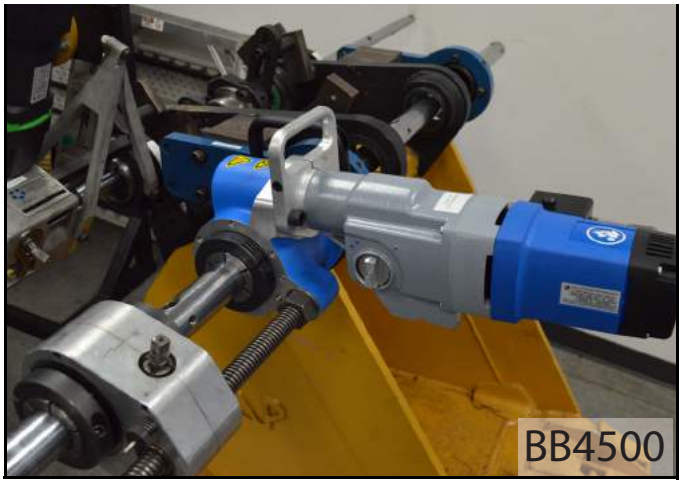
CE

BB4500-BB5000

BORING MACHINE

OPERATING MANUAL

ORIGINAL INSTRUCTIONS



CLIMAX
Portable Machining & Welding Systems

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CLIMAX | BORTECH CALDER H&S TOOL

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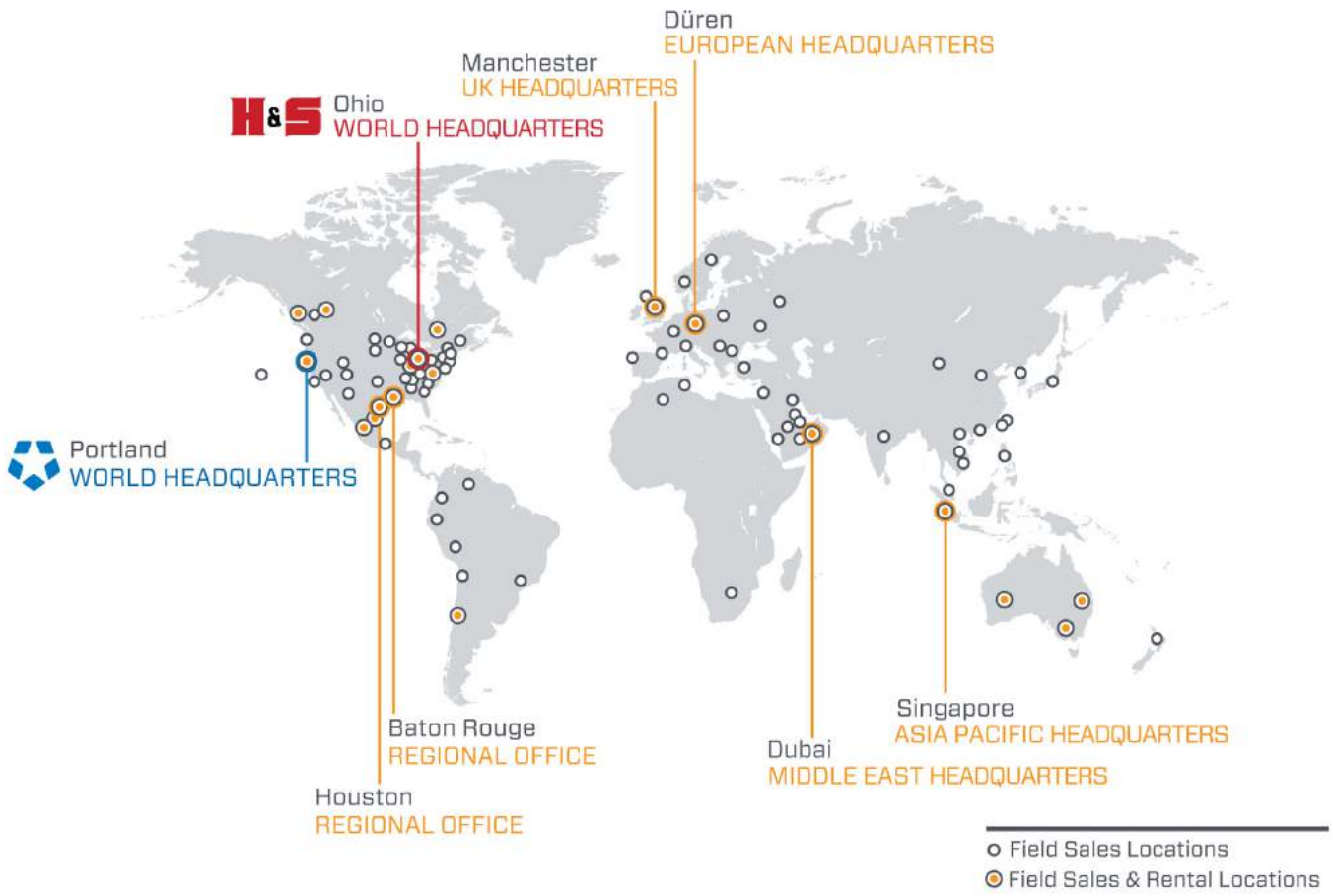

CE DOCUMENTATION

DECLARATION OF CONFORMITY

2006/42/EC Machine Directive
2014/30/EU EMC Directive

Name of manufacturer or supplier
Climax Portable Machining And Welding Systems

Full postal address including country of origin
2712 E Second Street
Newberg, OR 97132
USA

Description of product
Portable Boring Bar Machine

Name, type or model, batch or serial number
BB4500 and BB5000 Serial Number Range 160001877 - 2000000
Electric 120V, Electric 230V, Servo 230V,
Servo 460V,
Hydraulic Powered and Pneumatic Powered

Standards used, including number, title, issue date and other relative documents
EN ISO 3744:2010, ISO 4413:2010, BS EN ISO 4414:2010, EN ISO 11201:2010, EN ISO 12100:2010, EN 13128:2001+A2:2009, EN ISO 13732-1:2008, EN ISO 13849-1:2008, EN ISO 13857:2008, EN 60204-1:2006/AC:2010

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Declaration

I declare that as the Manufacturer, the above information in relation to the supply / manufacture of this product, is in conformity with the stated standards and other related documents following the provisions of the above Directives and their amendments.

Signature of Manufacturer: _____

Position Held: VP of Engineering

Date: 9/4/2019

CE

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About this manual

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1 INTRODUCTION

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1.1 How to use this manual

This manual describes information necessary for the setup, operation, maintenance, storage, shipping, and decommissioning of the BB4500-BB5000.

The first page of each chapter includes a summary of the chapter contents to help you locate specific information. The appendices contain supplemental product information to aid in setup, operation, and maintenance tasks.

Read this entire manual to familiarize yourself with the BB4500-BB5000 before attempting to set it up or operate it.

1.2 Safety alerts

Pay careful attention to the safety alerts printed throughout this manual. Safety alerts will call your attention to specific hazardous situations that may be encountered when operating this machine.

Examples of safety alerts used in this manual are defined here[1]:

⚠ DANGER

indicates a hazardous situation which, if not avoided, ***WILL*** result in death or severe injury.

⚠ WARNING

indicates a hazardous situation which, if not avoided, ***COULD*** result in death or severe injury.

1. For more information on safety alerts, refer to *ANSI/NEMA Z535.6-2011, Product safety Information in Product Manuals, Instructions, and Other Collateral Materials*.

⚠ CAUTION

indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE

indicates a hazardous situation which, if not avoided, could result in property damage, equipment failure, or undesired work results.

1.3 GENERAL SAFETY PRECAUTIONS

CLIMAX leads the way in promoting the safe use of portable machine tools and valve testers. Safety is a joint effort. You, the end user, must do your part by being aware of your work environment and closely following the operating procedures and safety precautions contained in this manual, as well as your employer's safety guidelines.

Observe the following safety precautions when operating or working around the machine.

Training – Before operating this or any machine tool, you should receive instruction from a qualified trainer. Contact CLIMAX for machine-specific training information.

Risk assessment – Working with and around this machine poses risks to your safety. You, the end user, are responsible for conducting a risk assessment of each job site before setting up and operating this machine.

Intended use – Use this machine in accordance with the instructions and precautions in this manual. Do not use this machine for any purpose other than its intended use as described in this manual.

Personal protective equipment – Always wear appropriate personal protective gear when operating this or any other machine tool. Flame-resistant clothing with long sleeves and legs is recommended when operating the machine. Hot chips from the workpiece may burn or cut bare skin.

Work area – Keep the work area around the machine clear of clutter. Restrain cords and hoses connected to the machine. Keep other cords and hoses away from the work area.

Lifting – Many CLIMAX machine components are very heavy. Whenever possible, lift the machine or its components using proper hoisting equipment and rigging. Always use designated lifting points on the machine. Follow lifting instructions in the setup procedures of this manual.

Lock-out/tag-out – Lock-out and tag-out the machine before performing maintenance.

Moving parts – CLIMAX machines have numerous exposed moving parts

and interfaces that can cause severe impact, pinching, cutting, and other injuries. Except for stationary operating controls, avoid contact with moving parts by hands or tools during machine operation. Remove gloves and secure hair, clothing, jewelry, and pocket items to prevent them from becoming entangled in moving parts.

Sharp edges – Cutting tools and workpieces have sharp edges that can easily cut skin. Wear protective gloves and exercise caution when handling a cutting tool or workpiece.

Hot surfaces – During operation, motors, pumps, HPUs, and cutting tools can generate enough heat to cause severe burns. Pay attention to hot surface labels, and avoid contact with bare skin until the machine has cooled.

1.4 MACHINE-SPECIFIC SAFETY PRECAUTIONS

Eye hazard – This machine produces metal chips during operation. Always wear eye protection when operating the machine.

Sound level – This machine produces potentially harmful sound levels. Hearing protection is required when operating this machine or working around it. During testing, the machine produced the sound levels[1] listed in Table 1-1.

TABLE 1-1. SOUND LEVELS

	BB4500 motor	BB5000 motor
Sound power	90.0 dBA	94.0 dBA
Operator sound pressure	91.4 dBA	91.4 dBA
Bystander sound pressure	89.6 dBA	89.6 dBA

Hazardous environments – Do not operate the machine in environments where potentially explosive materials, toxic chemicals, or radiation may be present.

Machine mounting – Do not operate the machine unless mounted to a workpiece in accordance with this manual. If mounting the machine in an overhead or vertical position, do not remove hoist rigging until the machine is mounted to the workpiece in accordance with this manual.

1. Machine sound testing was conducted in accordance with European Harmonized Standards EN ISO 3744:2010 and EN 11201:2010.

1.5 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 understand and follow the design intent, set-up, and operation practices that are unique to Portable Machine Tools.

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

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

1.6 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 1-2. 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 (Section 3.3) and took inventory of all the items required but not supplied (Section 2.7).
☐	I created a lift plan, including identifying the proper rigging, for each of the setup lifts required during the setup of the support structure and machine.
☐	I located the fall paths involved in lifting and rigging operations. I have taken precautions to keep workers away from the identified fall path.
☐	I considered how this machine operates and 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 1-3. RISK ASSESSMENT CHECKLIST AFTER SET-UP

	After set-up
☐	I checked that the machine is safely installed (according to Section 3) 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 checklist (Section 5.1) with the recommended lubricants (Section 5.2).
☐	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.

1.7 LABELS

1.7.1 Label identification

The following warning and identification labels should be on your machine. If any are defaced or missing, contact CLIMAX immediately for replacements.

TABLE 1-4. BB4500-BB5000 LABELS

	P/N 29154 Serial number plate		P/N 59037 Warning label: read the operating manual
	P/N 59044 Warning label: read the operating manual		P/N 77568 ICE electrical symbol
	P/N 78619 Warning label: hot surface		P/N 78735 Warning label: hand crush hazard
	P/N 78741 Warning label: foot crush hazard		P/N 78742 Warning label: entanglement hazard with rotating shaft

TABLE 1-4. BB4500-BB5000 LABELS (CONTINUED)

	P/N 78748 Warning label: eye protection		P/N 78824 Warning label: do not expose the plug to water; electrical hazard
	P/N 80207 Warning label: entanglement danger with rotating shaft		P/N 80510 Warning label: cutting hazard

1.7.2 BB4500-BB5000 label locations

The following figures display the location of the labels on the RDU and AFU. For further identification of location placement, refer to the BB4500 exploded views in Appendix A on page 65 and the BB5000 exploded views in Appendix B on page 83.

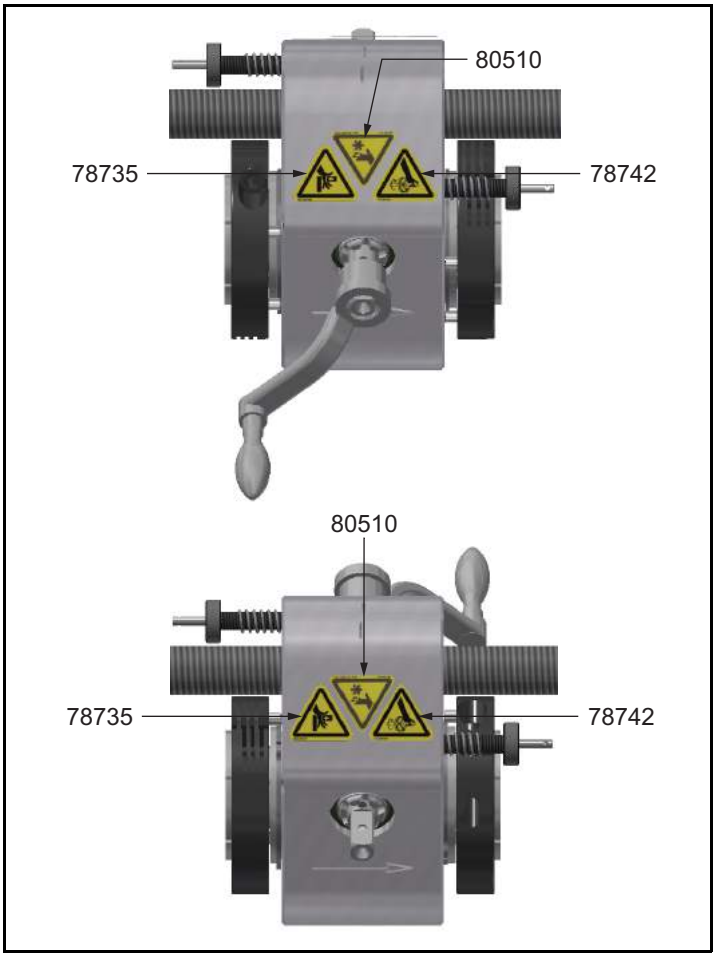

FIGURE 1-1. AFU LABEL LOCATIONS

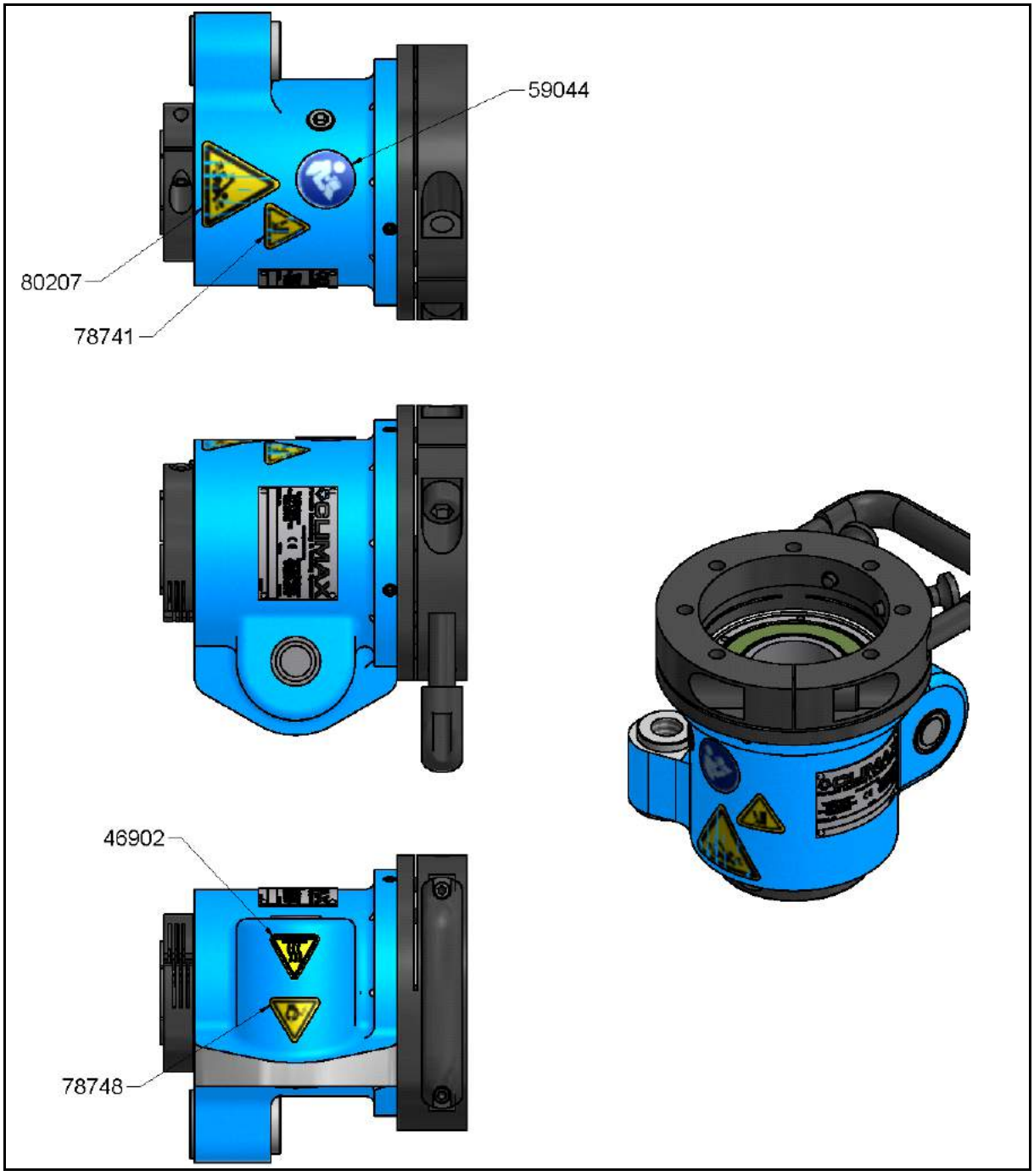

FIGURE 1-2. RDU LABEL LOCATIONS

ДЛЯ ЗАЯВОК: info@climax-stanki.ru
https://www.climax-stanki.ru

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ДЛЯ ЗАЯВОК: info@climax-stanki.ru
https://www.climax-stanki.ru

2 OVERVIEW

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The BB4500 and BB5000 are similar machines. The BB4500 has a smaller range but the same major components.

The following sections describe the differences between the two machines, as well as the components they have in common.

Figure 2-1 shows the BB4500-BB5000 major components, defined in Table 2-1.

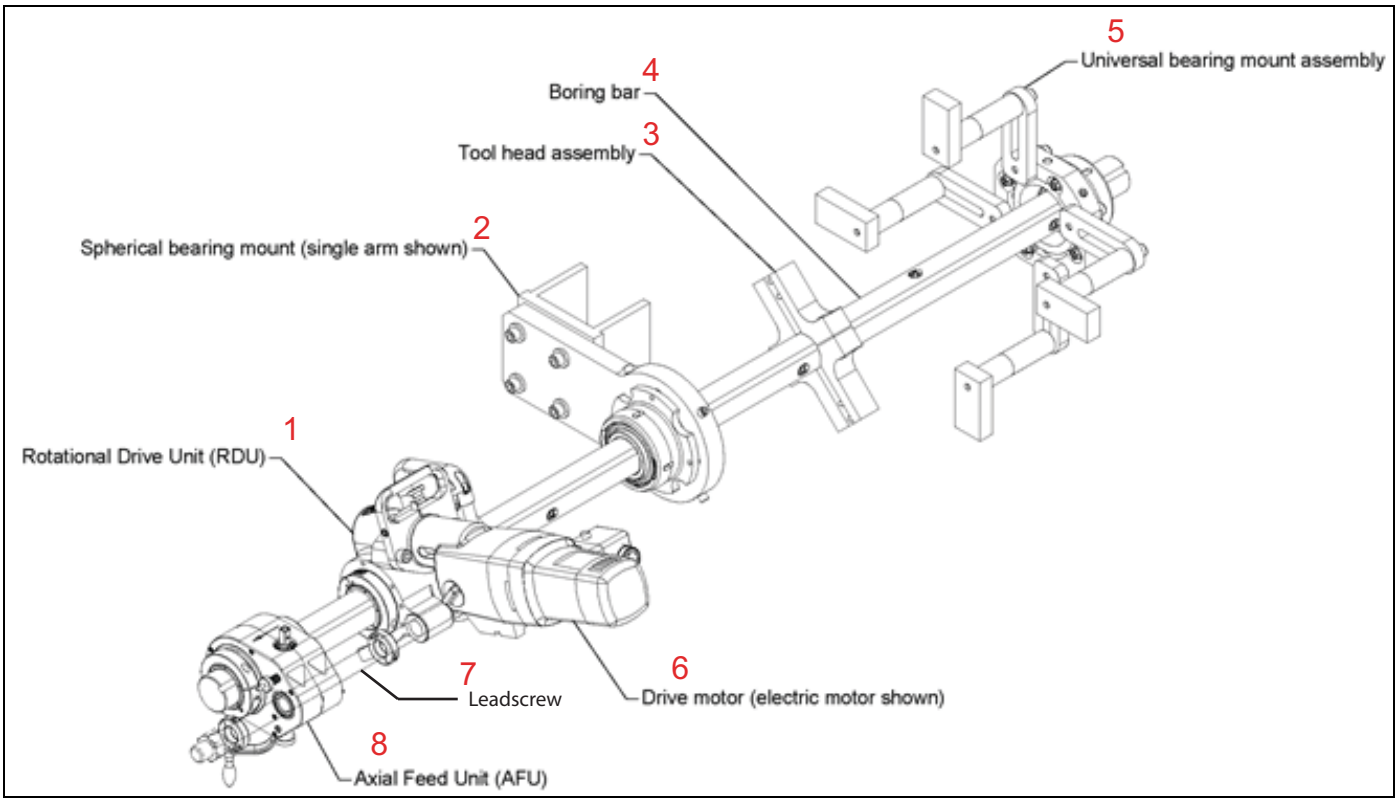

FIGURE 2-1. BB4500-BB5000 COMPONENTS WITH EIBENSTOCK MOTOR (BB5000 SHOWN)

TABLE 2-1. BB5000 COMPONENT IDENTIFICATION

Number	Component
1	Rotational drive unit (RDU)
2	Spherical bearing mount (single arm shown)
3	Tool head assembly
4	Boring bar
5	Universal bearing mount assembly
6	Drive motor (electric Eibenstock motor shown)
7	Leadscrew
8	Axial feed unit (AFU)

2.1 BB4500 FEATURES

The BB4500's modular design and diverse setup options offer innovative solutions to difficult on-site maintenance problems. The BB4500 is designed for on-site repair and servicing of heavy equipment at chemical plants, public utilities, mills, mines, power stations, fluid transmission, and distribution systems.

2.2 BB5000 FEATURES

The BB5000 can be used easily in small workspaces. CLIMAX's mounting components provide the flexibility to handle tough boring jobs. The BB5000's through-bar design allows you to mount the rotational drive and feed unit anywhere along the bar. This flexibility means the BB5000 will complete your job where others would not even fit.

This portable boring machine is a versatile tool. Its broad array of accessories enables the BB5000 for use in blind boring, line boring, drilling, facing, threading, valve repair, and trepanning. A special interface kit allows quick attachment and precise alignment of a welder to the BB5000's mounting fixtures. CLIMAX also offers the industry's broadest range of electric, hydraulic, and pneumatic power options for added flexibility.

The BB5000 is a highly configurable machine with many options and accessories, though this manual only covers the basic assembly components. If a specific machine application requires accessories, contact CLIMAX for more information.

This manual also describes the operation (Section 4 on page 51) and maintenance (Section 5 on page 57) of your BB5000. The machine is designed for on-site maintenance of heavy-duty industrial equipment. All parts meet CLIMAX's strict quality standards. For maximum safety and performance, read the entire manual before operating the machine.

2.3 COMPONENTS

The BB4500 and BB5000 have the following components.

2.3.1 Rotational drive unit

The RDU with sealed lubrication has worm gear reduction and may be mounted anywhere along the bar. A key within the collet drives the boring bar. The clamp ring holds the RDU to the spherical bearing mounting bracket. A clamp collar provides a snug, sliding fit between the RDU and the bar, or it may be clamped tight for facing operations.

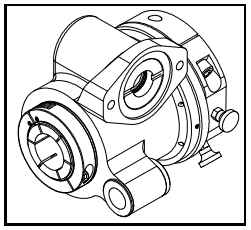

FIGURE 2-2. RDU

2.3.2 Axial feed unit

The AFU is held in place by two clamp collars and may be secured in any position along the bar. It travels with the bar and tool head axially along a fixed leadscrew.

Select the feed direction by shifting the feed shaft position (see Section 3.4.1 on page 40 for more information).

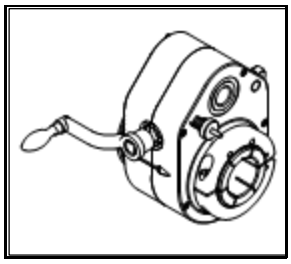

FIGURE 2-3. AFU

2.3.3 Leadscrew

The fixed leadscrew may be mounted either to the RDU or to the axial leadscrew-mounting block.

For the BB4500, standard leadscrews have 12" (305 mm) or 24" (610 mm) of travel.

For the BB5000, standard leadscrews have 12" (305 mm), 24" (610 mm), or 36" (914 mm) of travel.

Other lengths are available to suit your requirements. Contact CLIMAX for more information.

2.3.4 BB4500 tool heads

For the BB4500, the split-body tool heads may be clamped anywhere along the bar. The set of three tool heads bore 4–10" (102–254 mm) diameter. The tool heads hold tool bits that are 0.5" (12 mm) square.

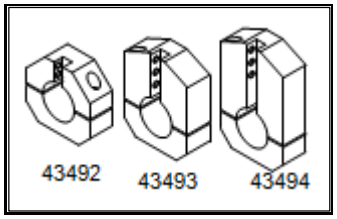

FIGURE 2-4. BB4500 TOOL HEADS

Boring heads accept 0.5" (12 mm) square tool bits and machine sizes that are 4–10" (102–152 mm), 6–8" (152–203 mm), and 8–10" (203–254 mm) in diameter. They are compatible with either high-speed steel (HSS) or carbide-tipped tool bits.

For boring diameters less than 4" (102 mm), use the broached tooling holes in the bar. For boring diameters less than 2" (51 mm), use the small boring option.

Blank and pre-ground 0.5" (12 mm) tool bits are available for the slotted boring heads.

2.3.5 BB5000 tool heads

For the BB5000, the split-body tool heads may be clamped anywhere along the bar.

Two sets of tool heads are available:

- One set of five tool heads bore 4.5–12" (114–305 mm) diameter.
- The optional large boring head features a split-body mounting hub and two sets of tool arms that bore 12–24" (305–610 mm) diameter.

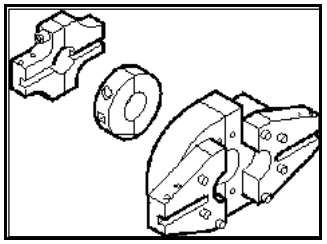

FIGURE 2-5. BB5000 TOOL HEADS

Tool bits are 1/2" (12 mm) square. Other tool head options are discussed in Section 3.3.2 on page 35.

2.3.6 BB4500 boring bar

Standard BB4500 bars are 1.75" (44 mm) in diameter and are available in lengths from 4–12 ft (1.2–3.66 m) in 24" (610 mm) increments. Contact CLIMAX for bars of other lengths and diameters.

All bars have 0.5" (12 mm) square tool bit mounting holes spaced at 10" or 6" (254 or 152 mm) intervals. Contact CLIMAX for custom hole spacing patterns.

Do the following to determine the bar length required (see Figure 2-14 on page 26):

1. Determine the workpiece overall dimension + stroke + 27" (686 mm).
2. Round up to the next 24" (610 mm) increment.

2.3.7 BB5000 boring bar

Standard BB5000 bars are 2.25" (57 mm) in diameter and are available in lengths from 4–12 ft (1.2–3.66 m) in 24" (610 mm) increments. Contact CLIMAX for bars of other lengths and diameters.

All bars have 0.5" (12 mm) square tool bit mounting holes spaced at 10" or 6" (254 or 152 mm) intervals. CLIMAX offers a drill jig with a tool sleeve kit for cutting intermediate tool bit holes for special applications. Contact CLIMAX for custom hole spacing patterns.

Do the following to determine the bar length required (see Figure 2-14 on page 26):

1. Determine the workpiece overall dimension + stroke + 27" (686 mm).
2. Round up to the next 24" (610 mm) increment.

2.3.8 Spherical bearing mounts

The spherical bearing mount support brackets hold the bar and machine in place during operation. Each bracket includes a spherical self-aligning bearing for quick, accurate setup. Spacer plates may be tack welded or clamped to the workpiece to secure the brackets in place.

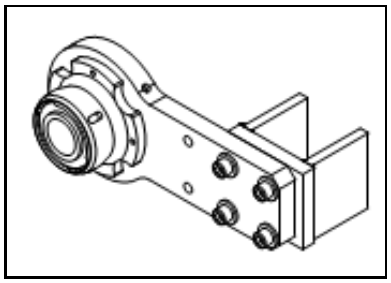

FIGURE 2-6. SINGLE-ARM SPHERICAL BEARING MOUNT

These brackets are available in single-arm, double-arm, and universal styles. The universal mount may also be turned into an inside diameter (ID) mount with the purchase of an optional set of jacking bolts.

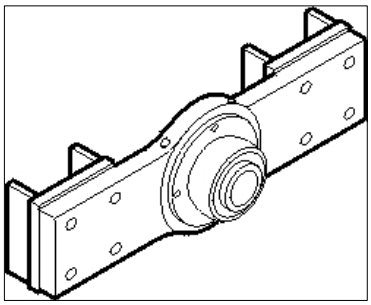

FIGURE 2-7. DOUBLE-ARM SPHERICAL BEARING MOUNT

Double-arm spherical bearing mounting brackets are better for those applications requiring extra support, such as when boring holes exceed 8" (203 mm) in diameter.

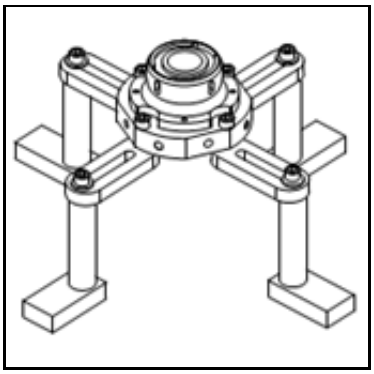

FIGURE 2-8. UNIVERSAL SPHERICAL BEARING MOUNT

2.4 CONTROLS

Table 2-2 shows the power options available for the BB4500-BB5000. Please note that only the BB5000 has the servo drive option.

TABLE 2-2. POWER OPTIONS

Power type	RPM[1] range	Power	Reference
Hydraulic	10 hp HPU[2]: 0 – 246 RPM at 60 Hz mains power 10 hp HPU: 0 – 200 RPM at 50 Hz mains power	10 hp (7.4 kW)	Section 2.4.1 on page 18
Electric	8 – 160 RPM	3.35 hp (2.5 kW)	Section 2.4.3 on page 21
Pneumatic	0 – 120 RPM	3.0 hp (2.2 kW)	Section 2.4.4 on page 24
Servo (BB5000 only)	3 – 230 RPM	4.7 hp (3.5 kW)	Section 2.4.2 on page 19

1. Revolutions per minute (RPM)
2. Hydraulic power unit (HPU)

For more information about using the BB4500-BB5000 controls, see Section 3.5 on page 43.

The RDU used with hydraulic, pneumatic, and electric drives has a 4:1 gear reduction. The servo drive uses 12:1 gear reduction.

TABLE 2-3. TEST DATA

Material:	A-36 (mild steel)
Bore diameter:	23" (584.2 mm)
Tool bit:	High speed steel (HSS)
Bearing spacing:	22" (558.8 mm)
Bar speed:	30 – 40 RPM
Depth of cut:	100” (2,540 mm)
Feed rate:	0.003" (0.076 mm) per revolution
Length of cut:	2” (50.8 mm)

TABLE 2-4. SETUP CONES

	Range
Standard	2.75–12” (70–305 mm)
Optional	1.375–5” (34.9–127 mm)

2.4.1 Hydraulic power unit and hydraulic motors

⚠ CAUTION

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

The high-torque, low-speed hydraulic motor mounts directly to the RDU. To reverse the bar rotation direction, switch the hydraulic hoses at the motor or at the HPU.

Table 2-5 on page 18 shows the available HPUs and their specifications.

TABLE 2-5. AVAILABLE HPU SPECIFICATIONS

4 Function, 208 - 230 Volts				
Cordset/hose length		Quick Connect Style		P/N
Feet	Meters	60 Series QD	ISO 16028 CE	
20	6	✓		55285
50	15	✓		51517
100	30	✓		94009
20	6		✓	93894
50	15		✓	94010
100	30		✓	94011

4 Function, 380 - 415 Volts				
Cordset/hose length		Quick Connect Style		P/N
Feet	Meters	60 Series QD	ISO 16028 CE	
20	6	✓		55279
50	15	✓		55856
100	30	✓		80909
20	6		✓	93927
50	15		✓	94012
100	30		✓	94013

4 Function, 575 Volts				
Cordset/hose length		Quick Connect Style		P/N
Feet	Meters	60 Series QD	ISO 16028 CE	
20	6	✓		51133
50	15	✓		51138
100	30	✓		81396
20	6		✓	94018
50	15		✓	94019
100	30		✓	94020

4 Function, 460 Volts				
Cordset/hose length		Quick Connect Style		P/N
Feet	Meters	60 Series QD	ISO 16028 CE	
20	6	✓		51130
50	15	✓		55645
100	30	✓		56658
20	6		✓	94015
50	15		✓	94016
100	30		✓	94017

If using an HPU not supplied by CLIMAX, the hydraulic requirement is 10 gpm at 2,000 psi (37.85 lpm at 138 bar).

Hydraulic motors with different displacement ratings are available. Please note the following:

- If the HPU runs on 50 Hz, it produces a maximum rate of 8.3 gpm.
- If the HPU runs on 60 Hz, it produces a maximum rate of 10 gpm.

Refer to the correct “Maximum bar RPM” column in Table 2-6 for hydraulic motor performance.

TABLE 2-6. HYDRAULIC MOTOR SPECIFICATIONS

Motor capacity	Maximum bar RPM		Torque at bar	Part number for motors with 60 series QD fittings	Part number for motors with ISO 16028 QD fittings
	8.36 gpm (31.5 L/min)[1]	10 gpm (37.9 L/min)[2]			
2.2 inch^3 (36 cm^3)	204	246	92 ft-lbs (124.7 Nm)	39837	65384
3.6 inch^3 (59 cm^3)	124	150	159 ft-lbs (215.6 Nm)	39843	63425
5.7 inch^3 (93.4 cm^3)	76	92	270 ft-lbs (367 Nm)	39844	63429
7.3 inch^3 (119.6 cm^3)	60	73	342 ft-lbs (463.7 Nm)	39845	69434
8.9 inch^3 (145.8 cm^3)	49	60	417 ft-lbs (565.4 Nm)	39846	69435
11.3 inch^3 (185.2 cm^3)	40	49	478 ft-lbs (648.1 Nm)	43451	69436
14.1 inch^3 (231.1 cm^3)	31	38	652 ft-lbs (884.0 Nm)	39847	39847
17.9 inch^3 (293.3 cm^3)	24	30	764 ft-lbs (1,035.8 Nm)	43452	69439

1. With 50 Hz mains power.
2. With 60 Hz mains power.

2.4.2 BB5000 servo motors

NOTICE

Never disconnect any cable from this machine without first turning off the mains disconnect switch. Interrupting the connection between the servo amplifier and the servo motor while they are energized may damage the servo amplifier, even if the motor is stopped. Failure to comply with this warning will void the warranty on the control system.

The 4.7 hp servo motor with a 12:1 worm gear reduction RDU provides quiet, reversible and extreme torque for operating the BB5000.

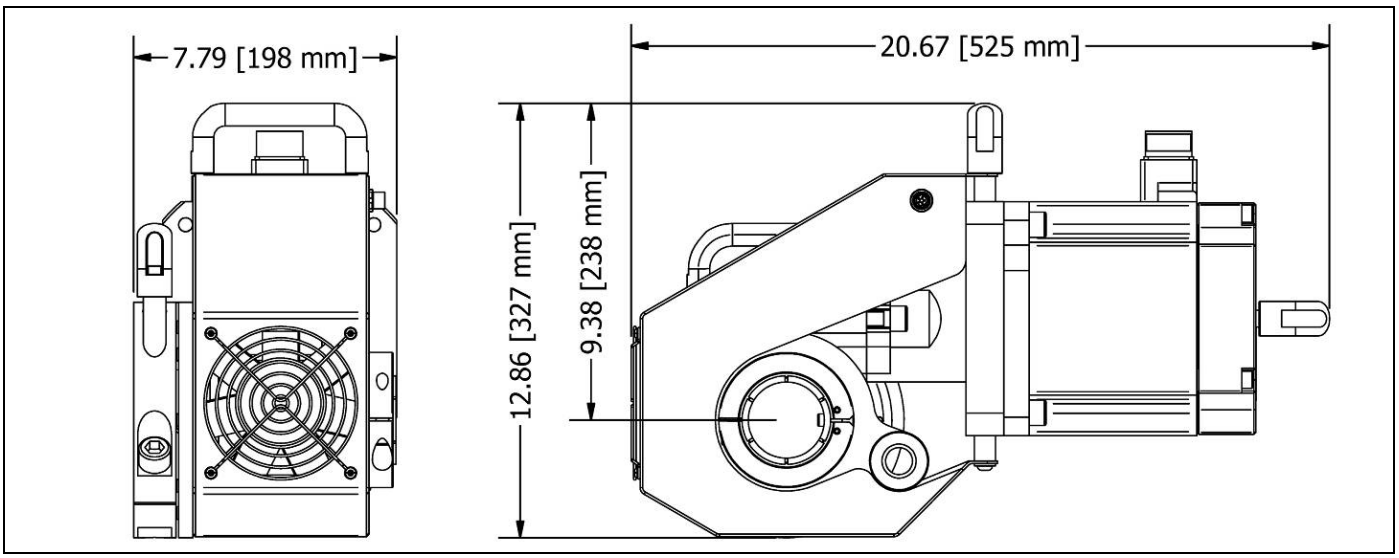

FIGURE 2-9. BB5000 SERVO DRIVE DIMENSIONS

WARNING

Handle cables carefully. Do not pull on them, step on them, or allow them to be kinked. Pelikan cases are water resistant, not water-proof.

Do not turn on the power unless all cables are plugged in. Do not unplug cables unless disconnected from mains power.

Servo drives for the BB5000 are available in 230V (16 amps) or 460V (8.5 amps).

TABLE 2-7. BB5000 SERVO MOTOR SPECIFICATION

Input power for the 230V system:	200V–240V, 50/60 Hz dual-rated, 16 amp, 3-phase
Input power for the 460V system:	380V–480V, 50/60 Hz dual-rated, 8.5 amp, 3-phase
Bar	
Bar speed:	3–230 RPM
Bar rated torque (continuously running):	3–167 RPM: 147.9 ft-lbs (200.4 Nm)
Bar maximum torque:	3–230 RPM: 443.7 ft-lbs (600.4 Nm)
Rotation:	Variable speed and reversible
Motor	
Manufacturer:	Mitsubishi
Speed rated continuous:	2,000 RPM

TABLE 2-7. BB5000 SERVO MOTOR SPECIFICATION (CONTINUED)

Speed maximum:	3,000 RPM
Speed permissible instantaneous:	3,450 RPM
Nominal rated full load hp:	4.7 hp (3.5 kW)
Motor torque rated:	12.3 ft-lbs (16.7 Nm)
Motor torque maximum:	37.0 ft-lbs (50.1 Nm)

2.4.3 Electric motor

Two electric versions of the BB5000 are available, as described in Table 2-9 on page 22. The motor has an integrated rotation reverse switch, while the pendant controller has an off/off switch, emergency stop, and a speed control knob.

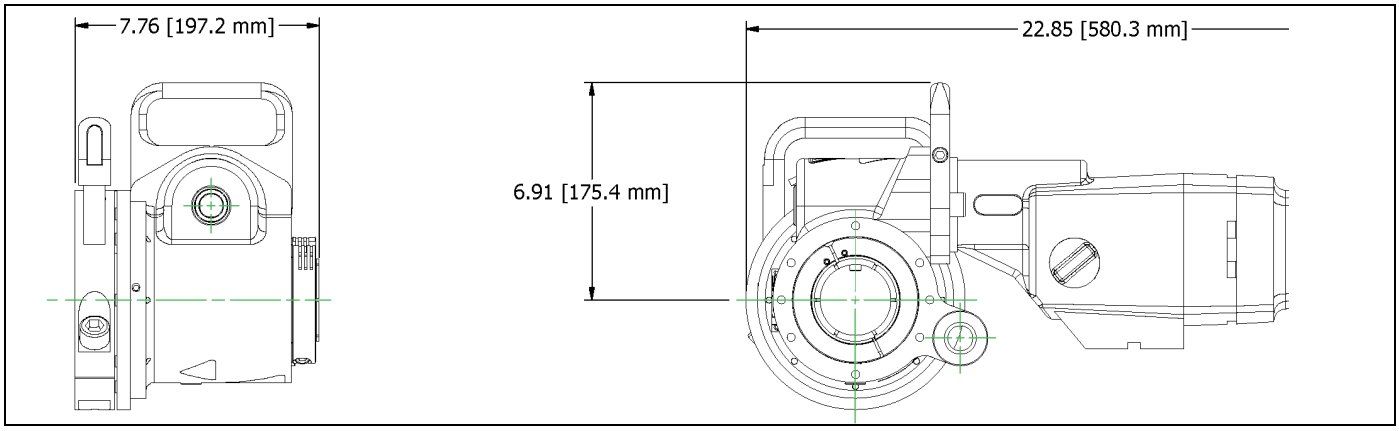

FIGURE 2-10. RDU AND EIBENSTOCK MOTOR DIMENSIONS

NOTICE

The second-generation Eibenstock motor is incompatible with the third-generation RDU. The second-generation Eibenstock motor requires the fourth-generation RDU.

NOTICE

Table 2-8 shows the four mains power plugs for the control box that CLIMAX offers. If the plug needed is not included in Table 2-8, the end user must cut off the factory-installed plug and install their own.

TABLE 2-8. CONTROL BOX

120V Controller:	L5-30P twist-lock
120V Controller:	ISO 309/CEE17
230V Controller:	CEE 7/7 Schuko
230V Controller:	6L-15P twist-lock

TABLE 2-9. POWER RATING

120V motor:	3.35 hp (2.5 kW) 20 Amps 60 Hz
230V motor:	3.35 hp (2.5 kW) 10.5 Amps 60 Hz

Both motors have a four-speed gearbox for maximum versatility. Table 2-10 specifies the operating range for each gear.

TABLE 2-10. SPEED RANGE AND TORQUE PER GEAR

Gear	Knobs	RPM range	Rated bar speed	Bar torque
1	● ●	8.0–23.0 RPM	20 RPM	470 ft-lb (637 Nm)
2	● ●●	12.5–35.5 RPM	30 RPM	300 ft-lb (407 Nm)
3	●● ●	35.5–101.0 RPM	90 RPM	105 ft-lb (142 Nm)
4	●● ●●	56.5–160.0 RPM	142.5 RPM	65 ft-lb (88 Nm)

⚠ CAUTION

Before shifting gears, remove the cutting load from the motor and stop the motor rotation. Shifting gears while the machine is under load could damage the motor and gearbox components.

CLIMAX's portable machine tools require a three-wire extension cord. Extension cords of inadequate wire size may cause a significant drop in mains voltage with a consequent loss of power.

As the distance from the supply outlet increases, heavier gauge extension cords are required (see Table 2-11).

TABLE 2-11. RECOMMENDED WIRE GAUGE FOR EXTENSION CORDS

	Cord length					
	25 feet (7.6 m)	**50 feet (15.2 m)**	**75 feet (22.9 m)**	**100 feet (30.5 m)**	**150 feet (45.7 m)**	**200 feet (61 m)**
Nameplate amps	**Minimum wire gauge**					
0–5.0	16	16	16	14	12	12
5.1–8.0	16	16	14	12	10	
8.1–12.0	14	14	12	10		
12.1–15.0	12	12	10	10		
15.1–20.0	10	10	10			

Table 2-12 and Table 2-13 list the service parts for both motors.

TABLE 2-12. 120V SERVICE PARTS

Part number	Description	Quantity
83595	Rotor complete	1
82698	Carbon brush	2
83593	PCB / circuit board	1
83594	Stator complete	1

TABLE 2-13. 230V SERVICE PARTS

Part number	Description	Quantity
90776	Rotor Complete	1
90778	Brush Holder	2
85088	Carbon Brush	2
83591	Anti Parasite Condenser	1
85089	PCB / Circuit Board	1
82699	Cap	1
90779	Stator Complete	1
83601	Grooved Ball Bearing 6201 LUZ	1
90780	Locking Ring 32x1,2	1
83602	Shaft Seal Ring 15x21x3 KEIV	1
90238	Work Spindle	1
90781	Shaft Seal Ring 30x42x7	1
90782	Grooved Ball Bearing 6005 2RS	1
90783	O-ring 106x2	1
85494	Switch Button Long	1
85493	Switch Button Short	1
90784	Connector Socket	1
90785	Insert	1
90786	Screw 3x10	4
87279	Reversing switch	1
90787	Connector Pin 2,5 mm2	3
90788	Connector Pin 0.75 mm2	2

2.4.4 Air motor

The 3 hp (2.24 kW) air motor is reversible and operates under the specifications listed in Table 2-14.

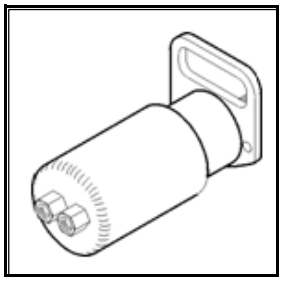

FIGURE 2-11. AIR MOTOR

TABLE 2-14. CONTROL BOX

Air pressure required:	90 psi (6.2 bar)
Air flow required:	95 ft3/min (2.7 m^3/min)

The available air motor assemblies produce boring bar speeds and torques listed in Table 2-15.

TABLE 2-15. BAR RPM AND TORQUE AT MAXIMUM HP

Air motor part number	Bar RPM	Torque
28614	120 RPM	115 ft-lb (156 Nm)
28697	57 RPM	234 ft-lb (318 Nm)

The assembly includes the RDU mounting flange and associated hardware. For a complete air-powered system, order an air motor assembly and connection package. The air connection package contains an air filter and lubricator, and hoses with quick disconnect fittings.

⚠ CAUTION

To maintain the air motor and avoid invalidating your warranty, always route incoming air through the pneumatic conditioning unit (PCU).

2.4.5 Pneumatic conditioning unit

The PCU (shown in Figure 2-12 on page 25) provides clean dry air and lubrication to the air motor. Install the PCU in the air supply circuit immediately before the BB4500 or BB5000.

⚠ WARNING

Always stop the machine and lock out/tag out the PCU before making adjustments to controls or machine components. Failure to follow this safety precaution may result in severe injury.

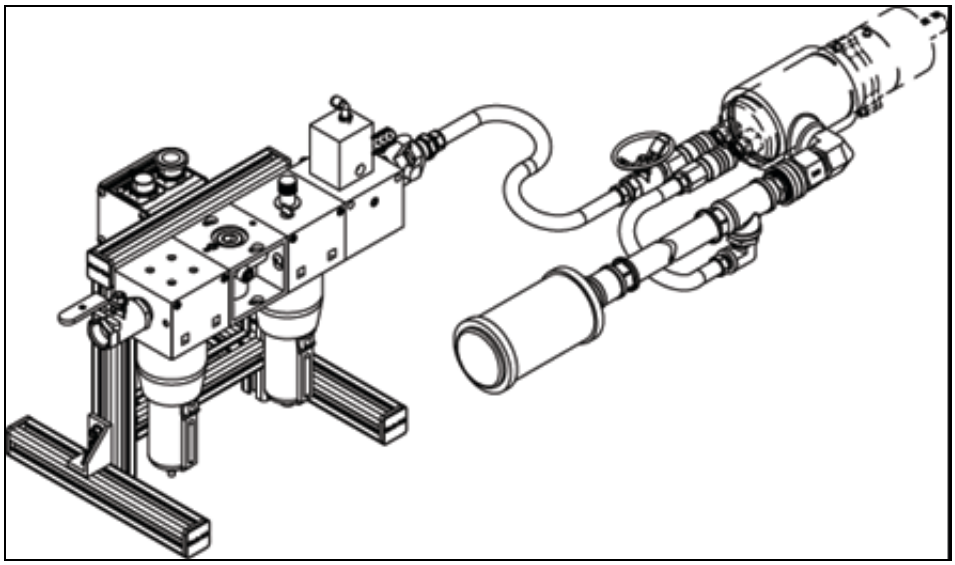

FIGURE 2-12. PNEUMATIC CONDITIONING UNIT

Emergency shutdown

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

Before restarting the BB4500-BB5000, check the following:

1. Close the speed adjustment valve.
2. Pull the emergency stop button up.
3. Press the START button (repeat step 1 if necessary).

2.5 DIMENSIONS

Table 2-16 shows the BB4500 and BB5000 dimensions.

TABLE 2-16. DIMENSIONS

Component	Width x diameter x height
Machine	52.5” x 27” x 16.5” (1,334 x 686 x 419 mm)
72" (1,828.8 mm) bar	74.5” x 6.5” x 7” (1,892 x 165 x 178 mm)
HPU	49.5” x 30.5” x 41” (1,257 x 775 x 1,041 mm)

The following figures show the BB4500-BB5000 machine and operating dimensions.

