ACCU-Master 652
AUTO - INDEX
SPIN / RELIEF
REEL MOWER GRINDER
with *ACCU*-Touch

- ORIGINAL INSTRUCTIONS-

Patent No. 6,010,394
6,290,581 & 6,685,544

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.

SAFETY INSTRUCTIONS

- ORIGINAL 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 - ORIGINAL 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 <u>ONLY</u>. 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 high-low voltage relay which is factory preset at 100-140 VAC. If the power supply line does not deliver 100-140 VAC power under load, the relay will open and trip out the starter. If this occurs, your power supply line is incorrect and must be correct before proceeding further with the grinder.

CONTENTS

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	GRADE8  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 around control panel. Remove the metal clips that secure the grinder to the wood 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 1500 - 2000 LBS. [680-907 kg] TO LIFT, USE POWER EQUIPMENT.

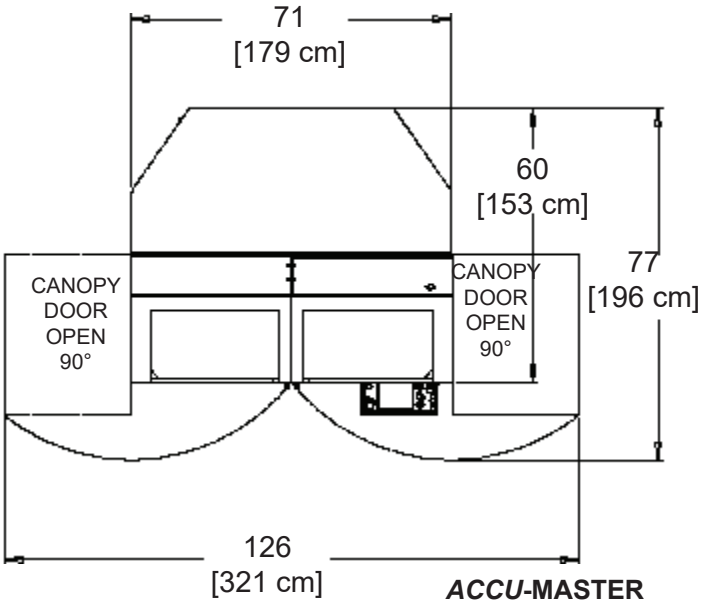
Remove shipping straps from traverse carriage. Remove window protective sheets.

If the machine is equiped with one, the winch boom is held in place during shipping with a steel brace. Remove and discard this brace. Remove the shrink wrap and cable tie that holds the winch trolley to the beam.

POSITION BASE

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.

The *652 ACCU*-Master with a boom will require an operating area of about 150" W x 108" D x 87" H [381 x 274 x 221 cm]. The machine will be operated and the reel mower assembly will be lifted from the front of the machine. The *652 ACCU*-Master with rear doors will require an operating area of about 150" W x 150" D x 87" H [381 x 381 x 221 cm]. The reel mower assembly will be lifted from the rear of the machine if a workstation is used. The machine operator will operate this unit from the front of the machine. Position the base to allow sufficient operating room in front and behind of the machine. See FIG. 1.



***ACCU*-MASTER with WINCH and BOOM**

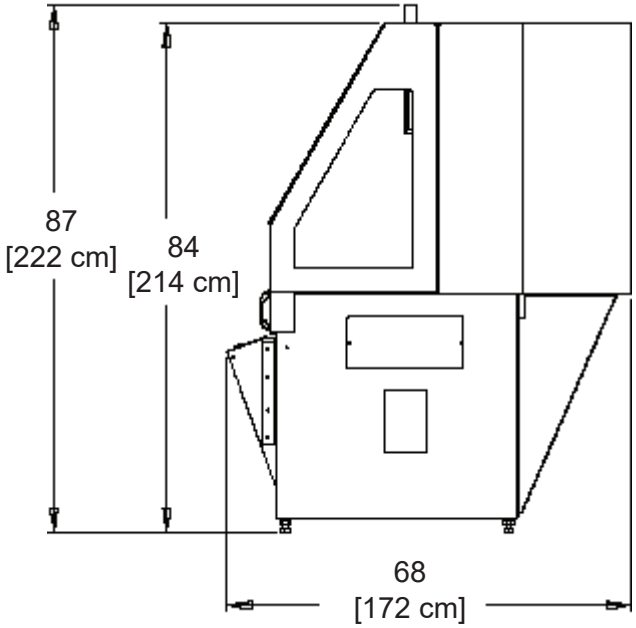
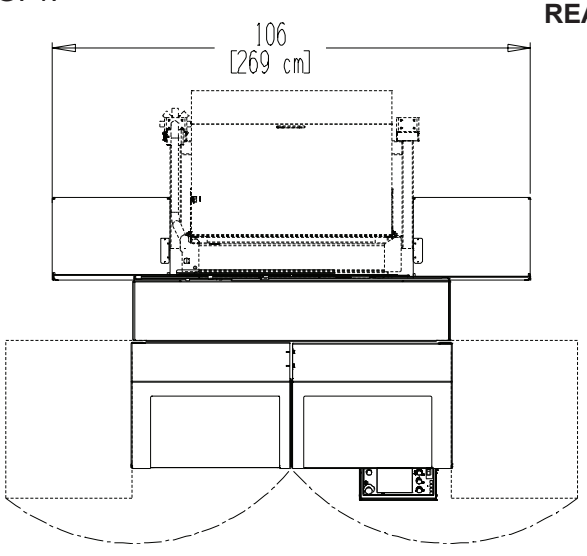
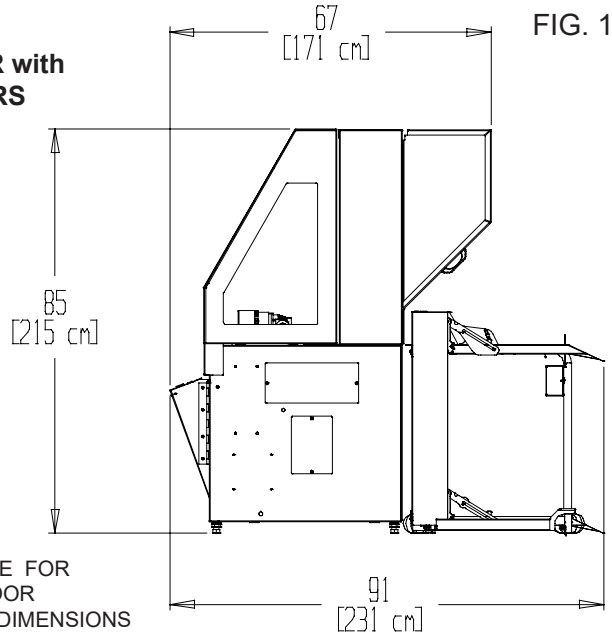


FIG. 1

***ACCU*-MASTER with REAR DOORS**



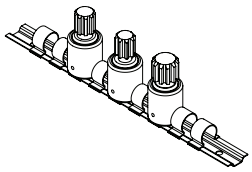


SEE ABOVE FOR FRONT DOOR OPENING DIMENSIONS

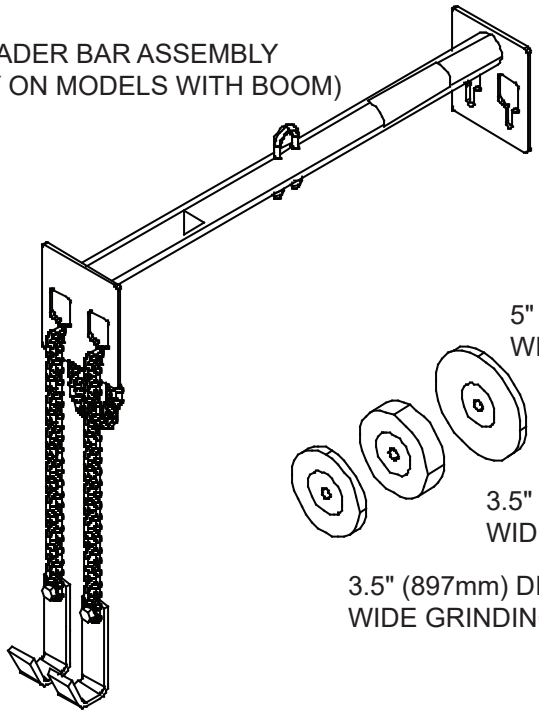
ASSEMBLY INSTRUCTIONS (Continued)

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

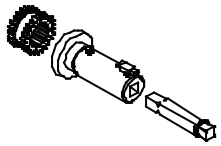
REEL ADAPTERS

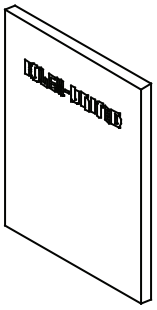


SPREADER BAR ASSEMBLY
(ONLY ON MODELS WITH BOOM)



SPIN DRIVE ADAPTER

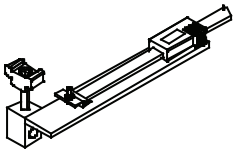




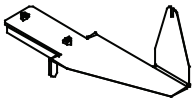
5" (127mm) DIA. X 3/8" (10mm)
WIDE GRINDING WHEEL

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

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



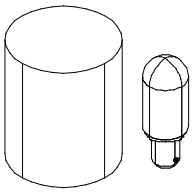
ALIGNMENT GAGE

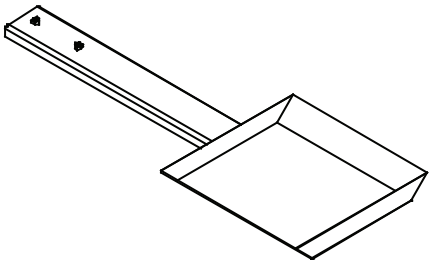


REEL POSITION GAGE

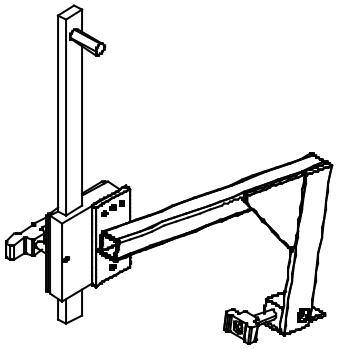
ALLEN WRENCH

FLASHER BULB
& LENS





DRIP PAN



HORIZONTAL EXTENSION
(ALIGNMENT GAGE)

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. If the machine has rear doors make adjustments to match machine table height to that of thet of the workstation or rear lift table.

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.

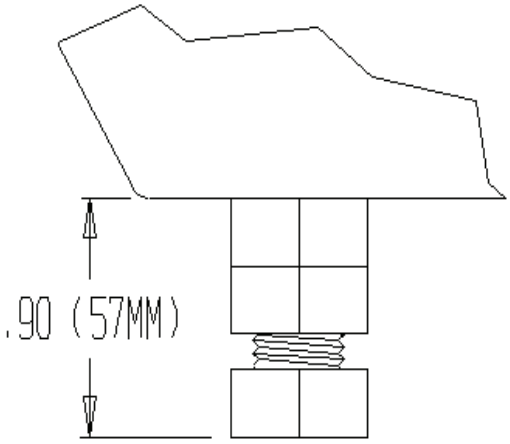


FIG. 3

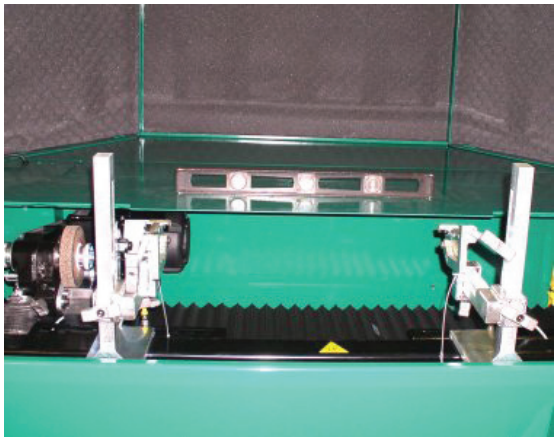


FIG. 4

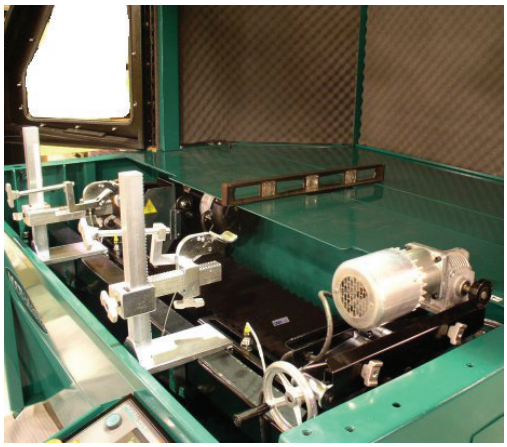


FIG. 5

INSTALL THE FLASHER LIGHT

Locate flasher bulb and lense in carton. Install bulb and lense to the flasher assembly socket. This is located ontop of the front right frame member on the 632 ACCU-Pro and on the top of the right canopy door for the 652 ACCU-Master. See Fig. 6.

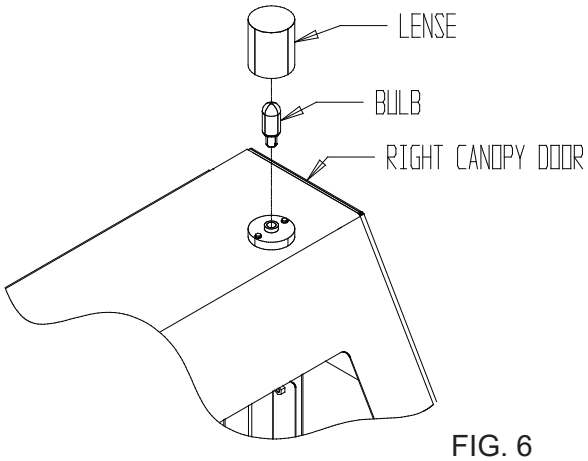


FIG. 6

APPLY POWER

BEFOREYOUAPPLYPOWERTOTHEGRINDER, REFER TO THE "IMPORTANT GROUNDING INSTRUCTIONS" ON PAGE 10.

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

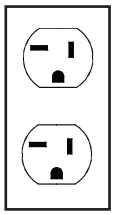


FIG. 7

220 Volt Model Only. For 220 Volt Applications order Part No. 6320916 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.

DO NOT OPERATE THIS GRINDER ON A GROUND FAULT INTERUPTER (GFI) CIRCUIT. THE (GFI) WILL TRIP CONSTANTLY.

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

When installing the grinder, the following guidelines should be used to establish the wire size between the power panel in your building and the grinder receptacle. Note that the wiring in your building must be per code between main power panels and sub panels.

FOR 20 AMP RATED LARGE MACHINES

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 2.5mm Wire.
For 12 to 130 Meters from panel to receptacle = Use 4.0mm Wire.

The grinder is equipped with a high-low voltage relay which is factory preset at 100-140 VAC. If the power supply line does not deliver 100-140 VAC power under load, the relay will open and trip out the starter. If this occurs, your power supply line is incorrect and must be corrected before proceeding further with the grinder.

ASSEMBLY INSTRUCTIONS (Continued)

For 220 V 50 or 60Hz applications Product No. 6520916 should be ordered.

This 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.

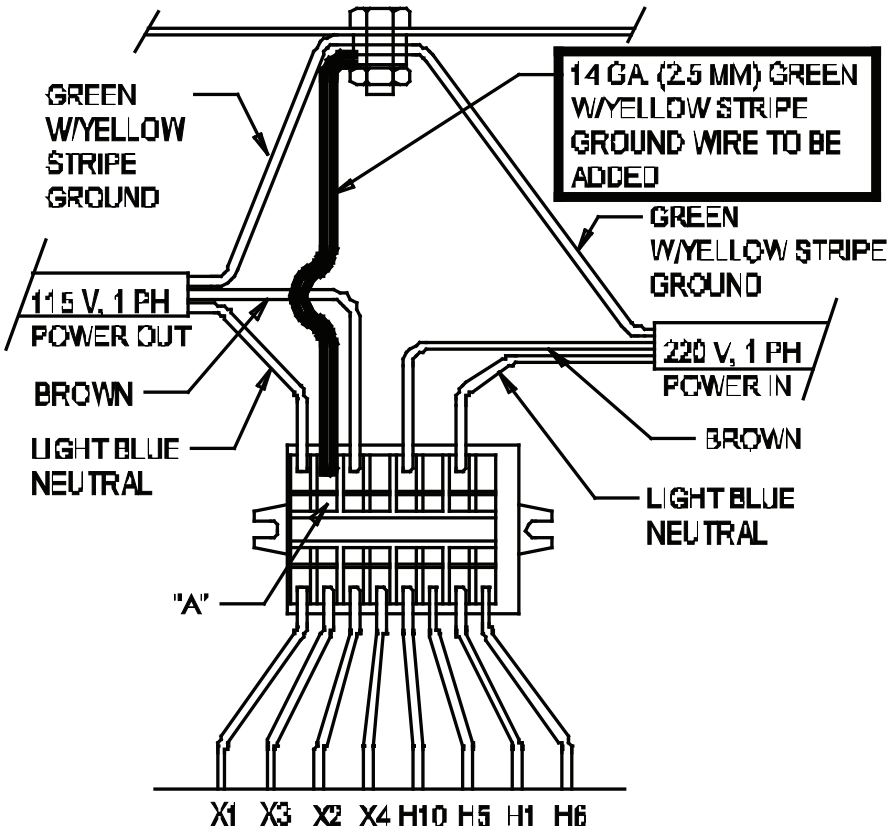


FIG. 8

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.

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.

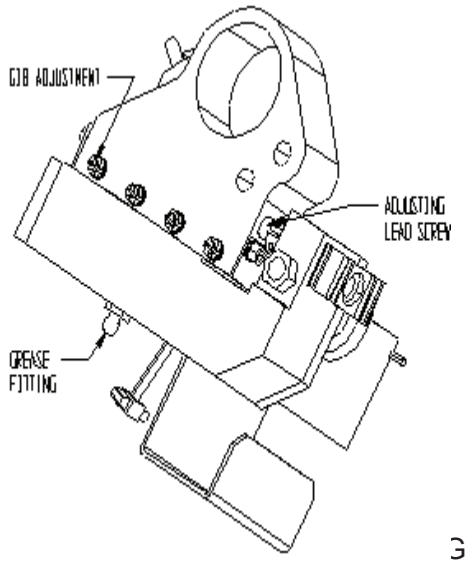


FIG. 9

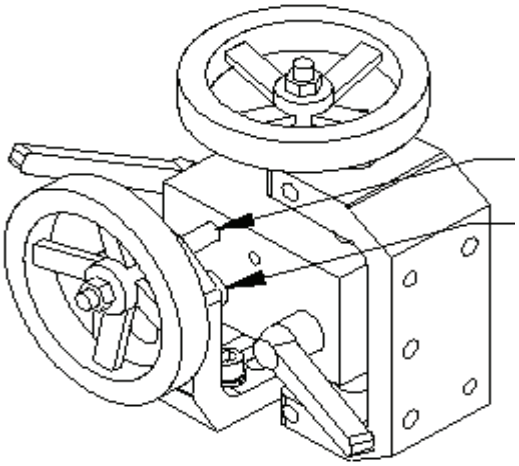


FIG. 10

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 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.

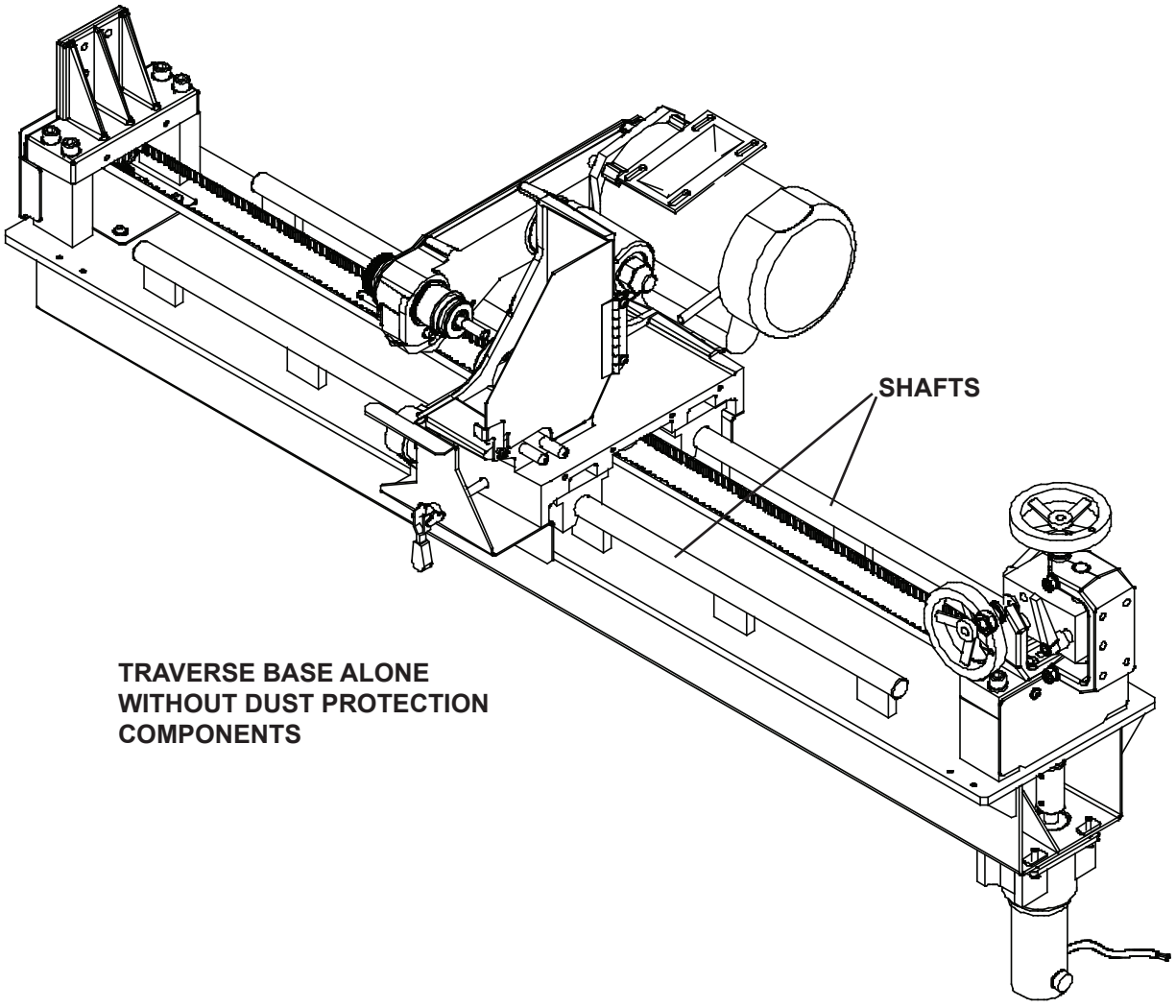


FIG. 11

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.

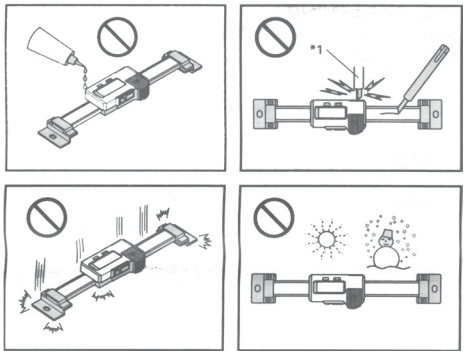
Graffiti Removal
- Butyl cellosolve, (for removal of paints, marking pen inks, lipstick, etc.)
- The use of masking tape, adhesive tape or lint removal tools works well for lifting off old weathered paints.
- To remove labels, stickers, etc., the use of kerosene, VM&P naphtha or petroleum spirits is 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

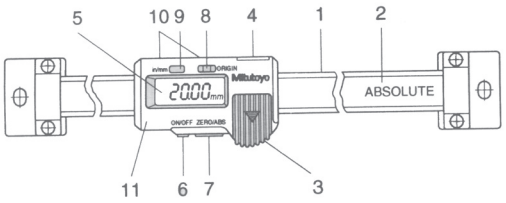
Important

- 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

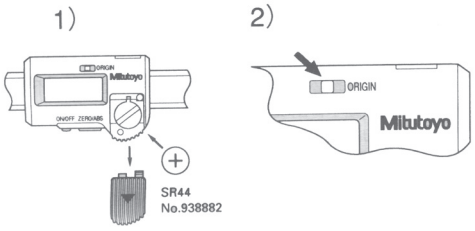


Battery Installation and Origin Setting

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.

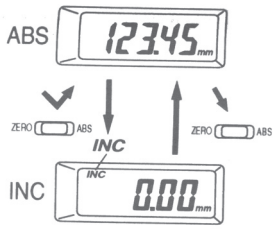
1) To install the battery, remove the compartment lid and istall the SR44 battery with its positive side facing up. After the battery is installed, set the origin.

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.



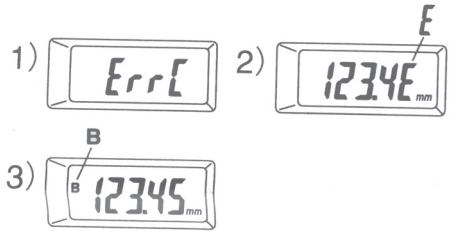
Incremental (INC) & Absolute (ABS) mode

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.



Cleaning

Clean gage with CRC 3-36 Cleaning and Lubrication Oil. Wipe off excess after cleaning. If CRC 3-36 is not available, use
Denatured Alcohol to clean, then apply light oil and wipe off excess.

