SUPERIOR

PBM-2500
ID Mount End Prep and Flange Facer
Operating Manual

CONFIDENTIALITY STATEMENT

This document contains proprietary and confidential information which is the property of Superior Plant Rentals LLC (SPR). It is loaned for limited purposes only and remains the property of SPR. Reproduction in whole or part, use of the design, or distribution of this information to others is not permitted without the express written consent of SPR. This document is to be returned to SPR upon request or upon completion of the use for which it was loaned. This document and the information contained and represented herein are copyrighted property of SPR.

DOCUMENT NUMBER SPR-MAN-PBM-2500

REV 02

THIS PAGE INTENTIONALLY LEFT BLANK

ABOUT US

Superior Plant Rentals, LLC. (SPR) specializes in portable machining, bore welding, line isolation, and testing solutions, providing equipment and tools manufactured under the highest standards of quality control and engineering expertise along with 24/7 service and support. Designed with the operator in mind, our tools and equipment deliver dependable and precise performance, providing cost-effective solutions and reduced downtime, making them beneficial resources in the Oil and Gas, Mining, Heavy Construction, Shipbuilding, and Power Generation industries.

SPR rents and sells equipment and tools; we offer our own line of portable ID/OD flange facers, linear/gantry and rotary mills, end prep bevelers, isolation and test plugs, line boring, and bore welders, as well as custom-designed equipment and tools.

Our team includes machining, test and isolation, and engineering experts, all with a thorough working knowledge of applications to support you with our equipment on any job. We understand the urgency of your projects and are committed to delivering the highest quality equipment and tools to satisfy the requirements of your clients.

SPR delivers outstanding customer service, specialized training by seasoned professionals, and tools as tough as the jobs you need them to do.

YORK
PORTABLE MACHINE TOOLS

SUPERIOR
PLANT RENTALS

CLIFF'S BITS
PRECISION GRINDING & TOOLING

SUPERIOR HEAT EXCHANGERS
PORTABLE TOOLS AND MACHINERY

WARNING:

SPR is committed to continued product improvement; therefore, the machine you received may be slightly different than the one described herein. This manual and the information provided is a basic guideline for our customers. SPR will do its best to ensure that the information and procedures contained in this manual are correct and up-to-date. Superior cannot guarantee that the information and procedures contained herein are correct for all applications or situations.

The contents of this manual are subject to change without notice. It is the obligation of the user to read all information in this manual, become familiar with the equipment to be used, and exercise the utmost care in equipment operation. **Do not make any modifications to this equipment. Any modifications will void all warranty claims, as well as increase the risk of injury or harm.** Do not operate this equipment if all parts are not functioning at 100% efficiency. Notify us immediately for any needed repairs.

Note: SPR will supply all repair and replacement parts necessary for maintenance and operation of this machine. For repair, service, or additional information, please locate repair and replacement part description/part numbers within the O&M manual in the exploded view section and contact us for ordering.

USA

Superior Plant Rentals LLC.
350 Dowdy Dr., Gonzales, LA 70737 | Phone: 225.647.7771

Superior Plant Rentals LLC.
1530 Live Oak, Webster, TX 77598 | Phone: 281.554.9400

Superior Plant Rentals LLC.
5450 Avenue A, Bldg. 1, Beaumont TX 77705 | Phone: 409.853.4382

Superior Plant Rentals LLC.
8233 Leopard Street, Corpus Christi, TX 78409 | Phone: 361.541.5900

Superior Plant Rentals LLC.
2030 Gladwick St., Unit B, Rancho Dominguez, CA 70220 | Phone: 310.356.6105

Superior Plant Rentals LLC.
8001 Hwy 90, Moss Point, MS 39562 | Phone: 251.370.8039

Superior Plant Rentals LLC.
3958 Airway Drive, Rock Hill, SC 29732 | Phone: 803.981.9065

INTERNATIONAL

SPR York
1641 17th Ave, Campbell River, BC, Canada, V9W 4L5 | Phone: 250.287.7716

TABLE OF CONTENTS

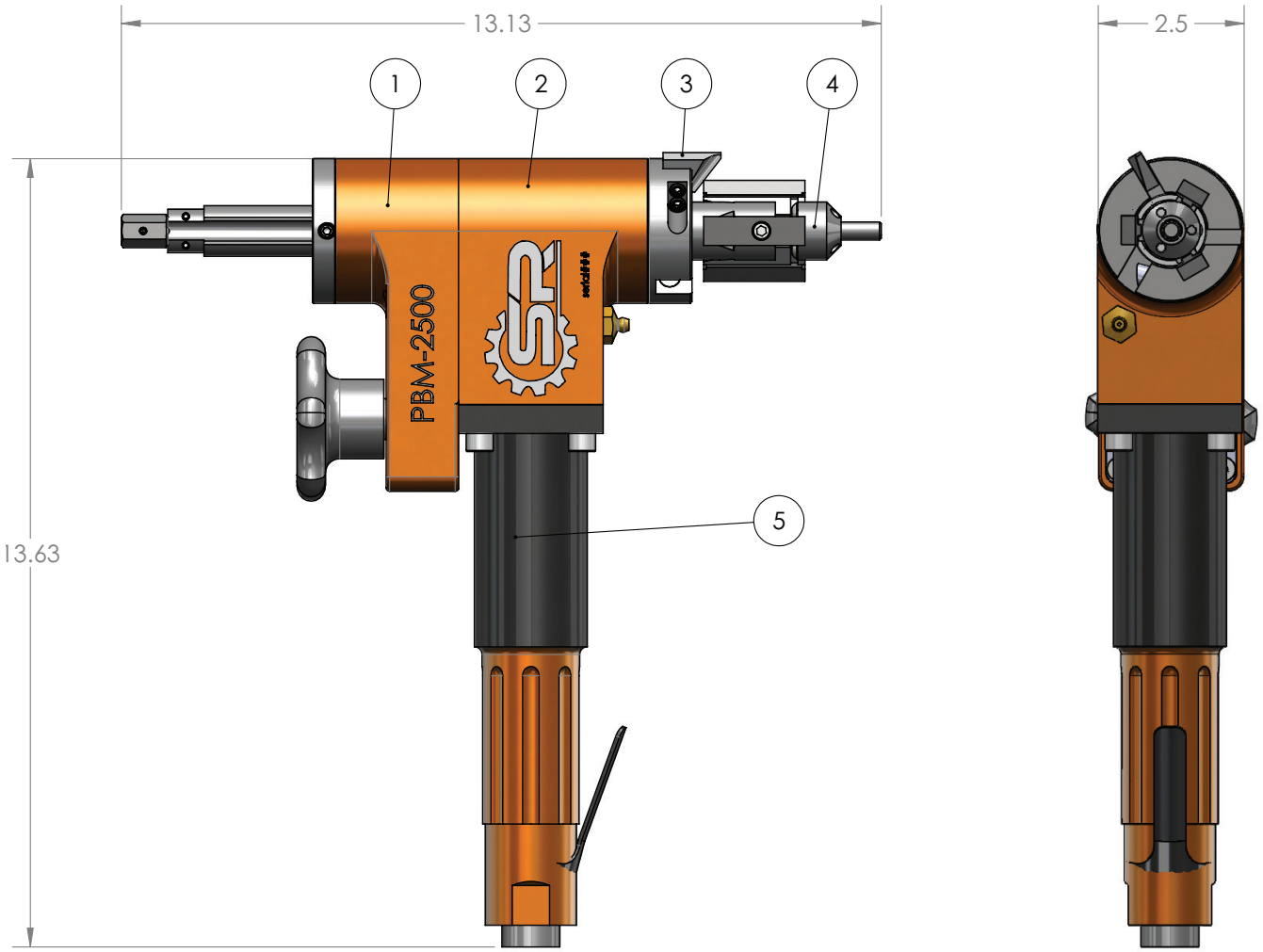
THIS PAGE INTENTIONALLY LEFT BLANK

INTRODUCTION

APPLICATIONS

The PBM-2500 machine is lightweight, just 13 lbs. and is designed to bevel boiler tubes and small pipe. The tool bits are held in place by our wedge lock system. The clamping mandrel with bolt-on locator pads (no springs) stops any pieces from dropping down into the work piece. Our gear drive unit has spiral bevel gears for backlash free motion and more teeth engagement.

When you receive the PBM-2500:
Inspect the machine for shipping damage. Verify that all of the parts listed below, or on the Bill of Materials, are present. If any parts are missing, or if you have questions regarding the PBM-2500, please contact a Superior Plant Rentals or York Portable Machine Tools location nearest you. immediately.



SPECIFICATIONS CHART

Machining Performance Range		2500
ID Mounting Range:	Small Mandrel (Optional)	0.500 in - 1.250 in (12.7 mm - 31.8mm)
	Standard Mandrel	1.000in - 2.500 in (25.4 mm – 63.5 mm)
	Large Mandrel (Optional)	2.500 in – 4.000 in (63.5mm – 101.6mm)
Cutting Range		0.500in - 4.000in (12.7 mm – 101.6 mm)
Radial Clearance		2.500in (63.5 mm)
Max Wall Thickness		0.625 in
Optional Flange Facer		Yes
Drive System		
Motor		1.11 HP (827.73 W)
Recommended Air Pressure		40 CFM @ 90 PSI
Speed		290 rpm @ Max output
Electric Motor		Available Upon Request
Measurements		
Machine Weight		14 lbs (6.35 kg)
Shipping Weight		29 lbs (13.15 kg)
Dimensions		
Machine (LxWxH)		Refer to drawing below
Crate/Shipping (LxWxH)		25 in x 20 in x 10 in (635 mm x 508 mm x 254 mm)

SAFETY PRECAUTIONS

Please follow this list of general safety guidelines when operating the PBM-2500 tool. Safe machining practices should always be followed when operating SPR machines.

Before operating this machine, read the entire operating manual. Inspect machine, cord, and accessories for any damage.

Wear safety glasses, ear plugs, and safety shoes while operating the PBM-2500 machine. For maximum protection keep your equipment clean and in good condition. Follow company and OSHA safety rules when operating equipment.

The motor should always be disconnected from the air supply or drive battery when servicing the machine or when changing cutting inserts, collets, or other components.

Moving machine parts can seriously injure operators. Understand and read all instructions before operating this machine.

For maximum safety and performance, read the entire instruction manual before operating this machine.

WARNING!
MOVING PARTS.
Keep hands, loose clothing, and hair away from rotating or moving parts. Disconnect the air supply from the machine and unplug all equipment prior to adjusting or servicing. If electric, remove power from the machine prior to adjusting or servicing.

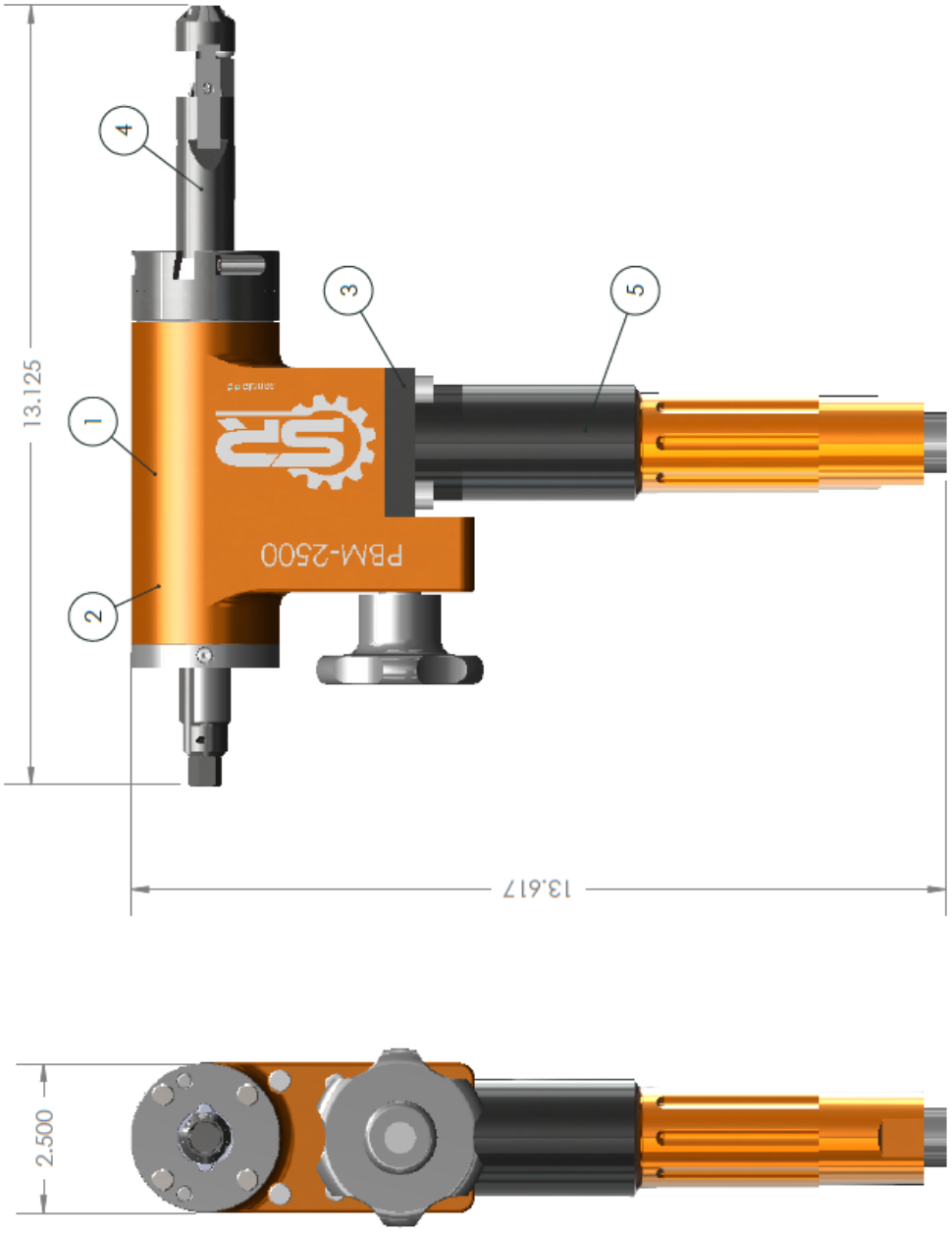
WARNING!
ELECTRICAL SHOCK.
Possible shock if not handled properly.

