ACCU-Pro AUTOMATIC REEL MOWER GRINDER with *ACCU*-Touch

ASSEMBLY and 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.

6327958 (6-07)

SAFETY INSTRUCTIONS

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

The ***Warning Symbol*** identifies special instructions or procedures which, if not correctly followed, could result in personal injury.

The ***Caution Symbol*** identifies special instructions or procedures which, if not strictly observed, could result in damage to or destruction of equipment.

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 cutting unit is securely fastened with the clamps 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,** or when changing the grinding wheel.
15. **DO NOT USE SHARP OBJECTS ON THE TOUCH SCREEN.** Do not clean the touch screen with solvents.
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.**

SAFETY INSTRUCTIONS

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 COVERING** 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.

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 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 work gets hot.

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.

This machine is intended for grinding the reel of reel type mower 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 manufactures 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. Machine is for indoor use only. Do not use a power washer to clean the machine.

Low Voltage Relay

The grinder is equipped with a low voltage relay which is factory preset at 100 VAC. If the power supply line does not deliver 100 VAC power under load, the relay will open and trip out the starter. If this occurs, your power supply line is inadequate and must be correct before proceeding further with the grinder.

CONTENTS

-Separate Drawings Included in the Product Packet

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 *ACCU*-Pro or *ACCU*-Master Grinder. 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 Manual, 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 questions not answered in this manual, please call your distributor. They will contact the manufacturer if necessary.

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 Thread Hole in Steel
Refer to the table at the right.

Bolts Going Into a Thread Hole in Aluminum
Use the Grade 2 values in the table at the right.

Socket-Head Screws Going Into a Nut or Steel
Use the Grade 8 values in the table at the right.

Machine Screws
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 (0.37 kg-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)

ASSEMBLY INSTRUCTIONS

Remove the sides, front, and back of the crate. Remove the plastic bag, shrink wrap and bubble wrap. Remove the metal clips that secure the grinder to the crate base. With a fork lift, raise the grinder from the wood base and set it in its final position. See FIG. 1 and 2.

THE UNIT WEIGHS 1490 LBS. (676 kg). USE POWER EQUIPMENT TO LIFT MACHINE.

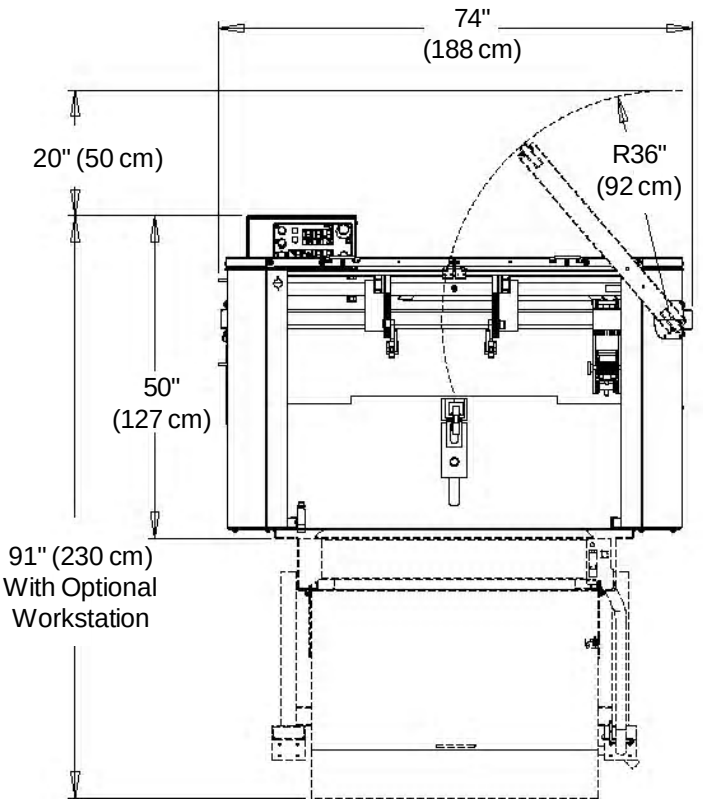


FIG.1

Remove shipping straps from traverse carriage. Remove window protective sheets.

POSITION BASE

The *ACCU*-Pro Spin/Relief Grinder will require an operating area of about 120" W x 140" D x 90" H (305 x 356 x 229 cm). The mower reel will be lifted from the front of the machine if using the optional winch & boom and from the rear with the optional workstation. The machine operator will operate the unit from the front of the machine. Position the base to allow sufficient operating room in front of the machine (and behind if using the optional workstation). See FIG. 1 and 2.

The base should be placed on a relatively level concrete floor, with ample ceiling height to allow for the installation of the unit. Do not place the unit across two concrete slab seams or across a large crack.

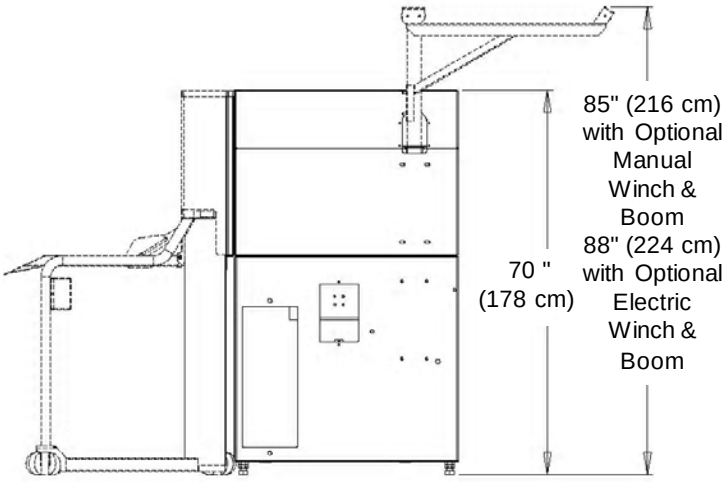
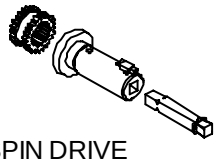


FIG. 2

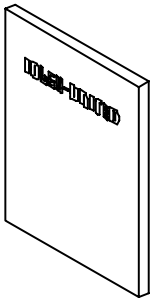
ASSEMBLY INSTRUCTIONS (Continued)

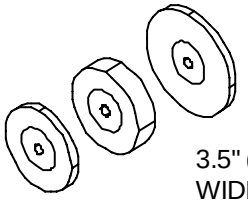
Remove the carton and remove the contents from the carton onto a workbench. The carton includes:



SPIN DRIVE ADAPTER

PRODUCT PACKET

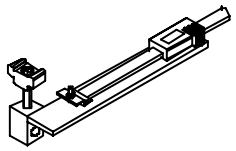




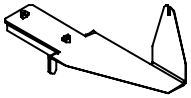
5" (127mm) DIA. X 3/8" (10mm) WIDE GRINDING WHEEL

3.5" (89mm) DIA. X 1" (25mm) WIDE GRINDING WHEEL

3.5" (897mm) DIA. X 3/8" (10mm) WIDE GRINDING WHEEL

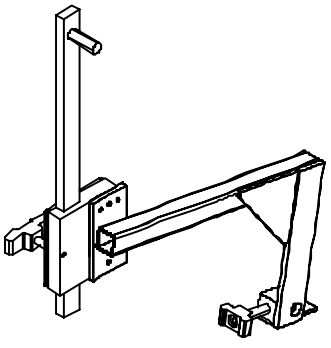


ALIGNMENT GAGE



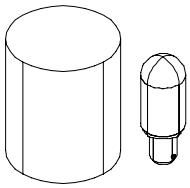
REEL POSITION GAGE

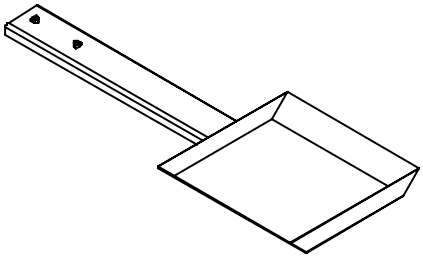
ALLEN WRENCH



HORIZONTAL EXTENSION (ALIGNMENT GAGE)

FLASHER BULB & LENS





DRIP PAN

ASSEMBLY INSTRUCTIONS (Continued)

LEVEL BASE

Place a level on the top of the table and check the unit from side to side for level. Adjust the leveling feet as necessary to bring to level. See FIG. 4.

Place a level across the table from front to rear. Adjust the leveling feet on the end of the machine as necessary to level. See FIG. 5.

When both front to back and side to side leveling procedures have been completed, thread the hex jam nuts up against the nut that is welded to the bottom until they lock into place. Be careful not to move the leveling feet during this process. See FIG. 3. Make certain that all four leveling feet are firmly contacting the floor.

Recheck with level after locking nuts are firmly tightened.

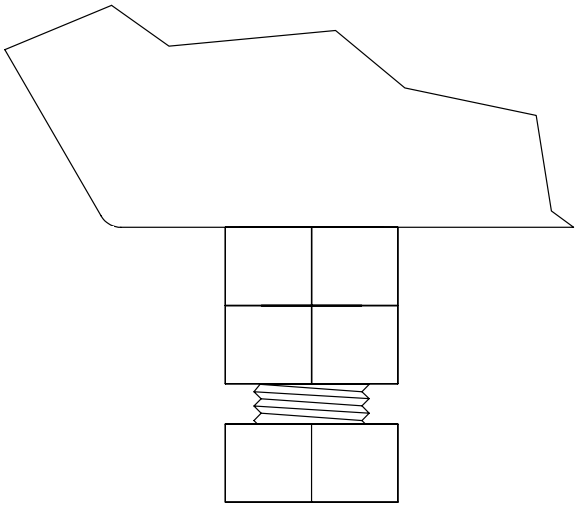


FIG. 3

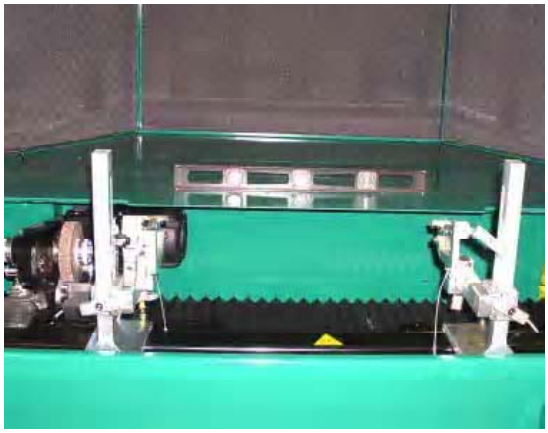


FIG. 4

FIG. 5

INSTALL THE FLASHER LIGHT

Locate flasher bulb and lense in carton. Install bulb and lense to the flasher assembly socket. This is located on top of the front right frame member on the 632 ACCU-Pro. See Fig. 6.

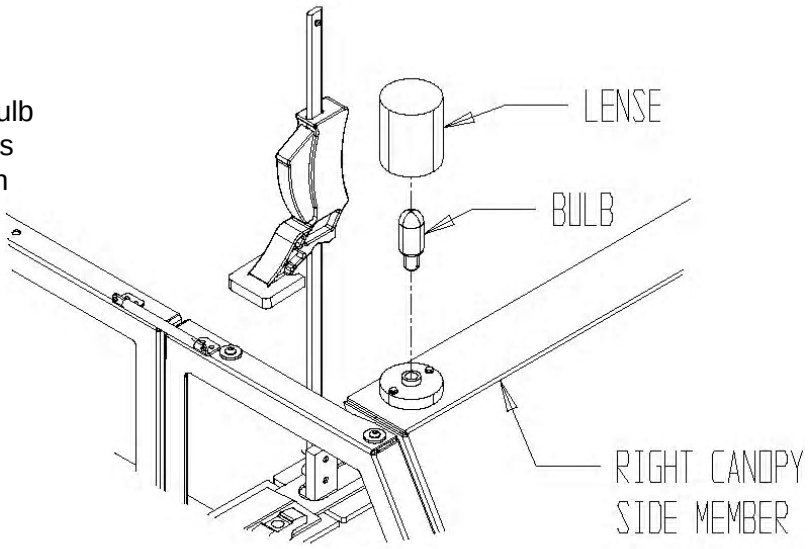


FIG. 6

ASSEMBLY INSTRUCTIONS (Continued)

APPLY POWER

BEFORE YOU APPLY POWER TO THE GRINDER, REFER TO THE "IMPORTANT GROUNDING INSTRUCTIONS" ON PAGE 10.

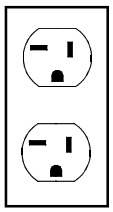


FIG. 7

115 Volt Model Only. Plug the power cord into a standard 115V AC 20-amp grounded receptacle. See FIG. 7.

220 Volt Model Only. For 220 Volt Applications order Part No. 6320935, 6320945, 6520915, or 6520925, which includes a prewired 3 KVA 220 V step down to 110 V 50-60 Hz transformer should be ordered.

IT IS RECOMMENDED THAT THIS ACCU-MASTER REEL MOWER GRINDER HAS ITS OWN PERMANENT POWER CONNECTION FROM THE POWER DISTRIBUTION PANEL, WITH NO OTHER MAJOR POWER DRAW EQUIPMENT ON THE SAME LINE.

IT IS REQUIRED THAT THE POWER DELIVERED TO THIS GRINDER IS 115 VAC - 20 AMPS. THE TOLERANCE ON THIS POWER REQUIREMENT IS +/- 5%. THEREFORE THE MINIMUM VOLTAGE REQUIREMENT IS 109VAC WITH 20 AMPS. VOLTAGE MUST BE CHECKED WITH ALL EQUIPMENT UNDER LOAD (OPERATING) ON THE CIRCUIT.

DO NOT OPERATE THIS GRINDER WITH AN EXTENSION CORD.

PROPER GROUNDING OF THE RECEPTACLE GROUND IN YOUR BUILDING MUST BE VERIFIED. IMPROPER GROUNDING IN YOUR BUILDING MAY CAUSE THE GRINDER TO MALFUNCTION.

The grinder is equipped with a low voltage relay which is factory preset at 100 VAC. If the power supply line does not deliver 100 VAC power under load, the relay will open and trip out the starter. If this occurs, your power supply line is inadequate and must be corrected before proceeding further with the grinder.

FOR 20 AMP RATED LARGE MACHINES

Below is a list of required wire size in **your** building. (This is the wiring from the main panel to the grinder receptacle box.)

For 0 to 40 Feet from panel to receptacle = Use 12 Ga. Wire.
For 40 to 60 Feet from panel to receptacle = Use 10 Ga. Wire.
For 60 to 100 Feet from panel to receptacle = Use 8 Ga. Wire.
For 100 to 160 Feet from panel to receptacle = Use 6 Ga. Wire.

For 0 to 12 Meters from panel to receptacle = Use 4.0mm Wire.
For 12 to 18 Meters from panel to receptacle = Use 6.0mm Wire.
For 18 to 30 Meters from panel to receptacle = Use 10.0mm Wire.
For 30 to 48 Meters from panel to receptacle = Use 16.0mm Wire.

ASSEMBLY INSTRUCTIONS (Continued)

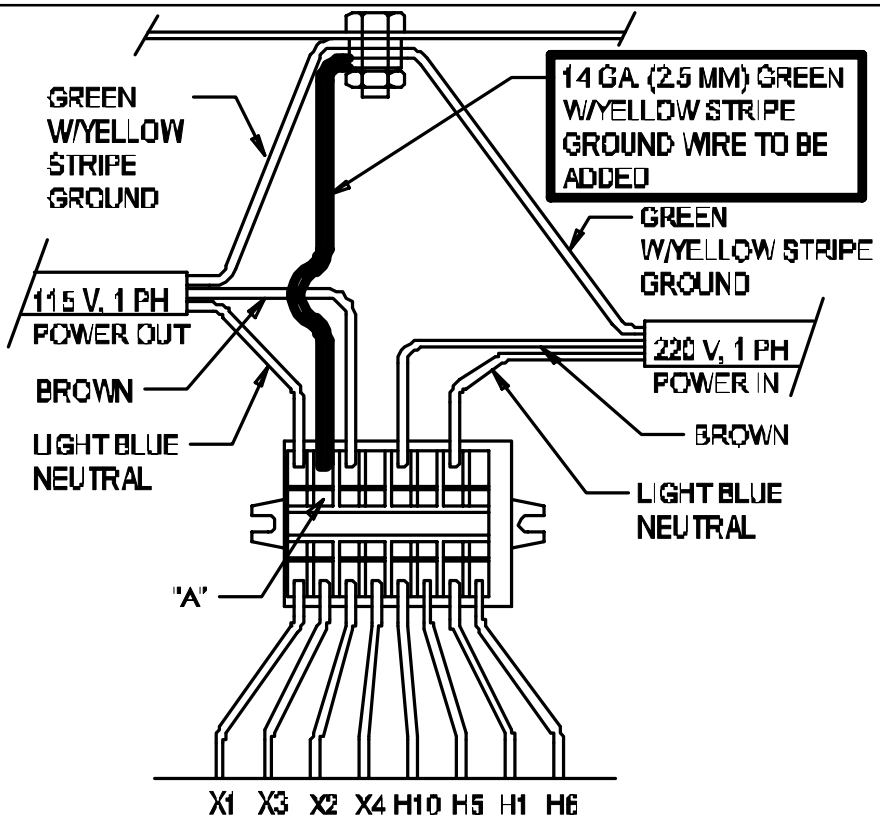
For 220 V 50 or 60Hz applications Product No. 6320935, 6320945, 6520915 or 6520925 should be ordered.

These products includes a 3 KVA 220 Volt Step Down to 110 volt 50/60 Hz transformer which is prewired.

The wiring diagram is shown in FIG. 8.

The power cord has no connector. A connector which is appropriate for your locality and 220 volt, 10 amp application should be installed.

USE ONLY A QUALIFIED ELECTRICIAN TO COMPLETE THE INSTALLATION.



INDIVIDUALLY WIRE NUT TRANSFORMER LEADS H2, H3, H4, H7, H8 AND H9

INSTALL THE GREEN W/YELLOW STRIPE WIRE SUPPLIED INTO THE TERMINAL BLOCK IN THE HOLE OPPOSITE WIRE X3 AS SHOWN. TO INSTALL THE WIRE INSERT A SMALL SCREWDRIVER INTO THE CAVITY MARKED "A" TO OPEN THE WIRE HOLE.

ATTACH THE OTHER END OF THE GREEN W/YELLOW STRIPE WIRE SUPPLIED TO THE GROUND STUD ON THE TRANSFORMER.

FIG. 8

IMPORTANT GROUNDING INSTRUCTIONS

In case of a malfunction or electrical 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.

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.

PERIODIC MAINTENANCE

DAILY MAINTENANCE IS SPECIFIED ON PAGE 4 OF THE OPERATOR'S MANUAL, AND IS TO BE PERFORMED BY THE OPERATOR.

LISTED BELOW ARE PERIODIC MAINTENANCE ITEMS TO BE PERFORMED BY YOUR COMPANY'S MAINTENANCE DEPARTMENT:

1. Clean the tank and filter of the vacuum system weekly or more often depending on the number of reels ground. **(VACUUM SYSTEM IS OPTIONAL EQUIPMENT ALL 632 ACCU-PRO MODELS).**

2. Use the grease fitting provided to grease the dove tail with high quality lithium grease monthly. Wipe off excess grease. See FIG. 9.

3. Wipe and re-oil with spray lubricant, the grinding wheel diameter adjusting lead screw every three months. Wipe off all excess lubricant. See FIG. 9.

4 Check the gib adjustment on the Grinding wheel diameter adjustment every 3 months. See FIG. 9.

5. Inspect the Grinding wheel Poly-V belt for cracking and adjust the belt tension per procedure called out in the adjustment section every six months.

6. Wipe and relube with never-seez, the vertical and horizontal alignment shafts and lead screws, every six months. See FIG. 10.

7. Lift the bellows and wipe off the bearing rails monthly. Lubricate linear bearing, follow the lubrication procedure on the following pages. Generally, this will be every six months to a year.

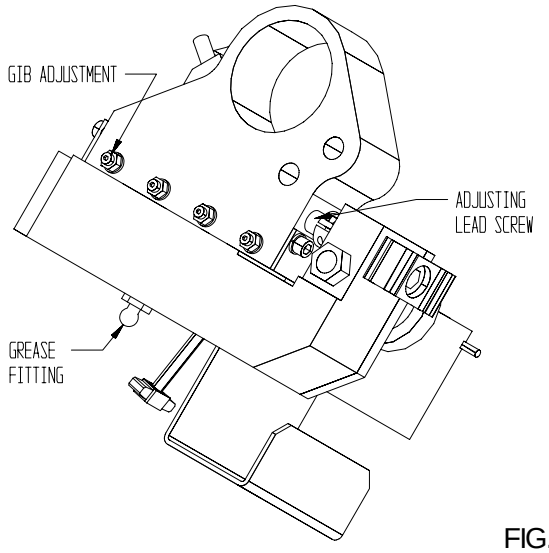


FIG. 9

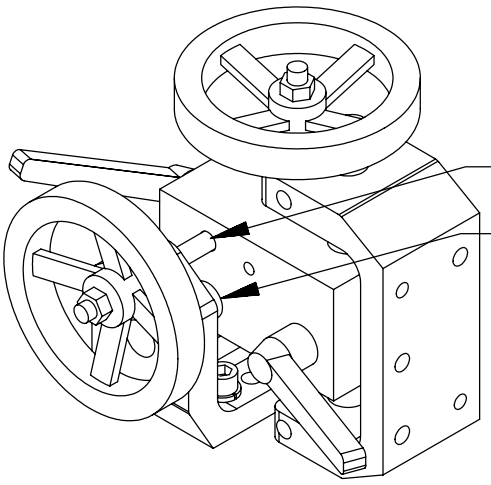


FIG. 10

STORAGE PROCEDURE

It is important to follow the procedures below when placing your grinding in storage for an extended period of time. Proper care will help maintain the working functions of the grinder and decrease maintenance and problems that occur when storing the grinder.

BEFORE STORING THE GRINDER:

-Clean the machine thoroughly. **(DO NOT USE COMPRESSED AIR OR A POWER WASHER TO CLEAN THIS MACHINE!)** See Maintenance section for instructions on cleaning polycarbonate.

-Lubricate the following parts by flooding the area with a spray lubricant and leaving it in place: (Do not use a Teflon based lubricant)

Traverse Shafts & Linear bearings (see Lubrication section of manual)
Remove grinding wheel and spray the movable parts of the finger system
Cross slide shafts and adjustment screws (Right side of Traverse Base)
Scratches in the paint or any other bare metal surfaces

-Work the lubricant in by moving parts through their full range of motion.

-Make sure all controls are in the off position and unplug the unit from the wall. Turn off the digital alignment gage.

-Cover the unit if possible with a sheet or tarp.

BRINGING THE UNIT BACK INTO SERVICE:

-Remove the cover and reapply lubricant to the items stated above. Wipe off all excess lubricant. (See Lubrication section for more details.)

-Plug the unit into the wall and test all electrical functions.

-Check the belts for cracking and adjust the tension if necessary.

-Check for damaged or missing parts.

LUBRICATION

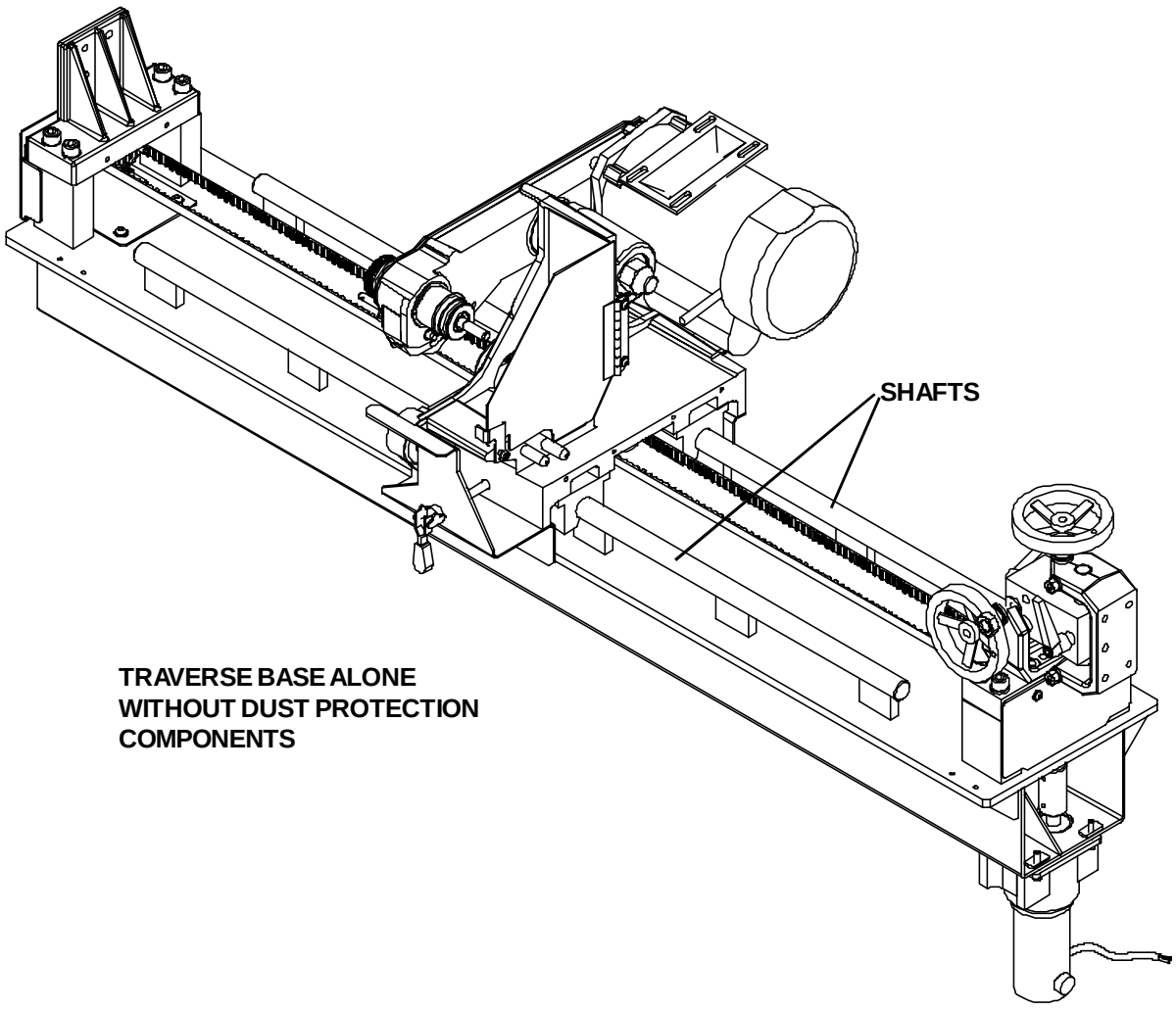
LUBRICATION OF LINEAR BEARINGS

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. See FIG. 11 Then run the carriage back and forth through its 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 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 and that lubricant 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.



**TRAVERSE BASE ALONE
WITHOUT DUST PROTECTION
COMPONENTS**

FIG. 11

CLEANING AND MAINTENANCE GUIDELINES FOR POLYCARBONATE WINDOWS

Cleaning Instructions

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

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, a warm final wash should be made, using a mild dish washing liquid detergent solution and ending with a thorough rinsing 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.

Some Important "DON'TS"

- **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.

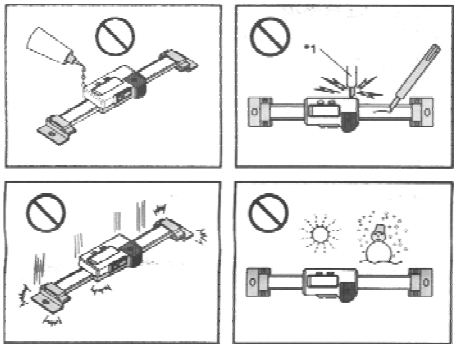
Graffiti Removal

- 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 (hair dryer) to soften the adhesive and promote removal.

  GASOLINE SHOULD NOT BE USED!

MAINTENANCE (Continued)

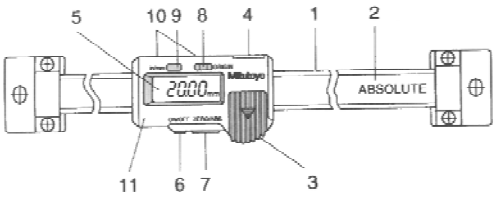
DIGITAL GAGE



Important

- ♦ Do not mark the scale unit with and electric engraver or scratch the scale.
- ♦ **Always use an SR44 battery (silver oxide cell)**
- ♦ **If the scale will not be used for more than three months, remove the battery and store it properly. Otherwise, leakage, if any, from the battery may damage the unit.**

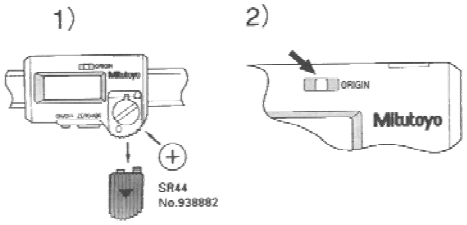
Description of Parts



1. Beam
2. Main Scale
3. Battery compartment
4. Output Connection
5. Display
6. ON/OFF Power
7. ZERO/ABS switch
8. Origin Switch
9. Inch/mm Switch
10. Tapped hole
11. Slider

Battery Installation and Origin Setting

Set the origin of the scale after installing the battery. Otherwise, the error sign("E" at the least significant digit) may appear, resulting in incorrect measurements.

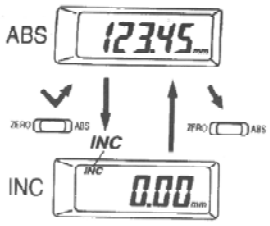


1) To install the battery, remove the compartment lid and install the SR44 battery with its positive side facing up. After the battery is installed, set the origin.

