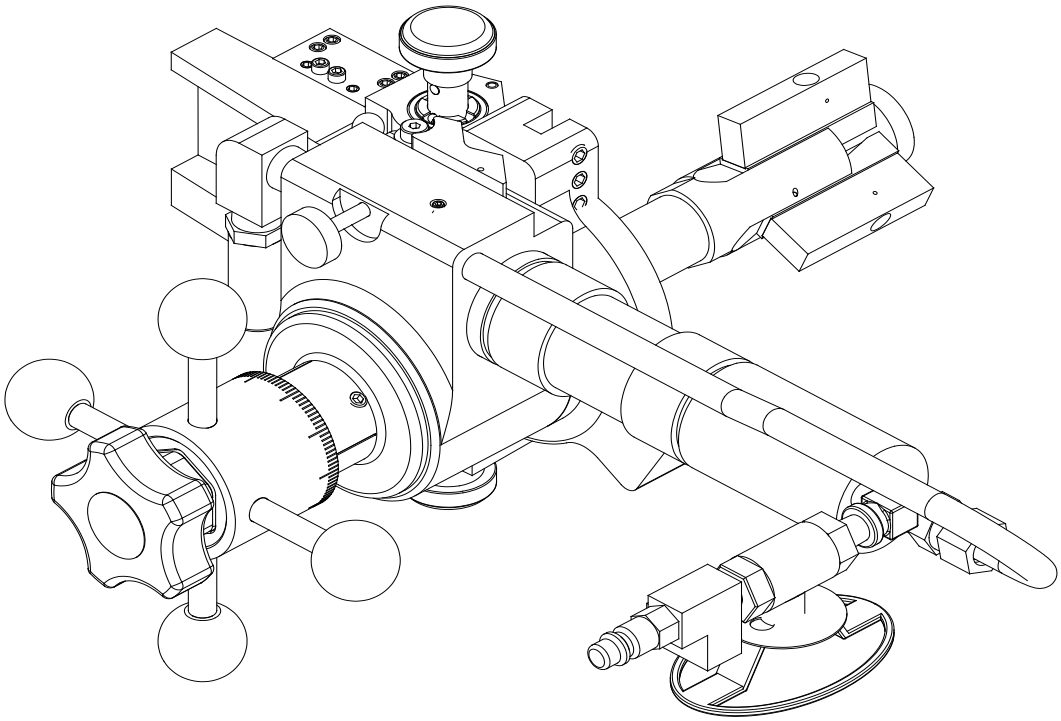
CE

# FF3000

## FLANGE FACER

## OPERATING MANUAL

ORIGINAL INSTRUCTIONS



CLIMAX
Portable Machining & Welding Systems

P/N 35426
October 2023
Revision 4

CLIMAX | BORTECH CALDER H&S TOOL

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- Your name
- Shipping address
- Telephone number
- Machine model
- Serial number (if applicable)
- Date of purchase

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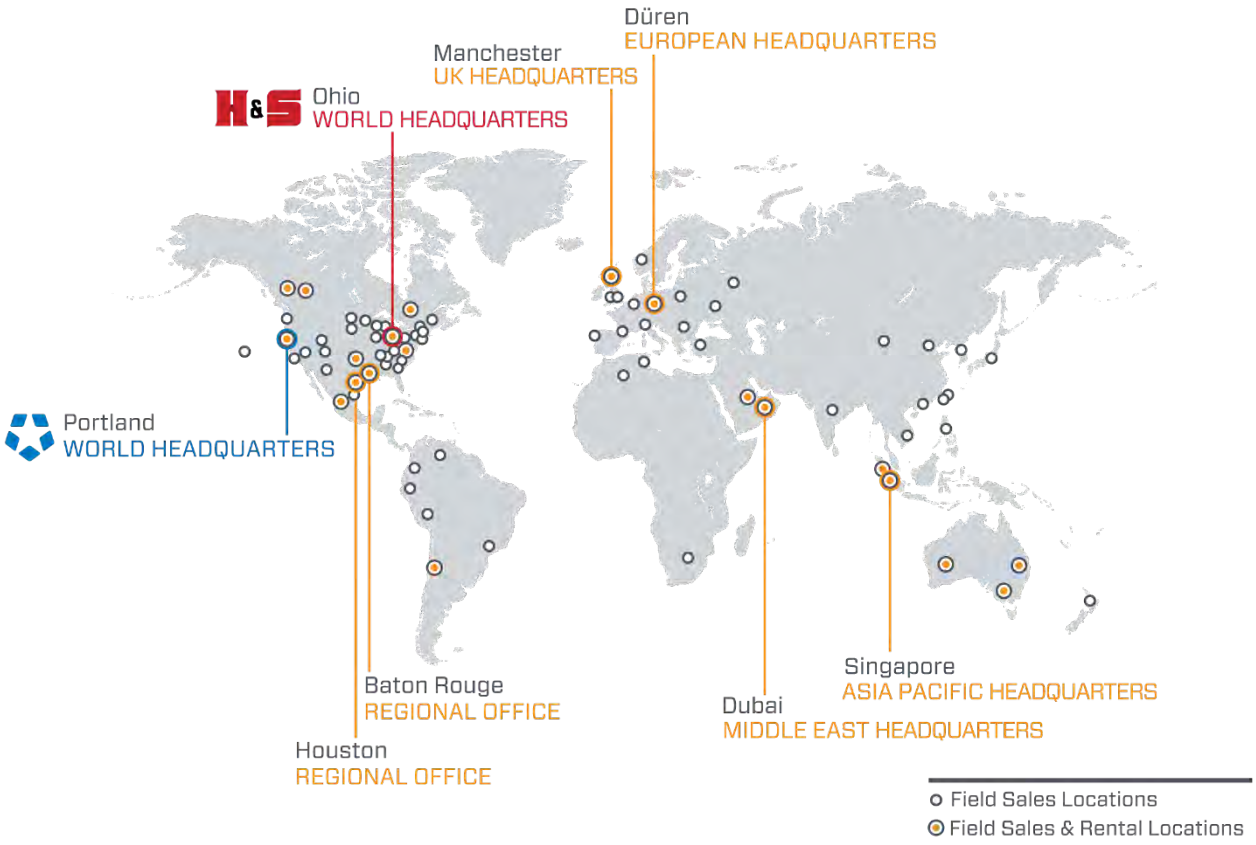
# CLIMAX GLOBAL LOCATIONS



# LIMITED WARRANTY

CLIMAX Portable Machine Tools, Inc. (hereafter referred to as “CLIMAX”) warrants that all new machines are free from defects in materials and workmanship. This warranty is available to the original purchaser for a period of one year after delivery. If the original purchaser finds any defect in materials or workmanship within the warranty period, the original purchaser should contact its factory representative and return the entire machine, shipping prepaid, to the factory. CLIMAX will, at its option, either repair or replace the defective machine at no charge and will return the machine with shipping prepaid.

CLIMAX warrants that all parts are free from defects in materials and workmanship, and that all labor has been performed properly. This warranty is available to the customer purchasing parts or labor for a period of 90 days after delivery of the part or repaired machine or 180 days on used machines and components. If the customer purchasing parts or labor finds any defect in materials or workmanship within the warranty period, the purchaser should contact its factory representative and return the part or repaired machine, shipping pre- paid, to the factory. CLIMAX will, at its option, either repair or replace the defective part and/ or correct any defect in the labor performed, both at no charge, and return the part or repaired machine shipping prepaid.

These warranties do not apply to the following:

- Damage after the date of shipment not caused by defects in materials or workmanship
- Damage caused by improper or inadequate machine maintenance
- Damage caused by unauthorized machine modification or repair
- Damage caused by machine abuse
- Damage caused by using the machine beyond its rated capacity

All other warranties, express or implied, including without limitation the warranties of merchantability and fitness for a particular purpose are disclaimed and excluded.

### *Terms of sale*

Be sure to review the terms of sale which appear on the reverse side of your invoice. These terms control and limit your rights with respect to the goods purchased from CLIMAX.

### *About this manual*

CLIMAX provides the contents of this manual in good faith as a guideline to the operator. CLIMAX cannot guarantee that the information contained in this manual is correct for applications other than the application described in this manual. Product specifications are subject to change without notice.

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**Table of Contents**

# Contents

# Sound levels and labels

| | |
|---|---|
| Recommended air pressure: | 90 psi **(DO NOT EXCEED 120 psi)** |
| Noise level: | 89 dB(A) – Hearing protection required |
| Sound Power Level: | 88.8 dB(A) (Pneumatic) |
| Operator Sound Pressure Level: | 86.0 dB(A) (Pneumatic) |
| Bystander Sound Pressure Level: | 83.4 dB(A) (Pneumatic) |

## Labels on the Machine

<table>
<tr>
<td> 

P/N 29154 – CE serial plate</td>
<td> 
P/N 46902 – hot surface</td>
</tr>
<tr>
<td> 
P/N 59042 – danger of hand crush</td>
<td> 
P/N 59044 – read the operating manual</td>
</tr>
<tr>
<td> 
P/N 78742 – danger of rotating parts</td>
<td> 
P/N 81008 – wear ear and eye protection</td>
</tr>
<tr>
<td> 

P/N 91217 – mass plate</td>
<td></td>
</tr>
</table>

# Safety Guidelines

The primary challenge for most on-site maintenance is that repairs are often done under difficult conditions.

CLIMAX leads the way in promoting the safe use of portable machine tools. Safety is a joint effort. As the operator of this machine, you are expected to do your part by scrutinizing the job site and closely following the operating procedures outlined in this manual, your own company rules, and local regulations. Save all warnings and instructions for future reference.

## WARNING

**For maximum safety and performance, read and understand this entire manual and all other related warnings and safety instructions before using this equipment. Failure to follow the warnings, instructions and guidelines in this manual could cause personal injury, fatalities, electric shock, fire and/or property damage.**

### QUALIFIED PERSONNEL!

Before operating this machine, you must receive training specific to this machine from a qualified trainer. If you are not familiar with the proper and safe operation, do not use the machine.

### OBEY WARNING LABELS!

Obey all warnings and warning labels. Failure to follow instructions or heed warnings could result in injury, or even be fatal. Proper care is your responsibility. Contact CLIMAX immediately for replacement of damaged or lost manuals or safety decals.

### INTENDED USE

Only use the machine according to the instructions in this operating manual. Do not use this machine for any purpose other than the intended use as described in this manual. When using the tools, machine, accessories and/or tool bits, you must determine the proper working conditions and the work to be performed.

### STAY CLEAR OF MOVING PARTS!

Keep clear of the machine during operation. Never lean toward or reach into the machine to remove chips or to adjust the machine while it is running. Keep bystanders away while operating this machinery.

### ROTATING MACHINERY

Rotating machinery can seriously injure an operator. Lock out all power sources before you interact with the machine.

### KEEP YOUR WORK AREA CLEAN AND TIDY!

Keep all cords and hoses away from moving parts during operation. Do not clutter the area around the machine. Keep the work area clean and well lit.

### AMBIENT LIGHTING

Do not operate this machine in ambient lighting that is less than normal intensity.

### SECURE LOOSE CLOTHING AND LONG HAIR!

Rotating machinery can seriously injure an operator as well as others close by. Don't wear loose fitting clothing or jewelry. Tie back long hair or wear a hat.

### HAZARDOUS ENVIRONMENTS

Do not use the machine in a hazardous environment, such as near explosive chemicals, flammable liquids, gasses, toxic fumes, or inappropriate radiation hazards.

### HOSES, PENDANT AND ELECTRICAL CABLES

Do not abuse the pendant cable as this can damage the cable and pedant. Never use the cord for carrying, pulling or unplugging. Remove any and all kinks before straightening the cable. Keep cords and hoses away from heat, oil, sharp edges or moving parts. Plugs must match the outlet. Never modify the plugs in any way. Do not use an adapter plug with grounded power tools. Do not expose the machine to rain or wet conditions. Always examine hoses and cables for damage before use. Be cautious and never drop electrical equipment, this will damage the components.

### REPETITIVE MOTION

Individuals can be susceptible to disorders of the hands and arms when exposed to tasks that involve highly repetitive motions and/or vibration.

### STAY ALERT

Stay alert, watch what you are doing and use common sense when operating machinery. Do not operate machinery while you are tired or under the influence of drugs, alcohol or medication

# Machine Specific Safety

All aspects of the machine have been designed with safety in mind. Rotating parts are not always shielded by machine components or by the workpiece. Do not force the machine.

### PERSONAL PROTECTIVE EQUIPMENT

Eye and hearing protection must be worn while using the machine. These safety items do not impose constraints to the safe operation of the machine.

### OPERATING CONDITIONS

Do not operate the machine if it is not mounted to the work-piece as described in this manual.

### TOOLING

The machine is provided with all the tools for the setup and operation of the machine. Remove all adjustment tools before starting the machine.

### LIFTING

Most of the machine components are heavy and must be moved or lifted with approved rigging and practices. CLIMAX accepts no responsibility for the selection of lifting equipment. Always follow your plant's procedures for lifting heavy objects. Do not lift heavy objects by yourself as serious injury can result.

### CUTTING TOOLS AND FLUIDS

There are no cutting or cooling fluids supplied with this machine. Keep cutting tools sharp and clean.

### CONTROLS

The machine controls are designed to withstand the rigors of normal use and external factors. The on-off switches are clearly visible and identifiable. If hydraulic power supply failure occurs, be sure to turn off the supply before leaving the machine.

### DANGER ZONE

The operator and other persons can be anywhere in the vicinity of the machine. The operator must ensure there are no other persons in danger from the machine.

### METAL FRAGMENT HAZARD

The machine produces metallic fragments during normal operation. You should wear eye protection at all times when working with the machine. Only remove fragments with a brush after the machine has stopped completely.

