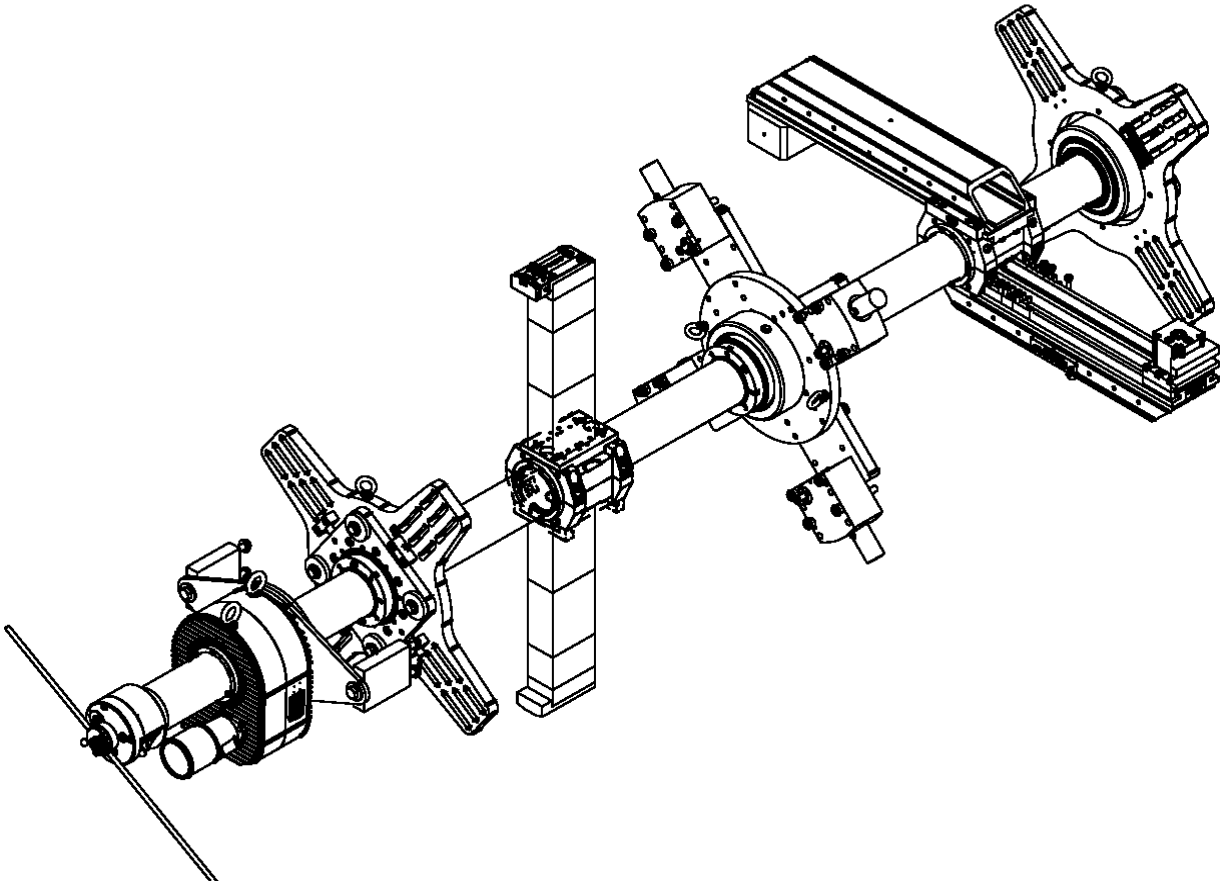
CE

BB7100

BORING MACHINE

OPERATING MANUAL

ORIGINAL INSTRUCTIONS



CLIMAX

Portable Machining & Welding Systems

PN: 55769 July 2023 Revision 8

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- Telephone number
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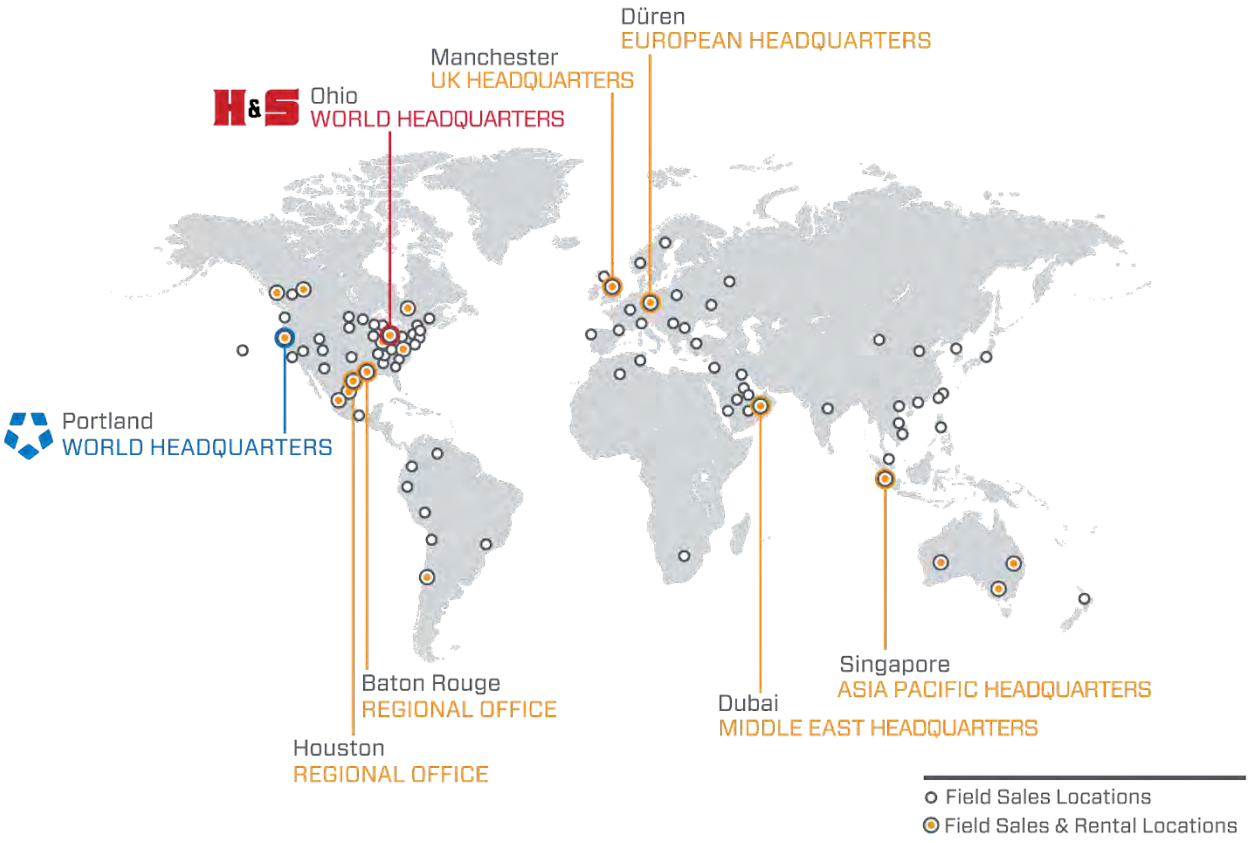

LIMITED WARRANTY

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

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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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GENERAL SAFETY GUIDELINES

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

CLIMAX Portable Machining & Welding Systems 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 closely examining the job site and following the operating procedures outlined in this manual, your own company rules, and local regulations.

WARNING

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

Qualified Personnel

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

Obey Warning Labels

Obey all 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 manuals or safety decals.

Intended Use

Use this machine according to the instructions in this operating manual. Do not use this machine for any purpose other than its intended use as described in this manual.

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.

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.

Secure Loose Clothing and Long Hair

Rotating machinery can cause serious injuries. Do not wear loose fitting clothing or jewelry. Tie back long hair or wear a hat.

Hazardous Environments

Do not use the machine near explosive chemicals, toxic fumes, inappropriate radiation hazards or other hazardous environments.

Flying Chips

Flying metal chips can cut or burn. Do not remove chips until after the machine has been locked out, all power sources are off and the machine has stopped.

MACHINE SPECIFIC SAFETY PRACTICES

All aspects of the machine have been designed with safety in mind. Following are safety practices that you should keep in mind when using the CLIMAX BB7100 Boring Machine.

Personal Protective Equipment (PPE)

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 workpiece as described in this manual.

Tooling

The machine is provided with all the tools for the setup and operation of the machine.

Lifting

Avoid lifting heavy objects by yourself as serious injury can result. Always follow your plant's procedures for lifting heavy objects.

Cutting Fluids

Use only recommended lubricants or similar equivalent when performing maintenance tasks. See the "Maintenance" section for more information.

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.

Clamp Collars

To prevent the bar from sliding through the support bearings, or falling, use P/N 42792 – The collars are made in matching sets and must be used to secure the bar when the machine is in the vertical orientation. Torque these collars to 46 ft-lbs. Use the clamp collars to prevent over tightening of the bearings. Clamp collars should be positioned ABOVE at least 2 support bearings when installed in a vertical orientation. Clamp collars should be shouldered against the bearing when in use.

Metal Fragment Hazard

The machine dispenses metallic fragments during normal operation. You should wear eye protection and gloves at all times when working with the machine.

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 disconnected from power. The shut-off valve should be locked and tagged out before any maintenance occurs.

Warning Labels

Warning labels are attached to your machine upon delivery. If any labels are defaced or missing, be sure to contact CLIMAX immediately for replacements.

Maintenance

Be sure the machine components are free of debris and properly lubricated prior to use.

Table 1. Sound pressure levels

Declared Sound Power Level:	80.0 dBA
Operator Sound Pressure Level:	72.4 dBA
Bystander Sound Pressure Level:	75.0 dBA

SAFETY WARNING SYMBOLS

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 to which it is attached become one complete machine during the material-removal process.

To achieve the intended results and to promote safety, the operator must under- stand 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

The following checklist is not intended to be an all-inclusive list of things to watch out for when setting up and operating this Portable Machine Tool. However, these checklists are typical of the types of risks the assembler and operator should consider. Use these checklists as part of your risk assessment:

TABLE 1-1. 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.
☐	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 pre-cautions to keep workers away from the identified fall path.
☐	I considered how this machine operates and identified the best placement for the controls, cabling, and the operator.
☐	I evaluated and mitigated any other potential risks specific to my work area.

TABLE 1-2. 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 installed at an elevated position, 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 required maintenance with the recommended lubricants.
☐	I checked that all affected personnel have the recommended personal protective equipment, as well as any site-required or regulatory equipment.
☐	I checked that all affected personnel understand and are clear of the danger zone.
☐	I evaluated and mitigated any other potential risks specific to my work area.

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INTRODUCTION

This manual describes how to use your Model BB7100 Portable Boring Machine. Every part meets CLIMAX's strict quality standards. For maximum safety and performance, read the entire Operating Manual before using the portable boring machine.

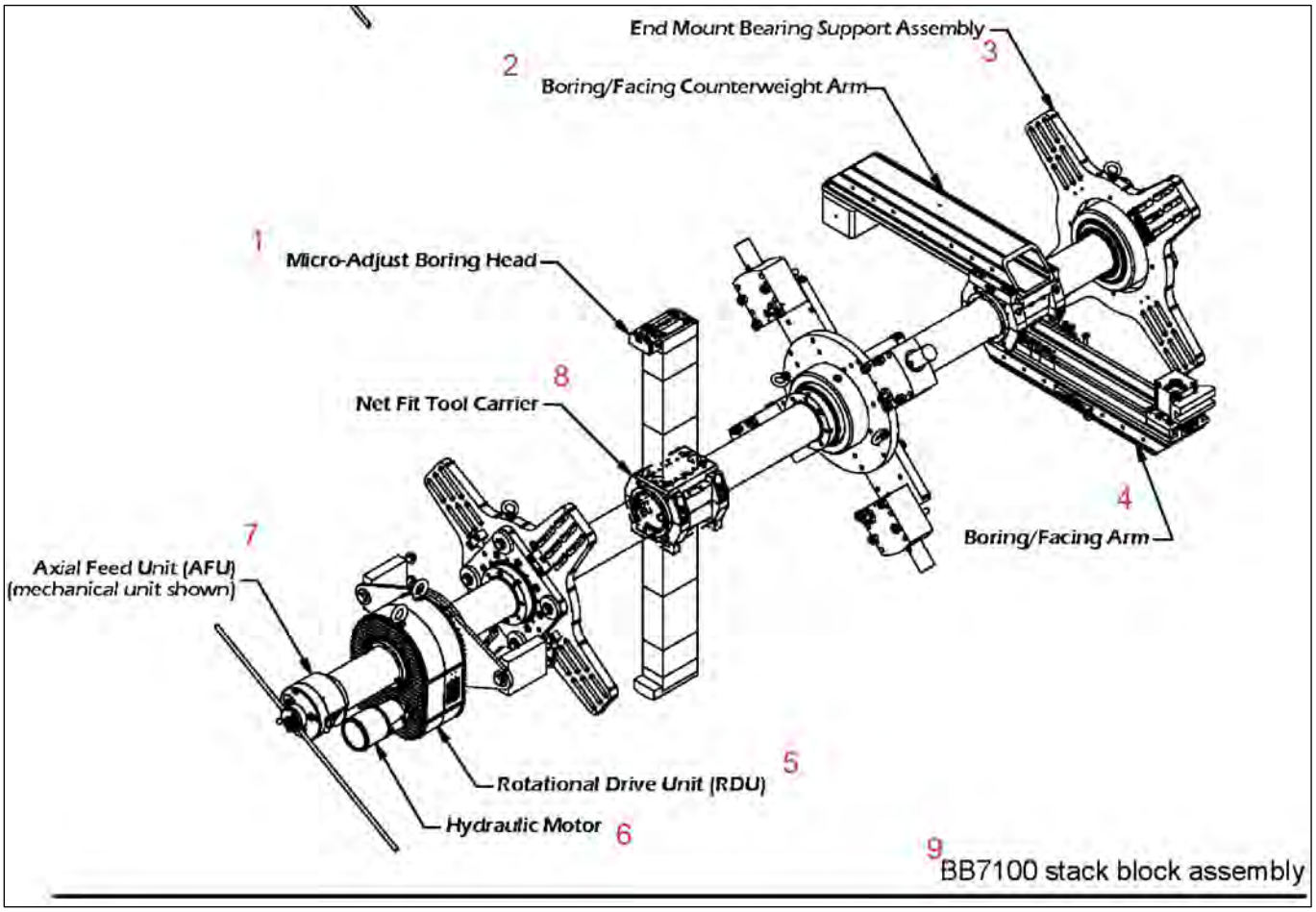


Figure 1. BB7100 main components

Number	Description
1	Micro-adjust boring head
2	Boring/facing counterweight arm
3	End mount bearing support assembly
4	Boring/facing arm
5	Rotational drive unit (RDU)

6	Hydraulic motor
7	Axial feed unit (AFU) – mechanical unit shown
8	Net fit tool carrier
9	BB7100 stack block assembly

Table 2. Hydraulic specifications

60 series P/N **QD ISO 16028 P/N**		**43453** **84230**	**43454** **84231**	**43455** **84232**	**43456** **84233**	**43457** **84234**	**43458** **84235**	**43459** **84236**
Displacement cm^3/r (cu. in^3/r)		59 (3.6)	97 (5.9)	120 (7.3)	146 (8.9)	185 (11.3)	231 (14.1)	293 (17.9)
Maximum speed (RPM) at continuous flow		962	585	470	385	303	243	192
Flow LPM (GPM)	Continuous	57 (15)	57 (15)	57 (15)	57 (15)	57 (15)	57 (15)	57 (15)
	Intermittent	68 (18)	76 (20)	76 (20)	76 (20)	76 (20)	76 (20)	76 (20)
Torque Nm (lb-in)	Continuous	107 (943)	181 (1,591)	227 (2,010)	263 (2,332)	324 (2,870)	369 (3,265)	411 (3,641)
	Intermittent[1]	133 (1,174)	225 (1,991)	281 (2,490)	323 (2,861)	390 (3,450)	438 (3,877)	485 (4,295)
Minimum starting torque Nm (lb-in)	Continuous pressure	90 (800)	148 (1,310)	184 (1,630)	212 (1,880)	263 (2,330)	302 (2,670)	338 (2,990)
	Intermittent pressure	116 (1,030)	190 (1,680)	236 (2,090)	271 (2,400)	329 (2,910)	374 (3,310)	417 (3,690)
Pressure Δ bar (Δ PSI)	Continuous[2]	138 (2,000)	138 (2,000)	138 (2,000)	131 (1,900)	128 (1,850)	117 (1,700)	103 (1,500)
	Intermittent[3]	172 (2,500)	172 (2,500)	172 (2,500)	162 (2,350)	155 (2,250)	141 (2,050)	124 (1,800)

[1] A simultaneous maximum torque and maximum speed is NOT recommended.

[2] Maximum intermittent pressure at the motor inlet port of 172 bar (2,500 PSI) without regard to the Δ [delta or difference] bar (Δ psi) and/or back pressure ratings or combination thereof.

[3] A simultaneous maximum torque and maximum speed is NOT recommended.

Δ bar (Δ PSI): the true pressure difference between inlet port and outlet port.

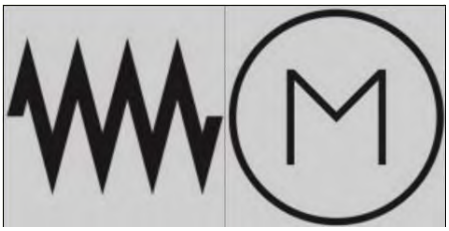
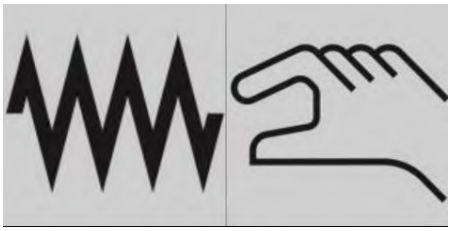
Continuous rating: the motor may be run continuously at these ratings.

Intermittent operation: 10% of every minute.

Recommended maximum system operating temperature: 82° C (180° F)

Recommended filtration: per ISO Cleanliness Code, level 18/13

Labels

	P/N 29154 CLIMAX CE serial plate		P/N 47981 CLIMAX CE serial and specifications plate
	P/N 59044 Label: refer to the operating manual		P/N 78748 Warning label: wear eye protection
	P/N 79304 Warning label: pinch point and crush hazard		P/N 82164 Warning label: crush hazard
	P/N 102885 Label: Axial feed unit (electric motor feed)		P/N 102887 Label: Axial feed unit (manual feed)

Controls

Operator controls for the machine are located on the remote pendants, described below.

Operator pendant (CE compliant)

Figure 2 shows the operator pendant controls that is CE compliant.

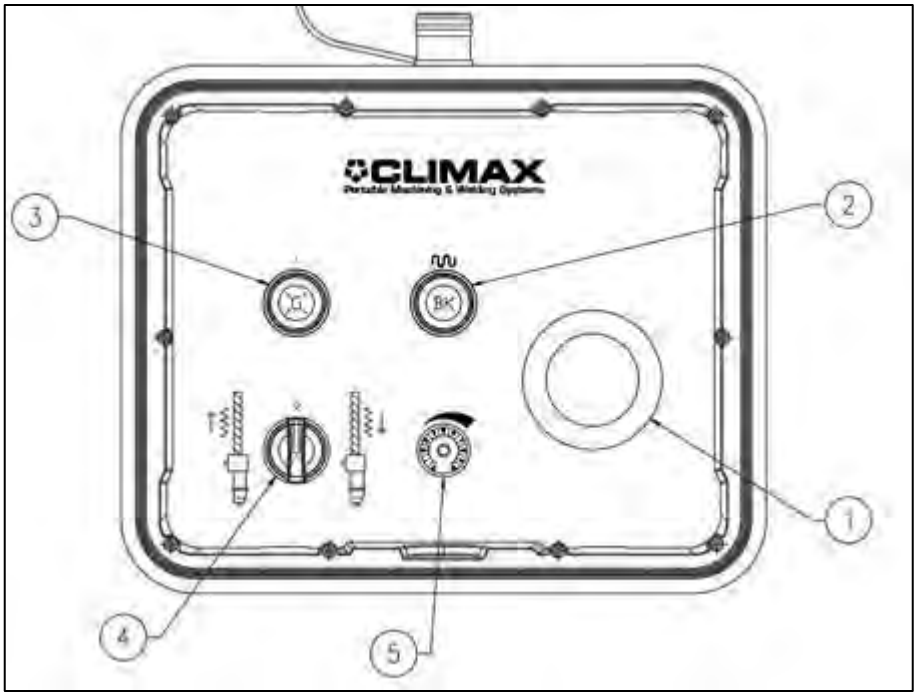


Figure 2. Operator pendant controls (CE compliant)

The controls are numbered in Figure 2 and defined as follows:

1. **Emergency stop:** press to stop. Pull out to reset.
2. **Rapid:** this is a momentary action, active while the button is pressed. Hold to run fast. Release to run at the speed set by the speed control.
3. **Motor running indicator light: indicates** when the feed motor is running. Off when the feed motor is not running.
4. **Feed direction selector switch**: the switch has three positions, the status of which is each maintained while in the switch position:
   - Left position: the tool moves away from the end of the bar with the feed motor.
   - Center position: the tool is stopped. The feed motor is off.
   - Right position: The tool moves towards the end of the bar where the feed motor is mounted.
5. **Speed control:** sets the speed of the feed motor. Turn clockwise to run faster, and turn counter-clockwise to run slower. It has a range of ten turns.

	**CAUTION** **The bar rotation and the axial feed are independent of each other. Be sure the feed is OFF when the bar is not running.**

Switching from 230V to 120V

If the operator must switch from the default 230VAC mains power to 115V, open the controller enclosure and adjust the two jumpers on the DC Drive, as shown in Figure 3.

⚠	**CAUTION** **To configure for 115VAC input, the DC drive jumpers J1A/J1B must be changed to 115V. Failure to do so could result in machine damage.**

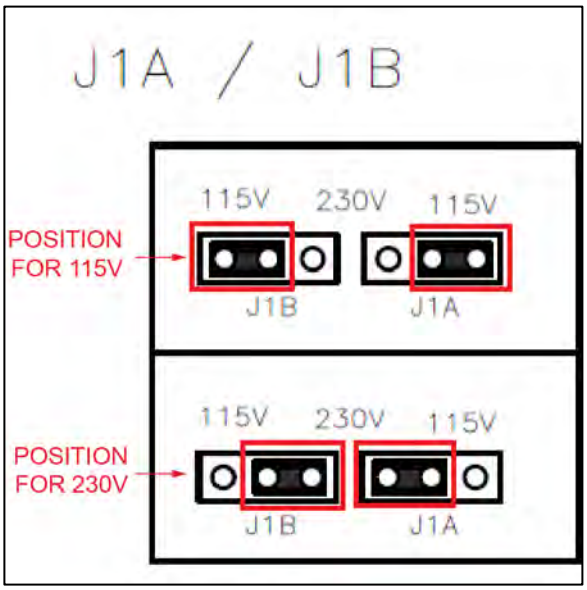


Figure 3. Jumper positions on the DC drive

Operator pendant (non-CE compliant)

The following is a description of the feed pendant controls.

Figure 4. Feedbox pendant

Symbol	Feature	Description
∿∿	Feed speed override	A momentary button which overrides the feed rate potentiometer and runs the axial power feed at maximum rate, regardless of the potentiometer setting.
∿∿ ← ○ →	Feed Fwd / Rev	A 3-position selector switch that determines the direction of axial feed. In neutral, power feed is disengaged. The feed rate can be adjusted or reversed during operation.
	Speed	The Feed potentiometer controls the axial feed rate. Counterclockwise decreases the feed rate; clockwise increases the feed rate.

	CAUTION
	Damage to the cutter, the boring machine and your work piece may occur if the bar rotation is stopped while the power feed is engaged and the cutting tool is in contact with the workpiece.

HPU Pendant

	TIP
	Additional information about the HPU function, construction, and maintenance schedule can be found in the HPU manual.

Figure 5. HPU pendant

Feature	Description
Run/Jog	Runs or jogs the hydraulic power unit.
RPM	Increases or decreases the rotational speed.
Bar Off (red)	Turns off the hydraulic power unit.
Bar On (green)	Turns on the hydraulic power unit.
Off (red)	Turns off the electric motor.
On (blue)	Turns on the electric motor.

INSPECTING THE MACHINE

Your CLIMAX product was inspected and tested prior to shipment, and packaged for normal shipment conditions. CLIMAX does not guarantee the condition of your machine upon delivery. When you receive your CLIMAX product, perform the following receipt checks.

1. Inspect the shipping containers for damage.
2. Check the contents of the shipping containers against the included invoice to ensure that all components have been shipped.
3. Inspect all components for damage.

IMPORTANT

Contact CLIMAX immediately to report damaged or missing components.

This is a highly configurable machine with many options and accessories. This manual covers the use and operation of all of those possible options. The machine configuration purchased by a customer may not contain all of the options and accessories detailed herein. If a specific machine application requires additional options or accessories, please contact a CLIMAX sales representative for assistance in obtaining the needed components.

SETUP

WARNING

When setting up or servicing the machine, disconnect the power source and lock the machine out. Failure to do so could result in accidental start-up and seriously injure you or others.

Crane or Hoist

A hoist, crane, or other lifting device is vital in the setup of the machine. Only use an apparatus that allows smooth operation with fine adjustment, such as a hydraulic lift or 2-stage winch. A lifting device that is unstable, erratic, or moves too fast or inconsistently can crash the machine into the work piece damaging the tool.

DANGER

A machine swinging or falling out of control can cause serious injury, or even be fatal. Make sure all crane/hoist operators are trained on the proper use of the machines. Also make sure the lifting devices are secure and properly rated for the load.

CAUTION

To prevent damage to the machine, always use the lifting eyes provided on the machine.

Space Requirements

Before setting up the portable boring machine, determine where you will place each assembly on the boring bar. Because the rotational drive and tool head assemblies can be anywhere along the bar, be sure to provide room for them when setting up the machine.

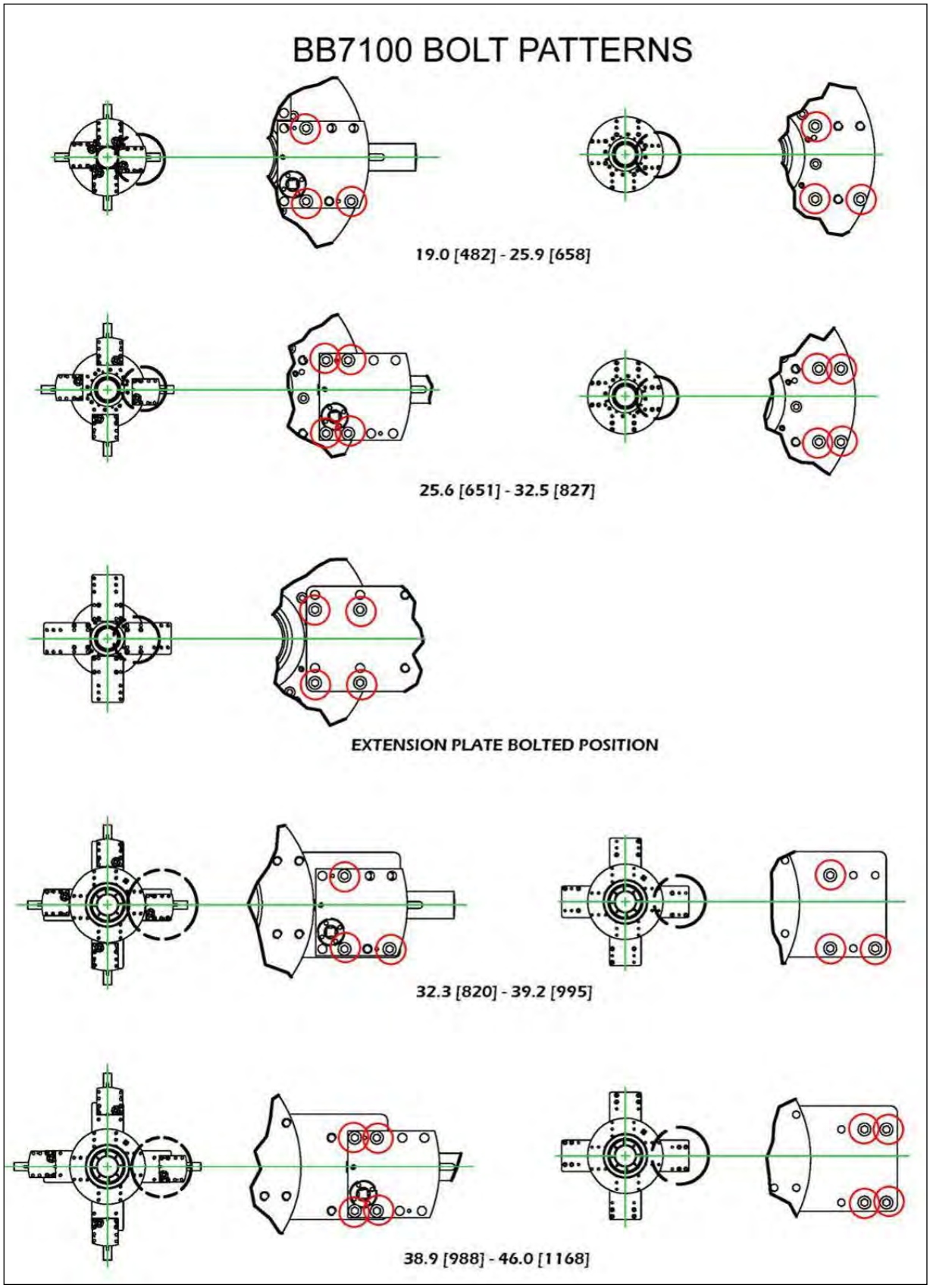


Figure 6. BB7100 bolt patterns 1

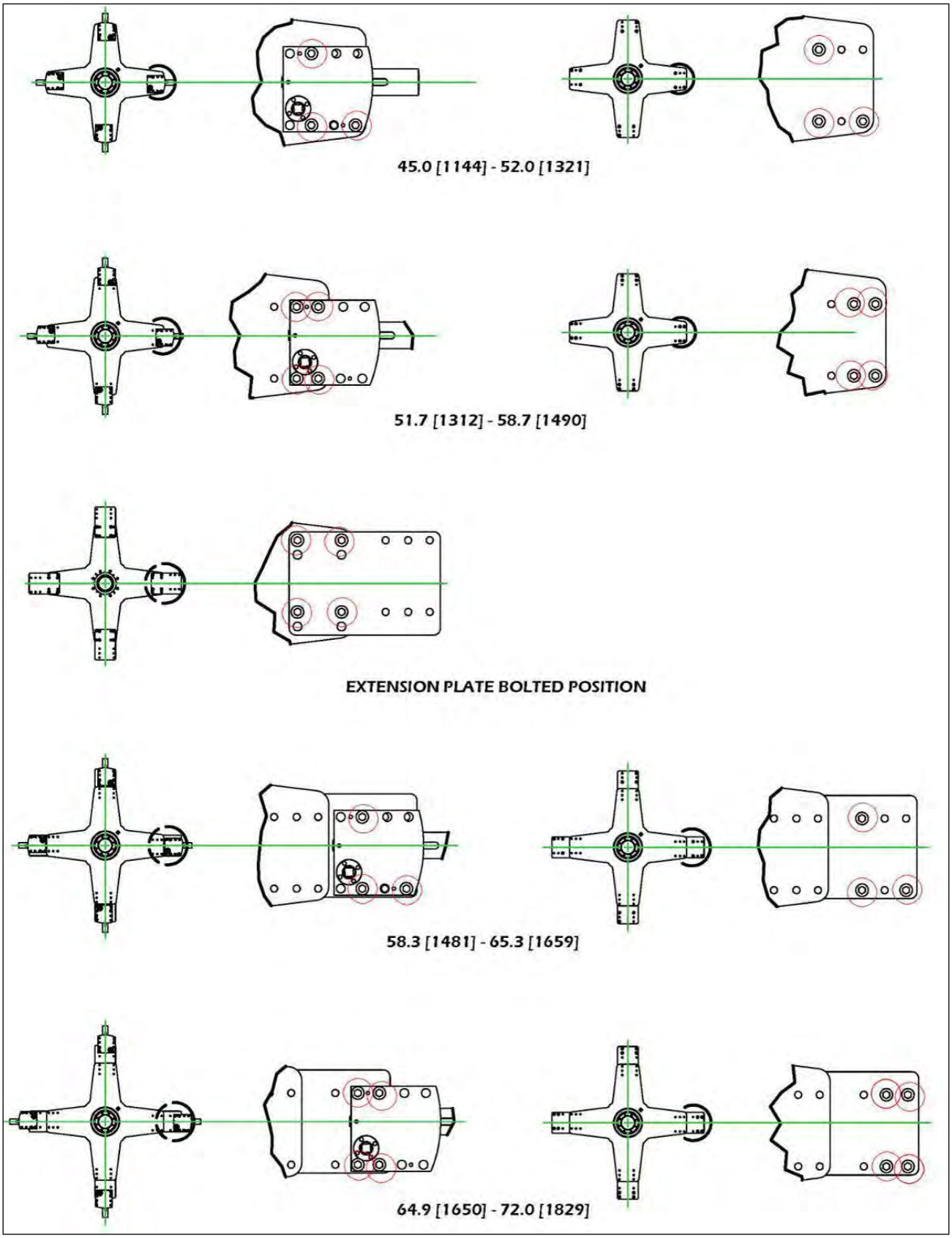


Figure 7. BB7100 bolt patterns 2

Boring bar and bearing support setup

At least two bearing support assemblies are required to ensure machine stability. The bearing assemblies may be different styles.

	CAUTION
	**At least two bearing supports are required to ensure machine stability. The bearing assemblies may be different styles. Bearing supports placed too far apart allow the bar to deflect, reducing bore precision.**

Clamp collars

The clamp collars (P/N 42792) are made in matching sets and must be used to secure the bar when the machine is in the vertical orientation.

This will prevent the bar from sliding through the support bearings or falling.

To prevent over tightening of the bearings, the clamp collars should be placed above at least two support bearings in a vertical orientation.

	DANGER
	**To prevent the bar from sliding through the support bearings, or falling, use the two clamp collars provided in the tool kit when using the boring bar in a vertical orientation. Torque to 46 ft.-lbs (62 Nm).**

End-mount bearing support setup

Even though the end-mount bearing support attaches to the outside of the work piece, it can be placed anywhere along the boring bar. During setup, the bearings can have as much as 1 degree of angle in the + or – direction.

1. Clean the bore of the work piece with solvent to remove grease, oil, and dirt.
2. Check the bar for nicks or cuts. Dress the bar smooth, if necessary. A bar with nicks or gouges can damage mating parts beyond repair (including the axial tool carrier and rotational drive unit).
3. Clean the bar with solvent to remove dirt and chips.