2) To set the origin, move the slider to an area you wish to set as your origin. Turn the power on. Hold the ORIGIN switch down for more than one second. The "0.00" display appears, indication Origin setting is complete. The origin will be retained even if the power is turned off.

Incremental (INC) & Absolute (ABS) mode

The LCD will dispay measurements from the origin when turned on (ABS mode). To set the origin see above. The display can be set to zero at any desired position by pressing the ZERO/ABS switch. INC indicator will apper in the display (INC mode), permitting measurements from this zero point. To return to the ABS mode hole the ZERO/ABS buttton for more than 2 seconds.

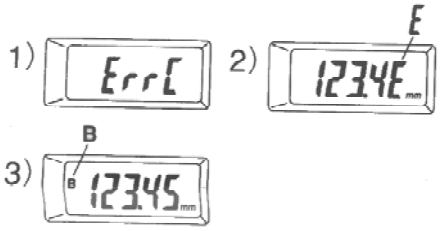


Error Symptoms & Remedies

◆◆ **ERRC and display flickering:** Occurs when the scale surface is stained. Clean the scale surface and coat a thin film of low viscosity oil to keep out moisture.

◆◆ **E in the least significant digit:** This occurs when the slider is moved too quickly, but it does not affect the measurement. If it stays on when the slider stops, the scale surface is probably stained. If this is the case, take remedies as for ErrC.

◆◆ **B indication:** Battery voltage is low. Replace the battery as soon as possible.



CARRIAGE LINEAR BEARING REPLACEMENT

STEP 1--Detach the bellows mounting brackets from the carriage. Detach front and rear shields. See FIG. 15.
STEP 2--Remove the three screws of one linear bearing and slide the linear bearing off the end of the carriage shaft.
STEP 3--Insert a new linear bearing onto the end of the carriage shaft with the tension adjustment screw pointing outward. See FIG. 14. 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: 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 tension screw is too tight.

Finally, sliding the bearing block back and forth should be a smooth uniform motion.

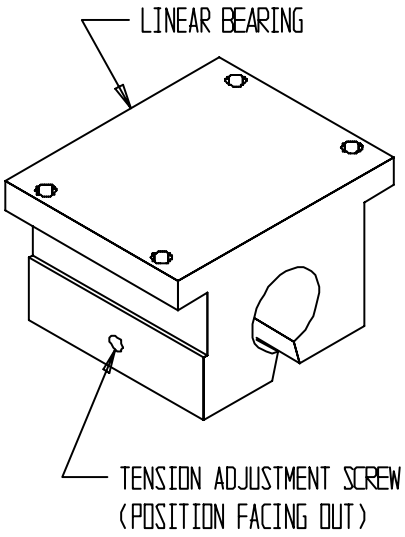


FIG. 14

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.

STEP 4--Slide linear bearing under carriage and attach with the three screws.
NOTE: Repeat Steps 2 thru 4 with the other three linear bearings.
STEP 5--After all four linear bearings are reattached to the carriage check for correct bearing tension. The bearing tension is correct when you try to lift the carriage and can feel no carriage movement, which is free play up and down. The most dependable method of checking free play is to use a magnetic base dial indicator attached to the traverse frame weldment and reading the vertical movement above each bearing. This movement should be within .001" (.03 mm) Also, when pulling the carriage in the traversing direction, there should be only approximately a 3 lb force, with the belt disengaged. To check this attach a spring scale to the carriage and pull parallel to the carriage shafts. To double check the assembly, slide the carriage assembly from "end of travel" to "end of travel", it should have very uniform resistance through the full range of travel.
STEP 6--Replace the bellows carriage mounting brackets onto the carriage. Replace front and rear shields. See FIG. 15.

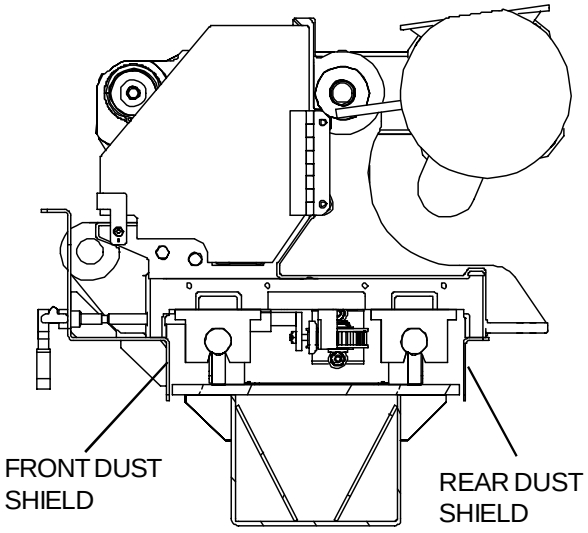


FIG. 15

ADJUSTMENTS (Continued)

REEL FINGER DOVETAIL GIB AND ADJUSTING KNOB ADJUSTMENTS

The reel finger slide to the reel finger positioner has a dovetail with an adjustable gib for tensioning. Tighten the gib set screws on the side so there is no free play in the dovetail slide. Check for movement when pushing on the relief finger side to side with a 20 lbs. (44 kg) force. Make sure the knob assembly for adjusting the relief finger to the grinding wheel is rotatable by hand. The gib adjustment should be sufficient to maintain a rigid position of the reel finger. See FIG. 16.

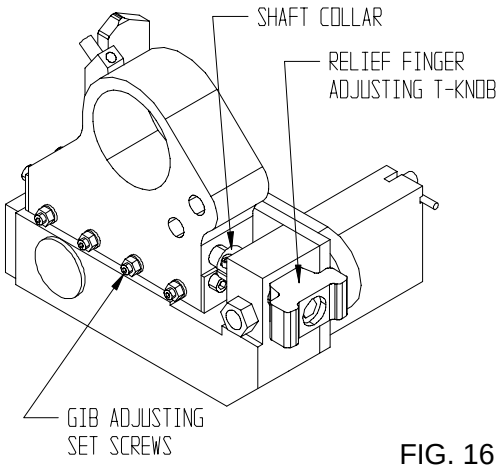


FIG. 16

Check the knob assembly rotating tension by checking the tightness of the nylon plug to the knob assembly threads. The tightness has to be sufficient so the knob assembly does not rotate during the relief grinding cycle. See FIG. 17.

NOTE: To adjust the nylon plug you must lock the index finger assembly down and then adjust the reel finger positioner so the clearance holes line up with the nylon plug set screw.

Take up any free play between the tee knob assembly, reel finger slide and .375 threaded split shaft collar. Loosen the shaft collar locking cap screw and rotate the shaft collar until there is no end play. Retighten locking cap screw on the threaded split shaft collar. See FIG. 16.

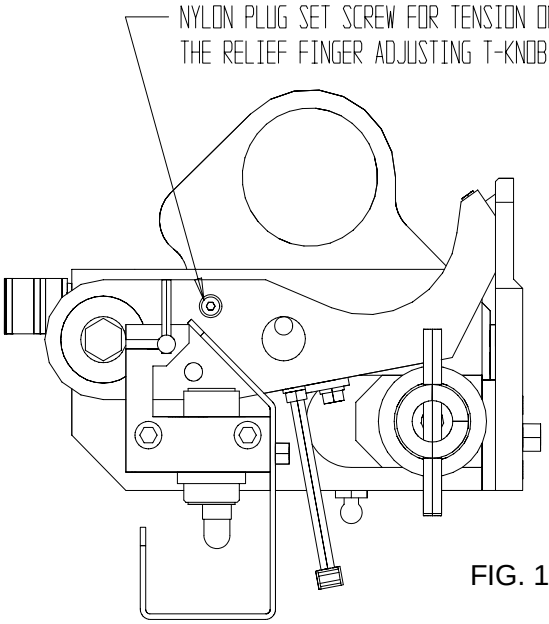


FIG. 17

GRINDING HEAD BELT TENSION ADJUSTMENT

The left side grip grinding wheel knob must be removed for belt tensioning adjustment. Remove the six screws holding the vacuum hose bracket, the two double tube clamps and the belt cover. For grinding motor belt adjustment, loosen the four socket head cap screws that attach the motor mounting plate. Adjust the grinding motor for proper belt tension and tighten the four socket head cap screws. The proper belt tension for the grinding head is to push down on the poly V belt half way between to two pulleys with 5 lbs. [2 kg] of force and belt movement dimensions to be .12 inches [3 mm]. See FIG. 18.

To verify belt tension mount the belt guard with two screws. Turn the motor on. If the belt is tensioned correctly, start-up torque of the motor through the pulley to the belt should have zero slippage. If there is belt slippage when turning on the motor there will be a slight squeal before the belt comes up to speed. When you achieve correct tension, reassemble all of the remaining parts that have been removed.

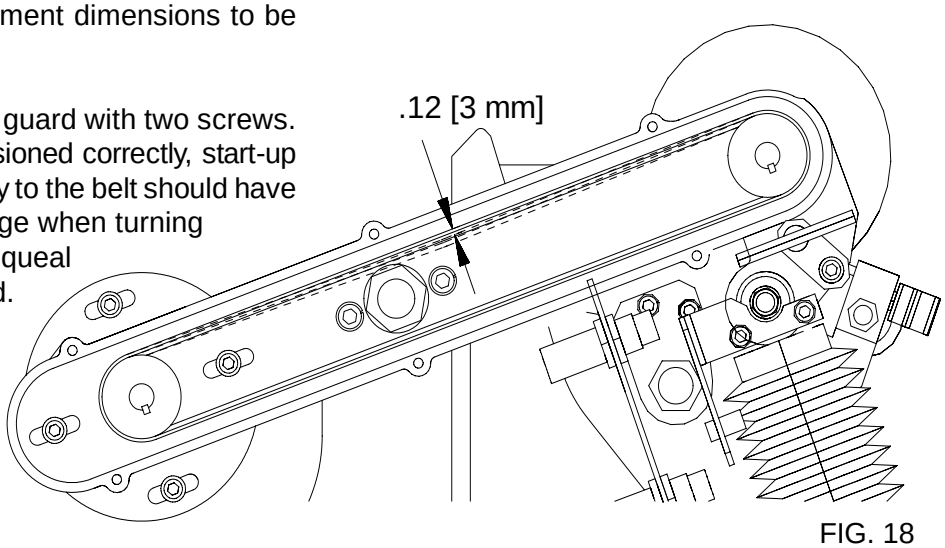


FIG. 18

ADJUSTMENTS (Continued)

INDEX FINGER PROXIMITY SETTING

Set all motor switches to the off position.

Press the machine system start switch, so the grinder is operational.

Push down on the index finger until the stop pin is within .06 inches (1.5 mm) of bottoming out. (You can use a 1/16" gage pin or rod stock between the stop pin and index finger). Set the proximity switch to activate the light at this setting. This assures the index finger to be close to its final stop position so the reel is completely indexed before the carriage starts to traverse. See FIG. 19.

The spring load force pushing up on the index finger brings it away from the proximity when released.

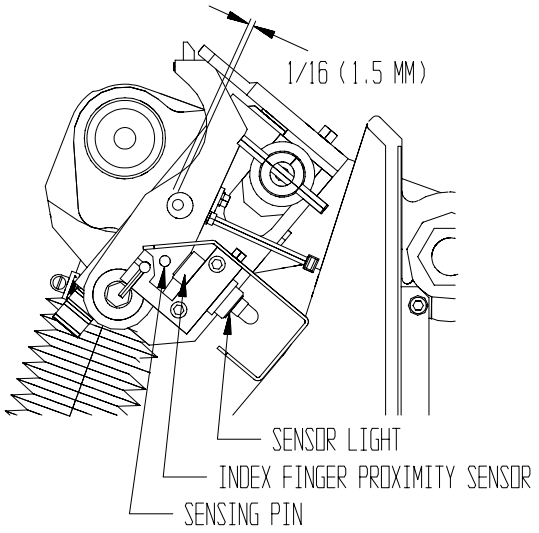


FIG. 19

STEPPPER INFEED TRAVEL LIMITS

The infeed stepper maximum extension is 6.0" (152 mm) and minimum compression is 3.5" (89 mm). If you experience a situation where the grind does not properly finish, check that you have not exceeded stepper travel by checking the values per FIG. 20.

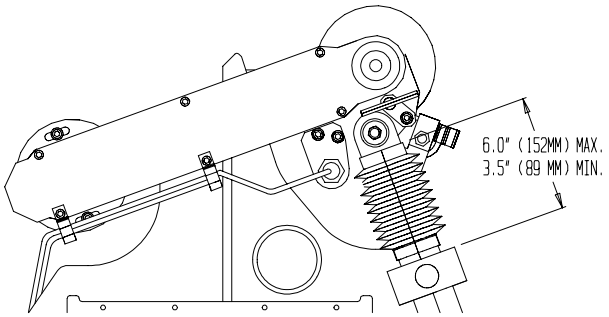


FIG. 20

LOCKING INDEX FINGER PIN

To align the Index Finger Locking Pin to the hole in the Index Finger Assembly loosen the two socket head cap screws so the index sensor block is movable. Push down on the index finger assembly until the spring loaded index finger locks into hole with no binding. Tighten the two socket head cap screws so the index sensor block is secured, and the locking pin moves freely. See FIG. 21.

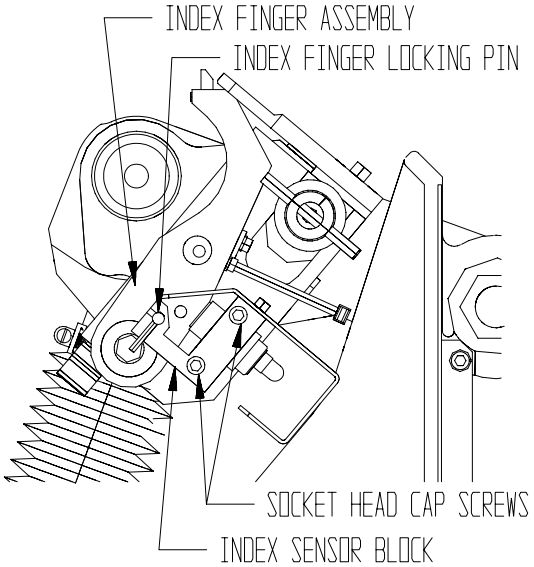


FIG. 21

ADJUSTMENTS (Continued)

PROXIMITY SWITCH

For the proximity switch to perform properly and reverse the direction of the carriage at each end of the rails, a distance of 3/16" [4 mm] to 1/4" [6 mm] needs to be maintained between the carriage proximity flag bracket and the proximity switch. See FIG. 22.

NOTE: The light on the proximity switch activates when metal crosses over the switch.

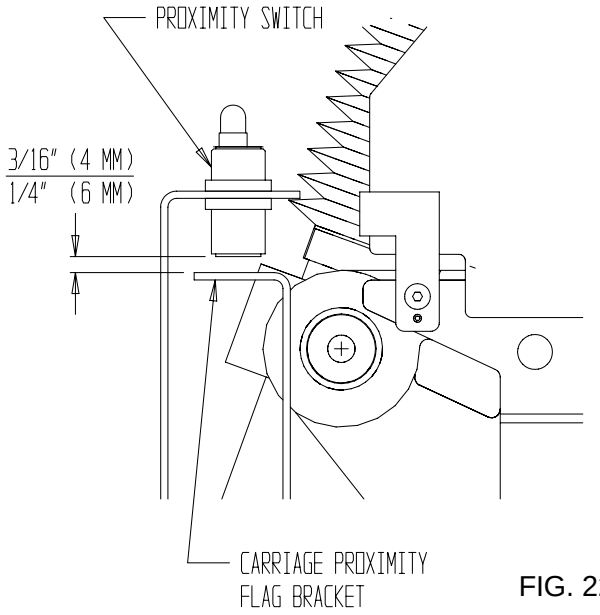


FIG. 22

ADJUSTABLE RELIEF TENSION

If the relief angle appears to vary during relief grinding adjust the tension on the nylon plug and set screw. See FIG. 23.

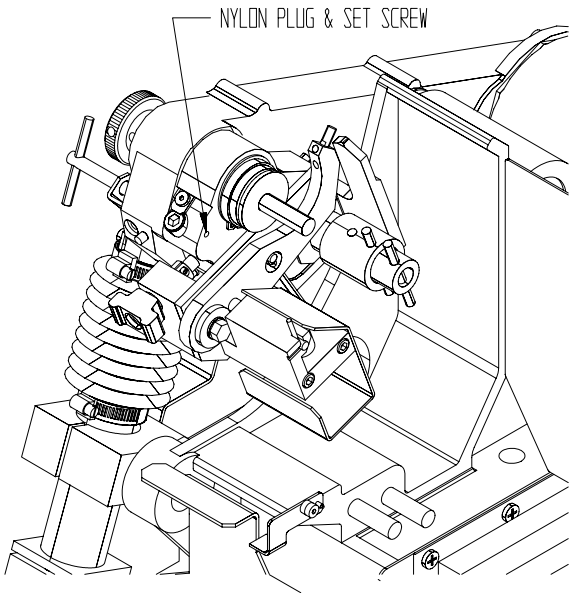


FIG. 23

SAFETY SWITCH ALIGNMENT

For the safety switches to work properly they must be adjusted so the sender and receiver are parallel to each other with a maximum gap of .19 inches (5mm).
See FIG. 24.
(Adjust by moving the doors or brackers. If this does not help, a special wrench is needed to adjust the safety screws used to hold the switch in place.)

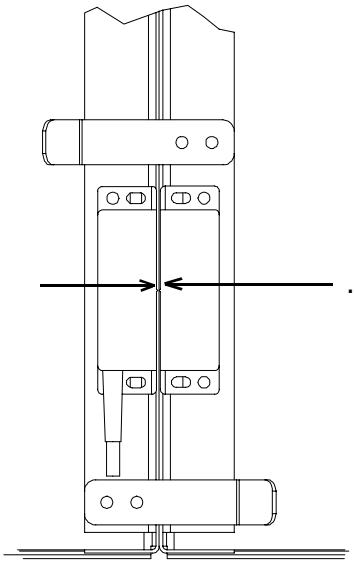


FIG. 24

ADJUSTMENTS (Continued)

SPIN GRINDING ATTACHMENT ADJUSTMENT

If free play develops so the crank handle wants to rotate with free play when operating in the scissor action (raising and lowering) on the spin grinding attachment, the free play can be eliminated by tightening the set screw identified in FIG. 24.

If there is too much play in the spin drive pivot points, torque down the hex nut tight so conical washer is compressed, then back off 1/2 turn. See FIG. 24.

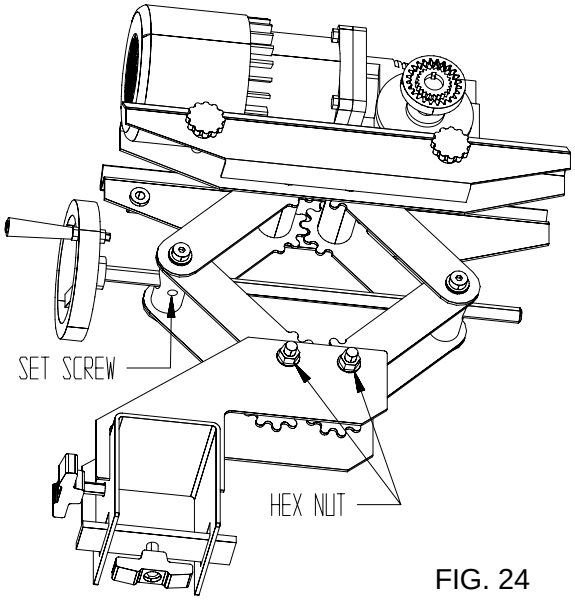


FIG. 24

TRAVERSE BELT TENSION

To adjust the tension on the traverse belt tighten the screws and nuts located at the left side of the traverse belt. Tighten nuts until the comprension springs measure 3/4". See FIG. 25. If the springs are not tensioned equally, uneven loading on the traverse system may cause parts to fail.

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

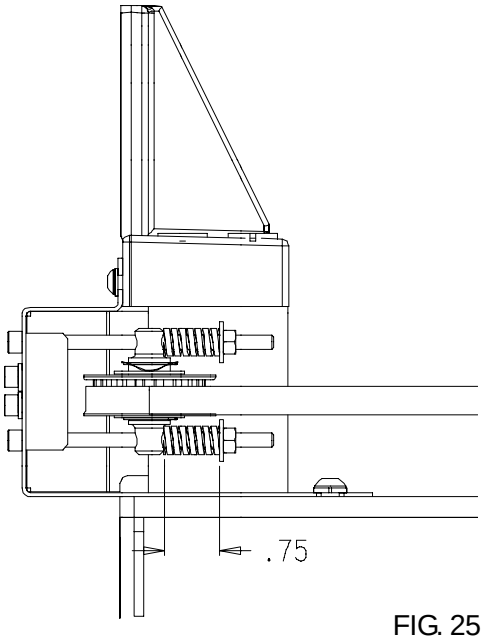


FIG. 25

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 on the clamp tip. Screw the tip out so there is .10" gap between the tip and the Clamp Support Block. See FIG 26. Lock in place by tightening the jam nut against the clamp being careful not to move the tip. Verify the distance between the clamp tip and block is still .10". The .10" setting allows slippage in a jam situation and damage can occur if this adjustment is set to narrow.

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

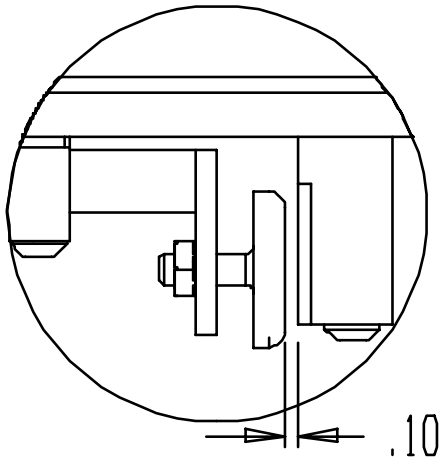
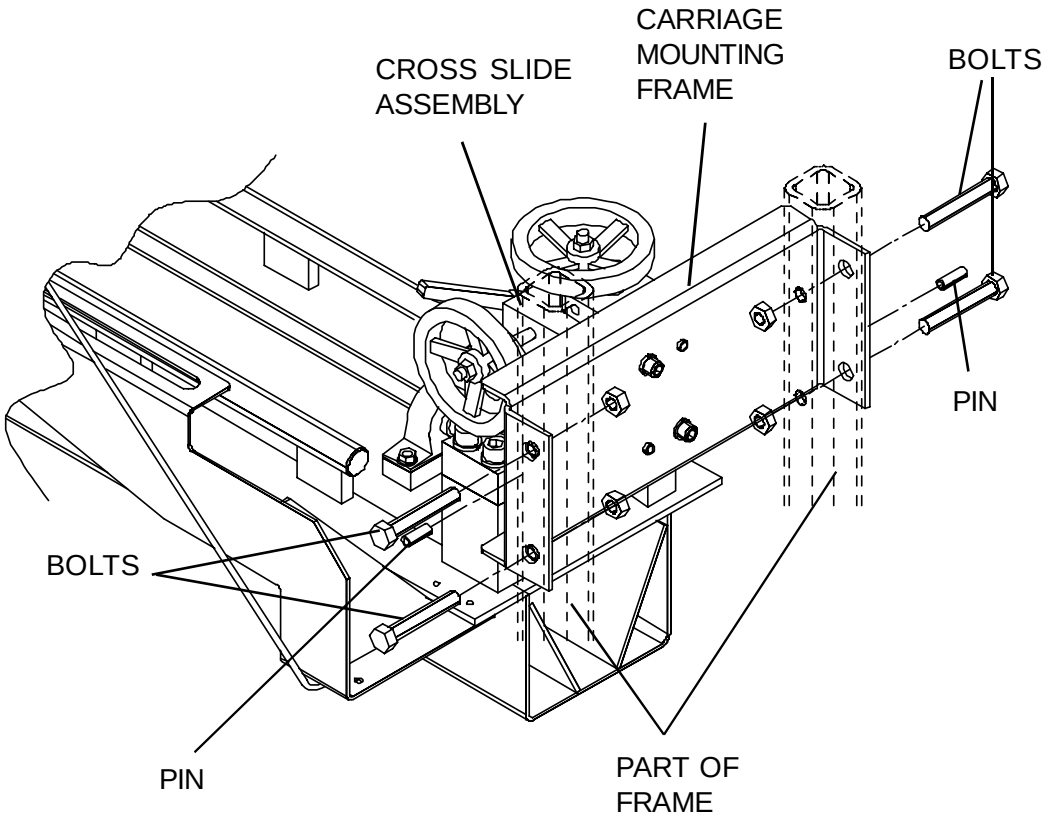


FIG. 26

ADJUSTING CROSS SLIDE ASSEMBLY

If the cross slide becomes very difficult to turn it may become necessary to adjust the assembly. To relieve the tension on the assembly follow the procedure listed below:

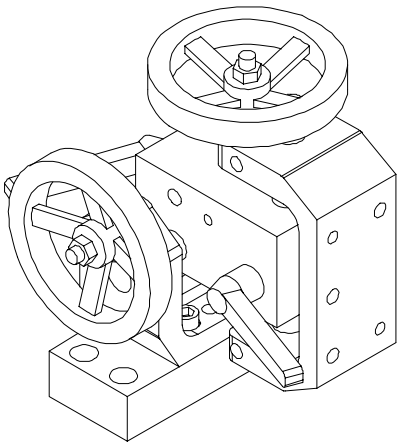
STEP 1--Using a hydraulic jack, raise the traversing carriage base just enough to alleviate the weight stress on the Cross Slide Assembly.
STEP 2--Knock out the pins on either side of the Mounting Frame Adjuster and loosen the 4 bolts (B504801) that connect the Carriage Mounting Frame to the frame of the grinder.
STEP 3--Jack the traversing carriage base up to put a preload on the Cross Slide Assembly.
STEP 4--Tighten the 4 bolts on the Carriage Mounting Frame to 75 ft-lbs.
STEP 5--Release the jack pressure and test the vertical and horizontal handwheels for ease of movement through their full range of motion.
STEP 6--If the Cross Slides tend to bind, repeat above steps jacking higher or lower (STEP 1) until the handwheels move freely.
STEP 7--When the Cross Slides move freely through their full range of motion, drill new holes and repin the assembly.



ADJUSTMENTS (Continued)

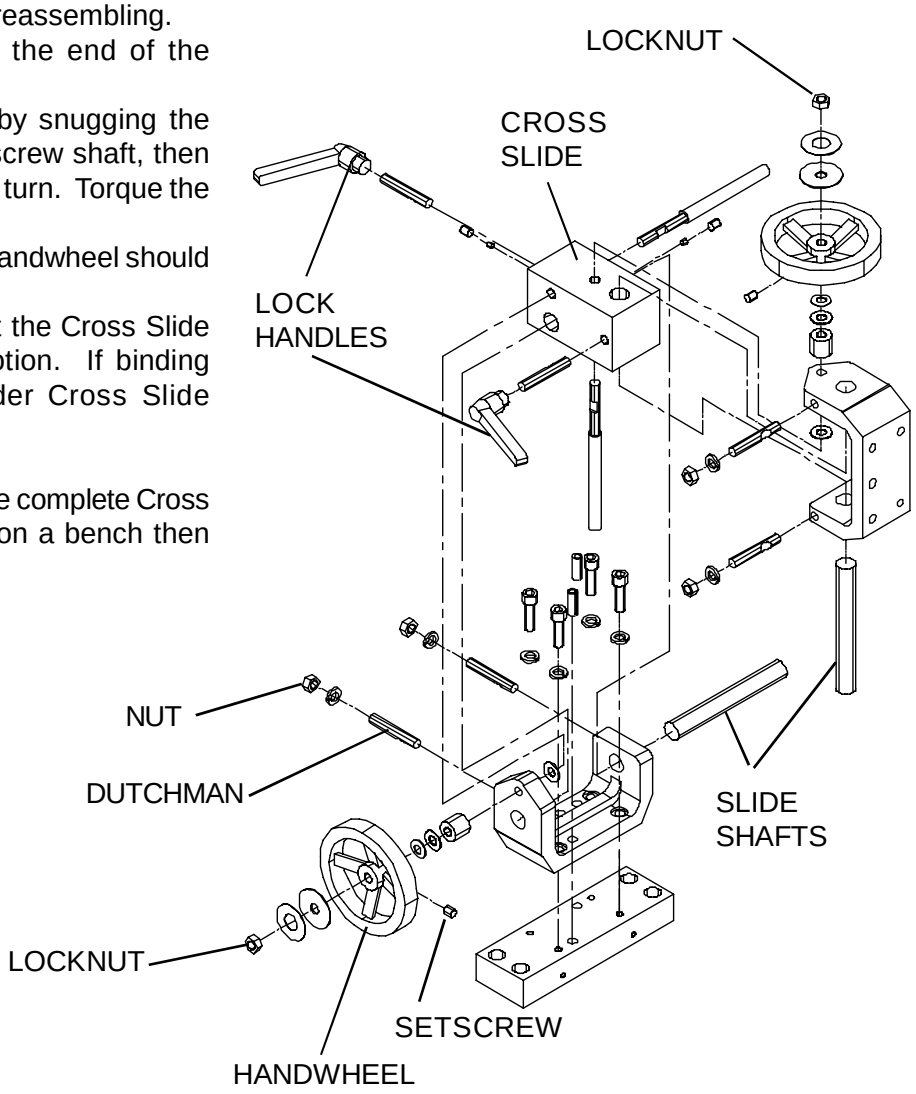
CROSS SLIDE SHAFT REPLACEMENT

If the cross slide shafts become scarred or gnarled, replace them by the following procedure:



STEP 1--Use a hydraulic jack to raise the weight off the Cross Slide Assembly.
STEP 2--Loosen the two nuts on the support casting that hold the locking stud and tap with plastic or rubber hammer to loosen.
STEP 3--Loosen the locking handles and tap the center stud with a plastic hammer.
STEP 4--Loosen locknut and setscrew and remove the handwheel.
STEP 5--Remove the Slide Shaft.
STEP 6--Remove all burrs and resurface the shaft to a clean, smooth, polished surface. (OR REPLACE WITH A NEW SHAFT.)
STEP 7--Coat shaft with Never-Cease and re-install the shaft through the Support, Cross Slide Block and the three locking studs. The shaft must move freely inside the Cross Slide Block before reassembling.
STEP 8--Retightening the nuts at the end of the locking studs to lock shaft in place.
STEP 9--Reinstall the Handwheel by snugging the setscrew to the flat located on the screw shaft, then torque nut until tight and back off 1/2 turn. Torque the setscrew to 70 in-lbs.
STEP 10--Test the Cross Slide, the handwheel should turn freely.
STEP 11--Lower the jack and retest the Cross Slide Assembly through full range of motion. If binding occurs, follow the procedure under Cross Slide Assembly located on page 21.