### HAZARDOUS ENVIRONMENTS

Do not use the machine in a hazardous environment, such as near explosive chemicals, toxic fumes, or a radiation hazard.

### RADIATION HAZARDS

There are no systems or components on this machine that are capable of producing hazardous EMC, UV or other radiation hazards. The machine does not use lasers nor does it create hazardous materials such as gasses or dust.

### ADJUSTMENTS AND MAINTENANCE

All adjustments, lubrication and maintenance should be done with the machine stopped, and locked out from all power sources. The shut-off valves should be locked and tagged out before performing any maintenance. Do not operate the machine if moving parts are misaligned, binding or broken. If the machine or parts are damaged, have the machine repaired before use.

### WARNING LABELS

Warning labels are already attached to your machine. Contact CLIMAX immediately if replacements are required.

### MAINTENANCE

Be sure the machine components are free of debris and properly lubricated prior to use. Have your machine serviced by a qualified repair person using only identical replacement parts

### NOISE LEVEL

89 dB(A) – Hearing Protection is required

### STORED ENERGY

Hydraulic fluids could still be under pressure! Make sure the HPU is shut off and locked out properly.

### SDS

Safety Data Sheets are included in the maintenance manual.

### UNINTENTIONAL STARTING

Prevent unintentional starting. The machine must be properly locked out and/or shut down before maintenance.

# Labeling Guidelines

The purpose of product safety signs and labels is to increase the level of awareness to possible dangers.

Safety Alert Symbols indicate DANGER, WARNING or CAUTION. These symbols may be used in conjunction with other symbols or pictographs. Failure to obey safety warnings can result in serious injury. Always follow safety precautions to reduce the risk of hazards and serious injury.

**DANGER**

**Indicates a hazardous situation that could be fatal or cause serious injury.**

**WARNING**

**Indicates a potentially hazardous situation that could be fatal or cause serious injury.**

**CAUTION**

**Indicates a potentially hazardous situation that could result in minor to moderate injury, damage to the machine or interruption of an important process.**

**IMPORTANT**

**Provides critical information for the completion of a task. There is no associated hazard to people or the machine.**

**TIP**

**Provides important information regarding the machine.**

## Risk assessment and hazard mitigation

Machine Tools are specifically designed to perform precise material-removal operations.

Stationary Machine Tools include lathes and milling machines and are typically found in a machine shop. They are mounted in a fixed location during operation and are considered to be a complete, self-contained machine. Stationary Machine Tools achieve the rigidity needed to accomplish material-removal operations from the structure that is an integral part of the machine tool.

In contrast, Portable Machine Tools are designed for on-site machining applications. They typically attach directly to the workpiece itself, or to an adjacent structure, and achieve their rigidity from the structure to which it is attached. The design intent is that the Portable Machine Tool and the structure attached to it become one complete machine during the material-removal process.

To achieve the intended results and to promote safety, the operator must understand and follow the design intent, set-up, and operation practices that are unique to Portable Machine Tools.

The operator must perform an overall review and on-site risk assessment of the intended application. Due to the unique nature of portable machining applications, identifying one or more hazards that must be addressed is typical.

When performing the on-site risk assessment, it is important to consider the Portable Machine Tool and the workpiece as a whole.

## Risk assessment checklist

Use these checklists as part of your on-site risk assessment and include any additional considerations that may pertain to your specific application.

TABLE 1. RISK ASSESSMENT CHECKLIST BEFORE SET-UP

| Before Set-up | |
|---|---|
| ☐ | I took note of all the warning labels on the machine. |
| ☐ | I removed or mitigated all identified risks (such as tripping, cutting, crushing, entanglement, shearing, or falling objects). |
| ☐ | I considered the need for personnel safety guarding and installed any necessary guards. |
| ☐ | I read the Machine Assembly instructions and took inventory of all the items required but not supplied. |
| ☐ | I created a lift plan, including identifying the proper rigging, for each of the setup lifts required during the setup of the support structure and machine. |
| ☐ | I located the fall paths involved in lifting and rigging operations. I have taken precautions to keep workers away from the identified fall path. |
| ☐ | I considered how this machine operates and the best placement for the controls, cabling, and the operator. |
| ☐ | I evaluated and mitigated any other potential risks specific to my work area. |

TABLE 2. RISK ASSESSMENT CHECKLIST AFTER SET-UP

| After Set-up | |
|---|---|
| ☐ | I checked that the machine is safely installed and the potential fall path is clear. If the machine is elevated, I checked that the machine is safeguarded against falling. |
| ☐ | I identified all possible pinch points, such as those caused by rotating parts, and informed the affected personnel. |
| ☐ | I planned for containment of any chips or swarf produced by the machine. |
| | I followed the Maintenance Intervals with the recommended lubricants. |
| ☐ | I checked that all affected personnel have the recommended personal protective equipment, as well as any equipment required by the site or other regulations. |
| ☐ | I checked that all affected personnel understand the danger zone and are clear of it. |
| ☐ | I evaluated and mitigated any other potential risks specific to my work area. |

## Controls

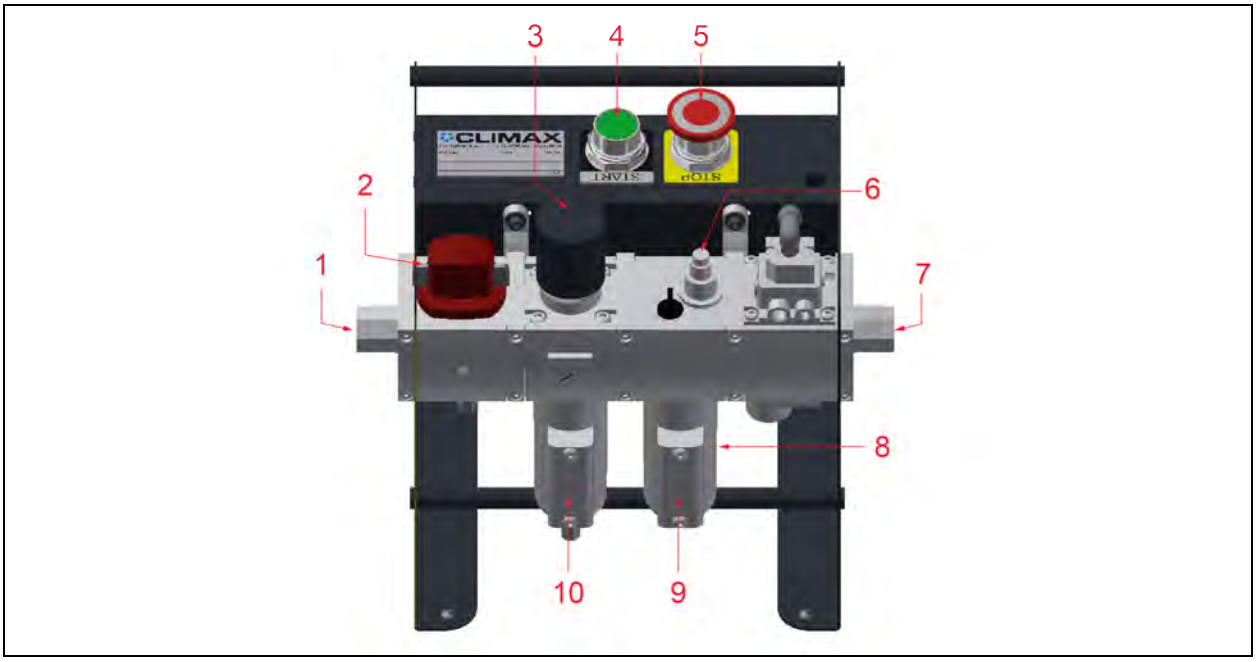



**Figure 1. Pneumatic conditioning unit**

**Table 3. Pneumatic conditioning unit functions**

| Number | Component | Function |
|---|---|---|
| 1 | Inlet Connection | Connects the PCU to the operator's compressed air source. |
| 2 | Air supply lock-out | Isolates air pressure from the machine and provides the ability to lock the valve closed before performing maintenance. |
| 3 | Regulator | Controls the air pressure supplied to the machine. The regulator is preset at the factory and does not require adjustment. |
| 4 | Start (system reset) | Resets the low-pressure dropout. |
| 5 | Emergency stop | Isolates the supply air and vents the downstream air. Press down to stop the machine; pull up to reset. |
| 6 | Oil drip rate dial | Controls the air lubricator drip rate. |
| 7 | Outlet Connection | Supplies the air to the machine. |
| 8 | Oil reservoir | Holds lubricating oil for the machine air motor. |
| 9 | Oil reservoir sight glass | Shows the oil level in the reservoir. |
| 10 | Filter | Removes foreign particulates from the air supply and protects the downstream valves and motor. |

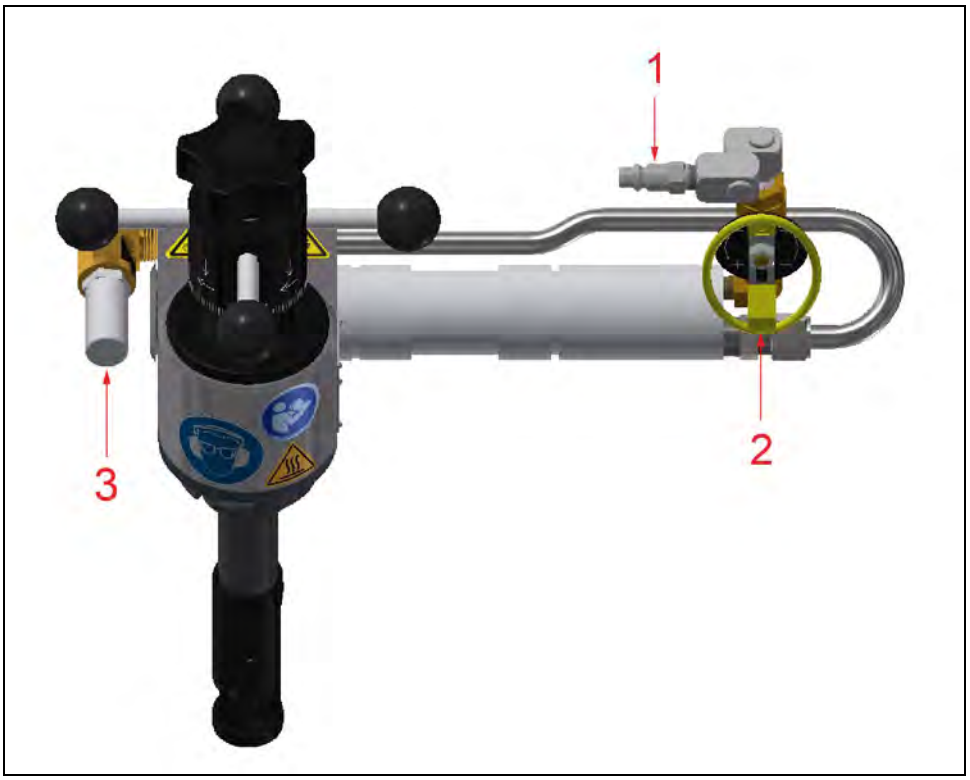



**Figure 2. FF3000 control components**

**Table 4. FF3000 controls identification**

| Number | Component | Function |
|---|---|---|
| 1 | Inlet Connection | Connects the FF3000 to the PCU. |
| 2 | Speed Adjustment Valve | Controls the machine's rate of rotation and is located on the exhaust of the pneumatic assembly. |
| 3 | Exhaust Muffler | Outlet for the air motor exhaust. |

## Machine Lock-Out

| | WARNING |
|---|---|
| ⚠ | **Always stop the machine and lock-out/tag-out the pneumatic unit (PCU) before making adjustments to controls or machine components. Failure to follow this safety precaution may result in severe injury.** |

### Emergency shutdown

To stop machine operation immediately, press the emergency stop button on the PCU.

Before restarting the FF3000, do the following:

1. Check that the area around the machine swing area is free from loose tools, obstructions or personnel.
2. Close the speed adjustment valve.
3. Pull the emergency stop button up.
4. Press the start button (repeat step 1 if necessary).

The FF3000 controls are located on the PCU, shown in Figure 1 on page 12, and on the motor, shown in Figure 2 on page 13.

The ball valve mounted to the motor is used to throttle the air flow to adjust the machine speed.

| | WARNING |
|---|---|
|  | **Always stop the machine using the e-stop button on the PCU. This removes all pressure from the FF3000 drive motor.** |

The air plumbing includes an exhaust muffler to reduce the noise level and also to trap oil mist in the motor exhaust.

| | WARNING |
|---|---|
|  | **The motor can operate unexpectedly when the air hose is connected. Close the valve to the pneumatic motor before connecting the air hose.** |

# Introduction

The Model FF3000 is a right-angled machining tool designed for facing flanges from 1.85 to 12.0 inches diameter (47 to 304.80 mm). It is also for beveling, squaring, counter boring, and cutting welding prep configurations on tube and pipe. It weighs 45 lb (21 kg).

An internal, expanding clamping chuck grips inside diameters from 1.50 to 6.75 inches (38.10 to 171.45 mm) with interchangeable jaw sets.