WARNING!
KEEP DRY.
Keep all equipment and components away from any water source.

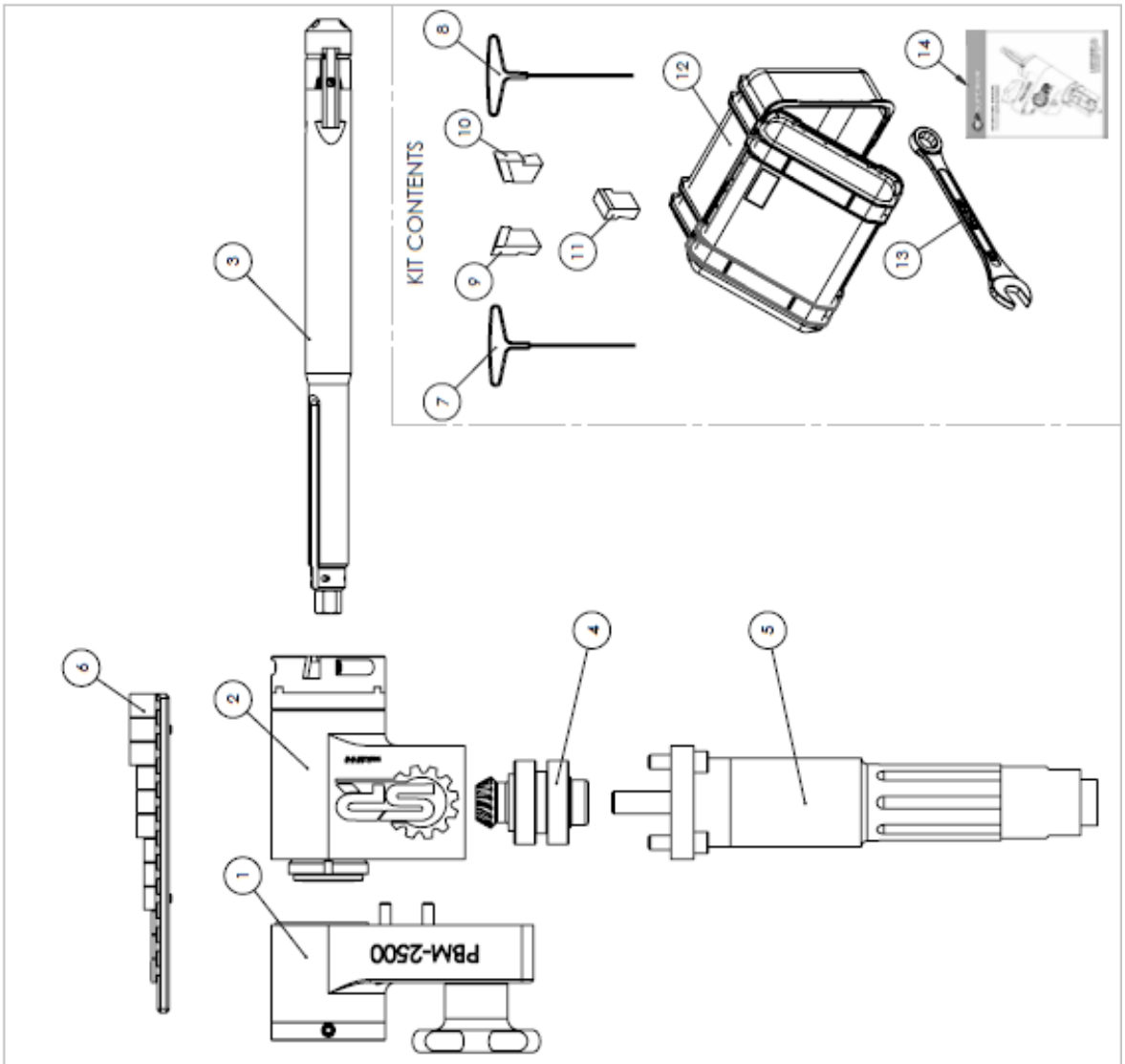
WARNING!
EYE PROTECTION.
Eye protection must be worn while operating or working near powered equipment.

WARNING!
EAR PROTECTION.
Ear protection should be worn while operating or working near loud equipment.

STANDARD EQUIPMENT - ID MOUNT END PREP



ITEM NO.	PART NUMBER	QTY.
1	14592 HOUSING MAIN ASSEMBLY	1
2	14598 FEED HOUSING ASSEMBLY	1
3	14610 ASSEMBLY PINION	1
4	14578 ASSY MANDREL	1
5	14619 ASSY MOTOR PNU	1



ITEM NO.	PART NUMBER	QTY.
1	14598 FEED HOUSING ASSEMBLY	1
2	14592 HOUSING MAIN ASSEMBLY	1
3	14578 ASSY MANDREL	1
4	14610 ASSEMBLY PINION	1
5	14619 ASSY MOTOR PNU	1
6	14622 ASSY HOLDER PAD	1
7	14790 KEY ALLEN T HANDLE 3/16 IN	1
8	14791 KEY ALLEN T HANDLE 5/32 IN	1
9	14664 TOOL BIT BEVEL OD 37.5 DEG	1
10	14813 TOOL BIT BEVEL ID 37.5 DEG	1
11	14687 TOOL BIT FACING	1
12	14792 CASE	1
13	14793 WRENCH RATCHET 1/2 IN	1
14	14794 MANUAL PBM-2500	1

PRODUCT DESCRIPTION

The PBM-2500 is a right-angled pipe (tube) end-prep machining tool designed to face, bevel, and counterbore for cutting end-prep configurations for welding. These operations can be performed separately or simultaneously. The current model uses a pneumatic powered motor. An optional electric motor is available upon request.

This machine uses an internal expanding clamping mandrel with interchangeable pad sets, which will accommodate internal diameters from a 1.000” to 2.50” ID (standard mandrel). Optional mandrels are available and will mount from 0.5” to 1.25” ID (small mandrel) and 2.50” to 4.00” ID (large mandrel) Components, operation and maintenance are covered in further detail in this manual.

The PBM-2500 beveling machine is capable of tube and pipe weld-end preparation that meets all existing conventional codes including the more stringent nuclear codes.

The expanding mandrel provides fast, accurate, self-centering alignment to the pipe or tube to be machined.

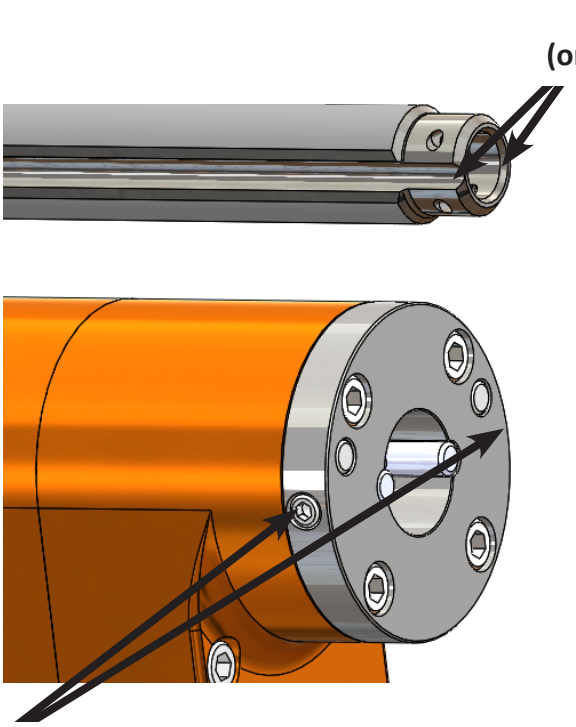
The standard PBM-2500-10 package includes:

- Beveling Machine assembled with air or electric motor (air motor comes with in-line oiler)
- Custom carrying case
- Mandrel pad set (standard mandrel 1.00” to 2.50” ID)
- Tool Bits - OD bevel angle, ID bevel angle, facing
- Allen keys t-handle: 5/32” & 3/16”
- Operating manual
- In-line oiler whip hose

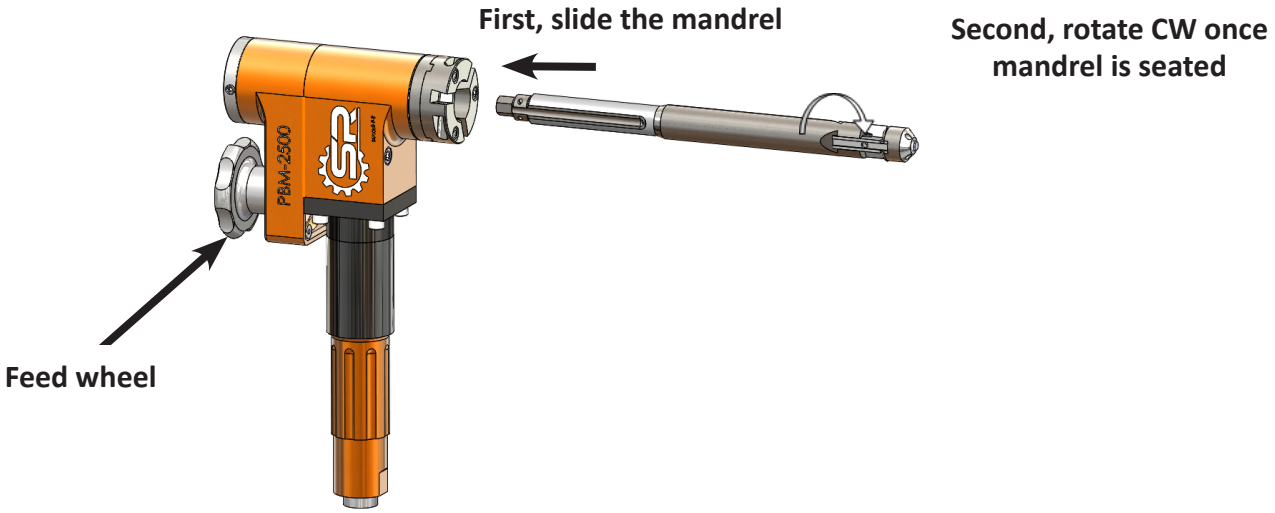
INITIAL SET-UP

CHANGING A MANDREL

1. In the event you need to change or install a mandrel, make sure to loosen the torque adjustment set screws on the beveling machine in order to allow alignment with the slots on either side of the mandrel shaft:



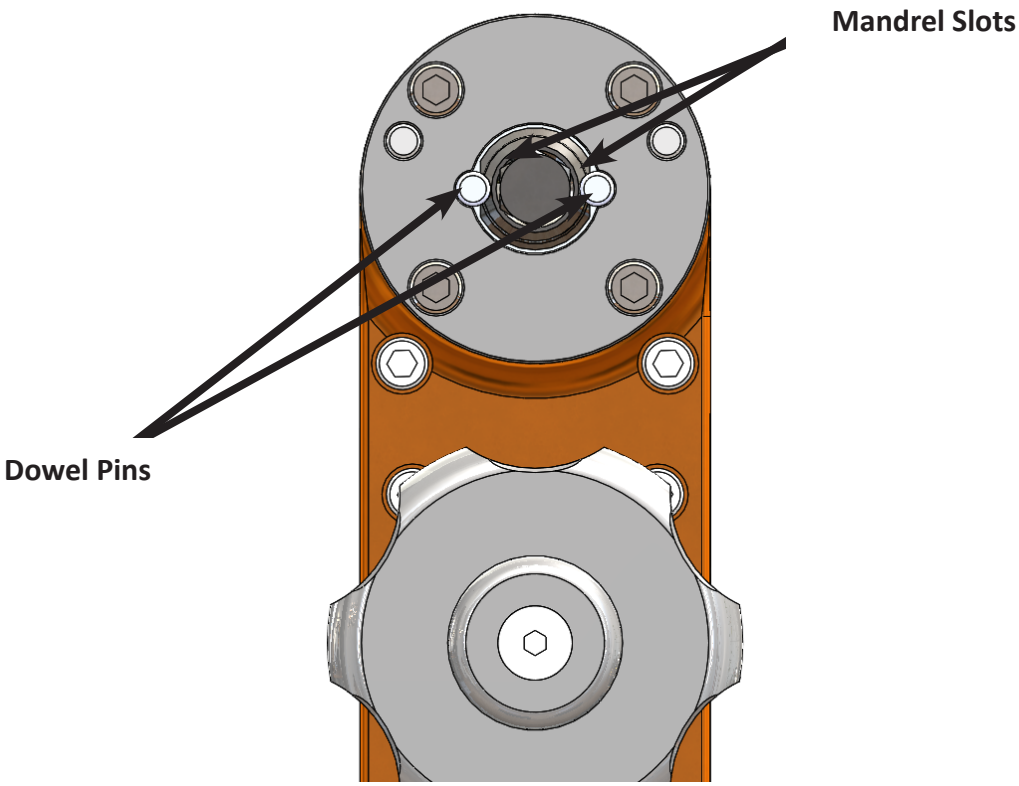
2. Gently feed the desired mandrel into the cutter head end of the tool (front end) until the mandrel is seated. Once seated, twist the mandrel in a clockwise direction (this will engage the mandrel into the feed wheel's nut). Once the mandrel begins threading into the nut you may also turn the feed wheel to install the mandrel.