NOTE: It is also possible to remove the complete Cross Slide Assembly and do the repairs on a bench then reinstall.



CONTROL BOARD POTENTIOMETER ADJUSTMENTS

SPIN DRIVE CONTROL BOARD (SDC)

The Spin Drive Control Board has three potentiometers on the lower board and two potentiometers on the upper board as shown on drawing 6524511 which is included. These potentiometers have been set at the factory to the positions shown on the drawing. Also see FIG. 27A and 27B.

In the Relief Grinding Mode---
The Remote Speed Pot and the Relief Torque Pot (RTP) interact with each other. The remote speed pot is located on the upper board of the Spin Drive Control (SDC) preset at 9:30. The (RTP) is located on the control panel and is for relief torque adjustment. See FIG. 27B.

The Remote Speed Pot when rotated clockwise will increase maximum spin drive speed. The remote speed pot should never be above the 10:30 setting.

Relief Torque Pot (RTP) can vary the reel to finger holding torque for relief grinding. The recommended starting point is 15 in/lbs of torque setting. Never adjust the (RTP) potentiometer dial past the red line marking. Setting the reel to finger torque to high could cause the traverse motor system to not operating smoothly.

In the Spin Grinding Mode---
The Remote Torque Potentiometer and the Spin Speed Pot (SSP) interact with each other. The remote torque pot is located on the upper board of the Spin Drive Control (SDC) preset at 2:00 for torque setting. The (SSP) is located on the control panel and is for spin speed adjustment. See FIG. 27B.

The Remote Torque Potentiometer controls maximum torque allowable in the spin grind cycle only. This should never be adjusted past the 2:30 position.

The Spin Speed Pot (SSP) controls reel spin speed, adjust as required. This controls the spin drive speed for spinning the reel.

POTENTIOMETERS ON THE SPIN DRIVE CONTROL (SDC) LOWER BOARD See FIG. 27A.

Maximum Speed Pot---
The maximum speed is factory preset to 4:30 (fully clockwise) to allow for maximum spin speed.

Minimum Speed Pot---
The minimum speed is factory preset at 8:30 (full counterclockwise) so zero speed is obtainable for spin speed.

IR Compensation Pot---
The IR Compensation is factory set at 9:00.

Regulation of the spin or relief grind spin motor may be improved by a 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.

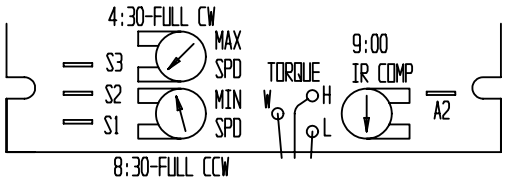


FIG. 27A

See potentiometer orientation on page 24

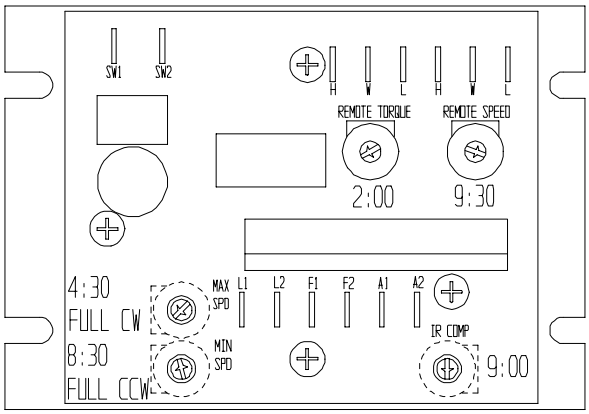


FIG. 27B

TRAVERSE DRIVE CONTROL BOARD (TDC)

The Traverse Drive Control Board has five potentiometers as shown on drawing 6524511 which is included. These potentiometers have been set at the factory to the positions shown on the drawing. Also see FIG. 29.

Maximum Speed---
The maximum speed potentiometer is preset to 2:30 position for 90 Volts DC to the traverse motor.

Rev Torque---
The Reverse Torque setting determines the maximum current limit for driving the motor in the reverse direction. The potentiometer is preset to the 3:00 position. It should not require adjustment.

Fwd Torque---
The Foward Torque setting determines the maximum current limit for driving the motor in the forward direction. The potentiometer is preset to the 3:00 position. It should not require adjustment.

Accel - Decel---
The potentiometer is factory preset to the minimum full counterclockwise 8:30 position. This position turns the Acceleration/Deceleration off for this application.

IR Compensation---
The IR Comp control is preset to 9:30 position. Never adjust past the 11:00 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.

50 HZ - 60 HZ Switch
This motor control board has a switch which must be set for 50 HZ or 60 HZ operation.

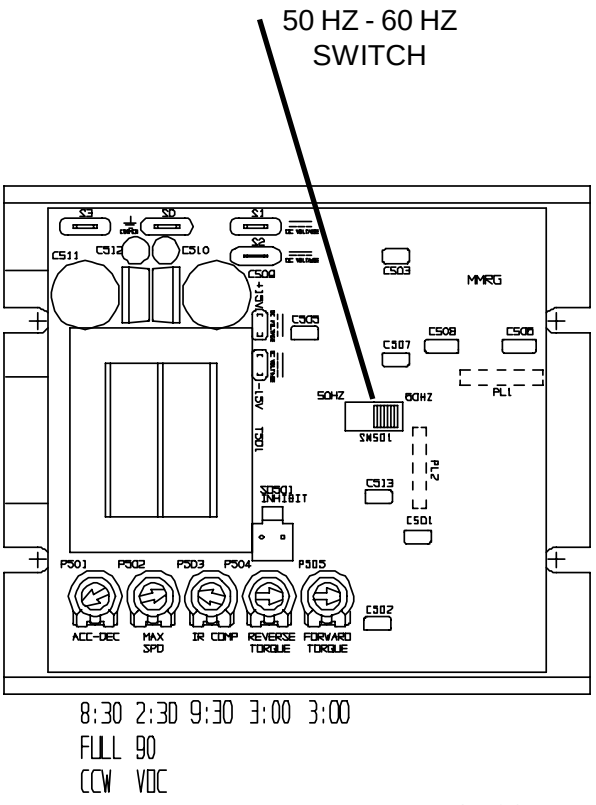
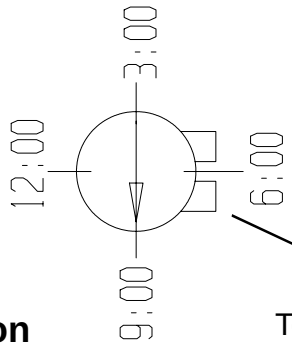


FIG. 29



Potentiometer Clock Orientation

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

MACHINE SERVICE (Continued)

REPLACEMENT OF GRINDING HEAD SHAFT & BEARINGS

Remove grinding wheel and grinding wheel knob. The Grinding Head Spindle Assembly consists of the grinding head spindle and a ball bearing press fit together. The left side ball bearing is slip fit on the opposite end. To replace the spindle assembly remove the left side grinding wheel grip knob, square key and belt cover. See FIG. 29. Loosen the 4 socket head cap screws on the motor plate to remove the poly-V belt. Loosen the 2 set screws on the spindle pulley and remove the pulley, square key and pulley spacer. Push on the right hand side of the spindle assembly to compress conical washers so there is no pressure on the shaft retaining ring. Using a retaining ring pliers remove the small external retaining ring from the spindle assembly. You can now remove the spindle assembly out the right side by lightly tapping on the left end with a rubber mallet. The second ball bearing can be removed from the belt side of the Grinding Head Housing.

To reassemble place the 4 conical washers (2 Pair nested and then place the 2 pairs back to back) against the ball bearing on the new spindle assembly. See FIG. 30. Thoroughly clean the housing bore and the outside diameter of both bearings. Apply blue Loctite #242 to the outside diameter of the two bearings. Slide the spindle assembly into the right side of the Grinding Head Housing. Install the bearing sleeve against the bearing on the spindle assembly. Slip fit the new left side ball bearing onto the spindle assembly and into grinding head housing. Install the 9/16-18 Locknut onto the spindle shaft and using a spanner wrench on the right side of the spindle and a 7/8 deepwell socket on the left side, torque the locknut to 20 Ft. Lbs.

Replace the square key and the pulley pushing the pulley against the locknut with no end play. Apply blue Loctite to the bore of the puley before instation. Next install blue Loctite #242 on the pulley setscrews and tighten the two pulley set screws. Then remount the poly-V belt. (See Grinding Head Belt Tension Adjustment in the adjusting section). Replace belt cover and square key and mount the left side grinding wheel grip knob and tighten the two set screws.

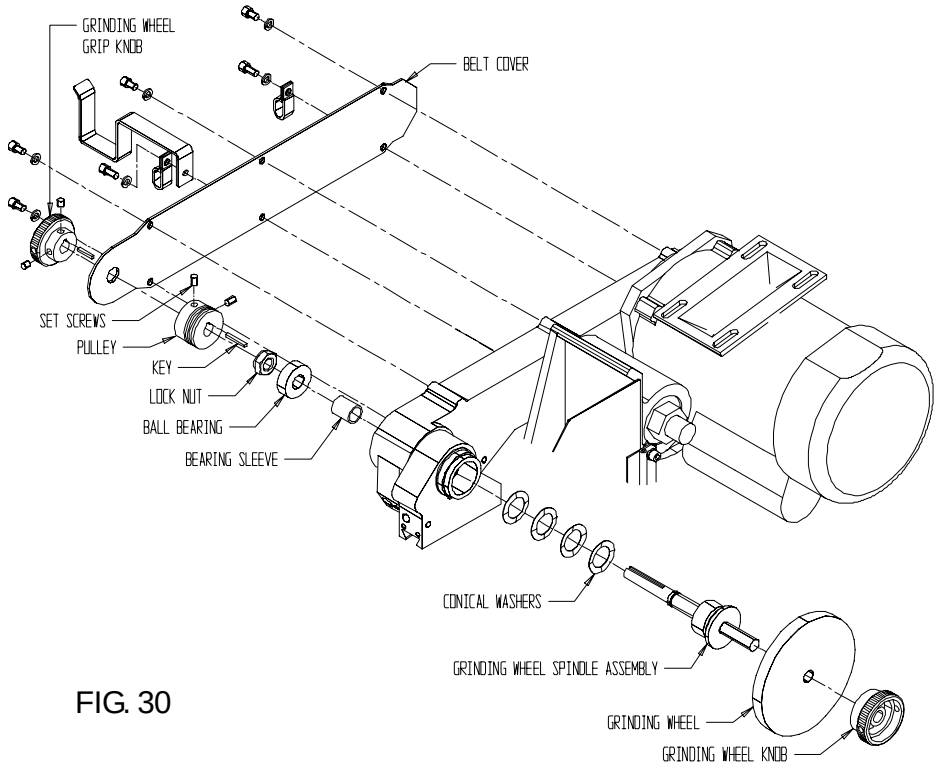


FIG. 30

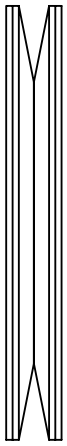
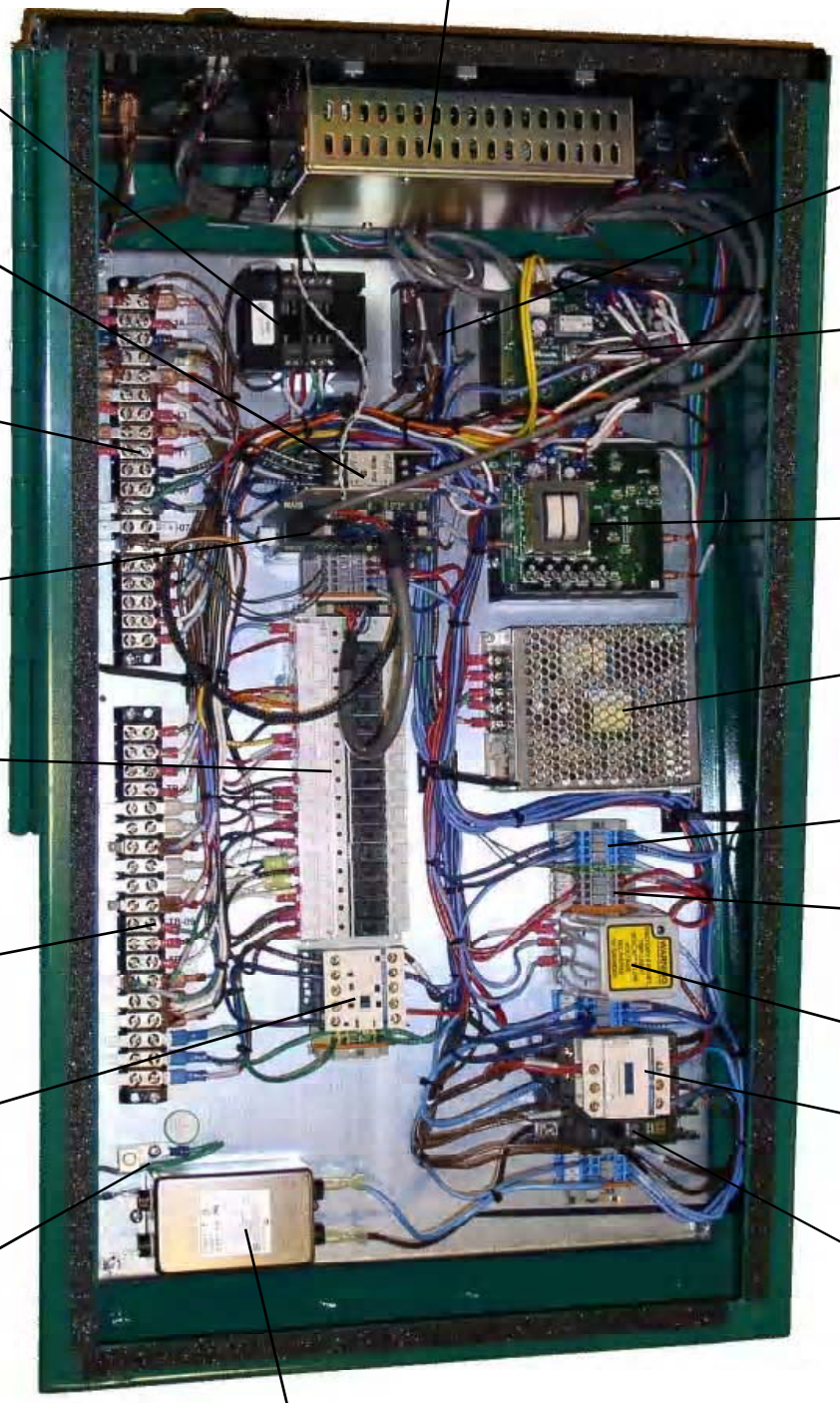


FIG. 31

ACCU-TOUCH CONTROL PANEL



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 *ACCU*-Touch 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 Manual, 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 on the ACCU-Master have a wire label at each end for assembly and troubleshooting. The wire label has a code which tells you wiring information. The first set of digits are the schematic wire number: These identify the connection number. Look at the column numbers on the left side of the schematic rung to identify the wire(s) The next number(s) are the Foley wire number. The next group of numbers or letters are the code for the component to which the wire attaches. Example: RT1 for Relay Terminal 1. The last set of 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.

In your Product Packet Assembly, there are a series of prints. Find the print titled *ACCU*-Touch Wiring Diagram, before starting the troubleshooting below. Verify all wires shown on that drawing 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 loose terminals are found, retighten and retest system. If problem persists, test as listed below.

Possible Cause	Checkout Procedure	
You must turn ON the Switch on the top of the control panel.	**A.** Look for Touch screen to come on.	Machine works Yes--end troubleshooting No--go to Step **B.** next
Main Power Cord is not plugged in	**B.** Plug in main power cord	Machine works Yes--end troubleshooting No--go to Step **C.** next
Main 20 amp outlet circuit breaker has tripped in building panel	**C.** Check circuit breaker and reset if necessary. (Check wall outlet with a light to make sure it works)	Machine works Yes--end troubleshooting No--but a light works in outlet--go to Step **D.** next No--but light does not work in outlet. You must solve your power delivery problem independent of machine.
Main 20 amp circuit breaker has tripped in machine panel	**D.** Check circuit breaker and reset if necessary.	Machine works Yes--end troubleshooting No----go to Step **E.** next
No 115 Volts AC to Main Circuit Breaker	**E.** Check for incoming power (MCB) for 115 Volts AC	Check 115 Volts AC from (MCB) 01MBC-brown wire to Blue Terminal Block TBB17 light blue wire. Yes--go to Step **F.** next No--Verify Filter function, check wiring.
No 115 Volts AC power from 2-Amp Circuit Breaker	**F.** Check for 115 Volts AC from 2-Amp Circuit Breaker	Check 115 Volts AC from 2-Amp CB "157CB13-BL" to Blue Terminal Block TBB17 light blue wire. Yes--go to Step **H.** next No--Check continuity of CB and replace.
No 115 Volts AC power from Power Switch (PSW)	**H.** Check for 115 Volts AC from Power Switch	Check 115 Volts AC from PSW terminal #3 to Blue Terminal Block TBB17. Yes--go to Step **I.** next No--Check continuity of Switch and replace
No 24 Volts DC power from Power Supply	**I.** Check for 24 Volts DC from Power Supply (PWR)	Check 24 Volts DC from PWR V+ to V- Yes--Verify wiring to Touch Screen No--Verify power to PWR. Replace power supply.

ELECTRICAL TROUBLESHOOTING (Continued)

PROBLEM--Red E-Stop screen displayed on Touch Screen

In your Product Packet Assembly, there are a series of prints. Find the print titled *ACCU*-Touch Wiring Diagram, before starting the troubleshooting below. Verify all wires shown on that drawing 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 loose terminals are found, retighten and retest system. If problem persists, test as listed below.

Possible Cause	Checkout Procedure	
You must push the green Push to Start Switch (PSS)	**A.** Listen for magnetic contactor (MAG) to pull in with a clunk.	Machine works Yes--end troubleshooting No--go to Step **B.** next
Pull red e-stop button out	**B.** Repeat push the green button (SSS) again.	Machine works Yes--end troubleshooting No--go to Step **C.** next
115V power not delivered to MAG coil	**C.** Check at Magnetic contactor coil for 115 Volts AC with main electrical power on and pushing (SSS)	(MAG) Term #A1 to A2 for 115 Volts AC Yes--replace magnetic starter if not pulling in with click. No--go to Step **D.** next
Controller E-stop ouput relay on	**D.** Check on relay board (RT1) for light on for output "F" (farthest light to right)	Light is: Off-- Controller software corrupt or missing, or Relay Board not working. On-- go to step **E.** next
Controller E-stop relay no continuity	**E.** With the machine power on, Relay light on, measure across relay contacts.	(RT1) terminals F+ to F- for 115 Volts AC Yes-- Replace output relay F in (RT1) No-- go to step **F.** next
(SSS) Is bad	**F.** With the machine power on, measure across normally open contacts of (SSS)	(SSS) Term #3 to #4 for 115 Volts AC (SSS) not pushed, "0" Volts AC (SSS) pushed. No-- Replace (PSS) Yes-- go to step **G.** next
(ESS) Is bad	**G.** With the machine power on, measure across normally closed contacts of (ESS)	(ESS) Term #1 to #2 for "0" Volts (ESS) pulled out, 115 Volts AC (ESS) pressed in. No-- Replace (ESS) Yes-- go to step **H.** next
Bad wires	**H.** With the machine power off, verify continuity of wires and connections.	Measure continuity of wires #11, 12, 15, 22, 35, 37, 50, 59, 60, 146, 147, 148, 149, & 150. Replace any bad wires or repair loose connections.

ELECTRICAL TROUBLESHOOTING (Continued)

PROBLEM--Machine light is not working

In your Product Packet Assembly, there are a series of prints. Find the print titled *ACCU*-Touch Wiring Diagram, before starting the troubleshooting below. Verify all wires shown on that drawing 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 loose terminals are found, retighten and retest system. If problem persists, test as listed below.

Possible Cause	Checkout Procedure	
Light switches are not turned on or there is a bad bulb	**A.** Turn on machine light toggle switch on light. Check the light bulb in another light fixture or replace with a new bulb. Plug a different light that is known to work into light plug.	Light works Yes--end troubleshooting No--go to Step **B.** next
Wire cord is bad	**B.** Check for 115 Volts AC at Terminal Strip	Check for 115 Volts AC across terminals # 6 & 7 on Terminal Strip 2 (TB2) Yes--replace cord for light No--go to Step **C.** next
Wiring is bad	**C.** Check continuity of wiring from MAG to Terminal Block	Check wiring and tighten or replace any damaged or loose parts.

*NOTE: The light may flicker on and off when the grinding motor is turned on. This is due to the high current draw on the system when starting the grind motor.

ELECTRICAL TROUBLESHOOTING (Continued)

PROBLEM--Spin Drive not working in (manual) jog mode and in SPIN MODE.

Assuming 115 Volts AC to control panel and all other manual (jog) mode functions are working.

In your Product Packet Assembly, there are a series of prints. Find the print titled *ACCU*-Touch Wiring Diagram before starting the troubleshooting below. Verify all wires shown on that drawing are correct and pull on wire terminals with approximately 3 lbs force to verify there are no loose terminal connections and/or loose crimps between wire and terminal. If loose terminals are found, tighten and retest system. If problem persists, test as listed below.

Possible Cause	Checkout Procedure	
Spin Speed Pot (SSP) set to zero	**A.** Set (SSP) to 200 on the control panel.	Spin Motor works Yes--end troubleshooting No--go to Step **B.** next
Spin Motor Switch not on on Touch Screen	**B.** Turn spin drive switch on (touch green area) from SPIN MANUAL screen.	Spin Motor works Yes--end troubleshooting No--go to Step **C.** next
Door is open	**C.** Alarm on screen should indicate that the door must be closed for the spin drive to operate. Close door.	Spin Motor works Yes--end troubleshooting No--go to step **D.** next
Circuit breaker 42 is tripped (4A)	**D.** Reset circuit breaker switch (Tripped by current overload) check that reel is free spinning	Spin Motor works Yes--end troubleshooting No--go to step **E.** next
Relay 9 (RT1) is not working	**E.** Check for (SDC) input of 115 Volts AC	(SDC) Term #L1 to #L2 for 115 Volts AC Yes--skip to step **H.** next No--go to Step **F.** next
Verify Light is on	**F.** Check (RT1) for light #9 to be on (Door must be closed and spin drive switch on)	Light is ON. Yes--go to Step **G.** next No--Bad PLC, RT1, cables, or Software.
Verify Continutiy of relay 9 in RT1	**G.** With light #9 on, Check (RT1) relay 9 for continuity.	(RT1) Term 9+ to term 9- for 115 Volts AC No-Check CB42 (4-Amp) for 115 Volts AC -check from CB to Blue Terminal Block 17 Yes--Replace relay #9 in (RT1)
Relay 4 (RT1) is not working (Spin/Torque selector relay)	**H.** With 115 Volts AC at Term L1 and L2, check (SDC) output. Have Spin speed pot (SSP) set at 400	(SDC) term A1 to term A2 measure approx 90 Volts DC Yes--Skip to Step **L.** No-- go to step **I.** Next
	I. With 115 Volts AC at Term L1 and L2, check (SDC) output. Have Relief Torque Pot (RTP) set to Red Line.	(SDC) term A1 to term A2 measure approx 12 Volts DC No-- Skip to step **N.** Yes-- go to step **J.** Next

ELECTRICAL TROUBLESHOOTING (Continued)

Possible Cause	Checkout Procedure	
	J. Check (RT1) for light #4 to be on Insure that Spin Drive switch has been pressed on from SPIN MANUAL screen at least once	Light is: On-- go to Step **K**. next Off-- Contact factory
Relay #4 is bad	**K.** With light #4 on, verify continuity	Remove one of the wires at Terminal 4, measure (RT1) 4+ to 4- for "0" Ohms Yes--Replace (SDC) No--replace Relay 4 (RT1)
Reversing relay(s) bad (RT1)	**L.** Measure voltage at spin motor	(RT1) Term A+ to term D+ should read the same 90 Volts DC measured at step **H.** Note polarity Yes--Skip to Step **O.** No-- go to Step **M.** next
	M. Reverse direction of spin motor from SPIN MANUAL touch screen	(RT1) Term A+ to term D+ should read the same 90 Volts DC measured at step H., but opposite polarity Yes--Skip to Step **O.** No-- Replace relays A, B, C, & D in (RT1)
Spin Speed Pot (SSP) is not working	**N.** (SSP) on Main Panel	(SDC) Black wire of (SSP)- H to Red wire of (SSP)-W Pot full CCW — Pot Full CW 4.4 Volts DC — 0 Volts DC (SDC) White wire of (SSP)- L to Red wire of (SSP)-W Pot full CCW — Pot Full CW 0 Volts DC — 4.4 Volts DC Yes-- Replace (SDC) No-- Replace (SSP)
Spin Drive motor is bad	**O.** With machine power off, Check spin motor continuity	At (RT1) Term A+ and B+ or C+ and D+ check approx. 0 ohms across the black and white wires Yes-- Motor should work, end trouble-shooting. No--go to Step **P.** next
Worn motor brushes	**P.** Inspect motor brushes	Remove the brushes one at a time and maintain orientation for reinsertion. See if brush is worn short 3/8" [10mm] minimum length. Yes-- replace motor brushes No-- replace Spin Drive motor

ELECTRICAL TROUBLESHOOTING (Continued)

PROBLEM--Spin Drive not working in (manual) jog mode and in RELIEF MODE.

Assuming 115 Volts AC to control panel and all other manual (jog) mode functions are working.

In your Product Packet Assembly, there are a series of prints. Find the print titled *ACCU*-Touch Wiring Diagram, before starting the troubleshooting below. Verify all wires shown on that drawing are correct and pull on wire terminals with approximately 3 lbs force to verify there are no loose terminal connections and/or loose crimps between wire and terminal. If loose terminals are found, tighten and retest system. If problem persists, test as listed below.

Possible Cause	Checkout Procedure	
Relief Torque Pot (RTP) set to zero	**A.** Set (SSP) to 20 on the control panel.	Spin Motor works Yes--end troubleshooting No--go to Step **B.** next
Spin Motor Switch not on on Touch Screen	**B.** Turn spin drive switch on (touch green area) from RELIEF MANUAL screen.	Spin Motor works Yes--end troubleshooting No--go to Step **C.** next
Door is open	**C.** Alarm on screen should indicate that the door must be closed for the spin drive to operate. Close door.	Spin Motor works Yes--end troubleshooting No--go to step **D.** next
Circuit breaker 42 is tripped (4A)	**D.** Reset circuit breaker switch (Tripped by current overload) check that reel is free spinning	Spin Motor works Yes--end troubleshooting No--go to step **E.** next
Relay 9 (RT1) is not working	**E.** Check for (SDC) input of 115 Volts AC	(SDC) Term #L1 to #L2 for 115 Volts AC Yes--skip to step **H.** next No--go to Step **F.** next
Verify Light is on	**F.** Check (RT1) for light #9 to be on (Door must be closed and spin drive switch on)	Light is On--go to Step **G.** next No--Bad PLC, RT1, cables, or Software.
Verify Continutiy of relay 9 in RT1	**G.** With light #9 on, Check (RT1) relay 9 for continuity.	(RT1) Term 9+ to term 9- for 115 Volts AC No--Check CB42 (4-Amp) for 115 VAC -check from CB to Blue Term Block 17 Yes--Replace relay #9 in (RT1)
Relay 4 (RT1) is not working	**H.** With 115 Volts AC at Term L1 and L2, check (SDC) output. Have Relief Torque Pot (RTP) set at Red Line.	(SDC) term A1 to term A2 measure approx 12 Volts DC Yes--Skip to Step **L.** No-- go to step **I.** Next
	I. With 115 Volts AC at Term L1 and L2, check (SDC) output. Have Spin Speed Pot (SSP) set to 400	(SDC) term A1 to term A2 measure approx 90 Volts DC No-- Skip to step **N.** Yes-- go to step **J.** Next

ELECTRICAL TROUBLESHOOTING (Continued)

Possible Cause	Checkout Procedure	
	J. Check (RT1) for light #4 to be off Insure that Spin Drive switch has been pressed on from RELIEF MANUAL screen at least once	Light is: Off-- go to Step **K**. next On-- Contact factory
Relay #4 is bad	**K.** With light #4 on, verify continuity	Remove one of the wires at Terminal 4, measure (RT1) 4+ to 4- for "0" Ohms Yes--Replace relay 4 (RT1) No--replace (SDS)
Reversing relay(s) bad (RT1)	**L.** Measure voltage at (RT1)	(RT1) Term A+ to term D+ should read the same 12 Volts DC measured at step **H.** Note polarity Yes--Skip to Step **M.** No-- Replace relays A, B, C, & D in (RT1)
	M. Reverse direction of spin motor from SPIN MANUAL touch screen	(RT1) Term A+ to term D+ should read the same 12 Volts DC measured at step H., but opposite polarity Yes--Skip to Step **O.** No-- Replace relays A, B, C, & D in (RT1)
Relief Torque Pot (RTP) is not working	**N.** (RTP) on Main Panel	(SDC) Black wire of (RTP)- H to Red wire of (RTP)-W Pot full CCW Pot @ Red line .2 Volts DC .1 Volts DC (SDC) White wire of (RTP)- L to Red wire of (RTP)-W Pot full CCW Pot @ Red line .1 Volts DC .2 Volts DC Yes-- Replace (SDC) No-- Replace (SSP)
Spin Drive motor is bad	**O.** With machine power off, Check spin motor continuity	At (RT1) Term A+ and B+ or C+ and D+ check approx. 0 ohms across the black and white wires Yes-- Motor should work, end troubleshooting. No--go to Step **P.** next
Worn motor brushes	**P.** Inspect motor brushes	Remove the brushes one at a time and maintain orientation for reinsertion. See if brush is worn short 3/8" [10mm] minimum length. Yes-- replace motor brushes No-- replace Spin Drive motor

ELECTRICAL TROUBLESHOOTING (Continued)

PROBLEM--Grinding motor not working in (manual) jog mode.

