MODEL 672
SEMI-AUTOMATIC
BEDKNIFE GRINDER

SERVICE
MANUAL

⚠ WARNING

You must thoroughly read and understand this manual before assembling or maintaining the equipment, paying particular attention to the Warning & Safety instructions.

6727952 (7-16)

IMPORTANT SAFETY MESSAGE

As manufacturers of sharpening equipment, we want to confirm to you, our customers, our concern for safety. We also want to remind you about the simple, basic, and common sense rules of safety when using this equipment. Failure to follow these rules can result in severe injury or death to operators or bystanders.

It is essential that everyone involved in the assembly, operation, transport, maintenance, and storage of this equipment be aware, concerned, prudent, and properly trained in safety. Always use proper shielding and personal protective equipment as specified by the manufacturer.

Our current production machines include, as standard equipment, guards or shields for the grinding wheel, safety signs, and operators and service manuals. Never bypass or operate the machine with any of the guards or safety devices removed or without the proper personal safety equipment.

Read and fully understand all the safety practices discussed in this manual and the Operator's Manual . All safety rules must be understood and followed by anyone who works with knife grinders.

Before operating this grinder, an operator must read and understand all of the information in the Operator's Manual and understand all of the safety signs attached to the product. A person who has not read or understood the Operator's Manual and safety signs is not qualified to operate the unit. Accidents occur often on machines that are used by someone who has not read the Operator's Manual and is not familiar with the equipment. If you do not have an Operator's Manual or current production safety signs, contact the manufacturer or your dealer immediately.

The equipment is designed for one-man operation. Never operate the equipment with anyone near, or in contact with, any part of the grinder. Be sure no one else, including bystanders, are near you when you operate this product.

Follow these simple, basic safety rules, as well as others, including:

- Find and understand all safety signs in the Operator's Manual and on the equipment. This will help minimize the possibility of accidents and increase your productivity in using this product.
- Be careful and make sure that everyone who operates the grinder knows and understands that it is a very powerful piece of machinery, and if used improperly, serious injury or death may result. The final responsibility for safety rests with the operator of this machine.

Throughout this manual, the following safety symbols will be used to indicate the degree of certain hazards.

This symbol is used throughout this manual to call attention to the safety procedures.

DANGER **The word DANGER indicates an immediate hazardous situation, which if not avoided, will result in death or serious injury.**

WARNING **The word WARNING indicates a potential hazardous situation, which if not avoided, could result in death or serious injury.**

CAUTION **The word CAUTION preceeded with a safety alert symbol indicates a potential hazardous situation which, if not avoided, may result in minor or moderate injury.**

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Read the Operator's Manual before operating this equipment. Keep this manual handy for ready reference. Require all operators to read this manual carefully and become acquainted with all adjustments and operating procedures before attempting to operate the equipment. Replacement manuals can be obtained from your selling dealer or the manufacturer.

The equipment you have purchased has been carefully engineered and manufactured to provide dependable and satisfactory use. Like all mechanical products, it will require cleaning and upkeep. Lubricate and clean the unit as specified in the Operator's Manual. Please observe all safety information in this manual, the Operators Manual, and the safety decals on the equipment.

This machine is designed for sharpening the bedknives used on reel type mower cutting units ONLY. Any use other than this may cause personal injury and void the warranty.

To assure the quality and safety of your machine and to maintain the warranty, you MUST use original equipment manufacturer's replacement parts and have any repair work done by a qualified professional.

ALL operators of this equipment must be thoroughly trained BEFORE operating the equipment.

Do not use compressed air to clean grinding dust from the machine. This dust can cause personal injury as well as damage to the grinder.

INSTALLATION, DAILY MAINTENANCE, AND BASIC UPKEEP IS DISCUSSED IN THE OPERATOR'S MANUAL. THIS MANUAL SHOULD BE USED IN CONJUNCTION WITH THE OPERATOR'S MANUAL FOR PERFORMING SERVICE ON THIS EQUIPMENT.

SAFETY INSTRUCTIONS

⚠ WARNING

Safety Awareness Symbols **are inserted into this manual to alert you to possible** ***Safety Hazards*****. Whenever you see these symbols, follow their instructions.**

1. **KEEP GUARDS IN PLACE** and in working order.
2. **REMOVE WRENCHES AND OTHER TOOLS.**
3. **KEEP WORK AREA CLEAN.**
4. **DON'T USE IN DANGEROUS ENVIRONMENT.** Don't use Grinder in damp or wet locations. Machine is for indoor use only. Keep work area well lit.
5. **KEEP ALL VISITORS AWAY.** All visitors should be kept a safe distance from work area.
6. **MAKE WORK AREA CHILD-PROOF** with padlocks or master switches.
7. **DON'T FORCE THE GRINDER.** It will do the job better and safer if used as specified in this manual.
8. **USE THE RIGHT TOOL.** Don't force the Grinder or an attachment to do a job for which it was not designed.
9. **WEAR PROPER APPAREL.** Wear no loose clothing, gloves, neckties, or jewelry which may get caught in moving parts. Nonslip footwear is recommended. Wear protective hair covering to contain long hair.
10. **ALWAYS USE SAFETY GLASSES.**
11. **SECURE YOUR WORK.** Make certain that the bedknife is securely fastened with the electromagnets provided before operating.
12. **DON'T OVERREACH.** Keep proper footing and balance at all times.
13. **MAINTAIN GRINDER WITH CARE.** Follow instructions in Service Manual for lubrication and preventive maintenance.
14. **DISCONNECT POWER BEFORE SERVICING.**
15. **REDUCE THE RISK OF UNINTENTIONAL STARTING.** Make sure the switch is OFF before plugging in the Grinder.
16. **USE RECOMMENDED ACCESSORIES.** Consult the manual for recommended accessories. Using improper accessories may cause risk of personal injury.
17. **CHECK DAMAGED PARTS.** A guard or other part that is damaged or will not perform its intended function should be properly repaired or replaced.
18. **KNOW YOUR EQUIPMENT.** Read this manual carefully. Learn its application and limitations as well as specific potential hazards.
19. **KEEP ALL SAFETY DECALS CLEAN AND LEGIBLE.** If safety decals become damaged or illegible for any reason, replace immediately. Refer to replacement parts illustrations in Service Manual for the proper location and part numbers of safety decals.
20. **DO NOT OPERATE THE GRINDER WHEN UNDER THE INFLUENCE OF DRUGS,** ALCOHOL, OR MEDICATION

⚠ WARNING **IMPROPER USE OF GRINDING WHEEL MAY CAUSE BREAKAGE AND SERIOUS INJURY.**

Grinding is a safe operation if the few basic rules listed below are followed. These rules are based on material contained in the ANSI B7.1 Safety Code for "Use, Care and Protection of Abrasive Wheels". For your safety, we suggest you benefit from the experience of others and carefully follow these rules.

DO

1. **DO** always **HANDLE AND STORE** wheels in a **CAREFUL** manner.
2. **DO VISUALLY INSPECT** all wheels before mounting for possible damage.
3. **DO CHECK MACHINE SPEED** against the established maximum safe operating speed marked on wheel.
4. **DO CHECK MOUNTING FLANGES** for equal and correct diameter.
5. **DO USE MOUNTING BLOTTERS** when supplied with wheels.
6. **DO** be sure **WORK REST** is properly adjusted.
7. **DO** always **USE A SAFETY GUARD THAT COVERS** at least one-half of the grinding wheel.
8. **DO** allow **NEWLY MOUNTED WHEELS** to run at operating speed, with guard in place, for at least one minute before grinding.
9. **DO** always **WEAR SAFETY GLASSES** or some type of eye protection when grinding.
10. **DO TURN OFF COOLANT** before stopping to avoid creating an out-of-balance condition.

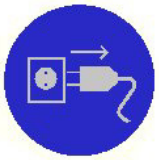
DON'T

1. **DON'T** use a cracked wheel or one that **HAS BEEN DROPPED** or has become damaged.
2. **DON'T FORCE** a wheel onto the machine **OR ALTER** the size of the mounting hole. If a wheel won't fit the machine, get one that will.
3. **DON'T** ever **EXCEED MAXIMUM OPERATING SPEED** established for the wheel.
4. **DON'T** use mounting flanges on which the bearing surfaces **ARE NOT CLEAN, FLAT AND FREE OF BURRS.**
5. **DON'T TIGHTEN** the mounting nut **EXCESSIVELY.**
6. **DON'T** grind on the **SIDE OF THE WHEEL** (see Safety Code B7.2 for exception).
7. **DON'T** start the machine until the **WHEEL GUARD IS IN PLACE.**
8. **DON'T JAM** work into the wheel.
9. **DON'T STAND DIRECTLY IN FRONT** of a grinding wheel whenever a grinder is started.
10. **DON'T FORCE GRINDING** so that motor slows noticeably or the work gets hot.

⚠ WARNING

AVOID INHALATION OF DUST generated by grinding and cutting operations. Exposure to dust may cause respiratory ailments. Use approved NIOSH or MSHA respirators, safety glasses or face shields, and protective clothing. Provide adequate ventilation to eliminate dust, or to maintain dust level below the Threshold Limit Value for nuisance dust as classified by OSHA.

⚠ WARNING



UNPLUG THE EQUIPMENT PRIOR TO DOING ANY SERVICE ON THIS EQUIPMENT. FAILURE TO REMOVE POWER TO THIS EQUIPMENT BEFORE SERVICING MAY RESULT IN INJURY OR DEATH.

IF POWER IS REQUIRED FOR TESTING OR TROUBLESHOOTING, THIS SHOULD BE PERFORMED BY A TRAINED PROFESSIONAL OR LICENSED ELECTRICIAN.

REVIEW THE SYMBOLS AND DESCRIPTIONS ON PAGES 10 AND 11 OF THE OPERATOR'S MANUAL. UNDERSTAND ALL SYMBOLS BEFORE OPERATING OR SERVICING THIS EQUIPMENT.

This is the electrical hazard symbol. It indicates that there are **DANGEROUS HIGH VOLTAGES PRESENT** inside the enclosure of this product. TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, do not attempt to open the enclosure or gain access to areas where you are not instructed to do so. **REFER SERVICING TO QUALIFIED SERVICE PERSONNEL ONLY.**

IMPORTANT GROUNDING INSTRUCTIONS

If electrical testing is required, alway verify the machine has a proper ground before performing any tests.

In case of a malfunction or breakdown, grounding reduces the risk of electrical shock by providing a path of least resistance for electrical current.

This grinder has an electrical cord with an equipment grounding conductor and a grounding plug. The plug must be plugged into a matching outlet that is properly installed and grounded according to all local or other appropriate electrical codes and ordinances.

Before plugging in the grinder, make sure it will be connected to a supply circuit protected by a properly sized circuit breaker or fuse. SEE SERIAL NUMBER PLATE FOR FULL LOAD AMP RATING OF YOUR MACHINE.

Never modify the plug provided with the machine--if it won't fit the outlet, have a proper outlet and circuit installed by a qualified electrician.

⚠ WARNING

ALWAYS PROVIDE A PROPER ELECTRICAL GROUND FOR YOUR MACHINE. AN IMPROPER CONNECTION CAN CAUSE A DANGEROUS ELECTRICAL SHOCK. IF YOU ARE UNSURE OF THE PROPER ELECTRICAL GROUNDING PROCEDURE, CONTACT A QUALIFIED ELECTRICIAN.

SKILL AND TRAINING REQUIRED FOR SERVICING

This Service Manual is designed for technicians who have the necessary mechanical and electrical knowledge and skills to reliably test and repair the Bedknife Grinder. For those without that background, service can be arranged through a local distributor.

This manual presumes that you are already familiar with the normal operation of the grinder. If not, you should read the Operator's Manual or do the servicing in conjunction with someone who is familiar with its operation.

PERSONS WITHOUT THE NECESSARY KNOWLEDGE AND SKILLS SHOULD NOT OPEN THE CONTROL BOX OR ATTEMPT ANY INTERNAL TROUBLESHOOTING, ADJUSTMENTS, OR PARTS REPLACEMENT.

If you have questions not answered in this manual, please call your distributor.

⚠ WARNING

TORQUE REQUIREMENTS

Throughout this manual we refer to torque requirements as "firmly tighten" or the like. For more specific torque values, refer to the information below.

Bolts going into a Nut or into a Threaded Hole in Steel.
Refer to table at the right.

Bolts going into a Threaded Hole in Aluminum.
Use the Grade 2 values in the table at the right.

Socket-Head Screws
Use the Grade 8 values in the table at the right.

Machine Screw
No. 6 Screws: 11 in.-lbs [0.125 kg-m]
No. 8 Screws: 20 in.-lbs [0.23 kg-m]
No. 10 Screws:32 in.-lbs [0.37kg-m]

	GRADE 2  SMOOTH HEAD	GRADE 5  3 MARKS on HEAD	GRADE 8  6 MARKS on HEAD
1/4 In. thread	6 ft-lbs (0.8 kg-m)	9 ft-lbs (1.25 kg-m)	13 ft-lbs (1.8 kg-m)
5/16 In. thread	11 ft-lbs (1.5 kg-m)	18 ft-lbs (2.5 kg-m)	28 ft-lbs (3.9 kg-m)
3/8 In. thread	19 ft-lbs (2.6 kg-m)	31 ft-lbs (4.3 kg-m)	46 ft-lbs (6.4 kg-m)
7/16 In. thread	30 ft-lbs (4.1 kg-m)	50 ft-lbs (6.9 kg-m)	75 ft-lbs (10.4 kg-m)
1/2 In. thread	45 ft-lbs (6.2 kg-m)	75 ft-lbs (10.4 kg-m)	115 ft-lbs (15.9 kg-m)

LUBRICATION OF LINEAR BEARINGS

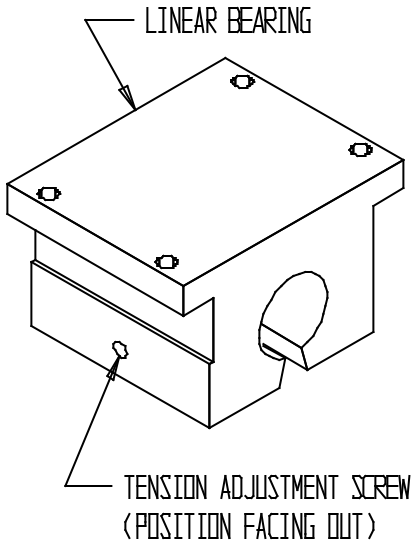


FIG. 1

STEP 1--Thoroughly clean the shafts.

STEP 2--Flood spray the two shafts with a spray lubricant **(do not use a teflon based lubricant)** until the lubricant is dripping off the shafts. Then run the carriage back and forth through its full range of travel. This will carry the lubricant into the bearings.

STEP 3--With a clean rag, wipe off the excess amount of lubricant from the shafts. Run the carriage back and forth through its full range of travel and wipe the shafts after each traverse. Repeat until the shafts are dry to the feel. This completes the lubrication process.

If the unit will be shut down for an extended period of time, more than four weeks, then the shafts and other appropriate parts of the unit should be flooded with lubricant. That lubricant should be left in place until the unit is brought back into service. When the unit is brought back into service the full lubrication procedure, as stated above, should be repeated.

TESTING FOR PLAY IN THE BEARINGS USING THE BEARING TESTER FORK

The traverse bearings on this grinder tend to wear and typically last around 3-6 years. If you believe your bearings are still in good working condition they may be tested and adjusted on the machine using the bearing tester fork and a dial indicator. If you do not have a dial indicator you may purchase a dial indicator kit (part no. 3706060) designed to be used with the bearing tester fork. If the bearings are being replaced follow the proceedures on the next page. The tester fork may be used at a later date to adjust the bearings in place if needed.

TESTING PROCEDURE:

1. Position the dial indicator assembly on the machine grinding head assembly next to the bearing to be tested. Remove the bellows if the machine has them installed. The dial indicator should be within 1" of the side of the grinding head carriage directly above the bearing being tested. It is best to measure to the traverse shaft with a wide flat tip.

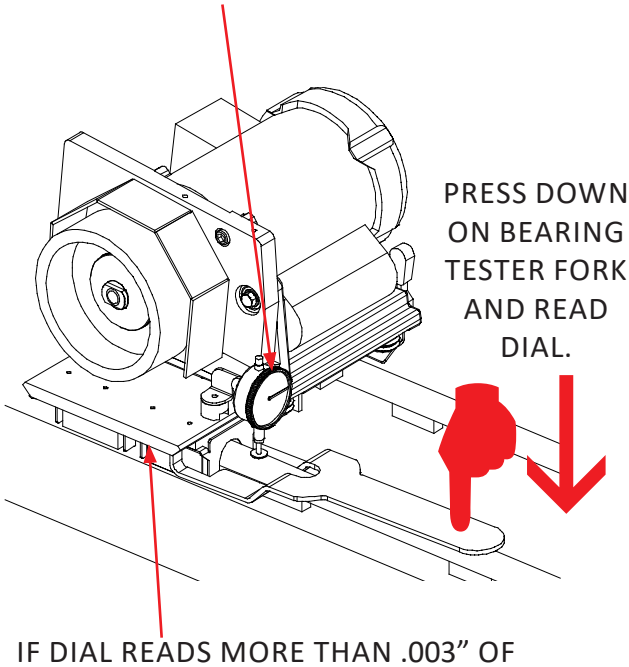
2. Insert the bearing testing fork 3706055 until the fork contacts the wiper bracket or the bearing.

3. With the tip of the dial indicator on the traverse shaft zero out the dial indicator.

4. Use your hand and press on the end of the bearing tester fork until it contacts the traverse rail. See FIG. 2. Read the movement on the dial indicator. If the movement exceeds .003” the bearing needs to be adjusted. Retest the bearing after adjusting the tension on the bearing. If the bearing does not improve to below the .003” reading then the bearing needs to be replaced.

Repeat steps 1-4 for the other other bearings on the located installed on the carriage.

DIAL INDICATOR MUST BE POSITIONED OVER THE BEARING BEING TESTED AND LOCATED WITHIN 1" OF THE SIDE OF THE CARRIAGE BASE.



IF DIAL READS MORE THAN .003” OF MOVEMENT, ADJUST BEARING TENSION USING THE BEARING TENSION SCREW. SEE FIG 2.