CHANGING A MANDREL (CONT'D)

3. When the mandrel has been fed through the feed nut enough to see it from the back side of the tool, hold and twist the mandrel to align the two mandrel slots to the two dowel pins, once aligned, continue turning the feed nut until the threads on the end of the mandrel begin to extend beyond the feed nut.

Note: Ensure set screws as per step 1 have been loosened



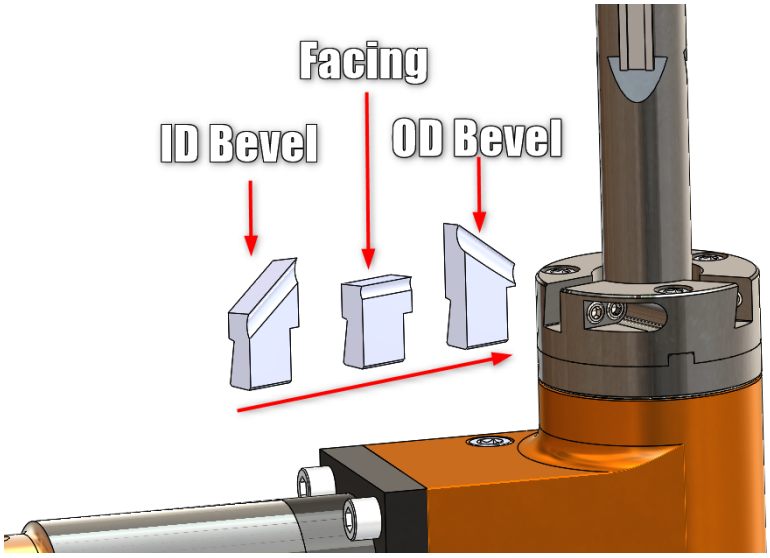
Note: A minimum of 10 threads must be engaged to prevent stripping of the threads during the machining operation.

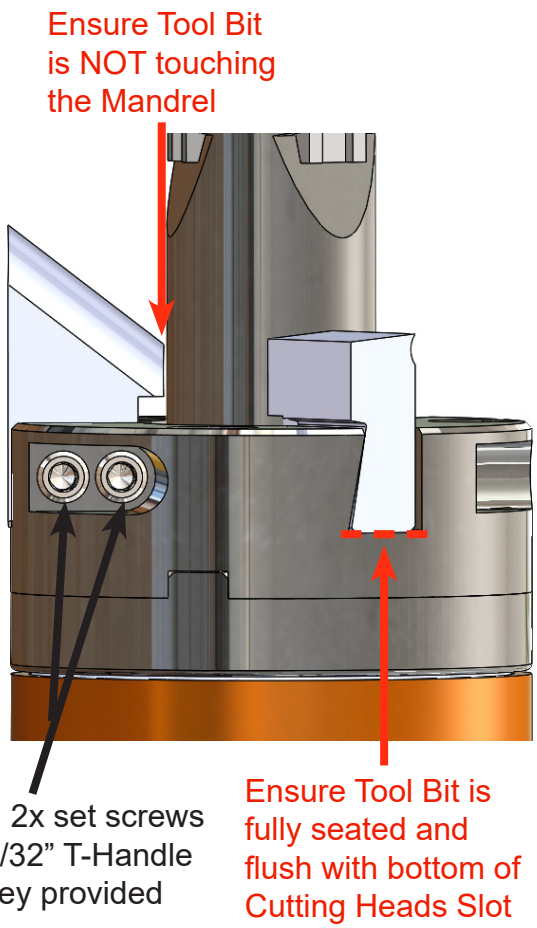
4. After you have installed the mandrel into the beveling machine, check the backlash on the mandrel and tighten the torque adjustment set screws to take out the backlash as required. **Make sure you do not over tighten the adjustment set screw, if they are too tight, you will not be able to move the mandrel while operating the machine.**

SELECTING & SETTING TOOL BITS

WARNING! Use of dull or improperly designed tool bits or cutting inserts not manufactured by SPR may result in poor performance and may constitute abuse of this machine and therefore voids the SPR factory warranty.

1. Select the correct Tool Bit or combination of Tool Bits and slip them into the cutter head. When putting in the Tool Bits, ensure the tapered surfaces align with each other, fasten the 2x set-screws to lock in Tool Bit.





Note: Depending on the required bevel configuration, the Tool Bits should be set in a certain order. Facing or squaring Tool Bits should be set first, and then either ID (inner diameter) or OD (outside diameter) beveling tool bits should follow.

TOOL BIT SELECTION

Standard Tool Bits Available for the PBM-2500

PART NUMBER	DESCRIPTION
14687	Facing Bit
14688	37.5 Deg OD Bevel Bit
14813	37.5 Deg ID Bevel Bit
14689	30 Deg Bevel Bit
14690	25 Deg 'J' Bevel Bit (Upper Range)
14691	25 Deg 'J' Bevel Bit (Lower Range)

*** Tool Bit can be requested with TIN or Laser Coating**

Additional ID and OD bevel Tool Bit angles (degree) are available.

SETTING UP CLAMPING MANDREL AND PAD/SIZES

1. Measure the inside diameter of the tube or pipe to be beveled or faced. This measurement is important for correct sizing and selection of the clamping mandrel and components.

2. Select the proper clamping mandrel and set of clamping pad blocks from the chart:

STANDARD MANDREL

PART NUMBER	QTY	DESCRIPTION	SIZES
		Without Pads	1.125" - 1.30"
14624	3	BLOCK A	1.30" - 1.60"
14625	3	BLOCK B	1.60" - 1.90"
14626	3	BLOCK C	1.90" - 2.20"
14627	3	BLOCK D	2.20" - 2.50"

SMALL MANDREL

PART NUMBER	QTY	DESCRIPTION	SIZES
14837-A	1	Collet A	.500" - .567"
14837-B	1	Collet B	.567" - .633"
14837-C	1	Collet C	.633" - .700
14837-D	1	Collet D	.700” - .767”
14837-E	1	Collet E	.767” - .833”
14837-F	1	Collet F	.833” - .900”
14837-G	1	Collet G	.900” - .967”
14837-H	1	Collet H	.967” - 1.033”
14837-I	1	Collet I	1.033” - 1.100”
14837-J	1	Collet J	1.100” - 1.167”
14837-K	1	Collet K	1.167” - 1.233”
14837-L	1	Collet L	1.233” - 1.250”

LARGE MANDREL

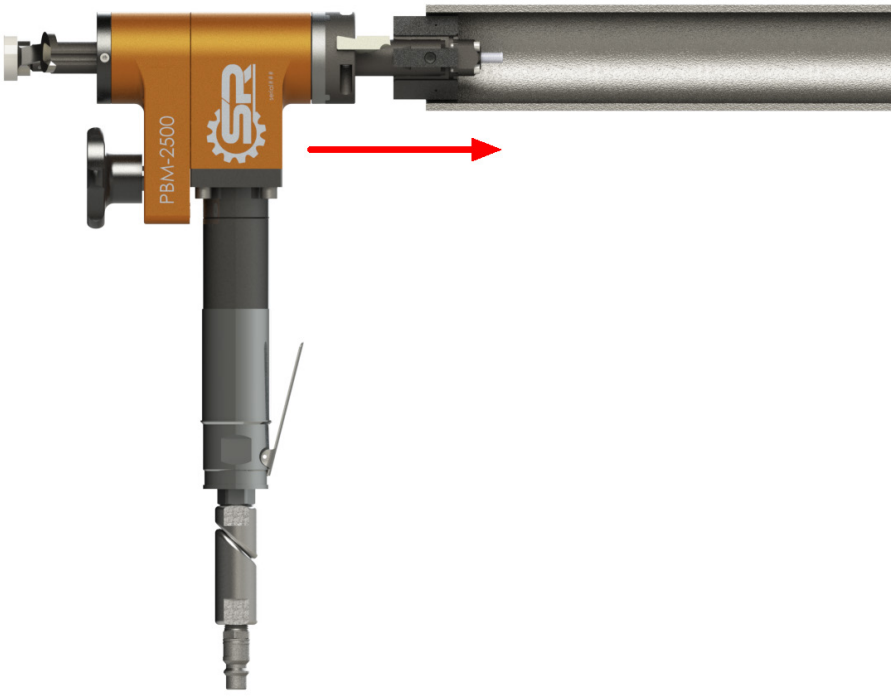
PART NUMBER	QTY	DESCRIPTION	SIZES
		Without Pads	2.50" - 2.80"
14849	3	BLOCK A	2.80" – 3.10"
14850	3	BLOCK B	3.10" – 3.40"
14851	3	BLOCK C	3.40" – 3.70"
14852	3	BLOCK D	3.70" – 4.00"

3. Install the correct clamping pad set on the ID clamping mandrel, being sure all mandrel pads are secure and seated properly.

STARTING AND OPERATING THE MACHINE

1. Once the correct mandrel, tool bit(s) and mandrel pads have been installed, slide the mandrel into the inside of the tube/pipe. Leave about 1” clearance from tool bit to end of pipe. Then, gently tighten the mandrel clamping nut (draw rod nut) until the internal clamping mechanism begins to grip the work piece.

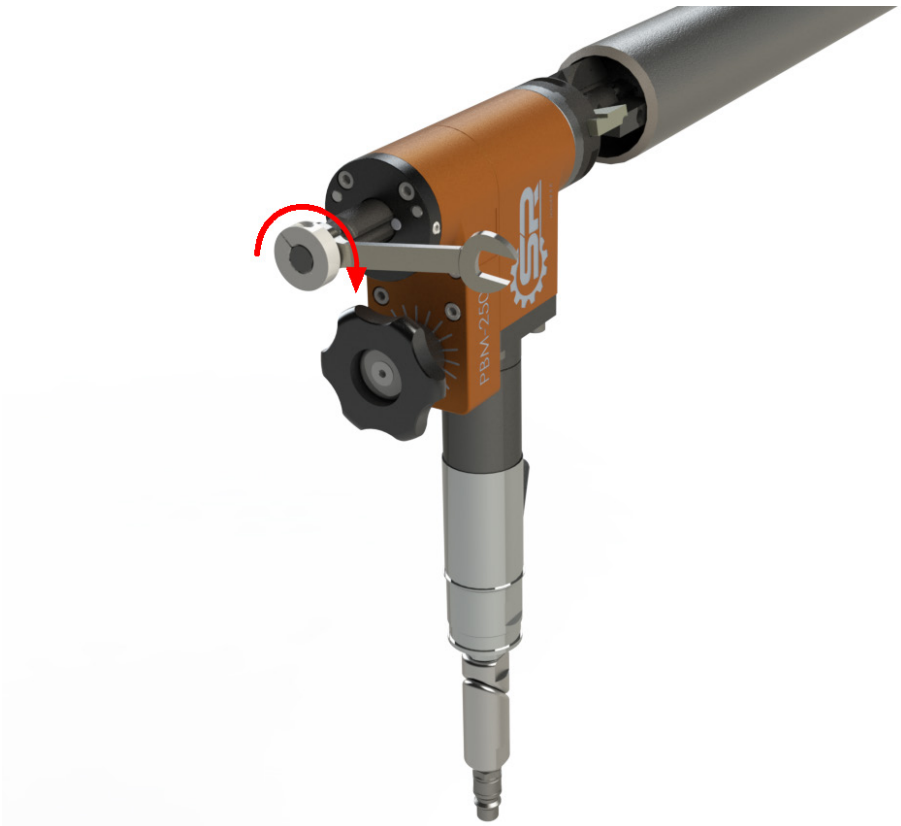
Note: Ensure there is enough room between the tool bit and mandrel pads to complete desired cutting operation; otherwise, the tool bit may cut into the mandrel pads.



2. Once the pads begin to touch the ID of the pipe, tighten the draw rod nut with the 1/2” wrench provided while gently working the tool back and forth so that the clamping pads seat evenly. It is very important to make sure the mandrel pads are fully set on the ID of the work piece; this will cause the misalignment of the head. The clamping mandrel must be tight to prevent slippage; however, do not over-tighten.

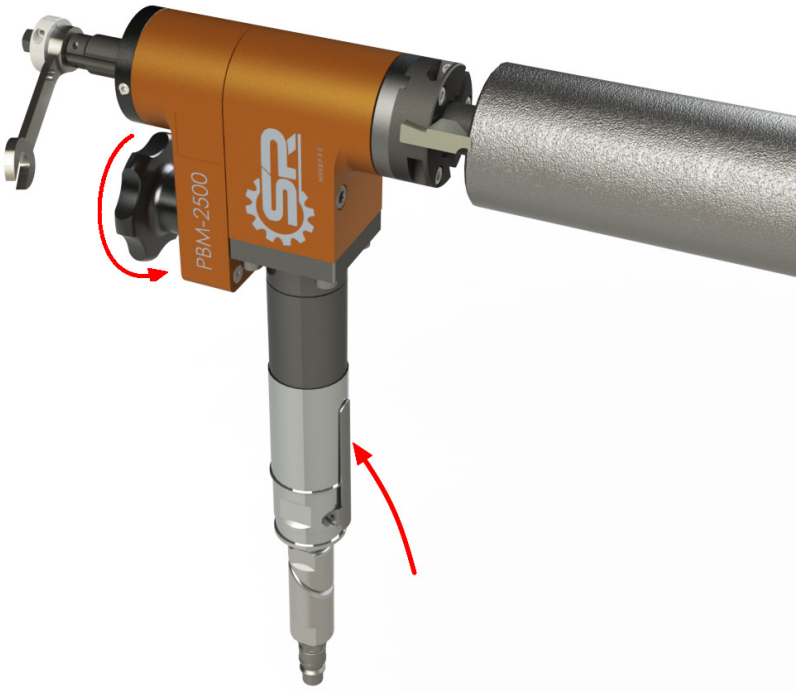
Note: Hand tighten only; do not power tighten.
The closer the tube/pipe clamp mount is to the PBM, the more ridged the machine.

