

# OPERATION MANUAL

92-2078 Rev. 250430  
Model SUREFIRE 1.5

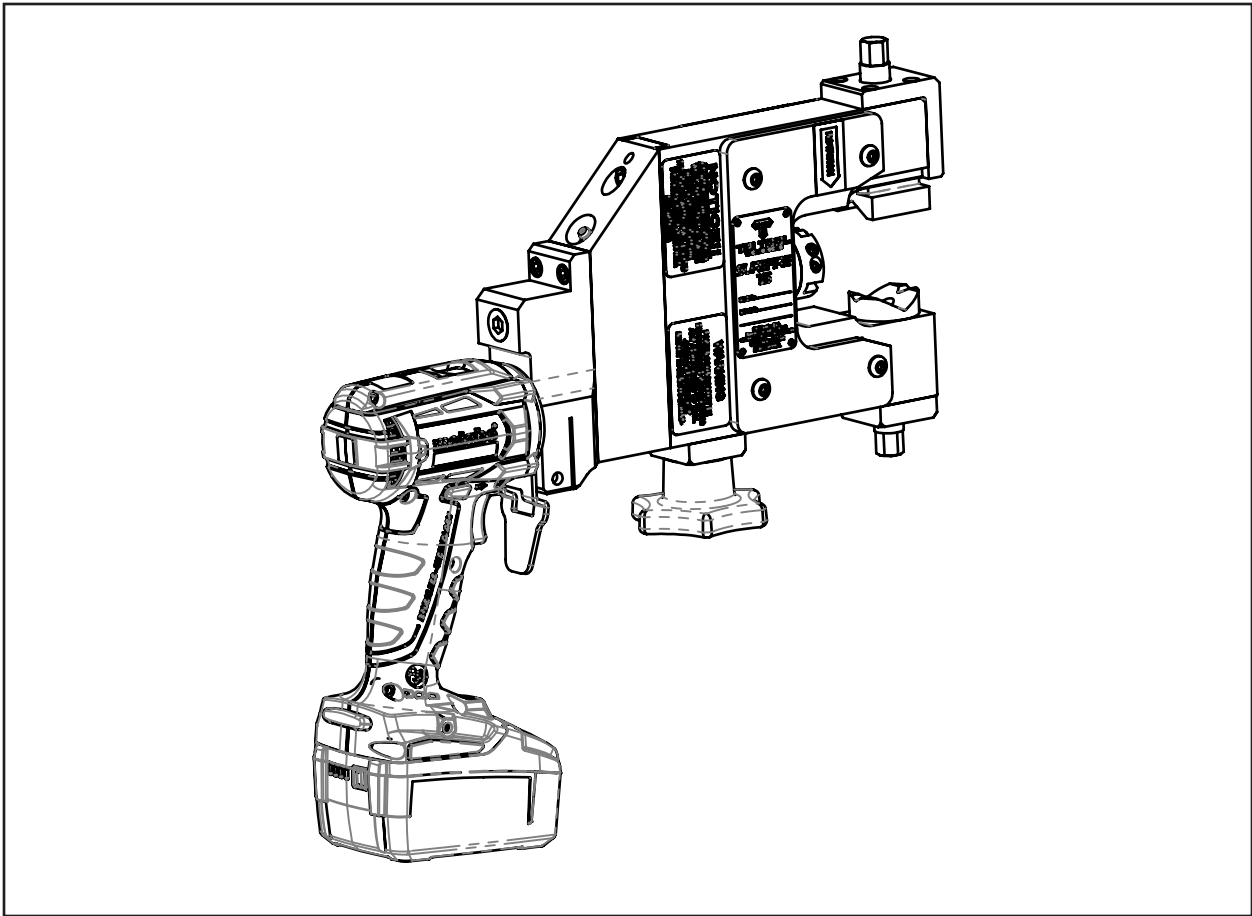


## ABOUT TRI TOOL TECHNOLOGIES

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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](http://tritool.com) or contact our engineers at +1 (916) 288-6100.



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## 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 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 upon Buyer's request. Buyer is responsible for all shipping charges to and from Seller.



# 1. ABOUT THE MANUAL

## Copyright

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

## 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 1.5 is a Pipe Beveler designed for facing and/or beveling the ends of the pipe or tubing in preparation for welding.

These machining operations may be performed either simultaneously or separately.

Pipe weld end preparations that meet all existing conventional codes (including the more stringent nuclear codes) may be machined using the SUREFIRE 1.5.

The Adjustable Saddle Assembly will secure the SUREFIRE 1.5 Pipe Beveler to pipe and tube having an outside diameter of .250" to 2.000" (6.4 mm to 50.8 mm).

There are two sizes of Adjustable Saddles:

- The Small Adjustable Saddle covers a range of .250" to .600" (6.4mm to 15.2 mm) diameter (P/N 26-1401).
- The Large Adjustable Saddle covers a range of .600" to 2.000" (15.2 mm to 50.8 mm) diameter (P/N 26-1376).

There are two sizes of Heads:

- The 1.45" DIA. Head Kit
- The 2.00" DIA. Head Kit

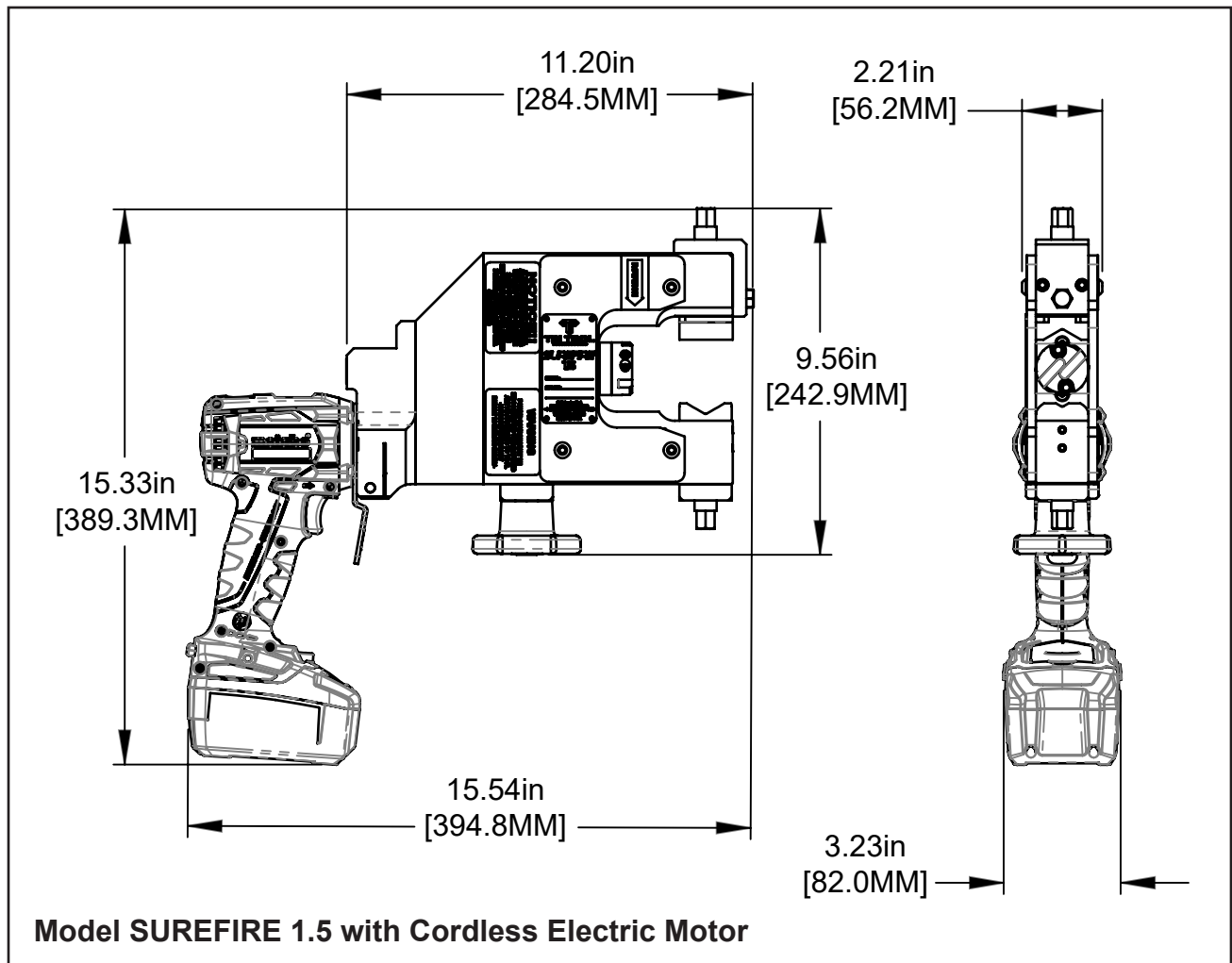
The SUREFIRE 1.5 accepts the reaction torque generated by the machining operations through the Saddles.

No additional restraining devices are required.