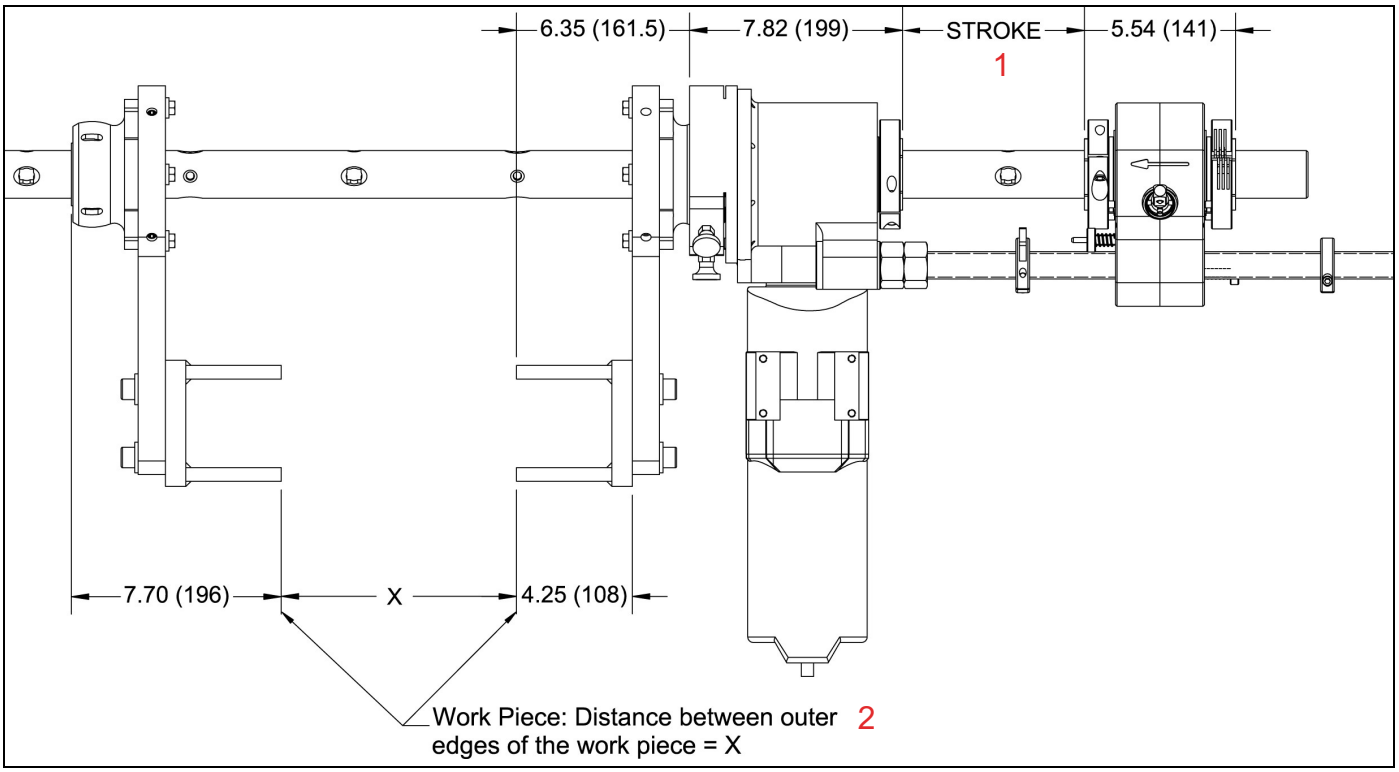

FIGURE 2-13. BB4500 DIMENSIONS

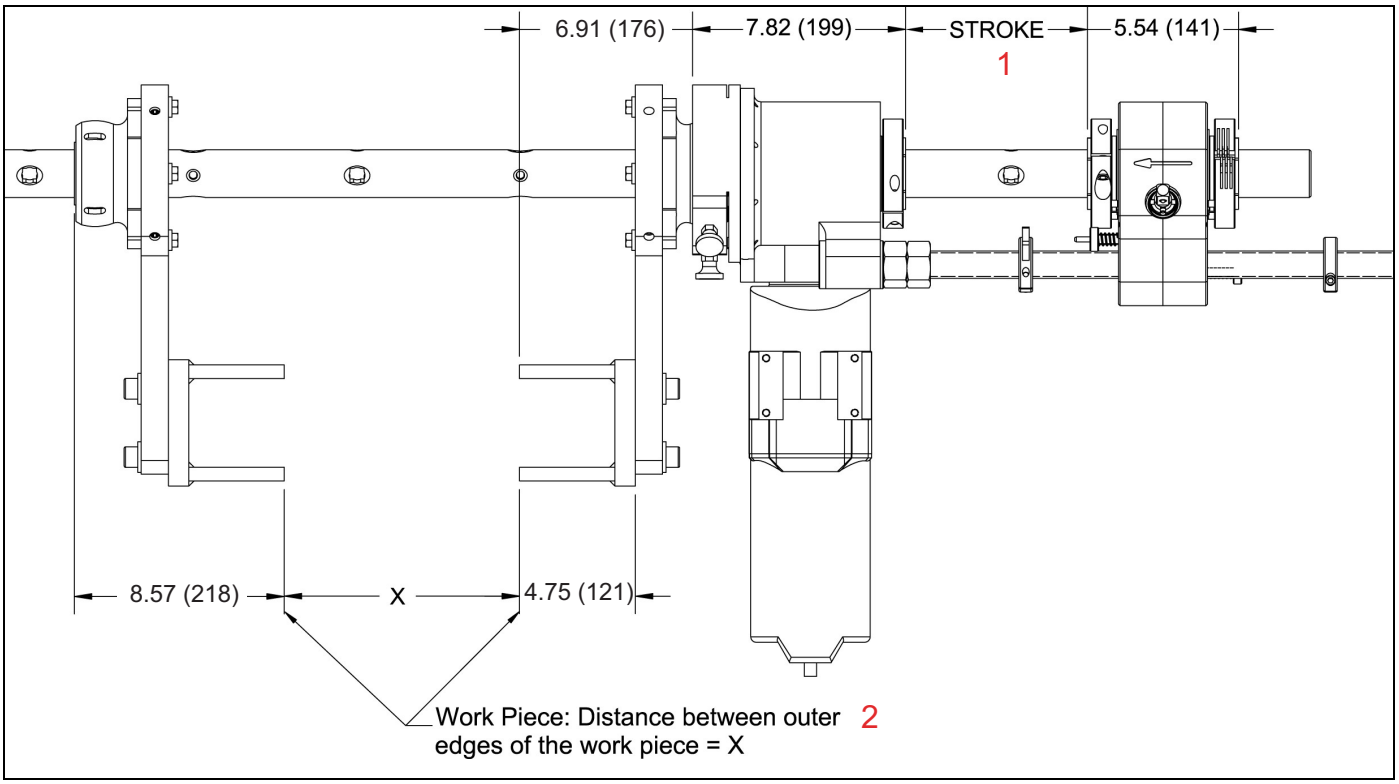

FIGURE 2-14. BB5000 DIMENSIONS

TABLE 2-17. BB4500-BB5000 BORING BAR DIMENSION IDENTIFICATION

Number	Component
1	Stroke
2	Workpiece: distance between outer edges of the workpiece = X

2.6 SPECIFICATIONS

TABLE 2-18. SUB-COMPONENT MASS

Component	Mass in lbs (kg)
Motor:	43 lbs (20 kg)
Adapter assembly (P/N 51536):	10 lbs (5 kg)
Rotational drive unit (P/N 53165):	31 lbs (14 kg)
Total for motor, adapter assembly and RDU:	85 lbs (39 kg)
Pendant:	4 lbs (2 kg)
HPU – 10 HP:	695 lbs (315.2 kg)
Machine total weight (including single arm mounts, setup cones, and hydraulic motor):	444 lbs (201 kg)
Approximate boring bar ship weight (including the metal shipping container):	1.48 lbs/inch (0.264 kg/cm)

TABLE 2-19. BORING SPECIFICATIONS

Component	BB4500 range	BB5000 range
Boring bar diameter (standard):	1.75" (45 mm)	2.25" (57 mm)
Boring bar diameter (optional):	1.25" (32 mm)	1.75" (45 mm) 1.25" (32 mm)
Boring diameter (standard):	2–10" (51–254 mm)	2.5–12" (64–305 mm)
Boring diameter (optional):	1.5–5" (38–127 mm)	1.375–24" (35 – 610 mm)
Boring stroke (standard):	12" (305 mm)	12" (305 mm)
Boring stroke (optional):	36" (914 mm)	24 (610 mm) 36" (914 mm)

2.6.1 Electrical specifications

CLIMAX electrical equipment is suitable for use in the physical environment and operating conditions specified below. When the physical environment or the operating conditions are outside those specified, consult CLIMAX before putting the electrical equipment into service.

TABLE 2-20. ELECTRICAL SPECIFICATIONS

Mains voltage (AC):	±10% of nominal
Mains frequency (AC):	±1% of nominal
Mains harmonics:	10% of RMS volts 2nd through 30th harmonic
Voltage imbalance (3-phase supplies):	2% maximum
Voltage impulses:	200% of nominal 1.5 milliseconds (ms) maximum duration
Voltage interruption:	3 ms maximum with 1 second between
Voltage dip (brownout):	20% of peak volts for 1 second maximum
Voltage supplied from batteries:	±10% of nominal
Voltage interruption (DC):	5 ms maximum
Ambient temperature (operating):	41–104°F (5–40°C)
Ambient temperature (transport and storage):	-13–131°F (-25–55°C)
Relative humidity:	20–95% non-condensing
Altitude:	6,600 ft (2,000 m)
Contaminants:	IP54 environment except for some motors and slip ring assemblies that are IP 20
Available fault current:	Not greater than that listed on the controls nameplate
Vibration	
Pushbuttons:	5g at 5–300 Hz
Relays, contactors, and breakers:	2g at 5–300 Hz
Touchscreen HMI:	1g at 9–150 Hz
Servo amplifiers and PLC:	1g at 9–150 Hz
Physical shock (impact)	
Pushbuttons:	30g for 18ms
Relays, contactors, and breakers:	6g for 11ms
Touchscreen HMI:	15g three times in X, Y, and Z
Servo amplifiers and PLC:	1g three times in X, Y, and Z

2.7 ITEMS REQUIRED BUT NOT SUPPLIED

The only item required but not supplied in your CLIMAX product kit is a welder to weld on the tack plate when mounting the bearings onto the workpiece.

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3 SETUP

IN THIS CHAPTER:

3.1 Receipt and inspection - - - -31
3.2 Lifting and rigging - - - -32
3.3 Machine assembly - - - -32
3.3.1 Bar and mounting bracket assembly - - - -33
3.3.2 Tooling and tool head assembly - - - -35
3.3.2.1 Placing the tool bit into the bar - - - -36
3.3.2.2 Placing the tool head onto the boring head - - - -36
3.3.3 RDU and AFU assembly - - - -37
3.4 Axial feed - - - -40
3.4.1 Selecting the feed direction - - - -40
3.4.2 Setting the feed rate - - - -41
3.4.3 Automatic feed stop - - - -42
3.5 Power connection - - - -43
3.5.1 Hydraulic machines - - - -43
3.5.2 BB5000 servo drive machine - - - -44
3.5.3 Electrical machines - - - -46
3.5.4 Pneumatic machines - - - -46
3.6 BB4500-BB5000 with small diameter bars - - - -47

This section describes the setup and assembly procedures for the BB4500-BB5000 boring machine.

3.1 Receipt and inspection

Your CLIMAX product was inspected and tested prior to shipment, and packaged for normal shipment conditions. CLIMAX does not guarantee the condition of your machine upon delivery.

When you receive your CLIMAX product, perform the following receipt checks:

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

5Contact CLIMAX immediately to report damaged or missing components.

NOTICE

Keep the shipping container and all packing materials for future storage and shipping of the machine.

The machine ships from CLIMAX with a heavy coating of LPS 3. The recommended cleaner is LPS PreSolve Orange Degreaser. All parts must be cleaned before use.

3.2 LIFTING AND RIGGING

⚠ WARNING

Do not lift the BB4500-BB5000 boring machine when fully assembled, as it can weigh up to 444 lbs (201 kg). To prevent serious injury to yourself and others, always follow the operating procedures outlined in this manual, your own company rules, and local regulations for heavy lifting. Serious injury or fatalities can result from improper lifting methods.

Falling or uncontrolled swinging of machinery can cause serious injury or be fatal to the operator and bystanders.

3.3 MACHINE ASSEMBLY

A basic setup is described in the following sections, but individual applications may require different setups based on, but not limited to, the following factors:

- The size of the bore
- The number of bores and bearings
- Distance between the bores
- Distance between the bearings
- Style of bearings (single arm, double arm, universal)

Contact CLIMAX for assistance with a custom application.

The BB4500-BB5000's through-bar design allows for mounting the rotational drive unit (RDU) and feed box anywhere along the bar. They do not need to be mounted next to each other. This allows assembly of the BB4500-BB5000 in very restricted spaces. Special setup cones are also available to make it easier to center and stabilize the bar in the workpiece bore.

Exactly attaching and aligning the tack mounting plates is designed to be straightforward. The initial fixture mounting may be 5° or more out of alignment. CLIMAX's spherical mounting system enables the BB4500-BB5000 to align perfectly with the bore.

The BB4500-BB5000 also features four precision alignment screws for precisely dialing into the center of an existing bore or into a bore that is not exactly true.

The BB4500-BB5000 modular design eliminates the problem of lifting heavy, bulky, one-piece machines on the job site. The BB4500-BB5000 quickly assembles and disassembles, one component at a time.

3.3.1 Bar and mounting bracket assembly

To roughly align a CLIMAX boring bar in a workpiece, use centering cones. These cones approximately center the bar until bearing supports and brackets are secured with clamps or welds, as appropriate. Cone sets are in two sizes, cover a wide range, and are offered as optional equipment with the BB4500-BB5000.

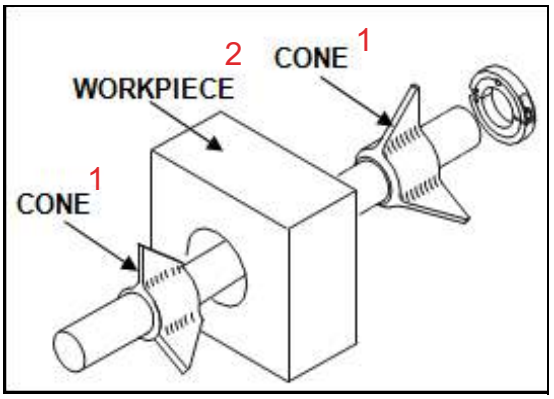

FIGURE 3-1. SETUP CONES

TABLE 3-1. SETUP CONE IDENTIFICATION

Number	Component
1	Cone
2	Workpiece

The goal is to support the boring bar in place until clamping or welds on tack plates are completed. Then remove the cones and make precise adjustments to center the bar.

Setup cones (optional equipment)

Do the following to install the setup cones:

1. Clean the bore and the boring bar to remove grease, oil, and dirt.
2. Carefully slide the boring bar through the holes to be bored (see Figure 3-2).

⚠ CAUTION

To avoid bodily injury or bar damage and to ease setup, lift heavy loads (bars over 72” [1,829 mm]) using a sling.

FIGURE 3-2. BORING BAR INSERTION

3. Slide a setup cone (or a substitute device) onto each end of the bar to center the bar in the bore.

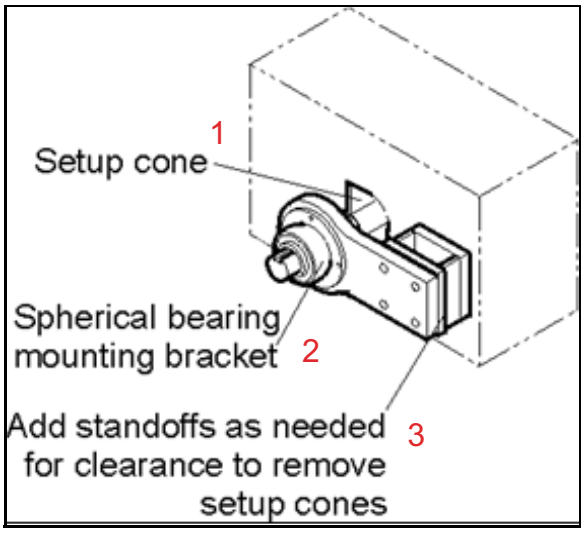

FIGURE 3-3. SETUP CONE INSTALLATION

TABLE 3-2. SETUP CONE INSTALLATION IDENTIFICATION

Number	Component
1	Setup cone
2	Spherical bearing mounting bracket
3	Standoffs (add as needed for clearance to remove the setup cones)

4. Tighten the set screw to secure one of the cones.
5. While pulling on the bar from the opposing end to seat the first cone, slide the second cone snug into place. Tighten the set screw.
6. Mount the clamp collar next to one setup cone. Loosen the set screw in the cone and drive it into the bore using the socket-head jacking screw. Tighten the set screw in the setup cone to hold it securely in place.
7. Repeat step 3 through step 6 until the cones are seated in the bores and there is no bar movement.
8. Center the spherical bearings in the mounting brackets by doing the following:
   a) Loosen the hex bolts.
   b) Adjust the four set screws until the bearing is centered.
   c) Tighten the hex bolts.

FIGURE 3-4. CENTERING THE SPHERICAL BEARINGS

TABLE 3-3. SPHERICAL BEARING IDENTIFICATION

Number	Component
1	Loosen bolts to adjust bearing
2	Adjust screws to center bearings in brackets

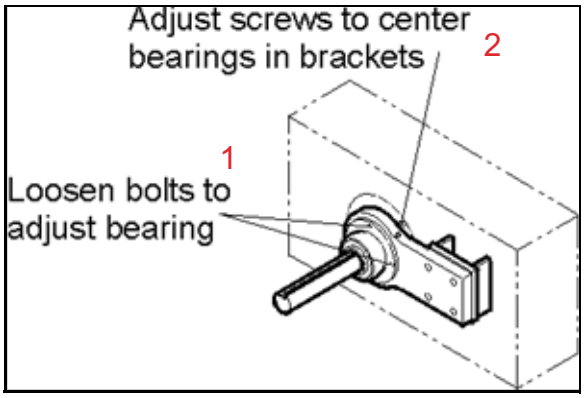

FIGURE 3-5. POSITIONING THE SPHERICAL BEARINGS

9. Mount the tack weld plates to the spherical bearing mounting brackets. If more clearance is required, weld 1" x 1" x 6" (12 mm x 12 mm x 72 mm) the tack weld blocks to the tack weld mounting spacer plates.
10. Temporarily clamp the bracket assemblies to the workpiece. Leave enough room to remove the cones after the brackets are welded in place.
11. Check that the setup cones are still securely in position.
12. Securely weld all standoffs and brackets in place.
13. Remove the temporary clamps.
14. Loosen the set screws in the setup cones.
15. Remove the bar from the brackets and remove the setup cones.
16. Carefully reinstall the bar through the mounting brackets.

If necessary, precisely align the bar by doing the following:

1. Loosen the hex bolts holding the bearing to the bracket.
2. Attach a dial indicator to the bar and touch the stylus to the workpiece ID.
3. Rotating the bar, adjust the set screws to center the bar.
4. Tighten the hex bolts to keep the bearing and the bar in place.

FIGURE 3-6. ALIGNING THE BAR

3.3.2 Tooling and tool head assembly

These machines are designed to cover a wide range of boring applications. The bar design allows for inserting a tool bit into the bar or clamping a tool head assembly

onto the bar. This gives you multiple positions of the tool bit. CLIMAX has designed these so that you can use a variety of tool bit types.

The cutting speed is primarily determined by the hardness of the metal being machined and the type of tool bit used. Other factors include the power source, feed and depth of cut, and cooling medium being used.

Generally, carbide cutting tools operate at higher RPM than high-speed steel (HSS) tools. For more information, see Section 4.2 on page 52.

3.3.2.1 Placing the tool bit into the bar

Do the following to insert the tool bit into the bar:

1. Retract the set screw that is located 90° from the tool slot.
2. Insert the tool bit into the tool slot so that it slides freely into the broached hole (see Figure 3-7).
3. Clamp the tool bit into place by re-tightening the set screw.
4. Set the tool bit to the correct radius for cutting the required diameter. There are multiple ways to set the desired radius (for instance, using a bore measuring tool).

FIGURE 3-7. INSERTING THE TOOL BIT

3.3.2.2 Placing the tool head onto the boring head

TABLE 3-4. TOOL HEAD SETUP IDENTIFICATION

Number	Component
1	Set screws
2	Tool head mounting screw
3	Tool head
4	Boring bar
5	Tool bit
6	Cutting direction

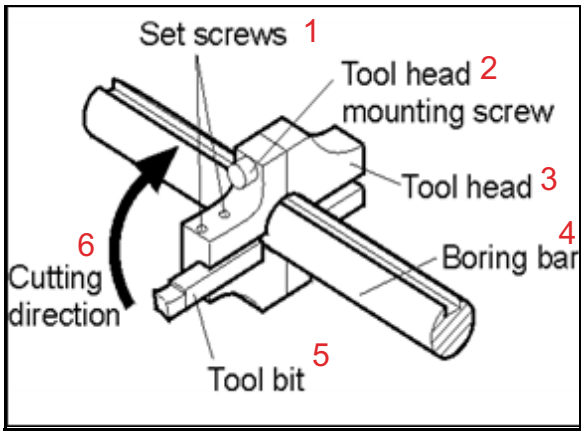

FIGURE 3-8. TOOL HEAD SETUP

Do the following for standard setup, referring to Figure 3-8 on page 36:

1. Using the clamping screw, secure the tool head tightly to the boring bar.
2. Select either a HSS or a brazed carbide tool bit.
3. Position the tool head on the bar with the open side of the tool slot toward the workpiece in the feed direction.
4. Slide the tool bit into the tool head with the cutting face toward the tightening screws. This will position the cutting face at or slightly below the centerline.

TIP:

Tool bits are either right-handed or left-handed. This allows for feeding both directions with the same rotation direction.

5. Use a dial indicator to set the tool bit to achieve the desired depth of cut. The maximum recommended cutting depth is 0.125" (3 mm). Tighten the tool bit mounting screws.

TIP:

CLIMAX offers a bore measuring tool specially built for setting the tool bit height and checking the actual bore diameter. Contact CLIMAX for more information on this tool.

3.3.3 RDU and AFU assembly

The compact RDU may be placed anywhere along the bar.

Before beginning set-up, plan the relationship between the RDU, motor, and axial feed unit (AFU) to allow for enough space.

FIGURE 3-9. POSITIONING THE RDU

The AFU may be set anywhere along the bar. It is not necessary to insert the leadscrew directly into the RDU. The leadscrew may be screwed into the tack weld block that may then be welded or clamped directly to the workpiece.

FIGURE 3-10. POSITIONING THE AFU

⚠ CAUTION

Take care not to bend or unduly stress the leadscrew during installation.

Do the following:

1. Carefully slide the bar through the spherical mounting bearings.

TIP:

If positioning the AFU between the mounting support brackets, slide it onto the bar at this point rather than in step 10.

2. Insert the bar into the opposing bearing bracket.
3. Install the RDU onto the bar, positioning it against the spherical bearing bracket so that one of the spring pins engages one of the slots in the bearing mount.
4. Tighten the clamp ring to 30 ft-lbs (41 Nm). Slide the bar to see if it is free to move. If it does not move, the clamp ring is too tight. Loosen the clamp ring bolt until the bar has some resistance but moves freely.

⚠ CAUTION

The clamp ring must be tightened before the machine is turned on. Do not rely on the spring pins to hold the rotational torque of the machine.

5. Tighten the clamp collar over the collet, as shown in Figure 3-11 on page 39. Turn the collar screw until the collar is snug, but the bar slides easily through the unit. In most boring applications, this collar can remain loose.

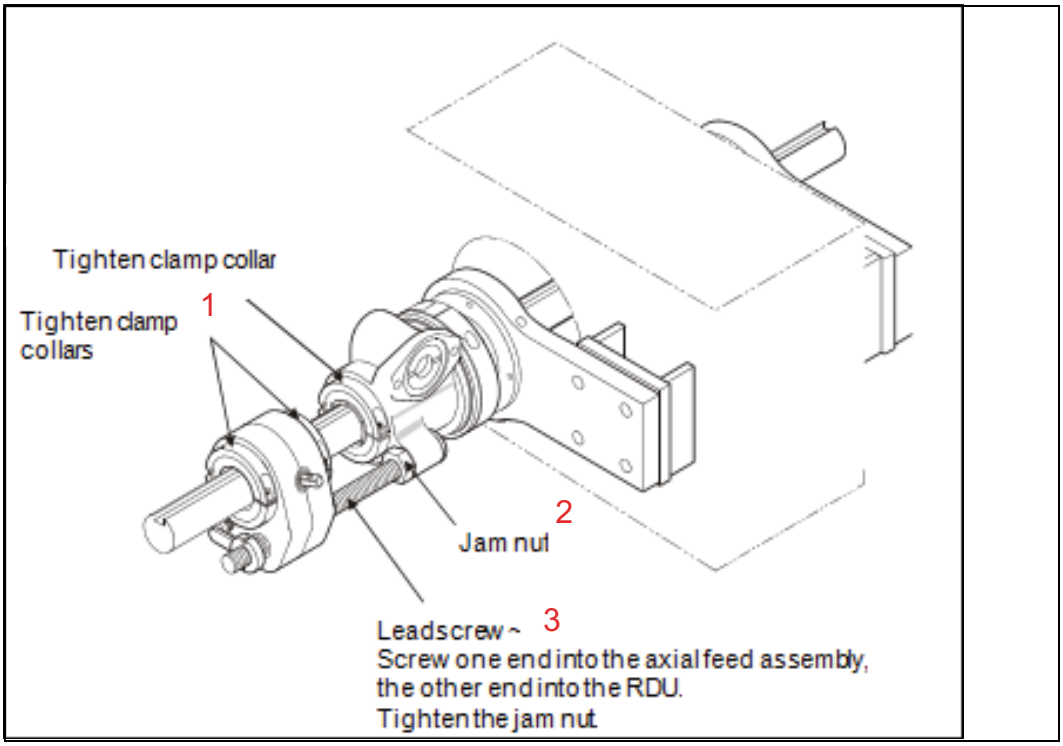

FIGURE 3-11. CLAMP COLLARS ON THE AFU

TABLE 3-5. CLAMP COLLARS INSTALLATION IDENTIFICATION

Number	Component
1	Tighten the clamp collars
2	Jam nut
3	Leadscrew (Screw one end into the AFU, the other end into the RDU. Tighten the jam nut.)

6. Hold the motor assembly so that the motor shaft is able to slide into the RDU housing. The key in the motor shaft must align with the keyway in the main drive worm.
7. Push the motor into the housing until the flange is snug against the drive housing face.
8. Tighten the mounting screws.
9. Install the leadscrew into the AFU. Check that the jam nut is on the other end of the leadscrew.
10. Slide the AFU onto the bar, if not already done so to position it between the mounting support brackets.
11. Thread the leadscrew into the RDU housing. Secure the leadscrew by tightening the jam nut snug against the face of the drive housing.

12. If mounting the leadscrew away from the RDU, weld the tack weld block to a fixed object and screw the leadscrew into it. Secure the leadscrew by tightening the jam nut snug against the face of the tack weld block.
13. Position the AFU and bar to achieve the required feed distance and to place a tooling hole in the correct position for machining.
14. Tighten the axial feed clamp collar screws to fasten the collar to the bar.

3.4 AXIAL FEED

3.4.1 Selecting the feed direction

The feed direction has three positions:

- Forward
- Neutral
- Reverse

Pushing the three-position feed shaft in on one side or the other will feed in the direction indicated by the arrow on that side of the body. Check that the engagement pins are fully engaged. The neutral (middle) position is for no feed.

A shaft under load may require a firm bump to disengage.

If the axial feed box fails to feed the tool head, check the shear pins. Replacement pins are included with the AFU. To replace a pin, see Section 5.3.1 on page 59.

⚠ CAUTION

Feeding the bar into a fixed object could damage the internal feed clutches.

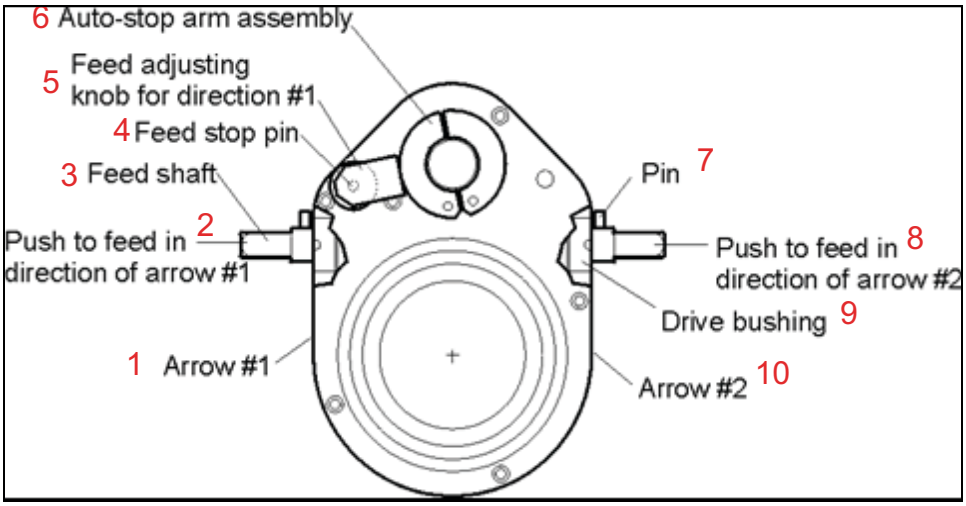

FIGURE 3-12. AFU COMPONENTS

TABLE 3-6. AFU COMPONENT IDENTIFICATION

Number	Component
1	Arrow #1
2	Push to feed in direction of arrow #1
3	Feed shaft
4	Feed stop pin
5	Feed adjusting knob for direction #1
6	Auto-stop arm assembly
7	Pin
8	Push to feed in direction of arrow #2
9	Drive bushing
10	Arrow #2

3.4.2 Setting the feed rate

The feed rate is adjusted by an adjusting screw. Each feed rate is independent of the other; FORWARD and REVERSE have separate feed adjusting knobs.

TABLE 3-7. FEED BOX ARROW IDENTIFICATION

Number	Component
1	Maximum (feeds in the direction shown on the feed box)
2	Minimum (feeds in the direction shown on the feed box)

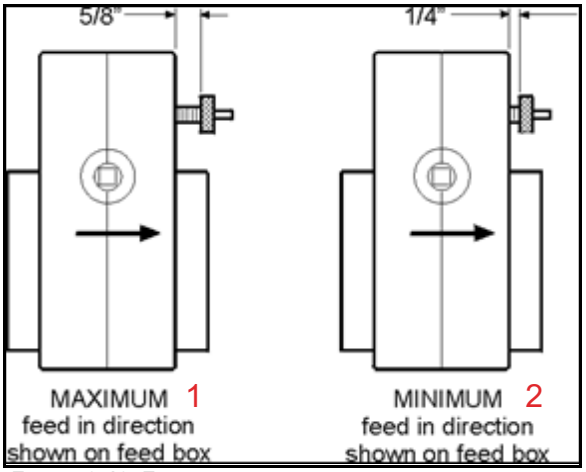

FIGURE 3-13. FEED BOX ARROWS

The feed rate operates by the following rules:

- Turning the knob counter-clockwise (out) increases the feed rate.
- Turning the knob clockwise (in) decreases the feed rate.
- The feed range is up to 0.018" (0.45 mm) per revolution of the bar.
- Maximum feed is reached when the knob is approximately 0.625" (16 mm) away from the feed box.
- Minimum feed is reached when the knob completely collapses the compression spring approximately 0.25" (6 mm).

⚠ CAUTION

The AFU will not stop until the pin is pushed in completely. To prevent overfeeding, check that the stop arm is positioned correctly.

3.4.3 Automatic feed stop

The automatic feed stop feature (see Figure 3-14) stops the AFU at any point along the leadscrew.

Do the following to use the automatic feed stop:

1. Clamp a stop arm onto the leadscrew at the position intended for the axial feed to stop. (Assemblies are included for stopping in either direction.)
2. Check that the stop arm is positioned to press against the feed stop screw assembly.

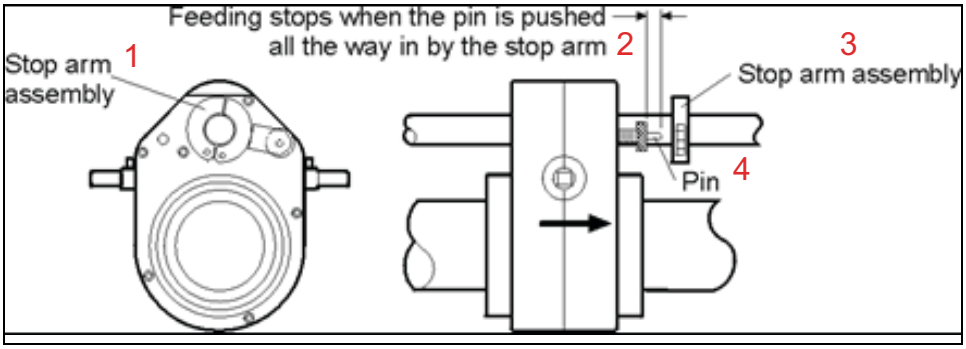

FIGURE 3-14. AUTOMATIC FEED STOP

TABLE 3-8. AUTOMATIC FEED STOP IDENTIFICATION

Number	Component
1	Stop arm assembly
2	Feeding stops when the pin is pushed all the way in by the stop arm
3	Stop arm assembly
4	Pin

When the axial feed box nears the stop arm, the stop arm will depress the feed stop screw assembly to stop the axial feed.

Do the following to retract the tool head:

1. Place the feed box in NEUTRAL.
2. Hand crank the tool bit away from the workpiece.

NOTICE

To protect tool bits from chipping, place the feed box in NEUTRAL before stopping bar rotation.

3.5 POWER CONNECTION

3.5.1 Hydraulic machines

For the BB4500-BB5000, do the following to connect the hydraulic power:

1. Disconnect the mains power to the HPU.
2. Inspect all electrical cables and check the oil level in the hydraulic reservoir.
3. Inside the electrical enclosure, check that all three phases of mains power (L1, L2, L3), and the safety ground wire are properly connected.

⚠ DANGER

High voltage in the electrical enclosure can cause serious or fatal injury. Unplug the power unit before servicing the pump motor.

4. Close the electrical enclosure. Connect the power unit to mains power.
5. After checking that all hydraulic hose quick coupler fittings are clean, connect the hydraulic hoses between the HPU and the hydraulic motor on the boring bar. The hose connection may be switched to reverse the bar rotation direction.

Checking the hydraulic pump rotation direction

NOTICE

Rotating the hydraulic pump in the wrong direction may damage the pump and result in poor performance.

To check the hydraulic pump rotation direction, jog the power unit momentarily. Check that the hydraulic pump is rotating in the direction indicated by the arrow on the pump housing.

If it is not rotating in the direction of the arrow, do the following:

1. Turn off and lock out the electric power to the HPU.
2. Call a qualified person to open the electrical enclosure and identify wires L1, L2, and L3 on the magnetic contactor. Switch any two of these wires. Close the electrical enclosure.

⚠ CAUTION

Do not reset the pressure relief valve on the HPU pump. It is factory set to the correct pressure to avoid system damage.

3.5.2 BB5000 servo drive machine

⚠ CAUTION

Never disconnect any cable from this machine without first turning the main disconnect off. Interrupting the connection between the servo amplifier and the servo motor while energized will damage the servo amplifier, even if the motor is stopped. Failure to comply with this warning will void the warranty on the control system.

For the BB5000 servo drive machines, do the following to connect the servo drive power:

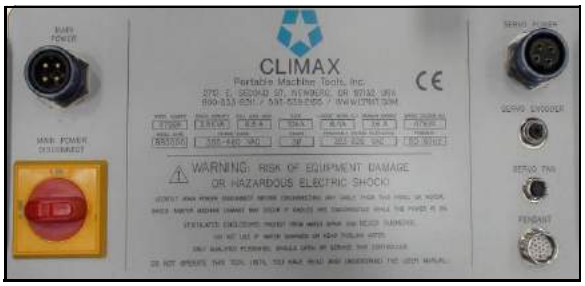

FIGURE 3-15. SERVO MOTOR MAIN CONTROL PANEL

1. Before connecting the servo drive system to mains power, examine all cables for damage. Repair or replace the cable if necessary.
2. Connect the servo motor encoder cable, power cable, and cooling fan power cable.
3. Connect the encoder and operator pendant cable to the main control panel (see Figure 3-15 and Figure C-19 on page 138).
4. Plug the mains power cable into the mains power source.

The MAINS POWER DISCONNECT switch on the control panel is an external emergency stop circuit that ensures operation can be stopped and power switched off immediately.

⚠ WARNING

Electrical equipment can shock or cause an explosion if used near wet or flammable materials. Do not operate the motor if it is wet or in a hazardous environment.

Servo motor pendant

Table 3-9 on page 45 shows the functions of the pendant controls (seen in Figure 3-16 on page 45) used to operate a servo-motor powered machine.

FIGURE 3-16. SERVO MOTOR PENDANT CONTROLS

TABLE 3-9. SERVO MOTOR CONTROL FUNCTIONS

Function	Action
Reset	Press and hold for three seconds to start the control system on power up, or to reset after an E-Stop.
Start	Hold for three seconds to start the spindle rotation.
RPM	Controls the rotational bar speed from 3–230 RPM.
Fault light	Indicates that the servo drive has stopped due to a fault condition, such as the following: • Motor overload • Loss of feedback • Motor is disconnected
E-stop	Press to immediately stop all machine functions and disconnect the motor from power.
Stop	Press to stop the spindle rotation.
Direction	Turn to change the direction of bar rotation.
Overload indicator	Warns that a fault condition is imminent unless the load is reduced.

NOTICE

The 230V and 460V units cannot be converted between voltages.

There is no servo drive for the BB4500.

3.5.3 Electrical machines

⚠ WARNING

Electrical equipment can shock or cause an explosion if used near wet or flammable materials. Do not operate the motor if it is wet or exposed to combustible materials.

⚠ CAUTION

The motor rotation reverse switch must be operated only when the motor is completely stopped. Failure to do so can damage the equipment.

Do the following to connect the electrical power:

1. Check the power cords and plugs for damage. Repair or replace any if necessary.
2. Plug the motor into the control box.
3. Connect the control box mains power cord to a grounded outlet of the correct voltage. 120V motors are rated at 20 amps full load; 230V motors are rated at 11.5 amps full load.

3.5.4 Pneumatic machines

For your safety and protection, the BB4500-BB5000 pneumatic system has an air control valve with a brightly colored oval handle (seen in Figure 3-17) clearly indicating the airflow direction.

FIGURE 3-17. AIR CONTROL VALVE HANDLE

Quick-disconnects between the incoming air supply and the machine enable the operator to quickly disconnect the machine if necessary.

The pneumatic conditioning unit (PCU) air filter and lubricator must be used to protect the pneumatic system and maintain the machine warranty. The lubricator is set to deliver oil at a rate of 20–30 drops per minute at full throttle.

⚠ CAUTION

If the machine stops moving unexpectedly, lock out the pneumatic safety valve located at the filter lubricator assembly before performing any troubleshooting.

3.6 BB4500-BB5000 WITH SMALL DIAMETER BARS

For the BB4500, boring bars with a diameter of less than 1.75" (44 mm) are easily adapted to accept the standard RDU, AFU, and the spherical bearing mounting brackets (see Figure 3-18).

For the BB5000, boring bars with a diameter of less than 2.25" (57.15 mm) are easily adapted to accept the standard RDU, AFU, and the spherical bearing mounting brackets (see Figure 3-18). This adaptation for the 1.25" (32 mm) boring bar is offered as a CLIMAX small bore kit (P/N 28698).

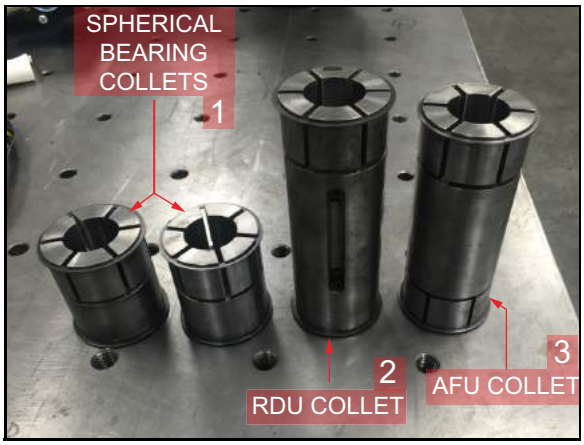

FIGURE 3-18. COLLETS (BB5000 VERSION SHOWN)

TABLE 3-10. COLLET IDENTIFICATION

Number	Component
1	Spherical bearing collets
2	RDU collet
3	AFU collet

NOTICE

The small bore kit adapter collets fit into the existing collets. Do not remove existing collets from the RDU and AFU.

The AFU collet is serrated on both ends and has no keyway. The RDU collet is serrated on one end only.

The RDU collet has a keyway milled into the outside diameter with two bolt heads visible (see Figure 3-19 on page 48). Those bolts are for retaining the key in the inner diameter of the collet, which will accept the keyway of the 1.25" boring bar.

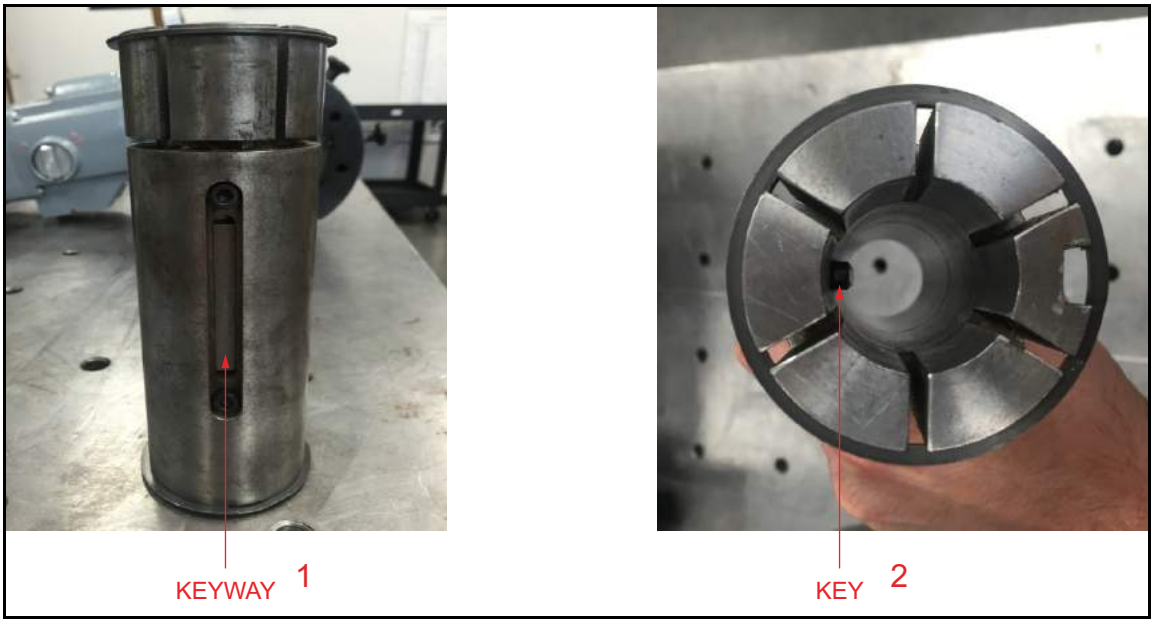

FIGURE 3-19. BB5000 RDU COLLET KEYWAY

TABLE 3-11. RDU COLLET KEYWAY IDENTIFICATION

Number	Component
1	Keyway
2	Key

Do the following to install the small-bore kit, or for installing collets for the RDU, AFU, or spherical bearings:

1. Remove a snap ring from one end of the small bore kit collet.

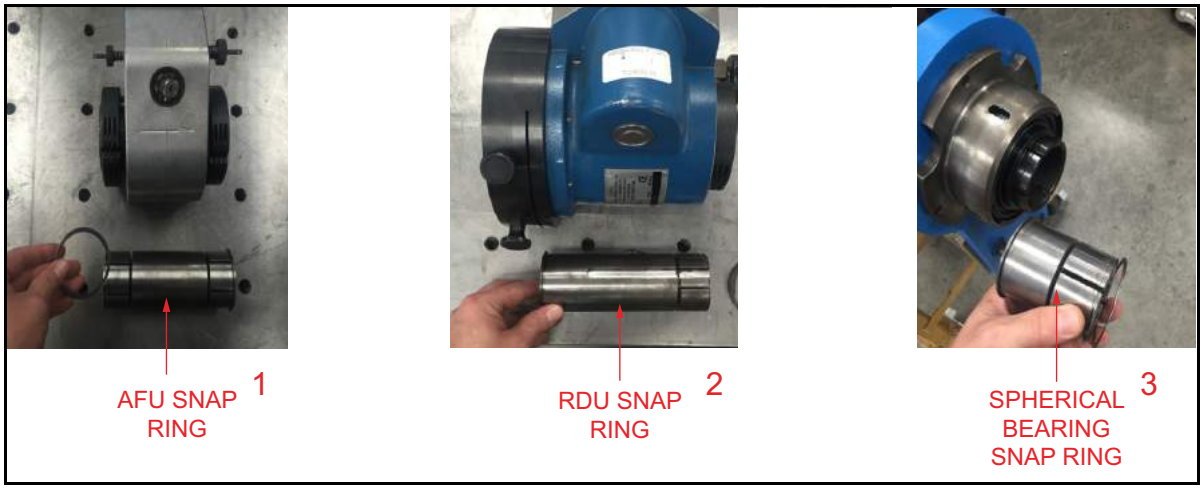

FIGURE 3-20. SNAP RING REMOVAL

TABLE 3-12. SNAP RING REMOVAL IDENTIFICATION

Number	Component
1	AFU snap ring
2	RDU snap ring
3	Spherical bearing snap ring

2. Insert the small bore kit adapter 1.25" (32 mm) ID collet into the existing 2.25" (57 mm) ID collet.

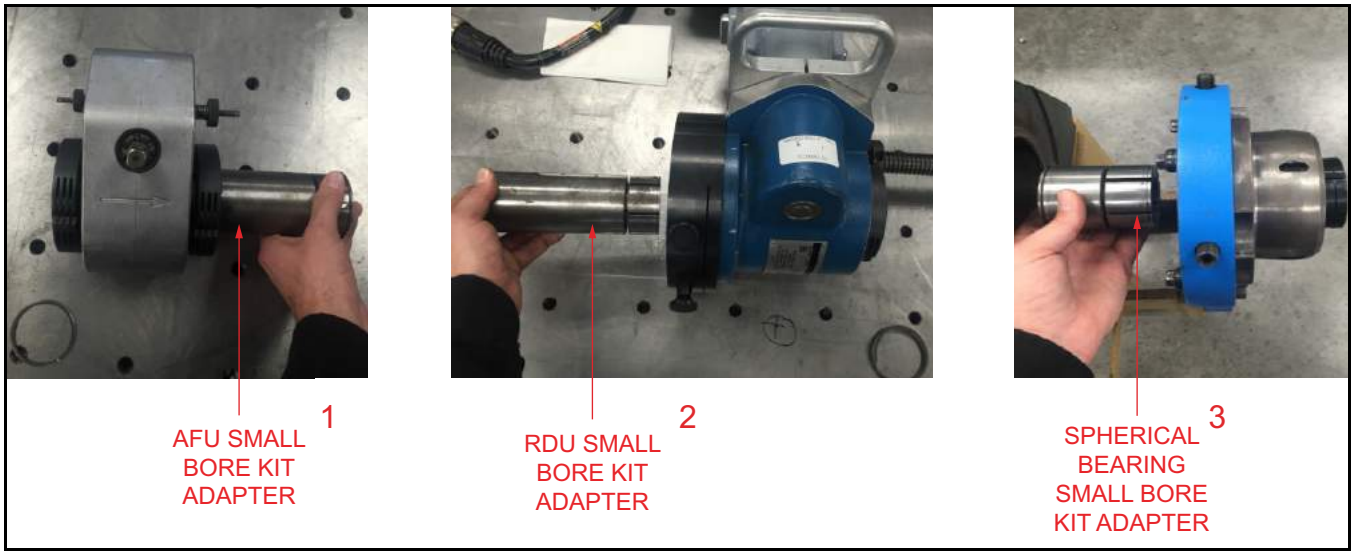

FIGURE 3-21. SMALL BORE KIT ADAPTER INSERTION

TABLE 3-13. SMALL BORE KIT ADAPTER IDENTIFICATION

Number	Component
1	AFU small bore kit adapter
2	RDU small bore kit adapter
3	Spherical bearing small bore kit adapter

TIP:

When installing the RDU collet, make sure to line up the keyway to accept the key in the RDU.

3. Replace the snap ring and install the 1-1/4" bar (see Figure 3-22 on page 50).

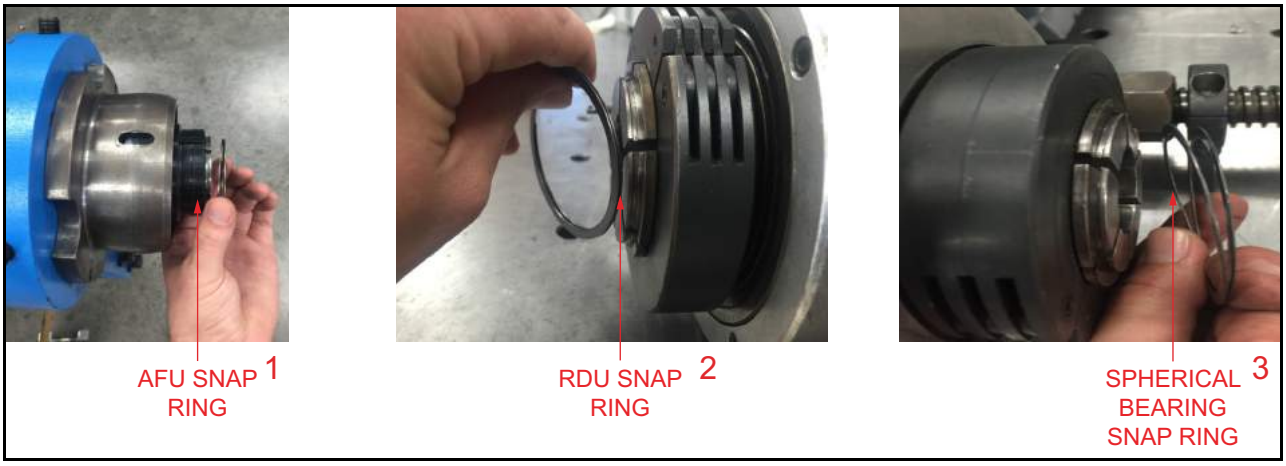

FIGURE 3-22. SNAP RING REPLACEMENT

TABLE 3-14. SNAP RING REPLACEMENT IDENTIFICATION

Number	Component
1	AFU snap ring
2	RDU snap ring
3	Spherical bearing snap ring

4 OPERATION

IN THIS CHAPTER:

4.1 Pre-operation checks -51
4.2 Tool bit selection -52
4.3 Operation -52
4.3.1 Starting the machine -52
4.3.1.1 Hydraulic drive -52
4.3.1.2 Electrical drive -52
4.3.1.3 Pneumatic drive -53
4.3.1.4 Servo drive (BB5000 only) -54
4.4 Shutdown -54
4.5 Disassembly -55

Do not operate this machine without adequate training to fully understand the safe setup, operation, and maintenance procedures.

⚠ CAUTION

To avoid serious injury, keep clear of moving machinery during operation. Apply cutting oil with a squirt can.

For machines with air motors, if the machine stops moving unexpectedly, lock out the pneumatic safety valve located at the filter lubricator assembly before performing any troubleshooting.

4.1 Pre-operation checks

Do the following checks before operating the machine:

1. Complete the risk assessment checklist in Table 1-3 on page 5.
2. Check that the work area is clear of non-essential personnel and equipment.
3. Check that all hand tools are removed from inside the machine and the work area.
4. Check that the machine control/observation area will not be in the path of hot flying chips during machine operation.
5. Check the machine is securely mounted to the workpiece.
6. Check that air hoses are routed and secured to avoid tripping, entanglement, damage from hot chips, or other damage should an air hose or connection fail.
7. Check the tool condition and sharpness.
8. Check that power lines and cables are properly connected.
9. Check that all machine parts, including the tool head, tool bit, and collar clamps are secure.

10. Check that the feed direction and rate are correctly set.
11. Check that all preventive maintenance has been completed.

4.2 TOOL BIT SELECTION

Bar rotation speed is adjustable depending on the power option chosen (electric, hydraulic, pneumatic). The cutting speed is primarily determined by the hardness of the metal being machined and the type of tool bit used. Other factors include the power source, feed and depth of cut, and cooling medium being used.

Generally, carbide cutting tools operate at a higher RPM than high-speed steel (HSS) tools.

If using a HSS tool bit, set the speed shift lever to LOW. Chips should be the color of the base material or no darker than a light straw in color.

When using carbide tool bits, set the speed shift lever to HIGH. These chips should be dark brown to blue.

4.3 OPERATION

4.3.1 Starting the machine

Check that the tool bit is installed so that, as the boring bar rotates, it presents its cutting edge to the workpiece. Before machining, lubricate the bore and tool bit with cutting oil.

4.3.1.1 Hydraulic drive

Do the following to start the hydraulic drive:

1. Turn the HPU to its minimum flow rate (lowest speed).
2. Jog the HPU to verify direction of bar rotation. Do the following to reverse bar rotation:
   a) Turn off the HPU.
   b) Reverse the hydraulic hoses.
3. With power switched on, adjust the bar speed by turning the hydraulic speed control knob (located on the control pendant) for one of the following results:
   - Counter-clockwise to decrease RPM.
   - Clockwise to increase RPM.