Note: Check the backlash on the mandrel and adjust the torque adjustment set screws (see Initial Set-Up) to take out the backlash as required. Do not over tighten the torque adjustment set screws. If they are too tight, you will not be able to move the mandrel while operating the machine.



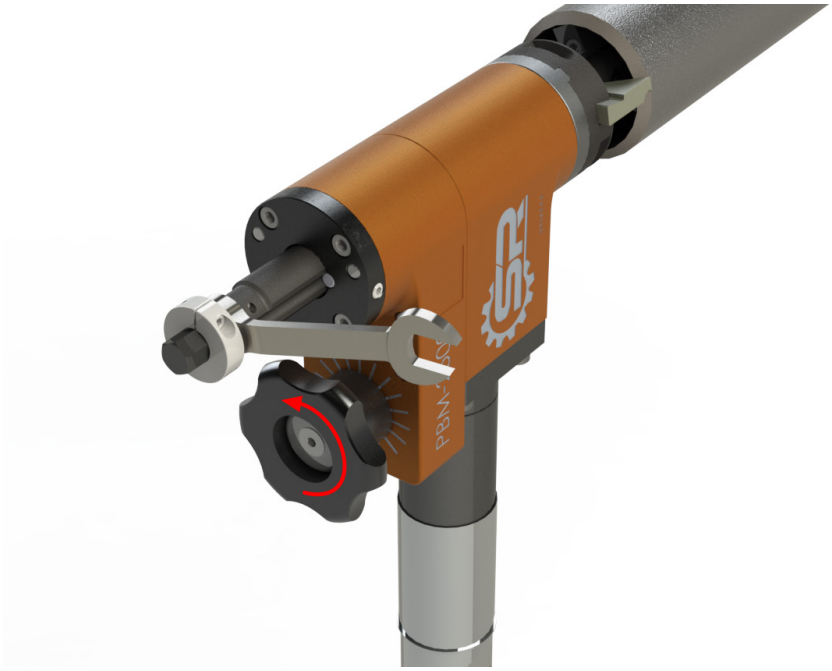
3. Position the machine with the tool bit roughly 1/8” above the pipe surface to be cut. Connect the air supply line to the tool and jog the motor throttle to ensure that the cutter(s) are not touching the tube/ pipe.

4. Depress and hold the throttle on the air motor and feed the cutter head forward using Feed Knob.

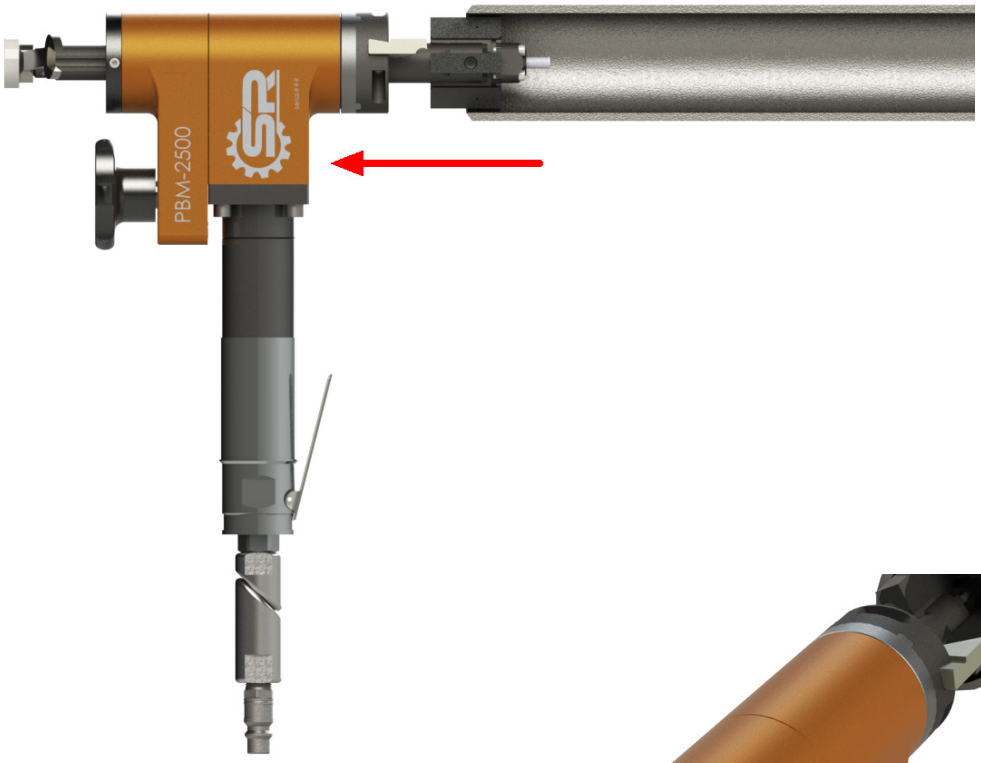


5. Continue feeding the beveling head into the work piece until you begin to get a smooth curly (ribbon) chip. Do not over-feed the tool bits; this will cause the machine to torque, resulting in damage of the machine and tool bits. You may wish to add a small amount of cutting oil to the cut as the beveller is cutting the work piece.

6. Do not stop the air motor while the tool is cutting the work piece. When the desired bevel is present on the end of the tube or pipe, let the cutting head rotate a few turns without feeding the machine forward. As the chip diminishes, reverse the feeding motion and back the cutter head assembly away from the work piece.

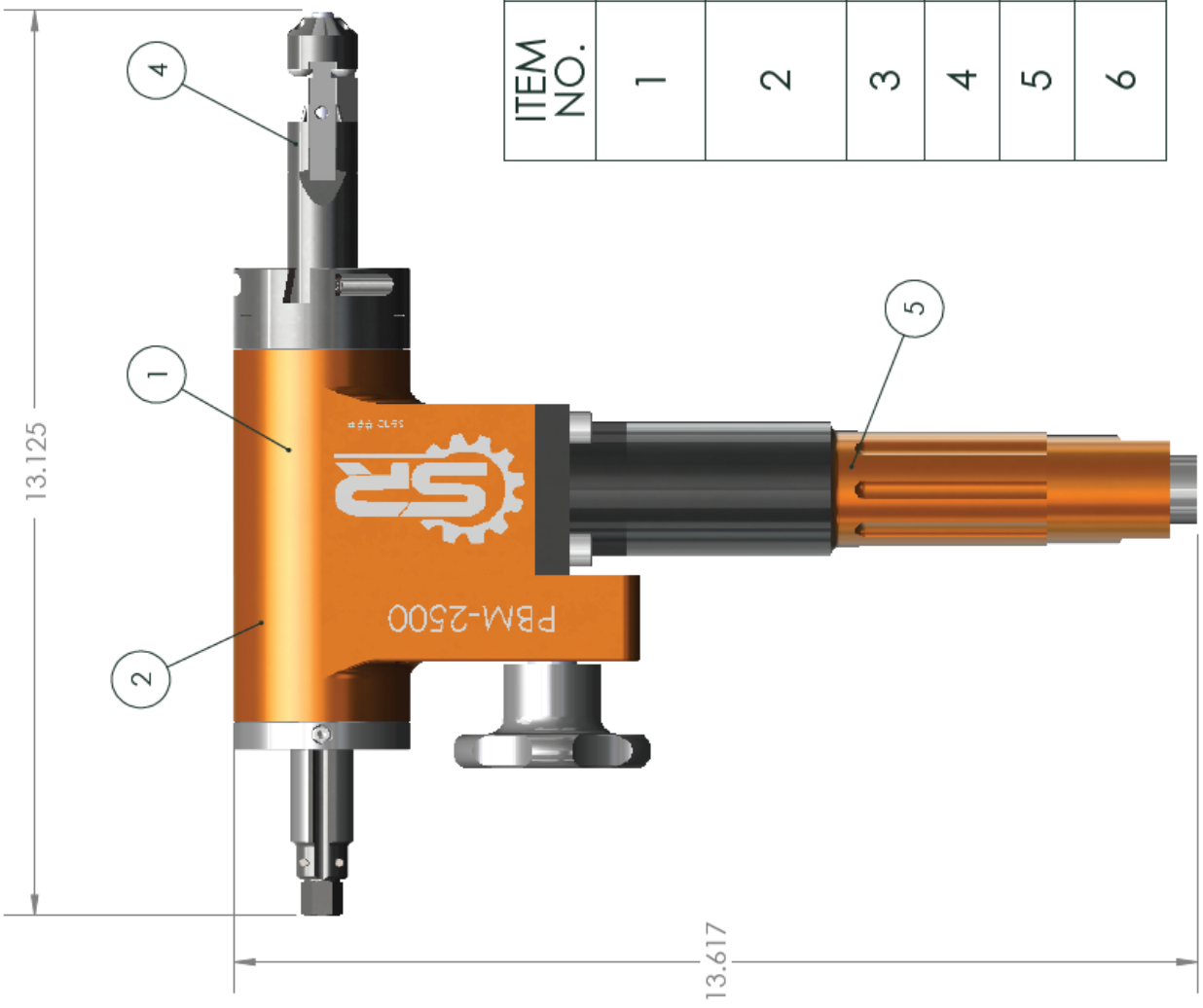


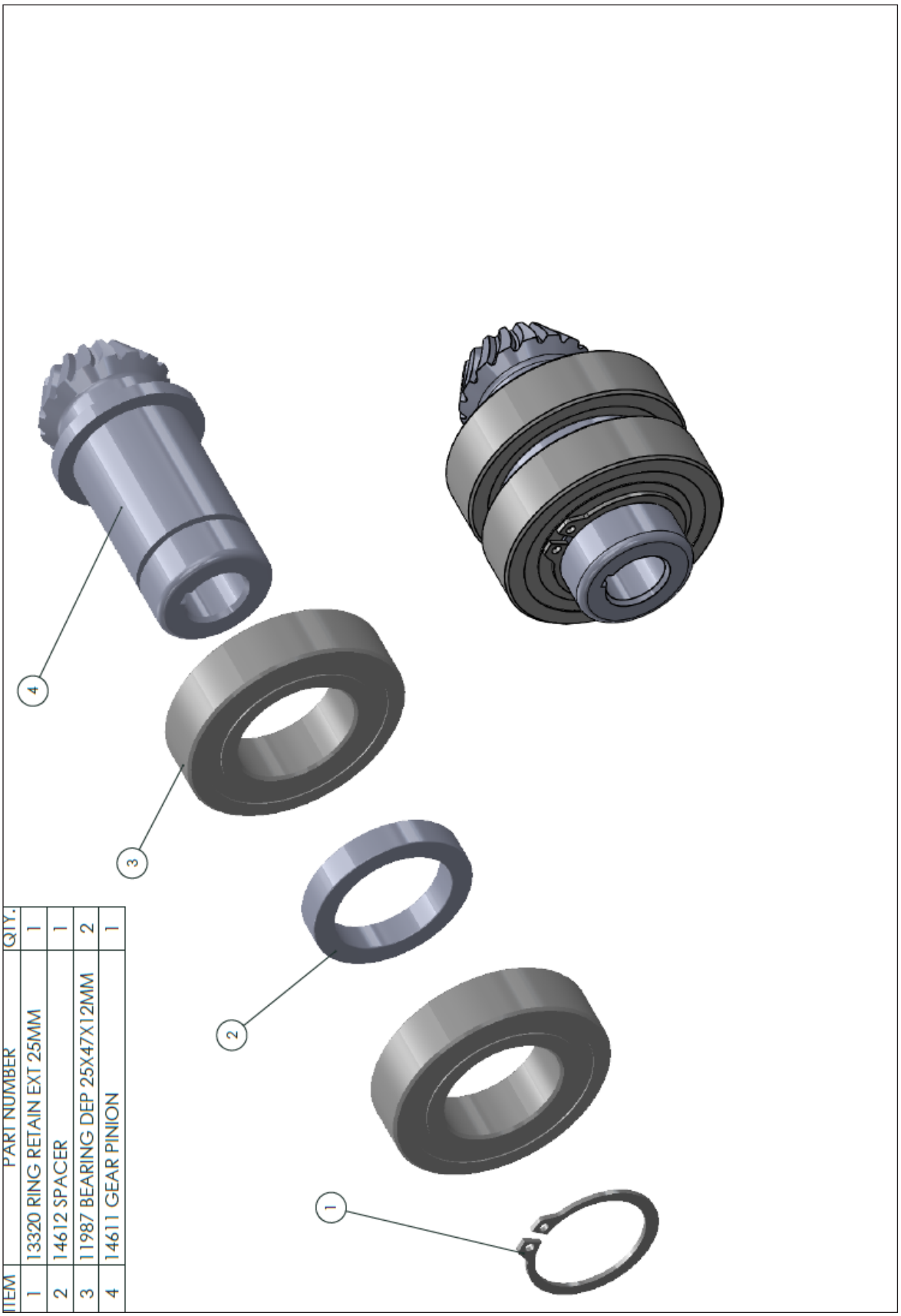
7. Release the throttle on the air motor assembly and disconnect the air supply hose. Back off the feed mechanism until the threads on the mandrel shaft assembly are even with the end of the feed nut. Loosen the draw rod nut and gently rock the tool to loosen the clamping mandrel and remove the beveling machine from the work piece.