Assuming 115 Volts AC to control panel and all other manual (jog) mode functions are working.

In your Product Packet Assembly there are a series of prints. Find the print titled *ACCU*-Touch Wiring Diagram, before starting the troubleshooting below. Verify all wires shown in the drawing are correct and pull on wire terminals with approximately 3 lbs force to verify there are no loose terminal connections and/or loose crimps between wire and terminal. If loose terminals are found, tighten and retest system. If problem persists, test as listed below.

Possible Cause	Checkout Procedure	
Grinding Motor Switch is not on	**A.** Turn switch on from either SPIN MANUAL screen or RELIEF MANUAL screen	Grinding Motor works Yes--end troubleshooting No--go to Step **B.** next
Circuit Breaker (CB28) 15A is tripped	**B.** Reset circuit breaker switch (tripped by current overload)	Grinding Motor works Yes--end troubleshooting No--go to step **C.** next
Grinding Motor Relay is not working (REL)	**C.** Check for (REL) incoming 115 Volts AC	(REL) Term #L1 to #L2 for 115 Volts AC Yes--go to step **D.** next No--Verify wiring, replace Circuit Breaker (CB28)
	D. Check for (REL) output voltage of 115 Volts AC	(REL) Term #T1 to #T2 for 115 Volts AC Yes-- Verify 115 VAC at TB1-1 & TB1-2, Check terminals, replace Grind motor. No--go to step **E.** next
Relay (REL) coil or contacts are not working	**E.** Check for (REL) input of 24 Volts DC at the coil. Reminder, Grind Drive switch must be on and doors must be closed.	(REL) Term A1 to Term A2 for 24 Volts DC Yes--Replace (REL) No--Skip to Step **F.**
Relay 5 (RT1) is not working	**F.** (RT1) check that the light is on for relay 5, make sure grind drive swich is on	Light is: On-- Go to Step **I.** next Off--Contact Factory
	I. Light is on for Relay 5, check continuity	(RT1) Term 5+ to 5-, measure DC voltage 0 Volts DC-- Check wiring, Relay (REL) should work, end troubleshooting. 24 Volts DC-- Replace relay 5 (RT1)

ELECTRICAL TROUBLESHOOTING (Continued)

PROBLEM--Dust Collector not working in (manual) jog mode.

Assuming 115 Volts AC to control panel and all other manual (jog) mode functions are working.

In your Product Packet Assembly, there are a series of prints. Find the print titled ***ACCU*-Touch Wiring Diagram,** **before starting the troubleshooting below. Verify all wires shown on that drawing 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 loose terminals are found, tighten and retest system. If problems persists, test as listed below.**

Possible Cause	Checkout Procedure	
Dust Collector Switch is not on (Vacuum)	**A.** Turn on switch located on top of Vacuum in the back right of corner of the machine.	Dust Collector works-- Yes--end troubleshooting No--go to Step **B.** next
Dust Collector Switch (Vacuum) on touch screen is not on	**B.** Turn switch on from SPIN MANUAL or RELIEF MANUAL screen.	Dust Collector works-- Yes--end troubleshooting No--go to Step **C.** next
Vacuum not working	**C.** Check for 115 Volts AC at the receptacle plug by plugging in a hand drill or light.	Light works Yes--Replace Vacuum No--go to Step **D**. next
(RT1) relay E is not working	**D.** With Vacuum switch on, Check for (RT1) Relay E on	Light is on: Yes--go to step **E.** next No--Contact Factory
	E. (RT1) Relay E, verify continuity	(RT1) Term #E+ to #E- for 115 Volts AC Yes--replace Relay E (RT1) No--go to Step **F.** next
Circuit Breaker (CB32) is not working (3-amp)	**F.** Check for power out of circuit breaker (CB32)	Terminal Block 17 (light blue wire) #02 to (CB32) (brown) #156 for 115 Volts AC Yes--go to Step **G.** next No--replace (CB2)
Relay 34 (RE34) is not working	**G.** Check for (RE34) input of 115 Volts AC at coil.	(RE34) Term 0 to term 1 for 115 Volts AC Yes-- go to Step **H.** next No--Check continuity of wires.
	H. Check for (RE34) input of 115 Volts AC at contacts	(RE34) Term 8 to term 4 for 115 Volts AC Yes--go to Step **I.** next No--Check continuity of wires.
	I. Check for (RE34) output of 115 Volts AC at contacts	(RE34) Term 6 to term 2 for 115 Volts AC Yes--Replace Plug No--replace (RE34)

ELECTRICAL TROUBLESHOOTING (Continued)

PROBLEM--Winch does not work in either direction.

In your Product Packet Assembly, there are a series of prints. Find the print titled *ACCU*-Touch Wiring Diagram, before starting the troubleshooting below. Verify all wires shown on that drawing are correct and pull on wire terminals with approximately 3 lbs force to verify there are no loose terminal connections and/or loose crimps between wire and Terminal. If loose terminals are found, tighten and retest system. If problem persists, test as listed below.

Possible Cause	Checkout Procedure	
7 amp circuit breaker on winch motor is tripped	**A.** Reason: Check for a lifting overload condition or wiring shorted to ground. Reset breaker located at end of winch motor.	Winch works-- Yes--end troubleshooting No--go to Step **B.** next
No voltage to motor	**B.** Check that motor coil cord from DC motor is plugged in	Winch works-- Yes--end troubleshooting No--go to Step **C.** next
	C. Check for 115 Volts AC at the plug end winch cord wire #6 by plugging in a hand drill	Drill works-- Yes--replace winch No-- go to Step **D.** next
	D. Check for Machine is plugged in Start button is pressed. (Red E-Stop Screen must not be up)	Winch works-- Yes--end troubleshooting No--go to Step **E.** next
	E. Verify wiring from MAG to Terminal Strip 2.	Measure 115 Volts AC from TB2-6 to TB2-7. Yes--replace cord to winch No--Verify power out of mag. Replace bad wiring.

ELECTRICAL TROUBLESHOOTING (Continued)

PROBLEM--Traverse Drive not working in (manual) jog mode

Assuming 115 Volts AC to control panel and all other manual (jog) mode functions are working.

In your Product Packet Assembly, there are a series of prints. Find the print titled *ACCU*-Touch Wiring Diagram, before starting the troubleshooting below. Verify all wires shown on that drawing are correct and pull on wire terminals with approximately 3 lbs force to verify there are no loose terminal connections and/or loose crimps between wire and terminal. If loose terminals are found, tighten and retest system. If problem persists, test as listed below.

Possible Cause	Checkout Procedure	
Traverse Speed Pot (TSP) set to zero	**A.** Set (TSP) to 35 on the control panel	Traverse works Yes--end troubleshooting No--go to step **B.** next
Traverse Belt Clamp release lever released	**B.** Insure release lever is in adjusted properly. See Adjustments section of this manual.	Traverse works Yes--end troublshooting No--go to Step **C.** next
Circuit Breaker 32 (CB32) (3 amp) tripped	**C.** Too heavy a grind causes grinding head traverse motor to overload and trip the circuit breaker. Reset (CB32)	Traverse works Yes--end troublshooting No--go to Step **D.** next
Traverse Drive Control (TDC) do not have power	**D.** Check for 115 Volts AC incoming to (TDC) (insure traverse right or left has been pressed at least once)	On (TDC) Term L1 to L2 for 115 Volts AC Yes--Skip to Step **H.** No--go to Step **E.** next
Relay 8 (RT1) is bad	**E.** Check for relay 8 (RT1) light on (insure traverse right or left has been pressed at least once)	Light is: On-- go to Step **F.** next Off-- Contact Factory
	F. Check relay 8 for continuity, Insure relay 8 light is on	(RT1) Term 8+ to 8- read 115 Volts AC Yes-- Replace Relay 8 (RT1) No-- go to Step **G.** next
Circuit Breaker 32 (CB32) bad	**G.** Check CB32 for voltage	(CB32) from Line neutral, Light Blue wire at the line filter wire # 02FTRBU, to wire #156CB32-BL at CB32 measure 115 Volts AC: No-- Replace CB32 Yes-- Verify continutiy of wires to RT1. Replace or repair bad wire(s)

ELECTRICAL TROUBLESHOOTING (Continued)

Possible Cause	Checkout Procedure	
No DC Voltage from (TDC) Traverse Drive Control	**H.** Check for 90 Volts DC across (TDC) terminals A! 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 **I.** next No--go to Step **J.** next Note:If voltage is less than 90 VDC verify pots on TDC. See page 24
Traverse Motor is bad	**I.** Check traverse motor continuity	Remove wires from terminals A1 & A2 0 ohms across the black and white wires Yes--go to Step **J.** next No--go to Step **N.**
Check Relays 2 and 3	**J.** (RT1) Verify that relay 2 light comes on when Traverse Right is pressed, and that relay 3 light comes on when Traverse Left is pressed	Lights come: On-- go to step **K.** next Off-- Skip to step **L.**
(TSP) (10K) is bad	**K.** Check (TSP) for 10,000 ohms Remove three wires from (TDC) red from term S2 white from term S0 black from inline connector (Wire 39)	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 **L.** next No--replace (TSP)
Gap between flag and prox is incorrect.	**L.** Gap between flag and Prox should be 3/16" to 1/4" [4-6mm]. Prox light does not light when flag is under prox.	If incorrect, adjust per adjustment section of manual. Traverse works-- Yes-- End troubleshooting No-- go to step **M.** next
Proximity switch is bad	**M.** From the Touch screen, Enter "HELP" screen from main menu.	Follow instructions on screen to verify traverse proximity switches are ok. Switch is Good-- Replace (TDC) Bad-- Replace switch
Worn motor brushes	**N.** Inspect Motor Brushes	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 Drive Motor

ELECTRICAL TROUBLESHOOTING (Continued)

PROBLEM--Stepper Infeed not working in (manual) jog mode.

Assuming 115 Volts AC to control panel and all other manual (jog) mode functions are working.

In your Product Packet Assembly, there are a series of prints. Find the print titled *ACCU*-Touch Wiring Diagram, before starting the troubleshooting below. Verify all wires shown on that drawing are correct and pull on wire terminals with approximately 3 lbs force all terminals to verify there are no loose terminal connections and/or loose crimps between wire and terminal. If loose terminals are found, tighten and retest system. If problem persists, test as listed below.

Possible Cause	Checkout Procedure	
Infeed Jog Switch is not held to on position	**A.** Hold switch on in either direction	Stepper motor works Yes--end troubleshooting No--go to Step **B.** next
Actuator is at physical limit	**B.** Move stepper in opposite direction	Stepper Motor works Yes--end troubleshooting No--go to step **C.** next
Circuit Breaker (CB13) is tripped (2 amp)	**C.** Reset circuit breaker switch (tripped by current overload) Grinding head stepper infeed mechanism jammed causing overload	Stepper Motor works Yes--end troubleshooting No--go to step **D.** next
High Low Switch is not on high speed	**D.** Put switch on high speed (rabbit) for ease of checkout of Stepper Infeed Control (SIC)	High speed works Yes--end troubleshooting No--go to Step **E.** next
Stepper motor drive coupling is loose	**E.** You can feel stepper pulses on motor when (HLS) is on high or low & (IJS) switch is depressed in either up or down direction. Open stepper infeed inspection plate to check for loose coupling. Retighten coupling to drive actuator screw. See adjustment section of manual.	Stepper works-- Yes--end troubleshooting No--go to Step **F.** next
No DC voltage to Stepper Infeed Control (SIC)	**F.** (SIC) Check for 24 Volts DC Power in	(SIC) Term GND to V+ measure 24 Volts DC Yes-- go to step **G.** next No-- Skip to step **H.**
No DC Voltage to OPTO terminal of (SIC)	**G.** (SIC) Check voltage at OPTO terminal	(SIC) Term GND to OPTO measure 24 Volts DC Yes-- go to step **I.** No-- Replace wire #60 (with resistor)

ELECTRICAL TROUBLESHOOTING (Continued)

Possible Cause	Checkout Procedure	
Mag contact or wire bad	**H.** Measure voltage at (MAG) insure power is on, and green (PSS) has been pressed.	(MAG) term 13 to 14, Measure 0 volts DC Yes--Verify DC power to Mag term 13 No-- if 24 Volts DC, Replace (MAG)
No Step pulse from PLC	**I.** Check light Y0 on PLC. While pressing up or down it should light (pressing down Y1 will also light)	Light comes on: Yes-- go to step H. next No-- Contact Factory
Stepper Infeed Control (SIC) Wiring bad	**J.** Check wiring at (SIC).	Insure all wires are connected at the (SIC) to the connectors and that none have become loose. Some connections have multiple wires in them, be sure all are tight by gently "tugging" on them. If all wires appear to be connected and correct, proceed:
Stepper Infeed Control (SIC) or Stepper motor is bad	**K.** Check output at (SIC). Have High/Low Switch set on high speed (rabbit)	(SIC) Terminal phase A to terminal phase A' Measure 4.7 Volts DC, 0.2-0.3 Volts while jog button is pressed. (SIC) Terminal phase B to terminal phase B' Measure 4.7 Volts DC, 0.2-0.3 Volts while jog button is pressed. Yes--replace stepper motor No--replace (SIC)

ELECTRICAL TROUBLESHOOTING (Continued)

PROBLEM--No Manual (jog) cycle or Auto Cycle stops because of a system error message on Touch Screen.

System Error Message	Checkout Procedure	Message Status
STORE FINGER FOR SPIN GRIND	**A.** Rotate index finger assembly to spin position	Clears--Proceed to next system error message you have or continue running. Remains--go to Step **B.** next
	B. Check (PLC) input from Finger Stored/Down prox	From "Help" Screen verify Finger Stored/Down prox input is on (Red) Follow instructions on screen.
ROTATE HEAD DOWN FOR SPIN GRIND	**A.** Rotate grind head assmbly down	Clears--Proceed to next system error message you have or Continue running. Remains--go to Step **B.** next
	B. Check (PLC) input from Head in Relief Pos. (Position) prox	From "Help" Screen verify Head in Relief Pos. prox input is working. Follow instructions on screen.
HOME TRAVERSE (TO RIGHT PROX) TO START	**A.** Jog Grind head to right prox with touch screen controls	Clears--Proceed to next system error message you have or Continue running. Remains--go to Step **B.** next
	B. Check (PLC) input from Right Traverse prox switch	From "Help" Screen verify Right Traverse Prox input is working. Follow instructions on screen.
ROTATE HEAD UP FOR RELIEF GRIND	**A.** Rotate grind head assmbly up	Clears--Proceed to next system error message you have or Continue running. Remains--go to Step **B.** next
	B. Check (PLC) input from Head in Relief Pos. prox	From "Help" Screen verify Head in Relief Pos. prox input is working. Follow instructions on screen.

ELECTRICAL TROUBLESHOOTING (Continued)

System Error Message	Checkout Procedure	Message Status
RELEASE FINGER FOR RELIEF	**A.** Release finger. Make sure that the finger is allowed to come foreward at least once.	Clears--Proceed to next system error message you have or continue running. Remains--go to Step **B.** next
	B. Check (PLC) input from Door Saftey Switch	From "Help" Screen verify Finger Stored / Down prox input is working. Follow instructions on screen.
ENTER NUMBER OF BLADES	**A.** Blade count is required to run Relief grind. Count blades and enter the number under the Blade # Field.	Clears--Proceed to next system error message you have or continue running.
LOW VOLTAGE DETECTED	**A.** Input line voltage has dropped below 100V. Plug machine into a better source of power. See Power requirements at front of manual.	Clears--Proceed to next system error message you have or continue running.
DOOR MUST BE CLOSED TO OPERATE	**A.** For safety reasons, door must be closed to operate spin and / or grind motors. Close and latch door.	Clears--Proceed to next system error message you have or continue running. Remains--go to Step **B.** next
	B. Check (PLC) input from Door Saftey Switch	From "Help" Screen verify Head in Relief Pos. prox input is working. Follow instructions on screen.
INCREASE TORQUE KNOB SETTING	**A.** An excessive amount of time has passed between blade indexes or at the start of a relief cycle. Increase the Relief Torque Pot.	Clears--Proceed to next system error message you have or continue running.
TORQUE KNOB LOW OR DIRECTION WRONG	**A.** An excessive amount of time has passed at the beginning of a Relief grind cycle before the finger down prox was detected. Verify Torque pot setting and / or spin direction. Reminder: Blade should push finger down.	Clears--Proceed to next system error message you have or continue running.

PROBLEM--No Manual (jog) cycle or Auto Cycle stops because of a system error message on Touch Screen (Continued)

System Error Message	Checkout Procedure	Message Status
FINGER NOT RELEASED, CHECK LH PROX POS (POSITION)	**A.** During a relief grind cycle, the PLC did not see the finger released at the left prox position. Verify that the setting of the left traverse prox allows the finger to come off the blade.	Clears--Proceed to next system error message you have or continue running. Remains--go to Step **B.** next
	B. Check (PLC) input from Finger Stored/Down prox	From "Help" Screen verify Finger Stored/Down prox input is Working. Follow instructions on screen.
MOVE NOT POSSIBLE IN PAUSE MODE	**A.** Press "Resume" on touch screen to finish current cycle.	Clears--Proceed to next system error message you have or Continue running.
MACHINE IS IN PAUSE MODE, PRESS RESUME	**A.** Machine was left in pause mode after last cycle. Press "resume" on touch screen.	Clears--Proceed to next system error message you have or Continue running.
DOOR OPENED WHILE GRIND AND / OR SPIN ON	**A.** Door was opened while potentially dangerous operations were still on. Turn off motors, pause, or finish cycle before opening doors.	Clears--Proceed to next system error message you have or Continue running.
INCREASE TRAVERSE KNOB SETTING	**A.** An excessive amount of time has passed at the beginning of an auto cycle before the grind head assy. has moved. Increase Traverse Speed pot or check that carriage is not released.	Clears--Proceed to next system error message you have or Continue running.
TRAVERSE TIMEOUT, CHECK POT OR SETUP	**A.** An excessive amount of time has passed during a traverse cycle. Increase Traverse Speed pot or verify that carriage assembly is not released or hitting an obstruction.	Clears--Proceed to next system error message you have or Continue running.

ELECTRICAL TROUBLESHOOTING (Continued)

System Error Message	Checkout Procedure	Message Status
ACCEPT VALUES BE-FORE RUNNING	**A.** Before an auto cycle can be started, verify the values in the displayed boxes and accept them by pressing the "Accept Values" button on the touch screen.	Clears--Proceed to next system error message you have or continue running.
OPEN DOOR TO RESET LIGHT	**A.** Before an auto cycle can be started, the last cycle completed must be cleared. Open the door or press the "Cycle Complete" button on the main screen to reset.	Clears--Proceed to next system error message you have or continue running.

ELECTRICAL TROUBLESHOOTING (Continued)

PROBLEM--Flasher light does not turn on at end of automatic cycle.

In your Product Packet Assembly, there are a series of prints. Find the print titled ***ACCU*-Touch Wiring Diagram,** **before starting the troubleshooting below. Verify all wires shown on that drawing are correct and pull on wire terminals with approximately 3 lbs force to verify there are no loose terminals. If loose terminals are found, tighten and retest system. If problem persists, test as listed below.**

Possible Cause	Checkout Procedure	
Bulb is burned out	**A.** Remove bulb and test continuity	Bulb- Measure approx 300 Ohms Yes--go to Step **B.** next No--Replace bulb
Flasher (FLR) is bad	**B.** (FLR) Unplug flasher at terminal (RT1) 7+ and touch lead to black wire at (RT1) 7-	Light works: Yes--go to step **C.** next No-- Replace Flasher Assy.
No 115 Volts AC to flasher	**C.** After a cycle has completed, measure voltage to Flasher.	(RT1) Term. 7+ to Blue Term Block 17 Measure 115 Volts AC Yes-- Verify continuity in cord, Replace flasher No-- go to step **D.** next
Relay 7 (RT1) is bad	**D.** After a cycle has completed, check (RT1) for light 7 to be on	Light is on: Yes-- go to step **E.** next No-- Contact Factory
	E. Check continuity of relay 7	(RT1) Term 7+ to 7- Measure 115 Volts AC Yes-- Replace Relay 7 (RT1) No-- go to step **F.** next
Circuit Breaker (CB32) tripped	**F.** Reset CB32	Press in on Circuit breaker CB32 on front of control panel. Works Yes--End Troubleshooting No-- Replace CB32

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MECHANICAL TROUBLESHOOTING

Possible Cause	Checkout Procedure
PROBLEM--Reels ground have high/low blades.	
Traverse Speed set to fast.	Check roundness using a magnetic base dial indicator. Traverse speed should be set approximately 12 ft/min [4 meters/min] if roundness is varying.
Lineal bearings for the grinding head carriage are out of adjustment (loose) or have grit buildup causing uneven traversing load.	Relubricate and adjust linear bearings per adjustment section. If problem persists, replace lineal bearings on the carriage base. Check for any holes in the bellows that would permit any grinding grit penitration. See adjustment section for lineal bearing replacement.
PROBLEM--Excessive grinding stock being removed when traversing to the right in the relief grinding mode.	
Gib adjustment for the relief finger assembly is loose so reel finger has movement. When traversing to the right minimum grinding stock removal should be seen as compared with heavy stock removal when traversing to the left.	Tighten the set screws for the gib adjustment. See procedure in the adjustment section in the manual.
PROBLEM--Grinding stock removal from reel is irregular during spin grinding.	
Lineal bearings on the grinding head carriage are too loose.	The lineal bearing must be preloaded to the traverse shafts with no vertical movement. See manual adjustment section for carriage linear bearing adjustments.
PROBLEM--Carriage traversing varies speed while grinding.	
Lineal bearings in the carriage do not rotate freely.	Check for grinding grit getting into the lineal bearings and cause excessive driving torque of carriage. Abrasive noise is detectable when excessive grit is in the lineal bearings. Replace the four lineal bearings in the main carriage. Check bellows for holes and replace if necessary.
Traverse Belt is slipping.	Check the spacing of the clamp to the support block. Clamp tip may need to be adjusted if the belt is slipping. The belt may also be too loose. See Adjustments section for proper measurements of clamp gap and belt tension.

MECHANICAL TROUBLESHOOTING (Continued)

PROBLEM--Too heavy a burr on cutting edge of reel blades.

Possible Cause	Checkout Procedure
Traverse speed set to high causing a heavy burr on the reel blade when spin grinding.	Traverse speed should be set lower approximately 12 ft/min. [4 meters/min.] for a smaller burr on cutting edge.

PROBLEM--Cone shaped reel after grinding.

Grinding head travel not parallel to the reel center shaft.	Grinding head travel was not setup parallel to the reel center shaft in vertical and horizontal planes. See Align the Reel Section in Operator's Manual.

PROBLEM--Relief grind on the reel blades do not go the full length of the reel.

The right side corner of the grinding wheel is always to be in contact with the reel blade. This is high point of the relief finger.	The right hand side of the grinding wheel is not in full contact for relief grinding. See Operator's Manual for NORMAL HELIX AND REVERSE HELIX for information of dressing the grinding wheel.

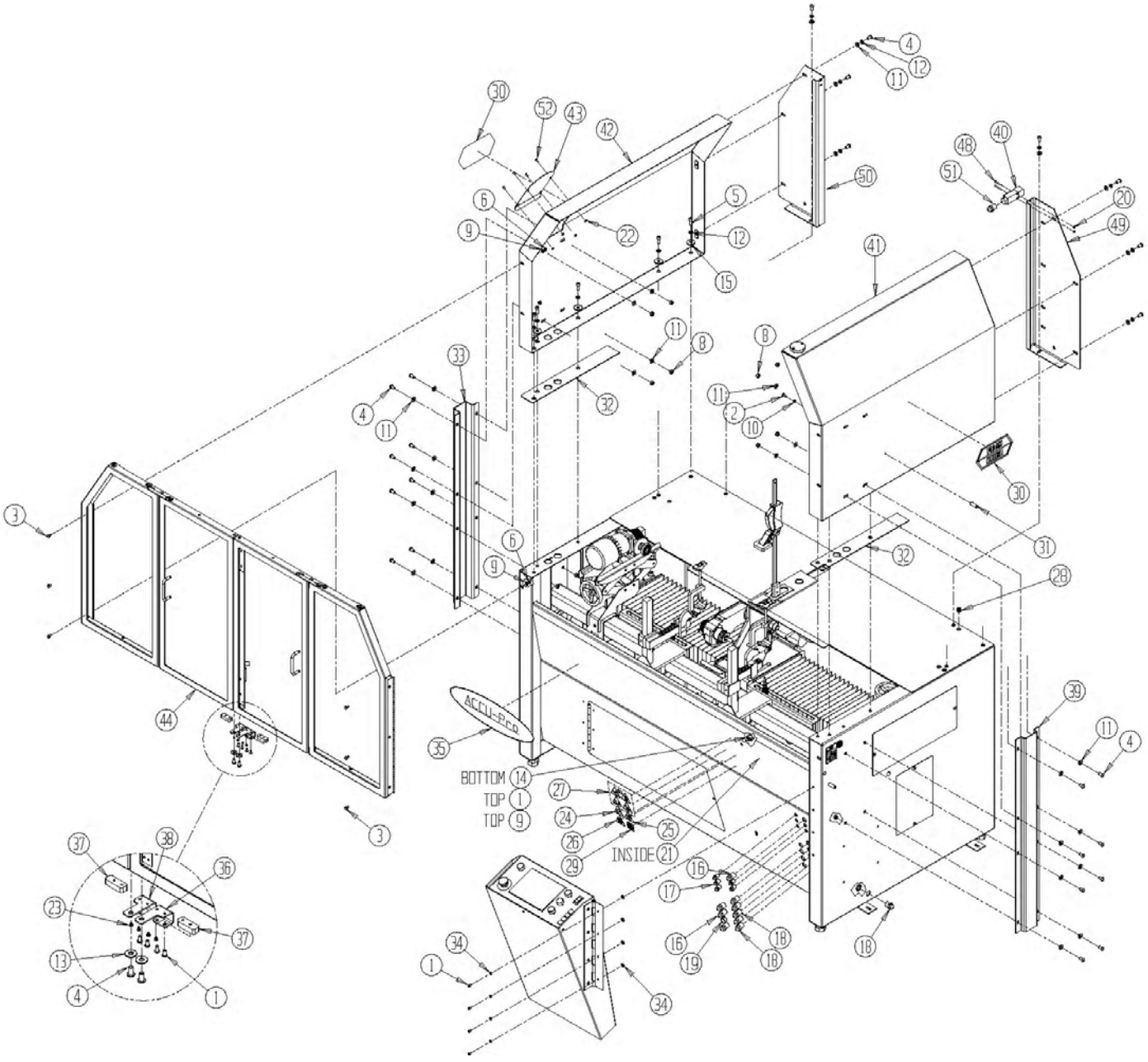
BOTTOM 14
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DIAGRAM NUMBER	PART NUMBER	DESCRIPTION
1	B250816	Button Head Cap Screw 1/4-20 x 1/2 Long
2	B251001	Hex Head Cap Screw 1/4-20 x 5/8 Long
3	B250801	Hex Head Cap Screw 1/4-20 x 1/2 Long
4	B371216	Button Head Cap Screw 3/8-16 x 3/4 Long
5	B371611	Socket Head Cap Screw 3/8-16 1 Long
6	J257000	1/4-20 Nylon Jam Locknut
7	J257100	1/4-20 Nylon Locknut
8	J377000	3/8-16 Nylon Jam Locknut
9	K250001	1/4 Flat Washer
10	K251501	1/4 Split Lockwasher
11	K370001	3/8 Flat Washer SAE
12	K371501	3/8 Split Lockwasher
13	R000454	Flat Washer (1 OD x .44 ID)
14	09394	2 Prong Knob
15	3589106	Flat Washer (1.38 OD x .39 ID)
16	3707009	Liquid Tight Strain Relief .27-.47 Wire
17	3707029	Liquid Tight Strain Relief .19-.30 Wire
18	3707093	Liquid Tight Strain Relief .43-.55 Wire
19	3707595	7/8 Hole Plug
20	J167000	8-32 Lock Nut - Jam
21	3708448	Electrical Warning Decal
22	J197000	10-24 Lock Nut - Jam
23	3708521	Plastic Rivet
24	3708605	Respirator Warning Decal
25	3708606	Hearing Protection Warning Decal
26	3708612	No Fuel Warning Decal
27	3708703	Multiple Safety Symbols Decal
28	3707273	Strain Relief
29	3708872	Patent Decal
30	3709990	Foley United Decal
31	6309039	Gage Mounting Pin
32	6329022	Side Frame Spacer Plate
33	6329024	Canopy Boom Support Bracket
34	R000536	Internal Tooth Lock Washer 1/4
35	6329053	ACCUPro Decal
36	6329047	Door Guide Bracket RH
37	6329048	Door Slide
38	6329049	Door Guide Bracket LH
39	6329059	Canopy Support Bracket
40	3707728	Safety Switch NC/NC
41	6329543	Guard Weldment RH
42	6329542	Guard Weldment LH
43	6329112	Boom Hole Cover Panel
44	6329533	Front Guard Door Assembly (see page 55)
45	R000480	#8 Lock Washer
46	R000558	#8-32 Kep Nut
47	6529019	Flasher Base Assembly
48	3708865	Safety Screw 8-32 x 1.5 Long
49	6329109	Rear Right Hand Guard Panel
50	6329110	Rear Left Hand Guard Panel
51	3707563	Strain Relief
52	B190613	10-24 x 3/8 Long Button Head Socket Cap Screw

