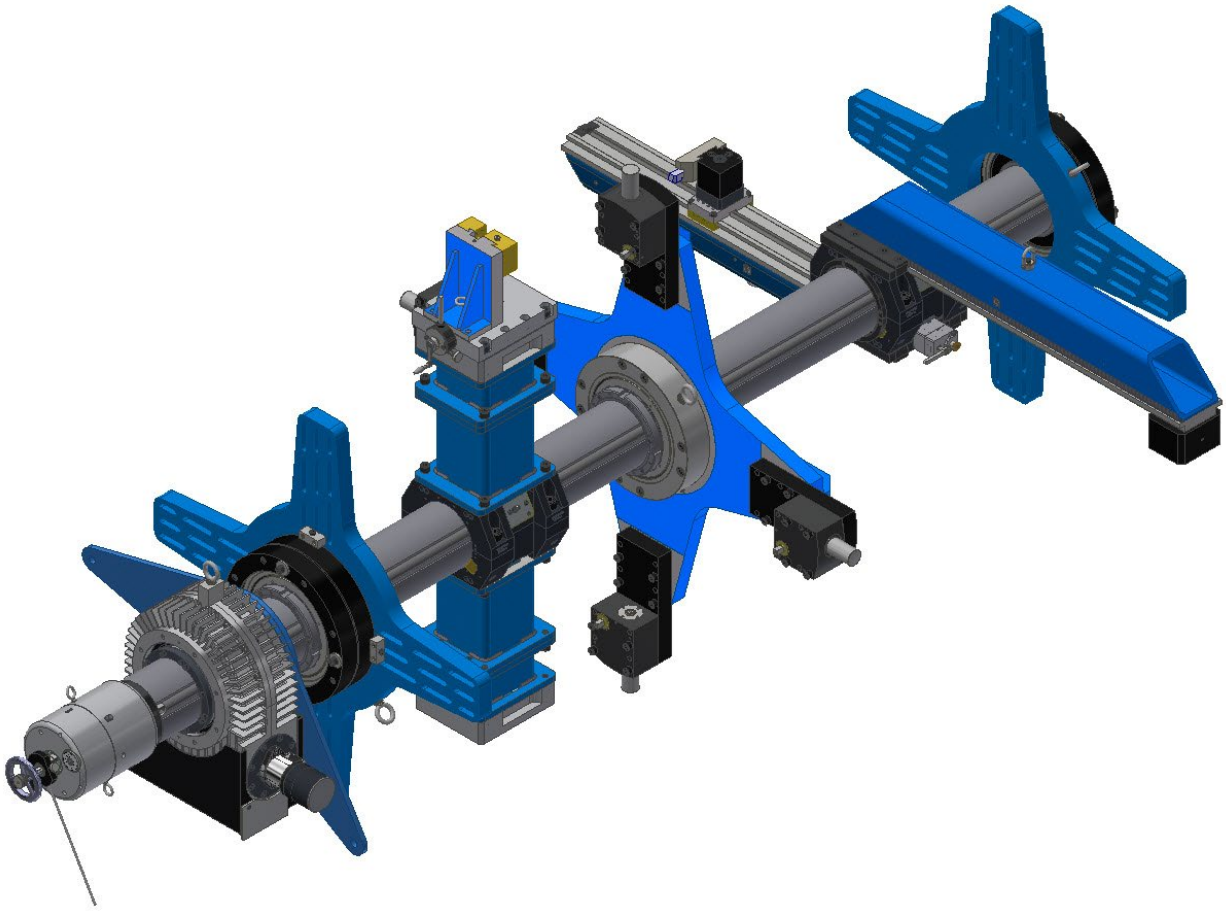
CE

BB8100

BORING MACHINE

OPERATING MANUAL

ORIGINAL INSTRUCTIONS



CLIMAX
Portable Machining & Welding Systems

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

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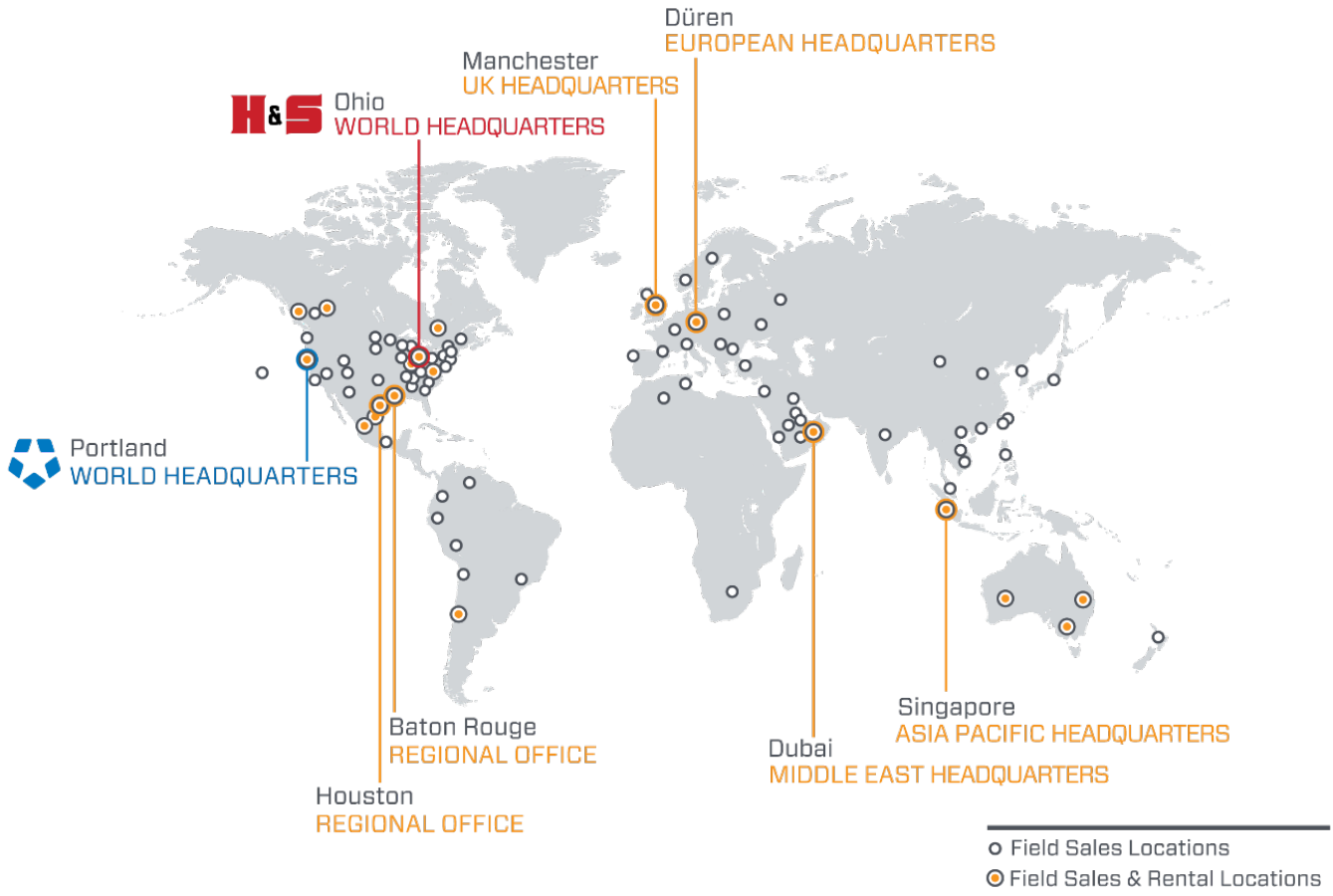

LIMITED WARRANTY

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

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

Terms of sale

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

About this manual

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

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INTRODUCTION

This manual describes how to use the Model BB8100 Portable Boring Bar. This precision machine tool is designed for on-site boring without costly disassembly of equipment. All parts and components meet CLIMAX's strict quality standards. For maximum safety and performance, read and understand the entire manual before operating the boring bar.

About this manual

Information in this manual is up-to-date at time of going to print. Because CLIMAX is committed to continued product improvement, the machine you receive may differ slightly from the one described here.

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.

NOTICE

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

General Safety

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

CLIMAX leads the way in promoting the safe use of portable machine tools. Safety is a joint effort. As the operator of this machine, you are expected to do your part by 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 BB8100 Boring Bar 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

There are no cutting or cooling fluids used with this machine.

DANGER ZONE

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

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

Check that the machine components are free of debris and properly lubricated prior to use.

CLAMP COLLARS

To prevent the bar from sliding through the support bearings, or falling, use P/N 40708 – 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 100 ft-lbs (136 Nm), using 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.

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.

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 container(s) for damage.
2. Check the contents of the shipping container(s) against the included invoice to make sure 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, contact CLIMAX for assistance in obtaining the needed components.

Basic Components

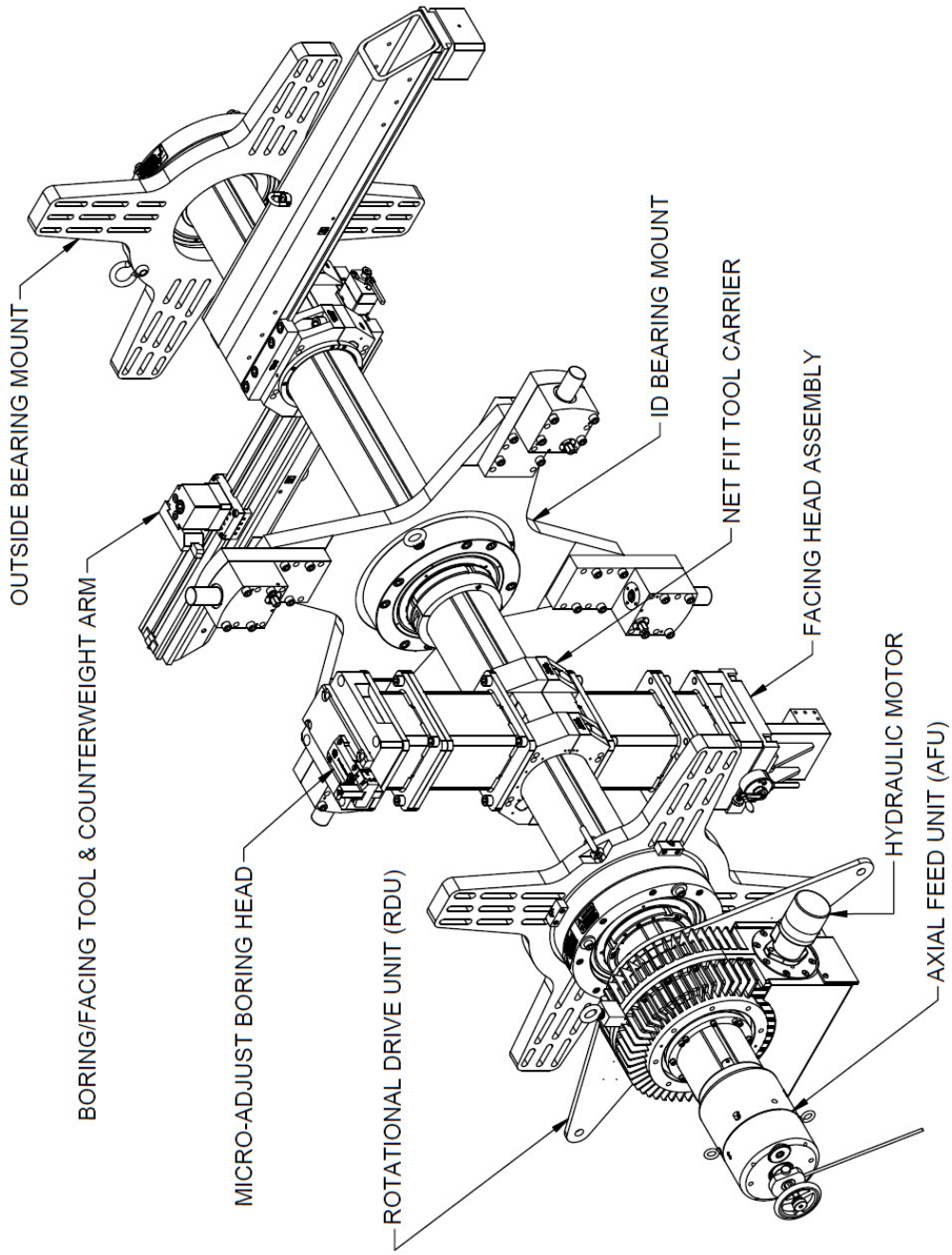

Figure 1. Components

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OVERVIEW

Model BB8100 Portable Boring Bar is a moving-head style line-boring machine. The 8" (203 mm) diameter machine will bore 14.5–85.6" (368.3–2,174.2 mm) diameters and face 23.1–97.1" (586.7–2,466.3 mm) diameters.

Rotational drive assembly

The rotational drive assembly can be positioned anywhere along the bar. Locking rings hold the assembly securely in place. Two torque arms provide stability.

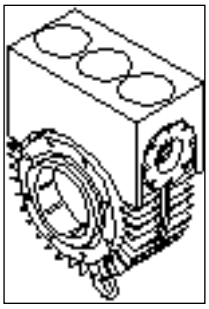


Figure 2. Rotational drive assembly

Mechanical axial feed assembly

The tool head feeds axially along the bar using the mechanical axial feed assembly.

	CAUTION
⚠	**If the mechanical axial feed unit is moved to the other end of the bar, the machine will feed in the opposite direction. Check the feed direction before operating the machine.**

The 8" mechanical axial feed assembly can be mounted to either end of the boring bar. Feed rate is reversible and variable up to 0.040" (1.016 mm) per revolution. Feed direction can be reversed or set to Neutral by pulling or pushing the shifter knob.

Because the hand wheel component of the axial feed assembly does not turn while the bar is rotating the feed rate can be adjusted during operation.

The assembly includes a 15" (381 mm) trip rod.

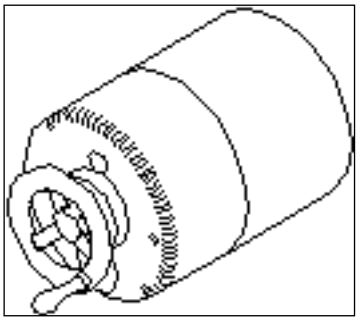


Figure 3. Mechanical axial feed assembly

Hydraulic power

General description

The hydraulic power unit is an electrically driven piston pump with a horizontally mounted motor. The unit has a 20-gpm pump and a 5-gallon (19 liter) reservoir.

Features include:

- Relief valve for system over pressure protection
- System pressure gage and shut-off valve
- Spin-on oil filter
- Combination fluid level and temperature gage
- Electric motor starter and motor overload heaters.

The hydraulic power unit connects to the rotational drive hydraulic motor with a pair of 25-foot (7.6-meter) long hoses and quick disconnect fittings. A multi-function pendant controls the power unit and the machine.

Several hydraulic power units are available. Obtain more information by calling CLIMAX.

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

Power unit pendant

The hydraulic power unit comes with a standard control pendant. The pendant, with 25-foot (7.6 m) cord, has the following controls:

- High/low volume control
- Jog/run
- Pressure start
- Pressure stop
- Power unit on
- Power unit off

Hydraulic motor

The high-torque low-speed hydraulic motor mounts directly to the rotational drive assembly. Motor ports are 7/8-14 SAE O-ring type. Motor fittings are included with the hydraulic power unit. A fitting kit may be purchased separately.

To reverse motor rotation, switch the hydraulic hoses at the motor. The hydraulic fluid that passes through the motor lubricates the motor during operation.

Motors with various displacement ratings are available. Contact your CLIMAX sales representative for more information.

Bearing support assemblies

The portable boring bar can be set up using two ID-mount bearing assemblies, two end-mount bearing assemblies, or a combination of bearing assemblies. Bearing support assemblies can be placed anywhere along the bar.

	NOTE
	CLIMAX recommends using at least two bearing support assemblies to ensure machine stability.

End-mount self-aligning bearing support assembly (with spider)

The end-mount bearing support assembly mounts to the end of the work piece through a slotted spider. The bar is held in place by a self-aligning bearing which can compensate for bar misalignment up to 1° from perpendicular to the bearing housing.

The 2" (52 mm) thick support spider has four legs and a universal mounting-hole pattern. The universal mounting-hole pattern allows you to set up the boring bar using existing bolt holes (if available).

End-mount self-aligning bearing assembly (without spider)

The bearing assembly provides 4-way adjustable bar alignment. The assembly does not include a spider; it mounts to any existing support structure. See Figure 40 on page 59 for mounting pattern dimensions. A taper locking adapter secures the bar inside the bearing.

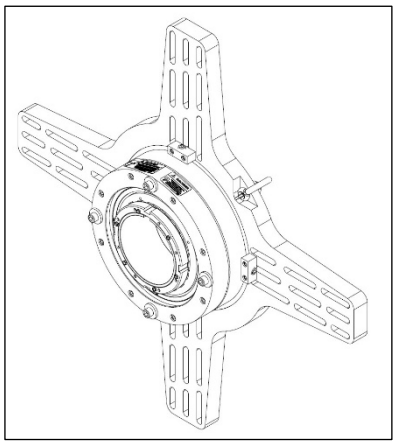


Figure 4. Self-aligning end mount with spider

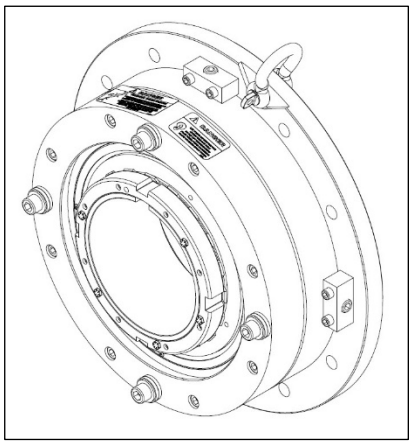


Figure 5. Self-aligning end mount without spider

ID-mount non self-aligning bearing support assembly (with spider)

The ID-mount bearing support assembly holds the bar in place with a taper locking adapter. Center the bar by adjusting the four jaws on the spider. The jaws can be adjusted from outside the bore.

Bearing support assemblies are available for bores with IDs from 23–77" (584–1,956 mm).

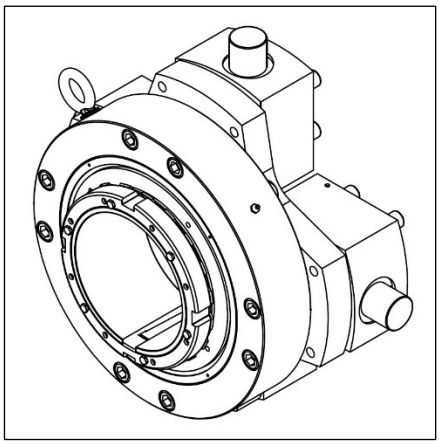


Figure 6. Non-self-aligning ID mount with spider (20–35" 508–889 mm)

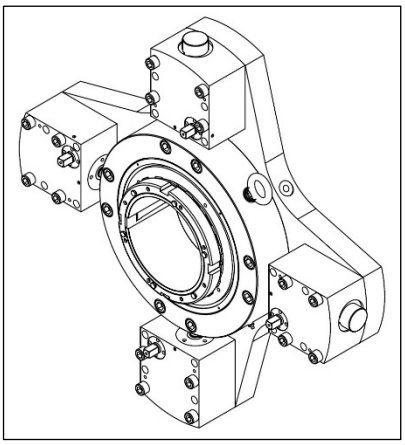


Figure 7. Non-self-aligning ID mount with spider (34.25–49.25" 870–1,251 mm)

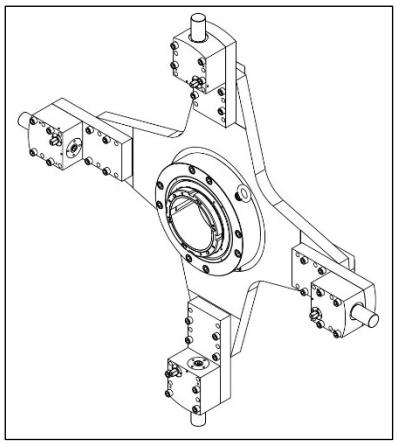


Figure 8. Non-self-aligning ID mount with spider (48.5–77" 1,232–1,956 mm)

Non self-aligning bearing assembly (without spider)

The bearing assembly does not include a spider; it mounts to any existing support structure. See Figure 41 on page 59 for mounting dimensions. A taper locking adapter secures the bar inside the bearing.

Clamp Collars

The clamp collars (P/N 40708) 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.

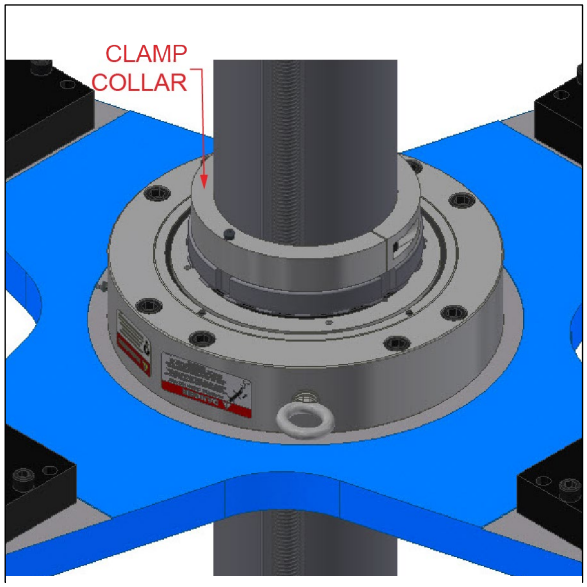


Figure 9. Clamp collar

	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 100 ft.-lbs.**

Boring bar and leadscrew assembly

Model BB8100 uses an 8" diameter bar. Standard bar lengths are 8 feet to 20 feet (2.44 to 6.10 m) long in 2-foot (.61 m) increments. Bars of other lengths are available upon request.

The chromed bars have full-length leadscrews. The bar end caps have anti-friction leadscrew bearings. Because both bar end caps are the same, the axial feed assembly can be mounted to either end of the bar.

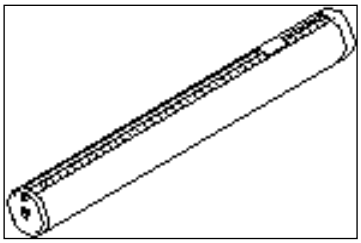


Figure 10. Boring bar

Axial tool carrier

The axial tool carrier holds the tool head assembly to the bar. The split-design carrier mounts anywhere along the bar. Boring and facing head assemblies mount to the tool carrier with screws and, if necessary, spacers. The tool carrier includes a brass nut and drive key.

Manual boring head assembly

The boring head assembly includes spacers, leading and trailing cartridge holders, carbide inserts and chip breakers. It requires an 8" (203 mm) tool carrier. Because the tool carrier is split, the boring head can be mounted anywhere along the bar.

The boring head assembly will bore IDs in a range of 14.5–85.6" (368–2,174 mm), depending on the number of stack blocks used. The carbide cartridges are micro adjustable for precision boring. The range of diameters the boring head assembly will cut is determined by the number of spacers mounted between the tool carrier and boring head. See the boring head tool range in Table 2 on page 33 and Table 3 on page 34 to determine how many spacers are needed for your application.

Facing head assembly

The facing head assembly mounts to the 8" (203 mm) tool carrier. Because the tool carrier is split, the facing head can be mounted anywhere along the bar.

Facing-head assemblies are available with 5" (127 mm), 8" (203.2 mm), or 12" (304.8 mm) stroke. The range of diameters the machine can face is determined by both the number of spacers used and the stroke of the facing head.

Feed rate is variable from 0.003–0.025" (0.076–0.635 mm) per revolution.

The facing head uses 1 square-inch tool bits.

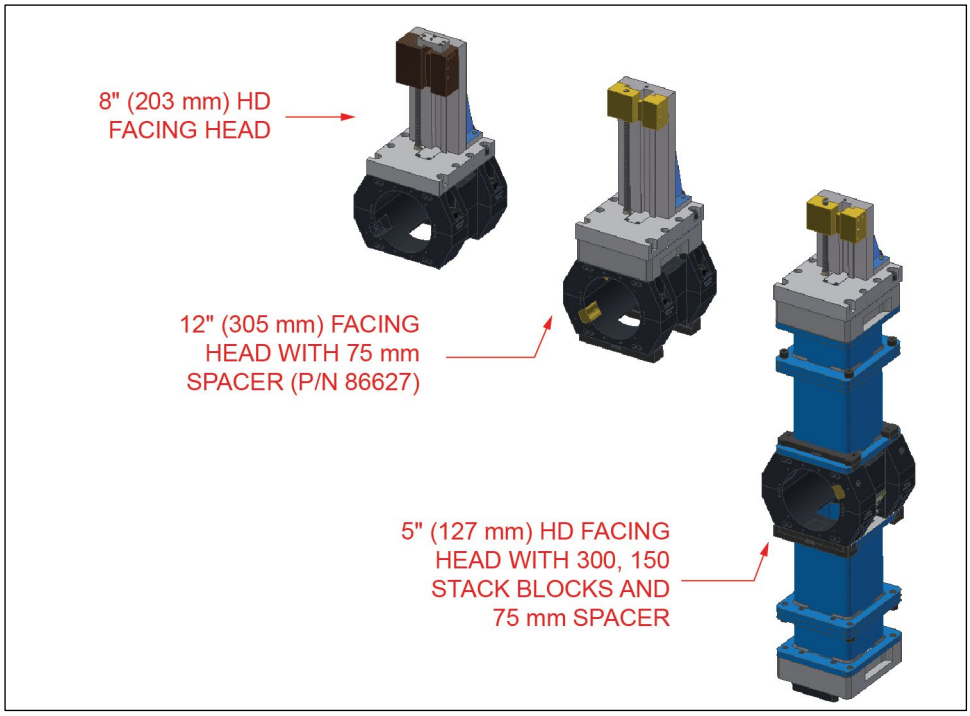
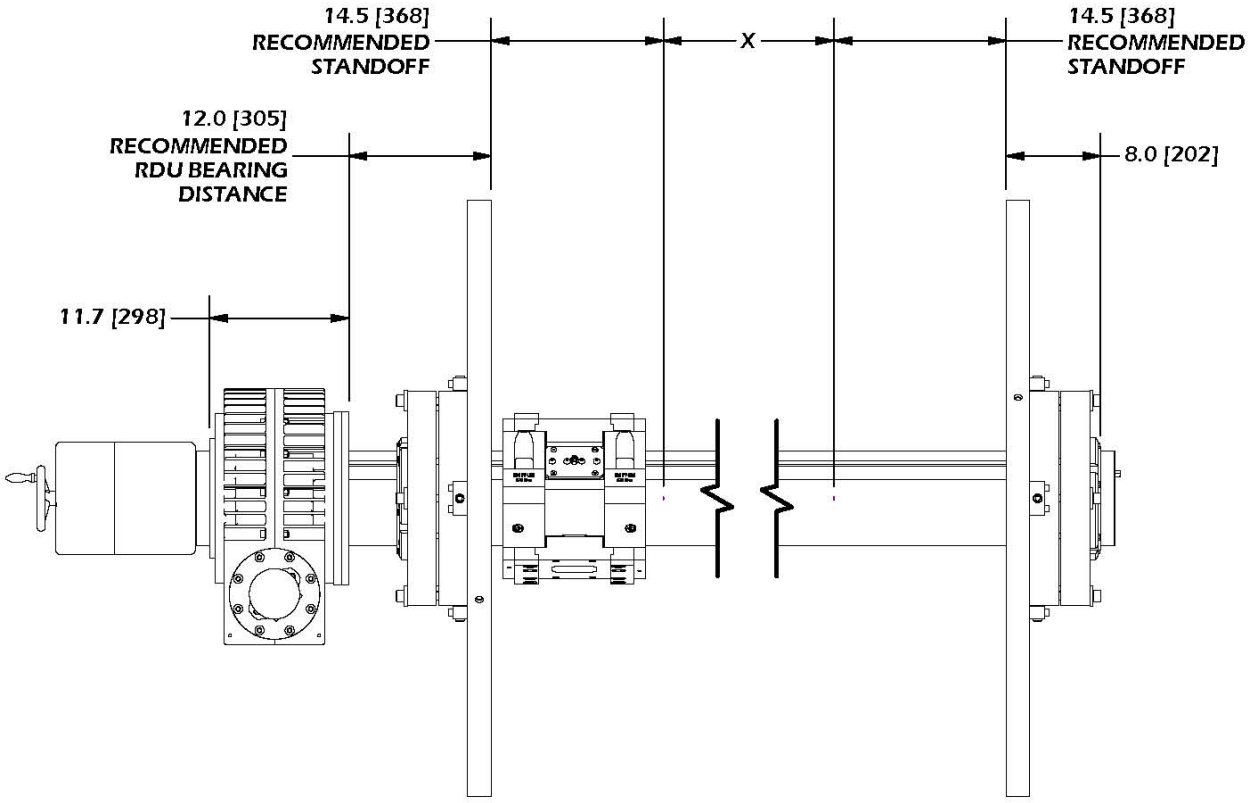


Figure 11. Available facing heads and some mounting configurations

Refer to Table 5 on page 41, Table 6 on page 42, and Table 7 on page 43 (depending on the travel head size) for the facing range of each.

SETUP



BAR LENGTH = X (BORE LENGTH) + 11.7 [298] + 8.0 [202] + STANDOFF + RDU BEARING DISTANCE

WARNING

Rotating and moving parts can seriously injure the operator. Turn off and lock out the machine before setting it up.

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

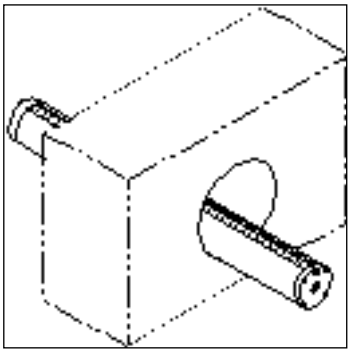


Figure 12. Inserting the bar into the bore

Boring bar and bearing support assembly setup

Clamp Collars

The clamp collars (P/N 40708) are made in matching sets and must be used to secure the bar when the machine is in the vertical orientation.

	DANGER
	To prevent the bar from sliding through the support bearings, or falling, use the 2 clamp collars provided in the tool kit when using the boring bar in a vertical orientation. Torque to 100 ft.-lbs (136 Nm).

	CAUTION
	At least two bearing support assemblies are needed to ensure machine stability.

NOTE: The bearing mounts may be different styles, depending on application.

End-mount bearing support assembly setup

Though the end-mount bearing support assembly mounts to the outside of the work piece, it can be placed anywhere along the boring bar.

	CAUTION
	Bearings placed too far apart allow the bar to deflect, reducing bore accuracy.

1. Clean the bore of the work 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 (including the tool head assembly and rotational drive unit) beyond repair. Clean the bar with solvent to remove dirt and chips.

	CAUTION
	The bar is not hardened. To prevent damage to the bar, do not strike it against the bearing supports or against the work piece.

3. Install the bearings at approximately the center of the bar.

   If using existing holes on your workpiece, make sure they align with the slots in the spider. Tap 5/8" (16 mm) or 1/2" (13 mm) new holes if necessary.

   If holes are to be tapped, hold the spider against the work piece and mark the locations of the slots in the spiders.

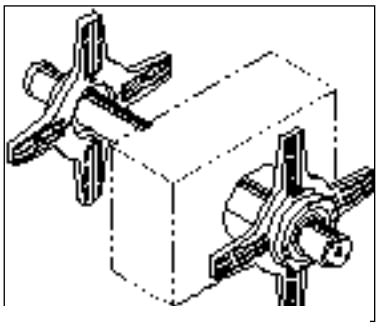


Figure 13. Attaching bearing assemblies

4. Slide the boring bar into the bearings to be machined (see Figure 15).

Figure 15. Boring bar into the bearings

5. Using a hoist, hold the bar and bearings near the center of the bore. Alignment should be within 1/8" (3 mm) (see Figure 14).

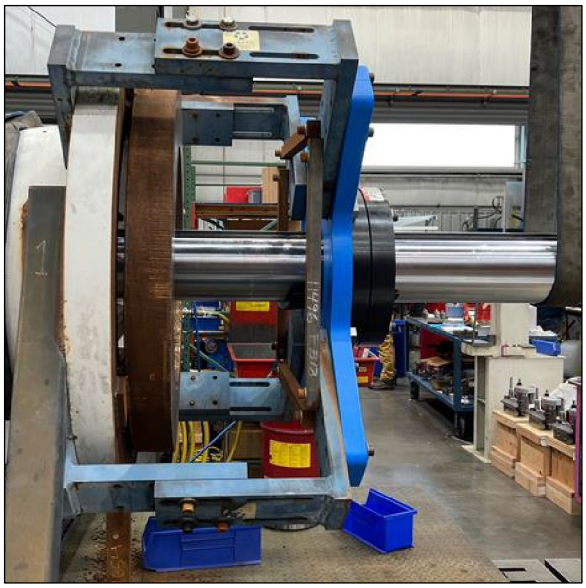


Figure 14. Centering and aligning the bar

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

6. If you want to mount the rotational drive assembly between the supports, do it now. See the “Rotational drive assembly setup” on page 23 for mounting information.
7. If mounting another end-mount bearing support assembly, repeat steps #4 through #10. If using an ID-mount bearing support assembly, see the “ID-mount bearing support assembly setup” on page 19. At least two support assemblies are needed to ensure machine stability.
8. Slide the boring bar through all bearing assemblies.

NOTE

When completing the following steps, check after each tightening of the socket set screw flat points (SSSFP) screws for sufficient remaining set screw travel.

If there is insufficient travel remaining, loosen the SSSFP screws. Remove the 1/4-28" hex heads (HHCS) and restart from step a.

9. Lock the bar in place by tightening the taper lock by doing the following:
   a) Tighten the taper lock nut onto the bar.
   b) Insert the 1/4-28" hex head cap screws (HHCS) through the lock nut and washer into the taper. Leave them loose as they are used to disassemble the bearing after operation.
   c) Tighten the 3/8-24" socket set screw flat points (SSSFP) to 23 ft-lb. The purpose of this is to tension the taper and nut to clamp the bar.

Figure 16. Set screw and hex head screw

NOTE

The purpose of step c is to tension the taper and nut to clamp the bar.

   d) Rotate the bar one and a half rotations to seat the taper lock.
   e) Repeat steps c and d until the torque remains at 23 ft-lb after one and a half rotations.