EXPLODED VIEWS

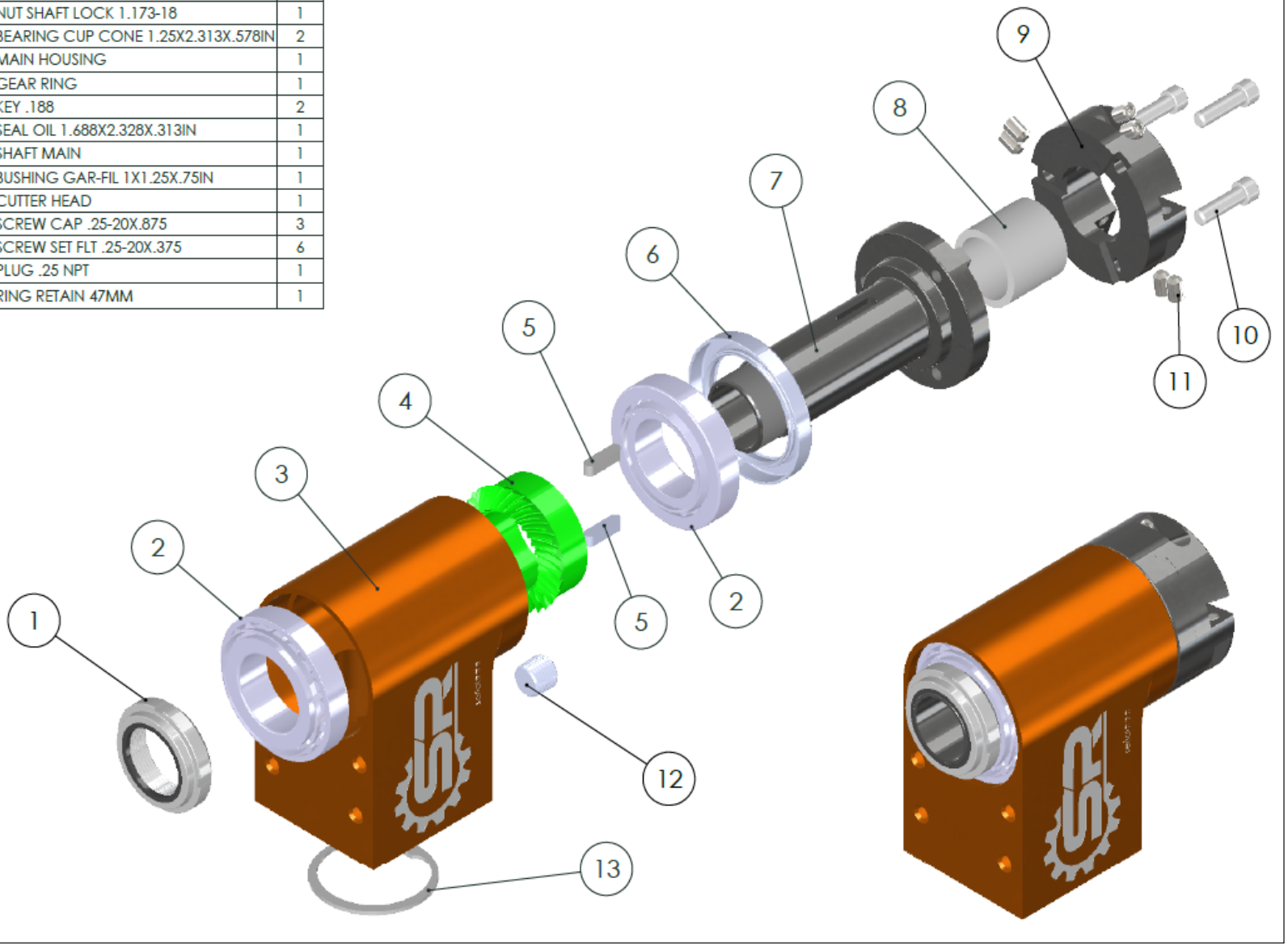
ITEM NO.	PART NUMBER	QTY.
1	14592 HOUSING MAIN ASSEMBLY	1
2	14598 FEED HOUSING ASSEMBLY	1
3	14610 ASSEMBLY PINION	1
4	14578 ASSY MANDREL	1
5	14619 ASSY MOTOR PNU	1
6	14622 ASSY HOLDER PAD	1

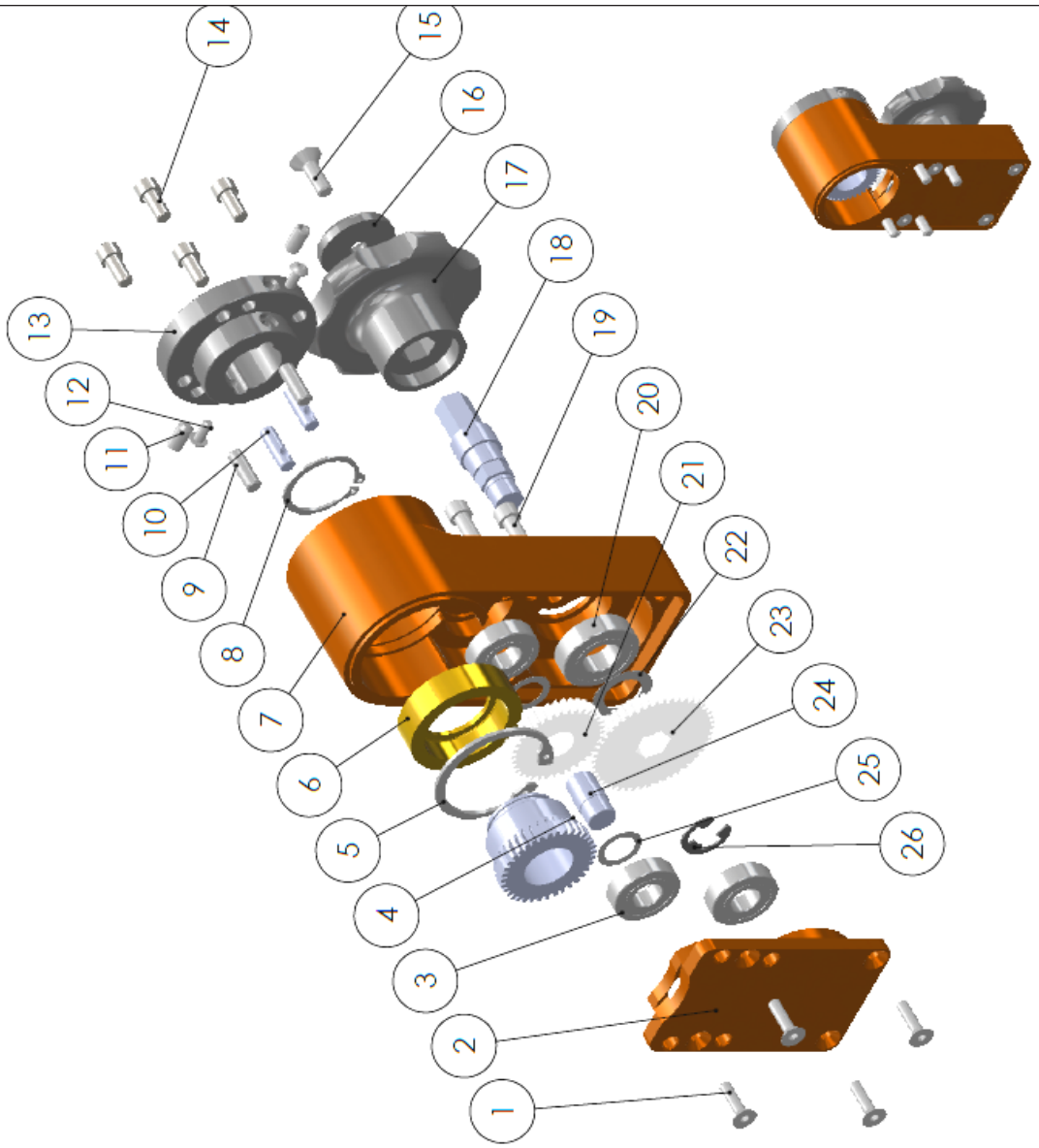




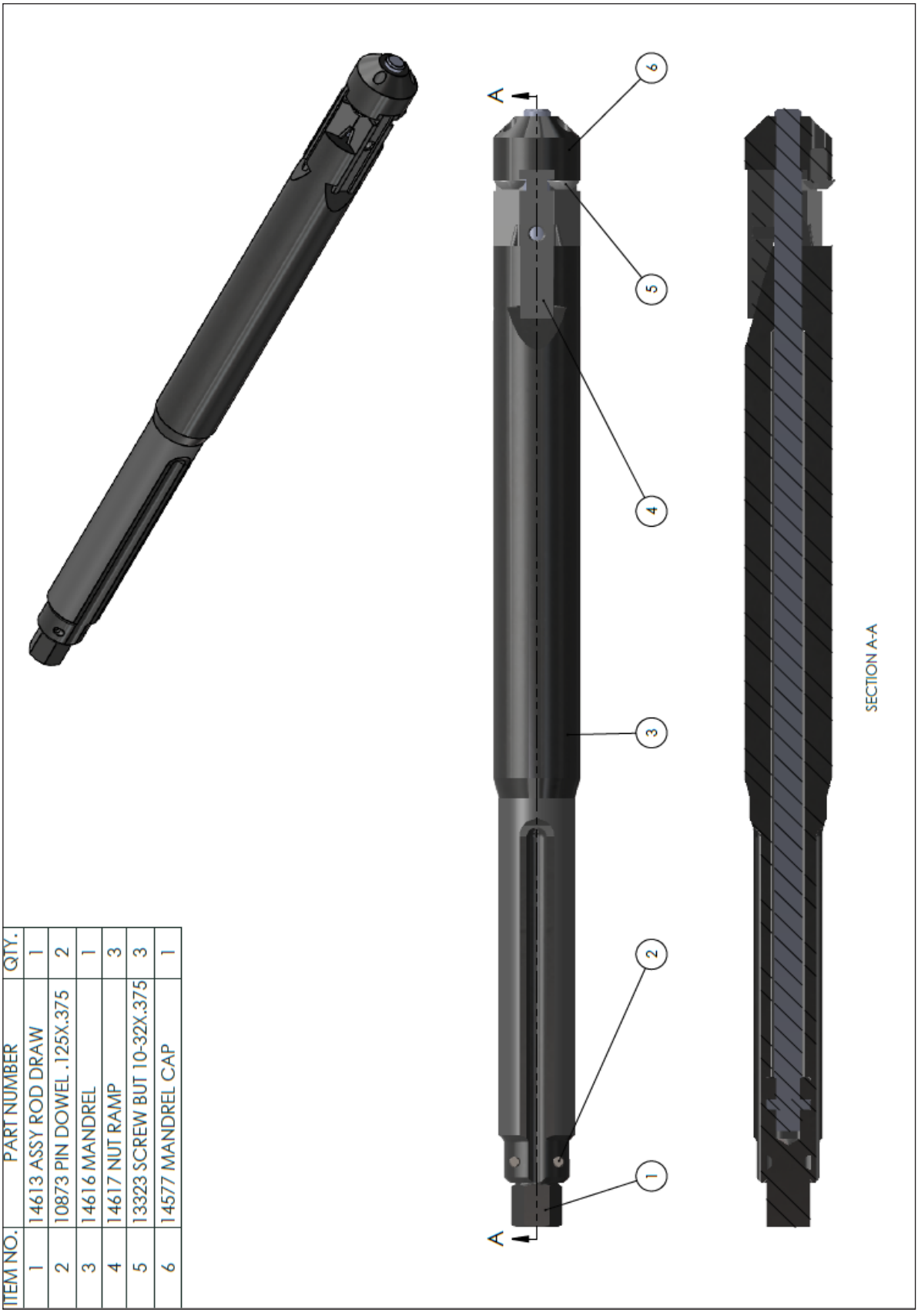
ITEM	PART NUMBER	QTY.
1	13320 RING RETAIN EXT 25MM	1
2	14612 SPACER	1
3	11987 BEARING DEP 25X47X12MM	2
4	14611 GEAR PINION	1

ITEM	PART NUMBER	QTY.
1	14405 NUT SHAFT LOCK 1.173-18	1
2	13315 BEARING CUP CONE 1.25X2.313X.578IN	2
3	14593 MAIN HOUSING	1
4	14594 GEAR RING	1
5	14595 KEY .188	2
6	13316 SEAL OIL 1.688X2.328X.313IN	1
7	14596 SHAFT MAIN	1
8	14417 BUSHING GAR-FIL 1X1.25X.75IN	1
9	14597 CUTTER HEAD	1
10	14419 SCREW CAP .25-20X.875	3
11	13524 SCREW SET FLT .25-20X.375	6
12	14449 PLUG .25 NPT	1
13	14412 RING RETAIN 47MM	1





ITEM	PART NUMBER	QTY.
1	13322 SCREW FLT 10-32X.75	4
2	14602 HOUSING COVER FEED	1
3	10857 BEARING DEP 12X28X8	3
4	14628 GEAR FEED	1
5	14412 RING RETAIN 47MM	1
6	14609 BUSHING NUT FEED	1
7	14599 HOUSING FEED	1
8	14411 RING RETAIN EXT 1.125IN	1
9	12305 PIN DOWEL .25X.75IN	2
10	14601 MANDREL KEY	2
11	51326 SCREW SET FLT .25-20X.5	2
12	50390 SCREW BUT 8-32X.375	2
13	14600 MANDREL LOCK	1
14	51321 SCREW CAP .25-20X.5	4
15	10308 SCREW FLT .25-20X.75	1
16	14608 KNOB FEED RETAINER	1
17	14607 KNOB FEED	1
18	14603 SHAFT FEED	1
19	10241 SCREW CAP .25-20X1.5	4
20	10798 BEARING DEP 15X32X9MM	1
21	14605 GEAR SHAFT FEED	1
22	14409 WASHER SHIM .625X1X.007IN	1
23	14606 GEAR SHAFT FEED LOWER	1
24	14604 SHAFT IDLE	1
25	14410 WASHER SHIM .5X.75X.007IN	2
26	12256 RING RETAIN .5IN	1



ITEM NO.	PART NUMBER	QTY.
1	14613 ASSY ROD DRAW	1
2	10873 PIN DOWEL .125X.375	2
3	14616 MANDREL	1
4	14617 NUT RAMP	3
5	13323 SCREW BUT 10-32X.375	3
6	14577 MANDREL CAP	1

MAINTENANCE

GENERAL MACHINE MAINTENANCE
During heavy operation, use a brush regularly to clean chips away from the machine and clamping mandrel assembly between each use. This is especially important around the mandrel feed nut and threads. Thoroughly clean the machine after use. Dirt and grit can severely shorten the life of the machine. Do not spray anything into the electric motor body.