## 4. SPECIFICATIONS

### Model SUREFIRE 1.5 with Cordless Electric Motor

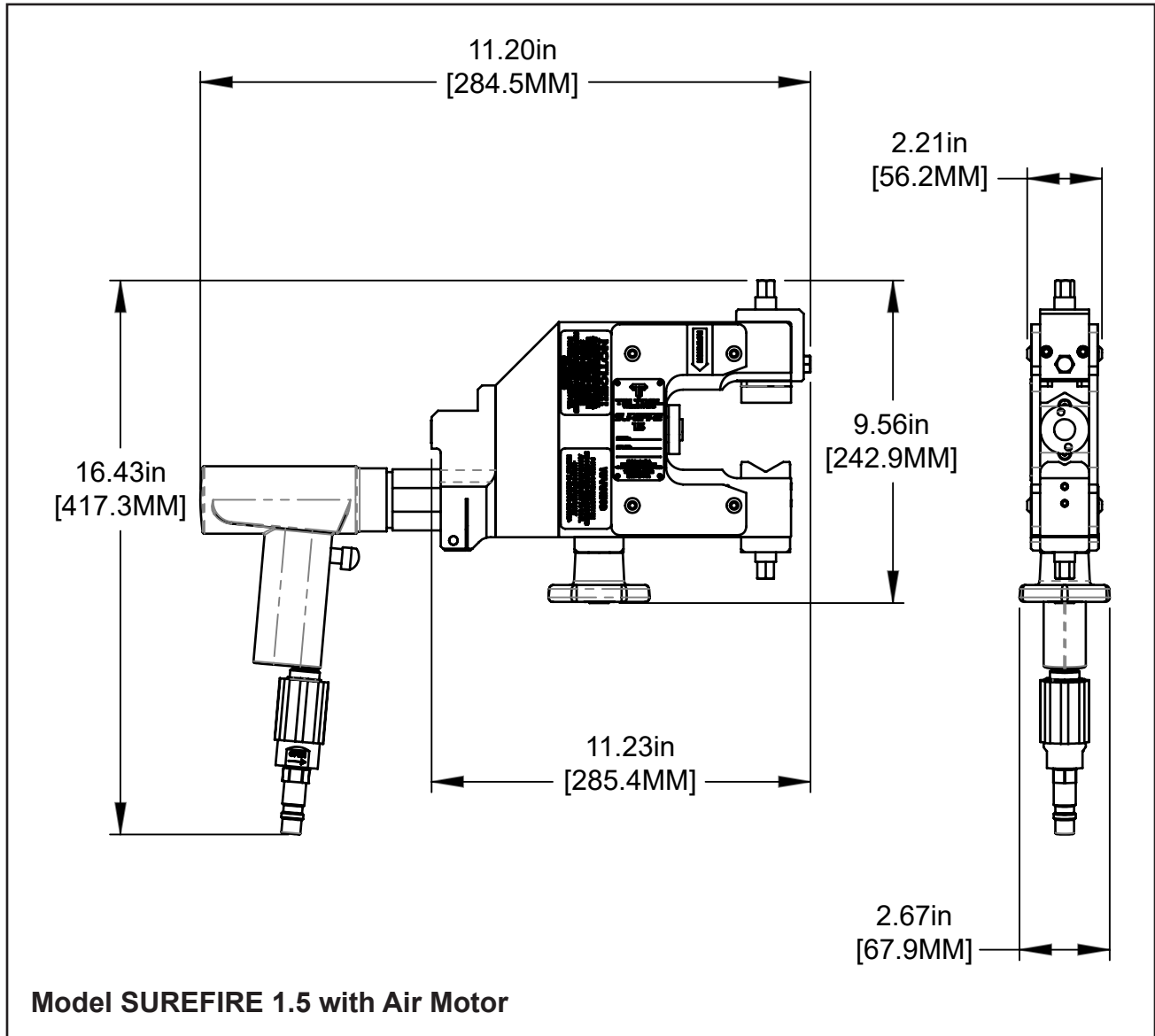
<b>Weight</b>	17.2 lbs. (7.8 kg)
<b>Power Requirements</b>	Metabo Li-Power battery (18V, 5.2Ah)



### Model SUREFIRE 1.5 with Air Motor

**Weight** 15 lbs. (6.8 kg)

**Power Requirements** 32 cfm at 90 psi (15 L/s at 621 kPa)



## Pipe Cutting Capacities

### Basic Pipe Sizes

All schedules of 1/8" through 1-1/2" pipe.

### Basic Tube Sizes

Up to .400" (10.2mm) wall tubing with a maximum OD of 2.00" (50.8mm) may be beveled with standard procedures.

No mounting limitations on ID.

### Wall Thickness Capacity

Wall thickness of all standard pipe schedules (.400" [10.2mm]) in the range listed.

Contact Tri Tool Technologies for heavier wall procedures.

## Material Cutting Capabilities

Mild steels, chrome steels (Rc 35 maximum), stainless steel, copper-nickel and aluminum without limitations except size and wall thickness as specified in previous paragraph.

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.

## Cutting Head Speeds

### Cordless Electric Motor

Maximum Cutting Head Speed (Gear Selection 1)	223 RPM
Cutting Head Speed at Maximum HP	112 RPM
Functional Speed Range	47-220 RPM

### Air Motor

Maximum Cutting Head Speed	390 RPM
Functional Speed Range	45-375 RPM

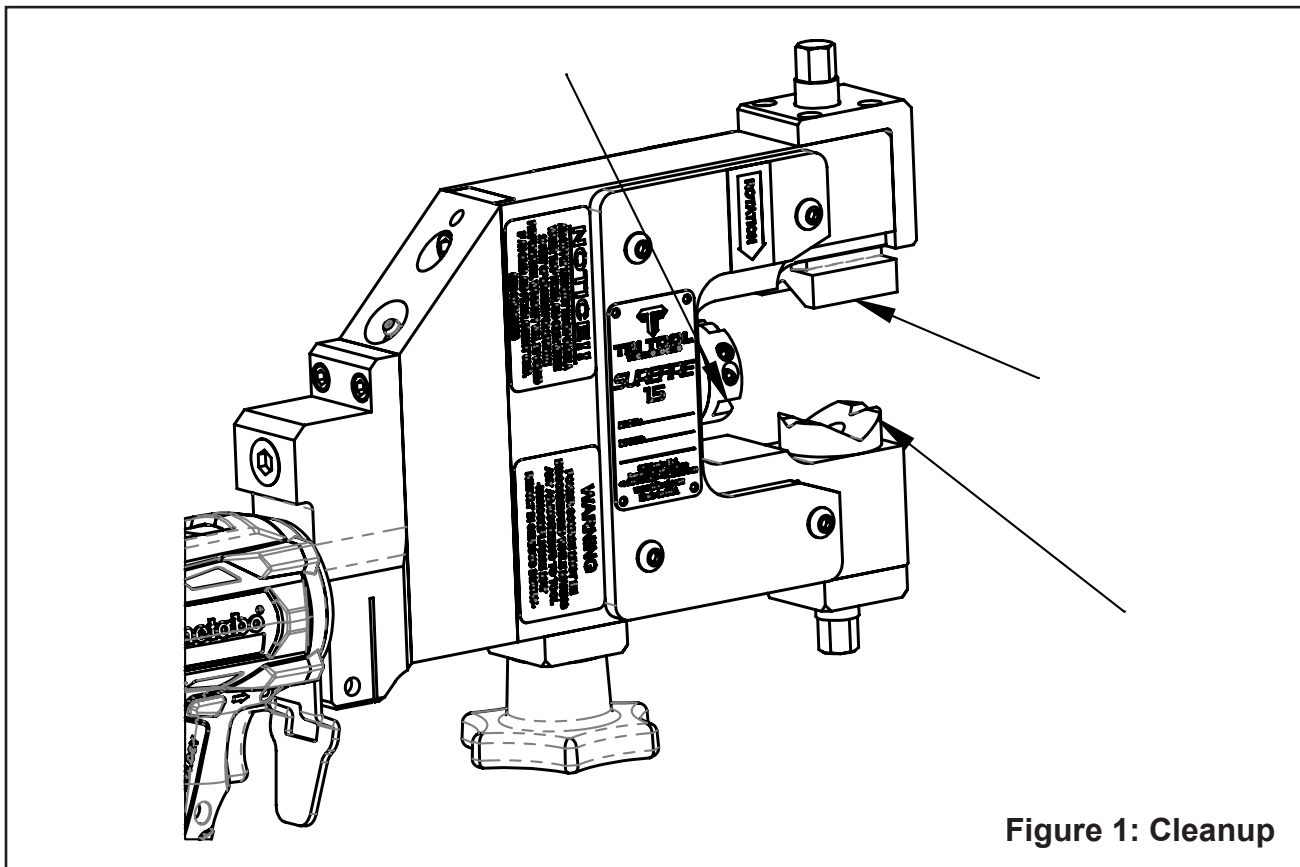
## 5. MAINTENANCE

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 oil as specified for the air motor.

Air supply for the Model SUREFIRE 1.5 with an Air Motor requires an adequate filter/regulator/lubricator (FRL) to be used.

A maximum of 90 PSI (621 kPa) line pressure is recommended.



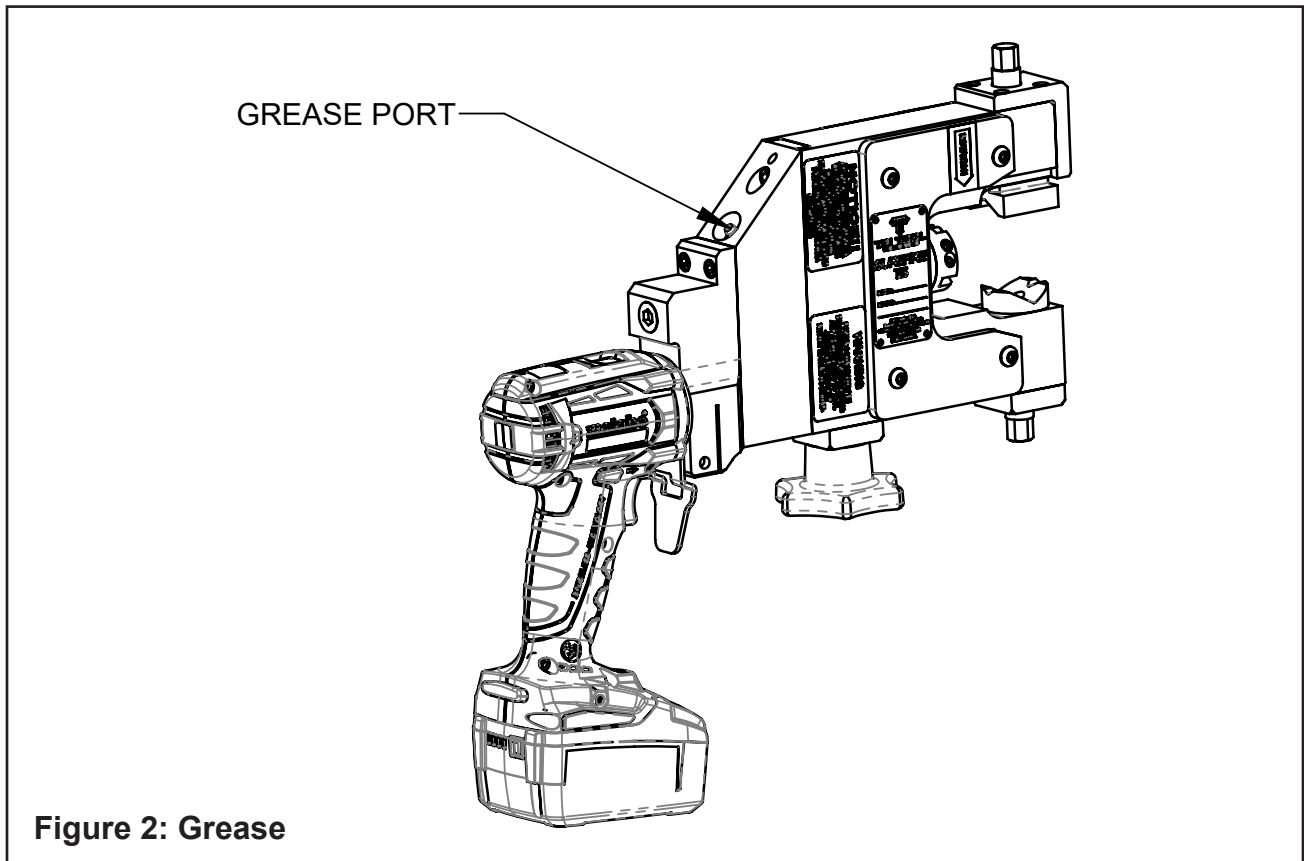
**NOTE: The air motor warranty is void if damage occurs from contaminated air or lack of lubrication.**