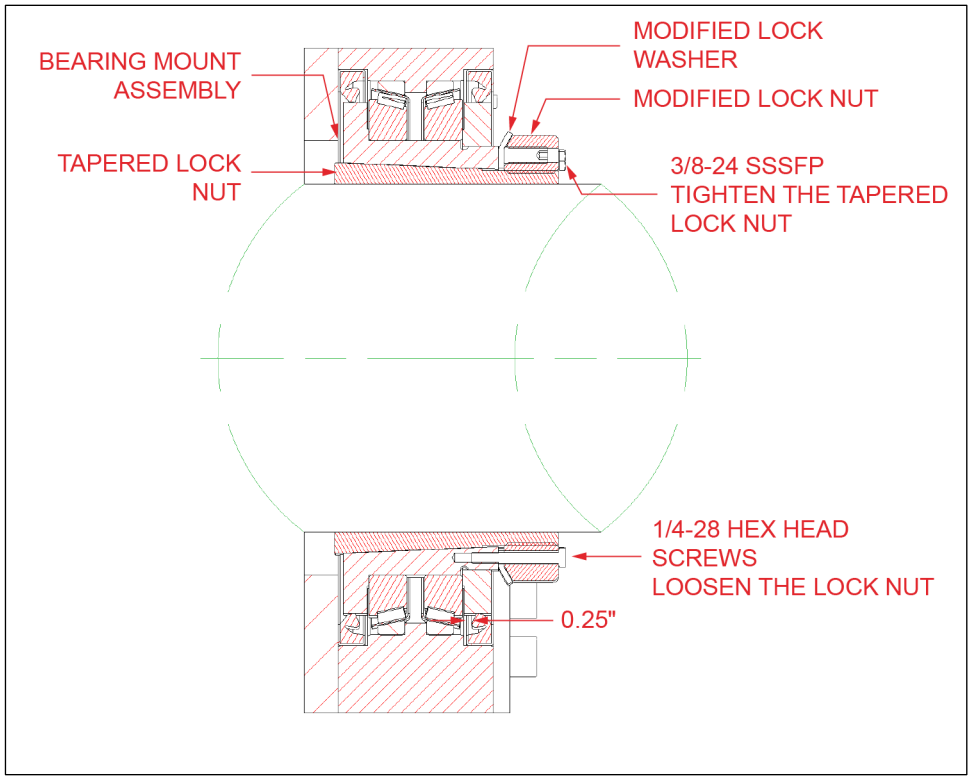


Figure 17. Tightening the bearing assemblies to the bar

	NOTE
	The six 1/4-28 hex head cap screws loosen the tapered lock nut.

10. Precisely align the boring bar:
    a) Position a dial indicator to check concentricity between the boring bar and the bore.
    b) Adjust the screws in the centering blocks until the bar is centered.

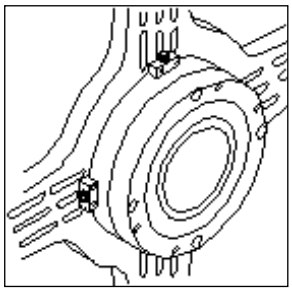


Figure 18. Bearing assembly

ID-mount bearing support assembly setup

Though the ID-mount bearing support assembly mounts inside the work piece, it can be placed anywhere along the boring bar.

	CAUTION
	Bearings placed too far apart allow the bar to deflect, reducing bore accuracy.

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

CAUTION

The boring bar is not hardened. To prevent damage to the bar, do not strike it against the bearing supports or the work piece.

3. Measure the diameter of the bore into which the bearing will fit. Using Table 1 on page 22, select the components required.
4. Position one bearing support assembly on the bar. Tighten the lock nut using the impact spanner wrench in the tool kit.
   a) Tighten the taper lock nut onto the bar.
   b) Insert the 1/4-28" hex head cap screws (HHCS) through the lock nut and washer into the taper. Leave them loose as they are used to disassemble the bearing after operation.
   c) Tighten the 3/8-24" socket set screw flat points (SSSFP) to 23 ft-lb. The purpose of this is to tension the taper and nut to clamp the bar.

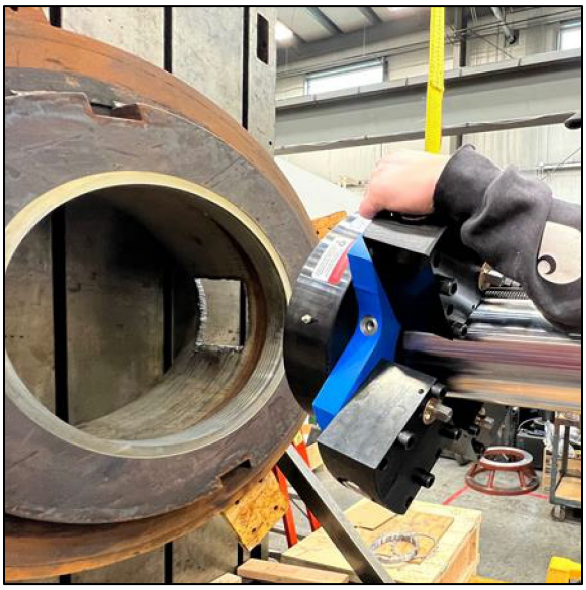


Figure 19. Positioning the bearing support assembly on the bar

NOTE

The purpose of step c is to tension the taper and nut to clamp the bar.

   d) Rotate the bar one and a half rotations to seat the taper lock.
   e) Repeat steps c and d until the torque remains at 23 ft-lb after one and a half rotations.

5. Slide the bar and bearing into the workpiece.
6. Using a dial indicator and the jaw crankshafts, center the bar in the work piece. Turn the crankshafts until the jaws are tight in the bore. Do not exceed 22 ft-lbs (30 Nm) of torque.
7. If you wish to mount the rotational drive assembly between the bearing supports, do it now. See “Rotational drive assembly setup” on page 23 for instructions.
8. If mounting another ID-mount bearing, repeat Steps #3 through #7. If mounting an end-mount bearing support assembly, see “End-mount bearing support assembly setup” on page 16.

Figure 20. Insert the bar and bearing

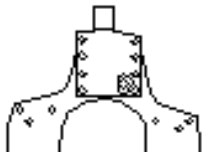
	CAUTION
⚠	**Bearings placed too far apart allow the bar to deflect, reducing bore accuracy.**

9. Check that the bar is centered by sweeping a dial indicator inside the bore. Adjust the jaws if necessary.

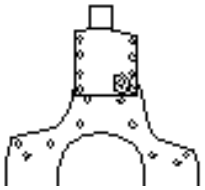
Table 1. ID-mount bearing assembly bore diameter range

	Bore diameter range inch (mm)	Parts required	Setup position
1	20.0 - 23.75 (508.0 - 603.3)	1, 2, 6	A
2	23.75 - 27.50 (603.3 - 698.5)	1, 2, 6	B
	27.5 - 31.25 (689.5 - 793.8)	1, 2, 7	A
	31.25 - 35.0 (793.8 - 889.0)	1, 2, 7	B
3	34.25 - 38.0 (870.0 - 965.2)	1, 3, 6	A
	38.0 - 41.75 (965.2 - 1060.5)	1, 3, 6	B
	41.75 - 45.5 (1060.5 - 1155.7)	1, 3, 7	A
	45.5 - 49.25 (1155 - 1251.0)	1, 3, 7	B
4	48.5 - 52.25 (1231.9 - 1327.2)	1, 4, 6	A
	52.25 - 56.0 (1327.2 - 1422.4)	1, 4, 6	B
	56.0 - 59.75 (1422.4 - 1517.7)	1, 4, 7	A
	59.75 - 63.5 (1517.7 - 1612.9)	1, 4, 7	B
	62.75 - 66.5 (1593.9 - 1689.1)	1, 4, 5, 6	C
5	66.5 - 70.25 (1689.1 - 1784.4)	1, 4, 5, 6	D
6	70.25 - 74.0 (1784.4 - 1879.6)	1, 4, 5, 7	C
7	74.0 - 77.0 (1879.6 - 1955.8)	1, 4, 5, 7	D

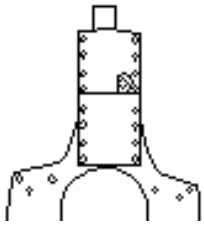
1. Centering Block
2. Spider 20” – 35” (508 – 889 mm) diameter
3. Spider 34.75” – 49.25” (882.65 – 1250.95mm) diameter
4. Spider 48.5” – 63.5” (1231.9 – 1612.9mm)
5. Extension
6. Jaw 4.625 (117.47mm)
7. Jaw 8” (203.2mm)



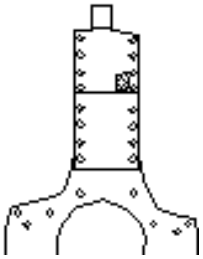
Setup A
Centering block closest to the center of the spider



Setup B
Centering block farthest from the center of the spider



Setup C
Extension closest to the center of the spider



Setup D
Extension farthest from the center of the spider

Rotational drive assembly setup

The rotational drive assembly can be placed anywhere on the boring bar.

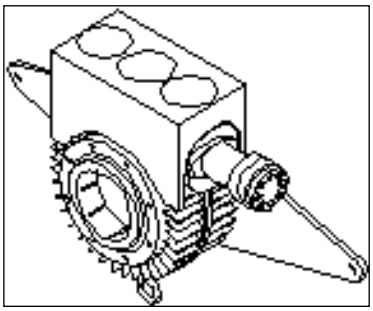


Figure 21. Rotational drive assembly

	CAUTION
	The boring bar is not hardened. To prevent damage, do not strike it against the bearing supports or the work piece.

1. Mount the torque arms to the rotational drive housing
2. Mount the hydraulic motor to the rotational drive housing, if necessary. Check that the mounting bolts are tight.
3. Loosen the socket-head screws. Push the locking rings out by screwing in the four socket set screws.
4. Slide the rotational drive assembly along the boring bar.
5. Remove one of the locking rings to gain access to the RDU keyway.
6. Insert the drive key into the boring bar leadscrew groove. Check that the key meshes with the leadscrew.
7. Slide the key along the groove and into the RDU keyway.

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

8. Replace the locking ring after the key is installed.
9. Lock the rotational drive assembly to the bar by tightening the socket-head cap screws.

	NOTE
	Tighten only the eight socket-head cap screws in the locking rings, not the four setscrews. The setscrews loosen the locking rings. Back out the setscrews before clamping the rings to avoid damage to the rings.

10. Secure the torque arms.

	WARNING
	**Loose torque arms can swing uncontrollably injuring the operator and damaging the machine. Secure the torque arms to a stationary structure strong enough to withstand the full torque of the rotational drive unit.**

11. Connect the hydraulic motor lines to 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.**

Mounting the axial feed assembly to the bar

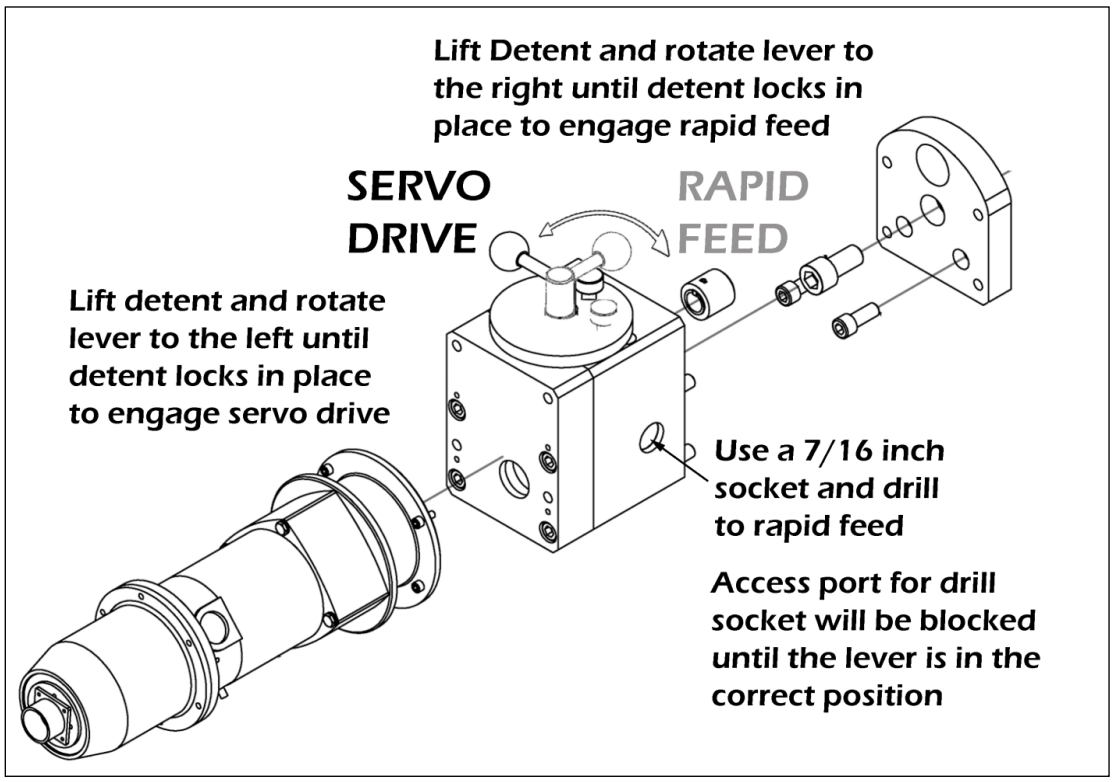
The mechanical axial feed unit can be mounted to either end of the boring bar.

1. Place the axial feed unit in NEUTRAL so the leadscrew drive can rotate in either direction. See “Setting the feed direction” for instructions.
2. While holding the axial feed unit against the bar end cap, turn the feed unit output shaft until the hex in the end of the leadscrew engages
3. Tighten the two mounting bolts into the end cap to secure the feed assembly to the bar.
4. Secure the axial feed unit stop rod to a stationary structure so it will trip the feed mechanism. The rod should be sufficiently free to be removed if necessary.

Attaching the Mechanical Rapid Feed (optional equipment)

The optional mechanical rapid feed attachment fits between the axial feed assembly and the end of the boring bar. It has a side port for a standard 7/16” drill socket, used to rapid advance the feed. The lever engages and disengages the rapid feed system.

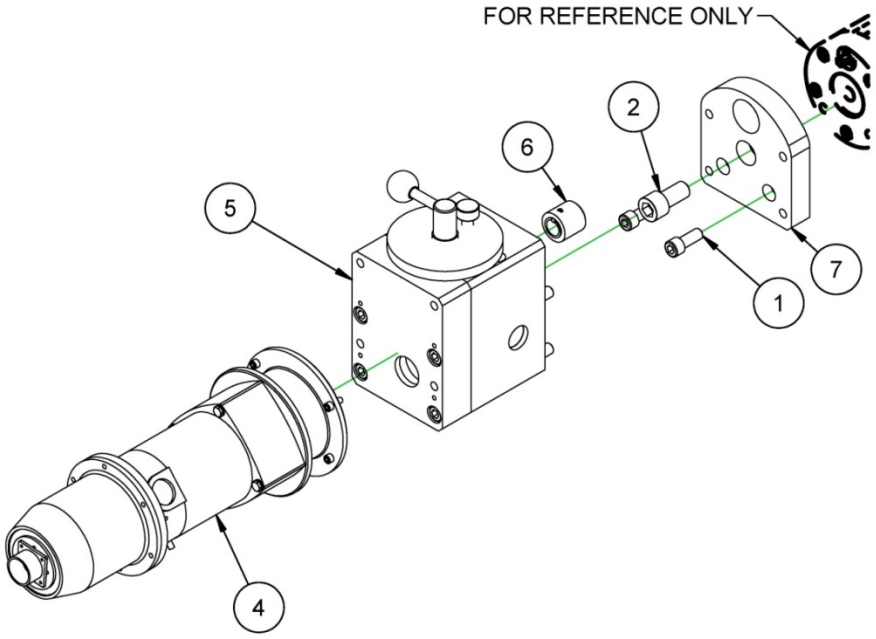
When engaged, access to the drill socket port is available. Access to this drill socket port opens and closes when the lever is switched between servo and rapid feed mode. This prevents operator error. When the servo is engaged, the drill socket will not fit into the port. Drawings and part numbers are found in the following pages.



Rapid Advance is available using your hand drill and a 7/16" (11 mm) drive socket (included). Typical rapid feed rates using your 0–400 RPM drill is 0.0–32" (0.0–813 mm)/min.

Electric feed with rapid feed shown below for the BB7000/7100 model.

A special adaptor plate allows you to easily connect the electric feed/ mechanical gearbox assembly to CLIMAX 3.5, 5, 6, and 8" (88.9, 127, 152.4, and 203.2 mm) boring bars. Adapters are also available for competitive boring systems.



PARTS LIST			
ITEM	QTY	PART No.	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	PENDANT - NOT SHOWN
4	1	41062	FEED AXIAL ELECTRIC
5	1	41064	ASSY MECHANICAL RAPID FEED FOR ELECTRIC AXIAL FEED
6	1	41465	COUPLING, KEY 3/4 TO HEX 3/8
7	1	42581	END CAP 5 DIA BB7000

ELECTRIC FEED W/MECHANICAL RAPID FEED AND PENDANT

41563

P/N 43735	Electric Feed Assembly for BB6000/BB6100	3.5" (88.9 mm) diameter bar
P/N 43736	Electric Feed Assembly for BB7000/BB7100 or BB8000/BB8100	5 or 6" (127 or 152.4 mm) diameter bar
P/N 43734	Electric Feed Assembly for BB8000/BB8100	8" (203.2 mm) diameter bar

Mounting an optional electric axial feed assembly

The electric feed unit consists of the adaptor plate, manual override, electric motor assembly, and remote pendant control.

The 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. Mount the adapter plate to the end of the bar using the ¾-10 cap screw and two ½-13 cap screws.
2. Mount the mechanical override assembly to the adaptor plate. Make sure the hex in the mechanical override is aligned with the hex on the lead screw.
3. Mount the electric axial feed assembly to the back of the mechanical override with 4 cap screws.
4. Check that the keyway is aligned in the coupling.
5. Attach the pendant electrical cable to the rear of the electric axial feed.

!	**NOTICE**
	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 machine.

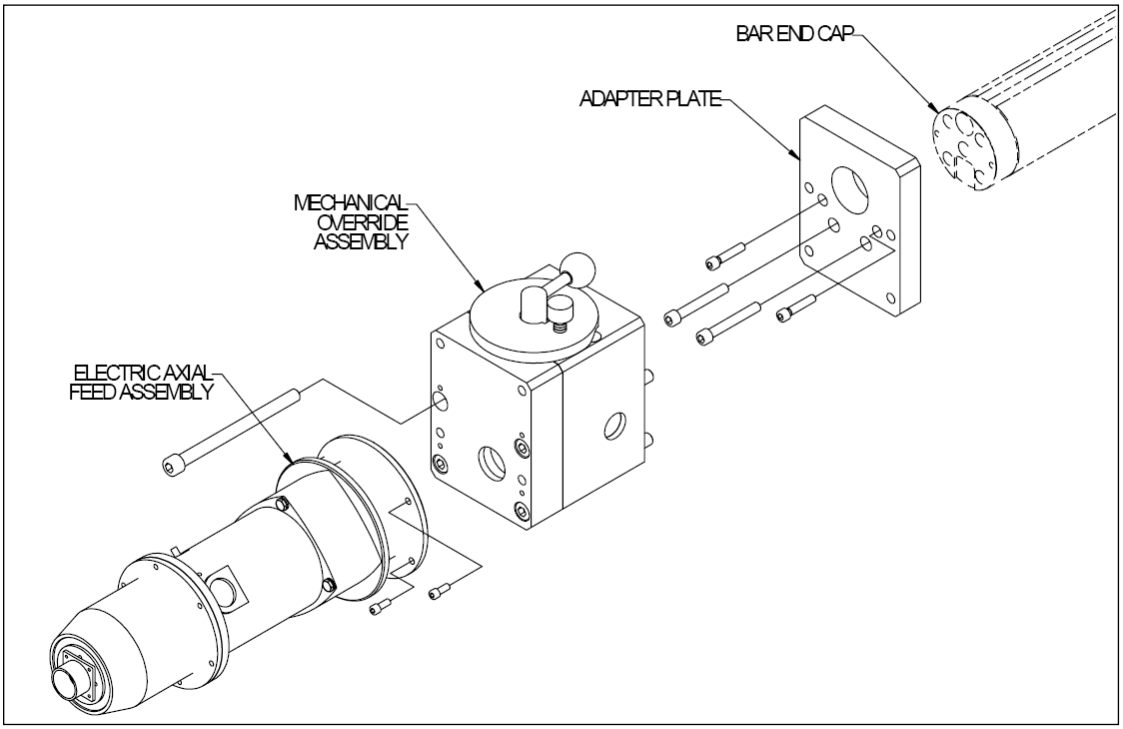


Figure 22. Mounting the rapid feed electric axial feed assembly

Setting the Axial Feed Rate

The feed potentiometer controls the axial feed rate. Turning the knob counterclockwise decreases the feed rate; turning the knob clockwise increases the feed rate.

Axial feed rate is adjustable and variable from 0.010–0.500" (0.25–13 mm) per minute.

Setting the feed direction

Setting feed direction while the bar is rotating

The axial feed unit has three positions: NEUTRAL, FORWARD, and REVERSE.

1. To set the feed to FORWARD (tool feeds AWAY FROM the axial feed unit), push and hold the shifter knob in toward the axial feed unit until you feel the feed engage.
2. To set the feed to REVERSE, (tool feeds TOWARD the axial feed unit), pull and hold the shifter knob out away from the axial feed unit until you feel the feed engage.
3. To set the feed to NEUTRAL, position the shifter knob half way between FORWARD and REVERSE.

NOTE

The higher the feed rate, the faster the axial feed unit will engage.

Setting feed direction when the bar is stopped

1. Insert a 1/2" hex wrench into the hex hole in the dial.
2. While pushing or pulling the shifter handle, slightly turn the wrench 1/6 of a turn or less.
3. When the feed is fully engaged, the hex wrench will turn only in the direction the feed is set. If the feed is in NEUTRAL, the wrench will turn in either direction.

WARNING

To avoid damage, check that the feed is fully engaged before running the machine.

Disengaging the feed

1. Set the feed to zero or remove the axial feed stop rod to limit the tool feed.
2. If the bar is rotating, see ”Setting feed direction while the bar is rotating” on page 28 for instructions to set the feed to NEUTRAL.
   If the bar is not moving, see “Setting feed direction when the bar is stopped” on page 28 for instructions to set the feed to NEUTRAL.

3. Replace the stop rod, if necessary.
4. Check that the tooling is not moving.

Setting the feed rate

Axial feed rate is fully adjustable up to 0.040" (1.016 mm) per revolution.

Adjust the feed rate by lifting the spring plunger with one hand and turning the hand wheel with the other. Turn clockwise to reduce the feed; counter-clockwise to increase the feed. The feed can be adjusted while the bar is rotating.

CAUTION

The feed has solid stops at maximum and minimum feed positions. To avoid damage, do not force the hand wheel past the solid stops.

A feed dial on the axial feed unit shows the feed speed when the bar is rotating.

Tooling setup

Tool carrier setup

Tool head assemblies require a tool carrier to mount 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. A bar with nicks or gouges can damage mating parts (including the tool head assembly and the rotational drive unit) beyond repair. Clean the bar with solvent to remove dirt and chips.
2. Position the carrier nut and carrier key inside the tool carrier.
3. Tighten the mounting screws.
4. Mount the two halves of the tool carrier onto the boring bar. Check that the leadscrew nut engages with the leadscrew.
5. Tighten the socket-head cap screws.
6. Lightly oil the boring bar and leadscrew.

To lock the tool carrier on the bar for other operations

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

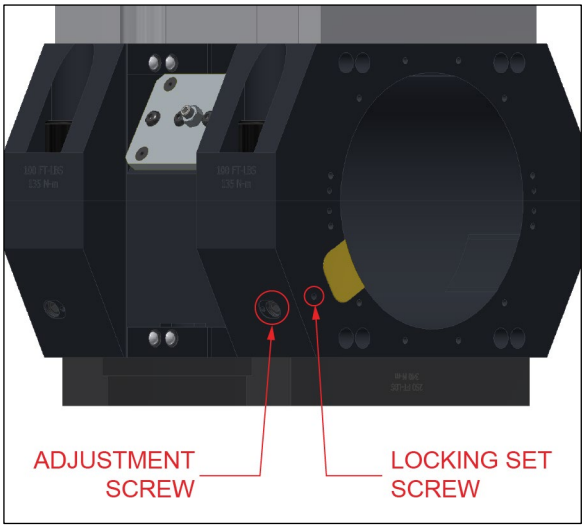


Figure 23. Adjustment and set screws in the tool carrier

To remove the brass nut

1. Do not remove all the screws.
2. Remove the screws on each corner of the brass nut.
3. If there is too much play in the brass nut, the center set screw can be tightened.

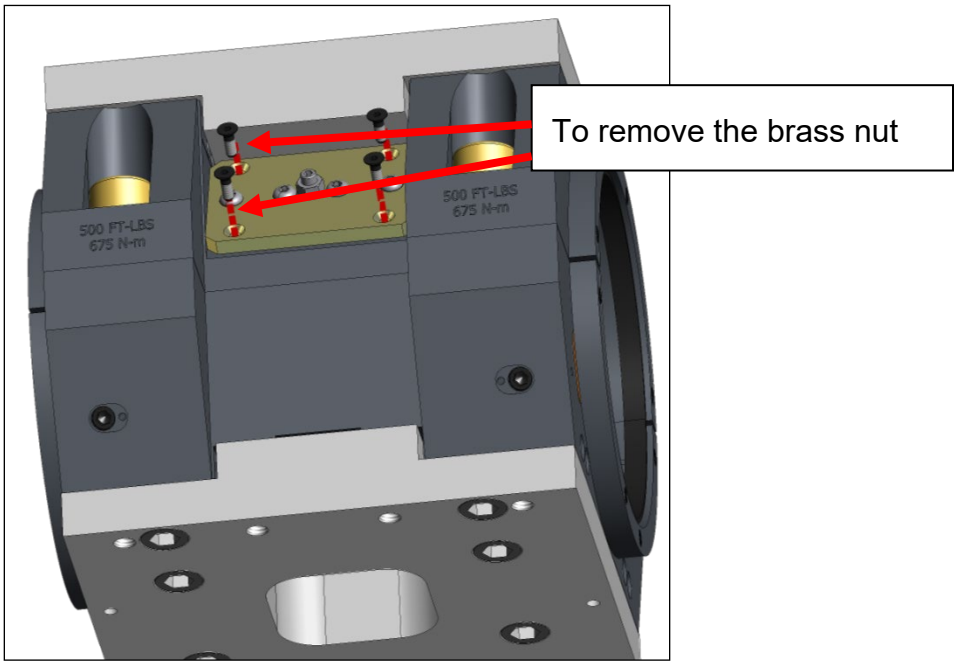


Figure 24. Screws to remove the brass nut

Boring

Manual boring head assembly setup

The manual boring assembly requires the tool carrier to mount it to the boring bar.

	**NOTE** **The bar can rotate either direction. Check that the tooling faces the correct direction.**

Using the boring head tool range in Table 2 on page 33 and Table 3 on page 34, select appropriate spacers and screws and assemble the tool carrier.

	**NOTE** **Precision bores are best achieved by boring several rough cuts and one shallow finish bore.**

	NOTE
	Parts listed are for one side of the carrier only. Identical parts are required for the other side.

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" (per setup).

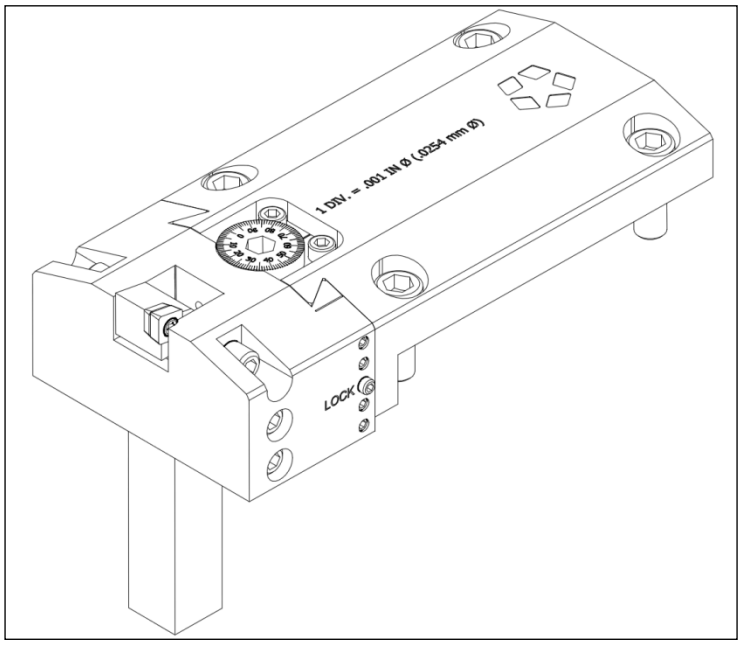


Figure 25. Micro-adjust boring head

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" (0.025 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. The lock also has this compound, and it might be necessary to re-apply some every once in a while, if necessary.

The BB8100 comes with a 1 square-inch shank tool holder.

To set up leading and trailing, simply 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 vc-3.

Table 2. Micro adjust boring head tool range table

BB 8100 MICRO ADJUST BORING HEAD TOOL RANGE TABLE 14.5–85.6" (368–2,174 MM) DIAMETER			
BORE RANGE DIAMETER	NUMBER OF SPACER BLOCKS REQUIRED		
	2.95" (76 mm) block	5.9" (150 mm) block	11.8" (300 mm) block
14.5–21.5" (368–546 mm)[1]	0	0	0
20.4–27.4" (518–696 mm)	1	0	0
26.3–33.3" (668–846 mm)	0	1	0
32.2–39.2" (818–996 mm)	1	1	0
38.1–45.1" (968–1,146 mm)	0	0	1
44–51" (1,118–1,295 mm)	1	0	1
49.9–56.9" (1,267–1,445 mm)	0	1	1
55.8–72.8" (1,417–1,849 mm)	1	1	1
61.7–68.7" (1,567–1,745 mm)	0	0	2
67.6–74.6" (1,717–1,895 mm)	1	0	2
73.5–80.5" (1,867–2,045 mm)	0	1	2
79.4–86.6" (2,017–2,200 mm)	1	1	2

[1] The tool holder must be shortened to avoid hitting the bar OD at the minimum diameter.

Table 3. Solid tooling boring head tool range table

BB 8100 SOLID TOOLING BORING HEAD TOOL RANGE TABLE 14.5–86.6" (368–2,200 MM) DIAMETER			
BORE RANGE DIAMETER	NUMBER OF SPACER BLOCKS REQUIRED		
	2.95" (76 mm) block	5.9" (150 mm) block	11.8" (300 mm) block
14.5–22.5" (368–572 mm)[2]	0	0	0
20.4–28.4" (518–721 mm)	1	0	0
26.3–34.3" (668–871 mm)	0	1	0
32.2–40.2" (818–1,021 mm)	1	1	0
38.1–46.1" (968–1,171 mm)	0	0	1
44–52" (1,118–1,321 mm)	1	0	1
49.9–57.9" (1,267–1,471 mm)	0	1	1
55.8–73.8" (1,417–1,875 mm)	1	1	1
61.7–69.7" (1,567–1,770 mm)	0	0	2
67.6–75.6” (1,717–1,920 mm)	1	0	2
73.5–81.5" (1,867–2,070 mm)	1	1	2
79.4–86.6" (2,017–2,200 mm)	1	1	2

[2] The tool holder must be shortened to avoid hitting the bar OD at the minimum diameter.

Boring head setup

1. Select the required parts using the boring head tool range in Table 2 on page 33 and Table 3 on page 34.
2. Using the drawing 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.

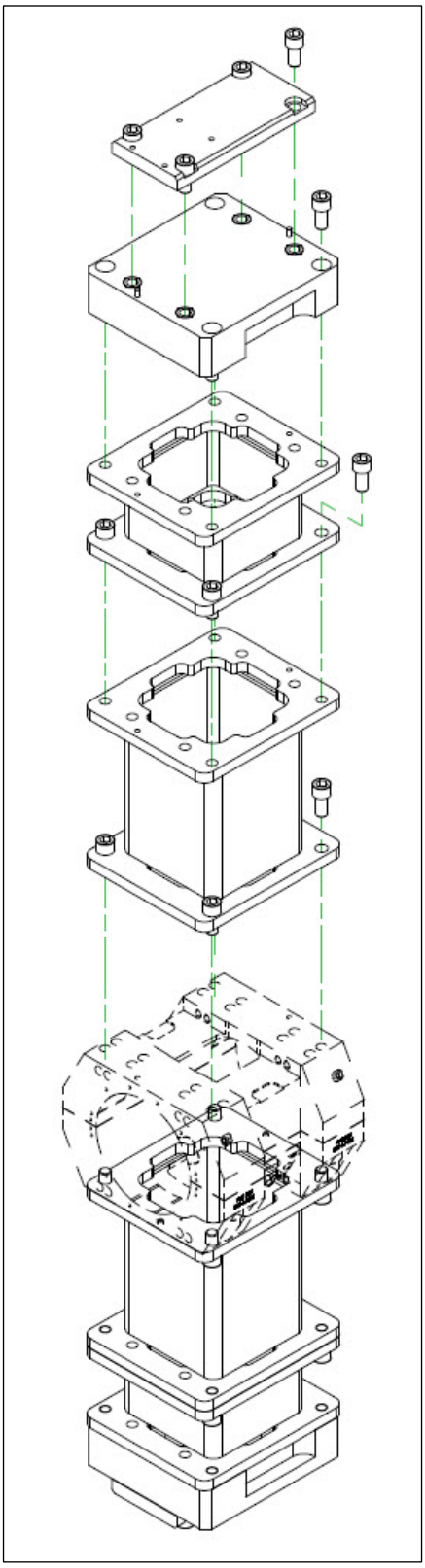


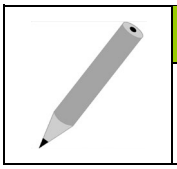
Figure 26. Boring head assembly

Facing head

Manual facing head assembly setup

The manual facing head attaches to the tool carrier on the boring bar.

1. Insert the tool holder into the facing head tool slide. Tighten the setscrews.



NOTE

The bar can rotate in either direction. Check that the tool bit is facing the correct direction.

2. Adjust the tension of the gib by doing the following:
   a) Crank the tool carrier until it is fully engaged with the slide.
   b) Tighten the gib screws until there is noticeable drag on the slide. Unscrew the setscrews slightly.
3. Retract the tool slide to protect the tool bit during setup.
4. Determine if spacers (from the boring head assembly) will be needed to face the workpiece, referring to Table 5 on page 41, Table 6 on page 42, and Table 7 on page 43 depending on the travel head size.
5. Mount the spacers, if necessary, to the tool carrier. CLIMAX recommends using the same number of spacers on both sides of the tool carrier to ensure smooth tool travel.
6. Mount the facing head to the tool carrier (or spacers) using mounting screws from the boring head assembly. Secure the facing head with four 3/4-16 socket head cap screws (SHCSs), according to the following guidelines:
   - Use 1.5" long SHCSs when bolting directly to the tool carrier or one of the 150- or 300-mm stack blocks.
   - Use 4.5" long SHCSs when bolting with the 75-mm spacer.
7. Adjust the cutting tool depth. Precision cuts are best obtained by making several rough cuts and one shallow finish pass.

Table 4 lists the available facing heads.