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.

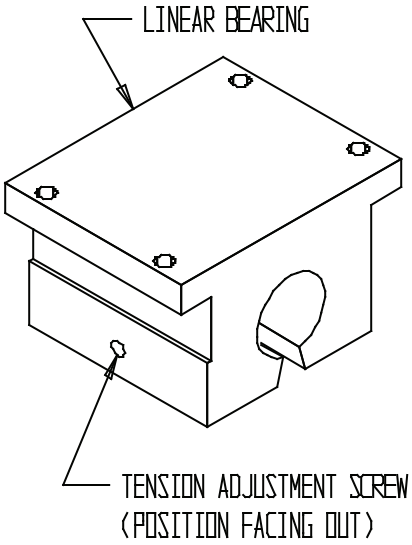


FIG. 14

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

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.

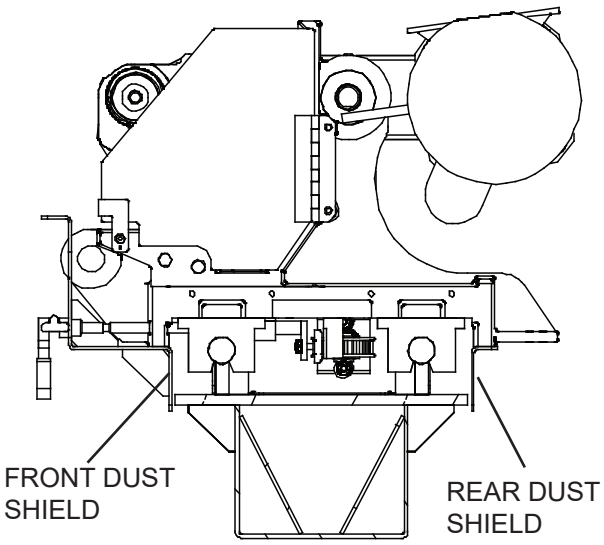


FIG. 15

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.

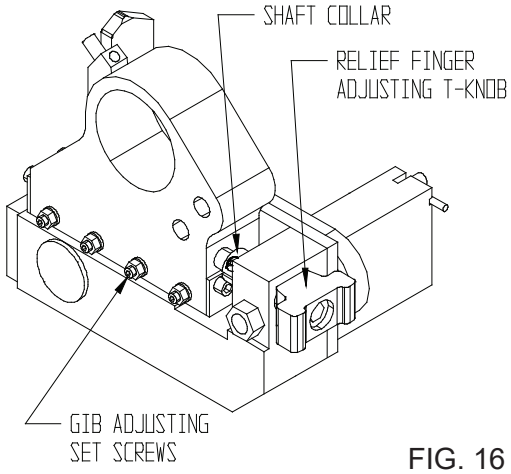


FIG. 16

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.

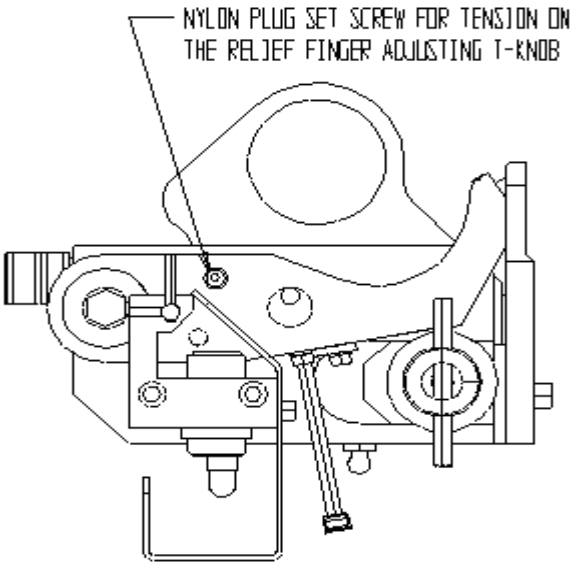


FIG. 17

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.

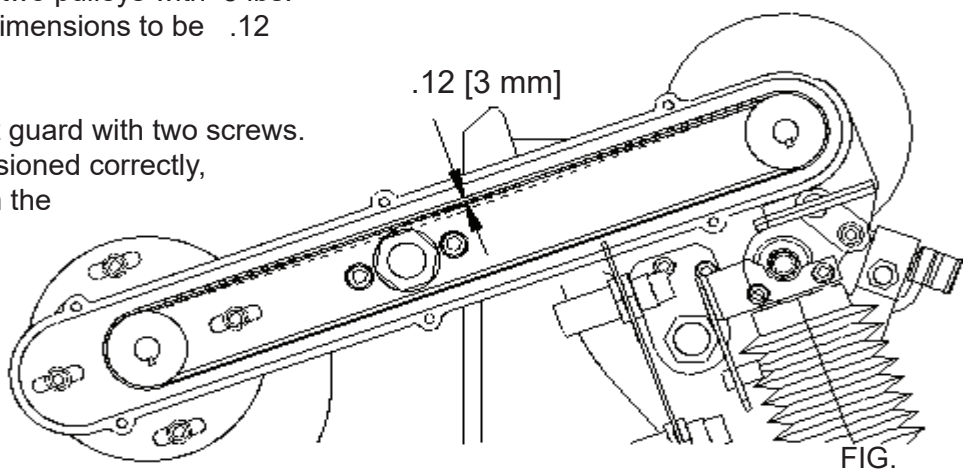


FIG. 18

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.

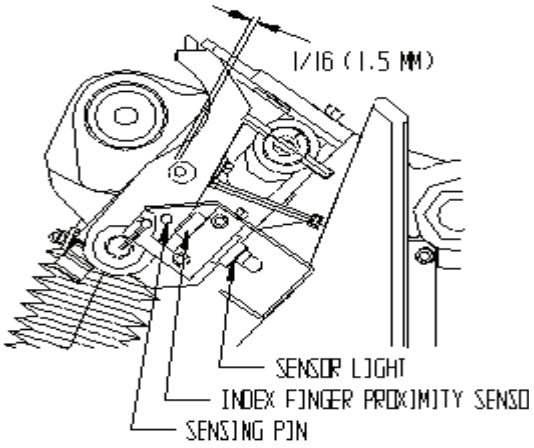


FIG. 19

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.

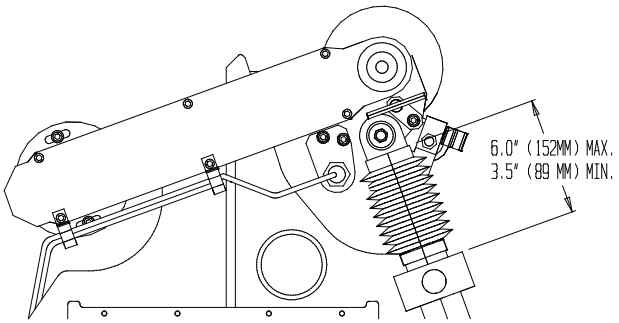


FIG. 20

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.

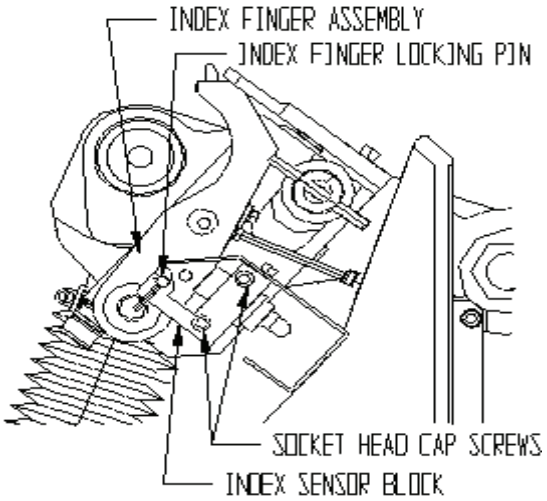


FIG. 21

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.

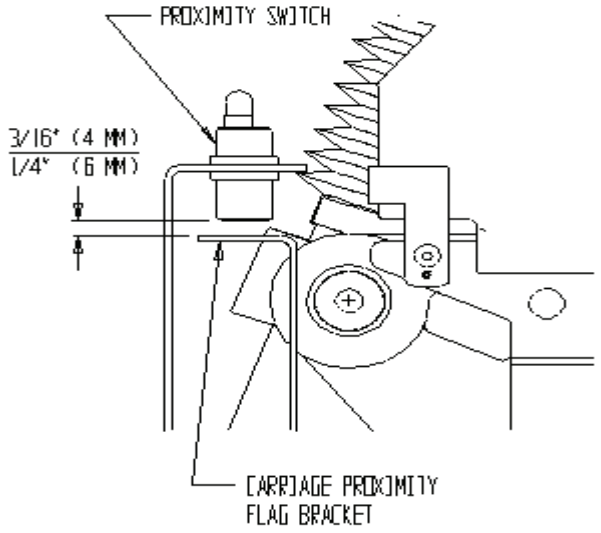


FIG. 22

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.

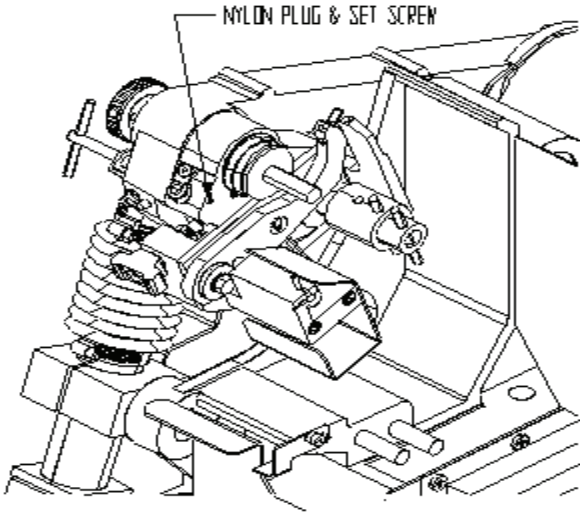


FIG. 23

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).

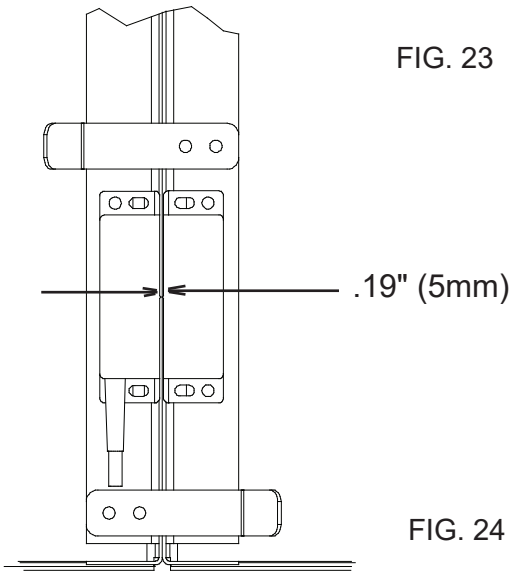


FIG. 24

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.

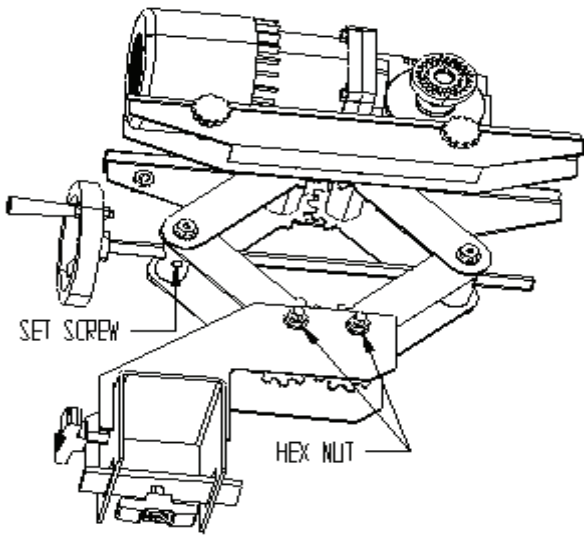


FIG. 24

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.

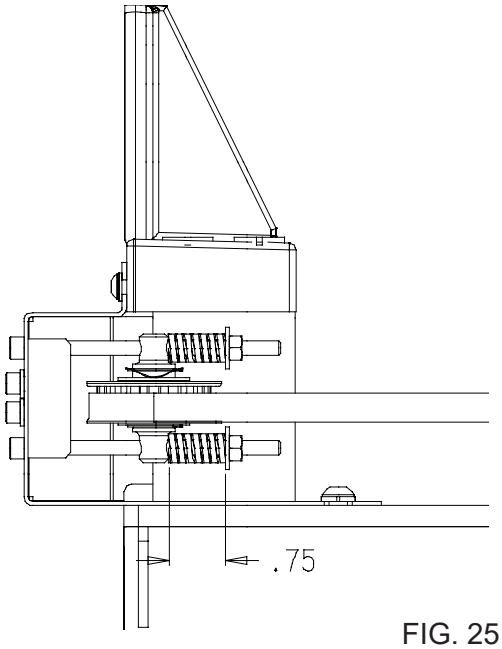


FIG. 25

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.

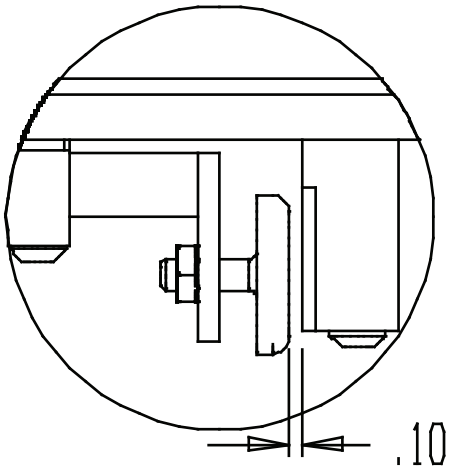


FIG. 26

ADJUSTMENTS (Continued)

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.

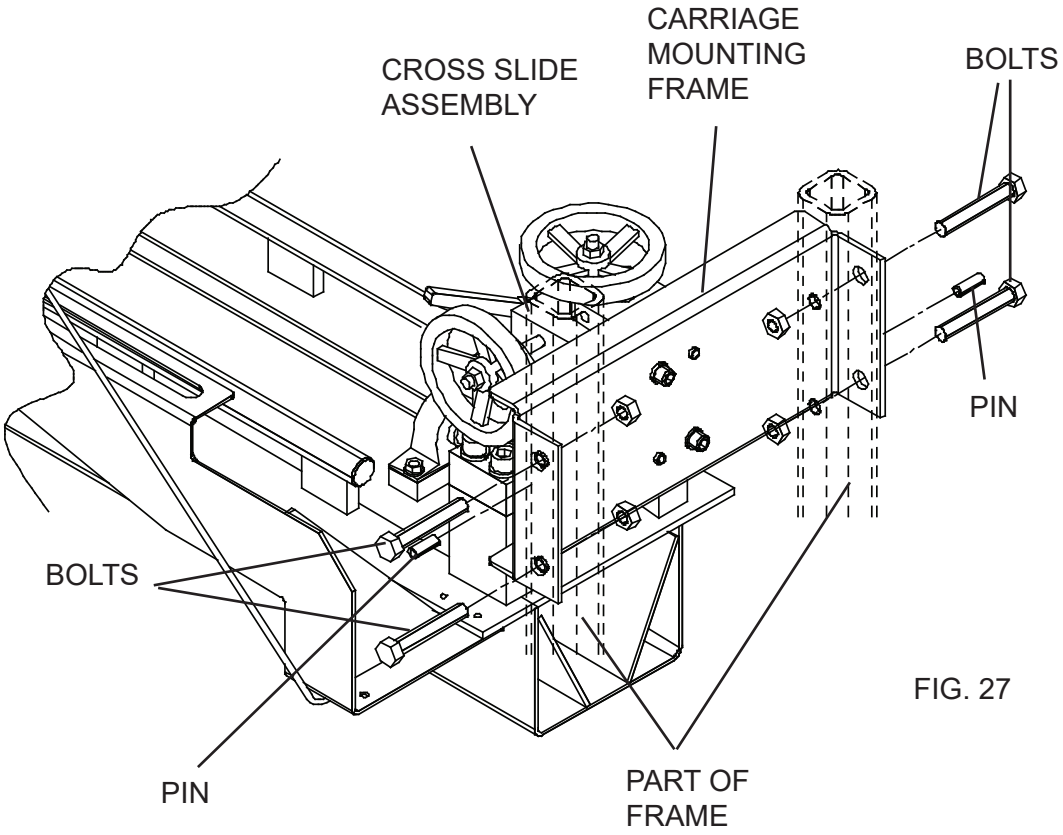


FIG. 27

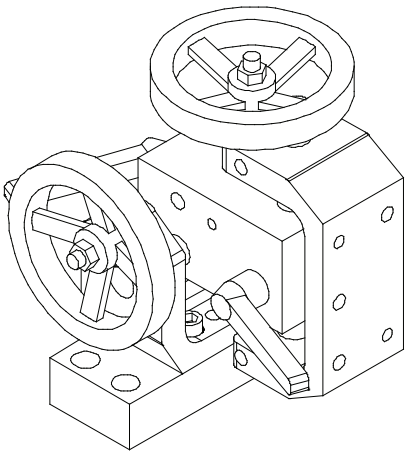
ADJUSTMENTS (Continued)

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.



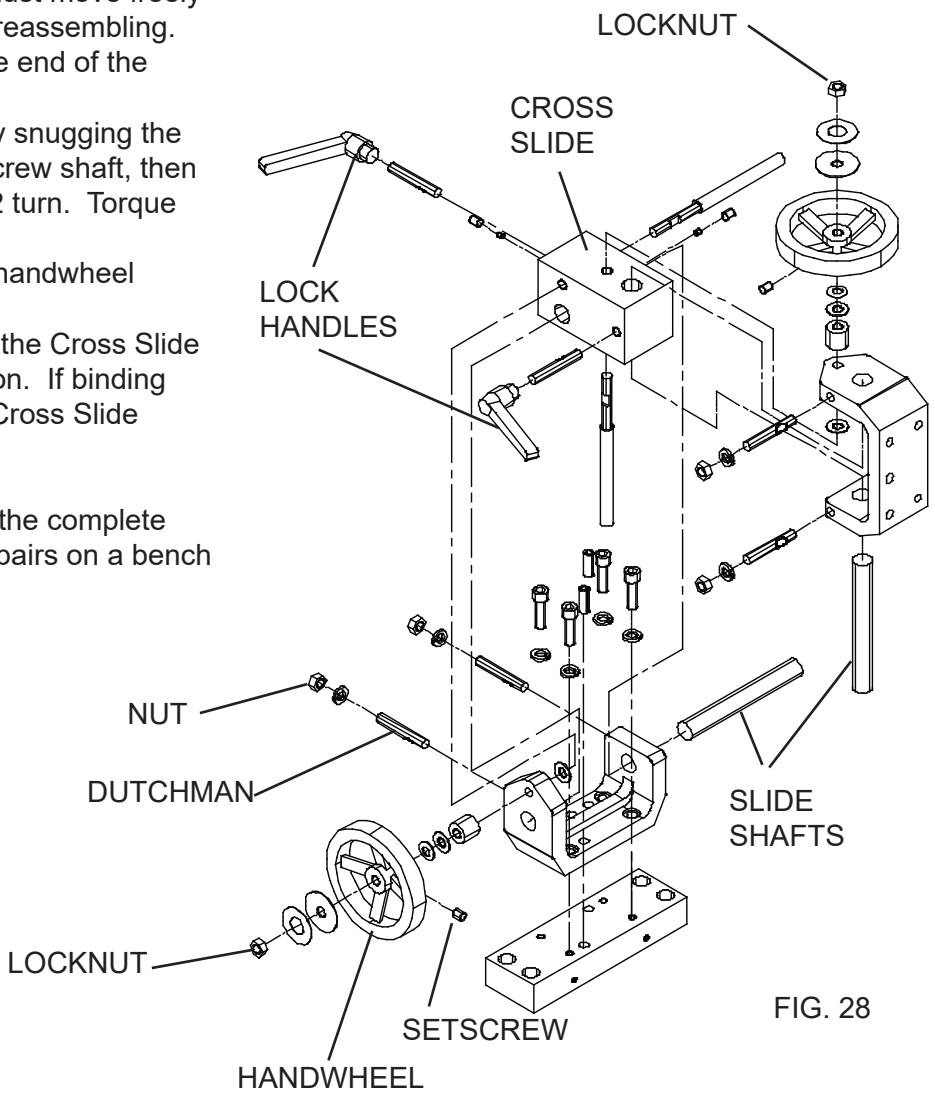


FIG. 28

TRAVERSE DRIVE CONTROL BOARD (TDC)

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

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

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

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

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

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

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

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

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

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

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

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

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

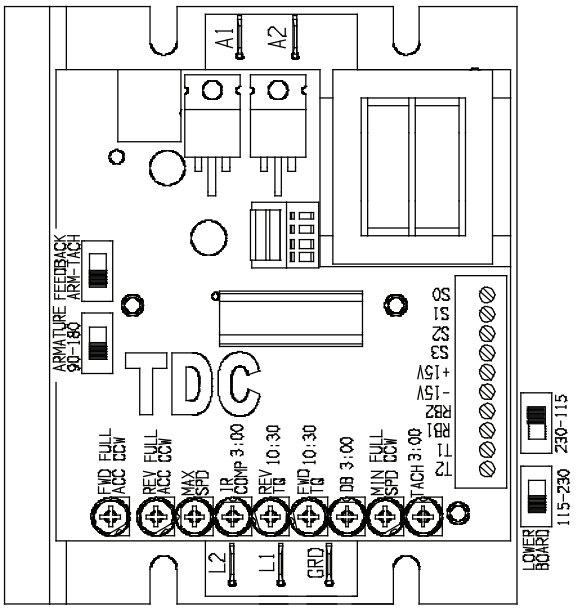


FIG. 29A

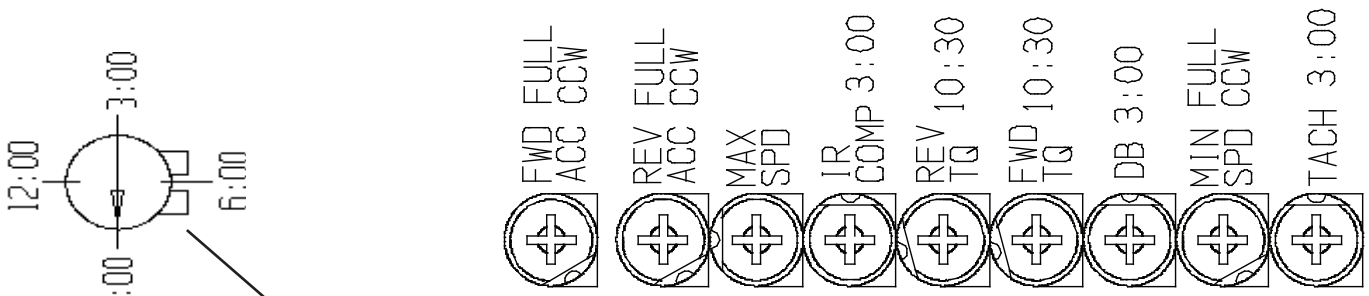


FIG. 29B

Potentiometer Clock Orientation

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

SPIN DRIVE CONTROL BOARD (SDC)

The Spin Drive Control Board has four potentiometers, two switches and one dial as shown on FIG. 26. These potentiometers,swtiches and dial have been set at the factory to the positions shown on FIG. 26.

In the Relief Grinding Mode--
The Torque Shut Off mode selector allows you to turn on or off the Torque Shut Off feature. When switch 1 is set to ON, the board will decrease the spin motor torque once the shut time is achieved after leaving the right proximity sensor. The amount of time it takes before the torque is decreased is set with the Torque Shut Off Delay dial. The spin motor toque will be increased to the higher value once the right proximity switch is activated again. If the Torque Shut Off selector is in the OFF position the torque will remain constant during relief grinding.

Torque Shut Off Delay dail is used to set the duration of time before the torque is decreased after leaving the right proximity sensor during relief grinding. If the dial is turned clockwise (higher number) the higher torque value will stay on for a longer period of time.

The Relief Speed (RSP) and the Relief Torque Pot (RTP) interact with each other. The (RSP) is located on the spin board as a remote speed preset at 12:00 (20 Volts DC). See FIG. 26. The (RTP) is located on the control panel and is for relief torque adjustment.

Relief Speed Pot (RSP) when rotated clockwise will increase spin drive speed (the speed at which the reel indexes to the next blade). This speed should never be above the 3:00 setting.

Relief Torque Pot (RTP) is used to vary the reel to finger holding torque for relief grinding. The recommended starting point is 30 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 spin motor system to not operate smoothly.

Relief Idle Torque Pot (ITP) is used to vary the reel to finger holding torque once the shut time is achieved after leaving the right proximity sensor if the Torque Shut Off Selector is set to on.