FIG. 2

CARRIAGE LINEAR BEARING REPLACEMENT

1. Remove the optional carriage bellows (if used) from the carriage.

2. Remove the four screws of one linear bearing and slide the linear bearing off the end of the carriage shaft.

3. Insert a new linear bearing onto the end of the carriage shaft with the tension adjustment screw pointing outward. See FIG. 3.

4. Adjust the tension screw of the linear bearing so when you radially rotate the linear bearing around the carriage shaft there should be no free play between the linear bearing and the carriage shaft.

   NOTE: The tension is too tight if you feel a cogging action when you rotate the linear bearing around the shaft. This cogging is from the skidding of the bearing on the shaft and indicates the tension screw is too tight. Sliding the bearing block back and forth should be a smooth uniform motion.

5. Slide the linear bearing under carriage and attach with the four screws.

Repeat Steps 2 through 5 with the other two linear bearings.

6. After all three linear bearings are secured to the carriage, you may check for correct bearing tension using the bearing tester fork as described on the previous page. Also, pulling the carriage in the traversing direction should require approximately three pounds of force (with the belt clamp disengaged). To double check the assembly, slide the carriage from "end of travel" to "end of travel". The carriage should have very uniform resistance through its full range of motion.

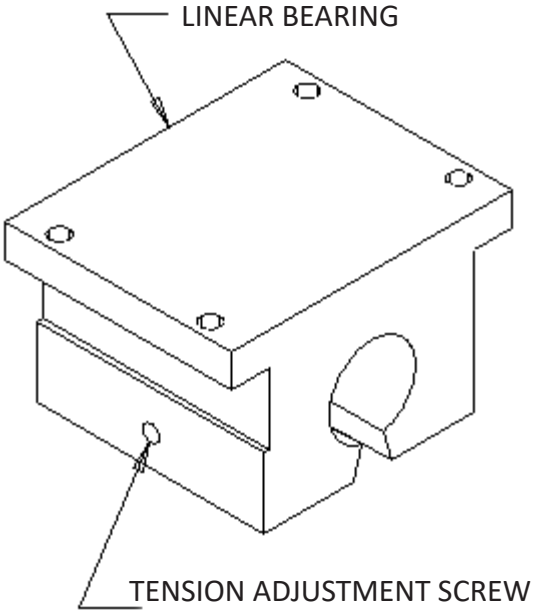


FIG. 3

SETTING THE BEARING TENSION CORRECTLY IS CRITICAL TO PROPER GRINDING. BEARINGS WHICH ARE TOO TIGHT OR TOO LOOSE WILL CAUSE POOR GRIND QUALITY. ALSO, BEARINGS WHICH ARE TOO TIGHT WILL HAVE SUBSTANTIALLY SHORTER LIVES AND MAY DAMAGE THE SHAFT.

MAGNET REPAIR ASSEMBLY

If a magnet is damaged or fails on your 673 ACCU-Pro Bedknife Grinder or if the linear bearing fails, follow the detailed instructions below:

1. Contact the Foley United Customer Service Department at 800-225-9810 and get a Return Goods Authorization (RGA) number. Your Repair Part No. is 6729510, Magnet Repair Assembly - INA.

   This Repair Assembly part number includes the labor to regrind the magnet set, but does not include replacement parts. When the magnet assemblies are returned to Foley United, we test the magnets. Foley United Customer Service Department will then contact you with a list of parts that are required to repair your magnet assemblies. Then we will install the new parts and regrind both magnets on our production fixture. The magnet assemblies are then retested and returned to you for reinstallation.

   Please provide your grinder serial number and all contact information for communication on the repairs. Your grinder has an INA linear bearing that uses a shipping guide. This shipping guide was included in your product packet assembly. IF YOU DO NOT HAVE THE SHIPPING GUIDE YOU MUST CALL THE FACTORY AND HAVE ONE SENT TO YOU BEFORE YOU ATTEMPT TO REMOVE THAT BEARING. To use the shipping guide you must perfectly align the bearing shipping guide to the profile rail and slide the bearing off the profile rail and immediately onto the bearing shipping guide.

2. Disconnect the electrical wiring for both electromagnets and coil up the wire next to the electromagnets. Remove the left side fixed magnet assembly.

3. Drive down the two roll pins and remove the four attaching screws, saving the screws. Remove the right side moveable magnet assembly. Remove both bellows and the lock block, saving all fasteners. Great care must be taken when removing the moveable magnet assembly from the profile rail. See the warning above.

4. See FIG. 4 which illustrates which parts to return to Foley United. Make certain the bearing shipping guide is in place and then wrap the assembly in heavy paper and tape. Package the two magnet assemblies in a very sturdy shipping container with adequate filler material around and between the magnet assemblies. Note: the magnet assemblies weigh approximately 30 lbs. each and have sharp edges. Make sure to package accordingly.

   NOTE: INADEQUATE PACKAGING MAY CAUSE SHIPPING DAMAGE TO THE MAGNETS AND REQUIRE REPLACEMENT OF ONE OR BOTH MAGNETS.

5. To reinstall the left magnet assembly, reinstall with four screws just snugged up, then drive the two new roll pins supplied to you in the return package. Then tighten the four mounting screws.

6. To reinstall the right magnet assembly, slide the linear bearing onto the profile rail. Again, the installation of the INA bearing is critical. You must slide the bearing off the bearing shipping guide and onto the profile rail with perfect alignment between the guide and the rail, or bearing damage will result.

7. Once the bearing is successfully on the profile rail, pump three pumps of grease from a standard grease gun into the bearing. Wipe off any excess grease that is visible. Then remove the grease fitting and install the plug supplied to you in the return package. The plug must be seated below the surface of the bearing.

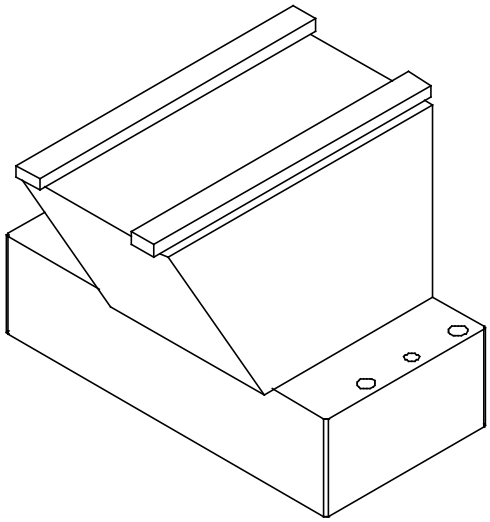
Continued on next page.

8. Now reinstall the lock block and bellows using the saved fasteners. The screw indicated in FIG. 4 must be left installed in both sides of the INA bearing or the bearing will come apart. The lock block and bellows are designed to use the remaining three screws on the INA bearing for each side for attachment, avoiding the retained screw in the bearing.

9. Reconnect and reattach the wiring for both magnets. Replacement cable ties are supplied to you in the return package. Your grinder should now be operational.

NOTE: FAILURE TO USE THE INA BEARING SHIPPING GUIDE WILL DAMAGE THE BEARING AND REQUIRE YOU TO PURCHASE A REPLACEMENT BEARING.

LEFT SIDE BEARING ASSEMBLY



RIGHT SIDE BEARING ASSEMBLY

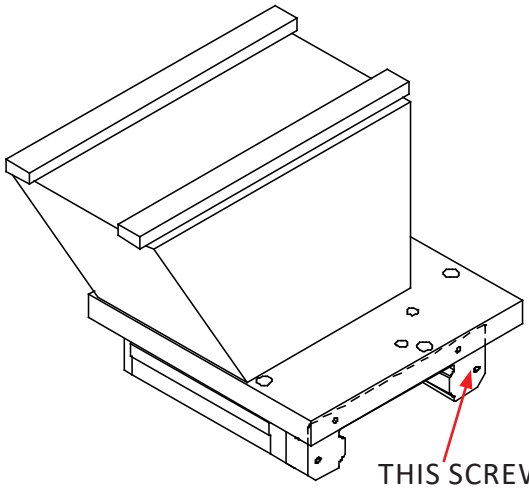


FIG. 4

CLEANING AND MAINTENANCE GUIDELINES FOR POLYCARBONATE WINDOWS

Adherence to regular and proper cleaning procedures is recommended to preserve appearance and performance. DO NOT USE GASOLINE to clean polycarbonate windows!

WASHING TO MINIMIZE SCRATCHING

Wash polycarbonate windows with a mild dish-washing liquid detergent and lukewarm water, using a clean soft sponge or a soft cloth. Rinse well with clean water. Dry thoroughly with a moist cellulose sponge to prevent water spots. Do not scrub or use brushes on these windows. Also, do not use butyl cellosolve in direct sunlight.

Fresh paint splashes and grease can be removed easily before drying by rubbing lightly with a good grade of VM&P naphtha or isopropyl alcohol. Afterward, wash with warm water and a mild dish washing liquid detergent solution and then thoroughly rinse with clean water.

MINIMIZING HAIRLINE SCRATCHES

Scratches and minor abrasions can be minimized by using a mild automobile polish. Three such products that tend to polish and fill scratches are Johnson Paste Wax, Novus Plastic Polish #1 and #2, and Mirror Glaze Plastic Polish (M.G. M10). It is suggested that a test be made on a corner of the polycarbonate window with the product selected following the polish manufacturer's instructions.

IMPORTANT

- **DO NOT** use abrasive or highly alkaline cleaners on the polycarbonate windows.
- **Never** scrape polycarbonate windows with squeegees, razor blades or other sharp instruments.
- Benzene, gasoline, acetone or carbon tetrachloride should **NEVER** be used on polycarbonate windows.
- **DO NOT** clean polycarbonate windows in hot sun or at elevated temperatures.

GRAFFITI REMOVAL

- Butyl cellosolve, (for removal of paints, marking pen inks, lipstick, etc.)
- The use of masking tape, adhesive tape or lint removal tools works well for lifting off old weathered paints.
- To remove labels, stickers, etc., the use of kerosene, VM&P naphtha or petroleum spirits is generally effective. When the solvent will not penetrate sticker material, apply heat from a hair dryer to soften the adhesive and promote removal. **DO NOT USE GASOLINE!**

LUBRICATION FOR EXTENDED DOWN TIME/STORAGE:

If the machine will be shut down for more than one month, flood the traverse shafts and other appropriate parts with lubricant as outlined on previous page. Leave the lubricant in place until the unit will be used again. Then repeat the lubrication procedure before operating. This procedure applies to the bearing rail and bearing for the moveable right side electromagnet as well.

TO ADJUST THE PROXIMITY SWITCHES

For the proximity switches to work properly and reverse the direction of the carriage at each end of a traverse, a distance of 3/16 in. +/- 1/32 [4.75 mm +/- 0.75] must be maintained between the top of the switch and the actuator bracket on the bottom of the carriage. See FIG. 5.
To adjust the clearance, loosen one of the switch mounting nuts while tightening the other.

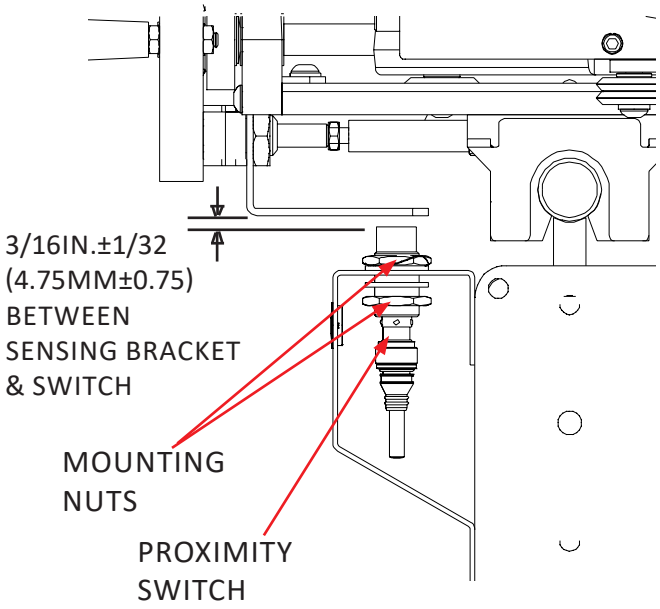


FIG. 5

TO ELIMINATE MOVEMENT IN THE DIAMOND DRESSER ADJUSTMENT COLLAR

The adjustment collar on the diamond dresser (see FIG. 6) has a nylon ball and set screw to put a holding drag on the diamond dresser shaft. If the adjustment collar is moving when not wanted or moving too freely, tighten the setscrew (this will put more load on the nylon ball). If the adjustment collar is difficult to turn, loosen the setscrew decreasing the load on the nylon ball.

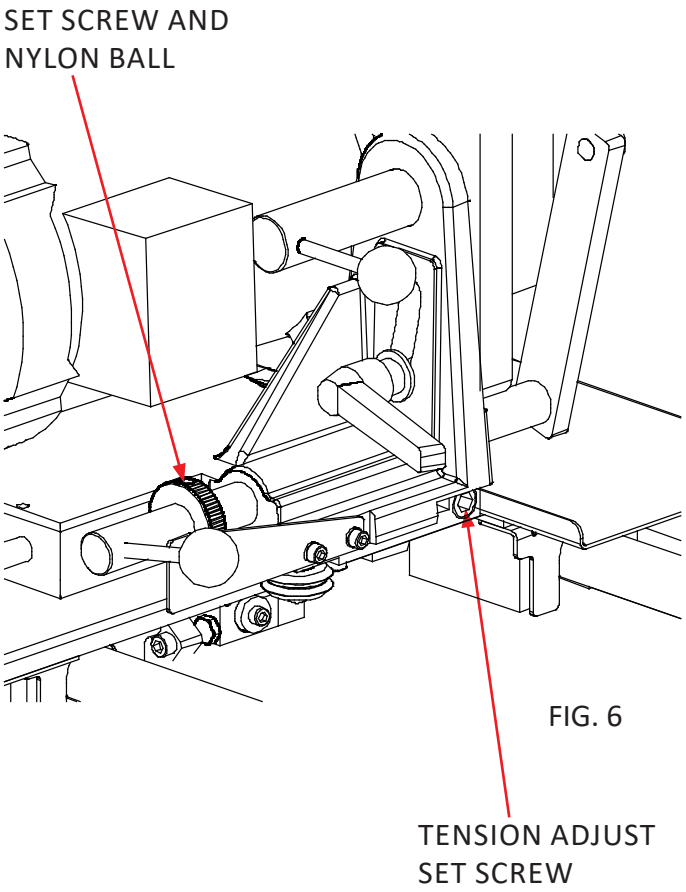


FIG. 6

ADJUSTING THE PRELOAD TENSION ON THE SMALL GRINDING HEAD SLIDE V-ROLLERS

The small grinding head slide V-rollers are positioned two fixed on the left and one adjustable on the right side. To set the correct preload on the right side adjuster, tighten the setscrew in FIG. 6 until the spring is fully compressed solid, then back off 1/2 turn.

TRAVERSE BELT TENSION

To adjust the tension on the traverse belt tighten the screws and nuts located at the right side of the traverse belt. Tighten nuts until the comprension springs measure 3/4". See FIG. 7. If the springs are not tensioned equally, uneven loading on the traverse system may cause parts to fail.

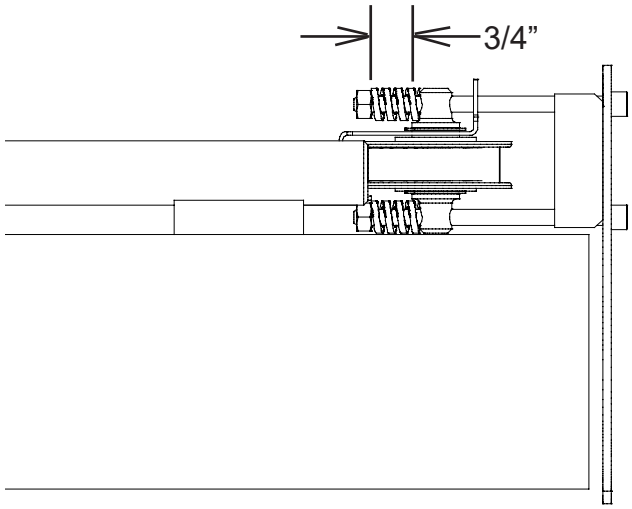


FIG. 7

DO NOT OVERTIGHTEN. OVERTIGHTENING COULD DAMAGE THE BELT OR TRAVERSE DRIVE SYSTEM.

TRAVERSE CLAMP FORCE

If the traverse clamp is slipping during regular operation it may be necessary to tighten the clamp. To tighten, loosen the jam nut and rotate the clamp tip out to adjust the position. Move the traverse belt out of the way and verify the clamped distance from the tip to the clamping block (shoe). See FIG. 8. Lock in place by tightening the jam nut against the clamp, being careful not to move the tip.

Do not set the adjustment at less than .10”. The .10” setting allows slippage in a jam situation and damage can occur if this adjustment is set to narrow.

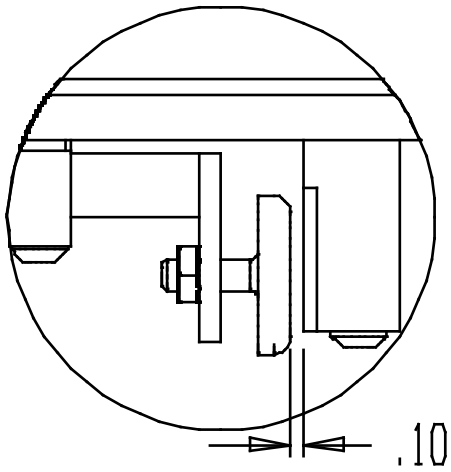


FIG. 8

CAUTION SHOULD BE USED AS ADJUSTING THE TIP WILL AFFECT THE SLIP LOAD AND COULD DAMAGE THE CLAMP TIP, BELT, OR TRAVERSE DRIVE SYSTEM.

TO ELIMINATE INFEED HANDWHEEL BACKLASH

If there is backlash in the Grinder Head Infeed handwheel (FIG. 20), there are two adjustment points on each to check:

1. Washers behind the handwheel:

A. Remove the setscrew holding the calibration ring to the handwheel.Go through the set screw hole and loosen the setscrew holding the handwheel to the shaft (about one-half turn).