If the SUREFIRE 1.5 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.

**NOTE: 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 gearbox.

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



**Figure 2: Grease**

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

## Air Motor Lubrication

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 2 to 5 seconds is flowing.

If the SUREFIRE 1.5 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 2 to 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 (380° C) minimum aniline point of 200° F 93° C.

- Tri Tool Technologies – 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

The bearings in the Air Motor are sealed and do not require any lubrication.

The Drive Gears require a high string utility grease.

## 6. OPERATION

Read the operating instructions carefully before attempting to operate the Model SUREFIRE 1.5.



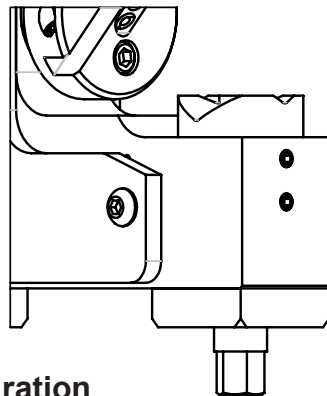
**CAUTION:** Use eye protection at all times when operating the Model SUREFIRE 1.5.



**WARNING:** Keep battery removed/air line disconnected from machine until ready to cut.

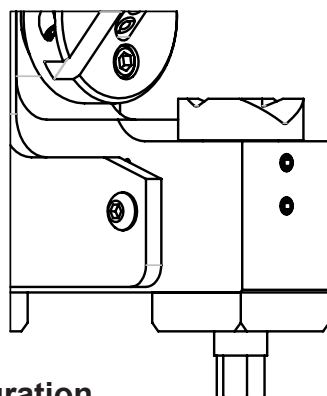
### Adjusting the Saddle Kit to the Required Pipe/Tube Size

1. The Clamping Saddle has two positions depending on pipe/tube size.
  - *Small Clamping Saddle position for .250"-.600" pipe/tube*



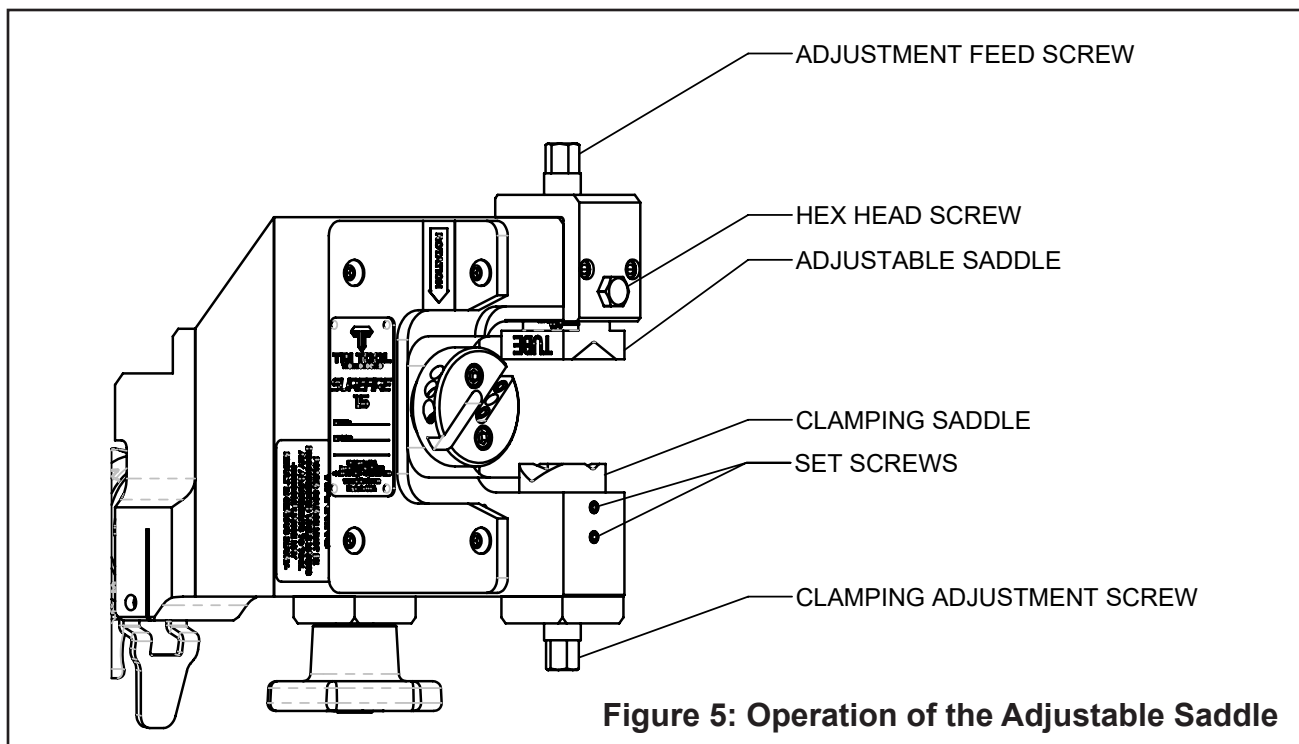
**Figure 3: Small Pipe Configuration**

- *Large Clamping Saddle position for .600"-2.000" pipe/tube*



**Figure 4: Large Pipe Configuration**

2. Loosen the set screws on the front of the SUREFIRE 1.5.
3. Rotate the Clamping saddle into position based on pipe/tube size.
4. Retract the Clamping Saddle completely by turning the Clamping Adjustment Screw.
5. Loosen the Hex Head Screw on the front of the SUREFIRE 1.5.
6. Insert Adjustable Saddle and turn the Adjustment Feed Screw to engage the Saddle.
7. Raise or lower the Adjustable Saddle so that the pipe/tube size appropriate marking is even with the seat of the Main Housing.
8. Tighten the Hex Head Screw on the front of the SUREFIRE 1.5 once the desired size has been selected.

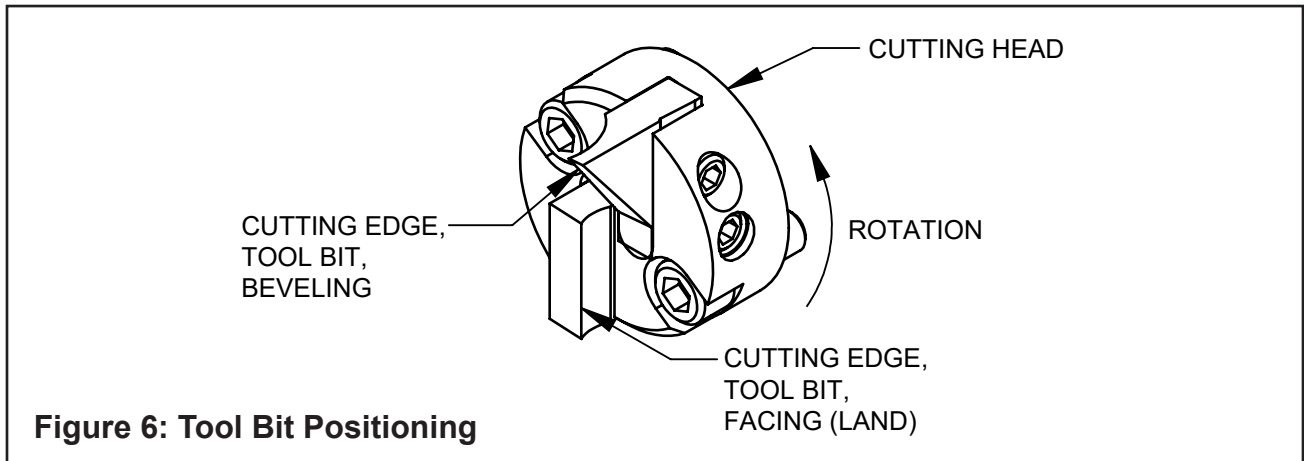


## Installing the Tool Bit

1. Retract the Cutting Head by rotating the Feed Knob.
2. Select the Tool Bit(s) required to machine the pipe to the configuration desired (refer to the TOOL BITS section for the Tool Bit selection chart).