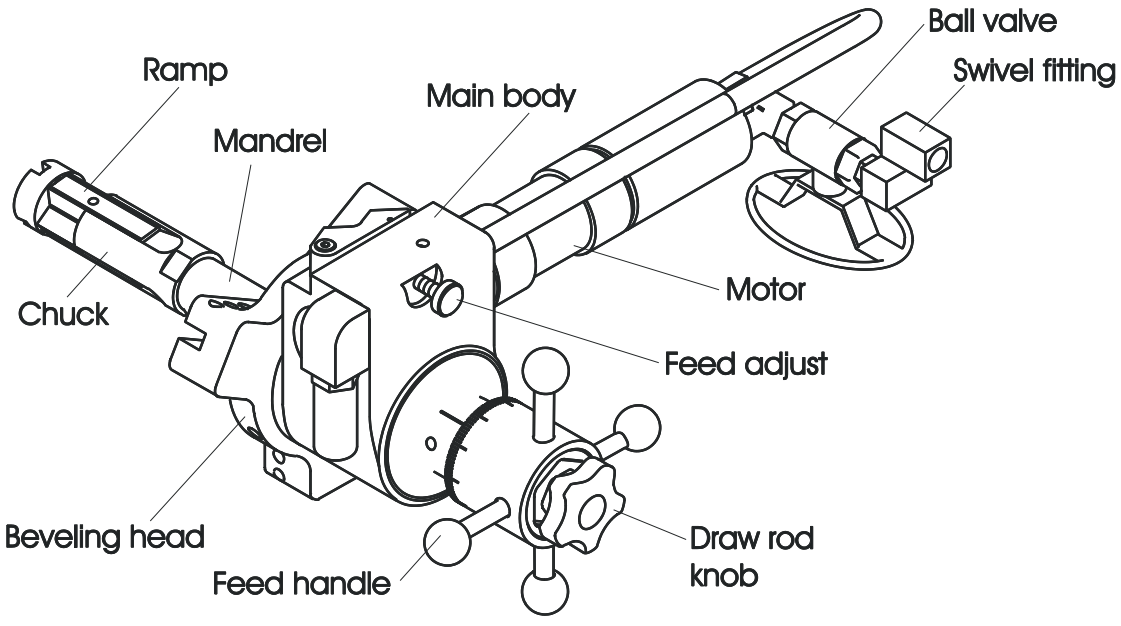
The basic facing package includes:

- Machine with air motor, pneumatic conditioner, and facing head
- 12 sets of clamp blades (3 blades/set) for bores 1.5" to 6.75" diameter (38.10 to 171.45 mm)
- Tool kit and operating manual
- Two facing bits, one roughing and one finishing
- Heavy duty plastic container for storage and shipping

The basic beveling package includes:

- FF3000 machine with air motor, pneumatic conditioner, and beveling head
- 12 sets of clamp blades (3 blades/set) for bores 1.5" to 6.75" diameter (38.10 to 171.45 mm)
- Tool kit and operating manual
- One facing bit, beveling bit, and counter bore bit
- Heavy duty plastic container for storage and shipping

Observe the instructions in this Operating Manual and preserve the integrity of the machine by not modifying it in any manner.



## About this manual

**WARNING**

Working machinery can cause serious injury. Understand all instructions before operating this machine.

This manual describes how to use your Model FF3000 flange facing/pipe beveling machine. All parts meet CLIMAX's strict quality standards. For maximum safety and performance, read the entire instruction manual before operating the machine.

## Check the machine when you receive it

Inspect the machine for shipping damage. Be sure you received the parts listed on the invoice. Contact CLIMAX immediately if there are any errors or questions regarding this machine.

## Recommended tools

Below is a list of tools that you should have on hand before you start using this machine. Although CLIMAX includes a general tool kit for basic operation, you will need to bring to the job all other tools necessary for your specific application and setup.

CLIMAX portable machines are designed to get your repair jobs done safely, quickly, and accurately. Preparation prior to setup can be as important as the actual machining operation. Know your application and what you will need to do it safely, quickly, and accurately.

### Basic hand tools

Refer to the FF3000 tool kit.

### Precision instruments

In most cases, these machines can be setup using basic measuring devices such as a steel rule or tape measure. In cases where precision machining and alignment is required, these additional items may be useful:

- Dial/digital slide calipers
- ID spring and/or dial calipers
- Precision level
- Micrometers
- Dial indicator

# Machine Setup

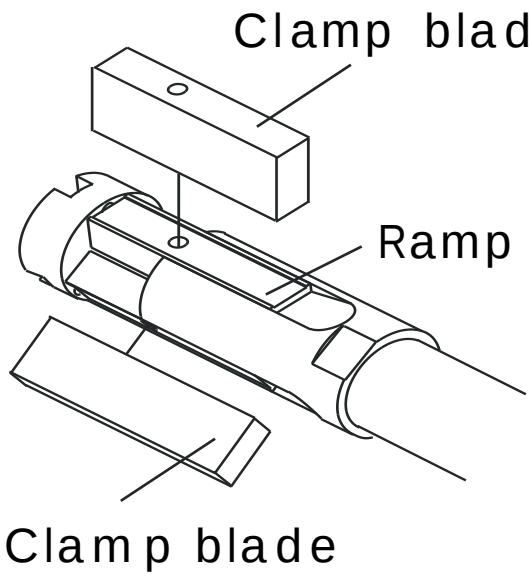
| | WARNING |
|---|---|
| | Avoid bodily injury from working machinery. Turn off and disconnect the air supply hose before machine setup. |

## Assemble and install tool head

Make sure the ramps in the clamping chuck are fully retracted before sliding a tool head over them. Install a tool head (beveling or facing), with the arrow-side facing away from the main body. Align the bayonet pins in the facing head with the slots on the body. Push and turn to lock. A strike with a dead blow hammer in the opposite direction of the arrow on the tool head ensures proper seating of the tool head.

## Selecting and setting clamp blades

1. Measure the inside diameter of the piece to be machined. This measurement is important for correct sizing and selection of the clamping blades.
2. No clamp blades are used for inside diameters (IDs) between 1.5” and 1.94”.
3. Clamp blades are marked with their size. Select the proper set of clamp blades from the following table:




| Clamp blade set selection | |
|---|---|
| **Bore diameter ID (mm)** | **Part number (set of 3)** |
| 1.5 – 1.94 (38 – 49) | NONE |
| 1.94 - 2.35 (48 - 60) | 35702 |
| 2.30 - 2.76 (58 - 70) | 35703 |
| 2.71 - 3.17 (69 - 81) | 35704 |
| 3.12 - 3.58 (79 - 91) | 35705 |
| 3.53 - 3.99 (90 - 101) | 35706 |
| 3.94 - 4.40 (100 - 112) | 35707 |
| 4.35 - 4.81 (110 - 122) | 35708 |
| 4.76 - 5.22 (121 - 133) | 35709 |
| 5.17 - 5.63 (131 - 143) | 35710 |
| 5.58 - 6.04 (142 - 152) | 35711 |
| 5.99 - 6.45 (152 - 164) | 35712 |
| 6.40 - 6.81 (163 - 173) | 35713 |

**TIP**

Dirt, burrs, and grease inside the work piece may prevent the clamp blades from mounting properly.

4. Install the correct clamp blade set on the ID clamping chuck ramps, being sure all blades are the same size and are secure and properly seated.
5. Lightly oil the draw rod and ramps in the chuck.

## Selecting and setting tool bits

### Facing head

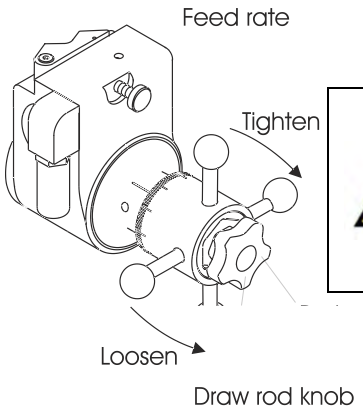
1. Select the correct bit and slip it into the tool head. Secure it by tightening the setscrews.
2. For production jobs, set and test the settings on a test flange.

### Beveling head

1. Select the bit or combination of bits the job requires and slip them into the tool head. Be sure to place bits in a position where they will cut the entire area required.
2. Depending upon the required bevel configuration, bits must be installed in a set order. Boring bits first, facing or squaring bits next, and O.D. or j-groove bits last.
3. With each bit in position, tighten the setscrews securely.
4. When a land is required on the work piece, use a facing bit in combination with the beveling bit. The FF3000 beveling head can plunge cut, but does not feed in a radial direction.

   The width of the land can be controlled by adjusting the position of the beveling bit or by using a bit with a greater or lesser overall height.
5. When a specific ID bevel is required, set and test the ID bit to ensure correct sizing. Cut the ID portion of the bevel first.
6. For production jobs, set and verify the bit settings on a test piece of tube or pipe.

## Mount the machine in the work piece




1. Turn the draw rod star-shaped knob counterclockwise, drawing the clamp blades back inward.

| | CAUTION |
|---|---|
| | **To prevent damaging the clamp blades when cutting, be sure the machine is mounted far enough inside the work piece to clear the cutters.** |

2. Put the machine in the pipe/tube end, and turn the draw rod knob clockwise to spread out the clamp blades in the bore.
3. To center and secure the machine in the tube/pipe, gently work the tool back and forth while tightening the draw rod knob (clockwise).

| | CAUTION |
|---|---|
| | Machine is NOT securely clamped until draw rod knob is pushed into the feed handle and turned for final tightening. |

Machine is NOT securely clamped until draw rod knob is pushed into the feed handle and turned for final tightening.

4. For final tightening, push the draw rod knob into the feed handle and use the added leverage to tighten the chuck.

## Power connection

| | WARNING |
|---|---|
| | To prevent serious injury from moving machinery during setup or adjustment, use quick disconnects provided between the air supply line and the ball valve. Close and lock out air valve before connecting the air supply line to the motor. |

The air filter and lubricator supplied with the machine must be used or the warranty is void. The lubricator should be set to deliver oil at a rate of 15-20 drops per minute.

| | CAUTION |
|---|---|
| | To prevent damage to the machine, use the filter and lubricator provided. |

1. Close and lock out the air valve.
2. Connect the air supply to the pneumatic conditioning unit (see Figure 1 on page 12). Check that the air supply line is at least 3/8".
3. Check that the ball valve is turned off. The ball valve is closed when the handle is perpendicular to the air line.
4. Connect the air supply line from the pneumatic conditioning unit to the machine using quick disconnect fittings.

## Starting and stopping the machine

The FF3000 has a .79 hp air motor and a ball valve. Adjust the motor speed by opening or closing the ball valve.

**TIP**

Air line connections should be made with nonrestrictive air line fittings.

### Starting the machine

**WARNING**

To prevent serious injury from moving machinery, secure the machine to the work piece before connecting the air supply.

Open the lockout valve on the PCU and reset the e-stop button. Press the start button to pressurize the outlet of the PCU.

Slowly open the ball valve. The ball valve is fully open when the handle is in line with the air line. Adjust the ball valve to achieve the desired tool-head speed.

### Stopping the machine

Close the ball valve and disconnect the air supply line.

### Feeding the machine

This machine travels axially along its mandrel to engage the tool bit with the work piece. To move the tool head toward the work piece turn the feed handles clockwise. To feed away from the work piece turn the feed handles counterclockwise.

A notable feature of the CLIMAX FF3000 Flange Facer includes a feed mechanism with both left-hand and right-hand screw threads. While providing a more compact feed system, this innovative design effectively doubles the length of travel for the tool head.

When feeding the tool head away from the work piece use caution to prevent the nut barrel from coming in contact with the main housing. The barrel has left hand threads. To move the barrel away from the housing turn the feed handles in the direction of the arrows engraved on the side of the nut barrel (clockwise).

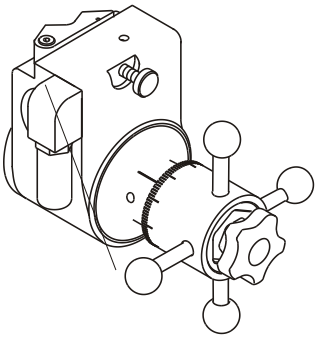
# Operation

## Pre-start checks

| | WARNING |
|---|---|
| | To prevent serious bodily injury from moving machinery, turn off and disconnect the air line before performing pre-start checks |

1. Check that tool bits are sharp.
2. Check that all moving parts move freely.
3. Fill the air lubricator with air oil. Use an air oil that has antioxidants and rust inhibitors such as Mobil ALMO525. The lubricator should deliver oil at a rate of 15-20 drops per minute.
4. Drain all liquid and remove all dirt from the air filter.
5. Close the ball valve.
6. Check that the in-line air pressure is 90 psi (620 kPa).

## Facing

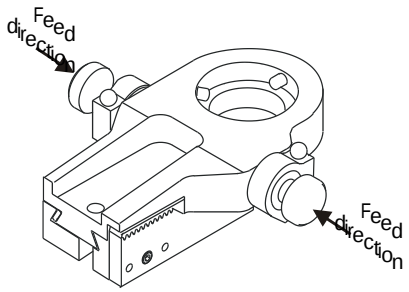



| | WARNING |
|---|---|
| | For protection from flying chips and excessive noise, wear eye and ear protection while operating the machine. |

1. Check that the air is off.
2. Check that the tool is firmly clamped in.
3. Position the facing head cutting depth using the feed handle. Lightly tighten the three setscrews under the feed handle to stabilize the mandrel, reducing the chance of chatter. Tightening these screws locks the facing head axial positioning.

### Facing feed direction

The facing head feeds automatically in either direction. It uses a set of internal one-way clutches to drive a pinion feed shaft along the rack. After pushing the feed shaft in on one side or the other,




Facing head

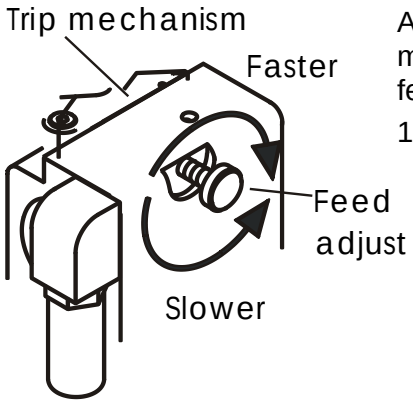
the machine will feed in the direction of the arrow engraved on the side of the head. Be sure the feed shaft engagement pins engage fully.

To feed outward from the chuck, push in the feed shaft on the side of the facing head with the arrow pointing out.