4.3.1.2 Electrical drive

Do the following to start the electrical drive:

1. Set the rotation speed on the speed control to minimum.

2. Turn on power at the motor controller.
3. Adjust the bar rotation speed as required by the bore size, tooling, and material requirements.
4. Adjust the feed rate.

The motor has thermal and current overload protections built in. If the motor is pushed beyond its protected range, it will stop. To prevent this, monitor the amp meter on the controller and do not let the reading exceed its rated maximum amperage (10.5 amps for the 230V and 20 amps for the 120V).

This motor is also reversible, allowing it to change the bar rotation direction.

⚠ CAUTION

Always stop the motor completely before switching the rotation direction. Failure to do so may damage both the motor and the controller.

⚠ CAUTION

Brush wear depends on the load and RPM. Regularly check both brushes for excessive wear and replace if necessary.

4.3.1.3 Pneumatic drive

Do the following to start the pneumatic drive:

1. Using the quick disconnect fittings, connect the pneumatic motor to the pneumatic conditioning unit (PCU).
2. Check that the incoming air pressure is 90-psi (6.2-bar) minimum.
3. Control the boring bar speed by slowly adjusting the air control valve.

NOTICE

The 3 hp (2.24 KW) air motor is reversible. Connect the airline so that, as the boring bar rotates, the tool bit presents its cutting edge to the workpiece. If the tool bit is backward, reverse the quick disconnects at the motor to change the bar rotation direction.

⚠ CAUTION

If the machine stops moving unexpectedly, lock out the pneumatic safety valve located at the filter lubricator assembly before performing any troubleshooting.

4.3.1.4 Servo drive (BB5000 only)

If using the servo drive with the BB5000, do the following to start the servo drive (see Figure 3-16 on page 45):

1. Pull the E-stop up.
2. Press and hold the RESET button for three seconds, or until the fault light turns off.
3. Select the rotation direction.
4. Press START.

To stop, press the STOP button.

4.4 SHUTDOWN

To protect tool bits from chipping, always place the feed box in neutral before stopping the bar rotation.

Do the following to shut down the machine:

1. Disengage the axial feed by pushing the feed shaft until the pins on both sides of the feed box are free of the drive bushings.

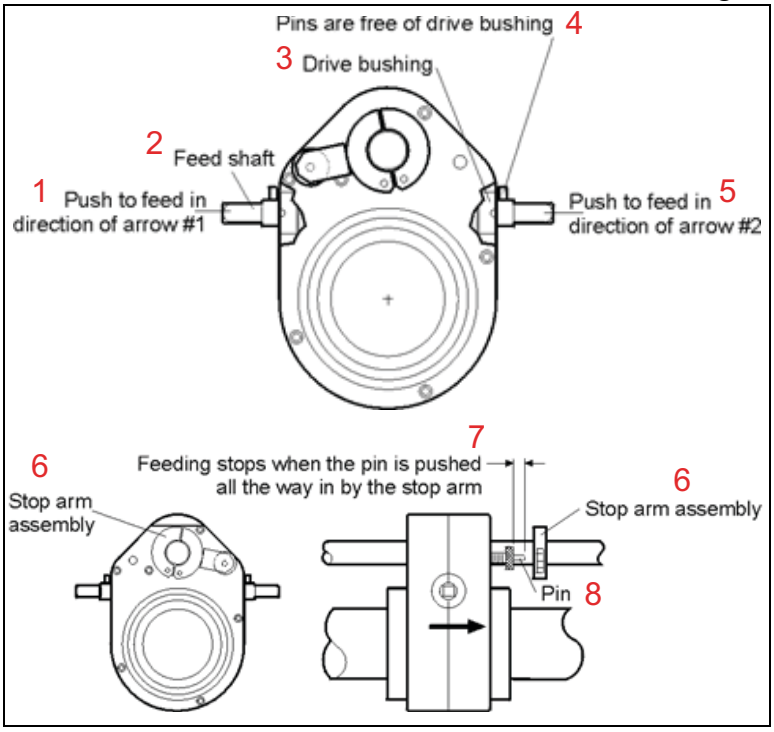

FIGURE 4-1. DISENGAGING THE AXIAL FEED

TABLE 4-1. AXIAL FEED DISENGAGEMENT IDENTIFICATION

Number	Component
1	Push to feed in direction of arrow #1

TABLE 4-1. AXIAL FEED DISENGAGEMENT IDENTIFICATION

Number	Component
2	Feed shaft
3	Drive bushing
4	Pins are free of drive bushing
5	Push to feed in direction of arrow #2
6	Stop arm assembly
7	Feeding stops when the pin is pushed all the way in by the stop arm
8	Pin

2. Turn off and disconnect power to the machine.
3. After the machine is at a complete standstill, use a brush to remove chips.

⚠ CAUTION

Even with power off, do not use your hands, compressed air, or metal tools to remove chips. Use a brush.

4. Retract the tool from the workpiece.

4.5 DISASSEMBLY

Do the following to disassemble the BB4500-BB5000:

1. Turn off and disconnect power to the unit.
2. Remove the tool head.
3. Disconnect the leadscrew from the rotational drive unit (RDU).

4. Loosen the clamp collars holding the axial feed unit (AFU) to the bar (see Figure 4-2 on page 56).

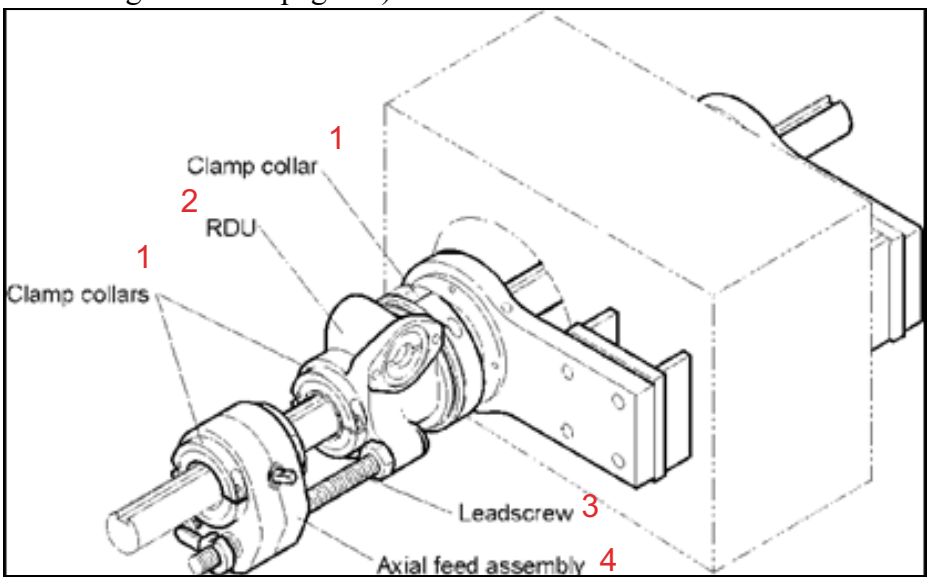

FIGURE 4-2. AFU DISASSEMBLY COMPONENTS

TABLE 4-2. AFU DISASSEMBLY IDENTIFICATION

Number	Component
1	Clamp collars
2	RDU
3	Leadscrew
4	AFU

5. Slide the AFU off the bar.
6. Loosen the clamp ring holding the RDU to the spherical bearing.
7. Loosen the clamp collar holding the RDU to the boring bar.
8. Remove the RDU.
9. Slide the boring bar from the workpiece.
10. Remove all mounting accessories.

5 MAINTENANCE

IN THIS CHAPTER:

5.1 MAINTENANCE CHECKLIST -57
5.2 APPROVED LUBRICANTS -58
5.3 MAINTENANCE TASKS -59
5.3.1 AFU -59
5.3.2 BORING BAR -59
5.3.3 HYDRAULIC POWER SYSTEM -59
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5.3.5 AIR MOTOR ASSEMBLY -60
5.3.6 BB5000 SERVO MOTOR -61
5.3.7 4:1 RDU GEARBOX -61
5.3.8 CUTTING FLUID -61
5.4 QUALITY CHECKS -61
5.5 TROUBLESHOOTING -62

5.1 MAINTENANCE CHECKLIST

Table 5-1 lists maintenance intervals and tasks.

TABLE 5-1. MAINTENANCE INTERVALS AND TASKS

Interval	Task	Reference
Before each use	Inspect the power cord for damage and replace as necessary.	--
	Fill the lubricator oil cup in the air motor assembly with 6 oz (177.4 mL) of AW 32.	Section 5.3.5 on page 60
	Spray the ACME screw and tool heads with WD-40.	
	Clean and lightly oil the bar.	Section 5.3.2 on page 59
	Spray the spherical bearing mounting bracket bearing mounts with WD-40.	--
Before and after each use	Remove debris, oil, and moisture from machine surfaces.	--

TABLE 5-1. MAINTENANCE INTERVALS AND TASKS (CONTINUED)

Interval	Task	Reference
Periodically	Clean and lightly oil (do not grease) the leadscrew in the axial feed unit (AFU).	Section 5.3.1 on page 59
	Every six months, fill the 4:1 servo rotational drive unit (RDU) gear-box with 1 oz (29.5 mL) of Mobil SHC 634 synthetic oil.	Section 5.3.7 on page 61
	Every six months, repack the spherical bearings in the spherical bearing mounting bracket with 2 cc's (2 mL) of Jetlube 550.	--
	Every six months or 500 hours, repack the gearbox with one ounce of Mobilith SHC 460 Synthetic gear grease.	--
	Every two years, replace the hydraulic oil with AW 32. Fill to the sight glass.	Section 5.3.3 on page 59
	Check both brushes for excessive wear and replace if necessary.	Section 5.3.4 on page 60
	Check the air system periodically to verify that the air pressure is 90 psi (6.2 bar).	Section 5.3.5 on page 60
Annually	Disassemble the AFU to clean, lubricate, and replace the seals.	Section 5.3.1 on page 59
	Repack the AFU gearbox with 1 oz (29.6 mL) of Mobilith SHC 460 grease.	Section 5.3.1 on page 59
As needed	Sharpen or replace the tool bits.	--

5.2 APPROVED LUBRICANTS

CLIMAX recommends using the following lubricants at the locations indicated.

⚠ CAUTION

Avoid damage, premature machine wear, and protect your warranty by using only approved lubricants.

TABLE 5-2. APPROVED LUBRICANTS

Application Area	Lubricant	Quantity	Frequency
4:1 RDU	Mobilith SHC 460 Synthetic	1 oz	Every 6 months
12:1 RDU (BB5000 only)	Mobil SHC 634 Synthetic	5 oz	Every 6 months
AFU	Mobilith SHC 460	1 oz	Yearly
Spherical bearings	JetLube 550	2 cc	Every 6 months
Hydraulic oil	AW 32	To sight glass	Every 2 years

TABLE 5-2. APPROVED LUBRICANTS (CONTINUED)

Application Area	Lubricant	Quantity	Frequency
Air motor	AW 32	6 oz	Per use through the lubricator
ACME screw Boring bar Tool heads Unpainted surfaces	WD 40	As required	Per use by hand
Cutting fluid	DoAll AL2000	As required	As required
Long-term rust pre-ventative	LPS-3	As required	For storage more than 3 months
Tool bits, work piece	Koolkut	As required	Per use by hand

5.3 MAINTENANCE TASKS

Maintenance tasks are described in the following sections.

5.3.1 AFU

Clutch performance may be compromised if the machine has been “crashed,” has seen over a thousand hours of operation, or is operated in a dirty environment.

If the axial feed fails, check that the shear pins are intact. Extra pins are included with the assembly. The pins must be in place (notched end out) to engage the feed.

NOTICE

Freezing temperatures may cause the axial feed box to run sluggishly.

5.3.2 Boring bar

Check the bar regularly for nicks, cuts, or abrasions. Dress the bar smooth if necessary. A bar with nicks or gouges can damage the bearing supports and RDU beyond repair. Wipe the bar clean with solvent to remove dirt and chips.

5.3.3 Hydraulic power system

For information on maintaining the hydraulic power system, see the manufacturer’s documentation for your hydraulic system.

5.3.4 Electric motor assembly

⚠ WARNING

The handle (PN 75648) clamped onto the motor acts as a torque restraint and only an authorized CLIMAX representative should remove and reinstall it. If the handle needs to be removed, contact CLIMAX. Failure to do this could cause severe damage to the machine or bodily injury.

FIGURE 5-1. ELECTRIC MOTOR WITH HANDLE

Replace or repair any damaged or abraded parts, including brushes.
Use only grounded, properly rated electrical outlets.

⚠ CAUTION

Brush wear mostly depends on the load and RPM. Depending on operating conditions, periodically check both brush for excessive wear and replace if necessary.

⚠ WARNING

Electrical equipment can shock or cause an explosion if used near wet or flammable materials. Do not operate the motor if it is wet or exposed to combustible materials.

5.3.5 Air motor assembly

Do the following to increase the life of the air motor:

- Route the air supply through a lubricator and filter.
- Use nonrestrictive air lines and fittings.
- Set the air motor speed only by adjusting the air control valve.

⚠ CAUTION

Do not attempt to adjust air motor speed by changing the in-line air pressure from 90 psi (6.2 bar).

- Use air oil that has antioxidants and rust inhibitors. The lubricator should deliver oil at a rate of 20-30 drops per minute at full throttle.
- Drain water from the air filter.

5.3.6 BB5000 servo motor

⚠ CAUTION

Let the surface of the servo cool before handling.

Servo temperatures of less than 140° F (60° C) are expected, as well as the formation of an oil droplet over an eight-hour use period. Replace oil with 5 ounces of Mobil SHC 634 Oil after the first 40 hours and then additionally every 80 hours.

Running at a high RDU temperature of more than 220° F (104° C) for over 30 minutes at a time or reaching an RDU temperature of 260° F (127° C) will limit the life of the RDU and can create oil leakage.

Replace oil with 5 ounces of Mobil SHC 634 Oil every 40 hours.

If the motor does not stop when the speed control knob is turned to zero, see Appendix D on page 141.

5.3.7 4:1 RDU gearbox

Improperly packed bearings or improperly torqued bearing nuts will significantly damage the gearbox. Have the gearbox serviced at CLIMAX every six months in order to maintain the warranty.

5.3.8 Cutting fluid

Only use water-based cutting fluids with the CLIMAX air mist system. Refill the reservoir with DoAll AL2000 as required.

5.4 QUALITY CHECKS

TABLE 5-3. QUALITY CHECKS

Area	Check
AFU	Rotate the collet by hand, checking for free movement.
	Check the feed engagement pins, feed operation, feed stop pins, and that feed screws are not bent.
RDU	Manually retract the spring plungers and drive key, checking for free movement.
Tool heads	All hardware is present and in good condition for each tool head.
Bearing mounts	All single-arm mount screws and washers are in good condition.
Tack weld plates (P/N 19869)	Welds are ground off and a flat surface is present for welding.
Safety devices and labels	Present and in good condition (see Section 1.7 on page 6).
Steel container (P/N 37732)	In good condition and all packaging materials are new.

5.5 TROUBLESHOOTING

This section is intended to help you solve basic machine performance problems. For serious maintenance or if you have questions on the following procedures, contact CLIMAX.

TABLE 5-4. TROUBLESHOOTING

Problem	Remedy
AFU does not advance the bar	• Fully engage the feed shaft pin in the bushing slot. • Check that the pin has not sheared. • Clean the leadscrew. • Check that the feed rate is not too low. • Check that the AFU is clamped tightly to the bar. • Check that none of the clamp collars, except those on the AFU, are over tightened. • Check that the stop arm has not depressed one of the stop feed screw assemblies.
Tool chatter	• Sharpen the tool bit. • Decrease the nose radius on the tool bit. • Increase the feed rate. • Increase or decrease the drive motor speed. • Change the depth of cut. • Add additional support arms or place the existing support arms closer to the workpiece.
Machine is unstable	Tighten all clamps and hardware. Provide additional support.
RDU will not rotate	• Check that the HPU is turned on. • Check that the HPU pump motor is rotating as indicated by the arrow on the pump body (see Section 3.5.1 on page 43). • Check the oil level in the HPU. • Check that the speed control is at maximum flow. • Check the hydraulic hose connections. • On electric powered units, check electrical connections and circuit breakers (see Section 3.5.3 on page 46). • Check that the control box on electric motors is plugged into the motor and turned on.
Feed is in wrong direction	Check the feed shaft position on the AFU (see Section 3.4 on page 40).
HPU fails to deliver fluid	• Check the fluid level and add more if necessary. • Check that the pump motor is turning in the correct direction (see Section 3.5.1 on page 43). • Check hydraulic connections for obstructions or leaks.
HPU motor does not run	• Check that the power unit and electrical supply are compatible. • Check that the unit is plugged in. • Check for faulty wiring. • Check the reset switch in the electrical box. • Check the fuses in the electrical box.
Servo motor does not stop when turned to zero	See Appendix D on page 141.

6 STORAGE AND SHIPPING

IN THIS CHAPTER:

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6.1.1 SHORT-TERM STORAGE -63
6.1.2 LONG-TERM STORAGE -63
6.2 SHIPPING -63
6.3 DECOMMISSIONING -64

6.1 STORAGE

Proper storage of the boring machine will extend its usefulness and prevent undue damage.

Before storing, do the following:

1. Clean the machine with solvent to remove grease, metal chips, and moisture.
2. Remove hoses to the HPU. Do not remove the ramp feature hoses.

Store the boring machine in its original shipping container. Keep all packing materials for repackaging the machine.

6.1.1 Short-term storage

Do the following for short-term storage (three months or less):

1. Remove the tooling.
2. Lower and support the spindle.
3. Remove the hoses to the HPU. Do not remove the ramp feature hoses.
4. Clean the machine to remove dirt, grease, metal chips, and moisture.
5. Spray all black and bare metal surfaces with LPS-3 to prevent corrosion.
6. Store in a protected area.

6.1.2 Long-term storage

For long-term storage (longer than three months), follow the short-term storage instructions, but use LPS-3 instead of LPS-2.

6.2 SHIPPING

The boring machine can be shipped in its original shipping container.

6.3 DECOMMISSIONING

To decommission the boring machine before disposal, remove the drive assembly from the RDU and dispose of the drive assembly separately from the rest of the machine components. Refer to the BB4500 exploded views in Appendix A on page 65 and the BB5000 exploded views in Appendix B on page 83.

APPENDIX A BB4500 ASSEMBLY DRAWINGS

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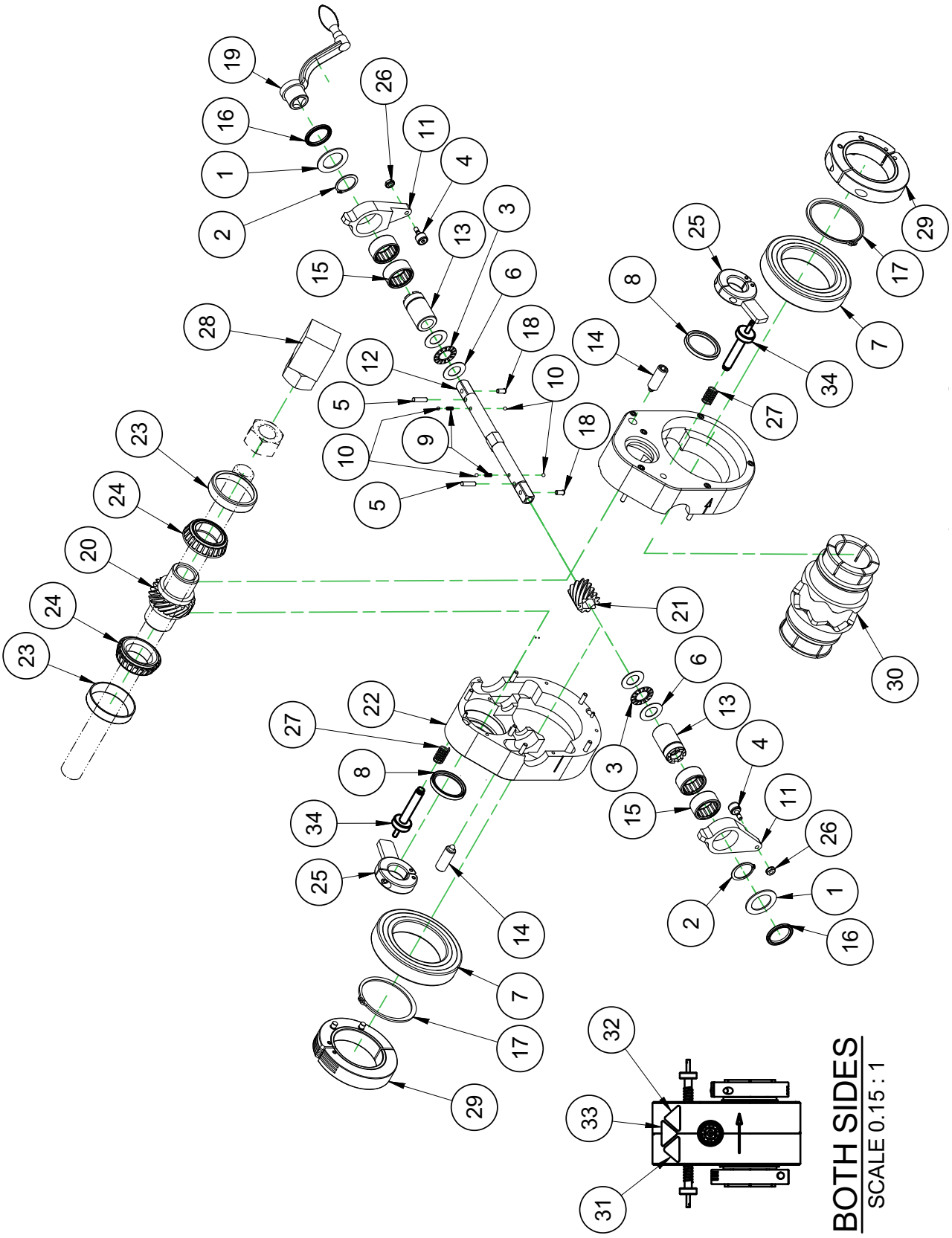
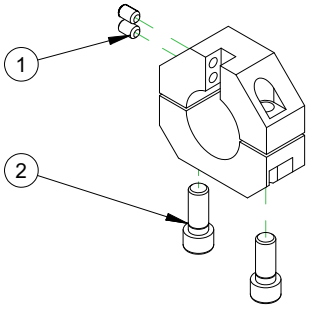


FIGURE A-1. AXIAL FEED UNIT ASSEMBLY (P/N 43378)

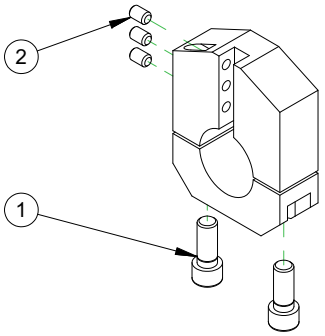
PARTS LIST			
ITEM	QTY	P/N:	DESCRIPTION
1	2	10144	WASHER THRUST 1 ID X 1.562 OD X .060
2	2	10534	RING SNAP 1 OD
3	2	10538	BRG THRUST .625 ID X 1.125 OD X .0781
4	2	10836	BRG CAM FOLLOW .500 X .344
5	2	11763	PIN DOWEL 3/16 x 3/4
6	4	11823	WASHER THRUST .625 ID X 1.125 OD X .030
7	2	12388	BRG BALL 2.7559 X 4.3307 X .7874
8	2	16505	SEAL 1.375 ID X 1.750 OD X .197 (KB)
9	2	19561	SPRING COMP .148 OD X .023 WIRE X .50 LONG STAINLESS
10	4	19562	BALL STEEL 5/32 DIA
11	2	25949	ARM RATCHET
12	1	25950	SHAFT FEED
13	2	25951	BUSHING DRIVE
14	2	25955	SPRING PLUNGER 1/2-13 LIGHT FORCE
15	4	25957	BRG ROLLER CLUTCH 1 X 1.312 X .625
16	2	25959	SEAL 1.000 ID X 1.312 OD X .125 HM14 LIP
17	2	25961	RING SNAP 2-3/4 BEVELED
18	2	26828	PLUNGER BALL PUSHFIT
19	1	26850	HANDLE CRANK MODIFIED
20	1	27197	LEAD NUT BB4500 BB5000 AXIAL FEED (VMI)
21	1	27198	GEAR HELICAL AXIAL FEED BB5000
22	1	27199	ASSEMBLED AXIAL FEED UNIT HOUSING
23	2	27203	BRG CUP 2.328 OD x .470 WIDE
24	2	27204	BRG CONE 1.3775 ID X .6600 WIDE
25	2	27222	STOP ARM ASSY
26	2	28060	NUT, 10-32 UNF KEPS
27	2	28618	SPRING COMP .48 OD X .051 WIRE X .88
28	1	28756	BLOCK TACKWELD BB5000
29	2	29552	CLAMP COLLAR MODIFIED 3RD GEN AFU
30	1	43379	COLLET BB4500
31	2	78735	LABEL WARNING HAND CRUSH/FORCE
32	2	78742	LABEL WARNING ENTANGLEMENT OF HAND/ROTATING SHAFT
33	2	80510	LABEL WARNING CUTTING OF FINGERS/ROTATING BLADE GRAPHIC 1.13 TALL TRIANGLE YELLOW
34	2	92494	SCREW ASSY FEED STOP GEN 2

FIGURE A-2. AXIAL FEED UNIT ASSEMBLY PARTS LIST (P/N 43378)



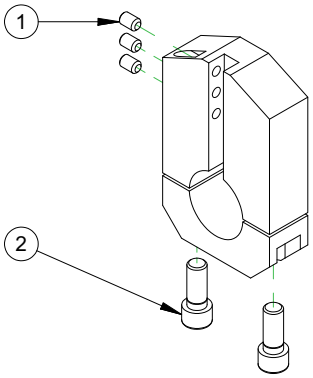
TOOL HEAD METRIC 4 TO 6 DIA 1-3/4 BAR BB4500
43563

PARTS LIST			
ITEM	QTY	P/N:	DESCRIPTION
1	2	35214	SCREW M8 X 1.25 X 12mm SSSCP
2	2	40697	SCREW M12 X 1.75 X 30mm SHCS



TOOL HEAD METRIC 6 TO 8 DIA 1-3/4 BAR BB4500
43564

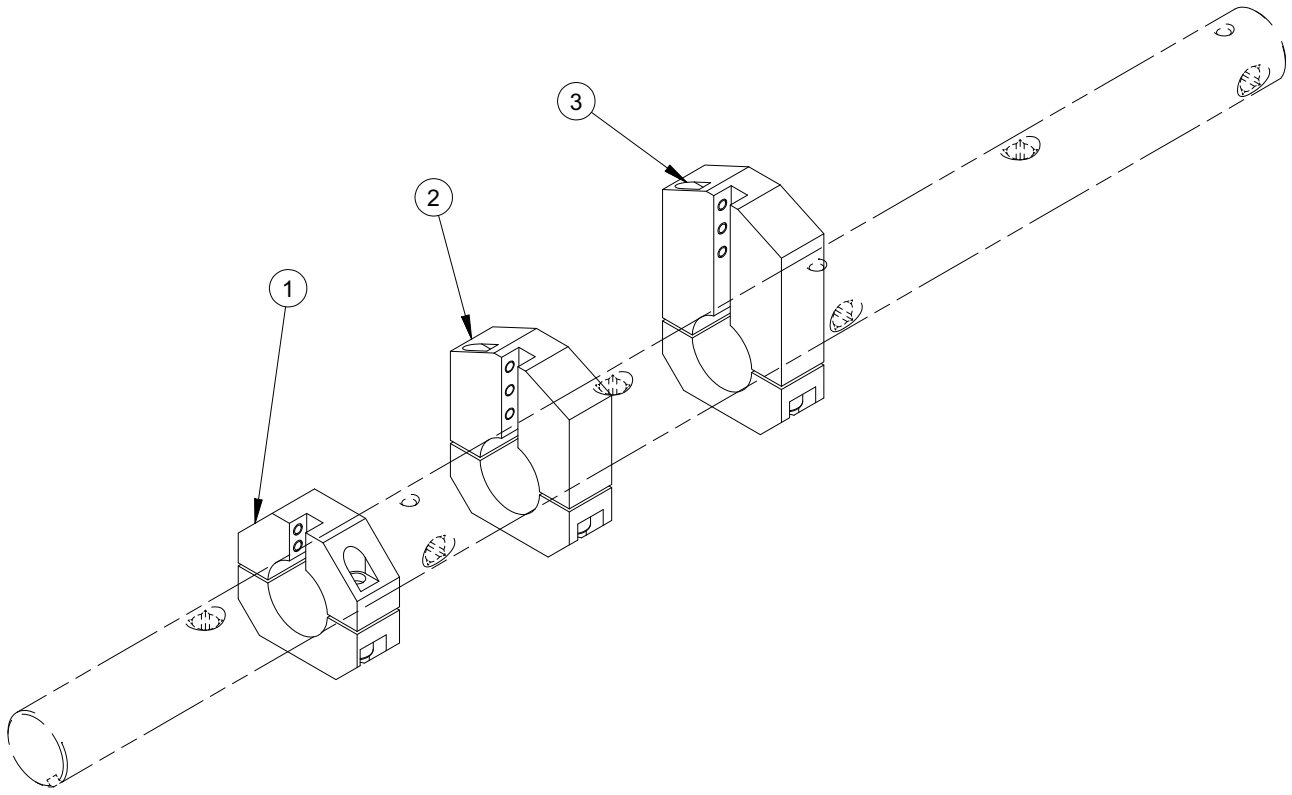
PARTS LIST			
ITEM	QTY	P/N:	DESCRIPTION
1	2	40697	SCREW M12 X 1.75 X 30mm SHCS
2	3	43120	SCREW M8 X 1.25 X 12 SSSFP



TOOL HEAD METRIC 8 TO 10 DIA 1-3/4 BAR BB4500
43565

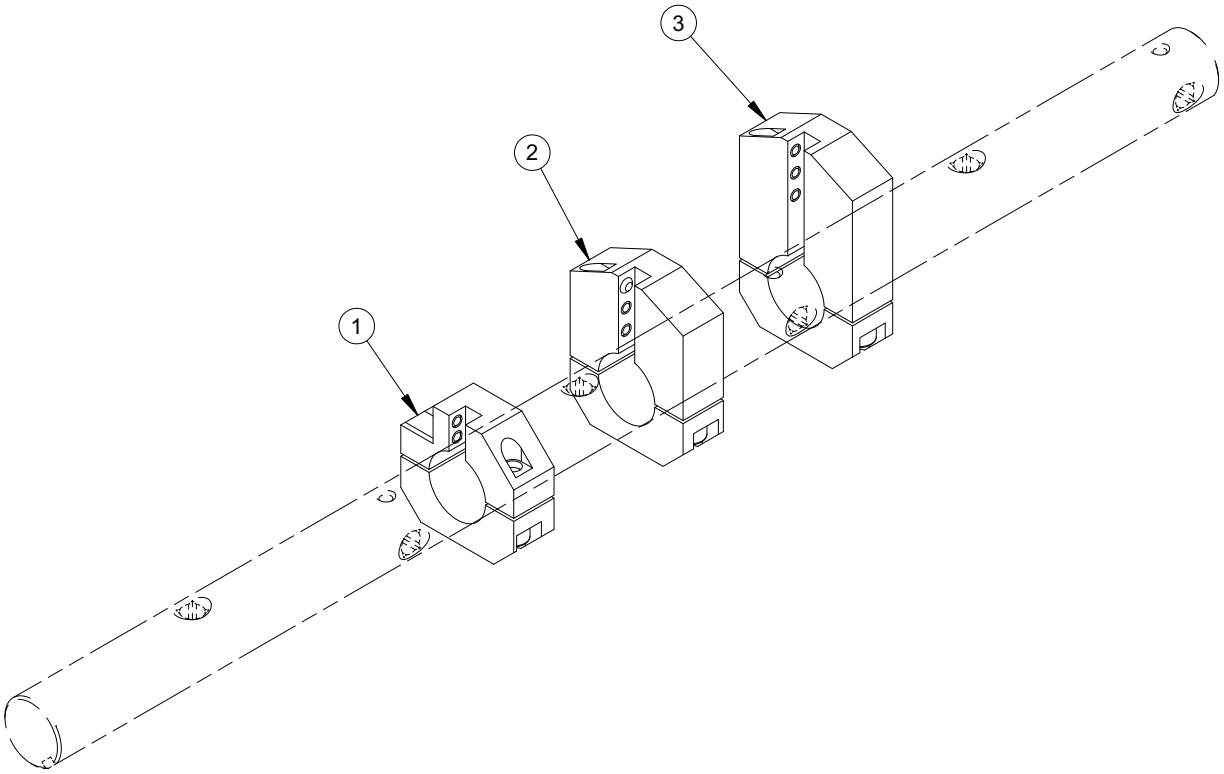
PARTS LIST			
ITEM	QTY	P/N:	DESCRIPTION
1	3	35214	SCREW M8 X 1.25 X 12mm SSSCP
2	2	40697	SCREW M12 X 1.75 X 30mm SHCS

FIGURE A-3. BORING HEADS SET ASSEMBLY (P/N 43576)



PARTS LIST			
ITEM	QTY	P/N:	DESCRIPTION
1	1	43563	TOOL HEAD METRIC 4 TO 6 DIA 1-3/4 BAR BB4500
2	1	43564	TOOL HEAD METRIC 6 TO 8 DIA 1-3/4 BAR BB4500
3	1	43565	TOOL HEAD METRIC 8 TO 10 DIA 1-3/4 BAR BB4500

FIGURE A-4. BORING HEADS SET 4–10 METRIC DIAMETER ASSEMBLY (P/N 43576)



PARTS LIST			
ITEM	QTY	P/N:	DESCRIPTION
1	1	43492	TOOL HEAD 4 TO 6 DIA 1-3/4 BAR
2	1	43493	TOOL HEAD 6 TO 8 DIA 1-3/4 BAR BB4500
3	1	43494	TOOL HEAD 8 TO 10 DIA 1-3/4 BAR

FIGURE A-5. BORING HEADS SET 4–10" DIAMETER ASSEMBLY (P/N 43575)

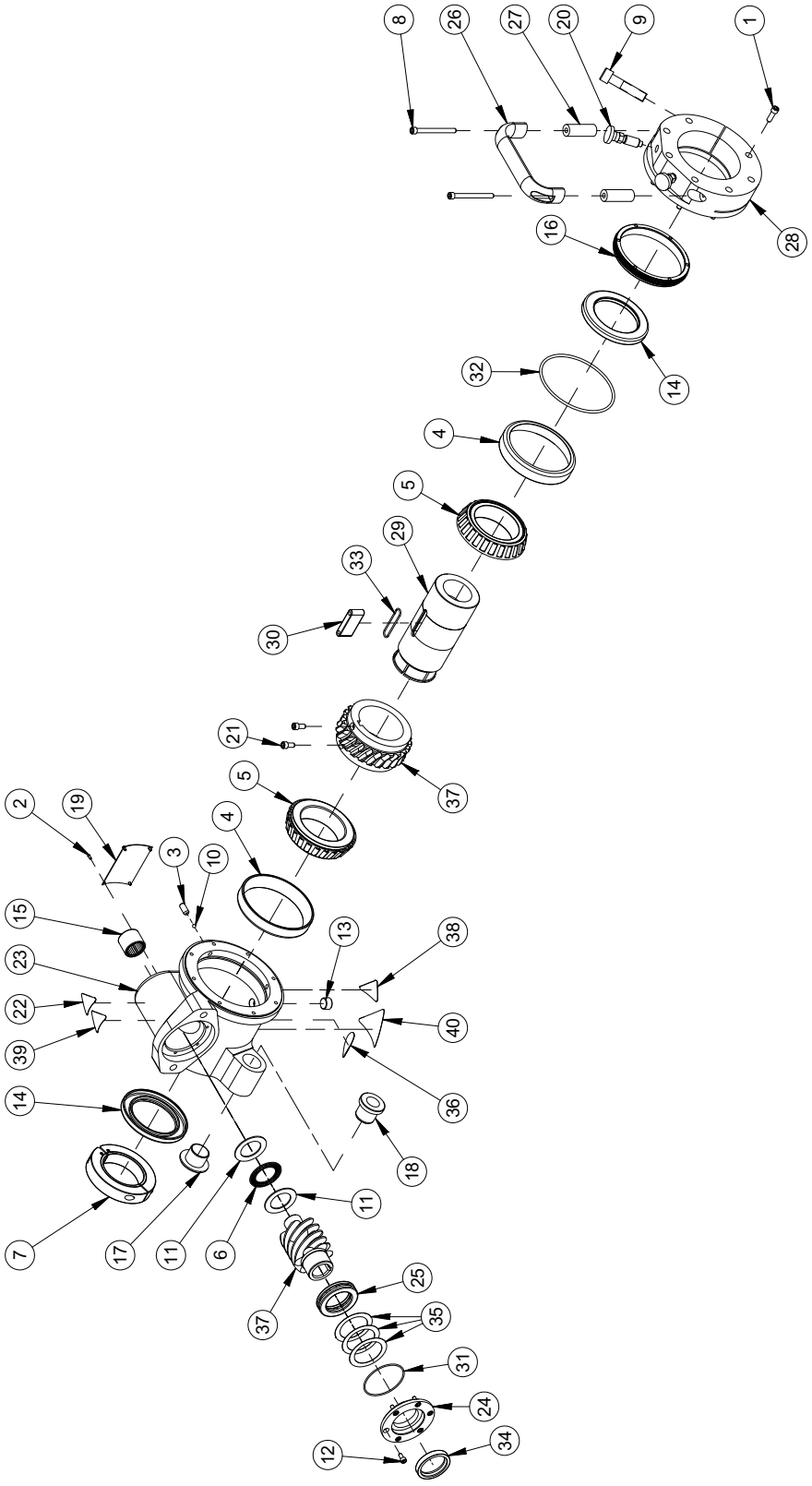
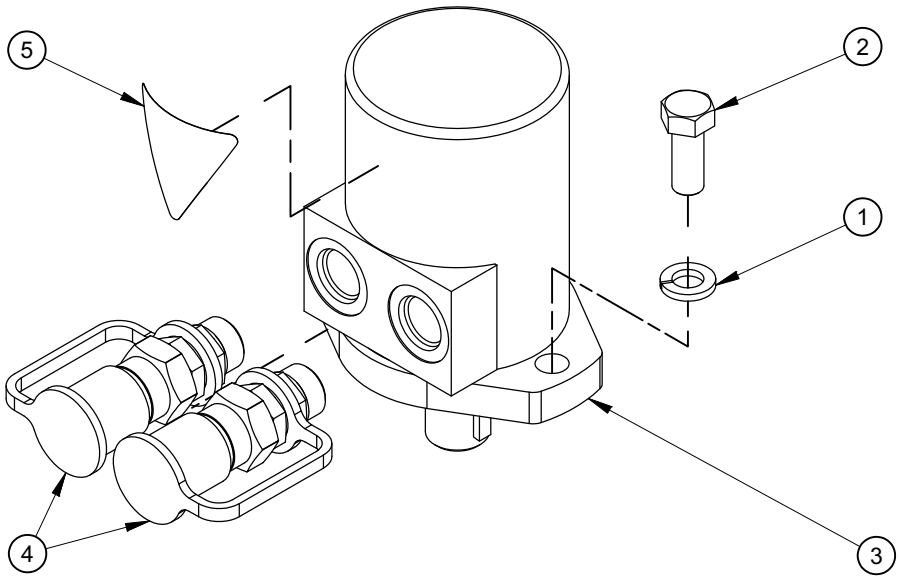


FIGURE A-6. RDU 2ND GEN ASSEMBLY (P/N 53912)

PARTS LIST			
ITEM	QTY	P/N:	DESCRIPTION
1	7	10160	SCREW 1/4-20 X 3/4 SHCS
2	4	10588	SCREW DRIVE #2 x 1/4 HOLE SIZE .089
3	2	11684	SCREW 5/16-18 X 3/4 SSSCP
4	2	11821	BRG CUP 4.4375 OD X .750 WIDE
5	2	11822	BRG CONE 2.75 ID X 1.00 WIDE
6	1	12387	BRG THRUST 1.259 ID X 1.937 OD X .0781
7	1	12395	CLAMP COLLAR SPLIT HINGED 2-1/2 ID
8	2	12592	SCREW 1/4-20 X 2-3/4 SHCS
9	1	15212	SCREW 1/2-20 X 2-1/4 SHCS
10	2	16594	BALL NYLON 3/16 DIA
11	2	16666	WASHER THRUST 1.250 ID X 1.937 OD X .060
12	6	19232	SCREW 10-24 X 3/8 SHCS
13	1	21956	FTG PLUG 3/8 NPTM SOCKET
14	2	27348	SEAL 2.750 ID X 4.000 OD X .375
15	1	27353	BRG NEEDLE 1 ID X 1-1/4 OD X 1 CLOSED
16	1	28219	NUT MAIN BRG PRELOAD
17	1	28220	BUSHING LEADSCREW FLANGED
18	1	28589	BUSHING FLANGED 1 5P ACME THREADED
19	1	29154	PLATE SERIAL YEAR MODEL CE 2.0 X 3.0
20	2	29207	SPRING PLUNGER HAND RETRACT 1/2 X 13
21	2	45900	SCREW 1/4-28 X 1/2 SHCS
22	1	46902	LABEL WARNING HOT SURFACE
23	1	49665	HOUSING RDU BB5000 4TH
24	1	49667	CAP WORM HOUSING BB5000 4TH GEN
25	1	52307	BRG BALL THRUST 40 MM ID X 60 MM OD X 13 MM
26	1	53610	HANDLE PULL 1/4 CBORE MTG 2.17 X 5.75 X 1.02W COATED
27	2	53613	SPACER .67 OD X .266 ID X 1.875 LG
28	1	53910	CLAMP RING RDU MOUNT BB4500 HD
29	1	53911	COLLET MAIN DRIVE BB4500 4TH GEN
30	1	53913	KEY MAIN DRIVE BB4500 HD
31	1	54920	RING O 1/16 X 2-1/4 ID X 2-3/8 OD
32	1	54921	RING O 4-3/8 ID X 4-5/8 OD X 1/8
33	1	54922	RING O 1/16 X 1-3/8 ID X 1-1/2 OD VITON 75 DUROMETER
34	1	55708	SEAL 1.500 ID X 2.000 OD X .375 HIGH TEMP
35	A/R	55784	SHIM 1.7 ID X 2.3 OD .001 THICK
35	A/R	55790	SHIM 1.7 ID X 2.3 OD .002 THICK
35	A/R	55791	SHIM 1.7 ID X 2.3 OD .005 THICK
36	1	59044	LABEL WARNING CONSULT OPERATOR'S MANUAL
37	1	73954	SET WORM GEAR 4:1 BB5000 4TH GEN 1PC WORM
38	1	78741	LABEL WARNING CRUSH FOOT
39	1	78748	LABEL WARNING FLYING DEBRIS/LOUD NOISE
40	1	80207	LABEL WARNING - ENTANGLEMENT/ROTATING SHAFT GRAPHIC 1.95 TALL TRIANGLE YELLOW

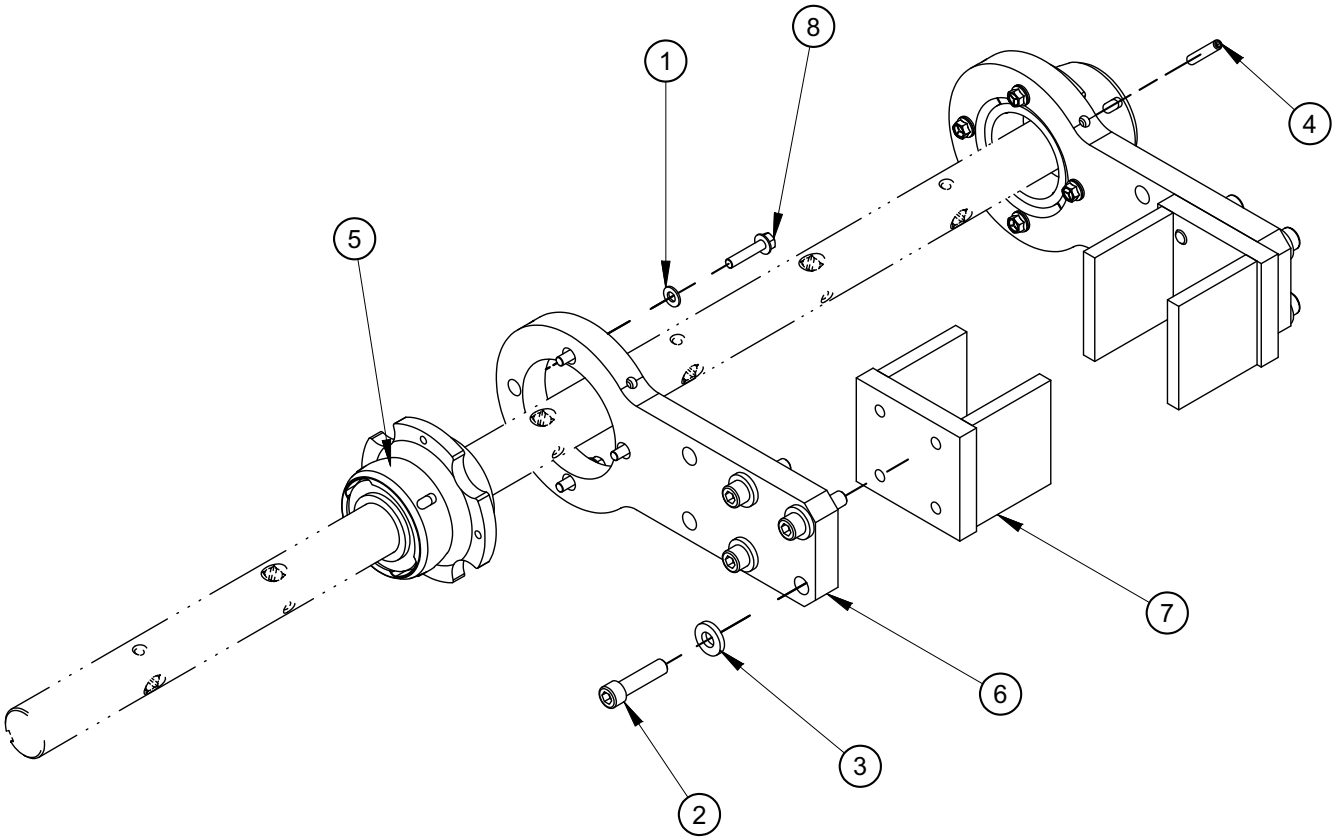
FIGURE A-7. RDU 2ND GEN ASSEMBLY (P/N 53912)



PARTS LIST			
ITEM	QTY	P/N:	DESCRIPTION
1	2	11238	WASHER LOCK 1/2
2	2	11826	SCREW 1/2-13 X 1-1/4 HHCS
3	1	A/R	SEE CHART
4	1	39828	KIT FTG 1/2 HYD QUICK COUPLERS
5	1	78619	LABEL WARNING HOT SURFACE GRAPHIC 1.95" TALL TRIANGLE YELLOW (KB)

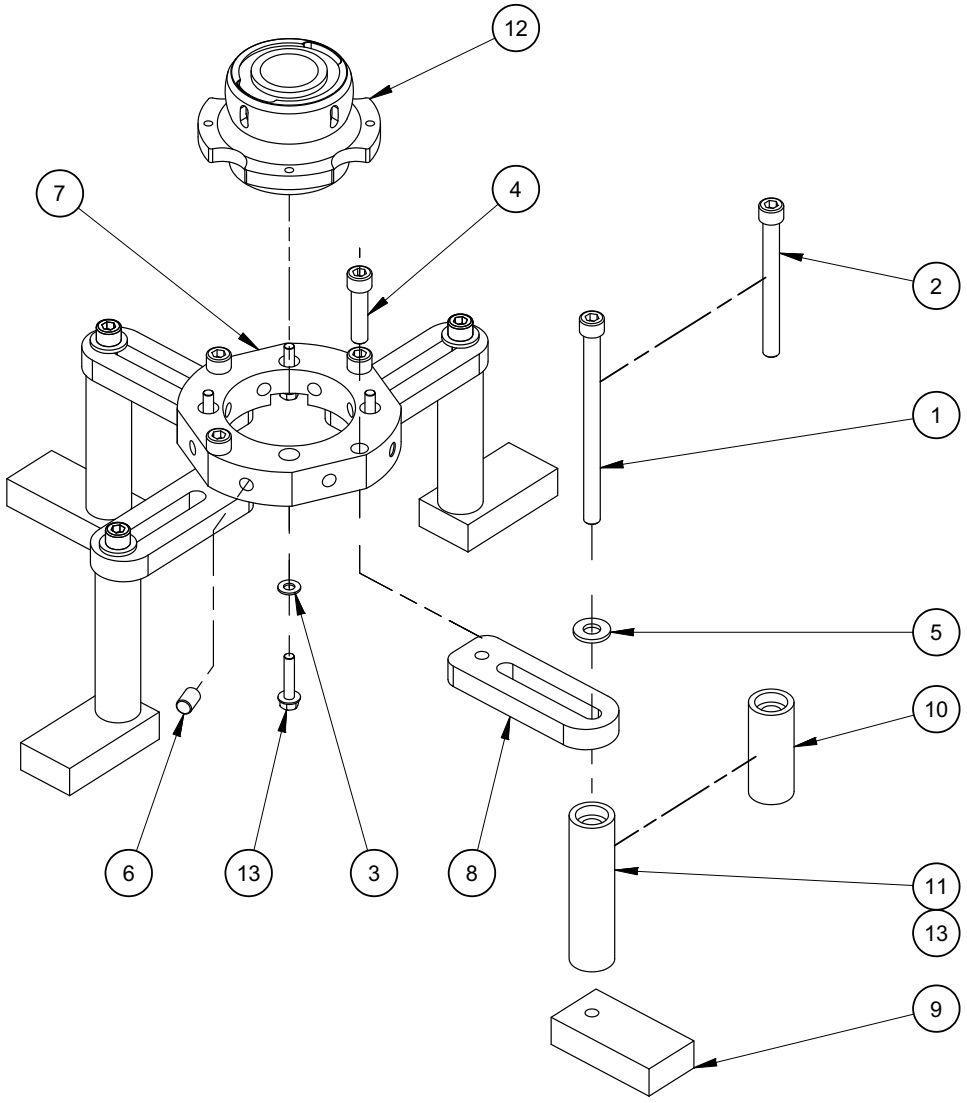
PART No	DESCRIPTION	MOTOR HYD P/N
39837	MOTOR ASSY HYD 2.2 CU IN KEYED 1/2 FTG	27477
39843	MOTOR ASSY HYD 3.6 CU IN KEYED 1/2 FTG	20684
39844	MOTOR ASSY HYD 5.7 CU IN KEYED 1/2 FTG S-SERIES	21530
39845	MOTOR ASSY HYD 7.3 CU IN KEYED 1/2 FTG	20231
39846	MOTOR ASSY HYD 8.9 CU IN KEYED S-SERIES 1/2 FTG	21531
39847	MOTOR ASSY HYD 14.1 CU IN KEYED 1/2 FTG	34585
43451	MOTOR ASSY HYD 11.3 CU IN KEYED 1/2 FTG	21532
43452	MOTOR ASSY HYD 17.9 CU IN KEYED 1/2 FTG	21534
43552	MOTOR ASSY HYD 22.5 CU IN KEYED SHAFT	30567

FIGURE A-8. HYDRAULIC MOTOR ASSEMBLY (P/N 39848)