Table 4. Facing heads

Part number	Description	Range description
P/N 21115	5” travel	Table 5 on page 41
P/N 38654	8” travel heavy duty	Table 6 on page 42
P/N 22359	12” travel	Table 7 on page 43

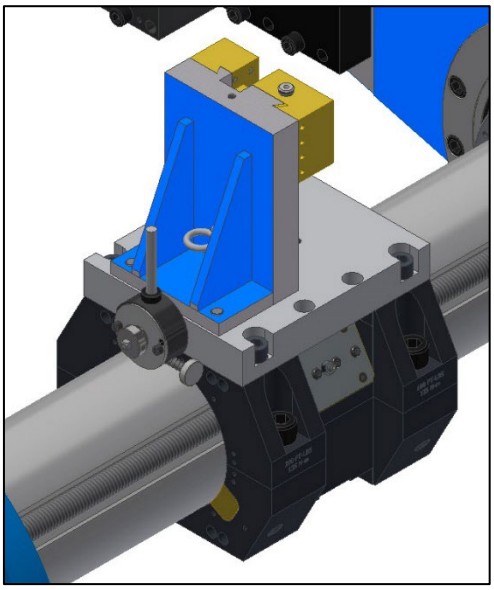


Figure 27. Facing head mounted directly to the tool carrier

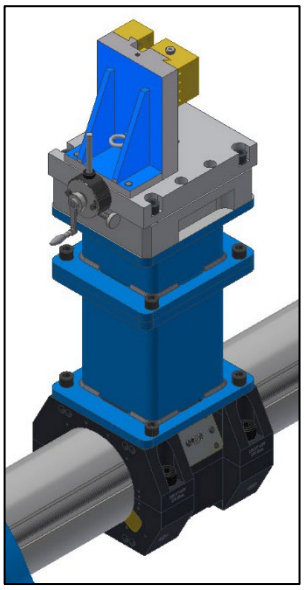


Figure 28. Facing head mounted with spacers to the tool carrier

The facing head may mount directly to the tool carrier, or with spacers from the boring head stack blocks as shown above.

Facing head radial feed

Radial feed is either manual or automatic. When the lid on the radial feed box is away from the boring bar, the facing head will feed away from the center of the bar.

Setup

1. Select and assemble the appropriate configuration of spacers based on the desired range, as specified in Table 5 on page 41.
2. Select the appropriate feed tools based on the following:
   a) If no spacers are being used (see Figure 27), use the straight crank handle and feed engagement knob to make manual adjustments and engage the auto feed (see Figure 30 and Figure 31 on page 38).
   b) If at least one spacer is being used (see Figure 28), use the feed box crank to make manual adjustments and engage the auto feed. The feed box crank is a combination tool that remains attached to the facing head while in operation (see Figure 32 on page 38).

	WARNING
⚠	**Do not use the feed box crank if there are no spacers in the configuration. This may damage the machine or the workpiece if operated while attached.**

To manually feed the facing head

1. Disengage the feed box crank. The pins should be retracted from the carrier feed ratchet slots (see Figure 29).

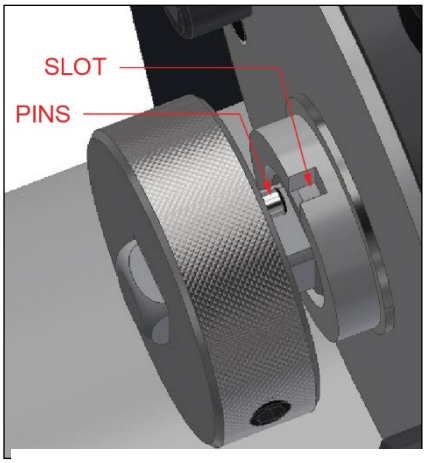


Figure 29. Crank pins disengaged

NOTE
If the facing head is assembled without spacers, remove the feed engagement knob and mount the straight crank handle.

2. Turn the crank handle clockwise to feed the tool out away from the center of the bar. Turn counter-clockwise to feed the tool in toward the center of the bar. At the maximum recommended torque rod angle of 15°, the automatic radial feed is infinitely variable up to 0.008" (0.2 mm) per trip.

NOTE
If the facing head is assembled without spacers, the straight crank handle cannot turn a full revolution without striking the bar. Remove and reattach as needed in order to complete each revolution.

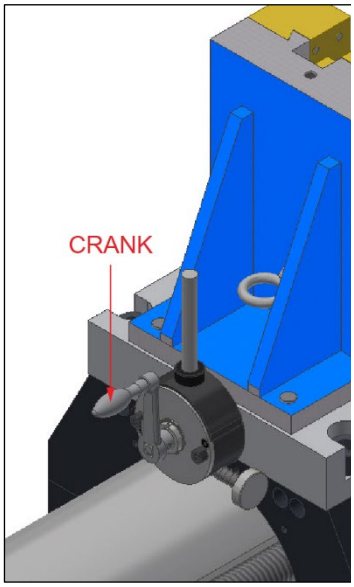


Figure 30. Facing head directly mounted with straight crank handle attached

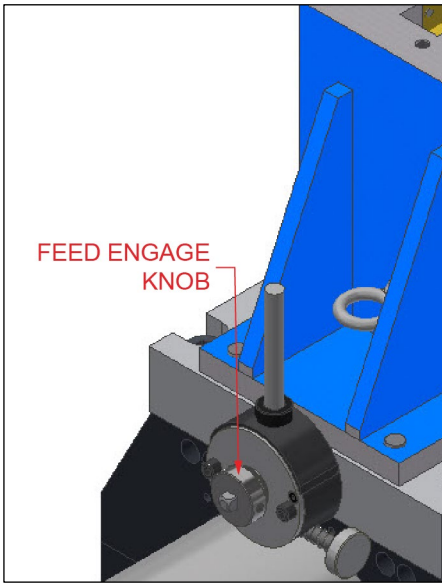


Figure 31. Facing head directly mounted with feed engagement knob attached

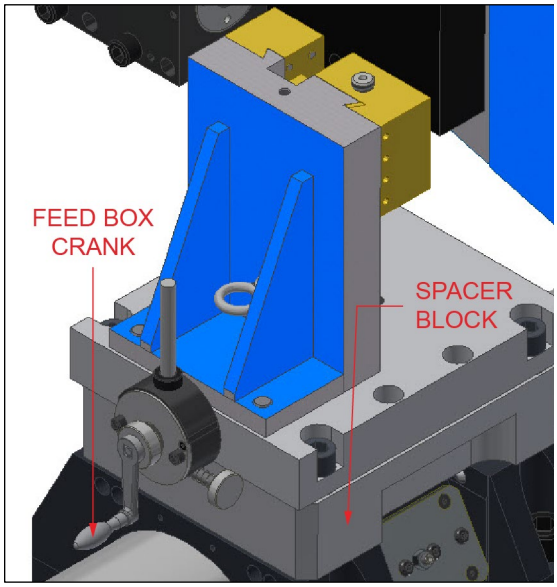


Figure 32. Facing head mounted on spacers with feed box crank attached

To automatically feed the facing head

Engage the feed box crank handle. Push the pins firmly into the carrier feed ratchet slots (see Figure 33).

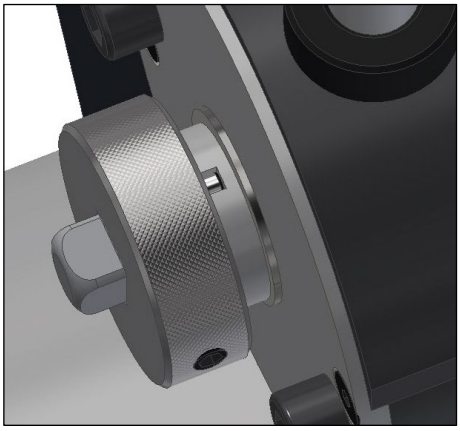


Figure 33. Crank pins engaged

	NOTE
	If the facing head is assembled without spacers, first remove the straight crank handle, then mount and engage the feed engagement knob.

To activate the feed ratchet, provide a trip mechanism for the steel rod. Set the trip to move the rod no more than 15°. If a radial feed of more than 0.008" (0.2 mm) per revolution is desired, use multiple trip mechanisms.

	NOTE
	CLIMAX recommends a maximum trip of 15º.

To set the radial feed rate to less than 0.008" (0.2 mm) per revolution, move the trip mechanism away from the center of the radial feed box. To increase the feed rate, move the trip mechanism toward the center of the radial feed box.

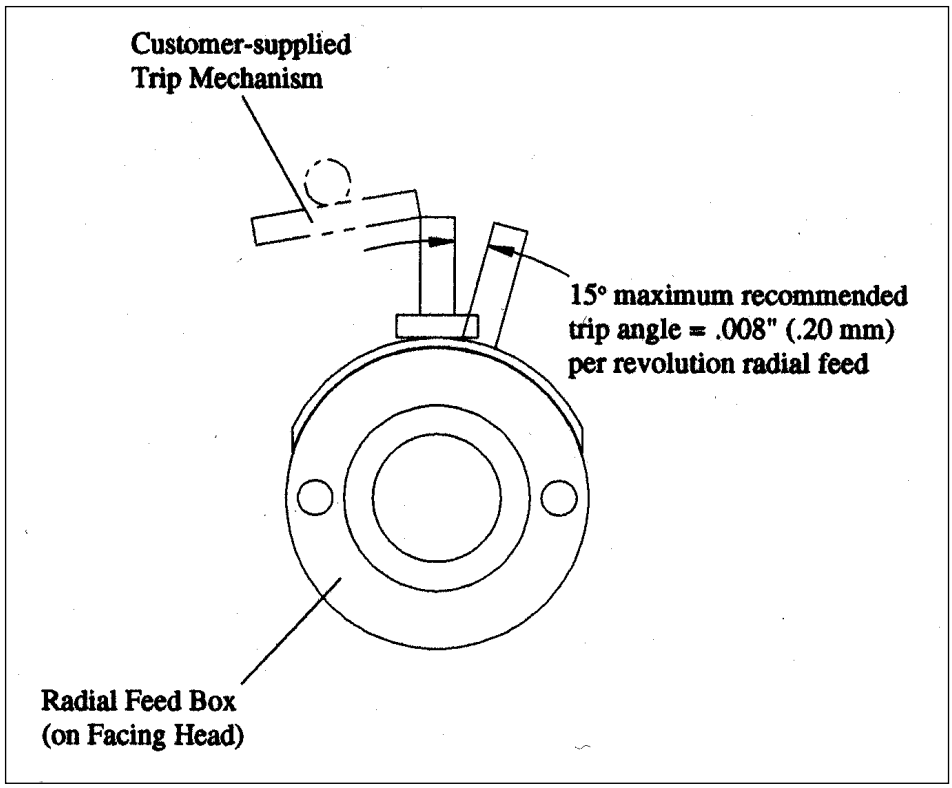


Figure 34. Radial feed trip mechanism

The feed trip arm must be tripped rotating clockwise relative to the feed box housing.

!	NOTICE
	Actuating the feed trip arm in the opposite direction will result in machine damage.

Use the feed trip arm according to the following principles:

- When the feed trip arm is oriented away from the boring bar, operate the bar in the counter-clockwise direction (feed is radially in to out).
- When the feed trip arm is oriented toward the boring bar, operate the bar in the clockwise direction (feed is radially out to in).

!	NOTICE
	The trip arm must be facing away from the boring bar when directly mounted to the tool carrier to ensure clearance for the boring bar.

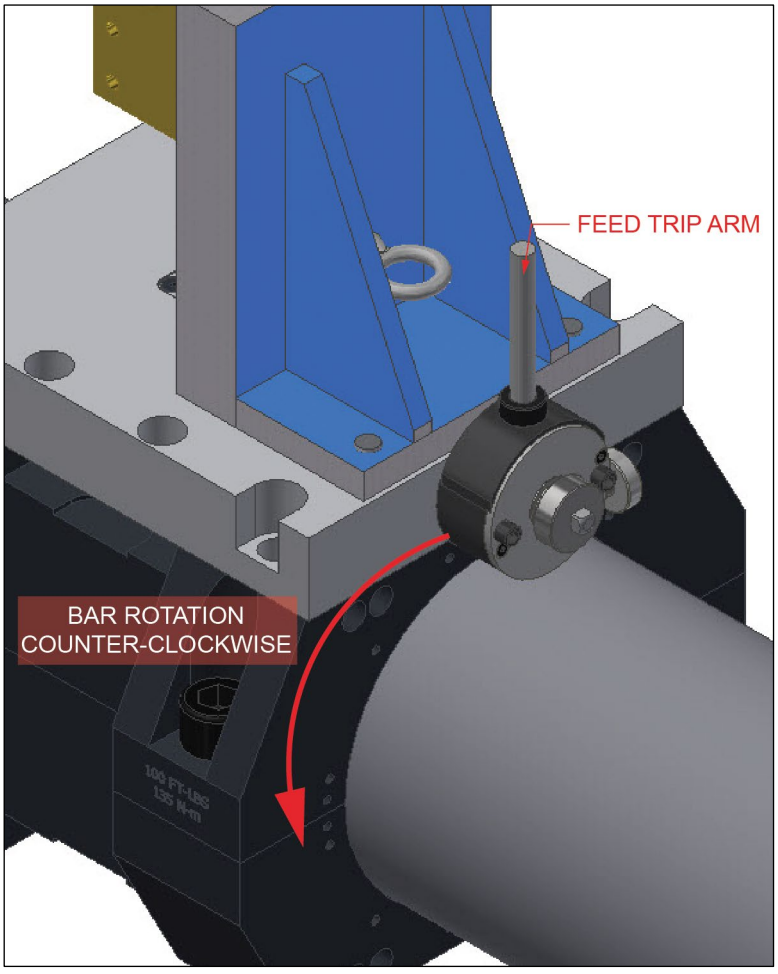


Figure 35. Feed trip arm and bar rotation

Table 5 shows the facing range for the 5" (127 mm) travel head (P/N 21115).

Table 5. Facing Range for the 5" (127 mm) travel head (P/N 21115)

Range	Number of blocks required for the thickness shown			Use 4.5" (114 mm) SHCS
	2.95" (75 mm)	5.9" (150 mm)	11.8" (300 mm)	
20.8–30.8" (528.32–782.32 mm)	0	0	0	No
26.7–36.7" (678.18–932.18 mm)	1	0	0	Yes
32.6--42.6" (828.04—1,082.04 mm)	0	1	0	No
38.5--48.5" (977.9—1,231.9 mm)	1	1	0	Yes
44.4--54.4" (1,127.76—1,381.76 mm)	0	0	1	No
50.3--60.3" (1,277.62—1,531.62 mm)	1	0	1	Yes
56.2--66.2" (1,427.48—1,681.48 mm)	0	1	1	No
62.1--72.1" (1,577.34—1,831.34 mm)	1	1	1	Yes

NOTICE

The facing ranges shown for these tables are calculated with the tool feed radially out.

Table 6 shows the facing range for the 8" (203 mm) travel head (P/N 38654).

Table 6. Facing range for the 8" (203 mm) travel head (P/N 38654)

RANGE	NUMBER OF BLOCKS REQUIRED FOR THE THICKNESS SHOWN			USE 4.5" (114 MM) SHCS
	2.95" (75 mm)	5.9" (150 mm)	11.8" (300 mm)	
20.8–36.8" (528.32–934.72 mm)	0	0	0	No
26.7–42.7" (678.18–1,084.58 mm)	1	0	0	Yes
32.6--48.6" (828.04–1,234.44 mm)	0	1	0	No
38.5--54.5" (977.9–1,384.3 mm)	1	1	0	Yes
44.4--60.4" (1,127.76–1,534.16 mm)	0	0	1	No
50.3--66.3" (1,277.62–1,684.02 mm)	1	0	1	Yes
56.2--72.2" (1,427.48–1,833.88 mm)	0	1	1	No
62.1--78.1" (1,577.34–1,983.74 mm)	1	1	1	Yes

!	**NOTICE**
	The facing ranges shown for these tables are calculated with the tool feed radially out.

Table 7 shows the facing range for the 12" (305 mm) travel head (P/N 22359).

Table 7. Facing range for the 12" (305 mm) travel head (P/N 22359)

RANGE	NUMBER OF BLOCKS REQUIRED FOR THE THICKNESS SHOWN			USE 4.5" (114 MM) SHCS
	2.95" (75 mm)	5.9" (150 mm)	11.8" (300 mm)	
20.8–44.8" (528.32–1,137.92 mm)	0	0	0	No
26.7–50.7" (678.18–1,287.78 mm)	1	0	0	Yes
32.6--56.6" (828.04–1,437.64 mm)	0	1	0	No
38.5--62.5" (977.9–1,587.5 mm)	1	1	0	Yes
44.4--68.4" (1,127.76–1,737.36 mm)	0	0	1	No
50.3--74.3" (1,277.62–1,887.22 mm)	1	0	1	Yes
56.2--80.2" (1,427.48–2,037.08 mm)	0	1	1	No
62.1--86.1" (1,577.34–2,186.94 mm)	1	1	1	Yes

!	**NOTICE**
	The facing ranges shown for these tables are calculated with the tool feed radially out.

Installing the facing slide arm onto the tool carrier

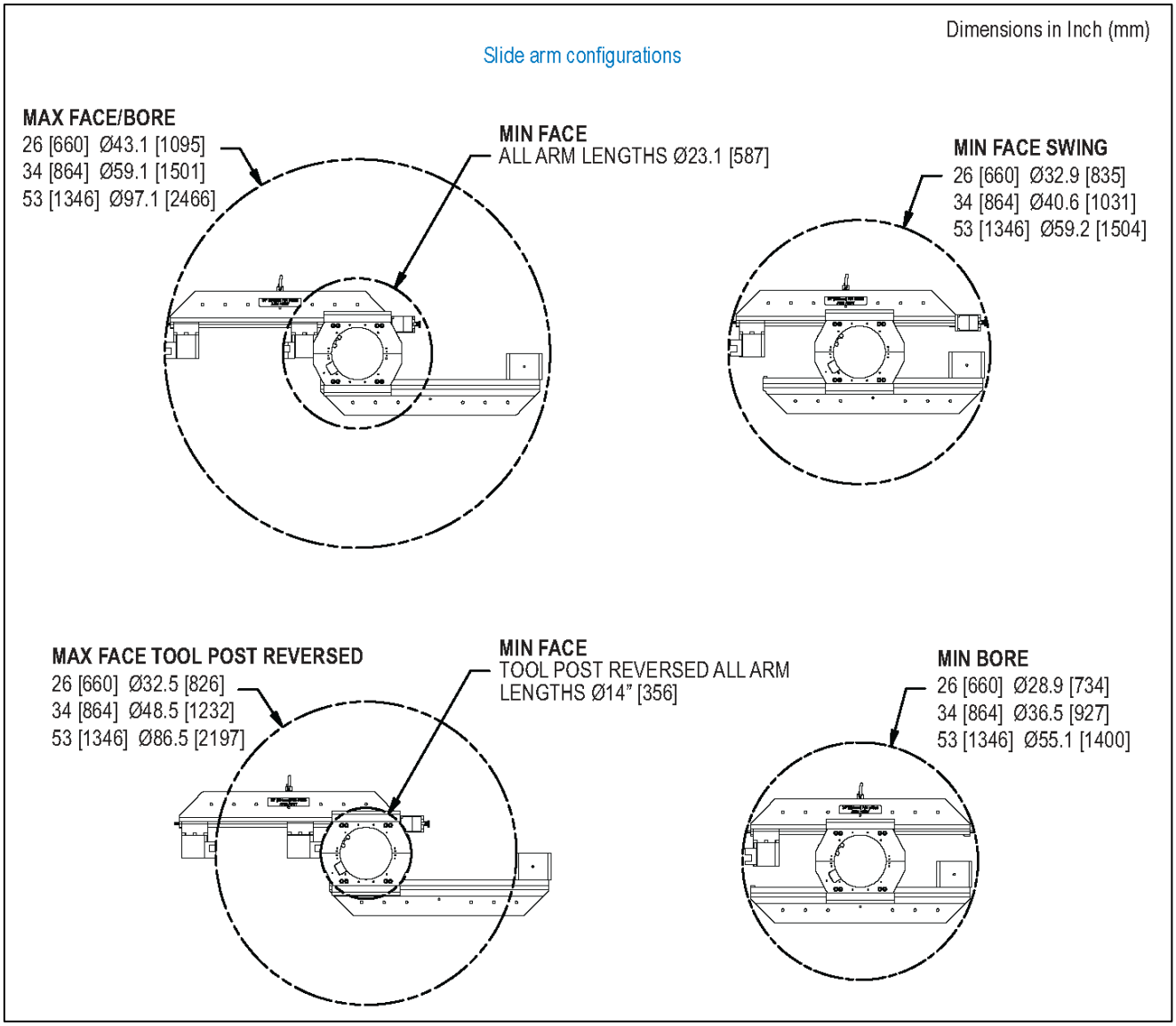


Figure 36. Facing slide arm dimensions

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 the clamp bars (P/N 54551) with 3/4-16 x 2 screws (P/N 28757) – four per clamp bar and torque to 100 ft-lbs (135 Nm).

	DANGER
	Failure to properly torque the four 3/4-16 x 2 SHCS (P/N 28757) to 150 ft-lb (210 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 54867), as shown in Figure 37.

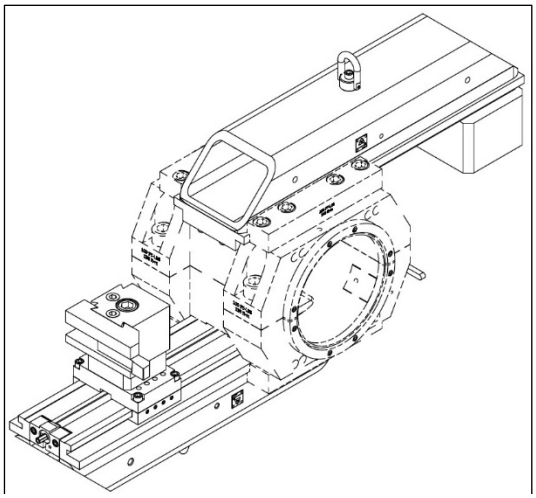


Figure 37. Facing slide arm with feedbox and adapter plate

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 you can position the counterweight itself anywhere along the arm as needed to balance the assembly.

Hydraulic power preparation and connection

	CAUTION
	**Before using the power unit, check pump rotation by jogging the motor. The motor should rotate in the direction indicated by the arrow on the pump.**

1. Turn the power unit OFF.
2. Check that all fittings are clean.
3. Connect the hydraulic lines from the hydraulic motor to the power unit.
4. Jog the motor to see which direction the bar is rotating. Do the following to reverse the bar rotation:
   a) Turn off the hydraulic power unit.
   b) Switch the hoses at the motor end.
5. Adjust the speed of the bar rotation by pressing the HIGH/LOW VOLUME CONTROL button on the pendant.

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

OPERATION

Pre-start checks

	**WARNING** **Rotating machinery can cause serious injury. Turn off and lock out power before making pre-start checks.**

Before operating the portable boring bar

1. Tie down the rotational drive unit torque arms and the axial feed unit stop rod.
2. Check that all cutters are sharp and in good condition.
3. Secure fixed machine parts, including the tool carrier, tool head and cutting tool. Check that moving parts move freely.
4. Check that the hydraulic power unit is OFF.
5. Check that the power unit wiring matches the electric power source. Plug the power unit into a grounded outlet.
6. Check the power unit reservoir level. Fill the reservoir to above the red bar with Mobil DTE-24 anti-wear hydraulic oil. Check that the power unit is level.
7. Clean the hydraulic hoses and fittings before connecting them.
8. Check that the electric pump motor on the hydraulic power unit is turning the same way as the arrow on the case.
9. If the machine is setup in a vertical orientation, the clamp collars must be installed for safety.

Using the remote pendants

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

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

Feed pendant

The following is a description of the Feed Pendant controls:

Figure 38. 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.

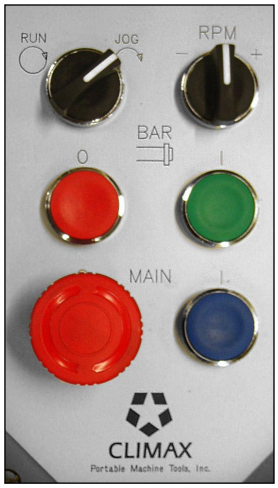


Figure 39. HPU pendant

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.

Manual override (electrical feed only)

The manual override consists of 2-position gear lever that disengages the electric drive from the boring bar. When disengaged, a hand-drill can be installed for manual rapid operation. When the gear box is in the manual override position, the pendant functions are not active.

	CAUTION
	Do not force the shift lever to engage. Forceful engagement can damage the mechanical override mechanism.

To move the tool carrier rapidly, shift the feed lever on the top of the gearbox to the back position. With a socket on the hexagon shaft, run with an electric drill or speed wrench. To re-engage the feed, remove the socket, turn the feed on slow, and shift the feed lever to the forward position.

Clamp collars

The collars (P/N 40708) are made in matching sets and must be used to secure the bar when the machine is in the 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 100 ft.-lbs (13.6 Nm).**

Starting the machine

	**WARNING** **To avoid injury from flying chips or loud noise, wear eye and ear protection while operating the machine.**

1. Turn off and lock out the hydraulic power unit.

If boring:

a) Set the feed direction on the axial feed assembly. See “Setting the feed direction” on page 29.

b) Set the feed rate on the axial feed assembly. See “Setting the feed rate” on page 29.

If facing:

a) Set the feed direction on the axial feed assembly to NEUTRAL. See “Setting the feed direction”

b) Adjust the automatic trip mechanism on the facing head. See “Facing head radial feed”.

2. Press POWER UNITON at the hydraulic power unit pendant.
3. Press PRESSURE START at the pendant.
4. Adjust the bar rotation speed using the HIGH/LOW VOLUME CONTROL knob on the pendant.
5. As cutting begins, lubricate the work piece and cutting tool with plenty of cutting oil. Apply cutting oil with a squirt can or use an automatic mister.

Stopping the machine

	**WARNING** **In case of emergency press POWER UNIT OFF on the control pendant.**

1. Press POWER UNIT OFF at the pendant to stop the power unit.
2. After all parts of the machine has stopped, use a brush to remove chips.

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

3. If you will be machining the work piece again, see “Repetitive machining”. If you are done machining, see “Disassembly”.

Repetitive machining

1. Reverse the tool head feed direction.
2. Manually or automatically feed the tool head back to where it started cutting.
3. Re-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 0.125" (3 mm).
5. Operate the boring bar as described in “Starting the machine” on page 50.

Disassembly

	WARNING
	The boring bar is not hardened. To prevent damage to the bar, do not strike it against the bearing supports or the work piece.

Standard disassembly

1. Turn off and lock out the hydraulic power unit.
2. Unplug electrical cords and cables.
3. Disconnect the hydraulic hoses from the motor.
4. Remove the cutting tool from the tool head.
5. Remove the tool head and tool carrier.
6. Remove the axial feed assembly from the bar.
7. Securely support the boring bar, bearing supports, and rotational drive assembly with hoists
8. If the rotational drive assembly is between 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.
9. Securing the rotational drive assembly with a hoist, loosen the eight socket-head cap screws in the rotational drive assembly.
10. Push the locking rings out by screwing in the four setscrews.

11. Remove one lock ring.
12. Remove the drive key.
13. Carefully slide the rotational drive assembly off the bar.
14. Loosen the bearing cartridges.
15. Remove the boring bar.
16. Remove all remaining bearing supports from the workpiece.

Alternative disassembly

In some cases, it is better to remove the bearings before removing the bar.

1. Turn off and lock out the hydraulic power unit.
2. Unplug all electric cords and cables, including the rotational drive assembly fan cord.
3. Disconnect the hydraulic hoses from the motor.
4. Remove the tool bit or carbide cartridge from the tool head.
5. Remove the tool head and tool carrier.
6. Securely support the boring bar, bearing supports, and rotational drive assembly with hoists.
7. Remove the axial feed assembly from the bar.
8. If the rotational drive assembly is between the bearing support assemblies, remove one support first:
9. Loosen the bearing cartridge.
10. Loosen the bearing support from the workpiece.
11. Remove the bearing support from the bar.
12. Support the rotational drive assembly with a hoist. Loosen the eight socket-head cap screws. Push out the locking rings by screwing in the four setscrews. Remove one lock ring. Remove the drive key. Carefully slide the rotational drive assembly off the bar.
13. Loosen the taper bore adapters in the bearings by doing the following:
    a) Loosen the 3/8"-24 set screws (SSSFP).
    b) Tighten the 1/4"-28 HHCS until the taper unseats.
    c) Loosen and remove the 1/4"-28 HHCS. Note that the HHCS screws pull the lock nut and taper out of the bearing mount.
    d) Loosen and remove the taper nut.
14. Place a clean wooden “crib” in the bottom of the bore.
15. Remove the bearing supports from the workpiece.
16. Slide the bar out of the bore using the crib.

MAINTENANCE

Recommended lubricants

LUBRICANT	BRAND	WHERE USED
Gear grease	UNOBA EP #0	Bearing cartridges
Rotation drive oil	Mobil SHC 634 Synthetic	Gear box cone drives
Light oil	LPS 2	Unpainted surfaces
Cutting oil	UNOCAL KOOLKUT	Tool bits, work piece
Way oil	Mobil VACTRA Heavy-Medium Way Oil	Dovetail ways
Hydraulic oil	Mobil DTE-24 Anti-wear hydraulic oil	Hydraulic power unit and motor

CAUTION

To avoid damage to the machine, only use recommended lubricants.

Boring bar/leadscrew

Clean the leadscrew and boring bar frequently during operation. Keep chips away from the leadscrew threads. Lubricate the leadscrew periodically with light oil to ensure smooth travel of the rotational drive assembly. Before storage, lightly oil the bar to prevent rusting. Lightly grease the leadscrew. Do not grease areas where chips can accumulate in the oils.

Axial feed assembly

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

Rotational drive assembly

Under normal use, change the drive oil in the rotational drive gearbox every 500 hours with Mobil 600W Super Cylinder Oil (AGMA 7 Compounded) or equivalent.

Do the following to fill the gear box:

1. Using the lifting eye, set the gearbox upright. Secure the rotational drive unit so it cannot move.
2. Remove the fill plug and oil plug.
3. Fill the rotational drive until oil overflows the oil plug hole.
4. Replace the oil plug.
5. Add one more quart of oil through the fill plug hole.

6. Replace the fill plug.

Bearing support assembly

Under normal conditions, bearing assemblies are lubricated for life.
Before storage, lightly oil the assemblies to prevent rusting.

Tool head assembly

Manual boring head assembly

Lightly oil all parts to prevent rusting.

Manual facing head assembly

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

Tool carrier

Lightly oil all parts with JET LUBE 550 to prevent rusting.

Hydraulic power unit and motor

General hydraulic system

After 72 hours of operation, do the following:

1. Replace the filter cartridge
2. Check the heat exchanger for leaks. Repair any leaks before running the power unit.
3. Clean the filler/breather.

Hydraulic motor

The hydraulic motor is maintenance-free. Fluid passing through the motor lubricates internal moving parts. To ensure long life and dependable operation, use high-quality clean hydraulic fluid as described in “Hydraulic filter and fluid” on page 54.

Hydraulic filter and fluid

Though the hydraulic power unit requires little maintenance, changing the filter and fluid is required for proper operation. Initially, change the filter after 72 hours of operation to remove

impurities from the system. From then on, replace the filter every 150-200 hours. Use a high-quality 10-micron industrial-grade filter. If the filtering system has a change-warning gage, replace the filter whenever the gage indicates. Clean hydraulic fluid will help keep the power unit and motor running properly.

The hydraulic fluid should be changed:

- When the oil becomes contaminated
- When the power unit is operated at high temperatures for a long time
- Every two years

Hydraulic fluid level should not drop below the red bar on the fluid level/temperature gage. Add only filtered fluid to the system. Should hydraulic fluid leak out, do not put it back in the reservoir.

Use Mobil DTE-24 anti-wear hydraulic oil or equivalent. Recommended oil operating temperature is 150° F (66 ° C).

	WARNING
	Connect the hydraulic motor to the power unit pump before turning on the power unit. Failure to do so will damage the pump and void all warranties.

Troubleshooting

SYMPTOM	SOLUTION
Axial feed unit will not advance the bar	Check the feed direction is set to the desired setting.
	Clean the leadscrew.
	Check that the feed rate is not too low.
	Check that 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.
Machine is unstable	Tighten all clamps and hardware.
	Provide additional support.
Rotational drive unit will not rotate	Check that the hydraulic power unit is turned on.
	Check that the pump motor is turning in the correct direction.
	Check the oil level in the power unit.
	Check that the speed control is open.
	Check the hydraulic hose connections.
Feeds in wrong direction	Check the handle position on the axial feed unit.
Hydraulic power unit fails to deliver fluid	Check the fluid level. Add more fluid if necessary.
	Check that the pump motor is turning in the correct direction.
	Check hydraulic connections for plugs or leaks.
Hydraulic power unit motor does not run	Check that the power unit and electrical supply are compatible.
	Check that the power unit is plugged in.
	Check for faulty wiring.

STORAGE

Proper storage of Model BB8100 Portable Boring Bar will prevent undue deterioration or damage of the machine.

1. Before storing, wipe the machine down with solvent to remove grease, metal chips, and moisture.
2. To prevent rusting, spray with a moisture-displacement material such as Jet-Lube 550 for short-term storage, LPS 3 for long-term storage.
3. Store the machine in the container provided.
4. Place desiccant bags or vapor wrap around the machine to absorb moisture.