	CAUTION
	**The bar is not hardened. To prevent bar damage, do not strike the bar against the bearing supports or against the workpiece.**

4. Place the boring bar into the bores to be machined.

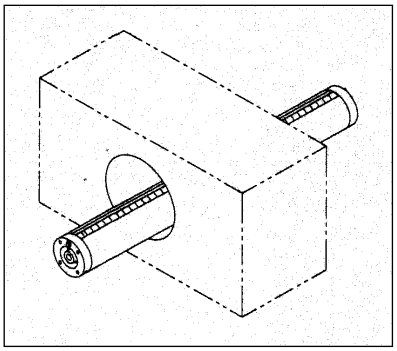


Figure 8. Placement of the boring bar in the bore

5. Slide bearing supports onto each end of the bar.

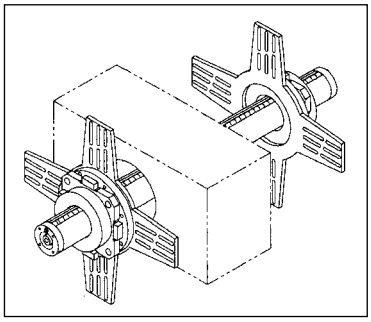


Figure 9. Attaching bearing supports

6. Using a hoist, hold the bar and bearings in the center of the bore.
7. Align within 0.6" (15 mm).

Locking the imperial bearing

Before following this procedure, do the following activities:

1. Mount the bearing hangers to the workpiece.
2. Insert the bar.
3. Center the bar to within 0.12” of the workpiece diameter.

Setting up the imperial bearing

Do the following to set up the imperial bearing:

1. Rotate both the bar and bearing so that the bar lead screw and bearing collet keyway are at the 12 o’clock position.
2. Check that the tensioning nut slots are positioned to the left of the bolts (see Figure 10).

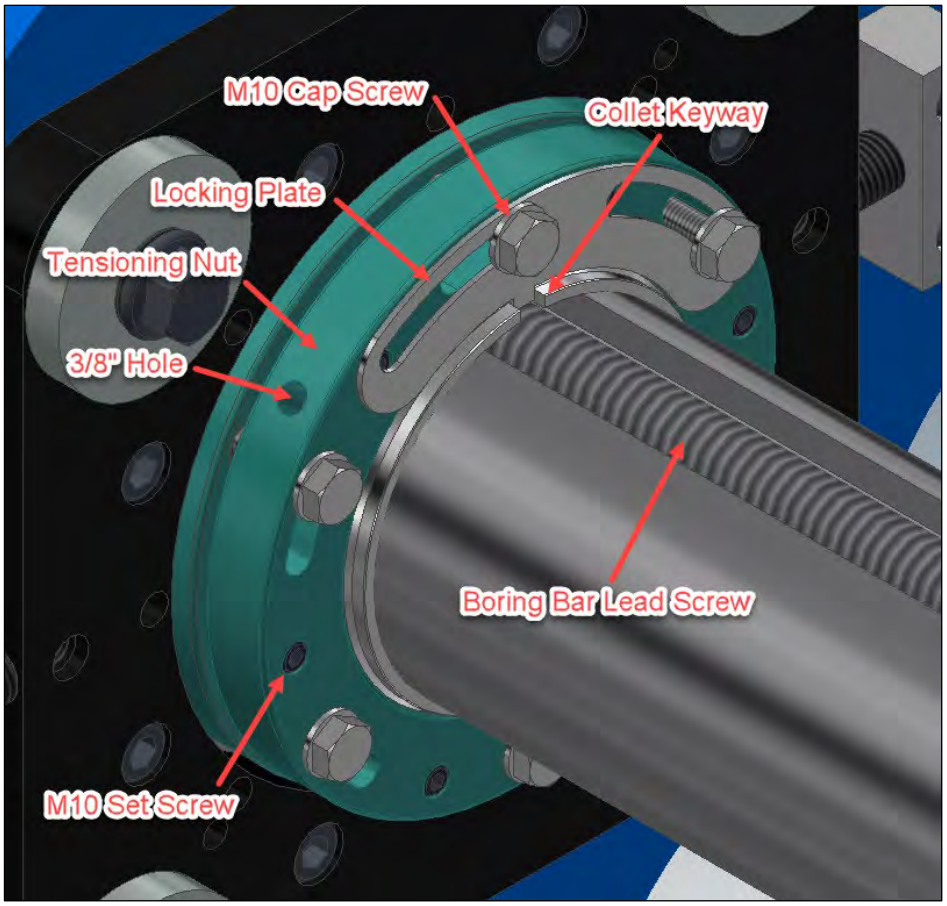


Figure 10. Imperial bearing components

3. Remove the M10 cap screws holding the bearing locking plate.
4. Remove the bearing locking plate.
5. Reinstall the M10 cap screws.
6. Install the bearing key tool (P/N 55572) into the bar lead screw channel, fitting its tab into the bearing collet keyway (see Figure 11).

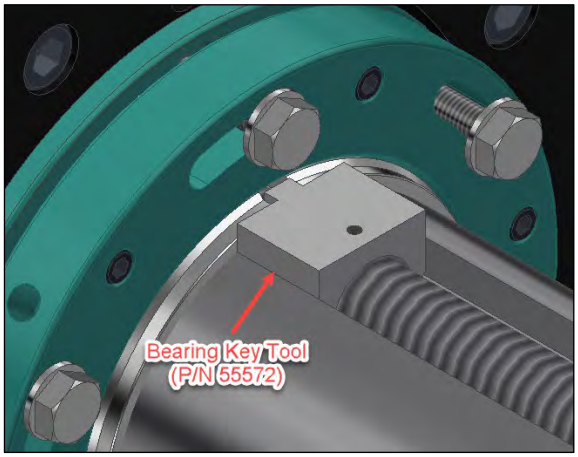


Figure 11. Bearing key tool (P/N 55572)

Note: Additional angular adjustments may be made to the bar or bearing until the tool is seated as specified.

7. Using a strap wrench to hold the bar steady, rotate the bearing clockwise by engaging one or two 3/8" (9.5 mm) tool rods (P/N 96567) into the radial holes on the tensioning nut's outsider diameter (see Figure 12). In between revolutions, strike the tensioning nut in different places with the dead blow mallet to alleviate any binding.
8. Rotate the tensioning nut by hand until it can no longer be tightened.

Figure 12. Inserting the 3/8" rod

9. Using the 1/2 drive torque wrench and 17-mm socket, loosen the hex bolts fastening the tensioning nut to the bearing (see Figure 13).
10. With the tool rod still engaged, hold the tensioning nut and bar steady, then rotate the bearing counter-clockwise by grasping and pulling the cap screws until they rest in the opposite end of the slots (see Figure 14).
11. Remove and retain the bearing key tool.
12. Tighten the M10 bolts with the torque wrench in a star pattern until all bolts are torqued to 30 ft-lbs (40 Nm). Strike the tensioning nut periodically with the dead blow in between bolt torquing to release any binding in the collet.

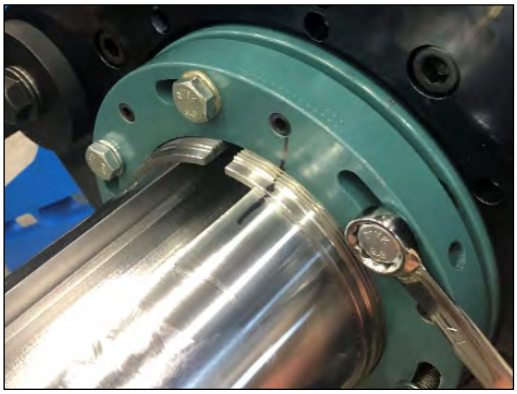


Figure 13. Loosening the hex bolts

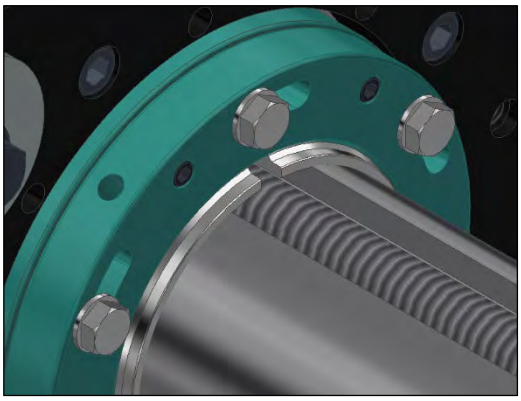


Figure 14. Cap screws in opposite end of slots

13. Remove the two bolts that flank both sides of the collet keyway.
14. Install the lock plate as shown in Figure 15.
15. Reinstall and re-torque the tensioning bolts.

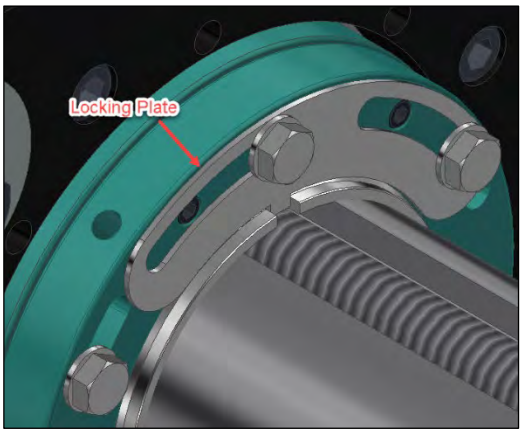


Figure 15. Locking plate installed

Note: The lock plate is reversible and may be flipped so that the key in the locking plate is engaged with the collet.

Removing the imperial bearing

Do the following to remove the imperial bearing:

1. Remove all six cap screws and the locking plate.
2. In a star pattern, engage the M10 set screws with the ½" drive 5-mm key socket and breaker bar for a few turns at a time until the collet breaks free.

   Note: Strike the bearing with a dead blow hammer to help break the collet free.
3. Rotate the tensioning nut counter-clockwise until it touches the raised contacts of the bearing collar (see Figure 16).

Figure 16. Bearing collar contacts

4. Attempt to center the vacant cap screw holes of the bearing collar with the rightmost end of the tensioning nut slots (see Figure 17).

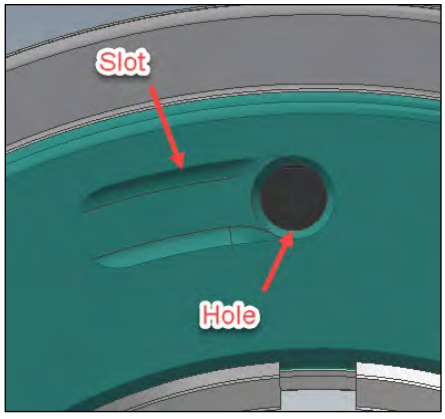


Figure 17. Positioning screw hole in the slot

Tip: If more room is needed to rotate the tensioning nut, engage the set screws further and drive the collet out.

5. Retract the set screws until they are flush with the outboard face of the tensioning nut.
6. Reinstall the locking plate and cap screws, torquing the cap screws to 20 ft-lbs (27 Nm).

The bearing assembly is now ready for dismount and storage.

	TIP
	CLIMAX recommends using at least two support assemblies to obtain machine stability.

Mechanical axial feed setup

Mounting the mechanical axial feed to the bar

The mechanical axial feed unit can be mounted to either end of the boring bar. The locating nose and hex nut hole of the feed unit fit into the locating nose seat and protruding hex shaft of the boring bar end cap.

1. Place the axial feed unit in NEUTRAL so the lead screw drive can rotate in either direction.
2. While holding the axial feed against the bar end cap, turn the feed unit output shaft until the hexes fit together.
3. Secure the axial feed unit with the two screws provided.
4. Secure the trip rod to a fixed object to engage the feed mechanism.

	WARNING
	A loose trip rod can cause damage and injury. Secure the trip rod to a fixed object.

Setting axial feed direction

The lever for axial feed direction is on the flat base of the axial feed.

- To feed the tool head TOWARD the axial feed, turn the lever toward the bar.
- To feed the tool head AWAY FROM the axial feed, turn the lever away from the bar.
- The feed is in NEUTRAL when the knob and the lever are perpendicular to the bar.

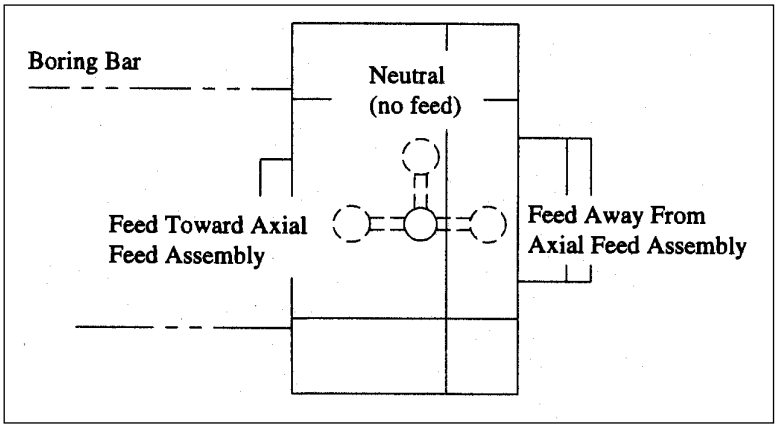


Figure 18. Axial feed direction

	**IMPORTANT** **If the axial feed unit is moved to the opposite end of the bar, the feed direction will reverse. Check feed direction before operating the boring bar.**

Setting the axial feed rate

Axial feed rate is adjustable and variable from 0.003–0.025" (0.07–0.63 mm) per revolution.

Do the following to set the feed rate:

1. Loosen the feed rate knob.
2. Turn the feed adjustment plate to the desired setting.
3. Tighten the feed rate knob.

Setting up the electric feed

Before connecting power, check that the main circuit breaker is rated to carry 125% of the full load of both the HPU and the axial feed drive. The full load of the axial feed drive is 10 amps at 460 volts. Refer to the electrical schematics for the HPU to determine the full load amps of the HPU and axial feed drive.

Do the following to mount the electric feed to the bar:

1. Connect the power supply cable.
2. Slide the leadscrew coupling onto the gearbox output shaft.
3. Mount the adapter plate with two 3/8-16 and one ¾-10 cap screws to the end of the boring bar.
4. Slide the gearbox with coupling onto the hex end of the boring bar leadscrew and secure with four ½-13 screws.
5. Install the motor shaft coupling and key on the electric feed motor shaft.
6. Mount the electric feed motor to the gearbox with four ¼ -20 screws.
7. Secure the electrical cable to the connector on the end of the feed unit.

Attaching the manual rapid feed (optional equipment)

Rapid mechanical feed is labeled on the unit as manual feed (see Figure 19). The manual feed assembly consists of a gear box, a two-position gear shift lever, and a side port with a 7/16" hexagonal shaft.

The lever disengages the electric drive from the boring bar and neutralizes movement from the control pendant.

When the lever is set to electric motor feed, the manual feed is not accessible to a standard socket.

When the lever is set to manual rapid feed, the 7/16" hex shaft is accessible.

When the gear lever is set to manual feed, the operator may place an electric drill or speed wrench on the hexagonal shaft and turn it to rapidly advance or retract the tool carrier.

Do the following to re-engage the electric feed motor and pendant control:

1. Remove the socket from the hexagonal shaft.
2. Turn the feed on slow.
3. Shift the lever to the electric feed position.

When electric motor feed is selected, a socket will not fit in the port.

	**CAUTION** **Do not force the shift lever to engage. Forceful engagement can damage the equipment.**

The optional manual rapid feed attachment fits between the axial feed assembly and the boring bar. See the exploded view of P/N 81709 on page 78.

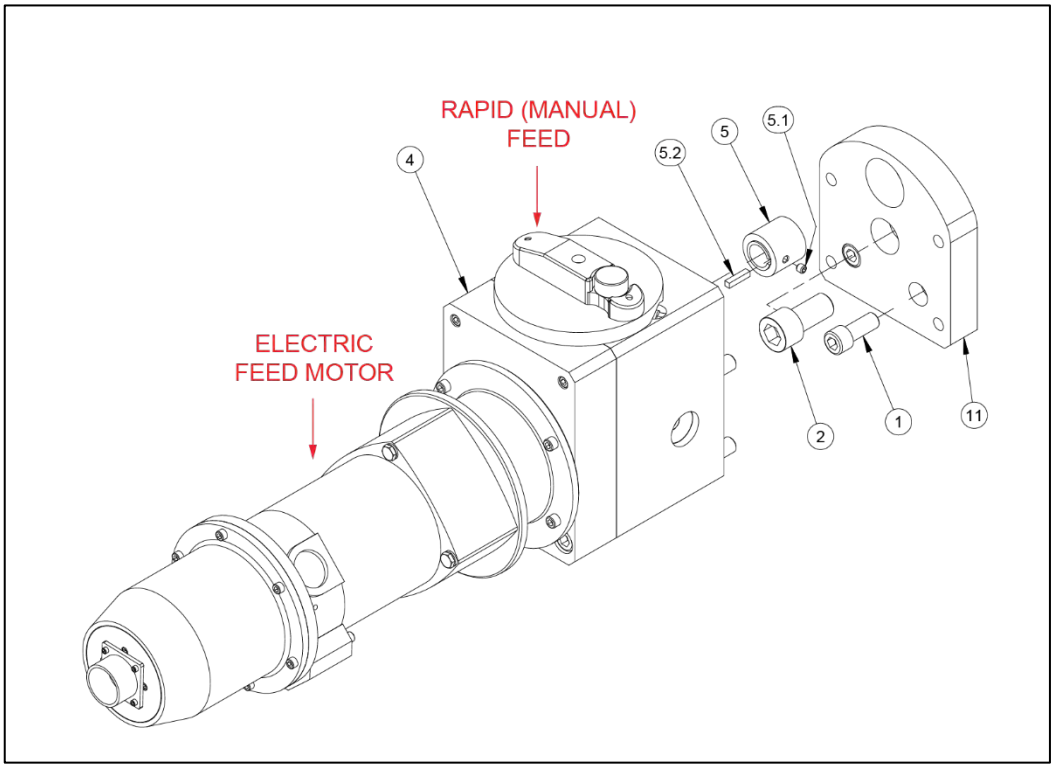


Figure 19. Electric feed motor and rapid feed drive

Rotational drive setup

The rotational drive can be placed anywhere along the boring bar.

	**CAUTION** **The boring bar is not hardened. To prevent bar damage, do not strike the bar against the bearing supports or against the workpiece.**

Do the following to set up the rotational drive:

1. Mount the torque arms onto the rotational drive unit housing.
2. If necessary, mount the hydraulic motor to the rotational drive unit housing.
3. Check that the mounting bolts are tight.

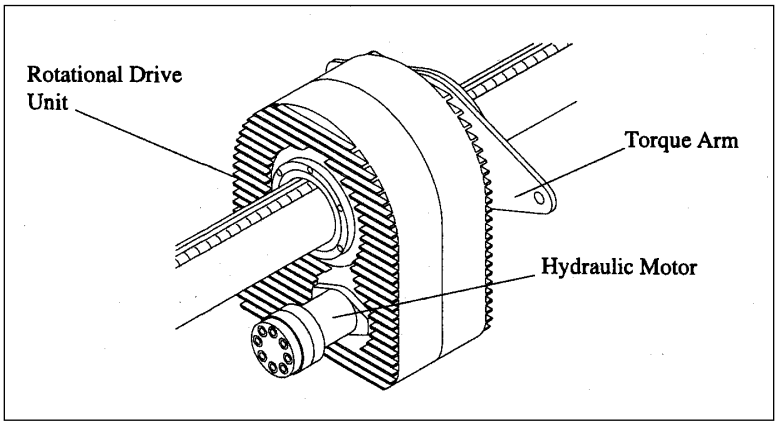


Figure 20. Mounting the hydraulic motor and torque arms on the RDU

4. Loosen the bar drive lock ring clamp screws. Push out both lock rings by screwing in the jacking screws.
5. Slide the rotational drive unit over the boring bar.
6. Remove the socket-head cap screws from one bar drive lock ring. Slide the ring away from the rotational drive along the bar.
7. Check that the key slots in the boring bar and gears are aligned. Check that the key meshes with the lead screw. Push the bar drive key into the key slot.

	**CAUTION** **The rotational drive key must be in engaged before operating the boring bar. Failure to do so may damage the machine.**

8. Slide the bar drive lock ring back into place in the rotational drive. Tighten the clamp screws on both lock rings.

	**CAUTION** **Tighten only the six clamping socket-head cap screws in the bar drive locking rings, not the jacking screws. The jacking screws loosen the locking rings. Back out the jacking screws before clamping the rings to avoid damaging the rings.**

9. Slide the bar drive lock ring back into place in the rotational drive.
10. Tighten the clamping screws on both lock rings.

	**WARNING** **Weak tie down failure or loose torque arms can allow the torque arms to swing uncontrollably, seriously injuring the operator and damaging the machine. Secure the torque arms to a stationary object strong enough to withstand the full torque.**

11. Connect the hydraulic lines between the motor and the hydraulic power unit.

	**CAUTION** **To avoid damaging the hydraulic power unit pump, connect the hydraulic motor to the power unit before plugging in and turning on the power unit.**

Installing the facing and boring arms to the boring bar

Do the following to mount the tool carrier:

1. Check the bar for nicks or cuts. Dress the bar smooth, if necessary.

	IMPORTANT **A bar with nicks or gouges can damage mating parts beyond repair (including the axial tool carrier and rotational drive unit).**

2. Clean the bar and tool carrier with solvent to remove dirt and chips.
3. Re-oil the bar (see the “Maintenance” section for further information).
4. Mount the two halves of the tool carrier onto the bar.
5. Secure the tool carrier with the four 3/4-10 x 2 SHCS screws (P/N 28757).
6. Insert the removable drive key (P/N 53523) inside the tool carrier onto the leadscrew. Tighten the mounting screws (P/N 22496) to 96 in/lbs (10.85 N-m).

	IMPORTANT **The bar can rotate in either direction. Check that the rotation is correct for the carbide cartridges.**

	TIP **Precision bores are best achieved with multiple roughing cuts then one or two finishing cuts.**

See the exploded view for the tool carrier (P/N 53922) on page 44 and 45.

Do the following to lock the tool carrier on the bar for other operations:

1. Loosen the lock screw on the side of the tool carrier
2. Tighten or loosen the adjustment screw.
3. Tighten the lock screw to keep the adjustment screw in position.

To remove the brass nut, remove the screws on each end of the brass nut. Leave the other screws in place. If there is too much play in the brass nut, the center set screw may be tightened.

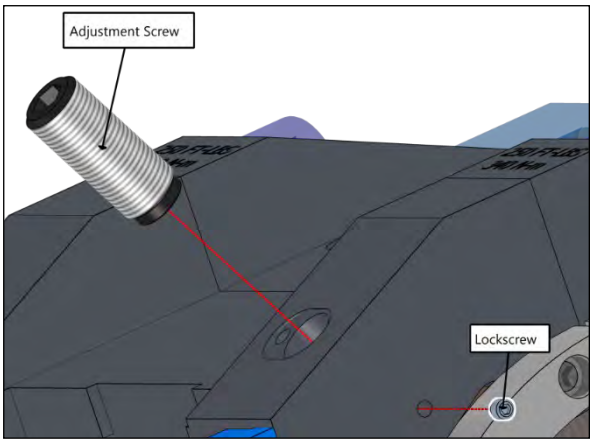


Figure 21. Adjustment screw and lockscrew

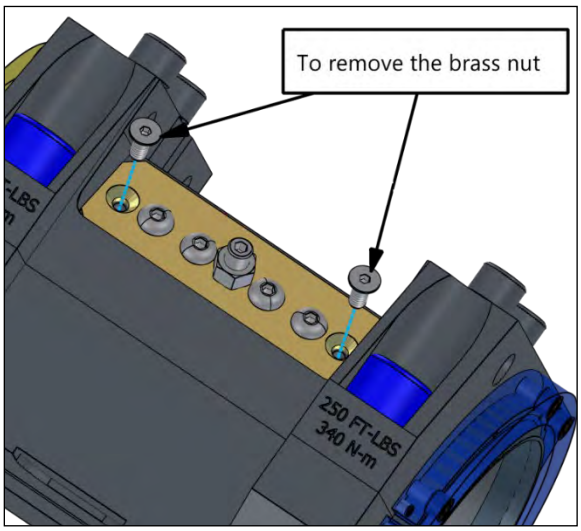


Figure 22. Removing the brass nut

Install the slide arm onto the tool carrier

Do the following to install the slide arm onto the tool carrier:

1. Using a device such as a crane, place arm onto tool carrier flush with carrier surface as shown.

	IMPORTANT
	Always use the lifting eyes when lifting the arms. The rotating lifting eyes provide the flexibility and safety during setup operations.

2. Secure arm with clamp bar (P/N 53074) with 1/2-20 x 1-3/4 screws (P/N 18225) – four per clamp bar and torque to 100 ft-lbs (135 Nm).

	DANGER
	Failure to properly torque the four ½-20 x 1-1/4 SHCS (P/N 18225) to 100 ft-lbs (135 Nm) can result in unexpected slippage of the tool arm which can result in injury or be fatal.

Adjusting the tool carrier for perpendicularity

The tool carrier is equipped with four set screws that allow you to adjust the slide arm perpendicularity if required.

Feedbox assembly

Mount and secure the feedbox with adapter plate (P/N 46879).

Feedbox and trip arm set-up

Do the following to install the counterweight arm onto the tool carrier:

1. Rotate the tool carrier on the bar to allow the counterweight arm to be mounted on the receiving surface of the tool carrier.
2. Attach the lifting eye onto counterweight arm and install arm

	IMPORTANT
	Always use the lifting eyes when lifting the arms. The rotating lifting eyes provide the flexibility and safety during setup operations.

3. Using a lifting device such as a crane, lift the counterweight assembly to the arm. Fasten the counterweight assembly to the arm using the 7/8-14 x 1-1/2 (P/N 53049).

Note that the counterweight may be positioned anywhere along the arm as needed to balance the assembly.

Micro-adjustment boring head

The micro-adjust boring head offers the possibility to micro-adjust readily available off-the-shelf square shank tooling for boring. The micro-adjust travel is 0.5" (13 mm), and the ability to slide the tool without having to change the setup provides a total tool travel of more than 2" (51 mm) per setup.

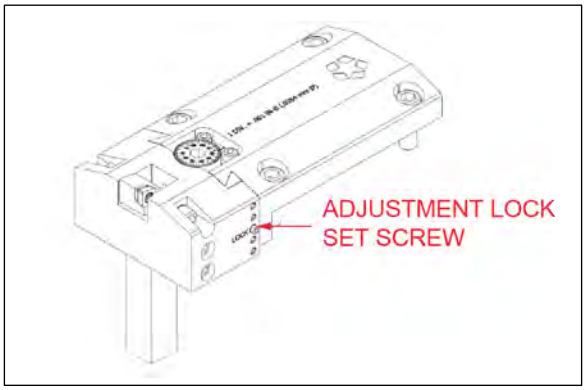


Figure 23. Micro-adjust boring head and adjustment lock set screw

To set the tool to the desired diameter, simply feed the dial screw until reaching it and then lock the middle dove tail set screw with the provided T handle hex drive. Each division in the dial screw resolves in 0.001" (0.0254 mm) change in diameter. The dove tail adjustment set screws are set to the correct load by CLIMAX and should not be necessary to re-adjust them. These set screws have Vibratite-VC3 in order to avoid losing tension during vibration. If the cutting tool is moving away from the work pieces, reapply Vibratite-VC3 on the adjustment lock set screw (see Figure 23).

The BB7100 micro-adjustment boring head comes with a 3/4" (19 mm) square shank tool holder. A bolt-on shim is provided the 3/4 tool holder so that it can be easily converted to a 1/2" (13 mm) tool holder.

To set up leading and trailing, shift the boring heads against the mounting screws in opposite directions.

There is a small set screw that stops the tool carriage from being removed from its holder, and the boring head should never be operated without it on.

Proper maintenance would involve cleaning and lubricating the dove tail surfaces and the dial screw threads and groove, and if the lock set screw feels loose after a while, applying the provided Vibrative-VC3.

Boring head setup

1. Select the required parts using the boring head tool range tables on the following pages.
2. Using Figure 24 as a guide, assemble the stack-up blocks on to the tool carrier symmetrically on both sides of the tool carrier, from tallest to shortest.
3. Mount the boring head and the counterweight on the stack up blocks.

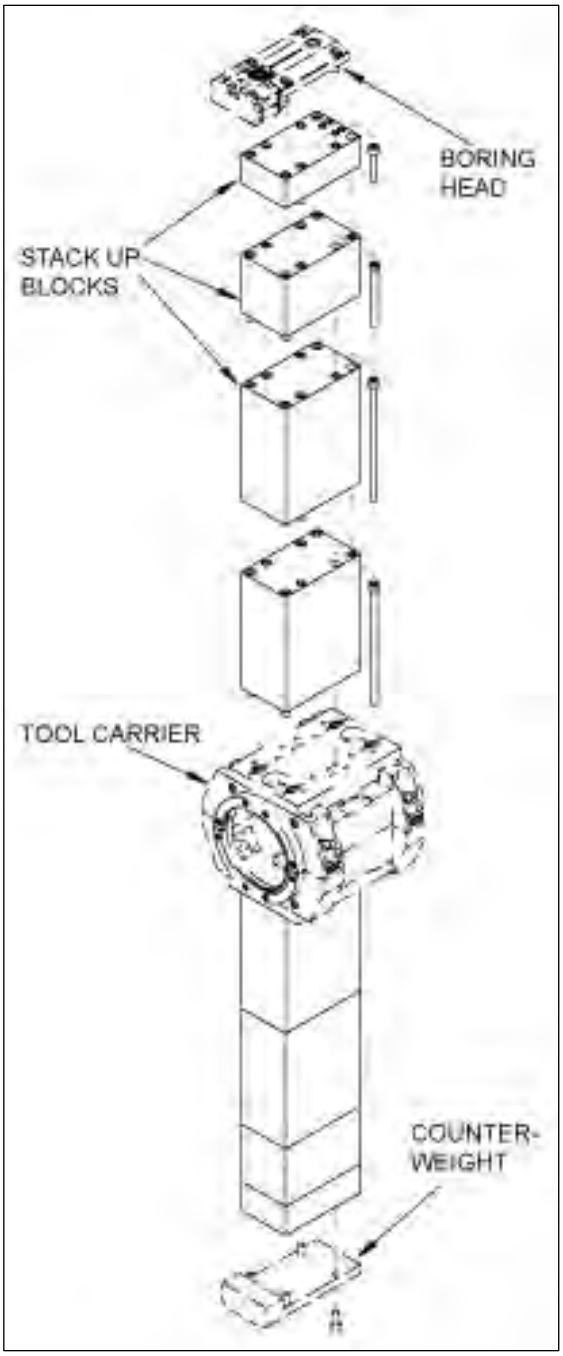


Figure 24. Boring head assembly

BB 7100 MICRO ADJUST BORING HEAD TOOL RANGE TABLE 10.25 –58.25" (260–1,480 MM) DIAMETER			
BORE RANGE DIAMETER	NUMBER OF SPACER BLOCKS REQUIRED		
	2" (51 MM) BLOCK	4" (102 MM) BLOCK	8" (203 MM) BLOCK
10.25–14.25" (260.35–362 mm)	0	0	0
14.25–18.25" (362–463.5 mm)	1	0	0
18.25–22.25" (463.5–565.2 mm)	0	1	0
22.25–26.25" (565.2–666.7 mm)	1	1	0
26.25–30.25" (666.7–768.3 mm)	0	0	1
30.25–34.25" (768.3–870 mm)	1	0	1
34.25–38.25" (870–971.5 mm)	0	1	1
38.25–42.25" (971.5–1,073.1 mm)	1	1	1
42.25–46.25" (1,073.1–1,174.7 mm)	0	0	2
46.25–50.25" (1,174.7–1,276.3 mm)	1	0	2
50.25–54.25" (1276.3–1,378 mm)	0	1	2
54.25–58.25" (1,378–1,479.5 mm)	1	1	2

BB 7100 SOLID TOOLING BORING HEAD TOOL RANGE TABLE 12.9–61.4" (328–1,560 MM) DIAMETER				
BORE RANGE DIAMETER	NUMBER OF SPACER BLOCKS REQUIRED			
	0.75" (19 MM) BLOCK	2" (51 MM) BLOCK	4" (102 MM) BLOCK	8" (203 MM) BLOCK
12.9–15.9" (327.66–403.86 mm)	0	0	0	0
14.4–17.4" (365.76–441.96 mm)	1	0	0	0

16.9–19.9" (429.26–505.46 mm)	0	1	0	0
18.4–21.4" (467.36–543.56 mm)	1	1	0	0

BB 7100 SOLID TOOLING BORING HEAD TOOL RANGE TABLE 12.9–61.4" (328–1,560 MM) DIAMETER				
BORE RANGE DIAMETER	**NUMBER OF SPACER BLOCKS REQUIRED**			
	0.75" (19 MM) BLOCK	**2" (51 MM) BLOCK**	**4" (102 MM) BLOCK**	**8" (203 MM) BLOCK**
20.9–23.9" (530.86–607.06 mm)	0	0	1	0
22.4–25.4" (568.96-645.16 mm)	1	0	1	0
24.9–27.9" (632.46-708.66 mm)	0	1	1	0
26.4–29.4" (670.56-746.76 mm)	1	1	1	0
28.9–31.9" (734.06-810.26 mm)	0	0	0	1
30.4–33.4" (772.16-848.36 mm)	1	0	0	1
32.9–35.9" (835.66-911.86 mm)	0	1	0	1
34.4–37.4" (873.76-949.96 mm)	1	1	0	1
36.9–39.9" (937.26-1,013.46 mm)	0	0	1	1
38.4–41.4" (975.36–1,051.56 mm)	1	0	1	1
40.9–43.9" (1,038.86–1,115.06 mm)	0	1	1	1
42.4–45.4" (1,076.96–1,153.16 mm)	1	1	1	1
44.9–47.9" (1,140.46–1,216.66 mm)	0	0	0	2
46.4–49.4" (1,178.56–1,254.76 mm)	1	0	0	2
48.9–51.9" (1,242.06–1,318.26 mm)	0	1	0	2
50.4–53.4" (1,280.16–1,356.36 mm)	1	1	0	2
52.9–55.9" (1,343.66–1,419.86 mm)	0	0	1	2
54.4–57.4" (1,381.76–1,457.96 mm)	1	0	1	2

56.9–59.9" (1,445.26–1,521.46 mm)	0	1	1	2
58.4–61.4" (1,483.36–1,559.56 mm)	1	1	1	2

Installing the micro adjustment boring head

1. Mount the tool carrier to the bar.
2. Mount the provided stack up blocks on the tool carrier to achieve the desired boring diameter range.
3. Mount the boring head and the counterweight to the top spacer blocks.
4. Mount the square shank tool and adjust it accordingly for the desired bore diameter.
5. Before installing turn off and lock out the electric power to the power unit.
6. Be sure all hydraulic hose fittings are clean.
7. Connect the hydraulic lines between the power unit and the hydraulic motor as described in the power unit instruction manual.
8. Plug the power unit into a grounded outlet.