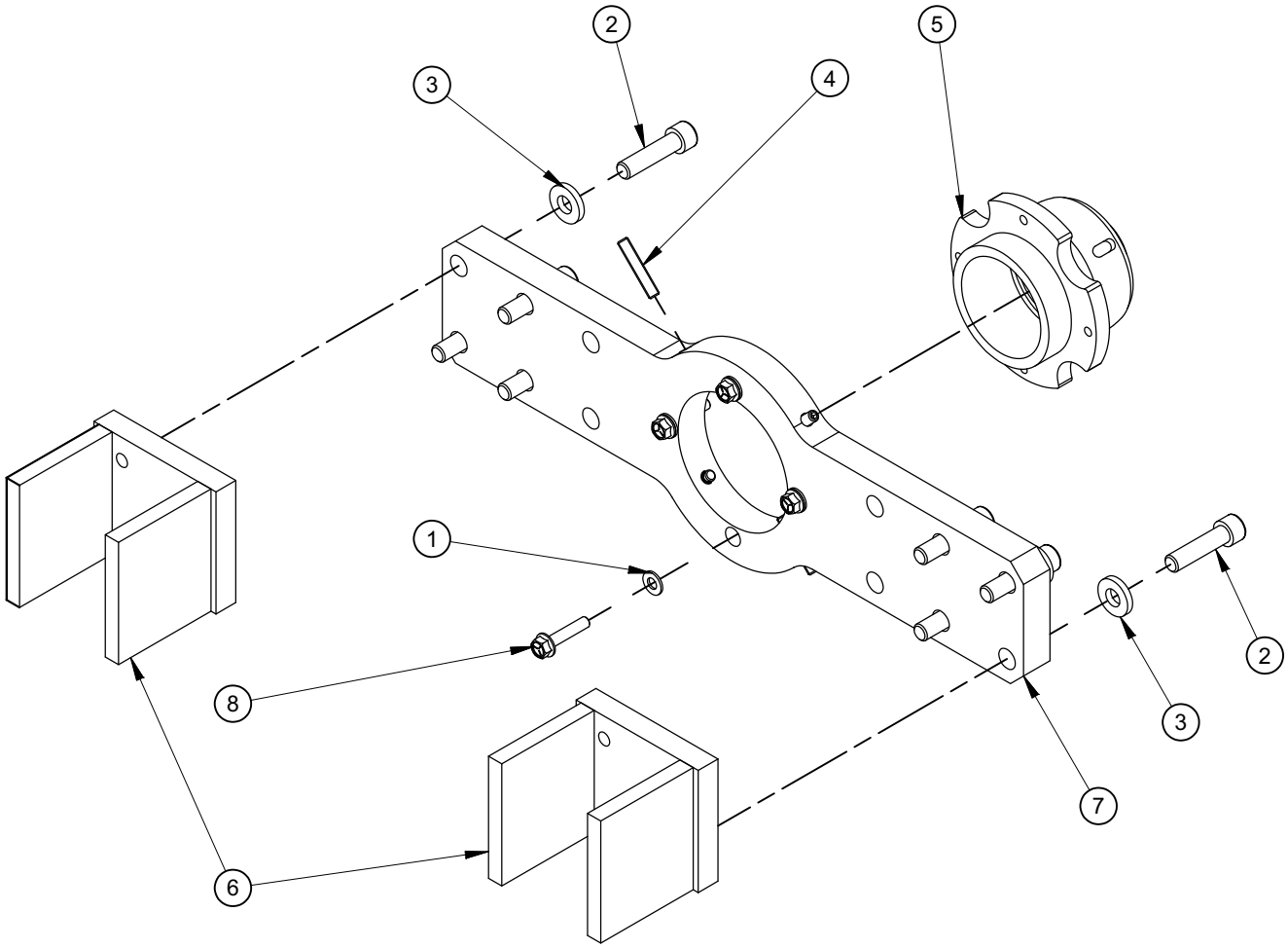
PARTS LIST			
ITEM	QTY	P/N:	DESCRIPTION
1	8	13489	WASHER 5/16 FLTW SAE
2	8	14036	SCREW 1/2-13 X 2 SHCS
3	8	17145	WASHER 1/2 FLTW HARDENED 1-1/8 OD X 3/16 THK
4	8	20174	SCREW 5/16-18 X 1-3/4 SSSFP
5	2	43264	MOUNT BRG SPHERICAL ARM BB45000 STD
6	2	43265	BRACKET MOUNTING ARM
7	2	43266	PLATE BEARING SCAB
8	8	45365	SCREW 5/16-24 X 1.500 HHCS FLANGED BLK OX

FIGURE A-9. SINGLE-ARM MOUNT ASSEMBLY (P/N 43262)



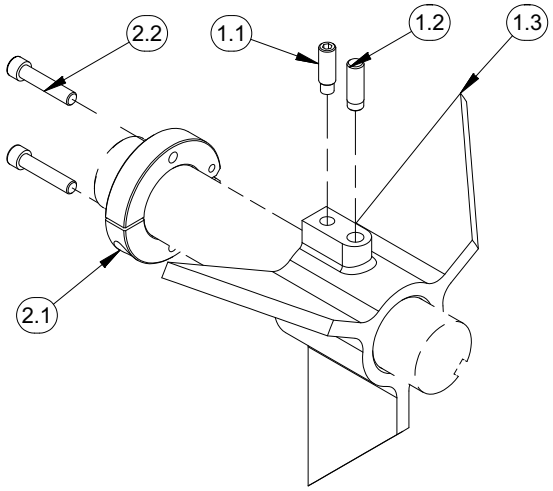
PARTS LIST			
ITEM	QTY	P/N:	DESCRIPTION
1	4	11223	SCREW 1/2-13 X 7 SHCS
2	4	11879	SCREW 1/2-13 X 5 SHCS
3	4	13489	WASHER 5/16 FLTW SAE
4	4	14036	SCREW 1/2-13 X 2 SHCS
5	4	22662	WASHER 1/2 FLTW HARDENED 1-1/8 OD X 1/8 THK
6	4	27273	SCREW 1/2-20 X 3/4 SSSFP
7	1	36962	BEARING MOUNT RING 1-3/4
8	4	36965	EXTENSION ARM MOUNT
9	4	36966	TACK BLOCK 4 IN
10	4	37598	ASSY STAND OFF TUBE 3.3 INCH
11	4	37599	ASSY STAND OFF TUBE 5.3 INCH
12	1	43264	MOUNT BRG SPHERICAL 1-3/4 ID W/CLAM STD
13	4	45365	SCREW 5/16-24 X 1.500 HHCS FLANGED BLK OX

FIGURE A-10. UNIVERSAL MOUNT ASSEMBLY (P/N 43267)



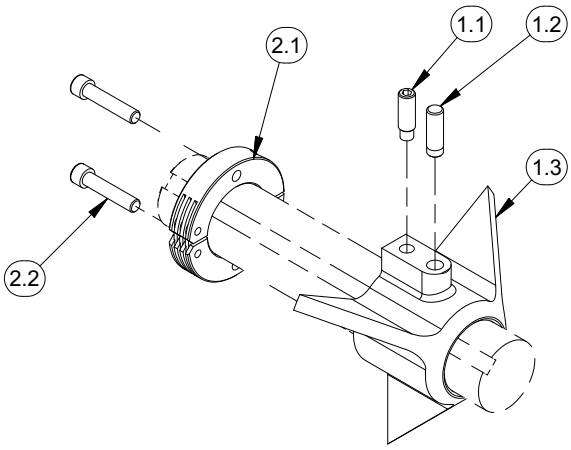
PARTS LIST			
ITEM	QTY	P/N:	DESCRIPTION
1	4	13489	WASHER 5/16 FLTW SAE
2	8	14036	SCREW 1/2-13 X 2 SHCS
3	8	17145	WASHER 1/2 FLTW HARDENED 1-1/8 OD X 3/16 THK
4	4	20174	SCREW 5/16-18 X 1-3/4 SSSFP
5	1	43264	MOUNT BRG SPHERICAL 1-3/4 ID W/CLAM STD
6	2	43266	PLATE BEARING SCAB
7	1	43277	BRACKET MOUNTING DOUBLE ARM
8	4	45365	SCREW 5/16-24 X 1.500 HHCS FLANGED BLK OX

FIGURE A-11. DOUBLE-ARM BEARING MOUNT ASSEMBLY (P/N 43279)



SET CONES SETUP 6 TO 10 DIA 1-3/4 KEYED BAR 43384

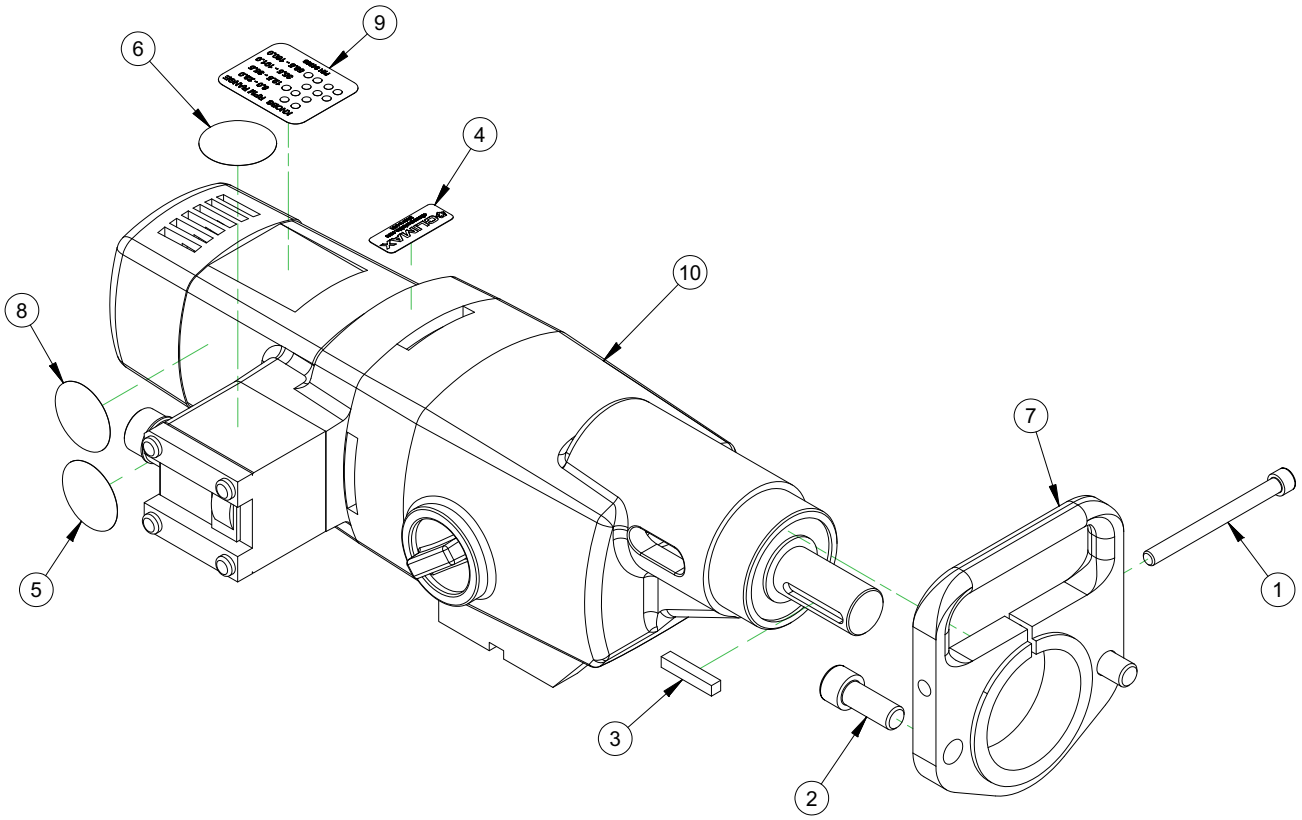
PARTS LIST			
ITEM	QTY	P/N:	DESCRIPTION
1	1	42228	CONE SETUP 6 TO 10 BB4500 1-3/4 BAR
1.1	1	29092	SCREW MOD 3/8-24 X 1-3/16 SSSFD
1.2	1	29091	PIN STOP
1.3	1	42228	CONE SETUP BB4000 6" TO 10"
2	1	42508	CLAMP COLLAR MODIFIED 1 3/4 ID
2.1	1	42508	CLAMP COLLAR MODIFIED
2.2	2	17125	SCREW 5/16-24 X 1-1/2 SHCS



SET CONES SETUP 2 TO 6 DIA 1-3/4 KEYED BAR 43383

PARTS LIST			
ITEM	QTY	P/N:	DESCRIPTION
1	1	41220	CONE SETUP 2 TO 6 BB4500 1-3/4 BAR
1.1	1	29092	SCREW MOD 3/8-24 X 1-3/16 SSSFD
1.2	1	29091	PIN STOP
1.3	1	41220	CONE SETUP 2" TO 6" BB4000
2	1	42508	CLAMP COLLAR MODIFIED 1 3/4 ID
2.1	1	42508	CLAMP COLLAR MODIFIED
2.2	2	17125	SCREW 5/16-24 X 1-1/2 SHCS

FIGURE A-12. LARGE AND SMALL SET CONES ASSEMBLY (P/N 49060)



AVAILABLE CONFIGURATIONS	
PART NO	DESCRIPTION
88008	MOTOR ELECTRIC ASSY EIBENSTOCK 120 V 4 SPEED REVERSIBLE GEN 2
88009	MOTOR ELECTRIC ASSY EIBENSTOCK 230 V 4 SPEED REVERSIBLE GEN 2

PARTS LIST			
ITEM	QTY	P/N:	DESCRIPTION
1	1	11873	SCREW 5/16-18 X 3-1/2 SHCS
2	2	12646	SCREW 1/2-13 X 1-1/4 SHCS
3	1	15724	KEY 1/4 SQ X 1.37 SQ BOTH ENDS
4	1	56300	LABEL CLIMAX LOGO .66 X 1.75
5	1	59037	LABEL WARNING - WEAR EAR PROTECTION
6	1	59044	LABEL WARNING - CONSULT OPERATOR'S MANUAL 1.5 DIA
7	1	75648	FLANGE MOTOR MTG ELEC RDU BB5000
8	1	78824	LABEL WARNING - DO NOT EXPOSE TO WATER
9	1	84393	LABEL EIBENSTOCK RPM RANGES
10	1	88004	NFIS MOTOR ELECTRIC 4 SPEED REVERSIBLE 120V CE EIBENSTOCK EAU 34/4.3 CB GEN 2
		88005	NFIS MOTOR ELECTRIC 4 SPEED REVERSIBLE 230V CE EIBENSTOCK EAU 34/4.3 CB GEN 2

FIGURE A-13. EIBENSTOCK MOTOR ASSEMBLY (P/N 88012)

FOR GENERATION 2 ONLY

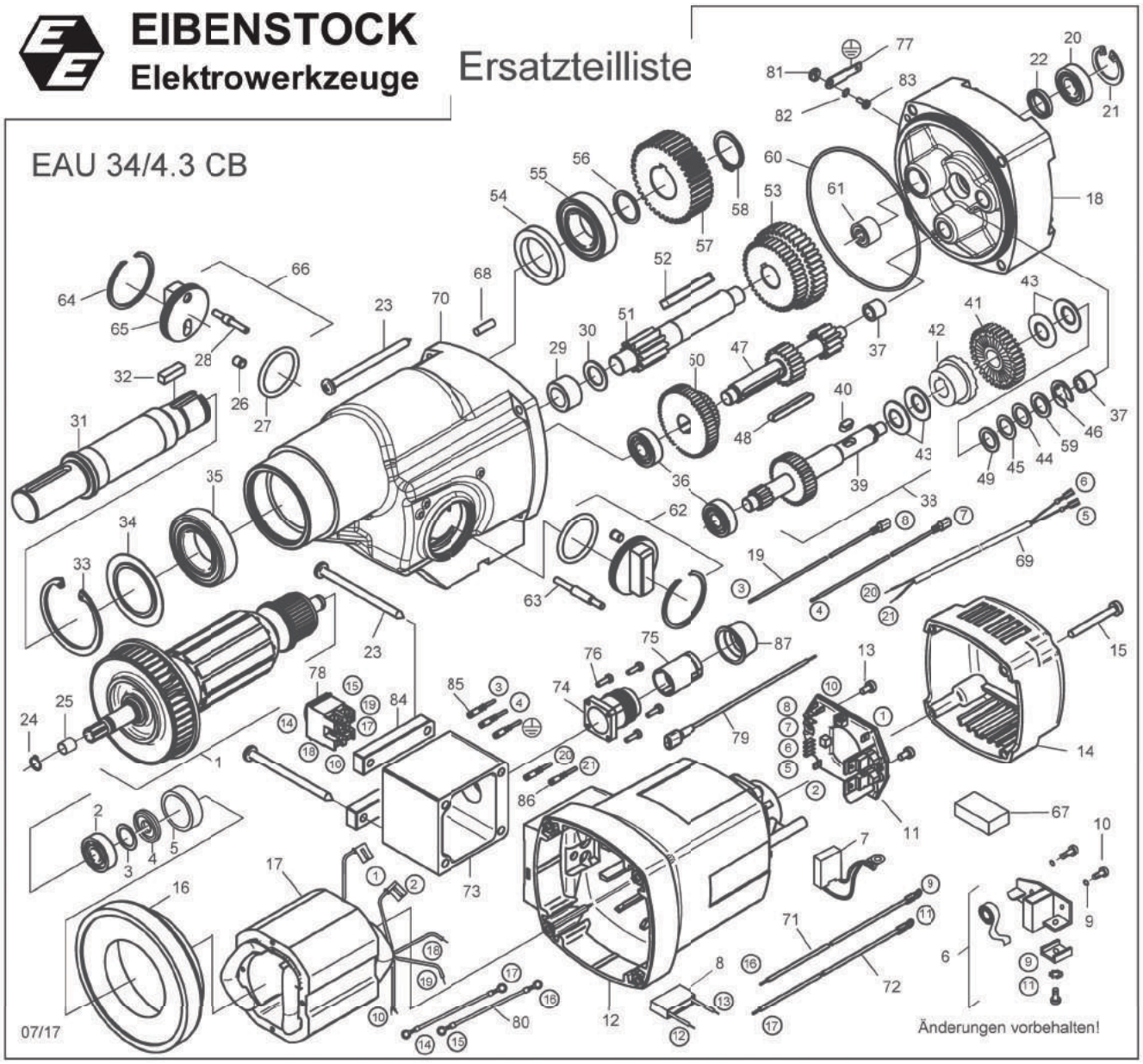


FIGURE A-14. EIBENSTOCK MOTOR ASSEMBLY -- GEN. 2 ONLY

FOR GENERATION 2 ONLY

EAU 34/4.3 CB - 230 V

04567000

No.	Description	Order No.	Pcs
1	rotor complete	7455U100	1
2	grooved ball bearing 6000 2Z	80410021	1
3	seal ring	83000507	1
4	magnetic disc	7633J325	1
5	bearing cap	83000031	1
6	brush holder	80204515	2
7	carbon brush	80700070	2
8	anti parasite condenser	80500010	1
9	lock washer B4	80201385	4
10	self tapping screw CM4x12	80201180	4
11	PCB / circuit board	74522280	1
12	motor housing	7455U201	1
13	self tapping screw HC 4,2x9,5	80201269	2
14	cap	80900082	1
15	self tapping screw HC 4,8x45	80201267	4
16	air guiding ring	73511141	1
17	stator complete	7455U150	1
18	end shield of gearing	7455U610	1
19	interconnecting wire	74555180	2
20	grooved ball bearing 6201 LUZ	80410101	1
21	locking ring 32x1,2	80201351	1
22	shaft seal ring 15x21x3 KEIV	83000042	1
23	self tapping screw HC 5,5x80	80201227	4
24	locking ring 12/1	80201321	1
25	bearing ring 12x15x12,5	80420160	1
26	spring loaded thrust pad	85000157	2
27	o-ring 36x1,5 NBR	83000022	2
28	switch-actuating wheel short	71641532	1
29	needle bearing RNA 4900	80420001	1
30	disc	71540517	1
31	work spindle	74565420	1
32	fitting key B6x6x20	80200606	1
33	locking ring 55/2	80201338	1
34	disc	71540426	1
35	grooved ball bearing 6006 2RS	80410071	1
36	grooved ball bearing 6000	80410020	2
37	needle sleeve HK 0810	80420110	2
38	clutch complete	74643493	1
39	intermediate shaft 1	74641490	1
40	fitting key 5x5x10	80200600	1
41	clutch wheel	74326550	1
42	coupling half	71540560	1
43	spring washer 28x12,2x1	80200713	4
44	fitting washer 12/18x0,5	80200503	1
45	fitting washer 12/18x0,2	80200502	1
46	lock washer 9	80201361	1
47	intermediate shaft 2	74641500	1
48	fitting key 5x5x40	80200612	1
49	pressure washer	71540607	1
50	gear block 1	74641440	1
51	intermediate shaft 3	74641510	1
52	fitting key 6x6x50	80200610	1
53	gear block 2	74641450	1
54	shaft seal ring 30x42x7	83000071	1
55	grooved ball bearing 6005 2RS	80410061	1
56	fitting washer 25x0,1	80200512	1
57	spindle wheel	74554430	1
58	locking ring 24/1,2	80201326	1
59	pressure washer	71540606	1
60	o-ring 106x2	83000092	1
61	needle sleeve HK 1212	80420130	1
62	switch button long	71641545	1
63	switch-actuating wheel long	71641542	1
64	circlip SB42	80201355	2
65	switch button	71641540	2
66	switch button short	71641535	1
67	foam filler	80600306	1
68	notched pin plug 5x16	80200580	1
69	control wire	77314187	1
70	gearbox housing	7455U400	1
71	brush holder wire 1	74555181	1
72	brush holder wire 2	74555182	1
73	switch box	74567630	1
74	connector socket	80601480	1
75	insert	80601481	1
76	screw 3x10	80201600	4
77	earth connector	80601189	1
78	reverser	80600103	1
79	ground wire	74567185	1
80	interconnecting wire	80600243	2
81	locking nut M4	73631188	1
82	tooth lock washer A4,3	80200752	1
83	allen screw M4x8	80201451	1
84	protection hood	7455U633	2
85	connector pin 2,5 mm²	80601484	3
86	connector pin 0,75 mm²	80601483	2
87	cap guard	80601482	1

EAU 34/4.3 CB - 110 V

04568000

1	rotor complete	7455V100	1	150,00	11	PCB / circuit board	7451I280	1	68,75
7	carbon brush	80700077	2	5,81	17	stator complete	74644150	1	68,75

FIGURE A-15. EIBENSTOCK MOTOR ASSEMBLY PARTS LIST -- GEN. 2 ONLY

TABLE A-1. BB4500 RECOMMENDED SPARE PARTS

Component	Part number	Description	Quantity
Rotational drive unit	12395	Clamp collar	2
Leadscrew assembly	12436	Leadscrew	1
	27356	1-5 Acme Nut	2
Axial feed box assembly	29552	Clamp collar	2
	27015	Shear pin	2
	25957	Clutch	4
	27197	Lead nut	2
	92494	Screw assembly, feed stop	2
	26850	Crank	1
Boring head/ bar	11734	Screw 3/8-16 X 3/4 SSSCP	4
	13356	Screw 5/8-11 X 2-1/2 SHCS	4
	11691	Screw 1/2-13 X 1.5 SHCS	2
	10191	Screw 3/8-16 X 1 SHCS	2
Spherical bearing mounting brackets	14036	Screw 1/2-13 x 2 SHCS	8
	22662	Washer ½	8
	26250	Screw 5/16-24 x 2 HHCS	4
	21798	Washer 5/16	4
	26252	Screw 1/2-20 x 2 SSSFP	4
HPU	29840	Hydraulic oil – 76 Unax AW 32 anti-wear fluid	NA
	20273	Key	1
Electric motor assembly	82698	SP brush carbon pair for Eibenstock EAU 34/4.1	2
	26845	3/8 short arm ball driver hex wrench	1

TABLE A-2. TOOL KIT

Part number	Description	Quantity
11920	1/2" Hex wrench	1
10199	1/4" Hex wrench	1
11082	3/16" Hex wrench	1

TABLE A-2. TOOL KIT (CONTINUED)

Part number	Description	Quantity
11919	3/8" Hex wrench	1
10601	5/16" Hex wrench	1
10600	5/32" Hex wrench	1
25710	Tool bit HSS 1/2 sq x 4"	3
43697	Operating Manual	1
82949	Bag tool 14 x 5.5 x 6 polyester	1
39099	Filter element replacement	1

APPENDIX B BB5000 ASSEMBLY DRAWINGS

Drawing list

FIGURE B-1. AXIAL FEED UNIT ASSEMBLY (P/N 28636) - - - 84
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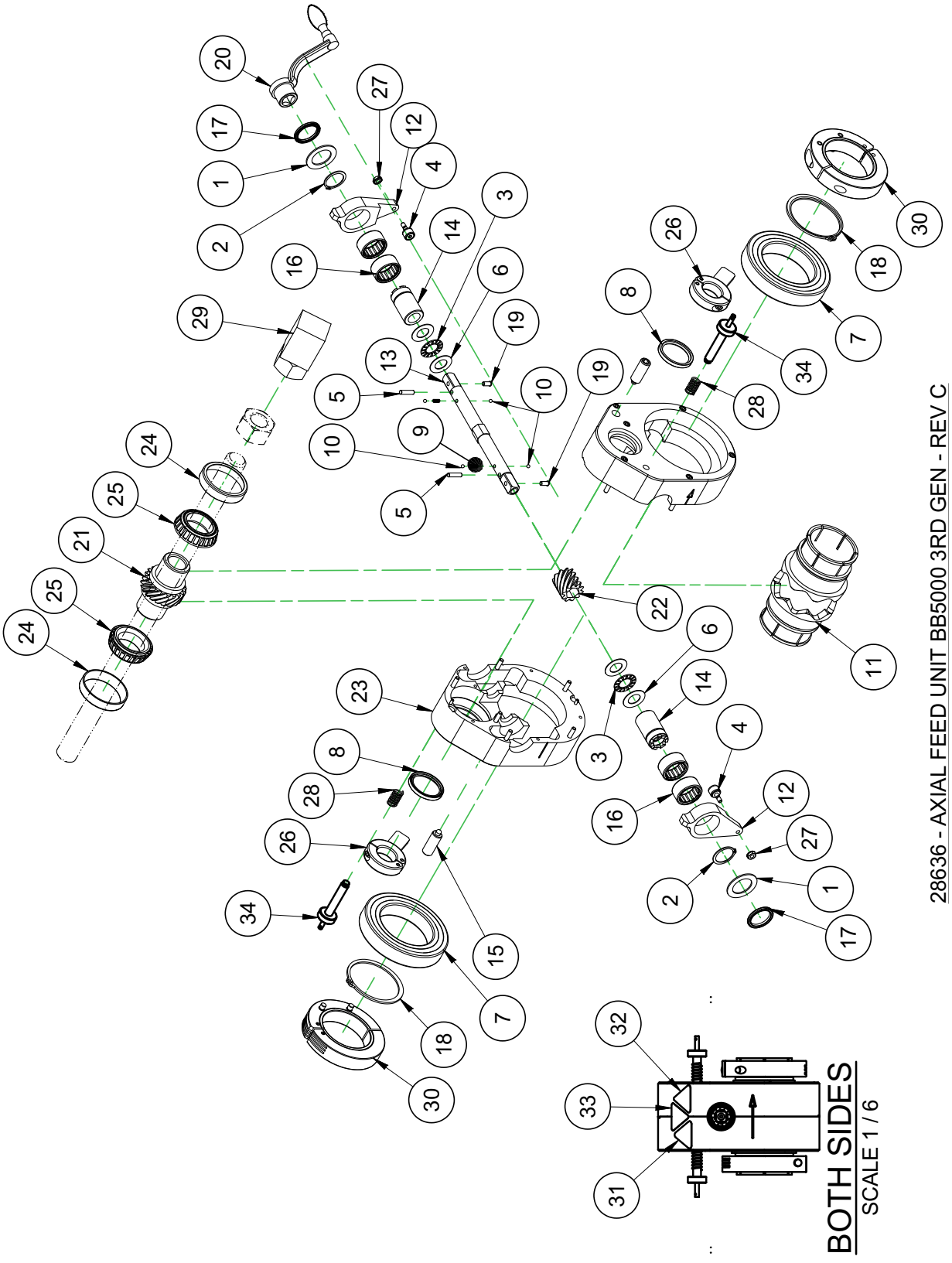


FIGURE B-1. AXIAL FEED UNIT ASSEMBLY (P/N 28636)

PARTS LIST			
ITEM	QTY	P/N:	DESCRIPTION
1	2	10144	WASHER THRUST 1 ID X 1.562 OD X .060
2	2	10534	RING SNAP 1 OD
3	2	10538	BRG THRUST .625 ID X 1.125 OD X .0781
4	2	10836	BRG CAM FOLLOW .500 X .344
5	2	11763	PIN DOWEL 3/16 x 3/4
6	4	11823	WASHER THRUST .625 ID X 1.125 OD X .030
7	2	12388	BRG BALL 2.7559 X 4.3307 X .7874
8	2	16505	SEAL 1.375 ID X 1.750 OD X .197 (KB)
9	2	19561	SPRING COMP .148 OD X .023 WIRE X .50 LONG STAINLESS
10	4	19562	BALL STEEL 5/32 DIA
11	1	25945	COLLET AFU BB5000 2-1/4 BAR
12	2	25949	ARM RATCHET
13	1	25950	SHAFT FEED
14	2	25951	BUSHING DRIVE
15	2	25955	SPRING PLUNGER 1/2-13 LIGHT FORCE
16	4	25957	BRG ROLLER CLUTCH 1 X 1.312 X .625
17	2	25959	SEAL 1.000 ID X 1.312 OD X .125 HM14 LIP
18	2	25961	RING SNAP 2-3/4 BEVELED
19	2	26828	PLUNGER BALL PUSHFIT
20	1	26850	HANDLE CRANK MODIFIED
21	1	27197	LEAD NUT BB4500 BB5000 AXIAL FEED (VMI)
22	1	27198	GEAR HELICAL AXIAL FEED BB5000
23	1	27199	ASSEMBLED AXIAL FEED UNIT HOUSING
24	2	27203	BRG CUP 2.328 OD x .470 WIDE
25	2	27204	BRG CONE 1.3775 ID X .6600 WIDE
26	2	27222	STOP ARM ASSY
27	2	28060	NUT, 10-32 UNF KEPS
28	2	28618	SPRING COMP .48 OD X .051 WIRE X .88
29	1	28756	BLOCK TACKWELD BB5000
30	2	29552	CLAMP COLLAR MODIFIED 3RD GEN AFU
31	2	78735	LABEL WARNING HAND CRUSH/FORCE
32	2	78742	LABEL WARNING ENTANGLEMENT OF HAND/ROTATING SHAFT
33	2	80510	LABEL WARNING CUTTING OF FINGERS/ROTATING BLADE GRAPHIC 1.13 TALL TRIANGLE YELLOW
34	2	92494	SCREW ASSY FEED STOP GEN 2

FIGURE B-2. AXIAL FEED UNIT ASSEMBLY PARTS LIST (P/N 28636)

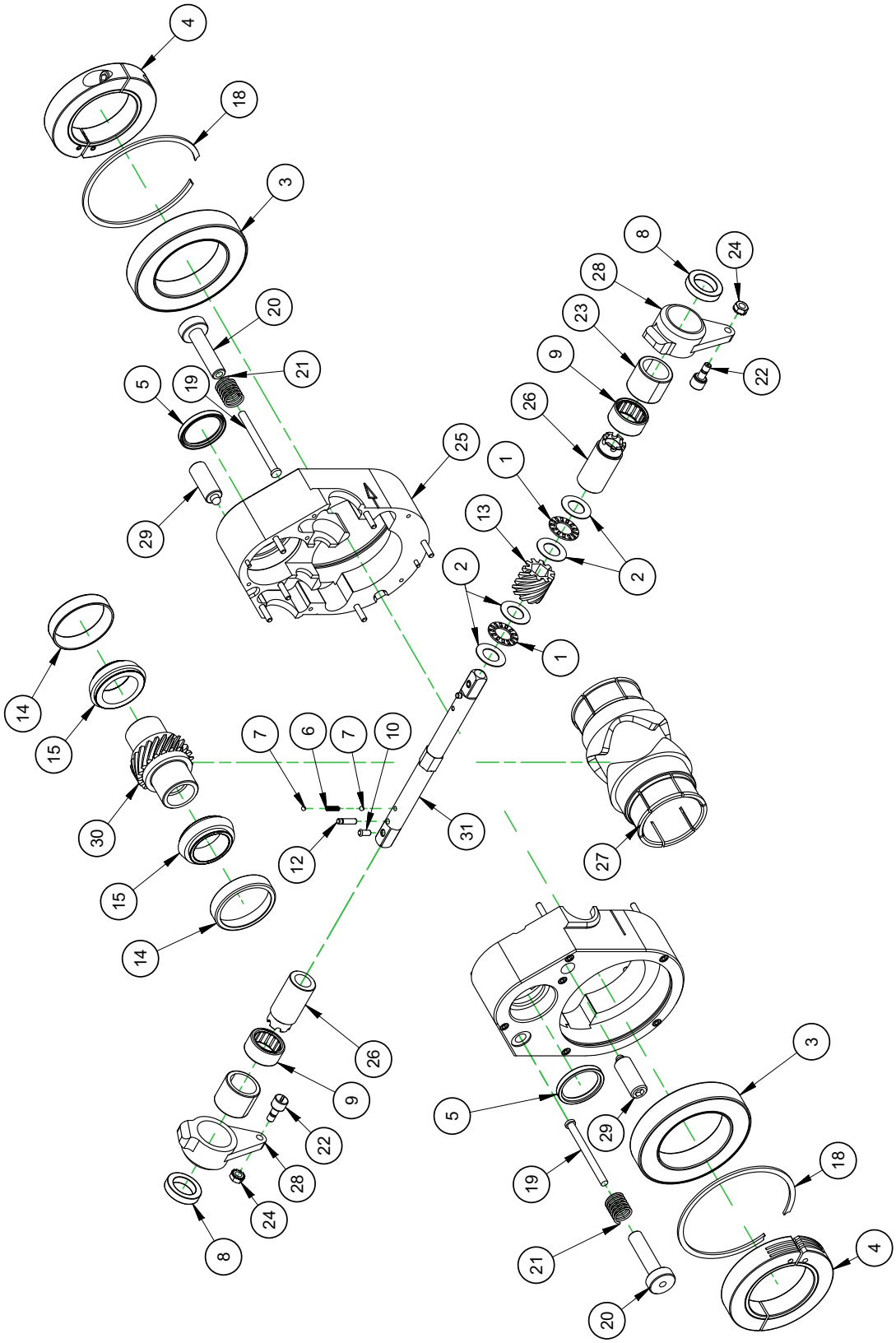
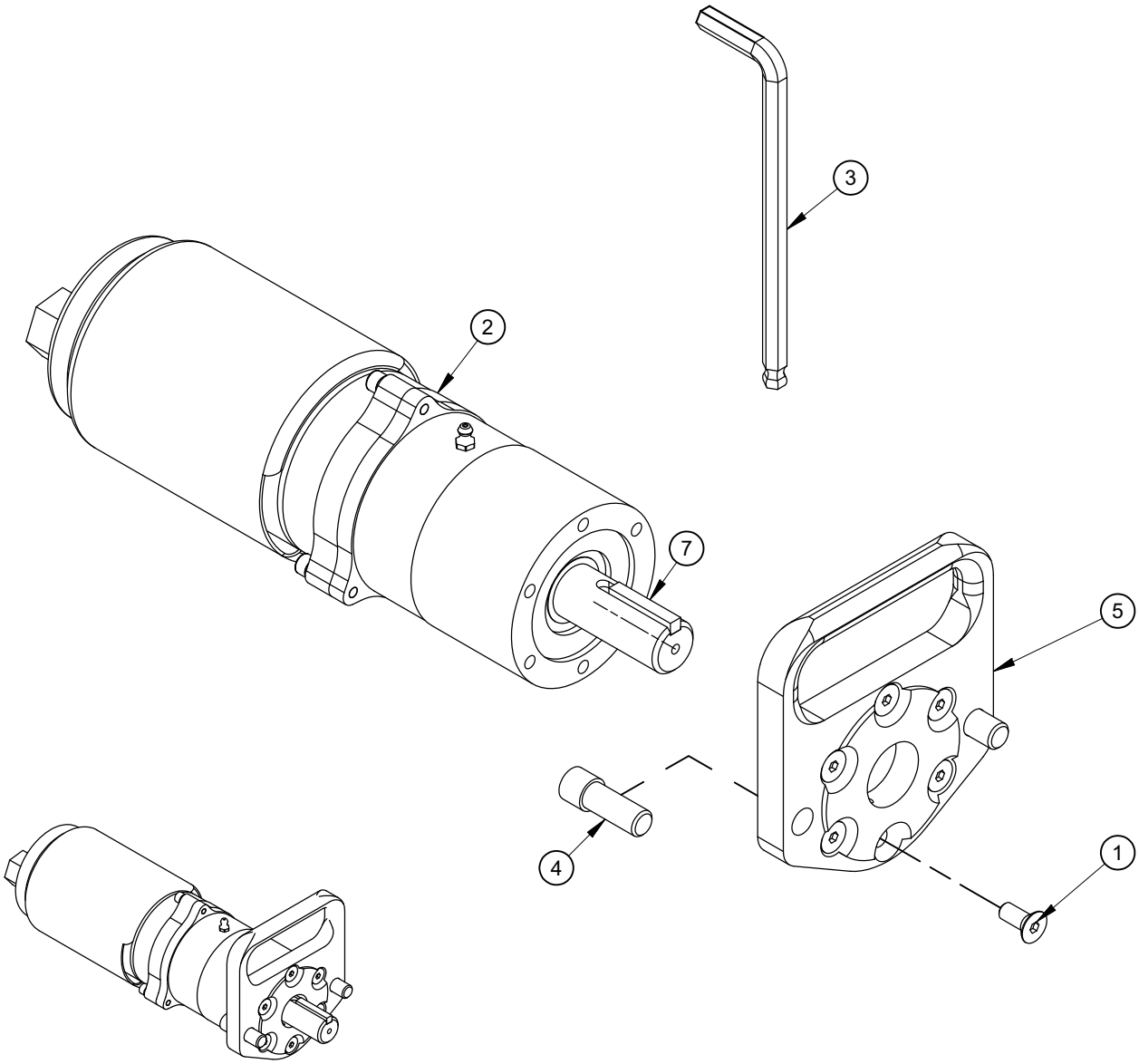


FIGURE B-3. HD AXIAL FEED UNIT ASSEMBLY (P/N 91518)

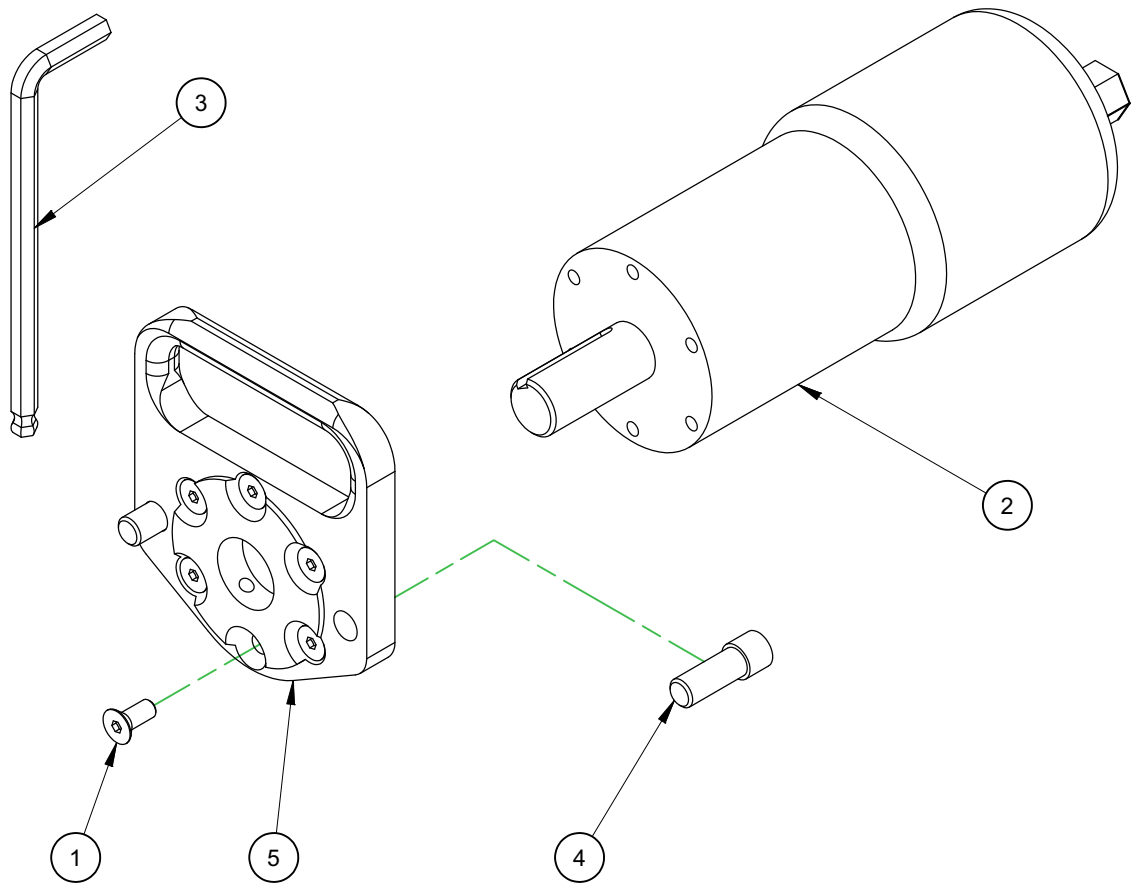
PARTS LIST			
ITEM	QTY	P/N:	DESCRIPTION
1	2	10538	BRG THRUST .625 ID X 1.125 OD X .0781
2	4	11823	WASHER THRUST .625 ID X 1.125 OD X .030
3	2	12388	BRG BALL 2.7559 X 4.3307 X .7874
4	2	12395	CLAMP COLLAR SPLIT HINGED 2-1/2 ID
5	2	16505	SEAL 1.375 ID X 1.750 OD X .197 (KB)
6	2	19561	SPRING COMP .148 OD X .023 WIRE X .50 LONG STAINLESS
7	4	19562	BALL STEEL 5/32 DIA
8	2	20890	BRG BALL .8750 ID X 1.3125 OD X .281
9	2	25957	BRG ROLLER CLUTCH 1 X 1.312 X .625
10	2	26828	PLUNGER BALL PUSHFIT
11	1	26850	(NOT SHOWN) HANDLE CRANK MODIFIED
12	2	27015	PIN MODIFIED 3/16 x 3/4 GROOVED
13	1	27198	GEAR HELICAL AXIAL FEED BB5000
14	2	27203	BRG CUP 2.328 OD x .470 WIDE
15	2	27204	BRG CONE 1.3775 ID X .66 WIDE
16	1	27222	(NOT SHOWN)STOP ARM ASSY
17	1	28756	(NOT SHOWN) BLOCK TACKWELD BB5000
18	2	43982	RING SNAP 4.331 ID METRIC 110
19	2	49696	CLEVIS STOP PIN
20	2	49697	SCREW 1/2-13 X 3 KHS MOD BB5000 4TH GEN FEED STOP
21	2	49699	SPRING COMP .72 OD X .063 WIRE X .88 LONG
22	2	52347	BRG CAM FOLLOWER .500 OD X .375 WIDE W/ 1/4-28 STUD
23	2	54712	BRG ROLLER CLUTCH 1 ID X 1-5/16 OD X 1.063 SS SPRINGS
24	2	56301	NUT 1/4-28 LOCKING STAR WASHER
25	1	56307	HOUSING AXIAL FEED BB5000 4TH GEN
26	2	56308	BUSHING DRIVE BB5000 4TH GEN
27	1	56309	COLLET AFU BB5000 2-1/4 BAR 4TH GEN
28	2	56310	ARM RATCHET BB5000 4TH GEN
29	2	56314	SPRING PLUNGER 5/8-11 X 1.5 FORCE 3.5 TO 10.5 LBS
30	1	56349	NUT LEAD BB5000 AXIAL FEED
31	1	56380	SHAFT FEED BB5000 4TH GEN PROTOTYPE

FIGURE B-4. HD AXIAL FEED UNIT ASSEMBLY PARTS LIST (P/N 91518)



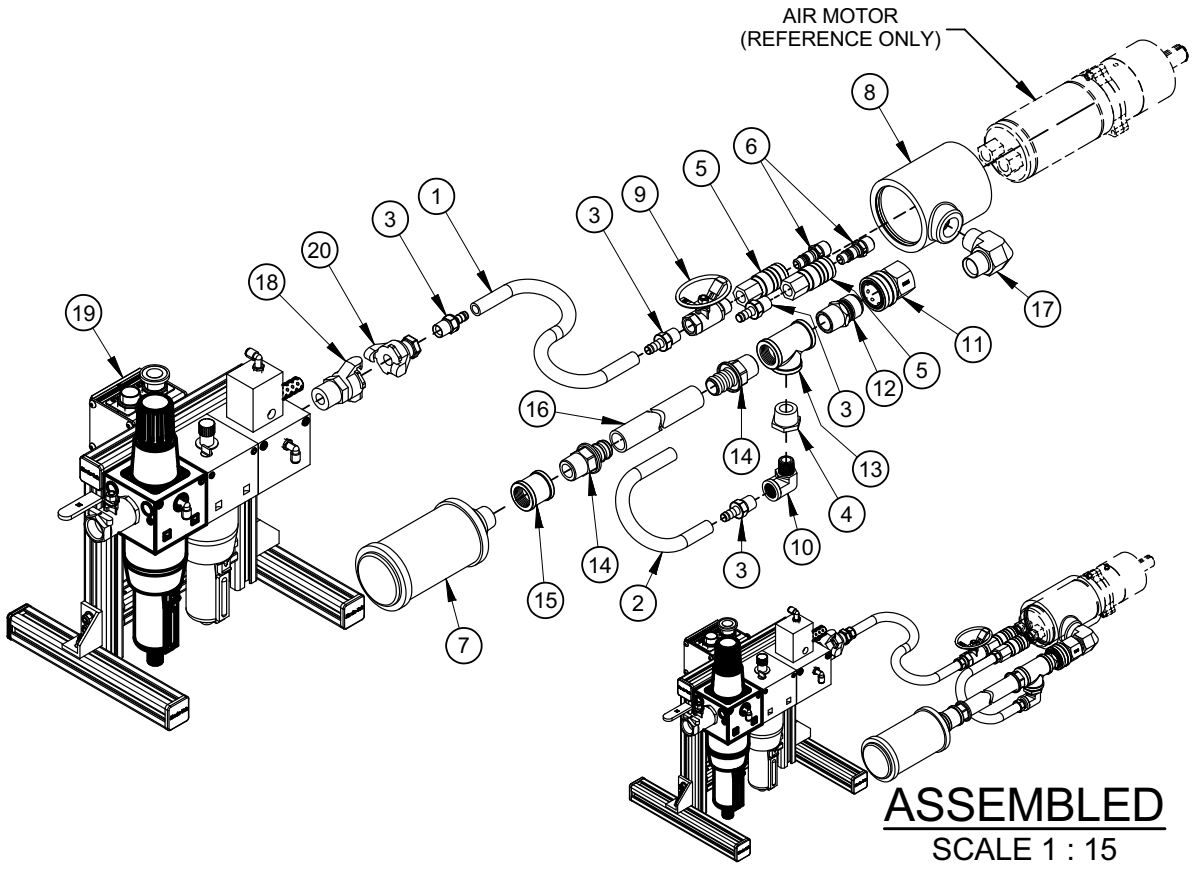
PARTS LIST			
ITEM	QTY	P/N:	DESCRIPTION
1	6	10516	SCREW 5/16-18 X 3/4 FHSCS
2	1	15087	MOTOR AIR 3HP 475 RPM FS 228 RPM MAX 93TQ
3	1	26845	WRENCH HEX 3/8 SHORT ARM BONDHUS BALLDRIVER
4	2	28611	SCREW 1/2-13 X 1-1/4 SHCS MODIFIED
5	1	28612	FLANGE MTG AIR MOTOR BB5000

FIGURE B-5. AIR MOTOR CE ASSEMBLY (P/N 28697)



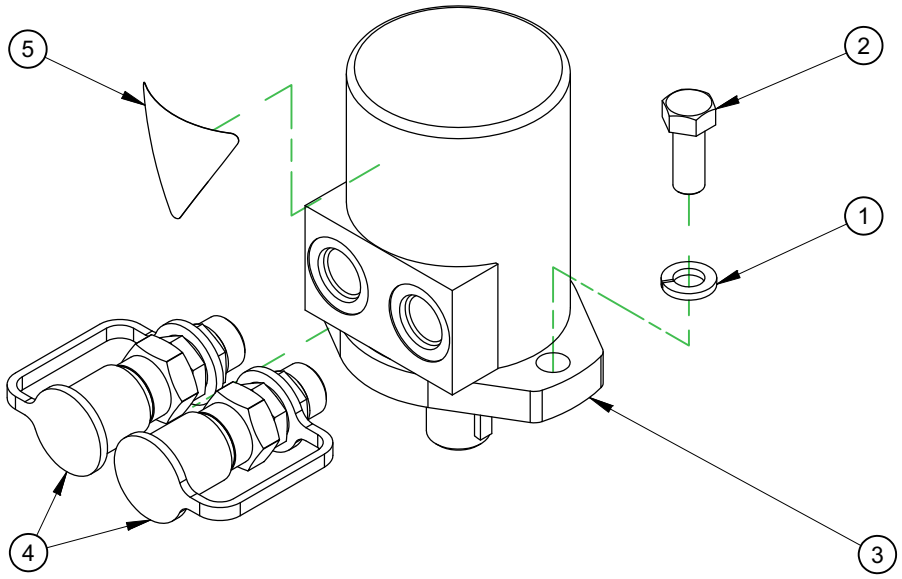
PARTS LIST			
ITEM	QTY	P/N:	DESCRIPTION
1	6	10516	SCREW 5/16-18 X 3/4 FHSCS
2	1	15109	MOTOR AIR 3.2HP 975 RPM FS 485 RPM MAX 47.3TQ
3	1	26845	WRENCH HEX 3/8 SHORT ARM BONDHUS BALLDRIVER
4	2	28611	SCREW 1/2-13 X 1-1/4 SHCS MODIFIED
5	1	28612	FLANGE MTG AIR MOTOR BB5000

FIGURE B-6. AIR MOTOR CE ASSEMBLY (P/N 28614)



PARTS LIST			
ITEM	QTY	P/N:	DESCRIPTION
1	70IN	10310	HOSE 801 SERIES PUSHLOK 1/2
2	16IN	10310	HOSE 801 SERIES PUSHLOK 1/2
3	4	10311	FTG BARB 1/2 NPTM X 1/2 HOSE
4	1	10321	FTG REDUCER BUSHING 1 NPTM X 1/2NPTF
5	2	13208	FTG QUICK COUPLER 1/2B 1/2NPTF FEMALE AIR
6	2	13209	FTG QD NIPPLE 1/2B 1/2 NPTM PNEUMATIC
7	1	15243	MUFFLER AIR MOTOR
8	1	19730	EXHAUST DEFLECTOR
9	1	35667	VALVE BALL 1/2 NPTM X 1/2 NPTF OVAL HANDLE
10	1	35692	FTG ELBOW 1/2 NPTM X 1/2 NPTF ST 90 DEG BRASS
11	1	55800	FTG QUICK COUPLER 1B 1 NPTF FEMALE AIR BRASS
12	1	55801	FTG QUICK COUPLER 1B 1 NPTM MALE AIR NON-VALVED BRASS
13	1	55802	FTG TEE 1 NPTF (3) BRASS
14	2	55803	FTG BARB 1 NPTM X 1 HOSE BRASS
15	1	55804	FTG CONNECTOR 1 NPTF X 1NPTF BRASS
16	60IN	55805	HOSE PUSH LOK 801 X 1 GREY
17	1	55832	FTG ELBOW 1 NPTM X 1 NPTM 90 DEG
18	1	58380	FTG QUICK COUPLER UNIVERSAL 1 NPTM
19	1	59248	PNEUMATIC CONDITIONING UNIT 1 IN W/ L.P. DROP OUT AND E-STOP CE
20	1	62564	FTG QUICK COUPLER UNIVERSAL 1/2 NPTF