B. Tighten the hex lock nut which secures the handwheel to 100 in. lbs. [1.15 kg-m], then back off 1/2 turn.

C. Check for .015 in. [.04mm] gap between the wave washer and the flat washer. See FIG. 21. Readjust the hex lock nut if necessary.

D. Tighten the setscrew holding the handwheel to the shaft. Install and tighten the calibration ring setscrew.

2. Check the nylon ball tension on the adjustment shaft threads at the grinding head slide. See FIG.20. When you turn the handwheel there should be no free play in the handwheel before the grinding head slide moves. If there is free play, tighten the setscrew that pushes the nylon ball against the acme thread of the adjustment shaft. The nylon ball preloads the free play out of the threaded joint between the adjustment shaft and the tooling bar slide block. Apply tension only enough to zero the free play. DO NOT over tension as the adjuster will be difficult to turn.

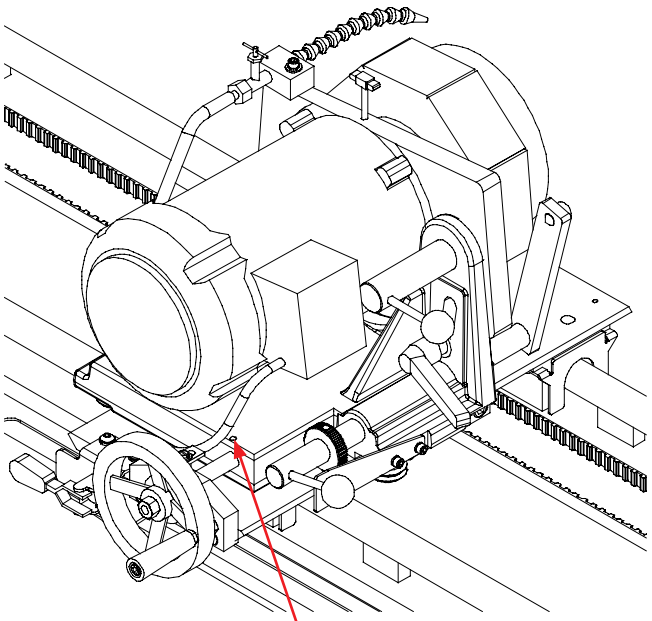


FIG. 20

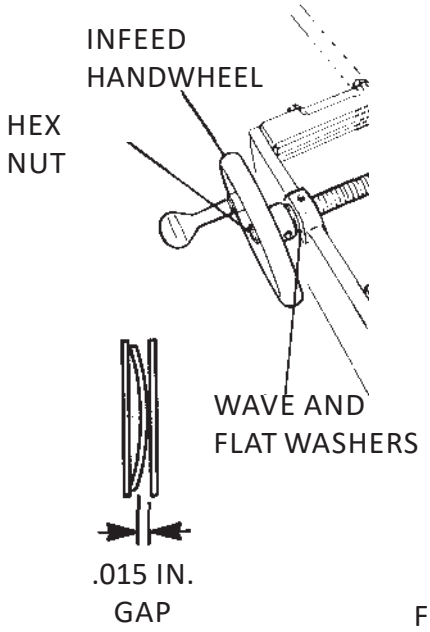


FIG. 21

TRAVERSE DRIVE CONTROL BOARD (TDC)
The Traverse Drive Control Board has nine potentiometers and four switches as shown on drawing 6734502 which is included. These potentiometers and switches have been set at the factory to the positions shown on the drawing. Also see FIG. 10 and FIG. 11.

Fwd Accel & Rev Accel---FWD ACC & REV ACC
The potentiometer is factory preset to the minimum full counterclockwise 8:30 position. This position turns the Acceleration/Deceleration off for this application.

Maximum Speed---MAX SPD
The maximum speed potentiometer is preset to position for 90 Volts DC output to the traverse motor at terminals A1 and A2.

IR Compensation---IR COMP
The IR Comp control is preset to 3:00 position. Never adjust past the 4:30 position.

Regulation of the traverse motor may be improved by slight adjustment of the IR COMP trim pot clockwise from its factory set position. Overcompensation causes the motor to oscillate or to increase speed when fully loaded. If you reach such a point, turn the IR COMP trim pot counterclockwise until the symptoms just disappear.

Rev Torque---REV TQ
The Reverse Torque setting determines the maximum current limit for driving the motor in the reverse direction. The potentiometer is preset to the 10:30 position. It should not require adjustment.

Fwd Torque---FWD TQ
The Foward Torque setting determines the maximum current limit for driving the motor in the forward direction. The potentiometer is preset to the 10:30 position. It should not require adjustment.

Deadband---DB
This motor control board has a potentiometer which must be set for 50 HZ or 60 HZ operation. For 60 HZ set to 3:00 position. For 50 HZ set to 9:00 position.

Minimum Speed---MIN SPD
The potentiometer is factory preset to the minimum full counterclockwise 8:30 position.

Tach---TACH
The tach poteniometer is not used in this application. It should be a the factory setting of 8:30.

Armature Switch---ARMATURE 90-180
This switch is factory preset to the 90 position for a 90 VDC motor..

Feedback Switch--- FEEDBACK ARM-TACH
This switch is factory preset to the ARM position.

The lower control board has two switches. Both switches are factory preset to 115 for 115 VAC operation.

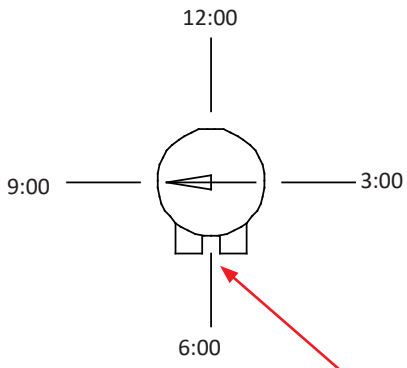


FIG. 9

Potentiometer
Clock Orientation

Terminal ends (Feet) are always at the 6:00 position,
no matter how the potentiometer is orientated on the board.

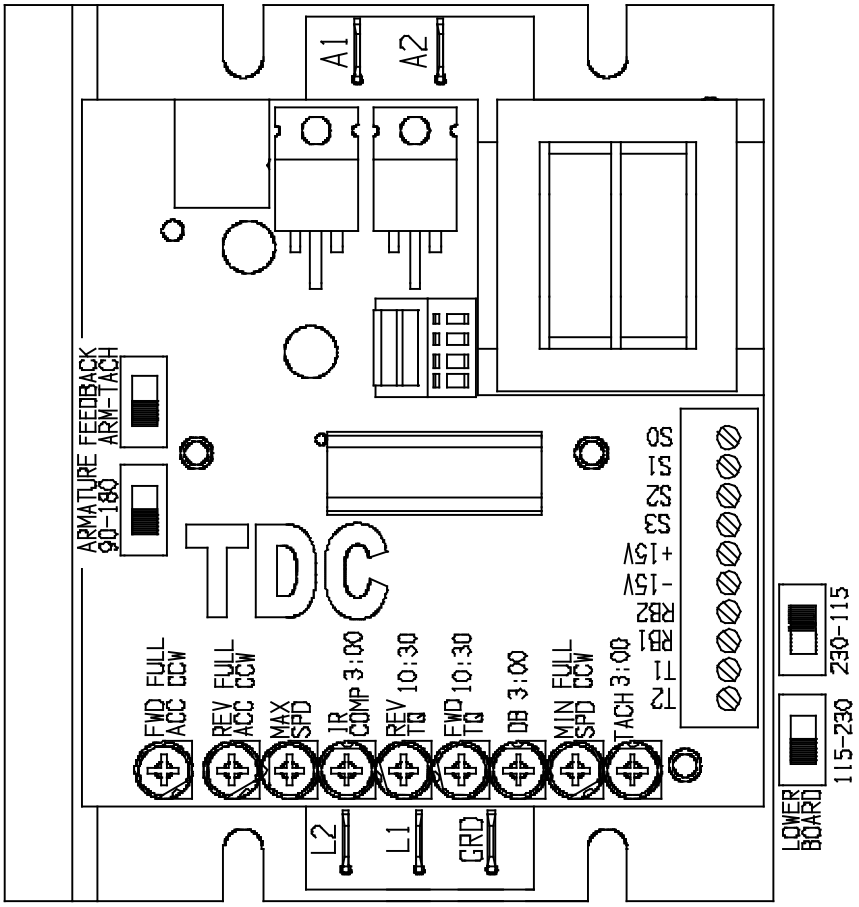

A1
A2
ARMATURE FEEDBACK
90-180
ARM-TACH
TDC
S0
S1
S2
S3
+15V
-15V
RB2
RB1
T2
FWD FULL ACC CCW
REV FULL ACC CCW
MAX SPD
IR COMP 3:00
REV 10:30 TQ
FWD 10:30 TQ
DB 3:00
MIN FULL SPD CCW
TACH 3:00
L2
L1
GRD
LOWER BOARD
230-115
115-230

FIG. 10

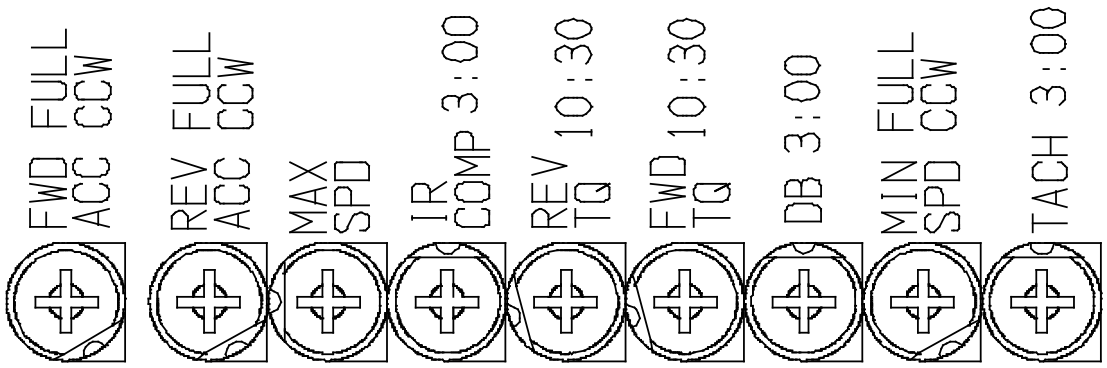
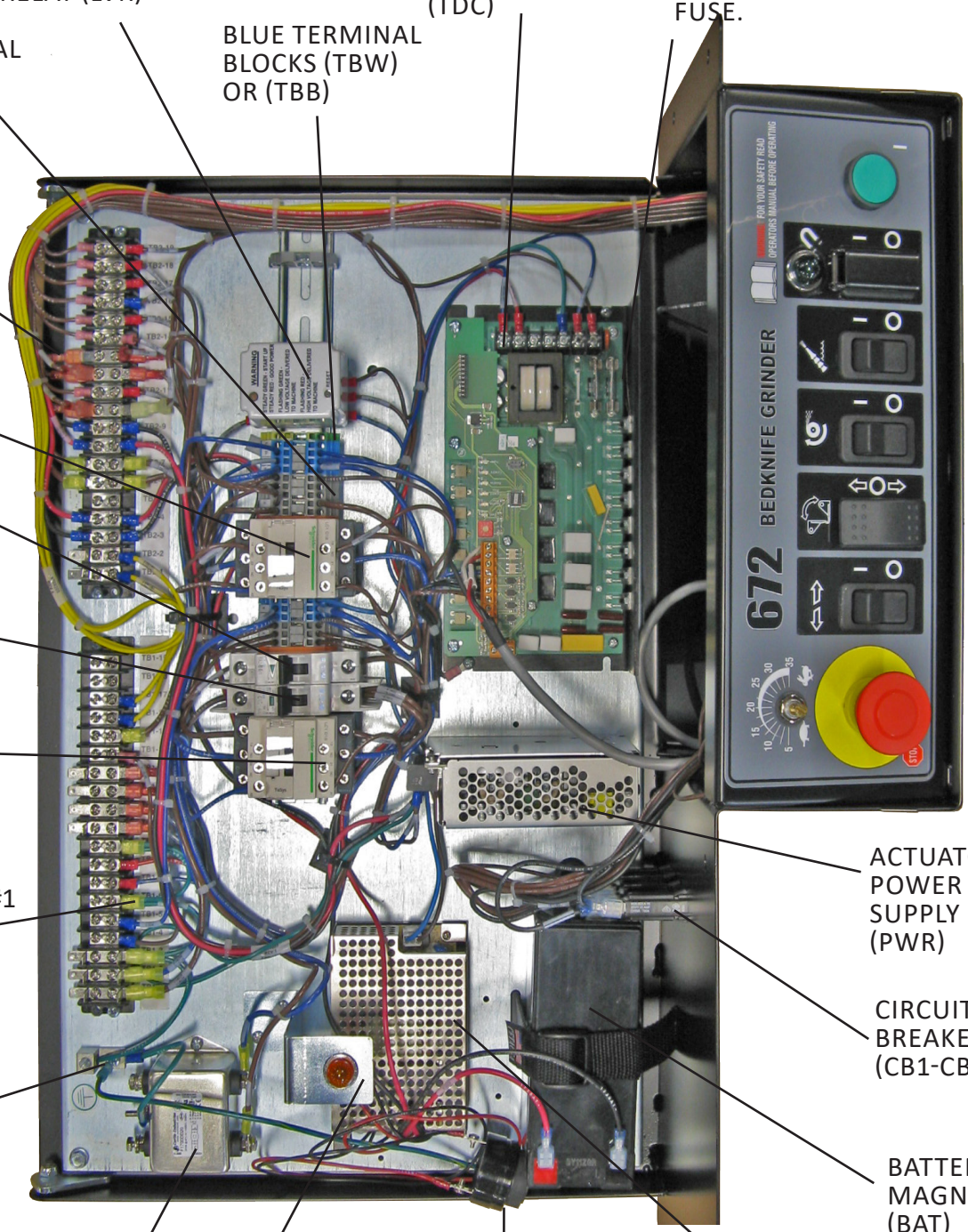

FWD FULL ACC CCW
REV FULL ACC CCW
MAX SPD
IR COMP 3:00
REV 10:30 TQ
FWD 10:30 TQ
DB 3:00
MIN FULL SPD CCW
TACH 3:00

FIG. 11

CONTROL BOX


LOW VOLTAGE RELAY (LVR)
TRAVERSE DRIVE CONTROL BOARD (TDC)
TRAVERSE BOARD 3-AMP SLOW-BLO FUSE.
GREY TERMINAL BLOCKS (TBG)
BLUE TERMINAL BLOCKS (TBW) OR (TBB)
TERMINAL STRIP #2 (TB2)
MAGNETIC CONTACTOR (MAG)
SECONDARY CIRCUIT BREAKER (SCB)
MAIN CIRCUIT BREAKER (MCB)
GRINDING MOTOR RELAY (REL)
TERMINAL STRIP #1 (TB1)
MAIN GROUND LUG
AC FILTER (FTR)
POWER LIGHT FOR MAGNETS (LGT)
ALARM FOR BATTERY (ALM)
UNINTERUPTABLE POWER SUPPLY (UPS)
BATTERY FOR MAGNETS (BAT)
CIRCUIT BREAKERS (CB1-CB4)
ACTUATOR POWER SUPPLY (PWR)
672
BEDKNIFE GRINDER

ELECTRICAL TROUBLESHOOTING

SKILL AND TRAINING REQUIRED FOR ELECTRICAL SERVICING

This Electrical Troubleshooting section is designed for technicians who have the necessary electrical knowledge and skills to reliably test and repair the electrical system. For those without that background, service can be arranged through your local distributor.

This manual presumes that you are already familiar with the normal operation of the Grinder. If not, you should read the operators section, or do the servicing in conjunction with someone who is familiar with its operation.

Persons without the necessary knowledge and skills should not remove the control box cover or attempt any internal troubleshooting, adjustments, or parts replacement.

If you have any question not answered in this manual, please call your distributor. They will contact the manufacturer if necessary.

WIRE LABELS

All wires have a wire label at each end for troubleshooting. The wire label has a code which tells you wiring information. The wire label has a seven or eight position code. The first two or three digits are the wire number: 01-99 or 123. The next three numbers or letters are the code for the component to which the wire attaches. Example: GMC for Grind Motor Control. The last two numbers or letters are the number of the terminal on the component to which the wire attaches.

ELECTRICAL TROUBLESHOOTING INDEX

ELECTRICAL TROUBLESHOOTING (Continued)

***PROBLEM*--AC Main Power Controls: no electrical power to control panel.**

Verify all wires shown on the wiring diagram on pages 54-55 are correct and pull on wire terminals with approximately 3 lbs force to verify there are no loose terminal connections and/or no loose crimps between wire and terminal. If problem persists, test as listed below.