CAUTION

Operating this hydraulic power unit for extended periods of time without connecting the hydraulic motor will overheat the system and may damage the pump.

WARNING

To avoid injury by flying chips or loud noise, wear personal protective equipment while operating the machine.

9. Jog the power unit motor to be sure the pump motor is rotating the same direction as the arrow located on the pump/motor coupling. If it is rotating the wrong way and you have a CLIMAX power unit:
    a) Turn off and lock out voltage to the power unit.
    b) Open the electrical enclosure.
    c) Identify wires L1, L2, and L3 on the terminal block.
    d) Switch any two wires.
    e) Close the enclosure.

OPERATION

In order to operate this machine, the operator must be trained in its safe setup and operation. Refer to the Safety and Risk Assessment sections from page 1 to page 5.

Power safety guidelines

Observe the following guidelines when connecting your equipment to a power source:

- Check that the equipment and attached devices are electrically rated to operate with the AC power available in your location.
- Check the voltage rating of the equipment before you connect the equipment to a mains power source. Check that the electrical mains power is suitable for the equipment voltage and frequency.
- Check that the mains power source has sufficient capacity to provide the full load current demand of the equipment.
- To prevent electric shock, only plug the equipment power cables into properly grounded electrical outlets. Do not use adapter plugs that bypass the grounding feature. Do not remove the grounding feature from the plug.
- Inspect portable cord-and-plug connected equipment, extension cords, power bars, and electrical fittings for damage or wear before each use. Repair or replace damaged equipment immediately.
- Do not plug the equipment power cables into an electrical outlet if the power cable or outlet is damaged.
- If using an extension power cable, check that the total ampere rating of the equipment plugged into the extension power cable does not exceed the ampere rating of the extension cable.
- Use extension cords that are rated for the mains power voltage.
- For single phase equipment: if you must use an extension cable or power strip, check that the extension cable or power strip is connected to a wall power outlet and not to another extension cable or power strip. The extension cable or power strip must be designed for grounded plugs and plugged into a grounded wall outlet.
- If you are using a multiple-outlet power strip: use caution when plugging the power cable into the power strip. Some power strips may allow you to insert a plug incorrectly. Incorrect insertion of the power plug could result in permanent damage to your equipment, as well as risk of electric shock and/or fire. Check that the ground prong of the power plug is inserted into the mating ground contact of the power strip.
- When disconnecting equipment from an electric socket, pull on the plug, not the cable.

	WARNING
	**If the machine is being used outdoors and there is a chance of lightning, do not operate. Unplug the machine first and direct all personnel to a safe area.**

Pre-start checks

WARNING

When setting up or servicing the machine, disconnect the power source and lock the machine out. Failure to do so could result in the machine being accidentally turned on, and seriously injuring you and others.

Do the following before operating the machine:

1. Tie down the rotational drive unit torque arms and the axial feed unit stop rod.
2. Check that the rotational drive unit is filled with drive oil.
3. Check that all cutters are sharp and in good condition.
4. Secure all machine parts, including the axial tool carrier, tool head and cutting tool. Check that moving parts move freely.
5. Check that electric cords and cables are in good condition and correctly connected.
6. Turn the hydraulic power unit OFF.
7. Check that the hydraulic power unit wiring matches the electric power source. Plug the power unit into a grounded outlet.
8. Check the hydraulic power unit reservoir level. Fill the reservoir to above the red bar with Mobil DTE-24 anti-wear hydraulic oil or equivalent. Check that the power unit is on a level surface.
9. Clean the hydraulic hoses and fittings before connecting them.
10. Check that the hydraulic power unit pump motor is rotating as directed by the arrow on the pump/motor coupling.

Recommended cutting tools

Use only single-point lathe tools. CLIMAX recommends carbide, but high-speed steel (HSS) can be used. Do not use tooling over 6" (152 mm) in length.

All square shank lathe tooling can be used ranging 0.75–1.25" (19–31.75 mm) in width. CLIMAX provides carbide tooling with all its machines, as shown in the P/N 96915 exploded view shown on page 46 and listed here:

- Carbide insert holder 1 square shank screw on left hand (P/N 79479)
- Carbide insert holder 1 square shank screw on right hand (P/N 79480)
- Carbide insert 80 degree 3/8 IC 1/32 nose radius (P/N 79484)

Starting the machine

Observe the following safety guidelines at all times during operation:

- Keep all cables and hoses away from moving parts during operation. Do not clutter the space around the machine.

- Stay away from moving parts.
- Keep your workspace clean and tidy.

WARNING

Stay away from the machine and all moving parts during operation. Never bend over or enter the machine to remove burrs or adjust it while it is running.

Failure to keep a safe distance from all moving parts could result in severe personal injury.

The CLIMAX BB7100 is intended for operation at varying rates of rotation and feed. The rotation speed is controlled by varying the output from the Hydraulic Power Unit (HPU). The feed rate of the mechanical unit is controlled manually from the feed unit.

The following types of cutting tools are commended for use with the BB7100:

If boring:

Set the feed direction on the axial feed.

Set the feed rate on the axial feed.

If facing:

Set the feed direction on the axial feed to NEUTRAL.

Lock the tool carrier to the bar using adjustable shoes.

Adjust the automatic trip mechanism on the facing head.

1. Turn on the hydraulic power unit.
2. Adjust the bar rotation to the desired speed.
3. As cutting proceeds, apply cutting fluid.

Stopping the machine

The axial feed is driven from the rotation of the bar. Stopping the bar also stops the feed.

IMPORTANT

In an emergency, turn off the hydraulic power unit.

Do the following to stop the machine:

1. Stop the hydraulic power unit.
2. Turn off and lock out the power unit.
3. After the machine is completely stopped, use a brush to remove chips.

	**CAUTION** **To avoid personal injury from flying chips, do not use compressed air to remove chips.**

Repetitive machining

Do the following to set up the machine for repetitive machining:

1. Reverse the axial feed (tool head) direction.
2. Manually or automatically feed the tool head back to where it started cutting.
3. Sharpen the tool bit or replace the carbide inserts if necessary.
4. Using a dial indicator reset the tool bit cutting depth. Maximum recommended cutting depth is 1/8" (3 mm).
5. Operate the boring bar as described in “Starting the machine” on page 34.

	**CAUTION** **The bar is not hardened. To prevent bar damage, do not strike the bar against the bearing supports or against the workpiece.**

Disassembly

Do the following to disassemble the machine:

1. Turn off and lock out the hydraulic power unit.
2. Disconnect the hydraulic hose from the motor.
3. Remove the tool bit or carbide cartridge from the tool head.
4. Remove the tool head and tool carrier.
5. Remove the axial feed from the bar.
6. Securely support the boring bar, bearing supports, and rotational drive with hoist\s.
7. If the rotational drive is between bearing support assemblies, remove one support first by doing the following:
    a) Loosen the bearing cartridge.
    b) Loosen the support from the workpiece.
    c) Remove the support from the bar.
8. Secure the rotational drive with a hoist.
9. Loosen the six clamping screws in the rotational drive.
10. Push the bar drive lock rings out by screwing in the four jacking screws.
11. Remove one lock ring. Remove the drive key.
12. Carefully slide the rotational drive off the bar.

13. Loosen the bearing cartridges.
14. Remove the boring bar.
15. Remove the bearing support(s) from the work piece.

Alternative disassembly

Do the following to remove the bearings before removing the bar:

1. Turn off and lock out the hydraulic power unit.
2. Disconnect the hydraulic hoses from the motor.
3. Remove the tool bit or carbide cartridge from the tool head.
4. Remove the tool head and tool carrier.
5. Securely support the boring bar, bearing supports, and rotational drive with hoists.
6. Remove the axial feed from the bar.
7. If the rotational drive is between the bearing support assemblies, remove one support first:
    a) Loosen the bearing cartridge.
    b) Loosen the support from the workpiece.
    c) Remove the support from the bar.
8. Secure the rotational drive with a hoist.
9. Loosen the six clamping screws in the rotational drive.
10. Push the bar drive lock rings out by screwing in the four jacking screws.
11. Remove one lock ring.
12. Remove the drive key.
13. Carefully slide the rotational drive off the bar.
14. Loosen the bearing cartridges.
15. Place a clean wooden “crib” in the bottom of the bore.
16. Remove the bearing supports from the workpiece.
17. Slide the bar out of the bore using the crib.

MAINTENANCE

Recommended Lubricants

Lubricant	Brand	Where used
Gear grease	UNOBA EP #0	Bearing cartridges
Rotational drive oil	Mobil SHC 634 Synthetic	Gear box gears
Light oil	LPS 2	Unpainted surfaces
Cutting oil	UNOCAL KOOLKUT	Tool bits, work piece
Hydraulic oil	Mobil DTE-24 anti-wear hydraulic oil	Hydraulic power unit and motor

CAUTION

To avoid damage only use specified lubricants.

Boring bar and lead screw

Clean the lead screw and boring bar frequently during operation. Keep chips away from the lead screw threads. Lubricate the lead screw periodically with light oil to ensure smooth travel of the rotational drive. Before storage, lightly oil the bar to prevent rusting. Do not grease the lead screw.

Axial feed

Under normal conditions, the axial feed is maintenance-free.

Rotational drive

Under normal operating conditions, replace the oil in the main rotational drive gearbox every 500 hours with Aero-Lube SAE 90 gear oil or equivalent.

Do the following to fill the gear box:

1. Using the lifting eye, set the gear box upright. Secure the gearbox so it cannot move.
2. Remove the fill plug and the level plug.
3. Fill the gearbox (through the fill hole) until oil comes out the level hole.
4. Replace the level plug.
5. Add one more quart of oil.
6. Replace the fill plug.

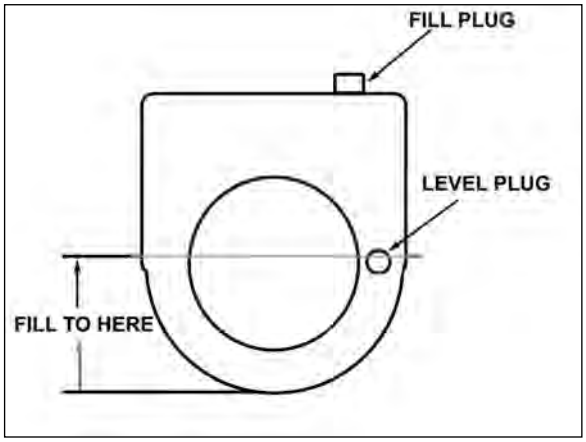


Figure 25. Filling the gearbox with oil

Bearing support

End-mount bearing support assemblies

Periodically grease the bearing cartridge by pumping grease through the grease fitting in the housing.

Before storage, lightly oil the assembly to prevent rusting.

ID-mount bearing support assemblies

If the jaws stick inside the blocks, pull the jaws out and grease the worm gears inside the blocks.

Periodically grease the bearing cartridge.

Boring head

Lightly oil all parts to prevent rusting.

Mechanical facing head

Before and frequently during operation, lubricate the tool head carrier with way oil through the grease fitting. Brush chips from the lead screw to prevent thread damage. Lightly oil the lead screw periodically to ensure smooth travel of the tool holder. When changing tool holders, apply way oil to the dovetail ways.

Axial tool carrier

Lightly oil all parts to prevent rusting.

Troubleshooting

Problem	Check
Axial feed unit will not advance the bar	Be sure the feed direction is set to the desired setting.
	Clean the leadscrew.
	Be sure the feed rate is not too low.
	Be sure the axial feed unit is securely mounted to the end of the bar.
Chatter	Re-sharpen the tool bit or replace the carbide inserts.
	Adjust the feed rate.
	Increase or decrease the hydraulic motor speed.
	Change the cutter depth.

Do the following to fix stuck tooling:

1. Stop the feed (usually electric, sometimes combined with rotation).
2. Stop rotation: electric or hydraulic. If hydraulic, release stored energy. All CLIMAX HPUs have a red lever labeled drain that may release stored pressure.
3. Reverse the feed: move the carrier away from the workpiece. The carbide tooling will most likely be broken.

4. Rotate the bar: safely rotate the bar to where the operator can safely remove the tool from the tool holder.
5. Inspect the workpiece: look for bits of carbide embedded in the workpiece. These must be removed with a grinder. Any pieces of carbide left in the workpiece can ruin the new tooling.
6. Replace the tooling.
7. Reset: make any adjustments to any setups that may have shifted and move the machine back into position to start again.
8. Restart.

Spare parts

Parts listed below include items most frequently replaced due to wear, loss, or damage. To avoid unwanted down time, contact CLIMAX to stock the items listed.

Table 3. Spare parts

PART NO.	DESCRIPTION	QTY	WHERE USED
15549	Lead screw bearing adjustment nut	2	Boring bar
15173	Thrust washer	4	
12446	Thrust bearing	2	
15172	Needle bearing	2	
15555	Bar Drive Key	1	
15754	Trip rod	1	Mechanical axial feed
15608	Seal	2	Rotational drive
15768	Seal	2	
18432	Extension spring	3	Facing head
10532	Roller clutch bearing	1	
18399	Axial clutch housing	1	
54134	Axial lead screw nut	1	Axial tool carrier
15826	Rod scraper	2	
21114	Hydraulic filter element	2	Hydraulic power unit
19259	Bearing lock key	1	Tool kit
16496	Adjustable spanner wrench	1	
15367	Strap wrench	1	

Tool kit

Table 4. BB7100 tool kit (P/N 54263)

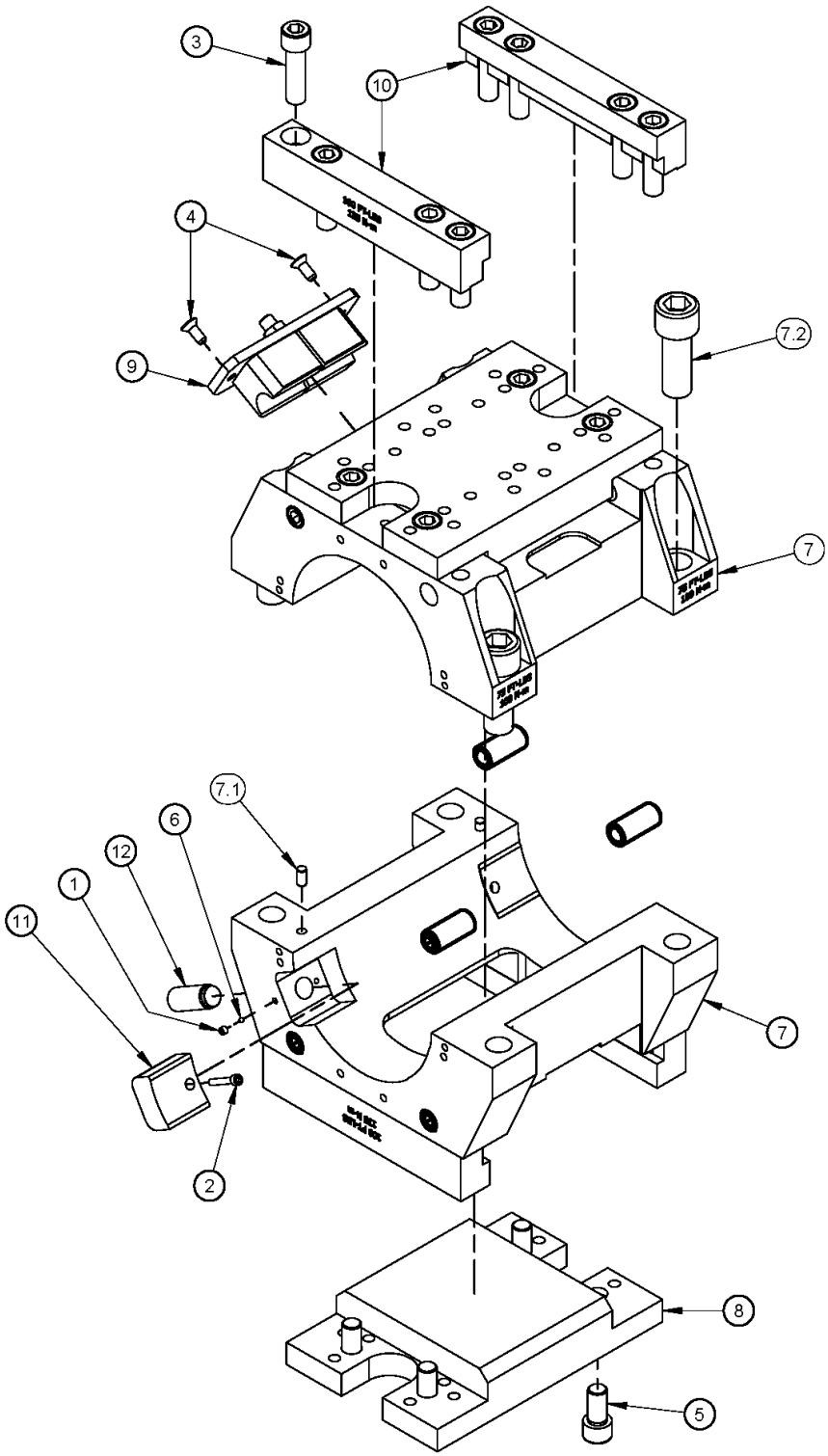
P/N	DESCRIPTION	QTY	UOM
10855	WRENCH EXTENSION 3/8 DRIVE X 6	1	Piece
11856	WASHER 5/8 FLTW	4	Piece
12339	WASHER 3/4 FLTW	2	Piece
12800	WRENCH END 15/16	1	Piece
12835	WRENCH END 1-1/8 COMBINATION LONG (KB)	1	Piece
14735	WRENCH EXTENSION 1/2 DRIVE X 10	1	Piece
14818	WRENCH RATCHET 1/2 DRIVE	1	Piece
15367	WRENCH STRAP 1-3/4 WIDE X 48 LONG	1	Piece
16792	WRENCH END 3/8 COMBINATION	1	Piece
17378	SCREW 5/8-11 X 2-1/4 HHCS	4	Piece
19261	WRENCH SOCKET 3/8 6 PT X 3/8 DRIVE	1	Piece
19700	CONTAINER SHIPPING FLAT ROOF 20 X 8.75 X 10.5	1	Piece
20869	WRENCH HEX SET 5/64 TO 3/4 15 PIECES	1	Piece
21406	SCREW 3/4-10 X 2 HHCS	2	Piece
24751	WRENCH RATCHET 3/8 DRIVE	1	Piece
29661	WRENCH HINGE HANDLE 1/2 DRIVE 17 IN HANDLE (KB)	1	Piece
33999	WRENCH HEX SET .050 - 3/8 BONDHUS BALL END (KB)	1	Piece
35516	HAMMER DEAD BLOW 1-3/4 DIA HEAD (KB)	1	Piece
42792	CLAMP COLLAR 5 ID X 6-1/4 OD X 7/8 2 PIECE	2	Piece
54411	STANDOFF RDU 6IN	1	Piece
54412	STANDOFF RDU 6.5IN	1	Piece
55045	WRENCH HEX BIT SOCKET SET 10 PIECE 1/2 X 3/8 DRIVE	1	Piece
55572	TOOL BEARING BB7100	1	Piece
55769	MANUAL INSTRUCTION BB7100 5 DIA BORING BAR	1	Piece
96567	TOOL BB7100 BEARING TENSIONING	2	Piece
96570	WRENCH SOCKET 17MM 6 PT 1/2 DRIVE	1	Piece
96571	WRENCH HEX BIT SOCKET 7MM X 1/2 DRIVE	1	Piece

STORAGE

Proper storage of Model BB7100 Portable Boring Machine will prevent undue deterioration or damage. Before storing the machine, clean it using solvent to remove grease, metal chips, and moisture. Spray the machine with a moisture-protective coating (LPS1 or LPS2 for short-term storage, LPS 3 for long-term storage) to prevent rusting. Store the machine in the boxes provided. Place desiccant bags or vapor wrap around the machine to absorb moisture.

EXPLODED PARTS AND VIEWS

The following diagrams and parts lists are for your reference purposes only. The machine Limited Warranty is void if the machine has been tampered with by anyone who has not been authorized in writing by CLIMAX Portable Machining & Welding Systems to perform service on the machine.



53922 - TOOL CARRIER ASSY BB7100 - REV C

FOR REFERENCE ONLY

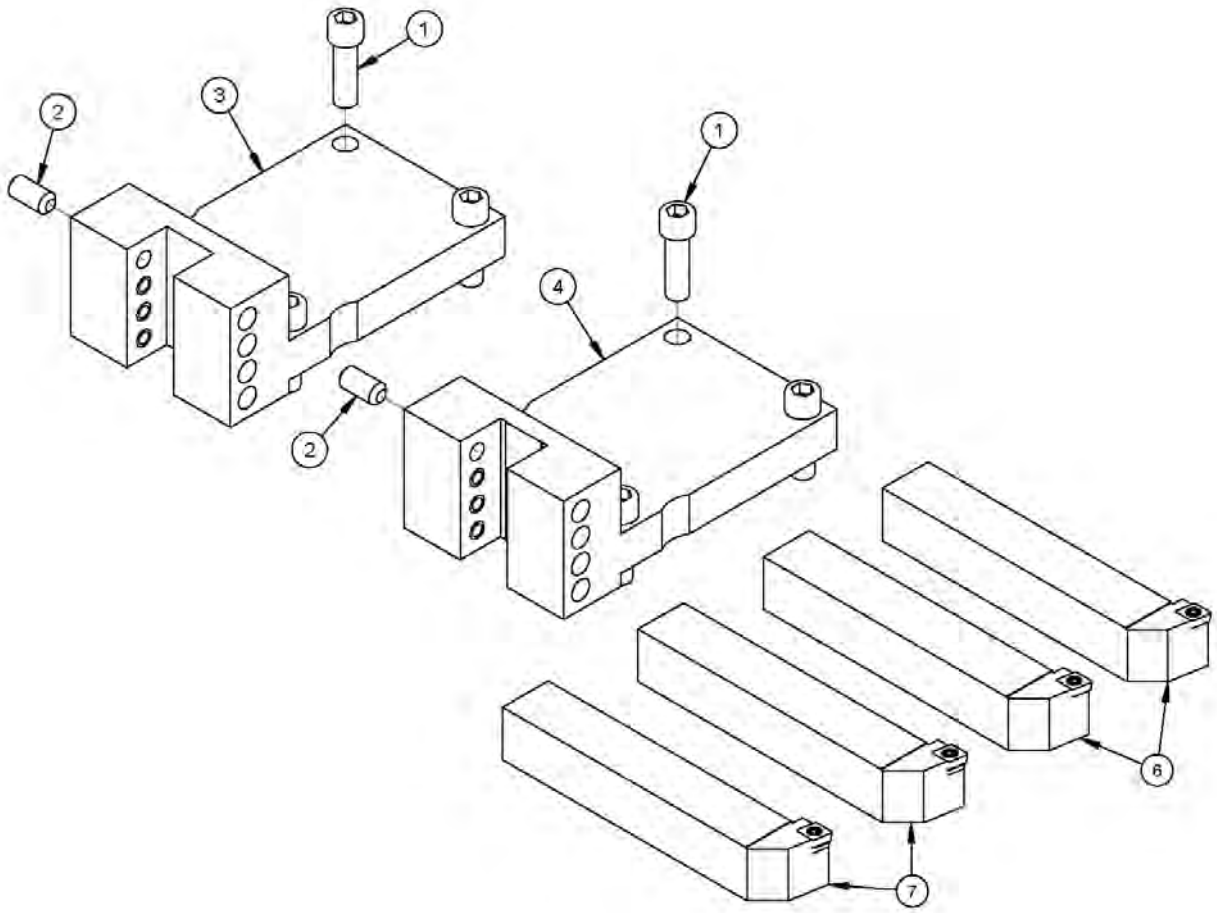
Figure 26. Tool carrier assembly (P/N 53922)

PARTS LIST			
ITEM	QTY	P/N:	DESCRIPTION
1	2	11050	SCREW 10-32 X 3/16 SSSCP
2	2	12880	SCREW 8-32 X 1 SHCS
3	16	18225	SCREW 1/2-20 X 1-3/4 SHCS
4	2	22496	SCREW 1/4-20 X 5/8 FHSCS
5	8	24955	SCREW 1/2-20 X 1 SHCS
6	2	43489	BALL NYLON 1/8 DIA
7	1	53850	TOOL CARRIER BB7100
7.1	2	20166	PIN DOWEL 1/4 DIA X 1/2
7.2	4	28757	SCREW 3/4-16 X 2 SHCS
8	2	53904	STACK UP MOUNTING BLOCK BB7100
9	1	54134	ADJUSTABLE NUT AXIAL LEAD SCREW 1-5 ACME
10	4	54177	CLAMP SLIDE ARM BB7100
11	2	54179	SHOE ADJUSTABLE TOOL CARRIER BB7100
12	2	55307	SCREW 5/8-18 X 1.55 SSSFP MODIFIED
13	8	55564	SCREW ASSY 5/8-18 X 1-1/2 SSSFP WITH NYLON BALL TIP

53922 - TOOL CARRIER ASSY BB7100 - REV C

FOR REFERENCE ONLY

Figure 27. Tool carrier assembly parts list (P/N 53922)



PARTS LIST			
ITEM	QTY	PART No.	DESCRIPTION
1	8	10453	SCREW 3/8-16 X 1 1/4 SHCS
2	16	11734	SCREW 3/8-16 X 3/4 SSSCP
3	1	23090	HOLDER TOOL 1 IN. SQUARE LEAD
4	1	23091	HOLDER TOOL 1 IN. SQUARE FOLLOW
5	1	39694	(NOT SHOWN) WRENCH TORX FT-15
6	2	79479	HOLDER INSERT CARBIDE 1 SQ SHANK SCREW ON LEFT HAND
7	2	79480	HOLDER INSERT CARBIDE 1 SQ SHANK SCREW ON RIGHT HAND
8	10	79484	(NOT SHOWN) INSERT CARBIDE 80 DEG 3/8 IC 1/32 NOSE RADIUS CCGT-3252

96915 - BORING HEAD SOLID TOOLING LEADING AND TRAILING FOR BB71 & BB81 - REV A

FOR REFERENCE ONLY

Figure 28. Boring head solid tooling (P/N 96915)

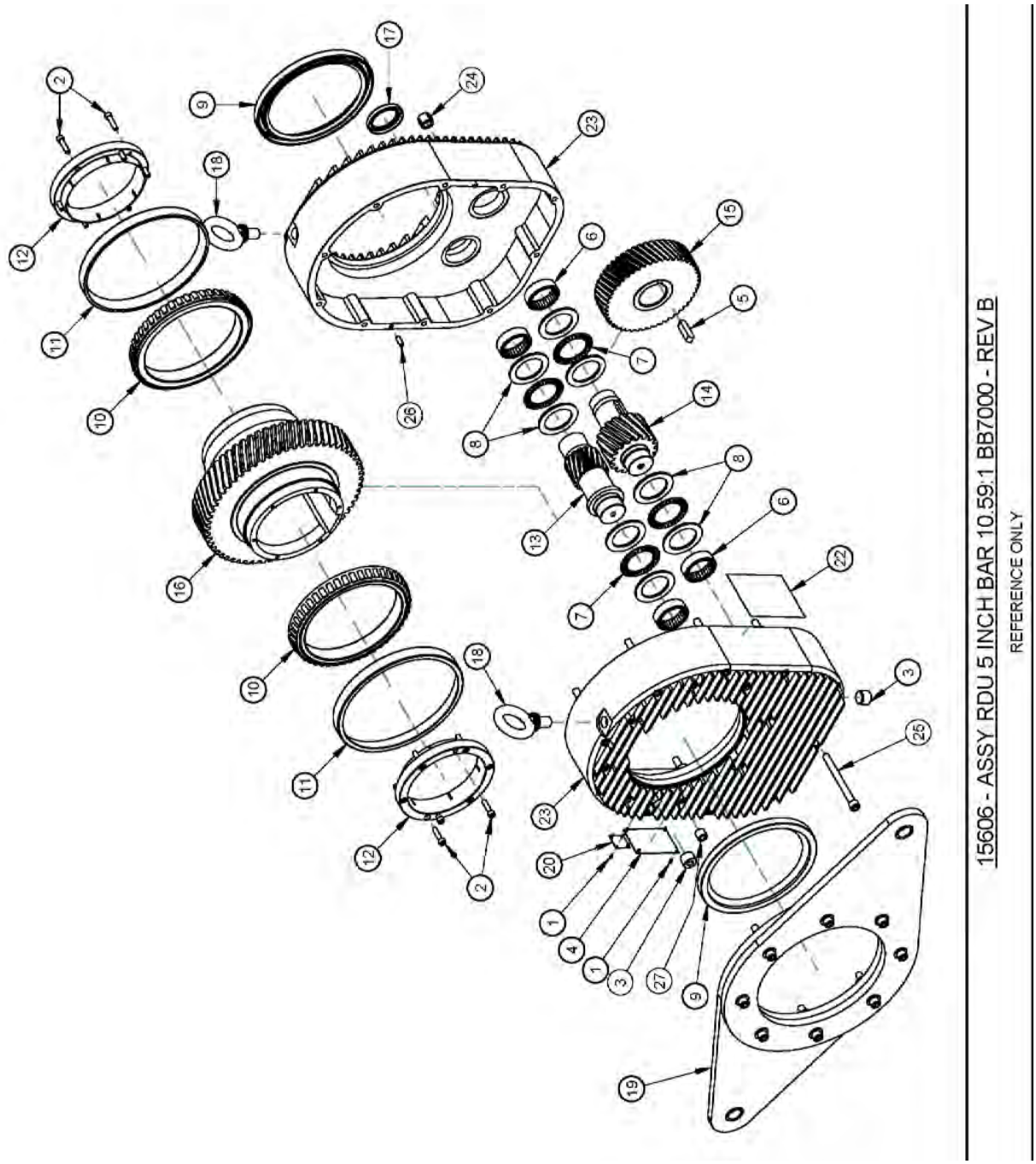


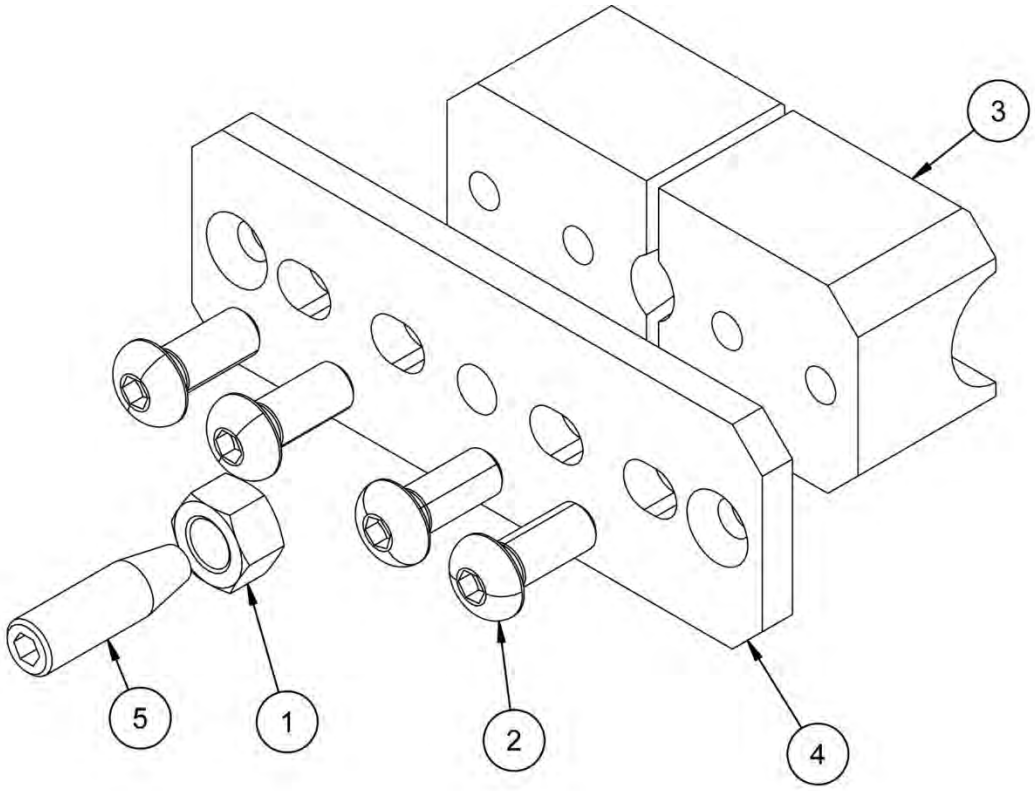
Figure 29. RDU assembly (P/N 15606)

PARTS LIST			
ITEM	QTY	P/N:	DESCRIPTION
1	8	10588	SCREW DRIVE #2 x 1/4 HOLE SIZE .089
2	16	11118	SCREW 1/4-20 X 1 SHCS
3	2	12579	FTG PLUG 1/2 NPTM SOCKET
4	1	14684	PLATE SERIAL YEAR MODEL 2.0 X 3.0
5	1	15093	KEY 3/8 SQ X 1.50 RADIUS BOTH ENDS
6	4	15602	BRG NEEDLE 1-5/8 ID X 2 OD X .625 OPEN
7	4	15605	BRG THRUST 1.750 ID X 2.500 OD X .0781
8	8	15607	WASHER THRUST 1.750 ID X 2.500 OD X .123
9	2	15608	SEAL 6.000 ID x 7.500 OD x .500 CRWA1 DBL LIP
10	2	15621	BRG CONE 6.2500 ID X .9375 WIDE
11	2	15622	BRG CUP 8.0938 OD X .7188 WIDE
12	2	15624	LOCK RING BAR DRIVE
13	1	15672	DRIVE SHAFT ROTATIONAL DRIVE
14	1	15673	JACK SHAFT ROTATIONAL DRIVE
15	1	15679	JACK GEAR ROTATIONAL DRIVE
16	1	15680	GEAR BULL ROTATIONAL DRIVE
17	1	15768	SEAL 1.625 ID X 2.250 OD X .313
18	2	16174	EYE LIFTING 5/8 MODIFIED
19	1	19294	ARM TORQUE ASSY
20	1	29152	PLATE MASS CE
21	80	32569	(NOT SHOWN) OIL SYNTHETIC FOR CONE DRIVE MOBIL SHC 634
22	1	34735	LABEL WARNING 3-1/2 X 4
23	1	45463	HOUSING RDU BB7000 5 DIA BAR
24	2	15399	INSERT THREADED 1/2-13 KEENSERT
25	10	15743	SCREW 3/8-16 X 4 SHCS
26	2	15756	PIN DOWEL 1/4 DIA X 5/8
27	8	15778	INSERT THREADED KEY LOCKING 3/8-16 X 9/16-12 X .50

15606 - ASSY RDU 5 INCH BAR 10.59:1 BB7000 - REV B

FOR REFERENCE ONLY

Figure 30. RDU assembly parts list (P/N 15606)



PARTS LIST			
ITEM	QTY	PART No.	DESCRIPTION
1	1	10536	NUT 3/8-24 STDN
2	4	14771	SCREW 5/16-18 X 3/4 BHSCS
3	2	54135	NUT AXIAL LEAD SCREW 1-5 ACME BB7100 MATCHED SET
4	1	54136	ADJUSTABLE HALFNUT BACK PLATE BB7100
5	1	54137	SCREW MODIFIED 3/8-24 SSS 10 DEG TAPER