6329533 FRONT GUARD DOOR ASSEMBLY

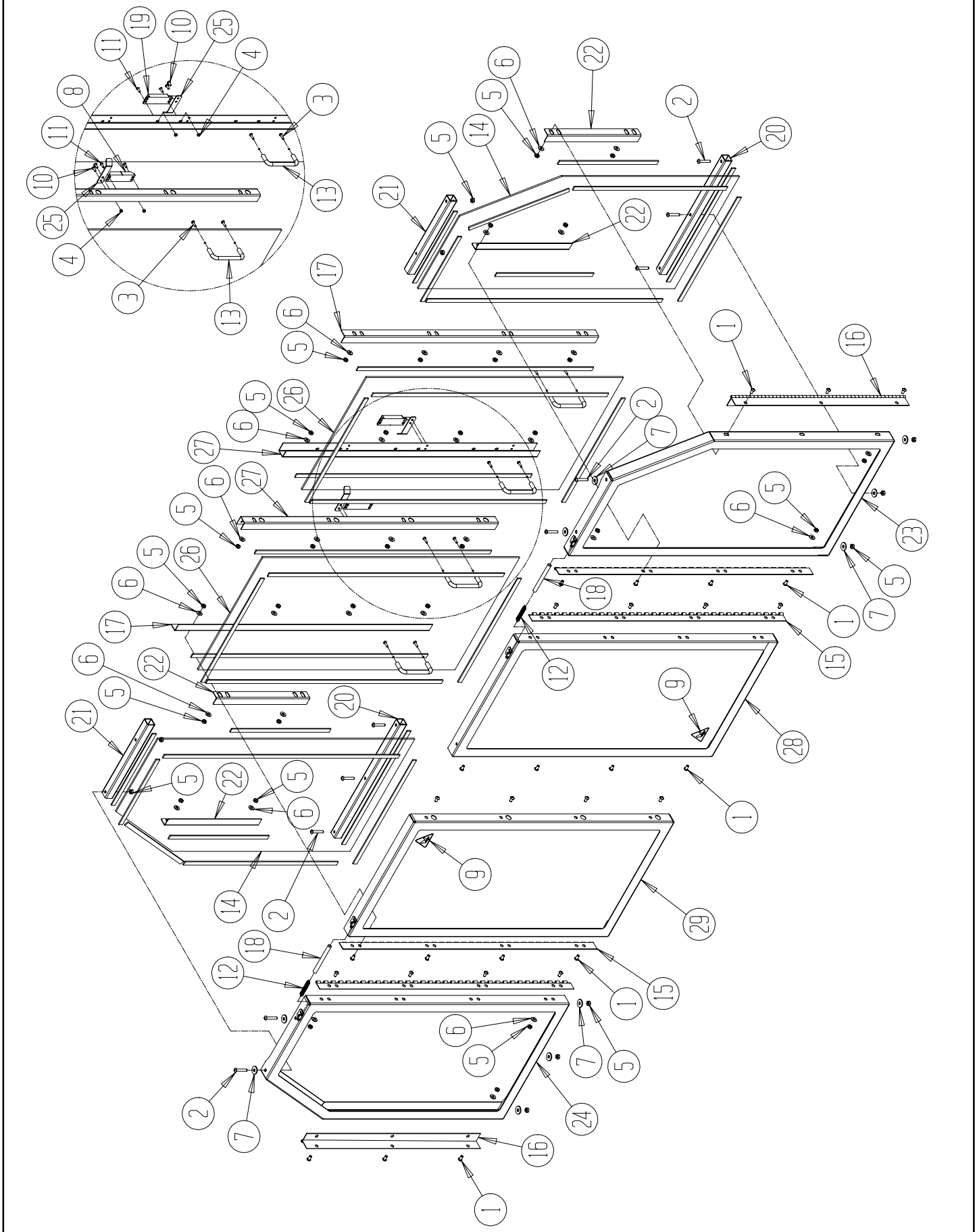

DIAGRAM NUMBER	PART NUMBER	DESCRIPTION
1	B250816	Button Head Cap Screw 1/4-20 x 1/2 Long
2	B252416	Button Head Cap Screw 1/4-20 x 1 1/2 Long
3	D161266	Pan Head Machine Screw #8 x 3/4 Long
4	J167000	8-32 Nylon Jam Locknut
5	J257000	1/4-20 Nylon Jam Locknut
6	K250001	1/4 Flat Washer
7	R000453	Flat Washer
8	3707647	Door Safety Switch Coded Magnet
9	3708458	Sharp Warning Decal
10	3708675	3/16 Blind Rivet
11	3708820	Button Head Safety Screw #8-32 x 1/2 Long
12	3708855	Extension Spring
13	3708857	Black Pull Handle
14	6059013	Front Outside Window
15	6059029	Front Center Hinge
16	6059030	Front End Hinge
17	6059036	Center Window Support
18	6059044	Spring Cover Sleeve
19	6059021	Door Safety Switch (Front)
20	6059066	Bottom Window Support
21	6059067	Top Window Support
22	6059068	Short Window Support
23	6059069	Front RH Window Frame Weldment
24	6059072	Front LH Window Frame Weldment
25	6309038	Door Bracket
26	6329046	Front Inside Window
27	6329071	Window Retainer/ Switch Mount
28	6329512	Front RH Inside Window Frame Weldment
29	6329513	Front LH Inside Window Frame Weldment

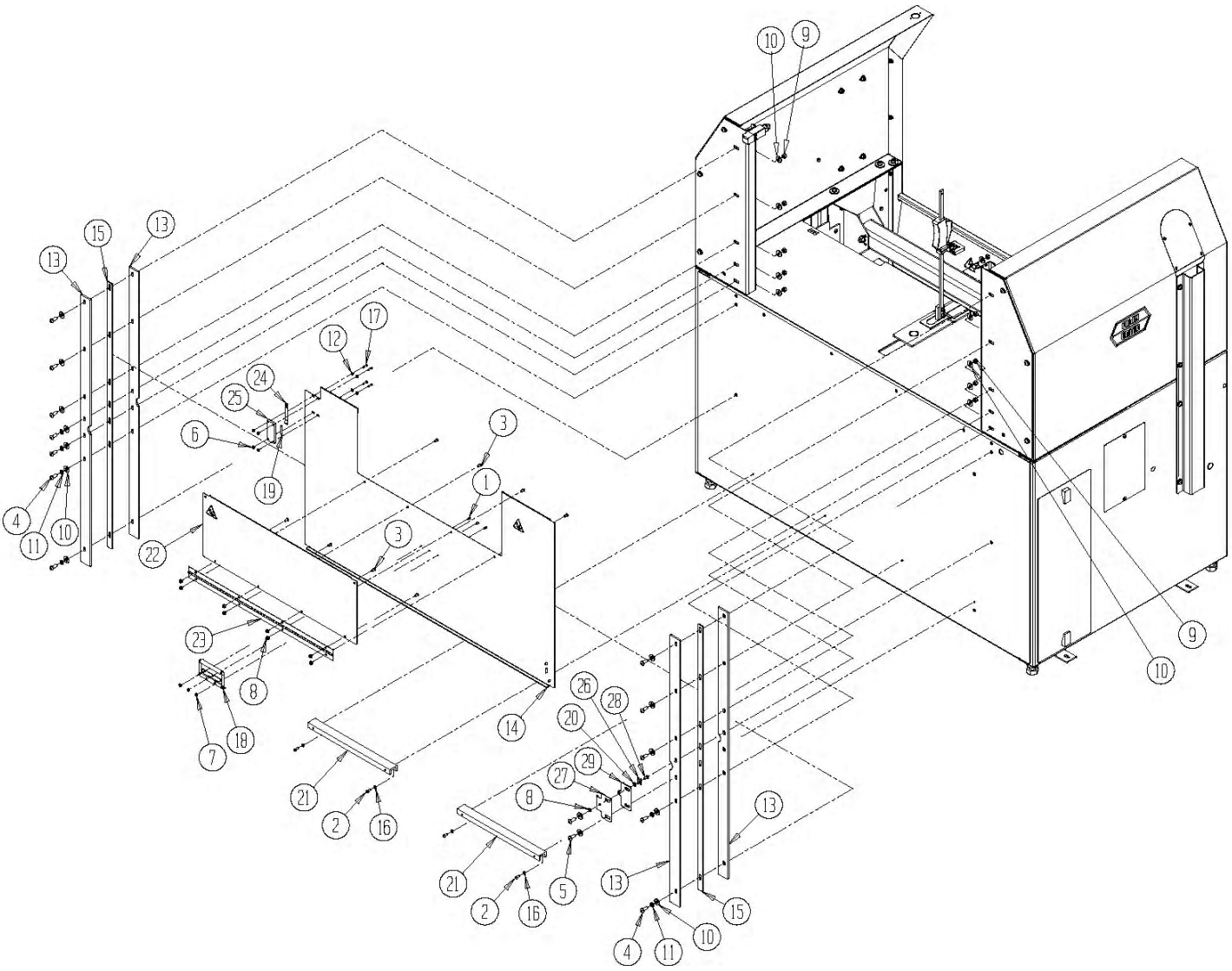
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DIAGRAM NUMBER	PART NUMBER	DESCRIPTION
1	B190613	Button Head Socket Cap Screw 10-24 x 3/8 Long
2	B251016	Button Head Socket Cap Screw 1/4-20 x 5/8 Long
3	B250816	Button Head Socket Cap Screw 1/4-20 x 1/2 Long
4	B372016	Button Head Socket Cap Screw 3/8-16 x 1-1/4 Long
5	B372416	Button Head Socket Cap Screw 3/8-16 x 1-1/2 Long
6	J167000	8-32 Lock Nut Jam
7	J197000	10-24 Lock Nut Jam
8	J257100	1/4-20 Lock Nut
9	J377000	3/8-16 Lock Nut Jam
10	K370001	3/8 Flat Washer
11	K371501	3/8 Lock Washer
12	K160001	No. 8 Flat Washer
13	6329135	Rear Door Slide
14	6329551	Slide Up Rear Door Weldment
15	6329136	Rear Slide Spacer Plate
16	K251501	1/4 Lock Washer
17	3708819	8-32 x .75 Button Head Safety Screw
18	3708992	Folding Handle
19	3708997	Compression Spring .24 OD x 1.5 Long
20	3708998	Wave Spring .35 ID
21	6209165	Lower Guide Bar
22	6329029	Hinged Walker Panel
23	3708869	Spring Hinge
24	6329127	Door Safety Switch Key
25	6329128	Door Key Housing
26	6329131	Catch
27	6329132	Catch Bracket
28	6329133	Catch Pin
29	6329134	Catch Spacer Plate

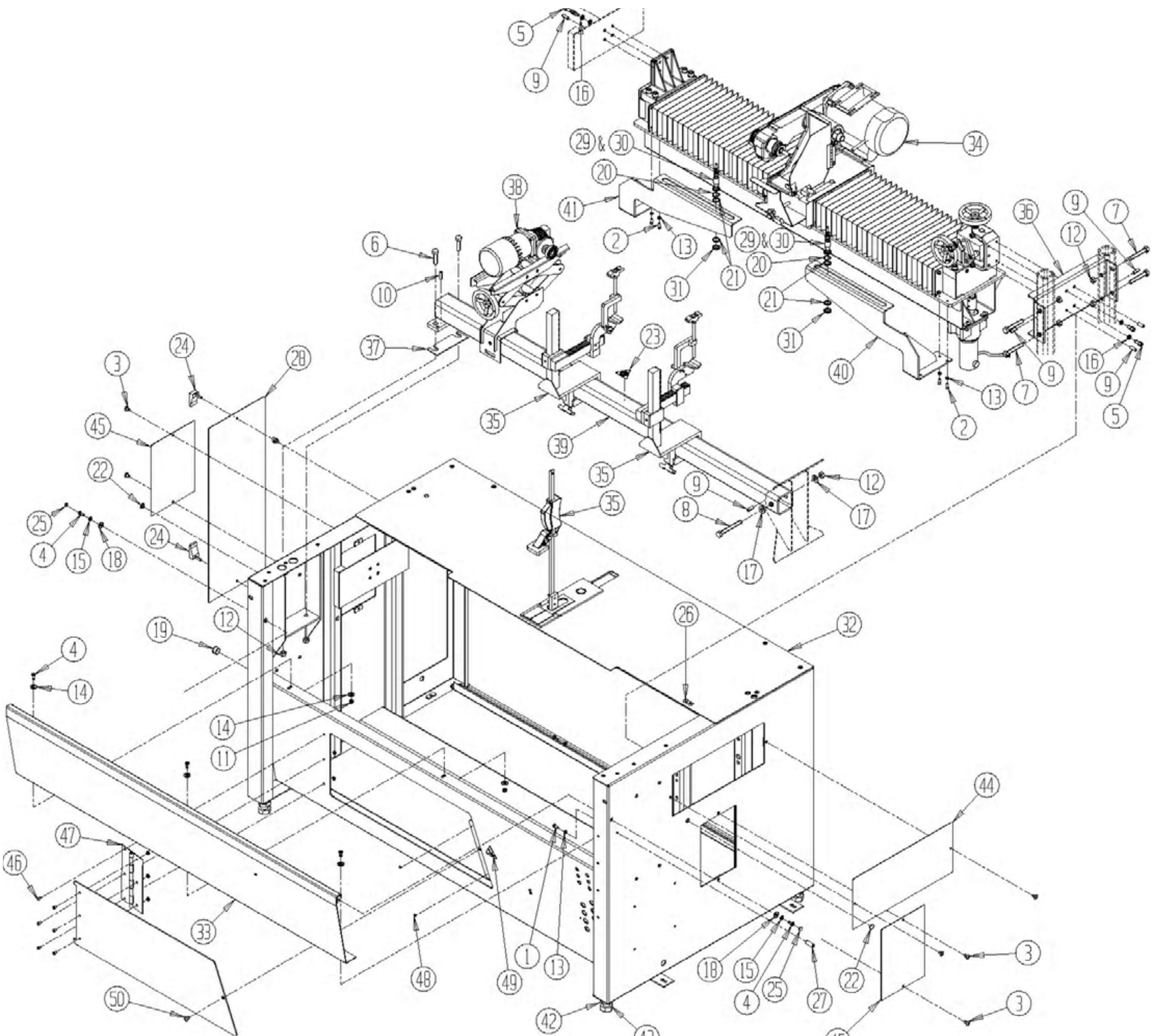
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DIAGRAM NUMBER	PART NUMBER	DESCRIPTION
1	B251001	Hex Head Cap Screw 1/4-20 x 5/8
2	B251011	Socket Head Cap Screw 1/4-20 x 5/8
3	B310813	Button Head Socket Cap Screw 5/16-18 x 1/2
4	B311213	Button Head Socket Cap Screw 5/16-18 x 3/4
5	B371211	Socket Head Cap Screw 3/8-16 x 3/4
6	B502801	Hex Head Cap Screw 1/2-13 x 1 3/4
7	B504801	Hex Head Cap Screw 1/2-13 x 3
8	B506801	Hex Head Cap Screw 1/2-13 x 4.25
9	H371602	Roll Pin .375 Dia. x 1 Long
10	H372002	Roll Pin .375 Dia. x 1 1/4 Long
11	J317100	5/16-18 Locknut
12	J507100	1/2-13 Locknut
13	K251501	1/4 Split Lockwasher
14	K310001	5/16 Flat Washer SAE
15	K311501	5/16 Split Lockwasher
16	K371501	3/8 Split Lockwasher
17	K500001	1/2 Flat Washer SAE
18	R000453	Flat Washer (.88 OD x .31 ID x .104 T)
19	3707595	7/8" Hole Plug
20	3708419	Wave Spring
21	3708421	Flat Washer (1.0 OD x .75 ID x .08T)
22	3708542	5/8" Hole Plug
23	3708612	Fuel Warning Decal
24	3708867	Swell Latch
25	3709372	1/2" Hole Plug
26	6309111	Decal - Up/Down
27	6309039	Gage Pin Mounting
28	6329098	Vac Door
29	3707601	Proximity Switch Head
30 a	6329075	LH Traverse Proximity Switch Cord
30 b	6329076	RH Traverse Proximity Switch Cord
31	3707459	Proximity Switch Nut
32	6329501	Cabinet Weldment
33	6329504	Front Panel Weldment
34	6329525	Traverse Base Assembly (see page 64)
35	6329535	Mower Support Assembly (see page 78)
36	6509035	Cross slide Mount
37	6509389	Tooling Bar Shim
38	6509465	Spin Drive Assembly (see page 80)
39	6509510	Tooling Bar Weldment
40	6509560	Proximity Switch Bracket Weldment RH
41	6509561	Proximity Switch Bracket Weldment LH
42	J992000	1-8 Hex Jam Nut
43	A993201	Adjustable Leveling Bolt
44	6509039	Right-Hand Access Panel
45	6509040	Left-Hand Access Panel - Small
46	B250816	1/4-20 x 1/2 Button Head Socket Cap Screw
47	50382	Hinge
48	3659083	Bumper
49	3708458	Warning Decal - Sharp
50	B370816	3/8-16 x 1/2 Button Head Socket Cap Screw

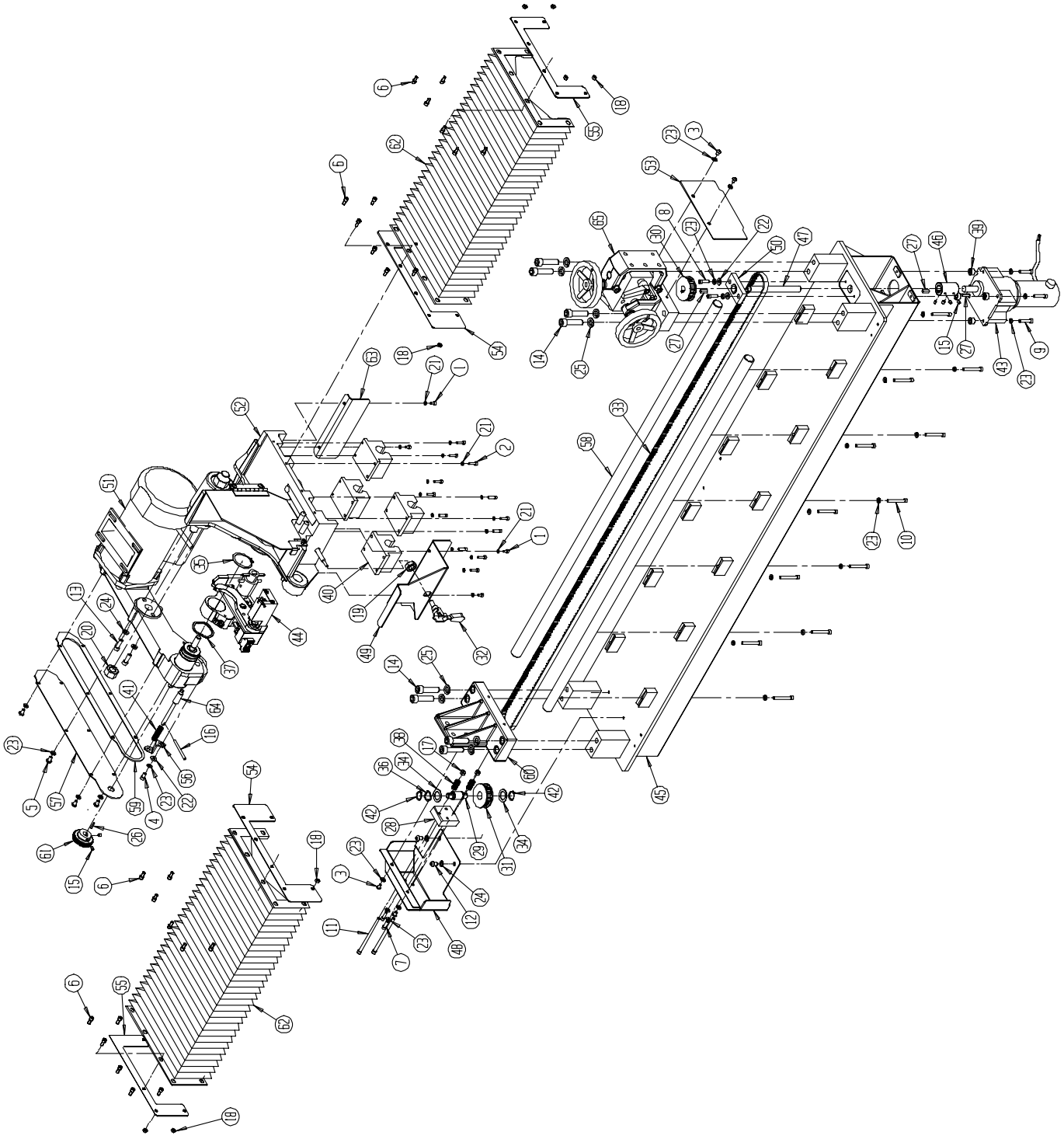

DIAGRAM NUMBER	PART NUMBER	DESCRIPTION
1	B190611	Socket Head Cap Screw 10-24 x 3/8 Long
2	B191211	Socket Head Cap Screw 10-24 x 3/4 Long
3	B250616	Button Head Socket Cap Screw 1/4-20 x 3/8 Long
4	B250811	Socket Head Cap Screw 1/4-20 x 1/2 Long
5	B250818	Pan Head Machine Screw 1/4-20 x 1/2 Long
6	B250819	Button Head Socket Cap Screw 1/4-20 x 1/2 Long
7	B251211	Socket Head Cap Screw 1/4-20 x 3/4 Long
8	B251411	Socket Head Cap Screw 1/4-20 x 7/8 Long
9	B252011	Socket Head Cap Screw 1/4-20 x 1 1/4 Long
10	B253211	Socket Head Cap Screw 1/4-20 x 2 Long
11	B256411	Socket Head Cap Screw 1/4-20 x 4 Long
12	B310813	Button Head Socket Cap Screw 5/16-18 x 1/2 Long
13	B311611	Socket Head Cap Screw 5/16-18 x 1 Long
14	B503211	Socket Head Cap Screw 1/2-13 x 2 Long
15	C250420	Socket Head Set Screw Cup Point 1/4-20 x 1/4 Long
16	H184002	3/8 Diameter Roll Pin x 2 1/2 Long
17	J257000	1/4-20 Nylon Locknut Thin
18	J257100	1/4-20 Nylon Locknut
19	J627200	5/8-18 Nylon Locknut Thin
20	J757300	3/4-16 Nylon Locknut
21	K191501	No. 10 Washer
22	K250001	1/4 Flat Washer SAE
23	K251501	1/4 Split Lockwasher
24	K311501	5/16 Split Lockwasher
25	K501501	1/2 Split Lockwasher
26	R000376	Square Key 1/8 x 3/4 Long
27	R000377	Square Key 3/16 x 3/4 Long
28	28192	Traverse Pulley Support
29	50309	Traverse Pulley Shaft
30	50354	Drive Pulley (Cog)
31	55553	Idler Pulley Assembly
32	80335	Destaco Clamp
33	80354	Cog Belt
34	80355	Thrust Washer (1 1/4OD x 3/4 ID)
35	3708195	External Retaining Ring
36	3708419	Wave Spring (.78 ID)
37	3708436	Wave Spring
38	3708658	Compression Spring
39	3708884	Spacer 5/8 OD x 9/32 ID x 3/8 Long
40	3709044	Linear Ball Bearing

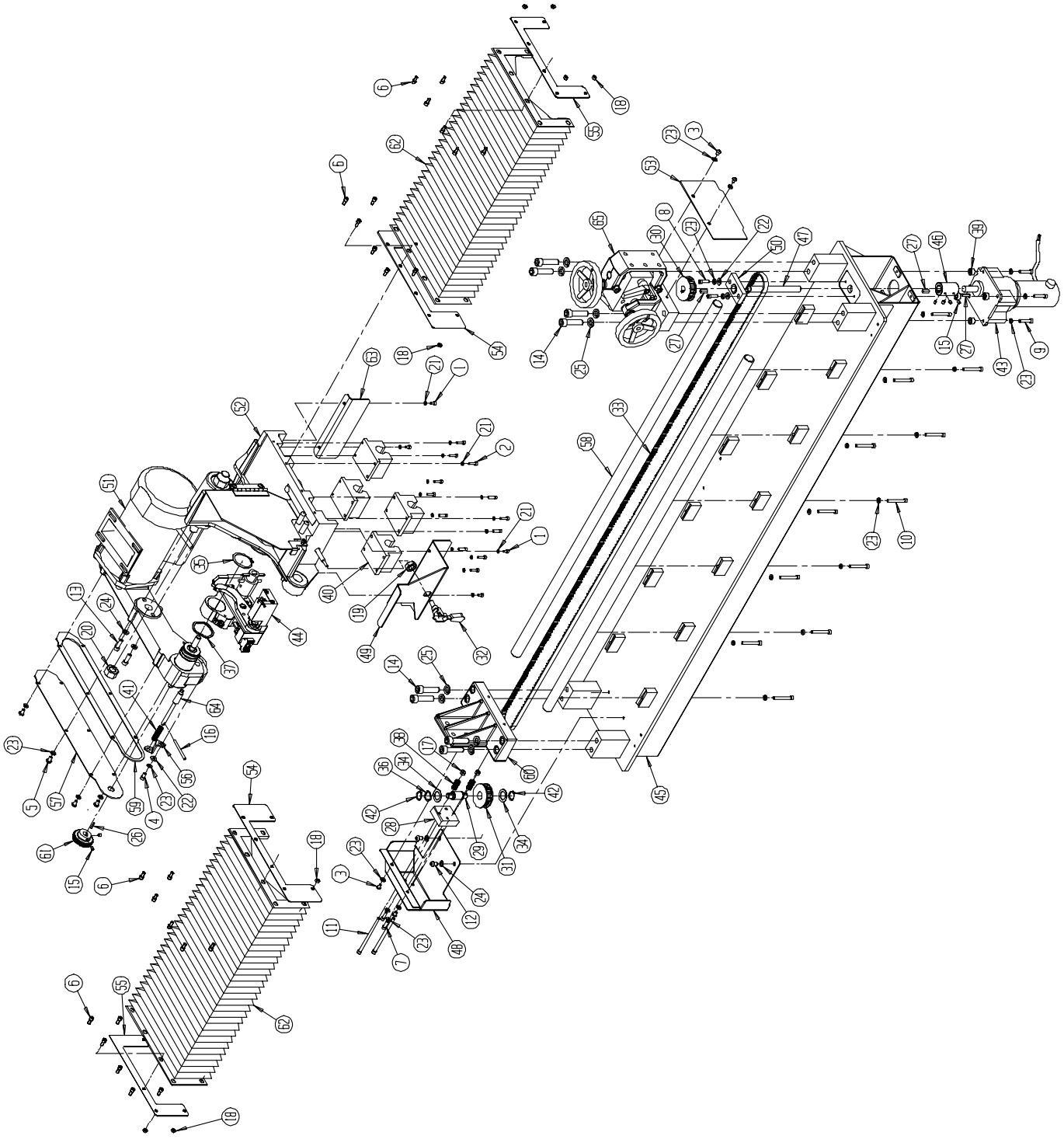

DIAGRAM NUMBER	PART NUMBER	DESCRIPTION
41	3709072	Compression Spring
42	3709331	External Retaining Ring
43	6059062	Traverse Motor Assembly
44	6309573	Finger & Body Assembly (see page 74)
45	6329032	Traverse Base
46	6329034	5/8 Shaft Coupler
47	6329035	Motor Extension Shaft
48	6329036	Pulley Mount Bracket
49	6329507	Prox Flag Bracket Weldment
50	6329511	Shaft Support Block Assembly
51	6329526	Grinding Head Assembly (see page 70)
52	6329527	Carriage Assembly (see page 72)
53	6509020	Traverse Base Adjuster End Cap
54	6509021	Bellows Bracket Carriage Mount
55	6509025	Bellows Bracket End Mount
56	6509054	Plunger Pin Retainer
57	6509055	Belt Cover
58	6509063	Carrier Shaft
59	6509210	Belt Cover Gasket
60	6509221	Traverse Base Fixed Bracket
61	6509238	Grinding Wheel Grip Knob
62	6509250	Bellows - Way cover
63	6509253	Carriage Dust Cover Bracket
64	6509484	Plunger Pin
65	6509565	Cross Slide Assembly (see page 68)