To feed toward the chuck, push in the feed shaft on the side of the facing head with the arrow pointing in.

| | **TIP** |
|---|---|
| | Provides important information regarding the machine. When both shaft pins are out of their detent slots, the feed system is in NEUTRAL. It can be hand fed in either direction. |

## Facing feed rate




Adjust the feed with the small round knob located near the trip mechanism. Clockwise feeds the tool faster. Counterclockwise feeds the tool slower.

1. Continue feeding the tool head into the work piece until you begin cutting. Add a small amount of cutting oil as cutting proceeds.

| | **CAUTION** |
|---|---|
| | Do not stop the air motor while the tool is cutting the work piece. |

2. Once you have the surface you want, back the tool head assembly away from the work piece, using the feed handles.
3. Close the ball valve to stop the machine.

## Beveling

**WARNING**

To prevent serious bodily injury from working machinery, turn off and disconnect power before disconnecting the machine.

1. Disconnect the air supply hose.
2. Remove any clamp blades and turn the draw rod knob counterclockwise, to retract the ramps in the clamping chuck.
3. Remove the facing head, if necessary. Striking it with a dead blow hammer in the direction of the engraved arrow loosens the bayonet lock. Twist and pull the part from the mandrel.
4. Install the beveling head, arrow side away from the main body. Align the bayonet pins in the beveling head with the slots on the body. Push and turn to lock. A strike with a dead blow hammer in the opposite direction of the arrow ensures proper seating of the tool head.
5. Change chuck blades if required.

**CAUTION**

To prevent damaging the clamp blades when cutting, be sure the machine is mounted far enough inside the work piece to clear the cutters.

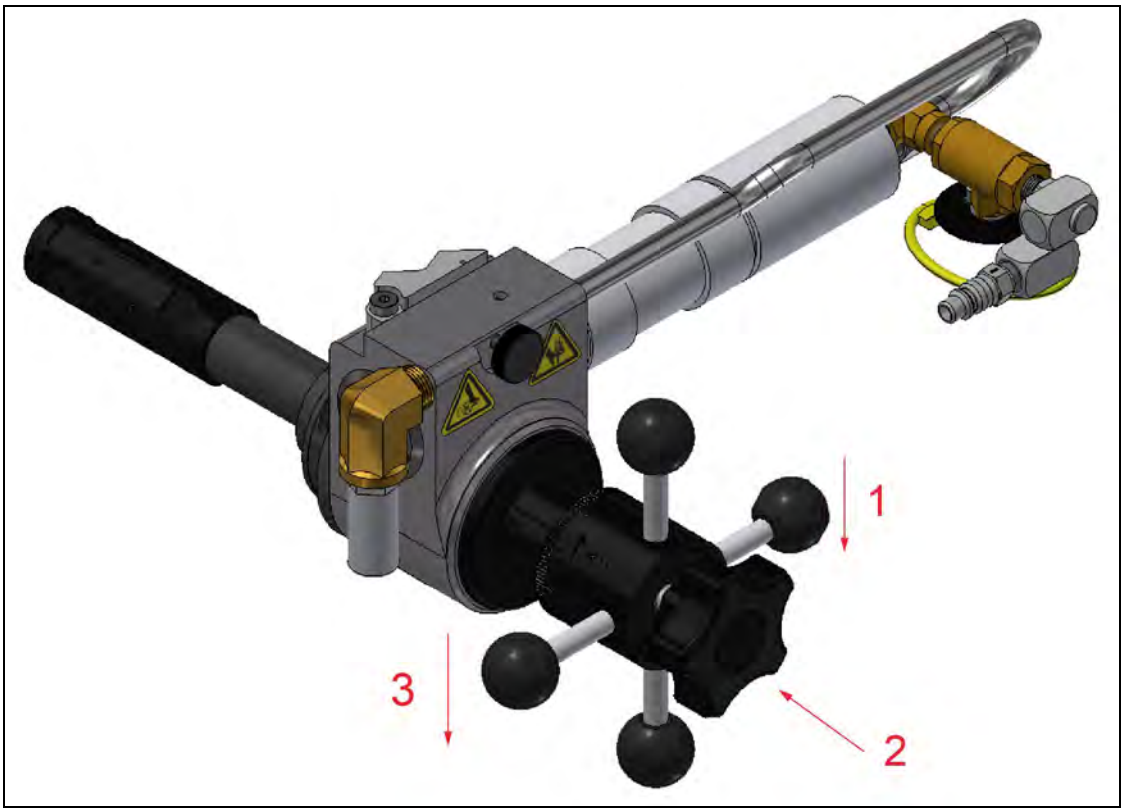



**Figure 3. FF3000 functions**

Note that the numbers in Table 5 are not meant as procedural steps to be followed in order from 1-4, but only to identify the parts and actions shown in Figure 3.

**Table 5. FF3000 control functions**

| Number | Function |
|---|---|
| 1 | Rotate the feed handle clockwise to tighten the clamp chuck. |
| 2 | Push the draw knob in to engage with feed handle for final tightening and loosening of clamp chuck. |
| 3 | Rotate the feed handle counter-clockwise to loosen the clamp chuck. |

6. Install the machine in the pipe/tube end and turn the draw rod knob clockwise to spread the clamp blades inside the bore.
7. To center and secure the machine in the tube/pipe, gently work the tool back and forth while tightening the draw rod knob (clockwise).
8. For final tightening, push the draw rod knob into the feed handle and use the added leverage to tighten the chuck.

9. Cutter vibration or chatter may be influenced by tightening the mandrel gib with the three set-screws under the feed handle. Over tightening these screws will make it difficult to turn the feed handles.

| | **TIP** |
|---|---|
|  | The gib screws are preset at the factory. Field adjustments may be required over time.<br><br>When adjusting the gib, the screws should be snug, but not too tight. When adjusted properly, the tool head moves smoothly along the slide but does not feel loose.<br><br>Check by manually feeding the tool head from end to end, looking for areas that are too loose, or too tight. Adjust accordingly. |

# Disassembly

**WARNING**

To prevent serious bodily injury from moving machinery, turn off and disconnect the power supply before disconnecting the machine.

1. Press the E-stop button on the PCU to release air pressure in the system.
2. Disconnect the air supply hose.
3. Back off the tool head so the tool bits clear the work piece by 1/4" to 1/2".
4. Loosen the draw rod knob by turning it counterclockwise and gently rock the tool to loosen the clamping chuck. Remove the machine from the work piece.

# Maintenance

## Recommended lubricants

| LUBRICANT | BRAND | WHERE USED |
|---|---|---|
| Light oil | WD-40 | Unpainted surfaces |
| Cutting oil | UNOCAL KOOLKUT | Tool bits, work piece |
| Lubricating oil | AW32 Hydraulic oil or similar | Lubricator oil cup |

**CAUTION**

Use only specified type lubricants.

- Between each use, clean chips and grit from the clamping chuck assembly, especially the chuck feed nut and threads. Dirt and grit can severely shorten the life of the tool.
- Check the machine housing for heat buildup during operation. If the temperature on the housing goes over 150°F (very hot to the touch), allow the machine to cool before using again.
- Inspect all visible thread areas for undue wear. Threaded parts that show wear must be replaced before they damage the mating assemblies.
- Excessive gear wear can be evident as backlash at the tool head. Call CLIMAX for recommended action.

## Air motor and pneumatic conditioning unit

To sustain the life of the air motor:

- Route the incoming air through the lubricator and air filter.
- Use nonrestrictive air lines and fittings. Check the air system periodically to be sure the air pressure is 90 psi (620 kPa).
- Adjust the air motor torque by turning the ball valve.

**TIP**

DO NOT change motor speed by adjusting the in-line air pressure from 90 psi (620 kPa).

- Fill the air lubricator oil cup before using the machine. Use high-quality oil with rust inhibitors and emulsifiers such as AW32 Hydraulic oil or similar. Set the lubricator to deliver oil at a rate of 15-20 drops per minute.
- Drain the air filter before and after using the machine.

**CAUTION**

Avoid machine damage; never operate the machine without the air filter and lubricator.

- It is important that the chuck clamping mechanism and components remain free from dirt and corrosion.
- Do not drop, strike (except as directed in this manual), or otherwise abuse your FF3000 flange facing/pipe-beveling machine.
- Do not use dull tool bits or force-feed into the work piece. If excessive backpressure exists, and the tool bits seem to be tearing rather than cutting or chips turn blue or brown, replace the tool bits immediately.

# Troubleshooting

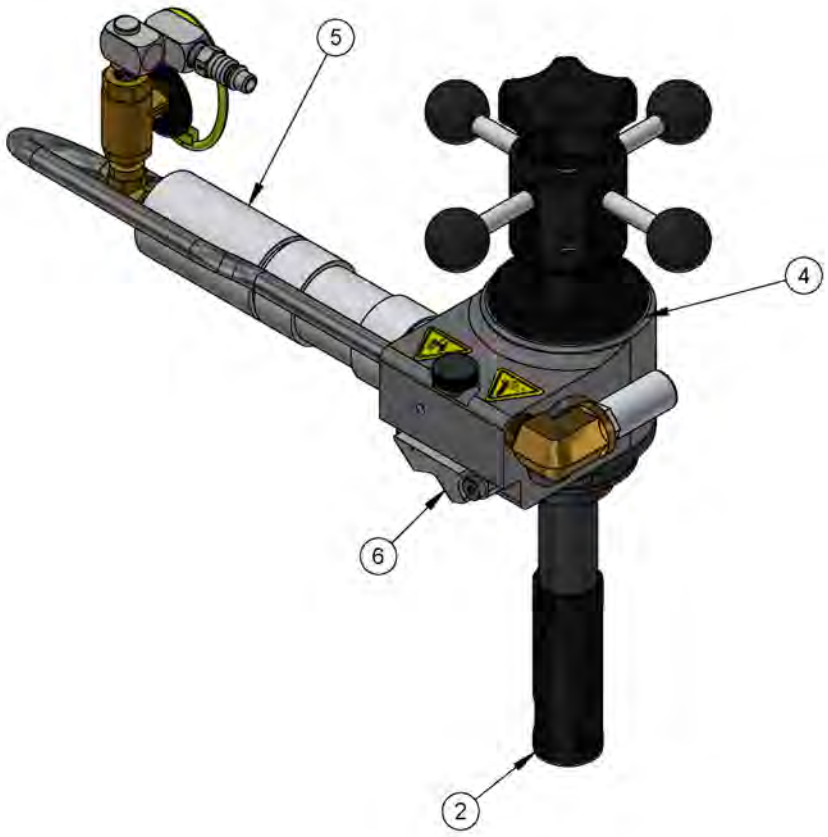
The FF3000 has few field serviceable parts. Contact the factory for any repairs or adjustments beyond those listed here.

| Symptom | Probable cause | Remedy |
|---|---|---|
| Machine is sluggish | Air supply limited or blocked | Be sure pressure is 90 psi (620 kPa), Check for crimped hoses or partially shut valves |
| | Lacks lubricant | Lubricate |
| | Air motor dragging | Check inline oil feed on pneumatic conditioning unit |
| | Worn air motor | Return to manufacturer for service |
| Machine makes unusual noise | Main shaft bearings in need of adjustment | Return to CLIMAX for repair |
| | Drive gears worn | |
| | Mandrel bushing is worn | |
| Beveling machine chatters while cutting | Dull or chipped tool bits | Replace tool bits |
| | Machine improperly mounted | Loosen draw nut and align machine with work piece. |
| | Feed rate too fast or uneven | Feed at a slow, steady rate |
| | Loose or mismatched clamping | Use matched sets of clamp blades; be sure the blades are fastened securely |
| | Worn chuck bearing | Replace bearing |
| | Front drive bearing worn or out of adjustment | Repair or adjust as needed. |
| | Mandrel gib set screws are loose | Adjust the three set screws under the feed handles |

# Exploded View Drawings and Parts Lists

**Table 6. Tool kit (P/N 35470)**

| Part Number | Description | Quantity |
|---|---|---|
| 35426 | MANUAL INSTRUCTION FF3000 | 1 |
| 35516 | HAMMER DEAD BLOW 1-3/4 DIA HEAD (KB) | 1 |
| 35827 | CASE ONE COMPARTMENT 8 X 4-1/8 X 1-3/16 | 1 |
| 35898 | WRENCH SET FOLD UP HEX 3MM -10MM 6 PCS CLIMAX LOGO | 1 |




| PARTS LIST | | | |
|---|---|---|---|
| ITEM | QTY | P/N: | DESCRIPTION |
| 1 | 1 | 34982 | (NOT SHOWN) CASE CARRYING COMPLETE FF3000 |
| 2 | 1 | 35428 | ASSY CHUCK HEAD FF3000 |
| 3 | 1 | 35470 | (NOT SHOWN) KIT TOOL FF3000 |
| 4 | 1 | 35686 | ASSY MAIN BODY FF3000 |
| 5 | 1 | 35687 | ASSY DRIVE PNEUMATIC FF3000 |
| 6 | 1 | 35730 | TRIP COMPONENTS FF3000 FACING HEAD |
| 7 | 1 | 36832 | (NOT SHOWN) CHUCK EXTENSION BLOCKS COMPLETE SET |