MONITOR THE TEMPERATURE
Monitor the temperature of the beveller housing during operation. Heat buildup on the aluminum housing is an indication that the bearings need lubrication or maintenance and should be handled immediately to insure proper life of the tool.

Note: Heat buildup can also be the result of improperly set bearing clearances. If this problem exists, it is recommended that you contact the factory.

THREAD INSPECTION
Inspect all visible thread areas for excessive wear. Parts that have worn threads should be replaced before damage to the mating thread assemblies occurs.

DRIVE ASSEMBLY
It is recommended that each beveling machine drive assembly be cleaned, inspected, and greased after approximately 600 hours of use. This will help maintain the gear backlash and isolate seal or bearing problems. The inspection should be performed by a qualified individual. To grease the machine, remove the 3/8” plug and install a grease fitting. Once greased, replace the grease fitting with the plug.

AIR MOTOR
Clean and lubricate the air motor assembly periodically. Light, high-quality oil is recommended, in conjunction with an automatic oiling system. An in-line hose/oiler must be used with all SPR beveling machines to keep the air motor warranty in effect. If automatic oiling is not available, add a few drops of oil to the air inlet at the end of each hour of operation. Do not put an excessive amount of oil in the air inlet or sludge will build up and cause problems. If you are interested in our Air Caddy/In-line oiler please contact our sales office.

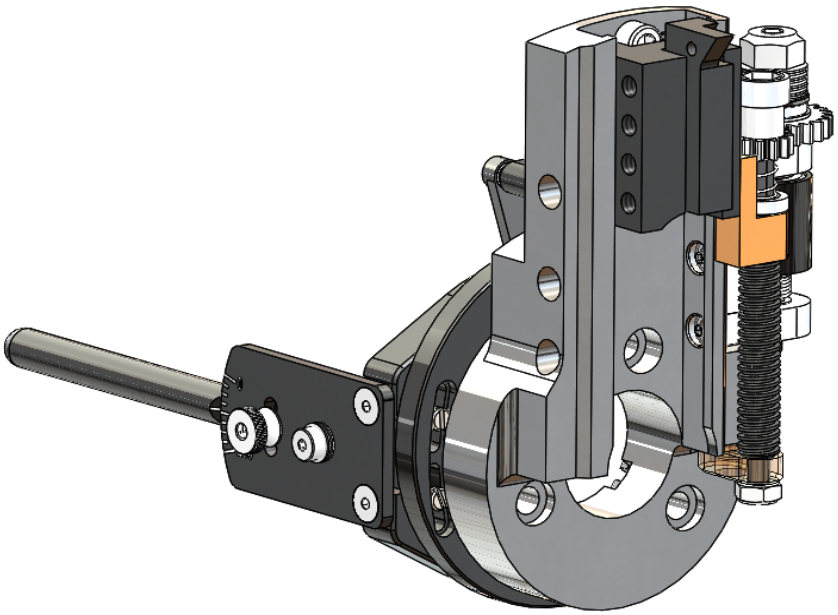
MANDREL CLAMP
It is important that the mandrel clamping mechanism and components remain free of dirt and corrosion. All machined surfaces and surfaces that come in contact with seals should be cleaned and inspected periodically. A light coat of oil can be put on all metal surfaces to protect from rusting.

DRIVE SHAFT
After approximately 50 hours of operation on a new (or newly assembled) machine, the drive shaft end play should be checked for main bearing pre-load and gear backlash. In certain instances, this area may need adjustment as the new parts wear into (seat) their mating surfaces. This adjustment should be performed by a qualified individual or by the factory if a qualified individual is not available.

PROPER HANDLING
Do not drop, hit, or otherwise abuse your pipe beveling machine. This equipment is designed as a portable machining assembly, and as such, is not designed to withstand excessive abuse. Care for your equipment will increase your utilization, the life of the machine, and minimize your repair cost.

TOOL BITS
Remember that tool bits (cutting tools) in good condition perform better. Do not try to use dull tool bits or force the tool bits into the work piece. If excessive back pressure exists, if the tool bits seem to be tearing rather then cutting, or if the chips begin to turn blue or brown, replace your cutting tool bits right away. When possible, leave unused tool bits in their packages to prevent them from being damaged. Please store tool bits that have been taken from their original package in a safe place.

PBM-2500 ID MOUNT FLANGE FACER



SPECIFICATIONS CHART

Machining Performance Range		
ID Mounting Range:	Standard Mandrel	1.000 in - 2.500 in (25.40 mm – 63.50 mm)
	Large Mandrel	2.500 in – 4.000 in (63.50 mm – 101.60 mm)
Cutting Range		1.000 in - 8.500 in (25.40 mm – 215.90 mm)
Drive System		
Motor		1.11 HP (827.73 W)
Recommended Air Pressure		40 CFM @ 90 PSI
Speed		540 rpm @ Max Output
Electric Motor		Available Upon Request
Measurements		
Machine Weight		4 lbs (1.81 kg)
Dimensions		
Machine (LxWxH)		Refer to drawing below

SAFETY PRECAUTIONS

Please follow this list of general safety guidelines when operating the FF-2500 tool. Safe machining practices should always be followed when operating SPR machines.

Before operating this machine, read the entire operating manual. Inspect machine, cord, and accessories for any damage.

Wear safety glasses, ear plugs, and safety shoes while operating the FF-2500 machine. For maximum protection, keep your equipment clean and in good condition. Follow company and OSHA safety rules when operating equipment.

The motor should always be disconnected from the air supply or drive battery when servicing the machine or when changing cutting inserts, collets, or other components.

Moving machine parts can seriously injure operators. Understand and read all instructions before operating this machine.

For maximum safety and performance, read the entire instruction manual before operating this machine.

WARNING!
MOVING PARTS.
Keep hands, loose clothing, and hair away from rotating or moving parts. Disconnect the air supply from the machine and unplug all equipment prior to adjusting or servicing. If electric, remove power from the machine prior to adjusting or servicing.

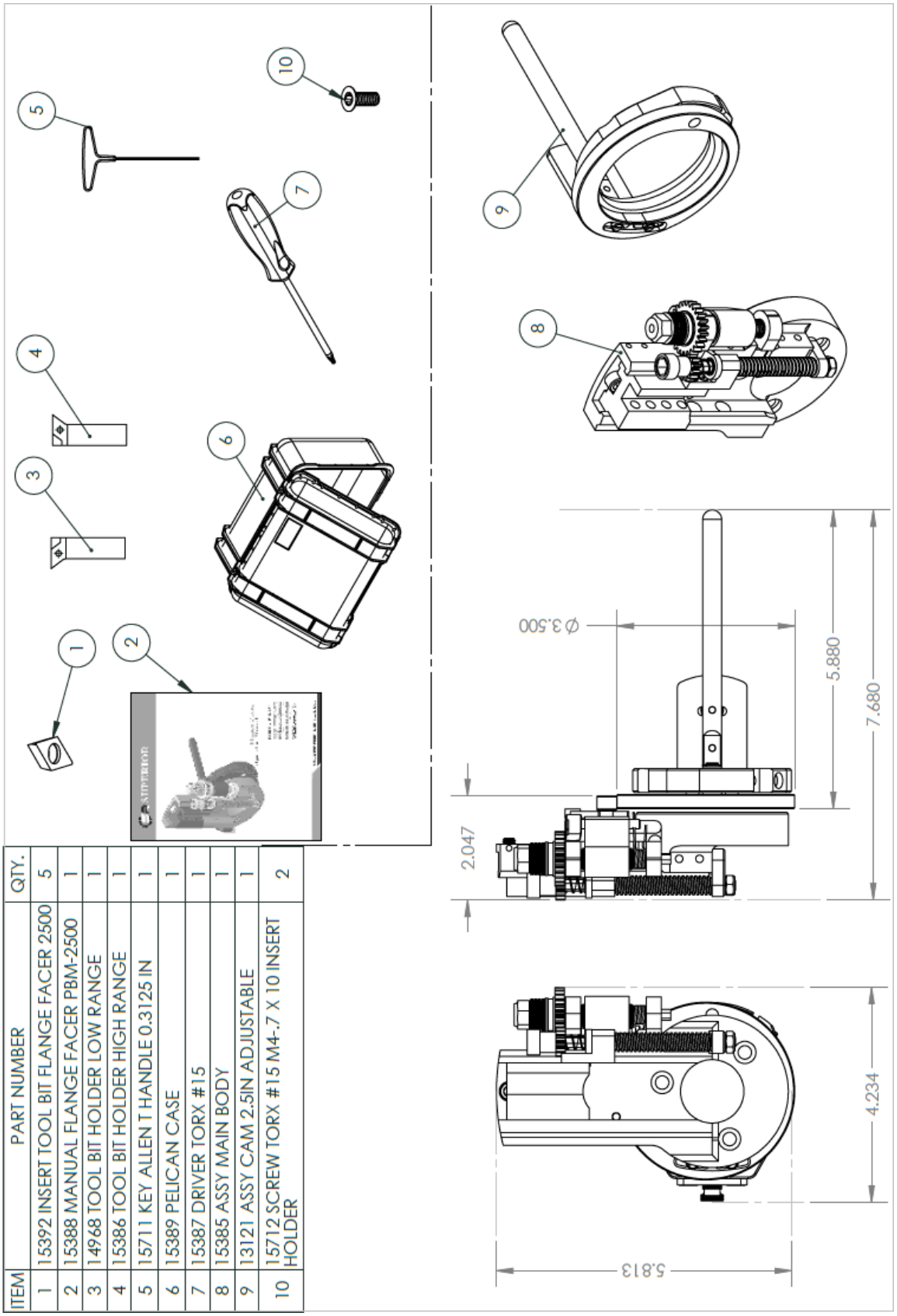
WARNING!
ELECTRICAL SHOCK.
Possible shock if not handled properly.

WARNING!
KEEP DRY.
Keep all equipment and components away from any water source.

WARNING!
EYE PROTECTION.
Eye protection must be worn while operating or working near powered equipment.

WARNING!
EAR PROTECTION.
Ear protection should be worn while operating or working near loud equipment.

STANDARD EQUIPMENT - ID MOUNT FLANGE FACER



ITEM	PART NUMBER	QTY.
1	15392 INSERT TOOL BIT FLANGE FACER 2500	5
2	15388 MANUAL FLANGE FACER PBM-2500	1
3	14968 TOOL BIT HOLDER LOW RANGE	1
4	15386 TOOL BIT HOLDER HIGH RANGE	1
5	15711 KEY ALLEN T HANDLE 0.3125 IN	1
6	15389 PELICAN CASE	1
7	15387 DRIVER TORX #15	1
8	15385 ASSY MAIN BODY	1
9	13121 ASSY CAM 2.5IN ADJUSTABLE	1
10	15712 SCREW TORX #15 M4-.7 X 10 INSERT HOLDER	2

PRODUCT DESCRIPTION

The FF-2500 is an attachment used in conjunction with the Pipe Bevel Machine PBM-2500. Its function is to face both the raised face and bolt hole surface of a flange while clamping to the pipe's inner diameter. The current PBM-2500 model uses a pneumatic powered motor. An optional electric motor is available upon request.

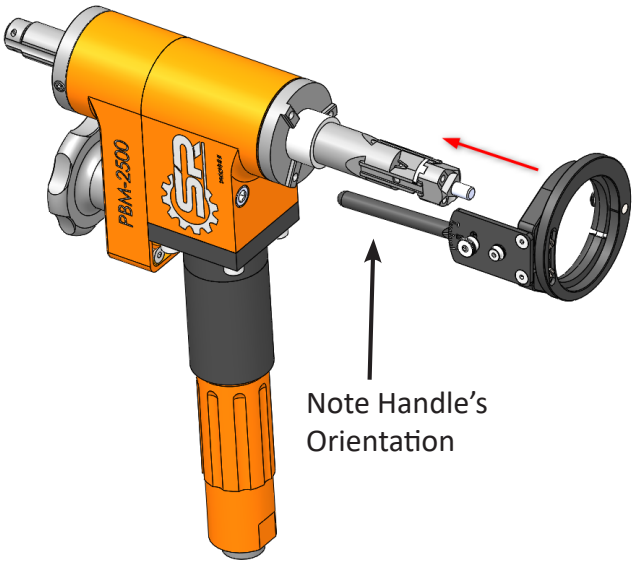
The FF-2500 is capable of facing flanges while meeting all existing conventional codes including the more stringent nuclear codes.