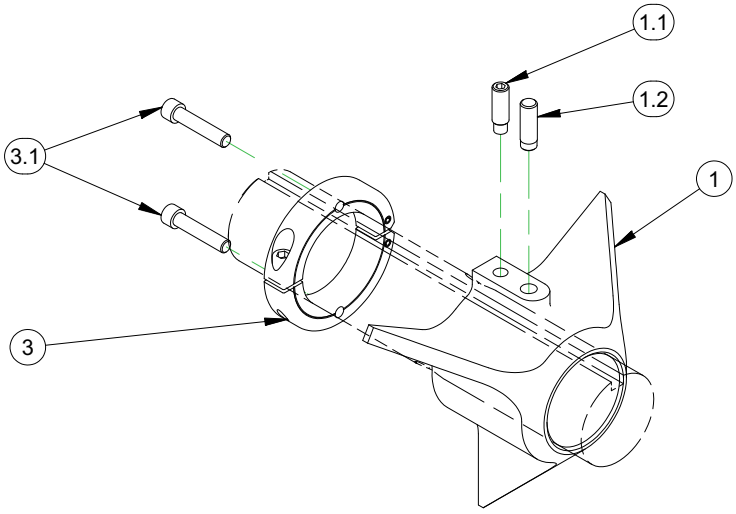
FIGURE B-7. PNEUMATIC CONNECTION ASSEMBLY (P/N 15088)



PARTS LIST			
ITEM	QTY	P/N:	DESCRIPTION
1	2	11238	WASHER LOCK 1/2
2	2	11826	SCREW 1/2-13 X 1-1/4 HHCS
3	1	A/R	SEE CHART
4	1	39828	KIT FTG 1/2 HYD QUICK COUPLERS
5	1	78619	LABEL WARNING HOT SURFACE GRAPHIC 1.95" TALL TRIANGLE YELLOW (KB)

PART No	DESCRIPTION	MOTOR HYD P/N
39837	MOTOR ASSY HYD 2.2 CU IN KEYED 1/2 FTG	27477
39843	MOTOR ASSY HYD 3.6 CU IN KEYED 1/2 FTG	20684
39844	MOTOR ASSY HYD 5.7 CU IN KEYED 1/2 FTG S-SERIES	21530
39845	MOTOR ASSY HYD 7.3 CU IN KEYED 1/2 FTG	20231
39846	MOTOR ASSY HYD 8.9 CU IN KEYED S-SERIES 1/2 FTG	21531
39847	MOTOR ASSY HYD 14.1 CU IN KEYED 1/2 FTG	34585
43451	MOTOR ASSY HYD 11.3 CU IN KEYED 1/2 FTG	21532
43452	MOTOR ASSY HYD 17.9 CU IN KEYED 1/2 FTG	21534
43552	MOTOR ASSY HYD 22.5 CU IN KEYED SHAFT	30567

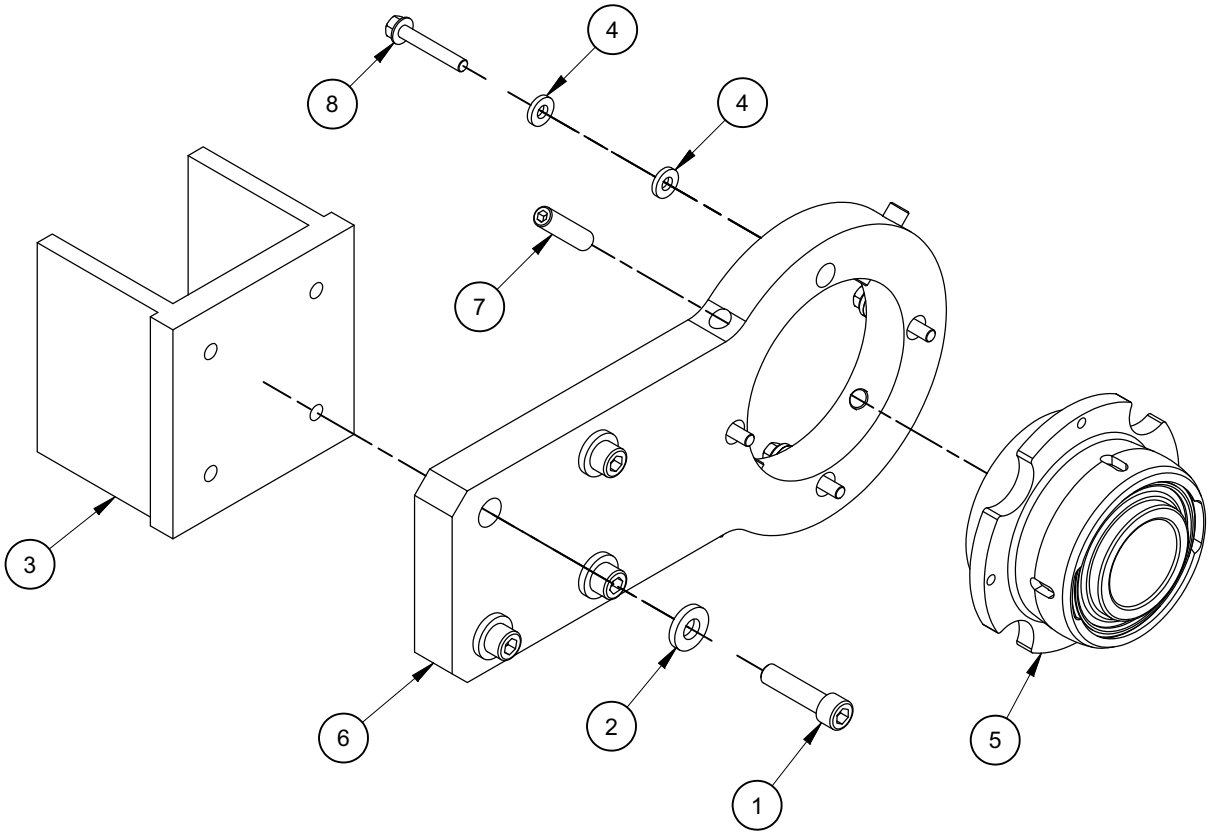
FIGURE B-8. HYDRAULIC MOTOR ASSEMBLY (P/N 39848)



PARTS LIST			
ITEM	QTY	P/N:	DESCRIPTION
1	1	26380	CONE SETUP Ø2.75 TO Ø8.37 BB5000
1.1	1	29092	SCREW MOD 3/8-24 X 1-3/16 SSSFD
1.2	1	29091	PIN STOP
3	1	29095	CLAMP COLLAR MODIFIED
3.1	2	17125	SCREW 5/16-24 X 1-1/2 SHCS

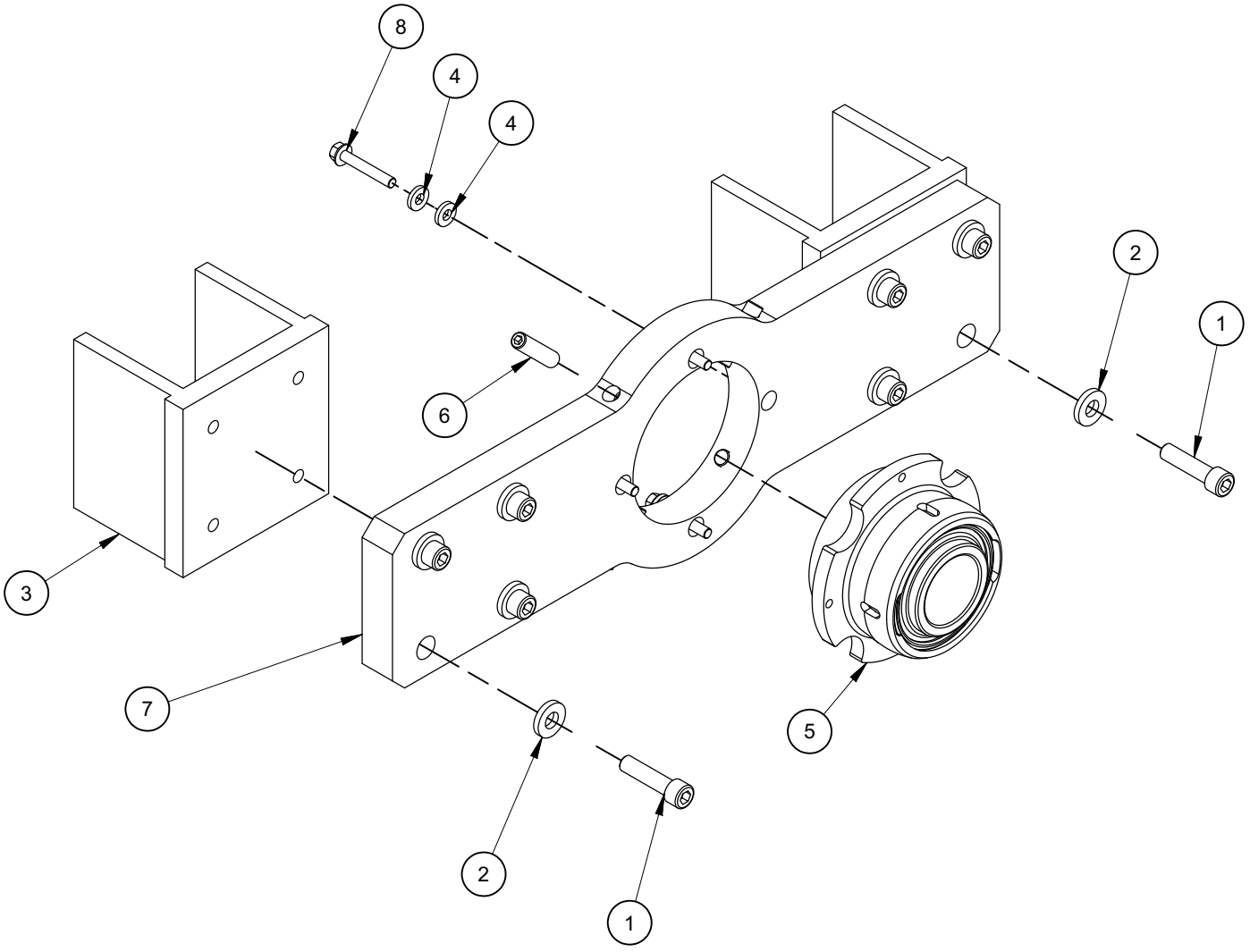
26507
SET CONE SETUP 2.75 TO 8.37 DIA BB5000

FIGURE B-9. SETUP CONE ASSEMBLY (P/N 26383)



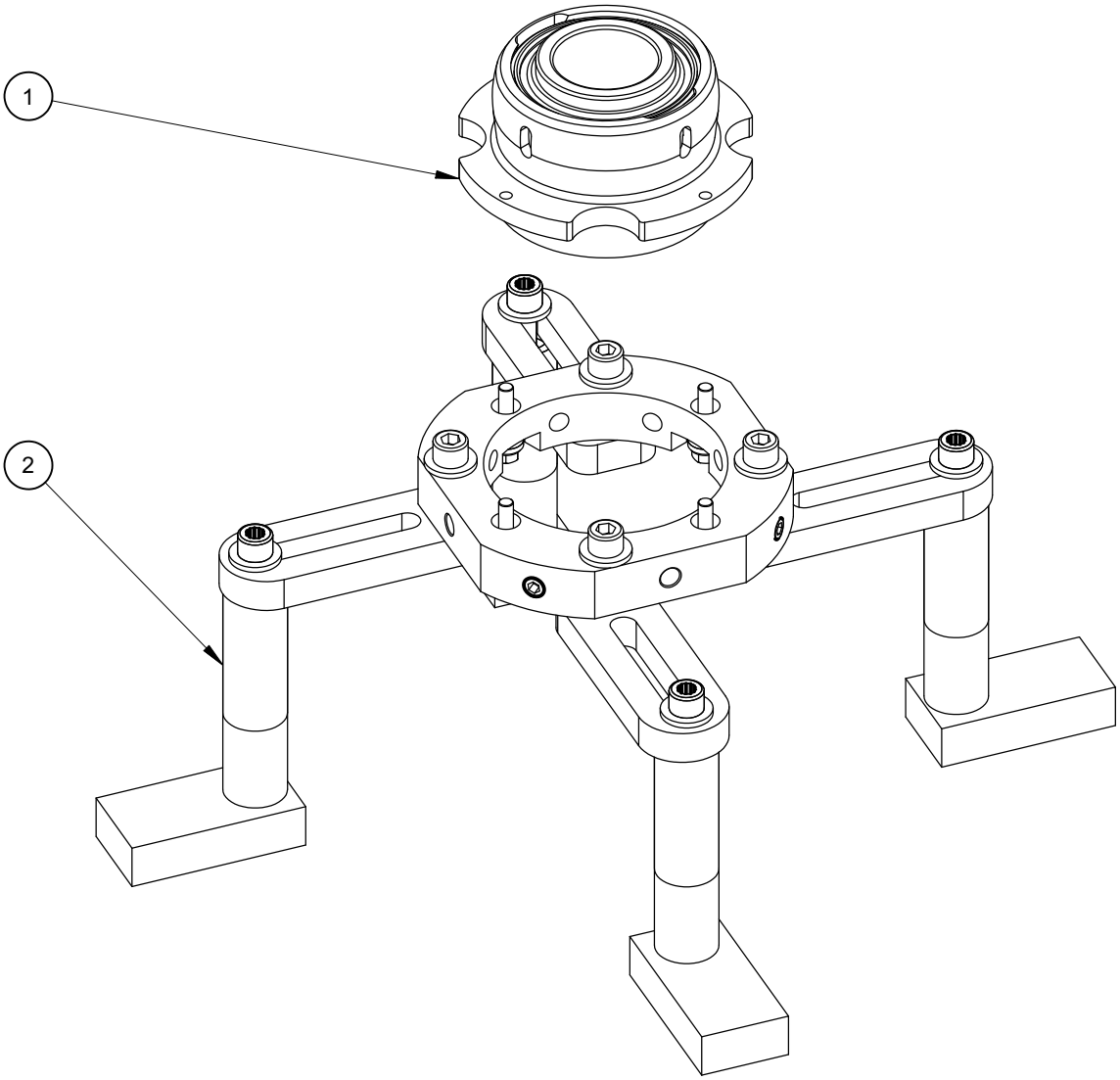
PARTS LIST			
ITEM	QTY	P/N:	DESCRIPTION
1	4	14036	SCREW 1/2-13 X 2 SHCS
2	4	17145	WASHER 1/2 FLTW HARDENED 1-1/8 OD X 3/16 THK
3	1	19869	PLATE SPACER TACK WELD MTG
4	8	21798	WASHER 5/16 FLTW HARDENED
5	1	26248	ASSY BRG SPHERICAL 2-1/4 ID W/ CLAMP COLLAR
6	1	26251	BRACKET MTG SPHERICAL BRG 1-ARM
7	4	26252	SCREW 1/2-20 X 2 SSSFP
8	4	45364	SCREW 5/16-24 X 2 HHCS FLANGED BLK OX

FIGURE B-10. SINGLE-ARM MOUNT ASSEMBLY (P/N 37472)



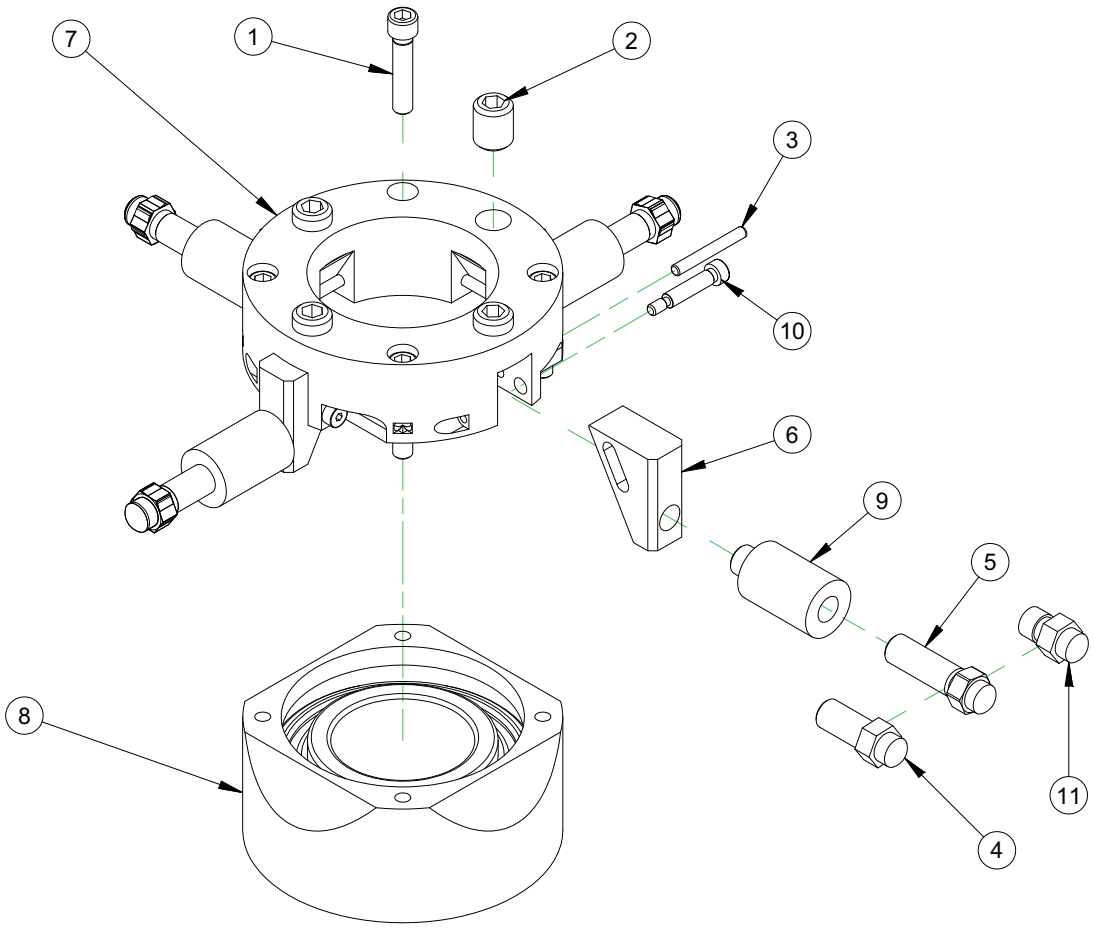
PARTS LIST			
ITEM	QTY	P/N:	DESCRIPTION
1	8	14036	SCREW 1/2-13 X 2 SHCS
2	8	17145	WASHER 1/2 FLTW HARDENED 1-1/8 OD X 3/16 THK
3	2	19869	PLATE SPACER TACK WELD MTG
4	8	21798	WASHER 5/16 FLTW HARDENED
5	1	26248	ASSY BRG SPHERICAL 2-1/4 ID W/ CLAMP COLLAR
6	4	26252	SCREW 1/2-20 X 2 SSSFP
7	1	26517	MTG BRACKET SPHERICAL BRG 2-ARM
8	4	45364	SCREW 5/16-24 X 2 HHCS FLANGED BLK OX

FIGURE B-11. DOUBLE-ARM MOUNT ASSEMBLY (P/N 37473)



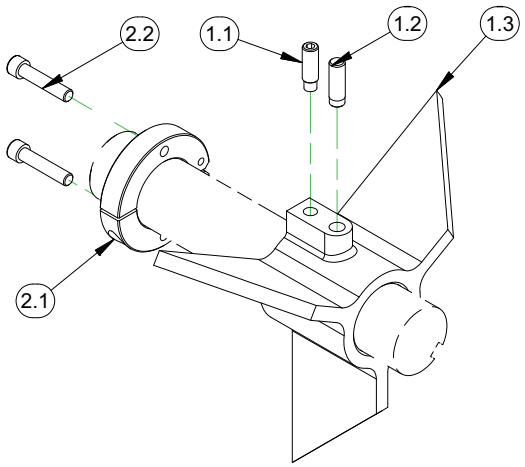
PARTS LIST			
ITEM	QTY	P/N:	DESCRIPTION
1	1	26248	ASSY BRG SPHERICAL 2-1/4 ID W/ CLAMP COLLAR
2	1	41514	MOUNT UNIVERSAL BORING BARS BB5000 NO BEARING

FIGURE B-12. AIR MOTOR CE ASSEMBLY (P/N 36959)



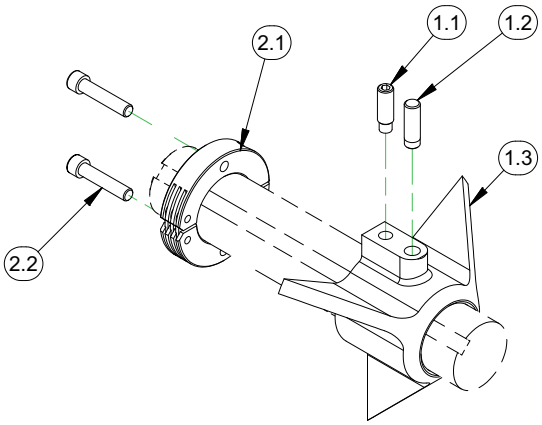
PARTS LIST			
ITEM	QTY	P/N:	DESCRIPTION
1	4	11741	SCREW 5/16-18 X 1-1/2 SHCS
2	4	12563	SCREW 5/8-18 X 3/4 SSSFP
3	4	35600	PIN DOWEL 3/16 DIA X 1-1/2
4	4	37618	BOLT JACKING 1 ID BRG MOUNT
5	4	37619	BOLT JACKING 1/2-20 X 1-1/2 ID BEARING MOUNT
6	4	46216	30 DEGREE SLIDE
7	1	46218	PLATE FACE ADJUST
8	1	46219	HOUSING MOUNT ID BRG BB5000
9	4	46227	1.5 INCH CHUCK JAW (KB)
10	4	46294	SCREW 1/4 DIA X 1 X 10-24 SHLDCS
11	4	46303	BOLT JACKING 1/2 ID BRG MOUNT
12	1	46589	(NOT SHOWN) MANUAL INSTRUCTION BB5000 ID BEARING MOUNT

FIGURE B-13. ID BEARING MOUNT ASSEMBLY (P/N 46293)



SET CONES SETUP 6 TO 10 DIA 1-3/4 KEYED BAR 43384

PARTS LIST			
ITEM	QTY	P/N:	DESCRIPTION
1	1	42228	CONE SETUP 6 TO 10 BB4500 1-3/4 BAR
1.1	1	29092	SCREW MOD 3/8-24 X 1-3/16 SSSFD
1.2	1	29091	PIN STOP
1.3	1	42228	CONE SETUP BB4000 6" TO 10"
2	1	42508	CLAMP COLLAR MODIFIED 1 3/4 ID
2.1	1	42508	CLAMP COLLAR MODIFIED
2.2	2	17125	SCREW 5/16-24 X 1-1/2 SHCS



SET CONES SETUP 2 TO 6 DIA 1-3/4 KEYED BAR 43383

PARTS LIST			
ITEM	QTY	P/N:	DESCRIPTION
1	1	41220	CONE SETUP 2 TO 6 BB4500 1-3/4 BAR
1.1	1	29092	SCREW MOD 3/8-24 X 1-3/16 SSSFD
1.2	1	29091	PIN STOP
1.3	1	41220	CONE SETUP 2" TO 6" BB4000
2	1	42508	CLAMP COLLAR MODIFIED 1 3/4 ID
2.1	1	42508	CLAMP COLLAR MODIFIED
2.2	2	17125	SCREW 5/16-24 X 1-1/2 SHCS

FIGURE B-14. SET CONES SETUP ASSEMBLY (P/N 49060)

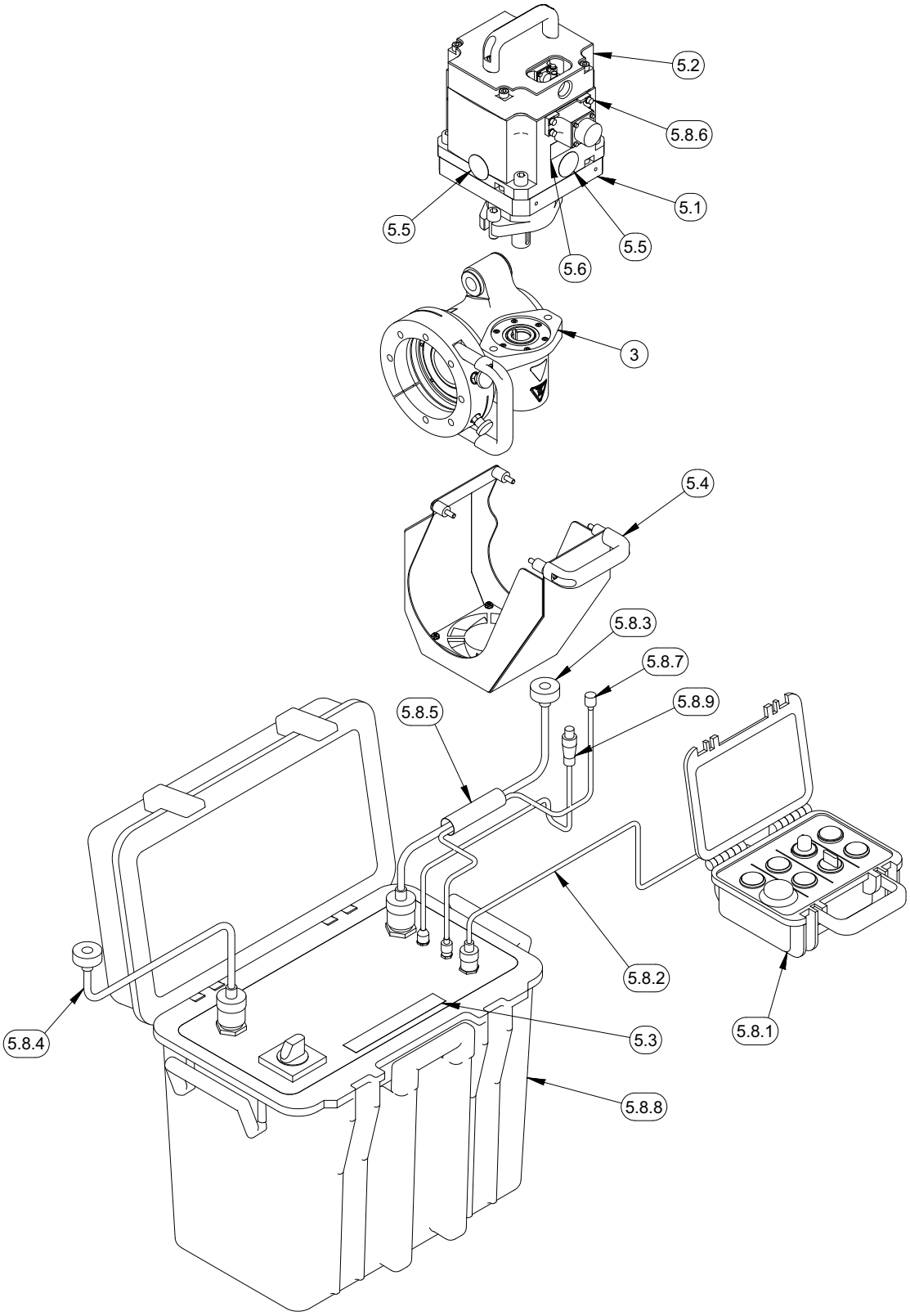


FIGURE B-15. SERVO DRIVE 460 CE ASSEMBLY (P/N 52876)

PARTS LIST 3RD GEN			
ITEM	QTY	P/N:	DESCRIPTION
1	1	26845	(NOT SHOWN) WRENCH HEX 3/8 SHORT ARM BONDHUS BONDHUS 10914 BALLDRIVER
2	1	52188	(NOT SHOWN) ASSY SHIPPING CASE WITH CUT FOAM FOR BB5000 SERVO PACKAGE
3	1	53165	RDU 12:1 BB5000 4TH GEN
4	1	55583	(NOT SHOWN) LAMINATED PENDANT INSTRUCTION
5	1	56027	SERVO DRIVE MOTOR ASSEMBLY 460V
5.1	1	51536	ADAPTER BB5000 RDU TO SERVO MOTOR
5.2	1	52937	GUARD ASSY BB5000 SERVO MOTOR
5.3	1	53483	LABEL WARNING VOLTAGE CABLE
5.4	1	56773	SHROUD FAN BB5000 SERVO ASSY
5.5	2	53464	LABEL WARNING HOT HAND
5.6	1	53482	LABEL WARNING VOLTAGE
5.7	1	45331	(NOT SHOWN) MANUAL INSTRUCTION BB5000 SUP SERVO FEED
5.8	1	91811	ASSY BB5000 SERVO DRIVE 460VAC CONTROLS MOTOR AND CABLES CE 3RD GEN
5.8.1	1	53263	PENDANT BB5000 SERVO DRIVE
5.8.2	1	53266	CORDSET OPERATOR PENDANT BB5000 SERVO DRIVE 5M LONG
5.8.3	1	66909	ASSY CABLE BB5000 SERVO POWER CABLE 90 DEG CONN 6M LONG 2ND GEN
5.8.4	1	66908	ASSY CORDSET BB5000 SERVO INCOMING POWER CABLE 90 DEG CONN LONG 2ND GEN
5.8.5	120	56269	SLEEVE WELD COVER 1" DIA STRAIGHTLINE W/VELCRO CLOSURE (10 FT)
5.8.6	1	91716	SERVO MOTOR MODEL HG-SR 3.5 kW 2000 RPM 400V KEYED SHAFT
5.8.7	1	64425	ASSY ENCODER CABLE BB5000 SERVO DRIVE 6 M LONG
5.8.8	1	91813	ASSY CONTROLLER SERVO DRIVE BB5000 460/3/50-60 CE 3RD GEN
5.8.9	1	57016	ASSY CABLE FAN BB5000 SERVO DRIVE 242 IN LONG
6	1	84310	(NOT SHOWN) MANUAL INSTRUCTION BB5000 BORING BAR

PARTS LIST 2ND GEN			
ITEM	QTY	P/N:	DESCRIPTION
1	1	26845	(NOT SHOWN) WRENCH HEX 3/8 SHORT ARM BONDHUS BONDHUS 10914 BALLDRIVER
2	1	52188	(NOT SHOWN) ASSY SHIPPING CASE WITH CUT FOAM FOR BB5000 SERVO PACKAGE
3	1	53165	RDU 12:1 BB5000 4TH GEN
4	1	55583	(NOT SHOWN) LAMINATED PENDANT INSTRUCTION
5	1	56027	SERVO DRIVE MOTOR ASSEMBLY 460V
5.1	1	51536	ADAPTER BB5000 RDU TO SERVO MOTOR
5.2	1	52937	GUARD ASSY BB5000 SERVO MOTOR
5.3	1	53483	LABEL WARNING VOLTAGE CABLE
5.4	1	56773	SHROUD FAN BB5000 SERVO ASSY
5.5	2	53464	LABEL WARNING HOT HAND
5.6	1	53482	LABEL WARNING VOLTAGE
5.7	1	45331	(NOT SHOWN) MANUAL INSTRUCTION BB5000 SUP SERVO FEED
5.8	1	64524	ASSY BB5000 SERVO DRIVE 460VAC CONTROLS MOTOR AND CABLES CE 2ND GEN
5.8.1	1	53263	PENDANT BB5000 SERVO DRIVE
5.8.2	1	53266	CORDSET EXTENSION MULTIFAST 19 CONDUCTOR SHIELDED 20 FT LONG
5.8.3	1	66909	ASSY CABLE BB5000 SERVO POWER CABLE 90 DEG CONN 6M LONG 2ND GEN
5.8.4	1	66908	ASSY CORDSET BB5000 SERVO INCOMING POWER CABLE 90 DEG CONN LONG 2ND GEN
5.8.5	120	56269	SLEEVE WELD COVER 1" DIA STRAIGHTLINE W/VELCRO CLOSURE
5.8.6	1	51448	SERVO MOTOR 3.5 kW 2000 RPM 400V
5.8.7	1	64425 54161	ASSY ENCODER CABLE BB5000 SERVO DRIVE 6M LONG (2ND GEN BLACK) ASSY ENCODER CABLE BB5000 SERVO DRIVE 6M LONG (1ST GEN TURQUOISE)
5.8.8	1	64427	ASSY CONTROLLER BB5000 SERVO DRIVE 460/3/50-60 CE 2ND GEN
5.8.9	1	57016	ASSY CABLE FAN BB5000 SERVO DRIVE 242 IN LONG
6	1	84310	(NOT SHOWN) MANUAL INSTRUCTION BB5000 BORING BAR

FIGURE B-16. SERVO DRIVE 460 CE ASSEMBLY PARTS LIST (P/N 52876)

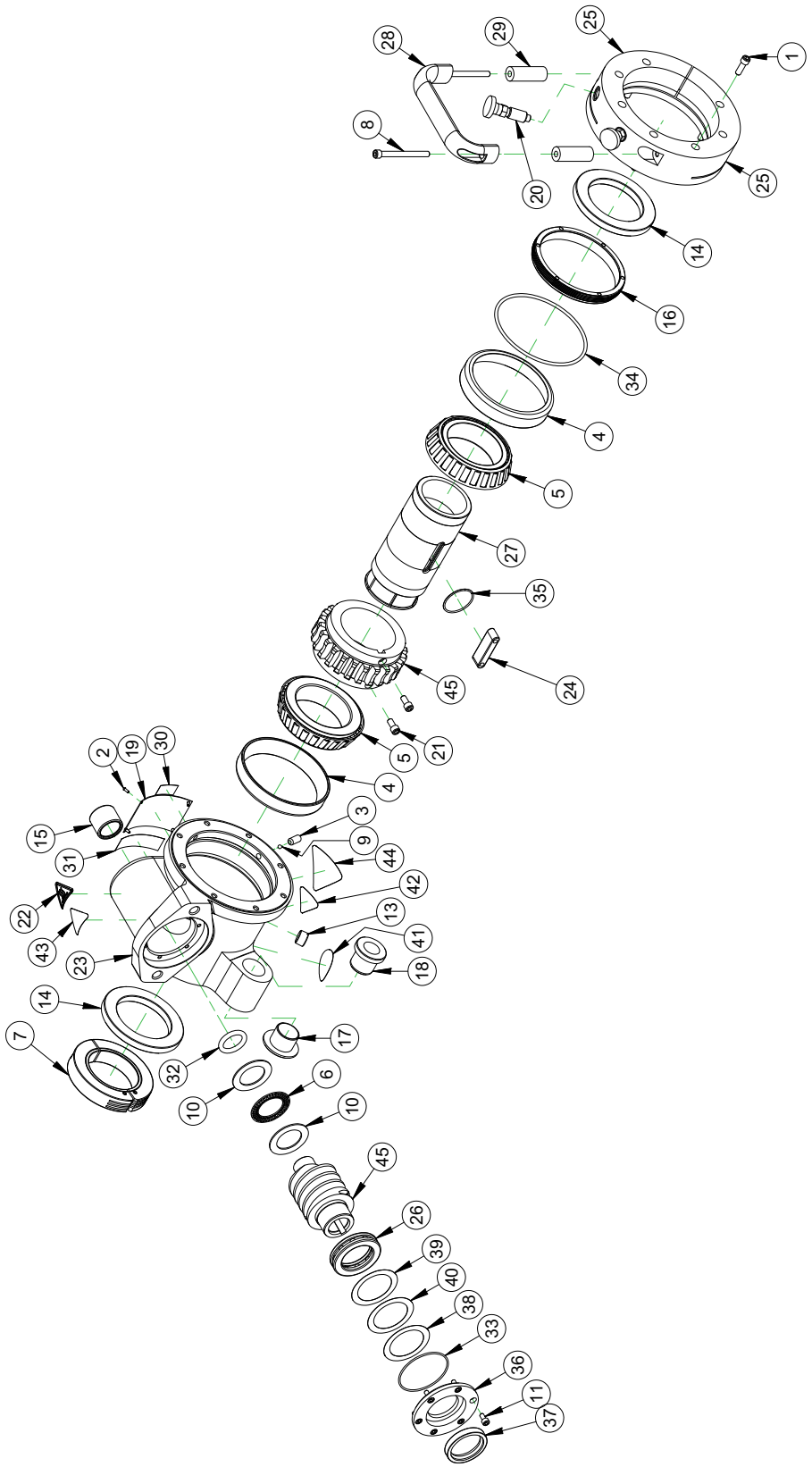


FIGURE B-17. RDU 12:1 ASSEMBLY (P/N 53165)

PARTS LIST			
ITEM	QTY	P/N:	DESCRIPTION
1	7	10160	SCREW 1/4-20 X 3/4 SHCS
2	4	10588	SCREW DRIVE #2 x 1/4 HOLE SIZE .089
3	2	11684	SCREW 5/16-18 X 3/4 SSSCP
4	2	11821	BRG CUP 4.4375 OD X .750 WIDE
5	2	11822	BRG CONE 2.75 ID X 1.00 WIDE
6	1	12387	BRG THRUST 1.259 ID X 1.937 OD X .0781
7	1	12395	CLAMP COLLAR SPLIT HINGED 2-1/2 ID
8	2	12592	SCREW 1/4-20 X 2-3/4 SHCS
9	2	16594	BALL NYLON 3/16 DIA
10	2	16666	WASHER THRUST 1.250 ID X 1.937 OD X .060
11	6	19232	SCREW 10-24 X 3/8 SHCS
12	1	19610	SCREW 5/8-18 X 2-1/4 SHCS
13	1	21956	FTG PLUG 3/8 NPTM SOCKET
14	2	27348	SEAL 2.75 X 4.00 X .375
15	1	27353	BRG NEEDLE 1 ID X 1-1/4 OD X 1 CLOSED
16	1	28219	NUT MAIN BRG PRELOAD
17	1	28220	BUSHING LEADSCREW FLANGED
18	1	28589	BUSHING FLANGED 1 5P ACME THREADED
19	1	29154	PLATE SERIAL YEAR MODEL CE 2.0 X 3.0 (KB)
20	2	29207	SPRING PLUNGER HAND RETRACT 1/2 X 13
21	2	45900	SCREW 1/4-28 X 1/2 SHCS
22	1	46902	LABEL WARNING HOT SURFACE GRAPHIC 1.13" TALL
23	1	49665	HOUSING RDU BB5000 4TH GEN
24	1	49666	KEY MAIN DRIVE BB5000 4TH GEN
25	1	52303	CLAMP RING RDU MOUNT BB5000 4TH
26	1	52307	BRG BALL THRUST 40 MM ID X 60 MM OD X 13 MM
27	1	53168	COLLET MAIN DRIVE BB5000 4TH GEN
28	1	53610	HANDLE PULL 1/4 CBORE MTG 2.17 X 5.75 X 1.02W COATED
29	2	53613	SPACER .67 OD X .266 ID X 1.875 LG
30	1	54131	LABEL "12:1"
31	1	54133	LABEL OIL RDU
32	1	54916	RING O 3/16 X 1 ID X 1-3/8 OD VITON 75 DUROMETER
33	1	54920	RING O 1/16 X 2-1/4 ID X 2-3/8 OD
34	1	54921	RING O 4-3/8 ID X 4-5/8 OD X 1/8
35	1	54922	RING O 1/16 X 1-3/8 ID X 1-1/2 OD VITON 75 DUROMETER
36	1	55090	CAP WORM HOUSING 12:1 RDU BB5000
37	1	55708	SEAL 1.500 ID X 2.000 OD X .375 HIGH TEMP
38	A/R	55784	SHIM 1.7 ID X 2.3 OD .001 THICK
39	A/R	55790	SHIM 1.7 ID X 2.3 OD .002 THICK
40	A/R	55791	SHIM 1.7 ID X 2.3 OD .005 THICK
41	1	59044	LABEL WARNING - CONSULT OPERATOR'S MANUAL
45	1	78688	SET WORM GEAR 12:1 BB5000 4TH GEN 1PC WORM
42	1	78741	LABEL WARNING CRUSH FOOT
43	1	78748	LABEL WARNING FLYING DEBRIS/LOUD NOISE
44	1	80207	LABEL WARNING - ENTANGLEMENT/ROTATING SHAFT GRAPHIC 1.95 TALL TRIANGLE YELLOW

FIGURE B-18. RDU 12:1 ASSEMBLY PARTS LIST (P/N 53165)

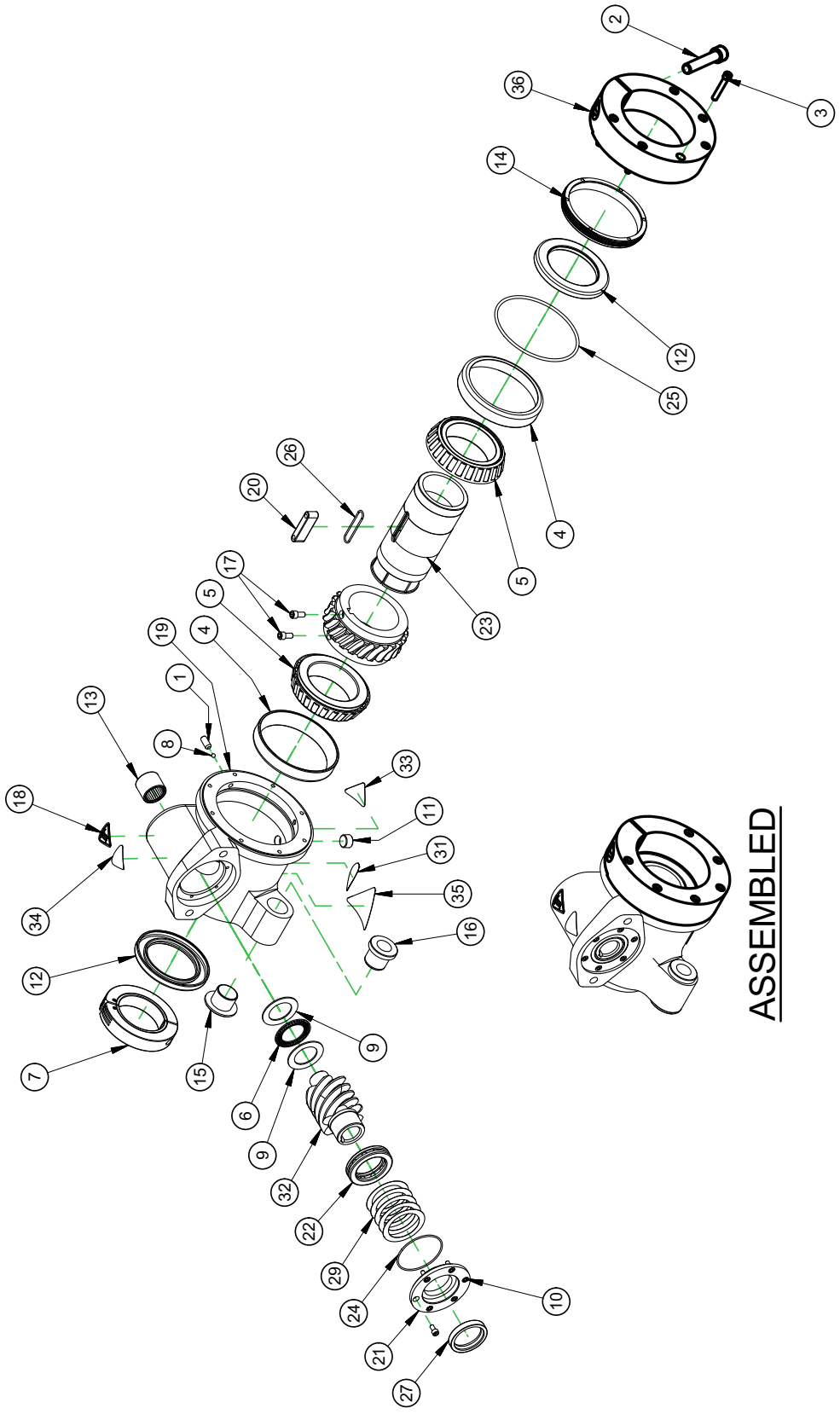


FIGURE B-19. RDU NO MOUNT MODIFIED ASSEMBLY (P/N 93090)

PARTS LIST			
ITEM	QTY	P/N:	DESCRIPTION
1	2	11684	SCREW 5/16-18 X 3/4 SSSCP
2	1	11694	SCREW 1/2-13 X 2-1/2
3	6	11777	SCREW 1/4-20 X 1-1/2 SHCS
4	2	11821	BRG CUP 4.4375 OD X .750 WIDE
5	2	11822	BRG CONE 2.75 ID X 1.00 WIDE
6	1	12387	BRG THRUST 1.259 ID X 1.937 OD X .0781
7	1	12395	CLAMP COLLAR SPLIT HINGED 2-1/2 ID
8	2	16594	BALL NYLON 3/16 DIA
9	2	16666	WASHER THRUST 1.250 ID X 1.937 OD X .060
10	6	19232	SCREW 10-24 X 3/8 SHCS
11	1	21956	FTG PLUG 3/8 NPTM SOCKET
12	2	27348	SEAL 2.750 ID X 4.000 OD X .375
13	1	27353	BRG NEEDLE 1 ID X 1-1/4 OD X 1 CLOSED
14	1	28219	NUT MAIN BRG PRELOAD
15	1	28220	BUSHING LEADSCREW FLANGED
16	1	28589	BUSHING FLANGED 1 5P ACME THREADED
17	2	45900	SCREW 1/4-28 X 1/2 SHCS
18	1	46902	LABEL WARNING HOT SURFACE GRAPHIC 1.13" TALL
19	1	49665	HOUSING RDU BB5000 4TH
20	1	49666	KEY MAIN DRIVE BB5000 4TH GEN
21	1	49667	CAP WORM HOUSING BB5000 4TH GEN
22	1	52307	BRG BALL THRUST 40 MM ID X 60 MM OD X 13 MM
23	1	53168	COLLET MAIN DRIVE BB5000 4TH GEN
24	1	54920	RING O 1/16 X 2-1/4 ID X 2-3/8 OD
25	1	54921	RING O 4-3/8 ID X 4-5/8 OD X 1/8
26	1	54922	RING O 1/16 X 1-3/8 ID X 1-1/2 OD VITON 75 DUROMETER
27	1	55708	SEAL 1.500 ID X 2.000 OD X .375 HIGH TEMP
28	A/R	55784	SHIM 1.7 ID X 2.3 OD .001 THICK
29	A/R	55790	SHIM 1.7 ID X 2.3 OD .002 THICK
30	A/R	55791	SHIM 1.7 ID X 2.3 OD .005 THICK
31	1	59044	LABEL WARNING - CONSULT OPERATOR'S MANUAL
32	1	73954	SET WORM GEAR 4:1 BB5000 4TH GEN 1PC WORM
33	1	78741	LABEL WARNING CRUSH FOOT
34	1	78748	LABEL WARNING FLYING DEBRIS/LOUD NOISE
35	1	80207	LABEL WARNING - ENTANGLEMENT/ROTATING SHAFT GRAPHIC 1.95 TALL TRIANGLE YELLOW
36	1	94857	CLAMP RING FOR RDU 6001-S2

FIGURE B-20. RDU NO MOUNT MODIFIED ASSEMBLY PARTS LIST (P/N 93090)

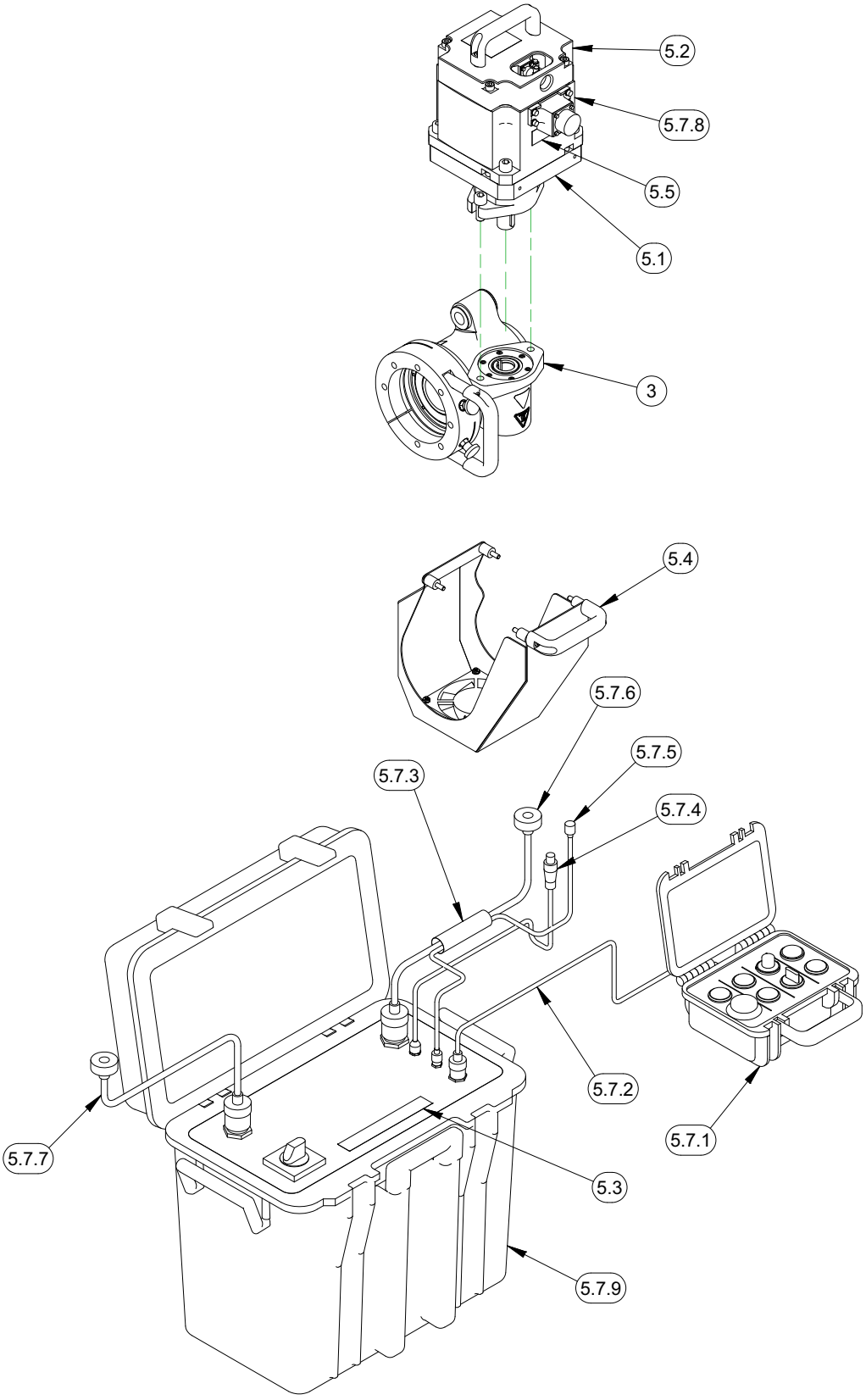
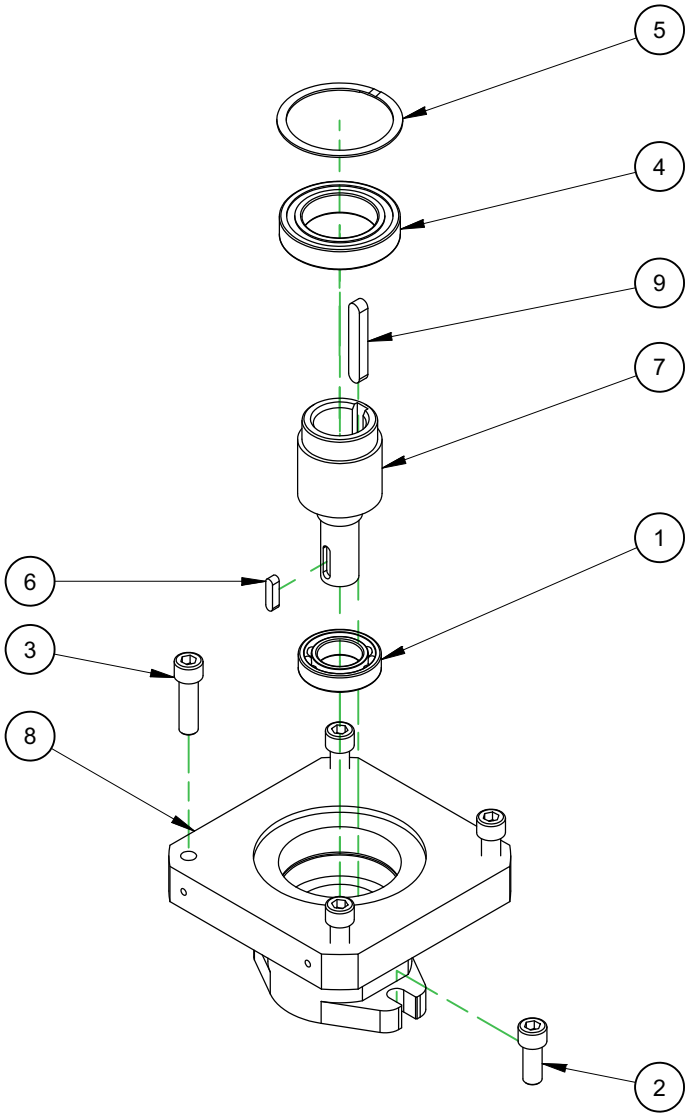