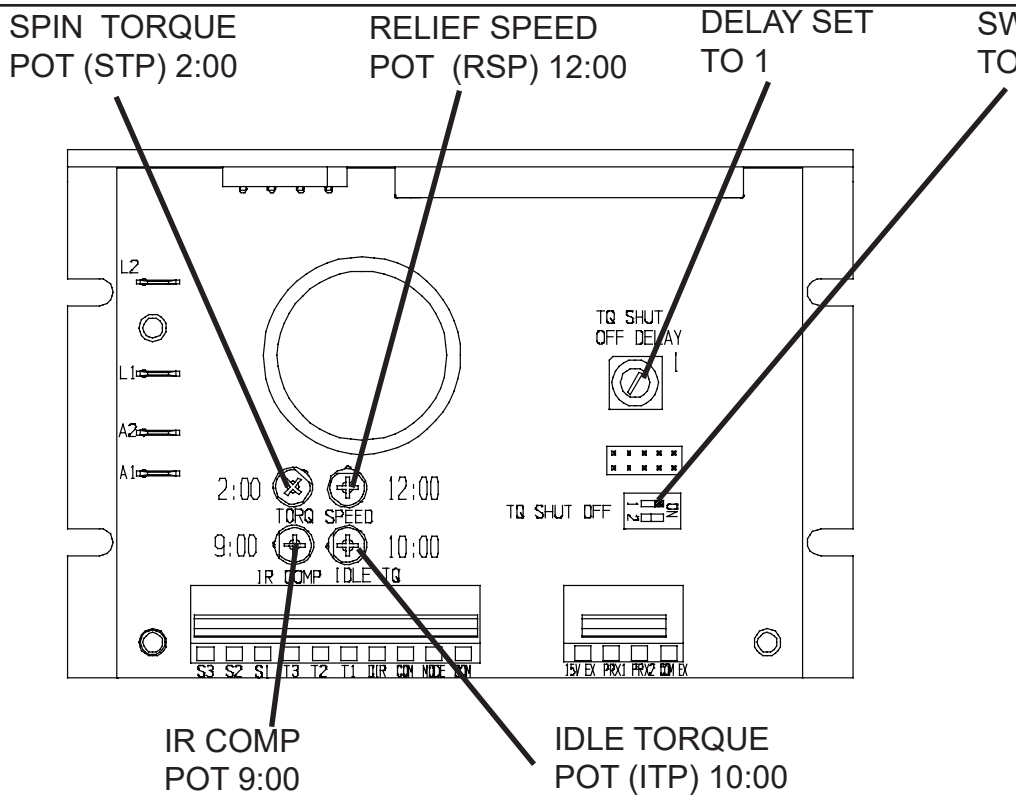
In the Spin Grinding Mode--
The Spin Torque Potentiometer (STP) and the Spin Speed Pot (SSP) interact with each other. The (STP) is located on the spin board as remote torque preset at 2:00 for torque setting. See FIG. 99. The (SSP) is located on the control panel and is for spin speed adjustment.

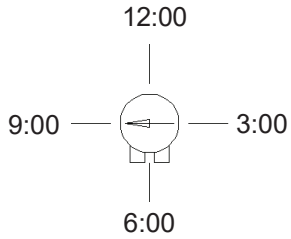
Spin Torque Pot (STP) controls maximum torque allowable in the spin grinding cycle only. This should never be adjusted past the 3:00 position. If the reel does not turn check that the reel is free turning by hand spinning with the power off and the spin drive disconected.

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

IR COMP 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 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 pot counterclockwise until symptoms just disappear.





Potentiometer
Clock Orientation

FIG. 30

STEPPER INFEED CONTROLLER (SIC)

The Stepper Infeed Controller has as set of 8 dip switches and 1 position rotatable dial. See Figure 31.

Motor Selection Dial-
Set the motor selection Dial to 6. This will setting is best suited for the stepper motor that is used on this machine.

DIP SWITCH SETTING:

SW1 and SW2 are used to set the maximum current. Too high of settion will overload the DC power supply:

SW1 - OFF
SW2 - ON

SW3 - OFF This switch adjusts the load inertia.
SW4 - ON Reduces the current when the motor is not on. If this is set to the OFF position the motor will get very hot.

SW5, SW6 and SW7 are used to set the speed of the motor. If the speed is not correct the motor will rotate too fast or too slow:

SW5 - ON
SW6 - OFF
SW7 - ON

SW8 - OFF Leave in OFF for normal operation. For testing move to the ON position. The drive will automatically rotate the motor back and forth two turns in each direction.

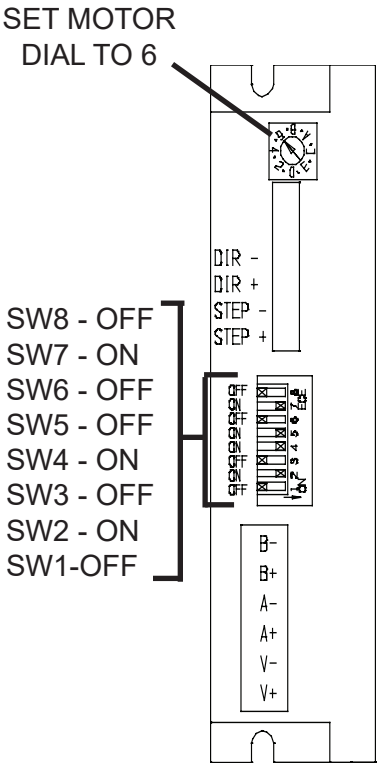


FIG. 31

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. 32. 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. 33. Thoroughly clean the housing bore and the outside diameter of both bearings. **APPLY BLUE LOCTITE #243 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. **APPLY BLUE LOCTITE #243 TO THE INSIDE THREAD OF THE 9/16-18 NUT** and install onto the spindle shaft with the grooved side toward the bearing. 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 15 Ft. Lbs.

APPLY BLUE LOCTITE #243 TO THE BORE OF THE PULLEY BEFORE INSTALLATION. Replace the square key and install the new pulley pushing the counterbore side of the pulley against the spindle nut with no end play. **NEXT INSTALL BLUE LOCTITE #243 ON THE PULLEY SETSCREWS AND TIGHTEN THE TWO PULLEY SET SCREWS.** Then install the new external retaining ring on the spindle shaft. Mount the new poly-V belt. (See Grinding Head Belt Tension and Alignment Adjustments in the adjusting sectionof the manual). Install the new belt cover gasket on the belt cover and install the belt cover and square key. Mount the left side grinding wheel grip knob with a slight gap to the cover and tighten the two set screws.

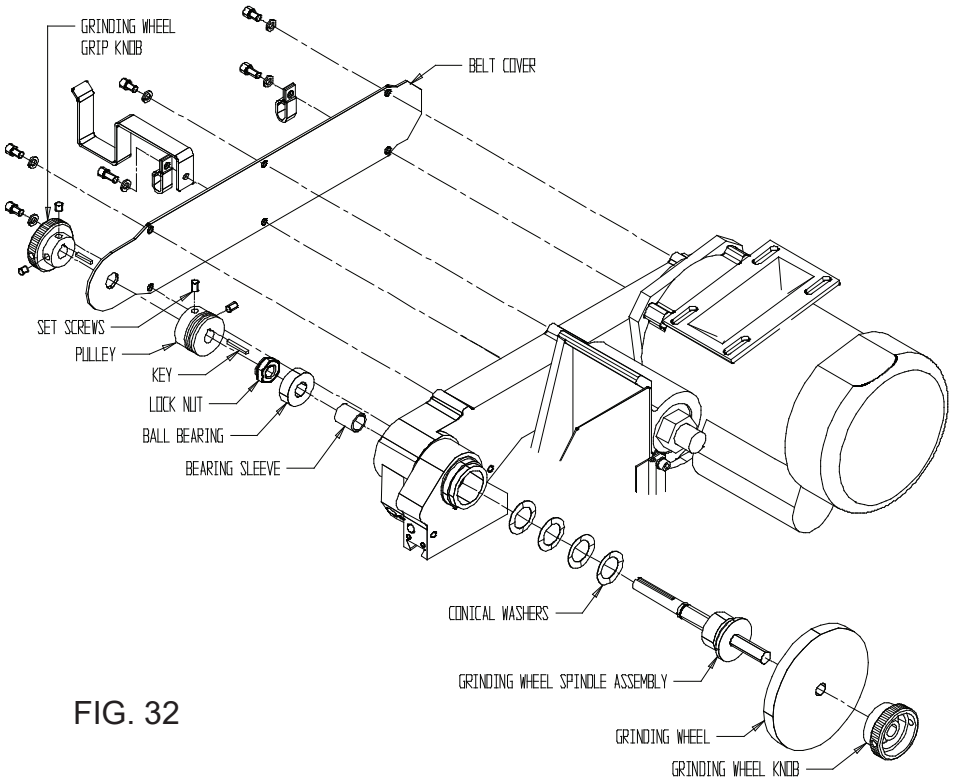


FIG. 32

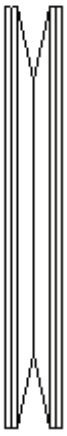
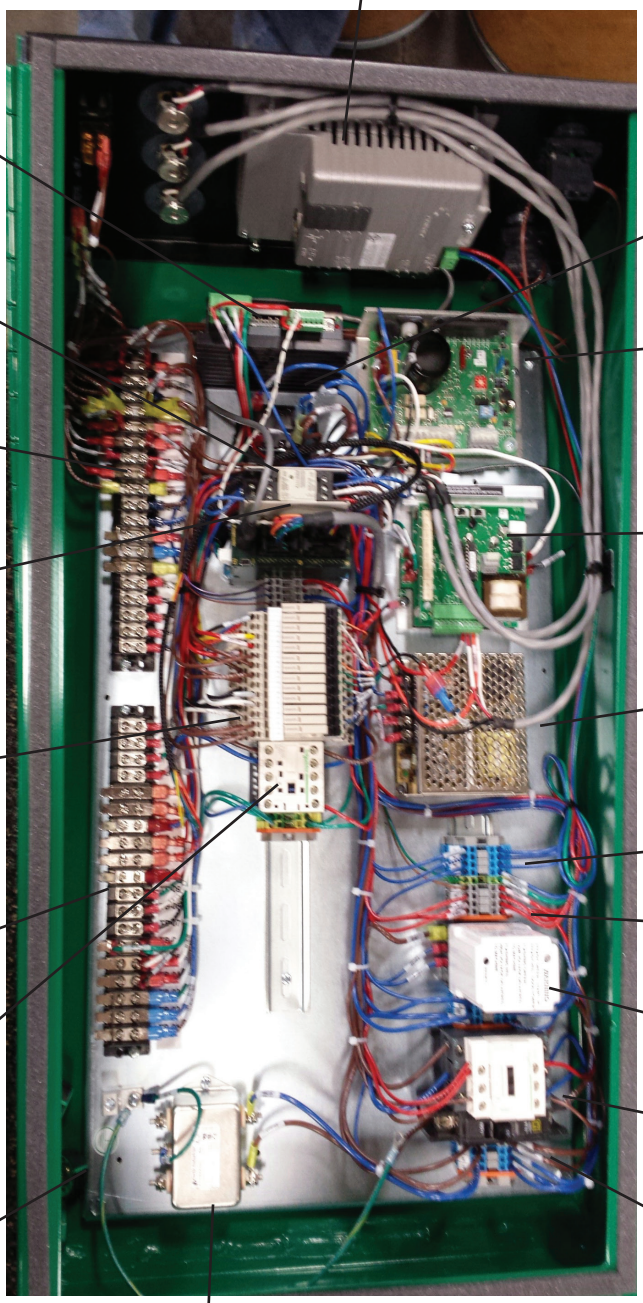


FIG. 33

- THIS PAGE IS LEFT INTENTIONALLY BLANK FOR NOTE TAKING PURPOSES. -

ACCU-TOUCH CONTROL PANEL



ELECTRICAL TROUBLESHOOTING

- ORIGINAL INSTRUCTIONS

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 two or three numbers are the Foley wire number. The next group of letters or numbers are the code for the component to which the wire attaches. Example: RT1 for Relay Terminal 1. The last set of numbers or letters is the name of the terminal on the component to which the wire attaches.

ELECTRICAL TROUBLESHOOTING INDEX

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 relay teminal blocks (RT1) for light on for output "F" (toward bottom)	Light is: Off-- Go to Step I 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.
Relay Terminal Block (RT1-F) Bad	I. No power to relay coil	Check for 24 VDC from RT1 - F - A1 to A2. Yes - Replace Relay Terminal Block No -Step J
No SSignal from PLC	J. Check for PLC output YF	Light on PLC at YF is on. YES- Verify jumper in RT1 connecting A1 is in place. Replace output cable. NO- Replace PLC

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
No Power to (SDC)	**E.** Power Light on (SDC) next to "PWR" should be ON.	PWR light is ON: Yes--Skip to step **I.** No-- go to Step **F.** next
Relay 9 (RT1) is not working verify Light is on	**F.** Check (RT1) for light #9 to be on (Door must be closed and spin drive switch on)	Light #9 is ON: Yes--go to Step **G.** next No--Bad PLC, RT9 Terminal Block, cables, or Software.
Verify Continutiy of relay 9 in RT1	**G.** With light #9 on, Check 115V AC into (RT1) relay 9.	Verify 115 VAC from (RT1) Term 9- to 02FTRBU (Filter blue wire) . Yes--got to Step **H.** next No-Check 4amp-Circuit Breaker (CB42) Remove wires, verify continuity (ohms) Replace CB if bad.
Spin Drive Controller (SDC) not functioning.	**H.** With light #9 on, Check 115V AC into (SDC)	Remove wires L1 & L2 at (SDC) and check for 115 AC between wires. Yes-- Replace (SDC) No-- Replace (RT1) Relay 9
Drive is not in Relief Mode.	**I.** Check for the LED light on (SDC) next to "SPD" to verify Broad is in Spin Mode.	Light on (SDC) next to "SPD" is on. Yes--skip to Step **L.** next No--If "TQ" light is on then board is in Torque "Relief" mode. go to Step **J.** next

ELECTRICAL TROUBLESHOOTING (Continued)

Possible Cause	Checkout Procedure	
Relay #4 is bad	**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-- Unplug machine to reset, if problem is still there contact factory.
⚠ WARNING	**K.** With light #4 on, verify continuity (reinstall wire after testing). WIRE HAS LINE POWER, USE CARE NOT TO SHORT OUT CONTROL	Temporarily remove one of the wires at Terminal 4, measure (RT1) 4+ to 4- for "0" Ohms Yes--Replace (SDC) No--replace Relay 4 (RT1)
No Power out of (SDC)	**L.** Check (SDC) output. Have Spin speed pot (SSP) set at 400	(SDC) term A1 to term A2 measure approx 90 Volts DC Yes--go to step **M.** Next No-- Skip to step **O.**
Reversing relay(s) bad (RT1)	**M.** Measure voltage at spin motor (these terminals are on the left side of the block)	(RT1) Term A+ to term D+ should read the same 90 Volts DC measured at step **L.** Note polarity Yes--Skip to Step **P.** No-- go to Step **N.** next
	N. Reverse direction of spin motor from SPIN MANUAL touch screen	(RT1) Term A+ to term D+ should read the same 90-120 Volts DC measured at step K., but opposite polarity Yes--Skip to Step **P.** No--Replace relays A, B, C, & D in (RT1)
Spin Speed Pot (SSP) is not working	**O.** (SSP) on Main Panel. Remove wires and check for resistance - Ohms of the Pot.	Check Black wire of (SSP)- H to Red wire of (SSP)-W Pot full CCW 10,000 Ohms — Pot Full CW 0 Ohms White wire of (SSP)- L to Red wire of (SSP)-W Pot full CCW 0 Ohms — Pot Full CW 10,000 Ohms Yes-- Replace (SDC) No-- Replace (SSP)
Spin Drive motor is bad	**P.** With machine power off, Check spin motor continuity	At TB1-4 to TB1-5 check approx. 0 ohms across the black and white wires Yes-- Motor should work, end troubleshooting. No--go to Step **Q.** next
Worn motor brushes	**Q.** 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

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
No Power to (SDC)	**E.** Power Light on (SDC) next to "PWR" should be ON.	PWR light is ON: Yes--Skip to step **I.** No-- go to Step **F.** next
Relay 9 (RT1) is not working verify Light is on	**F.** Check (RT1) for light #9 to be on (Door must be closed and spin drive switch on)	Light #9 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 115V AC into (RT1) relay 9. (Terminal RT1-9 is the top terminal on the left side of RT1)	Verify 115 VAC from (RT1) Term 9- to 02FTRBU (Filter blue wire) . Yes--got to Step **H.** next No-Check 4amp-Circuit Breaker (CB42) Remove wires, verify continuity (ohms) Replace CB if bad.
Spin Drive Controller (SDC) not functioning.	**H.** With light #9 on, Check 115V AC into (SDC)	Remove wires L1 & L2 at (SDC) and check for 115 AC between wires. Yes-- Replace (SDC) No-- Replace (RT1) Relay 9
Drive is not in Relief Mode.	**I.** Check for the LED light on (SDC) next to "TQ" to verify Broad is in Relief Mode.	Light on (SDC) next to "TQ" is on. Yes--skip to Step **L.** No--If "SPD" light is on then board is in Speed "Spin" mode. go to Step **J.** next

ELECTRICAL TROUBLESHOOTING (Continued)

Possible Cause	Checkout Procedure	
Relay 4 (RT1) not working	**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 **⚠ WARNING**	**K.** With light #4 on, verify continuity (Replace wire aferr testing) WARNING-WIRE MAY HAVE LINE POWER	Temporarily remove one of the wires at Terminal 4, measure (RT1) 4+ to 4- for "0" Ohms Yes--Replace relay 4 (RT1) No--replace (SDS)
Spin Drive Controller is bad (SDC)	**L.** Check (SDC) output. Have Relief Torque pot (RTP) set at Red Line	(SDC) term A1 to term A2 measure approx 13 Volts DC Yes--go to step **M.** Next No-- Skip to step **O.**
Reversing relay(s) bad (RT1)	**M.** Measure voltage at (RT1). (terminal A+ and B+ are the center hole on the left side of RT1)	(RT1) Term A+ to term D+ should read the same 13 Volts DC measured at step **L.** Note polarity Yes--Skip to Step **P.** No-- go to Step **N.** next
	N. 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 **P.** No--Replace relays A, B, C, & D in (RT1)
Relief Torque Pot (RTP) is not working	**O.** (RTP) on (SDC). Remove wires and check for resistance - Ohms of the Pot.	Check Black wire of (RTP)- H to Red wire of (RTP)-W Pot full CCW Pot Full CW 10,000 Ohms 0 Ohms White wire of (RTP)- L to Red wire of (RTP)-W Pot full CCW Pot Full CW 0 Ohms 10,000 Ohms Yes-- Replace (SDC) No-- Replace (RTP)
Spin Drive motor is bad	**P.** With machine power off, Check spin motor continuity	At TB1-4 to TB1-5 check approx. 0 ohms across the black and white wires Yes-- Motor should work, end troubleshooting. No--go to Step **Q.** next
Worn motor brushes	**Q.** 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

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.

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. (Terminal E+ and E1 are on the left side of RT1)	(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.

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
Circuit Breaker 32 (CB32) bad	**F.** Check relay 8 for continuity, Insure relay 8 light is on. (Terminal 8+ and 8+ are on the left side of RT1)	(RT1) Term 8+ to 8- read 115 Volts AC Yes-- Replace Relay 8 (RT1) No-- go to Step **G.** next
	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

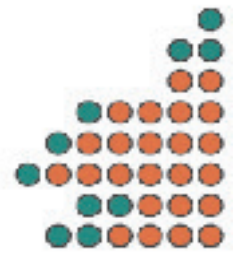
ELECTRICAL TROUBLESHOOTING (Continued)

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
Inccorect DC voltage to Stepper Infeed Control (SIC)	**F.** Look at LEDs on SIC:	(SIC) LED code: Flashing Green- go to step **G.** next Flashin Red-- Machine in E-stop (verify other functions work). If other function work replace SIC. 1 Green, 6 Red-- check motor wiring, replace motor assembly. Other -- Check for 24 VDC to terminals V+ and V-. If voltage is not correct replace Power Supply, if voltage is correct replace SIC.



Code	Error
solid green	no alarm, motor disabled
flashing green	no alarm, motor enabled
flashing red	configuration or memory error
1 green, 4 red	power supply voltage too high
1 green, 5 red	over current / short circuit
1 green, 6 red	open motor winding
2 green, 3 red	internal voltage out of range
2 green, 4 red	power supply voltage too low

ELECTRICAL TROUBLESHOOTING (Continued)

Possible Cause	Checkout Procedure	
SIC or motor bad	**G.** Move SIC dip switch SW8 to ON position for Test. Motor should rotate each direction 2 turns. TURN OFF AFTER TEST.	Motor rotates in test mode (SW8- ON) YES--Go to Step **H**. next NO-- Replace infeed stepper motor.
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 **J**. next No-- check continuity of wires from PLC to SIC. If OK, replace PLC.
No V+ to Step or Direction of SIC	**J.** Check for 24VDC at Dir + and Step + of (SIC).	Measure 24 VDC from V- on the SIC to 60SICS+. if 24VDC then measure from V- to 60SICD+ for 24VDC YES-- If both measure 24VDC then heck continuity of wires from PLC to SIC. If OK, replace PLC. NO-- Check wire 60, replace if bad.

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 Dnd / 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.

System Error Message	Checkout Procedure	Message Status
Accept values before 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
No 115 Volts AC to flasher	**B.** 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 **C.** next
Relay 7 (RT1) is bad	**C.** After a cycle has completed, check (RT1) for light 7 to be on	Light is on: Yes-- go to step **D.** next No-- Contact Factory
	D. Check continuity of relay 7 (Terminal 7+ and 7- are on the left side of RT1)	(RT1) Term 7+ to 7- Measure 115 Volts AC Yes-- Replace Relay 7 (RT1) No-- go to step **E.** next
Circuit Breaker (CB32) tripped	**E.** Reset CB32	Press in on Circuit breaker CB32 on front of control panel. Works Yes--End Troubleshooting No-- Replace CB32

***PROBLEM*-- Error Message "DOOR MUST BE CLOSED TO OPERATE" is present with doors closed when turning on the spin motor, grind motor, or atuo mode.**

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.

Possible Cause	***Checkout Procedure***	
Guard Doors are Open	**A.** Close the front doors and rear slide up door or workstation ramp depending on option installed.	Machine works Yes--end troubleshooting No--go to Step **B.** next
Door Safety Switch-es are not aligned properly	**B.** Check Alignment of Door Safety Switches on Front doors	See Alignment section of this Manual. Machine works Yes--end troubleshooting No--go to Step **C.** next
No 24 Volts DC to Safety Monitor (SSM)	**C.** Check SSM for 24 Volts DC. (Screen must NOT be in E-Stop)	Measure 24 volts DC from SSM Terminal A1+ to Terminal A2- Yes--Go to Step **D**. next. No--Verify continuity of wires 64 and 66.
No Power Out to Door Switches	**D.** Verify 24Volts DC out to Door Switches.	Measure approximately 24 volts DC from Terminal Strip 2 Terminal 3 to terminal S2 -C (Left side of SSM, Top screw (toward touch screen)) Yes--Go to Step **E**. next. No--Verify Continuity of Wires to Terminal strip2 , Replace SSM if wires check OK.
Front Door Switch is Bad	**E.** With Front doors Closed Verify 24Volts DC back form Front Door Switch.	Measure approximately 24 volts DC from Terminal S2-C on SSM to Terminal Strip 2 Terminals 2 and 4. Yes--Go to Step **F**. next. No--Check Alingment of Front door switch. If no Voltage to Term2 or 4 then replace front switch.
Relay on Safety Monitor is bad	**F.** With door closed the Green light should be ON. (If not check the jumper wires on SSM at terminals S2 termial c, S22 and S32)	Green light on SSM is ON when door is closed and goes OFF when the door is opened. Yes--Go to Step **G**. next. No-Check installation of jumper wires on SSM at S2 terminals C, S22 and S32. Replace SSM if everything else checks out.
	G. With door closed and the Green light on the SSM ON. Check for power out of SSM at terminal 13.	Measure approximately 24 Volts DC from Terminal A+ on SSM to Terminal 13 on SSM (wire labeled 69SSM-13) Yes--Go to Step **H**. next. No-Replace SSM.
Bad input Ribbon Cable to PLC	**H.** Look for light on PLC labeled XO to be on.	Light on PLC next to XO is on? Yes--Machine should work. Verify by going to the Help screen on the touch screen. Contact the factory if not working. No--Check continutiy of wires from SSM to PLC. [components involved: input rib-bon cable (6529030), Wires not properly connected in terminal block below PLC, or bad wire #69 from SSM to terminal block (69INP-xO).]

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.

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.