**WARNING:** 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 voids the Tri Tool Technologies factory warranty.



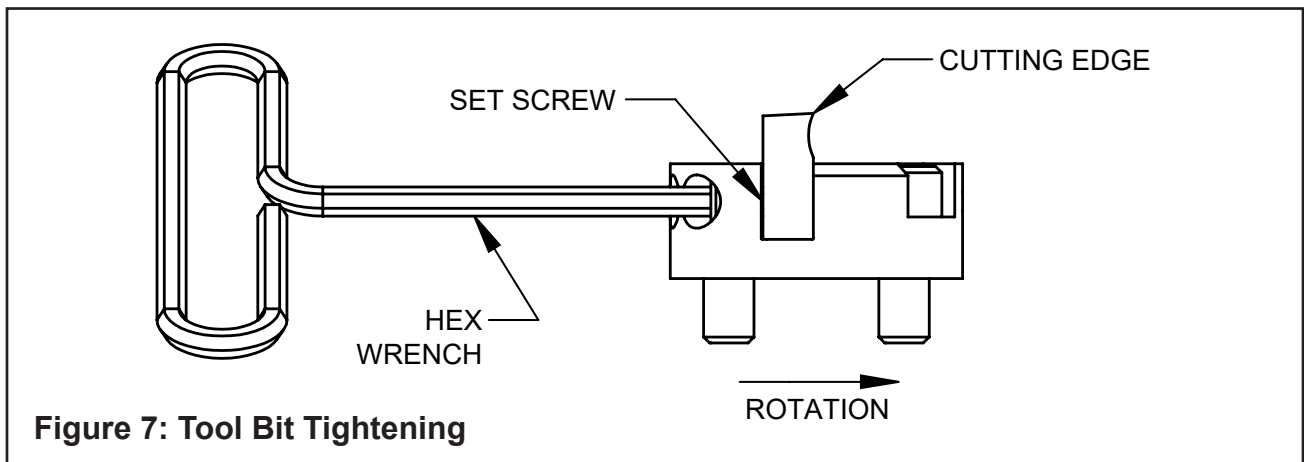
**Figure 6: Tool Bit Positioning**

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



**CAUTION:** The cutting edge of the Tool Bit(s) must be located on the radial centerline. Make sure that there are not any Tool Bits installed backwards.

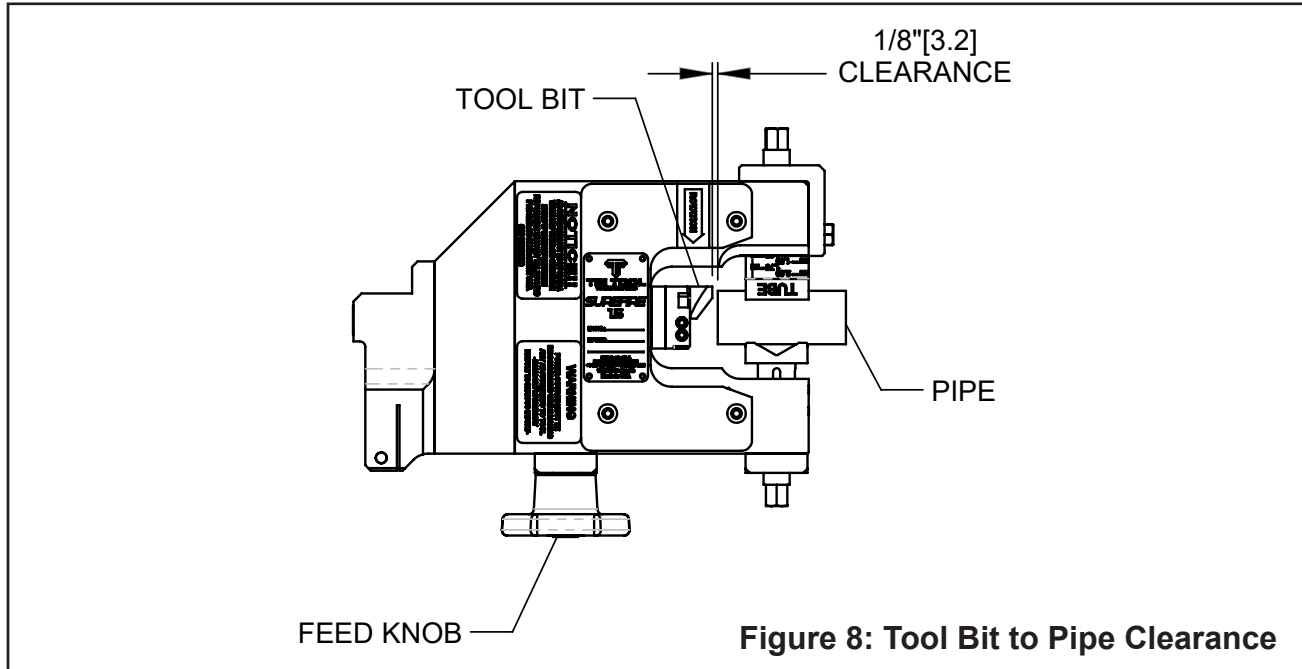
4. Make sure that there is a clearance between the Tool Bit(s) and the Saddles.
5. Tighten the Set Screws to secure the Tool Bit(s) to the Cutting Head.



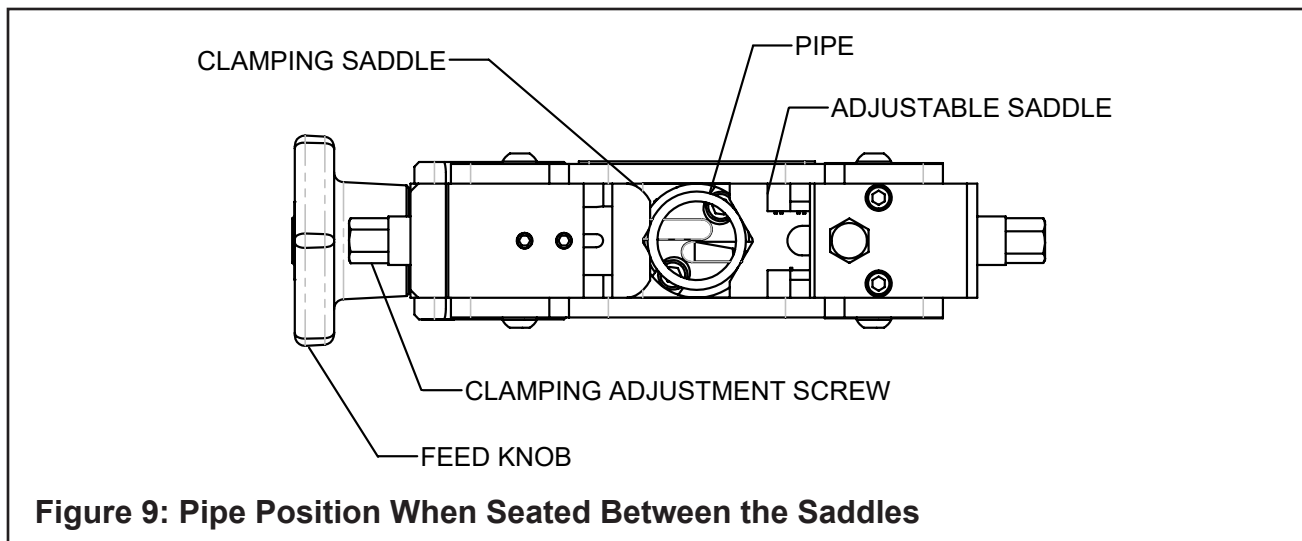
**Figure 7: Tool Bit Tightening**

## Installing the Pipe/Tube

1. The pipe/tube to be end-prepped may now be set into the Adjustable Saddle.
2. Verify a clearance of 1/8" (3.2mm) minimum between the Tool Bit and the pipe/tube face.



3. Turn the Clamping Adjustment Screw to lower the Clamping Saddle until the pipe/tube is clamped securely between the Adjustable Saddle and the Clamping Saddle.



4. Tighten the set screws on the front of the Surefire 1.5

## Making the Cut

1. Energize the system:
  - DC: Install the battery.
  - Air: Attach the proper air supply line to the SUREFIRE 1.5.

**NOTE: Check that the Filter/Regulator/Lubricator (FRL) is installed and set properly.**

2. Depress the Motor Trigger.
3. Adjust the cutting speed:
  - DC: Varying the amount of trigger pull
  - Air: Rotating the Flow Valve at the air connection (refer to the CUTTING SPEEDS AND FEEDS section for recommended cutting speeds).
4. Rotate the Feed Knob clockwise to bring the Tool Bit(s) and pipe/tube closer together.



**CAUTION: The actual machining operation will begin when the first Tool Bit contacts the pipe.**

5. 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.
6. To avoid Tool Bit damage, the feed rate should be very slow until the Tool Bit(s) is in contact with the pipe continually during at least one full revolution.
7. Continue rotating the Feed Knob clockwise until the end of the pipe is completely machined.
8. Discontinue feed and allow the Head to rotate one (1) to three (3) revolutions to improve finish of the prep surface.
9. Release the Motor Trigger to stop the Head rotation.
10. Rotate the Feed Knob counterclockwise to separate the Tool Bit(s) from the pipe.
11. Loosen the Saddle Clamping Screw on the Clamping Saddle to release the pipe or tube from the SUREFIRE 1.5.
12. If the next bevel is to be identical to the previous bevel, follow the sequence under *“Installing the Pipe/Tube.”*
13. If the next bevel is to be different than the previous bevel, then follow the sequence under *“Adjusting the Saddle Kit to the Required Pipe/Tube Size.”*

## 7. CUTTING SPEEDS AND FEEDS

The chart shows RPM required to obtain specified Tool Bit surface cutting speed at the surface of the pipe or tube.

### Cutting Speeds

Nominal Pipe Size	True Diameter		RPM for 200 in/min (508 cm/min)	RPM for 250 in/min (635 cm/min)
	.250"	6.4mm	255	318
	.375"	9.5mm	170	212
1/8"	.405"	10.3mm	157	196
	.500"	12.7mm	127	159
1/4"	.540"	13.7mm	118	147
3/8"	.675"	17.2mm	94	118
	.750"	19.1mm	85	106
1/2"	.840"	21.3mm	76	95
	1.000"	25.4mm	64	80
3/4"	1.050"	26.7mm	61	76
	1.250"	31.8mm	51	64
1"	1.315"	33.4mm	48	61
	1.500"	38.1mm	42	53
1 1/4"	1.660"	42.2mm	38	48
	1.750"	44.5mm	36	45
1 1/2"	1.900"	48.3mm	34	42

Use 200 surface inches per minute (508 surface centimeters per minute) for:

- Stainless steels in general when no coolant is allowed, all heavy-wall tube and some of the chrome/molybdenum steels.