49592 - BASE UNIT MODEL FF3000 CONFIGURATOR - REV A

FOR REFERENCE ONLY

**Figure 4. FF3000 base unit assembly (P/N 49592)**

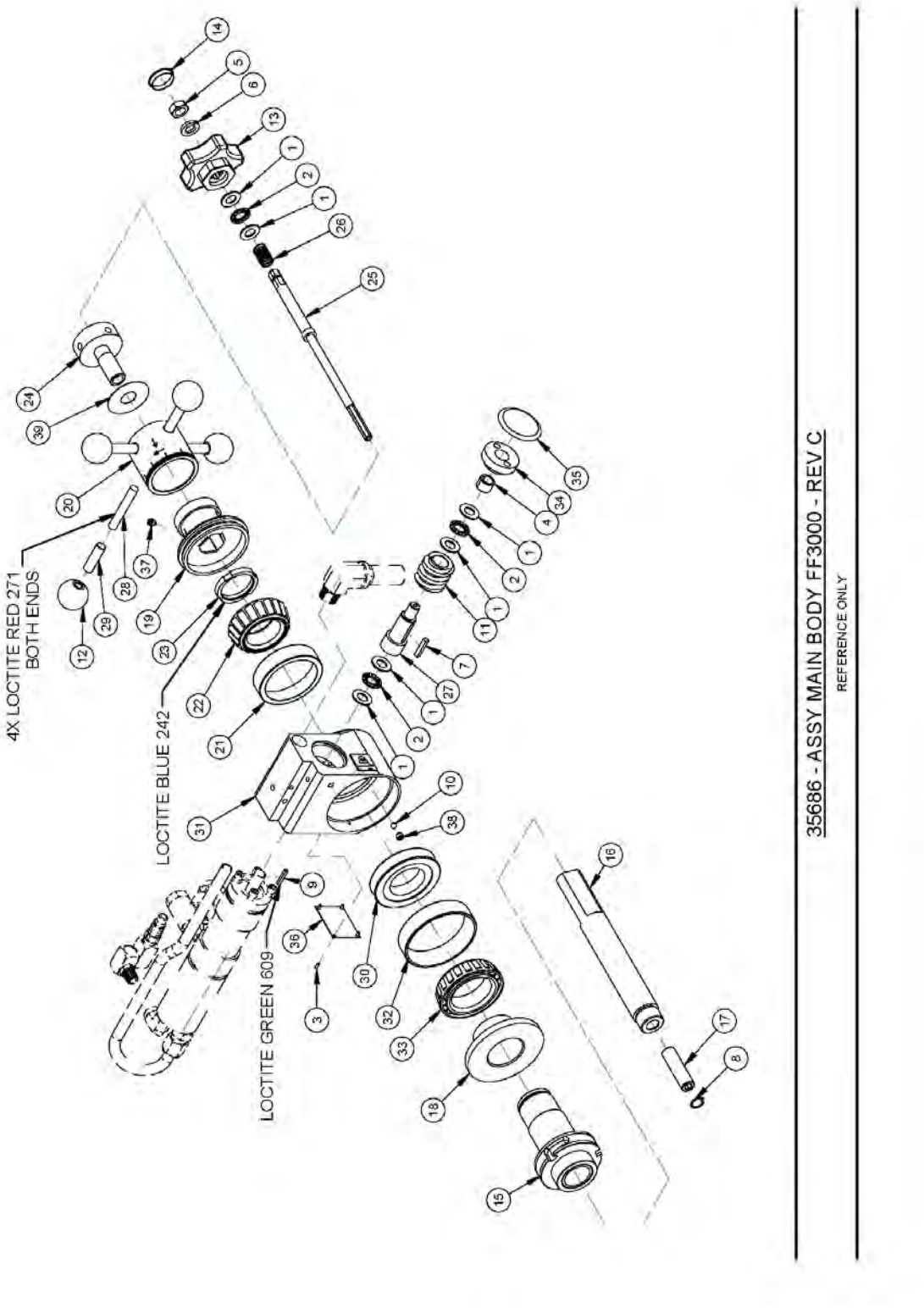



**Figure 5. FF3000 main body assembly 1 (P/N 35686)**

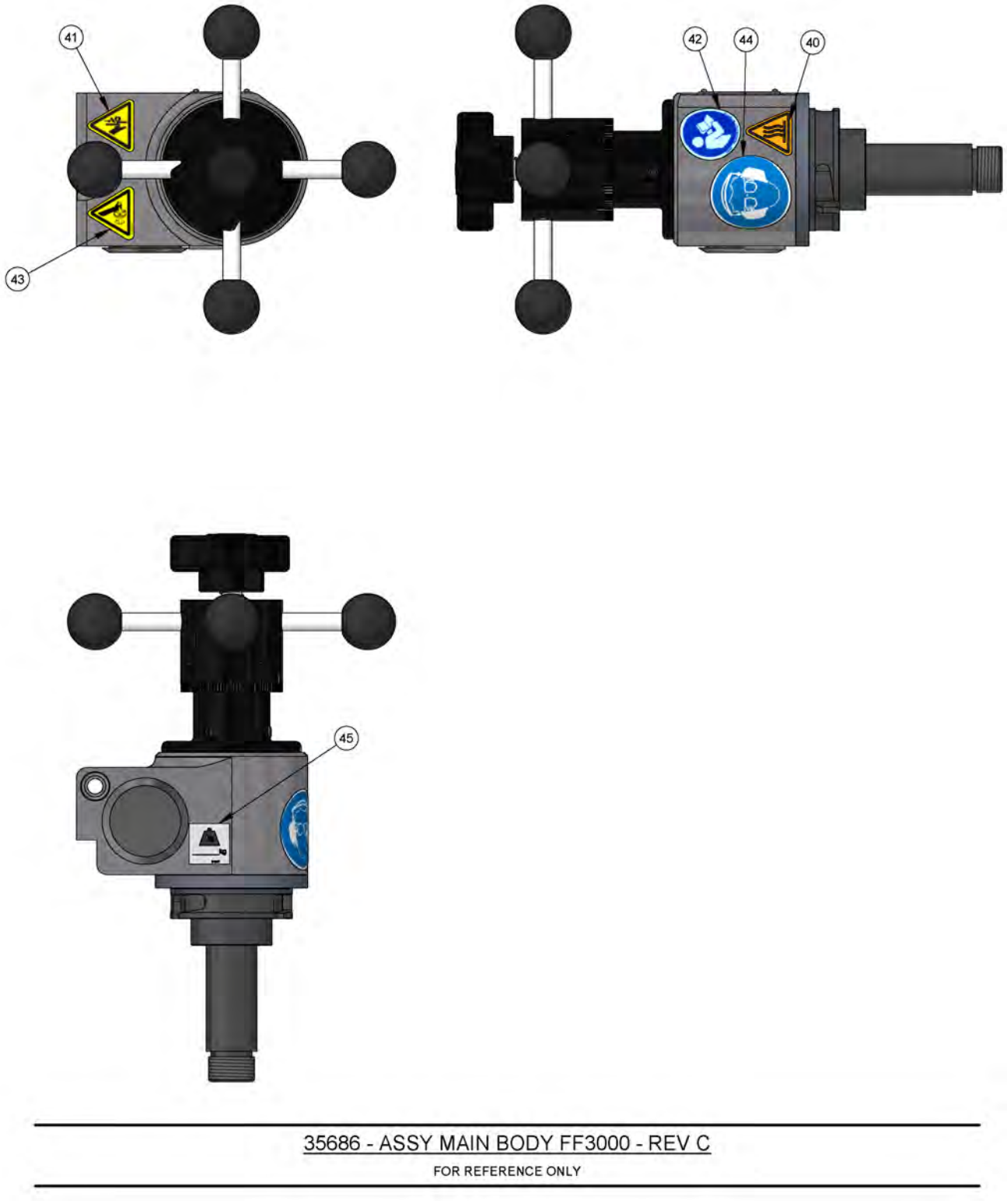


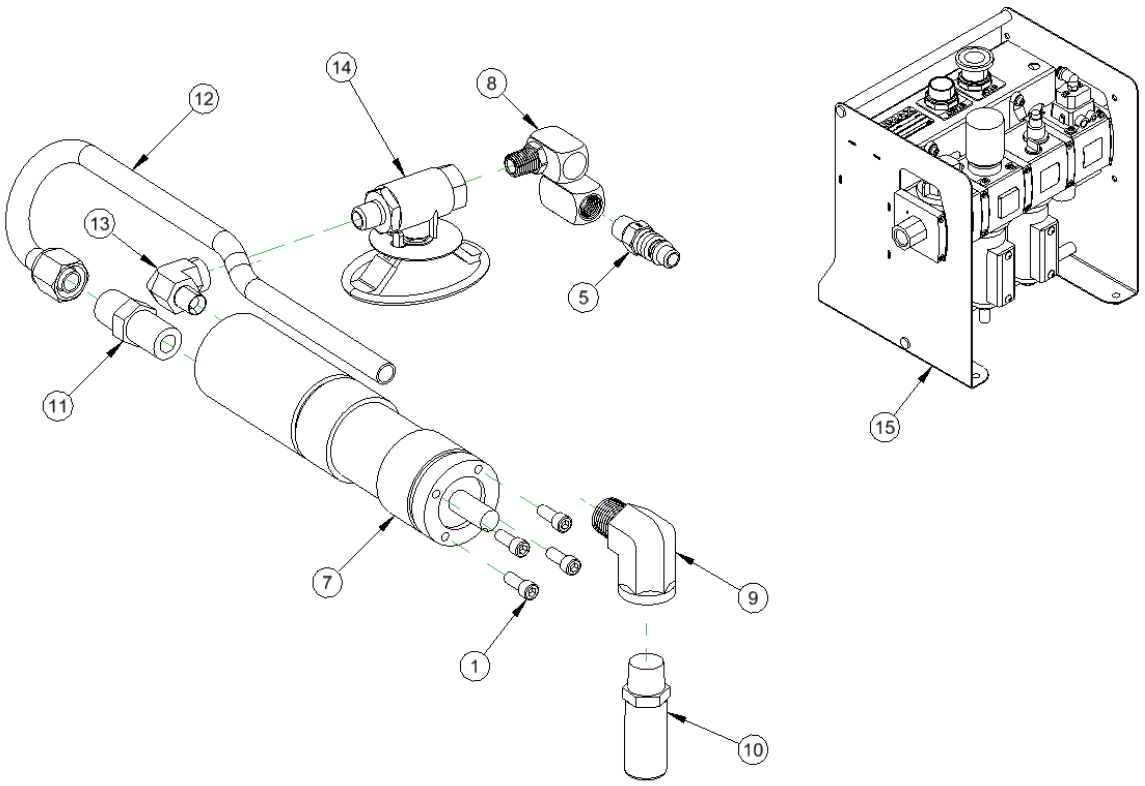

**Figure 6. FF3000 main body assembly 2 (P/N 35686)**

| PARTS LIST | | | |
|---|---|---|---|
| ITEM | QTY | P/N: | DESCRIPTION |
| 1 | 6 | 10436 | WASHER THRUST .500 ID X .937 OD X .060 |
| 2 | 3 | 10437 | BRG THRUST .500 ID X .937 OD X .0781 |
| 3 | 4 | 10588 | SCREW DRIVE #2 x 1/4 HOLE SIZE .089 |
| 4 | 1 | 11199 | BRG NEEDLE 1/2 ID X 11/16 OD X .5 OPEN |
| 5 | 1 | 11218 | NUT 1/2-13 JAMN |
| 6 | 1 | 11238 | WASHER LOCK 1/2 |
| 7 | 1 | 13080 | KEY 3/16 SQ X 1.00 SQ BOTH ENDS |
| 8 | 1 | 13530 | RING SNAP 5/8 ID |
| 9 | 1 | 17862 | KEY 1/8 SQ X .87 BOTH ENDS |
| 10 | 1 | 19225 | BALL NYLON 1/4 DIA |
| 11 | 1 | 20861 | WORM 10 DP DOUBLE LEAD RH |
| 12 | 4 | 33526 | KNOB BALL 1-3/8 DIA 3/8-16 THD |
| 13 | 1 | 33537 | KNOB MANDREL |
| 14 | 1 | 34436 | PLUG FINISHING 1-3/32 ID X 1-7/32 HEAD BLACK NYLON |
| 15 | 1 | 34702 | SPINDLE MAIN DRIVE FF3000 |
| 16 | 1 | 34965 | MANDREL FF3000 |
| 17 | 1 | 34979 | SLEEVE .315 HEX X .63 OD X 2-1/4 |
| 18 | 1 | 34986 | PLATE SPINDLE BEARING FF3000 |
| 19 | 1 | 34987 | TORQUE CAP BODY FF3000 |
| 20 | 1 | 34988 | NUT FEED BARREL FF3000 |
| 21 | 1 | 34989 | BRG CUP 3.1250 OD X .750 WIDE |
| 22 | 1 | 34990 | BRG CONE 1.6880 ID X 1.00 WIDE |
| 23 | 1 | 35074 | NUT SPINDLE PRELOAD FF3000 |
| 24 | 1 | 35076 | NUT FEED DOUBLER CORE FF3000 |
| 25 | 1 | 35084 | ROD CHUCK SETUP FF3000 |
| 26 | 1 | 35096 | SPRING COMP .60 OD X .045 WIRE X 1.00 LONG |
| 27 | 1 | 35097 | BUSHING MOTOR FF3000 |
| 28 | 4 | 35507 | STUD HANDLE |
| 29 | 4 | 35508 | FERRULE HANDLE |
| 30 | 1 | 35554 | GEAR WORM GEAR 10DP 30T 14.5PA |
| 31 | 1 | 35556 | HOUSING FF3000 |
| 32 | 1 | 35560 | BRG CUP 3.5430 OD X .7874 WIDE |
| 33 | 1 | 35561 | BRG CONE 2.0000 ID X .875 WIDE |
| 34 | 1 | 35590 | NUT PRELOAD MOTOR FF3000 |
| 35 | 1 | 35729 | PLUG FINISHING FITS 1.75 ID BLACK |
| 36 | 1 | 35828 | PLATE SERIAL YEAR MODEL CE 1.5 X 2.0 |
| 37 | 3 | 36050 | SCREW M8 X 1.25 X 6MM SSSDP BRASS TIP |
| 38 | 1 | 36087 | SCREW M8 X 1.25 X 6MM SSSFP |
| 39 | 1 | 39048 | WASHER 2.030 OD X .745 ID X .06 THICK |
| 40 | 1 | 46902 | LABEL WARNING HOT SURFACE GRAPHIC 1.13" TALL |
| 41 | 1 | 59042 | LABEL WARNING - HAND CRUSH/MOVING PARTS |
| 42 | 1 | 59044 | LABEL WARNING - CONSULT OPERATOR'S MANUAL 1.5 DIA |
| 43 | 1 | 78742 | LABEL WARNING ENTANGLEMENT OF HAND/ROTATING SHAFT |
| 44 | 1 | 81008 | LABEL WEAR HEARING AND EYE PROTECTION 2.0 DIA |
| 45 | 1 | 91217 | PLATE MASS CE 1.0 X 1.0 KG ADHESIVE BACKED |