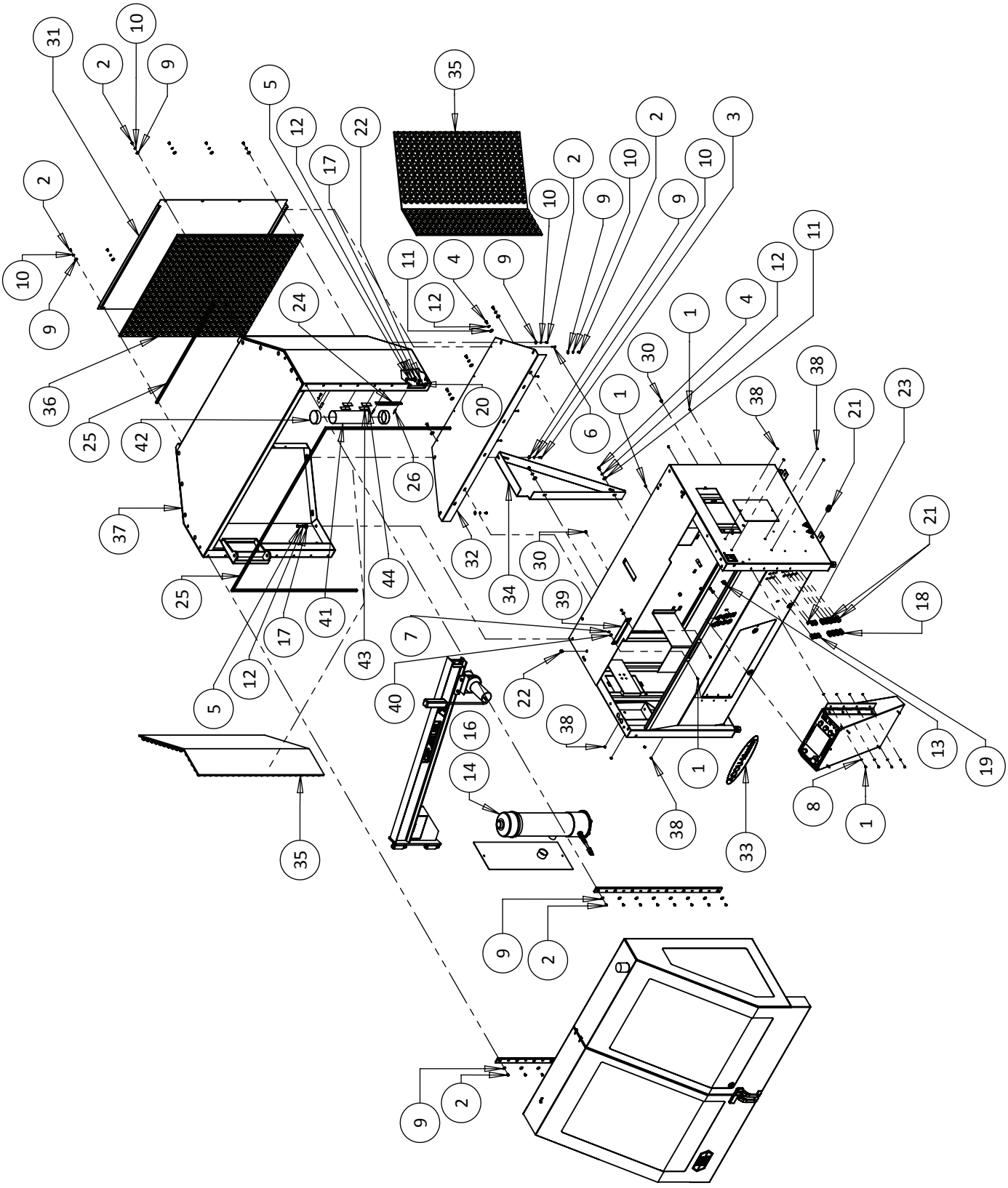
PROBLEM--Cone shaped reel after grinding.

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.

PARTS LIST 6529546 CANOPY ASSEMBLY (WINCH & BOOM MODEL)



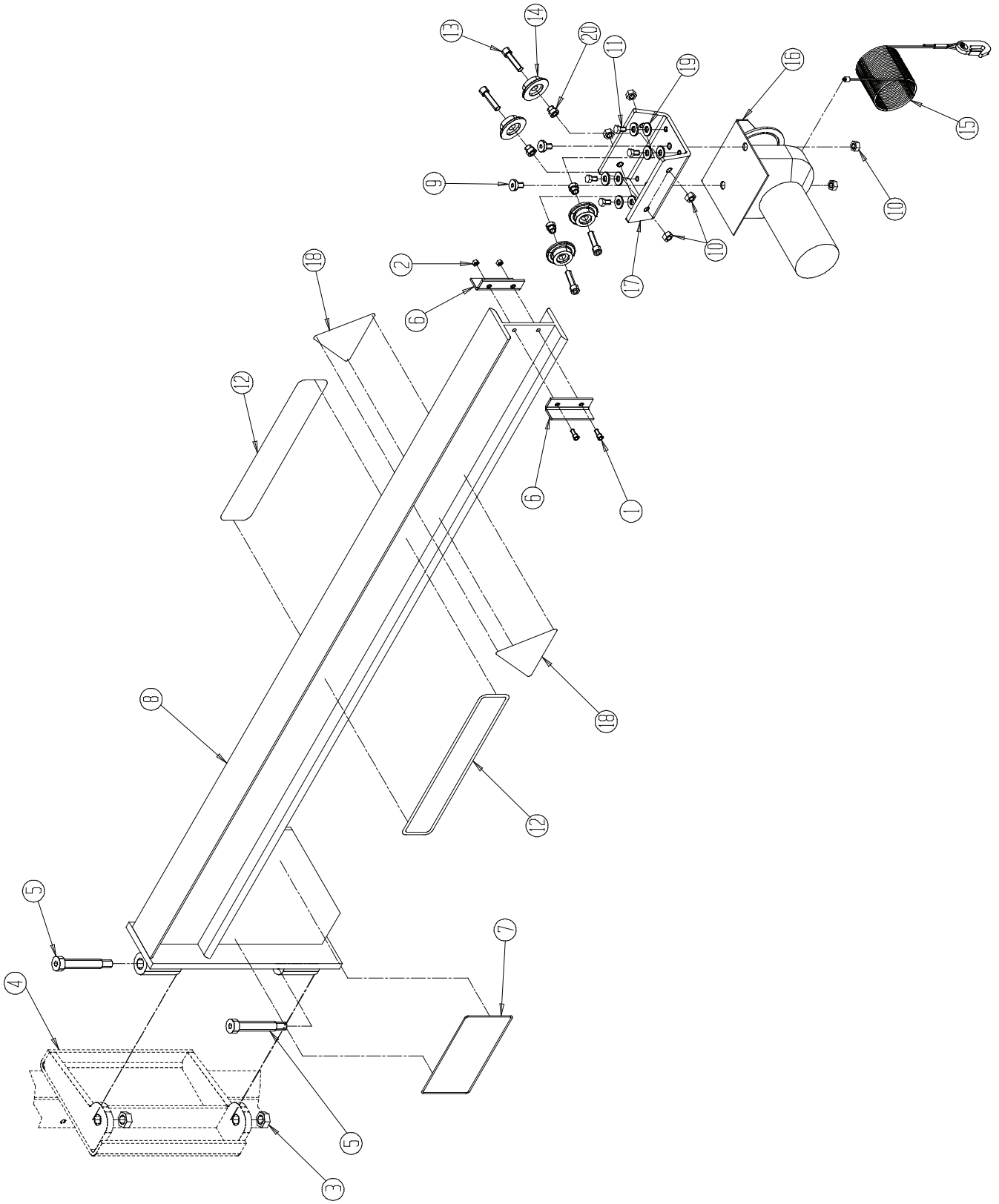
PARTS LIST 6529546 CANOPY ASSEMBLY (WINCH & BOOM MODEL)

DIAGRAM NUMBER	PART NUMBER	DESCRIPTION
1	B250816	Button Head Cap Screw 1/4-20 x 1/2 Long
2	B310813	Button Head Cap Screw 5/16-18 x 1/2 Long
3	B311211	Socket Head Cap Screw 5/16-18 x 3/4 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	D191067	#10 Machine Screw x 5/8 Long
7	J257000	1/4-20 Nylon Locknut
8	R000536	Internal Tooth Lock Washer 1/4
9	K310001	5/16 Flat Washer SAE
10	K311501	5/16 Split Lockwasher
11	K370001	3/8 Flat Washer SAE
12	K371501	3/8 Split Lockwasher
13	09394	2 Prong Knob
14	3706045	Vacuum
	3706046	Filter Bag - Cloth
16	3708874	Vacuum Sizing Adapter
17	3589106	Flat Washer (1.38 OD x .39 ID)
18	3707009	Liquid Tight Strain Relief .27-.47 Wire
19	3707029	Liquid Tight Strain Relief .19-.30 Wire
20	3707066	Strain Relief .22-.25 Wire
21	3707093	Liquid Tight Strain Relief .43-.55 Wire
22	3707273	Strain Relief .33-.36 Wire
23	3707597	5/8 Hole Plug
24	3708205	Socket Holder
25	3708379	Foam Strip
26	3708465	3/16 Blind Rivet
30	B370816	Button Head Cap Screw 3/8-16 x 1/2 Long
31	6529004	Rear Canopy Panel
32	6529005	Bottom Canopy Panel
33	6529021	ACCUMaster Decal
34	6529048	Canopy Support Panel
35	6529082	Canopy Side Foam Pad
36	6529083	Canopy Back Foam Pad
37	6529501	Canopy Weldment
38	3709372	1/2" Hole Plug
39	6529050	Cover Plate
40	K250001	1/4 Flat Washer
41	3706133	Clear Tube
42	3706134	End Cap
43	3706135	Velcro Hook
44	3706136	Velcro Loop

ITEMS NOT SHOWN

	6529038	Winch Cord Receptacle W139
	6529041	Front Door Switch Cord Assembly
	3708448	Electrical Warning Decal
	3706044	Gage mount pin - 1/2" Diameter x 1.5" long
	B251001	1/4-20 x 5/8" long Hex Head Screw (for gage mount)
	37086105	Multiple Safety Symbols Decal
	3708872	Patent Decal

PARTS 6509526 WINCH AND BOOM ASSEMBLY (BOOM MODEL)



PARTS LIST 6509526 WINCH AND BOOM ASSEMBLY (BOOM MODEL)

DIAGRAM NO.	PART. NO.	DESCRIPTION
1	B251611	Socket Head Cap Screw 1/4-20 x 1 Long
2	J257100	1/4-20 Nylok Locknut
3	J627100	5/8-11 Locknut
4	6509541	Canopy Frame Weldment
5	3708398	Shoulder Bolt, .75 Dia. x 3.5 Long
6	6509103	Trolley stop Bracket
7	6509115	Winch Warning Decal
8	6509544	Boom Weldment
9	B371616	Button Head Socket Cap Screw 3/8-16 x 1" Long
10	J377100	3/8-16 Hex Jam Nylok Locknut
11	3708519	5/16-18 x 1/2 Nylon HHCS
12	6509298	Decal - Boom Cap
13	B372411	3/8-16 x 1.50 SHCS
14	6509367	Trolley Wheel Assy
15	6509594	Hook and Cable Assembly
16	6509546	Electric Winch
17	6509364	Trolley Base
18	3708456	Decal - Boom Capacity Symbol
19	K310101	5/16 Flat Washer
20	6509366	Spacer - Trolley Wheel

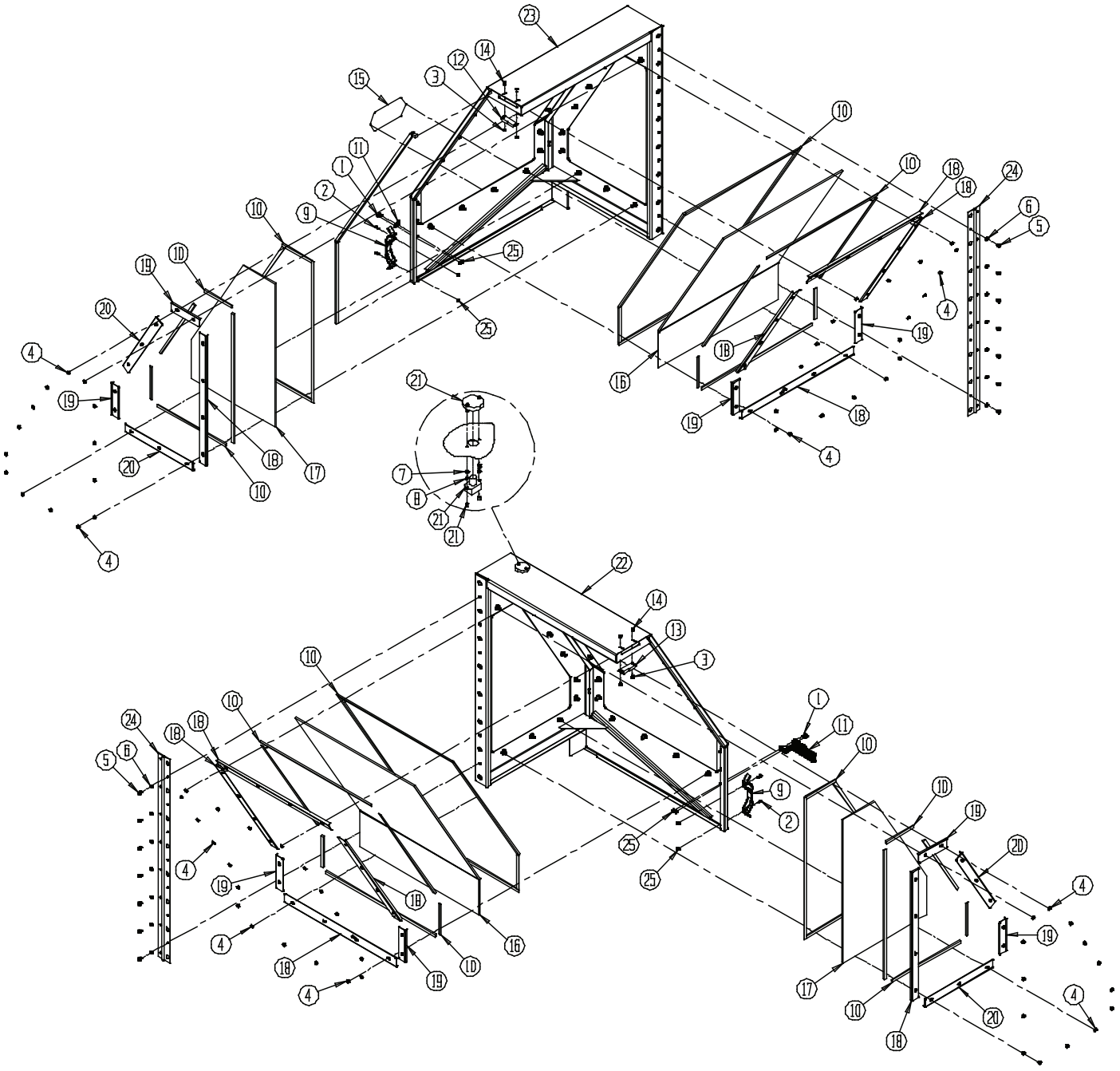
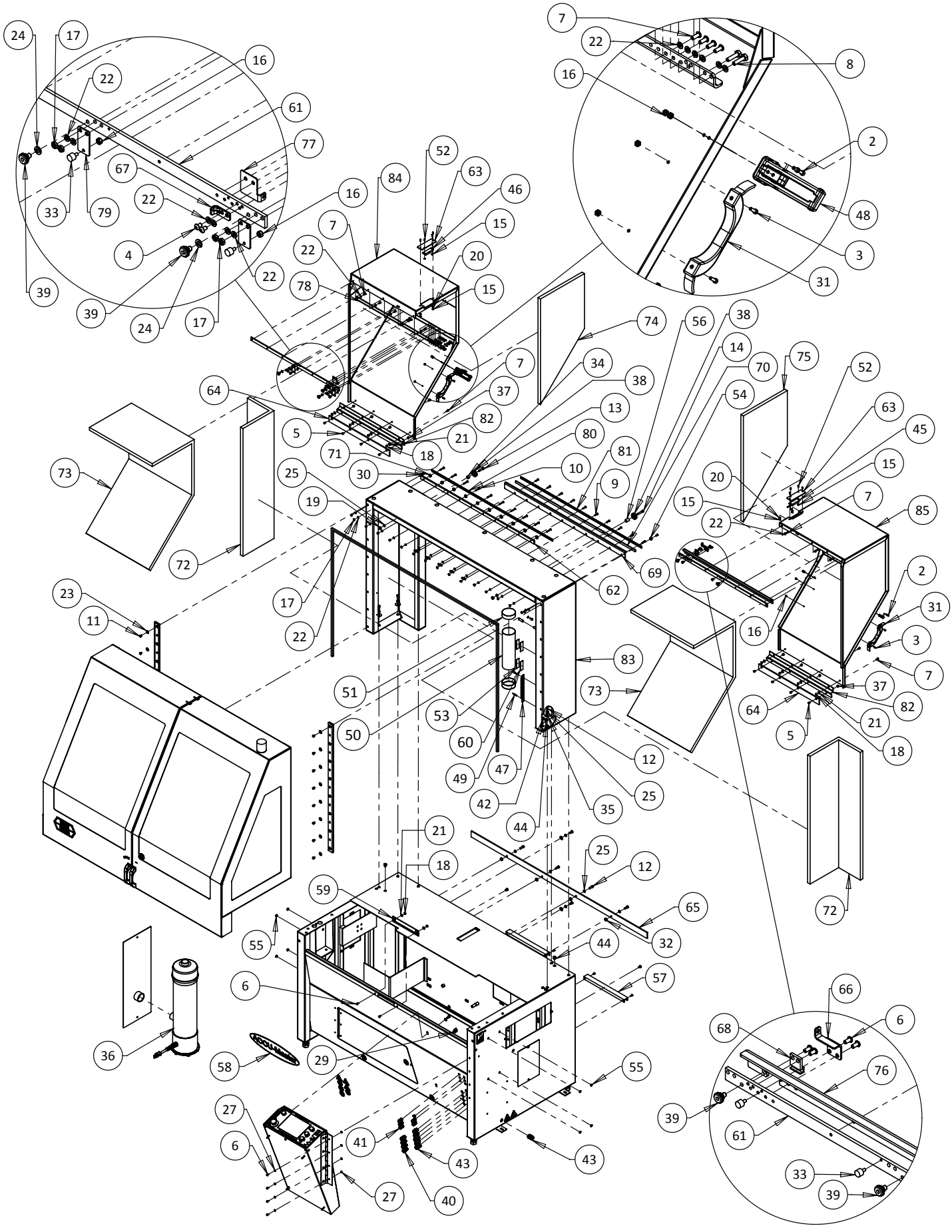


DIAGRAM NUMBER	PART NUMBER	DESCRIPTION
1	B190811	Socket Head Cap Screw #10-24 x 1/2 Long
2	B191011	Socket Head Cap Screw #10-24 x 5/8 Long
3	J167000	#8-32 Nylon Jam Locknut
4	J311000	5/16-18 Hex Nut
5	B250816	Button Head Cap Screw 1/4-20 x 1/2 Long
6	K251501	1/4 Split Lockwasher
7	R000480	#8 Lockwasher
8	R000558	#8-32 Kep Nut
9	09891	Grab Handle
10		Foam Strips
11	3708416	Soft Latch
12	3707647	Coded Door Switch Magnet
13	3707607	Door Switch Assembly
14	3708820	Button Head Safety Screw #8-32 x 1/2 Long
15	3709990	Large Foley United Decal
16	6509104	Canopy Door Front Window
17	6509105	Canopy Door Side Window
18	6509110	Window Retaining Bracket - Long
19	6509111	Window Retaining Bracket - Short
20	6509182	Window Retaining Bracket - Medium
21	6529019	Flasher Light Base Assembly
22	6529505	Right Door Weldement
23	6529506	Left Door Weldment
24	6509099	Hinge
25	J197100	#10-24 Nylon Locknut

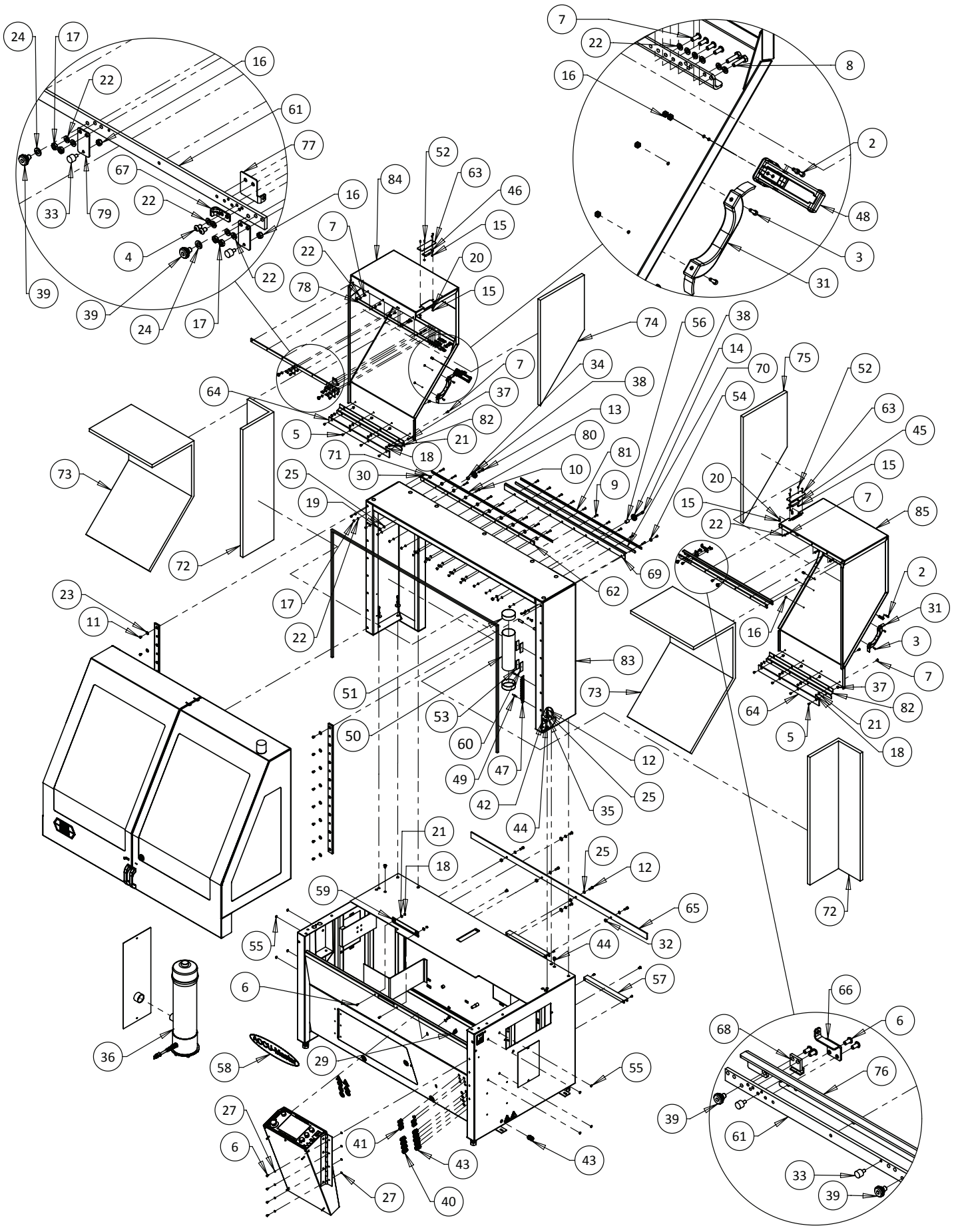
PARTS LIST 6529548 - CANOPY ASSEMBLY(REAR DOORS MODEL)



PARTS LIST 6529548 - CANOPY ASSEMBLY(REAR DOORS MODEL)

DIAGRAM NUMBER	PART NUMBER	DESCRIPTION
2	B190811	Socket Head Cap Screw #10-24 x 1/2 Long
3	B191011	Socket Head Cap Screw #10-24 x 5/8 Long
4	B250616	Button Head Cap Screw 1/4-20 x 3/8 Long
5	B250805	Flat Head Cap Screw 1/4-20 x 1/2 Long
6	B250816	Button Head Cap Screw 1/4-20 x 1/2 Long
7	B251016	
8	B251601	Hex Head Cap Screw 1/4-20 x 1 Long
9	B251616	Button Head Cap Screw 1/4-20 x 1 Long
10	B252416	Button Head Cap Screw 1/4-20 x 1-1/2 Long
11	B310813	Button Head Cap Screw 5/16-18 x 1/2 Long
12	B371611	Socket Head Cap Screw 3/8-16 x 1 Long
13	B372411	Socket Head Cap Screw 3/8-16 x 1-1/2 Long
14	B373211	Socket Head Cap Screw 3/8-16 x 2 Long
15	J167000	#8-32 Nylon Jam Locknut
16	J197100	#10-24 Nylon Locknut
17	J252000	1/4-20 Hex Jam Nut
18	J257000	1/4-20 Nylon Locknut
19	J372000	3/8-16 Hex Jam Nut
20	K160001	#8 Flat Washer SAE
21	K250001	1/4 Flat Washer SAE
22	K251501	1/4 Split Lockwasher
23	K310001	5/16 Flat Washer SAE
24	K311501	5/16 Split Lockwasher
25	K371501	3/8 Split Lockwasher
27	R000536	1/4 internal Lockwasher
29	09394	2 Prong Knob
30	09528	Shoulder Bolt .313 Dia x .75 Long
31	09891	Grab Handle
32	28212	Spacer .75 OD x .39 ID x .31 Long
33	80392	Cam Follower
34	3089052	Spacer .75 OD x .406 ID x .5 Long
35	3589106	Flat Washer (1.38 OD x .39 ID)
36	3706045	Vacuum
	3706046	Filter Bag - Cloth
	3706067	Gray filter inner bag
37	3706062	1/4-20 Acorn Nut
38	3706063	Pulley for wire rope
39	3706064	V-Roller
40	3707009	Liquid Tight Strain Relief .27-.47 Wire
41	3707029	Liquid Tight Strain Relief .19-.30 Wire
42	3707066	Strain Relief .22-.25 Wire
43	3707093	Liquid Tight Strain Relief .43-.55 Wire
44	3707273	Strain Relief .33-.36 Wire
45	3707607	Door Switch Assembly
46	3707647	Coded Door Magnet
47	3708205	Socket Holder
48	3708416	Soft Latch
49	3708465	3/16 Blind Rivet
50	3706133	

PARTS LIST 6529548 - CANOPY ASSEMBLY(REAR DOORS MODEL)