SPECIFICATIONS

	US	Metric
Boring and Facing Ranges		
Boring diameter range, standard stack block assembly:	14.5 - 85.6 inches	368.3 - 2174.2 mm
Boring diameter range boring/facing arm assembly:		
with 26 inch (660.4) boring/facing arm assembly	28.9 - 43.1 inches	734.1 - 1094.7 mm
with 34 inch (863.6) boring/facing arm assembly	36.5 - 59.1 inches	927.1 - 1501.1 mm
with 53 inch (1346.2) boring/facing arm assembly	55.1 - 97.1 inches	1399.5 - 2466.4 mm
Facing diameter range, mechanical facing head assembly:		
with 5, 8, or 12 inch (127.0, 203.2 or 304.8 mm) mechanical facing head assemblies (5 and 8 inch facing head assemblies have 8 inch stroke, 12 inch facing head assembly has 12 inch stroke)	24.5 - 80 inches	622.3 - 2032.0 mm
Facing diameter range, slide arm assembly:		
with 26 inch (660.4) boring/facing arm assembly	23.1 - 43.1 inches	586.7 - 1094.7 mm
with 34 inch (863.6) boring/facing arm assembly	23.1 - 59.1 inches	586.7 - 1501.1 mm
with 53 inch (1346.2) boring/facing arm assembly	23.1 - 97.1 inches	586.7 - 2466.4 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 26 inch (660.4) boring/facing arm assembly	26.0 - 32.5 inches	660.4 - 825.5 mm
with 34 inch (863.6) boring/facing arm assembly	34.0 - 48.5 inches	863.6 - 1231.9 mm
with 53 inch (1346.2) boring/facing arm assembly	53.0 - 86.5 inches	1346.2 - 2197.1 mm
Performance Data		
Rotational Drive Unit (RDU) Gear Ratio:	20 : 1	10 : 1 optional (2xfast, 1/2torque)
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:	7.3 - 17.9 in3	119.6 - 293.3 cm3
Boring Bar Torque with 20:1 RDU:	3350 - 6068 ft•lb	4542 - 8227.1 N•m
Max boring rpm with 20:1 RDU:	23.5 - 9.6 rpm	23.5 - 9.6 rpm
For example, with 11.3 in3 (185.3 cm3) hydraulic motor (43457):		
Boring Bar Torque with 20:1 RDU:	4783 ft•lb	6484.9 N•m
Max boring rpm with 20:1 RDU:	15.1 rpm	15.1 rpm
Feed Rate of mechanical Axial Feed Unit (AFU): 0.003 - 0.030 in/rev.		0.076 - 0.762 mm/rev.
Feed Rate of electric Axial Feed Unit (AFU)	0 - 0.48 in/min.	0 - 12.2 mm/min.
Measures		
Shipping weight (estimated): (machine with RDU, AFU, boring head set, tool carrier, tool kit, and hydraulic motor.)		
for machine (metal crate)	5700 lbs.	2585.5 kg
for machine (wood crate)	5850 lbs.	2653.5 kg
for 1 Bearing	1070 lbs.	485.3 kg
for boring bar	14.5 lbs/inch	2.6 kg/cm
15 Hp or 25 Hp Hydraulic Power Unit	1073 lbs	486.7 kg
Shipping dimensions:		
Machine, in wood crate, W, D, H	39 x 58 x 31.75 inches	469.6 x 863.6 x 602 mm
Machine, in steel crate, W, D, H	30 x 72 x 48 inches	762 x 1828.8 x 1219.2 mm
Bearing (each bearing shipped separately) W, D, H	40 x 40 x 12.7 inches	1016 x 1016 x 322.6
12 foot (365.8 cm) bar W, D, H	24 x 18 x 152 inches	609.6 x 457.2 x 3860.8 mm
15 or 25 Hp Hydraulic Power Unit W, D, H	64 x 30 x 50 inches	1625.6 x 762 x 1270 mm

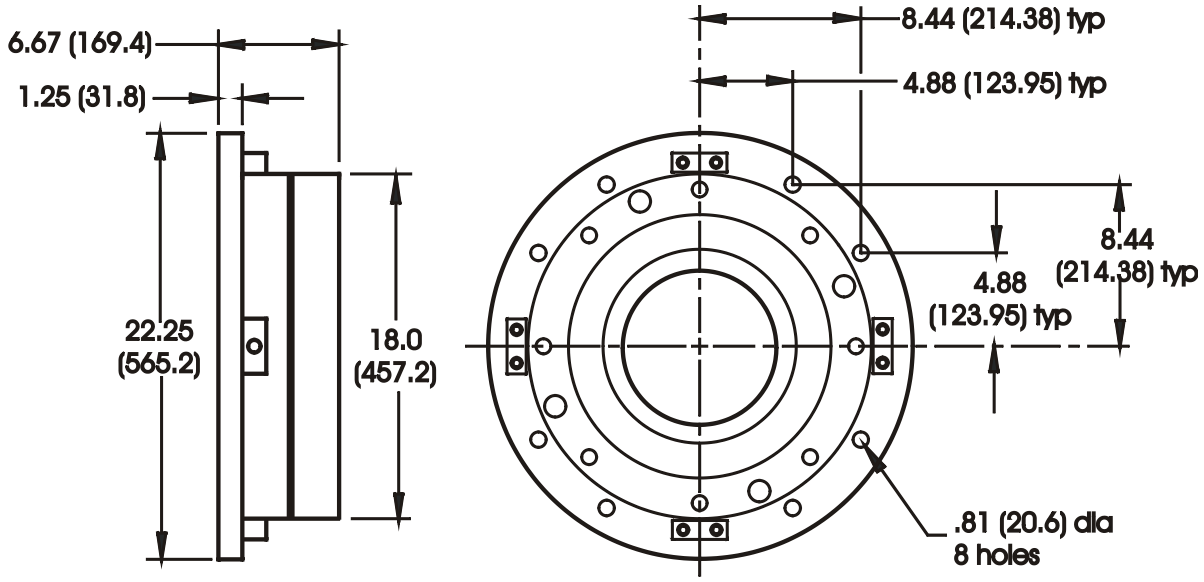


Figure 40. Dimensions of the self-aligning bearing assembly without spider

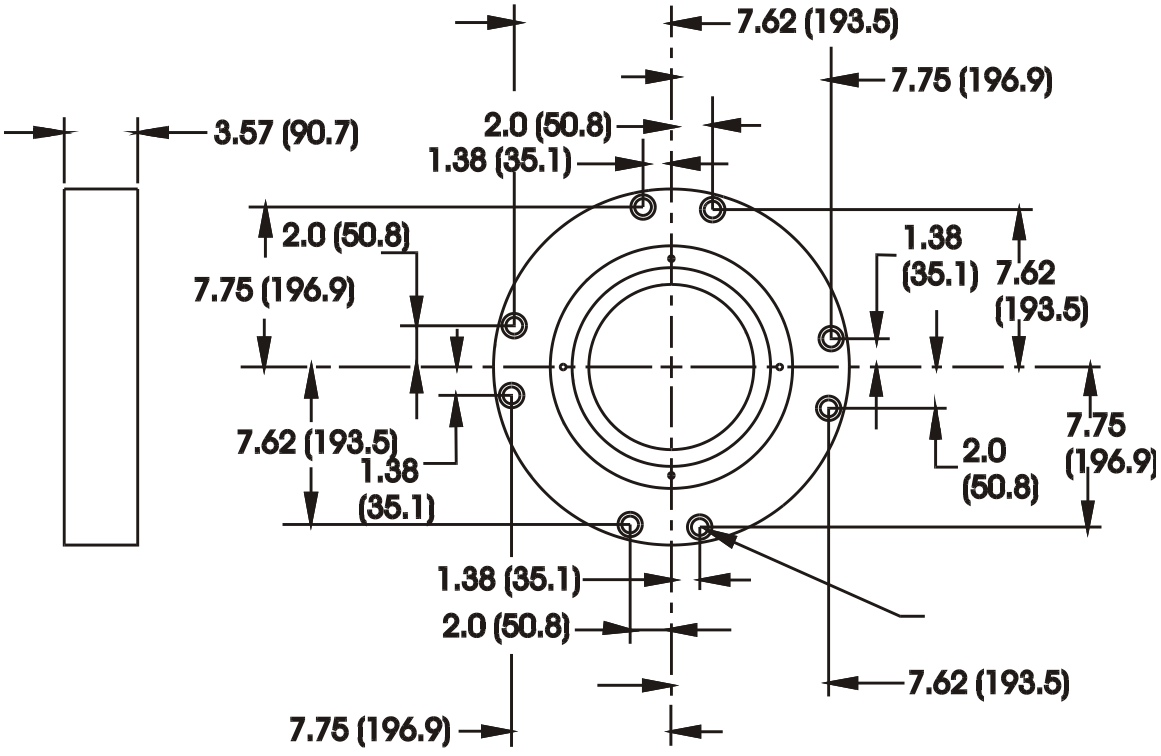
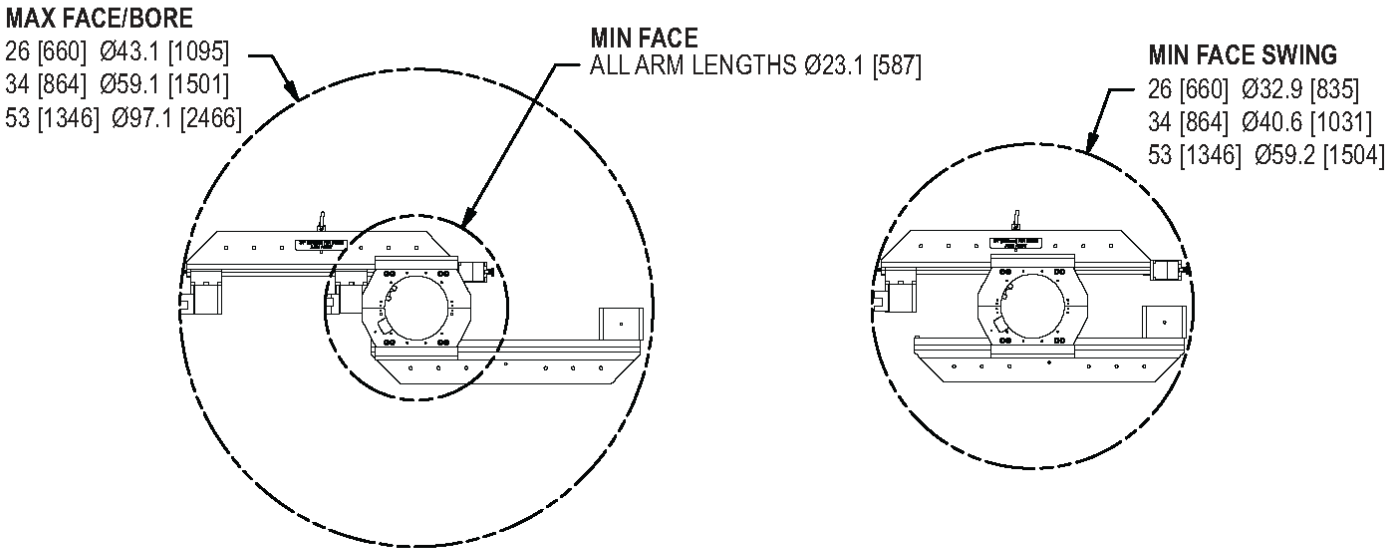
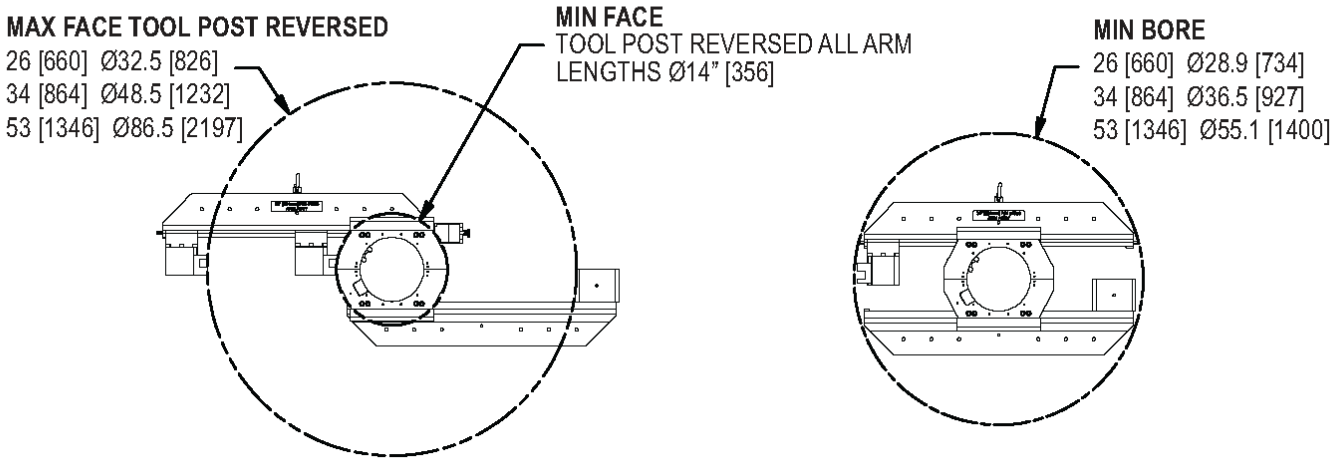


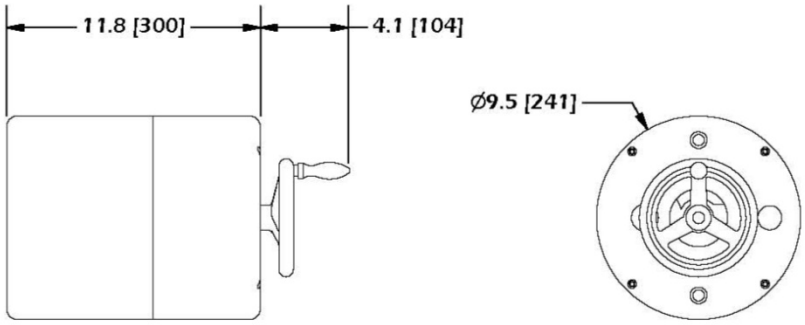
Figure 41. Dimensions of the non-aligning bearing assembly without spider

Dimensions in Inch (mm)

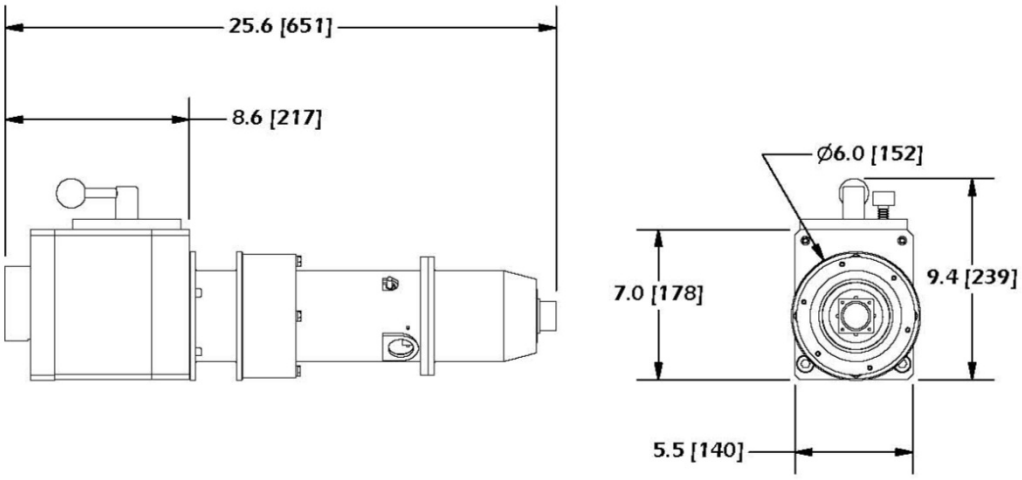
Slide arm configurations







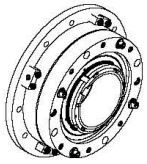
WT 89lbs

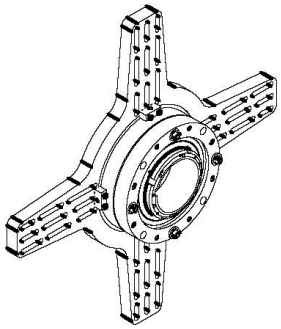


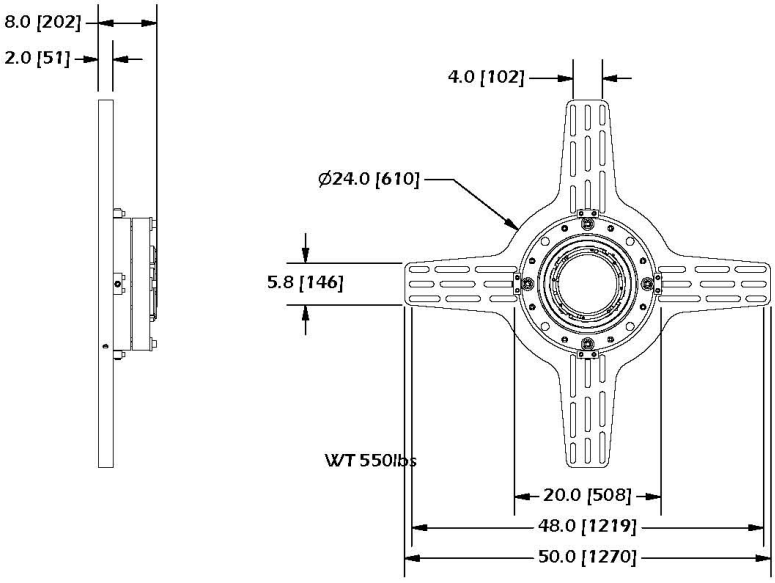
WT 122lbs

ELECTRIC FEED W/MECHANICAL RAPID FEED AND PENDANT

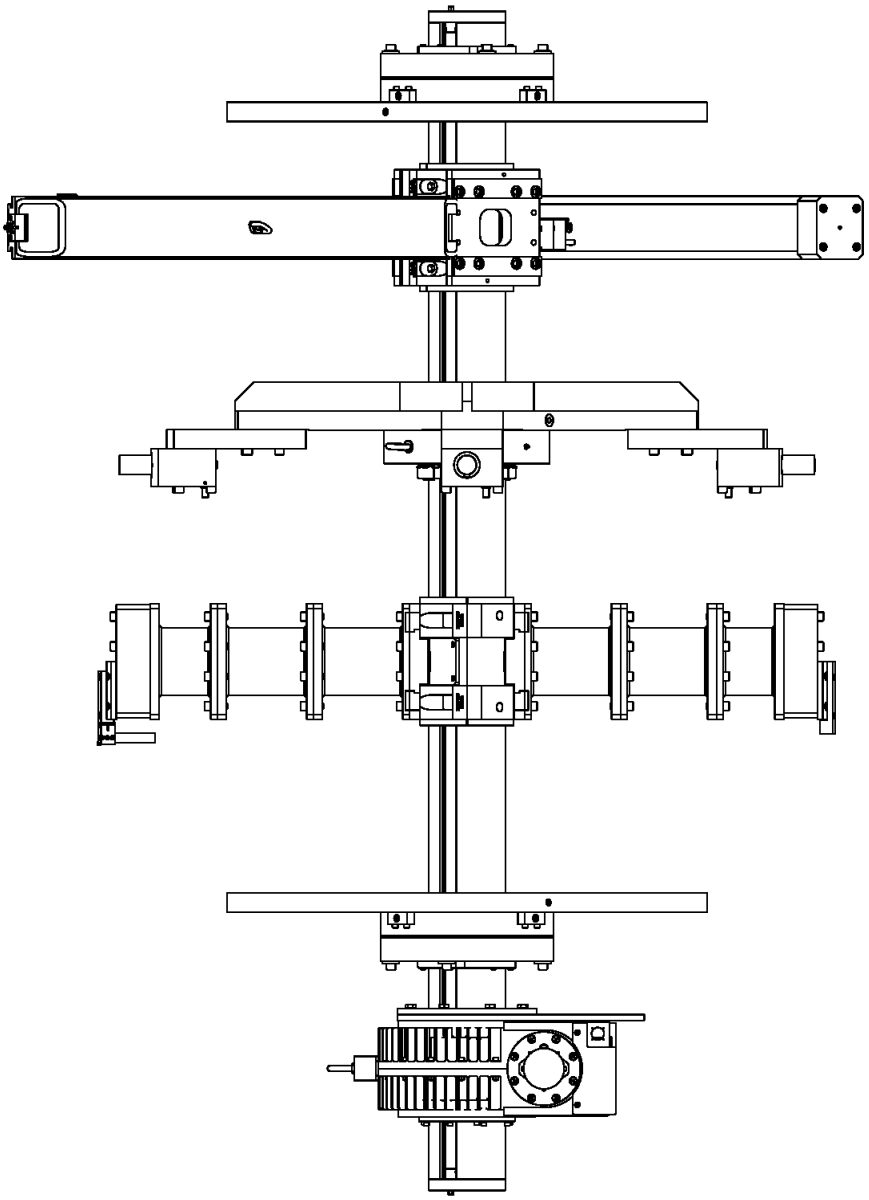
41071



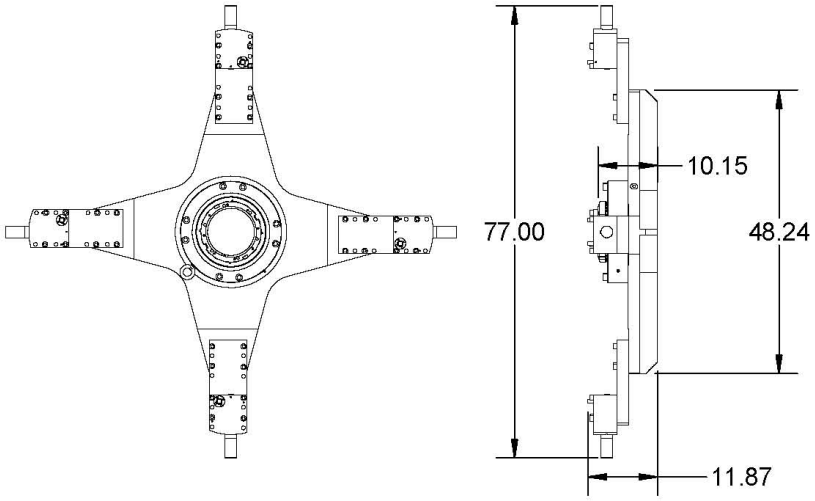




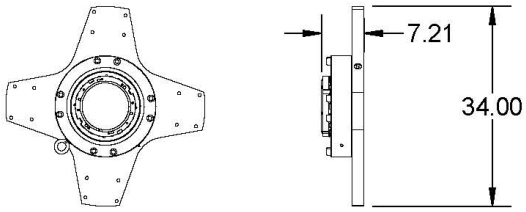
SUPPORT BRG SELF ALIGNIN 8 IN BAR W/SPIDER 23550



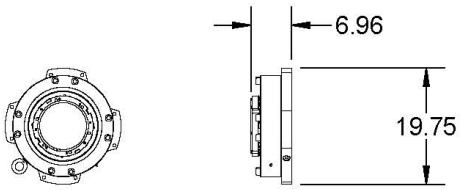
BB8100 cover assy



ID MOUNT 48-1/2 TO 77

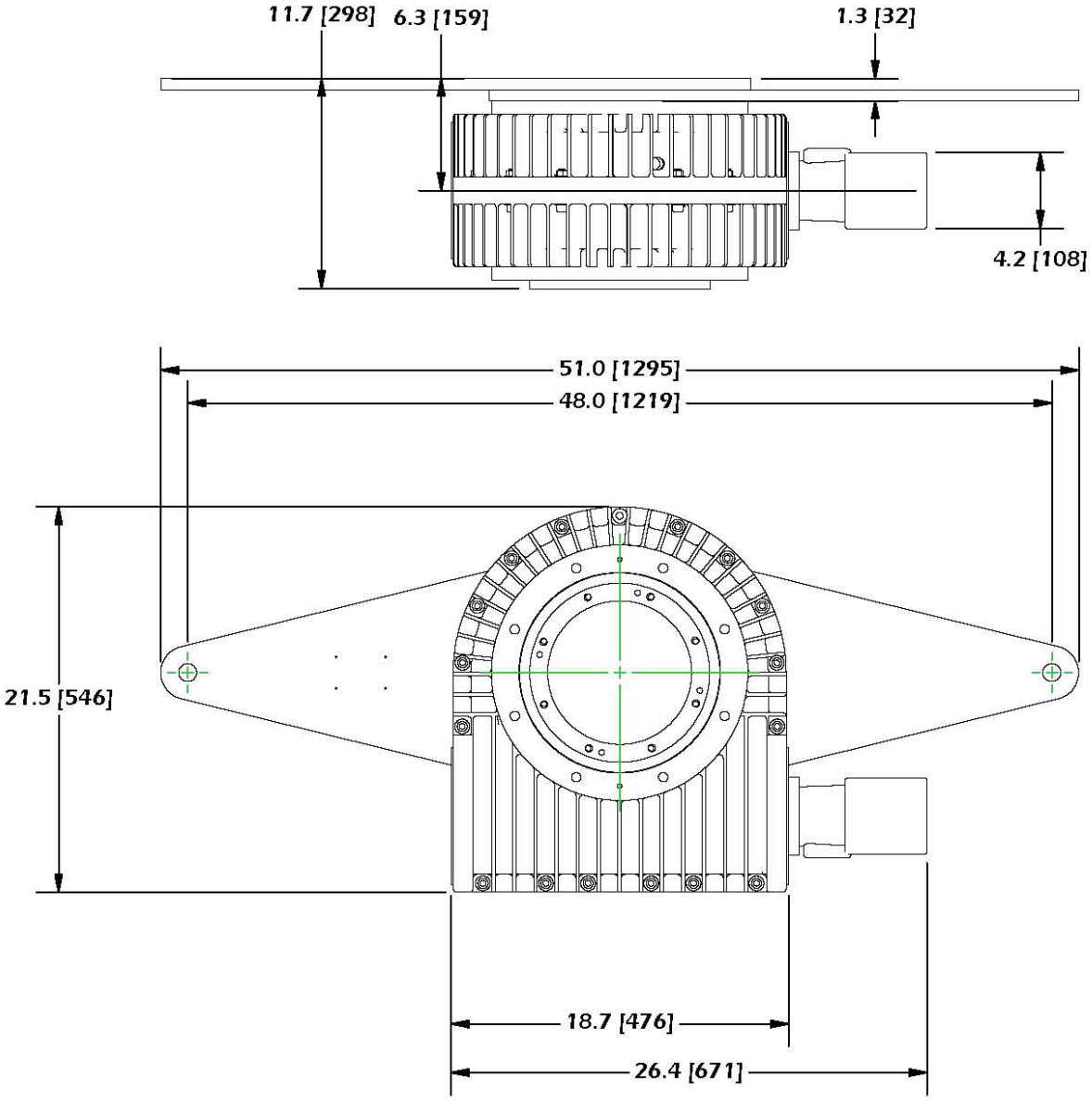


ID MOUNT 34-1/4 TO 62-3/4
CENTERING ASSY NOT SHOWN



ID MOUNT 20-48-1/2
CENTERING ASSY NOT SHOWN

18576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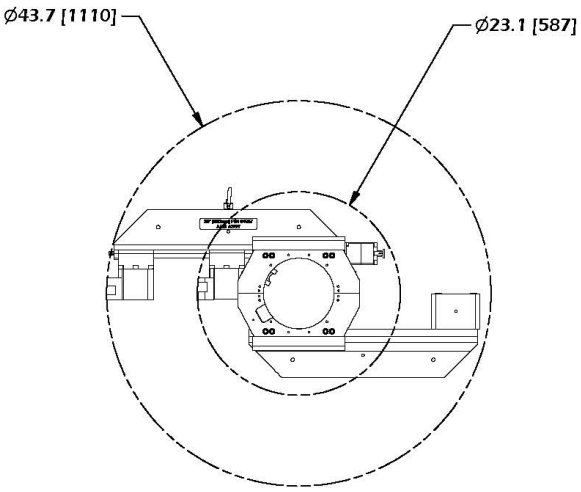
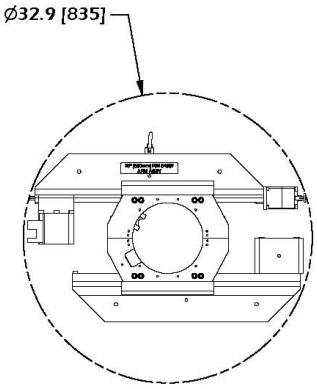
6.3 [159]
1.3 [32]
4.2 [108]
51.0 [1295]
48.0 [1219]
21.5 [546]
18.7 [476]
26.4 [671]

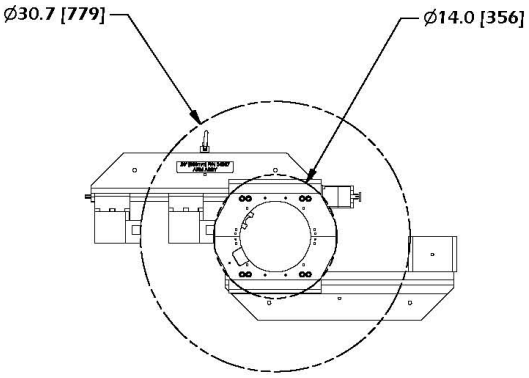
WT 420lbs



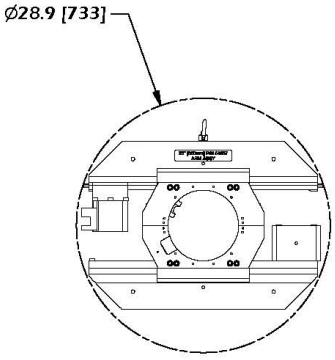
MAX/MIN FACING CONFIGURATION
MAX BORING CONFIGURATION



MIN FACING SWING CONFIGURATION

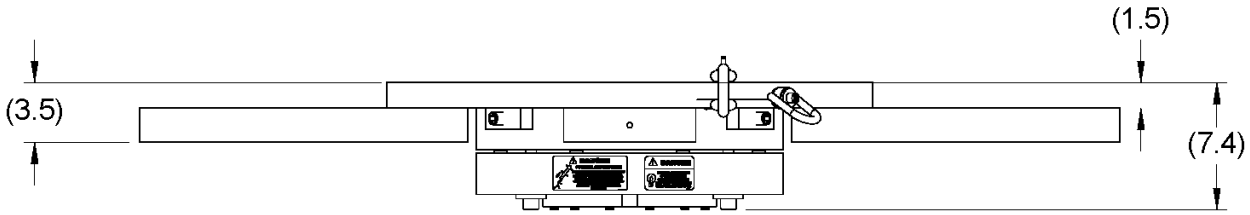


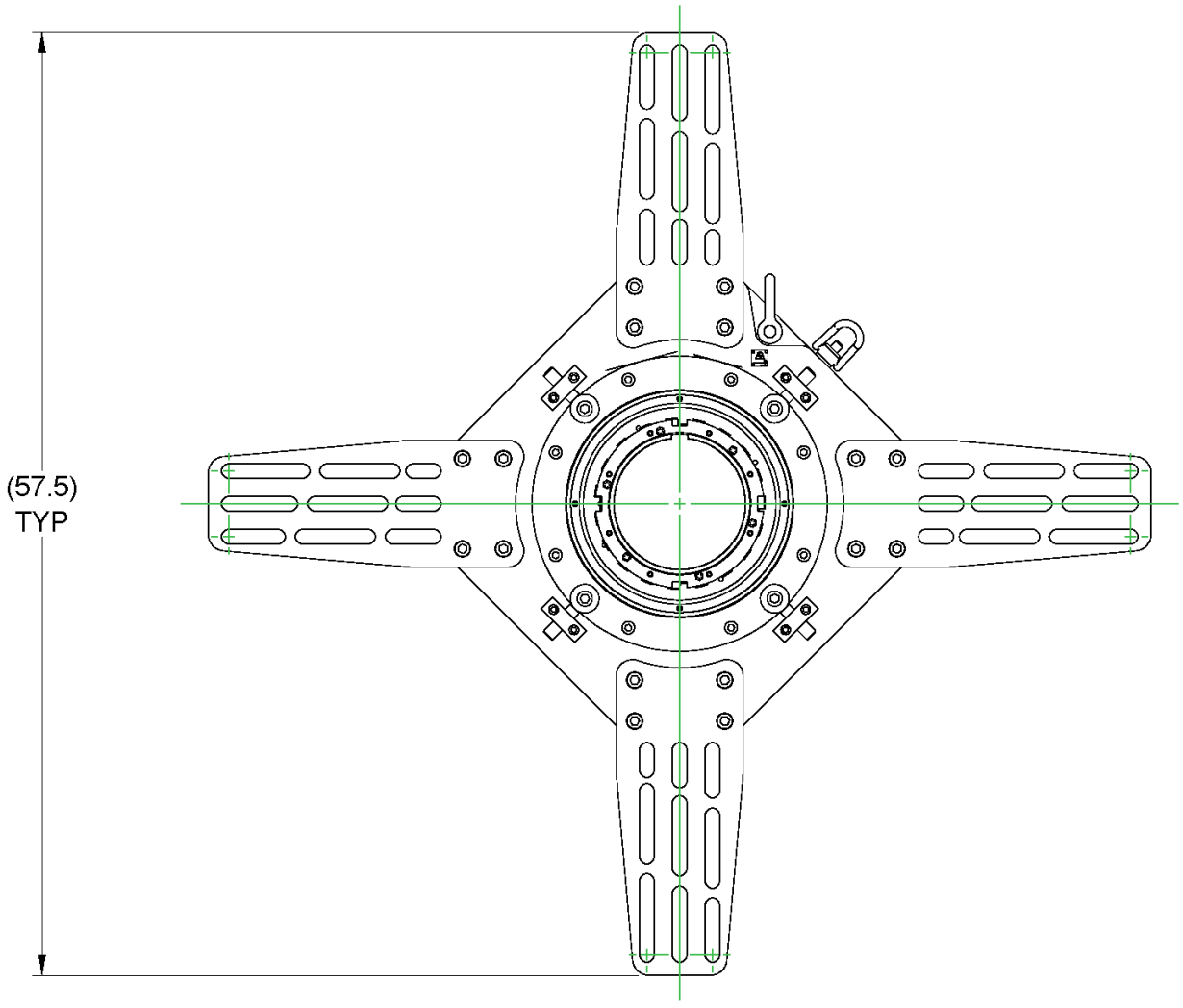
MAX/MIN FACING CONFIGURATION
TOOL POST REVERSED



MIN BORING CONFIGURATION

BB8100 26in arm facing minimum swing





102845 - SUPPORT BRG SELF ALIGNING 8 IN. BAR W/ REMOVEABLE LEGS SPIDER - REV C

FOR REFERENCE ONLY

TOOL KIT AND SPARE PARTS

Table 8. Tool kit (P/N 54264)

P/N	DESCRIPTION	QTY	UOM
13052	WRENCH HEX BIT SOCKET 1/2 X 1/2 (KB)	1	Piece
14526	WRENCH SPEED HANDLE 1/2 DRIVE	1	Piece
14650	WRENCH END 1/2 COMBINATION LONG (KB)	1	Piece
15367	WRENCH STRAP 1-3/4 WIDE X 48 LONG	1	Piece
16793	WRENCH SOCKET 1/2 8 PT X 1/2 DRIVE	1	Piece
17437	WRENCH IMPACT SPANNER	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
40708	CLAMP COLLAR 8 ID TWO PIECE W/ SET SCREWS	2	Piece
57064	MANUAL INSTRUCTION BB8100	1	Piece
71729	WRENCH HEX 3/32 3.25 T-HANDLE	1	Piece
71730	WRENCH HEX 1/8 3.75 T-HANDLE	1	Piece
71731	WRENCH HEX 3/16 4.5 T-HANDLE	1	Piece
71732	WRENCH HEX 7/64 6.25 T-HANDLE	1	Piece

The listed spare parts are most frequently required due to wear, loss, or damage. To avoid unscheduled down time, you may want to stock these items.