35686 - ASSY MAIN BODY FF3000 - REV C

FOR REFERENCE ONLY

**Figure 7. FF3000 main body assembly parts list (P/N 35686)**




| PARTS LIST | | | |
|---|---|---|---|
| ITEM | QTY | P/N: | DESCRIPTION |
| 1 | 4 | 12418 | SCREW 1/4-20 X 5/8 SHCS |
| 2 | 1 | 15915 | (NOT SHOWN) HOSE ASSY 801 1/2 X 1/2 NPTMS X 1/2 NPTMS X 72 |
| 3 | 1 | 19297 | (NOT SHOWN) FTG QUICK COUPLER 3/8B 1/2 NPTF FEMALE AIR |
| 4 | 1 | 22546 | (NOT SHOWN) LABEL AIR MOTOR CAUTION SHUT VALVE BEFORE CONNECTING AIR LINE |
| 5 | 1 | 30936 | FTG QUICK COUPLER 3/8B 1/4 NPTM MALE AIR |
| 6 | 1 | 34866 | (NOT SHOWN) OIL AIRTOOL COMPLETE |
| 7 | 1 | 35383 | MOTOR AIR .79HP 465 RPM FS 232 RPM MAX 23.2TQ 4 BOLT FACE MOUNT |
| 8 | 1 | 35671 | FTG SWIVEL 1/4 NPTM X 1/4 NPTF |
| 9 | 1 | 35692 | FTG ELBOW 1/2 NPTM X 1/2 NPTF ST 90 DEG BRASS |
| 10 | 1 | 35693 | MUFFLER AIR 1/2 NPTM MINI-EXHAUST |
| 11 | 1 | 35726 | FTG TUBE 1/2 FERULOK BODY ONLY |
| 12 | 1 | 35881 | TUBE AIR COOL FF3000 |
| 13 | 1 | 35883 | FTG ELBOW 1/4 NPTM X 1/4 NPTF STREET 90 DEG BRASS |
| 14 | 1 | 36863 | VALVE BALL 1/4 OVAL HANDLE ASSY W/ LABEL |
| 15 | 1 | 101920 | PNEUMATIC CONDITIONING UNIT CE UNIVERSAL |

35687 - ASSY DRIVE PNEUMATIC FF3000 - REV C

FOR REFERENCE ONLY

**Figure 8. Pneumatic drive assembly (P/N 35687)**

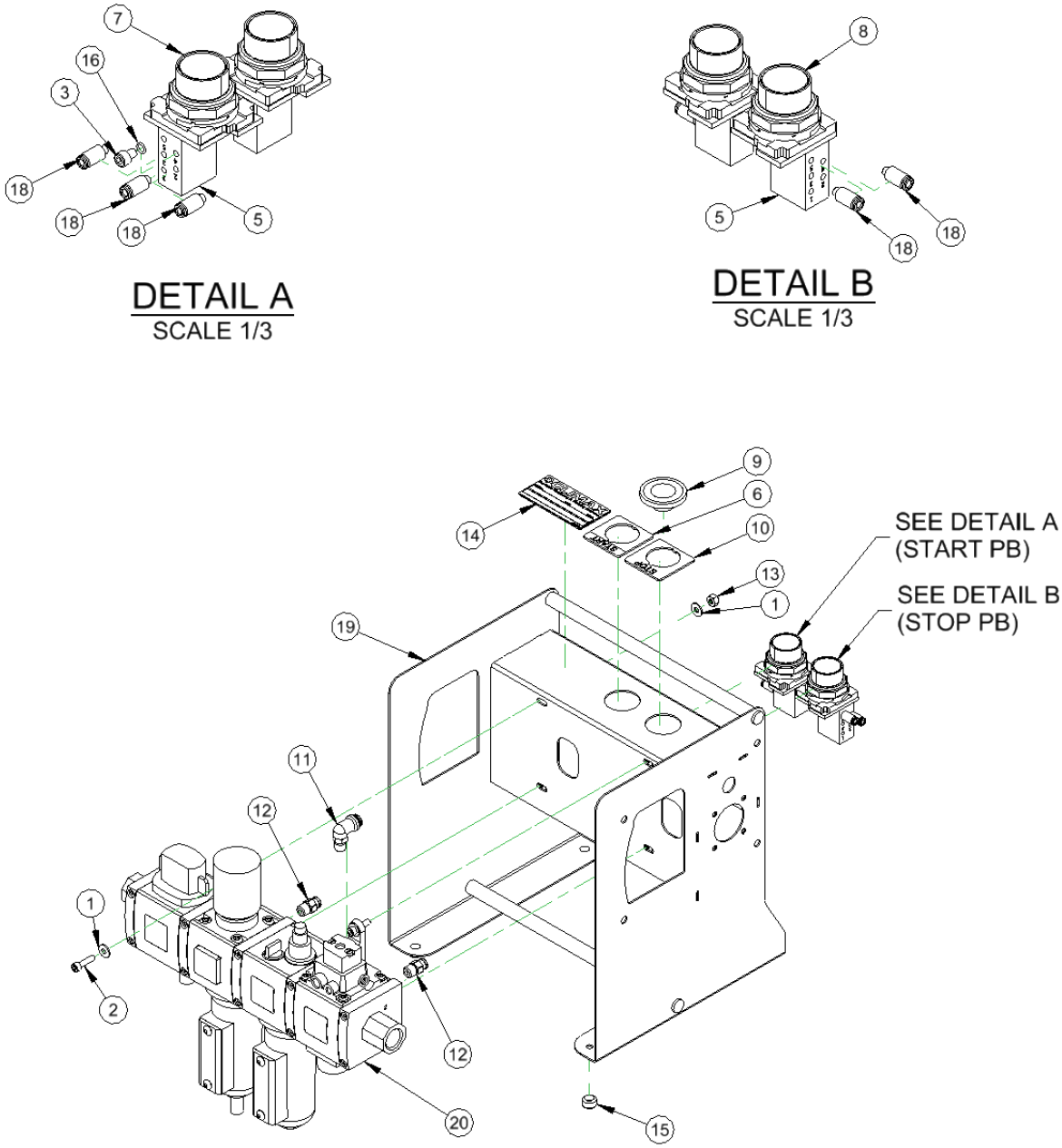
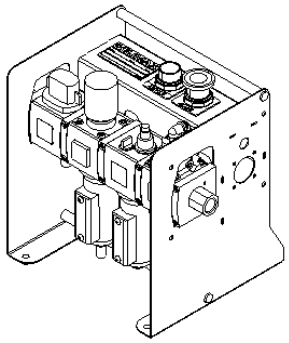
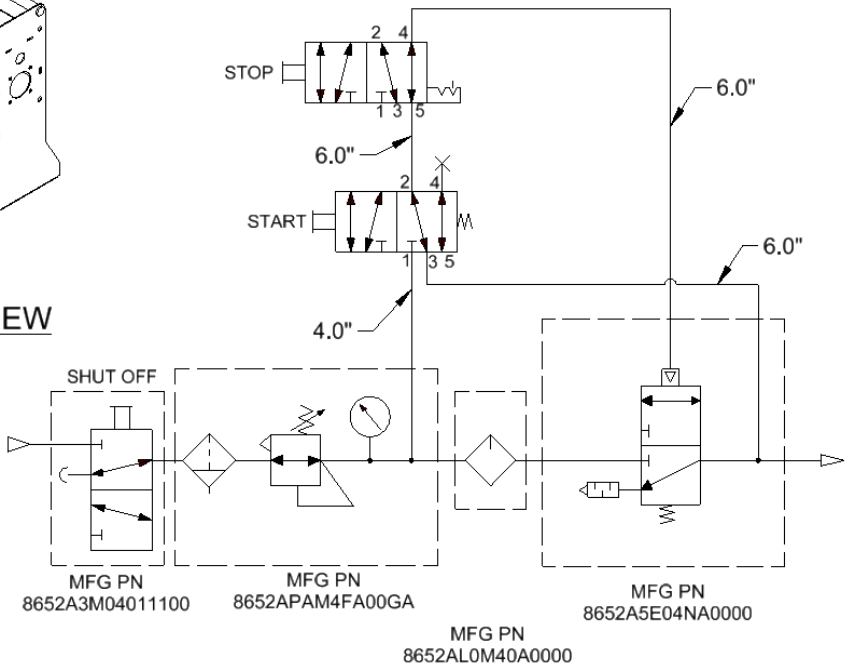



**Figure 9. Pneumatic conditioning unit (P/N 101920)**



ASSEMBLED VIEW
SCALE 1 : 8




| PARTS LIST | | | |
|---|---|---|---|
| ITEM | QTY | P/N: | DESCRIPTION |
| 1 | 8 | 11315 | WASHER #10 FLTW BLACK OXIDE |
| 2 | 4 | 12648 | SCREW 10-24 X 3/4 SHCS |
| 3 | 1 | 14726 | SCREW 10-32 X 1/4 SHCS |
| 4 | 2 | 15285 | (NOT SHOWN) FTG REDUCING ADAPTER 1 NPTF X 1/2 NPTM |
| 5 | 2 | 46785 | VALVE PUSHBUTTON 5 PORT PNEUMATIC |
| 6 | 1 | 46797 | LEGEND PLATE START 10250 SERIES |
| 7 | 1 | 59458 | PUSHBUTTON GREEN FLUSH |
| 8 | 1 | 59459 | PUSH BUTTON PUSH PULL MAINTAINED (M-M) |
| 9 | 1 | 59462 | PUSH BUTTON OPERATOR RED 1-5/8 |
| 10 | 1 | 59825 | LEGEND PLATE STOP 10250SERIES YELLOW BACKGROUND |
| 11 | 1 | 83517 | FTG ELBOW 1/8 NPTM X 5/32 TUBE PRESTOLOK |
| 12 | 2 | 83520 | FTG, STRAIGHT, 1/8 NPTM X 5/32 TUBE PRESTOLOK |
| 13 | 4 | 87533 | NUT 10-24 STDNYLOC SS |
| 14 | 1 | 91792 | PLATE PART NO YEAR MODEL 1.5 X 3.0 ADHESIVE BACKED |
| 15 | 4 | 96348 | BUMPER RUBBER 1/4" ID X 1/2" OD 1/16" MATL THICKNESS |
| 16 | 1 | 98553 | O-RING 4.5MM ID X 6.5MM OD X 1MM W NITRILE 70A DUROMETER |
| 17 | 24 | 98554 | (NOT SHOWN) TUBING 5/32 OD POLYURETHANE (INCHES) |
| 18 | 5 | 98555 | FTG STRAIGHT SOCKET HEAD 5/32 TUBE PUSH LOCK 10/32UNF |
| 19 | 1 | 101003 | STAND PCU |
| 20 | 1 | 101206 | FILTER REGULATOR LUBRICATOR CONTROL VALVE W SEMI AUTO DRAIN |
| 21 | 2 | 2151012 | (NOT SHOWN) FTG COUPLER 1/2 NPTM X CHICAGO W/ SAFETY PIN & LANYARD |