Possible Cause	***Checkout Procedure***	
Emergency Stop Botton(ESS) is Depressed	**A.** Pull Up on ESS Button	Machine works Yes--end troubleshooting No--go to Step **B.** next
You must push the System Start Switch (SSS) to get power to control Panel	**B.** Listen for the Magnetic Starter (MAG) contacts to pull in with a cl unk	Machine works Yes--end troubleshooting No--go to step **C.** next.
Main Power Cord is not plugged in	**C.** Plug in main power cord	Machine works Yes--end troubleshooting No--go to step **D.** next.
ALL Switches **MUST** be turned **OFF** for contactor to pull in.	**D.** Turn off all switches.	Machine works Yes--end troubleshooting No--go to step **E.** next.
Main 15 amp outlet circuit breaker has tripped	**E.** Check circuit breaker in your building and reset if necessary. (Check wall outlet with a light to make sure it works)	Machine works Yes--end troubleshooting No--but light works in outlet--go to Step **F.** next. No--but light does not work in outlet. You must solve your power delivery problem independent of machine.
No 120 Volts AC power to Filter (FTR)	**F.** Check for 120V at Cord into FTR (Power Cord #32)	FTR "Line" Terminals for 120 Volts AC wires labled 32FTRBL to 32FTRWH Yes--Go to Step **G**. next. No--Replace Power Cord- 6059054
No 120 Volts AC power out of Filter	**G.** Check for 120V out of FTR	FTR "Load" Terminals for 120 Volts AC wires labled 01FTRBR to 02FTRBU Yes--Go to Step **H**. next. No--Replace Filter
No 120 Volts AC power to Main Circuit Breaker (MCB) 15 Amp.	**H.** Check for 120V to MCB	MCB (01MCB--) to nuetral (blue) terminal out of FTR for 120VAC Yes--Go to Step **I**. next. No--Check wires & replace if needed.
No 120 Volts AC power from Main Circuit Breaker (MCB) 15 Amp.	**I.** Check for 120V from MCB	MCB (03MCB--) to nuetral (blue) terminal out of FTR for 120 VAC Yes--Go to Step **J**. next. No--Flip Switch on MCB to "ON" - Machine works-- end trouble shooting Machine does not work-- replace MCB

ELECTRICAL TROUBLESHOOTING (Continued)

Possible Causes	***Checkout Procedure***	
No 120 Volts AC power to Secondary Circuit Breaker (SCB) 6 Amp.	**J.** Check for 120V to SCB	SCB (03SCB--) to nuetral (blue) terminal out of FTR for 120VAC Yes--Go to Step **K**. next. No--Check wires & replace if needed.
No 120 Volts AC power from Secondary Circuit Breaker (SCB) 6 Amp.	**K.** Check for 120V from SCB	MCB (67SCB--) to nuetral (blue) terminal out of FTR for 120 VAC Yes--Go to Step **L**. next. No--Flip Switch on SCB to "ON" - Machine works-- end trouble shooting Machine does not work-- replace SCB
120 Volts AC power not delivered to Terminal Strip	**L.** Check for 120 Volts AC at terminal strip.	Terminal "11" on Terminal Strip 2 "07TB2-11" to nuetral (blue) terminal out of FTR for 120 VAC Yes--Go to Step **M**. next. No--Check wires #7 & #3, Check Jumper on Terminal Blocks 1-3.
Grinding Motor Switch (GMS) not working	**M.** Check for 120 Volts AC at GMS Terminals 1	Measure 120 volts AC from GMS Terminal 1 to FTR terminal (Blue) Yes--Go to Step **N**. next. No--Flip Switch and check again- Works--Switch is upside down. Does not work-- Check wiring/ Verify Continuity/ Replace Switch
Bad Emergency Stop Switch (ESS)	**N.** Check voltage after the (ESS) MAKE SURE SWITCH IS PULLED UP!	Measure 120 Volts AC from (ESS) term 2 to FTR terminal (Blue) Yes--Go to Step **O.** next No--Check wire for continuity, then verify switch continuity. If bad replace ESS contactor (NC)
Bad System Start Switch (SSS)	**O.** Hold in SSS and Check voltage after the (SSS)	Measure 120 Volts AC from (SSS) term 3 to FTR terminal (Blue) Yes--Go to Step **P.** next No--Check wire for continuity, then verify switch continuity. If bad replace SSS contactor (NO)
Low Voltage Relay (REL) not operating	**P.** Hold in SSS and Check voltage at LVR. LVR must be installed in 8-pin socket.	Measure 120 Volts AC from LVR term 8 to FTR terminal (Blue) Yes--Go to Step **Q.** next No--Check for 120 Volts AC from LVR term 6 to term 7. Yes--Verify Continuity of term 1 to term 8 on LVR. Replace LVR if bad. No--Verify Continuity of Wires.
Bad Main Contactor (MAG)	**Q.** Hold in SSS and Check voltage at MAG A1 & A2.	Measure 120 Volts AC from MAG Term A1 to Term A2 Yes--MAG Should pull in with clunck, if not replace MAG. No--Verify Continuity of Wires.

ELECTRICAL TROUBLESHOOTING (Continued)

***PROBLEM*--Machine Shuts off when you turn on Grind motor switch.**

Possible Cause	***Checkout Procedure***	
Guard Door is open.	**A.** Close the guard doors.	Machine works Yes--end troubleshooting No--go to Step **B.** next
Low Voltage Relay is tripping.	**B.** Power delivered to the grinder is inadequate. Verify that adequate power is delivered to the grinder. See page 4 of the manual. Fix the problem with building power.	Machine works Yes--end troubleshooting No--go to Step **C.** next
Door Safety Switch is not aligned	**C.** Check Alignment of Door Safety Switch on guard door.	Check aligment of door switch. Yes--end troubleshooting No--Go to Step **D**. next.
Door Safety Switch is not working properly.	**D.** Verify Door Swith is working properly.	Disconnect door safety switch cord at terminal 14 and 15 on Terminal Strip 1. Verify Continuity of switch with door closed. Yes--Reconnect Terminals and verify continuity of wires. No--Verify continuity of cord and replace cord or switch.

***PROBLEM*--(MAG) turns on only with System Start Switch held in.**

Possible Cause	***Checkout Procedure***	
No Power to MAG holding Contact	**A.** Check voltage to MAG holding contact in.	Measure 120 Volts AC at MAG term T3 to FTR terminal (Blue) with E-Stop Pulled out. (do NOT press start button while checking.) Yes--Go to Step **D**. next. No--Verify continuity of wiring to MAG T3.
MAG holding contact has failed	**B.** Verify the magnetic starter (MAG) holding contact is working.	Disconnect Wire to MAG L3 and Measure 120 Volts AC from MAG term L3 to FTR Terminal (Blue). Press and hold Green Start button to hold in MAG contacts while checking. Yes--Verify continuity of wiring from MAG L3 No--Replace MAG.

ELECTRICAL TROUBLESHOOTING (Continued)

***PROBLEM*-- Grinding motor not working.**

Assuming (SSS) System Start Switch is on with 120 volts AC to control panel and all other functions are working.

Verify all wires shown on the wiring diagram on pages 54-55 are correct and pull on wire terminals with approximately 3lbs force to verify there are no loose terminal connections and/or no loose crimps between wire and terminal. If loose terminals are found, retighten and retest system. If problem persists, test as listed below.

Possible Cause	***Checkout Procedure***	
Grinding Motor Switch (GMS) is not on	**A.** Turn switch on	Grinding Motor works Yes--end troubleshooting No--go to Step **B.** next
Guard door is not closed	**B.** Close Front guard doors	Grinding Motor works Yes--end troubleshooting No--go to Step **C.** next
12 Amp Circuit Breaker (CB) is tripped	**C.** Check 12 amp CB on front of Control panel. Press in if tripped.	Grinding Motor works Yes--end troubleshooting No--go to Step **D.** next
Grind Motor Switch (GMS) not working	**D.** Check for power to GMS	GMS term 5 to FTR Terminal (Blue) for 120 Volts AC Yes--go to Step **E.** next No--With power off, check continuity of wires to GMS.
	E. Check for power from GMS	With GMS ON , check GMS Term 6 to FTR Terminal (Blue) for 120 Volts AC. Yes--Go to Step **F.** next No--replace GMS
Grinding Motor Relay not working	**F.** Check for power to relay Coil (Relay should click when GMS is turned on.)	Check for 120 Volts (AC) from A1 to A2 of Grinding motor Relay. Yes--If Relay does not pull in with click, replace Relay, if it does Go to Step **G.** next No-- check continuity of wires to Grinding motor Relay.
No Power to Relay Contacts	**G.** Verify Power to Relay Contacts	(REL) Term L1 to Term L2 for 120 Volts (AC) Yes--Go to Step **H.** next No--Check wires to REL Term L1 & L2

ELECTRICAL TROUBLESHOOTING (Continued)

Possible Cause	***Checkout Procedure***	
Bad Contacts in Grinding motor Relay	**H.** Verify power out of Grinding Motor Relay. GMS in ON position.	With relay pulled in (click) check (REL) Term T1 to Term T2 for 120 Volts (AC) Yes--Go to Step **I.** next No--Replace Gringing Motor Relay
Bad Circuit Breaker	**I.** Verify Power out of Circuit Breaker.	Check for 120 Volts (AC) from terminals TB2-6 (terminal 6 on right terminal strip) to FTR Terminal (Blue Yes--Go to Step **J.** next No--Check circuit breaker for continuity. Verify wiring and replace if needed.
Bad Grinding Motor	**J.** Verify Power to Grinding motor Cord.	Verify wiring at terminals 1 & 2 on Terminal Strip 1 (left terminal strip). Check TB1-1 to TB1-2 for 120 VAC. Yes-- Check terminals on motor cord. If tight replace motor. No-- Check wires from Grinding Motor Relay and Circuit Breaker to Terminal Strip 1.

ELECTRICAL TROUBLESHOOTING (Continued)

***PROBLEM*--Traverse Drive not working.**

Assuming (SSS) System Start Switch is on with 120 volts AC to control panel and all other functions are working.

Verify all wires shown on the wiring diagram on pages 54-55 are correct and pull on wire terminals with approximately 3lbs force to verify there are no loose terminal connections and/or no loose crimps between wire and terminal. If loose terminals are found, retighten and retest system. If problem persists, test as listed below.

Possible Cause	***Checkout Procedure***	
Traverse Motor Switch (TMS) is not on	**A.** Turn on (TMS)	Traverse works Yes--end troubleshooting No--got to Step **B.** next
Traverse Speed Pot (TSP) set to zero	**B.** Set (TSP) to 35 on the control panel	Traverse works Yes--end troubleshooting No--go to Step **C.** next
Fuse on Traverse Drive Control (TDC) has failed	**C.** Check fuse on the Traverse Drive Control Board (TDC) and replace if failed. See Page 23. Too heavy a grind causes grinding head traverse motor to overload and blow the fuse, NOTE: Fuse can not be checked visually. Use Ohm test to check fuse. Fuse must be replaced with a slo-blo fuse.	Traverse works Yes--end troubleshooting No--go to Step **D.** next See Page 23 for location of fuse on the Traverse Drive Control Board (TDC)
Traverse Drive Control (TDC) is bad	**D.** Check for 120 Volts (AC) incoming to (TDC)	On (TDC) Terminal L1 to L2 for 120 Volts AC Yes--Go to Step **F.** No--Go to Step **E.** next
Bad Traverse Motor Switch (TMS)	**E.** Check for 120 Volts AC at (TMS). (Make certain (TMS) is on)__	Measure 120 volts AC from TMS Terminal 5 to FTR Terminal (Blue). Yes--Verify wiring to TDC. No--Flip Switch and check again- Works--Switch is upside down. Does not work-- Check wiring/Verify Continuity/ Replace Switch

ELECTRICAL TROUBLESHOOTING (Continued)

Possible Cause	***Checkout Procedure***	
No DC Voltage from (TDC) Traverse Drive Control	**F.** Check for 90 Volts DC across (TDC) terminals #A1 to #A2 this voltage drives the DC traverse motor. NOTE: Traverse must be on and have (TSP) turned full CW to maximum voltage of 90 VDC	Check (TDC) terminals #A1 to #A2 for 90 Volts DC Yes--go to Step **G.** next No--go to Step **H.** next
Traverse Motor is bad	**G.** Check traverse motor continuity	Remove motor wires from Terminal Strip 1 terminals #7 & #8 check for 0 ohms across the black and white wires. Yes--end troubleshooting, motor should run, if not, replace motor. No--go to Step **K.** next
(TSP) is not working	**H.** Check (TSP) (10K) on control panel	(TDC) Pin #8 to #7 Pot Full CCW Pot Full CW 0 VDC 9.75 VDC Pin #8 to 9 Pot Full CCW Pot Full CW 9.75 VDC 0 VDC Yes--replace the (TDC) No--go to Step **J.** next
(TSP) (10K) is bad	**J.** Check (TSP) for 10,000 ohms. Remove three wires from (TDC) red from term #8 white from term #7 black from term #9	Check for 10,000 ohms red to white wires Full CCW--0 ohms Full CW--10,000 ohms Red to black wires Full CCW--10,000 ohms Full CW--0 ohms Yes--replace the (TDC) No--replace (TSP)
Worn motor brushes	**K.** Inspect Motor Brushes **WARNING** **DISCONNECT POWER FROM MACHINE**	Remove the brushes one at a time and maintain orientation for reinsertion. See if brush is worn short, 3/8" (10 mm) minimum length. Yes--replace motor brushes No--replace Traverse Motor **NOTE: TRAVERSE MOTOR BRUSHES HAVE SHOWN A VERY LONG LIFE. THEREFORE IT IS IMPROBABLE THAT MOTOR BRUSHES ARE BAD.**

ELECTRICAL TROUBLESHOOTING (Continued)

***PROBLEM*--Traverse does not stop to reverse directions when flag goes under the proximity switch on the left side or right side of machine.**

Possible Cause	***Checkout Procedure***		
Gap between flag and prox is incorrect.	A. Gap between flag and prox should be 3/16 to 1/4" (4-6 mm). Prox LED does not light when flag is under prox.	If incorrect, adjust per adjustment section of manual. Yes--end troubleshooting No--go to Step B. next	
Proximity Switch is bad.	B. Proximity switch is not working properly or wire connections are loose.	First check to see if proximity light comes on. When the light is on, it means that there is electricity coming to proximity switch. Actuate prox switches with steel tool to take measurements.	The light coming on shows the proximity is getting electrical contact.
		Left proximity (PRO x 1) check Traverse drive Control (TDC) between terminals #13 (black wire) and #15 (brown wire).	Proximity light on- 0 Volts DC Proximity light off- 12 Volts DC
		Right proximity (PRO x) check #14 (black wire) and #15 (brown wire).	Proximity light on- 0 Volts DC Proximity light off- 12 Volts DC
			Replace proximity switch if the voltages do not read as above.

ELECTRICAL TROUBLESHOOTING (Continued)

***PROBLEM*--Traverse speed control goes at one speed only.**

Possible Cause	***Checkout Procedure***	
Defective speed control potentiometer	**A.** Check potentiometer on control panel.	Traverse Drive Control Pin #8 to 7 Pot full CCW Pot Full CW 0 VDC 9.75 VDC Pin #8 to 9 Pot full CCW Pot Full CW 9.75 VDC 0 VDC Yes--Pot is OK No--Go to Step **B.** next
	B. Check potentiometer for 10,000 ohms. Remove three wires from Traverse Drive Control red from term #8 white from term #7 black from term #9	Check for 10,000 ohms Red to White wires Full CCW - 0 ohms Full CW - 10,000 ohms Red to Black wires Full CCW - 10,000 ohms Full CW - 0 ohms Yes--Go to Step **C.** next No--replace potentiometer. Wiper inside of potentiometer controls speed. Wiper may be bad and not making contact.
Wiring hookup to potentiometer is improper. (If components have been replaced.)	**C.** Check potentiometer wiring for proper hookup. See that speed pot is wired per electrical diagram	Wrong wire hookup effects traverse control. Reversing wires from the potentiometer will cause the the D C motor to run slower than designed or may not funtion clorrectly. Check for Proper function. Yes--end troubleshooting No--Go to Step **D.** next
Traverse Drive Control Board (TDC) dial pot settings not correct. (If board has not been replaced.)	**D.** Check all pot settings on Traverse Drive Control Board (TDC) as shown in wiring diagram. (See adjustment section Traverse Motor Control Board Settings.)	Minimum and maximum pot settings effect traverse speed.

ELECTRICAL TROUBLESHOOTING (Continued)

***PROBLEM*--If the carriage traverses to one end of stroke or the other and it stops and does not reverse direction.**

Possible Cause	***Checkout Procedure***	
Proximity switch is not working properly or wire connections are loose	First check to see of proximity light comes on. When the light is on, it means that there is electricity coming to proximity switch. Actuate prox switches with steel tool to take measurements.	The light coming on shows the proximity is getting electrical contact.
	Left proximity (PRO x 1) check Traverse drive Control (TDC) between terminals #14 (black wire) and #15 (brown wire).	Proximity light on- 5 Volts DC Proximity light off- 14 Volts DC
	Right proximity (PRO x) check (TDC) between terminals #13 (black wire) and #15 (brown wire).	Proximity light on- 5 Volts DC Proximity light off- 14 Volts DC
		Replace proximity switch if the voltages do not read as above.

***PROBLEM*--Insufficient hesitation at carriage stops prior to reversing traverse.**

The dwell time on the traverse drive control not set properly.	Reset dwell time as required. One increment increases Dwell time by 1/2 second.	

***PROBLEM*--Traverse changes directions erratically while running in traverse cycle.**

Loose wire to proximity switch.	Check wire connections from the proximity switches and tighten down screws.	A loose wire connection will give intermittent electrical contact.

ELECTRICAL TROUBLESHOOTING (Continued)

***PROBLEM*--Electromagents do not function.**

Assuming (SSS) System Start Switch is on with 120 volts AC to control panel and all other functions are working.

Possible Cause	***Checkout Procedure***	
Electromagnet switch (EMS) is not on.	**A**. Turn (EMS) switch to on position.	Electromagnets work Yes-- end troubleshooting No-- go to Step **B.** next
Circuit Breaker tripped	**B.** Check Circuit breaker on front of Control Panel. Press in if Tripped.	Electromagnets work Yes-- end troubleshooting No-- go to Step **C**. next
No Power out of UPS	**C.** Check for 12 Volts (DC) out of UPS at Terminal Strip 2.	Check for 12 Volts (DC) from Terminal Strip 2 Terminal 4 (146TB2-4) to Terminal 3 (146TB2-3) Yes-- Go to Step **D.** No-- Go to Step **F**. next
Circuit Breaker is Bad	**D.** Check for 12 Volts (DC) at input to switch. Remove wires #153 and #162 and check for voltage out of wires.	Check for 12 Volts (DC) from wires removed from switch labeled 162EMS-5 to 153EMS-2 Yes-- Go to Step **E.** next No-- Bad Circuit Breaker or wire, check continuity of Circuit Breaker and wires, replace bad part.
Electromagnet Switch is Bad	**E.** With EMS on, Check for 12 VDC out of Elecromagnet switch (EMS) at Terminal Strip 2. NOTE: With 12 VDC at electromagnet switch terminals 166EMS-6 and 165EMS-3 the light above the switch on the ouside of the panel should be ON. If not, replace the bulb or wires.	Check for 12 Volts (DC) from Terminal Strip 2 Terminal 1 (157TB2-1) to Terminal 2 (158TB2-2) on Terminal Strip 2. Yes-- Bad Magnets- Call local Distributor or Factory Customer Service for assistance. No-- Bad Switch or wires, check Continuity of wires and EMS switch, replace bad part.
UPS is Bad	**F.** Check for 120 Volts (AC) to UPS at Terminal blocks.	Check for 120 Volts (AC) from Blue Terminal Block (148TBW-5b) to Grey Terminal Block (147TBG-3) Yes-- Replace UPS, also Check Battery (see Step G) No-- Check continuity of wires to UPS.
Bad Battery	**G.** Check for 10.5 -14 Volt DC at battery. Remove wires to battery and check across terminals on the battery.	Check for betwen 10.5-14 Volts (DC) out of Battery atBattery Terminals. Yes-- Go to Step G. No-- Machine must be plugged in to charge battery. Leave machine plugged in and check after 24 Hours. If battery still low replace Battery.