ADJUSTABLE NUT AXIAL LEAD SCREW 1-5 ACME 54134

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Figure 31. Adjustable nut axial lead screw (P/N 54134)

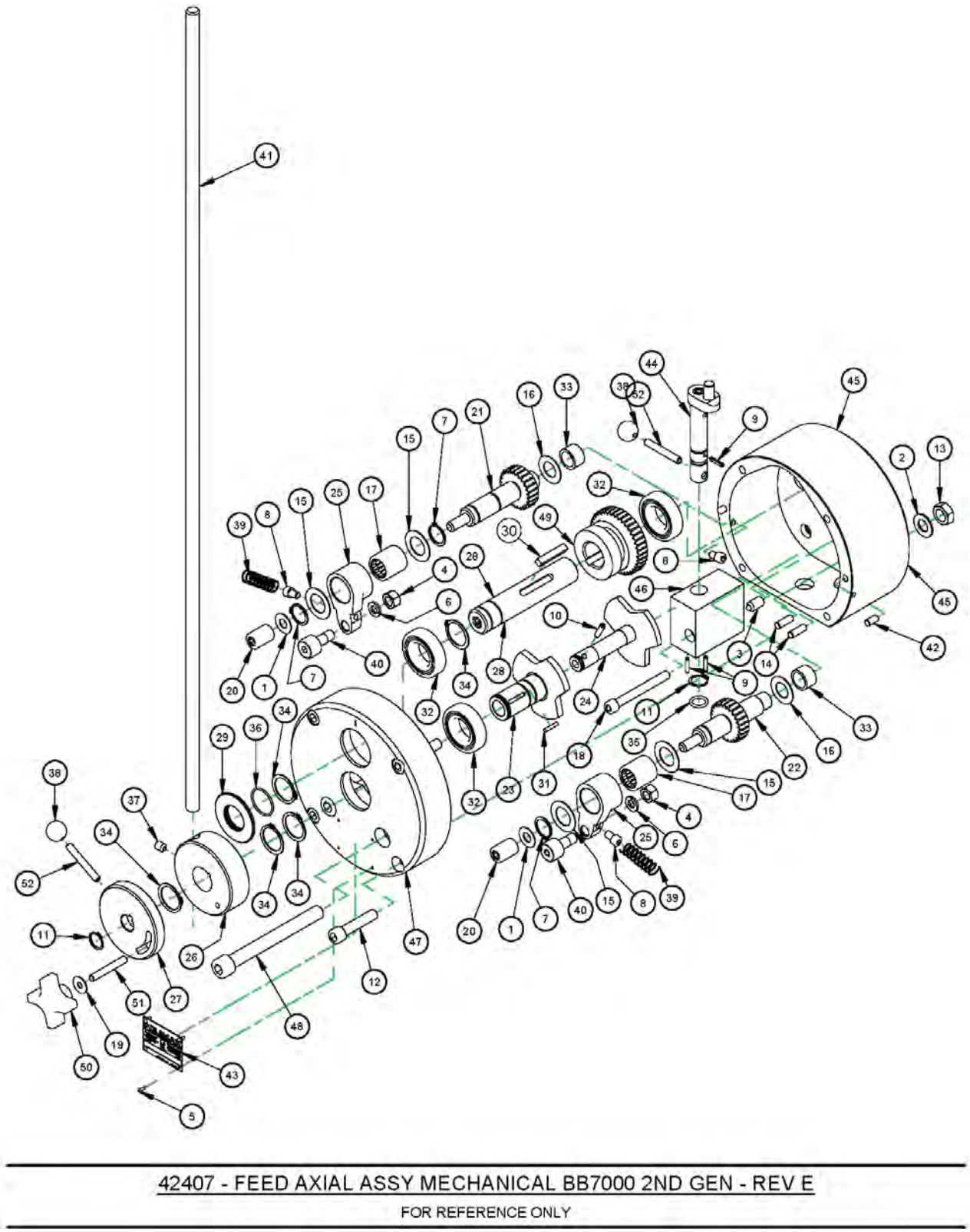


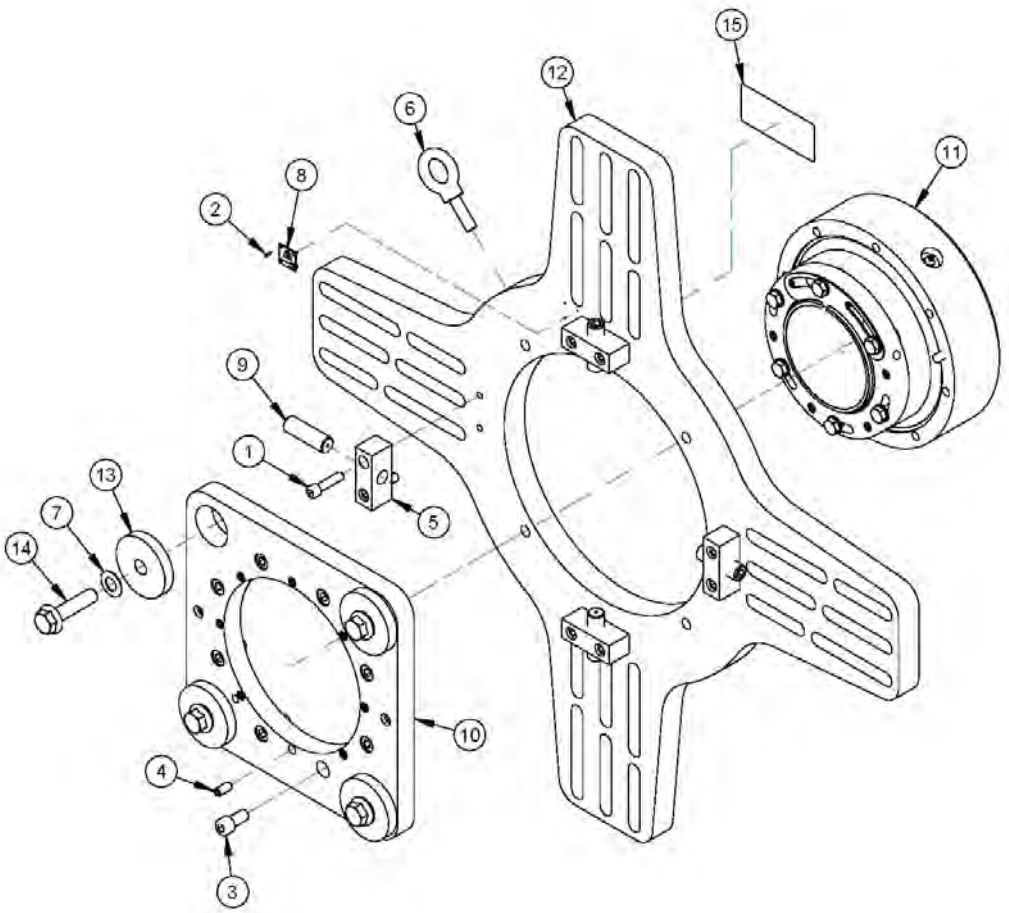
Figure 32. Axial feed assembly (P/N 42407)

PARTS LIST				PARTS LIST			
ITEM	QTY	P/N:	DESCRIPTION	ITEM	QTY	P/N:	DESCRIPTION
1	2	10058	WASHER THRUST .375 ID X .812 OD X .032	27	1	15717	PLATE FEED ADJUSTING
				28	1	15718	SHAFT FEED BB7000
2	2	10436	WASHER THRUST .500 ID X .937 OD X .060	29	1	15720	DIAL MANUAL FEED
				30	1	15724	KEY 1/4 SQ X 1.37 SQ BOTH ENDS
3	1	10441	SPRING PLUNGER 3/8-16 HEAVY FORCE	31	1	15725	KEY 1/8 SQ X .62 SQ
				32	3	15726	BRG BALL .9843 ID X 1.8504 OD X .4724 W/SEALS
4	2	10536	NUT 3/8-24 STDN				
5	4	10588	SCREW DRIVE #2 x 1/4 HOLE SIZE .089	33	2	15728	BRG NEEDLE 5/8 ID X 13/16 OD X .500 CLOSED
6	2	10595	WASHER 3/8 LOCW				
7	3	10612	RING SNAP 3/4 OD	34	5	15729	RING SNAP 63/64 OD (25mm)
8	4	10670	SCREW 1/4-20 X 3/8 SHCS	35	1	15730	RING O 3/32 X 1/2 ID X 11/16 OD
9	3	10819	PIN ROLL 1/8 DIA X 5/8	36	1	15731	RING O 1/16 X 1 ID X 1-1/8 OD
10	1	10850	PIN ROLL 3/16 DIA X 3/4	37	1	15744	SCREW 5/16-18 X 3/8 SSSFP
11	2	11019	RING SNAP 5/8 OD X .035 THICK	38	2	15745	BALL 3/4 DIA BLACK PLASTIC X 1/4-20
12	4	11211	SCREW 3/8-16 X 1-3/4 SHCS	39	2	15749	SPRING COMP .48 OD X .042 WIRE X 1.62 LONG
13	2	11218	NUT 1/2-13 JAMN				
14	2	11729	PIN DOWEL 1/4 DIA X 3/4	40	2	15750	BRG CAM FOLLOWER .750 OD X .500 WIDE W/STUD
15	4	11739	WASHER THRUST .750 ID X 1.250 OD X .0312	41	1	15754	ROD TRIP
16	2	11823	WASHER THRUST .625 ID X 1.125 OD X .030	42	2	20166	PIN DOWEL 1/4 DIA X 1/2
				43	1	35828	PLATE SERIAL YEAR MODEL CE 1.5 X 2.0
17	2	12385	BRG ROLLER CLUTCJ 3/4 ID X 1 OD X 1.000	44	1	42371	ASSY FEED SELECTOR
18	1	12578	SCREW 5/16-18 X 2-3/4 SHCS	45	1	42374	BOX GEAR AXIAL FEED MECH 5 DIA STRAIGHT MNT
19	1	12629	WASHER THRUST .25 ID X .687 OD X .030	46	1	42375	BLOCK FEED SELECTOR
20	2	13492	BRG ROLLER CLUTCH 3/8 ID X 5/8 OD X .875	47	1	42376	COVER AXIAL FEED
				48	2	42385	SCREW 1/2-13 X 4-3/4 SHCS
21	1	15707	SHAFT AXIAL FEED INWARD	49	1	42406	GEAR DRIVE
22	1	15708	SHAFT AXIAL FEED OUTWARD	50	1	59333	KNOB 4 LOBE 1/4-20 THREADED 2.O DIA X 1.02 HIGH STAINLESS
23	1	15710	CAM STATIONARY				
24	1	15711	CAM ADJUSTABLE	51	1	59336	STUD THREADED 1/4-20 X 1-3/4 GRADE B7
25	2	15713	ROCKER FEED				
26	1	15716	HOLDER TORQUE ARM	52	2	103768	STUD 1/4-20 X 1.25 SS

42407 - FEED AXIAL ASSY MECHANICAL BB7000 2ND GEN - REV E

FOR REFERENCE ONLY

Figure 33. Axial feed assembly parts list (P/N 42407)

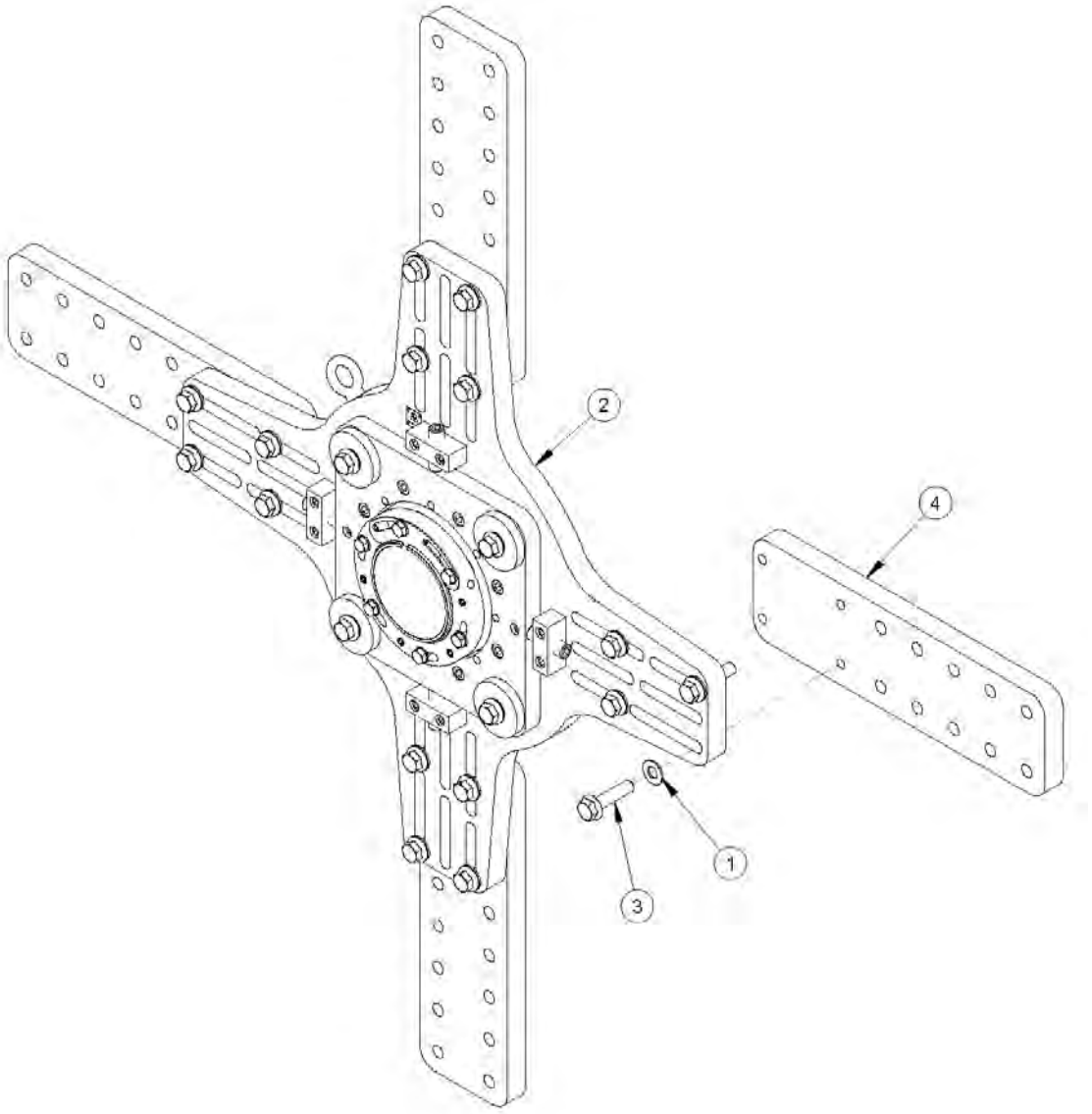


PARTS LIST			
ITEM	QTY	P/N:	DESCRIPTION
1	8	10474	SCREW 3/8-16 X 1-1/2 SHCS
2	4	10588	SCREW DRIVE #2 x 1/4 HOLE SIZE .089
3	8	15307	SCREW 1/2-13 X 1 SHCS
4	8	15322	SCREW 3/8-24 X 3/4 SSSFP
5	4	20956	BLOCK ADJUSTING
6	1	25211	EYE LIFTING 1/2-13
7	4	27172	WASHER SPRING BELLEVILLE 5/8 X 1-1/4 X .040
8	1	29152	PLATE MASS CE
9	4	42212	SCREW MOD SSSCP 3/4-10 UNC X 2.5
10	1	53687	COVER BRG 5" HOUSING EXTERNAL
11	1	53692	ASSY BRG AND HOUSING BRG 5" OD MOUNT BB7100
12	1	53708	SPIDER END BRG SUPPORT 5" BAR DIA
13	4	54239	WASHER 5/8 FLTW .7 ID 3.0 OD .5 THICK
14	4	54796	SCREW 5/8-11 X 2-1/2 HHCS FLANGED BLK OX
15	1	66767	LABEL LARGE BORING BAR CRUSH HAZARD

53711 - SPIDER ASSY END BRG SUPPORT 34.5" BB7100 - REV D

FOR REFERENCE ONLY

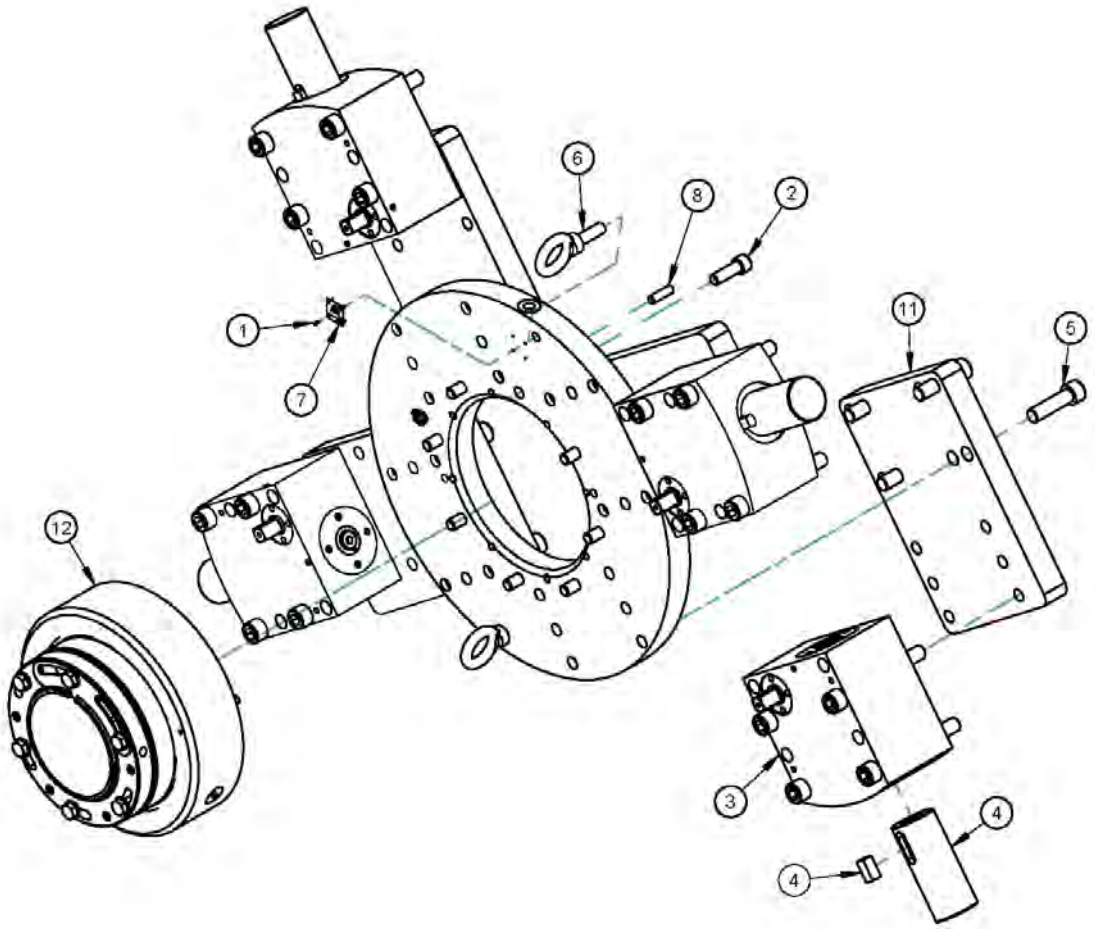
Figure 34. 34.5" (876 mm) spider bearing assembly (P/N 53711)



PARTS LIST			
ITEM	QTY	P/N:	DESCRIPTION
1	16	15208	WASHER 5/8 SAE FLTW HARDENED
2	1	53711	SPIDER ASSY END BRG SUPPORT 34.5" BB7100
3	16	54796	SCREW 5/8-11 X 2-1/2 HHCS FLANGED BLK OX
4	4	54825	EXTENSION PLATE SPIDER BB7100

54969 - SPIDER ASSY END BRG SUPPORT WITH EXT TO 60" BB7100 - REV A

Figure 35. Spider bearing assembly with extension to 60" (1,524 mm) (P/N 54969)

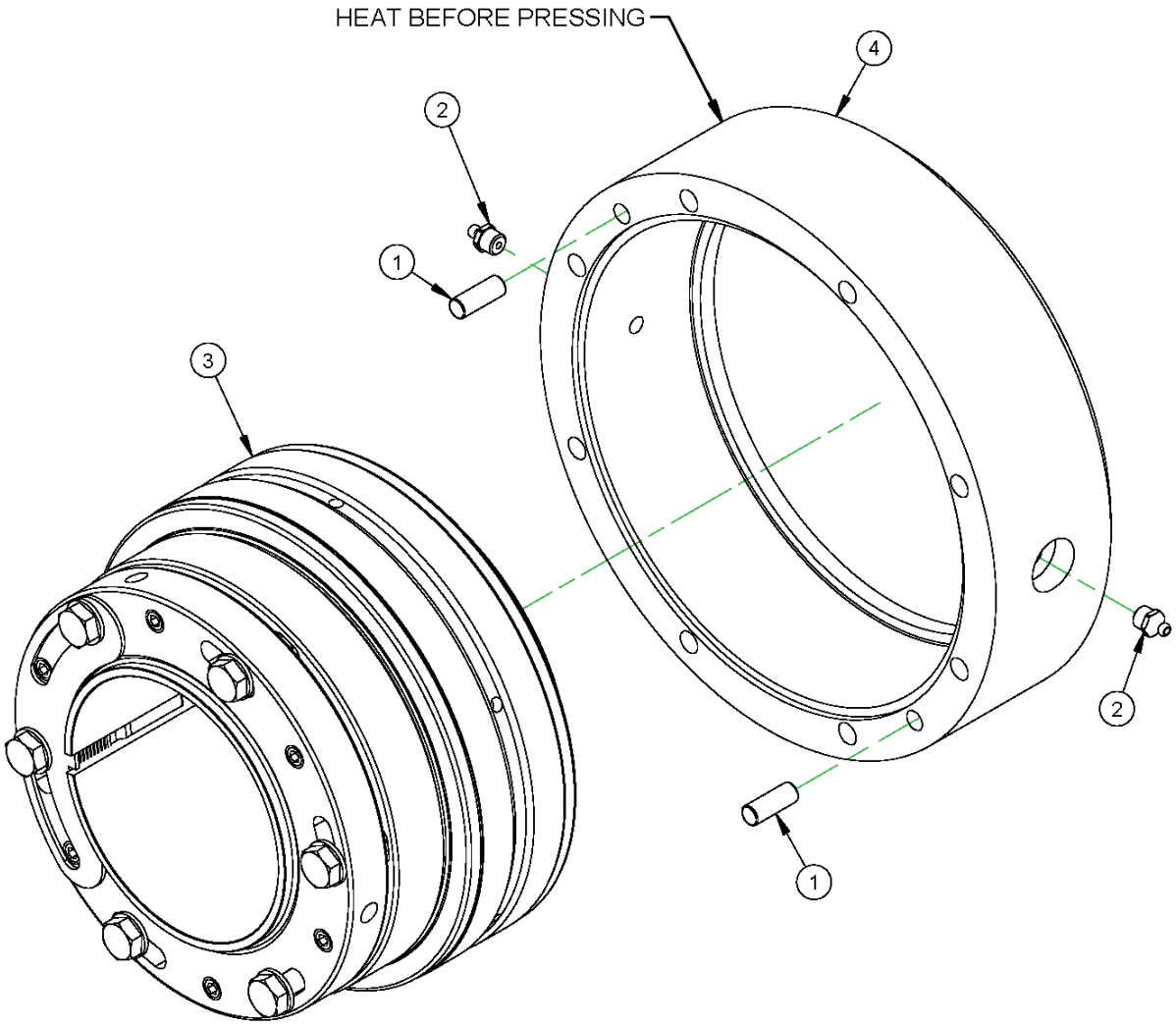


PARTS LIST			
ITEM	QTY	P/N:	DESCRIPTION
1	4	10588	SCREW DRIVE #2 x 1/4 HOLE SIZE .089
2	8	11691	SCREW 1/2-13 X 1-1/2 SHCS
3	4	17438	BLOCK CENTERING ASSY, 5/8-18 SCREW
4	4	17448	JAW 4.62 IN ID BRG MOUNT BB8100 WITH KEY
5	16	19610	SCREW 5/8-18 X 2-1/4 SHCS
6	2	25211	EYE LIFTING 1/2-13
7	1	29152	PLATE MASS CE
8	8	32284	SCREW 3/8-24 X 1.25 SSSFP
10	1	74562	SPIDER ID 19 TO 45 DIA BB7100
11	4	74563	SPIDER EXTENSION PLATE
12	1	96848	ASSY BRG AND HOUSING 5.0" ID MOUNT BB7100

54302 - MOUNT ID BRG ASSY FACE ADJUST 19-45 ID 5 BAR - REV C

FOR REFERENCE ONLY

Figure 36. ID bearing mount assembly (P/N 54302)



NOTES

1. SEE DRAWING 96848 FOR ID MOUNT ASSEMBLY

PARTS LIST

ITEM	QTY	P/N:	DESCRIPTION
1	2	11027	PIN DOWEL 3/8 DIA X 1
2	2	11898	FTG GREASE 1/8 NPTM
3	1	47110	IMPERIAL BRG INSERT 070911 FOR 5 IN BAR
4	1	53683	BEARING HOUSING 5" BAR

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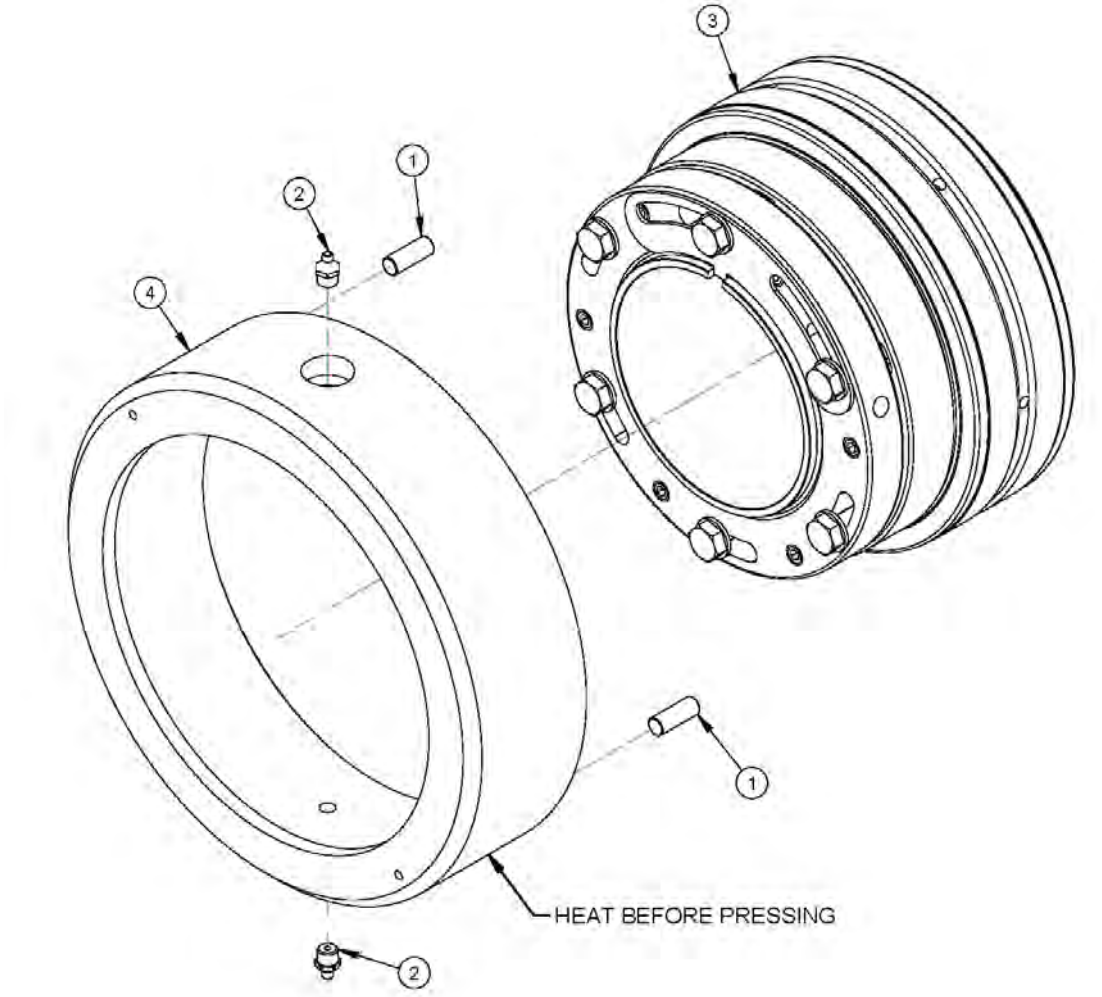
CLIMAX Portable Machining & Welding Systems

DESCRIPTION: ASSY BRG AND HOUSING BRG 5" OD MOUNT BB7100

DWG NO. 53692

Figure 37. 5” OD bearing and housing mount assembly (P/N 53692)



NOTES

1. SEE DRAWING 53692 FOR OD MOUNT ASSEMBLY

PARTS LIST

ITEM	QTY	P/N:	DESCRIPTION
1	2	11027	PIN DOWEL 3/8 DIA X 1
2	2	11898	FTG GREASE 1/8 NPTM
3	1	47110	IMPERIAL BRG INSERT 070911 FOR 5 IN BAR
4	1	53683	BEARING HOUSING 5" BAR

CONFIDENTIAL PROPERTY OF CLIMAX PORTABLE MACHINING & WELDING

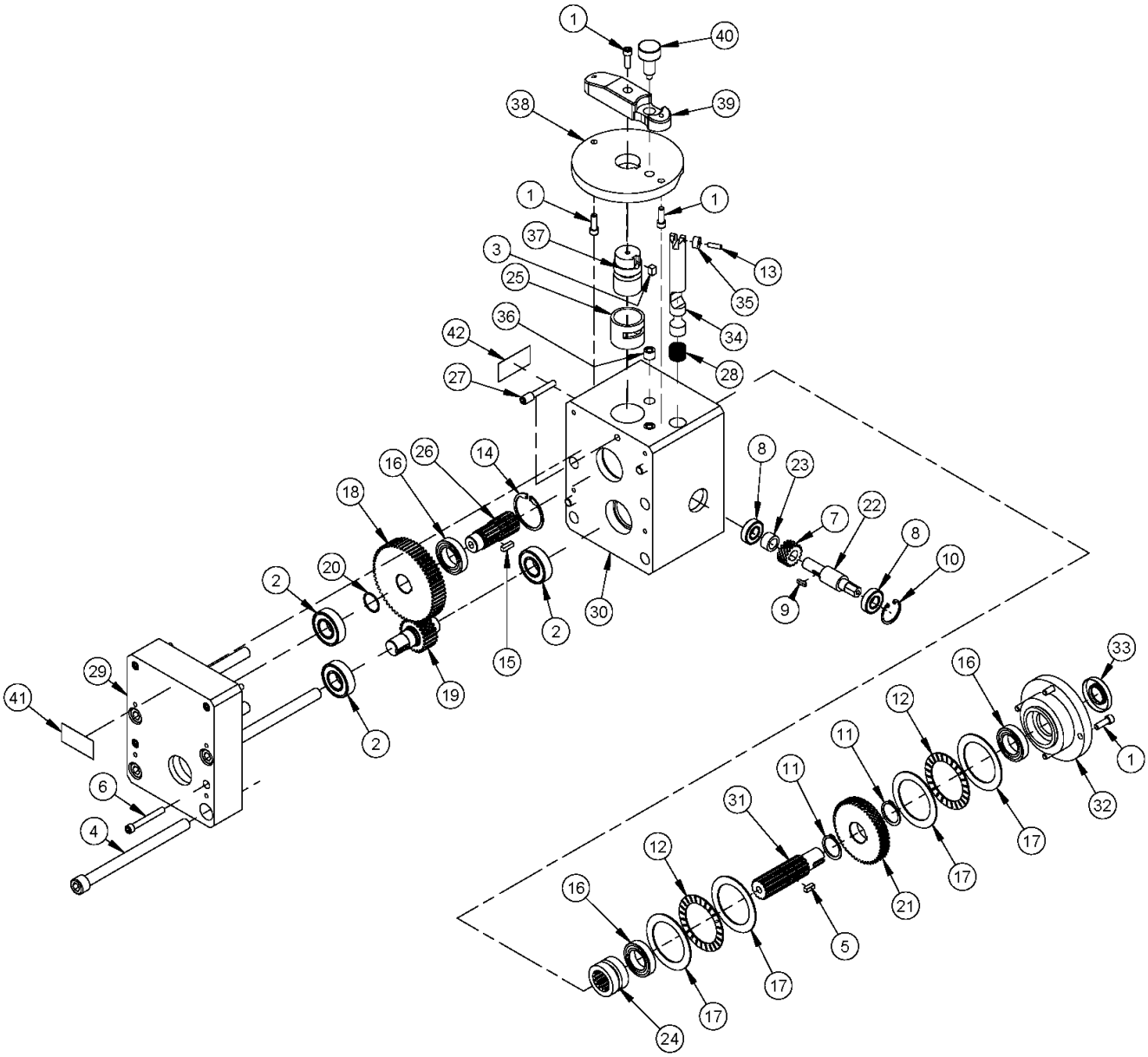
CLIMAX Portable Machining & Welding Systems

DESCRIPTION: ASSY BRG AND HOUSING 5.0" ID MOUNT BB7100

DWG NO: 96848

DRAWN:	DATE:	CHECKED:	DATE:	MFG APPROVED:	DATE:	ENG APPROVED:	DATE:	CAGE CODE:	SHEET:	OF:	REVISION:
JLR	2/5/2020	SMH	2/7/2020	JJS	2/7/2020	JLR	2/7/2020	15509	1	1	A

Figure 38. 5” ID bearing and housing mount assembly (P/N 96848)