PARTS LIST 6529548 - CANOPY ASSEMBLY(REAR DOORS MODEL)

DIAGRAM NUMBER	PART NUMBER	DESCRIPTION

--CONTINUED FROM PREVIOUS PAGE--

51	3706134	
52	3708820	8-32 x .50 Long Button Head Safety Screw
53	3706135	
54	3709255	Rubber Washer
55	3709372	Hole Plug 1/2 Dia.
56	3969065	Spacer .41 ID x .75 OD x 1" Long
57	6209165	Lower Guide Bar
58	6529021	ACCUMaster Decal
59	6529050	Cover Plate
60	3706136	
61	6529075	Door Support Bar
62	6529076	Rail Spacer Bar
63	6529077	Door Switch Bracket
64	6529078	Lower Door Slde
65	6529079	Lower Door Guide Bar
66	6529080	Outer Door Cable Bracket
67	6529081	Inside Door Cable Bracket
68	6529086	Top Inside Cable Bracket
69	6529087	Top Roller Guide
70	6529088	Top Rail Spacer
71	6529089	Lower Rail Spacer
72	6529090	Foam Pad Canopy Side Panel
73	6529091	Foam Pad Rear Door Panel
74	6529092	Foam Pad Rear Door Right Side
75	6529093	Foam Pad Rear Door Left Side
76	6529094	Right Door Support Bar
77	6529095	Lower Cable Bracket
78	6529096	Lower Door Support Bracket
79	6529097	Roller Bracket
80	6529099	Lower V-Roller Guide Bar
81	6529100	Upper V-Roller Guide Bar
82	6529104	Lower Door Bracket
83	6529552	Canopy Weldment
84	6529554	Left Rear Door Weldment
85	6529555	Right Rear Door Weldment

ITEMS NOT SHOWN

	6529074	Front Door Switch Cord
	6529044	Rear Door Switch Cord
	3706065	Wire Cable Assembly for Rear Doors
	3708448	Electrical Warning Decal
	3706044	Gage mount pin - 1/2" Diameter x 1.5" long
	B251001	1/4-20 x 5/8" long Hex Head Screw (for gage mount)
	3708703	Multiple Safety Symbols Decal
	3708872	Patent Decal

6329545 MAIN CABINET ASSEMBLY

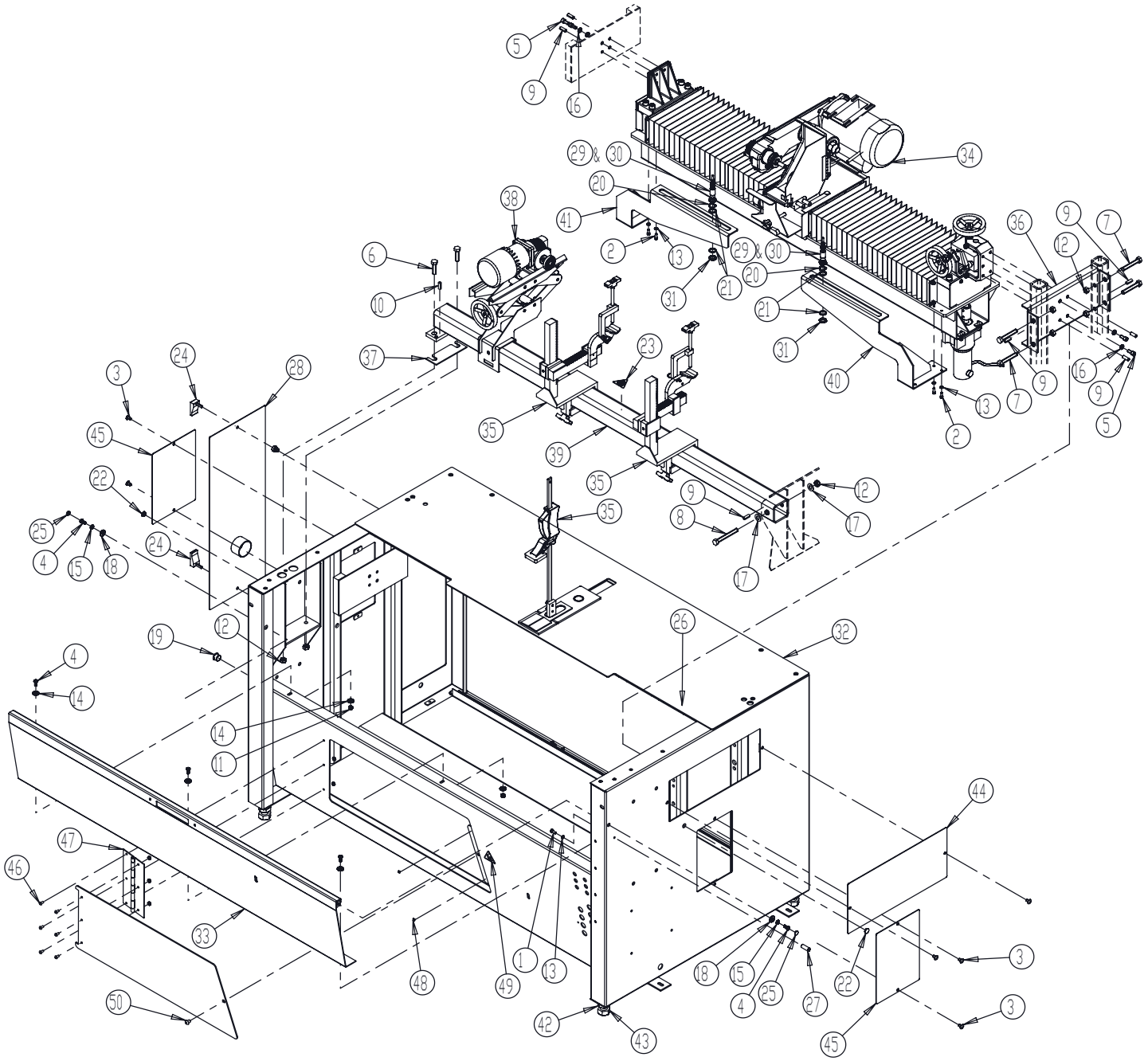


DIAGRAM NUMBER	PART NUMBER	DESCRIPTION
1	B251001	Hex Head Cap Screw 1/4-20 x 5/8
2	B251011	Socket Head Cap Screw 1/4-20 x 5/8
3	B310813	Button Head Socket Cap Screw 5/16-18 x 1/2
4	B311213	Button Head Socket Cap Screw 5/16-18 x 3/4
5	B371211	Socket Head Cap Screw 3/8-16 x 3/4
6	B502801	Hex Head Cap Screw 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	3706044	Gage Pin Mounting
28	6329539	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

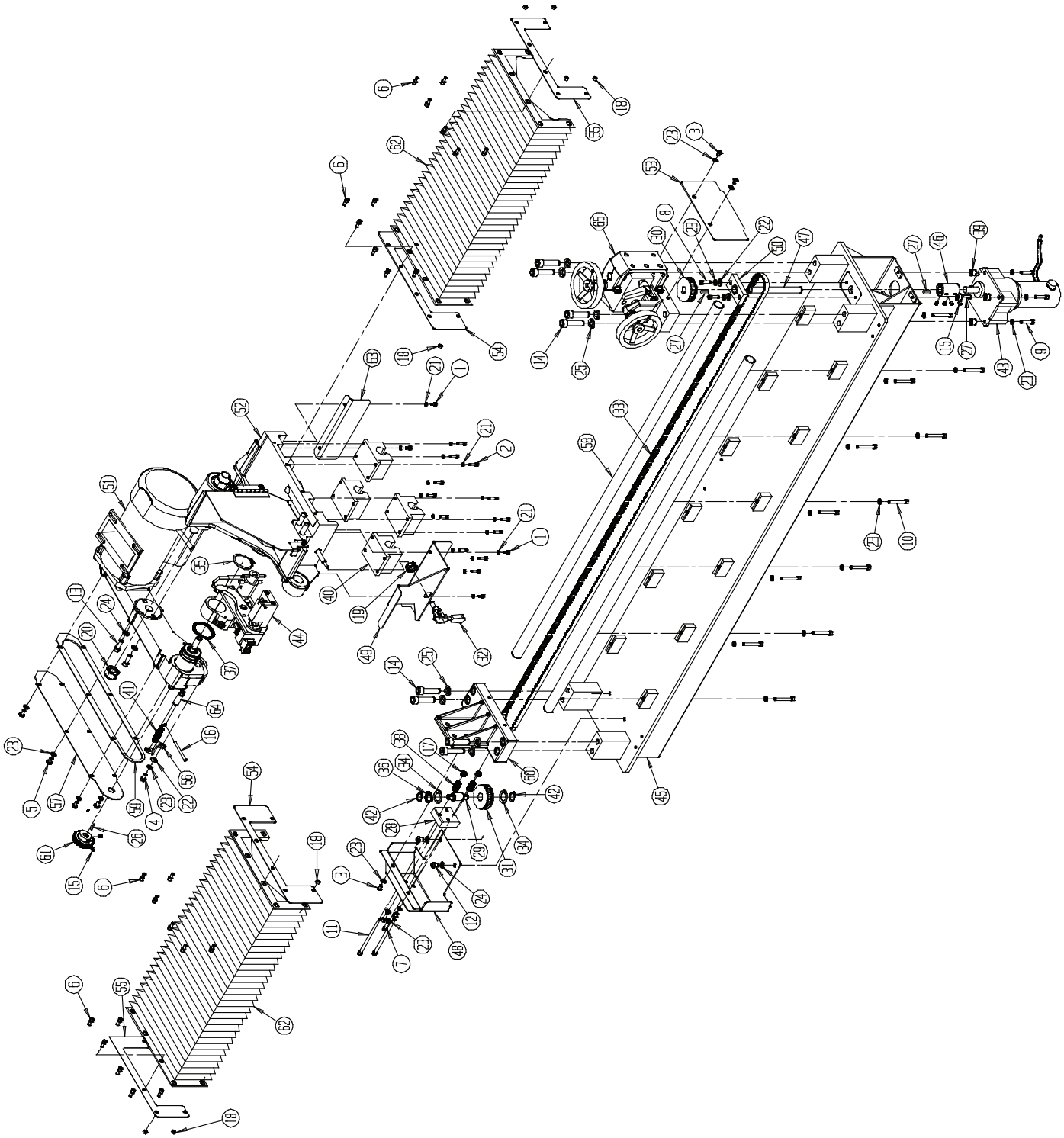


DIAGRAM NUMBER	PART NUMBER	DESCRIPTION
1	B190611	Socket Head Cap Screw 10-24 x 3/8 Long
2	B191211	Socket Head Cap Screw 10-24 x 3/4 Long
3	B250616	Button Head Socket Cap Screw 1/4-20 x 3/8 Long
4	B250811	Socket Head Cap Screw 1/4-20 x 1/2 Long
5	B250818	Pan Head Machine Screw 1/4-20 x 1/2 Long
6	B250819	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	3706056	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

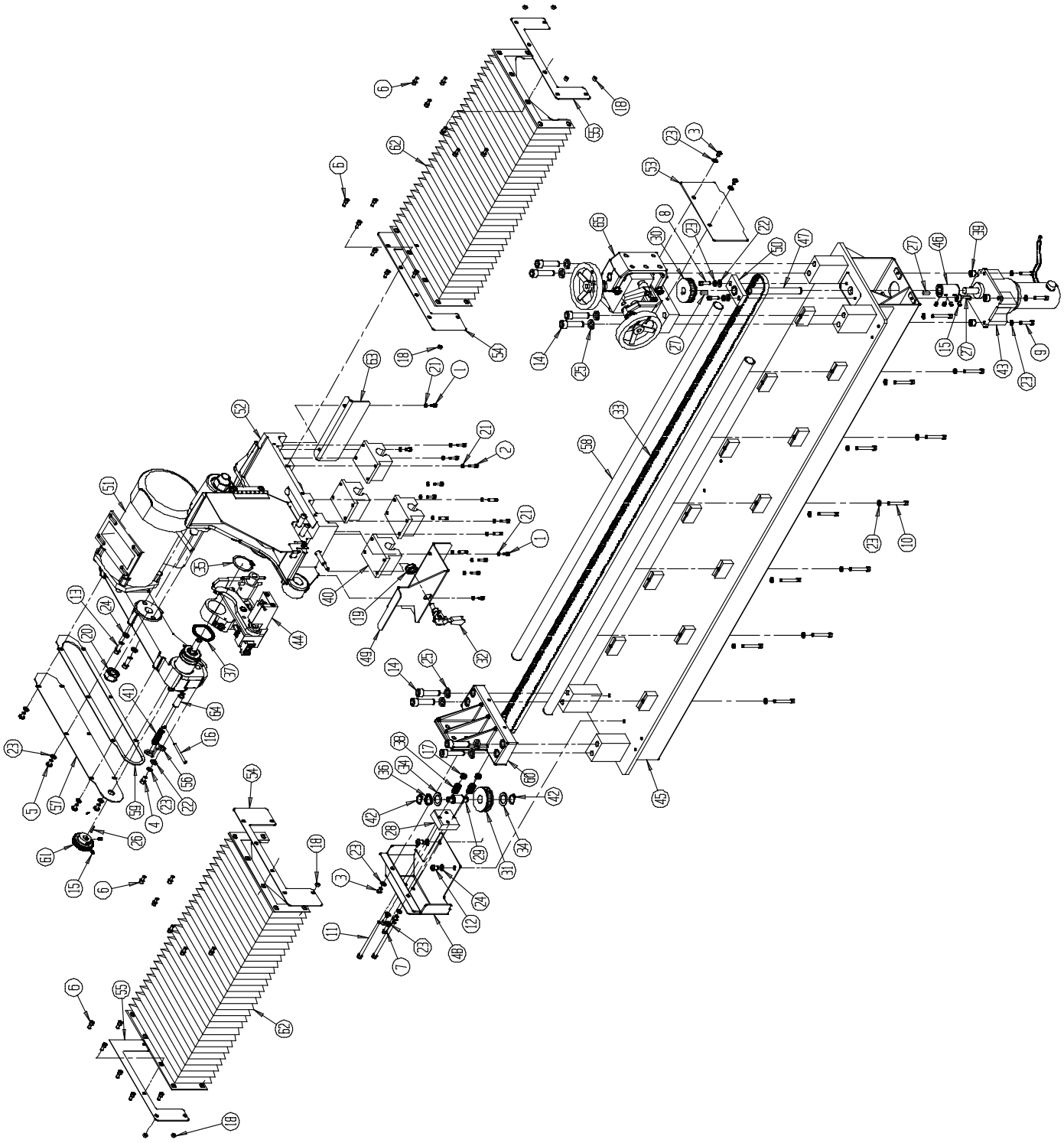


DIAGRAM NUMBER	PART NUMBER	DESCRIPTION
41	3709072	Compression Spring
42	3709331	External Retaining Ring
43	6059062	Traverse Motor Assembly
44	6309573	Finger & Body Assembly (see page 74)
45	6329032	Traverse Base
46	6329034	5/8 Shaft Coupler
47	6329035	Motor Extension Shaft 6.00 Long (Prior to 8-08)
	6329141	Motor Extension Shaft 5.75 Long (After 8-08)
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

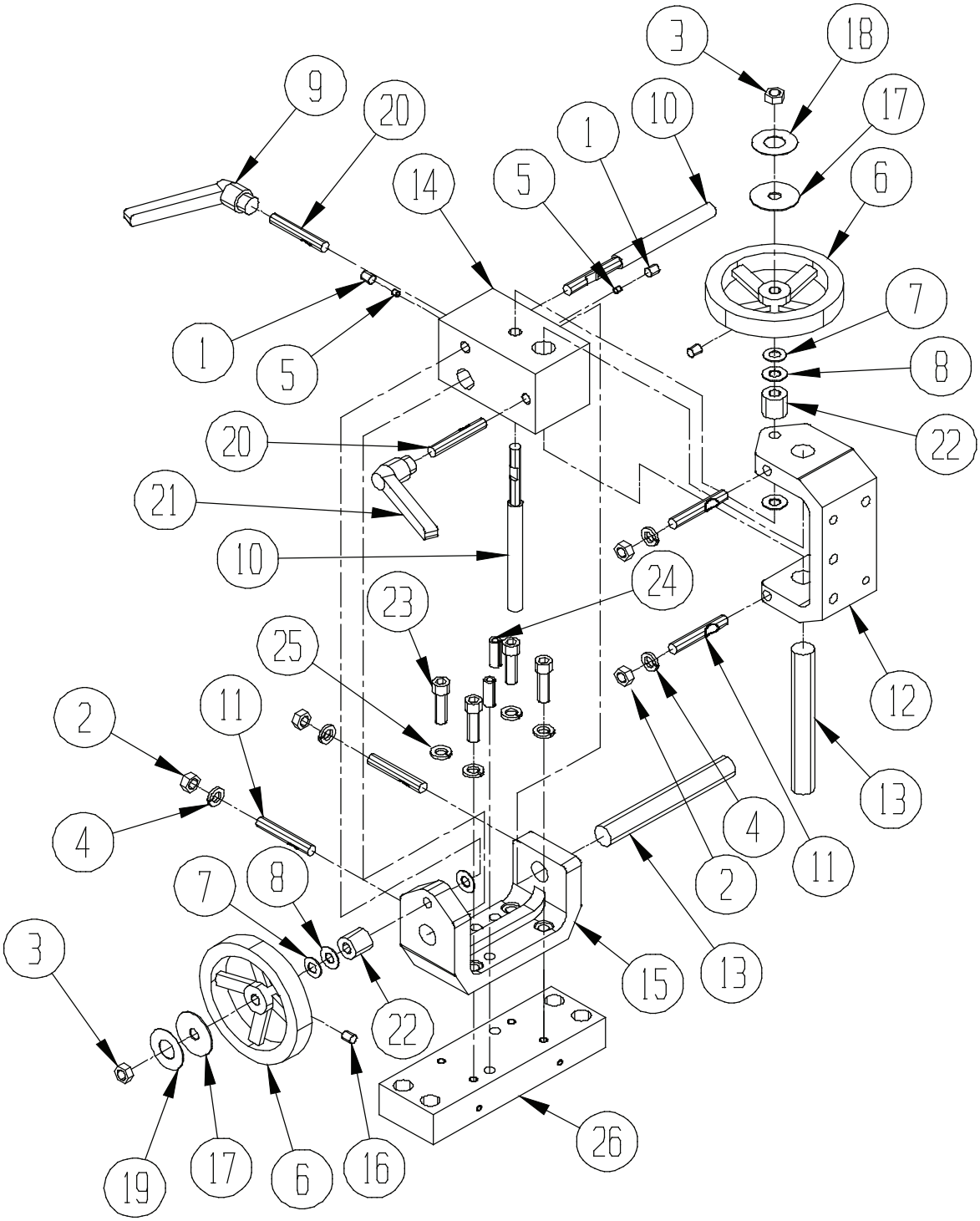


DIAGRAM NUMBER	PART NUMBER	DESCRIPTION
1	C311220	Socket Set Screw CPPT 5/16-18 x 3/4 Long
2	J371000	3/8-16 Hex Nut
3	J377000	3/8-16 Hex Jam Nylon Locknut
4	K371501	3/8 Split Lockwasher
5	3579109	3/16 Dia. Nylon Plug
6	3708148	Handwheel 4.5 Dia. .38 Bore
7	3709062	Bell V Washer .75 O. D. x .035 T
8	3709304	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

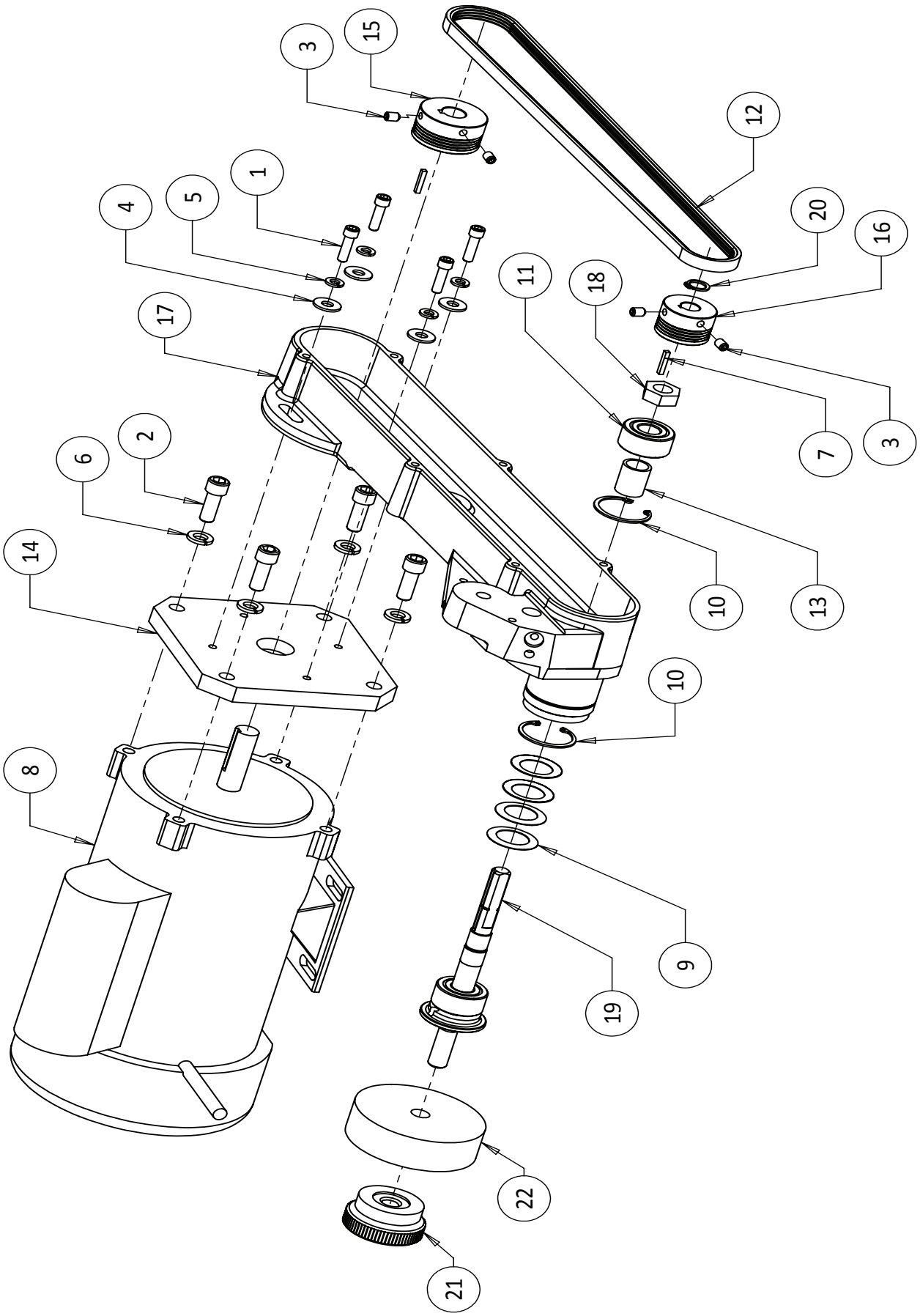


DIAGRAM NUMBER	PART NUMBER	DESCRIPTION
1	B251411	Socket Head Cap Screw 1/4-20 x 7/8 Long
2	B371611	Socket Head Cap Screw 3/8-16 x 1 Long
3	C250627	Socket Set Screw Cup Pt 1/4-20 x 3/8 Long - Lock Patch
4	K250001	1/4 Flat Washer SAE
5	K251501	1/4 Split Lockwasher
6	K371501	3/8 Split Lockwasher
7	R000376	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	6509494	9/16-18 Spindle Nut
19	6329523	Grinding Head Spindle Assembly
20	3708870	Retaining Ring - External .50 Shaft Heavy Duty
21	6509237	Grinding Wheel Knob
22		Grinding Wheel (See page 93)