TROUBLESHOOTING (Continued)

***PROBLEM*--Tooling Bar Rotation Actuator does not Function**

Possible Cause	***Checkout Procedure***	
Actuator Motor Switch (AMS) is not on.	**A**. Push (AMS) switch to the up or Down position.	Actuator works Yes-- end troubleshooting No-- go to Step **B.** next
Circuit Breaker tripped	**B.** Check Circuit breaker on front of Control Panel. Press in if Tripped.	Actuator works Yes-- end troubleshooting No-- go to Step **C**. next
No Power To Power Supply	**C.** Check for 120 **VAC** at input to Power Supply (L to N).	Check for 120 Volt (AC) from Terminal 169PWR-L to 150PWR-H Yes-- Go to Step **D.** next No-- Verify continuity of wires
No Power out of Power Supply	**D.** Check for 12 **VDC** from Power Supply (V- to V+)	Check for 12 Volt (DC) from Terminals 152PWR-V- to 152PWR-V+ Yes-- Go to Step **E.** next No-- Verify continuity of wires
Circuit Breaker is Bad	**E.** Check for 12 V **DC** into Actuator Motor Switch (AMS)	Check for 12 Volts **(DC)** from Terminals 161AMS-4 to 163AMS-1 Yes-- Go to Step **F.** next No-- Check continuity of wires and Circuit breaker. Repace if bad.
Actuator Motor Switch (AMS) is Bad	**F.** While pressing switch (AMS) up or down, measue 12 Volts **(DC)** at Terminal Strip 1	Check for 12 Volts **(DC)** from Terminals 16 (TB1-16) to 17 (TB1-17) on Terminal Strip 1. Yes-- Go to Step **G.** next No-- Check Continuity of wires and AMS, replace switch.
Bad Actuator Cord or Motor	**G.** While pressing switch (AMS) up or down, measure 12 Volts **(DC)** at end of Actuator Cord where it connects to the motor.	Check for 12 Volts **(DC)** from Terminals169ACT-B to 169ACT-O Yes-- Replace Actuator assembly No-- Replace Actuator cord 6709210.

ELECTRICAL TROUBLESHOOTING (Continued)

***PROBLEM*-- Coolant Pump not working.**

Assuming (SSS) System Start Switch is on with 120 volts AC to control panel and all other functions are working.

Verify all wires shown on the wiring diagram on pages 54-55 are correct and pull on wire terminals with approximately 3lbs force to verify there are no loose terminal connections and/or no loose crimps between wire and terminal. If loose terminals are found, retighten and retest system. If problem persists, test as listed below.

Possible Cause	***Checkout Procedure***	
Coolant Pump Switch (CPS) is not on.	**A.** Turn switch	Coolant Pump works Yes--end troubleshooting No--go to Step **B.** next
Coolant flow valve closed.	**B.** Open coolant flow valve.	Coolant Pump works Yes--end troubleshooting No--go to Step **C.** next
2 Amp Circuit Breaker (CB) is tripped	**C.** Check 2 amp CB on front of Control panel. Press in if tripped.	Coolant Pump works Yes--end troubleshooting No--go to Step **D.** next
2 Amp Circuit Breaker (CB) failed	**D.** Check power from CB	Measure 120 volt AC from both sides of 2 amp CB to FTR Terminal (Blue) Yes--go to Step **Ea.** next No--With power off, check continuity of CB & wires to CB. Replace CB or wires.
Coolant Pump Switch (CPS) not working	**E.** Check for power from CPS	CPS Term 5 to FTR Terminal (Blue) for 120 Volts AC Yes--Go to Step **F.** next No--replace CPS
Coolant Pump Not Working	**F.** Check for power from CPS	Measure 120 volt AC from TB1-4 to TB1-5. Yes--Replace Coolant Pump.

MECHANICAL Troubleshooting

--PROBLEM--	--POSSIBLE CAUSE--	--REMEDY--	--REASON--
Top face of bedknife is ground in a convex shape (high in the center) or concave shape (low in the center)	**A--**Grinding wheel is loading up with grinding grit.	Dress the wheel as prescribed in the Operators Manual.	A loaded wheel creates undue pressure on the surface being ground.
	B--Too heavy a grind on the final grinding pass.	Follow the procedures in the Operators Manual. On the final pass, infeed only about .001" [.025 mm]. Let the wheel spark out for 10-20 passes at about slow speed, with no additional infeed.	For precise grinding, sparking-out process is critical. It eliminates excessive final-grinding pressure which helps maintain grinding straightness.
	C--Small Grinding Head Slide Vee Roller loose	Adjust Vee Rollers per procedure on Page 34.	Looseness in roller causes erratic grind.
The top face of the bedknife is ground unevenly across the width.	**A--**Grinding wheel rim is not completely over the top face being ground.	The wheel rim must extend over the bedknife top face by 1/2" [13 mm] whenever possible. See Operators Manual. If not possible, dress the wheel more often.	When the rim doesn't extend over the top face, it wears unevenly and causes grooves across the bedknife.
	B--Small grinding Head Slide Vee Roller loose.	Adjust Vee rollers per procedure on Page 34.	Looseness in rollers causes erratic grind.
	C--Backlash in infeed handwheel.	Eliminate backlash in infeed handwheel, see Page 31.	Backlash allows grinding wheel to move under load.
Too coarse a grind on bedknife.	Grinding head is traversing too fast.	Slow down the traversing speed.	Traversing speed controls the grinding surface texture. A slower traverse produces grind marks closer together.
The top face of the bedknife shows burn marks from being too hot.	**A--**Coolant not directed onto the bedknife and grinding wheel.	Direct coolant into the bedknife, at the point of the grind. See Operators Manual.	When the front face of the bedknife gets too hot, the steel loses its temper (softens).
	B--Too heavy stock removal during grinding.	Take off about .002 to .003" [.05 to .075mm] per pass during rough grind. See Operators Manual.	Too much stock removal in one pass creates too much heat and softens the steel.
	C--Grinding wheel is glazing.	Dress the wheel before the finish-grinding pass on each bedknife. See Operators Manual.	Wheel will glaze if not dressed often enough. Also, as a general rule, use a higher traverse speed for the heavy grind.

MECHANICAL TROUBLESHOOTING (Continued)

--PROBLEM--	--POSSIBLE CAUSE--	--REMEDY--	--REASON--
Grinding wheel is glazing too quickly.	**A--**Wheel needs dressing.	Dress the wheel before the finish-grinding pass on each bedknife. See Operators Manual.	Wheel will glaze if not dressed often enough. If grinding wheel is not extended 1/2" [12 mm] over bedknife, it will glaze more quickly because there is less dressing.
	B--Too light a cut when rough grinding.	Take off about .002 to .003" [.05 to .075 mm] per pass during rough grind. See Operators Manual.	Too light a grinding cut doesn't permit enough dressing action on the wheel, so it glazes.
	C--Grinding head is traversing too slow.	Speed up traverse.	Too slow a traverse speed can cause excessive heat buildup in the grinding wheel, which glazes the wheel.
Grinding motor vibrates excessively.	Grinding wheel is out of balance.	Visually check the outside diameter runout while slowly rotating the wheel by hand. Also check the motor without a wheel installed. Replace the wheel if out-of -round. Minor imbalance between grinding wheel and motor armature can sometimes be corrected by rotating the wheel position on the motor shaft in 90° increments. This is called clocking the wheel. If you have vibration, try clocking the wheel 3 times. If this does not correct the problem, relace the wheel.	A grinding wheel which isn't properly trued up on outside or inside diameters can vibrate excessively and transfer that vibration to the motor.
Carriage traversing varies speed while grinding	**A--**Linear bearings in the carriage do not rotate freely	Adjust bearing for proper tension. See adjustments section of this manual.	When bearing preload is too tight, it causes excessive loading to drive carriage.
		Flush linear bearing per lubrication proceedure and replace wipers. Or replace three linear bearings and wipers.	Grinding grit is getting into the linear bearings and causing excessive driving torque of the carriage.
	B--Belt it slipping.	Adjust belt clamping force. See adjustment section of manual.	If the traverse belt clamp is damaged or not adjusted properly the belt will slip.
	C--Traverse belt tension is too loose.	Adjust traverse belt tension. See adjustments section of this manual.	If the belt is too loose it will tend to vibrate or the belt tensioning springs may tend to jump when loaded.

PARTS LIST 6729503 MAIN BASE ASSEMBLY

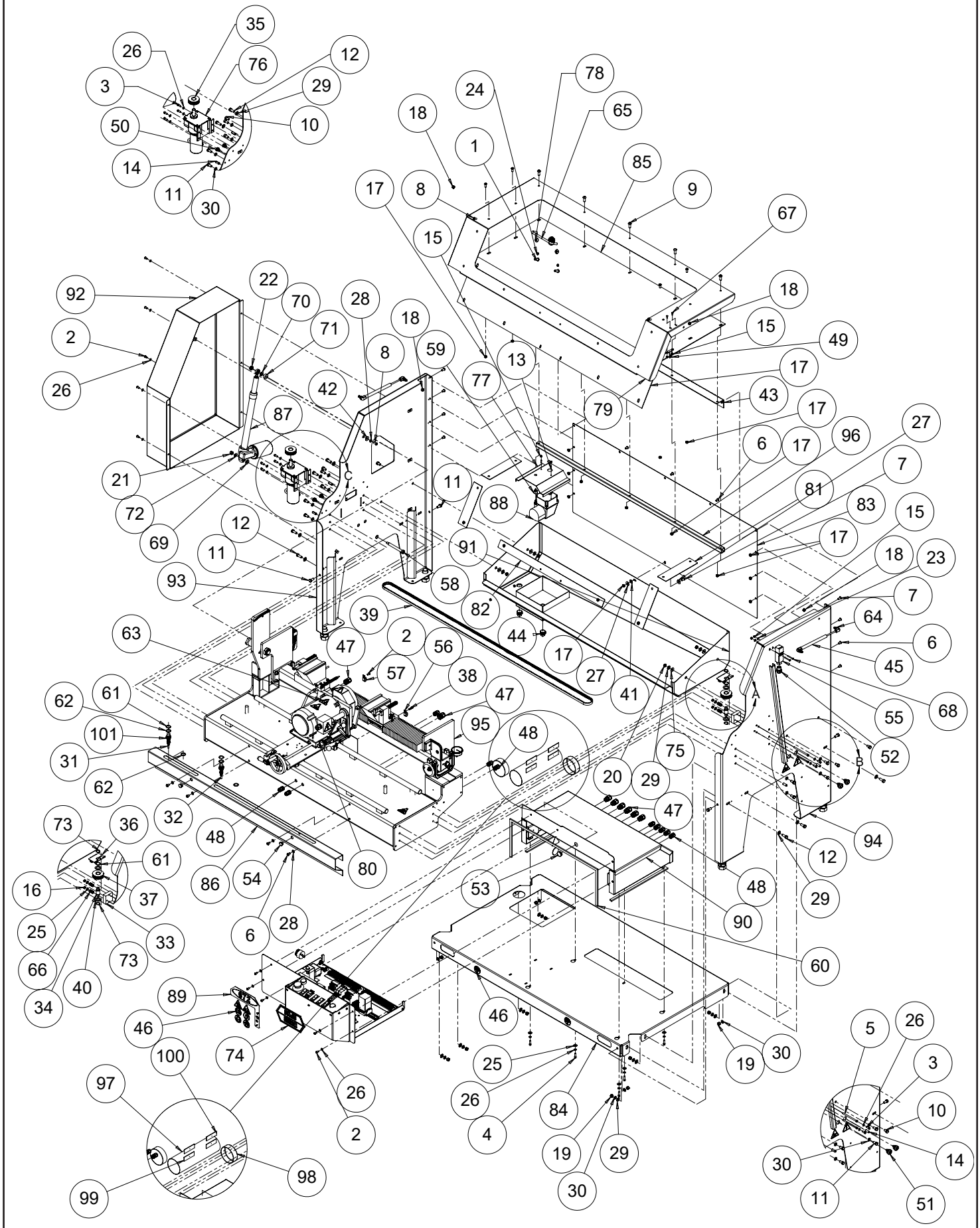


Diagram No.	Part No.	Description
1	B190834	10-32 x 1/2 Button Head Socket Cap Screw
2	B250816	1/4-20 x 1/2 Button Head Socket Cap Screw
3	B251011	1/4-20 x 5/8 Socket Head Cap Screw
4	B251411	1/4-20 x 7/8 Socket Head Cap Screw
5	B256411	1/4-20 x 4 Socket Head Cap Screw
6	B310813	5/16-18 x 1/2 Button Head Socket Cap Screw
7	B311013	5/16-18 x 5/8 Button Head Socket Cap Screw
8	B311213	5/16-18 x .75 Button Head Socket Cap Screw
9	B312413	5/16-18 x 1-1/2 Button Head Socket Cap Screw
10	B371001	3/8-16 x 5/8 Hex Head Cap Screw
11	B371201	3/8-16 x 3/4 Hex Head Cap Screw
12	B371601	3/8-16 x 1 Hex Head Cap Screw
13	C161020	8-32 x 5/8 Socket Set Screw Cap Point
14	H371602	Roll Pin .375 D x 1.00 L
15	J167000	8-32 Locknut Jam Nylon Insert
16	J257000	1/4-20 Locknut Jam Nylon Insert
17	J317000	5/16-18 Locknut Jam Nylon Insert
18	J317100	5/16-18 Locknut Full Nylon Insert
19	J371000	3/8-16 Hex Nut
20	J377000	3/8-16 Locknut Jam Nylon Insert
21	J377100	3/8-16 Locknut Full Nylon Insert
22	J507000	1/2-13 Locknut Jam Nylon Insert
23	K160001	Flat Washer #8 SAE
24	K190101	Flat Washer .225 ID x.75 OD x .05 T
25	K250001	Flat Washer 1/4 SAE
26	K251501	1/4 Lockwasher Split
27	K310001	Flat Washer 5/16 SAE
28	K311501	5/16 Lockwasher Split
29	K370001	Flat Washer 3/8 SAE
30	K371501	3/8 Lockwasher Split
31	27168	Prox Cord - Traverse LH (Service)
32	27169	Prox Cord - Traverse RH (Service)
33	28192	Support Traverse Pulley
34	50309	Shaft Traverse Pulley
35	3706057	Idler Cog Pulley 7/8 B x 2.149 PD
36	50363	Guard Traverse Pulley
37	55553	Idler Pulley Assembly
38	80141	Screw - Self Drill #10 x 1” Hex
39	80354	Belt Cog 1252L050 UK .375P.50W
40	80355	Thrust Washer .75 ID x1.25 OD
41	3389038	Rubber Washer .31 x .75 x .06 T
42	3529041	Washer - Flat .328 x .875 x .125 T
43	6739508	Hinge Weldment
44	3706022	Pipe Plug 3/4 NPTF (Steel)
45	3706088	Gas Spring 60# 7.8” Stroke
46	3706106	Decal Sheet (Bedknife Grinders)
47	3707009	Strain Relief Liq T.27-.47W .804H
48	3707029	Strain Relief Liq T.19-.30W .599H
49	3707132	Key - Safety Switch 90 Degree
50	3707273	Strain Relief .33-.36 Wire .625H
51	3707275	Strain Relief .37-.43 Wire .875H
52	3707563	Strain Relief Liq T.27-.46W .825H