Table 9. Spare parts

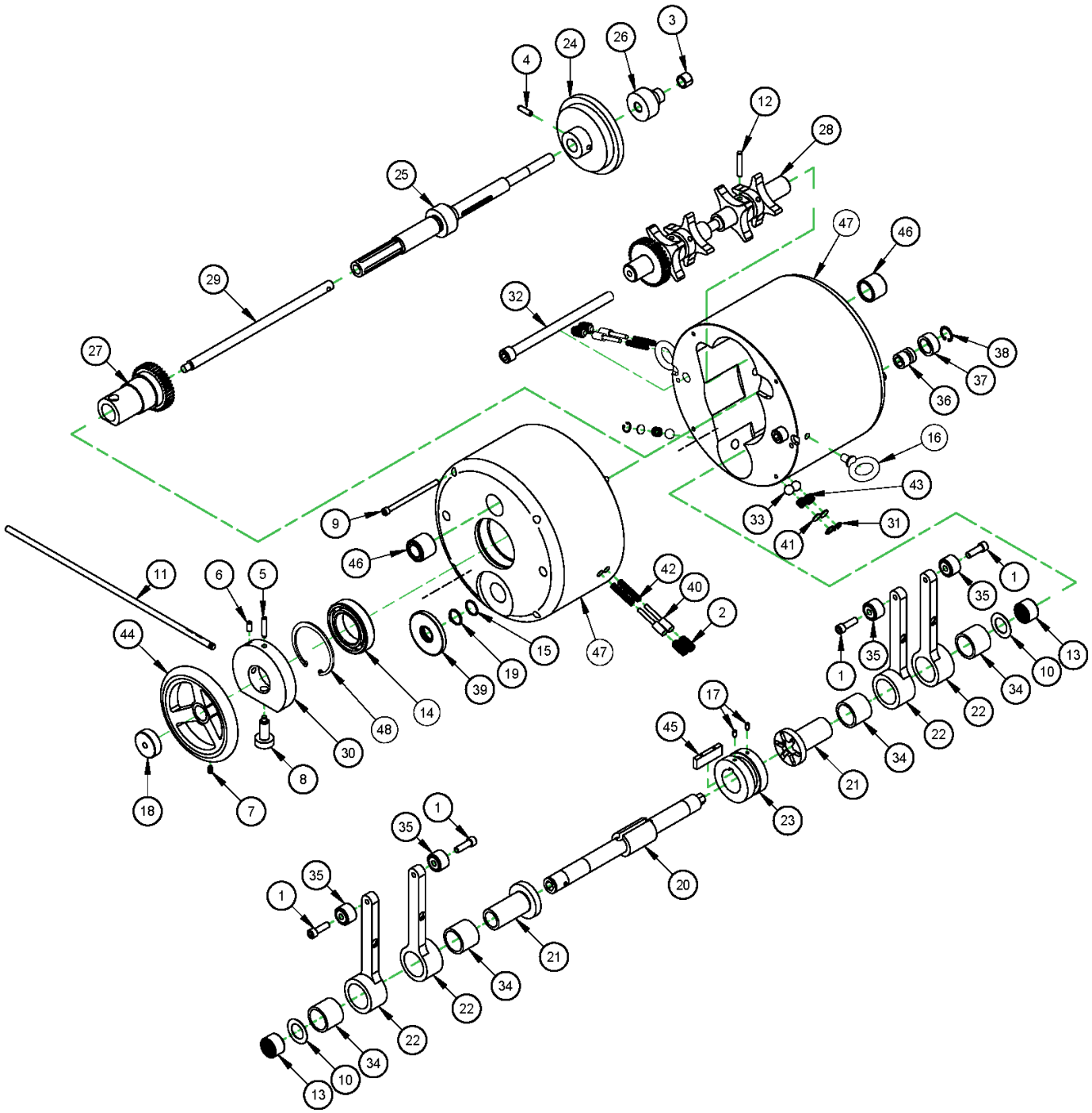
PART NO.	DESCRIPTION	QTY	WHERE USED
17575	Nut leadscrew bearing adj.	1	8" boring bar assembly
11739	Thrust washer	2	
10137	Thrust bearing	1	
13179	Needle bearing	1	
17616	O-ring	1	
17617	O-ring	1	
17448	4-5/8" Jaw	2	ID-mount bearing assembly
17449	8" Jaw	2	
17700	Screw 5/8-18 x 5-1/2 SHCS	2	

PART NO.	DESCRIPTION	QTY	WHERE USED
11823	Thrust washer	2	
10538	Thrust bearing	1	
10858	Gear worm	1	
17447	Crank shaft	1	
10217	3/16 square key	1	
14274	Thrust Washer	2	
13174	Thrust bearing	1	
17508	Worm nut	1	
17520	Screw assembly jam feed	1	
21053	Thrust washer	1	
17007	Thrust washer	1	
17507	Worm gear nut	1	
10612	Snap ring	1	
11739	Thrust washer	1	
11158	5/8" Lifting eye	1	End-mount bearing assembly
15208	5/8 Flat Washer	12	
20390	Screw 5/8-11 x 6 SHCS	4	
11696	Screw 1/2-13 x 3 SHCS	8	
26100	Screw 3/8-24 x 2 HHCS	8	
26101	Screw 1/4-28 x 2 HHCS	6	
20911	Screw 3/4-10 x 1-1/2 SSSFP	4	
20133	Boring head cartridge size 10	1	Manual boring head assembly
15210	Screw 6-32 x 5/8 SHCS	2	
15196	Clamp insert - size 10	2	
15195	Chip breaker - size 10	2	
17822	Carbide insert	6	
23069	Tool holder - positive rake	1	
23141	Chip breaker T3AE	2	
18155	Carbide insert TPG 321 KC-850	10	
13175	Thrust washer	2	Manual Facing Head Assembly
13174	Thrust bearing	2	
14274	Thrust washer	2	

PART NO.	DESCRIPTION	QTY	WHERE USED
11165	Thrust washer	4	
10538	Thrust bearing	2	
10532	Bearing roller clutch	1	
22357	Carbide insert SPU	20	
23046	Chip breaker	6	
25807	Filter element	1	Hydraulic power unit
14420	Hydraulic fluid	5 gal.	
23662	Axial feed bar fuse	1	Mechanical Unit Axial feed assembly Electric Unit
14303	Stop rod	1	
17825	Carrier nut	1	Tool carrier
10453	Screw 3/8-16 x 1-1/4 SHCS	2	
17864	Carrier key	1	
10191	Screw 3/8-16 x 1 SHCS	2	
11678	Screw 10-32 x 3/8 BHSCS	16	

EXPLODED VIEWS AND PARTS

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 to perform service on the machine.



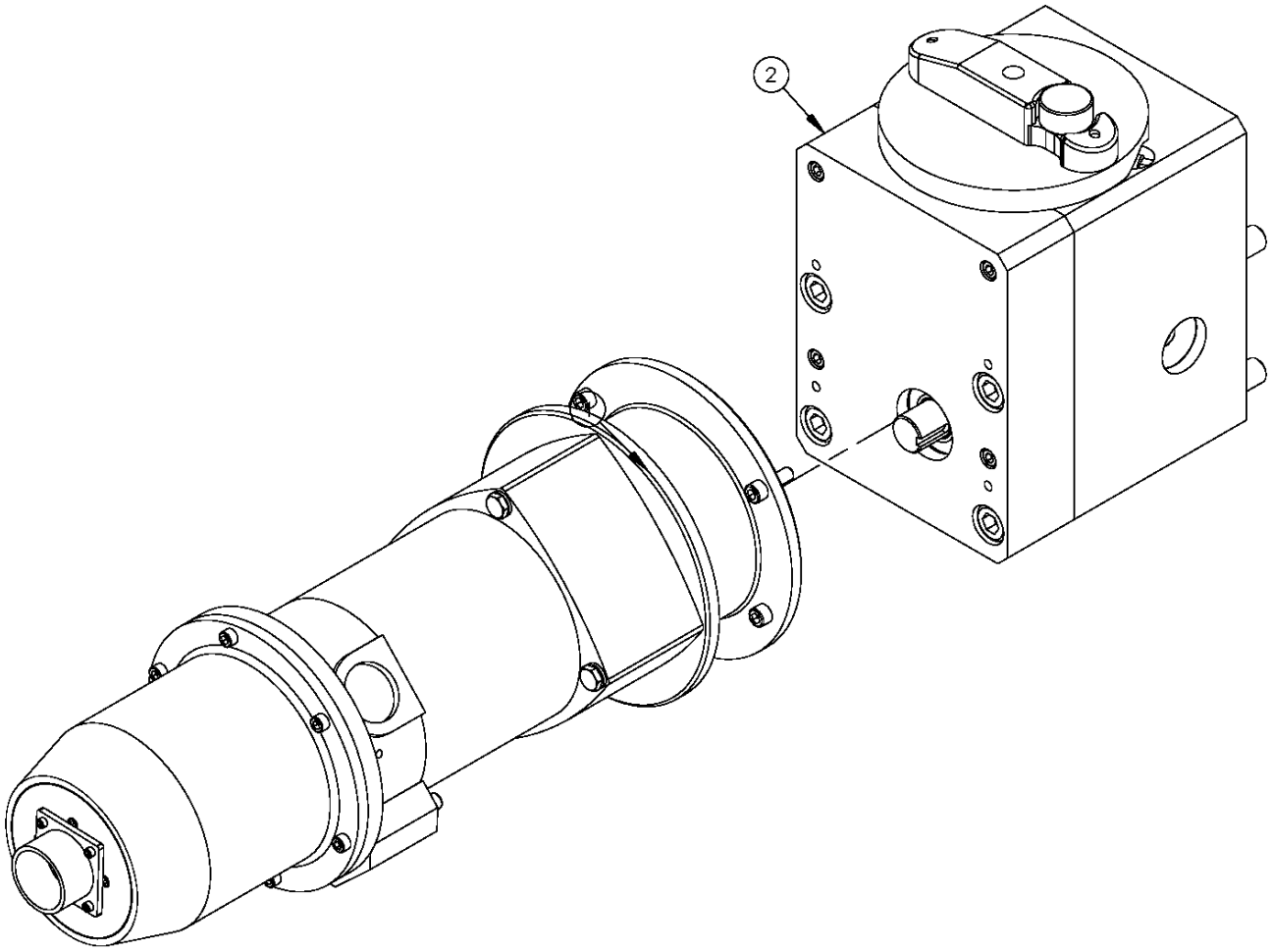
23393 - FEED AXIAL UNIT MECHANICAL 8 IN BAR - REV A

FOR REFERENCE ONLY

PARTS LIST			
ITEM	QTY	P/N:	DESCRIPTION
1	4	10431	SCREW 5/16-18 X 1 SHCS
2	4	11081	SCREW 7/16-14 X 7/8 SSSRN
3	1	11199	BRG NEEDLE 1/2 ID X 11/16 OD X .5 OPEN
4	1	11737	PIN DOWEL 1/4 DIA X 7/8
5	1	12830	SCREW 1/4-20 X 1-1/4 SSSHDP
6	1	13061	DETENT PLUNGER BALL 1/4-20 X .531
7	1	13374	SCREW 1/4-20 X 3/8 SSSHDP
8	1	13376	KNOB SPRING PLUNGER
9	4	13665	SCREW 1/4-20 X 3-3/4 SHCS
10	2	14274	WASHER THRUST .875 ID X 1.437 OD X .030
11	1	14303	ROD-STOP
12	5	14352	PIN DOWEL 1/4 X 1-1/2
13	2	15305	BRG NEEDLE 7/8 ID X 1-1/8 OD X 3/4 OPEN
14	1	16111	BRG BALL 1.7717 ID X 2.9528 OD X .6299 SEALS
15	1	17617	RING O 1/16 X 3/4 X 7/8
16	2	19239	EYE LIFTING 3/8 MODIFIED
17	2	20722	SCREW 10-32 X 3/8 SSSHDP
18	1	22406	KNOB FEED ADJUST
19	1	23269	RING SNAP 13/16 OD X .042 TH CRESCENT
20	1	23395	SHAFT OUTPUT
21	2	23396	BUSHING FEED DIRECTION
22	4	23397	ARM RATCHET AXIAL FEED UNIT BB8000
23	1	23399	SLIDE FEED DIRECTION SLAVE
24	1	23400	SLIDE-FEED DIRECTION MASTER
25	1	23401	SHAFT FEED ADJUSTING
26	1	23402	CONE FEED ADJUST
27	1	23403	GEAR CAM DRIVE
28	1	23407	CAMSHAFT ASSY
29	1	23408	ROD SHIFTER
30	1	23409	HUB TORQUE BB8000
31	3	23617	RING SNAP 1/2 ID X .035 TH
32	2	23618	SCREW 1/2-13 X 7-1/2 SHCS
33	3	23620	BALL STEEL 1/2 DIA
34	4	23622	BRG ROLLER CLUTCH 1.18 ID X 1.46 OD X 1.181
35	4	23623	BRG CAM FOLLOWER 1 OD X .625 WIDE NO STUD
36	1	23662	FUSE AXIAL FEED 8 IN BAR
37	1	23664	BUSHING FUSE RETAINER
38	1	23669	RING SNAP 13/16 ID
39	1	23858	DIAL AXIAL FEED
40	4	23936	PIN SPRING
41	3	23938	PLUG SPRING
42	4	23939	SPRING COMP .30 OD X .042 WIRE X 2.25 LONG
43	3	23940	SPRING COMP .48 OD X .042 WIRE X .88 LONG
44	1	24380	HANDWHEEL MODIFIED 5-1/2 OD
45	1	25674	KEY MAIN DRIVE
46	2	27353	BRG NEEDLE 1 ID X 1-1/4 OD X 1 CLOSED
47	1	41722	BOX AXIAL FEED MECHANICAL BB8000
48	1	48022	RING SNAP 2.953 ID (75mm)

23393 - FEED AXIAL UNIT MECHANICAL 8 IN BAR - REV A

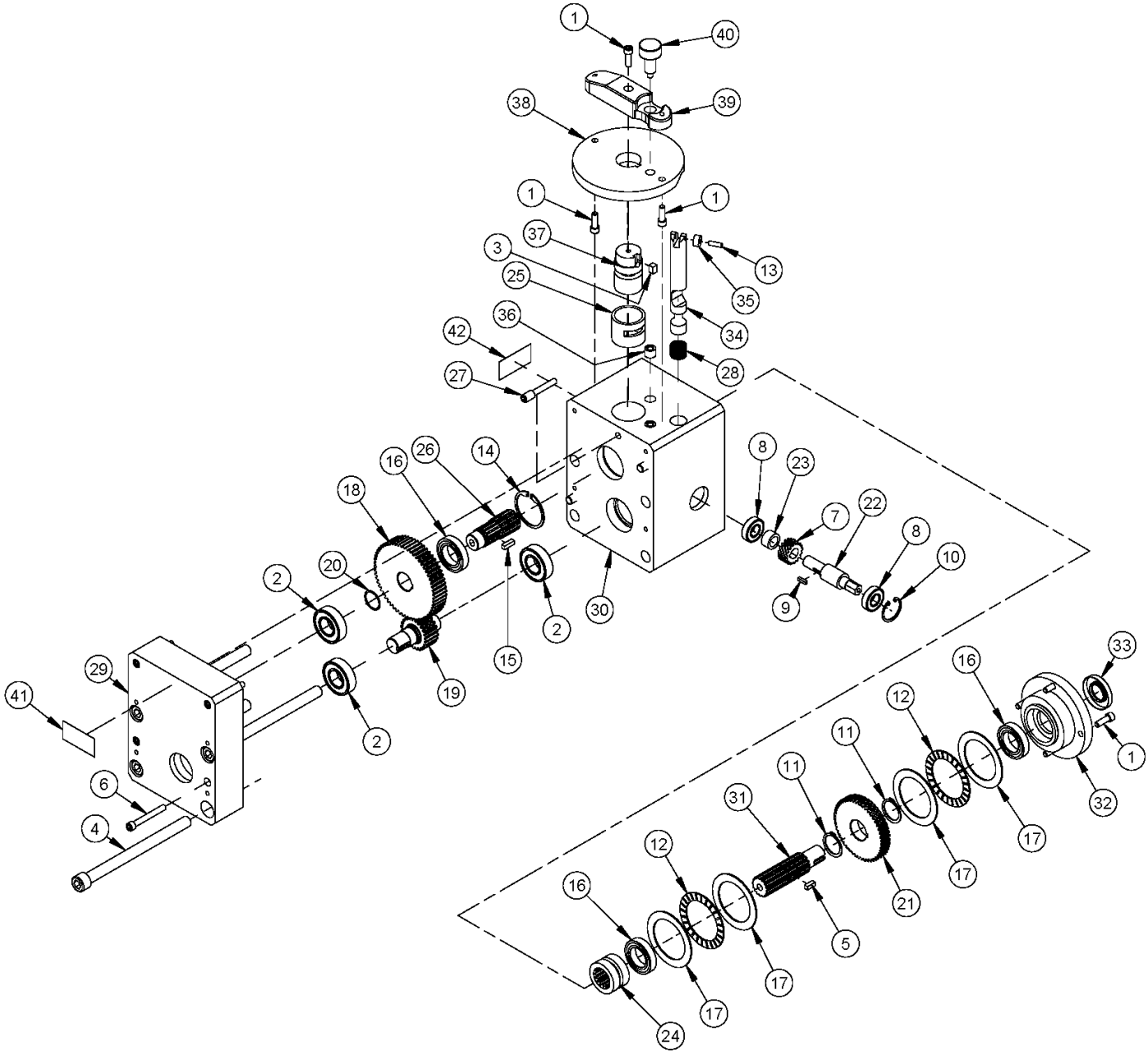
FOR REFERENCE ONLY



PARTS LIST			
ITEM	QTY	P/N:	DESCRIPTION
1	1	41062	FEED AXIAL ELECTRIC
2	1	41064	ASSY MECHANICAL RAPID FEED FOR ELECTRIC AXIAL FEED
3	1	41090	(NOT SHOWN) NUT DRIVER BIT 7/16 HEX
4	1	61889	(NOT SHOWN) WRENCH SOCKET 7/16 X 1/2 DRIVE 12 PT

41070 - FEED AXIAL ELECTRIC ASSY W/ MECH RAPID - REV B

FOR REFERENCE ONLY



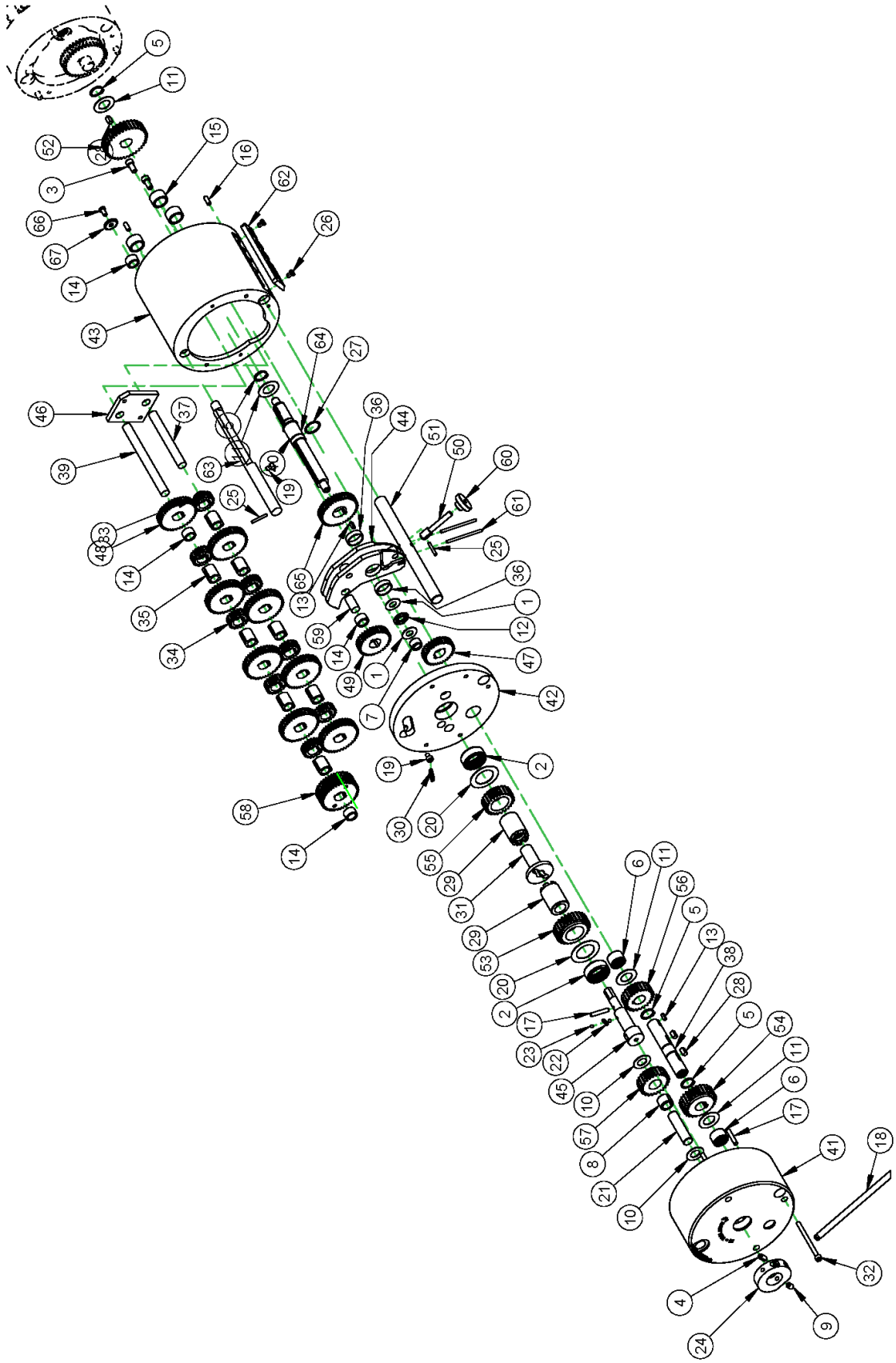
41064 - ASSY MECHANICAL RAPID FEED FOR ELECTRIC AXIAL FEED - REV E

FOR REFERENCE ONLY

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

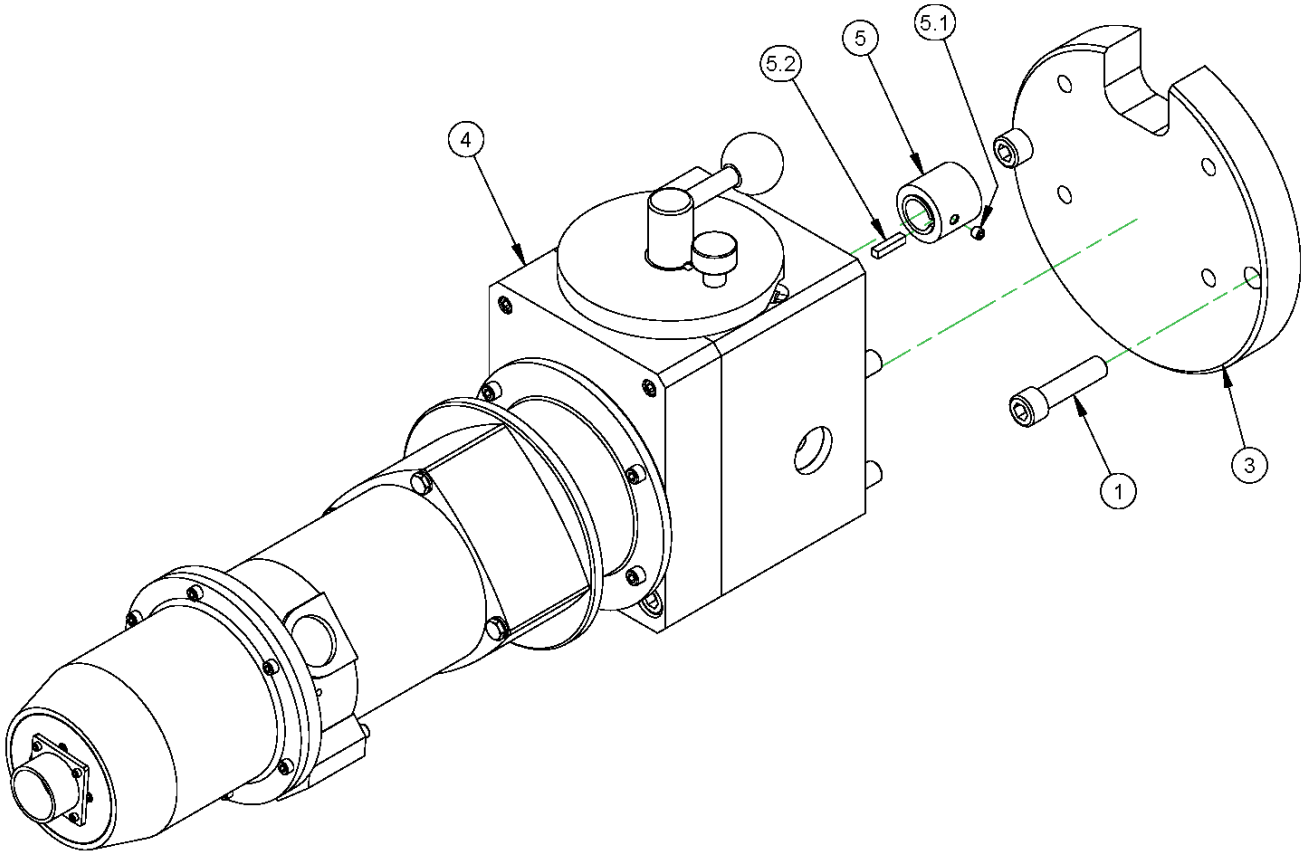


57720

ASSY UNIVERSAL AXIAL FEED CHANGE GEAR

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	35	8	56948	BUSHING COMPOUND STEEL .4375 BORE DOUBLE KEY
2	2	10524	BRG NEEDLE 1 ID X 1-1/4 OD X 1/2 OPEN				
3	2	10800	SCREW 1/4-20 X 1/2 SHCS	36	2	56990	BUSHING OILITE 3/4 ID X 7/8 OD X 1/4
4	1	10848	PLUNGER DETENT SPRING STUBBY 1/4-20 X .531	37	1	57630	SHAFT CHANGE GEAR SECONDARY 6279
				38	1	57631	SHAFT TRANSFER 6279
5	4	11019	RING SNAP 5/8 OD X .035 THICK	39	1	57632	SHAFT CHANGE GEAR PRIMARY 6279
6	2	11026	BRG NEEDLE 5/8 ID X 13/16 OD X .500 OPEN	40	1	57633	SHAFT SELECTOR OUTPUT 6279
7	1	11037	BRG NEEDLE 3/8 ID X 9/16 OD X .500 OPEN	41	1	57712	END COVER
8	1	11199	BRG NEEDLE 1/2 ID X 11/16 OD X .5 OPEN	42	1	57713	HOUSING INTERMEDIATE PLATE
9	1	11325	SCREW 1/4-20 X 3/8 SSSCP	43	1	57714	HOUSING MAIN SECTION
10	2	11736	WASHER THRUST .500 ID X .937 OD X .030	44	1	57717	SHIFTER PLATE
11	4	11823	WASHER THRUST .625 ID X 1.125 OD X .030	45	1	57719	SHAFT TORQUE ARM
12	1	11844	BRG THRUST .375 ID X .812 OD X .0781	46	1	57722	SPACER HOUSING
				47	1	57728	GEAR SPUR 20DP 32T 14.5PA .625 BORE DOUBLE KEY
13	2	12360	KEY 1/8 SQ X .37				
14	4	12952	BUSHING OILITE 7/16 ID X 5/8 OD X 3/8	48	8	57729	GEAR SPUR 20DP 40T 14.5PA .625 BORE DOUBLE KEY
15	3	13458	BUSHING OILITE 5/8 ID X 13/16 OD X 1/2				
16	2	13948	PIN DOWEL 3/16 DIA X 1/2	49	1	57730	GEAR SPUR 20DP 34T 14.5PA .625 BORE DOUBLE KEY
17	3	14284	PIN DOWEL 3/16 DIA X 1				
18	1	14303	ROD-STOP	50	1	57731	LEVER SELECTOR
19	2	14726	SCREW 10-32 X 1/4 SHCS	51	1	57732	ROD SELECTOR
20	2	15079	WASHER THRUST 1.000 ID X 1.562 OD X .030	52	1	57733	GEAR SPUR 16DP 36T 14.5PA MODIFIED
21	1	15410	PIN DOWEL 1/2 DIA X 2	53	1	57734	GEAR SPUR 16DP 28T 14.5PA MODIFIED
22	1	19561	SPRING COMP .148 OD X .023 WIRE X .50 LONG STAINLESS	54	1	57735	GEAR SPUR 16DP 28T 14.5PA .5 FACE MODIFIED
23	2	19562	BALL STEEL 5/32 DIA	55	1	57736	GEAR SPUR 16DP 24T 14.5PA .5 F MODIFIED
24	1	22307	HUB TORQUE	56	1	57737	GEAR SPUR 16DP 24T 14.5PA .5 F 5/8 BORE MODIFIED
25	2	25650	PIN DOWEL 1/8 DIA X 7/8				
26	2	26727	SCREW 10-32 X 1/4 LHSCS	57	1	57738	GEAR SPUR 16DP 24T 14.5PA .5 F MODIFIED
27	2	30693	RING SNAP 3/4 OD SPIRAL MEDIUM DUTY	58	1	57740	GEAR SPUR 20DP 40T CLUSTER
28	3	37798	KEY 3/16 X 3/16 SQUARE X 3/8	59	1	57741	SHAFT IDLER 6279
29	2	44721	DRIVE BUSHING	60	1	57745	KNOB 1/4-20 KNURLED STAINLESS
30	1	44970	SPRING EXT .187 OD X .023 WIRE X 1.00 LONG	61	2	57893	PIN DOWEL 1/8 DIA X 2
31	1	45870	DRIVE SHAFT FEEDBOX REVERSE CLUTCH INPUT	62	1	57894	PLATE SHIFT SELECTOR
				63	1	57911	SHAFT RATCHET
32	3	56357	SCREW 10-24 X 2.5 SHCS	64	1	60851	BUSHING KEYED 5/8 ID X 3/4 OD X 1.215
33	12	56650	SHIM 12 mm ID X 18 mm OD X .2 mm	65	1	65037	GEAR SPUR 20DP 40T 14.5PA .375 MODIFIED
34	8	56946	GEAR SPUR 20DP 20T 14.5PA .625 DOUBLE KEY	67	1	84039	WASHER SHAFT RATCHET
				66	1	74301	SCREW 10-32 X 3/8 LHSCS

57720 - ASSY UNIVERSAL AXIAL FEED CHANGE GEAR - REV B

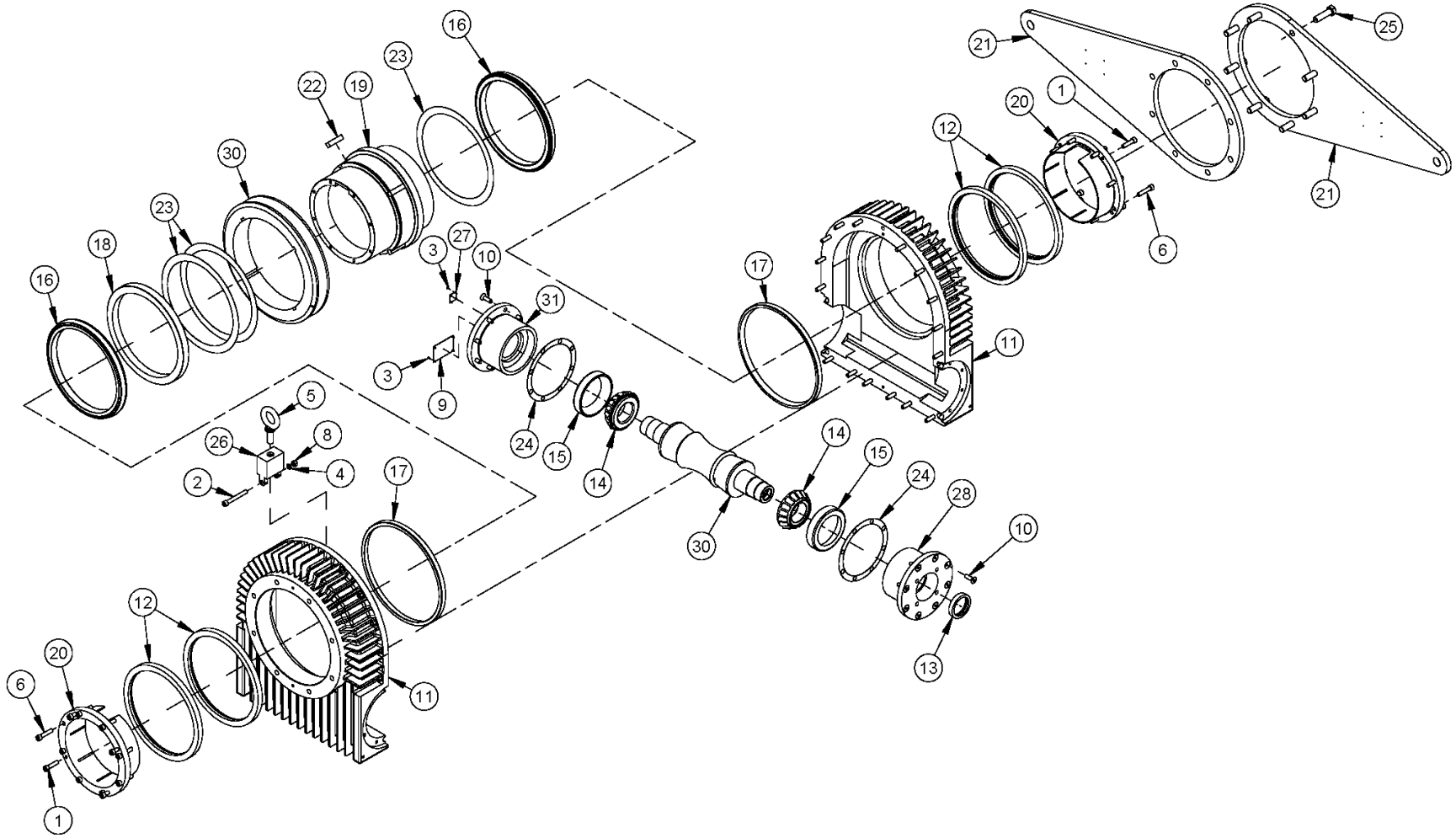


AVAILABLE CONFIGURATIONS	
PART NO	DESCRIPTION
40724	FEED ELEC W/MECH RAPID & CONTROLLER 8 BAR 230V
43734	FEED ELEC W/MECH RAPID & CONTROLLER 8 BAR 120V
71736	FEED ELEC W/MECH RAPID NO CONTROLLER 8 BAR

PARTS LIST			
ITEM	QTY	P/N:	DESCRIPTION
1	2	14036	SCREW 1/2-13 X 2 SHCS
2	1	40720	(NOT SHOWN) ASSY CONTROLLER BB8000/6000 AXIAL FEED 230VAC
		42368	(NOT SHOWN) ASSY CONTROLLER BB8000/6000 AXIAL FEED 120VAC
3	1	41067	PLATE ADAPTER ELEC/MECH FEED BB8000 8 INCH
4	1	41070	FEED AXIAL ELECTRIC ASSY W/ MECH RAPID
5	1	41475	COUPLING, ASSY 3/4 KEYED TO HEX 1/2
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