Use 250 surface inches per minute (635 surface centimeters per minute) for:

- Mild steels and some thin wall stainless steels when coolants are permitted and applied.

## Basic Feed Recommendations

Each turn of the Feed Knob is .018" of feed.

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" to .006" (.08mm to .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 a heavy enough feed to stay under the work hardened surface (.003" to .006" (.08mm to .15mm) feed). Never allow the Tool Bit to burnish the surface.

Reduced feed and speeds will normally minimize chatter problems.

## 8. TOOL BITS

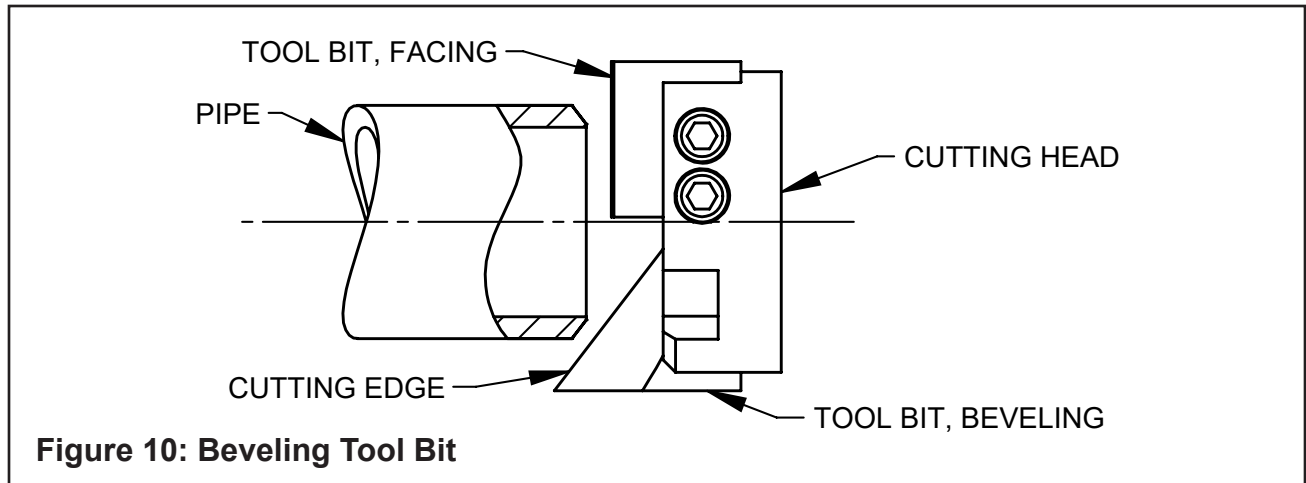


Figure 10: Beveling Tool Bit

### 37.5° Beveling Tool Bits

For Beveling and Facing with the 1.45" DIA Cutting Head  
(.355" [9.02mm] Maximum Wall)

Range	Pipe or Tube Material	37.5° Beveling Tool Bit P/N	Facing Tool Bit P/N
.125" - .375" ID (3.2mm - 9.5mm ID)	Low Carbon	99-4032	99-4000
	Stainless	99-4036	99-4040
.375" - .638" ID (9.5mm - 16.2mm ID)	Low Carbon	99-4033	99-4000
	Stainless	99-4037	99-4040
.630" - .880" ID (16.0mm - 22.4mm ID)	Low Carbon	99-4034	99-4000
	Stainless	99-4038	99-4040
.800" - 1.050" ID (20.3mm - 26.7mm ID)	Low Carbon	99-4035	99-4000
	Stainless	99-4039	99-4040
.900" - 1.150" ID (22.9mm - 29.2mm ID)	Low Carbon	99-4132	99-4000
	Stainless	99-4133	99-4040
1.150" - 1.400" ID (29.2mm - 35.6mm ID)	Low Carbon	99-0944	99-4000
	Stainless	99-3574	99-4040

Note: Cobalt High Heat Tool Bits are available

## 37.5° Beveling Tool Bits

For Beveling and Facing with the 2.00" DIA Cutting Head  
(.355" [9.02mm] Maximum Wall)

Range	Pipe or Tube Material	37.5° Beveling Tool Bit P/N	Facing Tool Bit P/N
.125" - .928" ID (3.2mm - 23.6mm ID)	Low Carbon	99-4032	99-4000
	Stainless	99-4036	99-4040
.664" - 1.470" ID (16.8mm - 37.3mm ID)	Low Carbon	99-4034	99-4000
	Stainless	99-4038	99-4040
.900" - 1.550" ID (22.9mm - 39.4mm ID)	Low Carbon	99-4132	99-4000
	Stainless	99-4133	99-4040
1.220" - 1.875" ID (31.1mm - 47.6mm ID)	Low Carbon	99-4132	99-0170
	Stainless	99-4133	99-1963

*Note: Cobalt High Heat Tool Bits are available*

## 37.5° Beveling Tool Bits

For Beveling Only with the 1.45" or 2.00" DIA Cutting Head  
(.355" [9.02mm] Maximum Wall)

Range	Pipe or Tube Material	37.5° Beveling Tool Bit P/N	Facing Tool Bit P/N
.125" ID - 1.250" OD (3.2mm ID - 31.8mm OD)	Low Carbon	99-4032	99-4000
	Stainless	99-4036	99-4040
.800" ID - 1.500" OD (20.3mm ID - 38.1mm OD)	Low Carbon	99-4034	99-4000
	Stainless	99-4038	99-4040
.125" ID - 1.800" OD (3.2mm ID - 45.7mm OD)	Low Carbon	99-4132	99-4000
	Stainless	99-4133	99-4040
.800" ID - 2.000" OD (20.3mm ID - 50.8mm OD)	Low Carbon	99-4132	99-0170
	Stainless	99-4133	99-1963

*Note: Cobalt High Heat Tool Bits are available*

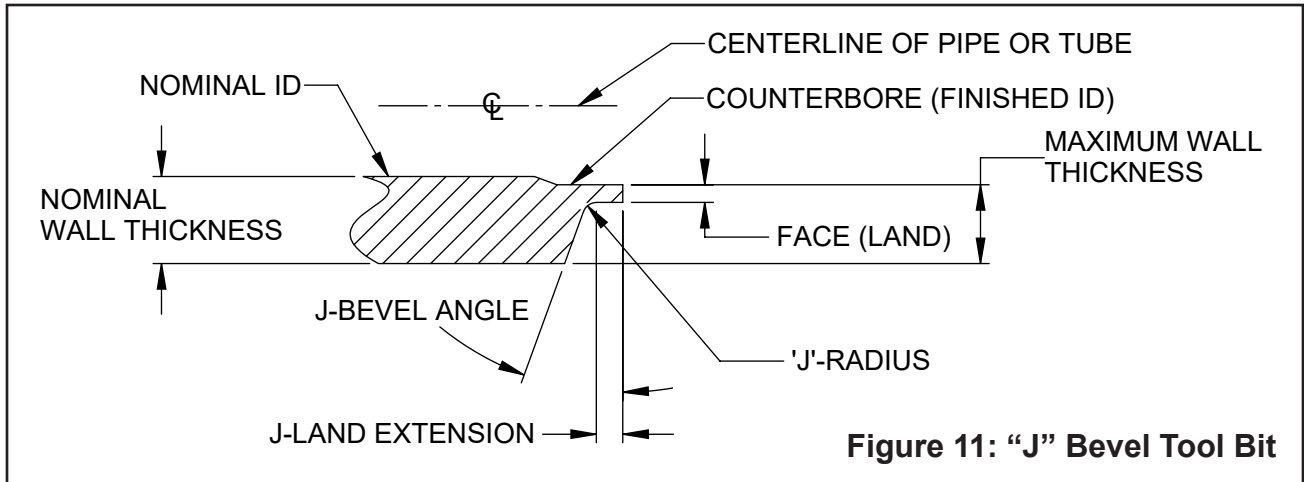


Figure 11: "J" Bevel Tool Bit

### "J" Bevel Tool Bits

Bevel Angle	"J" Radius	Land Extension	Pipe or Tube Material (4)	Maximum Wall Thickness (3/5)	Range "J" Bevel and Face (7)	"J" Bevel Tool Bit P/N	Facing Tool Bit P/N	Facing Tool Bit Height
22°	0.188"	N/A	SS	.400"	.360" ID thru 1.049" ID	99-11524	99-4040	.625"
22.5°	0.062"	0.062	CS	.400"	.360" ID thru .980" ID	99-6901	99-6908	.643"
22.5°	0.062"	0.080	CS	.400"	.360" ID thru .980" ID	99-6901	99-4040	.625"
22.5°	0.062"	0.062	Inconel	.400"	.360" ID thru .980" ID	99-9847	99-6908	.643"
22.5°	0.062"	0.080	Inconel	.400"	.360" ID thru .980" ID	99-9847	99-4040 99-8158*	.625"

\* M42

NL No Listing

- 1 Separate Operation
- 2 Copper/Nickel
- 3 Maximum wall dimension = maximum Tool Bit cut after Counterbore - not the overall pipe/tube wall dimension (see illustration)
- 4 High chrome/nickel alloys may require special cutting procedures/Tool Bit geometry. Contact Tri Tool Technologies Engineering Dept. for all special alloy cutting.
- 5 Heavy wall cutting may require a separate step cutting Tool Bit - Contact Tri Tool Engineering Dept. for all heavy wall applications.
- 6 Tool Bits designated CS, SS work best on CS; Tool Bits designated SS work best on SS and "soft" SS i.e. 316L.
- 7 Range based on Ø2.00 head.

## 9. TROUBLESHOOTING

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### **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.

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**Problem: Electric Motor Does Not Start**

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

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**Problem: 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: Air Motor Does 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.  
Sand or other foreign material may be in the vanes of the air 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.

## 10. ACCESSORIES

The following accessories are recommended for use with the Model SUREFIRE 1.5 and are available from Tri Tool Technologies.