PARTS LIST 6729504 MAIN BASE ASSEMBLY

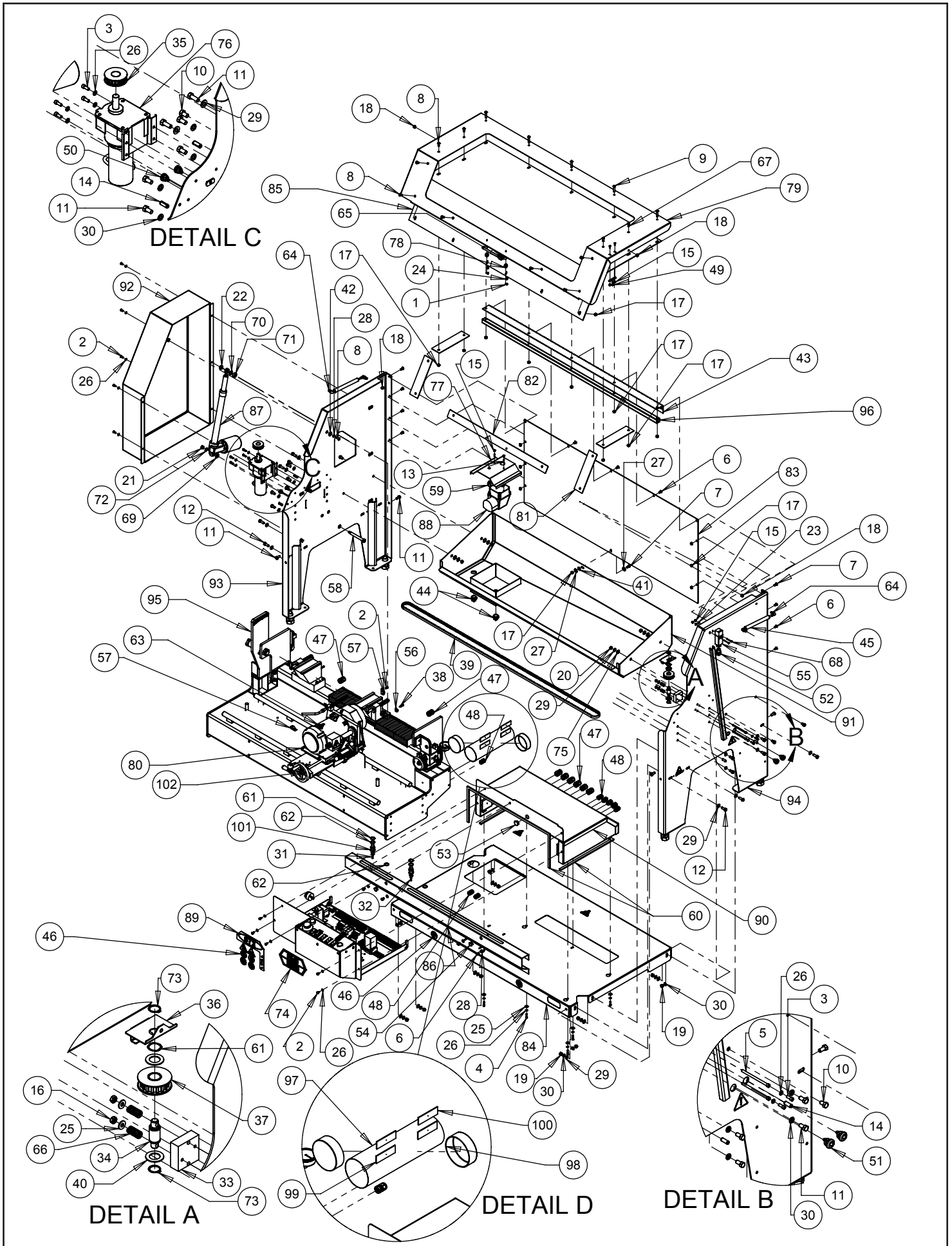
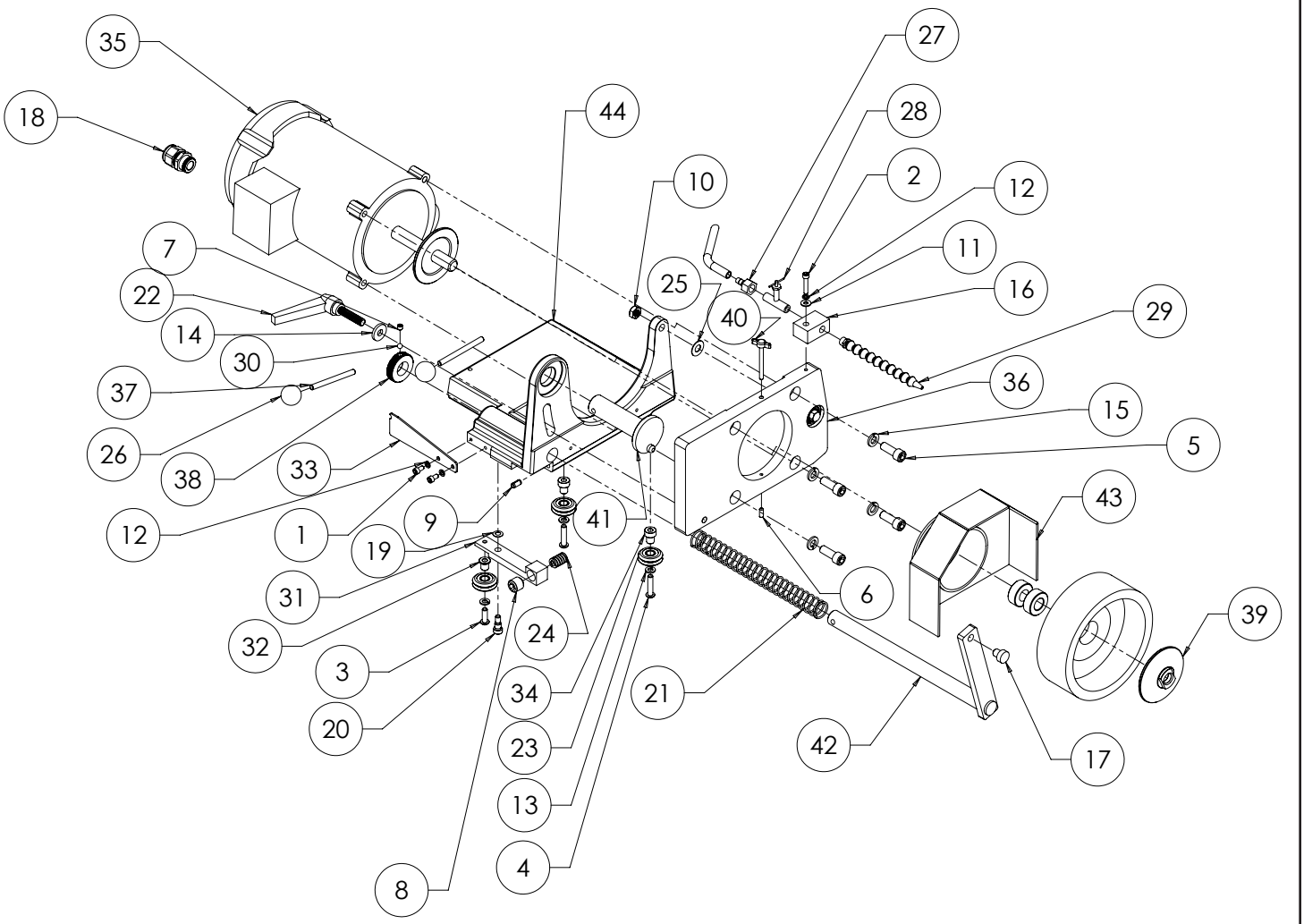


Diagram No.	Part No.	Description
53	3707595	Hole Plug .875 Diameter
54	3707597	Hole Plug .625 Diameter
55	3707728	Safety Switch NC/NC
56	3707933	Cord Clamp Single .44 Diameter Black
57	3708121	Cord Clamp Double .38 Diameter
58	3708330	Shoulder Bolt .500 D x 4.00 L
59	3708339	Connector - Barbed Insert
60	3708378	Strip Foam .25 T
61	3708419	Wave Spring .78 ID SSR-0100
62	3708421	Flat Washer .75 x 1.0 x .075 T
63	3708461	Decal Warning 3600 RPM
64	3708572	Ball Stud - 10 mm
65	3708577	Handle - D
66	3708658	Spring Compression Danly
67	3708820	8-32 x .50 Button HD Safety Screw
68	3708865	8-32 x 1.5 Button HD Safety Screw
69	3709016	Thrust Washer .500 x .937 x .093 T
70	3709019	Thrust Washer .500 x .937 x .032 T
71	2109095	Spacer .50 ID x 1.0 OD x.38 L Steel
72	3709304	Thrust Washer .375 x .812 x .032 T
73	3709331	Retaining Ring External 5100-75
74	3709990	Decal Foley United Large
75	6009125	Rubber Washer .34 x .88 x .06 T
76	6059062	Motor Assembly Traverse
77	6609046	Coolant Pump Cover
78	6709071	Ferrule - Handle
79	6739012	Hood Top Panel
80	6729509	Traverse Base Assembly
81	6739013	Window Support Plate
82	6739014	Window Support Long Plate
83	6709186	Upper Tank Back Panel
84	6709197	Lower Frame Panel
85	6739016	Door Polycarbonate
86	6709199	Prox Panel
87	6729014	Actuator Assembly W168 (12V Rod End)
88	6709209	Coolant Pump Assembly W118
89	6709226	672 Decal W/CB Symbols
90	6709568	Electrical Box Weldment
91	6709569	Coolant Tank Weldment
92	6709573	Actuator Cover Weldment
93	6729523	LH Side Frame Weldment
94	6729524	RH Side Frame Weldment
95	6709562	Bedknife Support Assembly
96	6739015	Window Rear Support Tube
97	3706133	Clear Tube 3.5 OD x 12” L
98	3706134	End Cap - 3.5 ID Black Vinyl
99	3706135	Velcro Hook - 1” W Adhesive Back
100	3706136	Velcro Loop - 1” W Adhesive Back
101	3707601	Prox Head - 18 mm DC (Service)
102	6729522	Manual Handwheel Assembly

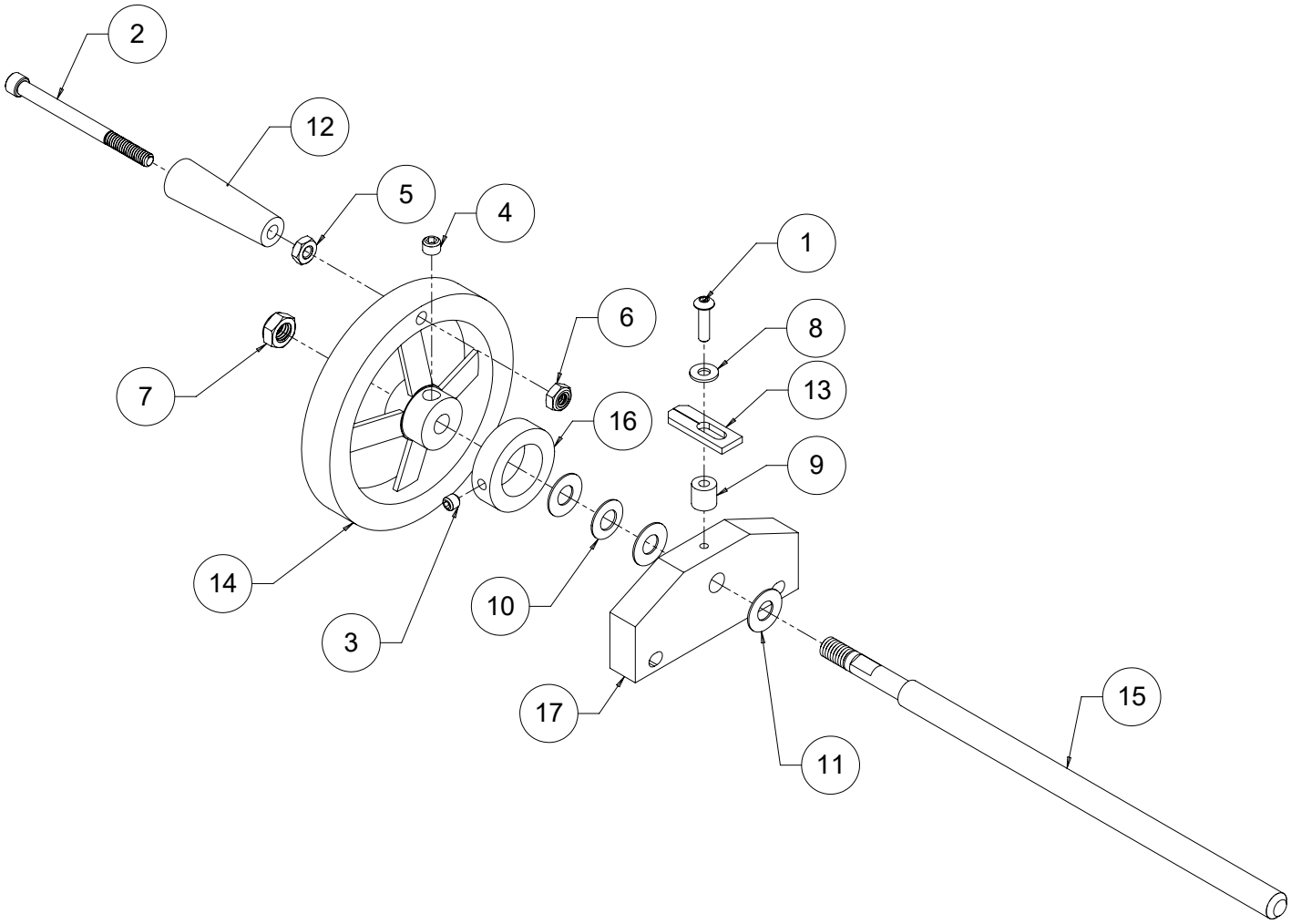
PARTS LIST (Continued) 6729514 GRINDING HEAD ASSEMBLY



PARTS LIST (Continued) 6729514 GRINDING HEAD ASSEMBLY

Diagram No.	Part No.	Description
1	B190611	10-24 x 3/8 Socket Head Cap Screw
2	B192011	10-24 x 1-1/4 Socket Head Cap Screw
3	B251216	1/4-20 x 3/4 Button Head Socket Cap Screw
4	B252016	1/4-20 x 1-1/4 Button Head Socket Cap Screw
5	B371611	3/8-16 x 1 Socket Head Cap Screw
6	C190820	10-24 x 1/2 Socket Set Screw Cap Point
7	C250420	1/4-20 x 1/4 Socket Set Screw Cap Point
8	C621060	5/8-18 x 5/8 Socket Set Screw Cap Point
9	H250802	Pin - Roll .25 D x.50 L
10	J377000	3/8-16 Locknut Jam Nylon Insert
11	K190001	Flat Washer #10 SAE
12	K191501	#10 Lockwasher Split
13	K251501	1/4 Lockwasher Split
14	K310101	Flat Washer 5/16 USS Cut Zinc
15	K371501	3/8 Lockwasher Split
16	3679116	Connector - Shut Off Valve
17	3702086	Diamond Dresser
18	3707009	Strain Relief Liq T.27-.47 W .804 H
19	3708103	Conical Washer .258 x .50 x.019 T
20	3708543	Shoulder Bolt .313 D x.313 L
21	3708553	Spring - Comp.924 OD x .78 ID x 8.75 L
22	3708561	Adjustable Handle 3/8-16 x 1.56 L
23	3708657	Roller - Dual Vee
24	3708658	Spring Compression Danly
25	3709304	Thrust Washer .375 x .812 x .032 T
26	3709526	Knob 1/4-20F 1” Ball
27	3709593	Connector - Barbed Female NPT
28	3709595	Valve - Shut Off Needle
29	3709642	Coolant Line Assembly
30	3709705	Nylon Ball 5/32 Diameter
31	6609027	Arm - Roller Pivot
32	6609028	Bushing - V Roller Short
33	6609029	Bracket - Dresser Lock
34	6609058	Bushing - V Roller Long
35	6609502	Motor Assy - 3/4HP C-Face
36	6609505	Motor Pivot Assembly
37	6709035	Stud 1/4-20 x 3.00 Ht
38	6709038	Collar - Adjuster
39	6709103	Flange - Outer 5/8-11 LH
40	6709501	Tee Knob Assembly
41	6709503	Eccentric Pin Assembly
42	6709509	Dresser Arm Weldment
43	6709552	Gr Wheel Guard Weldment
44	6729043	Base - Carriage Slide

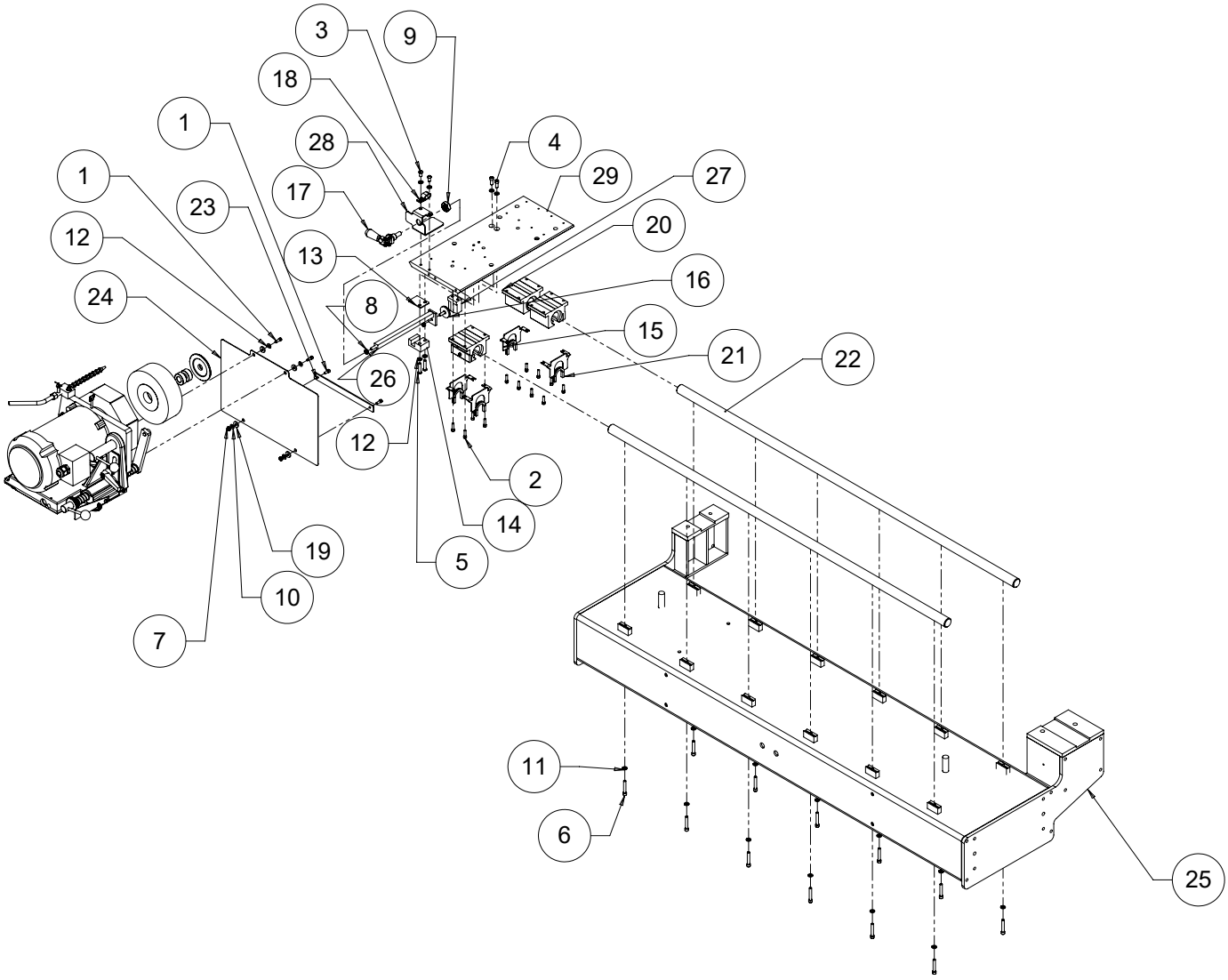
PARTS LIST (Continued) 6729522 GRINDING HEAD HANDWHEEL ASSEMBLY