81770 - CHART FEED ELEC W/ MECH RAPID 8 BAR - REV A

FOR REFERENCE ONLY



82037 - CHART DRIVE ROTATIONAL ASSY 8 DIA BB8100 - REV E

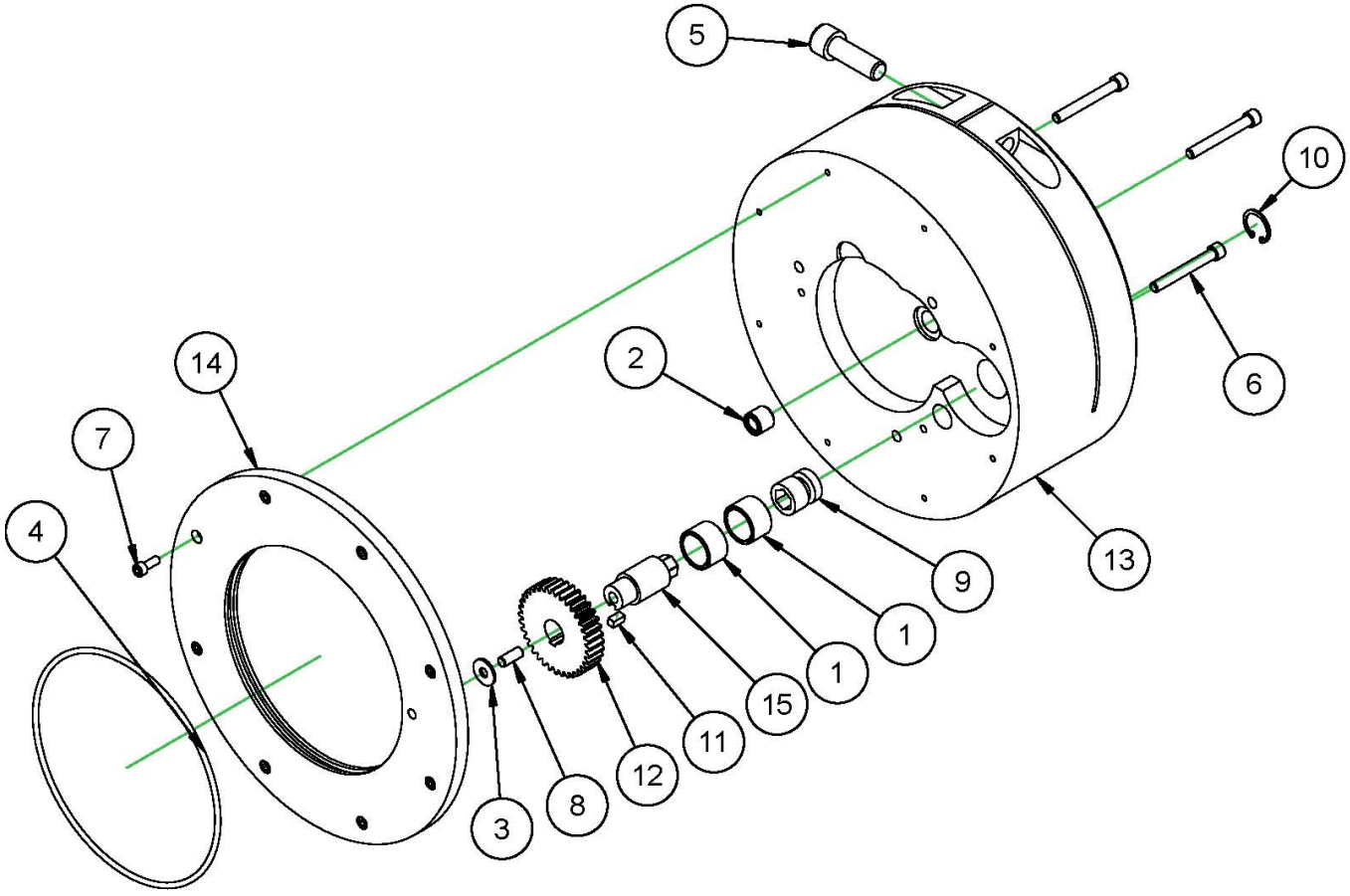
REFERENCE ONLY

PARTS LIST			
ITEM	QTY	P/N:	DESCRIPTION
1	8	10474	SCREW 3/8-16 X 1-1/2 SHCS
2	1	10568	SCREW 3/8-16 X 3
3	8	10588	SCREW DRIVE #2 x 1/4 HOLE SIZE .089
4	1	10595	WASHER 3/8 LOCW
5	1	11158	LIFTING EYE 5/8-11 X 1-3/4 1-3/8 ID 2-9/16 OD 4.6875 OAL 4000 LBS
6	16	11211	SCREW 3/8-16 X 1-3/4 SHCS
7	2	12579	FTG PLUG 1/2 NPTM SOCKET
8	1	13987	NUT 3/8-16 STDN ZINC PLATED
9	1	14684	PLATE SERIAL YEAR MODEL 2.0 X 3.0
10	16	15018	SCREW 3/8-16 X 1-1/4 FHSCS
11	1	17286	HOUSING ROTATIONAL DRIVE ASSY
12	4	17305	SEAL 9.75 ID X 11.125OD X .625
13	1	17306	SEAL 2.125 ID X 2.750 OD X .5
14	2	17307	BRG CONE 2.2500 ID X 1.4875 WIDE
15	2	17308	BRG CUP 4.875 OD X 1.000 WIDE
16	2	17309	BRG CONE 9.750 ID X .875 WIDE
17	2	17310	BRG CUP 12.000 OD X .625 WIDE - SEE NOTE
18	1	17322	SPACER ROTATIONAL DRIVE
19	1	17324	CARRIER WORM GEAR BB8000
20	2	17325	RING LOCK BAR DRIVE
21	2	17345	ARM TORQUE ROTATIONAL DRIVE
22	4	17356	KEY 1/2 SQ 2.00 SQ BOTH ENDS
23	3	17372	SHIM SET 9.80 ID
24	2	17373	SHIM SET 5.70 ID
25	8	17378	SCREW 5/8-11 X 2-1/4 HHCS
26	1	17391	CLEVIS ROTATIONAL DRIVE
27	1	29152	PLATE MASS CE
28	1	31425	CARRIER ROTATIONAL DRIVE SAE A FLANGE MOTOR
29	84	32569	(NOT SHOWN) OIL SYNTHETIC FOR CONE DRIVE MOBIL SHC 634
30	1	CHART	CONE DRIVE MODIFIED
31	1	54721	CARRIER ROTATIONAL DRIVE SAE A FLANGE MOTOR

NOTE: PART IS NOT A FIELD SERVICABLE ITEM!

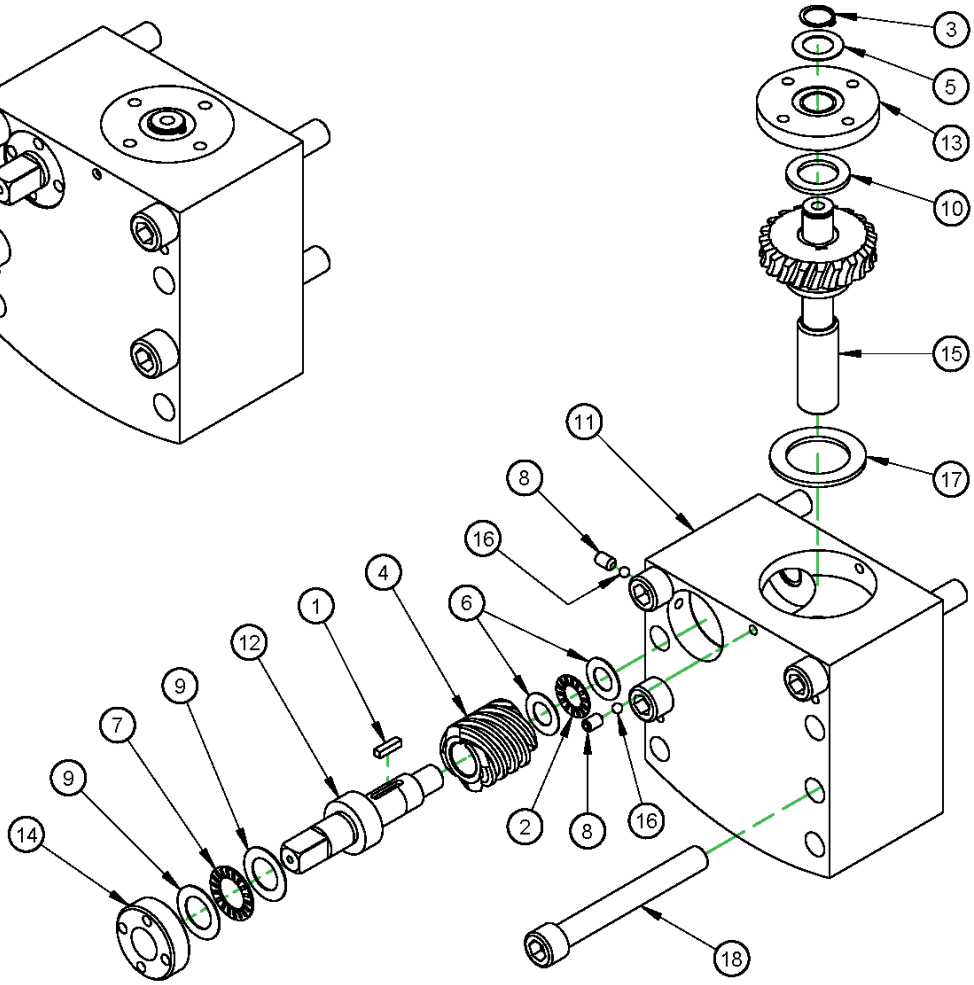
82037 - CHART DRIVE ROTATIONAL ASSY 8 DIA BB8100 - REV E

REFERENCE ONLY



PARTS LIST			
ITEM	QTY	PART No.	DESCRIPTION
1	2	10143	BUSHING OILITE 13/16 ID X 1 OD X 5/8
2	1	11021	BRG NEEDLE 3/8 ID X 9/16 OD X .500 OPEN
3	1	11046	WASHER THRUST .250 ID X .687 OD X .060
4	1	11113	RING O 1/8 X 6 ID X 6-1/4 OD
5	1	11691	SCREW 1/2-13 X 1-1/2 SHCS
6	3	12444	SCREW 1/4-20 X 2 SHCS
7	8	12743	SCREW 10-24 X 1/2 SHCS
8	1	15756	PIN DOWEL 1/4 DIA X 5/8
9	1	23662	FUSE AXIAL FEED 8 IN BAR
10	1	23669	RING SNAP 13/16 ID
11	1	37798	KEY 3/16 X 3/16 SQUARE X 3/8
12	1	57733	GEAR SPUR 16DP 36T 14.5PA MODIFIED
13	1	57750	CLAMP COVER 8 DIA BAR
14	1	57753	CLAMP COVER 8 DIA BAR
15	1	57756	SHAFT OUTPUT 1/2 HEX 6279

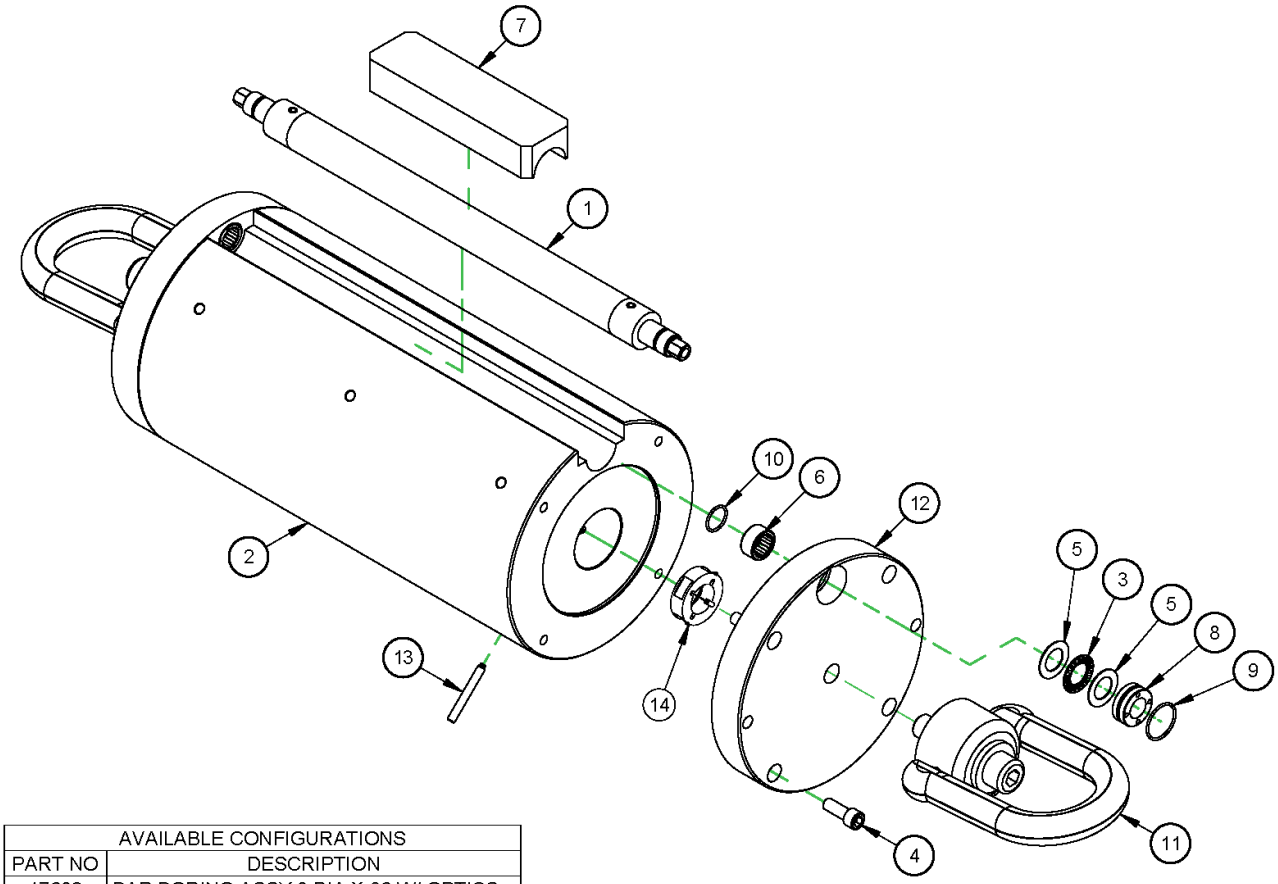
UNIVERSAL AXIAL FEED CHANGE GEAR ASSY 6279-S2 57752



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



AVAILABLE CONFIGURATIONS	
PART NO	DESCRIPTION
17602	BAR BORING ASSY 8 DIA X 96 W/ OPTICS
17603	BAR BORING ASSY 8 DIA X 120 W/ OPTICS
17604	BAR BORING ASSY 8 DIA X 144 W/ OPTICS
17605	BAR BORING ASSY 8 DIA X 168 W/ OPTICS
17606	BAR BORING ASSY 8 DIA X 192 W/ OPTICS
17607	BAR BORING ASSY 8 DIA X 216 W/ OPTICS
17608	BAR BORING ASSY 8 DIA X 240 W/ OPTICS
22160	BAR BORING ASSY 8 DIA X 252 W/ OPTICS
40219	BAR BORING ASSY 8 DIA X 264 W/ OPTICS
54753	BAR BORING ASSY 8 DIA X 288 W/ OPTICS

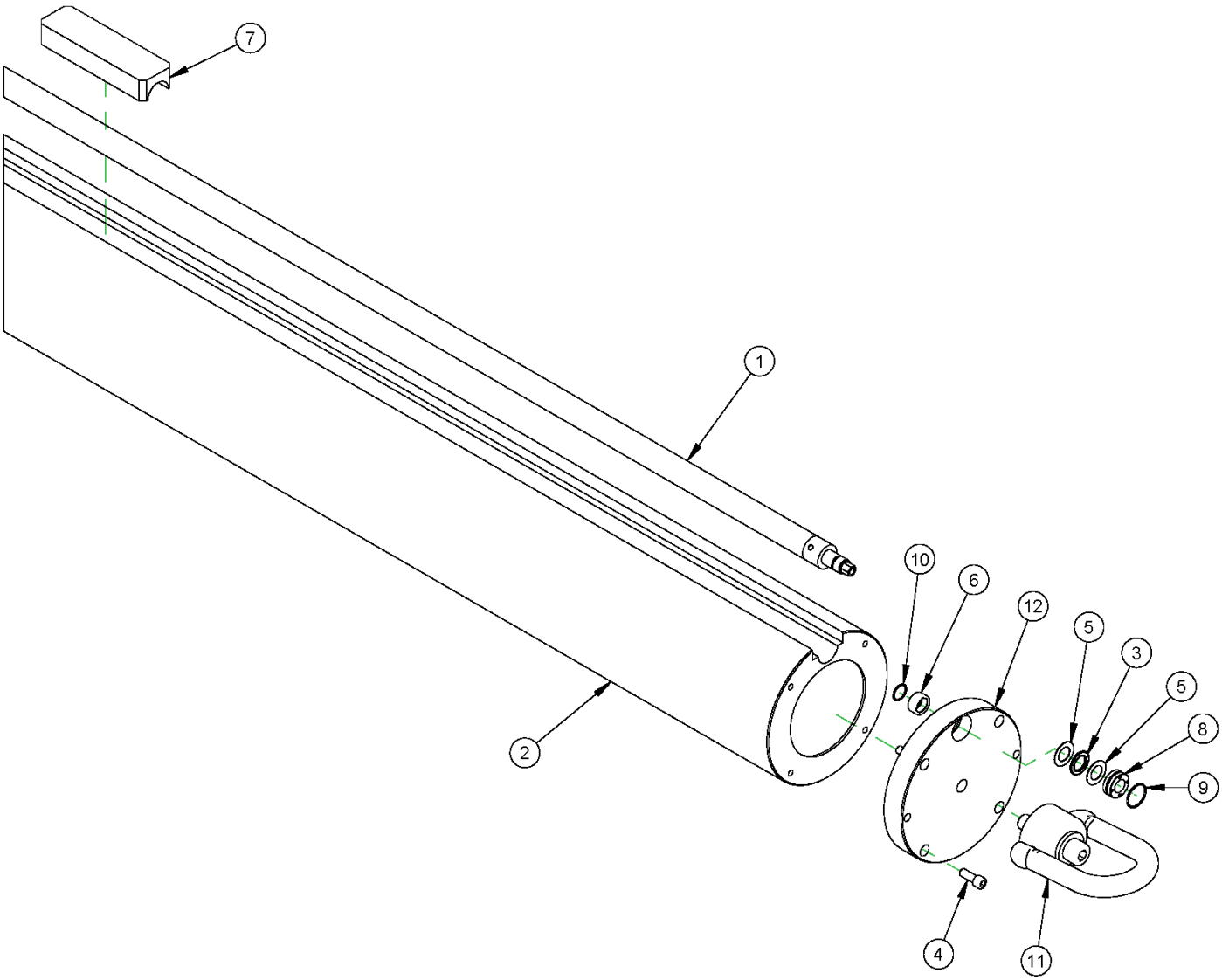
PARTS LIST			
ITEM	QTY	P/N:	DESCRIPTION
1	1	TABLE 1	LEADSCREW ASSEMBLY
2	1	TABLE 2	BORING BAR 8 DIA W/ OPTICS
3	2	10137	BRG THRUST .750 ID X 1.250 OD .0781
4	8	10191	SCREW 3/8-16 X 1 SHCS
5	4	11739	WASHER THRUST .750 ID X 1.250 OD X .0312
6	2	13179	BRG NEEDLE 3/4 ID X 1 OD X .500 OPEN
7	1	17568	KEY ROTATIONAL DRIVE 8 DIA BAR BB8000
8	2	17575	NUT LEADSCREW BRG ADJ 1-1/4 DIA
9	2	17616	RING O 1/16 X 1-1/8 ID X 1-1/4 OD
10	2	17617	RING O 1/16 X 3/4 X 7/8
11	2	23743	RING HOIST SAFETY HEAVY-DUTY 7000 LB
12	2	33614	CAP END 8 DIA BORING BAR
13	12	40845	SCREW 1/4-28 X 2 SSSHDP
14	3	81819	ASSY TARGET ALIGNMENT WITH CROSSHAIR

LEADSCREWS (TABLE 1)	
P/N	DESCRIPTION
22629	LEADSCREW ASSY 8 DIA X 96 BORING BAR
22628	LEADSCREW ASSY 8 DIA X 120 BORING BAR
22627	LEADSCREW ASSY 8 DIA X 144 BORING BAR
22626	LEADSCREW ASSY 8 DIA X 168 BORING BAR
22625	LEADSCREW ASSY 8 DIA X 192 BORING BAR
22624	LEADSCREW ASSY 8 DIA X 216 BORING BAR
22623	LEADSCREW ASSY 8 DIA X 240 BORING BAR
22622	LEADSCREW ASSY 8 DIA X 252 BORING BAR
54757	LEADSCREW ASSY 8 DIA X 264 BORING BAR
26325	LEADSCREW ASSY 8 DIA X 288 BORING BAR

BORING BARS (TABLE 2)	
P/N	DESCRIPTION
17579	BAR BORING 8 DIA X 96 FOR OPTICS
17580	BAR BORING 8 DIA X 120 FOR OPTICS
17581	BAR BORING 8 DIA X 144 FOR OPTICS
17582	BAR BORING 8 DIA X 168 FOR OPTICS
17583	BAR BORING 8 DIA X 192 FOR OPTICS
17584	BAR BORING 8 DIA X 216 FOR OPTICS
17585	BAR BORING 8 DIA X 240 FOR OPTICS
22147	BAR BORING 8 DIA X 252 FOR OPTICS
40216	BAR BORING 8 DIA X 264 FOR OPTICS
26131	BAR BORING 8 DIA X 288 FOR OPTICS

72814 - CHART BORING BAR 8 DIA WITH OPTICS - REV A

FOR REFERENCE ONLY



PARTS LIST			
ITEM	QTY	P/N:	DESCRIPTION
1	1	TABLE 1	LEADSCREW ASSEMBLY
2	1	TABLE 2	BAR BORING 8 DIA
3	2	10137	BRG THRUST .750 ID X 1.250 OD .0781
4	8	10191	SCREW 3/8-16 X 1 SHCS
5	4	11739	WASHER THRUST .750 ID X 1.250 OD X .0312
6	2	13179	BRG NEEDLE 3/4 ID X 1 OD X .500 OPEN
7	1	17568	KEY ROTATIONAL DRIVE 8 DIA BAR BB8000
8	2	17575	NUT LEADSCREW BRG ADJ 1-1/4 DIA
9	2	17616	RING O 1/16 X 1-1/8 ID X 1-1/4 OD
10	2	17617	RING O 1/16 X 3/4 X 7/8
11	2	23743	RING HOIST SAFETY HEAVY-DUTY 7000 LB
12	2	33614	CAP END 8 DIA BORING BAR

81784 - CHART ASSY BORING BAR 8 DIA - REV A

FOR REFERENCE ONLY

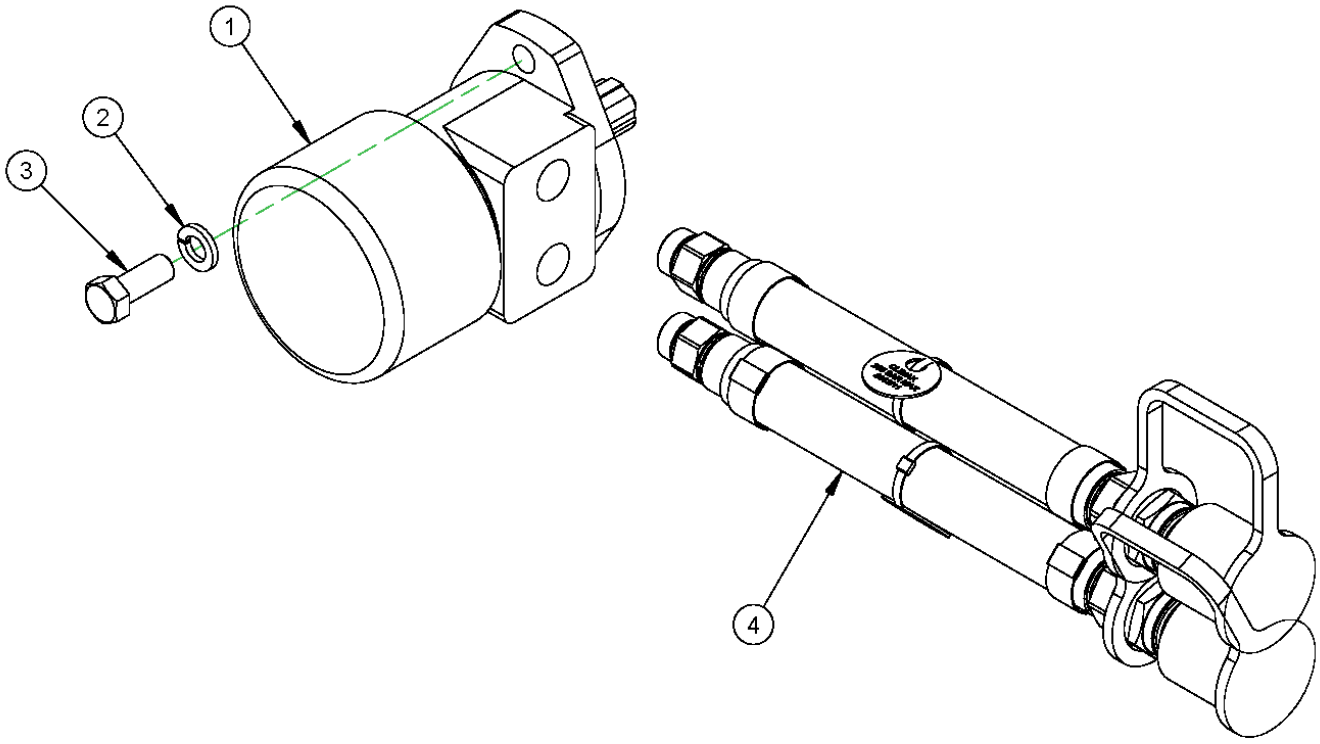
AVAILABLE CONFIGURATIONS	
PART NO	DESCRIPTION
34305	BAR BORING ASSY 8 DIA X 96
34306	BAR BORING ASSY 8 DIA X 120
34307	BAR BORING ASSY 8 DIA X 144
34308	BAR BORING ASSY 8 DIA X 168
34309	BAR BORING ASSY 8 DIA X 192
34310	BAR BORING ASSY 8 DIA X 216
34311	BAR BORING ASSY 8 DIA X 240
34312	BAR BORING ASSY 8 DIA X 252
54755	BAR BORING ASSY 8 DIA X 264
49077	BAR BORING ASSY 8 DIA X 275
34313	BAR BORING ASSY 8 DIA X 288
49078	BAR BORING ASSY 8 DIA X 315
42062	BAR BORING ASSY 8 DIA X 318
49079	BAR BORING ASSY 8 DIA X 354

LEADSCREWS (TABLE 1)	
PART NO	DESCRIPTION
22629	LEADSCREW ASSY 8 DIA X 96 BORING BAR
22628	LEADSCREW ASSY 8 DIA X 120 BORING BAR
22627	LEADSCREW ASSY 8 DIA X 144 BORING BAR
22626	LEADSCREW ASSY 8 DIA X 168 BORING BAR
22625	LEADSCREW ASSY 8 DIA X 192 BORING BAR
22624	LEADSCREW ASSY 8 DIA X 216 BORING BAR
22623	LEADSCREW ASSY 8 DIA X 240 BORING BAR
22622	LEADSCREW ASSY 8 DIA X 252 BORING BAR
54757	LEADSCREW ASSY 8 DIA X 264 BORING BAR
49083	LEADSCREW ASSY 8 DIA X 275 BORING BAR
26325	LEADSCREW ASSY 8 DIA X 288 BORING BAR
49084	LEADSCREW ASSY 8 DIA X 315 BORING BAR
42063	LEADSCREW ASSY 8 DIA X 318 BORING BAR
49085	LEADSCREW ASSY 8 DIA X 354 BORING BAR

BORING BARS (TABLE 2)	
PART NO	DESCRIPTION
34314	BAR BORING 8 DIA X 96
34315	BAR BORING 8 DIA X 120
34316	BAR BORING 8 DIA X 144
34317	BAR BORING 8 DIA X 168
34318	BAR BORING 8 DIA X 192
34319	BAR BORING 8 DIA X 216
34320	BAR BORING 8 DIA X 240
34321	BAR BORING 8 DIA X 252
54756	BAR BORING 8 DIA X 264
49064	BAR BORING 8 DIA X 275
34322	BAR BORING 8 DIA X 288
49065	BAR BORING 8 DIA X 315
41277	BAR BORING 8 DIA X 318
49066	BAR BORING 8 DIA X 354

81784 - CHART ASSY BORING BAR 8 DIA - REV A

FOR REFERENCE ONLY

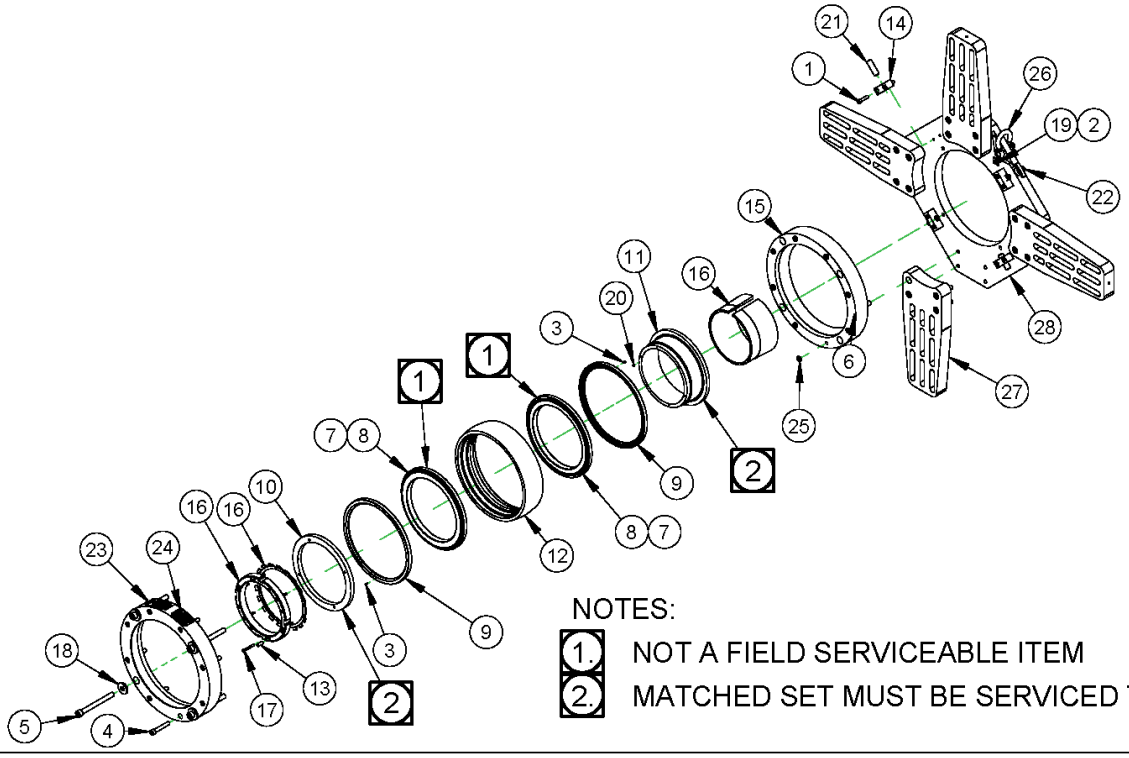


AVAILABLE CONFIGURATIONS			
PART NUMBER	DESCRIPTION	"A"	CHAR-LYNN P/N
43453	MOTOR ASSY HYD 3.6 CU IN SPLINE SHAFT	25472	103-1552
43454	MOTOR ASSY HYD 5.7 CU IN SPLINE SHAFT	25473	103-1083
43455	MOTOR ASSY HYD 7.3 CU IN SPLINE SHAFT	25474	103-1553
43456	MOTOR ASSY HYD 8.9 CU IN SPLINE SHAFT	25475	103-1554
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

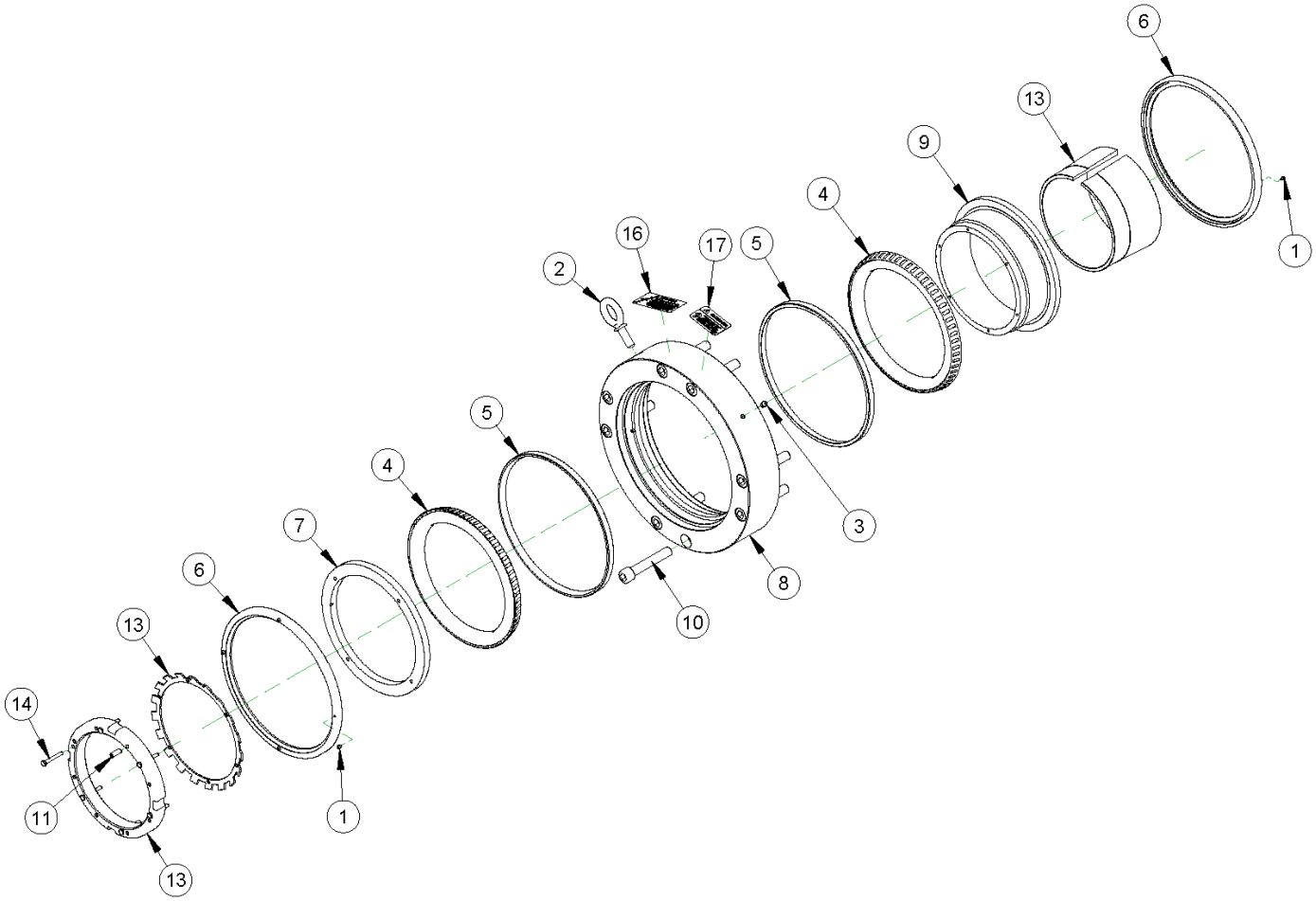
FOR REFERENCE ONLY



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	10839	SCREW 8-32 X 1/4 BHSCS
4	8	11696	SCREW 1/2-13 X 3 SHCS
5	4	11830	SCREW 5/8-11 X 6-1/2 SHCS
6	16	13356	SCREW 5/8-11 X 2-1/2 SHCS
7	2	17428	BRG CONE 10.000 ID X .875 WIDE
8	2	17429	BRG CUP 12.750 OD X .6250 WIDE
9	2	17430	SEAL 11.750 ID X 13.250 OD X .688
10	1	17432	NUT BRG LOAD
11	1	17434	MOUNT BEARING BB8000
12	1	17732	SPHERICAL INNER RING
13	8	19630	SCREW 3/8-24 X 1 SSSFP
14	4	20956	BLOCK ADJUSTING
15	1	23553	SPHERICAL RACEWAY SET
16	1	26047	ADAPTER TAPER BORE W/ MODIFIED LOCK NUT & WASHER
17	6	26101	SCREW 1/4-28 X 2 HHCS GRADE 8
18	4	28093	WASHER .68 ID X 1.75 OD X .25 THICK
19	1	29152	PLATE MASS CE
20	1	40481	SCREW 1/4-20 X 1/4 SSSCP
21	4	42212	SCREW MOD SSSCP 3/4-10 UNC X 2.5
22	1	58311	RING HOIST M10 X 1.5 X 82MM 450KG
23	1	66767	LABEL LARGE BORING BAR CRUSH HAZARD
24	1	71884	LABEL DANGER PART LIFT POINT ONLY 2 X 3 DO NOT LIFT ENTIRE MACHINE
25	8	95848	SHIM SET 0.500 ID X 0.750 OD .002/.005/.010/.125 THICK STEEL
26	1	95861	SHACKLE 3/4 SCREW PIN TYPE 6,500 LB
27	4	100201	SPIDER BRG SUPPORT LEG
28	1	102905	SPIDER BRG SUPPORT RING 8 IN BAR 15 IN ID