- Portable Air Filter Caddy (P/N 75-0341)

**NOTE: A Filter/Regulator/Lubricator (FRL) is required to protect the warranty on all Tri Tool Technologies air-driven tools.**

- Tool Bits (Refer to TOOL BITS Section)

## 11. ILLUSTRATED PARTS BREAKDOWN

### MODEL SUREFIRE 1.5

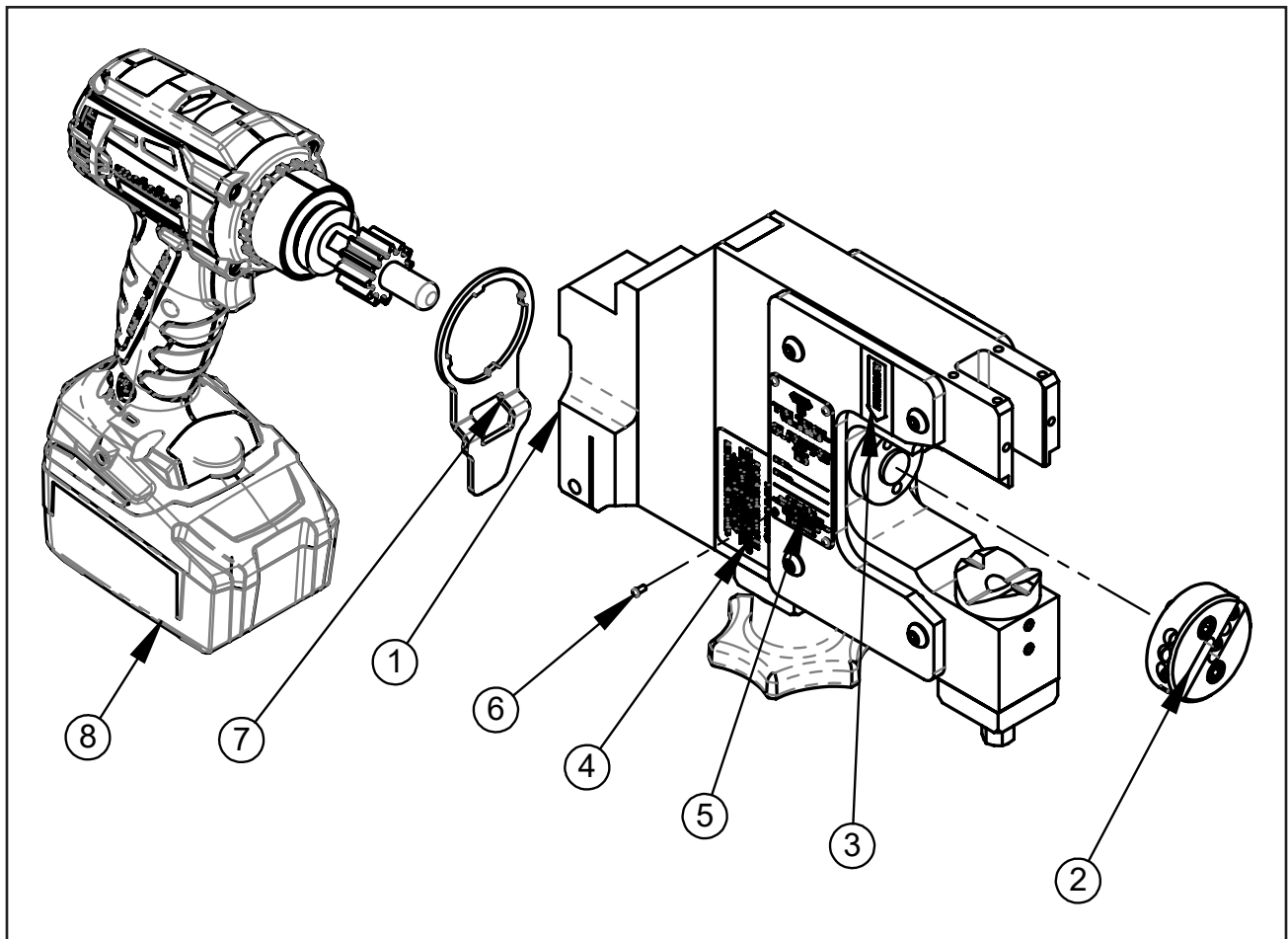
MODEL SUREFIRE 1.5 DC, 115V (P/N 01-2671)

MODEL SUREFIRE 1.5 DC, 230V TYPE C (P/N 01-2672C)

MODEL SUREFIRE 1.5 DC, 230V TYPE G (P/N 01-2672G)

MODEL SUREFIRE 1.5 DC, JAPAN (P/N 01-2720)

MODEL SUREFIRE 1.5 AIR (P/N 01-2743)

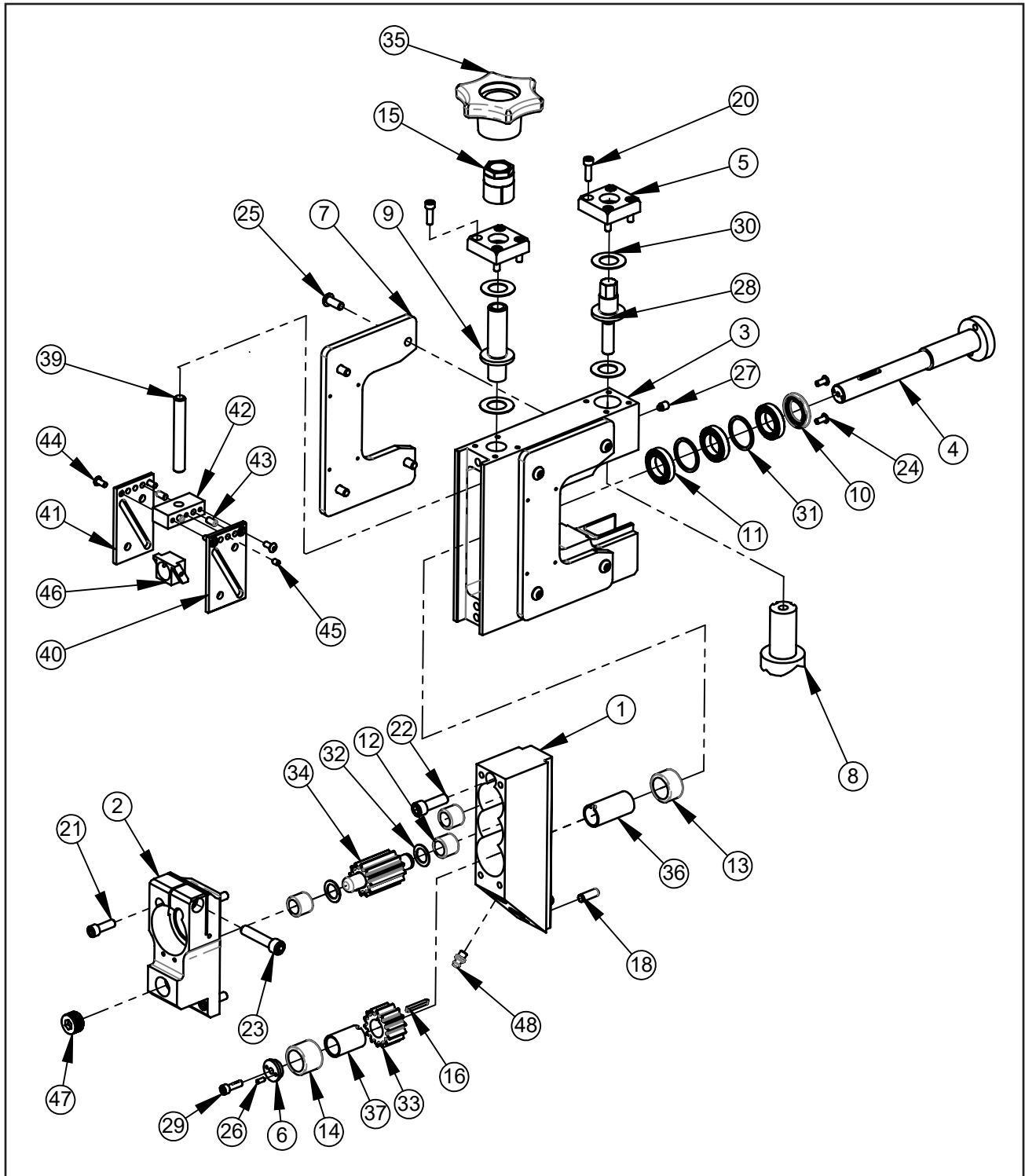


**Parts List, Model SUREFIRE 1.5**

- Model SUREFIRE 1.5 DC, 115V (P/N 01-2671)
- Model SUREFIRE 1.5 DC, 230V Type C (P/N 01-2672C)
- Model SUREFIRE 1.5 DC, 230V Type G (P/N 01-2672G)
- Model SUREFIRE 1.5 DC, Japan (P/N 01-2720)
- Model SUREFIRE 1.5 Air (P/N 01-2743)

Item No.	Part No.	Description	Qty
1	02-3275	MODEL SUREFIRE 1.5 SUB-ASSEMBLY	1
2	03-0038	HEAD KIT, 2.00" DIA, SUREFIRE 1.5	1
3	30-0105	LABEL, "ROTATION"	2
4	30-0508	LABEL, "WARNING, DISCONNECT"	1
5	30-7627	DATA PLATE, SUREFIRE 1.5	1
6	33-0995	SCREW, DRIVE, #2 X 3/16"	4
7	47-3038	GUARD, TRIGGER, METABO, CORDLESS	1
8	58-0439	MOTOR ASSEMBLY, CORDLESS, 18V, 115V	1
	57-0156	MOTOR ASSEMBLY, AIR (FOR 01-2743)	1
 <i>NOT SHOWN</i>			
	03-0037	HEAD KIT, 1.45" DIA, SUREFIRE 1.5	1
	05-0243	ADJUSTABLE SADDLE KIT, FULL RANGE	1
	05-1318	WRENCH KIT, SUREFIRE 1.5	1
	30-0962	LABEL, FRL (FOR 01-2743)	1
	30-6144	CHARGER, METABO, 18V, 230VAC TYPE C (FOR 01-2672)	1
	30-7570	CHARGER, METABO, 18V, 230VAC TYPE G (FOR 01-2672G)	1
	30-7533	CHARGER, METABO, 18V, JAPAN (PSE) (FOR 01-2720)	1
	86-0170	CASE, SUREFIRE 1.5, AIR (FOR 01-2743)	1
	86-0442	CASE, SUREFIRE 1.5, DC (FOR DC MODELS)	1