FIGURE B-21. SERVO DRIVE 230V CE ASSEMBLY (P/N 54321)

PARTS LIST 3RD GEN			
ITEM	QTY	P/N:	DESCRIPTION
1	1	26845	(NOT SHOWN) WRENCH HEX 3/8 SHORT ARM BONDHUS BONDHUS 10914 BALLDRIVER
2	1	52188	(NOT SHOWN) ASSY SHIPPING CASE WITH CUT FOAM FOR BB5000 SERVO PACKAGE
3	1	53165	RDU 12:1 BB5000 4TH GEN
4	1	55583	(NOT SHOWN) LAMINATED PENDANT INSTRUCTION
5	1	56026	SERVO DRIVE MOTOR ASSEMBLY 230V
5.1	1	51536	ADAPTER BB5000 RDU TO SERVO MOTOR
5.2	1	52937	GUARD ASSY BB5000 SERVO MOTOR
5.3	1	53483	LABEL WARNING VOLTAGE CABLE
5.4	1	56773	SHROUD FAN BB5000 SERVO ASSY
5.5	1	53482	LABEL WARNING VOLTAGE
5.6	1	45331	(NOT SHOWN) MANUAL INSTRUCTION BB5000 SUP SERVO FEED
5.7	1	91812	ASSY BB5000 SERVO DRIVE 230VAC CONTROLS MOTOR AND CABLES CE 3RD GEN
5.7.1	1	53263	PENDANT BB5000 SERVO DRIVE
5.7.2	1	53266	CORDSET OPERATOR PENDANT BB5000 SERVO DRIVE 5M LONG
5.7.3	120	56269	SLEEVE WELD COVER 1" DIA STRAIGHTLINE W/VELCRO CLOSURE (10 FT)
5.7.4	1	57016	ASSY CABLE FAN BB5000 SERVO DRIVE 242 IN LONG
5.7.5	1	64425	ASSY ENCODER CABLE BB5000 SERVO DRIVE 6 M LONG
5.7.6	1	66909	ASSY CABLE BB5000 SERVO POWER CABLE 90 DEG CONN 6M LONG 2ND GEN
5.7.7	1	66908	ASSY CORDSET BB5000 SERVO INCOMING POWER CABLE 90 DEG CONN LONG 2ND GEN
5.7.8	1	91717	SERVO MOTOR MODEL HG-SR 3.5 kW 2000 RPM 200V KEYED SHAFT
5.7.9	1	91814	ASSY CONTROLLER SERVO DRIVE BB5000 230/3/50-60 CE 3RD GEN
6	1	84310	(NOT SHOWN) MANUAL INSTRUCTION BB5000 BORING BAR

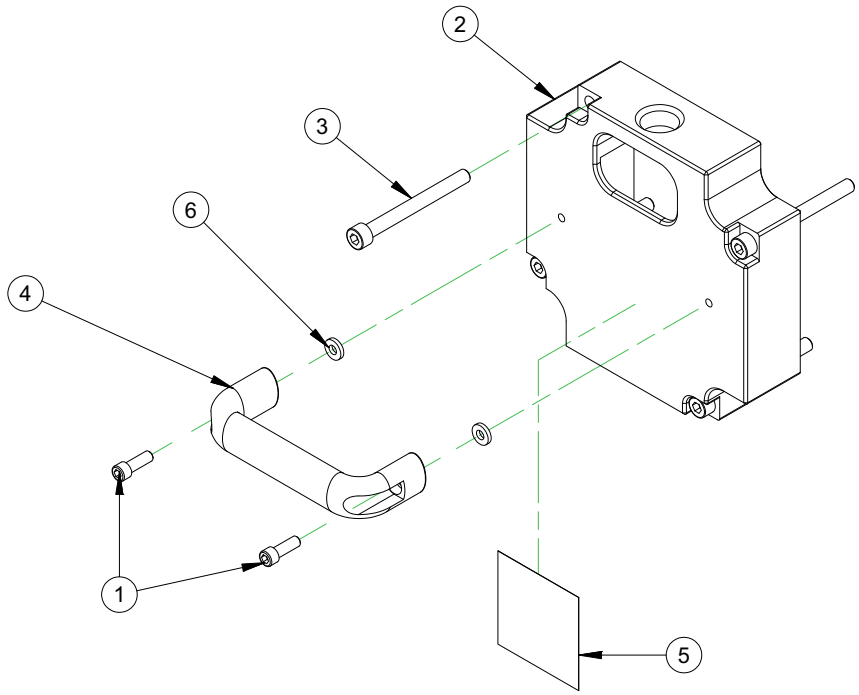
PARTS LIST 2ND GEN			
ITEM	QTY	P/N:	DESCRIPTION
1	1	26845	(NOT SHOWN) WRENCH HEX 3/8 SHORT ARM BONDHUS BONDHUS 10914 BALLDRIVER
2	1	52188	(NOT SHOWN) ASSY SHIPPING CASE WITH CUT FOAM FOR BB5000 SERVO PACKAGE
3	1	53165	RDU 12:1 BB5000 4TH GEN
4	1	55583	(NOT SHOWN) LAMINATED PENDANT INSTRUCTION
5	1	56026	SERVO DRIVE MOTOR ASSEMBLY 230V
5.1	1	51536	ADAPTER BB5000 RDU TO SERVO MOTOR
5.2	1	52937	GUARD ASSY BB5000 SERVO MOTOR
5.3	1	53483	LABEL WARNING VOLTAGE CABLE
5.4	1	56773	SHROUD FAN BB5000 SERVO ASSY
5.5	1	53482	LABEL WARNING VOLTAGE
5.6	1	45331	(NOT SHOWN) MANUAL INSTRUCTION BB5000 SUP SERVO FEED
5.7	1	66369	ASSY BB5000 SERVO DRIVE 230VAC CONTROLS MOTOR AND CABLES CE 2ND GEN
5.7.1	1	53263	PENDANT BB5000 SERVO DRIVE
5.7.2	1	53266	CORDSET EXTENSION MULTIFAST 19 CONDUCTOR SHIELDED 20 FT LONG
5.7.3	1	66909	ASSY CABLE BB5000 SERVO POWER CABLE 90 DEG CONN 6M LONG 2ND GEN
5.7.4	1	66908	ASSY CORDSET BB5000 SERVO INCOMING POWER CABLE 90 DEG CONN LONG 2ND GEN
5.7.5	120	56269	SLEEVE WELD COVER 1" DIA STRAIGHTLINE W/VELCRO CLOSURE
5.7.6	1	55606	SERVO MOTOR 3.5 kW 2000 RPM 200V
5.7.7	1	64425 54161	ASSY ENCODER CABLE BB5000 SERVO DRIVE 6M LONG (2ND GEN BLACK) ASSY ENCODER CABLE BB5000 SERVO DRIVE 6M LONG (1ST GEN TURQUOISE)
5.7.8	1	64426	ASSY CONTROLLER SERVO DRIVE BB5000 230/3/50-60 CE 2ND GEN
5.7.9	1	57016	ASSY CABLE FAN BB5000 SERVO DRIVE 242 IN LONG
6	1	84310	(NOT SHOWN) MANUAL INSTRUCTION BB5000 BORING BAR

FIGURE B-22. SERVO DRIVE 230V CE ASSEMBLY (P/N 54321)



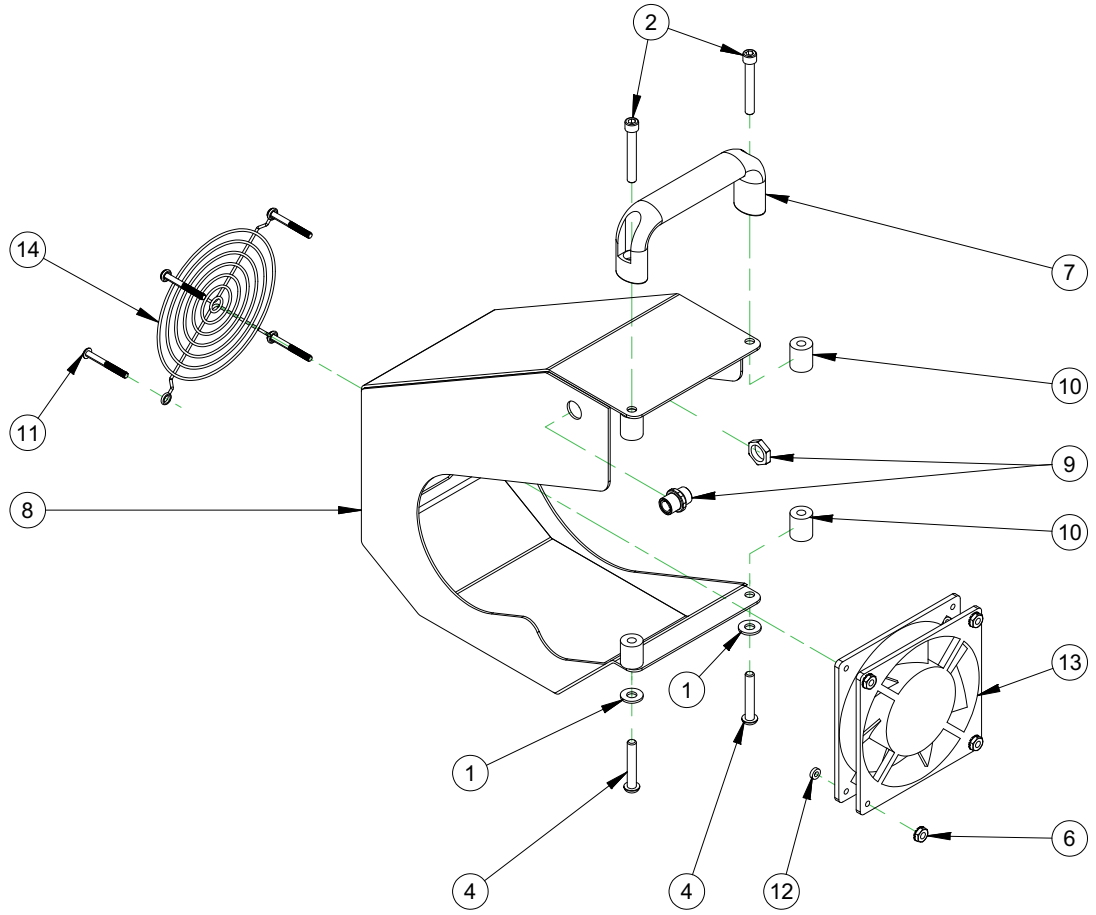
PARTS LIST			
ITEM	QTY	PART No.	DESCRIPTION
1	1	12524	BRG BALL 1.1811 ID X 2.1654 X .50
2	2	12646	SCREW 1/2-13 X 1-1/4 SHCS
3	4	20534	SCREW 1/2-13 X 1-3/4 SHCS
4	1	22575	BRG BALL 1.9685 ID X 3.1496 OD X .6299
5	1	39131	RING SNAP 3.149 ID (80mm) SPIRAL MED DUTY
6	1	48909	KEY 1/4 X 1/4 X 1.00 RAD BOTH ENDS
7	1	51530	SHAFT BB5000 RDU TO SERVO
8	1	51531	HOUSING ADAPTER BB5000 RDU INPUT TO PLANETARY
9	1	53195	KEY 10mm x 8mm x 2.5 LONG RADIUS BOTH END

FIGURE B-23. SERVO MOTOR RDU ADAPTER ASSEMBLY (P/N 51536)



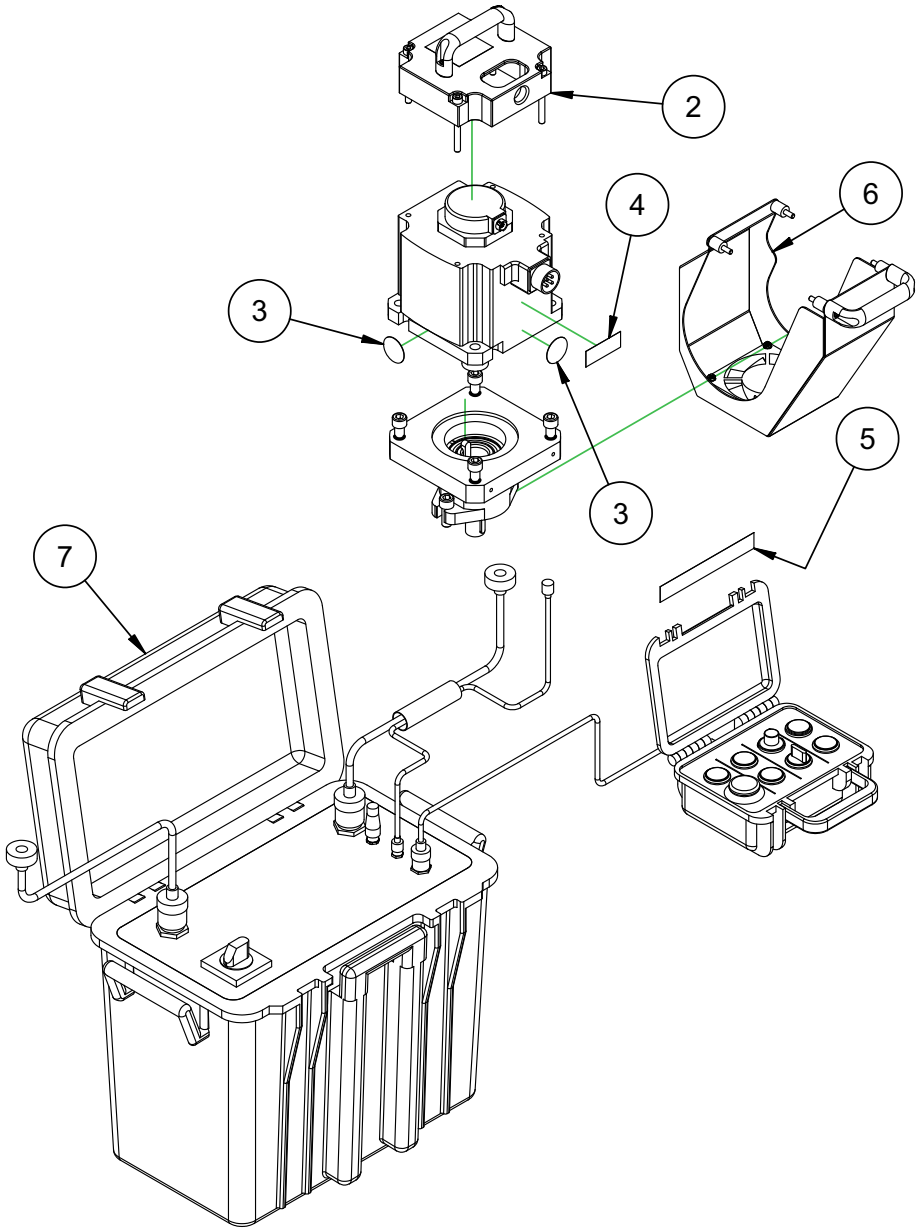
PARTS LIST			
ITEM	QTY	P/N:	DESCRIPTION
1	2	10160	SCREW 1/4-20 X 3/4 SHCS
2	1	52916	GUARD SERVO MOTOR REAR PLATE
3	4	52936	SCREW M8 X 1.25 X 80MM SHCS
4	1	53462	HANDLE PULL 1/4 CBORE MTG 2.0 X 5.12 X 1.02W PLASTIC COATED
5	1	53484	LABEL "HANDLE WITH CARE"
6	2	56079	WASHER RUBBER 1/4 X 1/2 X .093

FIGURE B-24. SERVO MOTOR GUARD ASSEMBLY (P/N 52937)



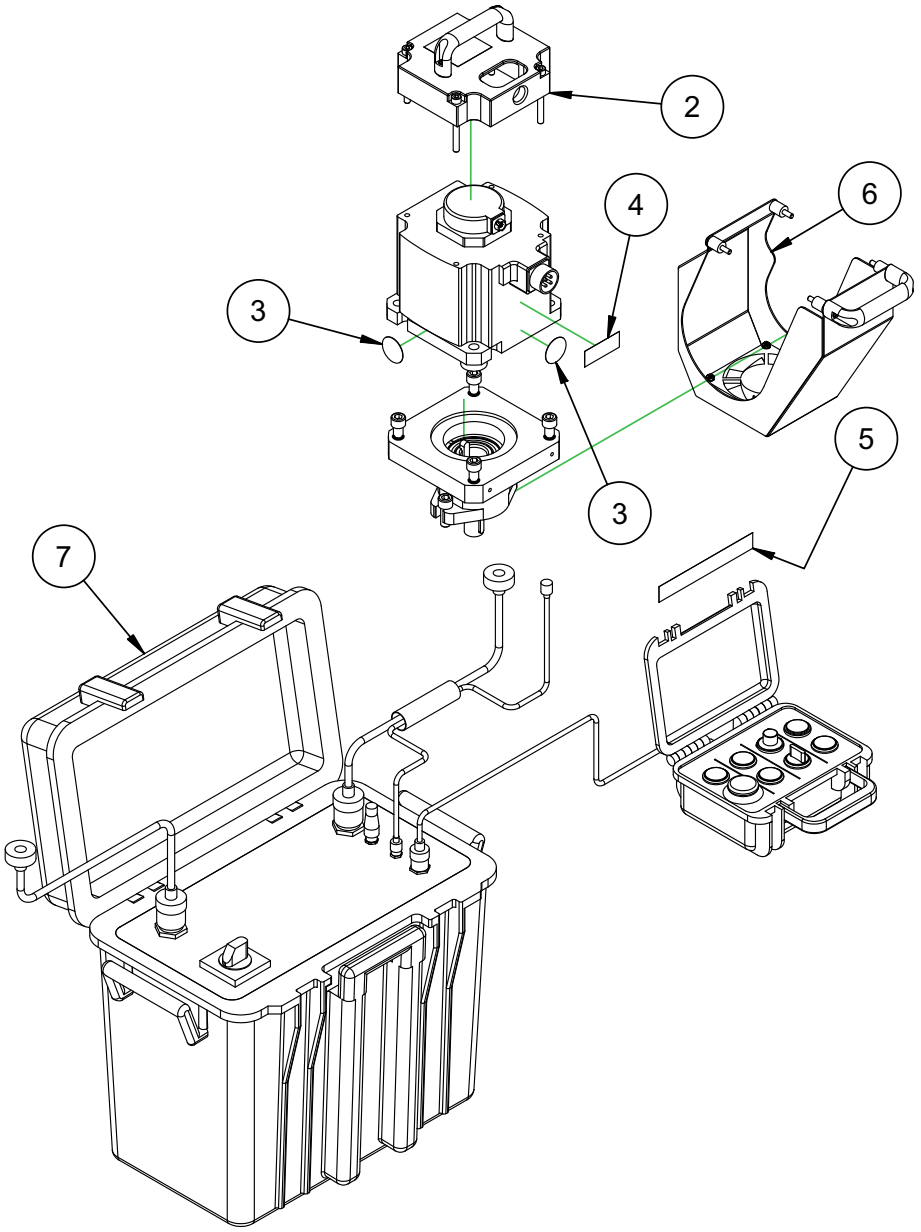
PARTS LIST			
ITEM	QTY	P/N:	DESCRIPTION
1	2	10702	WASHER 1/4 FLTW SAE
2	2	13252	SCREW 1/4-20 X 1-3/4 SHCS
3	1	13296	(NOT SHOWN) MOUNTING BASE WIRE TIE ADHESIVE BACKED LARGE
4	2	19001	SCREW 1/4-20 X 1-1/2 BHSCS
5	2 IN	22800	(NOT SOWN) TUBE SHRINK .125 DIA BLACK
6	4	28617	NUT 8-32 LOCKING STAR WASHER
7	1	53462	HANDLE PULL 1/4 CBORE MTG 2.0 X 5.12 X 1.02W PLASTIC COATED
8	1	56587	SHROUD FAN BB5000 RDU SERVO
9	1	56757	RECEPTACLE MICROFAST 3 POLE MALE 1/4 NPT THD 0.5M LONG CONDUCTORS
10	4	56767	SPACER ROUND .252 ID X .625 OD X .75 ALUMINUM
11	4	56771	SCREW 8-32 X 1-1/2 BHSCS
12	4	56772	WASHER #8 FLTW RUBBER .93 THICK
13	1	56774	FAN 4.69" SQUARE X 1" 24 VDC 80CFM
14	1	56775	GUARD FAN STEEL WIRE 4.13" SQUARE BOLT PATTERN

FIGURE B-25. SERVO SHROUD FAN ASSEMBLY (P/N 56773)



PARTS LIST		
ITEM	PART No.	DESCRIPTION
1	51536	ADAPTER BB5000 RDU TO SERVO MOTOR
2	52937	GUARD ASSY BB5000 SERVO MOTOR
3	53464	LABEL WARNING HOT HAND
4	53482	LABEL WARNING VOLTAGE
5	53483	LABEL WARNING VOLTAGE CABLE
6	56773	SHROUD FAN BB5000 SERVO ASSY
7	71068	ASSY BB5000 SERVO DRIVE 230VAC CONTROLS MOTOR AND CABLES NOT CE 2ND GEN

FIGURE B-26. SERVO DRIVE MOTOR 230V NON-CE ASSEMBLY (P/N 71071)



PARTS LIST		
ITEM	PART No.	DESCRIPTION
1	51536	ADAPTER BB5000 RDU TO SERVO MOTOR
2	52937	GUARD ASSY BB5000 SERVO MOTOR
3	53464	LABEL WARNING HOT HAND
4	53482	LABEL WARNING VOLTAGE
5	53483	LABEL WARNING VOLTAGE CABLE
6	56773	SHROUD FAN BB5000 SERVO ASSY
7	71067	ASSY BB5000 SERVO DRIVE 460VAC CONTROLS MOTOR AND CABLES NOT CE 2ND GEN

FIGURE B-27. SERVO DRIVE MOTOR 460V NON-CE ASSEMBLY (P/N 71072)

FOR GENERATION 2 ONLY

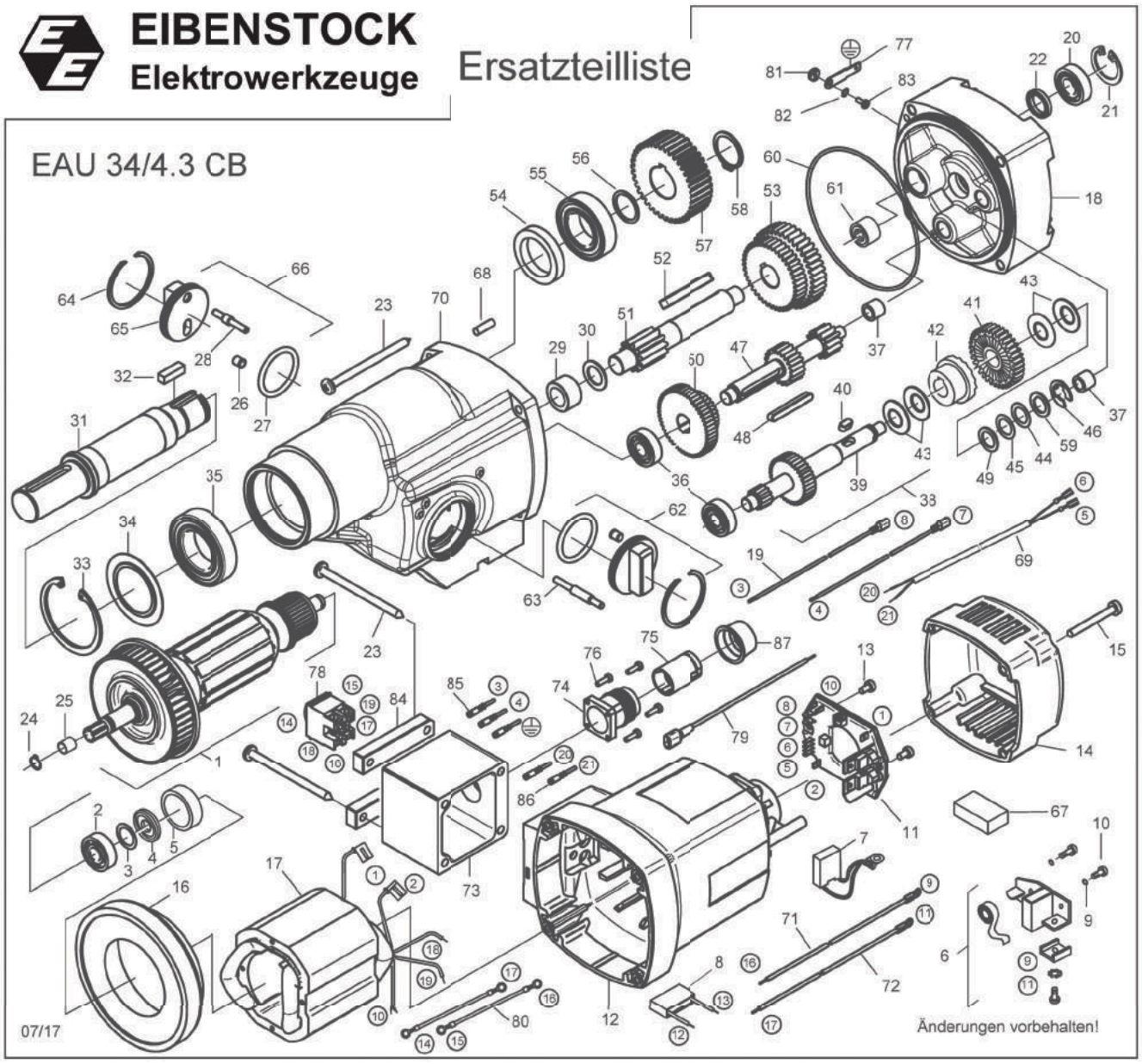


FIGURE B-28. EIBENSTOCK MOTOR ASSEMBLY -- GEN. 2 ONLY

FOR GENERATION 2 ONLY

EAU 34/4.3 CB - 230 V

04567000

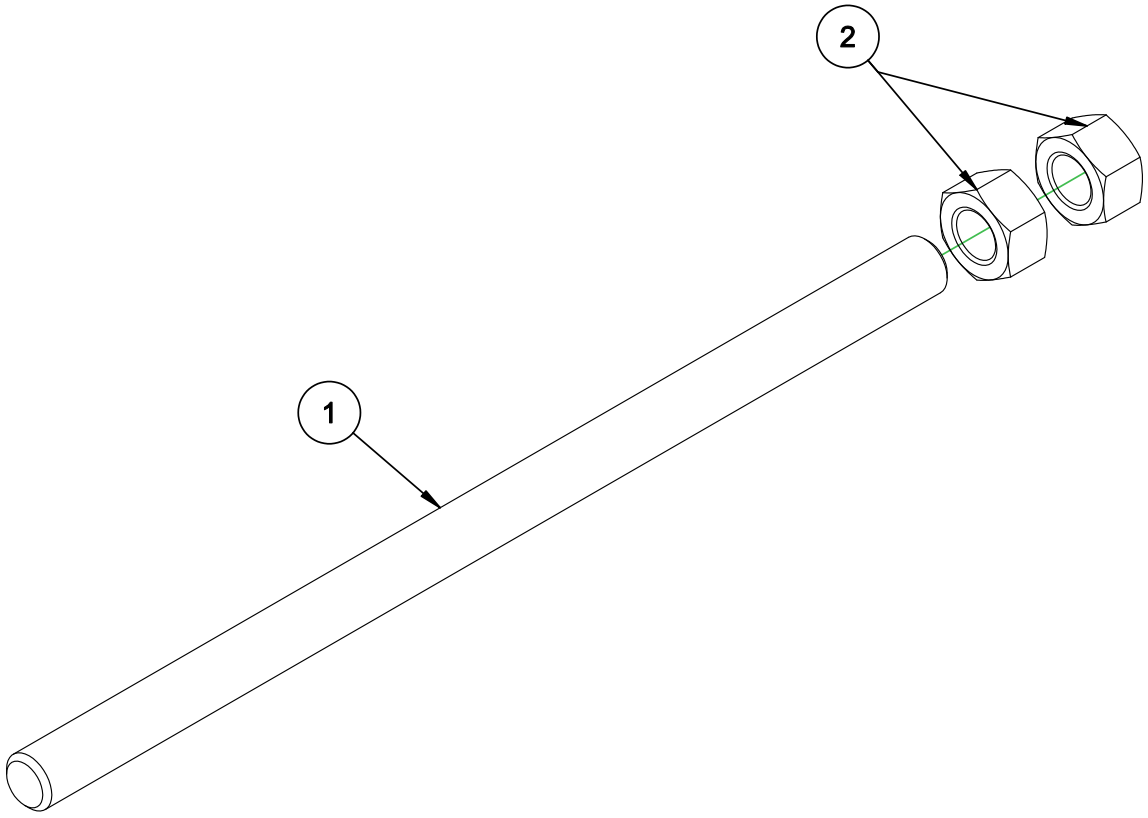
No.	Description	Order No.	Pcs
1	rotor complete	7455U100	1
2	grooved ball bearing 6000 2Z	80410021	1
3	seal ring	83000507	1
4	magnetic disc	7633J325	1
5	bearing cap	83000031	1
6	brush holder	80204515	2
7	carbon brush	80700070	2
8	anti parasite condenser	80500010	1
9	lock washer B4	80201385	4
10	self tapping screw CM4x12	80201180	4
11	PCB / circuit board	74522280	1
12	motor housing	7455U201	1
13	self tapping screw HC 4,2x9,5	80201269	2
14	cap	80900082	1
15	self tapping screw HC 4,8x45	80201267	4
16	air guiding ring	73511141	1
17	stator complete	7455U150	1
18	end shield of gearing	7455U610	1
19	interconnecting wire	74555180	2
20	grooved ball bearing 6201 LUZ	80410101	1
21	locking ring 32x1,2	80201351	1
22	shaft seal ring 15x21x3 KEIV	83000042	1
23	self tapping screw HC 5,5x80	80201227	4
24	locking ring 12/1	80201321	1
25	bearing ring 12x15x12,5	80420160	1
26	spring loaded thrust pad	85000157	2
27	o-ring 36x1,5 NBR	83000022	2
28	switch-actuating wheel short	71641532	1
29	needle bearing RNA 4900	80420001	1
30	disc	71540517	1
31	work spindle	74565420	1
32	fitting key B6x6x20	80200606	1
33	locking ring 55/2	80201338	1
34	disc	71540426	1
35	grooved ball bearing 6006 2RS	80410071	1
36	grooved ball bearing 6000	80410020	2
37	needle sleeve HK 0810	80420110	2
38	clutch complete	74643493	1
39	intermediate shaft 1	74641490	1
40	fitting key 5x5x10	80200600	1
41	clutch wheel	74326550	1
42	coupling half	71540560	1
43	spring washer 28x12,2x1	80200713	4
44	fitting washer 12/18x0,5	80200503	1
45	fitting washer 12/18x0,2	80200502	1
46	lock washer 9	80201361	1
47	intermediate shaft 2	74641500	1
48	fitting key 5x5x40	80200612	1
49	pressure washer	71540607	1
50	gear block 1	74641440	1
51	intermediate shaft 3	74641510	1
52	fitting key 6x6x50	80200610	1
53	gear block 2	74641450	1
54	shaft seal ring 30x42x7	83000071	1
55	grooved ball bearing 6005 2RS	80410061	1
56	fitting washer 25x0,1	80200512	1
57	spindle wheel	74554430	1
58	locking ring 24/1,2	80201326	1
59	pressure washer	71540606	1
60	o-ring 106x2	83000092	1
61	needle sleeve HK 1212	80420130	1
62	switch button long	71641545	1
63	switch-actuating wheel long	71641542	1
64	circlip SB42	80201355	2
65	switch button	71641540	2
66	switch button short	71641535	1
67	foam filler	80600306	1
68	notched pin plug 5x16	80200580	1
69	control wire	77314187	1
70	gearbox housing	7455U400	1
71	brush holder wire 1	74555181	1
72	brush holder wire 2	74555182	1
73	switch box	74567630	1
74	connector socket	80601480	1
75	insert	80601481	1
76	screw 3x10	80201600	4
77	earth connector	80601189	1
78	reverser	80600103	1
79	ground wire	74567185	1
80	interconnecting wire	80600243	2
81	locking nut M4	73631188	1
82	tooth lock washer A4,3	80200752	1
83	allen screw M4x8	80201451	1
84	protection hood	7455U633	2
85	connector pin 2,5 mm²	80601484	3
86	connector pin 0,75 mm²	80601483	2
87	cap guard	80601482	1

EAU 34/4.3 CB - 110 V

04568000

1	rotor complete	7455V100	1	150,00	11	PCB / circuit board	7451I280	1	68,75
7	carbon brush	80700077	2	5,81	17	stator complete	74644150	1	68,75

FIGURE B-29. EIBENSTOCK MOTOR ASSEMBLY PARTS LIST -- GEN. 2 ONLY



ITEM	QTY	PART No.	DESCRIPTION
2	2	27356	HEX NUT 1-5 ACME FINISHED
1	1	28654	LEADSCREW ASSY 12 INCH FEED

PARTS LIST

FIGURE B-30. LEADSCREW ASSEMBLY (P/N 28654)

TABLE B-1. BB5000 RECOMMENDED SPARE PARTS

Component	Part number	Description	Quantity
2 Rotational Drive Unit & 2 Axial Feed-box Assembly	12395	CLAMP COLLAR SPLIT HINGED 2-1/2 ID	4
Axial Feed-box Assembly	25957	BRG ROLLER CLUTCH 1 ID X 1.312 OD X .625	4
	26850	HANDLE CRANK MODIFIED	1
	27015	PIN DOWEL MODIFIED .187 DIA X .75 GROOVED	2
	27197	LEAD NUT BB4500 BB5000 AXIAL FEED	2
	92494	SCREW ASSY FEED STOP GEN 2	2
Boring Head / Bar	10191	SCREW 3/8-16 X 1 SHCS	2
	11691	SCREW 1/2-13 X 1-1/2 SHCS	2
	11734	SCREW 3/8-16 X 3/4 SSSCP	4
	13356	SCREW 5/8-11 X 2-1/2 SHCS	4
Electric Motor Assembly	20273	KEY 1/4 SQ X 1.00 SQ BOTH ENDS	1
	26845	WRENCH HEX 3/8 SHORT ARM BONDHUS BALL-DRIVER	1
	82698	SP BRUSH CARBON PAIR FOR EIBENSTOCK EAU 34/ 4.1 BB4500 BB5000	2
Leadscrew Assembly	27356	NUT 1-5 ACME 7/8 TALL 1-1/2 HEX FINISHED	2
Servo Motor Assembly	48909	KEY 1/4 SQ X 1.00 RADIUS BOTH ENDS	1
	53195	KEY 10mm X 8mm X 2.05 LONG RADIUS BOTH END	1
Spherical Bearing Mounting Brackets	14036	SCREW 1/2-13 X 2 SHCS	8
	21798	WASHER 5/16 FLTW HARDENED 1/8 THK BLK OX	4
	22662	WASHER 1/2 FLTW HARDENED 1-1/8 OD X 1/8 THICK	8
	26250	SCREW 5/16-24 X 2 HHCS	4
	26252	SCREW 1/2-20 X 2 SSSFP	4

TABLE B-2. LEADSCREW SPARE PARTS

Part number	Description	Quantity
28654	ASSY LEADSCREW 12 INCH FEED	1

TABLE B-2. LEADSCREW SPARE PARTS (CONTINUED)

Part number	Description	Quantity
28687	ASSY LEADSCREW 24 INCH FEED	1
28688	ASSY LEADSCREW 36 INCH FEED	1

TABLE B-3. HYDRAULIC METRIC SPARE PARTS

Part number	Description	Quantity
10191	SCREW 3/8-16 X 1 SHCS	2
11691	SCREW 1/2-13 X 1-1/2 SHCS	2
11734	SCREW 3/8-16 X 3/4 SSSCP	4
13356	SCREW 5/8-11 X 2-1/2 SHCS	4
14036	SCREW 1/2-13 X 2 SHCS	8
21798	WASHER 5/16 FLTW HARDENED 1/8 THK BLK OX	4
22662	WASHER 1/2 FLTW HARDENED 1-1/8 OD X 1/8 THICK	8
25957	BRG ROLLER CLUTCH 1 ID X 1.312 OD X .625	4
26250	SCREW 5/16-24 X 2 HHCS	4
26252	SCREW 1/2-20 X 2 SSSFP	4
26850	HANDLE CRANK MODIFIED	1
27015	SP PIN DOWEL MODIFIED .187 DIA X .75 GROOVED	2
27197	LEAD NUT BB4500 BB5000 AXIAL FEED	2
92494	SCREW ASSY FEED STOP GEN 2	2
27356	NUT 1-5 ACME 7/8 TALL 1-1/2 HEX FINISHED	2
29207	SPRING PLUNGER HAND RETRACT 1/2 X 13	2
33999	WRENCH HEX SET .050 - 3/8 BONDHUS BALL END	1
34571	BIT TOOL HSS 12MM X 4.0 LH FINISH SINGLE TC	4
34572	BIT TOOL HSS 12MM X 2.5 LH FINISH SINGLE TC	4
34573	BIT TOOL HSS 12MM X 1.8 LH FINISH SINGLE TC	4
34576	BIT TOOL HSS 12MM X 4.0 LH ROUGHING SINGLE	4
34577	BIT TOOL HSS 12MM X 2.5 LH ROUGHING SINGLE	4
34578	BIT TOOL HSS 12MM X 1.8 LH ROUGHING SINGLE	4
34642	SCREW M16 X 1.5 X 8 SSSFP	24
38678	WRENCH HEX SET 1.5 - 10MM BONDHUS BALL END	1

TABLE B-3. HYDRAULIC METRIC SPARE PARTS (CONTINUED)

Part number	Description	Quantity
53670	ELEMENT FILTER 5/10HP HPU 10 MICRON	1
63533	TOOL HOLDER SET 12MM	2
63543	INSERT 80 DEG DIAMOND 3/8 IC .015 R KC-5010	24
64446	OIL HYDRAULIC 5 GALLON 76 UNAX AW 32	2

TABLE B-4. BB5000 TOOL KIT

Part number	Description
14650	WRENCH END 1/2 COMBINATION LONG
29661	WRENCH HINGE HANDLE 1/2 DRIVE 17 IN HANDLE
34573	BIT TOOL HSS 12MM X 1.8 LH FINISH SINGLE TC
34572	BIT TOOL HSS 12MM X 2.5 LH FINISH SINGLE TC
13052	WRENCH HEX BIT 1/2 DRIVER X 1/2 DRIVE SOCKET
34568	WRENCH HEX 5MM SHORT ARM
33999	WRENCH HEX SET .050 - 3/8 BONDHUS BALL END
25550	WRENCH HEX 5/16 X 11.4 BALLDRIVER T-HANDLE
54033	VIDEO BB5000 SETUP AND OPERATION DVD
34578	BIT TOOL HSS 12MM X 1.8 LH ROUGHING SINGLE
29660	WRENCH HEX BIT 5/16 DRIVER X 12 DRIVE
35340	WRENCH HEX 8MM SHORT ARM
16794	WRENCH HEX BIT 3/8 DRIVER X 1/2 DRIVE
55923	WRENCH TEE 1/4 HEX
34579	BIT TOOL HSS 12MM X 1.0 LH ROUGHING SINGLE
34574	BIT TOOL HSS 12MM X 1.0 LH FINISH SINGLE TC
37528	PRINT LAYOUT BB5000 PACKAGING
34577	BIT TOOL HSS 12MM X 2.5 LH ROUGHING SINGLE
29652	WRENCH HEX 3MM SHORT ARM
55924	WRENCH TEE 3/8 HEX
34116	LABEL ACCESSORY BAG #1 BB5000
33785	WRENCH TORX T-45
14251	WRENCH TEE 3/16 HEX

TABLE B-4. BB5000 TOOL KIT (CONTINUED)

Part number	Description
29199	WRENCH HEX 1/2 LONG ARM
35516	HAMMER DEAD BLOW 1-3/4 DIA HEAD
29041	WRENCH END 1-1/2 (SINGLE OPEN END)
82949	BAG TOOL 14 X 5.5 X 6 POLYESTER

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APPENDIX C SCHEMATICS

Schematic list

FIGURE C-1. BB4500-BB5000 EIBENSTOCK CONTROLLER 2ND GEN 230V 50-60 HZ CE SCHEMATIC (P/N 88035 C00467) - 120
FIGURE C-2. BB4500-BB5000 EIBENSTOCK CONTROLLER 2ND GEN 230V 50-60 HZ DOMESTIC ASSEMBLY (P/N 88036 C00468) - 121
FIGURE C-3. BB4500-BB5000 EIBENSTOCK CONTROLLER 2ND GEN 120V DOMESTIC ASSEMBLY (P/N 88037 C00465) - 122
FIGURE C-4. BB4500-BB5000 EIBENSTOCK CONTROLLER 2ND GEN 120V CE ASSEMBLY (P/N 88038 C00466) - 123
FIGURE C-5. BB5000 MOTOR 230V AND 460V FAN ASSEMBLY (P/N 91811 E00034) - 124
FIGURE C-6. BB5000 SERVO MOTOR 230VAC AND 460VAC POWER CABLE ASSEMBLY (P/N 91811 E00048) - 125
FIGURE C-7. BB5000 EIBENSTOCK MOTOR CABLE ASSEMBLY 2ND GEN 120V 12AWG SCHEMATIC (P/N 88649 E00170) - 126
FIGURE C-8. BB5000 EIBENSTOCK MOTOR CABLE ASSEMBLY 2ND GEN 230V 14AWG SCHEMATIC (P/N 88650 E00171) - 127
FIGURE C-9. BB5000 EIBENSTOCK POWER CABLE ASSEMBLY 2ND GEN 120V DOMESTIC L5-30P PLUG (P/N 88652 E00172) - 128
FIGURE C-10. BB5000 EIBENSTOCK POWER CABLE ASSEMBLY 2ND GEN 120V CE 332P4W PIN/SLEEVE PLUG (P/N 88653 E00173) - 129
FIGURE C-11. BB5000 EIBENSTOCK POWER CABLE ASSEMBLY 2ND GEN 230V CE CEE7/7 SCHUKO PLUG (P/N 88654 E00174) - 130
FIGURE C-12. BB5000 EIBENSTOCK POWER CABLE ASSEMBLY 2ND GEN 230V DOMESTIC L6-15P PLUG (P/N 88655 E00175) - 131
FIGURE C-13. PNEUMATIC CONDITIONING UNIT SCHEMATIC (P/N 59248) - 132
FIGURE C-14. BB4500-BB5000 EIBENSTOCK CONTROLLER 2ND GEN 230V 50-60 HZ CE ASSEMBLY (P/N 88035 B00367) - 133
FIGURE C-15. BB4500-BB5000 EIBENSTOCK CONTROLLER 2ND GEN 230V 50-60 HZ DOMESTIC ASSEMBLY (P/N 88036 B00368) - 134
FIGURE C-16. BB4500-BB5000 EIBENSTOCK CONTROLLER 2ND GEN 120V DOMESTIC ASSEMBLY (P/N 88037 B00365) - 135
FIGURE C-17. BB4500-BB5000 EIBENSTOCK CONTROLLER 2ND GEN 120V CE ASSEMBLY (P/N 88038 B00366) - 136
FIGURE C-18. BB5000 SERVO CONTROLLER 3RD GEN 460VAC CE ASSEMBLY (P/N A00099) - 137
FIGURE C-19. BB5000 EIBENSTOCK CONTROLLER 2ND GEN 120V DOMESTIC ASSEMBLY (P/N A00100) - 138
FIGURE C-20. BB5000 SERVO PENDANT ASSEMBLY (P/N B00024) - 139

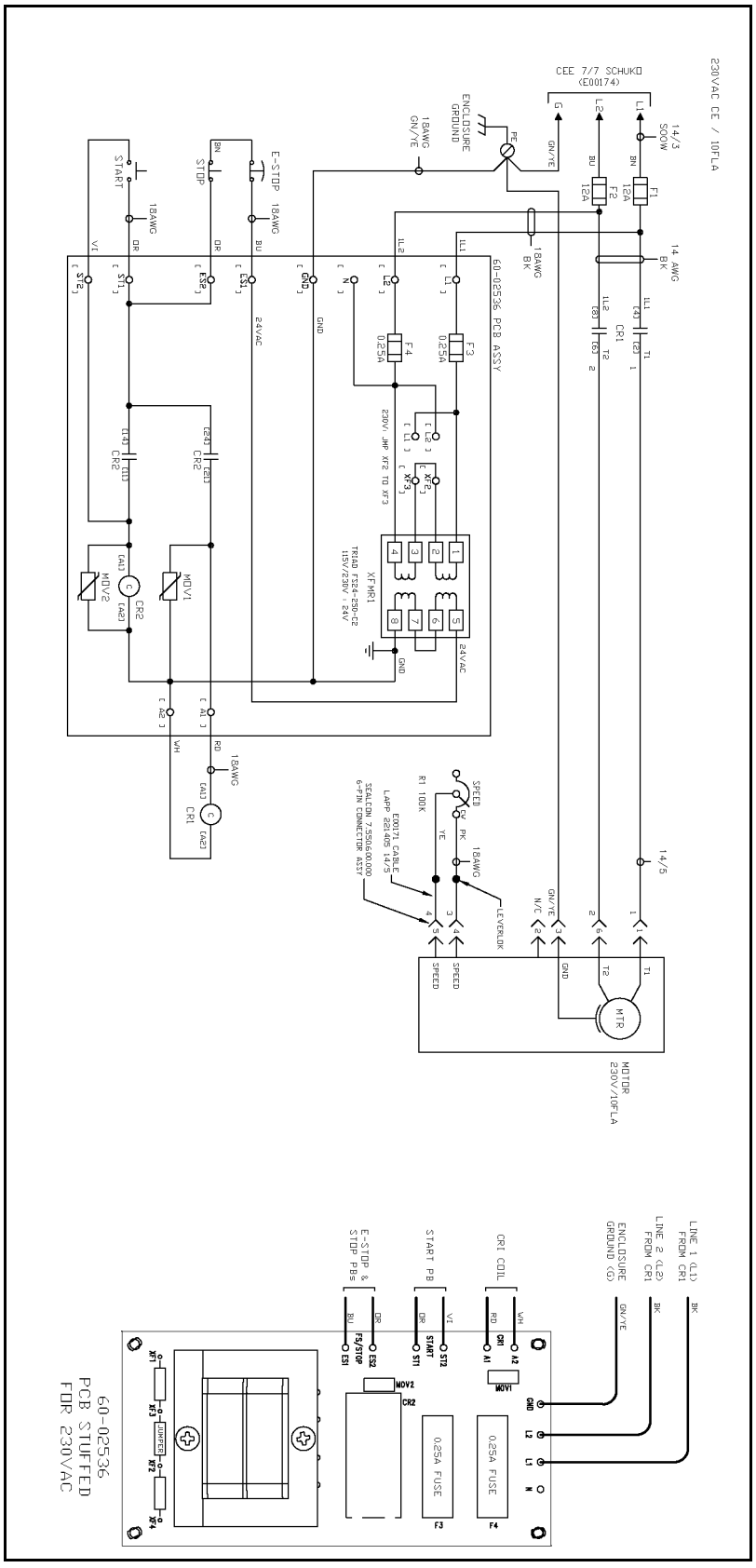


FIGURE C-1. BB4500-BB5000 EIBENSTOCK CONTROLLER 2ND GEN 230V 50-60 HZ CE SCHEMATIC (P/N 88035 C00467)

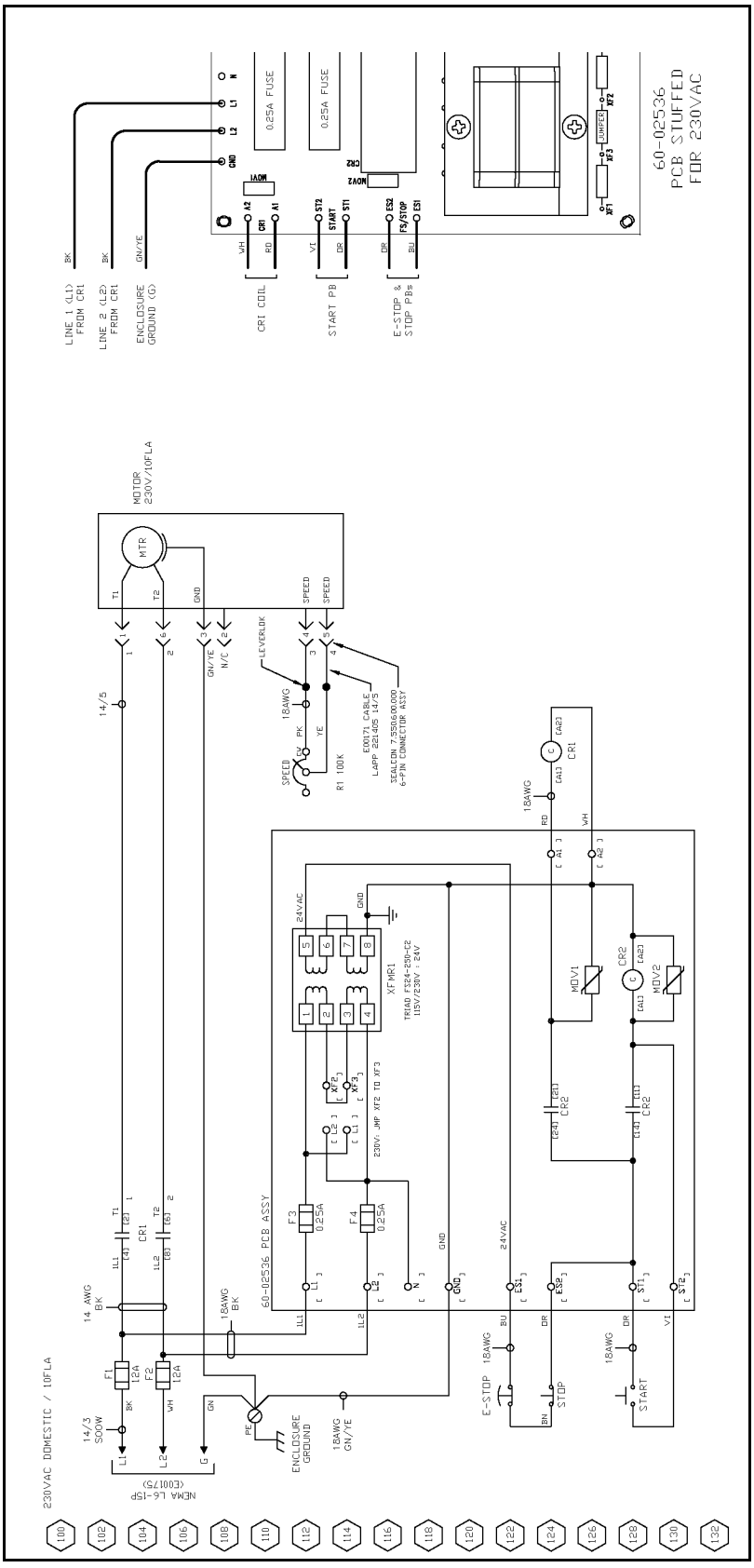


FIGURE C-2. BB4500-BB5000 EIBENSTOCK CONTROLLER 2ND GEN 230V 50-60 HZ DOMESTIC ASSEMBLY (P/N 88036 C00468)