41064 - ASSY MECHANICAL RAPID FEED FOR ELECTRIC AXIAL FEED - REV E

FOR REFERENCE ONLY

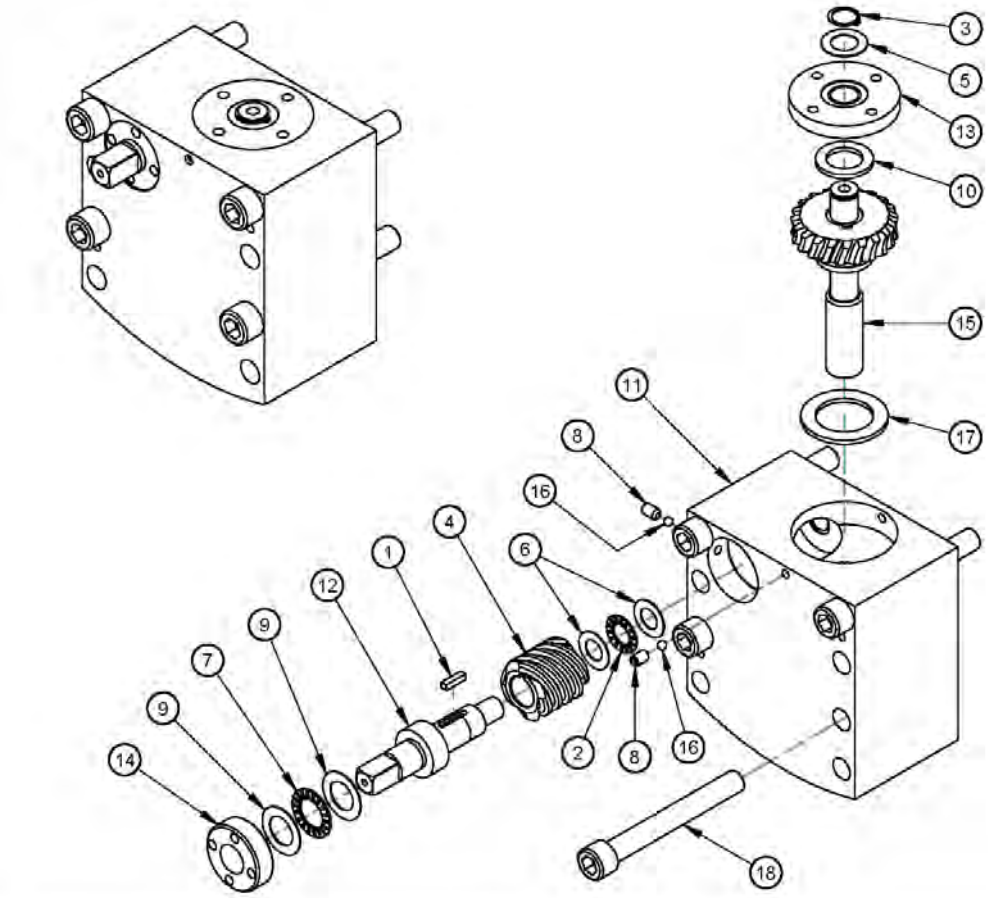
Figure 39. Manual feed assembly for axial feed (P/N 41064)

PARTS LIST			
ITEM	QTY	P/N:	DESCRIPTION
1	7	10160	SCREW 1/4-20 X 3/4 SHCS
2	3	10807	BRG BALL .7874 ID X 1.6535 OD X .4724 W/SEALS
3	1	10854	KEY 1/4 SQ X .37 SQ BOTH ENDS
4	4	11695	SCREW 1/2-13 X 6-1/2 SHCS
5	1	12361	KEY 3/16 SQ X .50 SQ BOTH ENDS (KB)
6	4	12444	SCREW 1/4-20 X 2 SHCS
7	1	12881	GEAR HELICAL 16DP 16T 14.5PA 45HA RH .5 STL H
8	2	14034	BRB BALL .5000 ID X 1.125 OD X .3125
9	1	14788	KEY 1/8 SQ X .50 SQ BOTH ENDS
10	1	14980	RING SNAP 1-1/8 ID
11	2	15729	RING SNAP 63/64 OD (25mm)
12	2	16177	BRB THRUST 2.000 ID X 2.750 OD X .0781
13	1	16953	PIN DOWEL 3/16 DIA X 5/8
14	1	17857	RING SNAP INT. 42MM X .062
15	1	18146	KEY 3/16 SQ X .62 SQ BOTH ENDS
16	3	21295	BRG BALL .9843 ID X 1.6535 OD X .3543 W/SEALS
17	4	30021	WASHER THRUST 2.000 ID X 2.750 OD X .060
18	1	39017	GEAR SPUR 16DP 60T 2-PA .745 X .875LG STEEL
19	1	39029	GEAR SPUR SHAFT INFO
20	1	39074	RING SNAP 7/8 OD SPIRAL MED DUTY
21	1	40371	GEAR HELICAL STEEL MODIFIED
22	1	40380	PINION SHAFT
23	1	40382	SPACER
24	1	40383	SPLINE COUPLING
25	1	40384	BUSHING OILITE 1-1/4 (1.254) ID X 1-1/2 (1.504) OD X 1-1/4
26	1	40397	SHAFT DRIVE INVOLUTE SPLINE 1 INCH 15T 16/32
27	1	40398	LOCK SCREW
28	1	40472	SPRING COMP .734 OD .050 WIRE X 1.31 LG
29	1	41065	COVER GEARBOX HOUSING MECH RAPID
30	1	41066	BOX GEAR MAIN HOUSING MECH RAPID
31	1	42593	SHAFT SPLINE OUTPUT 3/4 OD KEYED
32	1	42598	CAP SEAL AND GEAR COVER
33	1	42602	SEAL .750 ID X 1.625 OD X .25 WIDE CRW1
34	1	42631	ROD PUSH STOP RAPID FEED LOCKOUT
35	1	42642	BUSHING DRILL 3/16 ID X 1/2 OD X 1/4
36	2	42647	BUSHING DRILL 17/64 ID X 1/2 OD X 3/8
37	1	101519	ROD SHIFT
38	1	101527	SHIFT PLATE
39	1	101530	HANDLE ENGAGE
40	1	101531	PLUNGER SPRING 1/2-13 X .88 KNURLED KNOB STEEL
41	1	102885	LABEL FEED ELECTRIC
42	1	102887	LABEL FEED MANUAL

41064 - ASSY MECHANICAL RAPID FEED FOR ELECTRIC AXIAL FEED - REV E

FOR REFERENCE ONLY

Figure 40. Manual feed assembly for axial feed parts list (P/N 41064)

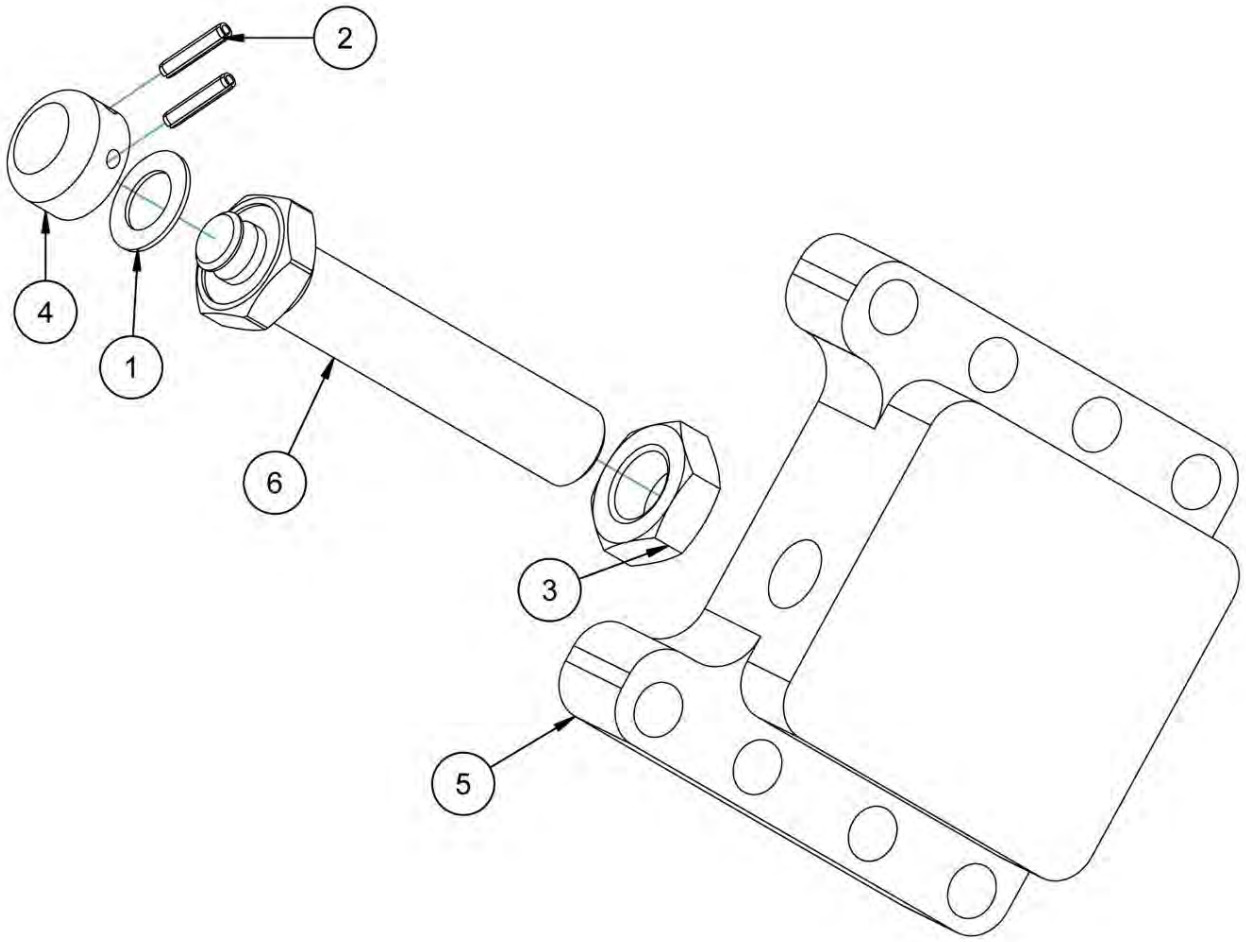


PARTS LIST			
ITEM	QTY	P/N	DESCRIPTION
1	1	10217	KEY 3/16 SQ X .75 SQ BOTH ENDS
2	1	10538	BRG THRUST .625 ID X 1.125 OD X .0781
3	1	10612	RING SNAP 3/4 OD
4	1	10858	WORM 8DP QUAD RH 1.75 14.5PA STEEL HARDENED
5	1	11739	WASHER THRUST .750 ID X 1.250 OD X .0312
6	2	11823	WASHER THRUST .625 ID X 1.125 OD X .030
7	1	13174	BRG THRUST .875 ID X 1.437 OD X .0781
8	2	13515	SCREW 5/16-18 X 1/2 SSSCP
9	2	14274	WASHER THRUST .875 ID X 1.437 OD X .030
10	1	17007	WASHER THRUST 1.000 ID X 1.562 OD X .123
11	1	17439	BLOCK CENTERING
12	1	17447	SHAFT CRANK
13	1	17507	NUT WORM GEAR
14	1	17508	NUT – WORM
15	1	17520	JACKING SCREW ASSEMBLY BB8000
16	2	19225	BALL NYLON 1/4 DIA
17	1	21053	WASHER THRUST
18	4	63416	SCREW 5/8-18 X 5 SHCS

17438 - BLOCK CENTERING ASSY, 5/8-18 SCREW - REV A

FOR REFERENCE ONLY

Figure 41. Centering block assembly (P/N 17438)



PARTS LIST			
ITEM	QTY	PART No.	DESCRIPTION
1	1	10136	WASHER THRUST .750 ID X 1.25 X .060
2	2	12959	PIN ROLL Ø3/16 X 1
3	1	15128	NUT 1-8 JAMN
4	1	50528	CAP JAW SCREW FF6100
5	1	54307	BLOCK CENTERING JACK BOLT BB7100 & BB8100
6	1	54308	JACK BOLT ID MOUNT BB7100 & BB8100

BLOCK CENTERING ASSY JACK BOLT BB7100 & BB8100 54306

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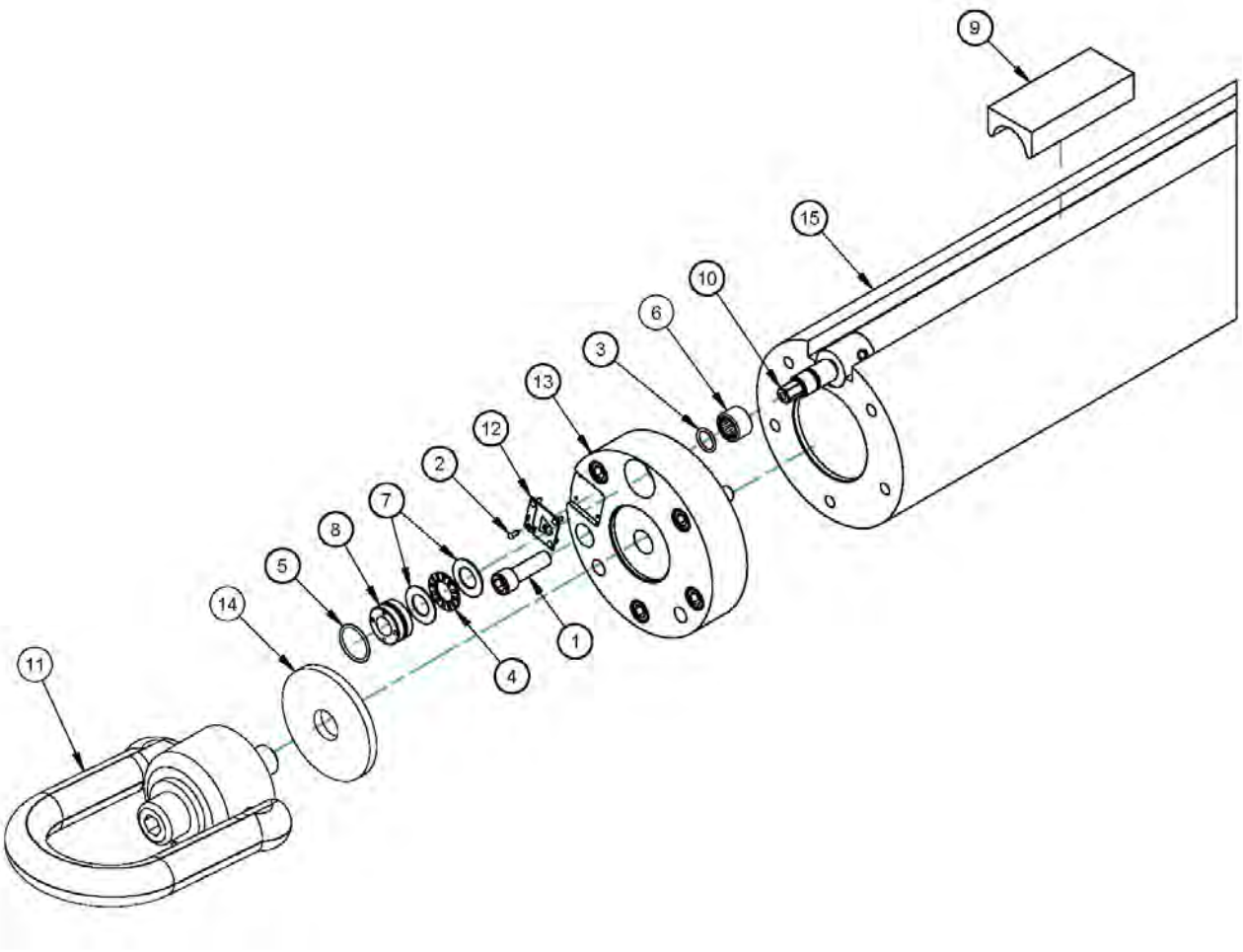
Figure 42. Centering block jack bolt assembly (P/N 54306)



81629 - CHART BAR BORING ASSY 5 DIA PILOT MOUNT - REV A
FOR REFERENCE ONLY

Figure 43. Boring bar assembly (P/N 81629)

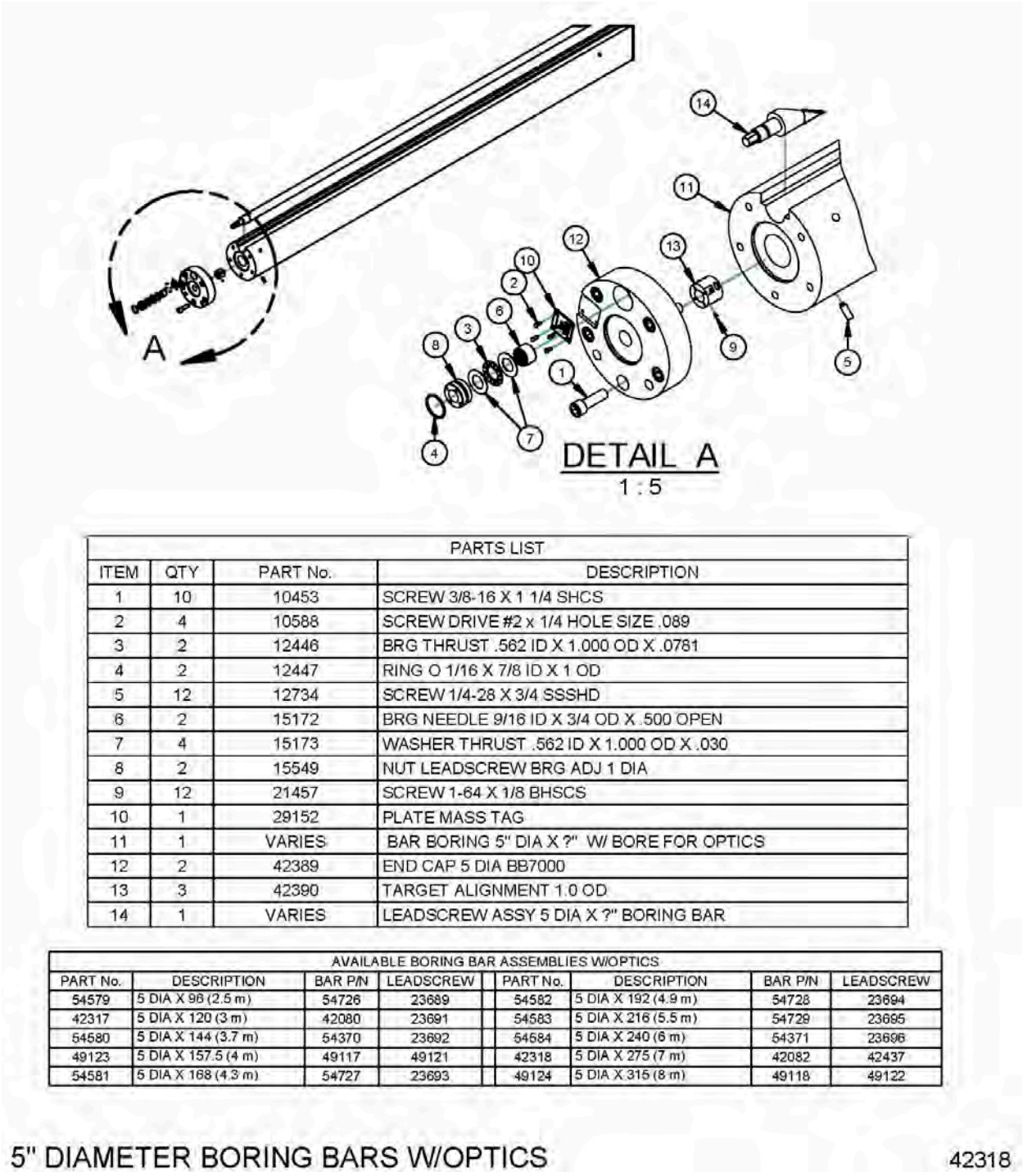
AVAILABLE CONFIGURATIONS	
PART NUMBER	DESCRIPTION
45211	BAR BORING ASSY 5 DIA X 96 PILOT MOUNT
45039	BAR BORING ASSY 5 DIA X 120 PILOT MOUNT
45036	BAR BORING ASSY 5 DIA X 144 PILOT MOUNT
45037	BAR BORING ASSY 5 DIA X 168 PILOT MOUNT
45038	BAR BORING ASSY 5 DIA X 192 PILOT MOUNT
45287	BAR BORING ASSY 5 DIA X 216 PILOT MOUNT
44814	BAR BORING ASSY 5 DIA X 240 PILOT MOUNT

PARTS LIST			
ITEM	QTY	P/N:	DESCRIPTION
1	10	10453	SCREW 3/8-16 X 1 1/4 SHCS
2	8	10588	SCREW DRIVE #2 x 1/4 HOLE SIZE .089
3	2	10840	RING O 1/16 X 1/2 ID X 5/8 OD (VMI)
4	2	12446	BRG THRUST .562 ID X 1.000 OD X .0781
5	2	12447	RING O 1/16 X 7/8 ID X 1 OD
6	2	15172	BRG NEEDLE 9/16 ID X 3/4 OD X .500 OPEN
7	4	15173	WASHER THRUST .562 ID X 1.000 OD X .030
8	2	15549	NUT LEADSCREW BRG ADJ 1 DIA
9	1	15555	KEY BAR DRIVE
10	1	23689	LEADSCREW ASSY 5 & 6 DIA X 8 FT BORING BAR
		23691	LEADSCREW ASSY 5 & 6 DIA X 10 FT BORING BAR
		23692	LEADSCREW ASSY 5 & 6 DIA X 12 FT BORING BAR
		23693	LEADSCREW ASSY 5 & 6 DIA X 14 FT BORING BAR
		23694	LEADSCREW ASSY 5 & 6 DIA X 16 FT BORING BAR
		23695	LEADSCREW ASSY 5 & 6 DIA X 18 FT BORING BAR
		23696	LEADSCREW ASSY 5 & 6 DIA X 20 FT BORING BAR
11	2	23743	RING HOIST SAFETY HEAVY-DUTY 7000 LB
12	2	29152	PLATE MASS CE
13	2	42389	END CAP 5 DIA BB7000
14	2	44491	WASHER 3/4 ID X 3 OD X .234
15	1	45123	BAR BORING 5 DIA X 96 PILOT MOUNT
		44918	BAR BORING 5 DIA X 120 PILOT MOUNT
		45436	BAR BORING 5 DIA X 144 PILOT MOUNT
		45437	BAR BORING 5 DIA X 168 PILOT MOUNT
		45439	BAR BORING 5 DIA X 192 PILOT MOUNT
		45440	BAR BORING 5 DIA X 216 PILOT MOUNT
		44816	BAR BORING 5 DIA X 240 PILOT MOUNT

45036 - BAR BORING ASSY 5 DIA PILOT MOUNT - REV A

FOR REFERENCE ONLY

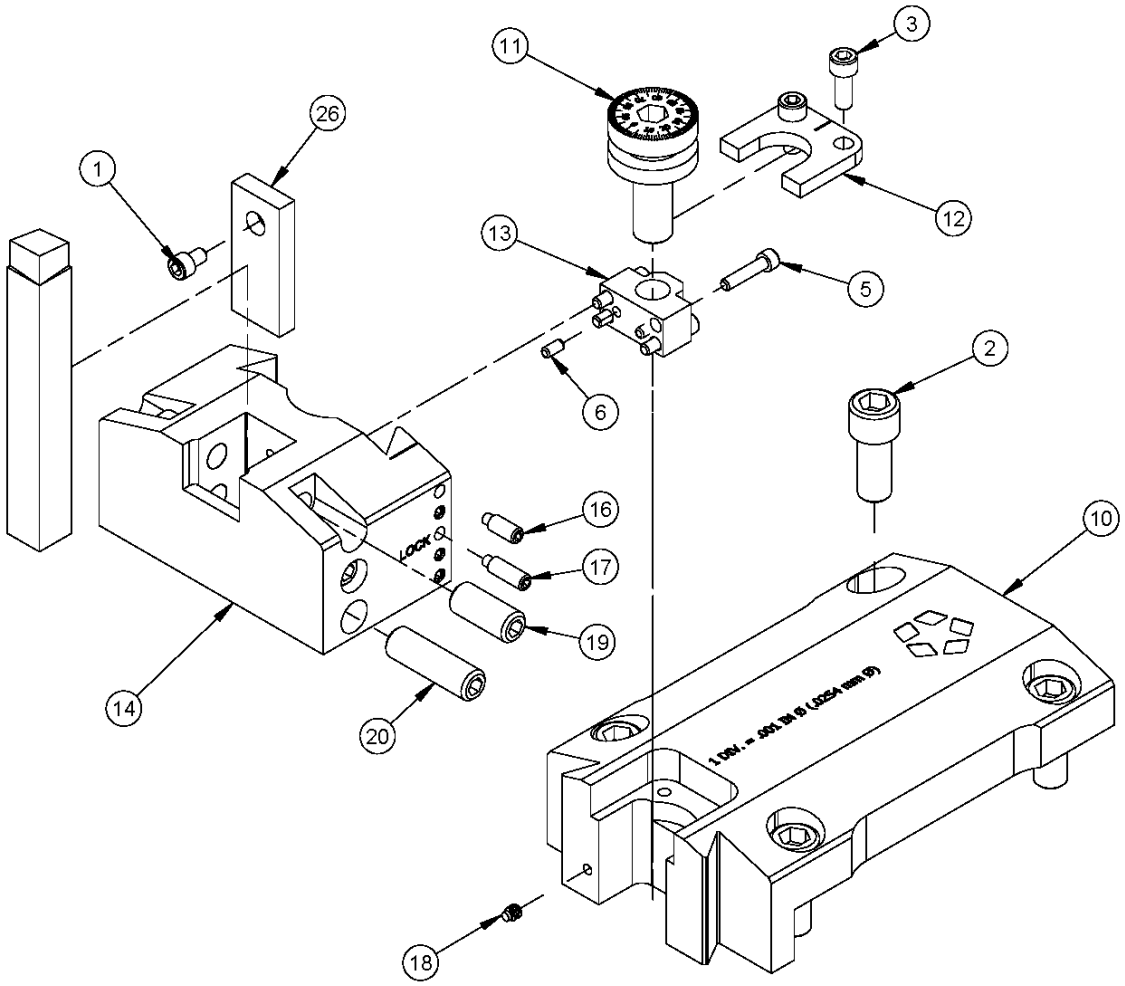
Figure 44. Boring bar assembly parts list (P/N 81629)



PARTS LIST			
ITEM	QTY	PART No.	DESCRIPTION
1	10	10453	SCREW 3/8-16 X 1 1/4 SHCS
2	4	10588	SCREW DRIVE #2 x 1/4 HOLE SIZE .089
3	2	12446	BRG THRUST .562 ID X 1.000 OD X .0781
4	2	12447	RING O 1/16 X 7/8 ID X 1 OD
5	12	12734	SCREW 1/4-28 X 3/4 SSSHD
6	2	15172	BRG NEEDLE 9/16 ID X 3/4 OD X .500 OPEN
7	4	15173	WASHER THRUST .562 ID X 1.000 OD X .030
8	2	15549	NUT LEADSCREW BRG ADJ 1 DIA
9	12	21457	SCREW 1-64 X 1/8 BHSCS
10	1	29152	PLATE MASS TAG
11	1	VARIES	BAR BORING 5" DIA X ?" W/ BORE FOR OPTICS
12	2	42389	END CAP 5 DIA BB7000
13	3	42390	TARGET ALIGNMENT 1.0 OD
14	1	VARIES	LEADSCREW ASSY 5 DIA X ?" BORING BAR

AVAILABLE BORING BAR ASSEMBLIES W/OPTICS							
PART No.	DESCRIPTION	BAR P/N	LEADSCREW	PART No.	DESCRIPTION	BAR P/N	LEADSCREW
54579	5 DIA X 96 (2.5 m)	54726	23689	54582	5 DIA X 192 (4.9 m)	54728	23694
42317	5 DIA X 120 (3 m)	42080	23691	54583	5 DIA X 216 (5.5 m)	54729	23695
54580	5 DIA X 144 (3.7 m)	54370	23692	54584	5 DIA X 240 (6 m)	54371	23696
49123	5 DIA X 157.5 (4 m)	49117	49121	42318	5 DIA X 275 (7 m)	42082	42437
54581	5 DIA X 168 (4.3 m)	54727	23693	49124	5 DIA X 315 (8 m)	49118	49122

Figure 45. 5" (127 mm) diameter boring bars (P/N 42318)



79325 - BORING HEAD MICRO ADJUST LARGE BB - REV C

FOR REFERENCE ONLY

Figure 46. Micro adjust boring head (P/N 79325)

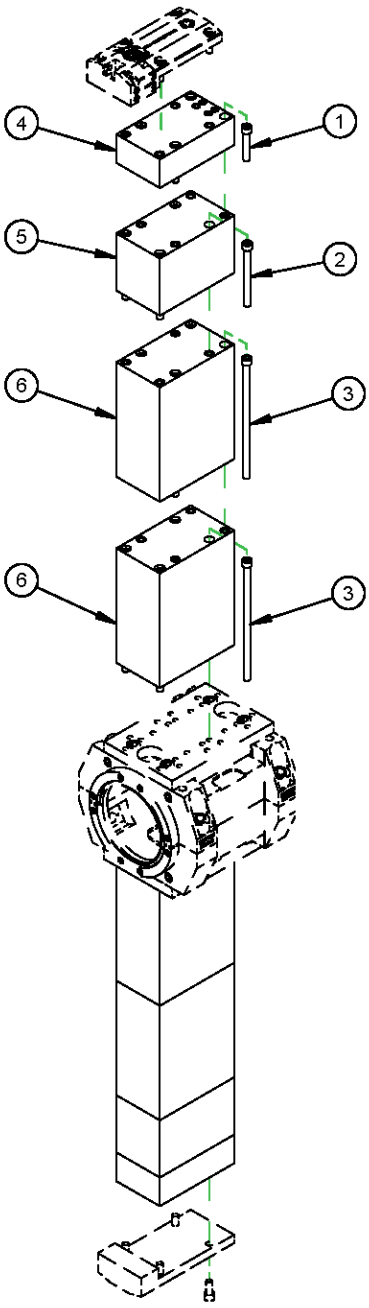
AVAILABLE CONFIGURATIONS		
PART NO.	DESCRIPTION	"A"
79020	BORING HEAD MICRO ADJUST 3/4 INCH TOOLING (1/2 INCH READY) LARGE BB	78777
79021	BORING HEAD MICRO ADJUST 1 INCH TOOLING LARGE BB	79022
79468	BORING HEAD MICRO ADJUST 1/2 INCH TOOLING LARGE BB	79500

PARTS LIST					
ITEM	QTY 79020	QTY 79021	QTY 79468	P/N:	DESCRIPTION
1	1	0	0	10226	SCREW 8-32 X 1/4 SHCS
2	8	8	8	11756	SCREW 3/8-16 X 7/8
3	2	2	2	12743	SCREW 10-24 X 1/2 SHCS
4	0	0	4	13484	(NOT SHOWN) SCREW 3/8-16 X 1-1/2 SSSFP
5	4	4	4	15210	SCREW 6-32 X 5/8 SHCS
6	2	2	2	15414	PIN DOWEL 1/8 DIA X 1/4
7	1	0	1	31859	(NOT SHOWN) BIT TOOL HSS 1/2 X 4.0 LH FINISHING SINGLE
8	1	0	1	31868	(NOT SHOWN) BIT TOOL HSS 1/2 X 4.0 LH ROUGHING SINGLE
9	1	1	0	39694	(NOT SHOWN) WRENCH TORX FT-15
10	1	1	1	78776	BORING HEAD CARRIAGE HOLDER
27	1	0	0	78777	CARRIAGE BORING HEAD TOOL 3/4 INCH TOOLING
11	1	1	1	78807	BORING HEAD MICRO ADJUST DIAL SCREW MOD
12	1	1	1	78809	DIAL SCREW PLATE
13	1	1	1	79019	NUT DIAL SCREW 7/16-20 UNF
15	1	1	1	79242	(NOT SHOWN) COUNTERWEIGHT BORING HEAD
16	4	4	4	79418	SCREW 10-32 X 1/2 SSSFDP
17	1	1	1	79419	SCREW 10-32 X 5/8 SSSFDP
18	1	1	1	79420	SCREW 8-32 X 3/16 SSSFDP
19	2	2	2	79422	SCREW 3/8-16 X 7/8 SSSFP
20	4	4	0	79424	SCREW 3/8-16 X 1-1/4 SSSFP
21	0	1	0	79479	(NOT SHOWN) HOLDER INSERT CARBIDE 1 SQ SHANK SCREW ON LEFT HAND
22	0	1	0	79480	(NOT SHOWN) HOLDER INSERT CARBIDE 1 SQ SHANK SCREW ON RIGHT HAND
23	1	1	0	79484	(NOT SHOWN) INSERT CARBIDE 80 DEG 3/8 IC 1/32 NOSE RADIUS CCGT-3252
24	1	0	0	79485	(NOT SHOWN) HOLDER INSERT CARBIDE 3/4 SQ SHANK SCREW ON LEFT HAND
25	1	0	0	79486	(NOT SHOWN) HOLDER INSERT CARBIDE 3/4 SQ SHANK SCREW ON RIGHT HAND
26	1	0	0	79556	SHIM FOR 1/2 TOOLING IN 3/4 CARRIAGE

79325 - BORING HEAD MICRO ADJUST LARGE BB - REV C

FOR REFERENCE ONLY

Figure 47. Micro adjust boring head parts list (P/N 79325)



81252 - BORING DIAMETER RANGE 10.25-58.25 STACK UP BLOCKS BB7100

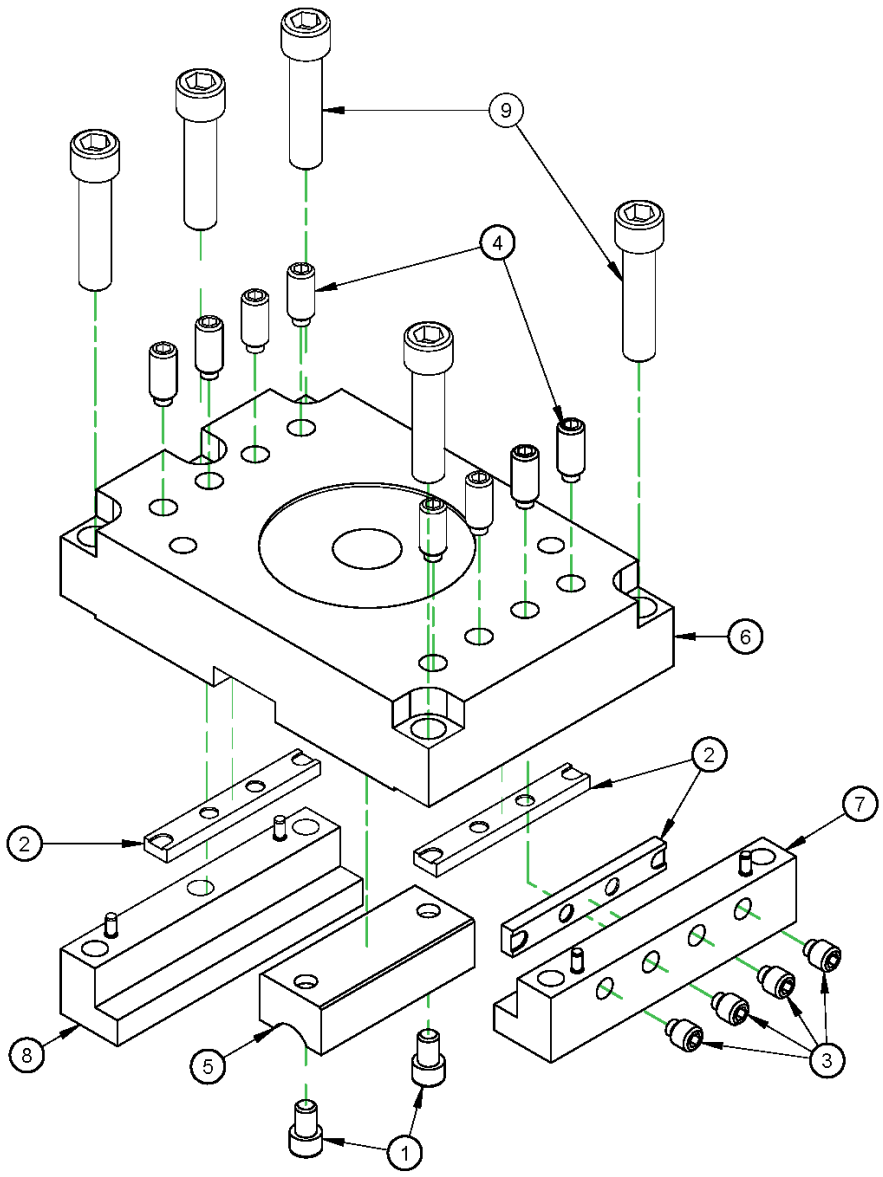
Figure 48. Stack up blocks assembly (P/N 81252)