6509565 CROSS SLIDE ASSEMBLY

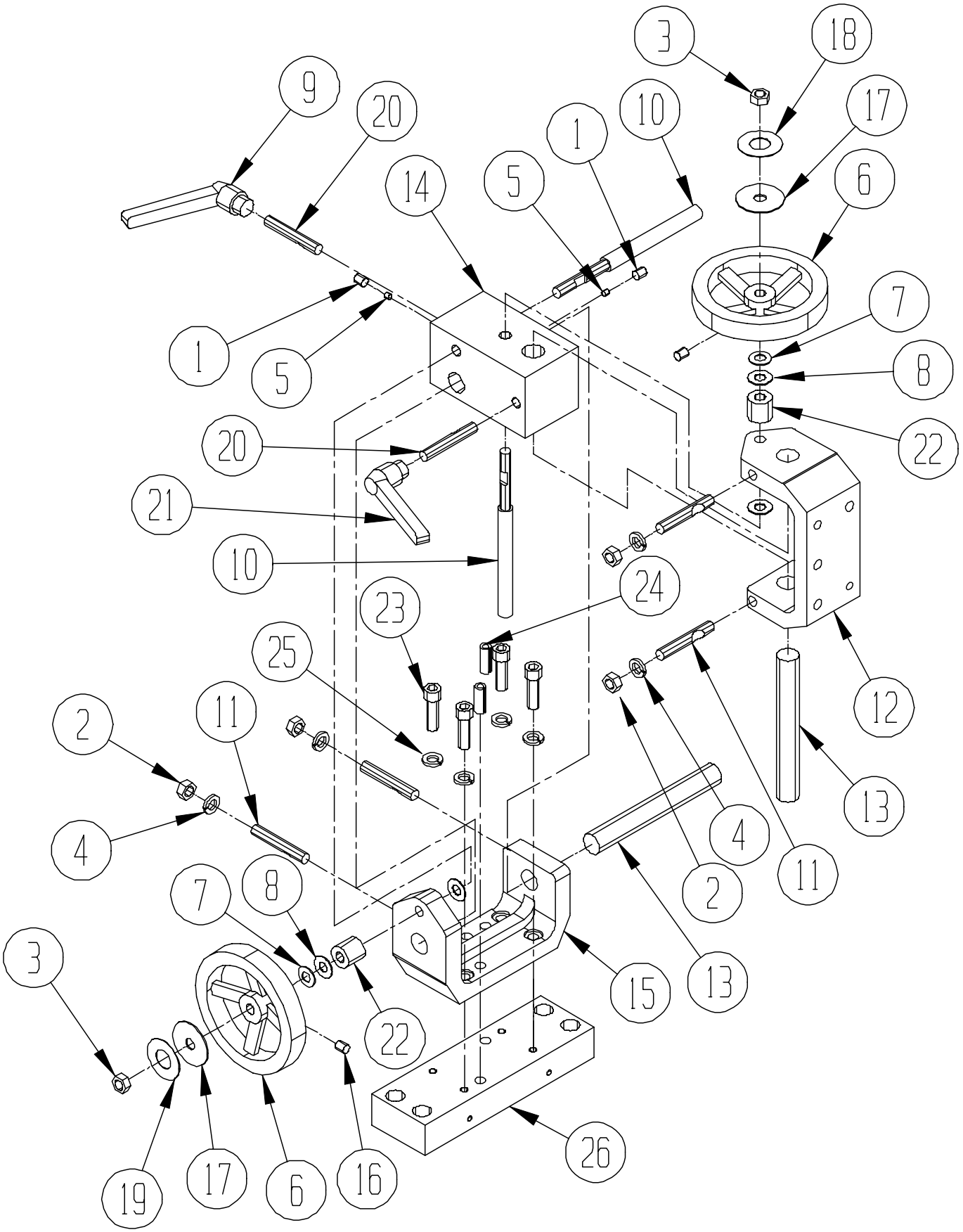

DIAGRAM NUMBER	PART NUMBER	DESCRIPTION
1	C311220	Socket Set Screw CPPT 5/16-18 x 3/4 Long
2	J371000	3/8-16 Hex Nut
3	J377000	3/8-16 Hex Jam Nylon Locknut
4	K371501	3/8 Split Lockwasher
5	3579109	3/16 Dia. Nylon Plug
6	3708148	Handwheel 4.5 Dia. .38 Bore
7	3709062	Bell V Washer .75 O. D. x .035 T
8	3709304	Thrust Washer
9	3708705	Adjustable Handle 5/16-18 Female - Orange
10	6509390	Adjusting ACME Shaft
11	6009035	Locking Stud Shaft
12	6009082	Cross Slide Support
13	6009095	Slide Shaft
14	6509011	Cross Slide
15	6509015	Cross Slide Horizontal support
16	C310820	Socket Set Screw 5/16-18 x 5/8 Long
17	3708665	Flat Washer
18	6309115	Grey Decal
19	6309114	Orange Decal
20	6309113	5/16-18 Locking Stud
21	3708706	Adjustable Handle 5/16-18 Female - Grey
22	3969065	Spacer .406 ID x .75 OD x 1.0 Long
23	B372011	Socket Head Cap Screw 3/8-16 x 1 1/4 Long
24	H371602	Rollpin 3/8 Dia. x 1 Long
25	K371501	3/8 Split Lockwasher
26	6509010	Traverse Base Adjuster Bracket

6329526 GRINDING HEAD ASSEMBLY

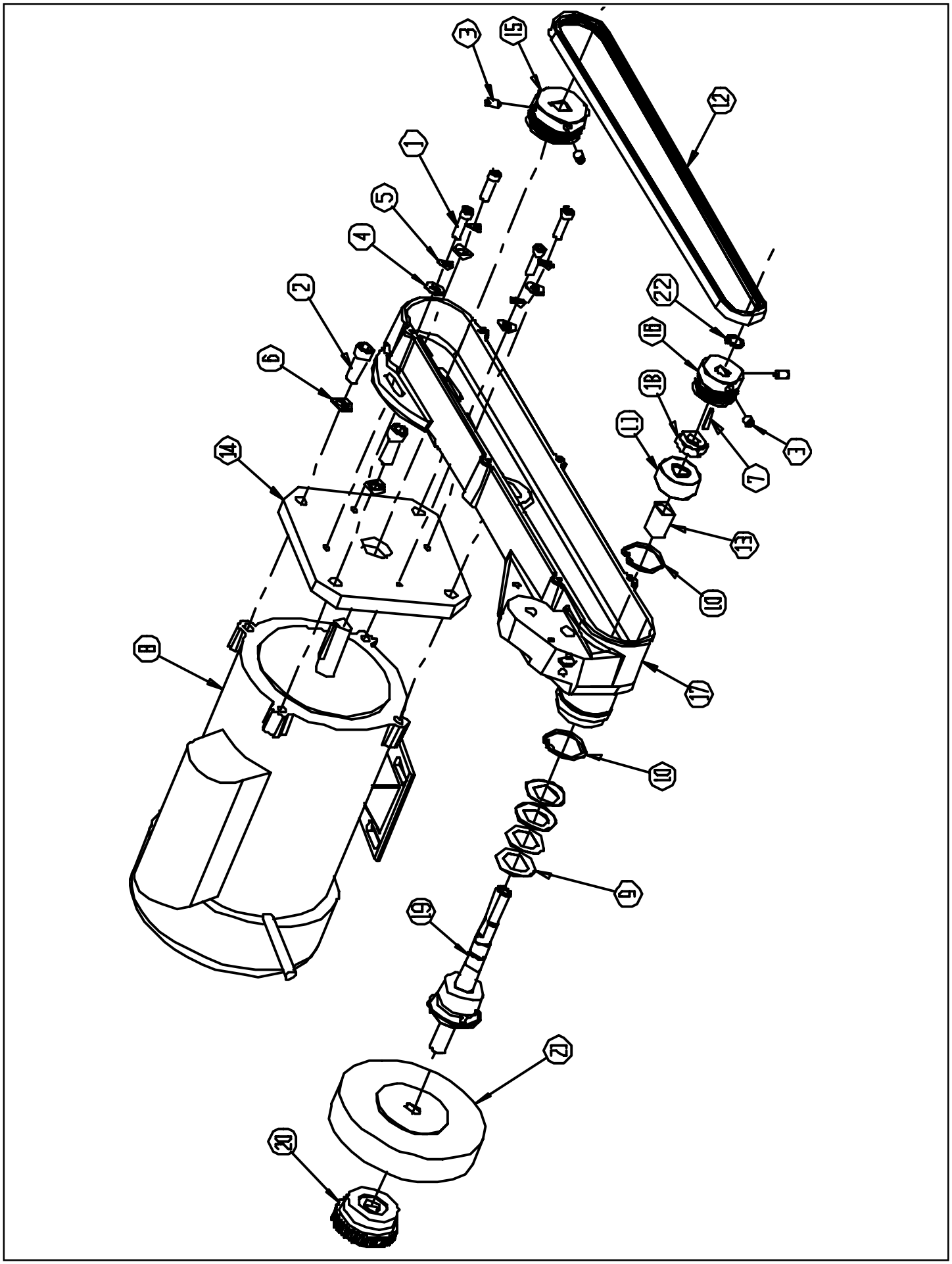

DIAGRAM NUMBER	PART NUMBER	DESCRIPTION
1	B251411	Socket Head Cap Screw 1/4-20 x 7/8 Long
2	B371611	Socket Head Cap Screw 3/8-16 x 1 Long
3	C250627	Socket Set Screw Cup Pt 1/4-20 x 3/8 Long - Lock Patch
4	K250001	1/4 Flat Washer SAE
5	K251501	1/4 Split Lockwasher
6	K371501	3/8 Split Lockwasher
7	R000376	Square Key 1/8 x 3/4 Long
8	3707690	1 HP 120 VAC Motor
9	3708193	Conical Washer 1.36 OD x .88 OD
10	3708194	Internal Retaining Ring
11	3708204	Double Row Ball Bearing
12	3708202	Poly-V Belt
13	6329089	Bearing Sleeve
14	6329041	Motor Mount Plate
15	6329042	Pulley - Poly V 1.80 Diameter
16	6329100	Pulley - Poly V 1.44 Diameter
17	6509018	Grinding Head Housing
18	J567200	9/16-18 Locknut Nylon Insert Jam
19	6329523	Grinding Head Spindle Assembly
20	6509237	Grinding Wheel knob
21		Grinding Wheel (see page 93)
22	3708870	Retaining Ring - External .50 Shaft Heavy Duty

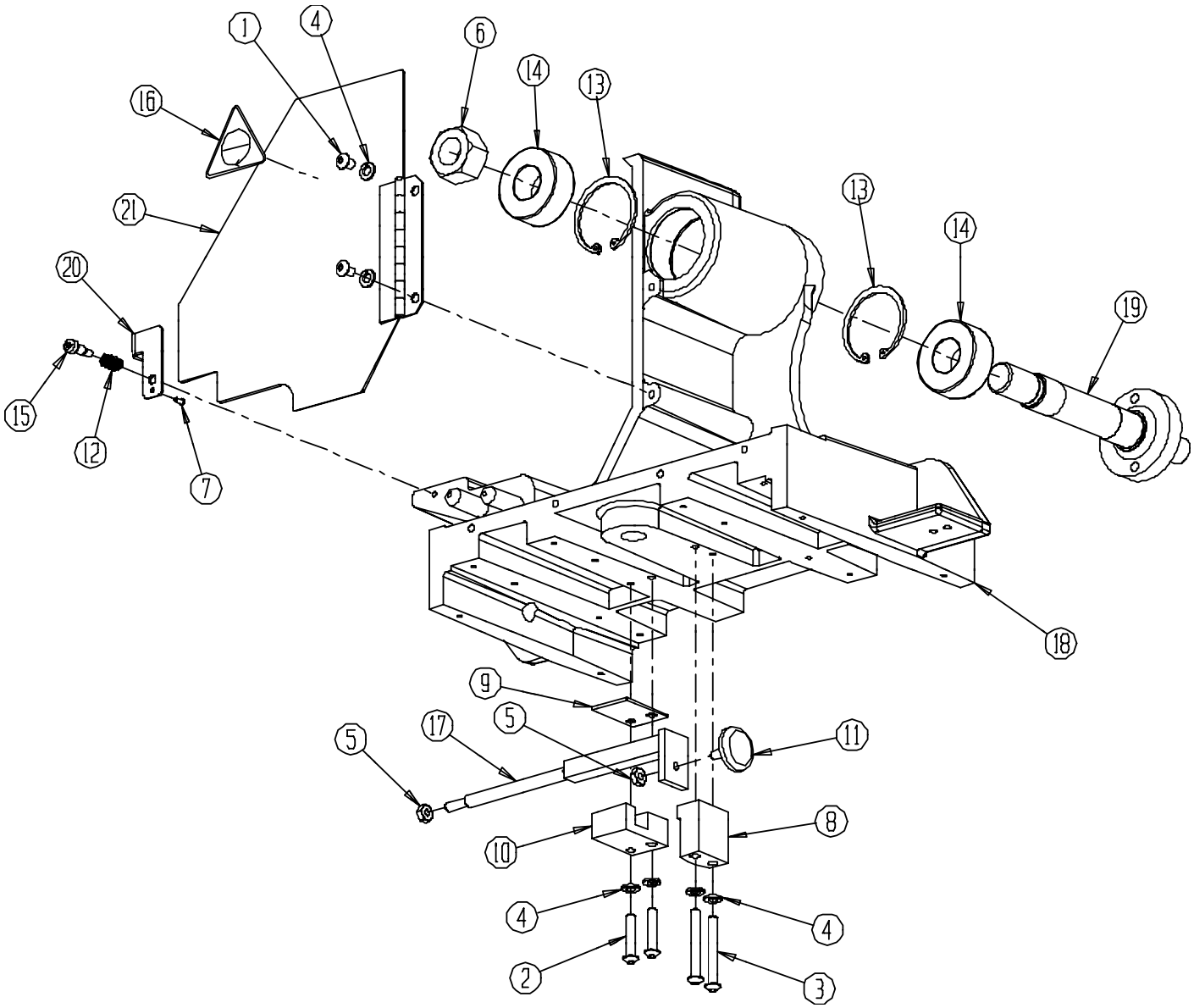
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DIAGRAM NUMBER	PART NUMBER	DESCRIPTION
1	B250616	Button Head Cap Screw 1/4-20 x 3/8 Long
2	B252016	Button Head Cap Screw 1/4-20 x 1 1/4 Long
3	B253216	Button Head Cap Screw 1/4-20 x 2 Long
4	K251501	1/4 Split Lockwasher
5	J252000	1/4-20 Jam Nut
6	J887300	7/8-14 Nylon Jam Locknut
7	R602031	#4 x .31 Drive Screw
8	28187	Traverse Clamp Block
9	28188	Traverse Clamp Spacer Plate
10	28189	Clamp Support Block
11	50310	Belt Clamp Tip
12	3708105	Compression Spring
13	3708184	Retaining Ring
14	3708186	Ball Bearing
15	3708208	Shoulder Bolt .250 Dia. x .387 Long
16	3708462	Decal - RPM, Symbol
17	6329040	Traverse Clamp
18	6329058	Carriage Base
19	6509023	Grinder Head Pivot Shaft
20	6509251	Swing Door Latch
21	6509584	Swing Door Weldment

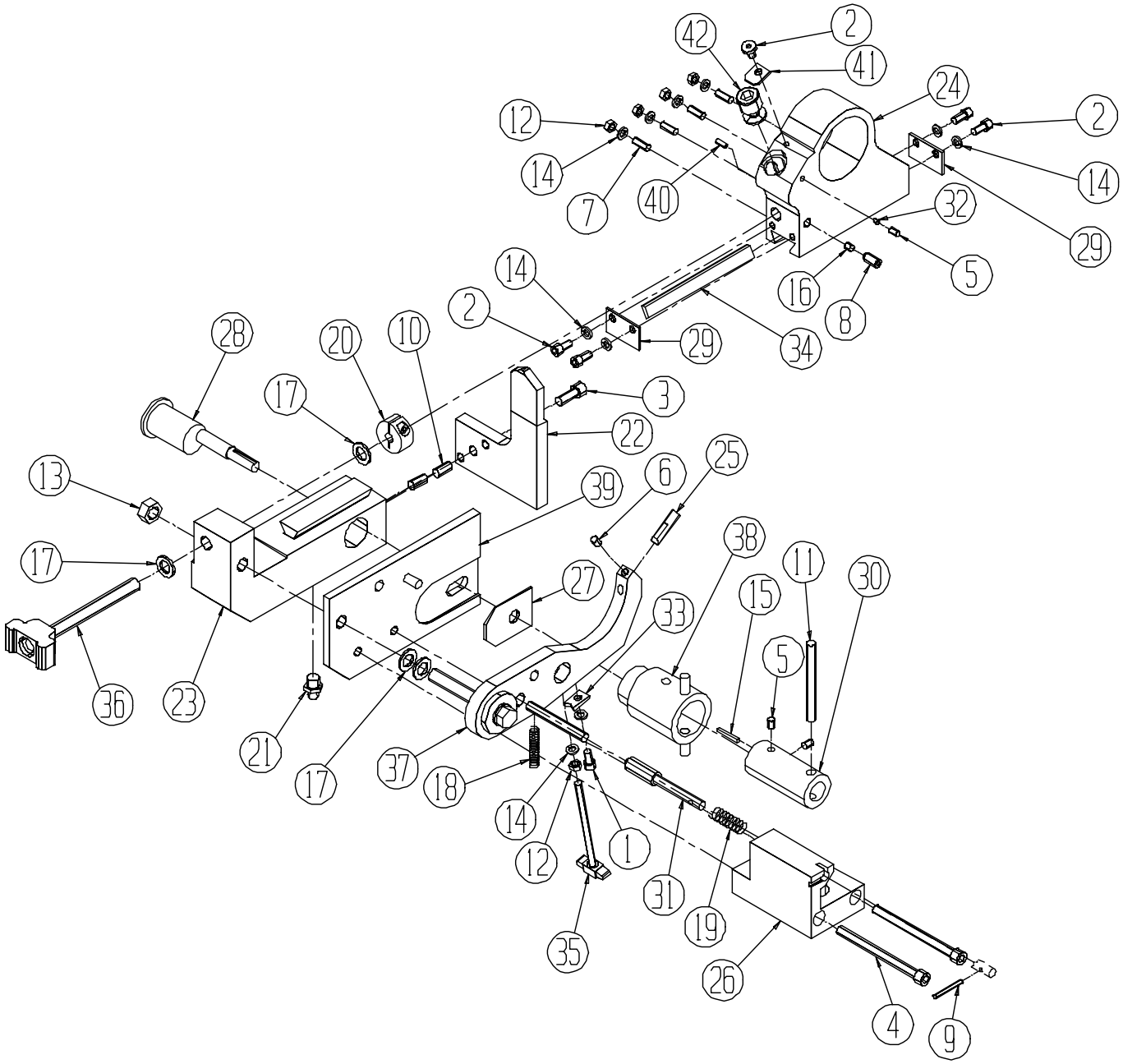
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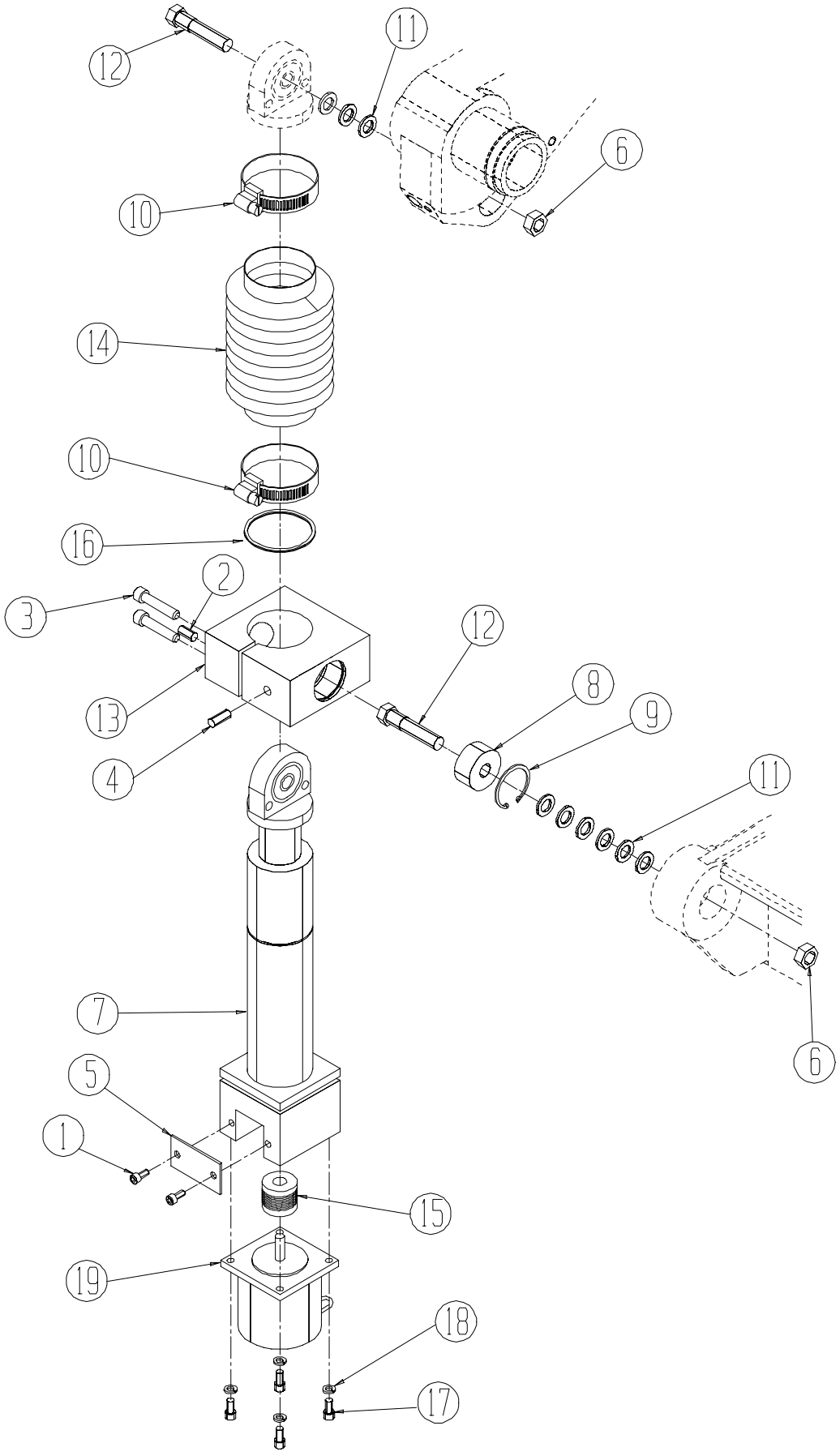
DIAGRAM NUMBER	PART NUMBER	DESCRIPTION
1	B190631	Socket Head Cap Screw 10-32 x 3/8 Long
2	B190634	Button Head Socket Cap Screw 10-32 x 3/8 Long
3	B251011	Socket Head Cap Screw 1/4-20 x 5/8 Long
4	B254811	Socket Head Cap Screw 1/4-20 x3 Long
5	C190460	Socket Set Screw 10-24 x 1/4
6	C190467	Socket Set Screw - Nylok Cup 10-32 x .25 Long
7	C190860	Socket Set Screw - CP-PT 10-32 x 1/2 Long
8	C190860	Socket Set Screw - 10-32 x 1/2 Long
9	H122002	Roll Pin 1/8 Dia. x 1 1/4 Long
10	H250813	Dowel Pin 1/4 Dia. x .5 Long
11	H253202	Drive Lock Pin 1/4 x 1.75 Long
12	J191100	10/32 Hex Nut
13	J377200	3/8-24 Jam Nylok Locknut
14	K191501	No. 10 Lock Washer
15	R000351	Square Key .093 x .75 Long
16	3579284	1/8 Dia. Nylon Plug
17	3709304	Thrust Washer
18	3708107	Compression Spring
19	3708175	Compression Spring
20	3708199	3/8-16 Dia. Split Shaft Collar
21	3709472	Straight Grease Fitting
22	6509432	Relief Finger
23	6509004	Reel Finger Slide
24	6509357	Reel Finger Positioner
25	6509007	Index Stop Pin
26	6509008	Index Sensor Block
27	6509009	Slide Washer
28	6509058	Eccentric Index Pin
29	6509060	Gib Stop Plate
30	6509215	Adjustable Index Lever
31	6509229	Locking Index Finger Pin
32	3579284	1/8" Diameter Nylon Plug
33	6509239	Anti Rotation Plate
34	6509258	Dovetail Gib
35	6509501	Tee Knob Assembly
36	6509547	Knob Assembly
37	6329592	Index Finger Assembly - High
38	6329593	Index Lock Handle Weldment
39	6509592	Index Finger Positioner Weldment
40	H120402	1/8" Diameter x 1/4" Long Pin Roll
41	6509358	Stop Plate
42	6509356	Reel Positioner Adjuster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PARTS LIST (Continued) 6509574 STEPPER & MOUNTING ASSEMBLY

DIAGRAM NO.	PART NUMBER	DESCRIPTION
1	B190613	Button Head Cap Screw #10-24 x 3/8 Long
2	B252011	Socket Head Cap Screw 1/4-20 x 1 1/4 Long
3	C250825	Socket Set Screw 1/4-20 x 1/2
4	C251020	1/4-20 x 5/8" Set Screw
5	6509381	Base Cover Plate
6	J377200	3/8-24 Nylok Jam Locknut
7	6509384	Infeed Stepper Assy.
8	3708187	Ball Bearing
9	3708189	Retaining Ring
10	3708192	Hose Clamp 2.25 Dia.
11	3709304	Thrust Washer
12	6509048	Hex Pivot Pin
13	6509051	Trunion Block
14	6509056	Bellows, 1.88 I. D.
15	3708629	Flex Coupling
16	3708424	Spiral Retaining Ring
17	B190811	Socket Head Cap Screw 10-24 x 1/2 Long
18	K191501	No. 10 Lock Washer
19	6509470	Stepper Infeed Motor

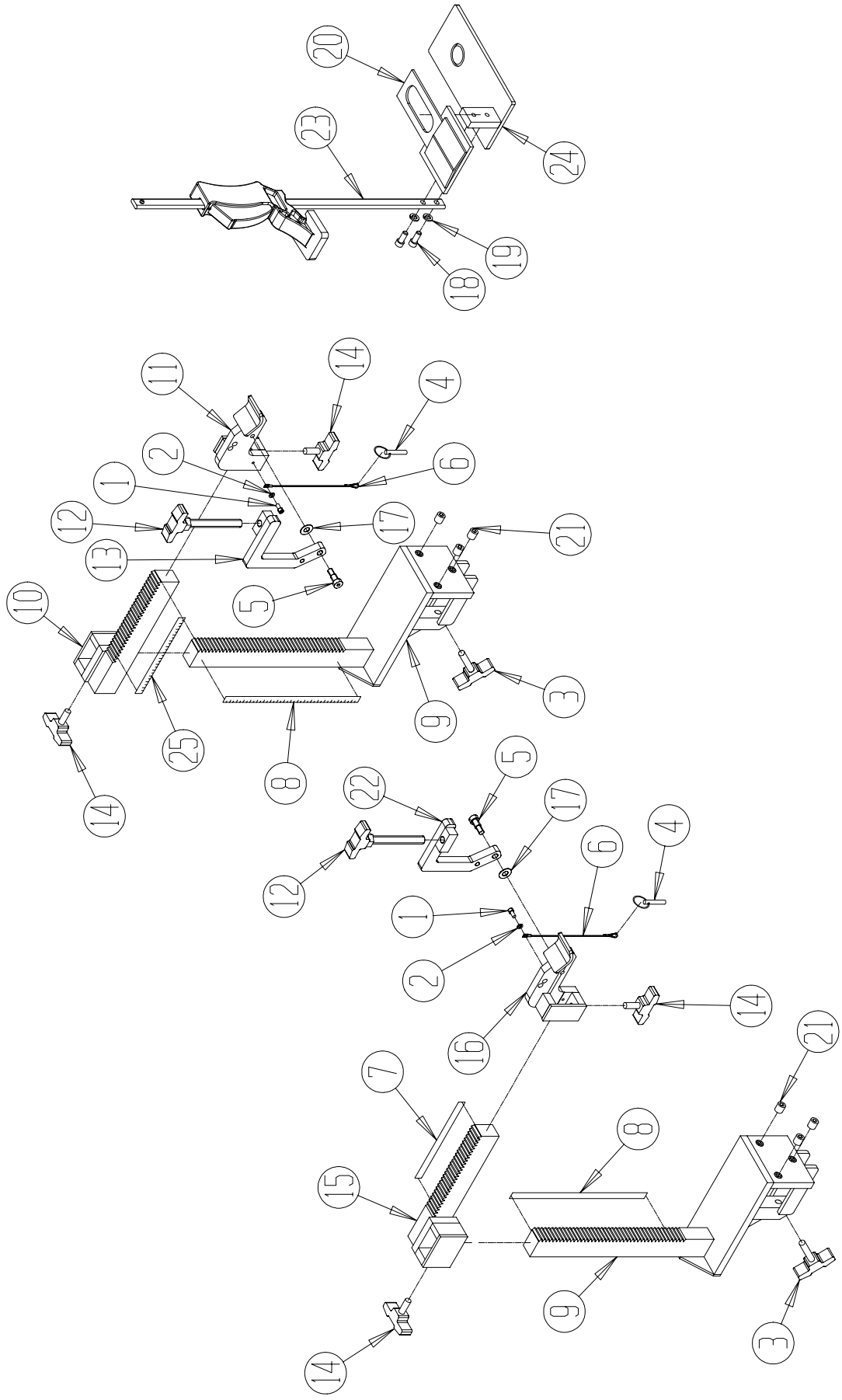
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DIAGRAM NUMBER	PART NUMBER	DESCRIPTION
1	B190614	Pan Head Machine Screw 10-24 x 3/8 Long
2	K191501	No.10 Lockwasher
3	6009577	Knob Assembly
4	3708364	Quick Release Pin .31 Dia.
5	3708158	Shoulder Bolt .375 Dia. x .50 Long
6	3708366	6" type B Lanyard
7	6509128	Horizontal Scale Decal RH
8	6329072	Vertical Scale Decal
9	6509507	Bar Mounting Weldment Bracket
10	6509517	L.H. Front Roller Horiz. Weldment Bracket
11	6329587	L. H. Roller Clamp Weldment Bracket
12	6509559	Knob Assembly
13	6509564	L.H. Front Roller Clamp Weldment
14	6509588	Knob Assembly
15	6509515	R.H. Front Roller Horiz. Welment Bracket
16	6329586	R.H. Roller Clamp Weldment Bracket
17	3709304	Thrust Washer
18	B311211	Socket Head Cap Screw 5/16-18 x 3/4 Long
19	K311501	5/16 Lockwasher
20	70512	Rear Roller Support Bracket Weldment
21	C500861	1/2-20 x 1/2 Flat Pt Socket Head Set Screw
22	6509576	R.H. Front Roller Clamp Weldment
23	3708881	Rear Clamp
24	6329514	Rear Clamp Base Weldment
25	6509304	Horizontal Scale Decal LH