101920 - PNEUMATIC CONDITIONING UNIT CE UNIVERSAL - REV B

FOR REFERENCE ONLY

**Figure 10. Pneumatic conditioning unit schematic and parts list (P/N 101920)**

**PCU REPLACEMENT PARTS:**

**MFG=AVENTICS SERIES 652 AIR PREP UNIT COMPONENTS**

A T652AT502468001 = END PLATES

B P652AT502466001 = BODY CONNECTOR

C P699AT502467001 = BRACKET ATTACHMENT FOR BODY CONN

(1) **8652A3M04011100 = SHUT OFF VALVE**

D M652AY524218002 = SIDE COVER PLASTIC

E M2MN = METAL SILENCER

(2) **8652APAM4FA00GA = FILTER/REGULATOR**

F M652AU440511003 = BOWL POLYMIDE

G M699AQ501862001 = DRAIN COCK

D M652AY524218002 = SIDE COVER PLASTIC

H M652AE433582003 = ELEMENT 40 MICRON

J M699AG438047004 = GAUGE 0-175 PSI

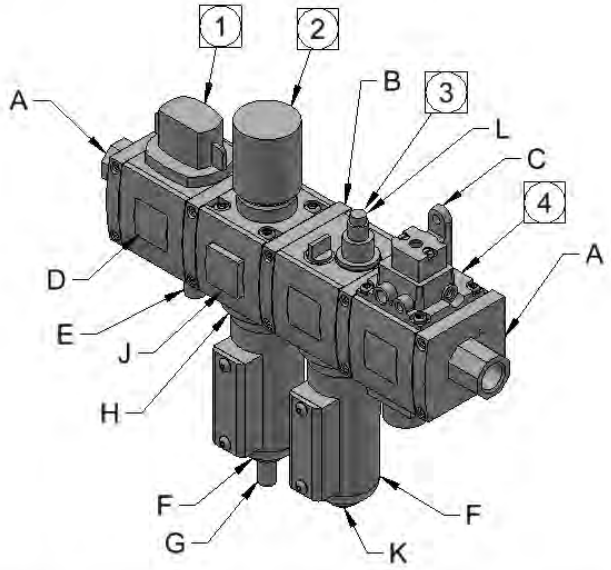
(3) **8652AL0M40A0000 = LUBRICATOR**

F M652AU440511003 = BOWL POLYMIDE

K M699AQ440512001 = DRAIN COCK PLUG

L M699AY506842001 = SIGHT DOME ASSEMBLY NBR

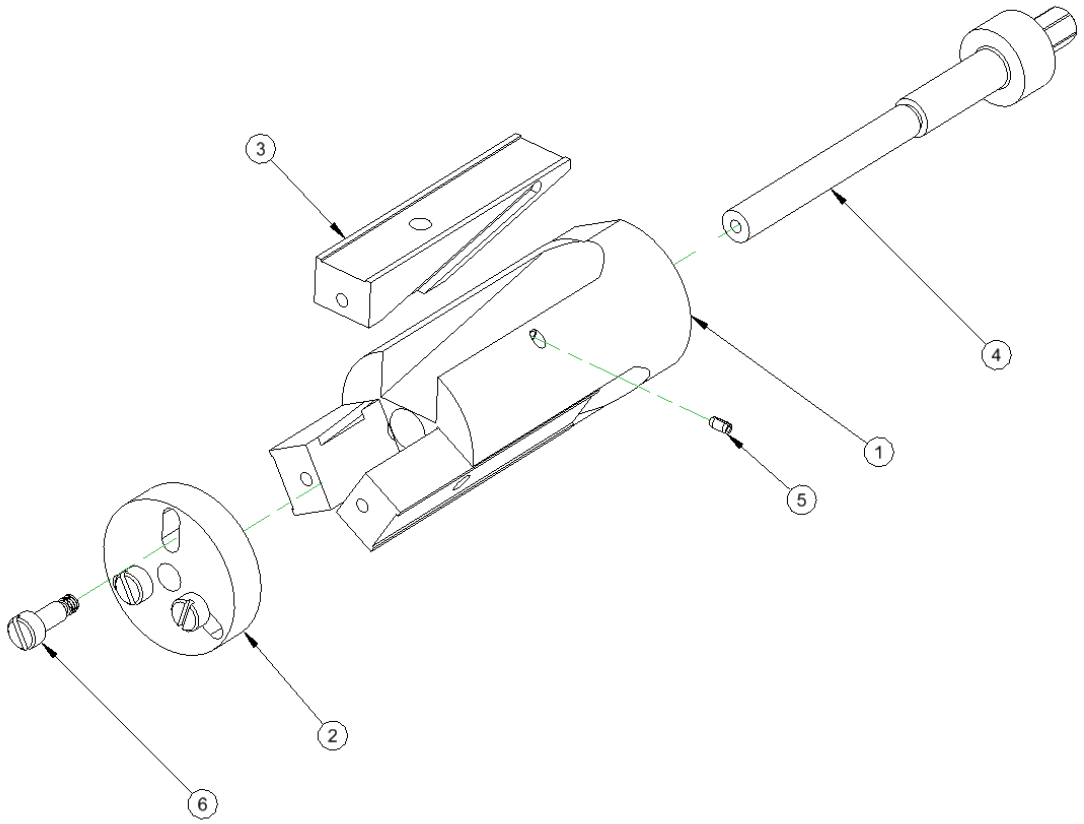
(4) **8652A5E04NA0000 = 3/2 VALVE**




101920 - PNEUMATIC CONDITIONING UNIT CE UNIVERSAL - REV B

FOR REFERENCE ONLY

**Figure 11. Pneumatic conditioning unit replacement parts (P/N 101920)**

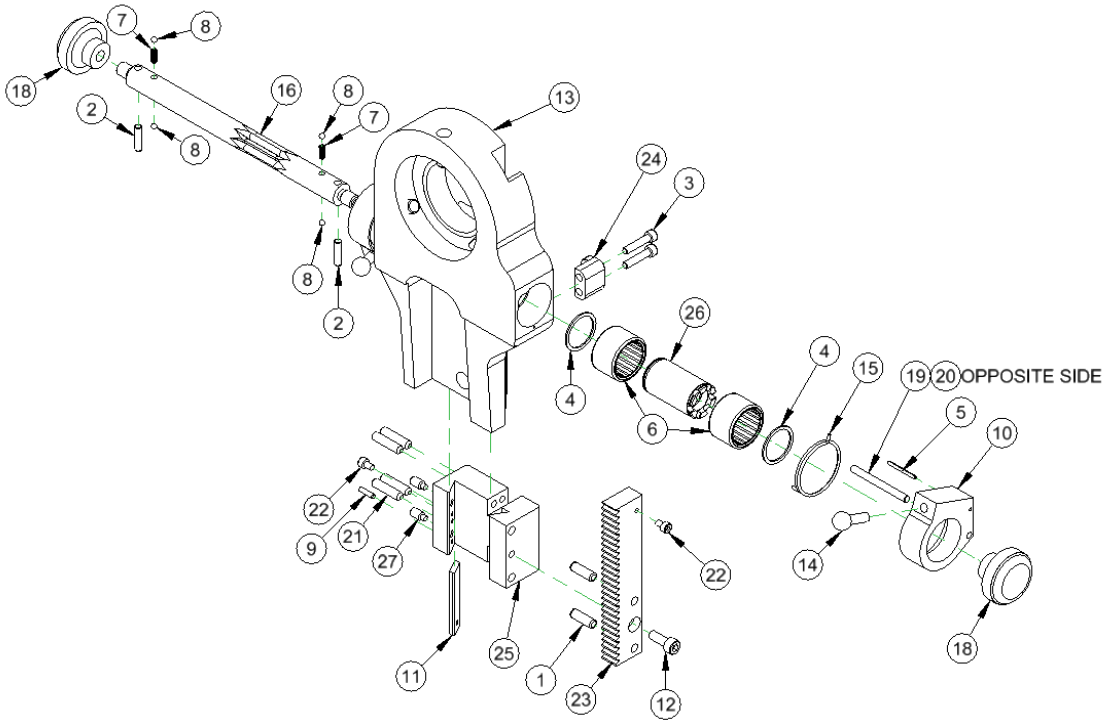



| PARTS LIST | | | |
|---|---|---|---|
| ITEM | QTY | P/N: | DESCRIPTION |
| 1 | 1 | 34969 | CHUCK FF3000 |
| 2 | 1 | 36723 | CAP CHUCK REGULAR |
| 3 | 3 | 34971 | RAMP CHUCK REGULAR FF3000 |
| 4 | 1 | 36722 | BOLT CHUCK FF3000 |
| 5 | 3 | 36046 | PIN ROLL 3/32 DIA X 3/16 |
| 6 | 3 | 36681 | SCREW 3/16 DIA X 3/8 X 8-32 SLOTTED SHLDCS |

35428 - ASSY CHUCK HEAD FF3000 - REV A

FOR REFERENCE ONLY

**Figure 12. Chuck head assembly (P/N 35428)**

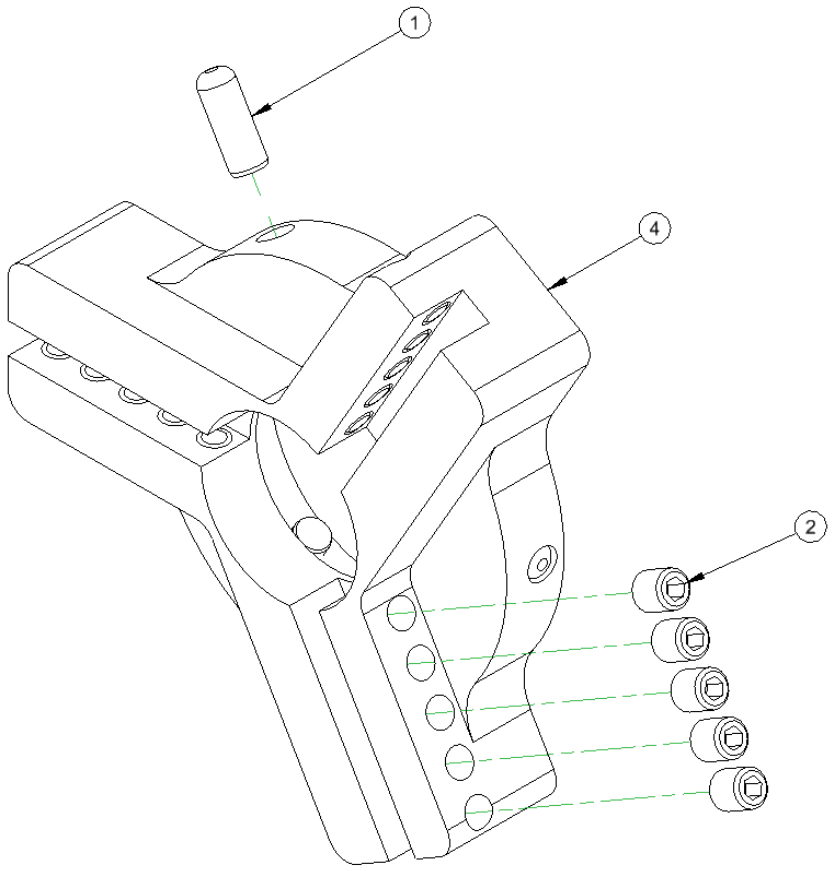



| PARTS LIST | | | |
|---|---|---|---|
| ITEM | QTY | P/N: | DESCRIPTION |
| 1 | 2 | 11729 | PIN DOWEL 1/4 DIA X 3/4 |
| 2 | 2 | 11763 | PIN DOWEL 3/16 x 3/4 |
| 3 | 2 | 11846 | SCREW 10-32 X 7/8 SHCS |
| 4 | 4 | 14241 | RING SNAP 1 OD SPIRAL HEAVY DUTY |
| 5 | 2 | 18689 | PIN ROLL Ø3/32 X 1 |
| 6 | 4 | 19307 | BRG ROLLER CLUTCH .984 ID 1.26 OD X .787 |
| 7 | 2 | 19561 | SPRING COMP .148 OD X .023 WIRE X .50 LONG SS |
| 8 | 4 | 19562 | BALL STEEL 5/32 DIA |
| 9 | 1 | 22480 | PIN DOWEL 1/8 DIA X 1/2 |
| 10 | 2 | 34992 | LEVER FEED |
| 11 | 1 | 35005 | GIB .47 X .15 X 2.0 1018 2 SS X 1.0 |
| 12 | 1 | 35014 | SCREW M6 X 1.0 X 16mm SHCS |
| 13 | 1 | 35037 | ARM FLANGE FACER 12 DIA |
| 14 | 2 | 35196 | BALL TOOLING 1/2 DIA |
| 15 | 2 | 35374 | SPRING TRIP RETURN |
| 16 | 1 | 35382 | SHAFT PINION AXIAL FEED |
| 17 | 1 | 35553 | (NOT SHOWN) SET TOOL BITS HIGH SPEED STEEL |
| 18 | 2 | 35595 | KNOB KNURLED DOMED 1-1/2 OD 3/8-16 TAP STEEL |
| 19 | 1 | 35599 | PIN DOWEL 3/16 DIA X 2 |
| 20 | 1 | 35600 | PIN DOWEL 3/16 DIA X 1-1/2 |
| 21 | 4 | 35911 | SCREW M6 X 1.0 X 25MM SSSCP |
| 22 | 2 | 36152 | SCREW M4 X 0.7 X 6mm SHCS |
| 23 | 1 | 41289 | RACK RADIAL FEED 12 DIA |
| 24 | 1 | 41290 | SUPPORT RACK RADIAL FEED FACING HEAD |
| 25 | 1 | 41300 | CARRIAGE TOOL HOLDER FACING HEAD BB4500/5000 |
| 26 | 2 | 43219 | BUSHING FEED DIRECTION BB FACING HEAD |
| 27 | 2 | 45034 | SCREW M6 X 1.0 X 12MM SSSDPPL |

35222 - ASSY HEAD FACING 12 DIA FF3000 FF4000 - REV B

FOR REFERENCE ONLY

**Figure 13. Facing head 12” (305 mm) assembly (P/N 35222)**

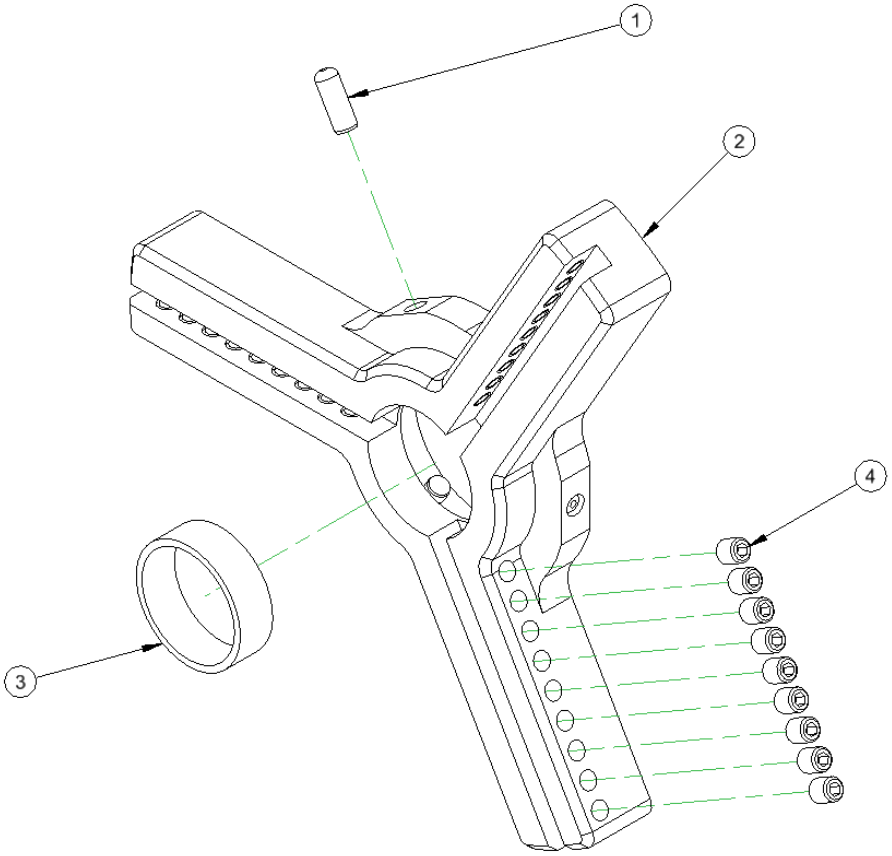



| PARTS LIST | | | |
|---|---|---|---|
| ITEM | QTY | P/N: | DESCRIPTION |
| 1 | 3 | 11027 | PIN DOWEL 3/8 DIA X 1 |
| 2 | 15 | 35368 | SCREW M10 X 1.5 X 12mm SSSCP |
| 3 | 1 | 35541 | (NOT SHOWN) SET STARTER FORM TOOLS |
| 4 | 1 | 35557 | HEAD BEVELING 7.00 DIA |