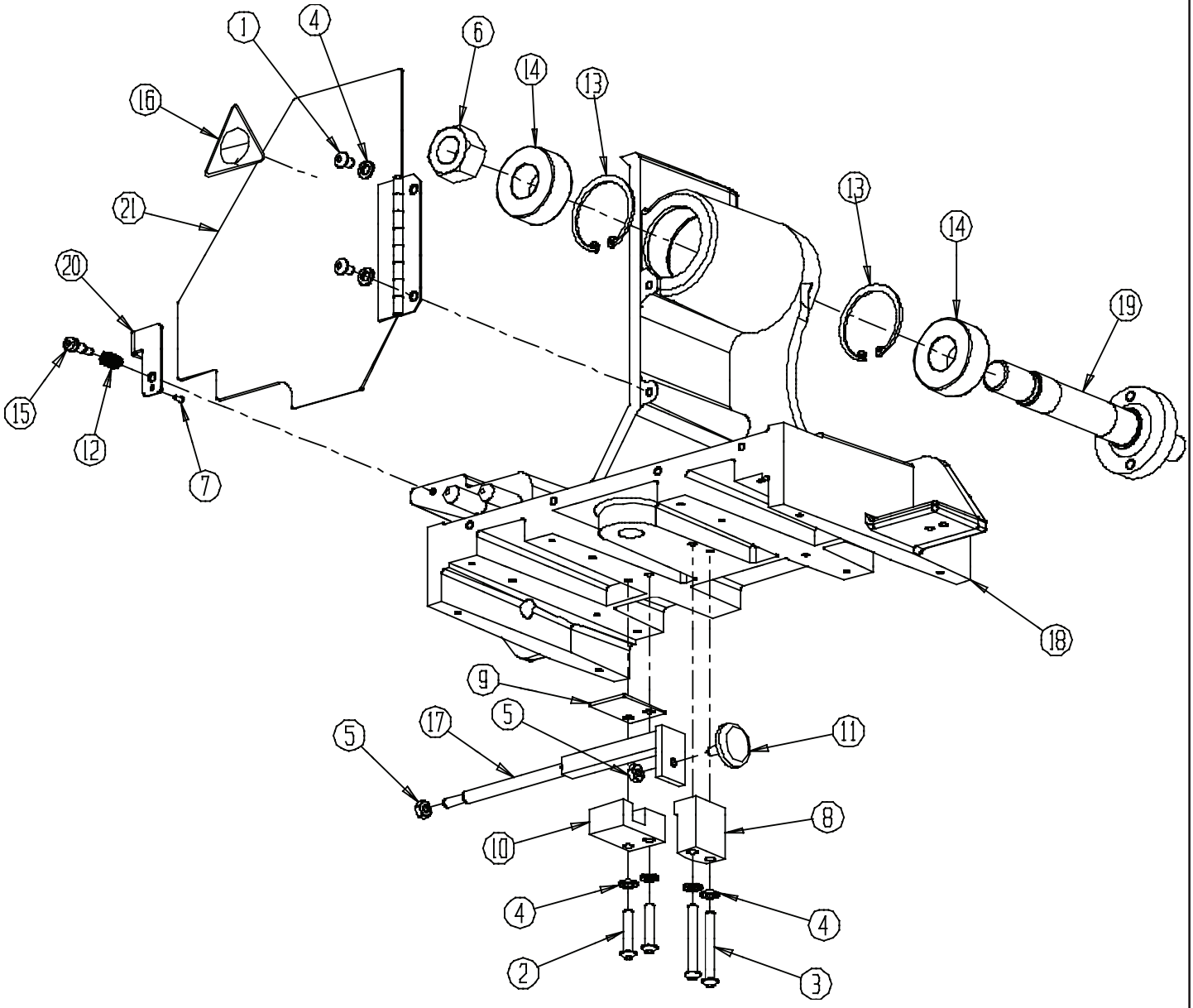

1
4
6
14
13
16
21
20
15
12
7
13
14
19
18
9
17
5
5
11
8
10
4
4
2
3

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

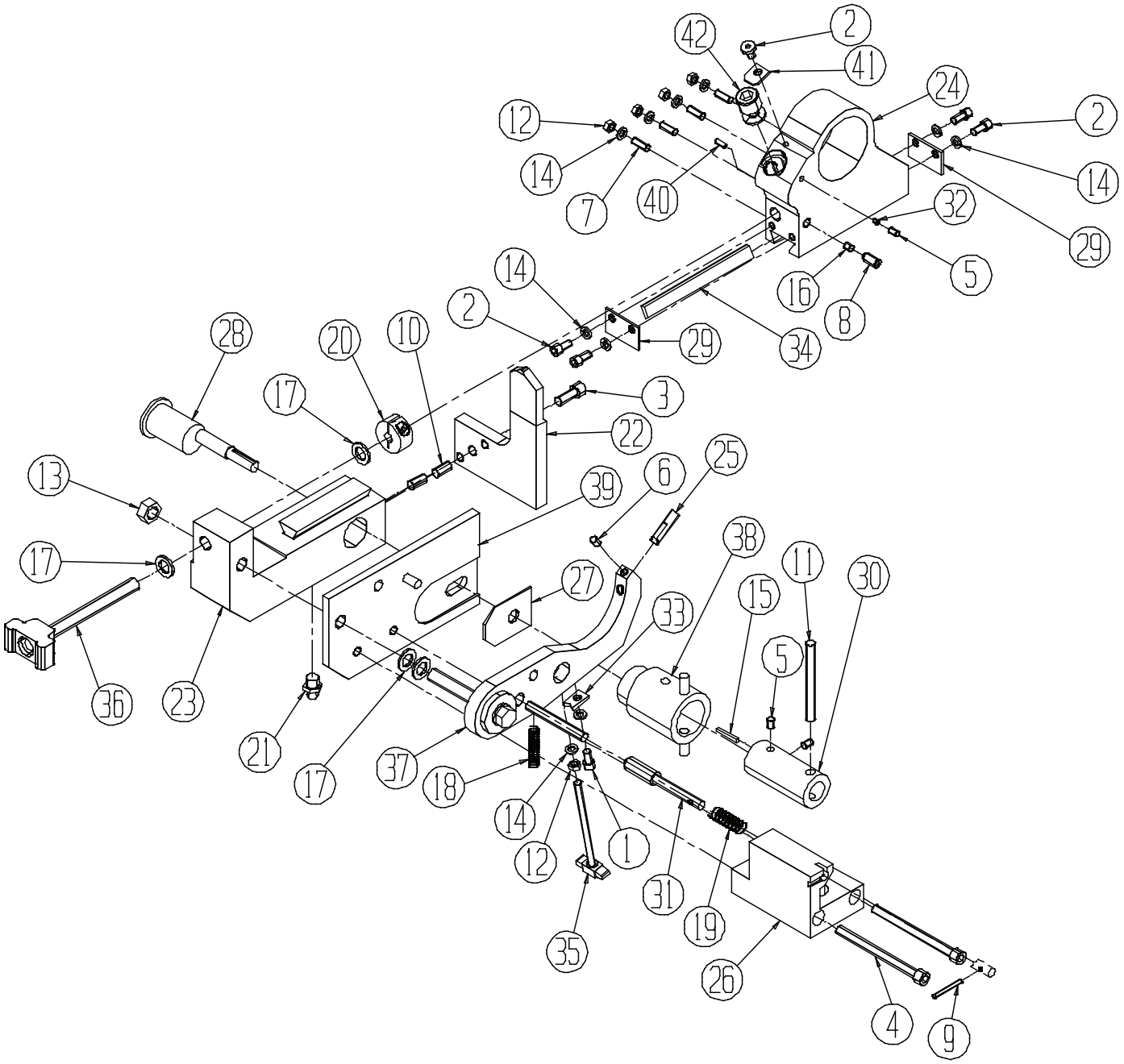
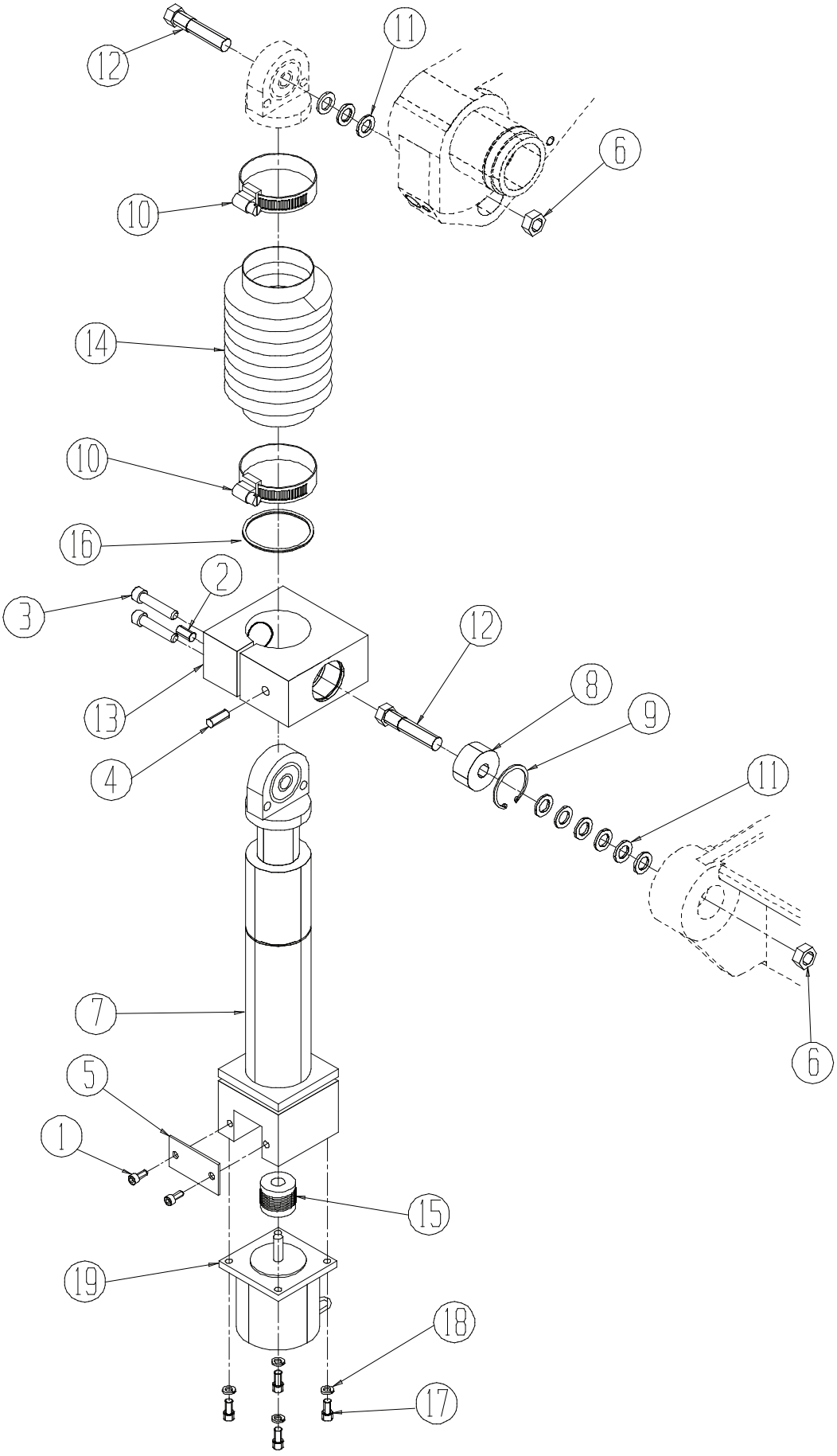

42
2
41
24
12
2
14
14
7
40
32
29
5
16
8
14
2
29
34
28
20
10
17
3
22
13
39
6
25
38
17
27
11
30
15
33
5
36
23
21
17
37
18
14
12
1
31
19
35
26
4
9

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


12
11
6
10
14
10
16
2
3
12
8
9
13
4
11
6
7
5
1
15
19
18
17

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	6529514	Stepper Infeed Motor/Cord Assembly

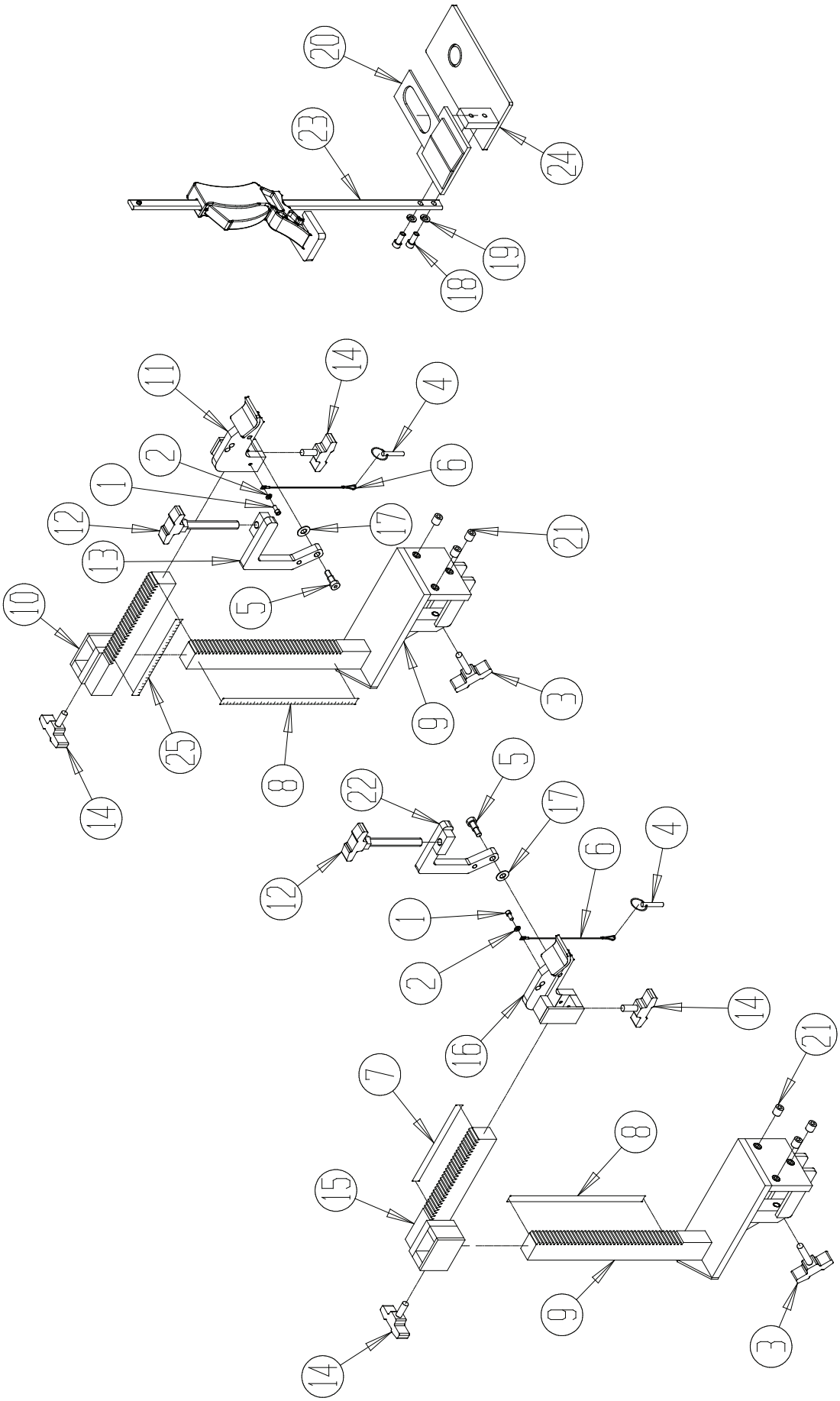

20
23
24
19
18
11
14
4
2
6
1
12
17
21
13
5
10
3
9
25
8
14
22
5
17
12
6
4
1
2
14
16
21
7
8
15
9
3
14

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

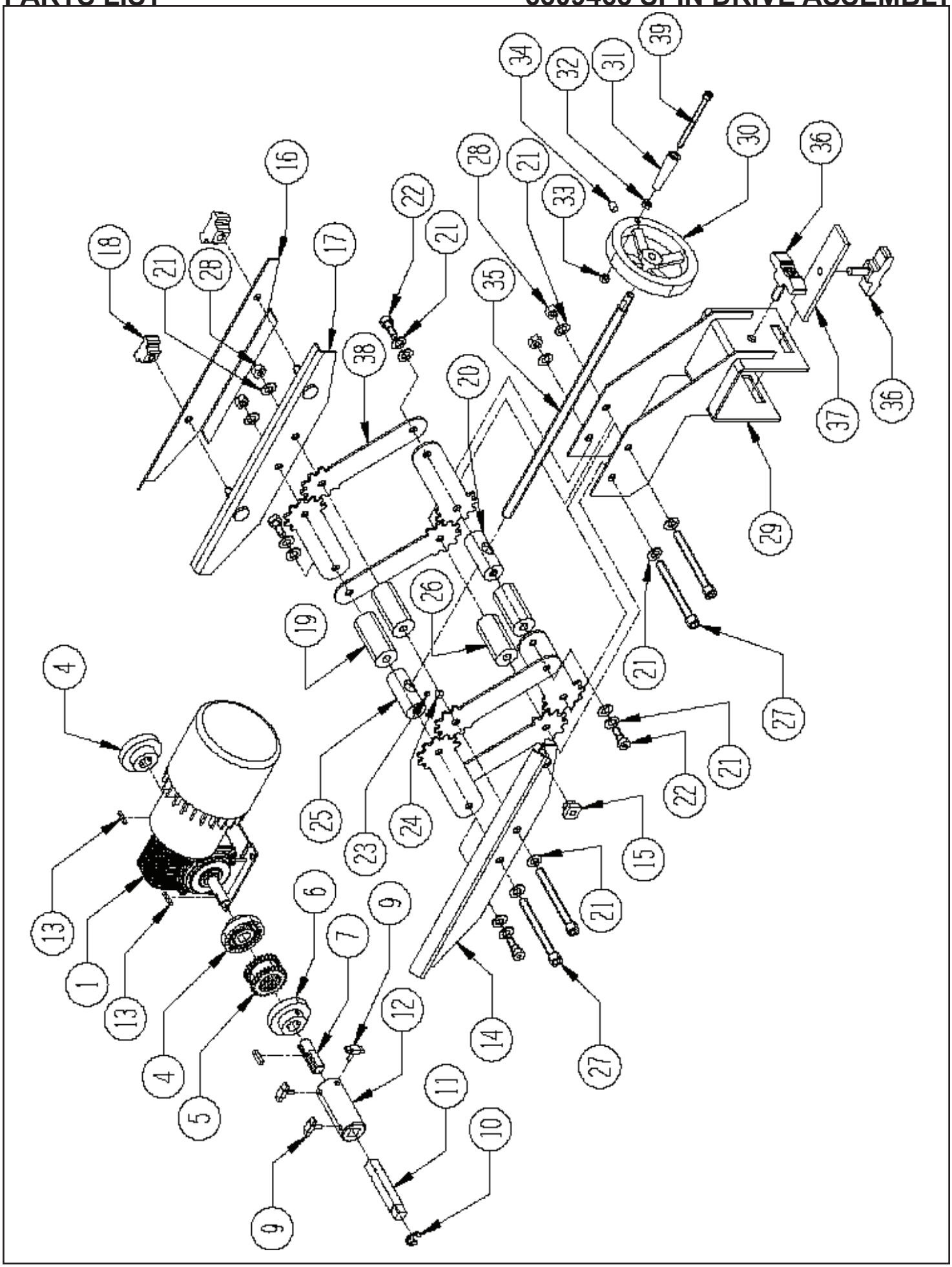

39
34
32
31
30
36
16
28
21
33
22
21
18
21
28
17
35
38
20
37
36
29
26
19
4
21
27
22
21
25
24
23
15
6
21
13
1
13
6
7
9
12
14
27
4
5
11
10
9

DIAGRAM NUMBER	PART NUMBER	DESCRIPTION
1	6329160	Gearmotor, DC (Spin)
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

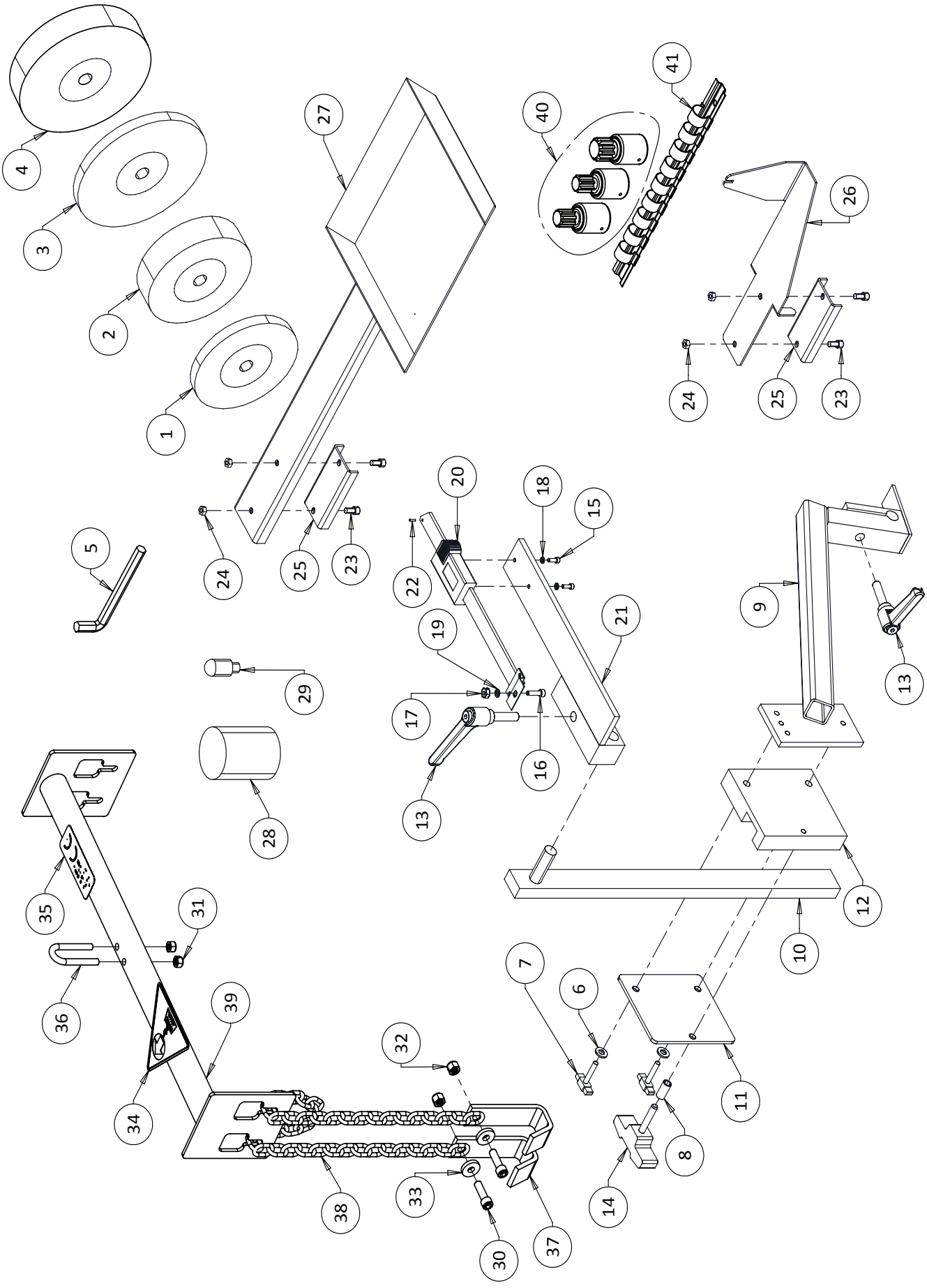

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41

DIAGRAM NUMBER	PART NUMBER	DESCRIPTION
1	3700088	Grinding Wheel 3.5" Dia. x .38 Wide
2	3700086	Grinding Wheel 3.5" Dia. x 1" Wide
3	3700087	Grinding Wheel 5" Dia. x .38" Wide
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	Spacer
9	6329555	Alignment Extension Weldment
10	6329518	Gage Bar Weldment
11	6509349	Retaining Plate
12	6509418	Plate-Pivot
13	3708094	Adjustable Handle 5/16-18 x 1.25 Long
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	6329556	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
30	B372011	Socker Head Cap Screw 3/8-16 x 1 1/4" Long
31	J317100	5/16-18 Lock Nut
32	J377100	3/8-16 Nylok Locknut
33	3599028	Flat Washer 1.00 OD x .375 ID x .188 Thick
34	3708456	Warning Capacity Decal
35	3708856	Spreader Bar Decal
36	3709316	5/16-18 x 3" U-Bolt 1 1/2"
37	6009102	Grab Hook
38	6329061	Chain
39	6509590	Spreader Bar Weldment
40	3706130	
41	3708205	

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

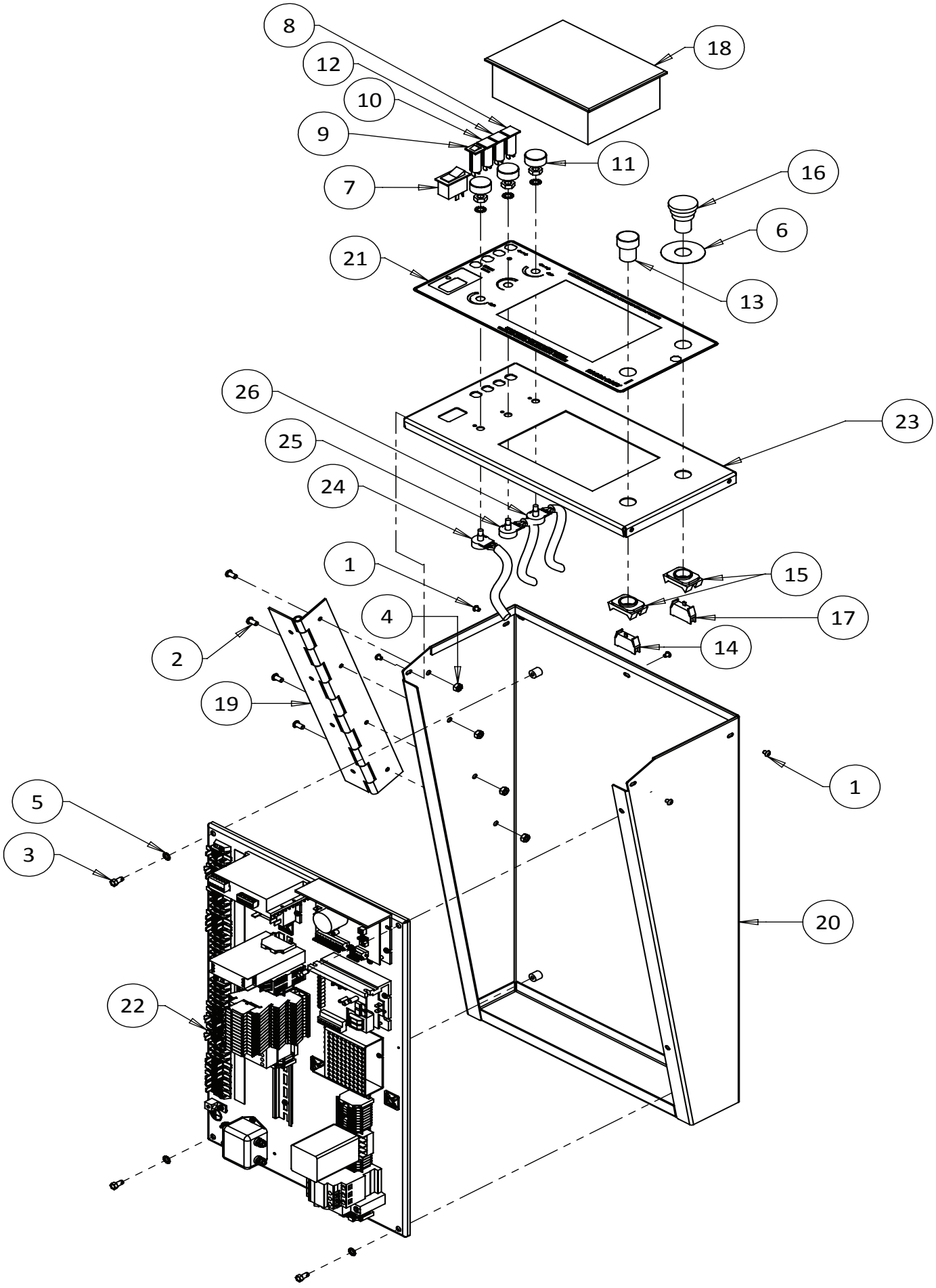

8
12
10
9
7
18
11
16
6
21
13
26
25
24
23
1
15
4
17
14
2
19
1
5
3
20
22

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	6529529	Electrical Panel
23	6529545	Control Panel Top Weldment
24	6529053	Potentiometer Assembly - Spin Speed
25	6529052	Potentiometer Assembly - Relief Torque
26	6529049	Potentiometer Assembly - Traverse Speed
27	3707624	Ground Terminal Block
28	3707626	Jumper Adjacent Terminal Block
29	3707628	Terminal Block 2 Conductor Grey