PARTS LIST 6729522 GRINDING HEAD HANDWHEEL ASSEMBLY

DIAGRAM NO.	PART NO.	DESCRIPTION
1	B191213	10-24 x 3/4 Button Head Socket Cap Screw
2	B255011	1/4-20 x 3-1/8 Socket Head Cap Screw
3	C250420	1/4-20 x 1/4 Socket Set Screw Cap Point
4	C310420	5/16-18 x 1/4 Socket Set Screw Cap Point
5	J252000	1/4-20 Hex Jam Nut
6	J257000	1/4-20 Locknut Jam Nylon Insert
7	J377000	3/8-16 Locknut Jam Nylon Insert
8	K190001	Flat Washer #10 SAE
9	6009224	Spacer .50 OD x .191 ID x .43 L
10	3709062	Conical Washer .382 x .75 x .035 T
11	3709304	Thrust Washer .375 x .812 x .032 T
12	3709370	Handle 691-P
13	3809047	Indicator - Clear
14	6009044	Handwheel - 4.50 Diameter Modified
15	6009218	Shaft Adjusting Acme LH
16	6059082	Ring - Calibration
17	6609030	Shaft - Locking Stud 1.125 S

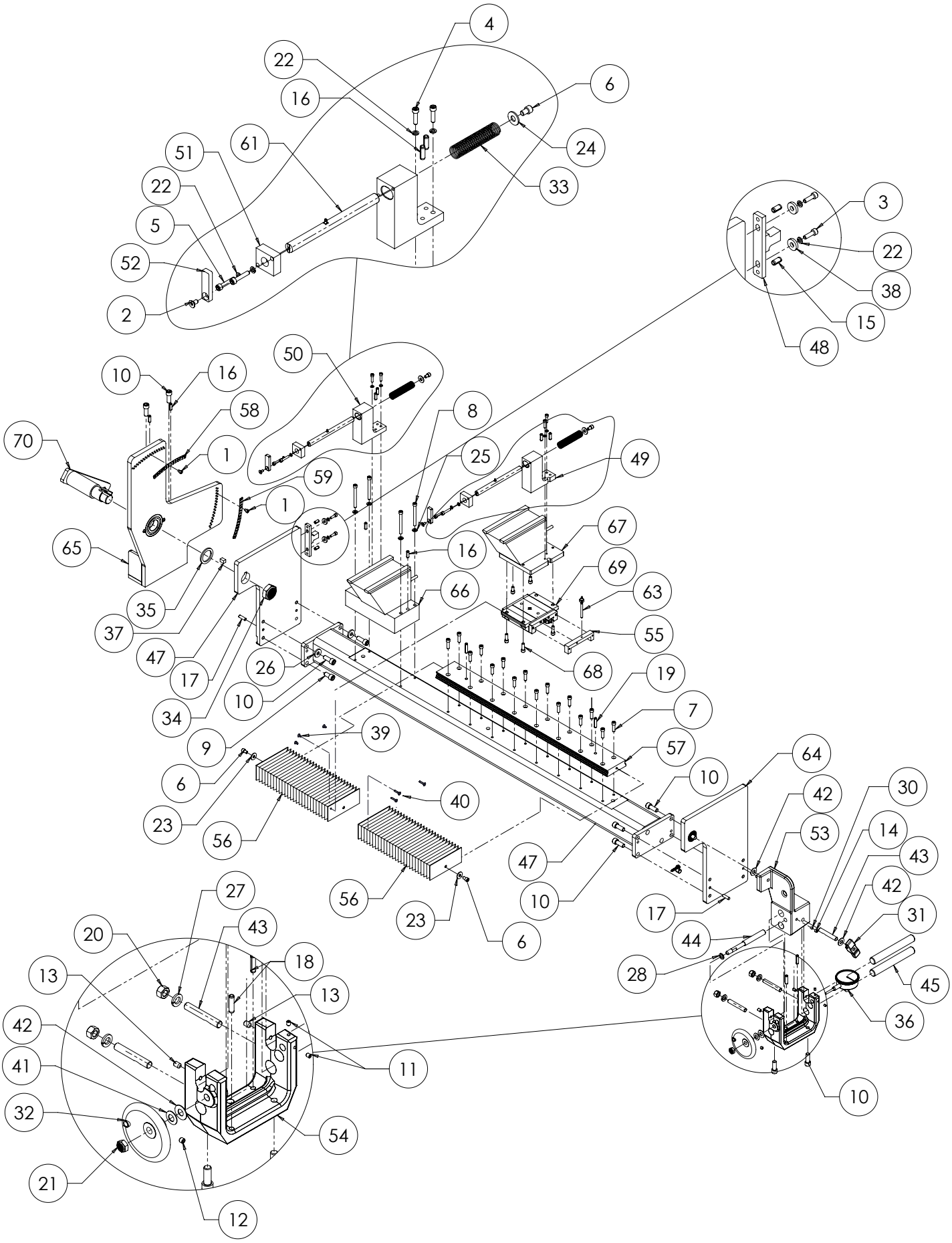
PARTS LIST (Continued) 6729509 TRAVERSE & CARRIAGE ASSEMBLY



PARTS LIST (Continued) 6729509 TRAVERSE & CARRIAGE ASSEMBLY

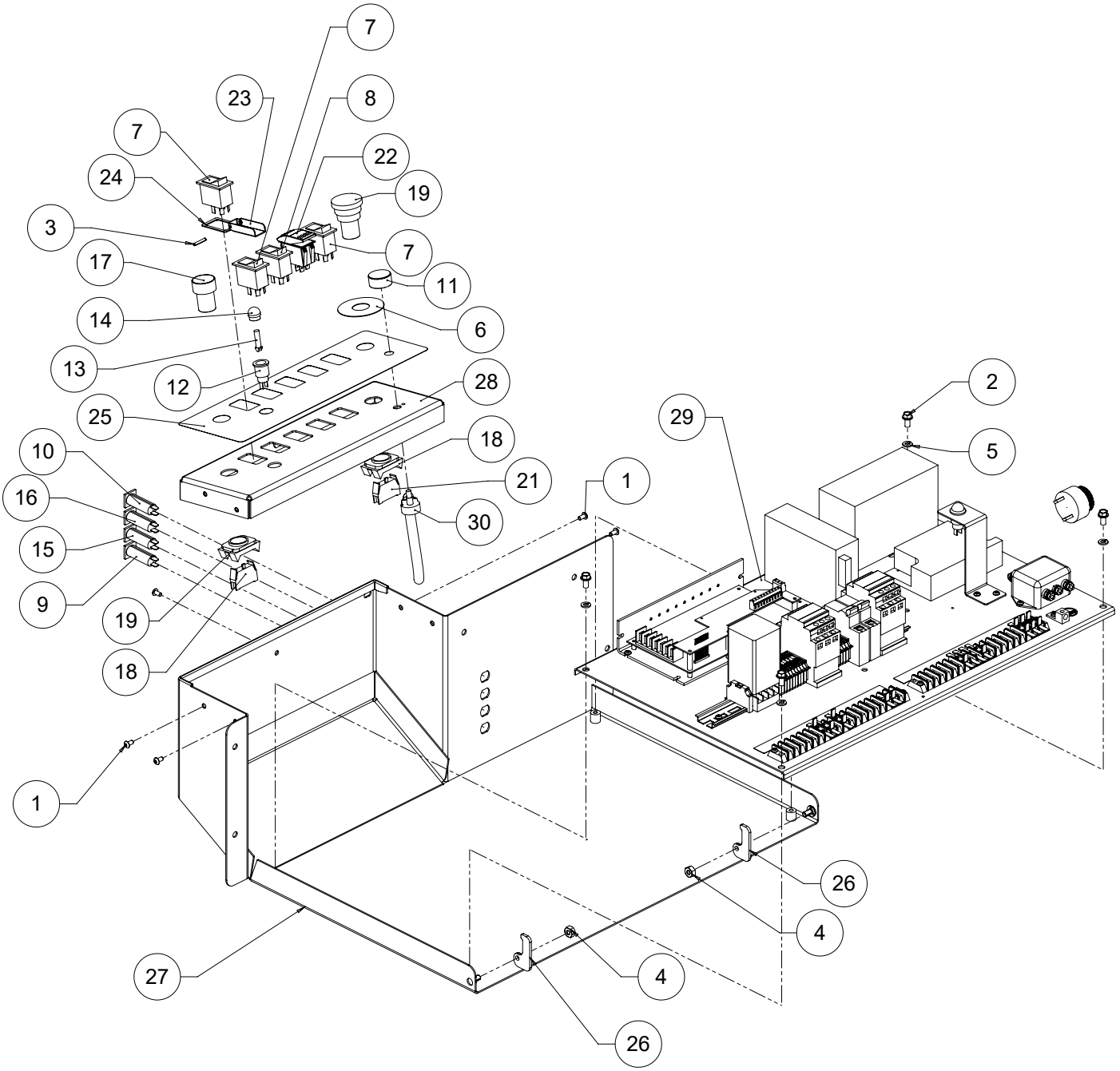
DIAGRAM NO.	PART NO.	DESCRIPTION
1	B190811	10-24X1/2 Shcs
2	B191211	10-24X3/4 Shcs
3	B250816	1/4-20X1/2 Bhscs
4	B251026	1/4-28X5/8 Shcs
5	B252016	1/4-20X1-1/4 Bhscs
6	B252411	1/4-20X1-1/2 Shcs Full Thread
7	J197000	10-24 Locknut Jam Nylon Insert
8	J252000	1/4-20 Hex Jam Nut
9	J627200	5/8-18 Locknut Jam Nylon Insert
10	K190001	Flat Washer #10 Sae
11	K241501	
12	K251501	1/4 Lockwasher Split
13	28188	Spacer Trav Clamp
14	28189	Block Clamp Support
15	28211	Brkt - Rail Wiper 1” Shaft
16	50310	Tip Belt Clamp
17	80335	Clamp Destaco
18	3708121	Cord Clamp Double .38 Dia.
19	3708691	Flat Washer .25X.62X.12T
20	3709044	Ball Brg Bushing
21	3969064	Wiper - Foam
22	6509063	Carrier Shaft
23	6709039	Brkt - Rubber Cover
24	6709149	Cover - Rubber
25	6709174	Traverse Base Machned (Belt)
26	6709566	Belt Clamp Bar Assy
27	6729004	Traverse Clamp Block
28	6729040	Traverse Clamp Bracket
29	6729041	Carriage (Belt)

PARTS LIST (Continued) 6709562 BEDKNIFE SUPPORT ASSEMBLY



PARTS LIST (Continued) 6709562 BEDKNIFE SUPPORT ASSEMBLY

DIAGRAM NO.	PART NO.	DESCRIPTION
1	B190411	Socket Head Cap Screw 10-24 x 1/4
2	B190805	Flat Head Socket Cap Screw 10-24 x 1/2
3	B191011	Socket Head Cap Screw10-24 x 3/8
4	B191211	Socket Head Cap Screw 10-24 x 3/4
5	B191611	Socket Head Cap Screw 10-24 x 1
6	B250611	Socket Head Cap Screw 1/4-20 x 3/8
7	B251411	Socket Head Cap Screw 1/4-20 x 7/8
8	B253611	Socket Head Cap Screw 1/4-20 x 2-1/4
9	B371211	Socket Head Cap Screw 3/8-16 x 3/4
10	B371611	Socket Head Cap Screw 3/8-16 x 1
11	C190420	Set Screw Cup Point 10-24 x 1/4
12	C250420	Set Screw Cup Point 1/4-20 x 1/4
13	C250627	Set Screw Cup Point 1/4-20 x 3/8 with nylon patch
14	C310420	Set Screw Cup Point 5/16-18 x 1/4
15	H250802	Roll Pin .25D x .50LG
16	H251202	Roll Pin .25D x .75LG
17	H251406	Drive Lock Pin .25D x .875LG
18	H251602	Roll Pin .25D x 1.00 LG
19	H251802	Roll Pin .25D x 1.125LG
20	J371000	Hex Nut 3/8-16
21	J377000	Nylon Locknut Jam 3/8-16
22	K191501	Split Lockwasher #10
23	K250001	Flat Washer 1/4
24	K250101	Washer - Flat .31 x .73 x .052T
25	K251501	Split Lockwasher 1/4
26	K310101	Flat Washer 5/16
27	K371501	Split Lockwasher 3/8
28	09054	3/8 ID x 5/8 OD x 1/16 Thick Flat Washer
30	3579109	Nylon Plug 3/16 Diameter
31	3708245	T-Knob 2.5 3/8-16F
32	3708393	Handwheel 3.5 Diameter
33	3708554	Compression Spring .6250D x 3.0L
34	J997200	1-14 Locknut Jam Nylon Insert
35	3708564	Oilite Thrust Bearing 1.25ID
36	3708581	Inch Dial Indicator
37	3708593	Square Key 5/16 x 1/2L
38	3708691	Washer .25 x .62 OD x .12
39	3708701	Button Head Socket Cap Screw M3-.5 x 16
40	3708702	Button Head Socket Cap Screw M3-.5 x 30
41	3709062	Conical Washer .382 x .75 x .035
42	3709304	Thrust Washer
43	6009035	Locking Stud Shaft
44	6009036	Acme Adjusting Shaft
45	6009095	Slide Shaft
46	6709004	Machined Tooling Bar
47	6709008	Left-hand Pivot Plate
48	6709011	Index Stop Bracket
49	6709012	Right-Hand Gage Base
50	6709013	Left-Hand Gage Base
51	6709015	Retainer Block Gage
52	6709021	Gage Tip
53	6709107	Tooling Slide Mounting
54	6709108	Cross Slide Support
55	6709134	Bearing Block Lock Block
56	6709135	Rail Bellows 25/70
57	6709136	Wide Machined Rail 25/70
58	6709151	Decal - Upper Tooling Index
59	6709152	Decal - Lower Tooling Index
61	6729502	Gage Shaft Assembly
63	6709501	Tee Knob Assembly
64	6709519	Pivot Bearing Assembly
65	6729512	Tooling Mounting Bracket Assembly
66	6729510	Magnet Repair Assembly - INA 672
67	6729510	Magnet Repair Assembly - INA 672
68	B251211	Socket Head Cap Screw 1/4 -20 x 3/4
69	3708694	Linear Bearing Wide
70	6729511	Tooling Rotate Arm Weldment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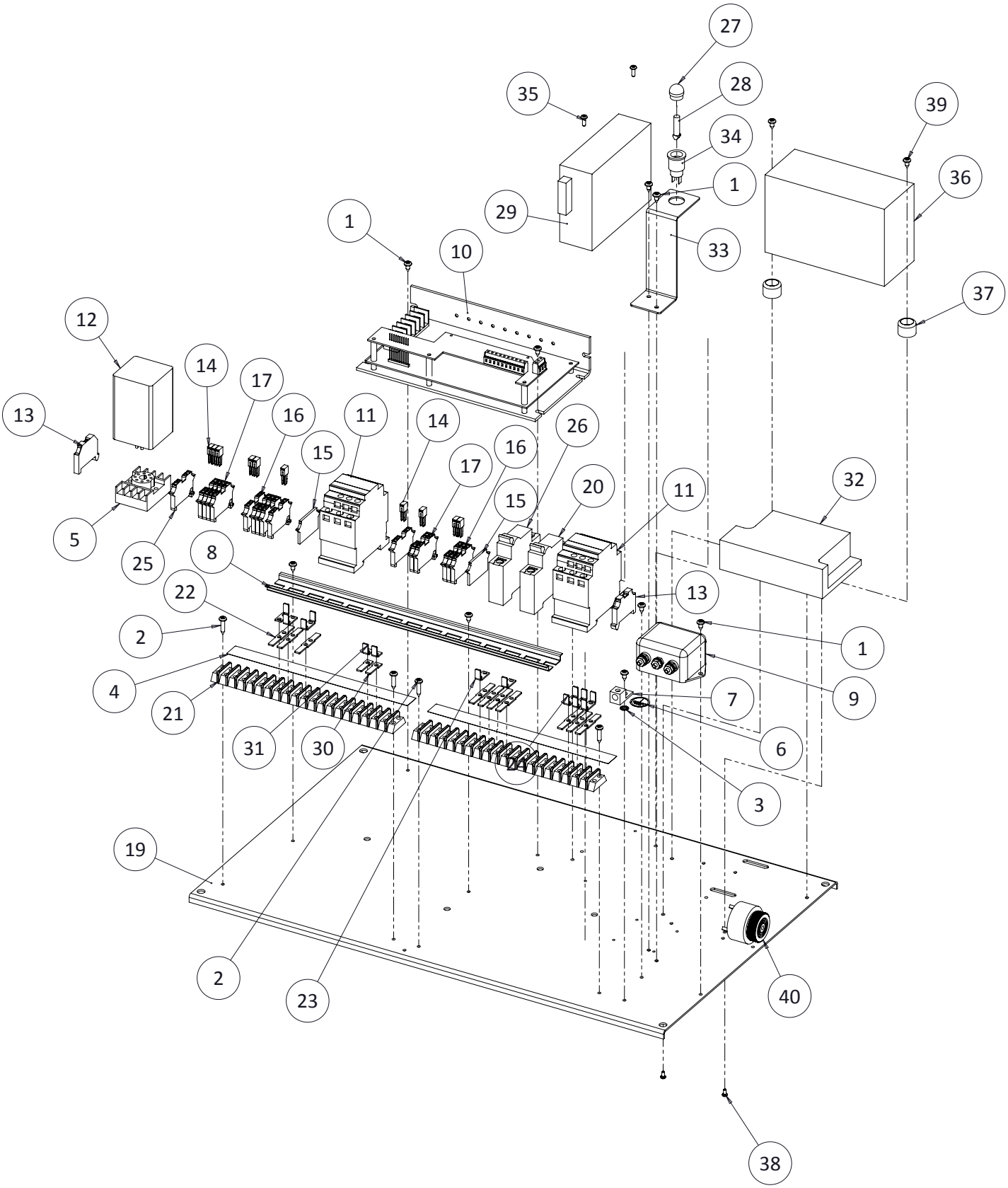
PARTS LIST (Continued) 6729516 CONTROL PANEL ASSEMBLY