102845 - SUPPORT BRG SELF ALIGNING 8 IN. BAR W/ REMOVEABLE LEGS SPIDER - REV C

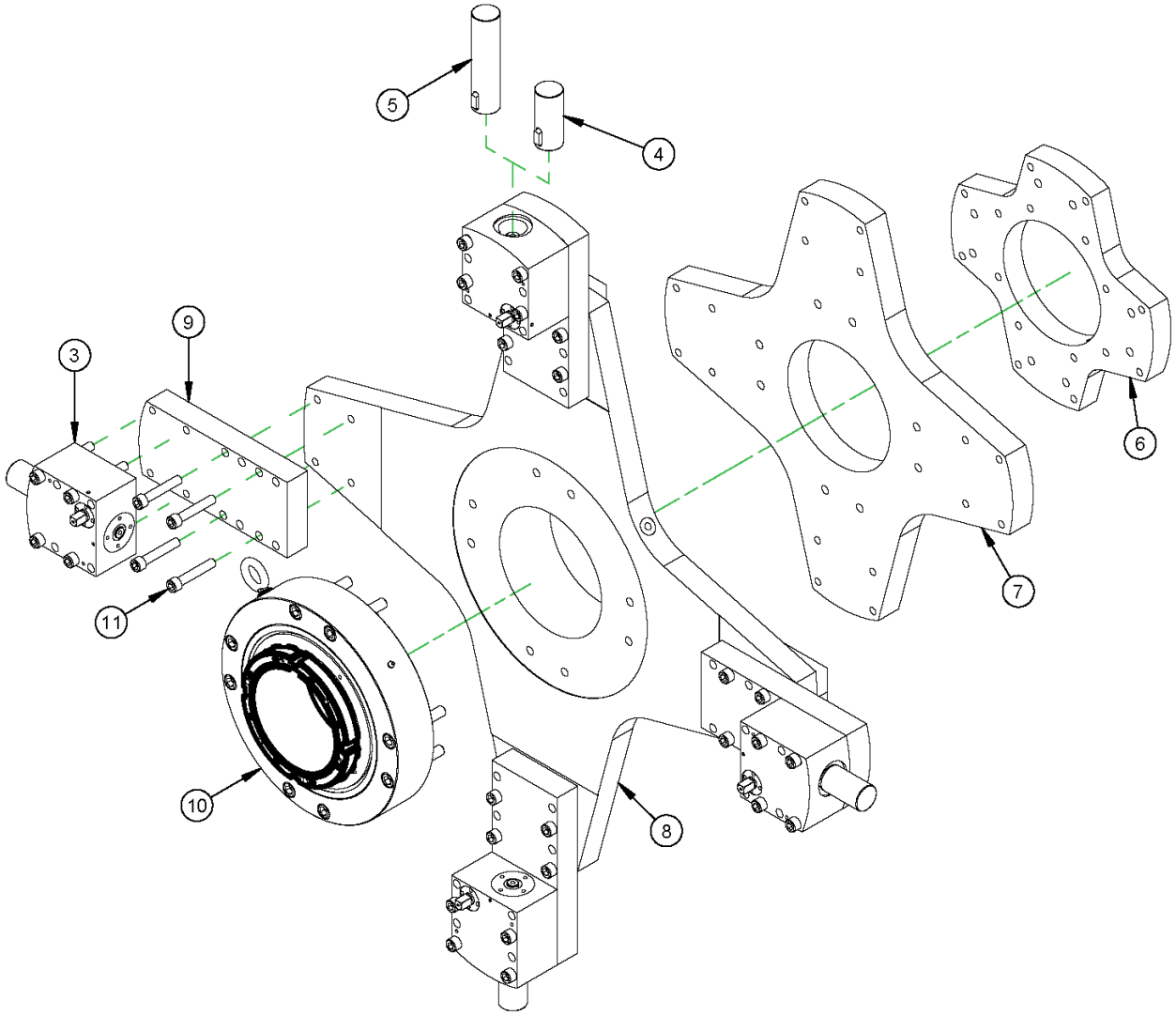
FOR REFERENCE ONLY



PARTS LIST			
ITEM	QTY	P/N:	DESCRIPTION
1	8	10839	SCREW 8-32 X 1/4 BHSCS
2	1	11158	LIFTING EYE 5/8-11 X 1-3/4 1-3/8 ID 2-9/16 OD 4.6875 OAL 4000 LBS
3	1	11898	FTG GREASE 1/8 NPTM
4	2	17428	BRG CONE 10.000 ID X .875 WIDE
5	2	17429	BRG CUP 12.750 OD X .6250 WIDE
6	2	17430	SEAL 11.750 ID X 13.250 OD X .688
7	1	17432	NUT BRG LOAD
8	1	17433	HOUSING
9	1	17434	MOUNT BEARING BB8000
10	8	17806	SCREW 3/4-10 X 4-1/2 SHCS
11	8	19630	SCREW 3/8-24 X 1 SSSFP
12	1	22958	(NOT SHOWN) KEY TAPER BORE
13	1	26047	ADAPTER TAPER BORE W/ MODIFIED LOCK NUT & WASHER
14	6	26101	SCREW 1/4-28 X 2 HHCS GRADE 8
16	1	66767	LABEL LARGE BORING BAR CRUSH HAZARD
17	1	71884	LABEL DANGER PART LIFT POINT ONLY 2 X 3 DO NOT LIFT ENTIRE MACHINE

18533 - SUPPORT BRG ASSY NON SELF-ALIGNING 8 DIA BAR - REV B

FOR REFERENCE ONLY

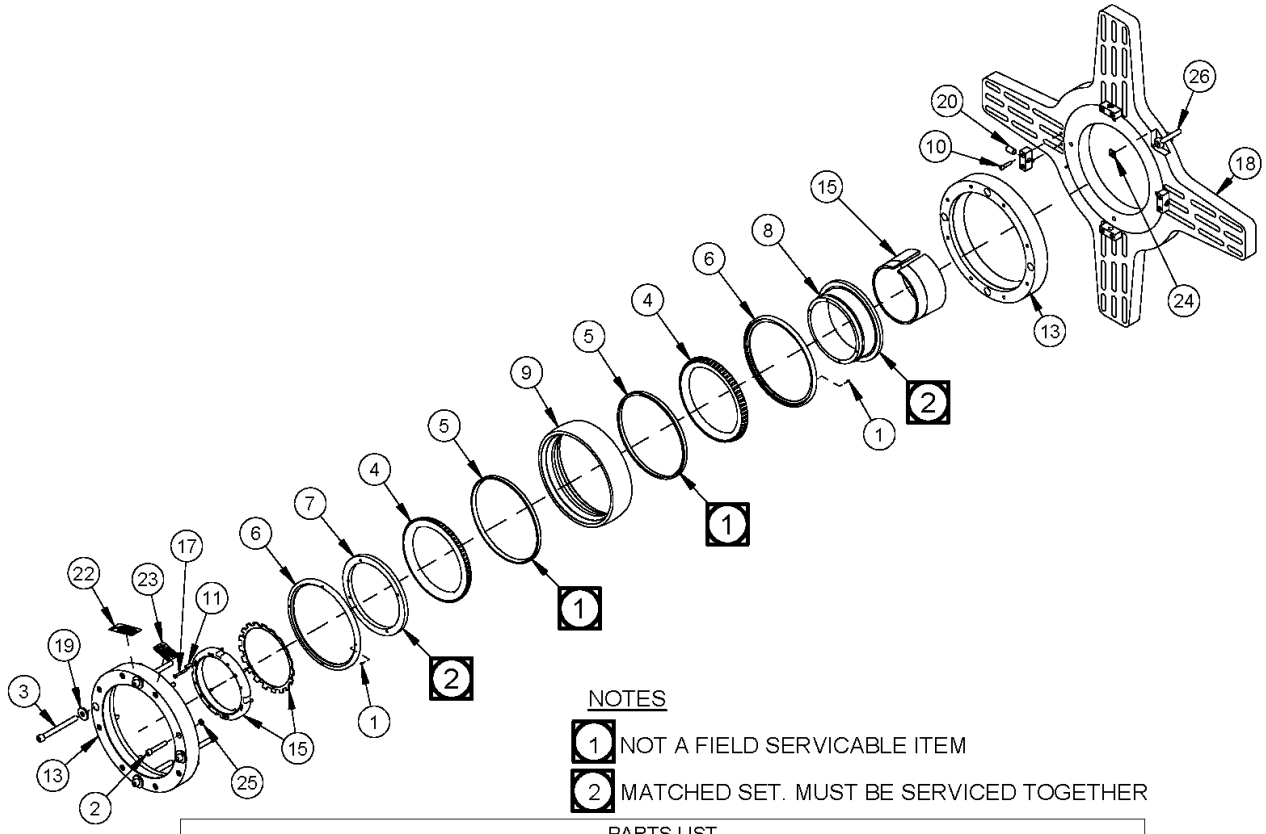


AVAILABLE CONFIGURATIONS	
PART NO	DESCRIPTION
18572	MOUNT ID BRG SUPPORT ASSY 8 DIA 20-27.5 ID
18573	MOUNT ID BRG SUPPORT ASSY 8 DIA 20-35 ID
18574	MOUNT ID BRG SUPPORT ASSY 8 DIA 20-49.5 ID
18575	MOUNT ID BRG SUPPORT ASSY 8 DIA 20-63.5 ID
18576	MOUNT ID BRG SUPPORT ASSY 8 DIA 23-77 ID

PARTS LIST			
ITEM	QTY	P/N:	DESCRIPTION
3	4	17438	BLOCK CENTERING ASSY, 5/8-18 SCREW
4	4	17448	JAW 4.62 IN ID BRG MOUNT BB8000 WITH KEY
5	4	17449	JAW 8 IN ID BRG MOUNT BB8000 WITH KEY
6	1	17450	SPIDER 20 TO 35 DIA BB8000
7	1	17452	SPIDER 34-1/4 TO 49-1/4 DIA
8	1	17454	SPIDER 48.5 TO 63.5 DIA
9	4	17620	EXTENSION ID SPIDER 8" BAR
10	1	18533	SUPPORT BRG ASSY NON SELF-ALIGNING 8 DIA BAR
11	16	31081	5/8-18 X 3-1/2 SHCS

82045 - CHART MOUNT ID BRG SUPPORT ASSY 8 DIA - REV B

FOR REFERENCE ONLY



NOTES

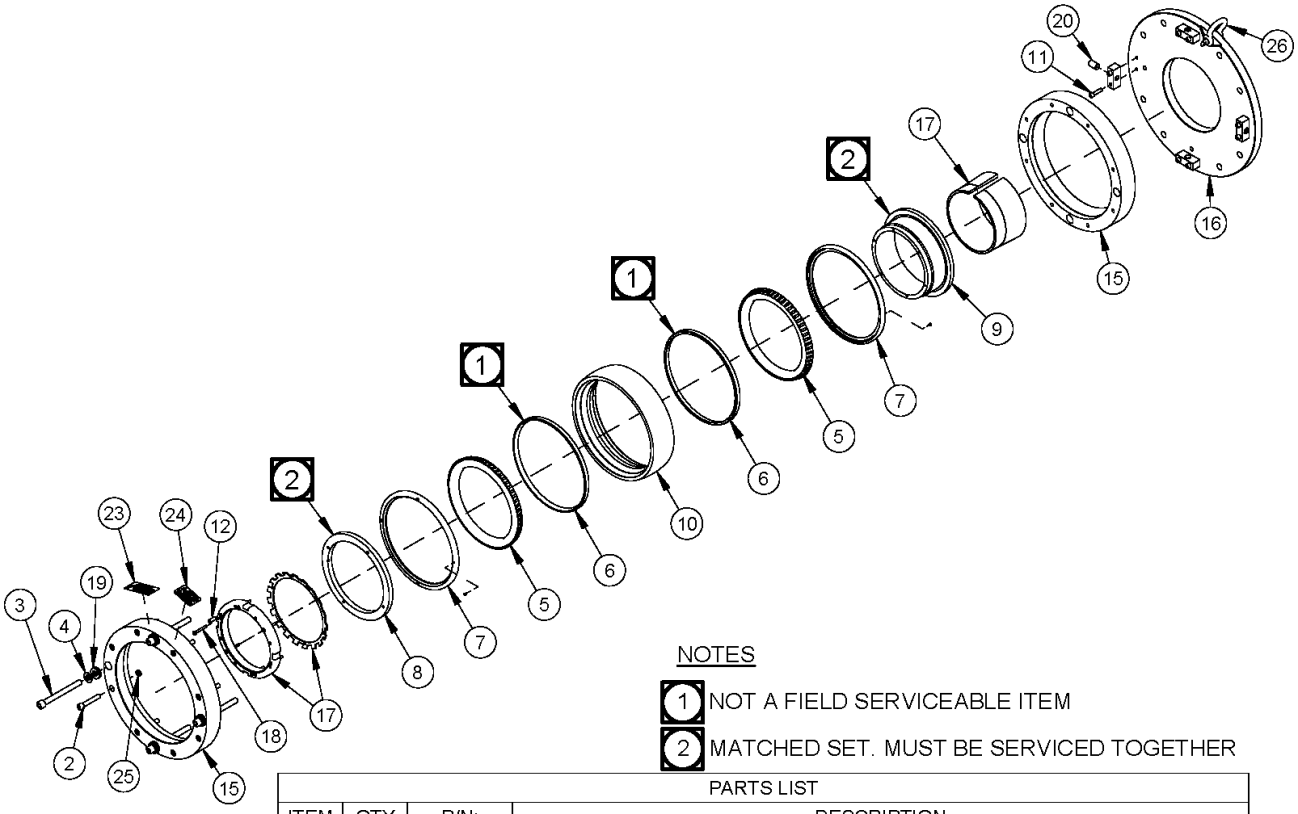
1 NOT A FIELD SERVICABLE ITEM

2 MATCHED SET. MUST BE SERVICED TOGETHER

PARTS LIST			
ITEM	QTY	P/N:	DESCRIPTION
1	8	10839	SCREW 8-32 X 1/4 BHSCS
2	8	11696	SCREW 1/2-13 X 3 SHCS
3	4	11830	SCREW 5/8-11 X 6-1/2 SHCS
4	2	17428	BRG CONE 10.000 ID X .875 WIDE
5	2	17429	BRG CUP 12.750 OD X .6250 WIDE
6	2	17430	SEAL 11.750 ID X 13.250 OD X .688
7	1	17432	NUT BRG LOAD
8	1	17434	MOUNT BEARING BB8000
9	1	17732	SPHERICAL INNER RING
10	8	18199	SCREW 3/8-24 X 1-1/2 SHCS
11	8	19630	SCREW 3/8-24 X 1 SSSFP
12	4	20956	BLOCK ADJUSTING
13	1	23553	SPHERICAL RACEWAY SET
14	1	22958	(NOT SHOWN) KEY TAPER BORE
15	1	26047	ADAPTER TAPER BORE W/ MODIFIED LOCK NUT & WASHER
16	1	25088	(NOT SHOWN) CRATE 40 X 40 X 12 5/8 PLY
17	6	26101	SCREW 1/4-28 X 2 HHCS GRADE 8
18	1	26303	SPIDER BRG SUPPORT 48 DIA BOLT PATTERN
19	4	28093	WASHER .68 ID X 1.75 OD X .25 THICK
20	4	38168	SCREW MODIFIED 3/4-10 X 1.3
22	1	66767	LABEL LARGE BORING BAR CRUSH HAZARD
23	1	71884	LABEL DANGER PART LIFT POINT ONLY 2 X 3 DO NOT LIFT ENTIRE MACHINE
24	1	91217	PLATE MASS CE 1.0 X 1.0 KG ADHESIVE BACKED
25	8	95848	SHIM SET 0.500 ID X 0.750 OD .002/.005/.010/.125 THICK STEEL
26	1	95861	SHACKLE 3/4 SCREW PIN TYPE 6,500 LB

23550 - SUPPORT BRG SELF ALIGNING 8 IN. BAR W/ SPIDER - REV C

FOR REFERENCE ONLY



NOTES

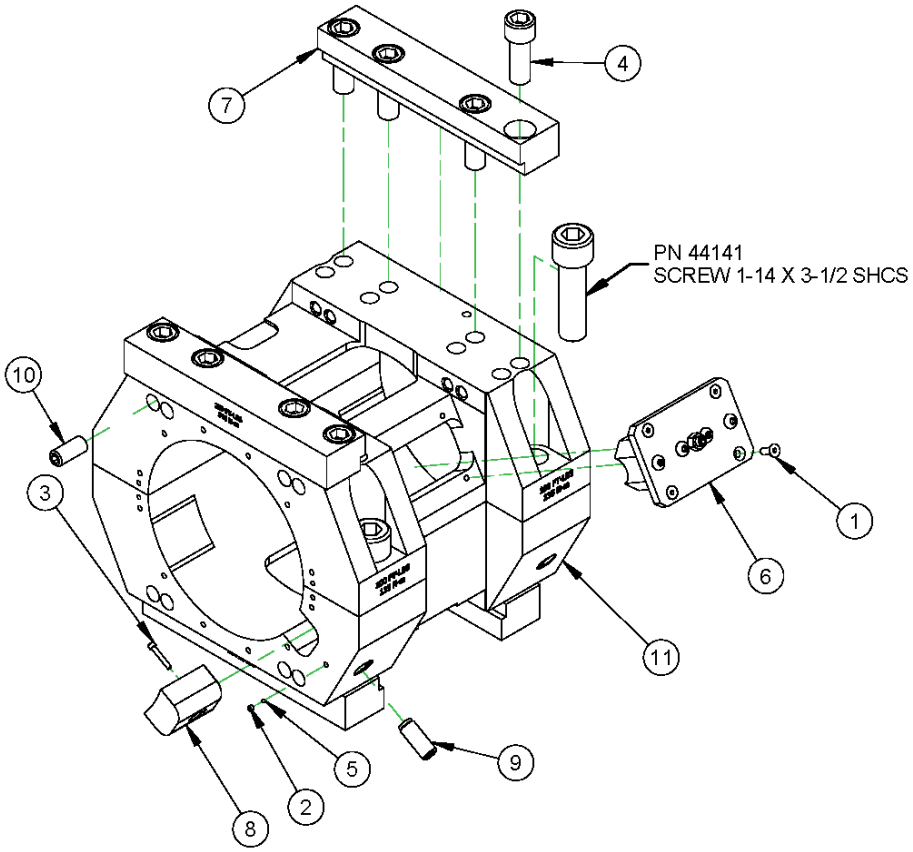
1 NOT A FIELD SERVICEABLE ITEM

2 MATCHED SET. MUST BE SERVICED TOGETHER

PARTS LIST			
ITEM	QTY	P/N:	DESCRIPTION
1	8	10839	SCREW 8-32 X 1/4 BHSCS
2	8	11696	SCREW 1/2-13 X 3 SHCS
3	4	11830	SCREW 5/8-11 X 6-1/2 SHCS
4	4	15208	WASHER 5/8 SAE FLTW HARDENED
5	2	17428	BRG CONE 10.000 ID X .875 WIDE
6	2	17429	BRG CUP 12.750 OD X .6250 WIDE
7	2	17430	SEAL 11.750 ID X 13.250 OD X .688
8	1	17432	NUT BRG LOAD
9	1	17434	MOUNT BEARING BB8000
10	1	17732	SPHERICAL INNER RING
11	8	18199	SCREW 3/8-24 X 1-1/2 SHCS
12	8	19630	SCREW 3/8-24 X 1 SSSFP
13	4	20956	BLOCK ADJUSTING
14	1	22958	(NOT SHOWN) KEY TAPER BORE
15	1	23553	SPHERICAL RACEWAY SET
16	1	25077	PLATE CENTERING SELF ALIGNING BRG ASSY
17	1	26047	ADAPTER TAPER BORE W/ MODIFIED LOCK NUT & WASHER
18	6	26101	SCREW 1/4-28 X 2 HHCS GRADE 8
19	8	33552	WASHER 3/4 ID X 1.45 OD X .20 THICK
20	4	38168	SCREW MODIFIED 3/4-10 X 1.3
22	1	42619	(NOT SHOWN) CRATE 24 X 24 X 10 5/8 PLY HINGED
23	1	66767	LABEL LARGE BORING BAR CRUSH HAZARD
24	1	71884	LABEL DANGER PART LIFT POINT ONLY 2 X 3 DO NOT LIFT ENTIRE MACHINE
25	8	95848	SHIM SET 0.500 ID X 0.750 OD .002/.005/.010/.125 THICK STEEL
26	1	95861	SHACKLE 3/4 SCREW PIN TYPE 6,500 LB

25074 - BRG ASSY END MTG SELF ALIGN NO SPIDER 8 IN DIA. - REV B

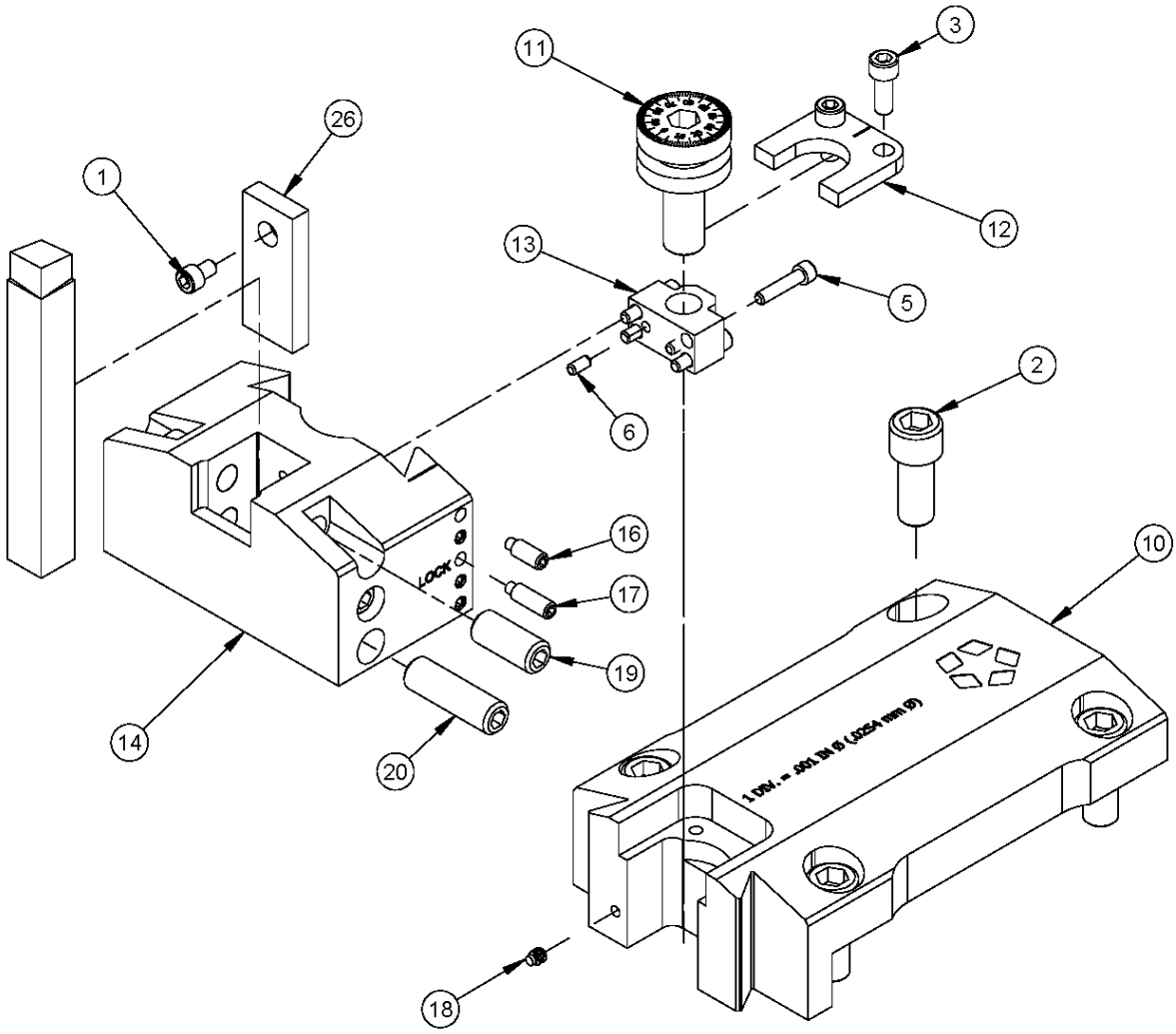
FOR REFERENCE ONLY



PARTS LIST			
ITEM	QTY	P/N:	DESCRIPTION
1	4	10843	SCREW 1/4-20 X 3/4FHSCS
2	2	11050	SCREW 10-32 X 3/16 SSSCP
3	2	12880	SCREW 8-32 X 1 SHCS
4	16	28757	SCREW 3/4-16 X 2 SHCS
5	2	43489	BALL NYLON 1/8 DIA
6	1	54550	ADJUSTABLE NUT AXIAL LEAD SCREW 1.25-5 ACME
7	4	54551	CLAMP SLIDE ARM BB8100
8	2	54743	SHOE ADJUSTABLE TOOL CARRIER BB8100
9	2	55307	SCREW 5/8-18 X 1.55 SSSFP MODIFIED
10	16	55564	SCREW ASSY 5/8-18 X 1-1/2 SSSFP WITH NYLON BALL TIP
11	1	86617	TOOL CARRIER BB8100 HD TURNING ARM

86620 - TOOL CARRIER ASSY BB8100 HD TURNING ARM - REV A

FOR REFERENCE ONLY



79325 - BORING HEAD MICRO ADJUST LARGE BB - REV C

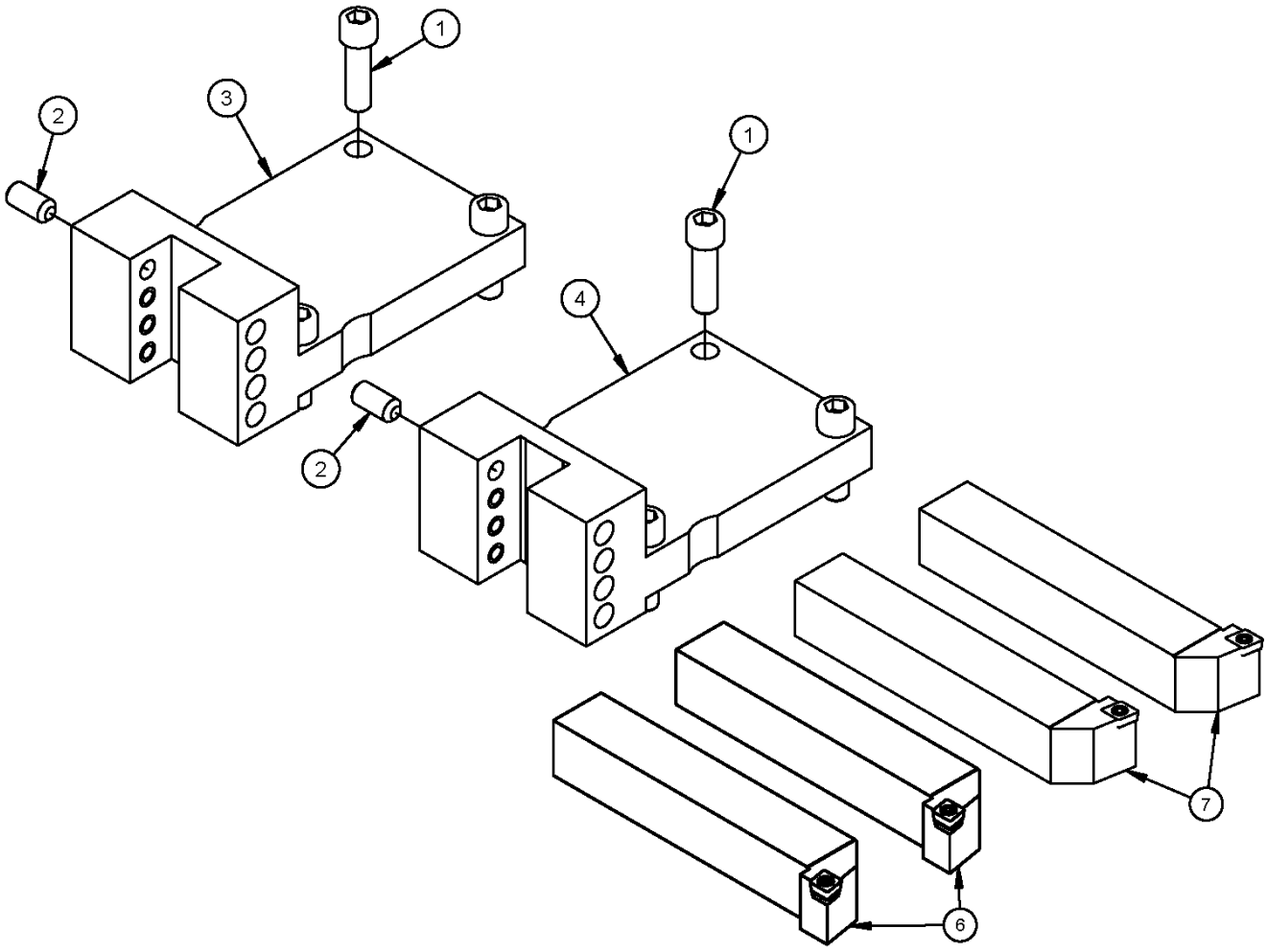
FOR REFERENCE ONLY

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

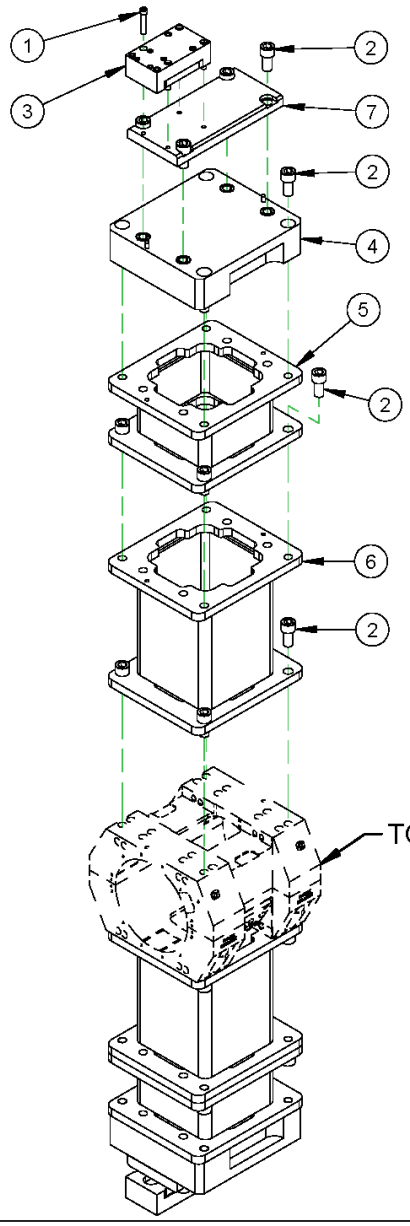
FOR REFERENCE ONLY



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



PART NUMBER
86630 SHOWN

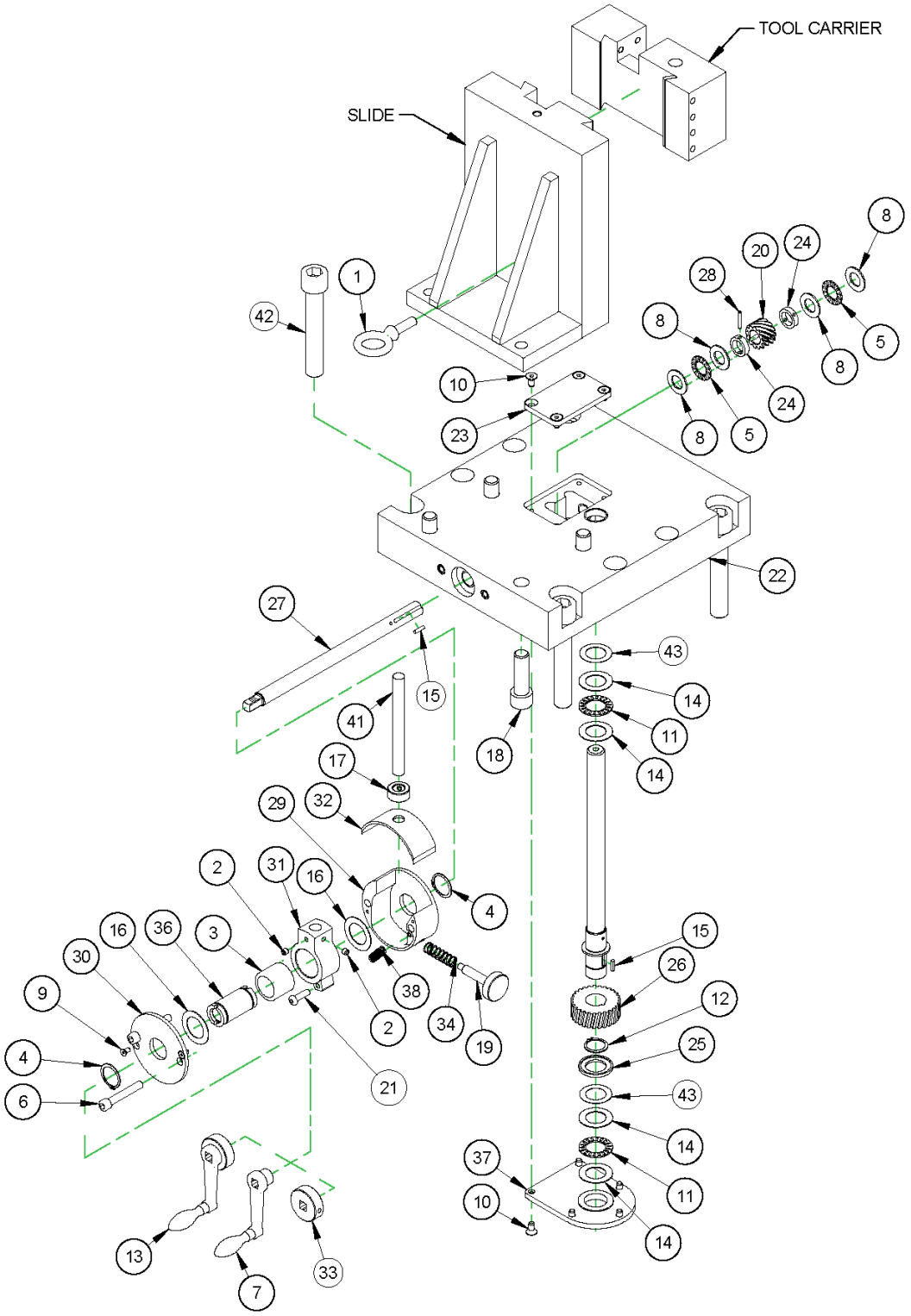
AVAILABLE CONFIGURATIONS					
PART NO.	DESCRIPTION	ITEM 2 QTY	ITEM 4 QTY	ITEM 5 QTY	ITEM 6 QTY
81254	BORING DIAMETER RANGE 14.5-26.6 STACK UP BLOCKS	16	2		
81255	BORING DIAMETER RANGE 14.5-38.4 STACK UP BLOCKS	24	2	2	
86630	BORING DIAMETER RANGE 14.5-62.0 STACK UP BLOCKS	32	2	2	2
81256	BORING DIAMETER RANGE 14.5-85.6 STACK UP BLOCKS	40	2	2	4