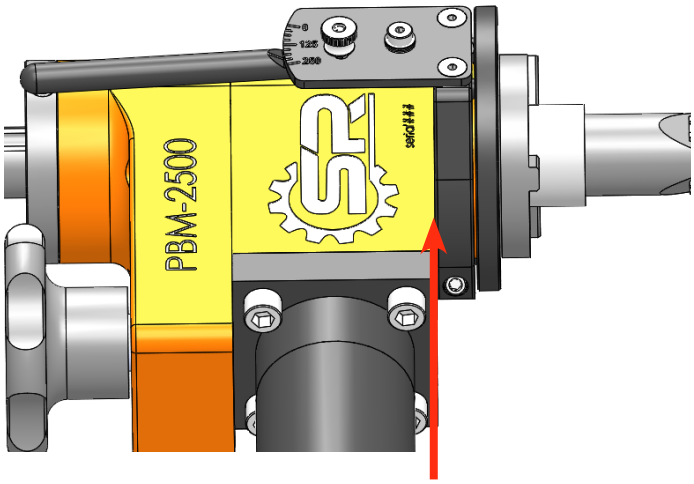
The standard FF-2500 package includes:

- Flange Facing Main Body Assembly
- Custom carrying case
- Adjustable Cam Assembly
- Tool Bits – 5 DPMT Inserts
  Coating: PVD-AlTiN-coated grade with a tough, ultra-fine-grain unalloyed substrate.
  Application: For general-purpose machining of most steels, stainless steels, high-temp alloys, titanium, irons, and non-ferrous materials. Speeds may vary from low to medium and will handle interruptions and high feed rates.
- Allen keys T-handle: .3125" (5/16")
- Operating manual
- 'Hi' Range Tool Holder and screw
- 'Low' Range Tool Holder and screw
- Screw Driver Torx #15

INITIAL SET-UP

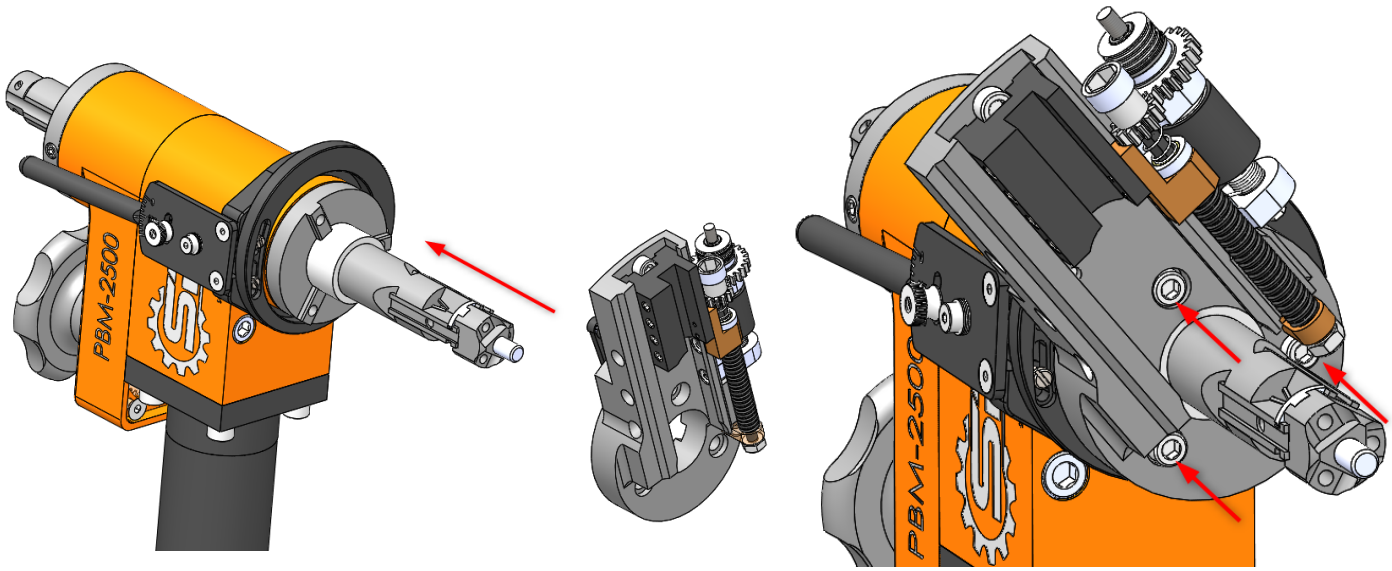
1. Install Adjustable Cam Assembly to the PBM Body as shown.



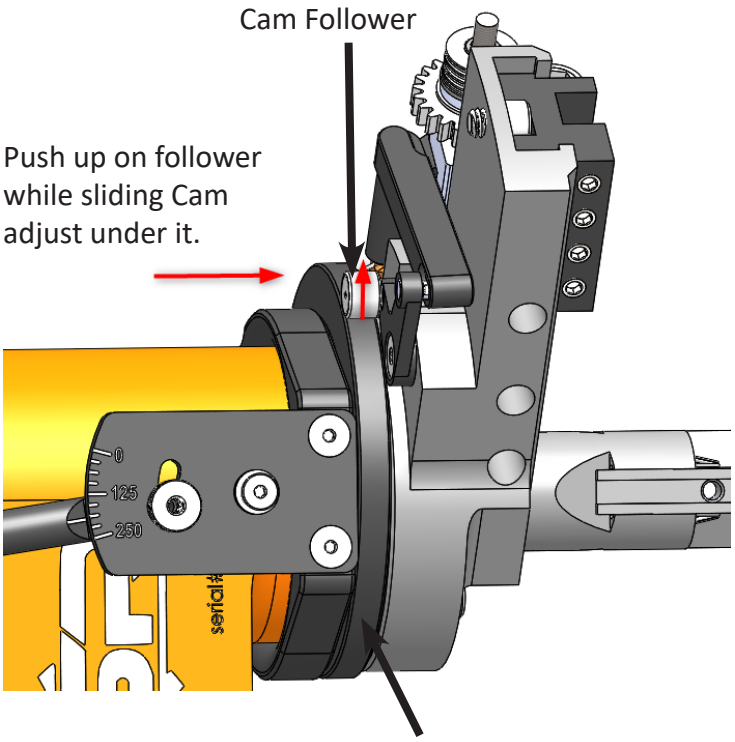


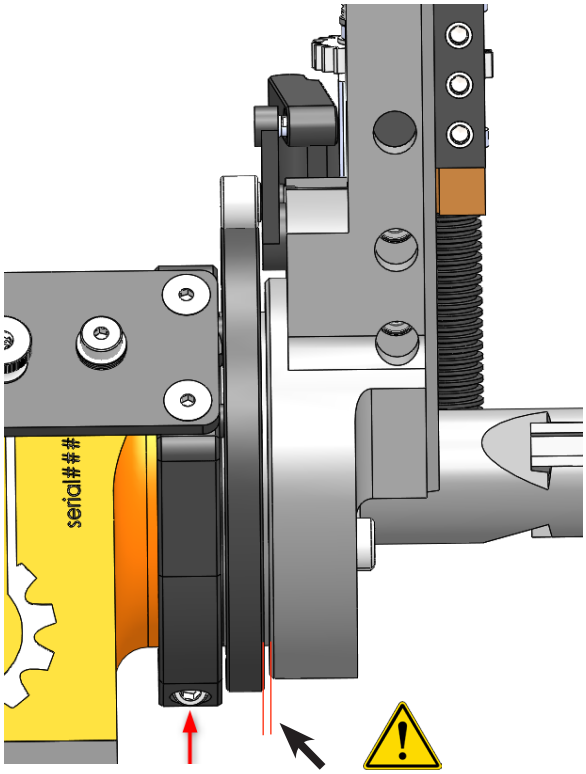
Fully seat Cam Assembly against PBM body; do not tighten screw yet.

2. Insert Flange Facer Main Body Assembly on the PBM unit as follows and secure with 3 Screws.

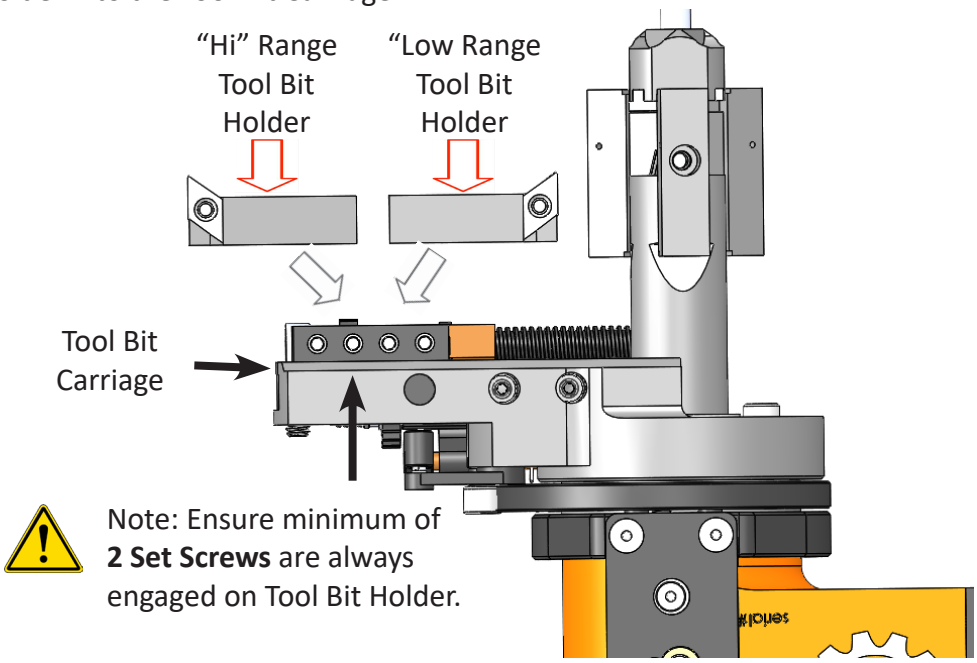


3. Once the Flange Facer Main Body has been installed, push the Cam Adjust towards the Flange Facer while lifting the follower up, allowing the follower to run on the Cam Adjust Wheel as shown below:





4. Select the correct Tool Bit Holder for the desired range to face from the following table and load the Tool Bit Holder into the Tool Bit Carriage:

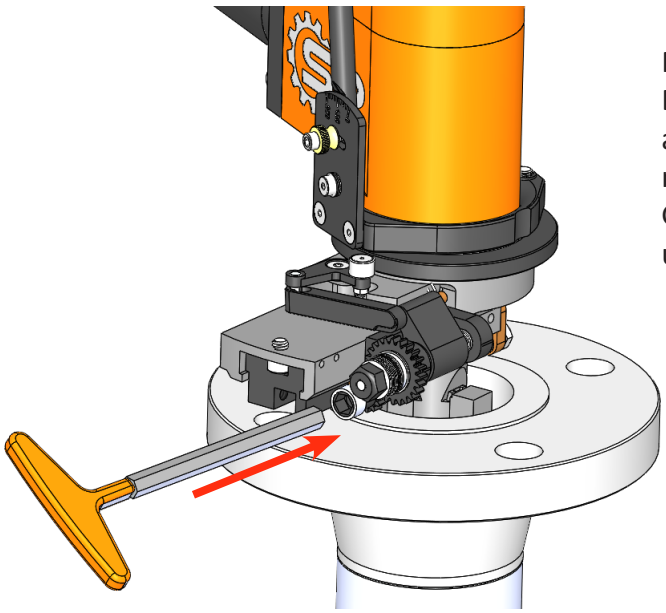


			Flange Class																		
I.D. Diameter Nominal	Seal Surface Diameter		150			300, 400, 600			400			600			900			1500			2500		
0.5	1.375	Low	3.5	2.13	Low	3.75	2.375	Low	3.75	2.375	Low	3.75	2.375	Low	4.75	3.375	Low	4.75	3.375	Low	5.25	3.875	Hi
0.75	1.688	Low	3.875	2.19	Low	4.625	2.937	Low	4.625	2.937	Low	4.625	2.937	Low	5.125	3.437	Low	5.125	3.437	Low	5.5	3.812	Hi
1	2.000	Low	4.25	2.25	Low	4.875	2.875	Low	4.875	2.875	Low	4.875	2.875	Low	5.875	3.875	Hi	5.875	3.875	Hi	6.25	4.250	Hi
1.25	2.500	Low	4.625	2.13	Low	5.25	2.750	Hi	5.25	2.750	Hi	5.25	2.750	Hi	6.25	3.750	Hi	6.25	3.750	Hi	7.25	4.750	Hi
1.5	2.875	Low	5	2.13	Low	6.125	3.250	Hi	6.125	3.250	Hi	6.125	3.250	Hi	7	4.125	Hi	7	4.125	Hi	8	5.125	Hi
2	3.625	Low	6	2.38	Hi	6.5	2.875	Hi	6.5	2.875	Hi	6.5	2.875	Hi	8.5	4.875	Hi	8.5	4.875	Hi	9.25		
2.5	4.125	Low	7	2.88	Hi	7.5	3.375	Hi	7.5	3.375	Hi	7.5	3.375	Hi	9.625			9.625			10.5		
3	5.000	Low	7.5	2.5	Hi	8.25	3.250	Hi	8.25	3.250	Hi	8.25	3.250	Hi	9.5			10.5			12		
3.5	5.500	Hi	8.5	3	Hi	9			9			9											
4	6.188	Hi	9			10			10			10.75			11.5			12.25			14		

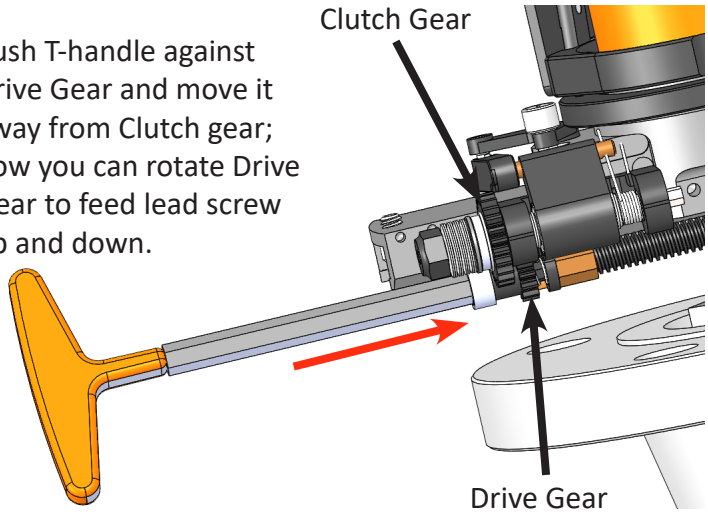
This table shows Flange dimensions including:
- Raised Face Diameters
- Outer Diameters of Flanges for given class
- Correct Tool Bit Range 'Hi' or 'Low' bits to best per form cutting operation for a given range to complete with one range.