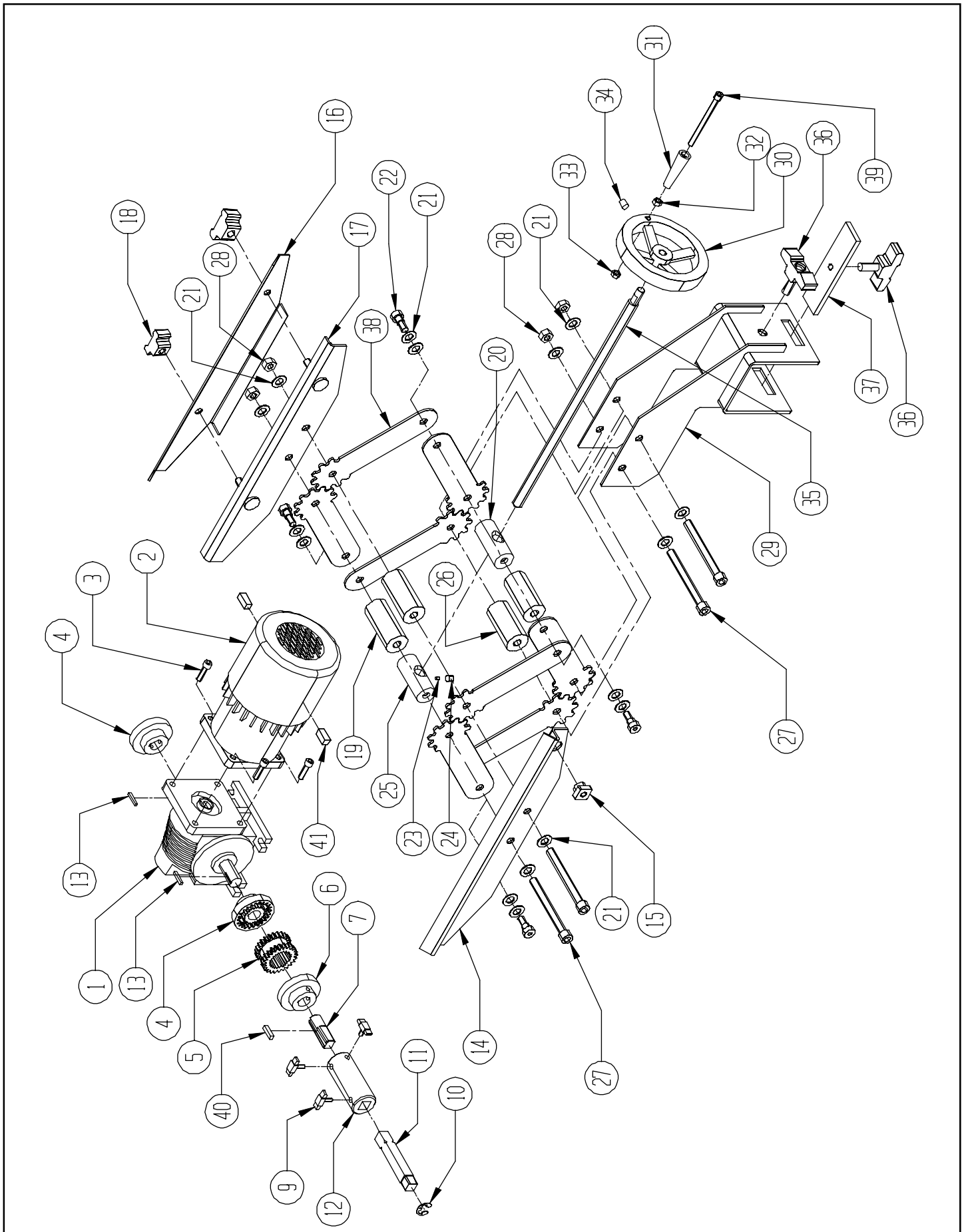
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DIAGRAM NUMBER	PART NUMBER	DESCRIPTION
1	3708391	Reducer: 10:1 Ratio
2	6329039	Motor, DC .20 HP TEFC
3	B251411	Socket Head Cap Screw 1/4-20 x 7/8 Long
4	3709586	Flange Coupler .50
5	3709585	Sleeve Coupler
6	3709584	Flange Coupler 5/8
7	6009217	Drive Coupling Adapter
9	09394	Tee Knob Assembly
10	3709073	Retaining Ring
11	6009051	Drive Adapter 1/2 Square
12	6009052	Adapter
13	R000376	Square Key 1/8 x .75 Long
14	6009078	Gearbox Slide Bracket
15	3707279	Strain Relief Wire
16	6009079	Gearbox Clamp Bracket
17	6009580	Gearbox Slide Weldment Bracket
18	3708262	T-Knob - 5/16-18
19	6009045	Linkage Spacer 2.29 Long
20	6009046	Linkage Spacer R.H. Thread
21	3709062	Belleville .75 Dia. x .35 T
22	3709809	Shoulder Bolt .375 Dia. x .375 Long
23	3709705	Nylon Ball 5/32 Dia.
24	C310420	Socket Set Screw 5/16-18 x 1/4
25	6009047	Linkage spacer L. H. Thread
26	6009048	Linkage Spacer 2.5 Long
27	B375611	Socket Head Cap Screw
28	J377100	Nylok Hex Locknut 3/8-16
29	6509519	Support Bracket Weldment
30	3708148	Handwheel 4.5 Dia.
31	3709370	Handle
32	J252000	Hex Jam Nut 1/4-20
33	J257000	1/4-20 Nylok Locknut
34	C310620	Socket Set Screw 5/16-18 x 3/8 Long
35	6009076	Double Thread Rod
36	6009555	Knob Assembly
37	6509114	Spin Drive Plate Lock
38	6009067	Geared Linkage
39	B255011	Socket Head Cap Screw 1/4-20 x 3 1/8 Long
40	R000377	Square Key 3/16 x .75 Long
41	3707623	DC Motor Brush

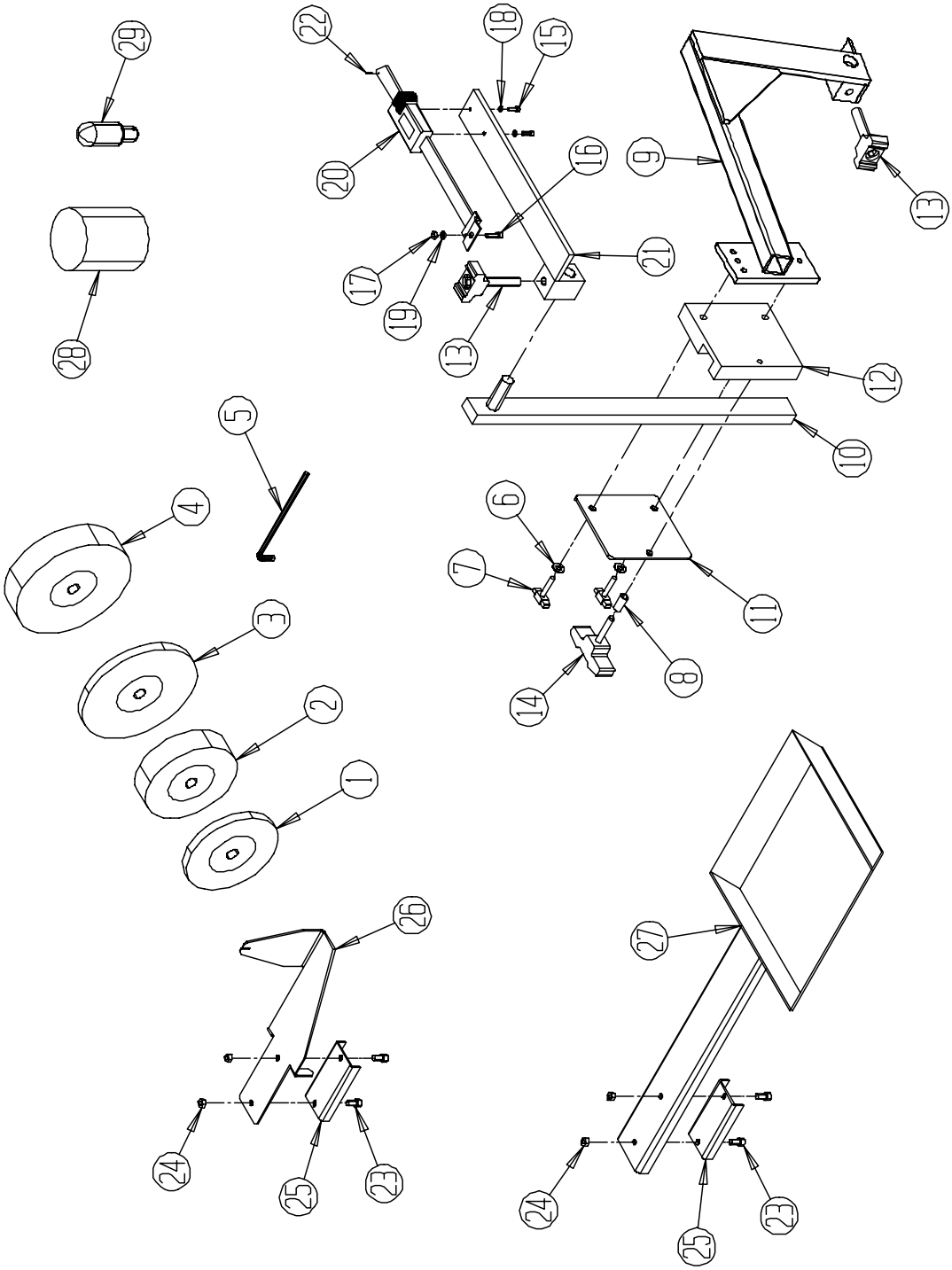
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DIAGRAM NUMBER	PART NUMBER	DESCRIPTION
1	3700088	Grinding Wheel 3.5" Dia. x .38 w
2	3700086	Grinding Wheel 3.5" Dia. x 1" Wide
3	3700087	Grinding Wheel 5" Dia. x .3/8" Side
4	3700089*	Grinding Wheel 5" Dia. x 1" Wide
5	R000863	5/16 Allen Key
6	K251501	1/4 Lockwasher
7	80396	T-Knob Assembly
8	3529069	Space
9	6329517	Alignment Extension Weldment
10	6329518	Gage Bar Weldment
11	6509349	Retaining Plate
12	6509418	Plate-Pivot
13	6509567	Knob Assembly
14	3708894	T-Knob Assembly
15	B120611	Socket Head Cap Screw 5-40 x .38 Long
16	B161011	Socket Head Cap Screw 8-32 x 5/8 Long
17	J161000	8-32 Hex Nut
18	K121501	No. 5 Split Lockwasher
19	K161501	No. 8 Lockwasher
20	6509359	Digital Gage
	3707712	Battery Cover - Digital Gage
21	6509412	Base Weldment Indicator
22	H060302	1/16 x 3/16L Roll Pin
23	B190811	Socket Head Cap Screw 10-24 x 1/2
24	J197100	10-24 Nylok Locknut
25	3708384	Magnet
26	6509474	Reel Positioner Gage
27	6509557	Drip Pan Weldment
28	3707603	Blue Lens
29	3707465	Flasher bulb

* 3700089- Grinding wheel is installed on grinding head when shipped. The other wheels are located in the carton assembly.

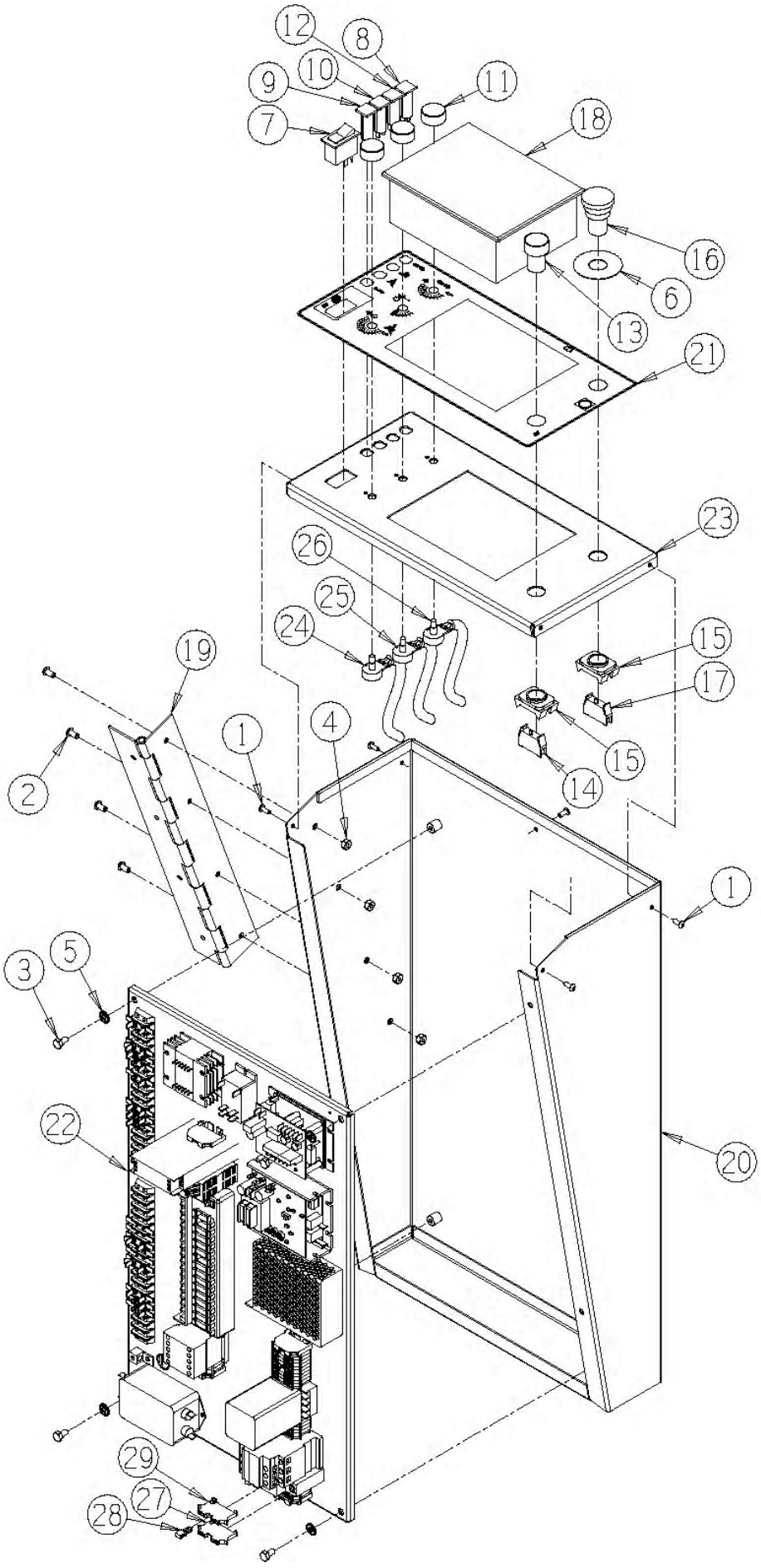
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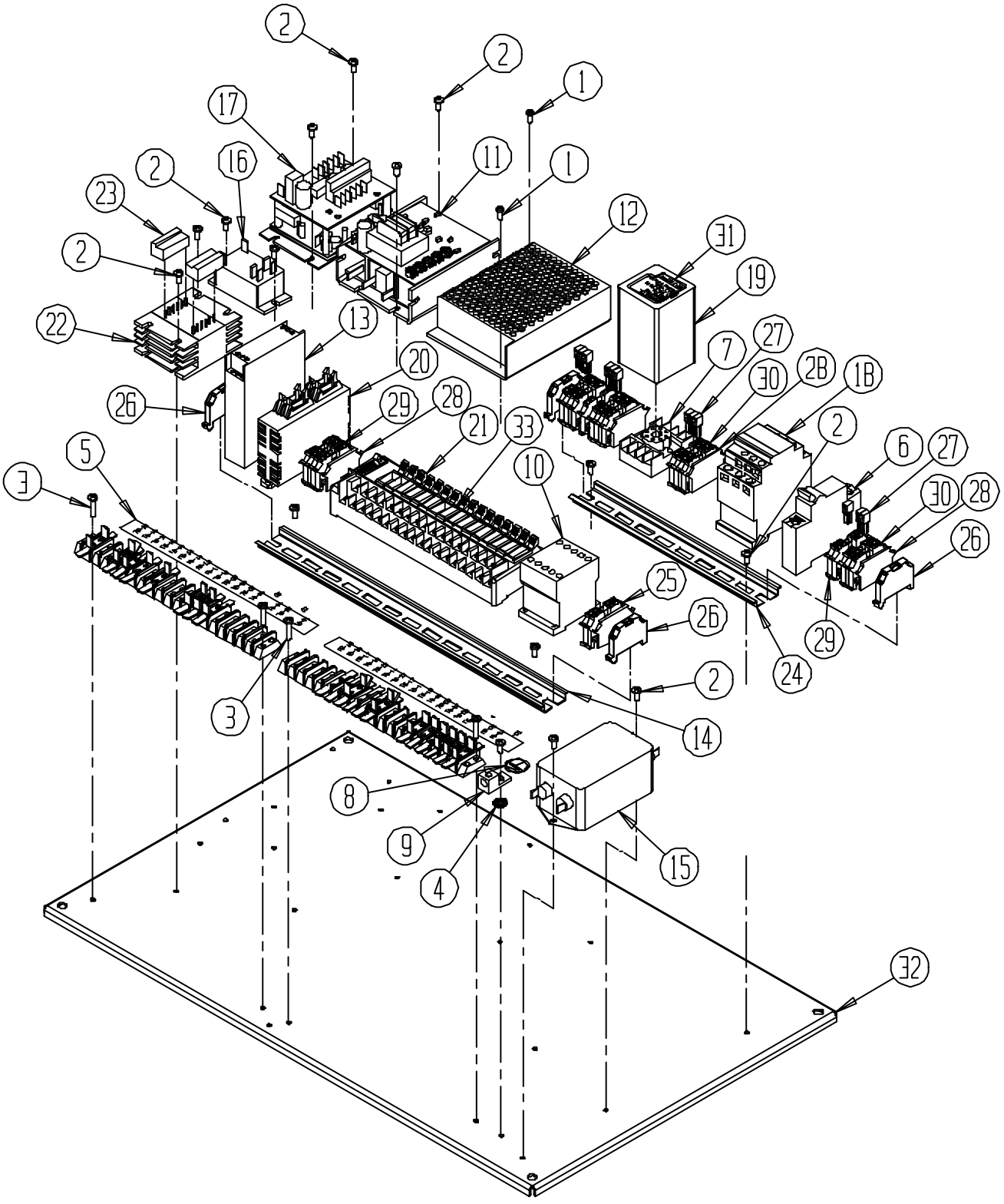
DIAGRAM NUMBER	PART NUMBER	DESCRIPTION
1	B190834	Button Head Cap Screw 10-32 x 1/2 Long
2	B250816	Button Head Cap Screw 1/4-20 x 1/2 Long
3	D250800	Thread Cutting Screw 1/4-20 x 1/2 Long
4	J257000	1/4-20 Nylon Jam Locknut
5	R000536	1/4 Lock Washer
6	3707342	Yellow Emergency Stop Ring
7	3707367	Rocker Switch DPST
8	3707399	3-Amp Circuit Breaker
9	3707442	2-Amp Circuit Breaker
10	3707443	4-Amp Circuit Breaker
11	3707446	Potentiometer Knob
12	3707547	15-Amp Circuit Breaker
13	3707564	Green Start Pushbutton
14	3707565	Normaly Open Contact Block
15	3707566	Switch Mounting Latch
16	3707567	Push/Pull Red Emergency Stop Button
17	3707568	Normaly Closed Contact Block
18	3707725	Touch Screen
19	6329070	Hinge
20	6329509	Control Box Weldment
21	6529046	Control Panel Decal
22	6529511	Electrical Panel Sub-Assembly
23	6529545	Control Panel Top Weldment
24	6509446	Potentiometer Assembly - Spin Speed
25	6509447	Potentiometer Assembly - Relief Torque
26	6059445	Potentiometer Assembly - Traverse Speed
27	3707624	2 Conductor Terminal Block - Ground
28	3707626	Terminal Block Jumper
29	3707628	2 Conductor Terminal Block - Grey

Cords Not Shown

	6329078	Main Power Cord
	6529036	Light Receptacle
	6529037	Dust Collector Receptacle
	6529039	Flasher Cord
	6329124	Rear Sliding Door Safety Swich Cord
	3707224	Cable Tie Mount
	3707225	Cable Tie 6.5 Long x .18 Wide
	3707255	Cable Tie 4.0 Long x .10 Wide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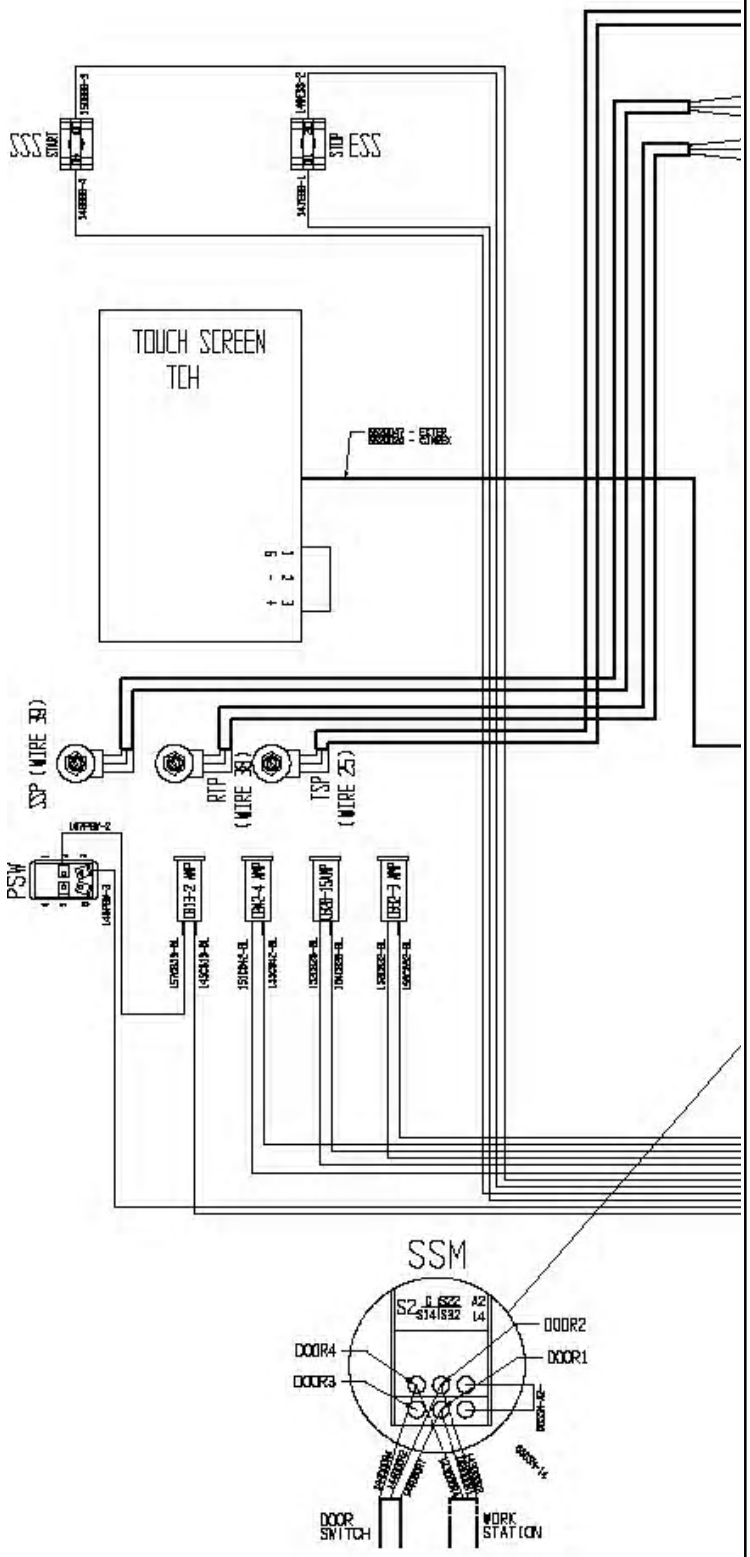
6529511 CONTROL PANEL SUB-ASSEMBLY

DIAGRAM NUMBER	PART NUMBER	DESCRIPTION
1	D130608	Pan Head Self-Tapping Screw #6 x 3/8 Long
2	D160666	Pan Head Self-Tapping Screw #8 x 3/8 Long
3	D161266	Pan Head Self-Tapping Screw #8 x 3/4 Long
4	R000480	#8 Lockwasher
5	55223	Terminal Strip Decal
6	80259	20-Amp Main Circuit Breaker
7	3707073	8-Pin socket
8	3707163	Primary Ground Decal
9	3707164	Primary Ground Lug
10	3707186	24VDC Contactor
11	3707321	Traverse Control Board
12	3707322	Power Supply 40 Watt - 24VDC
13	3707328	Door Safety Switch Monitor
14	3707378	14" Din Rail
15	3707654	Power Line Filter
16	3707447	Relay - DPDT 120VAC Coil
17	3707524	Spin/Relief Control Board
18	3707556	Magnetic Starter
19	3707688	High/Low Voltage Sensor Relay
20	3707569	Aromat PLC
21	3707571	Output Block with Relays
22	3707577	Stepper Drive - 2-Amp
23	3707593	6Pin Terminal Strip (for Stepper Drive)
24	3707606	9" Din Rail
25	3707624	2-Conductor Terminal Block - Ground
26	3707625	Screwless Terminal Bock End Stop
27	3707626	Terminal Block Jumper
28	3707627	Terminal Block End Plate
29	3707628	2-Conductor Terminal Block - Grey
30	3707629	2-Conductor Terminal Block - Blue
31	3708920	Low Voltage Warning Decal
32	6529031	Electrical Sub Panel
33	3707574	5-Amp Relay Block
	3707631	Terminal Block Marker - 1-10
	3707632	Terminal Block Marker - 11-20
	3707656	Ground Wire Assembly W99
	6509449	PLC to Output Block Cable
	6529047	PLC to Touchscreen Cable
	6529030	PLC to Inputs Cable

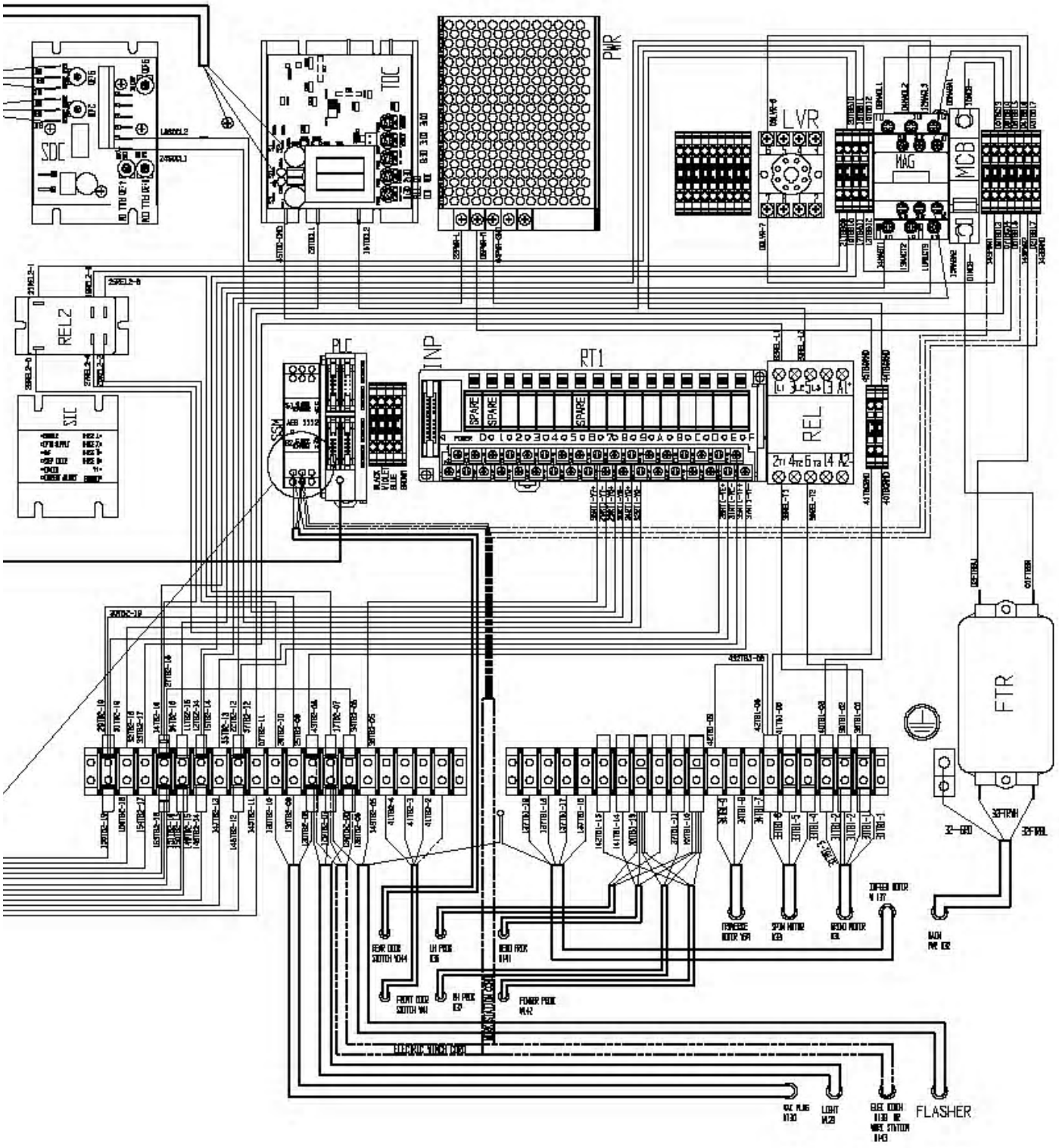
CB42- 4-AMP CIRCUIT BREAKER (SPIN)
CB28- 15-AMP CIRCUIT BREAKER (GRIND)
CB13- 2-AMP CIRCUIT BREAKER (DC POWER)
CB32- 3-AMP CIRCUIT BREAKER (TRAVERSE)
ESS - EMERGENCY STOP SWITCH
FTR - FILTER
INP- INPUT TERMINAL BLOCK
LVR- LOW VOLTAGE RELAY
MAG - MAGNETIC STARTER
MCB - MAIN CIRCUIT BREAKER 20 AMP
PLC- PROGRAMABLE LOGIC CONTROLLER
PSW- POWER SWITCH - CONTROL BOX
PWR- DC POWER SUPPLY
REL - GRIND MOTOR RELAY
REL2 - VACUUM RELAY
RT1- RELAY TERMINAL BLOCK 1
RTP - RELIEF TORQUE POT
SDC - SPIN DRIVE CONTROL
SIC - STEPPER INFEED CONTROL
SSM - SAFETY SWITCH MONITOR
SSP - SPIN SPEED POT
SSS - SYSTEM START SWITCH
TB1- TERMINAL BLOCK 1
TB2- TERMINAL BLOCK 2
TBB - TERMINAL BLOCK BLUE
TBG - TERMINAL BLOCK GREY
TCH - TOUCH SCREEN
TDC - TRAVERSE DRIVE CONTROL
TSP - TRAVERSE SPEED POT



