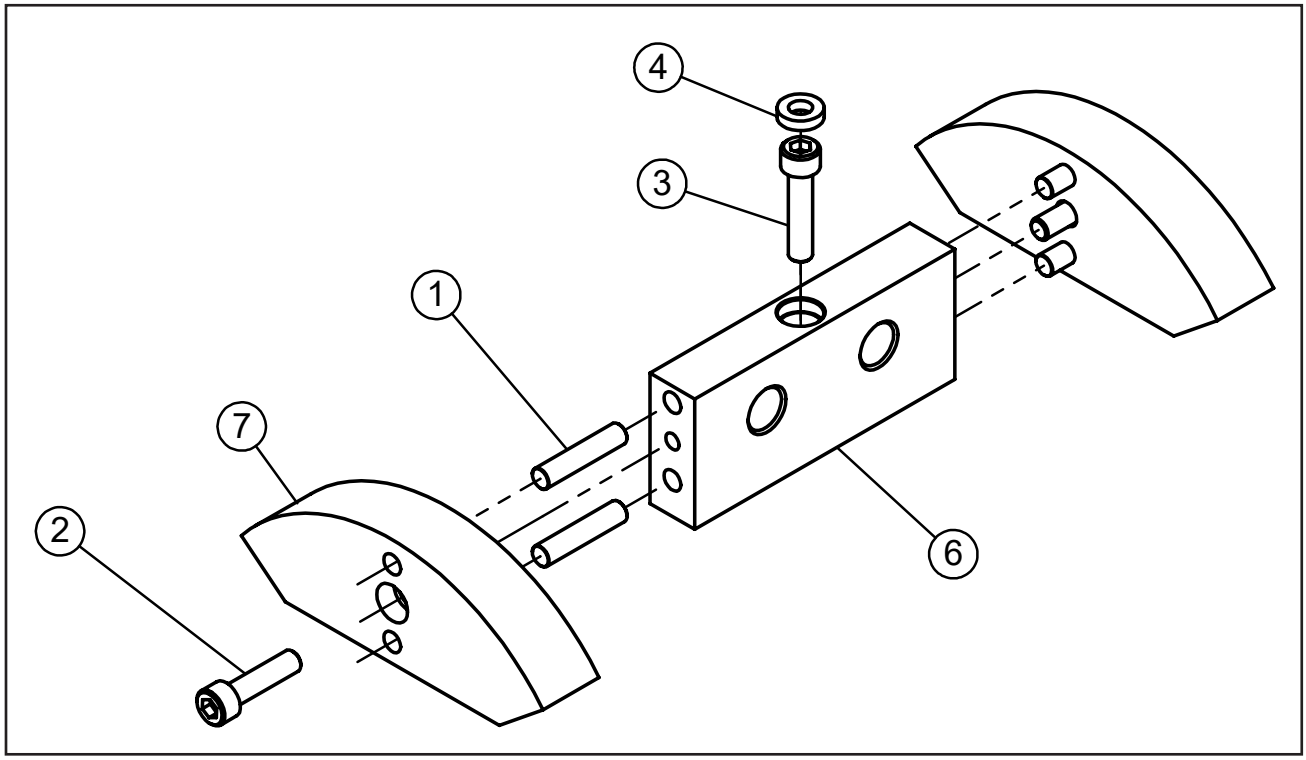
KIT, SUREFIRE PAD, SUREFIRE 8 (P/N 05-1618 / 05-1619)



Parts List, Kit, SUREFIRE Pad, SUREFIRE 8 (P/N 05-1618 / 05-1619)

Item No.	Part No.	Description	Qty
1	33-0027	SCREW, CAP, 10-24 X 3/8”	3
2	34-0252	WASHER, NYLON, .370" OD X .192" ID	3
3	67-5765	PAD, FULL SUPPORT, SUREFIRE 8, 3" SCH 5S (05-1618)	3
	67-5766	PAD, FULL SUPPORT, SUREFIRE 8, 3" SCH 10S (05-1619)	3

KIT, SUREFIRE PAD, SUREFIRE 8 (P/N 05-1620 - 05-1627)



Parts List, Kit, SUREFIRE Pad, SUREFIRE 8 (P/N 05-1620 / 05-1621)

Item No.	Part No.	Description	Qty
1	32-0293	PIN, DOWEL, 3/16 DIA X 7/8”	12
2	33-0030	SCREW, CAP, 10-24 X 3/4”	6
3	33-0031	SCREW, CAP, 10-24 X 7/8”	3
4	34-0252	WASHER, NYLON, .370" OD X .192" ID	3
5	40-0250	SPRING, EXT, 1/4" OD X 6"	2
6	48-4687	BLOCK, EXTENSION, SUREFIRE 8, 4" PIPE	3
7	67-5767	PAD, FULL SUPPORT, SUREFIRE 8, 4" SCH 5S (05-1620)	6
	67-5768	PAD, FULL SUPPORT, SUREFIRE 8, 4" SCH 10S (05-1621)	6

Parts List, Kit, SUREFIRE Pad, SUREFIRE 8 (P/N 05-1622 / 05-1623)

Item No.	Part No.	Description	Qty
1	32-0293	PIN, DOWEL, 3/16 DIA X 7/8”	12
2	33-0030	SCREW, CAP, 10-24 X 3/4”	6
3	33-0031	SCREW, CAP, 10-24 X 7/8”	3
4	34-0252	WASHER, NYLON, .370" OD X .192" ID	3
5	40-0250	SPRING, EXT, 1/4" OD X 6"	2
	48-4688	BLOCK, EXTENSION, SUREFIRE 8, 5" PIPE	3
	67-5769	PAD, FULL SUPPORT, SUREFIRE 8, 5" SCH 5S (05-1622)	6
	67-5770	PAD, FULL SUPPORT, SUREFIRE 8, 5" SCH 10S (05-1623)	6

Parts List, Kit, SUREFIRE Pad, SUREFIRE 8 (P/N 05-1624 / 05-1625)

Item No.	Part No.	Description	Qty
1	32-0293	PIN, DOWEL, 3/16 DIA X 7/8”	12
2	33-0030	SCREW, CAP, 10-24 X 3/4”	6
3	33-0032	SCREW, CAP, 10-24 X 1”	3
4	34-0252	WASHER, NYLON, .370" OD X .192" ID	3
5	40-0250	SPRING, EXT, 1/4" OD X 6"	2
6	48-4689	BLOCK, EXTENSION, SUREFIRE 8, 6" PIPE	3
7	67-5771	PAD, FULL SUPPORT, SUREFIRE 8, 6" SCH 5S (05-1624)	6
	67-5772	PAD, FULL SUPPORT, SUREFIRE 8, 6" SCH 10S (05-2625)	6

Parts List, Kit, SUREFIRE Pad, SUREFIRE 8 (P/N 05-1626 / 05-1627)

Item No.	Part No.	Description	Qty
1	32-0293	PIN, DOWEL, 3/16 DIA X 7/8”	12
2	33-0030	SCREW, CAP, 10-24 X 3/4”	6
3	33-0034	SCREW, CAP, 10-24 X 1-1/2”	3
4	34-0252	WASHER, NYLON, .370" OD X .192” ID	3
5	40-0250	SPRING, EXT, 1/4" OD X 6"	2
6	48-4690	BLOCK, EXTENSION, SUREFIRE 8, 8" PIPE	3
7	67-5773	PAD, FULL SUPPORT, SUREFIRE 8, 8" SCH 5S (05-1626)	6
	67-5774	PAD, FULL SUPPORT, SUREFIRE 8, 8" SCH 10S (05-1627)	6

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 defate 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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