Cords Not Shown

	6329078	Main Power Cord
	6529036	Light Receptacle Cord
	6529037	Dust Collector Receptacle Cord
	6529039	Flasher Cord
	3707224	Cable Tie Mount
	3707225	Cable Tie 6.5 Long x .18 Wide
	3707255	Cable Tie 4.0 Long x .10 Wide

6529529 CONTROL PANEL SUB-ASSEMBLY

4/1/2014 6529529.SLDDRW 3:46 PM

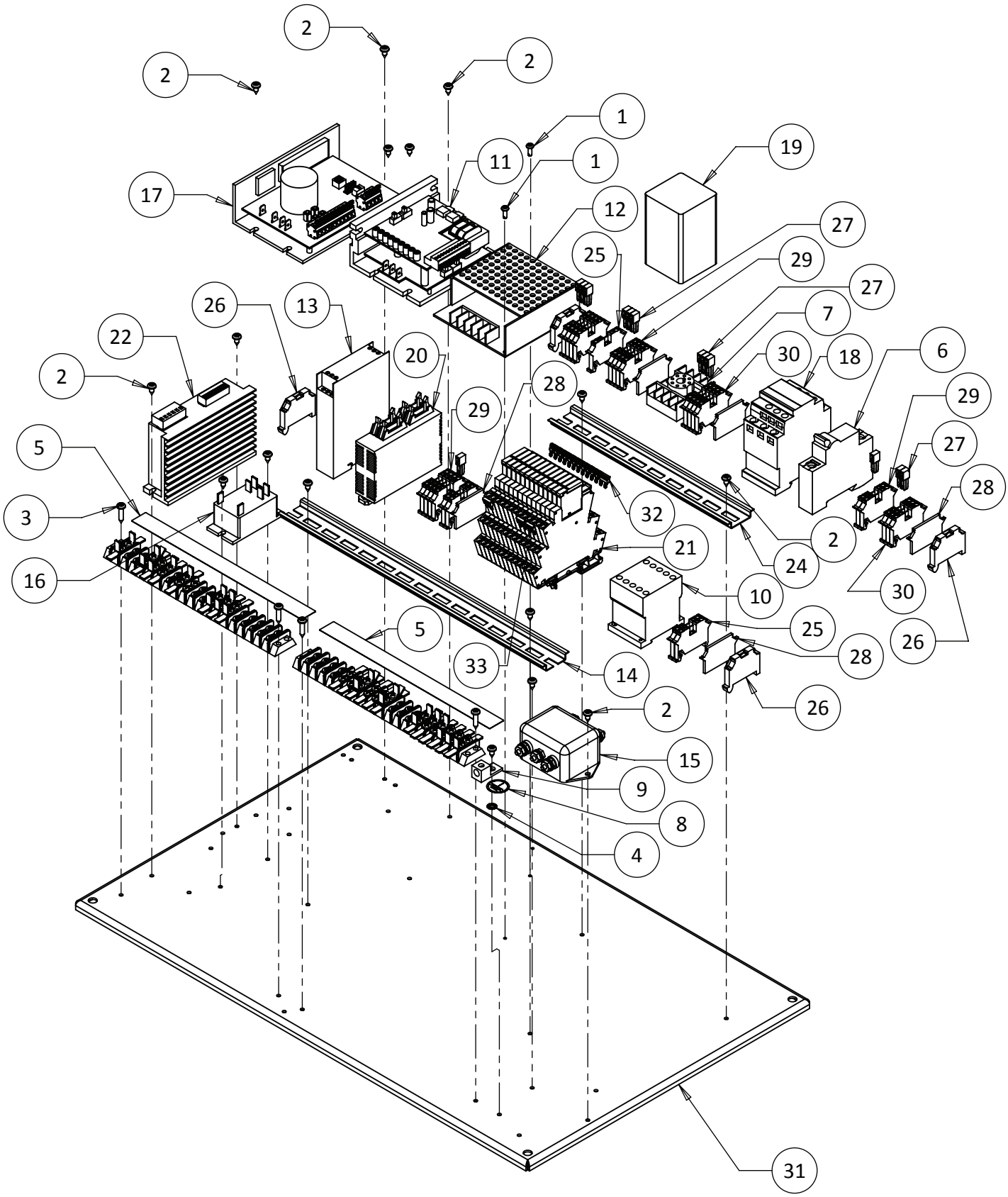
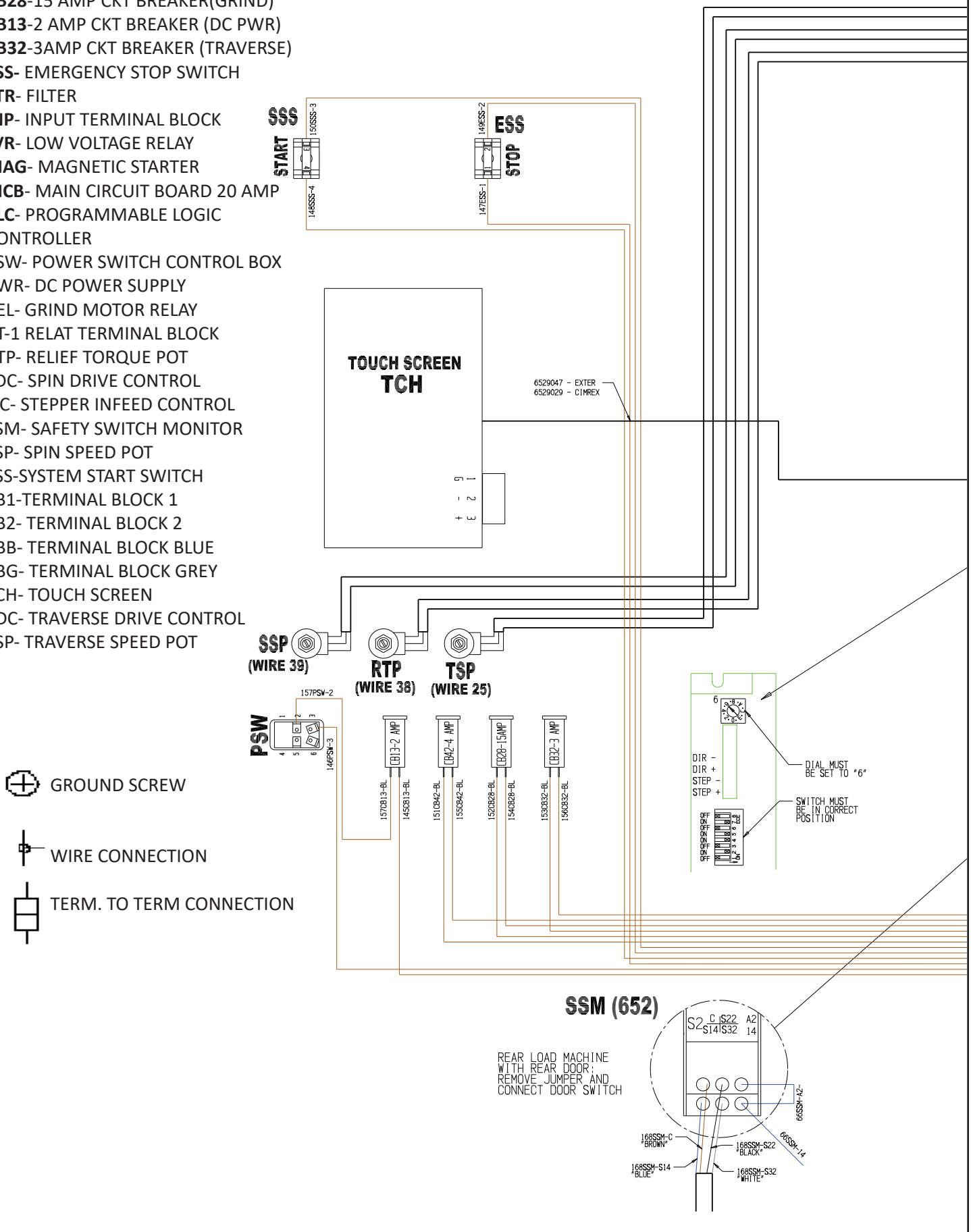
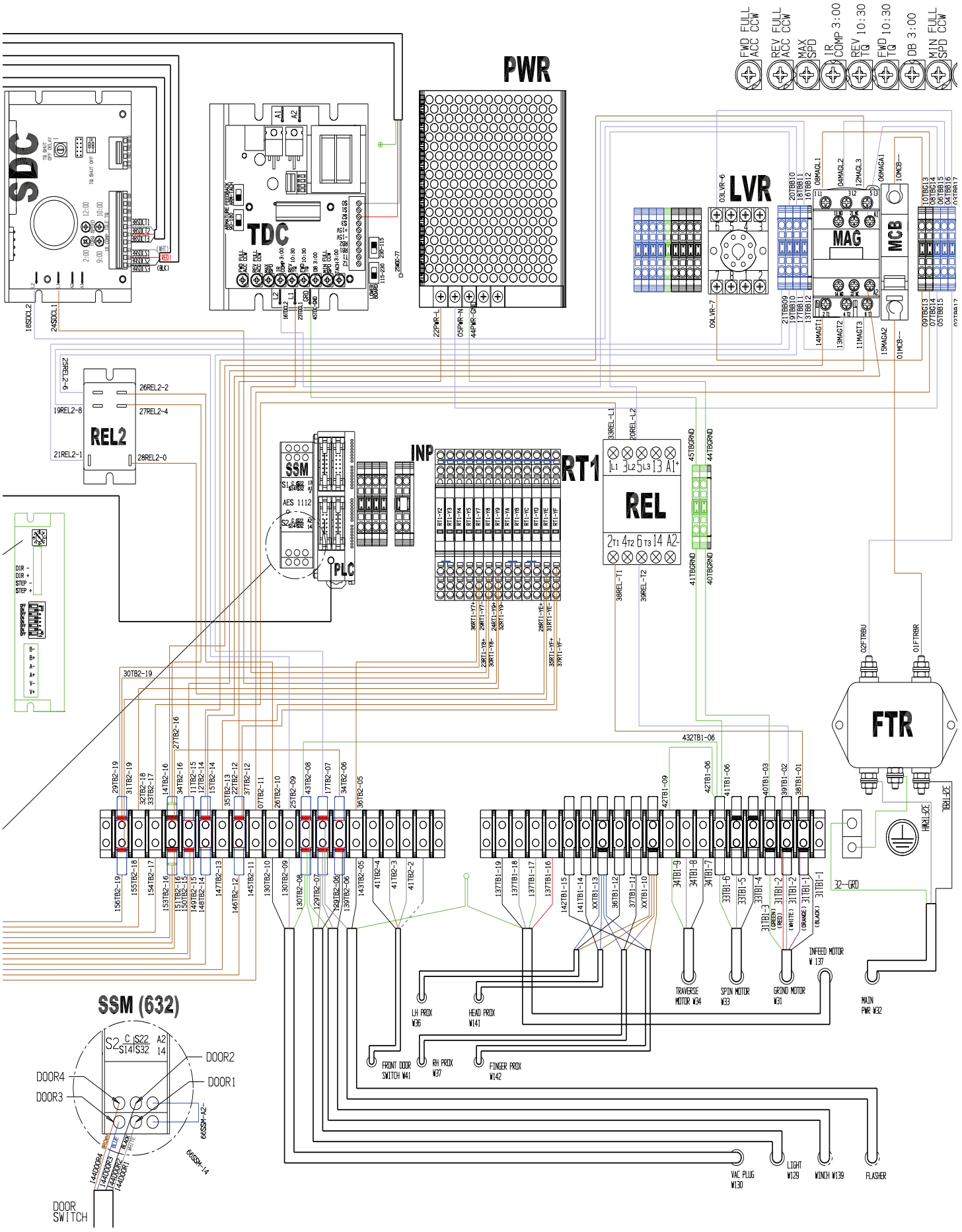


DIAGRAM NUMBER	PART NUMBER	DESCRIPTION
1	D130608	Pan Head Self-Tapping Screw #6 x 3/8 Long
2	D160866	Pan Head Self-Tapping Screw #8 x 1/2 Long
3	D161266	Pan Head Self-Tapping Screw #8 x 3/4 Long
4	R000480	#8 Lockwasher
5	55223	Terminal Strip Decal
6	80259	20-Amp Main Circuit Breaker
7	3707073	8-Pin socket
8	3707163	Primary Ground Decal
9	3707164	Primary Ground Lug
10	3707186	24VDC Contactor
11	3707697	Traverse Control Board
12	3707839	Power Supply 40 Watt - 24VDC
13	3707328	Door Safety Switch Monitor
14	3707378	14" Din Rail
15	3707764	Power Line Filter
16	3707447	Relay - DPDT 120VAC Coil
17	3707830	Spin/Relief Control Board
18	3707556	Magnetic Starter
19	3707688	Low Voltage Sensor Relay
20	3707569	Aromat PLC
21	3706148	Terminal Block Relay 6A
	3706152	Replacement Relay
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	6529031	Electrical Sub Panel
32	3706150	13 Pole Jumper
33	3706149	2 Pole Jumper
	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

WIRING DIAGRAM

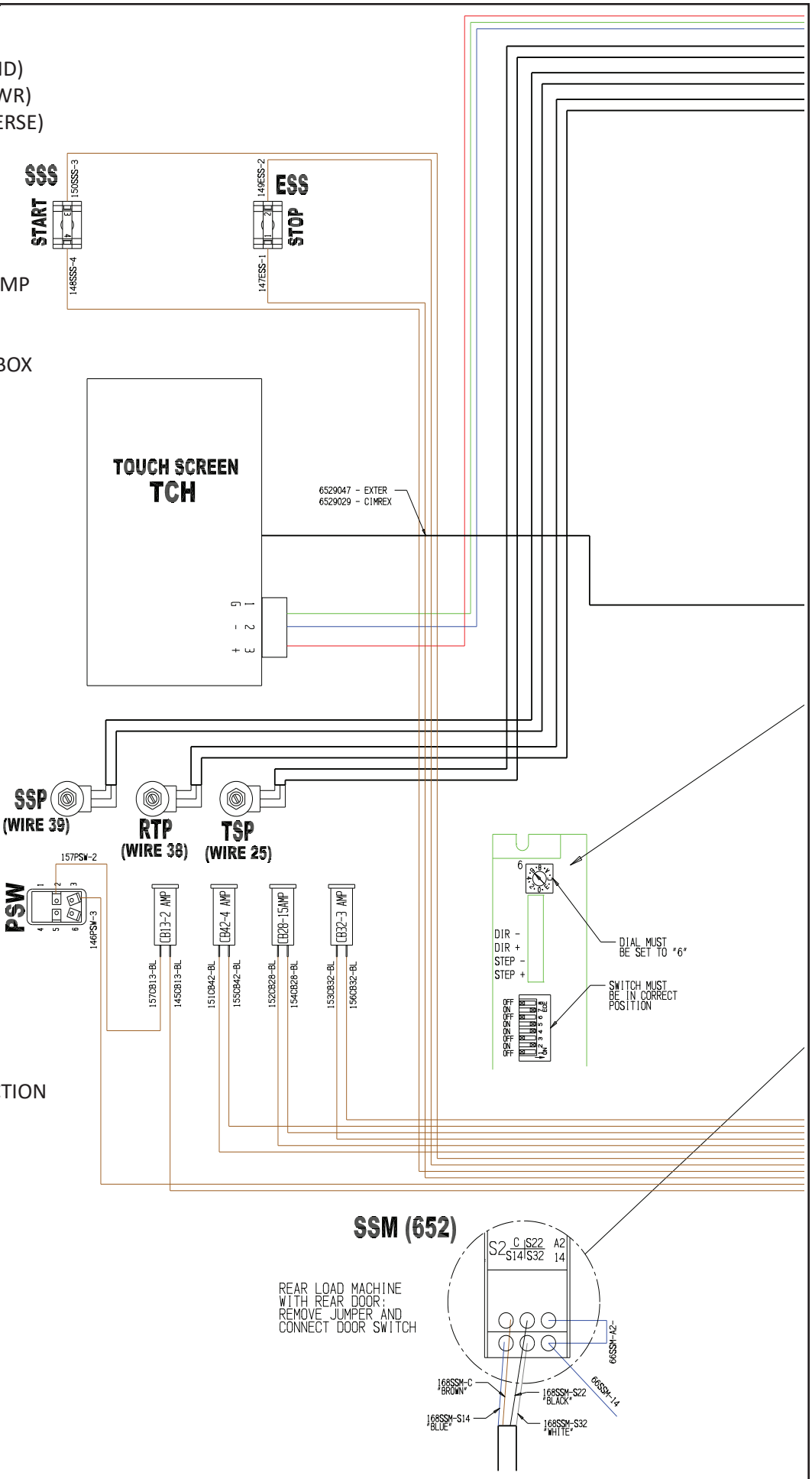
CB42-4 AMP CKT BREAKER(SPIN)
CB28-15 AMP CKT BREAKER(GRIND)
CB13-2 AMP CKT BREAKER (DC PWR)
CB32-3AMP CKT BREAKER (TRAVERSE)
ESS- EMERGENCY STOP SWITCH
FTR- FILTER
INP- INPUT TERMINAL BLOCK
LVR- LOW VOLTAGE RELAY
MAG- MAGNETIC STARTER
MCB- MAIN CIRCUIT BOARD 20 AMP
PLC- PROGRAMMABLE LOGIC CONTROLLER
PSW- POWER SWITCH CONTROL BOX
PWR- DC POWER SUPPLY
REL- GRIND MOTOR RELAY
RT-1 RELAT TERMINAL BLOCK
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




SDC
TDC
PWR
LVR
MAG
MCB
REL2
INP
RT1
REL
PLC
SSM
FTR
SSM (632)
DOOR2
DOOR1
DOOR4
DOOR3
DOOR SWITCH
FWD ACC FULL CCW
REV ACC FULL CCW
MAX SPD
IR COMP 3:00
REV TQ 10:30
FWD TQ 10:30
DB 3:00
MIN SPD FULL CCW
LH PROX W36
HEAD PROX W141
FRONT DOOR SWITCH W41
RH PROX W37
FINGER PROX W142
TRAVERSE MOTOR W94
SPIN MOTOR W33
GRIND MOTOR W31
INFEED MOTOR W 137
MAIN PWR W32
VAC PLUG W130
LIGHT W129
WINCH W139
FLASHER

WIRING DIAGRAM

CB42-4 AMP CKT BREAKER(SPIN)
CB28-15 AMP CKT BREAKER(GRIND)
CB13-2 AMP CKT BREAKER (DC PWR)
CB32-3AMP CKT BREAKER (TRAVERSE)
ESS- EMERGENCY STOP SWITCH
FTR- FILTER
INP- INPUT TERMINAL BLOCK
LVR- LOW VOLTAGE RELAY
MAG- MAGNETIC STARTER
MCB- MAIN CIRCUIT BOARD 20 AMP
PLC- PROGRAMMABLE LOGIC CONTROLLER
PSW- POWER SWITCH CONTROL BOX
PWR- DC POWER SUPPLY
REL- GRIND MOTOR RELAY
RT-1 RELAT TERMINAL BLOCK
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