AVAILABLE CONFIGURATIONS	
P/N:	DESCRIPTION
81251	BORING DIAMETER RANGE 10.25-26.25 STACK UP BLOCKS BB7100
81252	BORING DIAMETER RANGE 10.25-58.25 STACK UP BLOCKS BB7100

PARTS LIST			
ITEM	QTY	P/N:	DESCRIPTION
1	8	10557	SCREW 3/8-16 X 2 SHCS
2	8	15743	SCREW 3/8-16 X 4 SHCS
3	16	20884	SCREW 3/8-16 X 8 SHCS
4	2	22760	SPACER 2.0 IN FOR BORING SET BB6100 & BB7100
5	2	79011	SPACER 4.0 IN FOR BORING SET BB6100 & BB7100
6	4	79012	SPACER 8.0 IN FOR BORING SET BB6100 & BB7100

81252 - BORING DIAMETER RANGE 10.25-58.25 STACK UP BLOCKS BB7100

Figure 49. Stack up blocks assembly parts list (P/N 81252)



PARTS LIST			
ITEM	QTY	P/N:	DESCRIPTION
1	2	10670	SCREW 1/4-20 X 3/8 SHCS
2	3	49639	GIB TOOL CARRIER
3	4	53878	SCREW 5/16-24 X 3/8 SSSDPPL
4	8	53880	SCREW 5/16-24 X 1 SSSDPPL
5	1	54178	NUT HALF FACING HEAD BB7100
6	1	54192	FACING ARM CARRIER MOUNTING DECK BB7100
7	1	54195	KEEPER SLIDE ARM CARRIAGE GIB SIDE
8	1	57054	KEEPER SLIDE ARM CARRIAGE NON-GIB SIDE
9	5	81634	SCREW 3/8-16 X 1-5/8 SHCS

54193 - FACING CARRIER ASSY SLIDE ARM - REV A

FOR REFERENCE ONLY

Figure 50. Carrier facing assembly (P/N 54193)

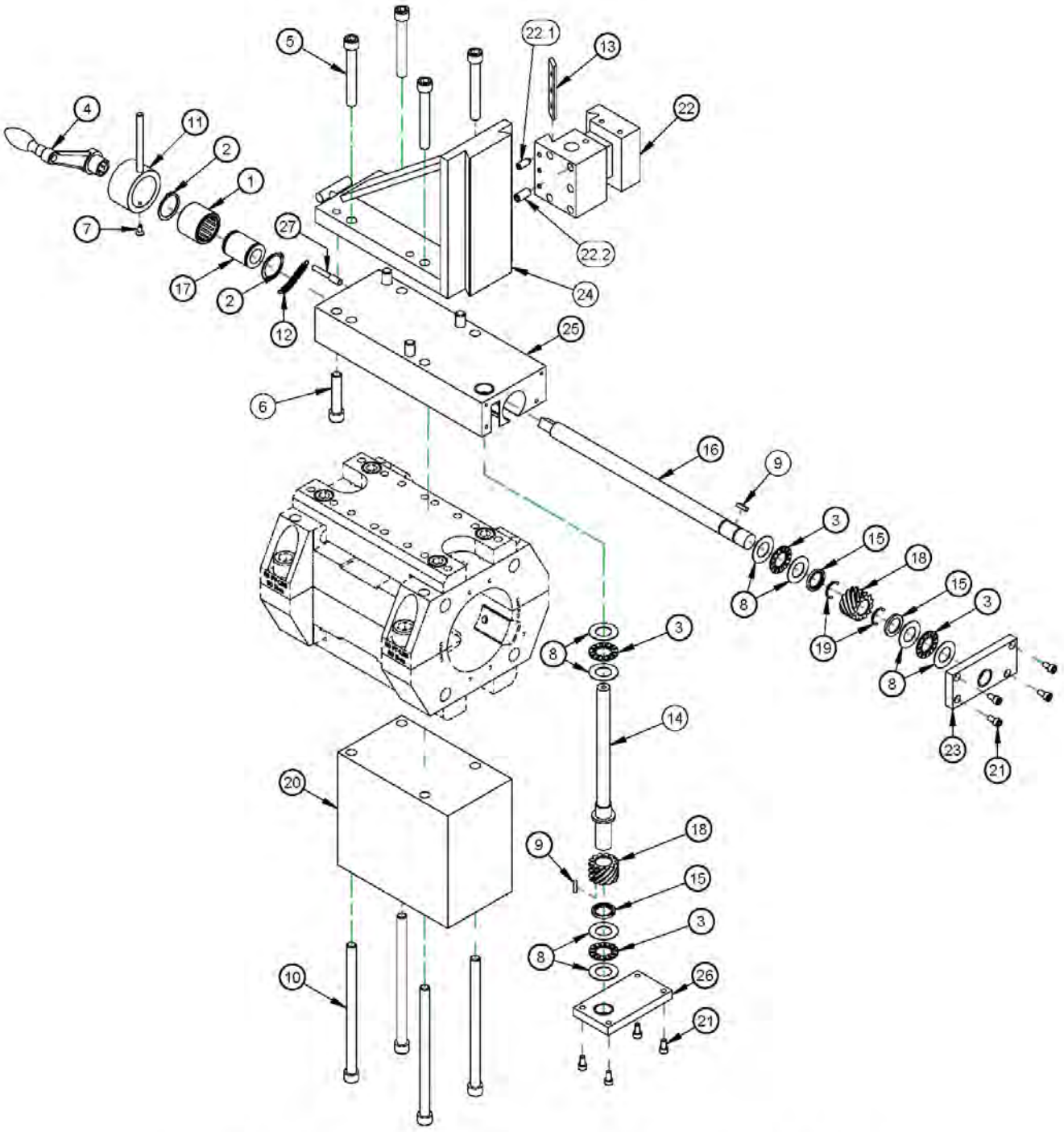


Figure 51. Facing head assembly (P/N 75682)

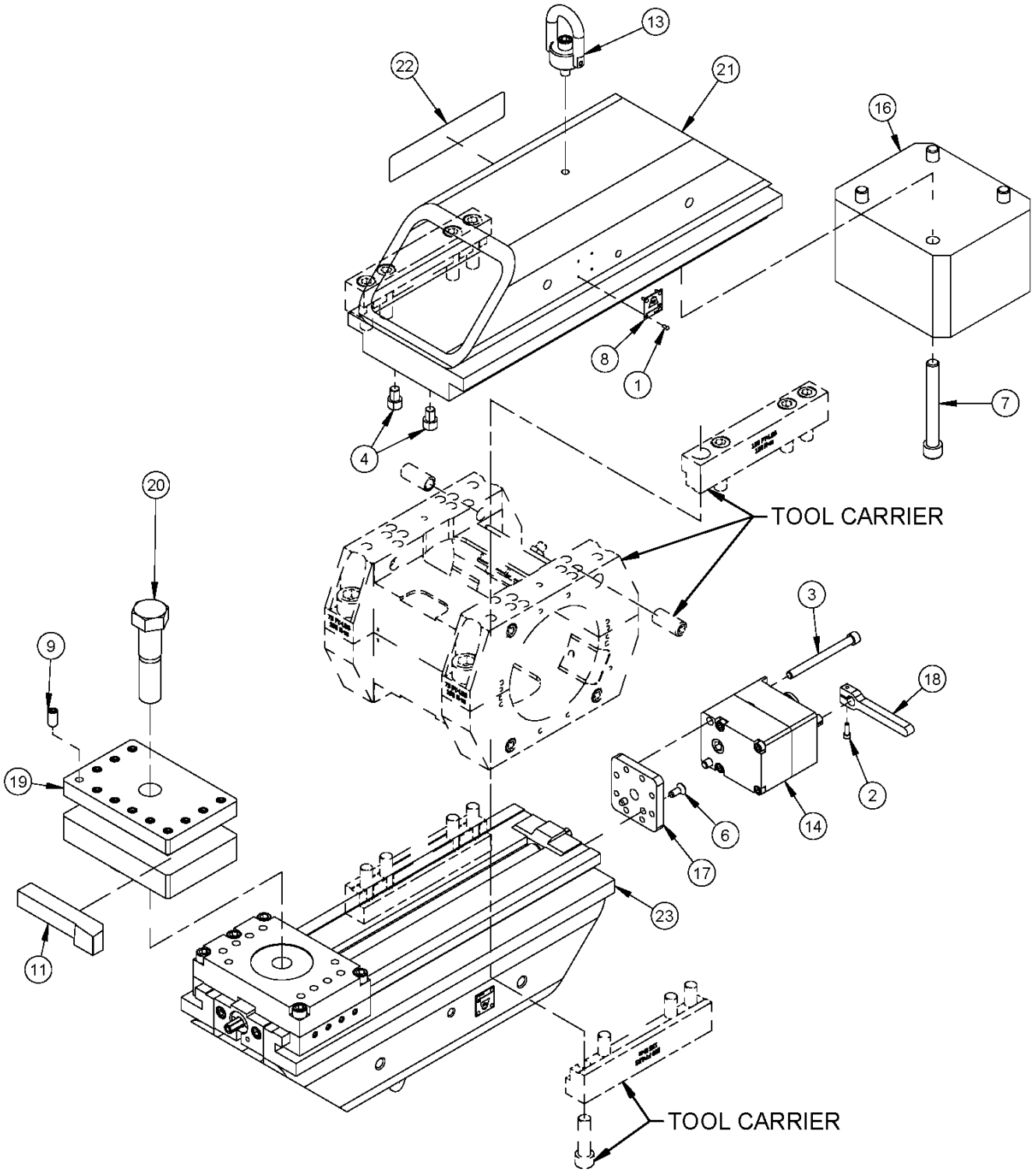
AVAILABLE CONFIGURATIONS	
P/N	DESCRIPTION
22680	ASSY FACING HEAD 4 INCH TRAVEL BB6 BB7
49753	ASSY FACING HEAD 6 INCH TRAVEL BB6 BB7
49754	ASSY FACING HEAD 8 INCH TRAVEL BB6 BB7

PARTS LIST			
ITEM	QTY	P/N:	DESCRIPTION
1	1	10532	BRG ROLLER CLUTCH 1 ID X 1-5/16 OD X 1.063
2	2	10534	RING SNAP 1 OD
3	4	10538	BRG THRUST .625 ID X 1.125 OD X .0781
4	1	11020	HANDLE CRANK STRAIGHT 10MM SQUARE
5	4	11053	SCREW 3/8-16 X 2-3/4 SHCS
6	4	11211	SCREW 3/8-16 X 1-3/4 SHCS
7	1	11259	SCREW 8-32 X 3/8 FHSCS
8	8	11823	WASHER THRUST .625 ID X 1.125 OD X .030
9	2	14788	KEY 1/8 SQ X .50 SQ BOTH ENDS
10	4	15613	SCREW 3/8-16 X 6 SHCS
11	1	18399	HOUSING CLUTCH AXIAL
12	1	18432	SPRING EXTENSION .24 OD X .026 WIRE X 1.250
13	1	19099	GIB CARRIER TOOL BB8000 FACING HEAD
14	1	19104	LEADSCREW ASSY FACING HEAD 4 INCH STROKE
		41098	LEADSCREW ASSY FACING HEAD 6 INCH STROKE
		43366	LEADSCREW ASSY FACING HEAD 8 INCH STROKE
15	3	19105	SPACER
16	1	19110	SHAFT DRIVE
17	1	19112	COLLAR FEED CLUTCH
18	2	19122	GEAR HELICAL 12DP 12T 14.5PA 45HA RH .75 STLH
19	2	19130	RING SNAP 5/8 OD LOW PROFILE
20	1	19223	COUNTERWEIGHT FACING ASSY
21	8	19232	SCREW 10-24 X 3/8 SHCS
22	1	22685	CARRIER TOOL
22.1	3	10189	SCREW 1/4-20 X 5/8 SSSHDPPL
22.2	5	11684	SCREW 5/16-18 X 3/4 SSSCP
23	1	22686	PLATE END DRIVE SHAFT
24	1	22687	SLIDE FACING HEAD 4 INCH TRAVEL BB6000
		41097	SLIDE FACING HEAD 6 INCH TRAVEL BB6000
		43364	SLIDE FACING HEAD 8 INCH TRAVEL BB6000
25	1	22688	BASE PLATE FACING HEAD
26	1	22689	PLATE END LEADSCREW
27	1	28953	PIN DOWEL MODIFIED

75682 - CHART FACING HEAD 4 THRU 8 INCH TRAVEL BB6 BB7 - REV A

FOR REFERENCE ONLY

Figure 52. Facing head assembly parts list (P/N 75682)



NOTE: 54258 SHOWN

81512 - CHART BORING/FACING SLIDE ARM SET BB7100 - REV C

FOR REFERENCE ONLY

Figure 53. Boring/facing slide arm assembly (P/N 81512)

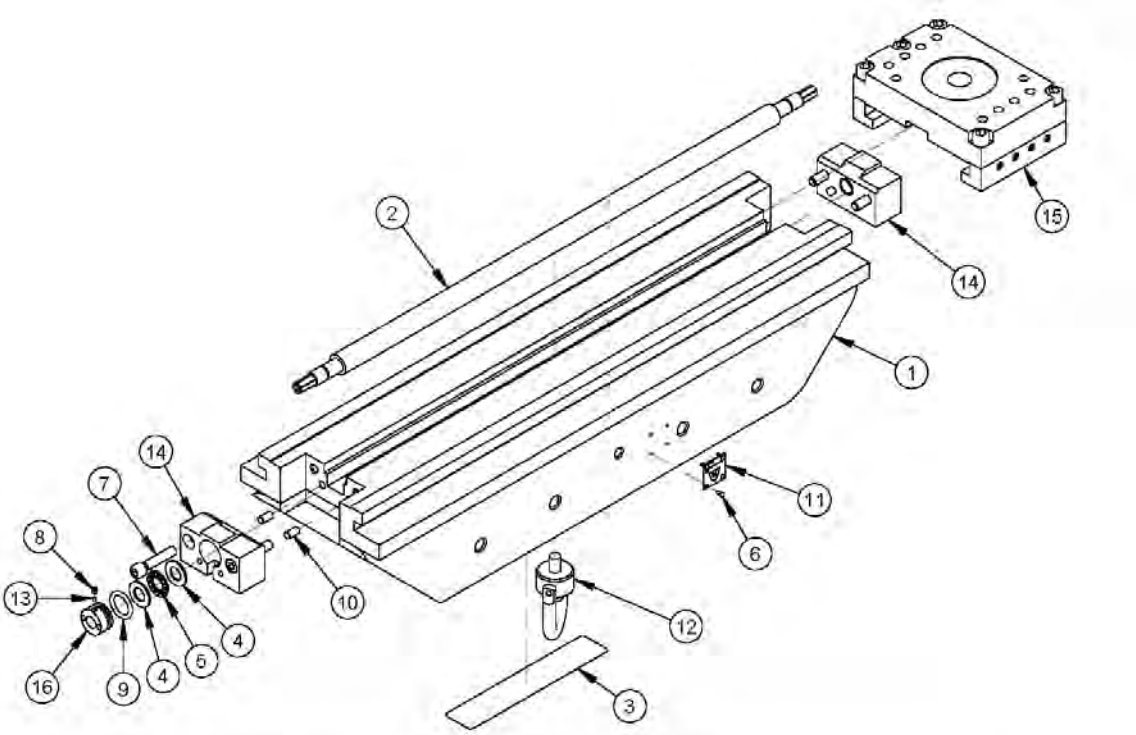
AVAILABLE CONFIGURATIONS				
PART No.	DESCRIPTION	ITEM 21 P/N	ITEM 22 P/N	ITEM 23 P/N
54258	BORING/FACING SLIDE ARM SET 18" BB7100	53893	54939	54955
54259	BORING/FACING SLIDE ARM SET 23" BB7100	54255	54940	54956
54260	BORING/FACING SLIDE ARM SET 34" BB7100	54256	54942	54958

PARTS LIST			
ITEM	QTY	P/N:	DESCRIPTION
1	4	10588	SCREW DRIVE #2 x 1/4 HOLE SIZE .089
2	1	11845	SCREW 8-32 x 1/2 SHCS
3	2	11873	SCREW 5/16-18 X 3-1/2 SHCS
4	2	16403	SCREW 3/8-16 X 1/2 SHCS
5	1	19700	(NOT SHOWN) TOOL BOX W/ TRAY, GREY STRUCTURAL FOAM, 23 X 12 X 10.5
6	2	22496	SCREW 1/4-20 X 5/8 FHSCS
7	4	22517	SCREW 1/2-13 X 4 SHCS
8	1	29152	PLATE MASS CE
9	12	29378	SCREW 3/8-16 X 3/4 SSSFP
10	1	40463	(NOT SHOWN) HOLDER INSERT 80 DEG NEGATIVE L/H 3/4 SHANK
11	1	40787	HOLDER INSERT 80 DEG NEG R/H
12	10	41407	(NOT SHOWN) INSERT CARBIDE 80 DEG 1/2 IC 1/64 NOSE RADIUS KC5010
13	1	41471	RING HOIST SWIVEL 3/8-16 X .56 1000 LBS
14	1	45691	ASSY FEEDBOX REVERSE CLUTCH INPUT
15	1	48370	(NOT SHOWN) WRENCH COMBINATION 1-5/16 12PT
16	1	53905	COUNTERWEIGHT BB7100
17	1	54867	PLATE ADAPTER FEEDBOX
18	1	55094	TRIP ARM STEEL 3 INCH
19	1	104351	TOOL POST ROTATING 1IN TOOLING 4IN SQUARE
20	1	104379	SCREW 7/8-14 X 3-3/4 HHCS GRADE 5 ZINC PLATED
21	1	CHART	COUNTERWEIGHT BB6100 & BB7100
22	1	CHART	LABEL COUNTERWEIGHT ARM
23	1	CHART	ASSEMBLY 18IN SLIDE ARM

81512 - CHART BORING/FACING SLIDE ARM SET BB7100 - REV C

FOR REFERENCE ONLY

Figure 54. Boring/facing slide arm assembly parts list (P/N 81512)



AVAILABLE CONFIGURATIONS				
Part Number	Description	"A"	"B"	"C"
54782	ASSEMBLY 35IN SLIDE ARM	54441	54642	54950
54783	ASSEMBLY 42IN SLIDE ARM	54449	54649	54951
54784	ASSEMBLY 27IN SLIDE ARM	54434	54635	54949
54785	ASSEMBLY 21IN SLIDE ARM	54429	54630	54948
54955	ASSEMBLY 18IN SLIDE ARM	54229	54232	54931
54956	ASSEMBLY 23IN SLIDE ARM	54230	54233	54932
54957	ASSEMBLY 26IN SLIDE ARM	54433	54634	54934
54958	ASSEMBLY 34IN SLIDE ARM	54231	54234	54933
54959	ASSEMBLY 53IN SLIDE ARM	54900	54864	54936

PARTS LIST			
ITEM	QTY	P/N:	DESCRIPTION
1	1	"A"	SLIDE ARM BB61 BB71
2	1	"B"	LEADSCREW SLIDE ARM
3	1	"C"	LABEL TOOL ARM ASSY
4	4	10436	WASHER THRUST .500 ID X .937 OD X .060
5	2	10437	BRG THRUST .500 ID X .937 OD X .0781
6	4	10588	SCREW DRIVE #2 x 1/4 HOLE SIZE .089
7	4	11741	SCREW 5/16-18 X 1-1/2 SHCS
8	2	12897	SCREW 10-32 X 3/16 SSSNT
9	2	15906	RING O 1/8 X 3/4 X 1 OD
10	4	20166	PIN DOWEL 1/4 DIA X 1/2
11	1	29152	PLATE MASS CE
12	1	41471	RING HOIST SWIVEL 3/8-16 X .56 1000 LBS
13	2	43489	BALL NYLON 1/8 DIA
14	2	46733	END CAP SLIDE ARM 3.5 IN BAR
15	1	54193	FACING CARRIER ASSY SLIDE ARM
16	2	54197	NUT BEARING PRELOAD 1/2-20 .94 OD 10-32 SETSCREW

72875 - CHART ASSEMBLY SLIDE ARM BORING BAR BB6 BB7 - REV A

FOR REFERENCE ONLY

Figure 55. Boring bar slide arm assembly (P/N 72875)

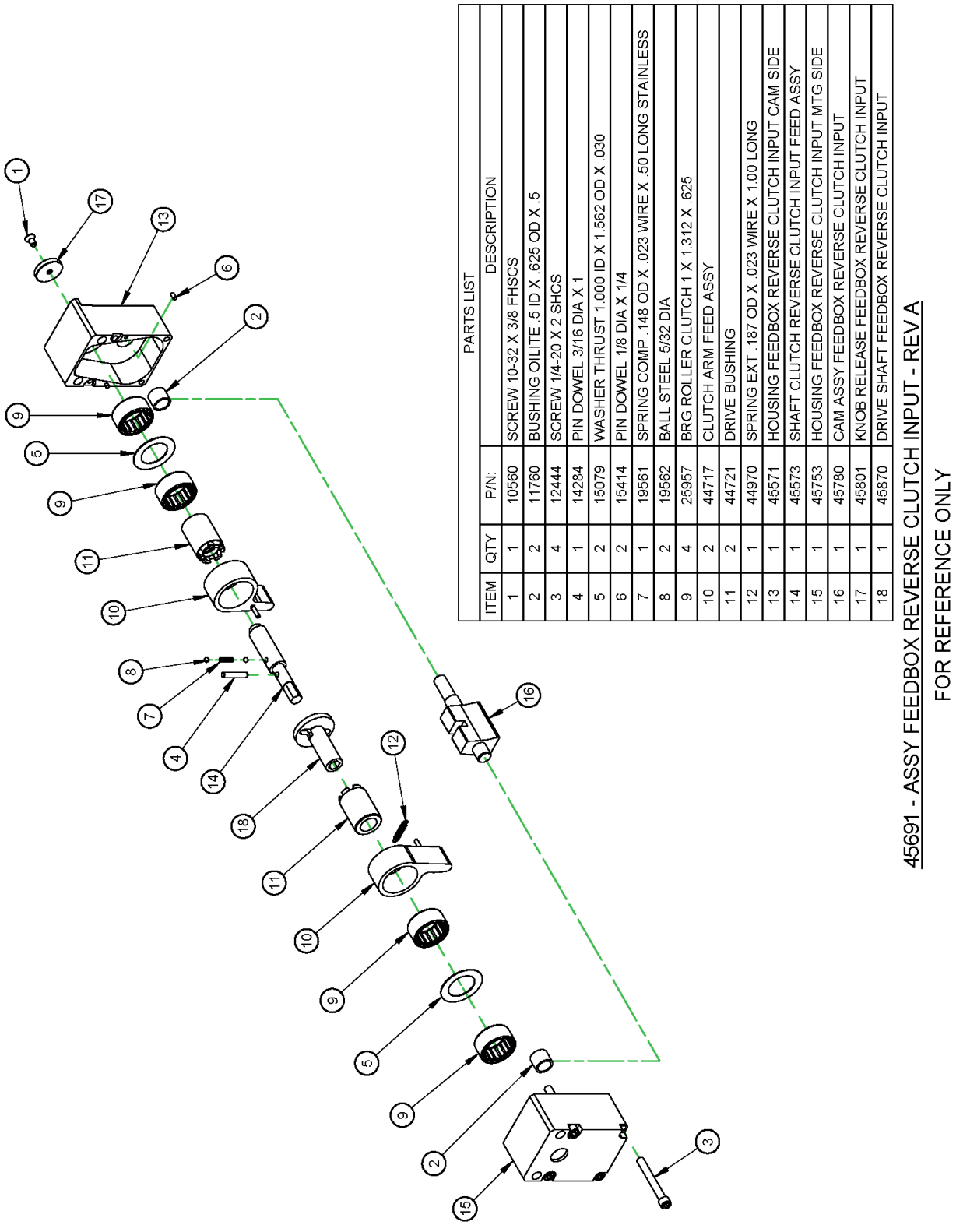
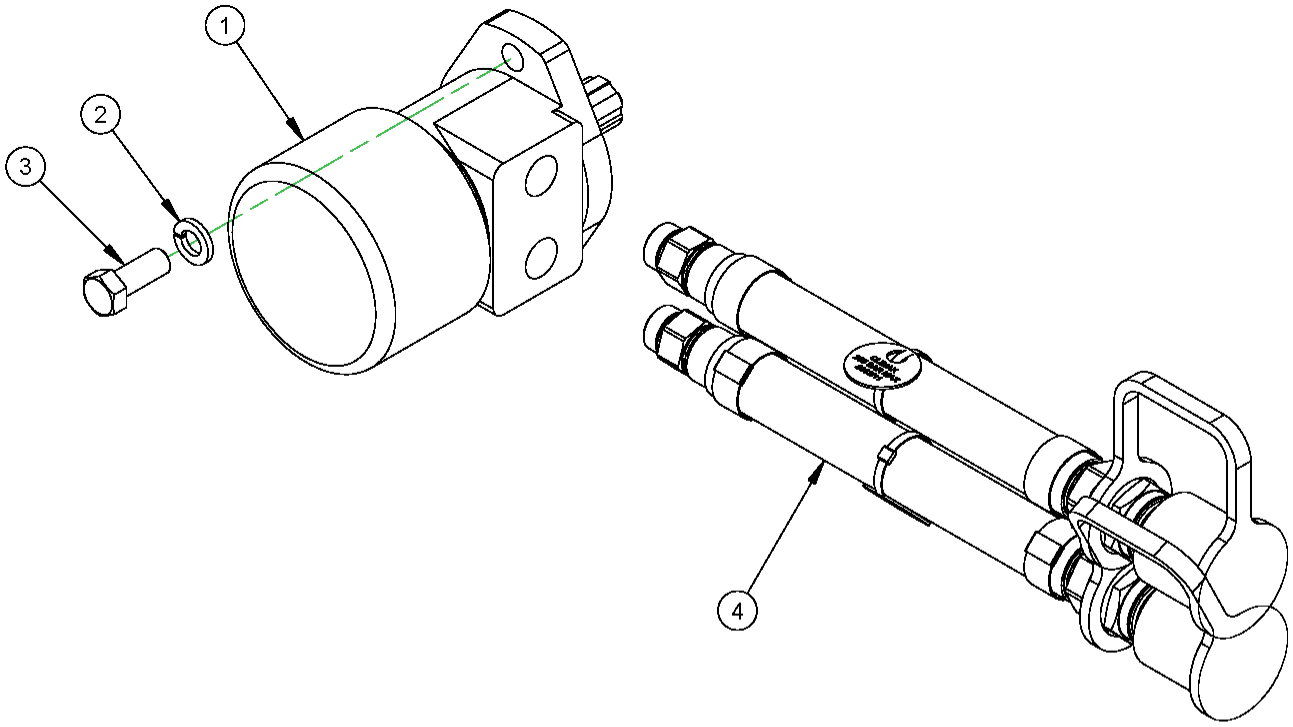


Figure 56. Feedbox assembly (P/N 45691)



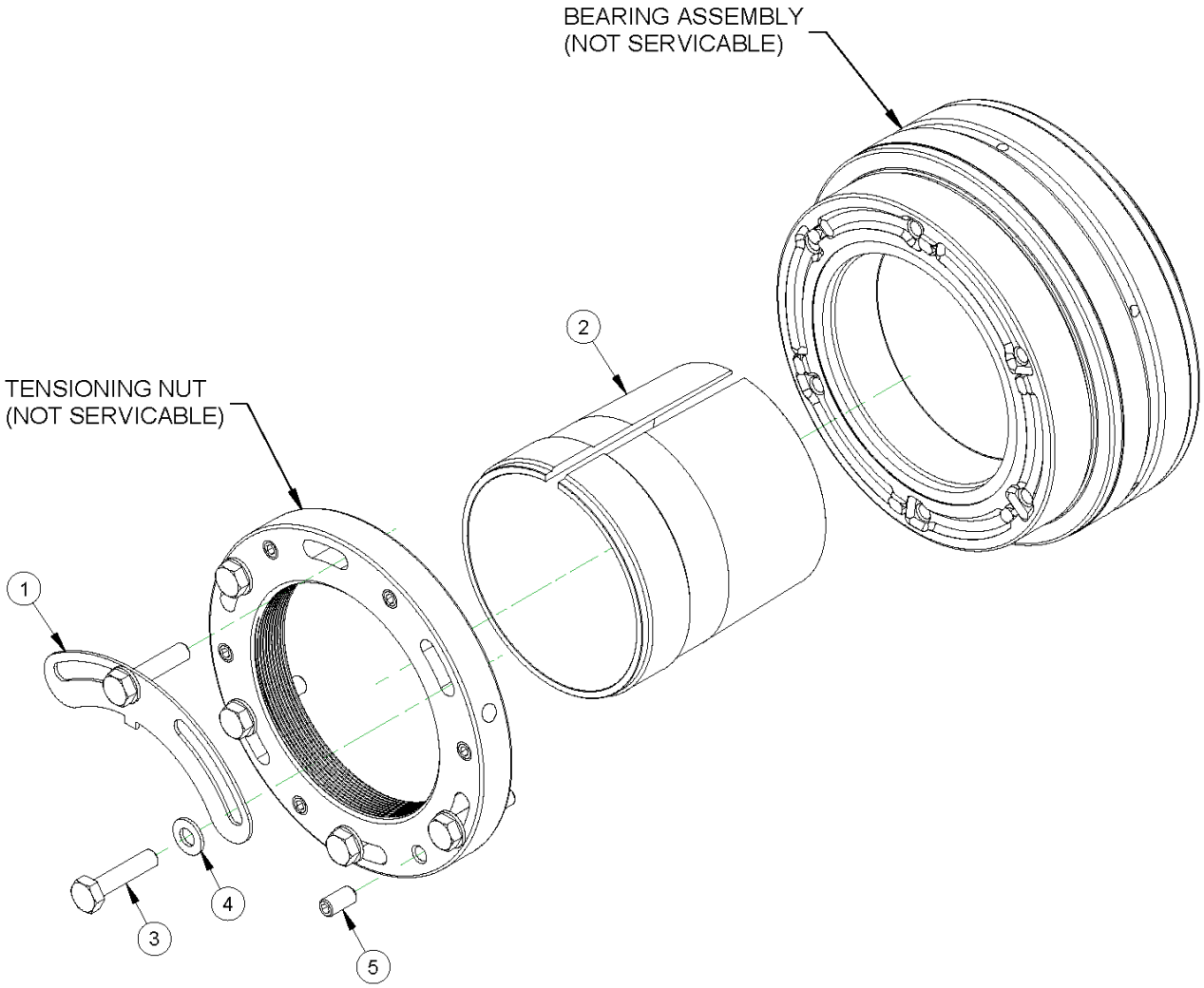
AVAILABLE CONFIGURATIONS			
PART NUMBER	DESCRIPTION	"A"	CHAR-LYNN P/N
43453	MOTOR ASSY HYD 3.6 CU IN SPLINE SHAFT	25472	103-1552
43454	MOTOR ASSY HYD 5.7 CU IN SPLINE SHAFT	25473	103-1083
43455	MOTOR ASSY HYD 7.3 CU IN SPLINE SHAFT	25474	103-1553
43456	MOTOR ASSY HYD 8.9 CU IN SPLINE SHAFT	25475	103-1554
43457	MOTOR ASSY HYD 11.3 CU IN SPLINE SHAFT	25476	103-1085
43458	MOTOR ASSY HYD 14.1 CU IN SPLINE SHAFT	25477	103-1086
43459	MOTOR ASSY HYD 17.9 CU IN SPLINE SHAFT	25478	103-1087

PARTS LIST			
ITEM	QTY	P/N:	DESCRIPTION
1	1	"A"	MOTOR HYDRAULIC SPLINE SHAFT
2	2	11238	WASHER LOCK 1/2
3	2	11826	SCREW 1/2-13 X 1-1/4 HHCS
4	1	39829	KIT FTG 3/4 HYD 60 SERIES W/12 IN HOSES

43491 - CHART MOTOR HYD ASSY 3/4 FITTINGS - REV B

FOR REFERENCE ONLY

Figure 57. Hydraulic motor assembly (P/N 43491)