# MODEL SUREFIRE 1.5 SUB-ASSEMBLY (P/N 02-3275)



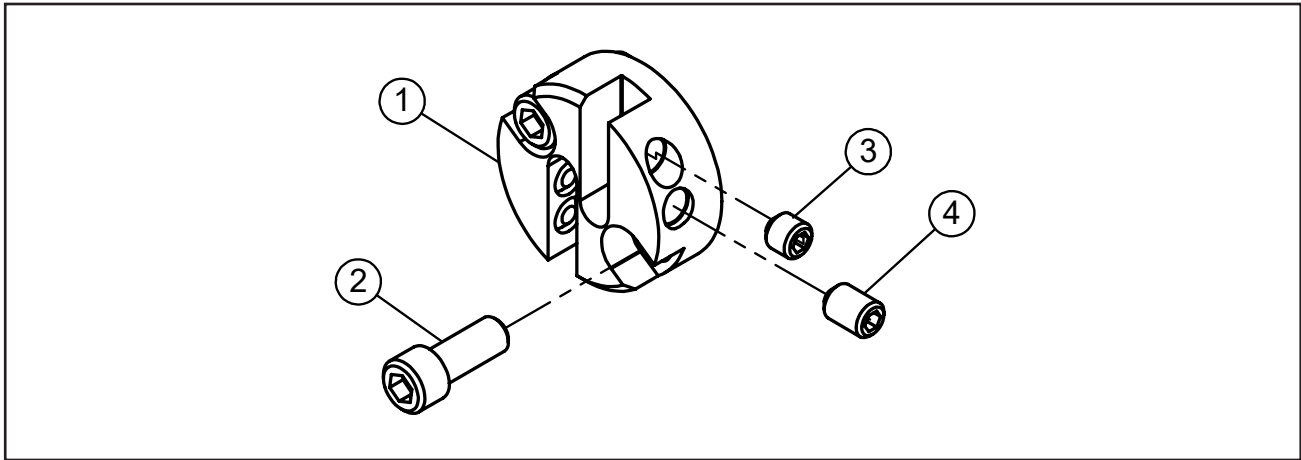
## Parts List, Model SUREFIRE 1.5 Sub-Assembly (P/N 02-3275)

Item No.	Part No.	Description	Qty
1	19-0521	HOUSING, DRIVE	1
2	19-0522	HOUSING CLAMP	1
3	19-0690	HOUSING, MAIN	1
4	20-0441	SHAFT, DRIVE	1
5	24-0996	PLATE, RETAINING	2
6	24-1024	PLATE, END	1
7	24-5432	PLATE, STIFFENER, SUREFIRE 1.5	2
8	26-1099	SADDLE, ADJUSTABLE	1
9	27-0362	FEED ADAPTER	1
10	28-0218	SEAL, GREASE	1
11	29-0080	BEARING, BALL	3
12	29-0255	BRG, RLLR, 1/2" X 11/16" X 9/16"	3
13	29-0256	BRG, RLLR, 3/4" X 1" X 9/16"	1
14	29-0257	BRG, RLLR, 3/4" X 1" X 3/4"	1
15	30-1790	BUSHING, KEYLESS	1
16	31-0115	KEY, 1/8" SQ X 15/16", BOTH ENDS ROUND	1
18	32-0140	DOWEL PIN (DIA .250" X .75")	1
20	33-0029	SCREW, CAP (#10-24 X .63")	8
21	33-0040	SCREW, CAP, 1/4-20 X 3/4"	4
22	33-0056	SCREW, CAP, 5/16-18 X 1"	2
23	33-0058	SCREW, CAP, 5/16-18 X 1-1/2"	1
24	33-0273	SCREW, BUTTON, #8-32 X 3/8"	2
25	33-0286	SCREW, BUTTON HEAD (1/4-20 x .63")	8
26	33-0459	SCREW, SET, #5-40 X 5/16", CUP PT	2
27	33-0928	SCREW, SET, HALF DOG (1/4-20 x .50")	2
28	33-1654	SCREW, FEED, LH	1
29	33-2017	SCREW, CAP, 10-32 X 5/8", SELF-LOCK	1
30	34-0192	WASHER, THRUST, 5/8" X 1-1/8" X 1/32"	4
31	34-0245	WASHER, FLAT	2
32	34-0247	WASHER, THRUST	2
33	39-0575	GEAR, DRIVE, 14T	1
34	39-0576	GEAR, IDLER, 12T	1
35	42-0123	KNOB, FEED	1
36	45-0176	BUSHING, .625" X .750" X 1.582" LG	1
37	45-0177	BUSHING, .625" X .750" X 1.150" LG	1

Parts List, Model SUREFIRE 1.5 Sub-Assembly (P/N 02-3275) *continued*

<b>Item No.</b>	<b>Part No.</b>	<b>Description</b>	<b>Qty</b>
38	48-0634	YOKE ASSEMBLY, FEED	
39	23-0235	ROD, FEED 3/8-16 X 2-3/4"	1
40	24-0991	PLATE, FEED, R.H.	1
41	24-0992	PLATE, FEED, L.H.	1
42	24-0994	PLATE, SPACER	1
43	32-0200	PIN, DOWEL, 3/16" DIA X 3/8"	4
44	33-0273	SCREW, BUTTON, #8-32 X 3/8"	4
45	33-0478	SCREW, SET, 8-32 X 1/4", CUP PT	1
46	48-0633	YOKE, FEED	1
47	54-0304	PLUG, 3/8" MP	1
48	54-0375	FITTING, GREASE	1

### CUTTING HEAD KITS (P/N 03-003X)



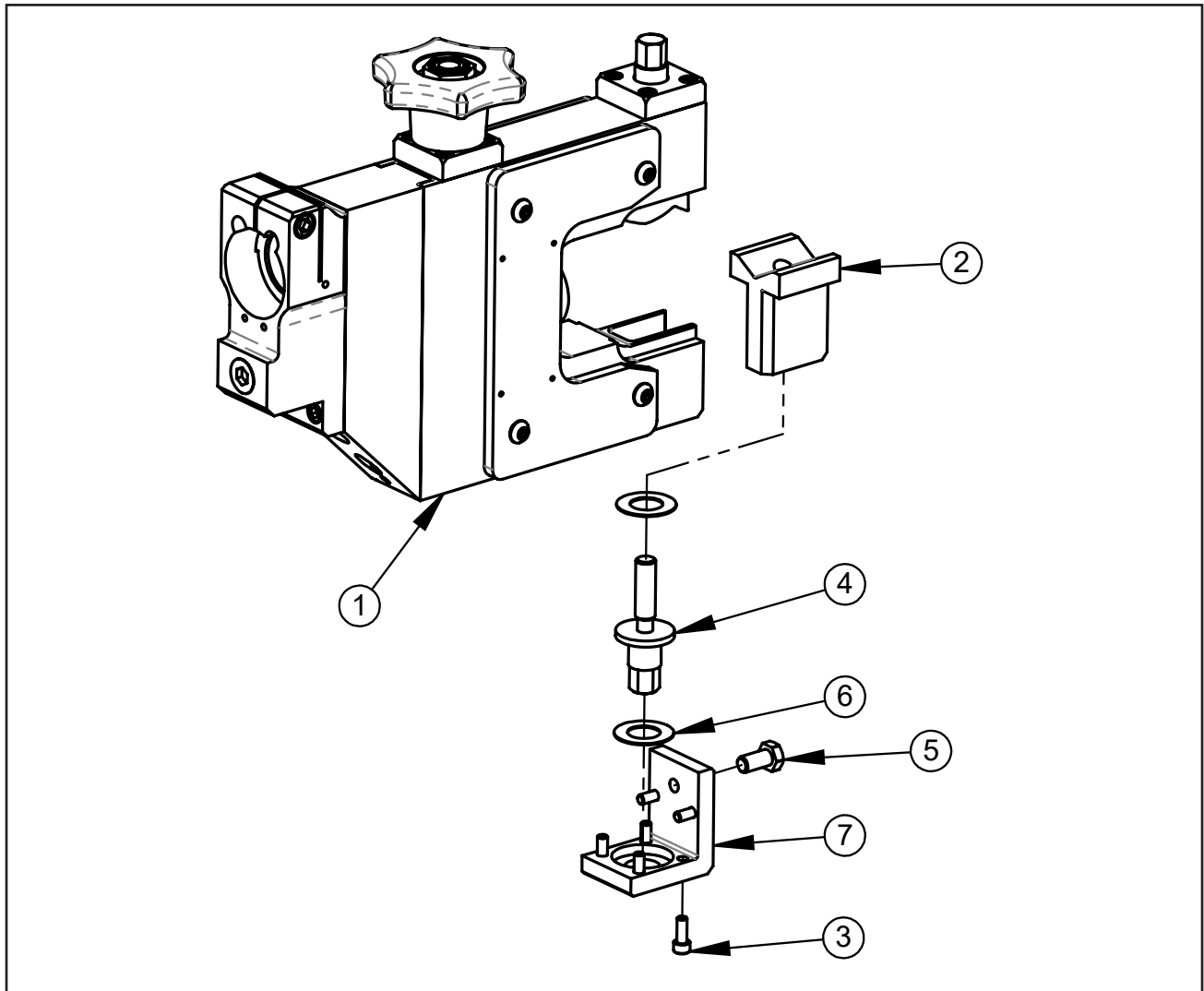
Parts List, Cutting Head Kit, 1.45" DIA (P/N 03-0037)

Item No.	Part No.	Description	Qty
1	21-0325	HEAD, 1.45" DIA	1
2	33-0039	SCREW, CAP, 1/4-20 X 5/8	2
3	33-0499	SCREW, SET, 1/4-20 X 1/4, CUP PT	2
4	33-0501	SCREW, SET, 1/4-20 X 3/8 , CUP PT	2