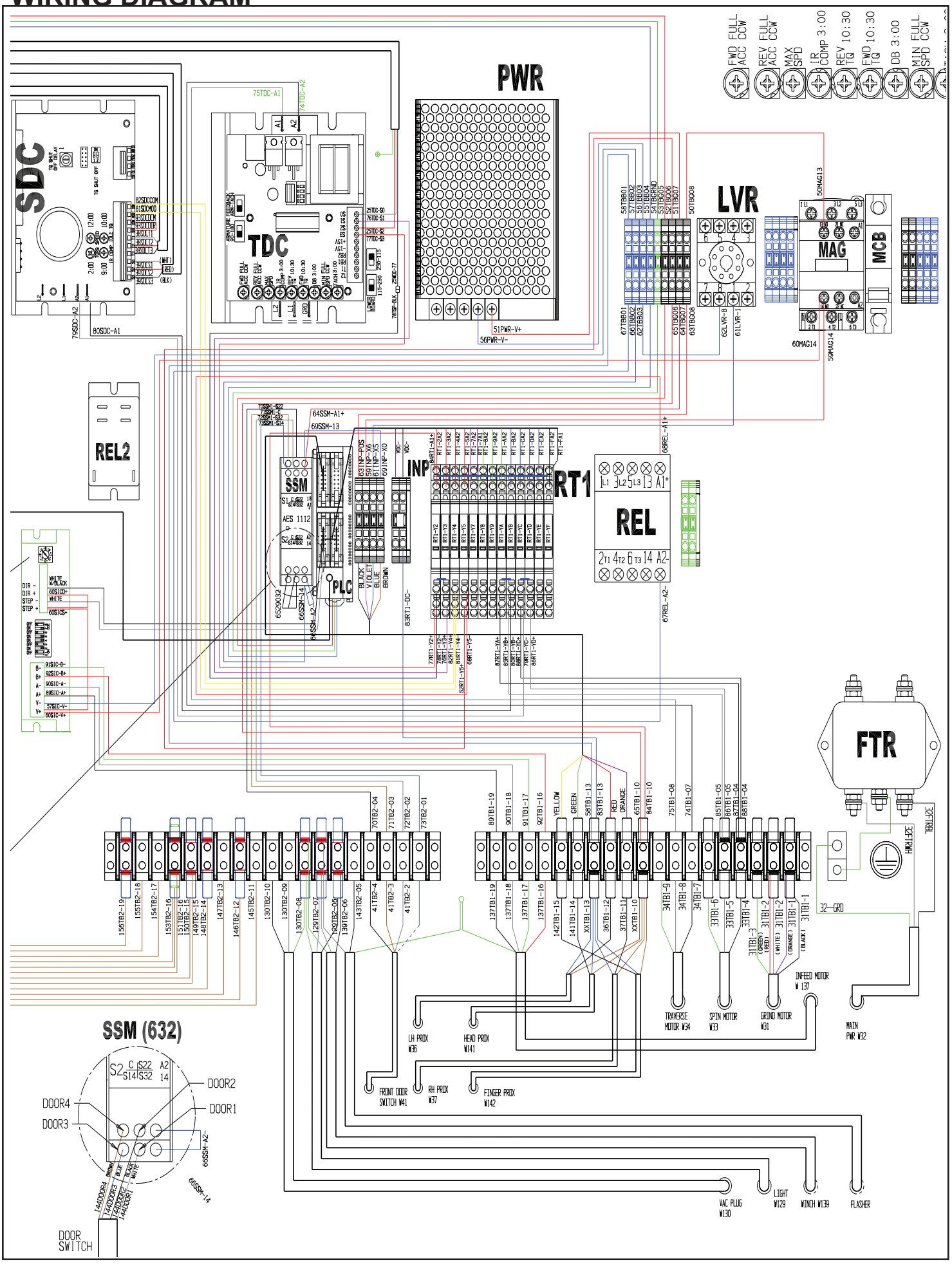
GROUND SCREW

WIRE CONNECTION

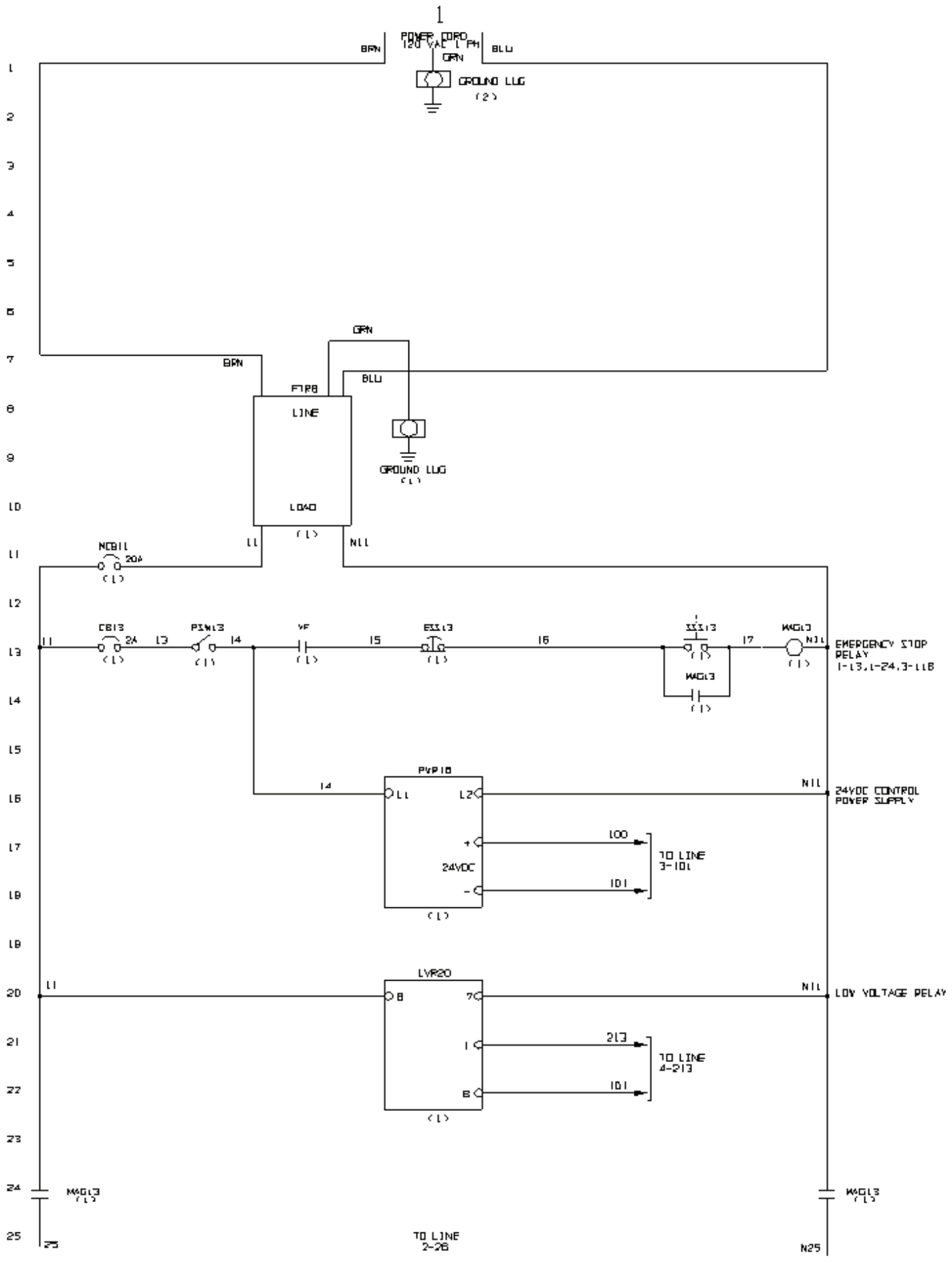
TERM. TO TERM CONNECTION

WIRING DIAGRAM

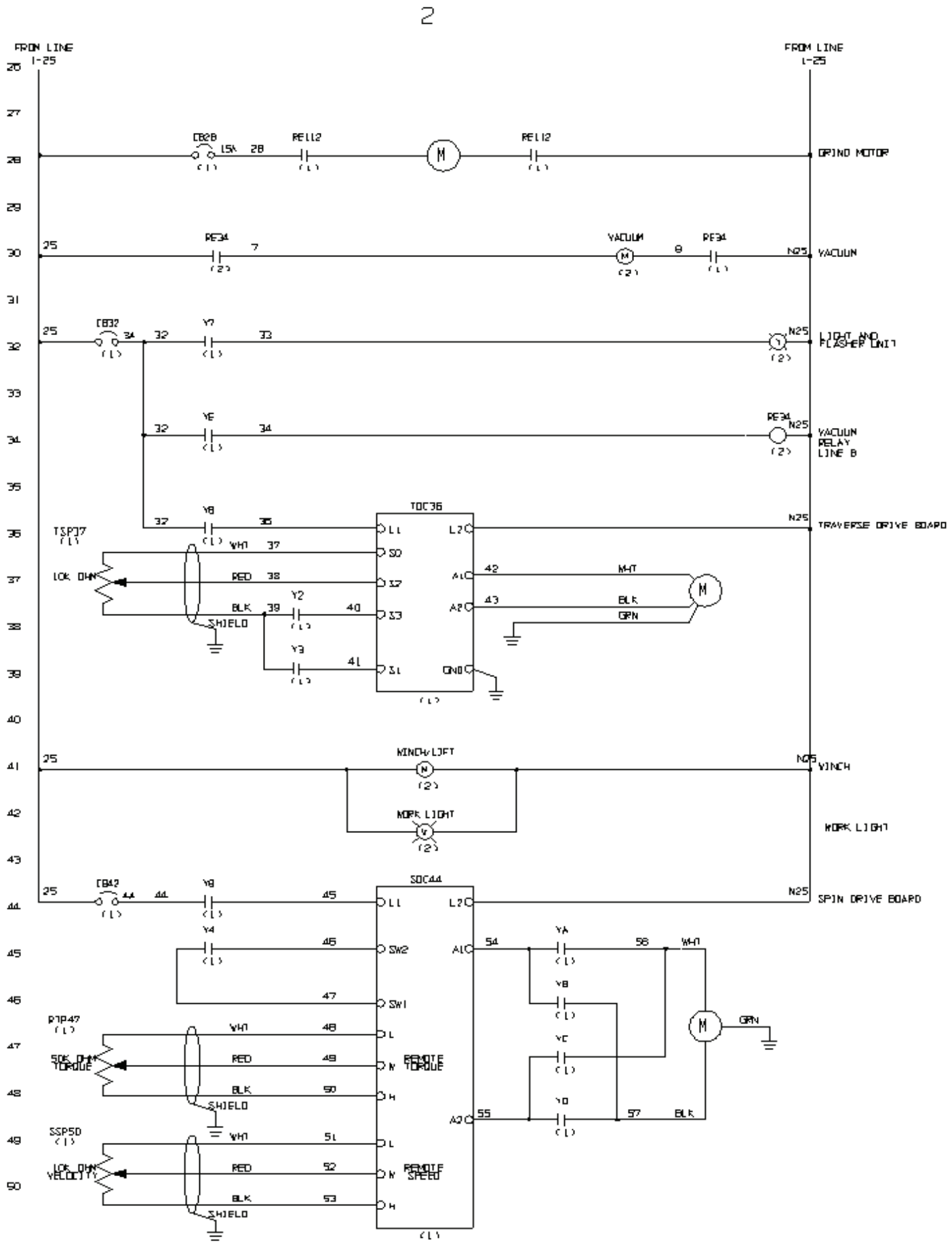
6524525 - DC



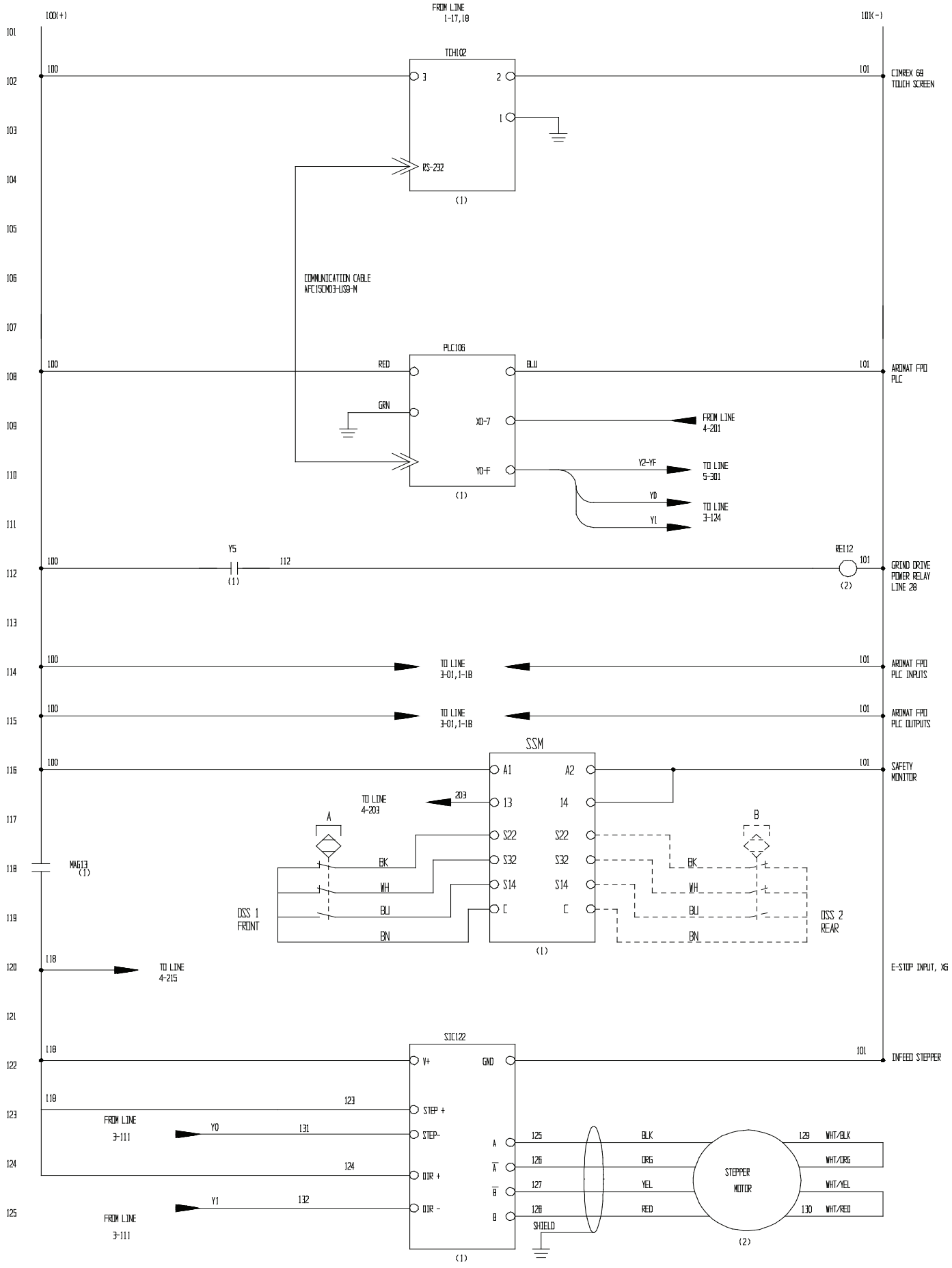
WIRING SCHEMATIC



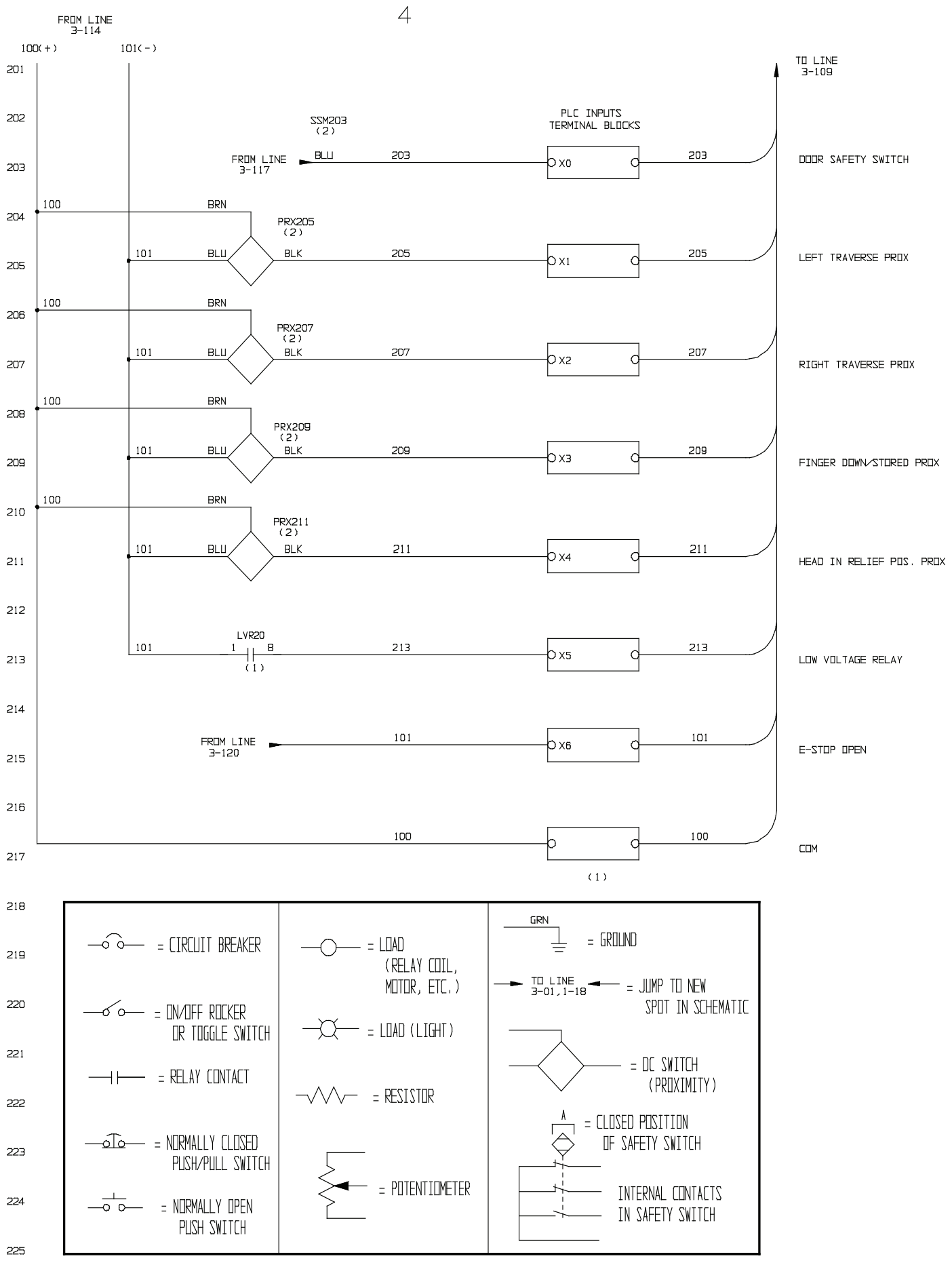
WIRING SCHEMATIC



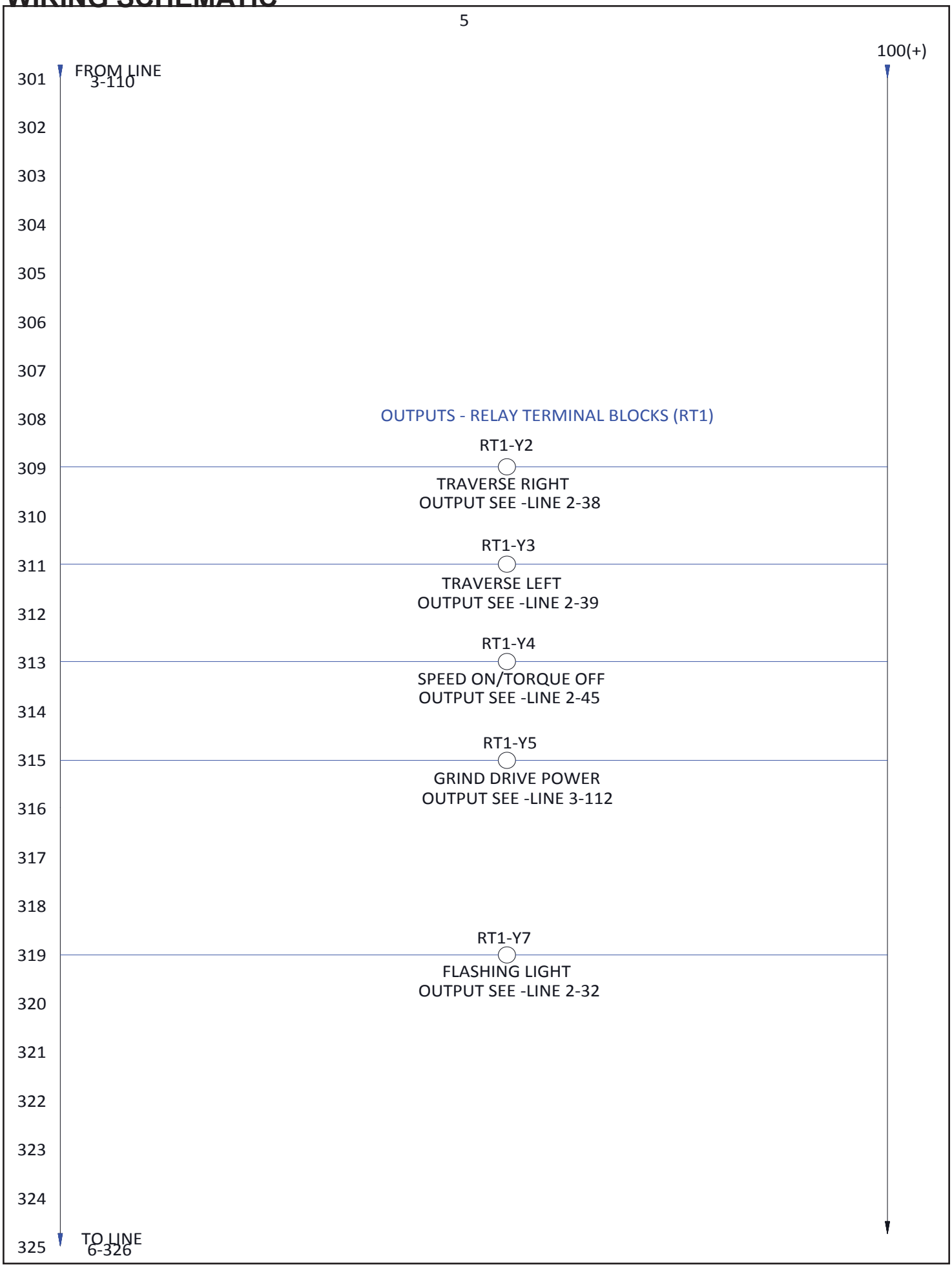
WIRING SCHEMATIC



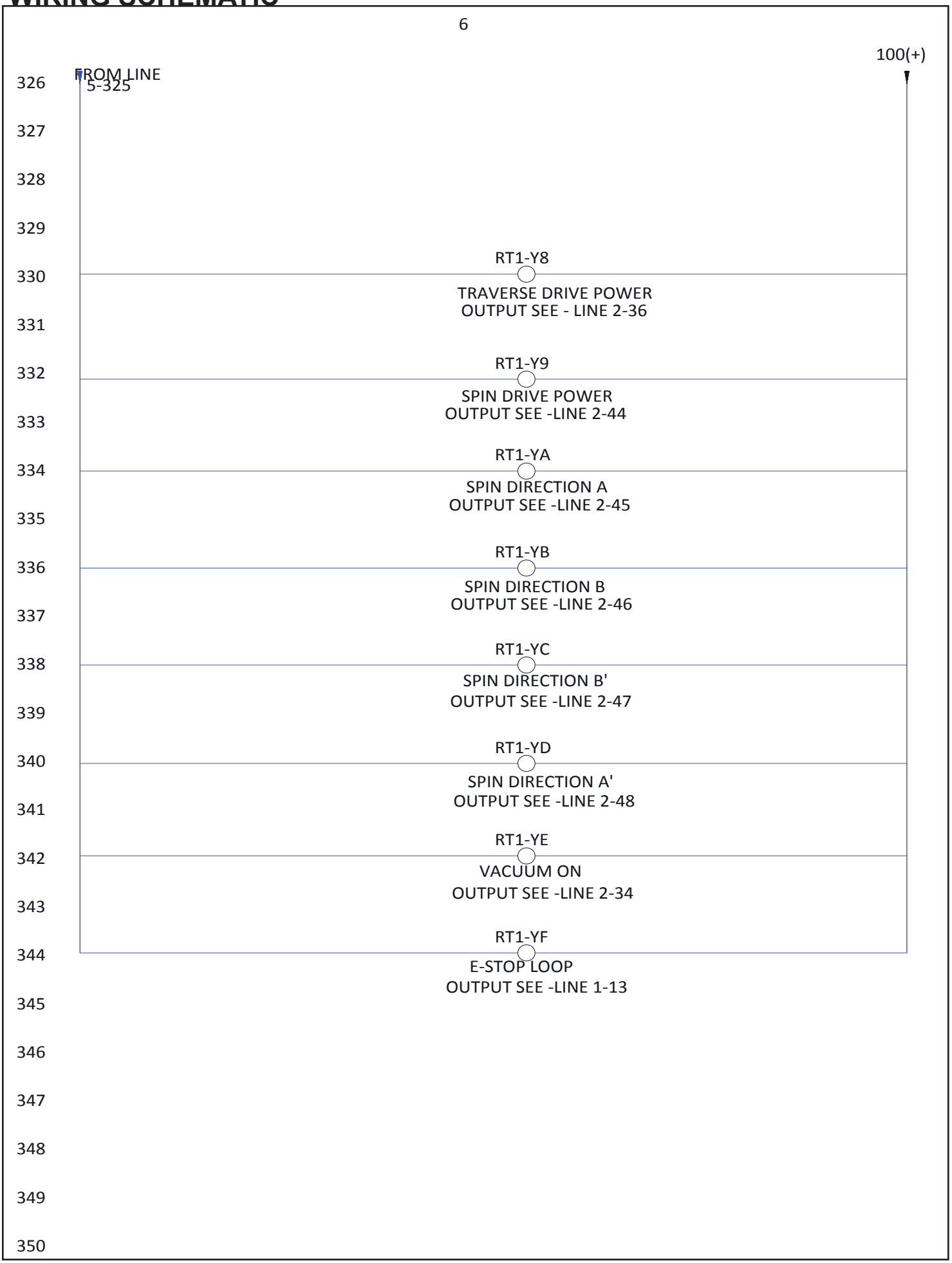
WIRING SCHEMATIC



WIRING SCHEMATIC



WIRING SCHEMATIC

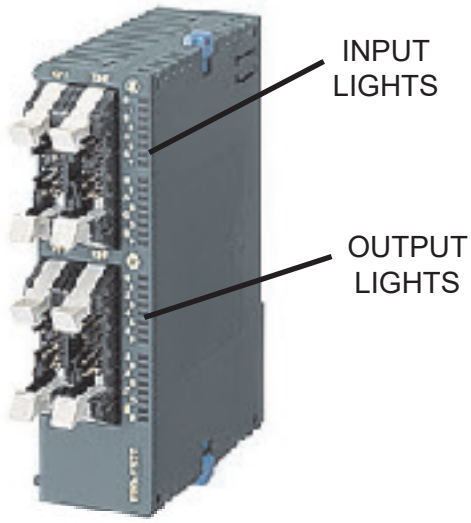


PLC INPUT AND OUTPUT LIGHTS

PLC INPUT LIGHTS

X0 DOOR SAFETY SWITCH
LIT WHEN DOORS CLOSED
X1 LEFT TRAVERSE PROX
LIT WHEN ACTIVATED
X2 RIGHT TRAVERSE PROX
LIT WHEN ACTIVATED
X3 FINGER POSITION PROX
LIT WHEN FINGER DOWN
X4 HEAD POSITION PRX
LIT WHEN HEAD IN RELIEF
X5 LOW VOLTAGE RELAY
LIT WHEN RELAY IS GREEN
X6 E – STOP
LIT WHEN E-STOP IS DOWN – PUSHED IN

PLC



PLC OUTPUT LIGHTS

Y0 STEP SIGNAL TO INFEED DRIVE
LIT WHEN INFEED MOVING (DIM)
Y1 DIRECTION SIGNAL TO INFEED DRIVE
LIT WHEN FEEDING OUT
Y2 TRAVERSE RIGHT TO TRAVERSE BOARD
LIT WHEN OUTPUTING
Y3 TRAVERSE LEFT TO TRAVERSE BOARD
LIT WHEN OUTPUTING
Y4 SPIN ON / TORQUE OFF TO SPIN BOARD
LIT WHEN IN SPIN POSITION
Y5 GRIND DRIVE POWER
LIT WHEN OUTPUTING
Y6 SPARE
Y7 FLASHING LIGHT
LIT WHEN OUTPUTING
Y8 TRAVERSE DRIVE POWER
LIT WHEN OUTPUTING
Y9 SPIN DRIVE POWER
LIT WHEN OUTPUTNG
YA SPIN DRIVE DIRECTION A (ON WITH YD)
LIT WHEN SPIN SET TO CW
YB SPIN DRIVE DIRECTION B (ON WITH YC)
LIT WHEN SPIN SET TO CCW
YC SPIN DRIVE DIRECTION B' (ON WITH YB)
LIT WHEN SPIN SET TO CCW
YD SPIN DRIVE DIRECTION A' (ON WITH YA)
LIT WHEN SPIN SET TO CW
YE VACUUM POWER
LIT WHEN OUTPUTING
YF E – STOP LOOP
LIT WHEN PROGRAM RUNNING & LVR IS GREEN