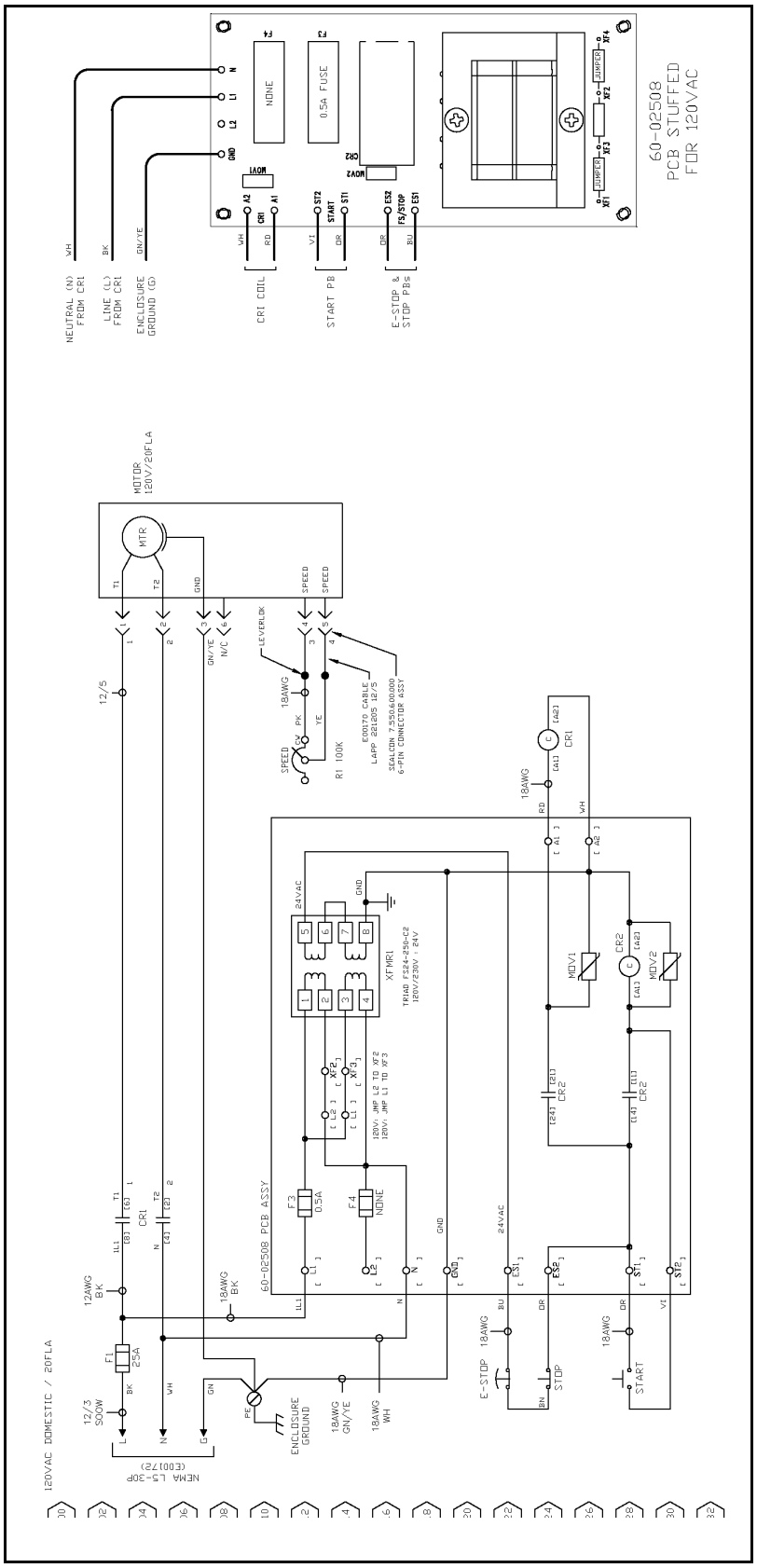


FIGURE C-3. BB4500-BB5000 EIBENSTOCK CONTROLLER 2ND GEN 120V DOMESTIC ASSEMBLY (P/N 88037 C00465)

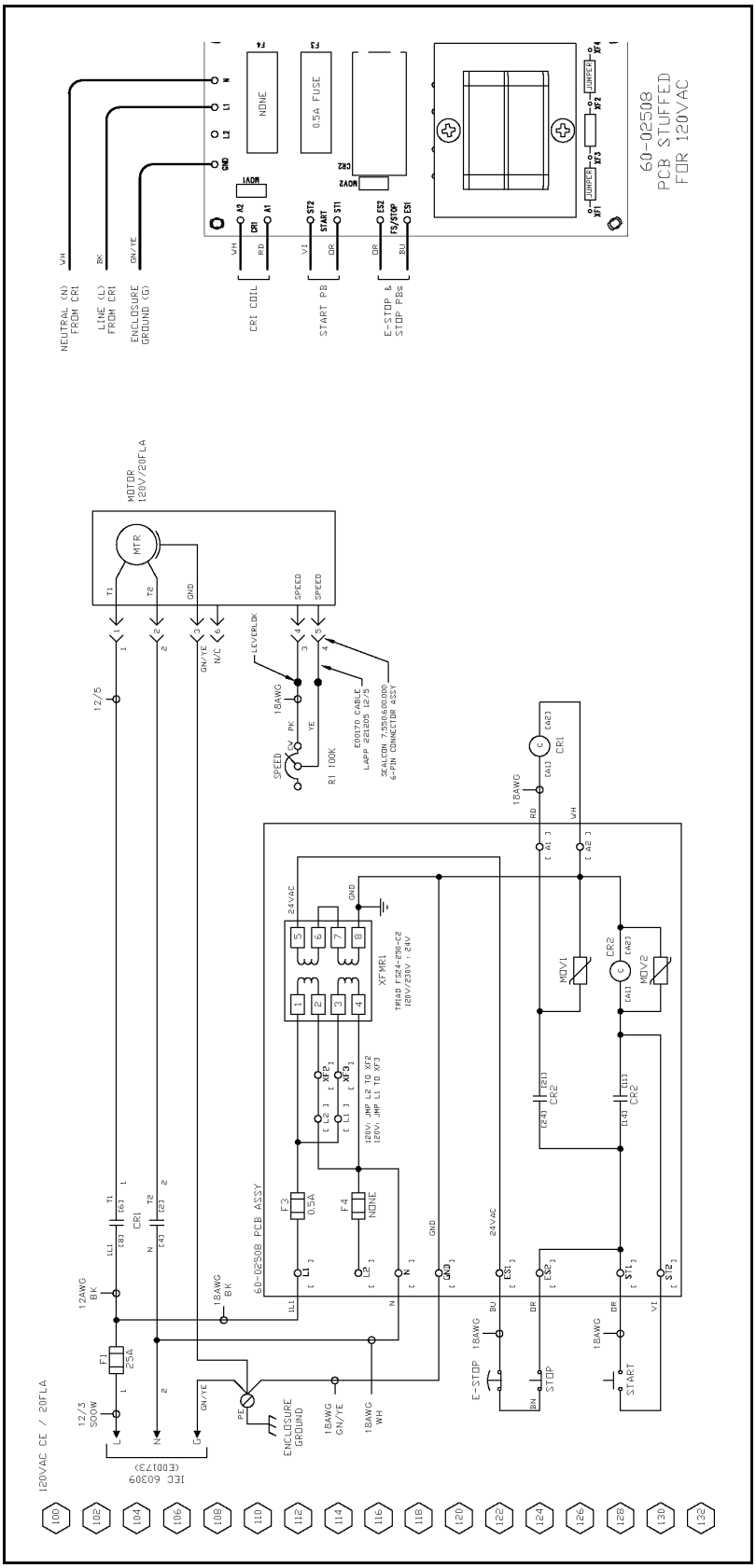


FIGURE C-4. BB4500-BB5000 EIBENSTOCK CONTROLLER 2ND GEN 120V CE ASSEMBLY (P/N 88038 C00466)

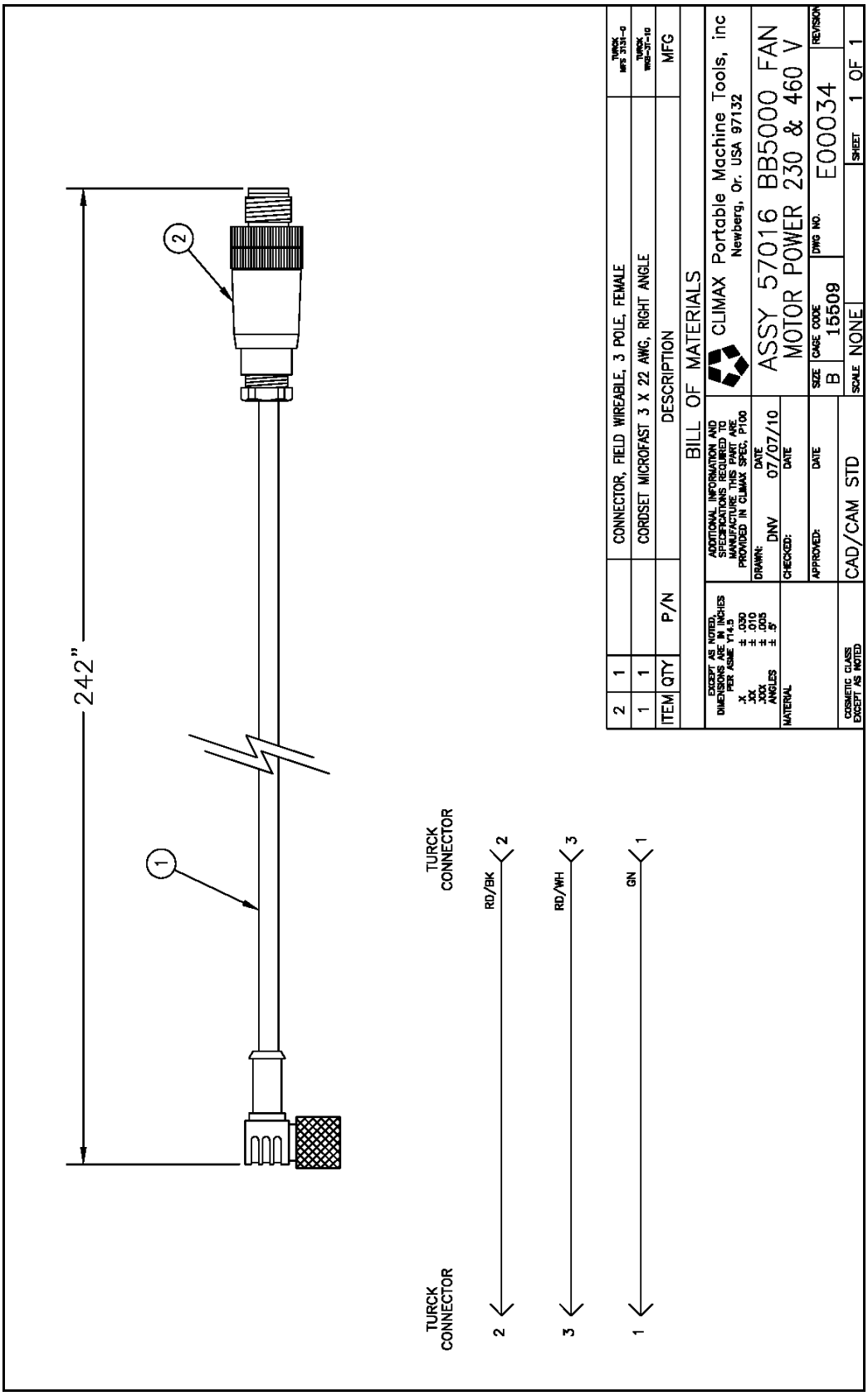


FIGURE C-5. BB5000 MOTOR 230V AND 460V FAN ASSEMBLY (P/N 91811 E00034)

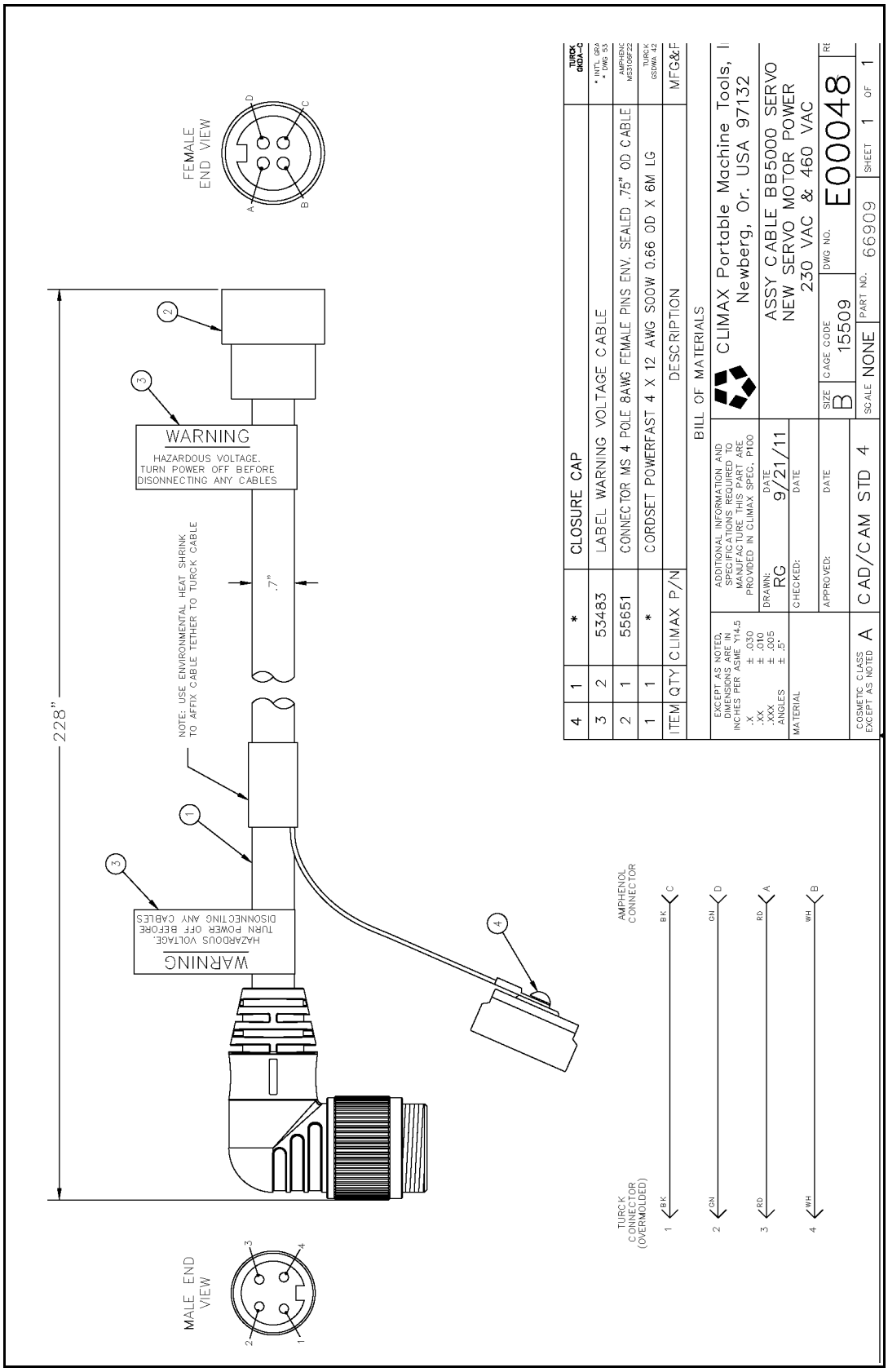


FIGURE C-6. BB5000 SERVO MOTOR 230VAC AND 460VAC POWER CABLE ASSEMBLY (P/N 91811 E00048)

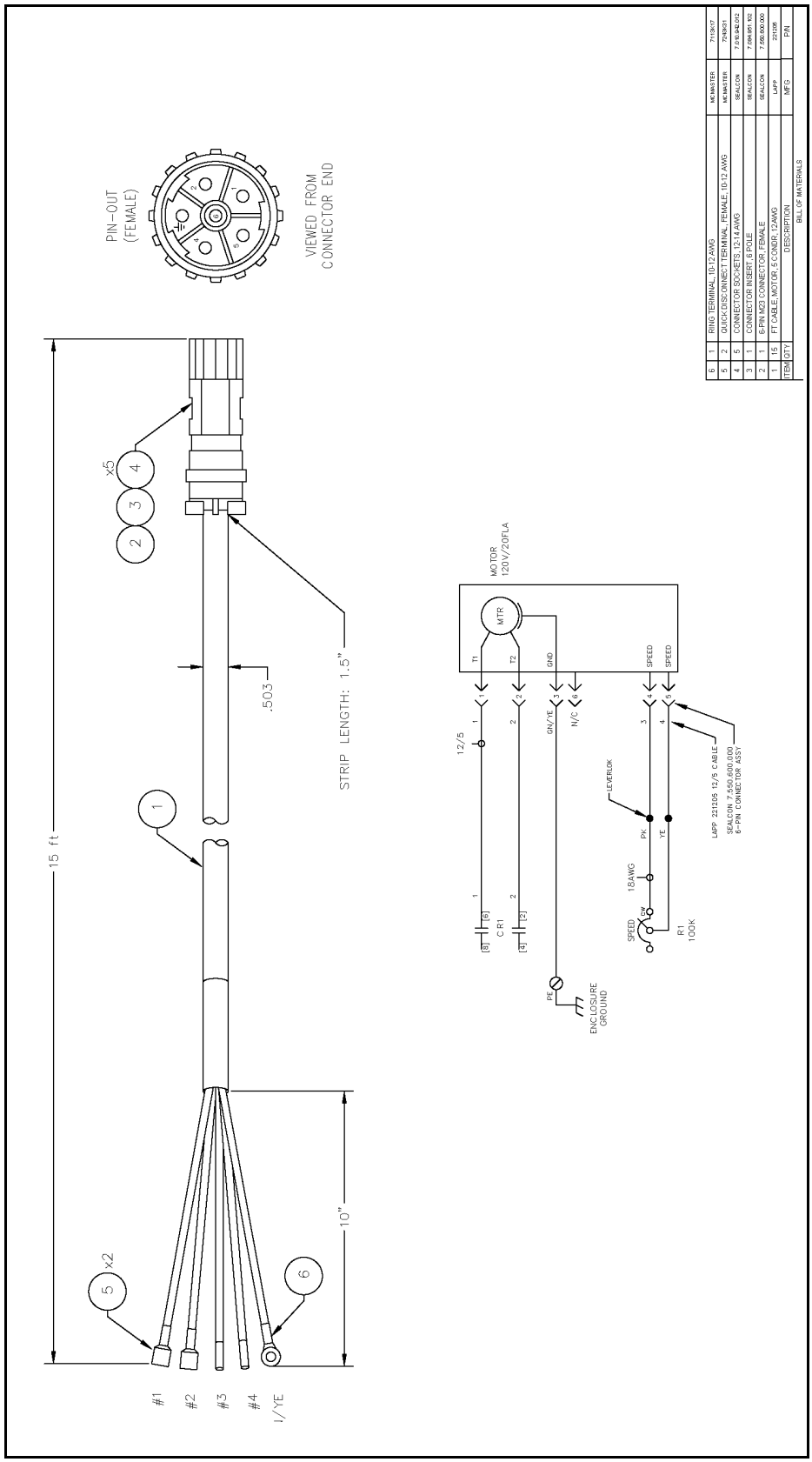


FIGURE C-7. BB5000 EIBENSTOCK MOTOR CABLE ASSEMBLY 2ND GEN 120V 12AWG SCHEMATIC (P/N 88649 E00170)

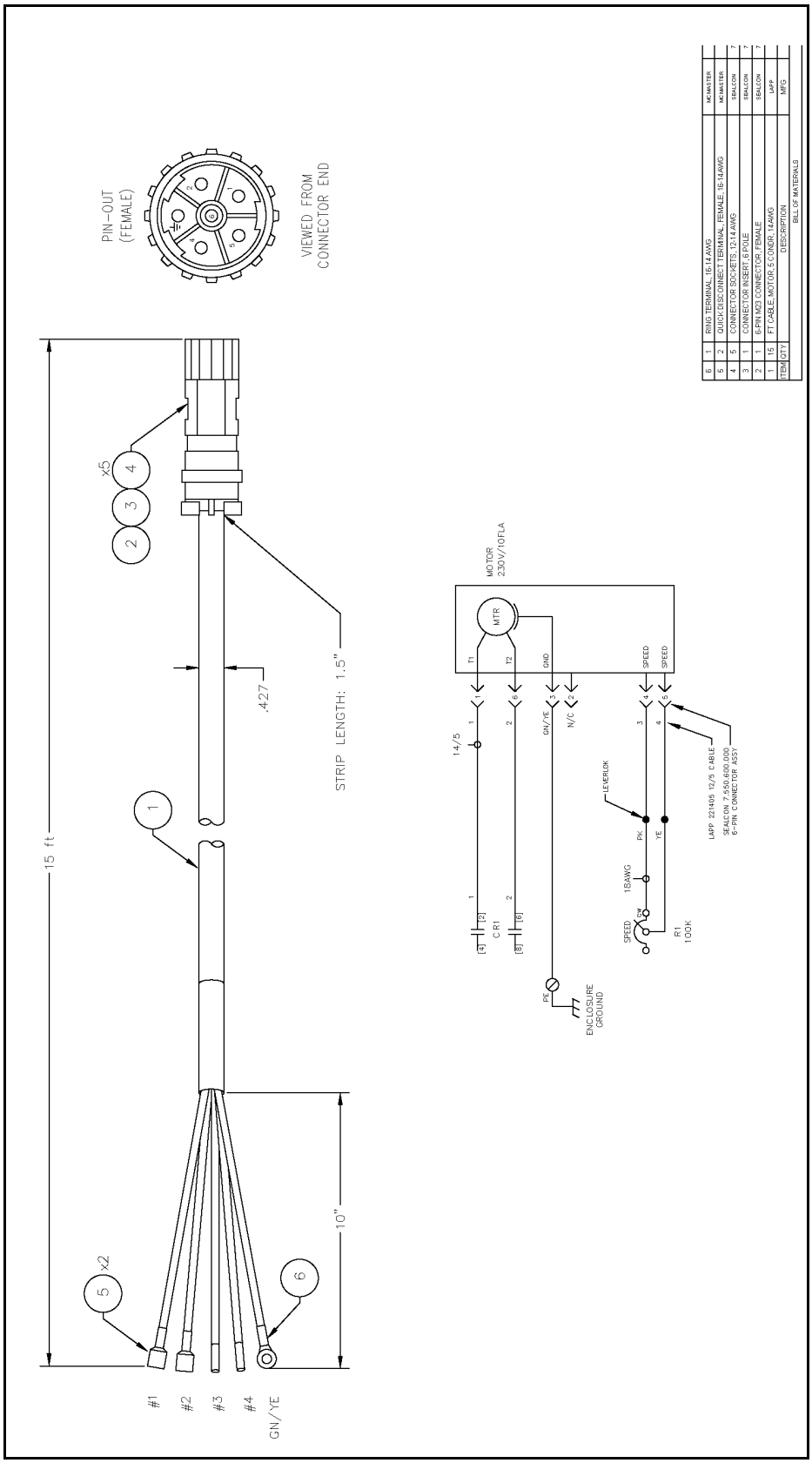


FIGURE C-8. BB5000 EIBENSTOCK MOTOR CABLE ASSEMBLY 2ND GEN 230V 14AWG SCHEMATIC (P/N 88650 E00171)

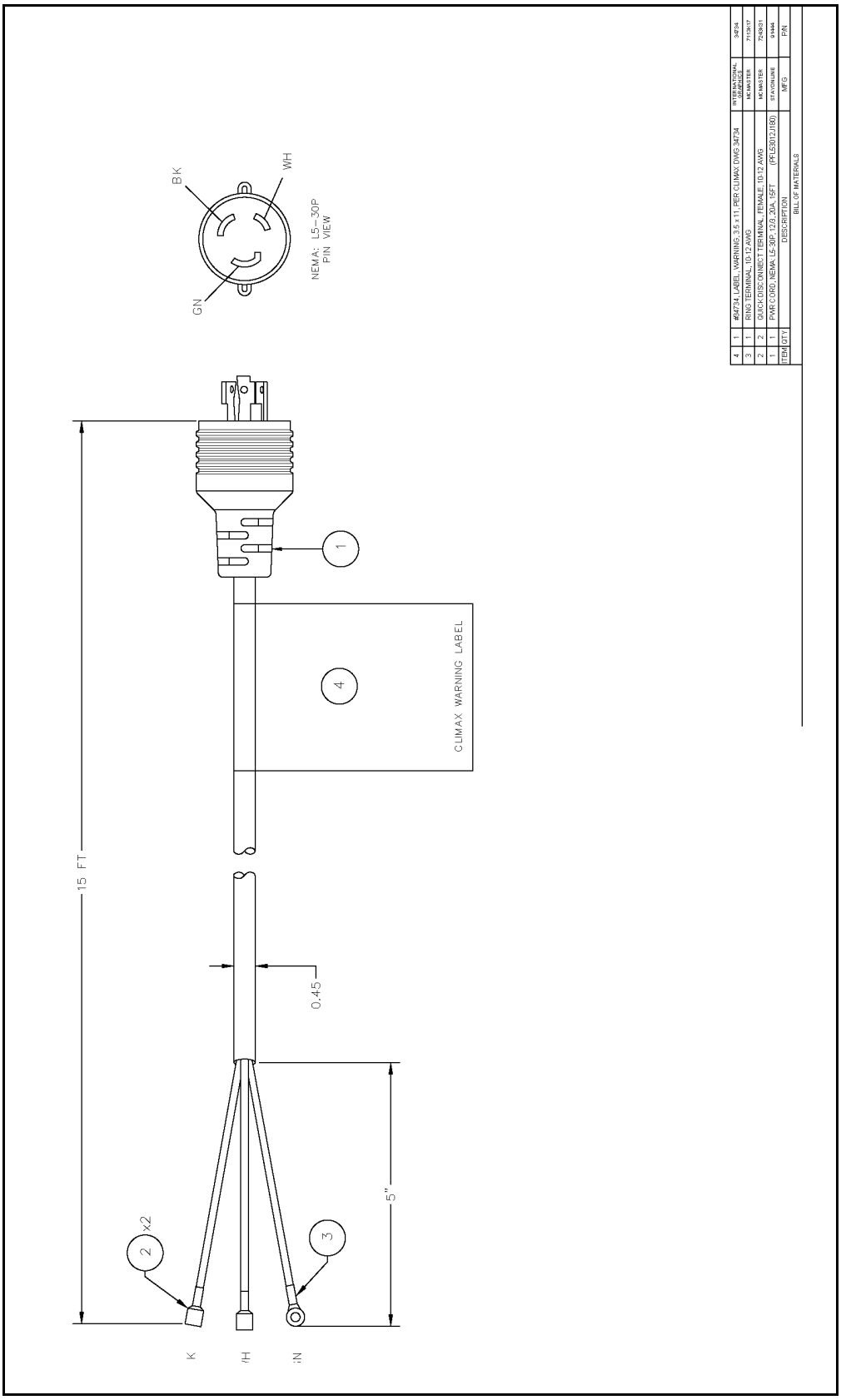


FIGURE C-9. BB5000 EIBENSTOCK POWER CABLE ASSEMBLY 2ND GEN 120V DOMESTIC L5-30P PLUG (P/N 88652 E00172)

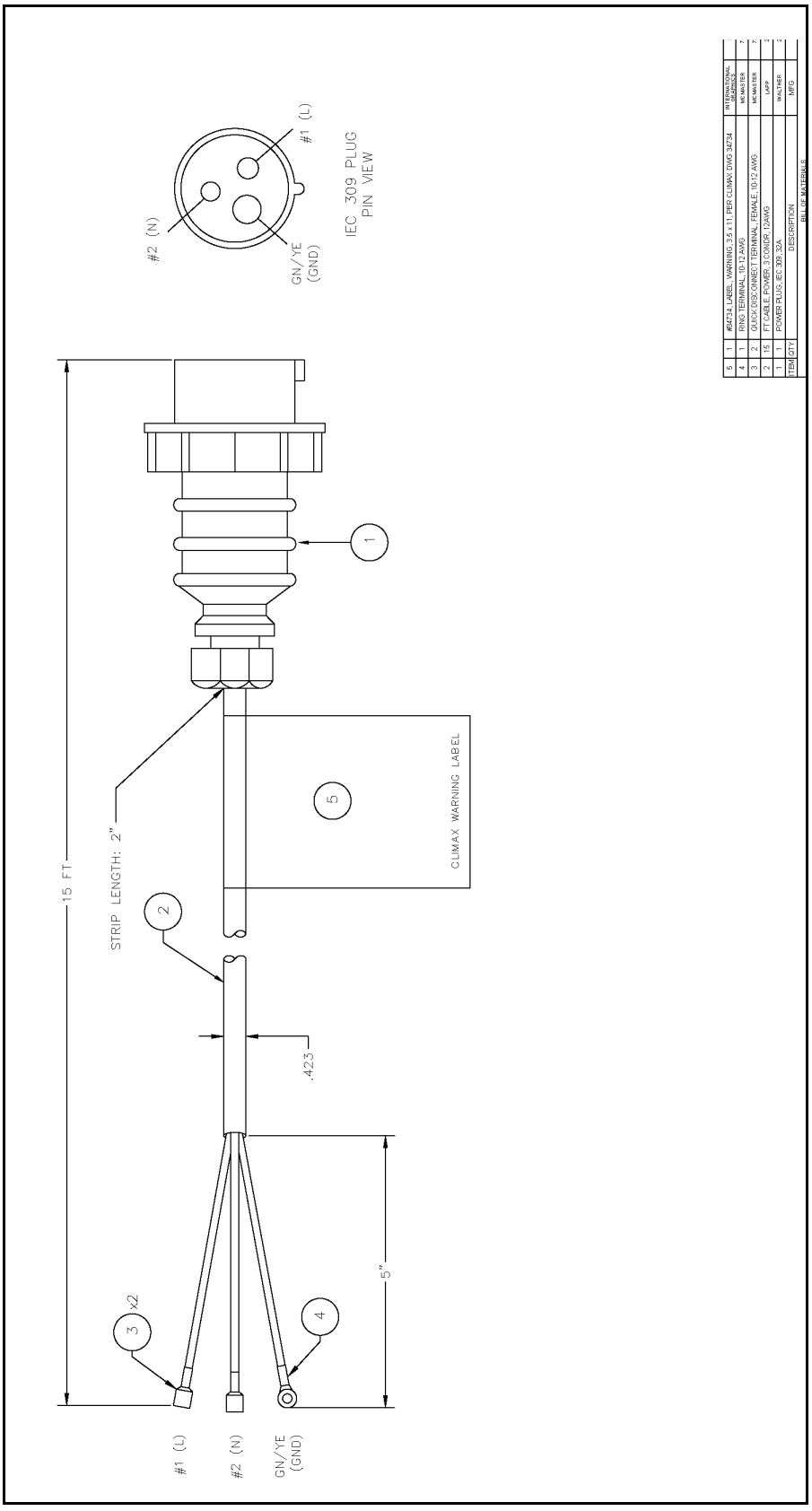


FIGURE C-10. BB5000 EIBENSTOCK POWER CABLE ASSEMBLY 2ND GEN 120V CE 332P4W PIN/SLEEVE PLUG (P/N 88653 E00173)

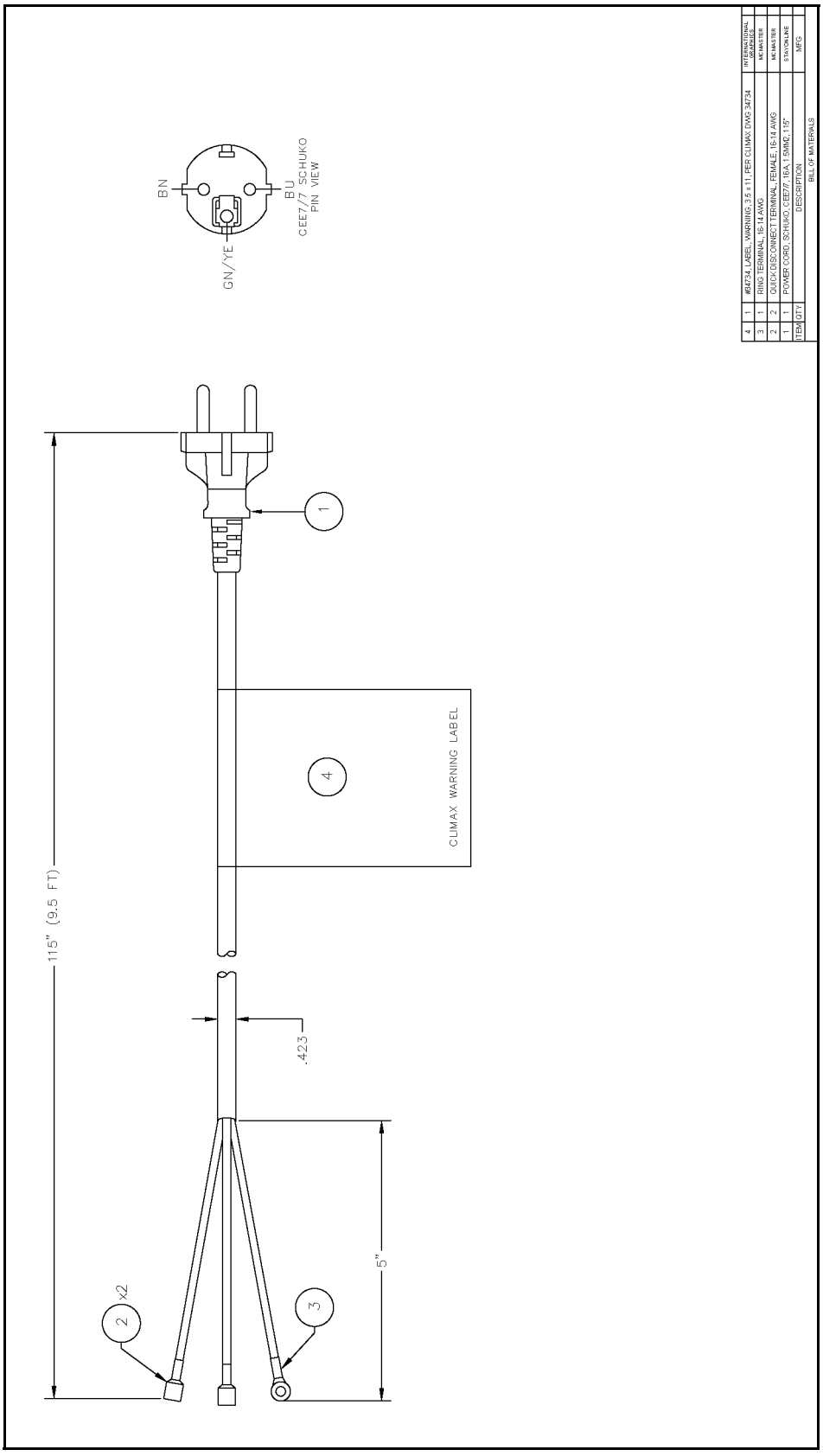


FIGURE C-11. BB5000 EIBENSTOCK POWER CABLE ASSEMBLY 2ND GEN 230V CE CEE7/7 SCHUKO PLUG (P/N 88654 E00174)

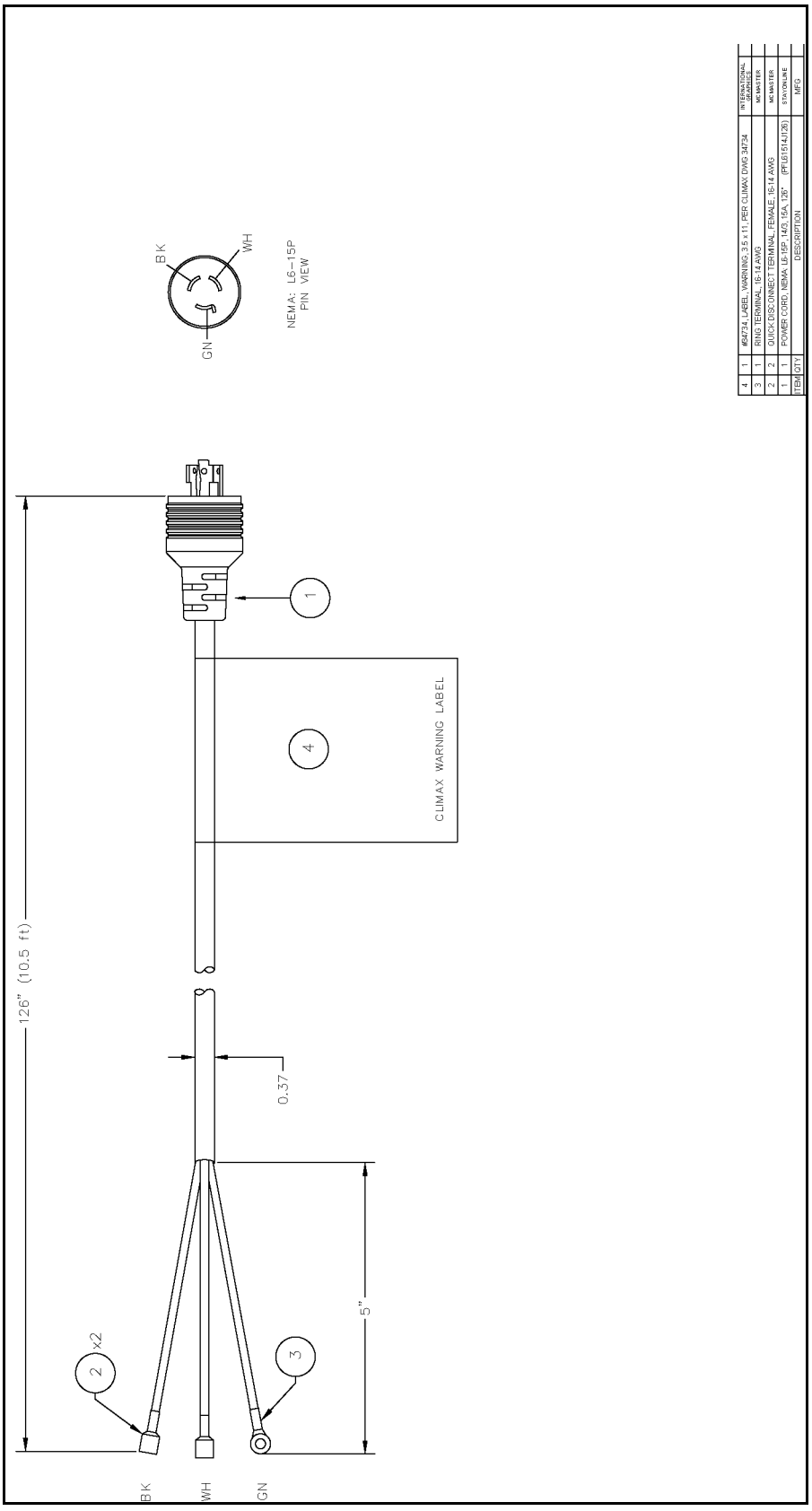


FIGURE C-12. BB5000 EIBENSTOCK POWER CABLE ASSEMBLY 2ND GEN 230V DOMESTIC L6-15P PLUG (P/N 88655 E00175)

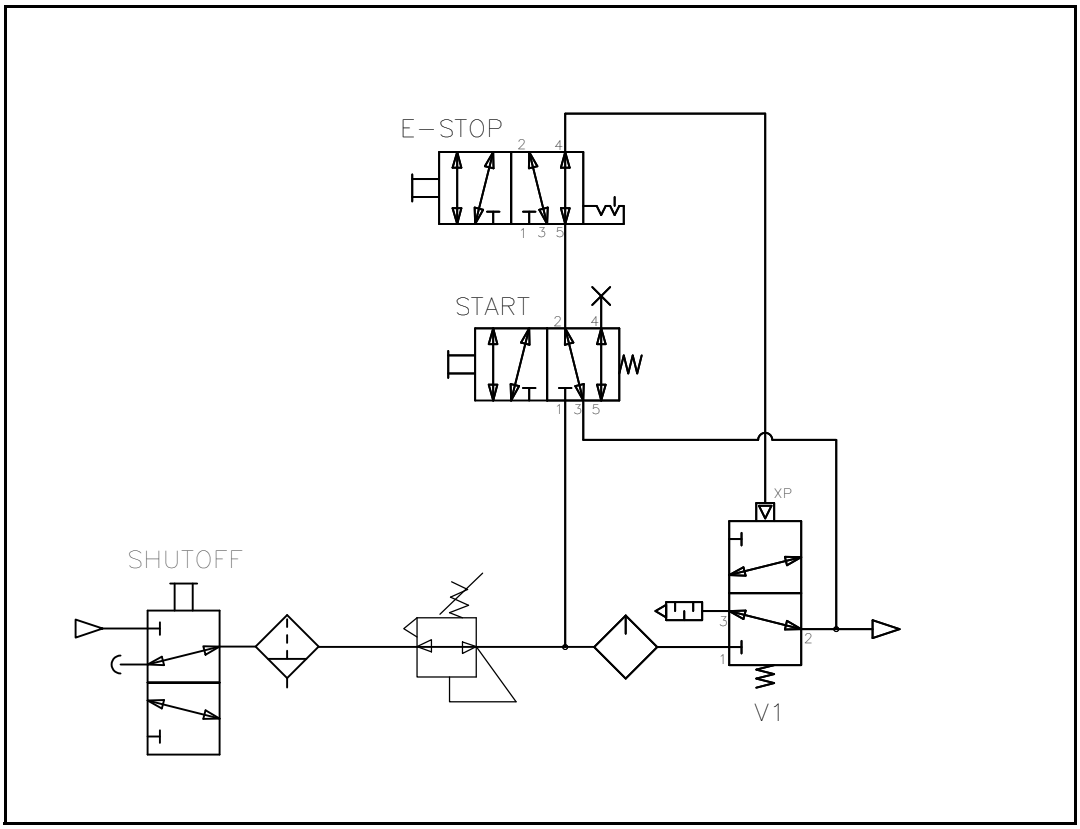
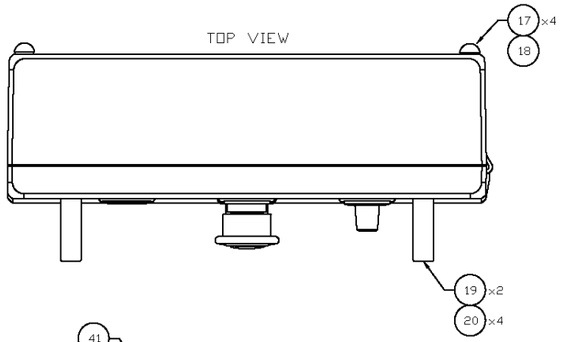
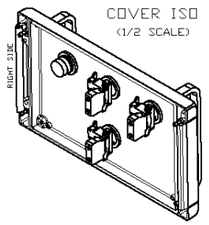
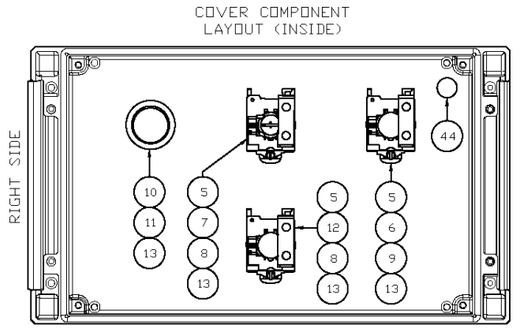
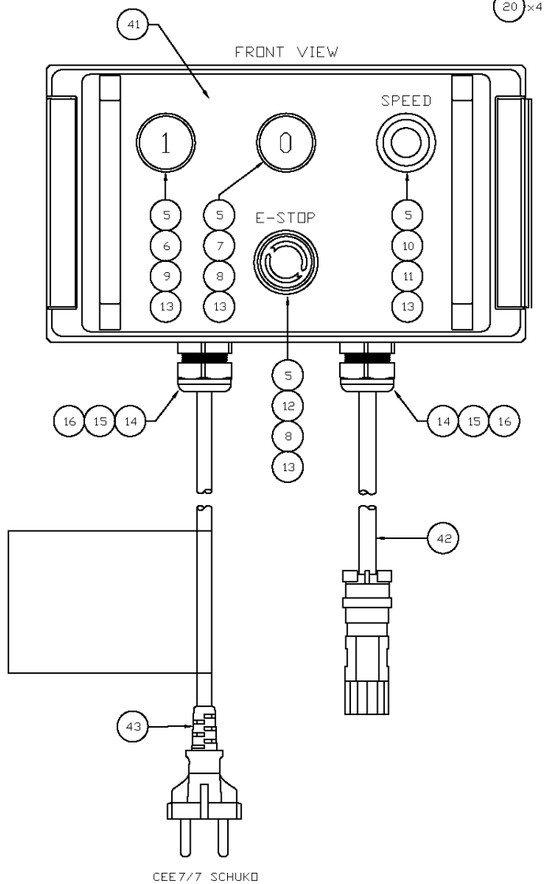


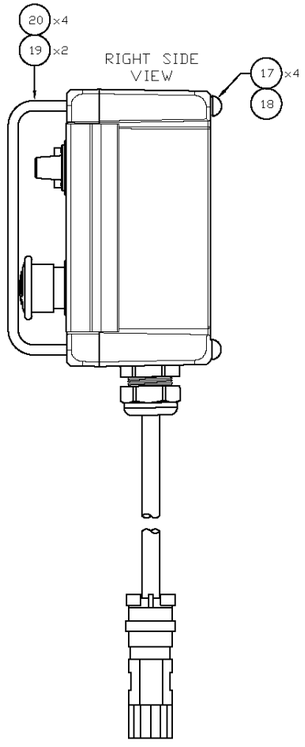
FIGURE C-13. PNEUMATIC CONDITIONING UNIT SCHEMATIC (P/N 59248)

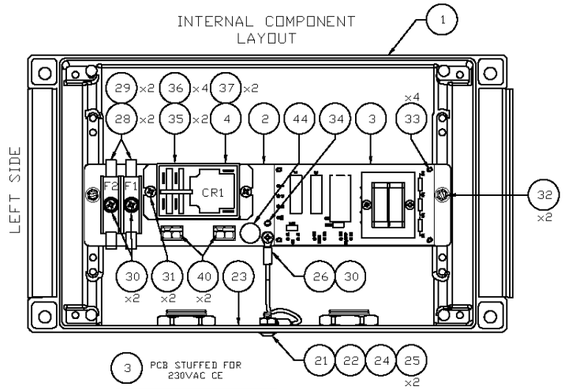


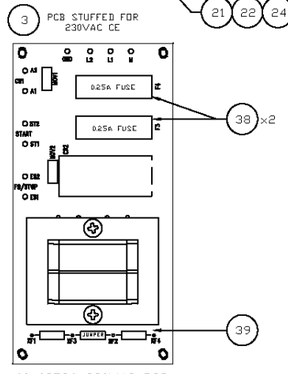








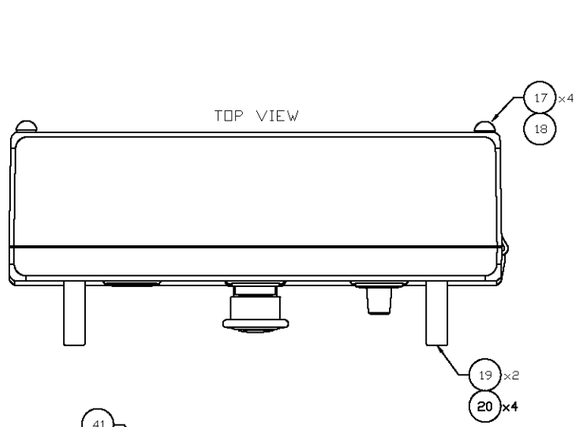


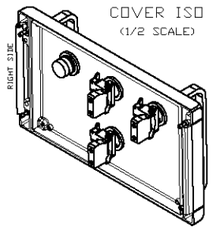


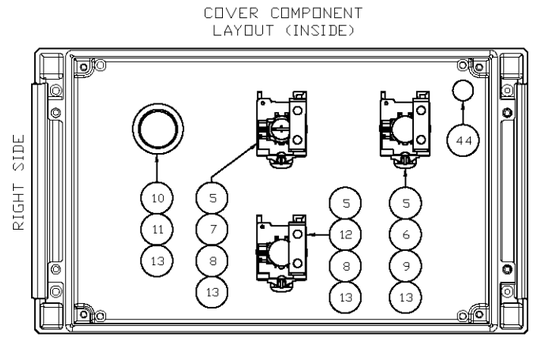
ITEM	QTY	DESCRIPTION	MFG	P/N
44	2	STICKER, GND SYMBOL	PANDUIT	PESS-A-ES
43	1	ASSY POWER CORD, CEE7/7 (SCHUKO), 1.5MM2, 115 IN	AUTOMATION SOLUTIONS	E00174
42	1	ASSY MOTOR CABLE, 230V, 14AWG, 5 CONDR, 15FT	AUTOMATION SOLUTIONS	E00171
41	1	LABEL, LEGEND/SERIAL#- 230V CE (88035)	AUTOMATION SOLUTIONS	G00245
40	2	COMPACT SPLICING CONNECTOR	WAGO	221-412
39	1	PCB JUMPER, ZERO OHM RESISTOR (OR WIRE JUMPER)	VISHAY	SFR2500000ZR500
38	4	FUSE, 5x20mm, 0.25A SLO-BLO (2 SPARE)	LITTELFUSE	0239.250MXP
37	2	QUICK DISCONNECT, FEMALE, 18AWG	MCMASTER	7243K11
36	4	QUICK DISCONNECT, FEMALE, 12AWG	MCMASTER	7243K31
35	2	QUICK DISCONNECT w/PIGGYBACK, FEMALE, 18AWG	MCMASTER	72065K24
34	1	STANDOFF, NYLON, 1/4", ADHESIVE BACKED	MCMASTER	91443A120
33	4	STANDOFF, NYLON, 4.7MM	KEYSTONE	8889
32	2	SCREW, 8-32, 1/8" LONG	MCMASTER	90096A191
31	2	SCREW, 6-32, 3/8" LONG	MCMASTER	90087A146
30	3	SCREW, 6-32, 1/4" LONG	MCMASTER	90087A144
29	4	FUSE, .25" x 1.25", 12A, SLO-BLO (2 SPARE)	LITTELFUSE	0326012.HXP
28	2	FUSEBLOCK, 1/4" x 1.25"	LITTELFUSE	03540902.XGY
27	1	RING TERMINAL, 14-16AWG, #8 SCREW (LID NOT SHOWN)	MCMASTER	7113K38
26	1	RING TERMINAL, 14-16AWG, #6 SCREW (BACKPANEL)	MCMASTER	7113K34
25	2	RING TERMINAL, 14-16AWG, #10 SCREW (GND STUD)	MCMASTER	7113K12
24	1	RING TERMINAL, 22-18AWG, #10 SCREW (GND STUD)	MCMASTER	7113K97
23	3	STICKER, PROTECTIVE EARTH	PANDUIT	PESS-A-PE
22	1	GROUND NUT, w/WASHER, 10-32	MCMASTER	90675A195
21	1	GROUND SCREW, 10-32, 18-8SS	MCMASTER	97654A173
20	4	THREAD LOCKING SHCS SCREW, 8-32, WASHER HEAD	MCMASTER	91205A192
19	2	HANDLES	MCMASTER	15145A63
18	1	ADHESIVE PACKET FOR BUMPERS	MCMASTER	7493A41
17	4	BUMPERS, PUSH-IN, FOR 1/4" HOLE	MCMASTER	9544K22
16	2	CORD GRIP SEALING RING, 3/4"	SEALCON	SR-34-NY
15	2	CORD GRIP, LOCK NUT	SEALCON	NN-21-BK
14	2	CORD GRIP, 3/4" NPT	SEALCON	CD21NR-BK
13	4	FLUSH MOUNT KIT	SCHNEIDER	ZB4BZ021
12	1	E-STOP PB, MUSHROOM HEAD	SCHNEIDER	ZB4BS844
11	1	POTENTIOMETER, 100K, LINEAR	HONEYWELL	380C1100K
10	1	POTENTIOMETER OPERATOR	SCHNEIDER	ZB4BD922
9	1	N/O CONTACT BLK, 10A, SPRING CLAMP	SCHNEIDER	ZBE1015
8	2	N/C CONTACT BLK, 10A, SPRING CLAMP	SCHNEIDER	ZBE1025
7	1	PUSHBUTTON, RED, EXTENDED, NON-ILLUM, MOM, 22MM	SCHNEIDER	ZB4BL432
6	1	PUSHBUTTON, GREEN, NON-ILLUM, MOM, 22MM	SCHNEIDER	ZB4BA331
5	3	MOUNT BASE	SCHNEIDER	ZB4BZ009
4	1	RELAY, E-MECH DPST, 30A, 24VAC COIL	SCHNEIDER	9S7A22D-24
3	1	UNIVERSAL STARTER CONTROLLER PCB ASSY - 230V	AUTOMATION SOLUTIONS	60-02536
2	1	SUPPORT PLATE FOR STARTER CONTROLLER & RELAY	AUTOMATION SOLUTIONS	H00423
1	1	ENCLOSURE 11.77 x 6.81 x 3.54	ROSE-BOPLA	00126335