PARTS LIST			
ITEM	QTY	P/N:	DESCRIPTION
1	8	10557	SCREW 3/8-16 X 2 SHCS
2	SEE CHART	27301	SCREW 3/4-16 X 1-1/2 SHCS
3	2	79010	SPACER 2.0 IN FOR BORING SET BB6100 & BB7100
4	SEE CHART	86627	SPACER 2.95 BORING STACKUP BLOCK
5	SEE CHART	86628	EXTENSION 5.9 BORING STACKUP LEG
6	SEE CHART	86629	EXTENSION 11.8 IN BORING STACK UP LEG
7	2	86660	PLATE ADAPTER BORING HEAD

103491 - CHART SET BLOCKS BORING DIA STACK UP BB8100 - REV A

FOR REFERENCE ONLY

AVAILABLE CONFIGURATIONS				
Part Number	Description	SLIDE	LEADSCREW	TOOL CARRIER
21115	FACING HEAD ASSY MANUAL WITH 5 STROKE BB8100	32884	32887	74856
38654	FACING HEAD ASSY MANUAL WITH 8 STROKE BB8100	38667	38668	74857
22359	FACING HEAD ASSY MANUAL WITH 12 STROKE BB8100	22509	22511	74856



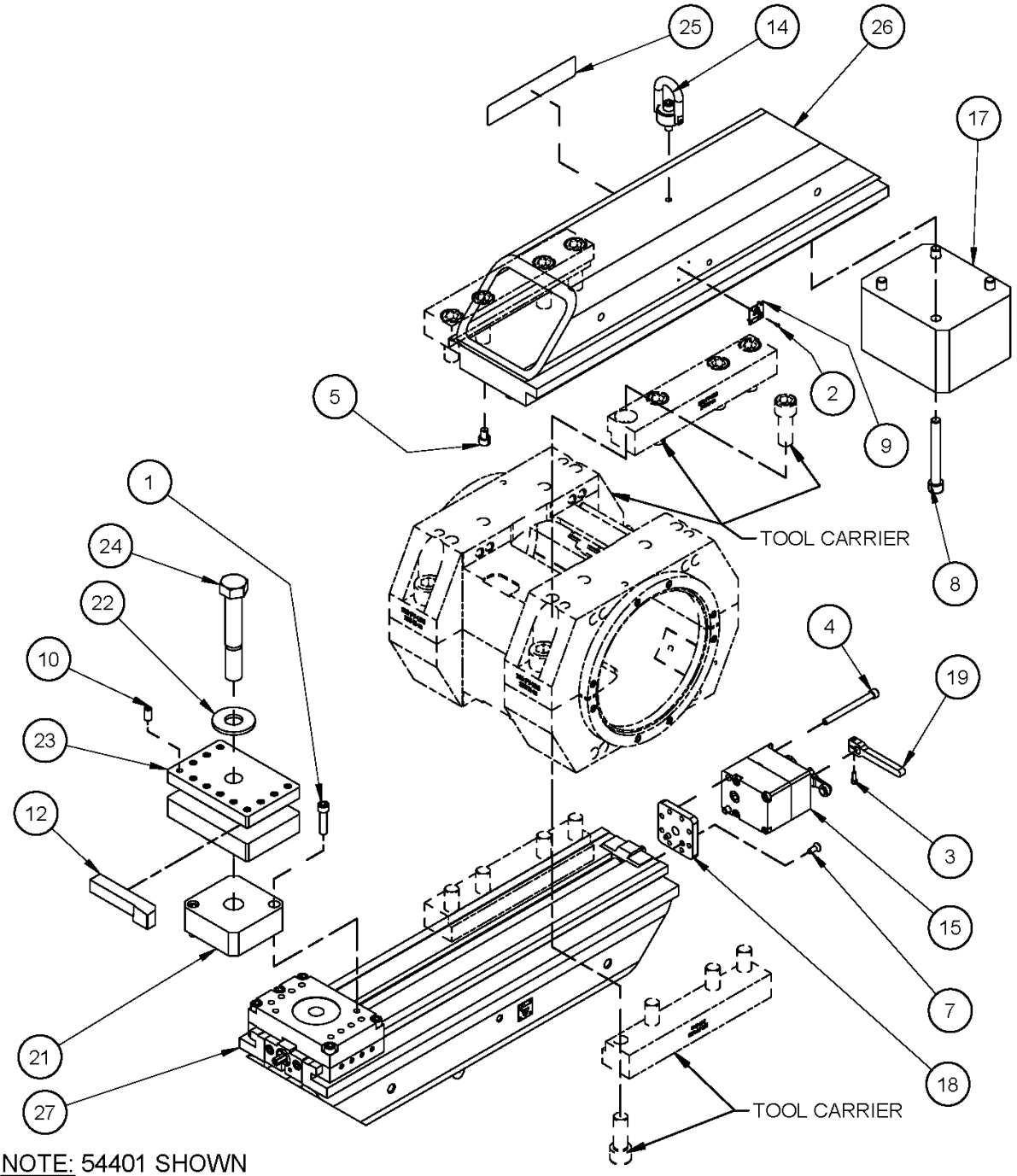
74053 - CHART ASSY FACING HEAD MANUAL 5, 8 & 12 IN STROKE - REV C

FOR REFERENCE ONLY

PARTS LIST			
ITEM	QTY	P/N:	DESCRIPTION
1	1	10460	EYE LIFTING 3/8-16 X 1-1/4 THREAD 1300 LBS
2	2	10464	SCREW 1/4-20 X 1/4 SSSCP
3	1	10532	BRG ROLLER CLUTCH 1 ID X 1-5/16 OD X 1.063
4	2	10534	RING SNAP 1 OD
5	2	10538	BRG THRUST .625 ID X 1.125 OD X .0781
6	2	10911	SCREW 5/16-18 X 2 SHCS
7	1	11020	HANDLE CRANK STRAIGHT 10MM SQUARE
8	4	11165	WASHER THRUST .625 ID X 1.125 OD X .060
9	2	11259	SCREW 8-32 X 3/8 FHSCS
10	9	11675	SCREW 1/4-20 X 1/2 FHSCS
11	2	13174	BRG THRUST .875 ID X 1.437 OD X .0781
12	1	14035	RING SNAP 7/8 OD
13	1	14136	CRANK FEED BOX ENGAGEMENT
14	4	14274	WASHER THRUST .875 ID X 1.437 OD X .030
15	2	14788	KEY 1/8 SQ X .50 SQ BOTH ENDS
16	2	15079	WASHER THRUST 1.000 ID X 1.562 OD X .030
17	1	16220	COLLAR SET 1/2 ID
18	4	16511	SCREW 5/8-11 X 2 SHCS
19	1	18193	FINGER SCREW KNURLED HEAD MODIFIED
20	1	19122	GEAR HELICAL 12DP 12T 14.5PA 45HA RH .75 STLH
21	1	20125	SCREW 1/4-20 X 7/8 BHSCS
22	1	22473	PLATE BASE FACING HEAD BB8000
23	1	22494	COVER PLATE TOP FACING HEAD
24	2	22501	SPACER DRIVE SHAFT
25	1	22502	SPACER LEADSCREW BB8000 FACING HEAD
26	1	22504	GEAR HELICAL MODIFIED
27	1	22506	SHAFT DRIVE BB8000 FACING
28	1	22522	PIN ROLL 1/8 DIA X 7/8
29	1	22537	BOX FEED FACING HEAD BB8000
30	1	22548	LID BOX FACING HEAD BB8000
31	1	22551	RATCHET FEED 12 FACING HEAD
32	1	22553	GUARD CHIP 12 FLANGE FACER
33	1	25800	FEED ENGAGE KNOB
34	1	26921	SPRING COMP .48 OD X .045 WIRE X 1.50 LONG
35	1	32016	(NOT SHOWN) TOOL HOLDER MODIFIED KENDEX POS RAKE CSDPN
36	1	32652	ARBOR FEED RATCHET
37	1	34517	COVER BOTTOM FACING HEAD BB8000
38	1	40031	SPRING EXT .36 OD X .045 WIRE X 1.25 LOOP END
39	2	40708	(NOT SHOWN) CLAMP COLLAR 8 ID TWO PIECE W/ SET SCREWS
40	10	41407	(NOT SHOWN) INSERT CARBIDE 80 DEG 1/2 IC 1/64 NOSE RADIUS KC5010
41	1	54416	ROD STEEL 1/2 DIA
42	4	64920	SCREW 3/4-16 X 4-1/2 SHCS (1 SHOWN)
43	9	95751	SHIM 7/8 ID X 1-3/8 OD X .005 316 SS

74053 - CHART ASSY FACING HEAD MANUAL 5, 8 & 12 IN STROKE - REV C

FOR REFERENCE ONLY



NOTE: 54401 SHOWN

Table					
PART NUMBER	DESCRIPTION	ITEM 20	ITEM 25 P/N	ITEM 26 P/N	ITEM 27 P/N
54401	BORING/FACING SLIDE ARM SET 26" BB8100	Exclude	54464	54941	54957
54402	BORING/FACING SLIDE ARM SET 34" BB8100	Include	54256	54942	54958
54403	BORING/FACING SLIDE ARM SET 53" BB8100	Include	54947	54943	54959

81763 - CHART BORING/FACING SLIDE ARM SET BB8100 - REV B

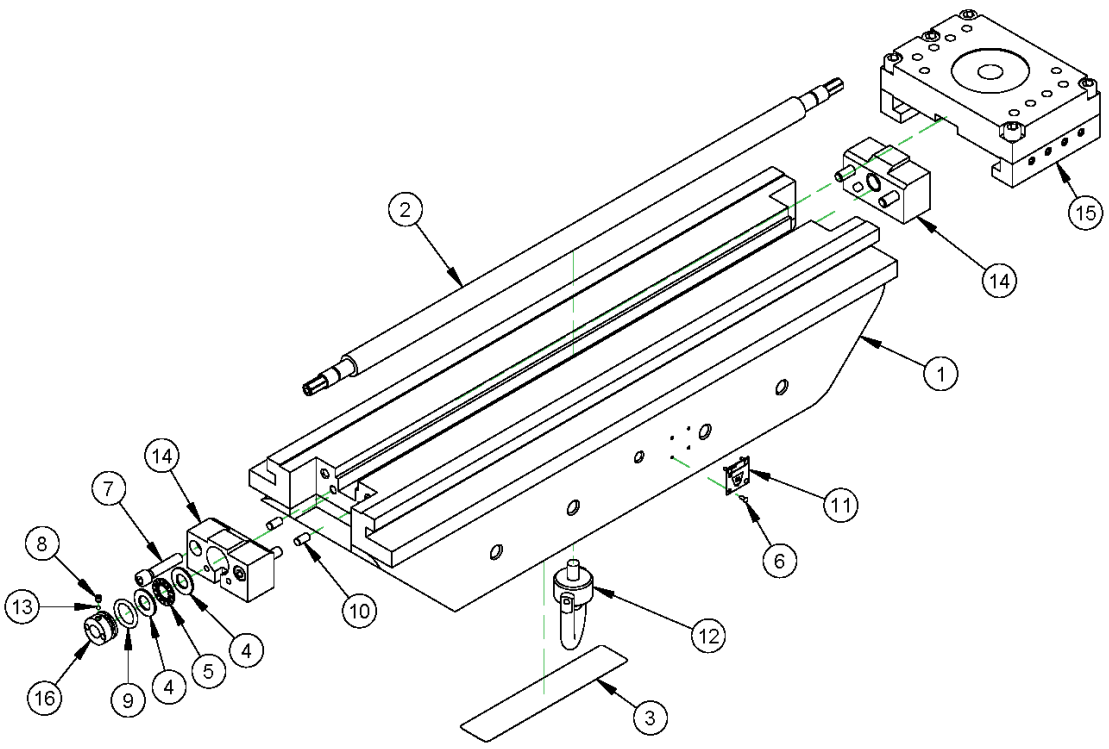
FOR REFERENCE ONLY

PARTS LIST			
ITEM	QTY	PART No.	DESCRIPTION
1	2	10474	SCREW 3/8-16 X 1-1/2 SHCS
2	4	10588	SCREW DRIVE #2 x 1/4 HOLE SIZE .089
3	1	11845	SCREW 8-32 X 1/2 SHCS
4	2	11873	SCREW 5/16-18 X 3-1/2 SHCS
5	2	16403	SCREW 3/8-16 X 1/2 SHCS
6	1	19700	(NOT SHOWN) TOOL BOX W/ TRAY, GREY PLASTIC, 23 X 12 X 10.5
7	2	22496	SCREW 1/4-20 X 5/8 FHSCS
8	4	22517	SCREW 1/2-13 X 4 SHCS
9	1	29152	PLATE MASS CE
10	12	29378	SCREW 3/8-16 X 3/4 SSSFP
11	1	40463	(NOT SHOWN) HOLDER INSERT 80 DEG NEGATIVE L/H 3/4 SHANK
12	1	40787	HOLDER INSERT 80 DEG NEG R/H
13	10	41407	(NOT SHOWN) INSERT CARBIDE 80 DEG 1/2 IC 1/64 NOSE RADIUS KC5010
14	1	41471	RING HOIST SWIVEL 3/8-16 X .56 1000 LBS
15	1	45691	ASSY FEEDBOX REVERSE CLUTCH INPUT
16	1	48370	(NOT SHOWN) WRENCH COMBINATION 1-5/16 12PT
17	1	53905	COUNTERWEIGHT BB7100
18	1	54867	PLATE ADAPTER FEEDBOX
19	1	55094	TRIP ARM STEEL 3 INCH
20	4	56432	(NOT SHOWN SEE CHART) STRAP TENSION ASSY BB8100
21	1	56557	SPACER TOOL POST 8" BAR
22	1	95386	WASHER 7/8 FLTW USS ZINC PLATED
23	1	104351	TOOL POST ROTATING 1IN TOOLING 4IN SQUARE
24	1	104380	SCREW 7/8-14 X 5-1/2 HHCS GRADE 5 ZINC PLATED
25	1	CHART	LABEL COUNTERWEIGHT ARM 26"
26	1	CHART	COUNTERWEIGHT ARM 26 INCH
27	1	CHART	ASSEMBLY 26IN SLIDE ARM

Table					
PART NUMBER	DESCRIPTION	ITEM 20	ITEM 25 P/N	ITEM 26 P/N	ITEM 27 P/N
54401	BORING/FACING SLIDE ARM SET 26" BB8100	Exclude	54464	54941	54957
54402	BORING/FACING SLIDE ARM SET 34" BB8100	Include	54256	54942	54958
54403	BORING/FACING SLIDE ARM SET 53" BB8100	Include	54947	54943	54959

81763 - CHART BORING/FACING SLIDE ARM SET BB8100 - REV B

FOR REFERENCE ONLY

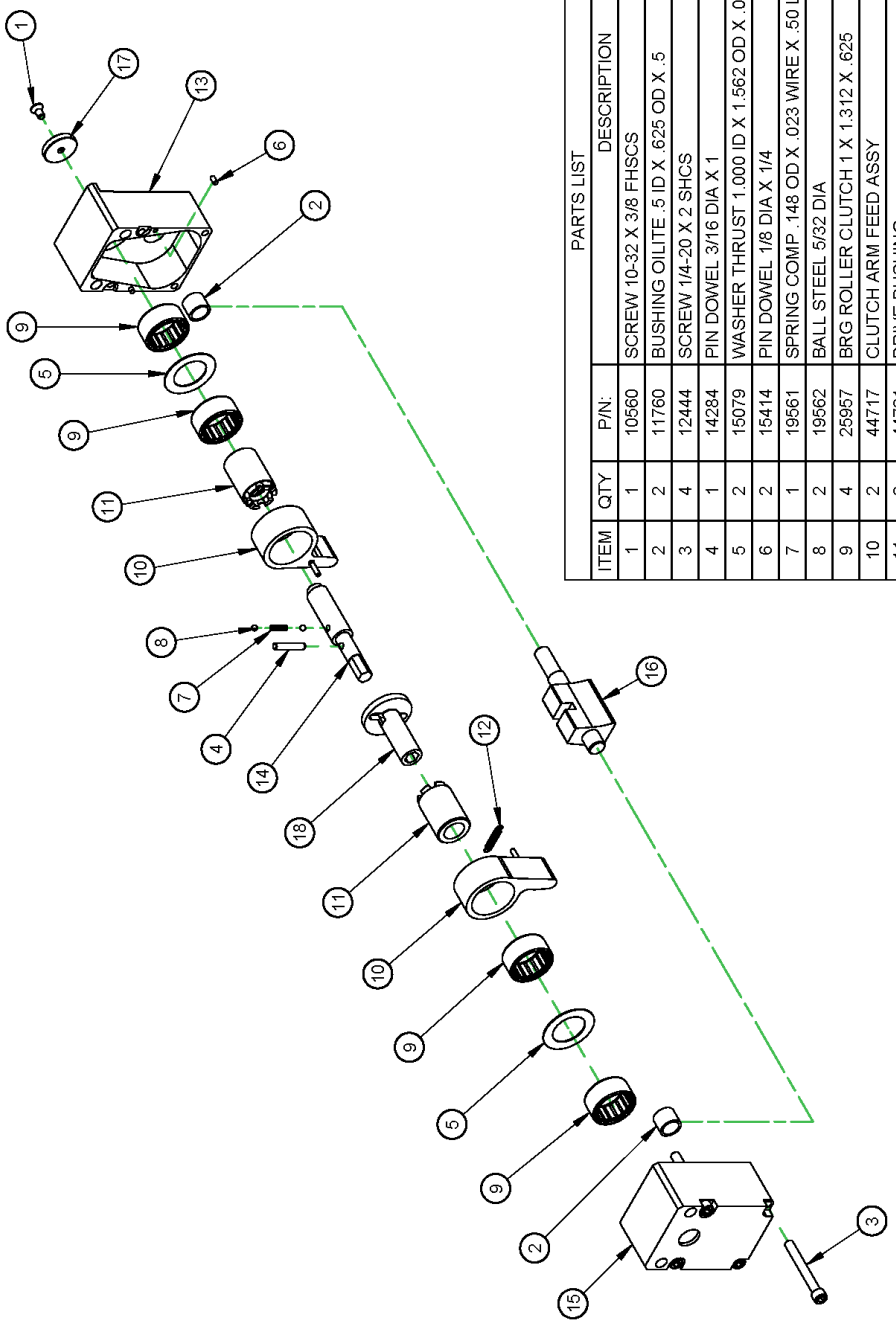


AVAILABLE CONFIGURATIONS				
Part Number	Description	"A"	"B"	"C"
54782	ASSEMBLY 35IN SLIDE ARM	54441	54642	54950
54783	ASSEMBLY 42IN SLIDE ARM	54449	54649	54951
54784	ASSEMBLY 27IN SLIDE ARM	54434	54635	54949
54785	ASSEMBLY 21IN SLIDE ARM	54429	54630	54948
54955	ASSEMBLY 18IN SLIDE ARM	54229	54232	54931
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



PARTS LIST			
ITEM	QTY	P/N:	DESCRIPTION
1	1	10560	SCREW 10-32 X 3/8 FHSCS
2	2	11760	BUSHING OILITE .5 ID X .625 OD X .5
3	4	12444	SCREW 1/4-20 X 2 SHCS
4	1	14284	PIN DOWEL 3/16 DIA X 1
5	2	15079	WASHER THRUST 1.000 ID X 1.562 OD X .030
6	2	15414	PIN DOWEL 1/8 DIA X 1/4
7	1	19561	SPRING COMP .148 OD X .023 WIRE X .50 LONG STAINLESS
8	2	19562	BALL STEEL 5/32 DIA
9	4	25957	BRG ROLLER CLUTCH 1 X 1.312 X .625
10	2	44717	CLUTCH ARM FEED ASSY
11	2	44721	DRIVE BUSHING
12	1	44970	SPRING EXT .187 OD X .023 WIRE X 1.00 LONG
13	1	45571	HOUSING FEEDBOX REVERSE CLUTCH INPUT CAM SIDE
14	1	45573	SHAFT CLUTCH REVERSE CLUTCH INPUT FEED ASSY
15	1	45753	HOUSING FEEDBOX REVERSE CLUTCH INPUT MTG SIDE
16	1	45780	CAM ASSY FEEDBOX REVERSE CLUTCH INPUT
17	1	45801	KNOB RELEASE FEEDBOX REVERSE CLUTCH INPUT
18	1	45870	DRIVE SHAFT FEEDBOX REVERSE CLUTCH INPUT

45691 - ASSY FEEDBOX REVERSE CLUTCH INPUT - REV A

FOR REFERENCE ONLY

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SCHEMATICS

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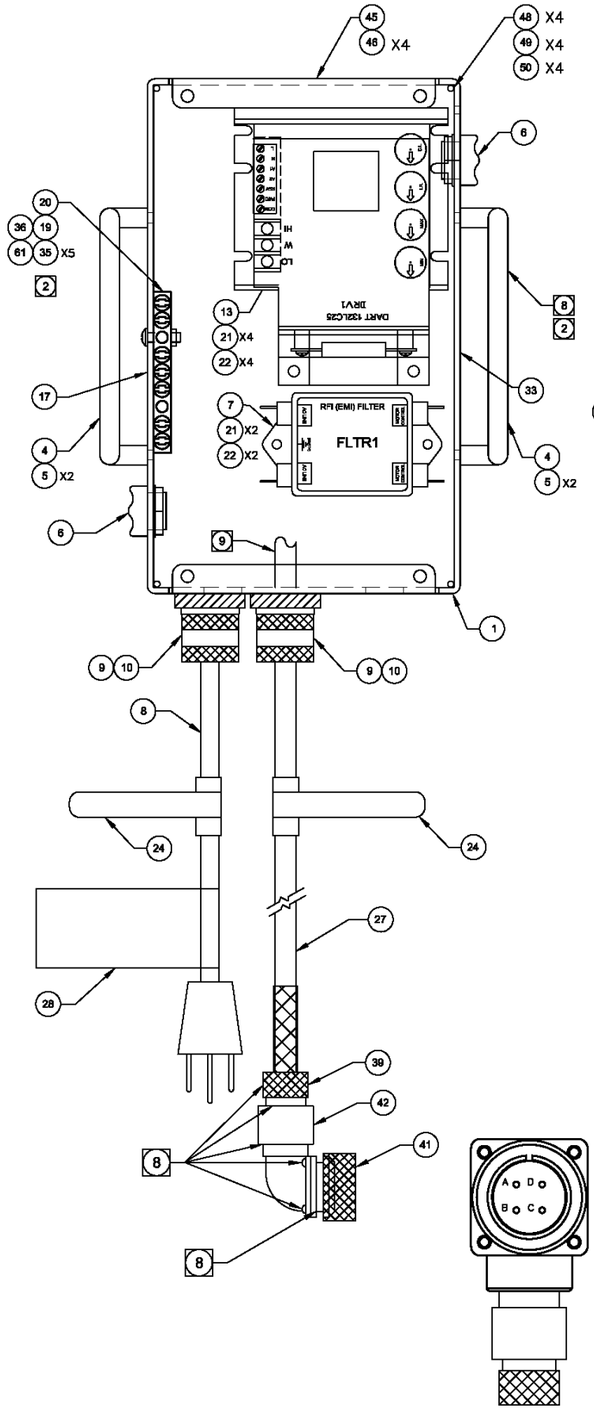
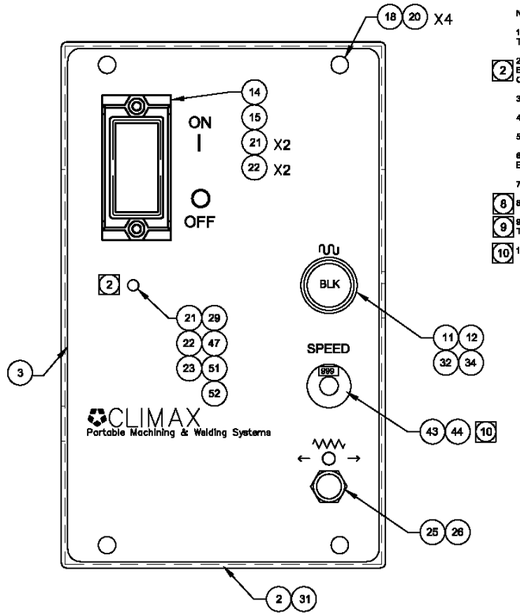




NOTES:

1) USE SILICONE BASE HEAT SINK COMPOUND SUCH AS (CLIMAX 31739) TECH SPRAY #1977-DP BETWEEN THE CHASSIS OF THE DART DRIVE AND THE ENCLOSURE SURFACE

2 2) USE IDEAL NOALOX ANTIOXIDIZING COMPOUND OR EQUIVALENT AT ALL GROUND TERMINALS AND TO THE POINT OF CONTANCT OF ALL ELECTRICALLY CONDUCTIVE OBJECTS ON THE OUTSIDE OF THE ENCLOSURE SUCH AS THE HANDLES AND CORD GRIPS. ENSURE THAT THE CONTACT SURFACE IS FREE OF PAINT, OXIDATION OR OTHER FOREIGN MATERIALS PRIOR TO NOALOX APPLICATION AND INSTALLATION

3) TIGHTEN LOCK NUTS AND SEALING NUTS ON SWITCHES AND POTENTIOMETERS TO 60-70 IN-LBS.

4) TIGHTEN SET SCREWS ON POTENTIOMETERS KNOBS TO 5-7 IN-LBS

5) PROVIDE SUFFICIENT LENGTH ON ALL WIRES TO ALLOW ENCLOSURE COVER TO OPEN 180° TO THE LEFT

6) CUT AND REMOVE 12 INCHES OF THE OUTER COVER ON ALL CORD SETS AND INSTALL SO THAT OUTER COVER EXTENDS 1/4 INCH INSIDE THE ENCLOSURE.

7) INSTALL PIN TERMINALS ON ALL GROUND CONDUCTORS AT THE GROUND BUS6

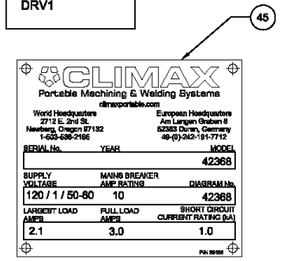
6 8) APPLY BLUE LOCKTITE 242 TO ALL THREADS, BOTH INTERNAL AND EXTERNAL.

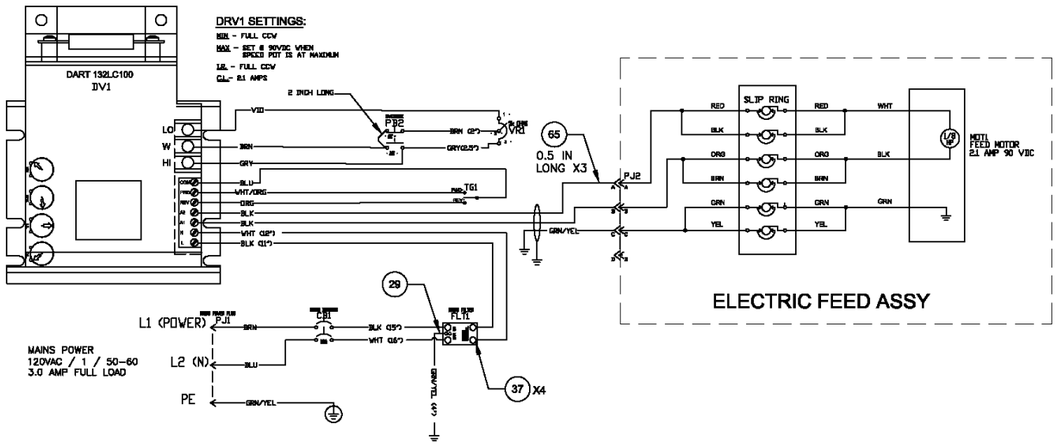
9 9) INSIDE OF THE ENCLOSURE, SEPARATE THE SHIELD BRAID FROM THE CONDUCTORS. TWIST THE SHIELD INTO A SINGLE CONDUCTOR AND TERMINATE ON THE GROUND BUS.

10 10) SEAL THE ANTIROTATION HOLE IN THE COVER WITH SILICONE SEALER WHEN INSTALLING THE POT.

DEVICE LABELS

PB2
VR1
TG1
FLT1
CB1
DRV1





IF USING 1 HOT LEG OF 230V + N, TERMINAL L = HOT; TERMINAL N = NEUTRAL

IF USING 2 HOT LEGS OF 120V, TERMINALS ARE INTERCHANGEABLE

★ NOT SHOWN

★	65	1.5	70901	TUBING HEAT SHRINK .19 ID 2:1 SHRINK RATIO	
★	64	1	10873	WIRE TIE SMALL .09 X 3.5	
★	63	3	13243	WIRE TIE MEDIUM .14 X 8	
★	62	3	13295	MOUNTING BASE WIRE TIE ADHESIVE BACKED LARGE	
	61	1	77568	LABEL PE PROTECTIVE EARTH TERMINAL 1/2 IN DIA	
	60	24	38429	WIRE 16 AWG BROWN TYPE MTW	
	59	15	38430	WIRE 16 AWG VIOLET TYPE MTW	
	58	20	38428	WIRE 16 AWG GRAY TYPE MTW	
	57	26	27572	WIRE 16 AWG BLACK TYPE MTW	
	56	28	27575	WIRE 16 AWG WHITE TYPE MTW	
	55	17	27829	WIRE 16 AWG BLUE TYPE MTW	
	54	18	38437	WIRE 16 AWG ORANGE TYPE MTW	
	53	17	38438	WIRE 16 AWG WHITE/ORANGE TYPE MTW	
	52	14	27571	WIRE 16 AWG GREEN/YELLOW TYPE MTW	
	51	1	37572	LABEL PE GROUND TERMINAL (KB)	
	50	4	67151	NUT 6-32 NYLOCK ZINC PLATED	
	49	4	30120	SCREW 6-32 X 1/2 SHCS BLACK OXIDE	
	48	4	55771	BUMPER 1/2 OD X 1/4 TALL X 1/8 CENTER HOLE	
	47	1	35923	WASHER #8FLTW NYLON	
	46	4	10586	DRIVE SCREW #2 X 1/4	
	45	1	39125	NAMEPLATE ELECTRICAL PANELS	
	44	1	41046	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	40365	ADAPTER SIZE 22MS CONNECTOR TO 3/4 NPT	
	41	1	39083	CONNECTOR ANGLED PLUG 4 POLE SIZE 22	
	40	-	-	-	
	39	1	40365	CORD GRIP W/WIRE MESH .375-.50 X 3/4 NPT	
	38	-	-	-	
★	37	8	27377	TERMINAL SPADE FM .25 16-14 AWG	
	36	1	38444	GROUND BUSS 7 POLE COPPER	
★	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	33	35855	SEAL NEOPRENE SPONGE 3/8 X 5/32 ADHESIVE BACK	
★	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	38931	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	1	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	35366	SCREW 10-32 X 3/4 BINDING HEAD SLOTTED MS	
	19	1	28060	NUT 10-32 LOCKING STAR WASHER	
	18	4	29458	WASHER #10 FLTW NYLON	
★	17	1	32585	LABEL VOLTAGE 120V	
	15	1	41687	CIRCUIT BREAKER COLLAR W/COVER FOR TA45 BREAKERS	
	14	1	42187	CIRCUIT BREAKER ROCKER HANDLE 10 AMP 2POLE 240VAC	
	13	1	71365	DC DRIVE 120VAC/90 VDC 5.5A REVERSING	
	12	1	38051	CONTACT BLOCK 1 NC	
	11	1	38050	CONTACT BLOCK 1 NO	
	10	2	37739	CORD GRIP NONMETALLIC .17-.47 DIA X 1/2 NPT	
	9	2	12574	CONDUIT NUT 1/2 NPT	
	8	1	37315	CORDSET POWER 120VAC 16 -3 NEMA 15-5 PLUG 79 IN INTL COLOR	
	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	40885	COVER PENDANT ENCLOSURE	
	1	1	40896	PENDANT ENCLOSURE	

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

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

MATERIAL: LISTED

CLIMAX
Portable Machining & Welding Systems

ASSY CONTROLLER BB8100
ELECTRIC FEED 120V

SIZE	CAGE CODE	DWG NO.	REVISION
D	15509	42368	G

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SDS

Contact CLIMAX for the current Safety Data Sheets.

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CLIMAX
BORTECH
CALDER
H&S TOOL