34980 - ASSY HEAD BEVELING 7.00 DIA - REV A

FOR REFERENCE ONLY

**Figure 14. Beveling head 7” (178 mm) diameter assembly (P/N 34980)**




| PARTS LIST | | | |
|---|---|---|---|
| ITEM | QTY | P/N: | DESCRIPTION |
| 1 | 3 | 11027 | PIN DOWEL 3/8 DIA X 1 |
| 2 | 1 | 33619 | HEAD BEVELING 2 TO 12.75 DIA |
| 3 | 1 | 35252 | BUSHING MODIFIED 2.25 OD X 2.00 ID X .7 |
| 4 | 27 | 35368 | SCREW M10 X 1.5 X 12mm SSSCP |
| 5 | 1 | 35541 | (NOT SHOWN) SET STARTER FORM TOOLS |

35439 - ASSY HEAD BEVELING 2.00-12.75 DIA - REV A

FOR REFERENCE ONLY

**Figure 15. Beveling head 2–12.75" (51–324 mm) diameter assembly (P/N 35439)**

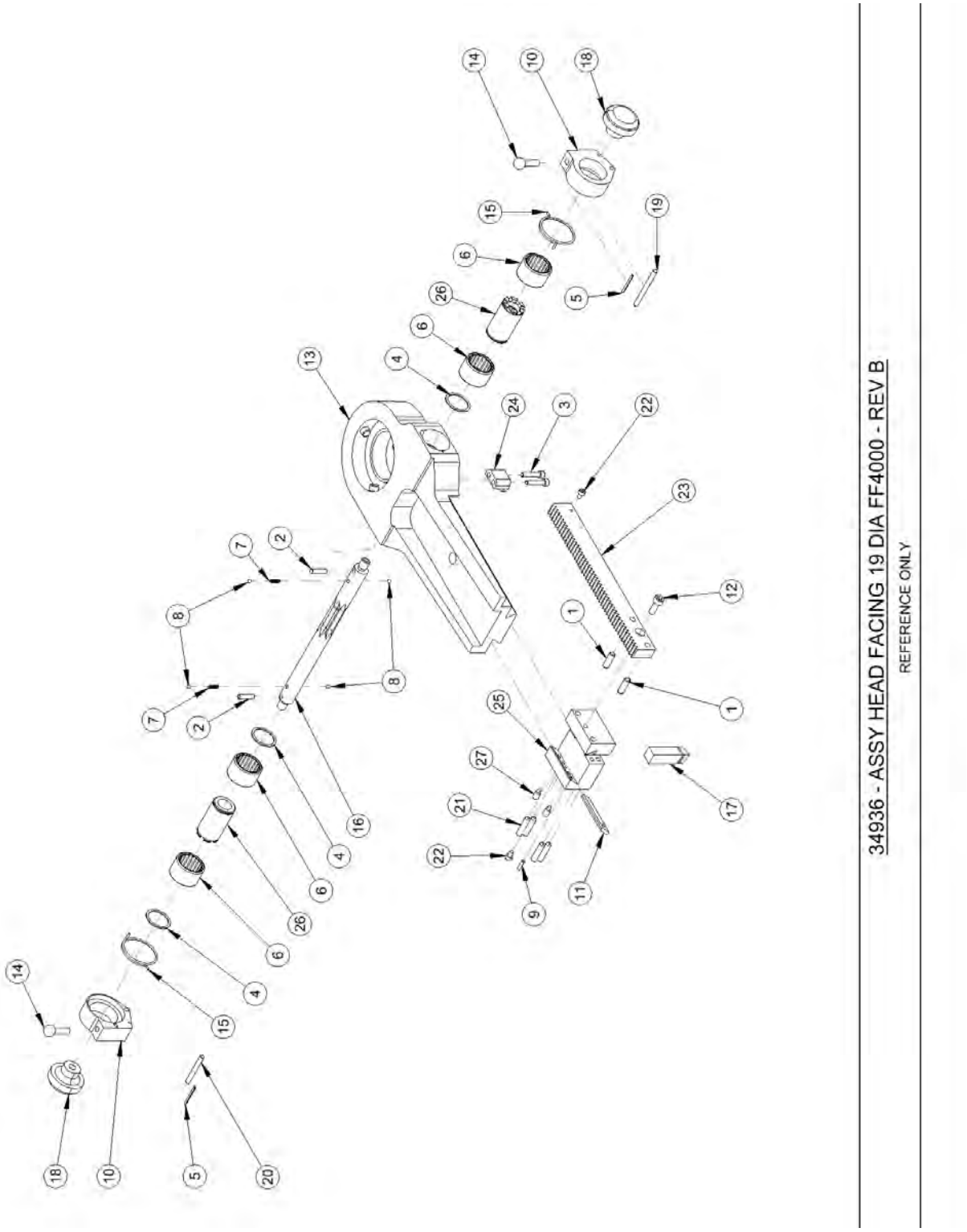
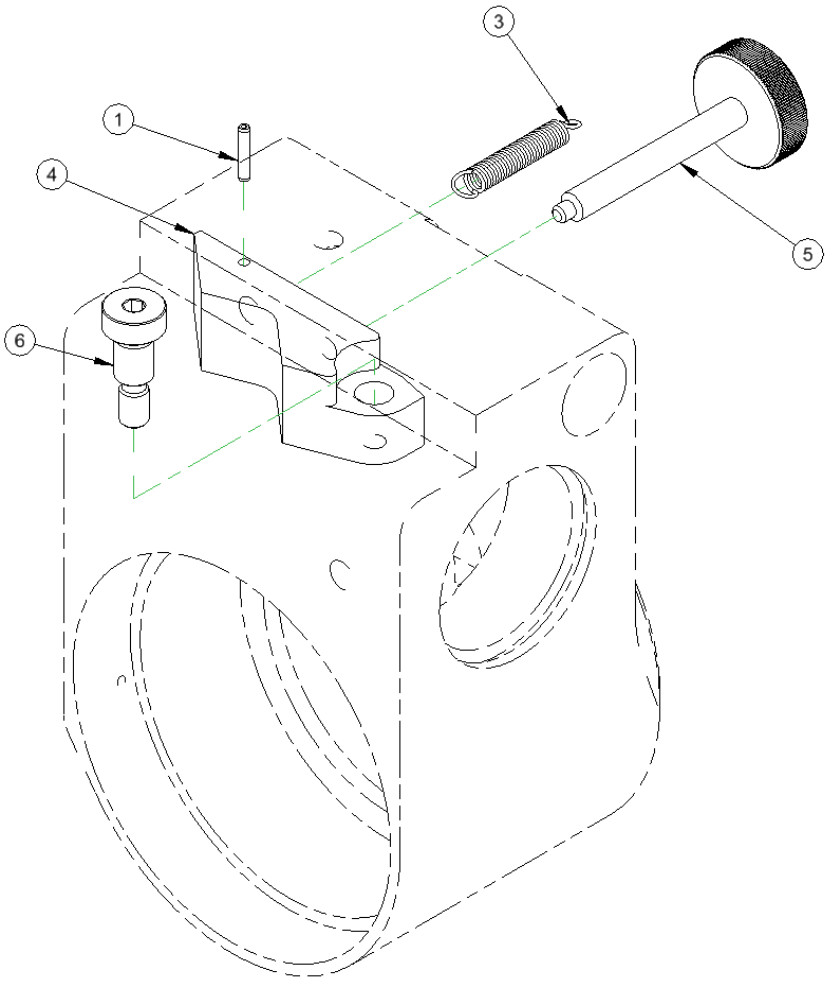



**Figure 16. Facing head 19" (483 mm) assembly (P/N 34936)**




| PARTS LIST | | | |
|---|---|---|---|
| ITEM | QTY | P/N: | DESCRIPTION |
| 1 | 1 | 13598 | PIN ROLL 3/32 X 1/2 |
| 2 | 1 | 19829 | (NOT SHOWN) SCREW 4-40 X 3/8 SHCS |
| 3 | 1 | 31979 | SPRING EXT .18 OD X .029 WIRE X 1 |
| 4 | 1 | 35118 | LEVER FEED ADJUST |
| 5 | 1 | 35724 | SCREW 1/4-20 X 2 X 1 DIA KHS KNURLED HEAD |
| 6 | 1 | 35913 | SCREW 8MM DIA X 12 X M6 X 1.0 SHLDCS |
| 7 | 1 | 36148 | (NOT SHOWN) SPRING COMP .36 OD X .032 WIRE X 1.25 LONG |

35730 - TRIP COMPONENTS FF3000 FACING HEAD - REV A

FOR REFERENCE ONLY

**Figure 17. Facing head trip components (P/N 35730)**

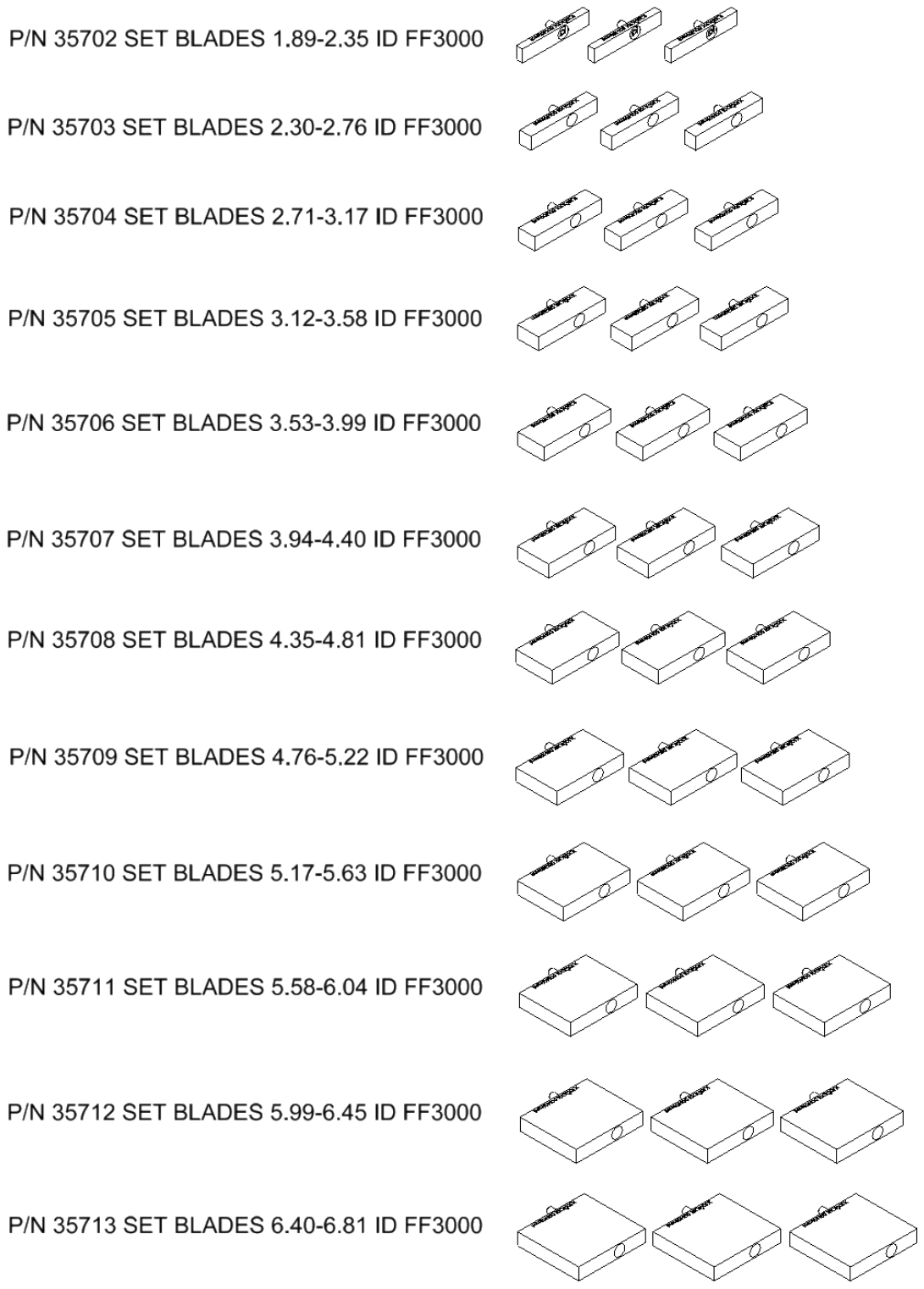



**Figure 18. Chuck extension blocks (P/N 36832)**


CLIMAX
BORTECH
CALDER
H&S TOOL