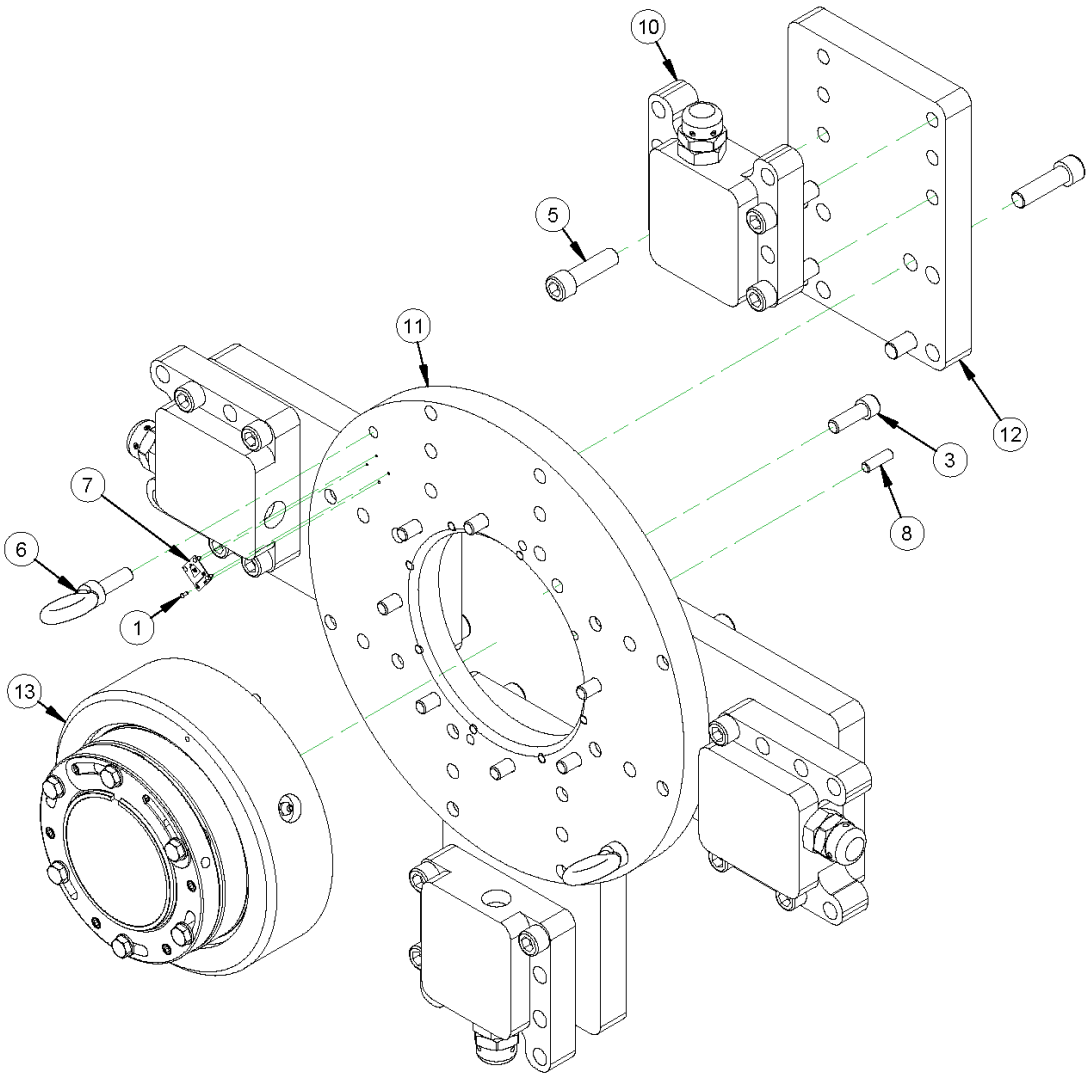


PARTS LIST					
ITEM	QTY	P/N:	DESCRIPTION	MANUFACTURER	MFG P/N
1	1	66798	PLATE LOCKING FOR DODGE 4-15/16"-5" IMPERIAL BRG	ABB	079116
2	1	69220	ADAPTER SLEEVE FOR DODGE 070911 IMPERIAL BEARING	ABB	069317
3	6	N/A	SCREW M10 X 1.5 X 45 MM LG HHCS	N/A	N/A
4	6	N/A	WASHER FLAT M10	N/A	N/A
5	6	N/A	SCREW M10 X 1.5 X 20 MM LG SSSFP	N/A	N/A

47110 - IMPERIAL BRG INSERT 070911 FOR 5 IN BAR - REV A

FOR REFERENCE ONLY

Figure 58. Imperial bearing assembly (P/N 47110)

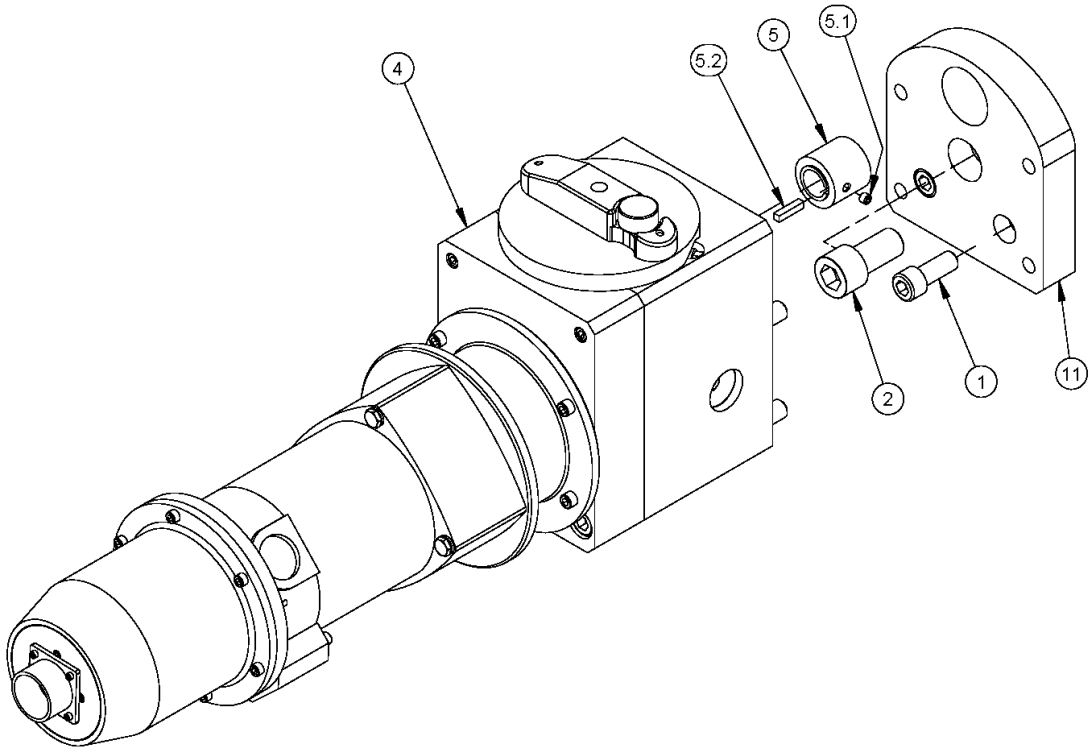


PARTS LIST			
ITEM	QTY	P/N:	DESCRIPTION
1	4	10588	SCREW DRIVE #2 x 1/4 HOLE SIZE .089
3	8	11691	SCREW 1/2-13 X 1-1/2 SHCS
5	32	19610	SCREW 5/8-18 X 2-1/4 SHCS
6	2	25211	EYE LIFTING 1/2-13
7	1	29152	PLATE MASS CE
8	8	32284	SCREW 3/8-24 X 1.25 SSSFP
10	4	54306	BLOCK CENTERING ASSY JACK BOLT BB7100 & BB8100
11	1	74562	SPIDER ID 19 TO 45 DIA BB7100
12	4	74563	SPIDER EXTENSION PLATE
13	1	96848	ASSY BRG AND HOUSING 5.0" ID MOUNT BB7100

54305 - MOUNT ID BRG ASSY JACK BOLT 19-45 ID 5 BAR - REV E

FOR REFERENCE ONLY

Figure 59. ID mount bearing assembly (P/N 54305)



AVAILABLE CONFIGURATIONS	
PART NUMBER	DESCRIPTION
41563	FEED ELEC W/MECH RAPID & CONTROLLER 5 BAR 230V
43736	FEED ELEC W/MECH RAPID & CONTROLLER 5 BAR 120V
56319	FEED ELEC W/MECH RAPID NO CONTROLLER 5 BAR

PARTS LIST			
ITEM	QTY	P/N:	DESCRIPTION
1	2	12646	SCREW 1/2-13 X 1-1/4 SHCS
2	1	22045	SCREW 3/4-10 X 1-1/2 SHCS
3	1	40720	(NOT SHOWN) ASSY CONTROLLER BB8000/6000 AXIAL FEED 230VAC
		42368	(NOT SHOWN) ASSY CONTROLLER BB8000/6000 AXIAL FEED 120VAC
4	1	41070	FEED AXIAL ELECTRIC ASSY W/ MECH RAPID
5	1	41465	COUPLING, ASSY 3/4 KEYED TO HEX 3/8
5.1	1	10464	SCREW 1/4-20 X 1/4 SSSCP
5.2	1	12657	KEY 3/16 SQ X .87 SQ BOTH ENDS

81709 - CHART FEED ELEC W/ MECH RAPID 5 BAR - REV A

FOR REFERENCE ONLY

Figure 60. Electric feed assembly (P/N 81709)

SCHEMATICS

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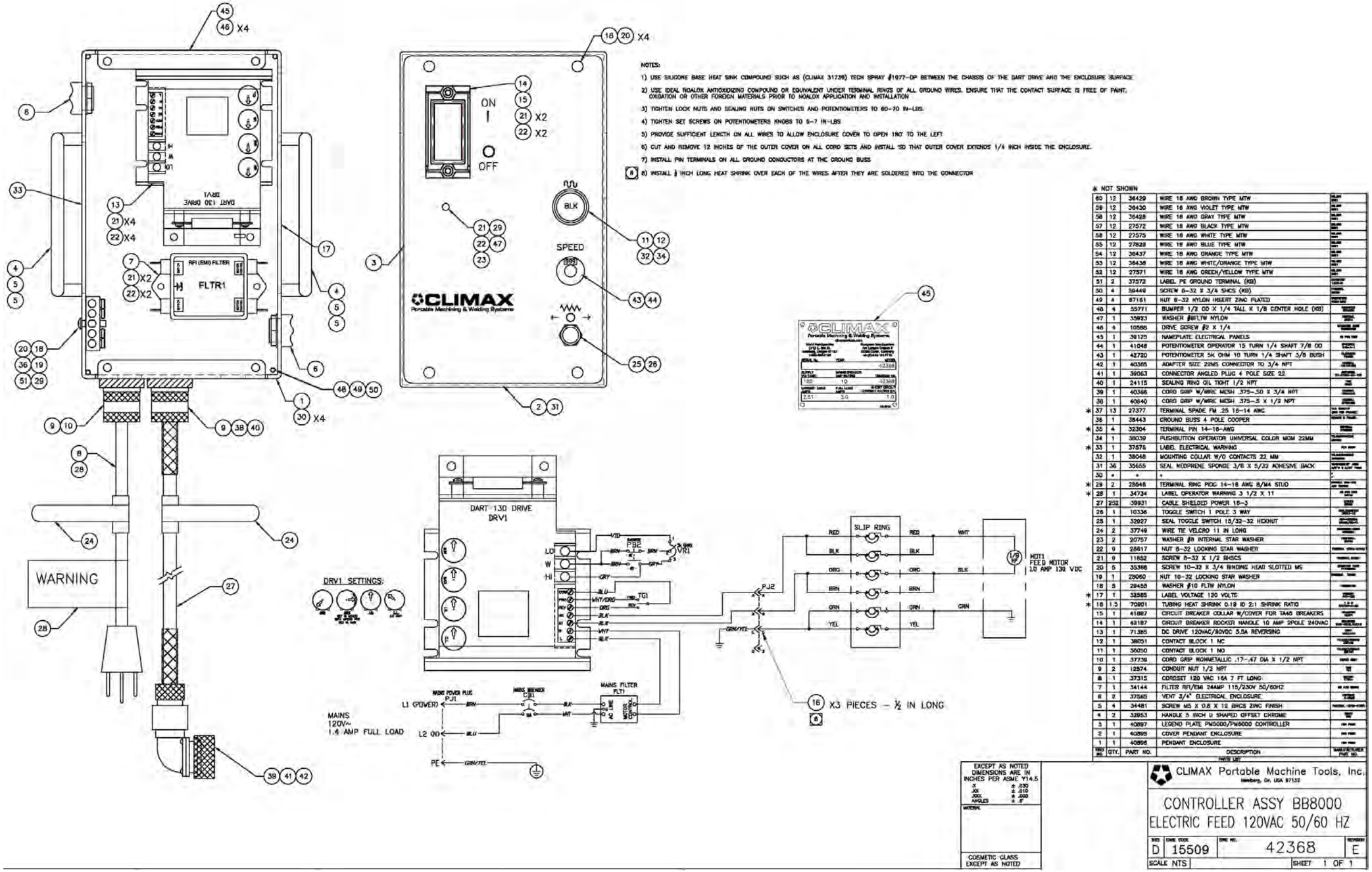
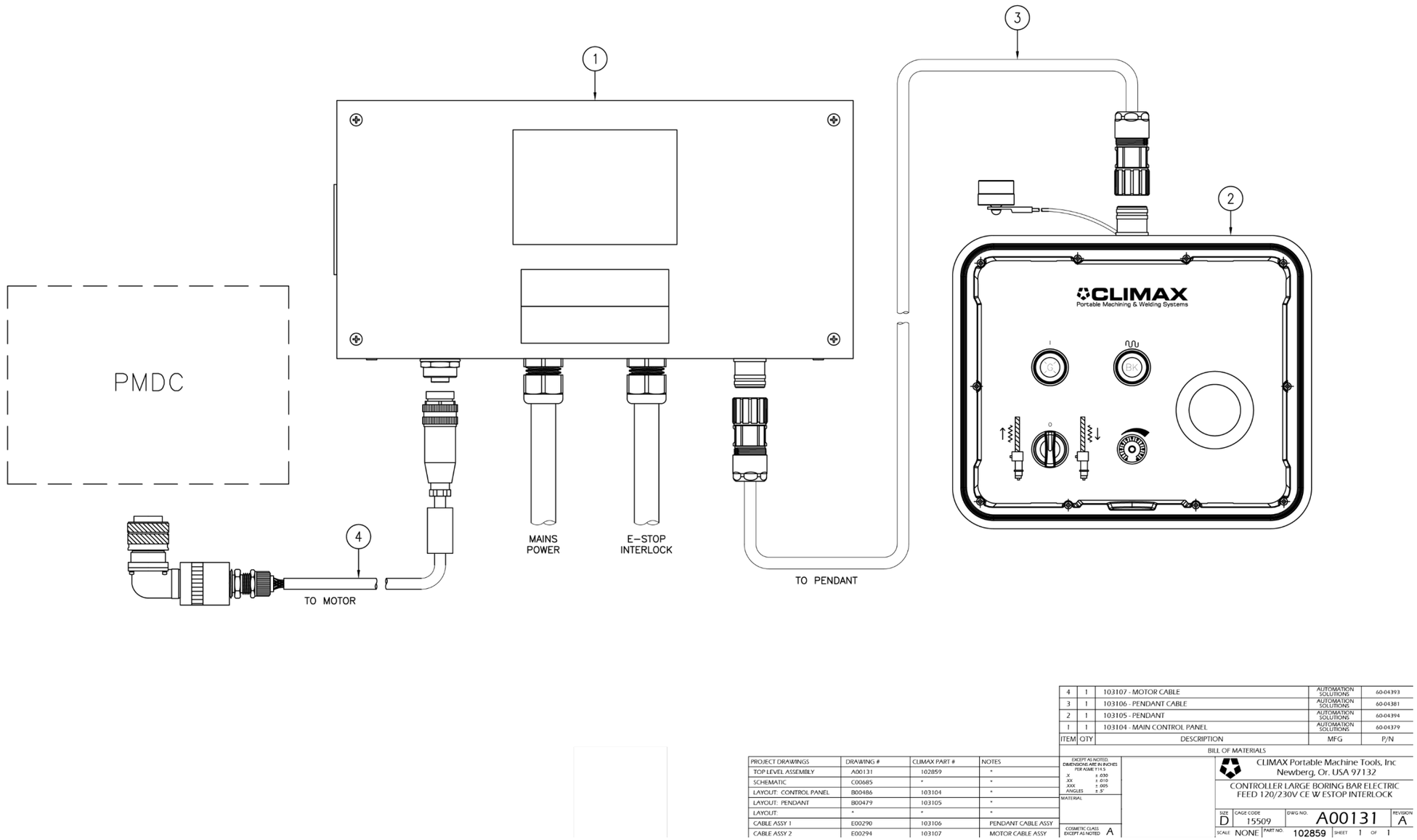


★ NOT SHOWN

ITEM NO.	QTY.	PART NO.	DESCRIPTION
60	12	36429	WIRE 18 AWG BROWN TYPE MTW
59	12	36430	WIRE 18 AWG VIOLET TYPE MTW
58	12	36428	WIRE 18 AWG GRAY TYPE MTW
57	12	27572	WIRE 18 AWG BLACK TYPE MTW
56	12	27575	WIRE 18 AWG WHITE TYPE MTW
55	12	27828	WIRE 18 AWG BLUE TYPE MTW
54	12	36437	WIRE 18 AWG ORANGE TYPE MTW
53	12	36436	WIRE 18 AWG WHITE/ORANGE TYPE MTW
52	12	27571	WIRE 18 AWG GREEN/YELLOW TYPE MTW
51	2	37572	LABEL PE GROUND TERMINAL (KIT)
50	4	58449	SCREW 8-32 X 3/4 SHCS (KIT)
49	4	67161	NUT 8-32 NYLON INSERT ZINC PLATED
48	4	35771	BUMPER 1/2 OD X 1/4 TALL X 1/8 CENTER HOLE (KIT)
47	1	35923	WASHER #8FLTW NYLON
46	4	10588	DRIVE SCREW #2 X 1/4
45	1	38125	NAMEPLATE ELECTRICAL PANELS
44	1	41048	POTENTIOMETER OPERATOR 15 TURN 1/4 SHAFT 7/8 OD
43	1	42720	POTENTIOMETER 5K OHM 10 TURN 1/4 SHAFT 3/8 BUSH
42	1	40385	ADAPTER SIZE 20MS CONNECTOR TO 3/4 NPT
41	1	39063	CONNECTOR ANGLED PLUG 4 POLE SIZE 22
40	1	24115	SEALING RING OIL TIGHT 1/2 NPT
39	1	40386	CORD GRIP W/WIRE MESH .375-.50 X 3/4 NPT
38	1	40640	CORD GRIP W/WIRE MESH .375-.5 X 1/2 NPT
★ 37	13	27377	TERMINAL SPADE FM .25 16-14 AWG
36	1	38443	GROUND BUSS 4 POLE COOPER
★ 35	4	32304	TERMINAL PIN 14-16-AWG
34	1	38039	PUSHBUTTON OPERATOR UNIVERSAL COLOR MOM 22MM
★ 33	1	37576	LABEL ELECTRICAL WARNING
32	1	38048	MOUNTING COLLAR W/O CONTACTS 22 MM
31	36	35655	SEAL NEOPRENE SPONGE 3/8 X 5/32 ADHESIVE BACK
30	*	*	*
★ 29	2	28546	TERMINAL RING PIDG 14-16 AWG 8/M4 STUD
★ 28	1	34734	LABEL OPERATOR WARNING 3 1/2 X 11
27	252	39931	CABLE SHIELDED POWER 16-3
26	1	10336	TOGGLE SWITCH 1 POLE 3 WAY
25	1	32927	SEAL TOGGLE SWITCH 15/32-32 HEXNUT
24	2	37749	WIRE TIE VELCRO 11 IN LONG
23	2	20757	WASHER #8 INTERNAL STAR WASHER
22	9	28617	NUT 8-32 LOCKING STAR WASHER
21	9	11852	SCREW 8-32 X 1/2 BHSCS
20	5	35396	SCREW 10-32 X 3/4 BINDING HEAD SLOTTED MS
19	1	28060	NUT 10-32 LOCKING STAR WASHER
18	5	29458	WASHER #10 FLTW NYLON
★ 17	1	32585	LABEL VOLTAGE 120 VOLTS
★ 16	1.5	70901	TUBING HEAT SHRINK 0.18 ID 2:1 SHRINK RATIO
15	1	41887	CIRCUIT BREAKER COLLAR W/COVER FOR TA45 BREAKERS
14	1	42187	CIRCUIT BREAKER ROCKER HANDLE 10 AMP 2POLE 240VAC
13	1	71385	DC DRIVE 120VAC/80VDC 5.5A REVERSING
12	1	38051	CONTACT BLOCK 1 NC
11	1	35050	CONTACT BLOCK 1 NO
10	1	37739	CORD GRIP NONMETALLIC .17-.47 DIA X 1/2 NPT
9	2	12574	CONDUIT NUT 1/2 NPT
8	1	37315	CORDSET 120 VAC 16A 7 FT LONG
7	1	34144	FILTER RFI/EMI 24AMP 115/230V 50/60HZ
6	2	37565	VENT 3/4" ELECTRICAL ENCLOSURE
5	4	34481	SCREW M5 X 0.8 X 12 BHCS ZINC FINISH
4	2	32953	HANDLE 5 INCH U SHAPED OFFSET CHROME
3	1	40897	LEGEND PLATE PM5000/PM6000 CONTROLLER
2	1	40895	COVER PENDANT ENCLOSURE
1	1	40896	PENDANT ENCLOSURE

Figure 61. Controller assembly and schematic (P/N 42368)



ITEM	QTY	DESCRIPTION	MFG	P/N
BILL OF MATERIALS				
4	1	103107 - MOTOR CABLE	AUTOMATION SOLUTIONS	60-04393
3	1	103106 - PENDANT CABLE	AUTOMATION SOLUTIONS	60-04381
2	1	103105 - PENDANT	AUTOMATION SOLUTIONS	60-04394
1	1	103104 - MAIN CONTROL PANEL	AUTOMATION SOLUTIONS	60-04379

PROJECT DRAWINGS	DRAWING #	CLIMAX PART #	NOTES
TOP LEVEL ASSEMBLY	A00131	102859	*
SCHEMATIC	C00685	*	*
LAYOUT: CONTROL PANEL	B00486	103104	*
LAYOUT: PENDANT	B00479	103105	*
LAYOUT:	*	*	*
CABLE ASSY 1	E00290	103106	PENDANT CABLE ASSY
CABLE ASSY 2	E00294	103107	MOTOR CABLE ASSY

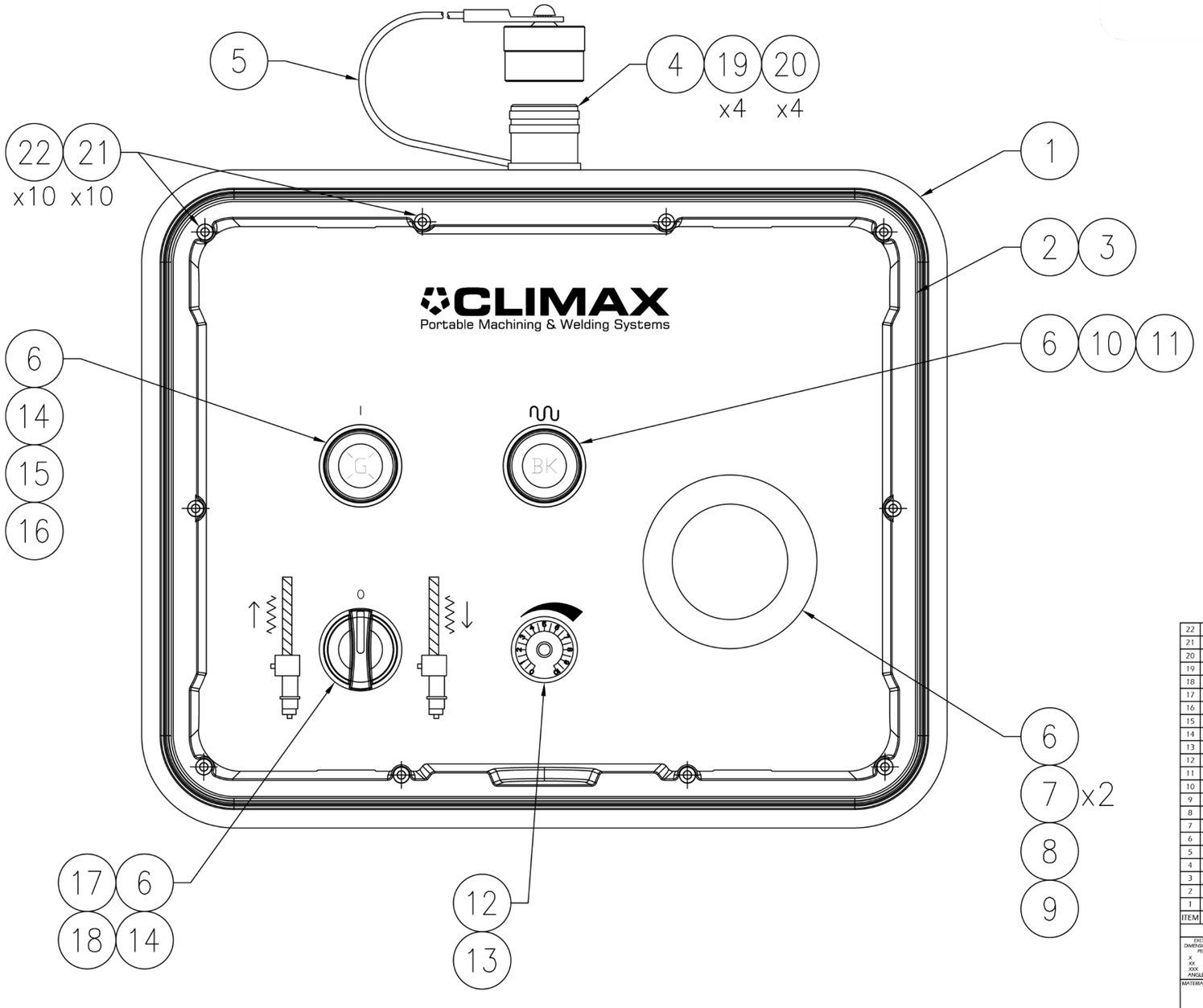
EXCEPT AS NOTED: DIMENSIONS ARE IN INCHES PER ASME Y14.5
.X ± .030
.XX ± .010
.XXX ± .005
ANGLES ± .5°
MATERIAL
COSMETIC CLASS EXCEPT AS NOTED: A

CLIMAX Portable Machine Tools, Inc
Newberg, Or. USA 97132

CONTROLLER LARGE BORING BAR ELECTRIC FEED 120/230V CE W ESTOP INTERLOCK

SIZE D | CAGE CODE 15509 | DWG NO. A00131 | REVISION A
SCALE NONE | PART NO. 102859 | SHEET 1 OF 1

Figure 62. Electric feed controller assembly 120/230V (P/N A00131)



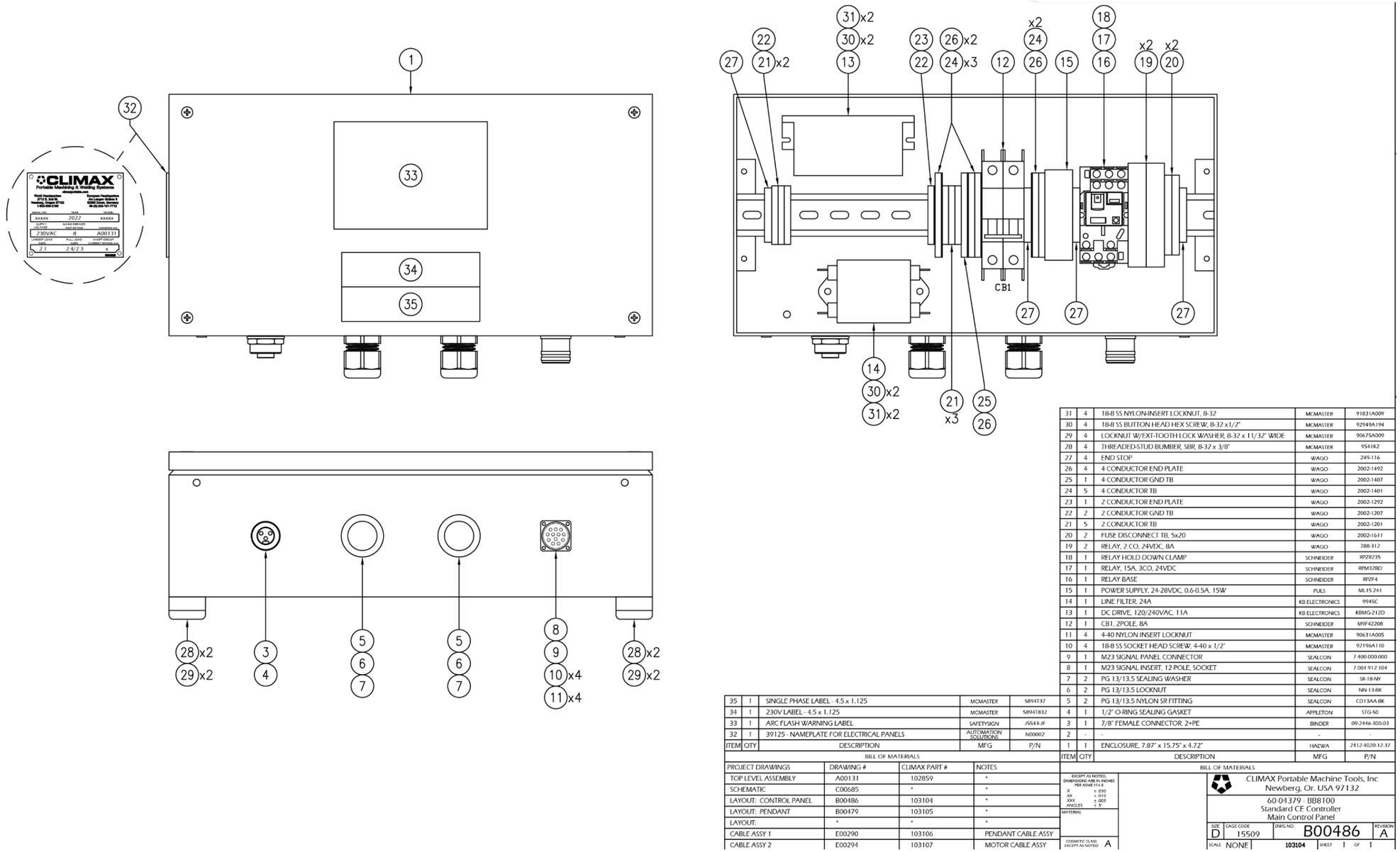
ITEM	QTY	DESCRIPTION	MFG	P/N
22	10	NYLON PLASTIC WASHER, #5	MULTIPLE	
21	10	18-8 SS 6-19 x 1/2 PLASTIC TAPPING SCREWS	MULTIPLE	
20	4	4-40 NYLON INSERT NUTS	MULTIPLE	
19	4	18-8 SHCS 4-40 x 5/8" SCREWS	MULTIPLE	
18	1	SELECTOR SWITCH, 3 POS	SCHNEIDER	ZB4BD3
17	2	NO CONTACT BLOCK	SCHNEIDER	ZBE1016P
16	1	GREEN PUSHBUTTON, 22mm, ILLUMINATED, FLUSH	SCHNEIDER	ZB4BW333
15	1	GREEN LED LIGHT BLOCK	SCHNEIDER	ZBVBG3
14	2	NO CONTACT BLOCK	SCHNEIDER	ZBE101
13	1	KNOB, 10-TURN POT, 1/4" SHAFT	BOURNS	H-516-6A
12	1	POTENTIOMETER, 10-TURN, 10K, 0.25" SHAFT	VISHAY	536B103
11	1	PUSHBUTTON, 22mm	SCHNEIDER	ZB4BA9
10	1	1 NC, 1 NO CONTACT BLOCK	SCHNEIDER	ZBE205
9	1	E-STOP LEGEND	IDEC	HAAV4-27
8	1	E-STOP PUSHBUTTON PUSH-TWIST 22mm	SCHNEIDER	ZB4BS844
7	2	NC CONTACT BLOCK	SCHNEIDER	ZBE102
6	4	PUSHBUTTON MOUNTING COLLAR	SCHNEIDER	ZB4BZ009
5	1	BRASS PROTECTIVE CAP	HUMMEL	7.010.951.002
4	1	M23 PANEL MOUNT HOUSING, MALE THREAD, FRONT MOUNT	HUMMEL	7.400.000.000
3	1	Laser Cut Top Plate	AUTOMATION SOLUTIONS	H00867
2	1	NANUK 905 GASKET	NANUK	905 GASKET
1	1	ENCLOSURE, PORTABLE 9.4" x 7.4" x 5.5"	NANUK	905-0001

BILL OF MATERIALS

EXCEPT AS NOTED, DIMENSIONS ARE IN INCHES PER ASME Y14.5
X ± .030
XX ± .010
XXX ± .005
ANGLES ± 5°
MATERIAL
COSMETIC GLASS EXCEPT AS NOTED A

CLIMAX Portable Machining & Welding Systems
SMD394 - BB8100 STANDARD CE CONTROLLER PENDANT
SIZE B | CAGE CODE 15509 | DWG NO. B00479 | REVISION A
SCALE NONE | P/N 103105 | SHEET 1 OF 1

Figure 63. Controller pendant assembly (P/N B00479)



35	1	SINGLE PHASE LABEL - 4.5 x 1.125	MCMASTER	58941T37
34	1	230V LABEL - 4.5 x 1.125	MCMASTER	58941T832
33	1	ARC FLASH WARNING LABEL	SAFETYSIGN	J5543-JF
32	1	39125 - NAMEPLATE FOR ELECTRICAL PANELS	AUTOMATION SOLUTIONS	N00002
ITEM	QTY	DESCRIPTION	MFG	P/N

BILL OF MATERIALS

PROJECT DRAWINGS	DRAWING #	CLIMAX PART #	NOTES
TOP LEVEL ASSEMBLY	A00131	102859	*
SCHEMATIC	C00685	*	*
LAYOUT: CONTROL PANEL	B00486	103104	*
LAYOUT: PENDANT	B00479	103105	*
LAYOUT:	*	*	*
CABLE ASSY 1	E00290	103106	PENDANT CABLE ASSY
CABLE ASSY 2	E00294	103107	MOTOR CABLE ASSY

31	4	18-8 SS NYLON-INSERT LOCKNUT, 8-32	MCMASTER	91831A009
30	4	18-8 SS BUTTON HEAD HEX SCREW, 8-32 x1/2"	MCMASTER	92949A194
29	4	LOCKNUT W/EXT-TOOTH LOCK WASHER, 8-32 x 11/32" WIDE	MCMASTER	90675A009
28	4	THREADED-STUD BUMBER, SBR, 8-32 x 3/8"	MCMASTER	9541K2
27	4	END STOP	WAGO	249-116
26	4	4 CONDUCTOR END PLATE	WAGO	2002-1492
25	1	4 CONDUCTOR GND TB	WAGO	2002-1407
24	5	4 CONDUCTOR TB	WAGO	2002-1401
23	1	2 CONDUCTOR END PLATE	WAGO	2002-1292
22	2	2 CONDUCTOR GND TB	WAGO	2002-1207
21	5	2 CONDUCTOR TB	WAGO	2002-1201
20	2	FUSE DISCONNECT TB, 5x20	WAGO	2002-1611
19	2	RELAY, 2 CO, 24VDC, 8A	WAGO	788-312
18	1	RELAY HOLD DOWN CLAMP	SCHNEIDER	RP2R23S
17	1	RELAY, 15A, 3CO, 24VDC	SCHNEIDER	RPM32BD
16	1	RELAY BASE	SCHNEIDER	RP2F4
15	1	POWER SUPPLY, 24-28VDC, 0.6-0.5A, 15W	PULS	ML15.241
14	1	LINE FILTER, 24A	KB ELECTRONICS	9945C
13	1	DC DRIVE, 120/240VAC, 11A	KB ELECTRONICS	KBMG-212D
12	1	CB1, 2POLE, 8A	SCHNEIDER	M9F42208
11	4	4-40 NYLON INSERT LOCKNUT	MCMASTER	90631A005
10	4	18-8 SS SOCKET HEAD SCREW, 4-40 x 1/2"	MCMASTER	92196A110
9	1	M23 SIGNAL PANEL CONNECTOR	SEALCON	7.400.000.000
8	1	M23 SIGNAL INSERT, 12-POLE, SOCKET	SEALCON	7.001.912.104
7	2	PG 13/13.5 SEALING WASHER	SEALCON	SR-18-NY
6	2	PG 13/13.5 LOCKNUT	SEALCON	NN-13-BK
5	2	PG 13/13.5 NYLON SR FITTING	SEALCON	CD13AA-BK
4	1	1/2" O-RING SEALING GASKET	APPLETON	STG-50
3	1	7/8" FEMALE CONNECTOR, 2+PE	BINDER	09-2446-300-03
2	-	-	-	-
1	1	ENCLOSURE, 7.87" x 15.75" x 4.72"	HAEWA	2412-4020-12-37
ITEM	QTY	DESCRIPTION	MFG	P/N