Parts List, Cutting Head Kit, 2.00" DIA (P/N 03-0038)

Item No.	Part No.	Description	Qty
1	21-0326	HEAD, 2.00" DIA	1
2	33-0039	SCREW, CAP, 1/4-20 X 5/8	2
3	33-0499	SCREW, SET, 1/4-20 X 1/4, CUP PT	2
4	33-0503	SCREW, SET, 1/4-20 X 1/2 , CUP PT	4

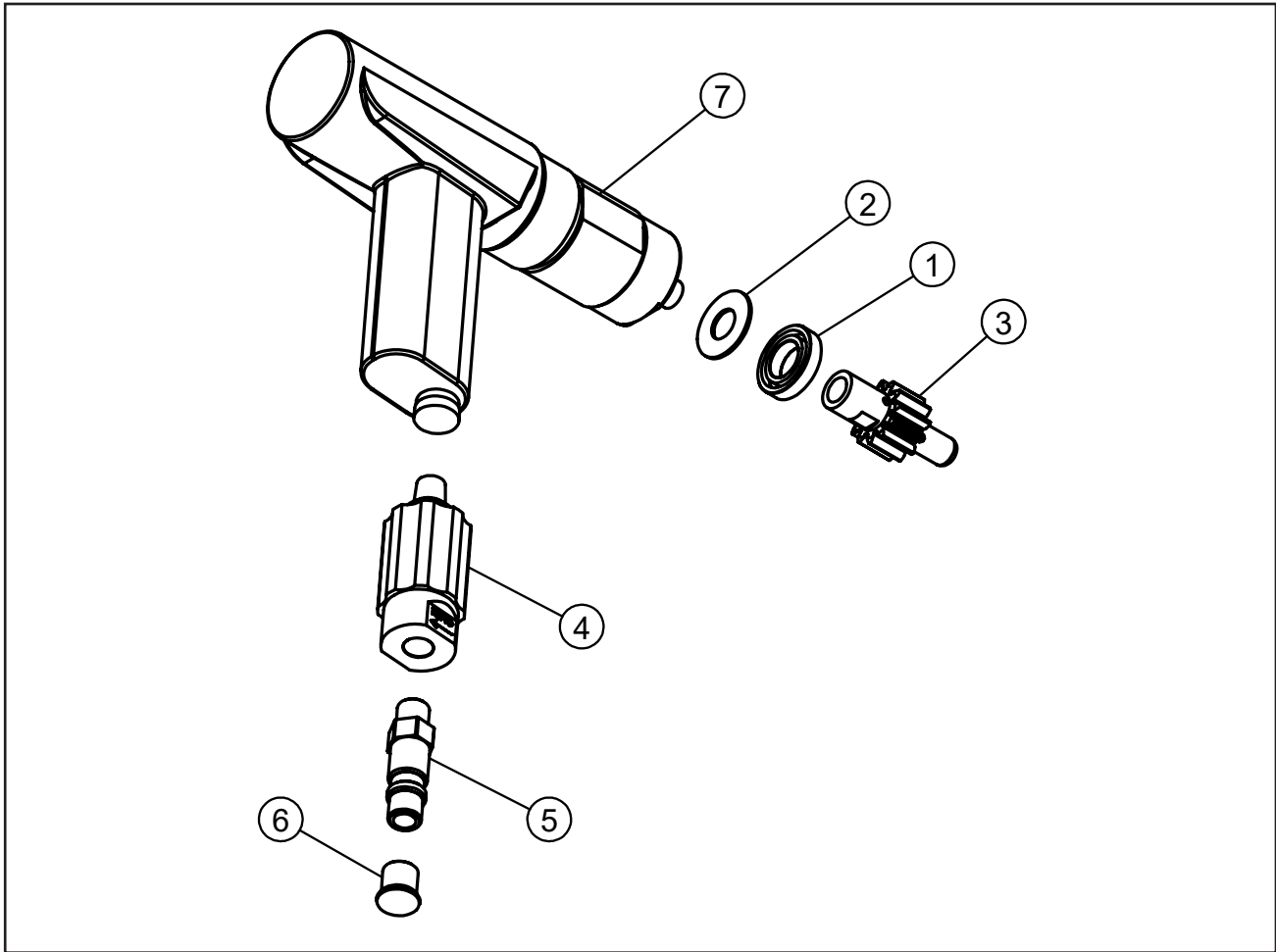
## ADJUSTABLE SADDLE KIT, FULL RANGE (P/N 05-0243)



Parts List, Saddle Kit, Adjustable, Full Range (P/N 05-0243)

Item No.	Part No.	Description	Qty
1	19-0690	HOUSING, MAIN	REF
2	26-1376	SADDLE, ADJUSTABLE, LARGE	1
	26-1401	SADDLE, ADJUSTABLE, SMALL	1
3	33-0028	SCREW, CAP, #10-24 X 1/2	6
4	33-1654	SCREW, FEED, LH	1
5	33-1951	SCREW, HEX HD CAP, 5/16-18 X 5/8	1
6	34-0192	WASHER, THRUST	2
7	47-0972	BRACKET, RETAINING	1

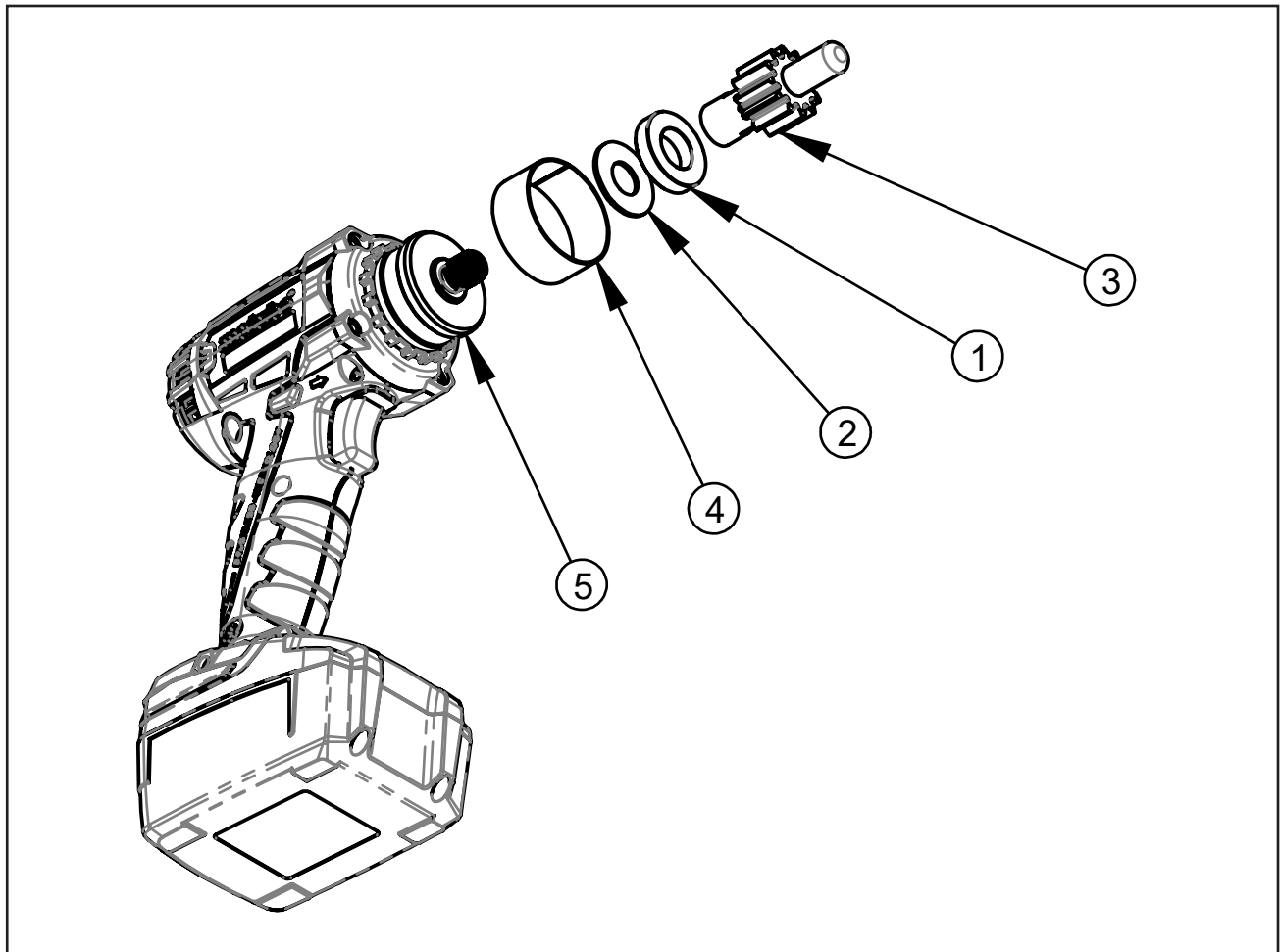
## MOTOR ASSEMBLY, AIR (P/N 57-0156)



Parts List, Motor Assembly, Air (P/N 57-0156)

Item No.	Part No.	Description	Qty
1	28-0219	SEAL, GREASE	1
2	34-0246	WASHER, FLAT	1
3	39-0582	GEAR ASSEMBLY, PINION	1
4	53-0045	VALVE, AIR FLOW CONTROL	1
5	54-0149	COUPLING, MALE, QD	1
6	54-0201	CAP, YELLOW	1
7	57-0077	MOTOR, AIR	1

**MOTOR ASSEMBLY, CORDLESS, ELECTRIC, 18V, 115V (P/N 58-0439)**



Parts List, Motor Assembly, Cordless, Electric, 18V, 115V (P/N 58-0439)

Item No.	Part No.	Description	Qty
1	28-0219	SEAL, GREASE	1
2	34-0246	WASHER, 1.22" OD X .504" ID X .062" THK	1
3	39-0582	GEAR ASSEMBLY, PINION, 12T	1
4	46-0836	SLEEVE, BUSHING, SUREFIRE 1.5	1
5	58-0317	MOTOR, CORDLESS, 18V, METABO, MOD CW, 115V	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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