5. Install correct size pad for clamping range (see PBM-2500 document for chart) and tighten the PBM to the pipe as per operating manual.

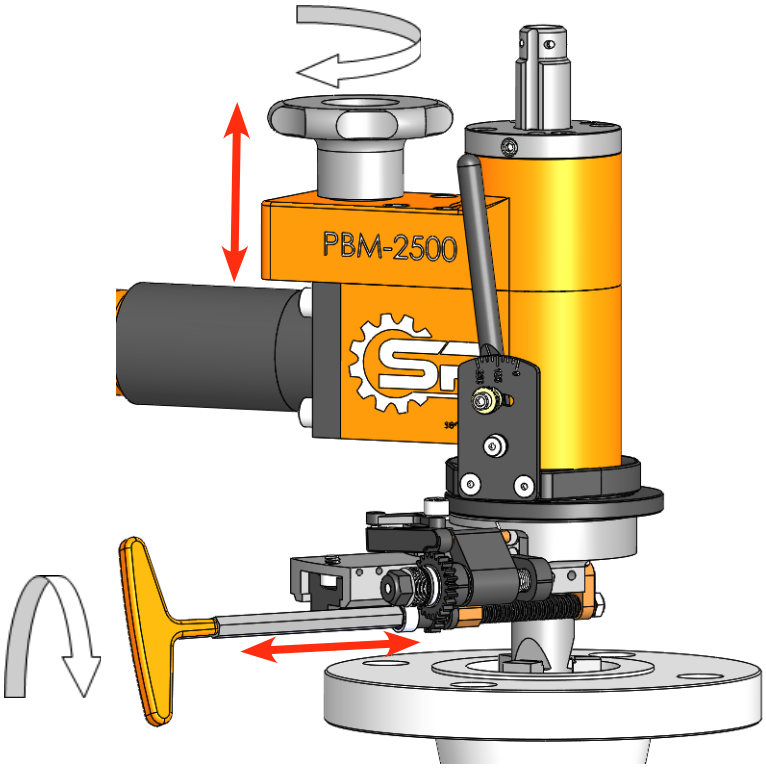
   Once the PBM has been fastened to the pipe/flange, insert the T-Handle into the Drive Gear as shown and press it down until it moves away from the Clutch Gear. Turn the T-Handle to feed lead screw up or down.



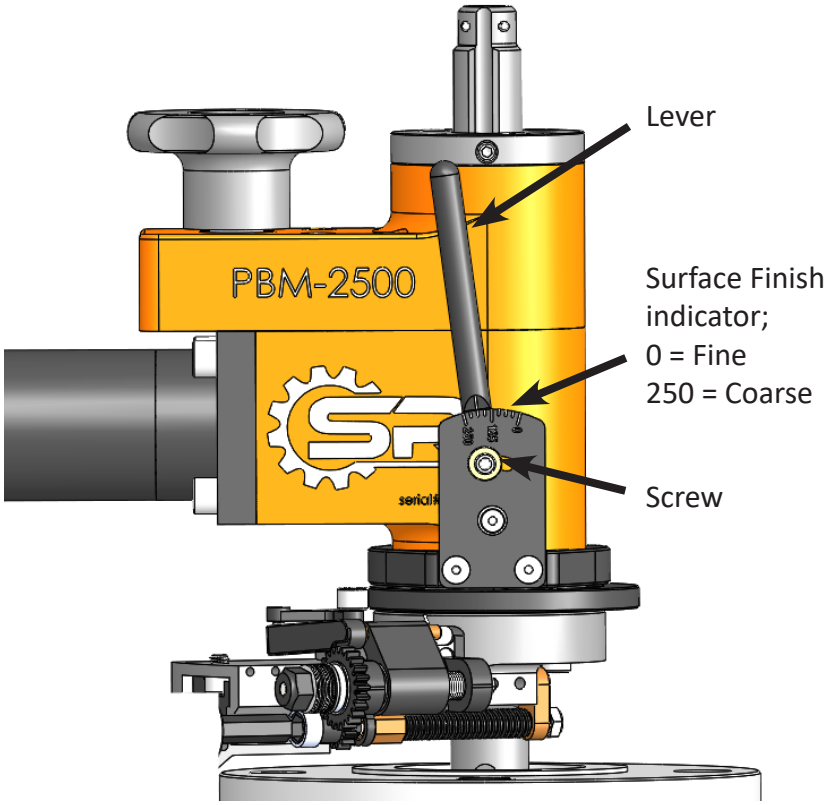
Push T-handle against Drive Gear and move it away from Clutch gear; now you can rotate Drive Gear to feed lead screw up and down.



6. To position the tool, use the Vertical Feed Knob and the T-Handle to feed the tool in both axial and radial directions, manually position the cutting tip over the desired area of the flange to be faced:



7. Once tool is positioned correctly on work piece, set the desired surface finish by loosening Lever Screw and setting to desired finish, then tighten screw.



8. Remove all adjustment/install tools from the PBM and Flange Facer, now you are ready to take a cut; connect the air hose wipe to the PBM's air motor, when all tools/obstructions are clear of the PBM unit, depress and hold Air Motor Trigger to feed out flange facer and face desired flange:

NOTE: Never lean on or put pressure on handle; this will cause inconsistent cutting of the flange.

Air Connection

NOTE: Ensure all tools and obstructions are clear of PBM and Flange Facer before running machine

MACHINE OPERATION

TOOL BIT INSERT SELECTION:

The Flange Facer Kit contains 5 tool bit inserts. These inserts are the following type:

- DPMT 325 2LF KC5025
- The inserts offer good cutting conditions for most material types expect for hard alloys.
- Cutting radius is: .032”

For customer supplied inserts, please use DPMT type; this type will fit in the Tool Bit Holders supplied.

CUTTING CONDITIONS:

The following will give an indication of the machining conditions for a given material:

Flange Material Type:
(The below are recommendations only, DOC is also dependent on the Surface Finish selected.)

Carbon Steel (A105N) Flange:
Depth of cut:

- .030” Max
- .020” Optimal Cutting DOC
- .010” Recommended for Bolt Hole Circle or Interrupted Cutting

Stainless Steel (304) Flange:
Depth of cut:

- .020” Max
- .010” Optimal Cutting DOC
- .005” Recommended for Bolt Hole Circle or Interrupted Cutting

ERNiCu-7 (Monel) Clad A105N Flange:
Depth of cut:

- .020” Max
- .010” Optimal Cutting DOC
- .005” Recommended for Bolt Hole Circle or Interrupted Cutting

VIBRATION REDUCTION TECHNIQUES:

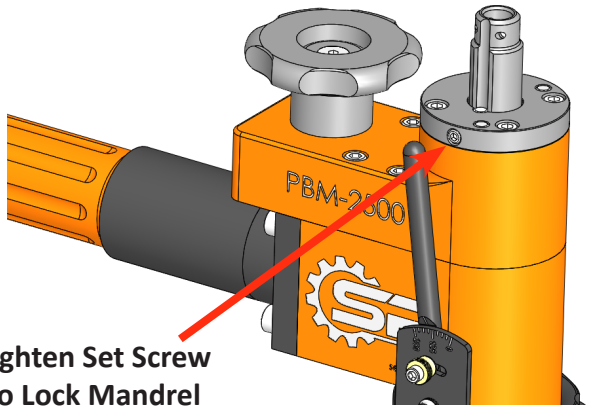
If excessive vibration occurs, the following techniques can be used to reduce or eliminate vibration.

1. Lubrication: Adding cutting fluid to workpiece can greatly reduce vibrations and improve surface conditions. If cutting fluid such as oil-based coolant is not permitted, misting water on the workpiece will help with vibration reduction.

2. Reducing Depth of Cut: In almost all situations, reducing the depth of cut will reduce vibration. *Tip for facing: take a heavier 'rough' cut, disregarding surface finish or cutting chatter marks, down close to required depth, then take a light 'finish' cut to get the desired surface finish and face out any chatter marks.*

3. Reducing the Surface Finish: Using a finer (lower) surface finish will reduce the chip load on the tool bit and allow for greater depth of cut without excessive vibration.

4. Locking of the Mandrel Dowel Pin: Once the Flange Facer is set up and operator is ready to take a cut, the Mandrel Dowel Pin can be tightened to improve rigidity.

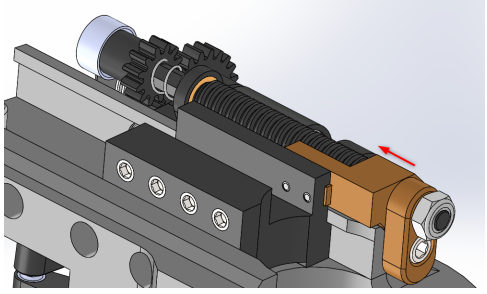


Tighten Set Screw to Lock Mandrel

Note: by tightening the Dowel Pin the Mandrel will be locked for axial feeding and must be loosened to feed axially.

TROUBLESHOOTING:

1. **Unit will not feed -** Possible reasons for unit not feeding:
   - Feed nut is jammed against end stop: when manually feeding the nut back down the screw, do not drive it into the end stop, otherwise the pre-loaded nut will not feed. To correct, back feed nut off of stop slightly:



2. **Unit is feeding/cutting slowly** - Possible reasons for slow feed:
   - Depth of cut is too large and the cutter needs to do a clean up pass before stepping into next cut. To correct, make a lighter depth of cut.

MAINTENANCE

GENERAL MACHINE MAINTENANCE
During heavy operation, use a brush regularly to clean chips away from the machine and clamping mandrel assembly between each use. This is especially important around the mandrel feed nut and threads. Thoroughly clean the machine after use. Dirt and grit can severely shorten the life of the machine. Do not spray anything into the electric motor body.

THREAD INSPECTION
Inspect all visible thread areas for excessive wear. Parts that have worn threads should be replaced before damage to the mating thread assemblies occurs.

PROPER HANDLING
Do not drop, hit, or otherwise abuse your pipe beveling machine or flange facer. This equipment is designed as a portable machining assembly, and as such, is not designed to withstand excessive abuse. Care for your equipment will increase your utilization, the life of the machine, and minimize your repair cost.

TOOL BITS
Remember that tool bits (cutting tools) in good condition perform better. Do not try to use dull tool bits or force the tool bits into the work piece. If excessive back pressure exists, if the tool bits seem to be tearing rather than cutting, or if the chips begin to turn blue or brown, replace your cutting tool bits right away. When possible, leave unused tool bits in their packages to prevent them from being damaged. Please store tool bits that have been removed from their original package in a safe place.

WARRANTY

Superior Plant Rentals, LLC (SPR) warrants that the equipment manufactured by it will: (i) conform to SPR's written specifications and descriptions, and (ii) be free from substantial defects in design, materials, and workmanship for a period of one year from date of shipment to the original buyer, or six months from date of placing in service by buyer, whichever date is earlier.

During this period, if any equipment is proved to SPR's satisfaction to be defective, SPR will, at our sole and absolute discretion, and as SPR's sole warranty liability and buyer's sole remedy, repair, replace, or credit buyer's account for any equipment that fails to conform to the warranties, provided that: (i) SPR is notified in writing within 10 days following discovery of such failure with a detailed explanation of any alleged deficiencies; (ii) SPR is given a reasonable opportunity to investigate all claims; and (iii) SPR's examination of such equipment confirms the alleged deficiencies and that the deficiencies were not caused by accident, misuse, neglect, improper use, unauthorized alteration, repair, or improper testing.

Shipping cost of the alleged defective equipment to SPR is to buyer's account. However, if SPR agrees that the equipment is defective, then pursuant to this warranty, SPR will reimburse buyer its shipping cost to return the equipment to SPR.

The warranty against defects does not apply to: (1) consumable components or ordinary wear items, and (2) use of the equipment with equipment, components, or parts not specified or supplied by SPR or contemplated under the equipment documentation.

The following actions will void the one-year warranty:

1. Repairs or attempted repairs have been made by persons other than SPR personnel, or authorized service repair personnel;

2. Repairs are required because of normal wear;

3. The tool has been abused or involved in an accident;

4. There is evidence is misuse, such as overloading of the tool beyond its rated capacity, use after partial failure, or use with improper accessories.

5. Damage to the motor due to lack of oiler/mister while tool was in use (pending motor type).

NO OTHER WARRANTY IS VALID

SUPERIOR

Beaumont, TX | Benicia, CA | Campbell River, BC
Corpus Christi, TX | Edmonton, AB | Gonzales, LA | Houston, TX
Moss Point, MS | Rancho Dominguez, CA | Rock Hill, SC | Toronto, ON | Webster, TX