BILL OF MATERIALS

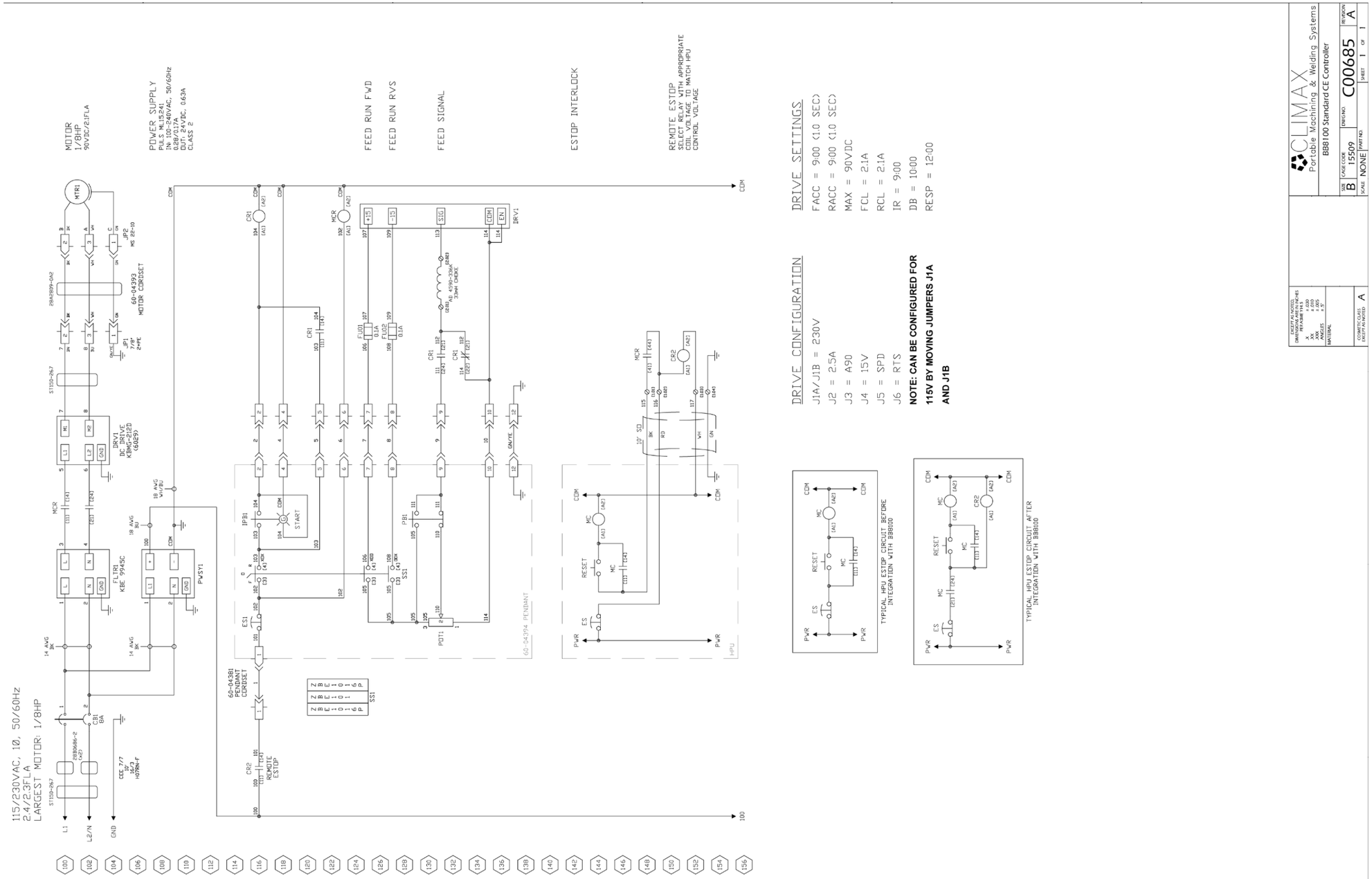
EXCEPT AS NOTED, DIMENSIONS ARE IN INCHES PER ASME Y14.5
X ± .030
XX ± .010
XXX ± .005
ANGLES ± 5°
MATERIAL
COSMETIC CLASS EXCEPT AS NOTED A

CLIMAX Portable Machine Tools, Inc
Newberg, Or. USA 97132

60-04379 - BB8100
Standard CE Controller
Main Control Panel

SIZE	CAGE CODE	DWG NO.	REVISION
D	15509	B00486	A
SCALE NONE	103104	SHEET 1 OF 1	

Figure 64. Main control panel assembly (P/N B00486)



DRIVE CONFIGURATION

J1A/J1B = 230V
J2 = 2.5A
J3 = A90
J4 = 15V
J5 = SPD
J6 = RTS

NOTE: CAN BE CONFIGURED FOR 115V BY MOVING JUMPERS J1A AND J1B

DRIVE SETTINGS

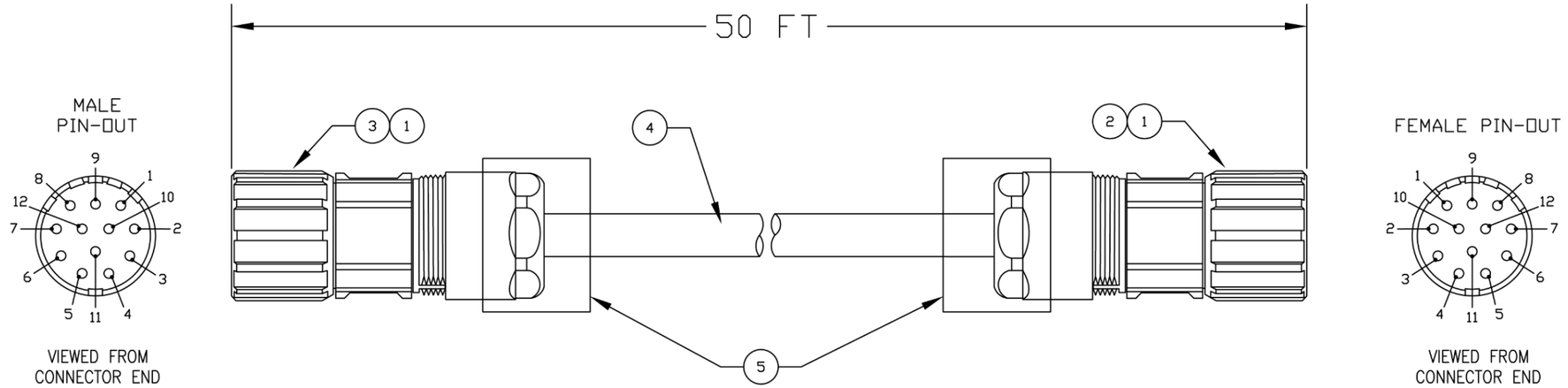
FACC = 9.00 (1.0 SEC)
RACC = 9.00 (1.0 SEC)
MAX = 90VDC
FCL = 2.1A
RCL = 2.1A
IR = 9.00
DB = 10.00
RESP = 12.00

TYPICAL HPU ESTOP CIRCUIT BEFORE INTEGRATION WITH BB8100

TYPICAL HPU ESTOP CIRCUIT AFTER INTEGRATION WITH BB8100

CLIMAX
Portable Machining & Welding Systems
BB8100 Standard CE Controller
SIZE B | CAGE CODE 15509 | DWG NO. C00685 | REVISION A
SCALE NONE | WEIGHT: | SHEET 1 OF 1

Figure 65. Controller schematic (P/N C00685)



5	2	*	HEAT SHRINK BOOT FOR M23 FIELD WIRABLE	TE 202K132-25L-0
4	50	*	CONTROL CABLE, SHIELDED, 12 x 20AWG, 0.35" D	IGUS CF891-05-12
3	1	*	CONNECTOR INSERT, SOLDER CONTACTS, M23, PIN	SEALCON 7.001.912.103
2	1	*	CONNECTOR INSERT, SOLDER CONTACTS, M23, SOCKET	SEALCON 7.001.912.104
1	2	*	SIGNAL CABLE CONNECTOR	SEALCON 7.106.500.000

EXCEPT AS NOTED, DIMENSIONS ARE IN INCHES PER ASME Y14.5

.X	± .030
.XX	± .010
.XXX	± .005
ANGLES	± .5°

MATERIAL

COSMETIC CLASS EXCEPT AS NOTED A

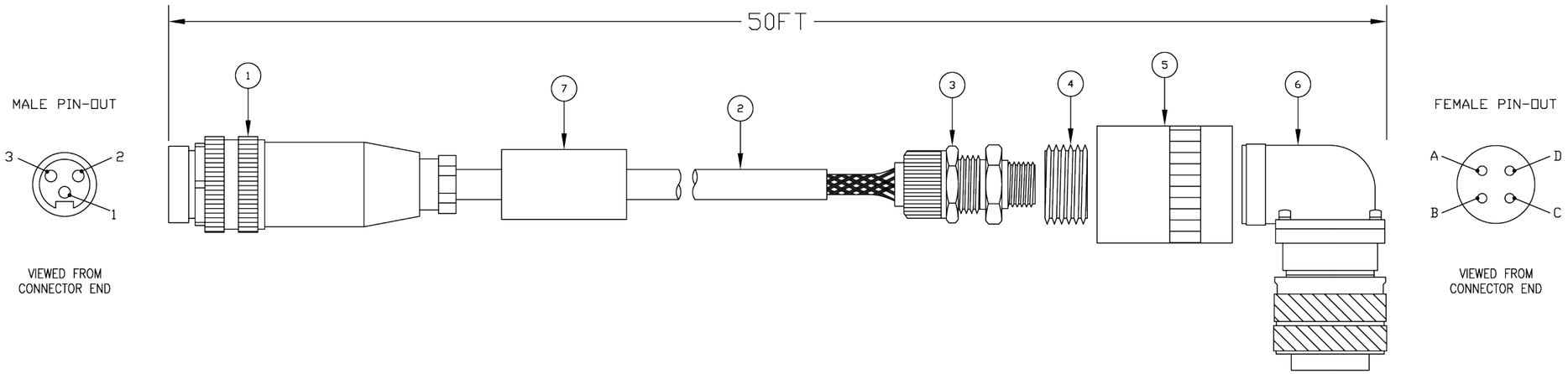
CLIMAX
Portable Machining & Welding Systems

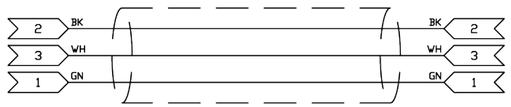
60-04381 - BB8100 Standard CE Controller
Pendant Cordset 50 ft

SIZE	CAGE CODE	DWG NO.	REVISION
B	15509	E00290	A

SCALE NONE | 103106 | SHEET 1 OF 1

Figure 66. Pendant cord set assembly (P/N E00290)





7	1	*	SNAP-ON FERRITE	LAIRD 28A2809-0A2
6	1	*	CIRCULAR MIL SPEC CONNECTOR, 4 POS, FEMALE	AMPHENOL 97-3108A-22-10S
5	1	*	THREADED ADAPTER, 1-3/16" x 3/4"	HUBBELL 091041008
4	1	*	REDUCING BUSHING, THREADED, 3/4" x 1/2"	APPLETON RB75-50A
3	1	*	1/2" CONNECTOR, MALE	LEVITON L7706
2	50	*	FT, CABLE	IGUS CF890-15-03
1	1	*	7/8" MALE CONNECTOR, 2+PE	BINDER 99-2441-12-03

EXCEPT AS NOTED, DIMENSIONS ARE IN INCHES PER ASME Y14.5

.X	± .030
.XX	± .010
.XXX	± .005
ANGLES	± .5°

MATERIAL

COSMETIC CLASS EXCEPT AS NOTED: A

CLIMAX
Portable Machining & Welding Systems

60-04393 - BB8100 Standard CE Controller
Motor Cordset 50'

SIZE	CAGE CODE	DWG NO.	REVISION
B	15509	E00294	A

SCALE NONE | 103107 | SHEET 1 OF 1

Figure 67. Motor cord set assembly (P/N E00294)

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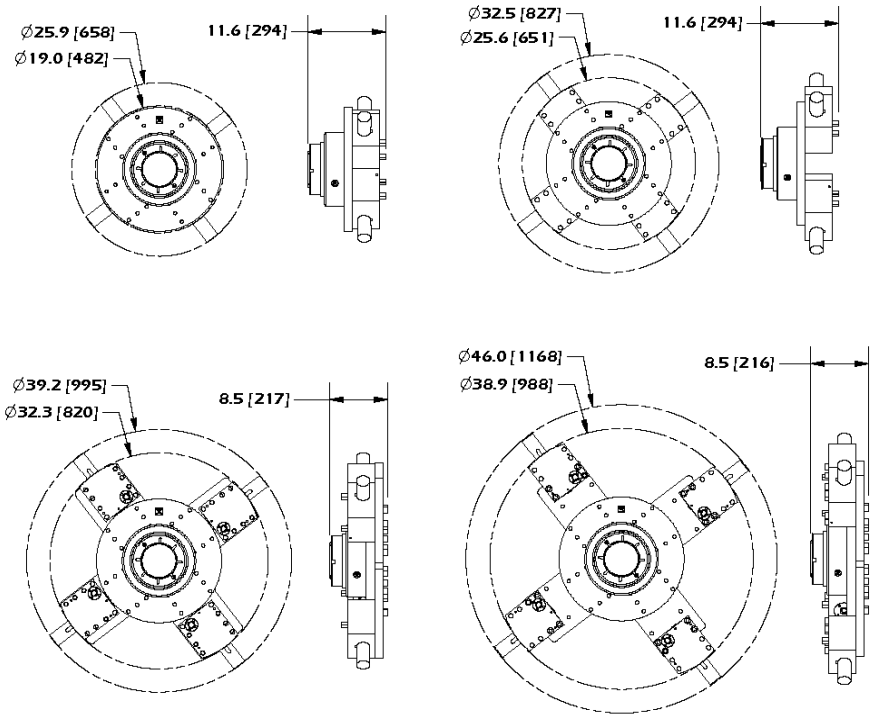
SPECIFICATIONS

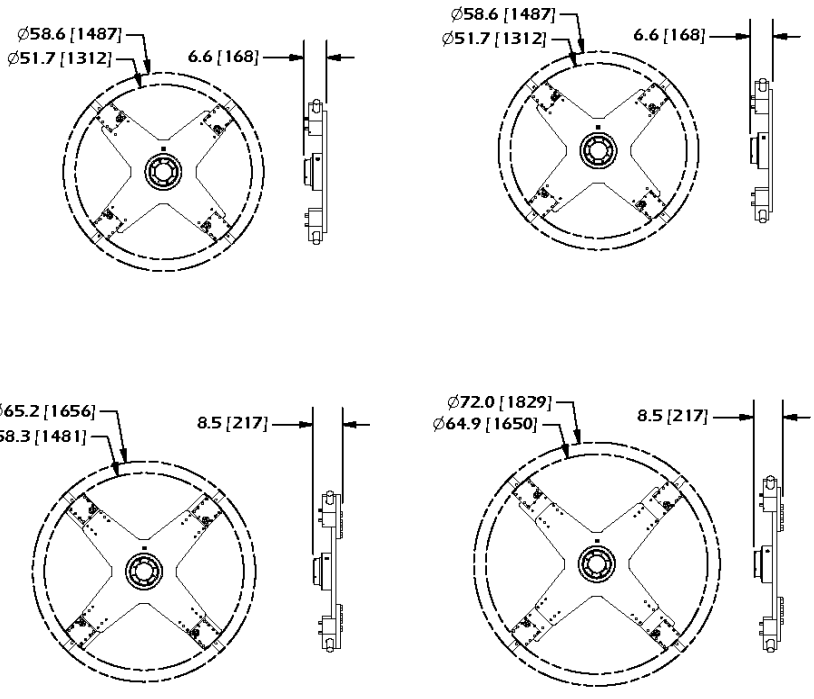
	US	Metric
Boring and Facing Ranges:		
Boring diameter range, standard stack block assembly:	10.25 - 58.25 inches	260.4 - 1479.6 mm
Boring diameter range, boring/facing arm assembly:		
with 18 inch (457.2 mm) boring/facing arm	22.1 - 29.9 inches	561.3 - 759.5 mm
with 23 inch (584.2 mm) boring/facing arm	25.1 - 39.9 inches	637.5 - 1013.5 mm
with 34 inch (863.6 mm) boring/facing arm	35.9 - 61.9 inches	911.9 - 1572.6 mm
Facing diameter range, mechanical facing head assembly:	12.0 - 57.5 inches	304.8 - 1460.5 mm
Facing diameter range, boring/facing arm assembly:		
with 18 inch (457.2 mm) boring/facing arm	17.8 - 29.9 inches	452.1 - 759.5 mm
with 23 inch (584.2 mm) boring/facing arm	17.8 - 39.9 inches	452.1 - 1013.5 mm
with 34 inch (863.6 mm) boring/facing arm	17.8 - 61.9 inches	452.1 - 1572.6 mm
Facing diameter range, boring/facing arm assembly (tool post reversed):		
("tool post reversed" refers to rotating the tool post so that the tool is on the bar side of the tool post.)		
with 18 inch (457.2 mm) boring/facing arm	9.6 - 19.8 inches	243.8 - 502.92 mm
with 23 inch (584.2 mm) boring/facing arm	9.6 - 29.8 inches	243.8 - 756.9 mm
with 34 inch (863.6 mm) boring/facing arm	9.6 - 51.8 inches	243.8 - 1315.7 mm
Performance Data		
Rotational Drive Unit (RDU) Gear Ratio:	10.59:1 gear reduction	
Hydraulic motor size affects torque and speed		
Theoretical values calculated using a 25 Hp hydraulic power unit producing 2000 psi (13790 kPa) continuous, [normal operation is 1200 psi (8270 kPa)] and pumping 15 gpm (68 l/min).		
Hydraulic motor size range:	3.6 - 17.9 in^3	59.9 - 293.3 cm^3
Boring Bar Torque:	750 - 2900 ft•lb	1020 - 3930 N•m
Max boring rpm:	90 - 18 rpm	90 - 18 rpm
For example, with 11.3 in^3 (185.3 cm^3) hydraulic motor (43457):		
Boring Bar Torque:	2280 ft•lb	3090 N•m
Max boring rpm:	29 rpm	29 rpm
Feed rate of mechanical Axial Feed Unit (AFU):	0.003 - 0.025 in/rev.	0.076 - 0.635 mm/rev.
Feed rate of electric Axial Feed Unit (AFU):	0 - 0.48 in/min.	0 - 12.2 mm/min.
Measures:		
Operating weight (estimated)	2012.3 lbs.	912.8 kg
Typical machine consisting of Rotational Drive Unit (RDU), Axial Feed Unit (AFU), boring head set, tool carrier, 2 bearing mounts, 12 foot (365.8 cm) bar, tool kit, and hydraulic motor.		
Shipping weight (estimated), for machine (metal crate)	2203 lbs.	999.3 kg
Shipping weight (estimated), for machine (wood crate)	2117.3 lbs.	960.4 kg
(machine with RDU, AFU, boring head set, tool carrier, tool kit, and hydraulic motor.)		
Shipping weight (estimated), set of 2 Bearings	780 lbs.	353.8 kg
Shipping weight (estimated), Boring Bar	5.9 lbs/inch	1.05 kg/cm
Shipping weight (estimated), 15 Hp Hydraulic Power Unit	750 lbs	340.2 kg
Shipping weight (estimated), 25 Hp Hydraulic Power Unit	875 lbs	396.9 kg
Shipping dimensions:		
Machine, in wood crate, W, D, H	24 x 37 x 20-5/8 inches	609.6 x 939.8 x 523.9 mm
Machine, in steel crate, W, D, H	43.3 x 29.5 x 22.5 inches	1099.8 x 749.3 x 571.5 mm
Bearing (each bearing shipped separately) W, D, H	36.5 x 36.5 x 17 inches	927 x 927 x 432 mm
12 foot (365.8 cm) bar W, D, H	15 x 14 x 158 inches	381 x 356 x 4013 mm
15 or 25 Hp Hydraulic Power Unit W, D, H	24 x 43 x 47 inches	610 x 1092 x 1194 mm

OPERATIONAL DIMENSIONS

Dimensions in Inch (mm)

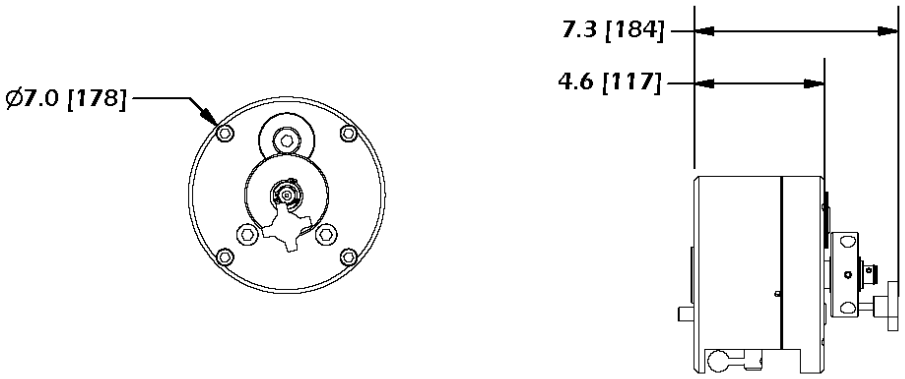


20 - 46 inch (508.0 - 1168.4 mm) ID Mount
(Face Adjust shown. Jack screw adjust ranges are the same)

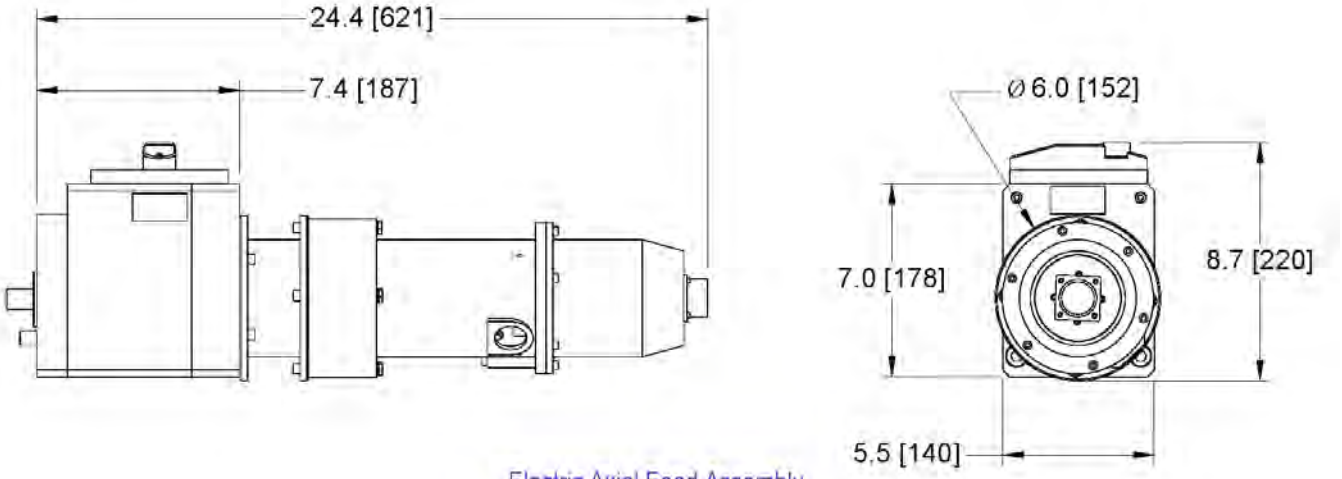


46 - 72 inch (1168.4 - 1828.8 mm) ID Mount
(Face Adjust shown. Jack screw adjust ranges are the same)

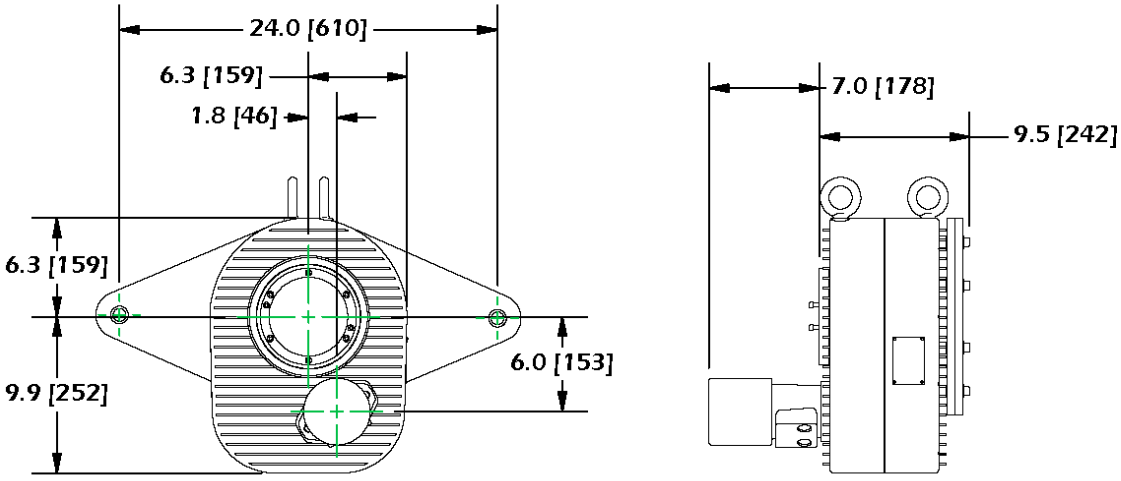
Dimensions in Inch (mm)



Mechanical Axial Feed Assembly



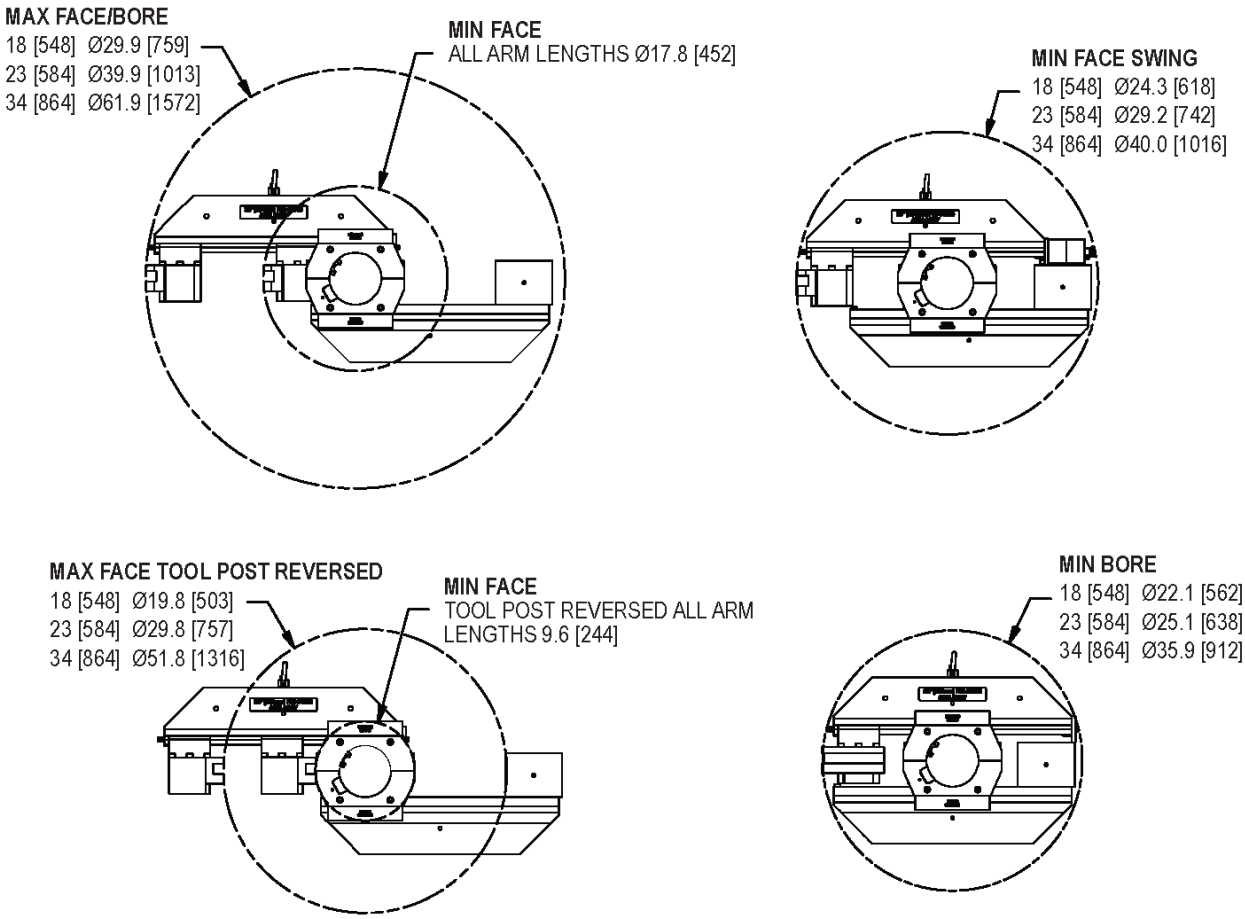
Electric Axial Feed Assembly



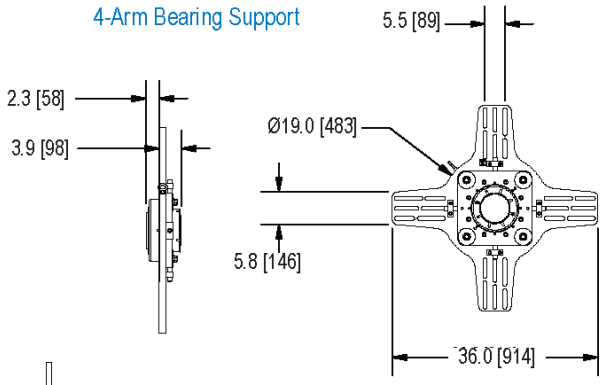
Rotational Drive Unit

Dimensions in Inch (mm)

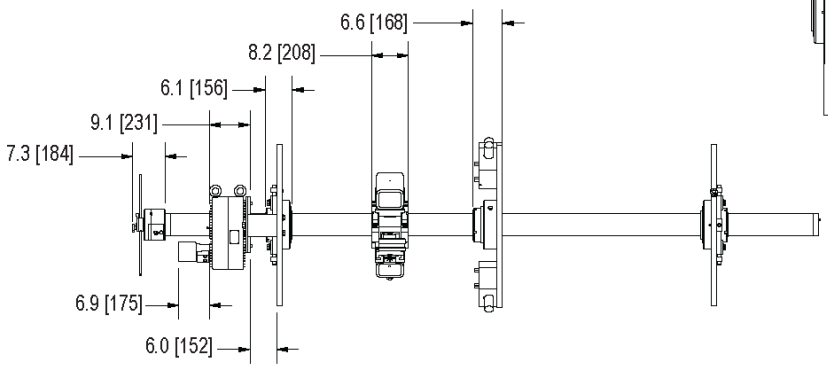
Boring/facing arm configurations



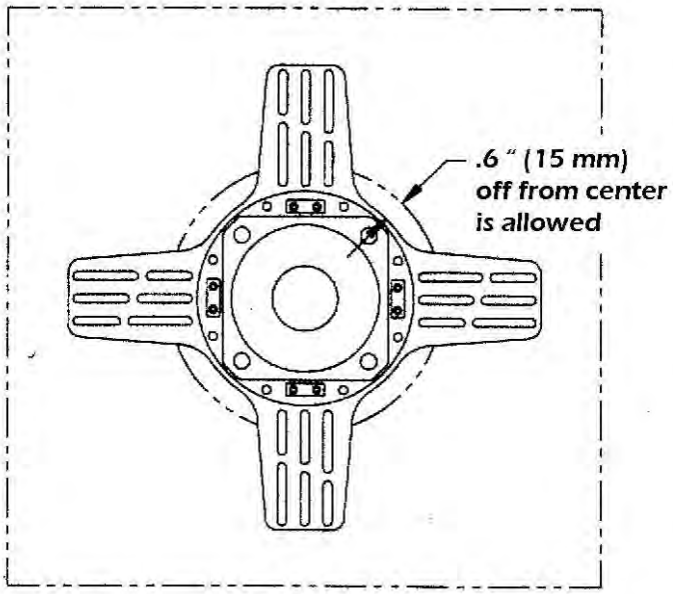
4-Arm Bearing Support



Side view, boring/facing arm assembly



BEARING AND BAR ALIGNMENT (2019 AND EARLIER)



Aligning the bar and bearing supports with the center bore

	WARNING
	Swinging or falling machinery can seriously injure the operator. Securely wrap the hoist or straps around the bar and bearings before lifting the machine.

1. When using existing holes, make sure they align with the slots in the spider. Tap new holes if necessary. If holes are to be tapped in the work piece, hold the spiders against the work piece and mark the position of the slots in the spiders.
2. Pull the bearing assemblies from the boring bar.
3. Remove the bar from the workpiece.
4. If necessary, tap 5/8" (16 mm) holes on the end of the work piece to align with slots in the spiders.
5. Mount one bearing to the end of the work piece.
6. Slide the boring bar through the bearing support.
7. If you need to mount the rotational drive between the supports, do it now.
8. If mounting another end-mount bearing support, repeat previous steps.
9. Slide the boring bar through all bearing assemblies.
10. Lock the bar in place by tightening the bearing cartridge nut.

11. Insert the bearing key tool between the groove in the boring bar and the groove in the bearing tapered sleeve.
12. This tool (P/N 55572) rests in the leadscrew slot while tightening. The tab fits into the split of the tapered sleeve to prevent the sleeve from rotating on the bar when tightening the bearing.
13. Tighten the strap wrench around the boring bar.
14. While holding the strap wrench in place, tighten the bearing nut using the bearing nut wrench.
15. Remove the bearing key tool (P/N 55572) from the boring bar.
16. Precisely align the boring bar.
17. Position a dial indicator to measure the concentricity between the boring bar and the bore.
18. Adjust the screws in the bearing support adjusting blocks until the bar is centered.

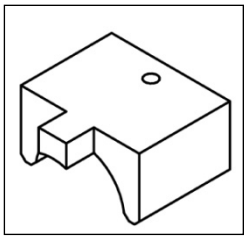


Figure 68. Bearing key tool (P/N 55572)

SDS

Contact CLIMAX for the current list of Safety Data Sheets.

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