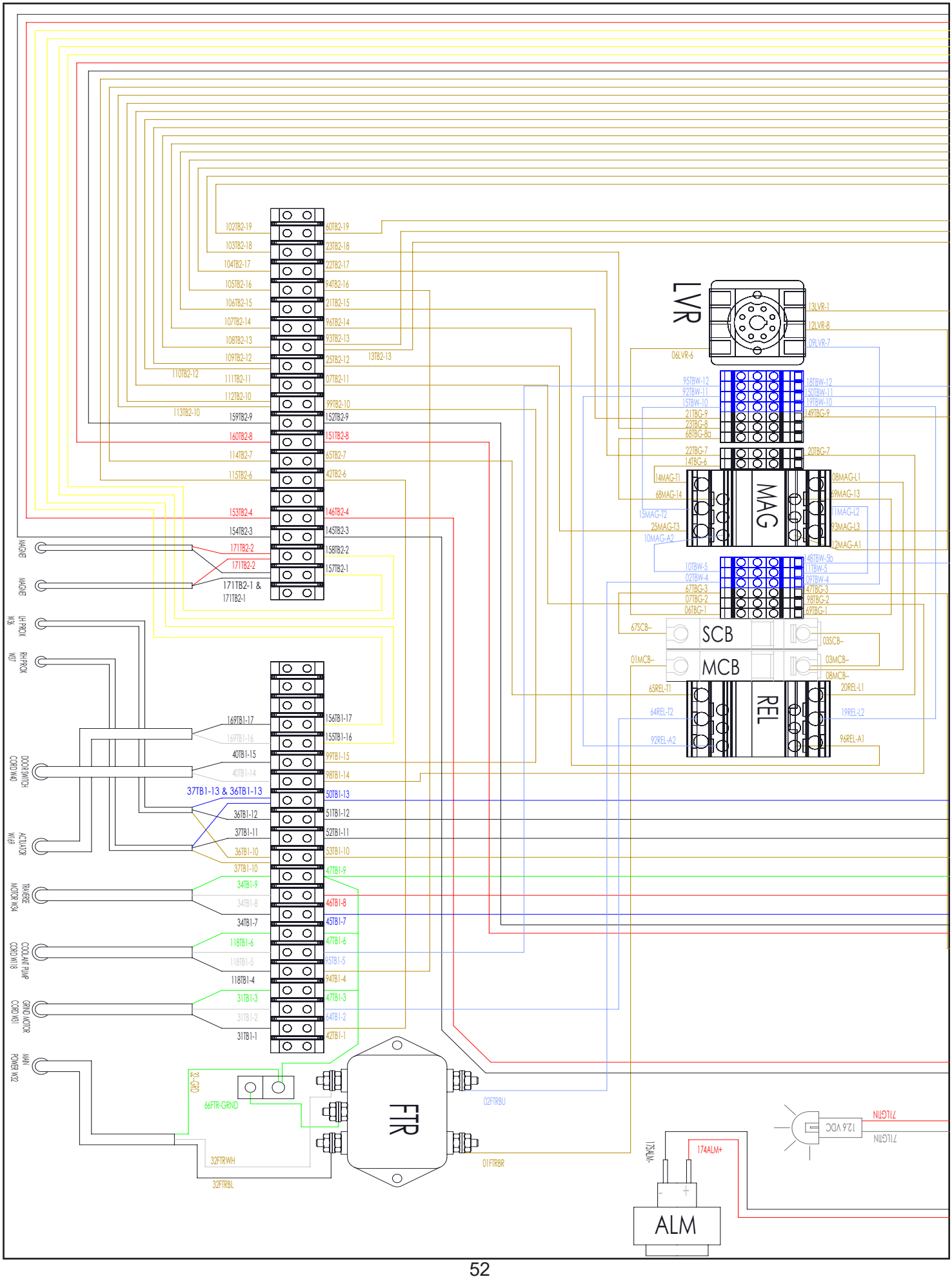
DIAGRAM NO.	PART NO.	DESCRIPTION
1	B190634	10-32 x 3/8 Button Head Socket Cap Screw
2	D250800	Hex Head Thread Cutting Screw 1/4-20 x .5”
3	H121302	Roll Pin .125 D x .813 Lg
4	J257000	1/4-20 Nylon Insert Jam Locknut
5	R000536	Lock Washer 1/4 Internal Teeth
6	3707342	Ring Yellow E-Stop
7	3707367	Switch Rocker On/Off Dpst
8	3707429	Switch Rocker On-Off
9	3707442	Circuit Breaker 2 Amp
10	3707444	Circuit Breaker 10 Amp
11	3707446	Speed Knob With Pointer
12	3707487	Pilot Lamp Socket
13	3707489	Lamp - 24V .073 Amp
14	3707539	Green Fluted Dome Lens
15	3707543	Circuit Breaker 12 Amp
16	3707547	Circuit Breaker 15 Amp
17	3707564	Pushbutton Green Start
18	3707565	No Contact Block
19	3707566	Switch Latch
20	3707567	Push/Pull Red Stop Button
21	3707568	NC Contact Block
22	3707713	Rocker Switch Momentary On/Off/On Wide
23	6709122	Switch Guard Cover
24	6709123	Switch Guard Base
25	6709206	Control Panel Decal
26	6709213	Control Travel Stop
27	6709567	Control Panel Weldment
28	6709572	Control Top Weldment
29	6729519	Control Panel Sub Assembly
30	6059050	672 Traverse Potentiometer

PARTS LIST (Continued) 6759519 CONTROL PANEL SUB-ASSEMBLY



PARTS LIST (Continued) 6729519 CONTROL PANEL SUB-ASSEMBLY

DIAGRAM NO.	PART NO.	DESCRIPTION
1	D160666	Pan Head Self-Tapping Screw #8 x 3/8 Long
2	D161266	Pan Head Self-Tapping Screw #8 x 3/4 Long
3	R000480	#8 Lockwasher
4	55223	Terminal Strip Decal
5	3707073	8-Pin socket
6	3707163	Primary Ground Decal
7	3707164	Primary Ground Lug
8	3707378	14" Din Rail
9	3707764	Power Line Filter 20 Amp
10	3707850	Traverse Control Board
	3707546	3-Amp Slow-Blo fuse for Traverse Board
11	3707556	Magnetic Starter
12	3707688	High/Low Voltage Sensor Relay
13	3707625	Screwless Terminal Bock End Stop
14	3707626	Terminal Block Jumper
15	3707627	Terminal Block End Plate
16	3707628	2-Conductor Terminal Block - Grey
17	3707629	2-Conductor Terminal Block - Blue
18	3708920	Low Voltage Warning Decal
19	6009270	Electrical Sub Panel
20	3707589	15-Amp Circuit Breaker
21	3707706	19 Pole Terminal Strip
22	3707707	Double Spade Terminal
23	3707709	Single Spade Terminal 90°
24	3707708	Double Spade Terminal 90°
25	3707624	2-Conductor Terminal Block - Ground
26	3707779	6 Amp Circuit Breaker
27	3707488	Amber Dome Lens
28	3707489	24V Lamp
29	3707948	Power Supply 150 Watt
30	3707741	Flat Single Spade Terminal
31	3707742	90° Single Spade Terminal
32	3707855	Power Supply with Battery Backup (UPS)
33	6729027	Power Light Bracket
34	3707487	Lamp Socket
35	D130608	Pan Head Self-Tapping Screw #6-32 x 3/8 Long
36	3707854	12 V Battery
37	3709767	Rubber Bumper
38	3708574	M3 x .5 Screw
39	D160866	Pan Head Self-Tapping Screw #8 x 3/8 Long
40	3707856	Alarm


LVR
MAG
SCB
MCB
REL
FTR
ALM
102TB2-19
103TB2-18
104TB2-17
105TB2-16
106TB2-15
107TB2-14
108TB2-13
109TB2-12
110TB2-12
111TB2-11
112TB2-10
113TB2-10
159TB2-9
160TB2-8
114TB2-7
115TB2-6
153TB2-4
154TB2-3
171TB2-2
171TB2-2
171TB2-1 & 171TB2-1
60TB2-19
23TB2-18
22TB2-17
94TB2-16
21TB2-15
96TB2-14
93TB2-13
25TB2-12
13TB2-13
97TB2-11
99TB2-10
152TB2-9
151TB2-8
65TB2-7
42TB2-6
146TB2-4
145TB2-3
158TB2-2
157TB2-1
169TB1-17
169TB1-16
40TB1-15
40TB1-14
37TB1-13 & 36TB1-13
36TB1-12
37TB1-11
36TB1-10
37TB1-10
34TB1-9
34TB1-8
34TB1-7
118TB1-6
118TB1-5
118TB1-4
31TB1-3
31TB1-2
31TB1-1
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98TB1-14
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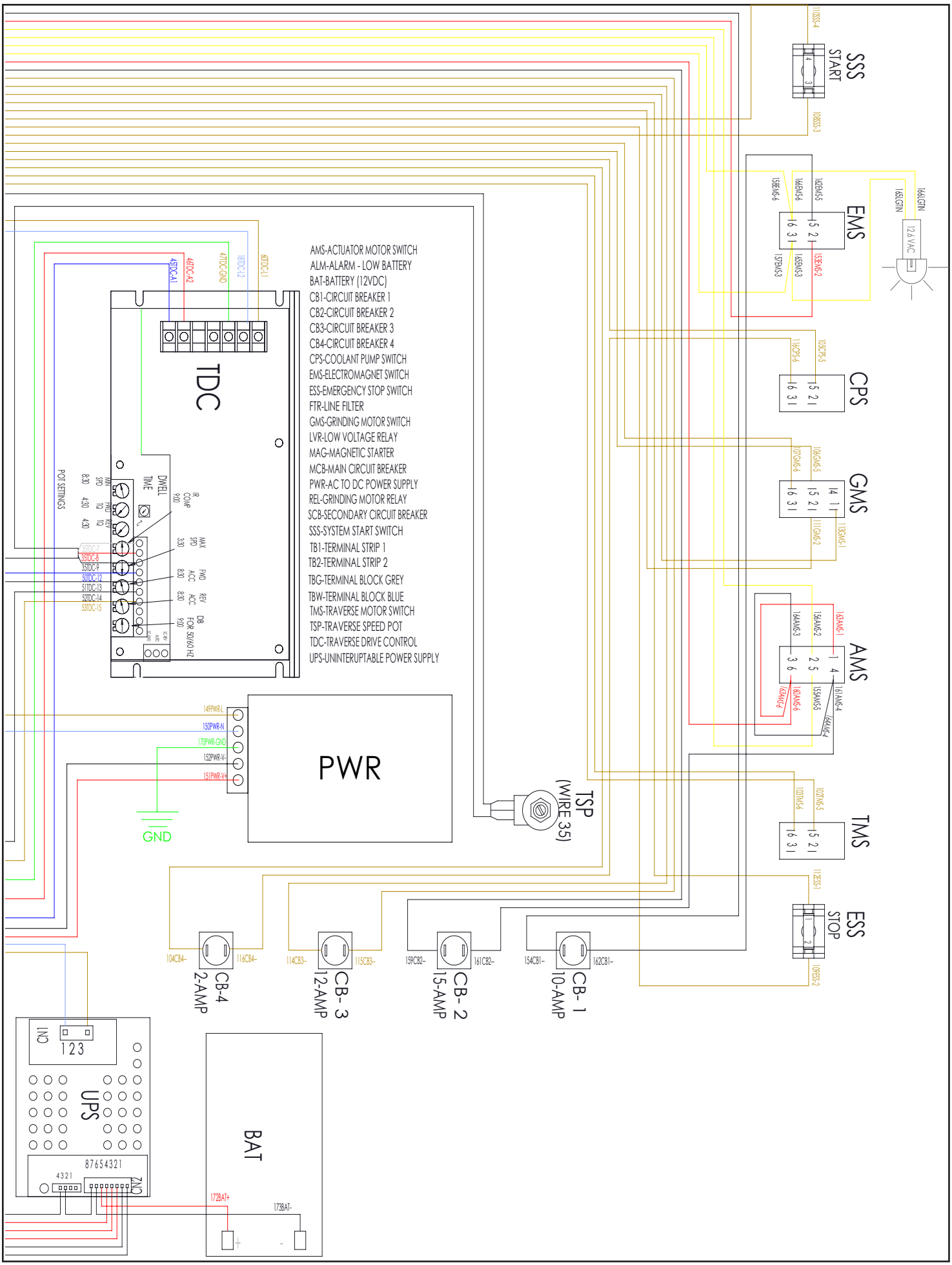
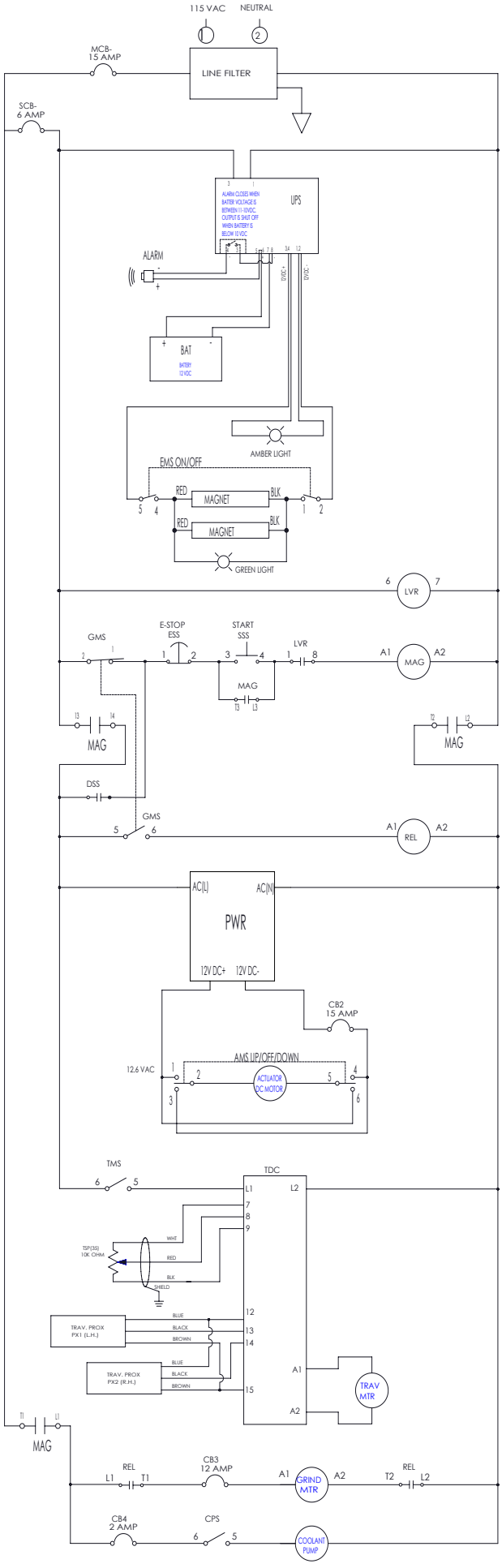
51TB1-12
52TB1-11
53TB1-10
47TB1-9
46TB1-8
45TB1-7
47TB1-6
95TB1-5
94TB1-4
47TB1-3
64TB1-2
42TB1-1
13LVR-1
12LVR-8
09LVR-7
06LVR-6
95TBW-12
92TBW-11
15TBW-10
21TBG-9
23TBG-8
68TBG-8a
18TBW-12
50TBW-11
49TBW-10
49TBG-9
22TBG-7
14TBG-6
20TBG-7
14MAG-T1
68MAG-14
15MAG-T2
25MAG-T3
10MAG-A2
08MAG-L1
69MAG-13
11MAG-L2
23MAG-L3
12MAG-A1
10TBW-5
02TBW-4
67TBG-3
07TBG-2
06TBG-1
48TBW-5b
11TBW-5
29TBW-4
47TBG-3
98TBG-2
49TBG-1
67SCB--
03SCB--
01MCB--
03MCB--
08MCB--
65REL-T1
64REL-T2
92REL-A2
20REL-L1
19REL-L2
96REL-A1
02FTRBU
01FTRBR
66FTR-GRND
32FTRWH
32FTRBL
175ALM-
174ALM+
12.6 VDC
71LGTIN
71LGTIN
MAGNET
MAGNET
LH PROX
RH PROX
DOOR SWITCH
ACTUATOR
TRAVERSE MOTOR
COOLANT PUMP
GRIND MOTOR
MAIN POWER
32 GRD


AMS-ACTUATOR MOTOR SWITCH
ALM-ALARM - LOW BATTERY
BAT-BATTERY (12VDC)
CB1-CIRCUIT BREAKER 1
CB2-CIRCUIT BREAKER 2
CB3-CIRCUIT BREAKER 3
CB4-CIRCUIT BREAKER 4
CPS-COOLANT PUMP SWITCH
EMS-ELECTROMAGNET SWITCH
ESS-EMERGENCY STOP SWITCH
FTR-LINE FILTER
GMS-GRINDING MOTOR SWITCH
LVR-LOW VOLTAGE RELAY
MAG-MAGNETIC STARTER
MCB-MAIN CIRCUIT BREAKER
PWR-AC TO DC POWER SUPPLY
REL-GRINDING MOTOR RELAY
SCB-SECONDARY CIRCUIT BREAKER
SSS-SYSTEM START SWITCH
TB1-TERMINAL STRIP 1
TB2-TERMINAL STRIP 2
TBG-TERMINAL BLOCK GREY
TBW-TERMINAL BLOCK BLUE
TMS-TRAVERSE MOTOR SWITCH
TSP-TRAVERSE SPEED POT
TDC-TRAVERSE DRIVE CONTROL
UPS-UNINTERUPTABLE POWER SUPPLY
SSS START
EMS
CPS
GMS
AMS
TMS
ESS STOP
TDC
PWR
TSP (WIRE 35)
GND
CB-4 2-AMP
CB- 3 12-AMP
CB- 2 15-AMP
CB- 1 10-AMP
UPS
BAT
POT SETTINGS
DWELL TIME
MIN SPD
FWD TQ
REV TQ
IR COMP
MAX SPD
FWD ACC
REV ACC
DB FOR 50/60 HZ


115 VAC
NEUTRAL
MCB-
15 AMP
LINE FILTER
SCB-
6 AMP
UPS
ALARM
BAT
BATTERY
12 VDC
AMBER LIGHT
EMS ON/OFF
RED
MAGNET
BLK
GREEN LIGHT
LVR
GMS
E-STOP
ESS
START
SSS
MAG
DSS
REL
AC(L)
AC(N)
PWR
12V DC+
12V DC-
CB2
15 AMP
AMS UP/OFF/DOWN
12.6 VAC
ACTUATOR
DC MOTOR
TMS
TDC
TSP(3S)
10K OHM
WHT
RED
BLK
SHIELD
TRAV. PROX
PX1 (L.H.)
TRAV. PROX
PX2 (R.H.)
BLUE
BLACK
BROWN
TRAV
MTR
CB3
12 AMP
GRIND
MTR
CB4
2 AMP
CPS
COOLANT
PUMP