⊕ - GROUND SCREW

- WIRE CONNECTION

- TERM. TO TERM. CONNECTION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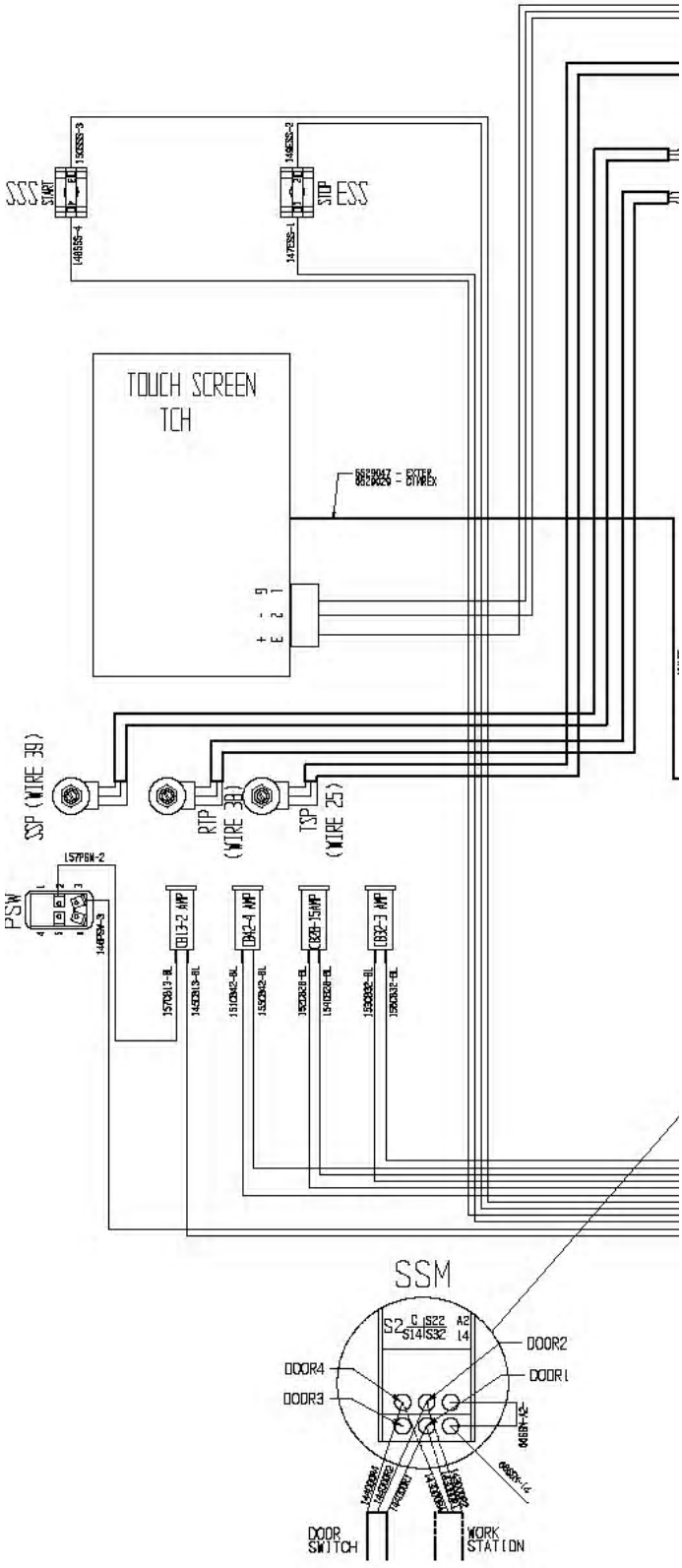
FLASHER

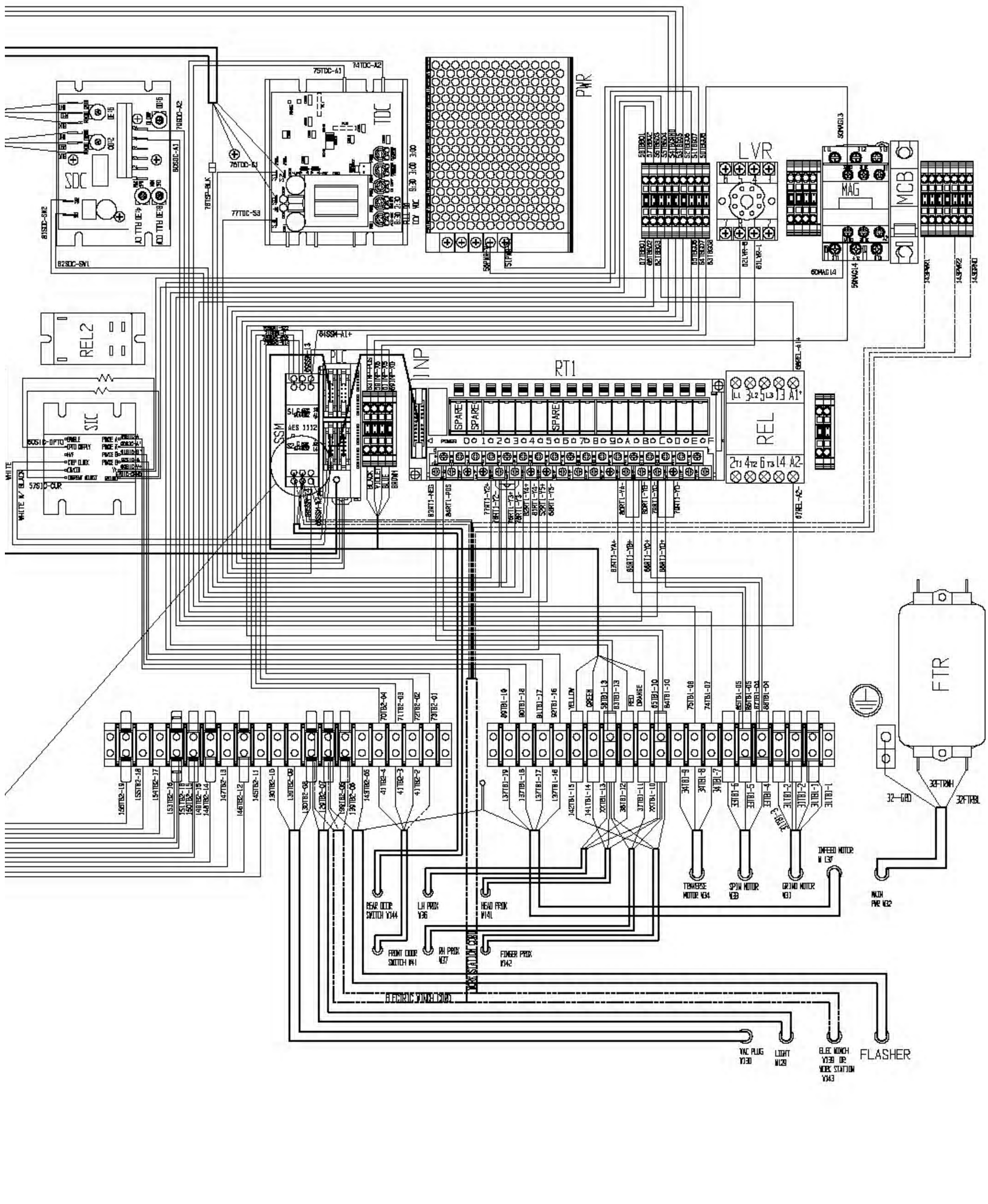
CB42- 4-AMP CIRCUIT BREAKER (SPIN)
CB28- 15-AMP CIRCUIT BREAKER (GRIND)
CB13- 2-AMP CIRCUIT BREAKER (DC POWER)
CB32- 3-AMP CIRCUIT BREAKER (TRAVERSE)
ESS - EMERGENCY STOP SWITCH
FTR - FILTER
INP- INPUT TERMINAL BLOCK
LVR- LOW VOLTAGE RELAY
MAG - MAGNETIC STARTER
MCB - MAIN CIRCUIT BREAKER 20 AMP
PLC- PROGRAMABLE LOGIC CONTROLLER
PSW- POWER SWITCH - CONTROL BOX
PWR- DC POWER SUPPLY
REL - GRIND MOTOR RELAY
REL2 - VACUUM RELAY
RT1- RELAY TERMINAL BLOCK 1
RTP - RELIEF TORQUE POT
SDC - SPIN DRIVE CONTROL
SIC - STEPPER INFEED CONTROL
SSM - SAFETY SWITCH MONITOR
SSP - SPIN SPEED POT
SSS - SYSTEM START SWITCH
TB1- TERMINAL BLOCK 1
TB2- TERMINAL BLOCK 2
TBB - TERMINAL BLOCK BLUE
TBG - TERMINAL BLOCK GREY
TCH - TOUCH SCREEN
TDC - TRAVERSE DRIVE CONTROL
TSP - TRAVERSE SPEED POT



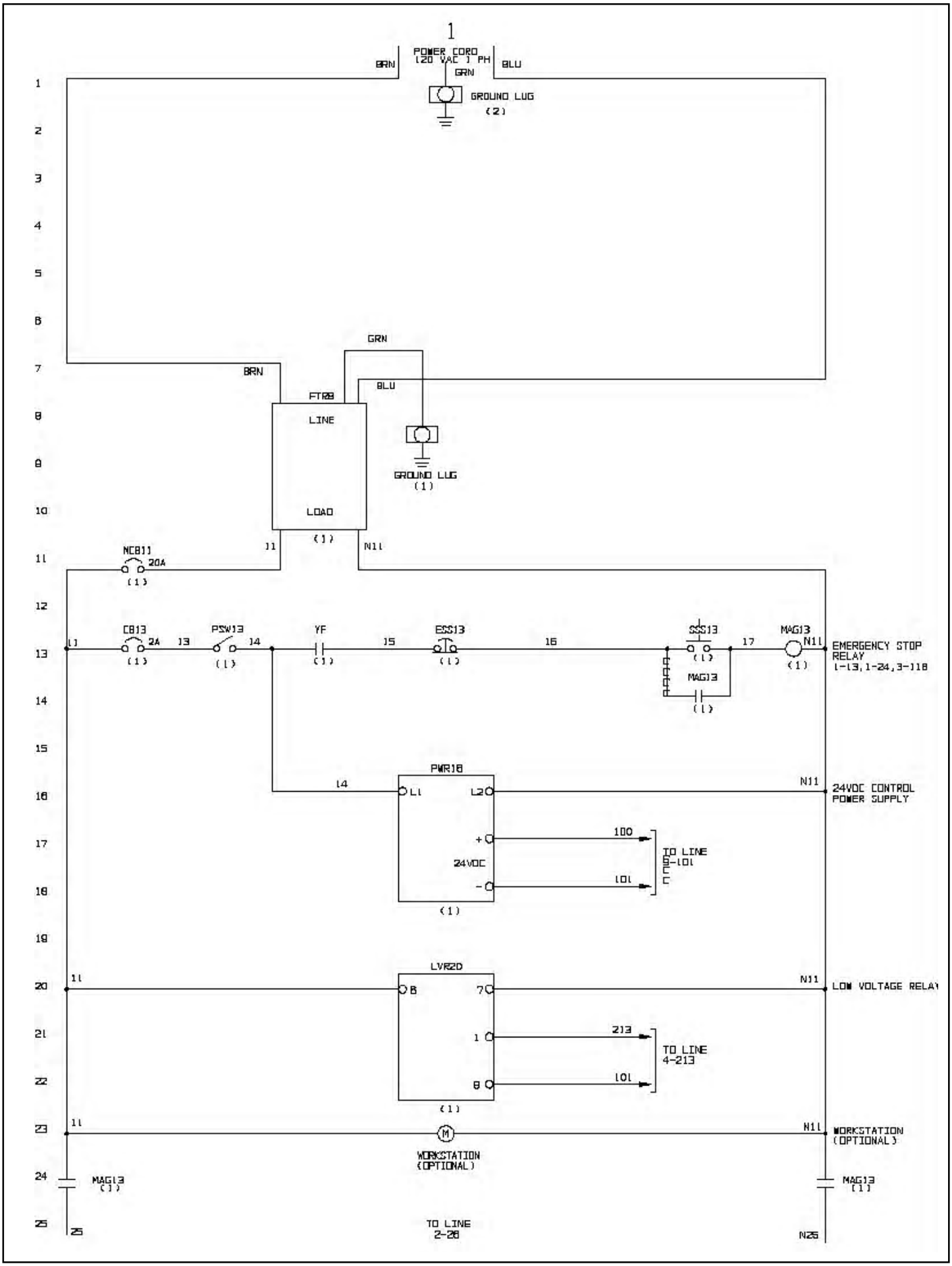
⊕ - GROUND SCREW

- WIRE CONNECTION

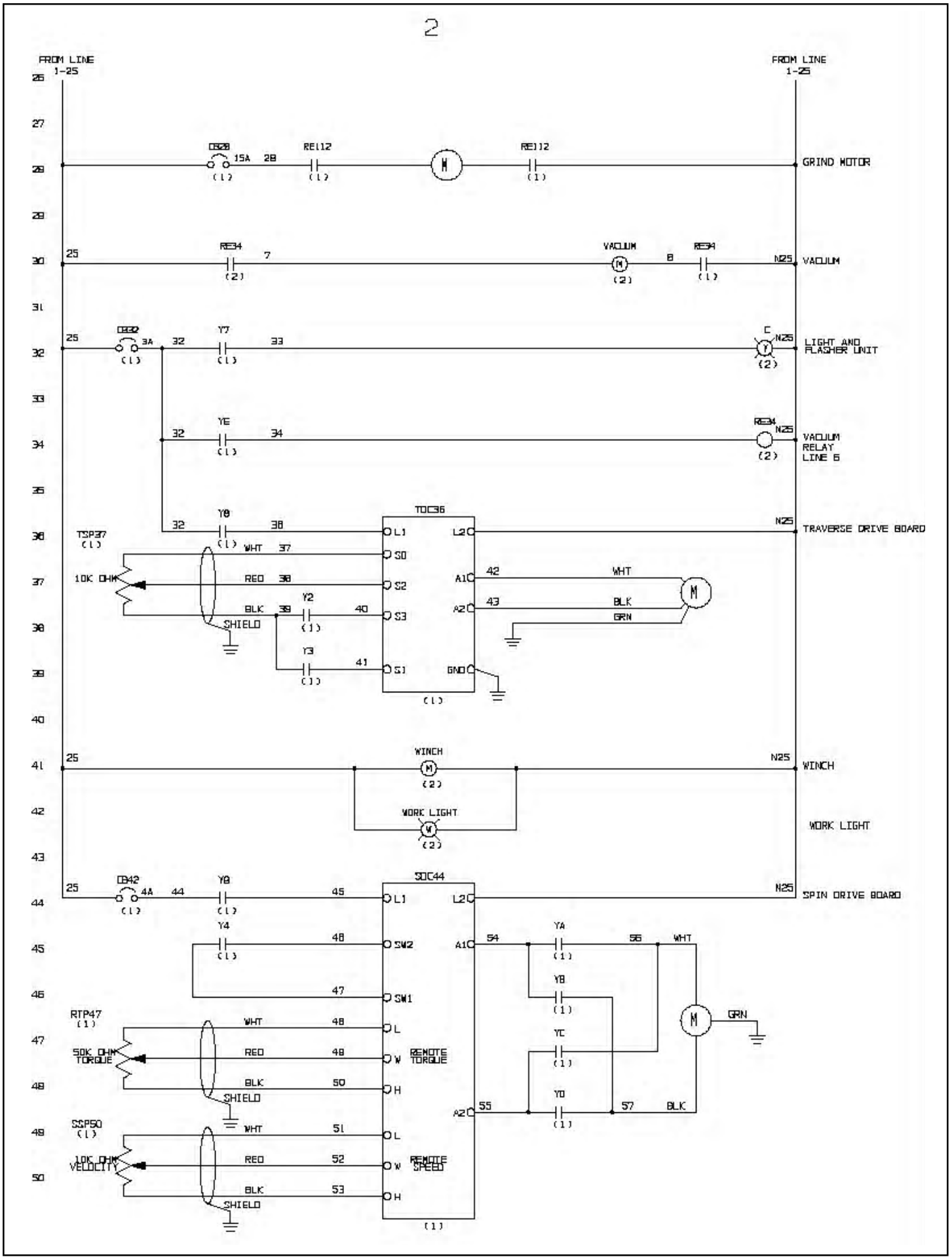
- TERM. TO TERM. CONNECTION


PWR
TDC
SDC
LVR
MAG
MCB
REL2
RT1
INP
SSM
STC
REL
FTR
FLASHER
WHITE
WHITE W/ BLACK
SPARE
YELLOW
GREEN
RED
ORANGE
BLACK
VIOLET
BLUE
BROWN

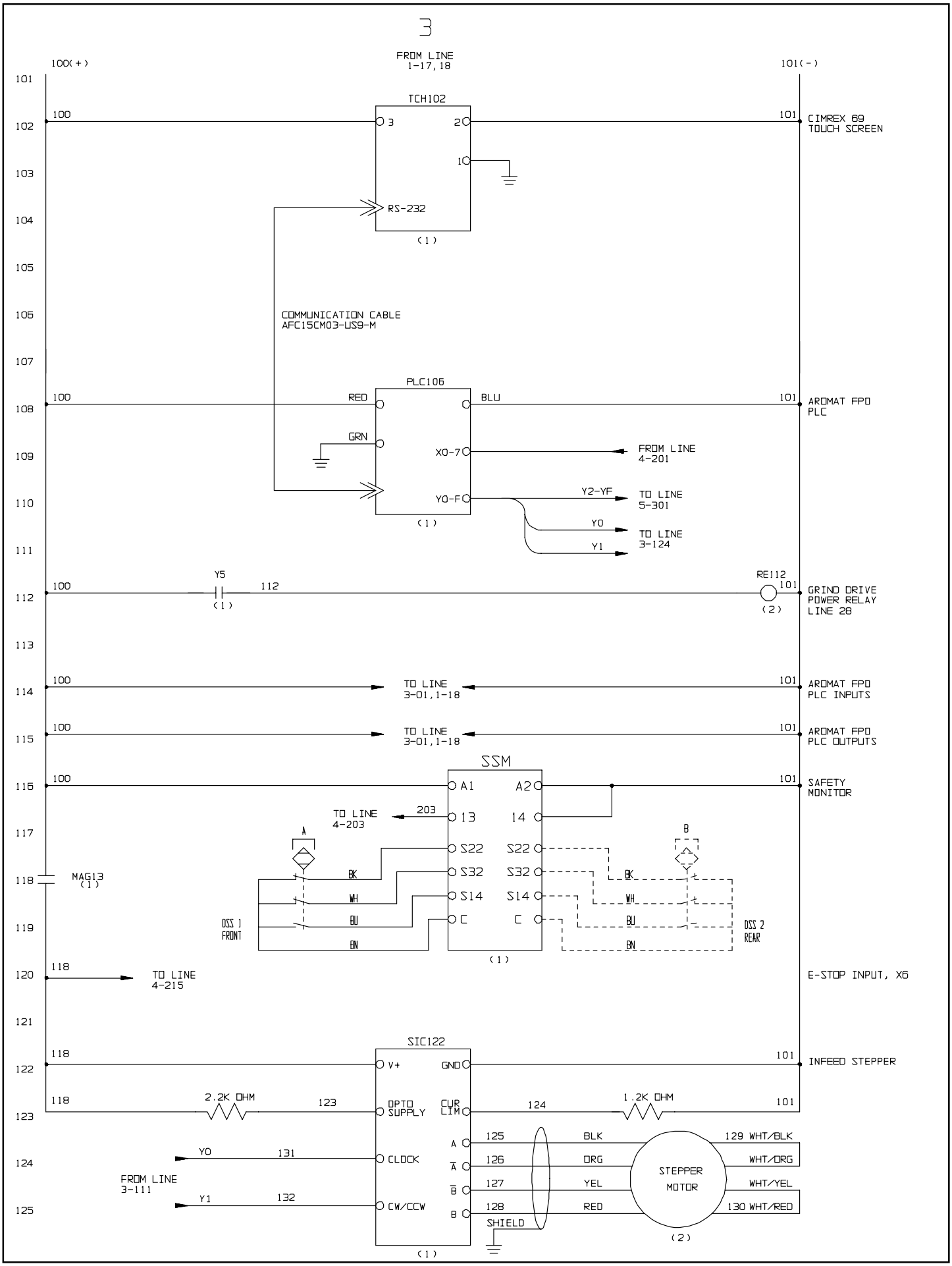
WIRING SCHEMATIC



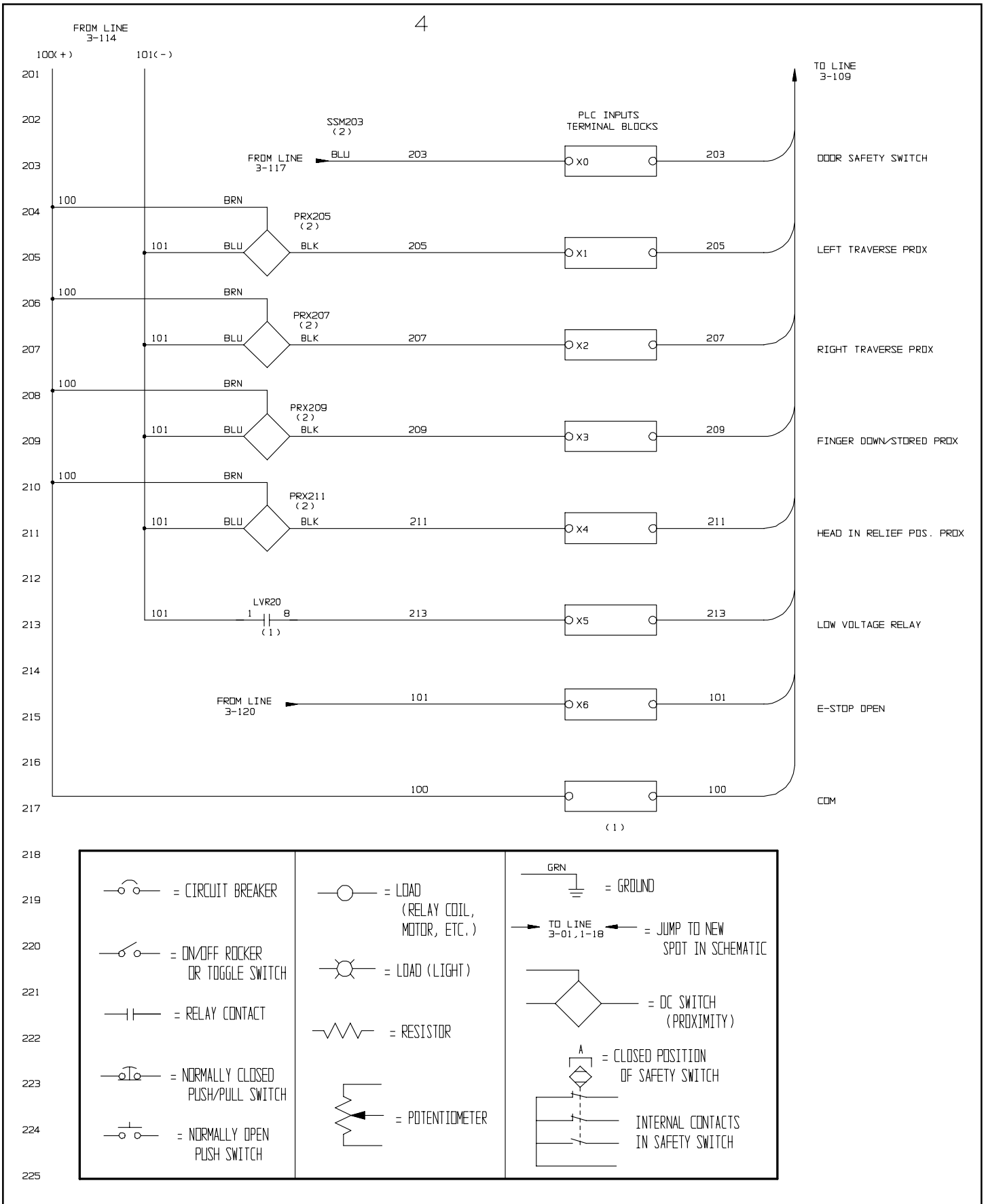
WIRING SCHEMATIC



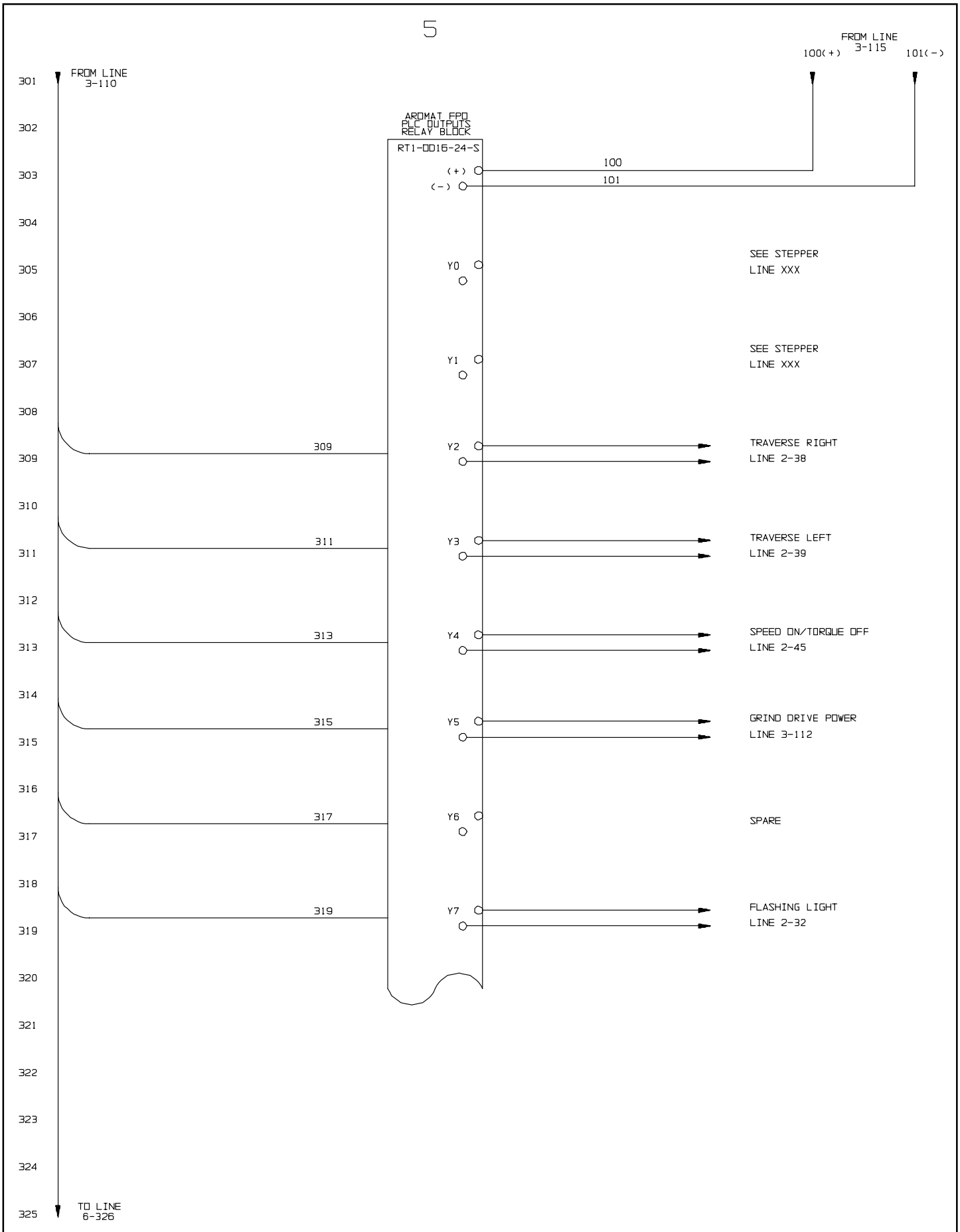
WIRING SCHEMATIC



WIRING SCHEMATIC



WIRING SCHEMATIC



WIRING SCHEMATIC