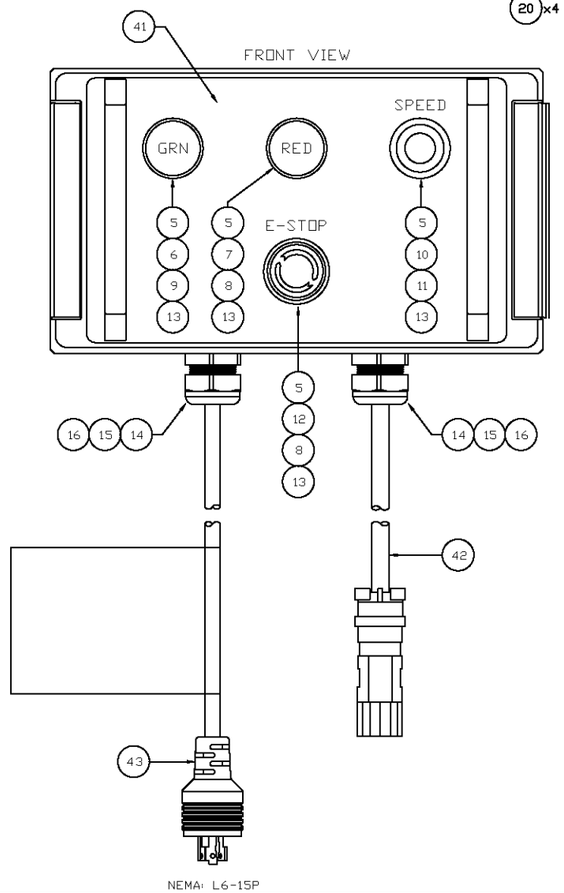
BILL OF MATERIALS

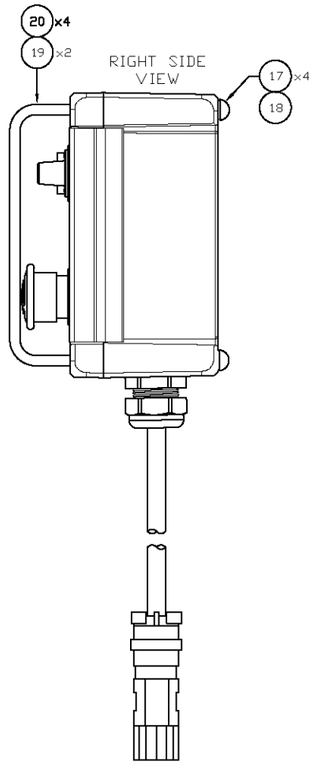
FIGURE C-14. BB4500-BB5000 EIBENSTOCK CONTROLLER 2ND GEN 230V 50-60 HZ CE ASSEMBLY (P/N 88035 B00367)

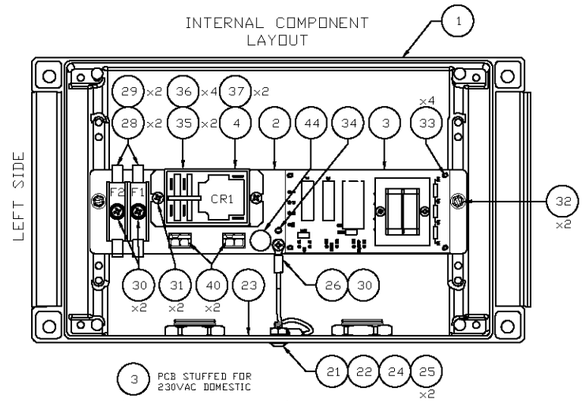


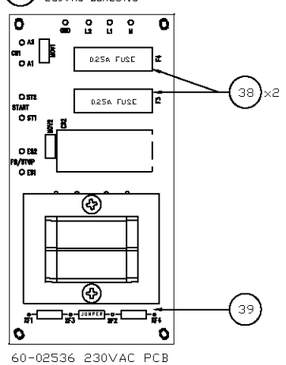








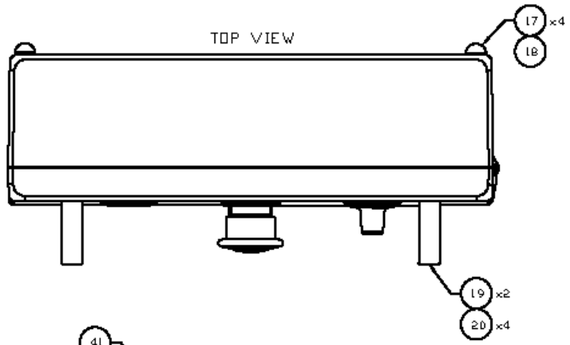


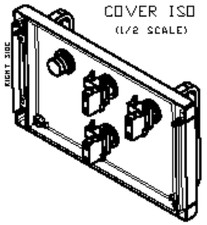


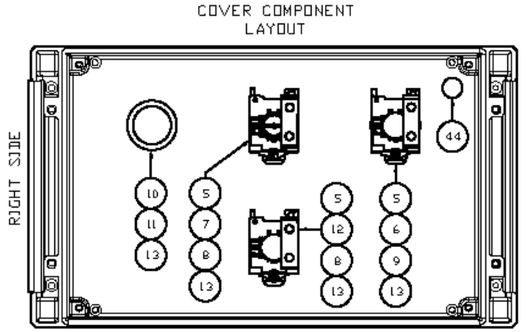
ITEM	QTY	DESCRIPTION	MFG	P/N
44	2	STICKER, GND SYMBOL	PANDUIT	PESS-A-ES
43	1	ASSY POWER CORD, NEMA: L6-15P, 14/3, 126 IN	AUTOMATION SOLUTIONS	E00175
42	1	ASSY MOTOR CABLE, 230V, 14AWG, 5 CONDR, 15FT	AUTOMATION SOLUTIONS	E00171
41	1	LABEL, LEGEND/SERIAL#- 230V DOMESTIC (88036)	AUTOMATION SOLUTIONS	G00246
40	2	COMPACT SPLICING CONNECTOR	WAGO	221-412
39	1	PCB JUMPER, ZERO OHM RESISTOR (OR WIRE JUMPER)	VISHAY	SFR2500000ZR500
38	4	FUSE, 5x20mm, 0.25A SLO-BLO (2 SPARE)	LITTELFUSE	0239.250MXP
37	2	QUICK DISCONNECT, FEMALE, 18AWG	MCMASTER	7243K11
36	4	QUICK DISCONNECT, FEMALE, 12AWG	MCMASTER	7243K31
35	2	QUICK DISCONNECT w/PIGGYBACK, FEMALE, 18AWG	MCMASTER	72065K24
34	1	STANDOFF, NYLON, 1/4", ADHESIVE BACKED	McMASTER	91443A120
33	4	STANDOFF, NYLON, 4.7MM	KEYSTONE	8889
32	2	SCREW, 8-32, 1/8" LONG	MCMASTER	90096A191
31	2	SCREW, 6-32, 3/8" LONG	MCMASTER	90087A146
30	3	SCREW, 6-32, 1/4" LONG	MCMASTER	90087A144
29	4	FUSE, .25" x 1.25", 12A, SLO-BLO (2 SPARE)	LITTELFUSE	0326012.HXP
28	2	FUSEBLOCK, 1/4" x 1.25"	LITTELFUSE	03540901ZXGY
27	1	RING TERMINAL, 14-16AWG, #8 SCREW (LID NOT SHOWN)	MCMASTER	7113K38
26	1	RING TERMINAL, 14-16AWG, #6 SCREW (BACKPANEL)	MCMASTER	7113K34
25	2	RING TERMINAL, 14-16AWG, #10 SCREW (GND STUD)	MCMASTER	7113K12
24	1	RING TERMINAL, 22-18AWG, #10 SCREW (GND STUD)	MCMASTER	7113K97
23	3	STICKER, PROTECTIVE EARTH	PANDUIT	PESS-A-PE
22	1	GROUND NUT, w/WASHER, 10-32	MCMASTER	90675A195
21	1	GROUND SCREW, 10-32, 18-8SS	MCMASTER	97654A173
20	4	THREAD LOCKING SHCS SCREW, 8-32, WASHER HEAD	MCMASTER	91205A192
19	2	HANDLES	MCMASTER	15145A63
18	1	ADHESIVE PACKET FOR BUMPERS	MCMASTER	7493A41
17	4	BUMPERS, PUSH-IN, FOR 1/4" HOLE	MCMASTER	9544K22
16	2	CORD GRIP SEALING RING, 3/4"	SEALCON	SR-34-NY
15	2	CORD GRIP, LOCK NUT	SEALCON	NN-21-BK
14	2	CORD GRIP, 3/4" NPT	SEALCON	CD21NRBK
13	4	FLUSH MOUNT KIT	SCHNEIDER	ZB4BZ021
12	1	E-STOP PB, MUSHROOM HEAD	SCHNEIDER	ZB4BS844
11	1	POTENTIOMETER, 100K, LINEAR	HONEYWELL	380C1100K
10	1	POTENTIOMETER OPERATOR	SCHNEIDER	ZB4BD922
9	1	N/O CONTACT BLK, 10A, SPRING CLAMP	SCHNEIDER	ZBE1015
8	2	N/C CONTACT BLK, 10A, SPRING CLAMP	SCHNEIDER	ZBE1025
7	1	PUSHBUTTON, RED, EXTENDED, NON-ILLUM, MOM, 22MM	SCHNEIDER	ZB4BL432
6	1	PUSHBUTTON, GREEN, NON-ILLUM, MOM, 22MM	SCHNEIDER	ZB4BA331
5	3	MOUNT BASE	SCHNEIDER	ZB4BZ009
4	1	RELAY, E-MECH DPST, 30A, 24VAC COIL	SCHNEIDER	9S7A22D-24
3	1	UNIVERSAL STARTER CONTROLLER PCB ASSY - 230V	AUTOMATION SOLUTIONS	60-02536
2	1	SUPPORT PLATE FOR STARTER CONTROLLER & RELAY	AUTOMATION SOLUTIONS	H00123
1	1	ENCLOSURE 11.77 x 6.81 x 3.54	ROSE-BOPLA	00126335

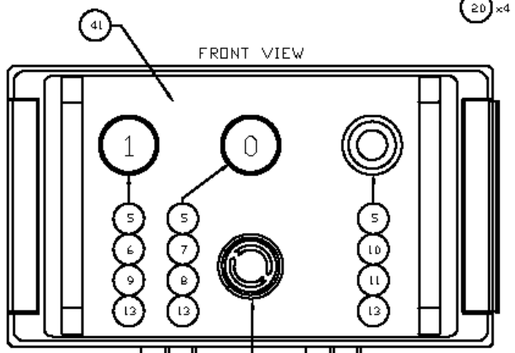
BILL OF MATERIALS

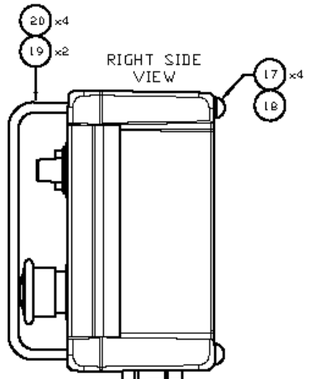
FIGURE C-15. BB4500-BB5000 EIBENSTOCK CONTROLLER 2ND GEN 230V 50-60 HZ DOMESTIC ASSEMBLY (P/N 88036 B00368)

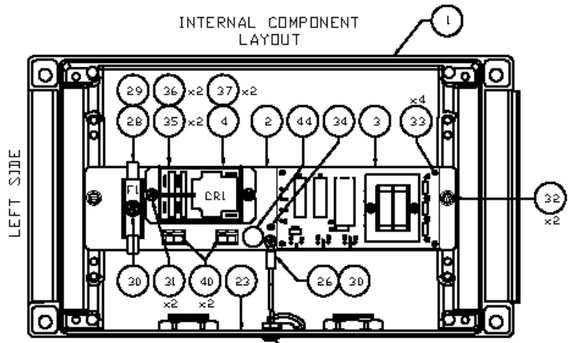


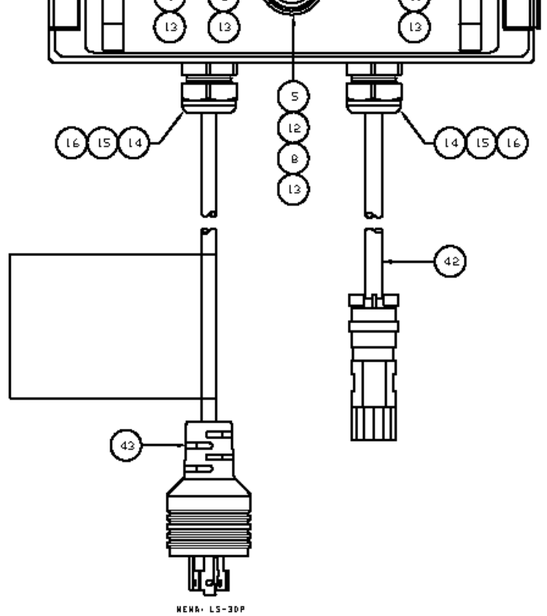


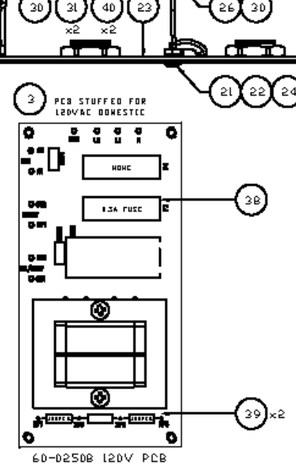








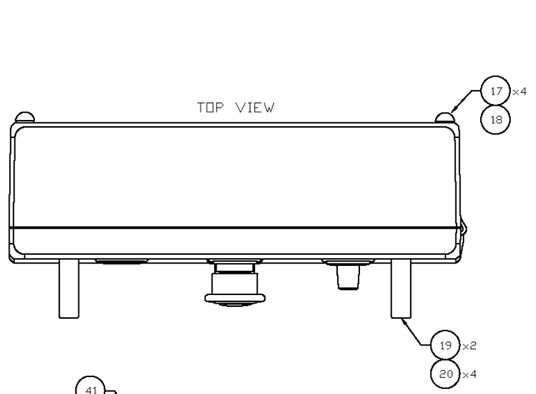


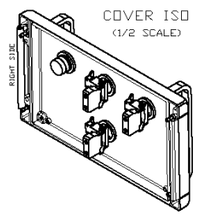


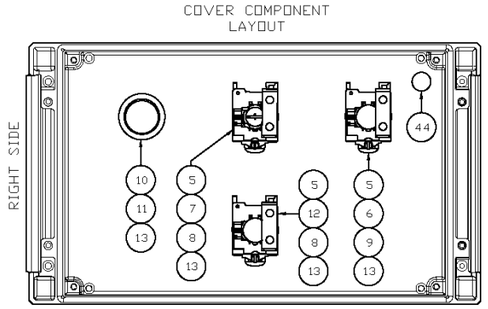
ITEM	QTY	DESCRIPTION	MFG	P/N
44	2	STICKER, GNDSYMBOL	PANDUIT	PESS-AUE
43	1	ASSY POWER CORD, NEMA: L530P, 12/3, 20A, 15FT	AUTOMATION SOLUTIONS	E00172
42	1	ASSY MOTOR CABLE, 120V, 12AWG, 5 CONDR, 15FT	AUTOMATION SOLUTIONS	E00170
41	1	LABEL, LEGEND/SERIAL#- 120V DOMESTIC (88037)	AUTOMATION SOLUTIONS	G00246
40	2	COMPACT SPLICING CONNECTOR	WAGO	221-412
39	2	PCB JUMPER, ZERO OHM RESISTOR (OR WIRE JUMPER)	VISHAY	DR1250Z0 0025500
38	2	FUSE, 5x20mm, 0.5A SLOBLO (1 SPARE)	LITTELFUSE	0259.500MXP
37	2	QUICK DISCONNECT, FEMALE, 18AWG	MCMASTER	7245K11
36	2	QUICK DISCONNECT, FEMALE, 12AWG	MCMASTER	7245K31
35	2	QUICK DISCONNECT w/ PIGGYBACK, FEMALE, 18AWG	MCMASTER	7206K24
34	1	STANDOFF, NYLON, 1/4", ADHESIVE BACKED	McMASTER	91443A120
33	4	STANDOFF, NYLON, 4.7MM	KEYSTONE	8829
32	2	SCREW, 8-32, 1/8" LONG	MCMASTER	90091A191
31	2	SCREW, 6-32, 3/8" LONG	MCMASTER	90031A146
30	2	SCREW, 6-32, 1/4" LONG	MCMASTER	90031A144
29	2	FUSE, .25" x 1.25", 25A, SLO-BLO (1 SPARE)	LITTELFUSE	0326.025HXP
28	2	FUSEBLOCK, 1/4" x 1.25"	LITTELFUSE	0354.0012XXGY
27	1	RING TERMINAL, 14-16AWG, #8 SCREW (LID NOT SHOWN)	MCMASTER	7113K38
26	1	RING TERMINAL, 14-16AWG, #6 SCREW (BACKPANEL)	MCMASTER	7113K34
25	2	RING TERMINAL, 14-16AWG, #10 SCREW (GND STUD)	MCMASTER	7113K12
24	1	RING TERMINAL, 22-18AWG, #10 SCREW (GND STUD)	MCMASTER	7113K97
23	1	STICKER, PROTECTIVE EARTH	PANDUIT	PESS-AJPE
22	1	GROUND NUT, w/WASHER, 10-32	MCMASTER	90675A195
21	1	GROUND SCREW, 10-32, 18-8SS	MCMASTER	97654A173
20	4	THREAD LOCKING SHCS SCREW, 8-32, WASHER HEAD	MCMASTER	91205A192
19	2	HANDLES	MCMASTER	1514SR63
18	1	ADHESIVE PACKET FOR BUMPERS	MCMASTER	7492A41
17	4	BUMPERS, PUSH-IN, FOR 1/4" HOLE	MCMASTER	9544K22
16	2	CORD GRIP SEALING RING, 3/4"	SEALCON	SR-34-NY
15	2	CORD GRIP, LOCK NUT	SEALCON	NN-21-BK
14	2	CORD GRIP, 3/4" NPT	SEALCON	CD21NR-BK
13	4	FLUSH MOUNT KIT	SCHNEIDER	ZB4BZ021
12	1	E-STOP PB, MUSHROOM HEAD	SCHNEIDER	ZB4BS844
11	1	POTENTIOMETER, 100K, LINEAR	HONEYWELL	32DC1100K
10	1	POTENTIOMETER OPERATOR	SCHNEIDER	ZB4BD922
9	1	N/O CONTACT BLK, 10A, SPRING CLAMP	SCHNEIDER	ZBE1015
8	2	N/C CONTACT BLK, 10A, SPRING CLAMP	SCHNEIDER	ZBE1025
7	1	PUSHBUTTON, RED, EXTENDED, NON-ILLUM, MOM, 22MM	SCHNEIDER	ZB4BL432
6	1	PUSHBUTTON, GREEN, NON-ILLUM, MOM, 22MM	SCHNEIDER	ZB4BA831
5	3	MOUNT BASE	SCHNEIDER	ZB4BZ009
4	1	RELAY, EMECH DPST, 30A, 24VAC COIL	SCHNEIDER	92S7AZ2D-24
3	1	UNIVERSAL STARTER CONTROLLER PCB ASSY - 120V	AUTOMATION SOLUTIONS	60-02508
2	1	BACKPANEL FOR STARTER CONTROLLER & RELAY	AUTOMATION SOLUTIONS	H00423
1	1	ENCLOSURE 11.77 x 6.81 x 3.54	HOFFMAN	00126335

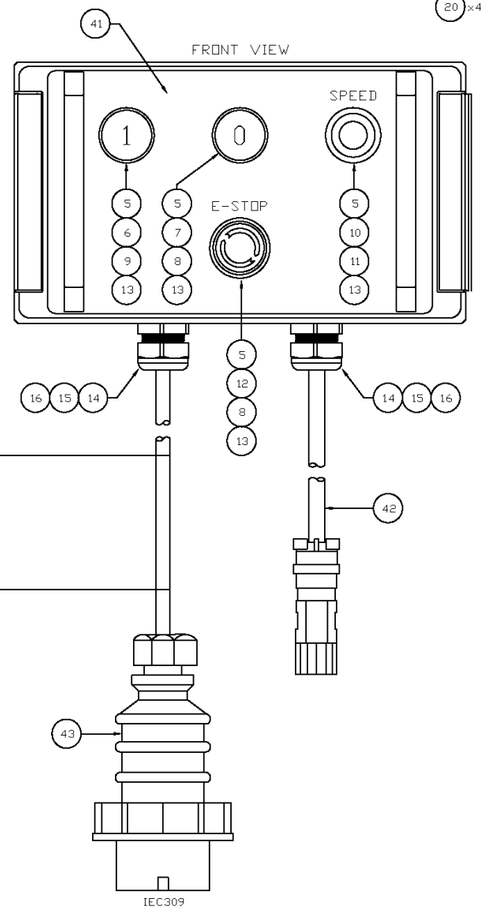
BILL OF MATERIALS

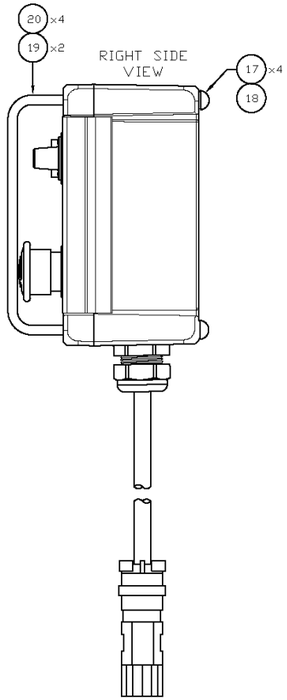
FIGURE C-16. BB4500-BB5000 EIBENSTOCK CONTROLLER 2ND GEN 120V DOMESTIC ASSEMBLY (P/N 88037 B00365)

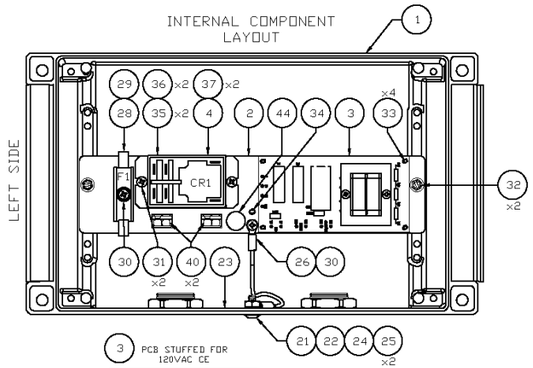


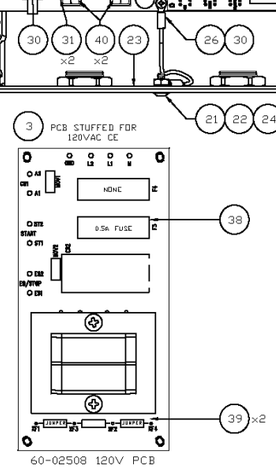








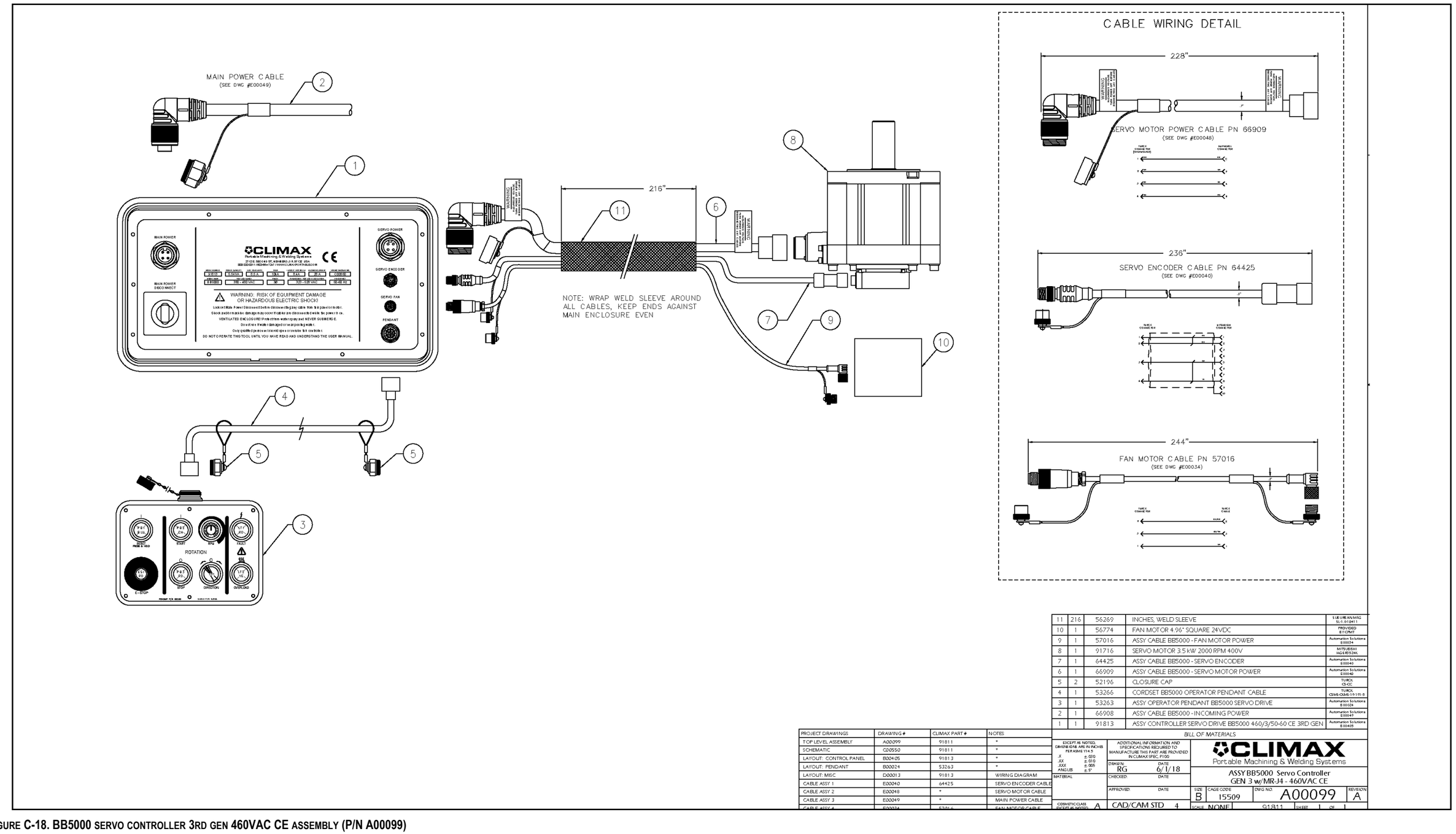




ITEM	QTY	DESCRIPTION	MFG	P/N
		BILL OF MATERIALS		
44	2	STICKER, GND SYMBOL	PANDUIT	PESS-A-ES
43	1	ASSY POWER CORD, IEC 309 (PIN & SLEEVE), 12/3, 15FT	AUTOMATION SOLUTIONS	E00173
42	1	ASSY MOTOR CABLE, 120V, 12AWG, 5 CONDR, 15FT	AUTOMATION SOLUTIONS	E00170
41	1	LABEL, LEGEND/SERIAL#- 120V CE (88038)	AUTOMATION SOLUTIONS	G00245
40	2	COMPACT SPLICING CONNECTOR	WAGO	221-412
39	2	PCB JUMPER, ZERO OHM RESISTOR (OR WIRE JUMPER)	VISHAY	SFR2500200ZR500
38	2	FUSE, 5x20mm, 0.5A SLO-BLO (1 SPARE)	LITTELFUSE	0239.500MXP
37	2	QUICK DISCONNECT, FEMALE, 18AWG	MCMASTER	7243K11
36	2	QUICK DISCONNECT, FEMALE, 12AWG	MCMASTER	7243K31
35	2	QUICK DISCONNECT w/PIGGYBACK, FEMALE, 18AWG	MCMASTER	72065K24
34	1	STANDOFF, NYLON, 1/4", ADHESIVE BACKED	McMASTER	91443A120
33	4	STANDOFF, NYLON, 4.7MM	KEYSTONE	8889
32	2	SCREW, 8-32, 1/8" LONG	MCMASTER	90096A191
31	2	SCREW, 6-32, 3/8" LONG	MCMASTER	90087A146
30	2	SCREW, 6-32, 1/4" LONG	MCMASTER	90087A144
29	2	FUSE, .25" x 1.25", 25A, SLO-BLO (1 SPARE)	LITTELFUSE	0326025.HXP
28	2	FUSE BLOCK, 1/4" x 1.25"	LITTELFUSE	03540901ZXGY
27	1	RING TERMINAL, 14-16AWG, #8 SCREW (LID NOT SHOWN)	MCMASTER	7113K38
26	1	RING TERMINAL, 14-16AWG, #6 SCREW (BACKPANEL)	MCMASTER	7113K34
25	2	RING TERMINAL, 14-16AWG, #10 SCREW (GND STUD)	MCMASTER	7113K12
24	1	RING TERMINAL, 22-18AWG, #10 SCREW (GND STUD)	MCMASTER	7113K97
23	3	STICKER, PROTECTIVE EARTH	PANDUIT	PESS-A-PE
22	1	GROUND NUT, w/WASHER, 10-32	MCMASTER	90675A195
21	1	GROUND SCREW, 10-32, 18-8SS	MCMASTER	97654A173
20	4	THREAD LOCKING SHCS SCREW, 8-32, WASHER HEAD	MCMASTER	91205A192
19	2	HANDLES	MCMASTER	1514SA63
18	1	ADHESIVE PACKET FOR BUMPERS	MCMASTER	7493A41
17	4	BUMPERS, PUSH-IN, FOR 1/4" HOLE	MCMASTER	9544K22
16	2	CORD GRIP SEALING RING, 3/4"	SEALCON	SR34-NY
15	2	CORD GRIP, LOCK NUT	SEALCON	NN-21-BK
14	2	CORD GRIP, 3/4" NPT	SEALCON	CD21NRBK
13	4	FLUSH MOUNT KIT	SCHNEIDER	ZB4BZ021
12	1	E-STOP PB, MUSHROOM HEAD	SCHNEIDER	ZB4BS844
11	1	POTENTIOMETER, 100K, LINEAR	HONEYWELL	38OC100K
10	1	POTENTIOMETER OPERATOR	SCHNEIDER	ZB4BD922
9	1	N/O CONTACT BLK, 10A, SPRING CLAMP	SCHNEIDER	ZBE1015
8	2	N/C CONTACT BLK, 10A, SPRING CLAMP	SCHNEIDER	ZBE1025
7	1	PUSHBUTTON, RED, EXTENDED, NON-ILLUM, MOM, 22MM	SCHNEIDER	ZB4BL432
6	1	PUSHBUTTON, GREEN, NON-ILLUM, MOM, 22MM	SCHNEIDER	ZB4BA331
5	3	MOUNT BASE	SCHNEIDER	ZB4BZ009
4	1	RELAY, E-MECH DPST, 30A, 24VAC COIL	SCHNEIDER	9257A22D-24
3	1	UNIVERSAL STARTER CONTROLLER PCB ASSY - 120V	AUTOMATION SOLUTIONS	60-02508
2	1	SUPPORT PLATE FOR STARTER CONTROLLER & RELAY	AUTOMATION SOLUTIONS	H00423
1	1	ENCLOSURE 11.77 x 6.81 x 3.54	ROSEBOPLA	00126335

FIGURE C-17. BB4500-BB5000 EIBENSTOCK CONTROLLER 2ND GEN 120V CE ASSEMBLY (P/N 88038 B00366)

ДЛЯ ЗАЯВОК: info@climax-stanki.ru
https://www.climax-stanki.ru



11	216	56269	INCHES, WELD SLEEVE	SUBURBAN MFG SL-1.0-0411
10	1	56774	FAN MOTOR 4.96" SQUARE 24VDC	PROVIDED E-STOUT
9	1	57016	ASSY CABLE BB5000 - FAN MOTOR POWER	Automation Solutions E00034
8	1	91716	SERVO MOTOR 3.5 kW 2000 RPM 400V	MITSUBISHI HG-KR73(M)
7	1	64425	ASSY CABLE BB5000 - SERVO ENCODER	Automation Solutions E00040
6	1	66909	ASSY CABLE BB5000 - SERVO MOTOR POWER	Automation Solutions E00048
5	2	52196	CLOSURE CAP	TURCK CI-CC
4	1	53266	CORDSET BB5000 OPERATOR PENDANT CABLE	TURCK CSMS-0306-19-19-5
3	1	53263	ASSY OPERATOR PENDANT BB5000 SERVO DRIVE	Automation Solutions E00024
2	1	66908	ASSY CABLE BB5000 - INCOMING POWER	Automation Solutions E00049
1	1	91813	ASSY CONTROLLER SERVO DRIVE BB5000 460/3/50-60 CE 3RD GEN	Automation Solutions E00409

BILL OF MATERIALS

PROJECT DRAWINGS	DRAWING #	CLIMAX PART #	NOTES
TOP LEVEL ASSEMBLY	A00099	91811	*
SCHEMATIC	C00550	91811	*
LAYOUT: CONTROL PANEL	B00405	91813	*
LAYOUT: PENDANT	B00024	53263	*
LAYOUT: MISC	D00013	91813	WIRING DIAGRAM
CABLE ASSY 1	E00040	64425	SERVO ENCODER CABLE
CABLE ASSY 2	E00048	*	SERVO MOTOR CABLE
CABLE ASSY 3	E00049	*	MAIN POWER CABLE
CABLE ASSY 4	E00034	57016	FAN MOTOR CABLE

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

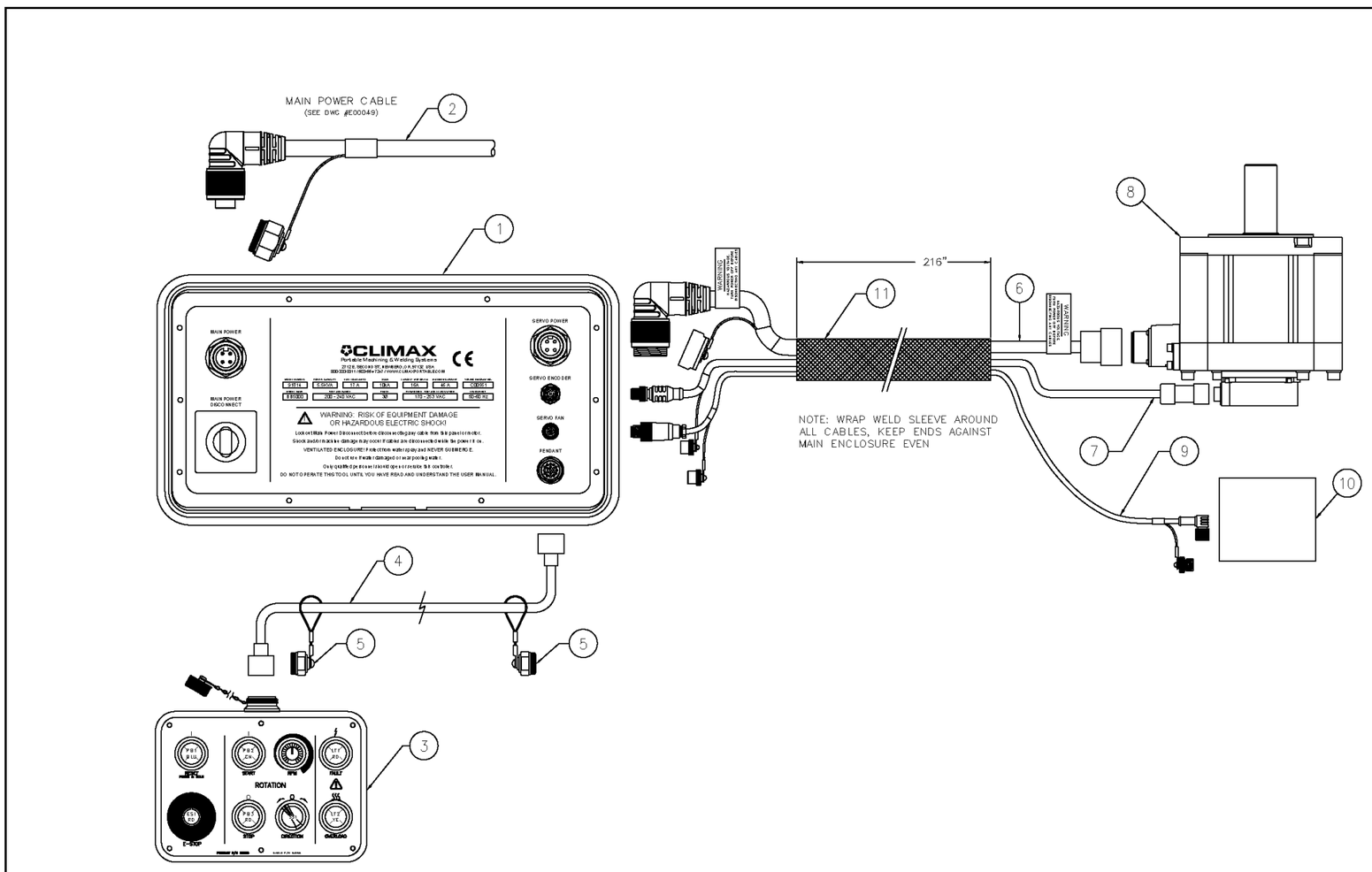
ADDITIONAL INFORMATION AND SPECIFICATIONS REQUIRED TO MANUFACTURE THIS PART ARE PROVIDED IN CLIMAX SPEC. P100
DRAWN: RG DATE: 6/1/18
CHECKED: DATE
APPROVED: DATE
CAD/CAM STD 4

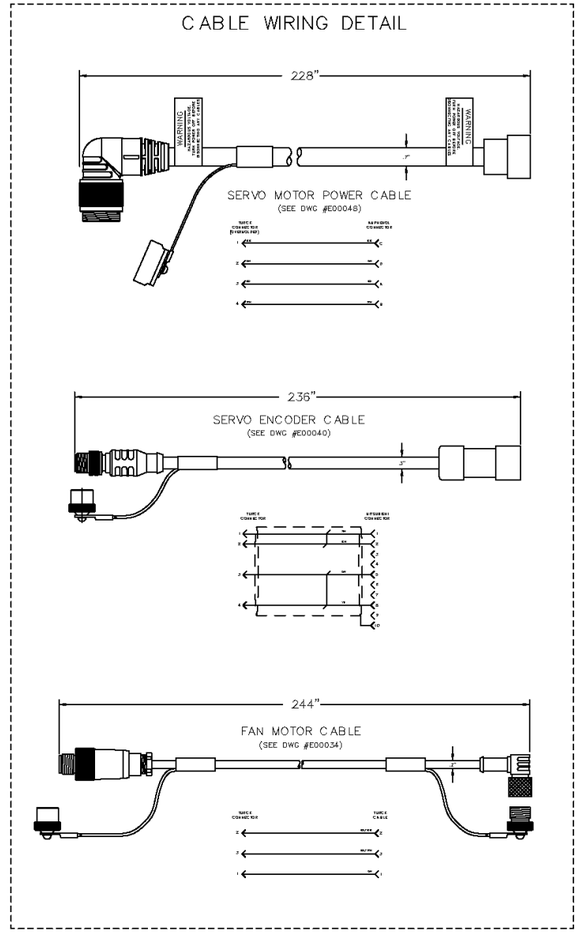
CLIMAX Portable Machining & Welding Systems

ASSY BB5000 Servo Controller
GEN 3 w/MR-J4 - 460VAC CE

SIZE B | CAGE CODE 15509 | DWG NO. A00099 | REVISION A
SCALE NONE | 91811 | SHEET 1 OF 1

FIGURE C-18. BB5000 SERVO CONTROLLER 3RD GEN 460VAC CE ASSEMBLY (P/N A00099)





11	216	56269	INCHES, WELD SLEEVE	SUBURBAN MFG SL-1-010411
10	1	56774	FAN MOTOR	PROVIDED BY CMT
9	1	57016	ASSY CABLE BB5000 - FAN MOTOR POWER	Automation Solutions E00034
8	1	91717	SERVO MOTOR 3.5 kW 2000 RPM 200V	MITSUBISHI HG-SR152X
7	1	64425	ASSY CABLE BB5000 - SERVO ENCODER	Automation Solutions E00040
6	1	66909	ASSY CABLE BB5000 - SERVO MOTOR POWER	Automation Solutions E00048
5	2	52196	CLOSURE CAP	TUNCK CS-OC
4	1	53266	CORDSET BB5000 OPERATOR PENDANT CABLE	TUNCK CSMS-03M5-15-191-S
3	1	53263	ASSY OPERATOR PENDANT BB5000 SERVO DRIVE	Automation Solutions E00024
2	1	66908	ASSY CABLE BB5000 - INCOMING POWER	Automation Solutions E00049
1	1	91814	ASSY CONTROLLER SERVO DRIVE BB5000 230/3/50-60 CE 3RD GEN	Automation Solutions E00406

BILL OF MATERIALS

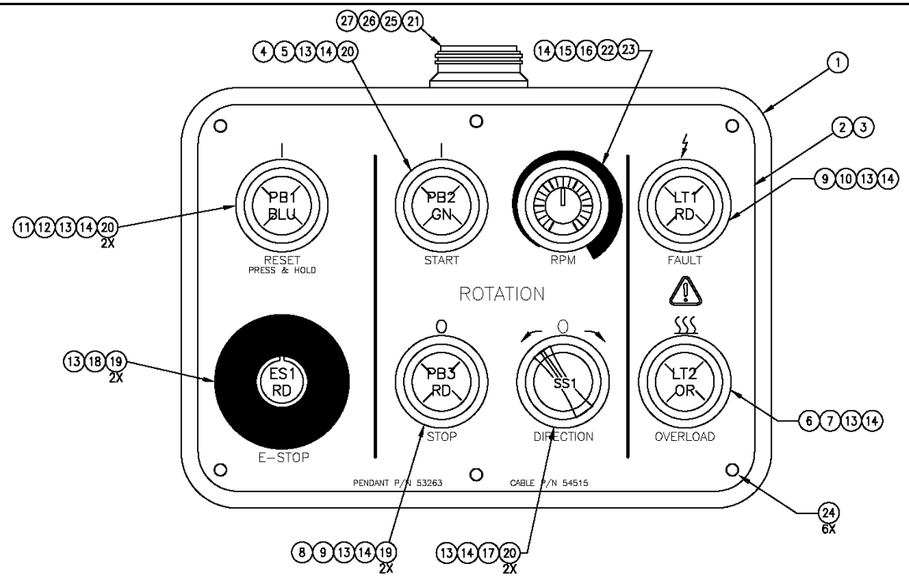
PROJECT DRAWINGS	DRAWING #	CLIMAX PART #	NOTES
TOP LEVEL ASSEMBLY	A00100	91812	*
SCHEMATIC	C00551	91812	*
LAYOUT: CONTROL PANEL	B00406	91814	*
LAYOUT: PENDANT	B00024	53263	*
LAYOUT: MISC	D00014	91814	WIRING DIAGRAM
CABLE ASSY 1	E00040	64425	SERVO ENCODER CABLE
CABLE ASSY 2	E00048	*	SERVO MOTOR CABLE
CABLE ASSY 3	E00049	*	MAIN POWER CABLE
CABLE ASSY 4	E00034	57016	FAN MOTOR CABLE

EXCEPT AS NOTED, DIMENSIONS ARE IN INCHES PER ASME Y14.5
.X ± .010
.XX ± .010
.XXX ± .005
ANGLES ± 1°
MATERIAL
COSMETIC CLASS EXCEPT AS NOTED A

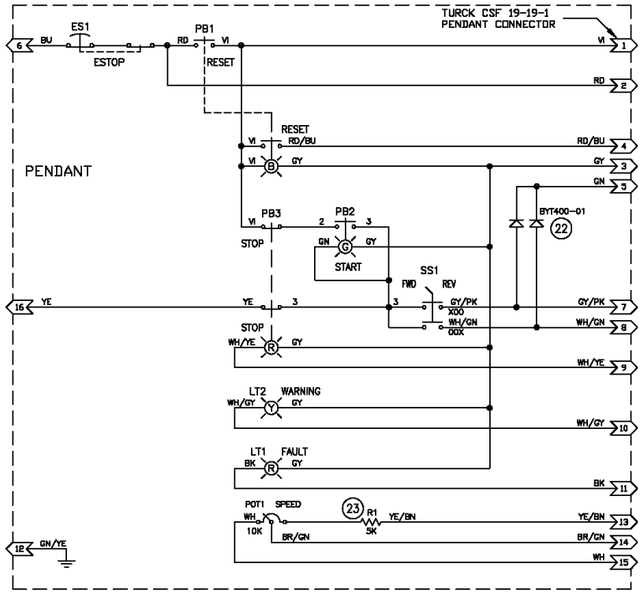
CLIMAX
Portable Machining & Welding Systems
ASSY BB5000 Servo Controller
GEN 3 w/MR-J4 - 230VAC CE
SIZE B | CAGE CODE 15509 | DWG NO A00100 | REVISION A
SCALE NONE | 91812 | SHEET 1 OF 1

FIGURE C-19. BB5000 EIBENSTOCK CONTROLLER 2ND GEN 120V DOMESTIC ASSEMBLY (P/N A00100)

ДЛЯ ЗАЯВОК: info@climax-stanki.ru
https://www.climax-stanki.ru



SCHEMATIC



ITEM	QTY	P/N	DESCRIPTION	MFR MFG P/N
28	1	*	LEGEND PLATE CLIMAX LOGO FOR EXTERIOR OF ENCLOSURE	ACCENT SIGNS F00004
27	1	*	CONNECTOR CLOSURE CAP	TURCK CK-CC
26	2	*	BUTTON HEAD SOCKET SCREW, 10-32 x 1/2", 18-8 SS	MCMASTER CARR 92949A252
25	1	*	RECEPTACLE REINFORCEMENT PLATE, M20	AUTOMATION SOLUTIONS K00002
24	6	*	6-19 HIGH LOW THREAD FORMING SCREW	MCMASTER CARR 97975A252
23	1	*	RESISTOR, 5K 3 OHM	ALLIED 652-4534
22	1	*	ABS KNOB FOR POTENTIOMETER, ALL 543-1105	DAVIES MOLDING 1192
21	1	*	PANEL MOUNT CONNECTOR, 20 PIN	TURCK CSF 19-19-1
20	5	38050	CONTACT BLOCK 1 N.O.	TELEMECANIQUE ZBE101
19	4	38051	CONTACT BLOCK 1 N.C.	TELEMECANIQUE ZBE102
18	1	*	PUSHBUTTON OPERATOR PUSH-TWIST 22mm	IDEC XAGE-3V402-R
17	1	38042	SELECTOR SWITCH OP 3 POS M-M-M 22mm	TELEMECANIQUE ZB4BD9
16	1	38041	POTENTIOMETER 10K OHMS .25 x 2" SHAFT	CLAROSTAT 53CL10K
15	1	38045	POTENTIOMETER OPERATOR (W/O POT).25 SHAFT 22mm	TELEMECANIQUE ZB4BD902
14	7	*	MOUNTING BASE FLUSH MOUNT ADAPTER	TELEMECANIQUE ZB4BZ101
13	7	38048	MOUNTING COLLAR W/O CONTACTS 22MM	TELEMECANIQUE ZB4BZ009
12	1	46421	PILOT LIGHT MODULE BLUE LED 24V AC/DC	TELEMECANIQUE ZBVB6
11	1	40167	PUSHBUTTON OP FLUSH ILL BLUE 22mm	TELEMECANIQUE ZB4BW363
10	1	*	PILOT LIGHT OPERATOR, RED (CHROME) 22mm	TELEMECANIQUE ZB4BV43
9	2	*	PILOT LIGHT MODULE RED LED 24V AC/DC 22mm	TELEMECANIQUE ZBVB4
8	1	*	PUSHBUTTON, EXTENDED LIGHTED RED	TELEMECANIQUE ZB4BW343
7	1	*	PILOT LIGHT MODULE ORANGE 24V AC/DC 22mm	TELEMECANIQUE ZBVB8
6	1	*	PILOT LIGHT OPERATOR, ORANGE (CHROME) 22mm	TELEMECANIQUE ZB4BV53
5	1	46422	PILOT LIGHT MODULE 24V AC/DC GREEN LED 22mm	TELEMECANIQUE ZBVB3
4	1	40171	PUSHBUTTON, LIGHTED GREEN	TELEMECANIQUE ZB4BW333
3	1	56033	LEGEND PLATE BB5000 SERVO CONTROLLER PENDANT	ACCENT SIGNS F00002 (56033)
2	1	-	FRONT PANEL	LASER CUTTING SERV. H00002-A
1	1	-	ENCLOSURE 7.45 X 8.70 X 3.89	BEAVERSE SZ-1210

PARTS LIST

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

MATERIAL

COSMETIC CLASS A

ADDITIONAL INFORMATION AND SPECIFICATIONS REQUIRED TO MANUFACTURE THIS PART ARE PROVIDED IN P100

DRAWN: K. POWERS 02/18/09 DATE
CHECKED: DATE
MFG: DATE
ENG APPROVAL: D. BRIGGS 3/16/09 DATE
CAD/CAM STD 4-3D

CLIMAX Portable Machine Tools
Newberg, Or. USA 97132

PENDANT 53263 ASSEMBLY
BB5000 SERVO DRIVE

SIZE D | CAGE CODE 15509 | DWG NO. B00024 | REVISION B

FIGURE C-20. BB5000 SERVO PENDANT ASSEMBLY (P/N B00024)

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APPENDIX D SERVO CONTROLS ADJUSTMENT

This procedure applies only to the BB5000 servo controls (MR-J3), for the purpose of manually adjusting the parameter in order to reset the motor zero speed.

When a new servo amplifier has been installed and the motor does not stop when the speed control knob is turned to zero, do the following:

1. Carefully connect the system components (such as the pendant cable and pendant, motor cables, and servo motor).
2. Remove the top cover of the main control box.

NOTICE

Leave the servo motor assembly on the ground or work bench. Do not install it on the boring bar.

3. Connect the main control box to power and turn on the system.
4. Select the rotation direction for the motor and press the START button.
5. Increase the motor speed to full speed by turning the speed knob clockwise on the operator pendant.
6. Reduce speed to zero by turning the knob fully counter-clockwise.
7. Open the cover to access the function keys on the servo amp. See Figure D-1.
8. Press the mode button repeatedly until the display reads P .C01.
9. Press the UP button repeatedly until the display reads P .C37.

FIGURE D-1. SERVO AMP FUNCTION KEYS

10. Press the SET button twice. The current setting for P .C37 will be flashing. Adjust up or down by 4 points, then press the SET button once more.
11. Recheck the motor speed with the speed control knob set to zero.
    - If the motor shaft is not moving and the stop button on the pendant is illuminated, no further adjustment is necessary.
    - If the motor is still moving slowly in either direction, repeat step 5 in small increments until the motor remains stopped when the speed control is turned down to zero. The final setting on the display may be as much as ±12 when the motor finally stops with the speed control knob turned to zero.
12. Switch off the mains power and secure the top plate of the main control box by reinstalling the screws.

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APPENDIX E SDS

Contact CLIMAX for the current Safety Data Sheets.

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