

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

**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



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



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

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

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

# SAFETY INSTRUCTIONS



## IMPROPER USE OF GRINDING WHEEL MAY CAUSE BREAKAGE AND SERIOUS INJURY.

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

### DO

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

### DON'T

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



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

This machine is intended for grinding the reel of reel type mower units ONLY. Any use other than this may cause personal injury and void the warranty.



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

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

Do not use compressed air to clean grinding dust from the machine. This dust can cause personal injury as well as damage to the grinder. Machine is for indoor use only. Do not use a power washer to clean the machine.



### Low Voltage Relay

The grinder is equipped with a 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.

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-Separate Drawings Included in the Product Packet

## SERVICE DATA

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

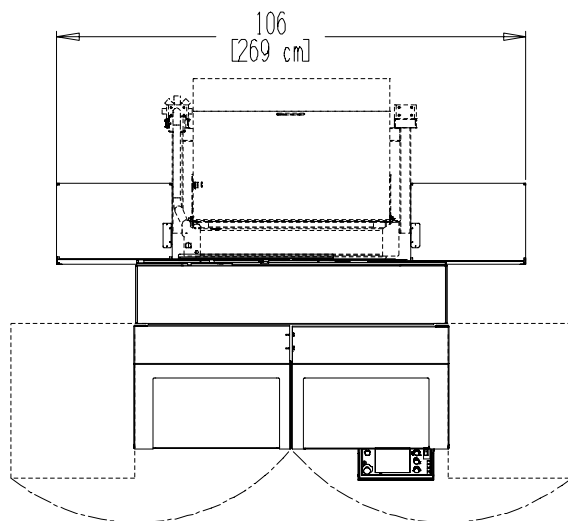
If the machine is equipped with one, the winch boom is held in place during shipping with a steel brace. Remove and discard this brace. Remove the shrink wrap and cable tie that holds the winch trolley to the beam.

## POSITION BASE

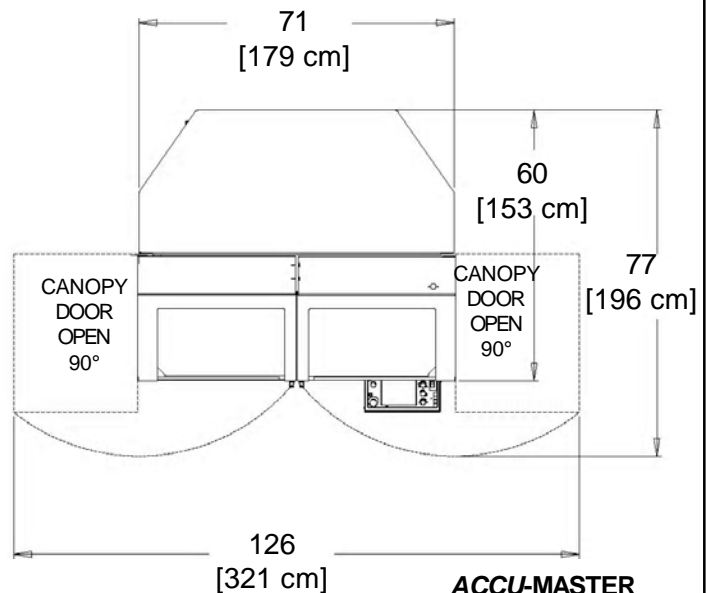
The base should be placed on a relatively level concrete floor, with ample ceiling height to allow for the installation of the unit. Do not place the unit across two concrete slab seams or across a large crack.

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.

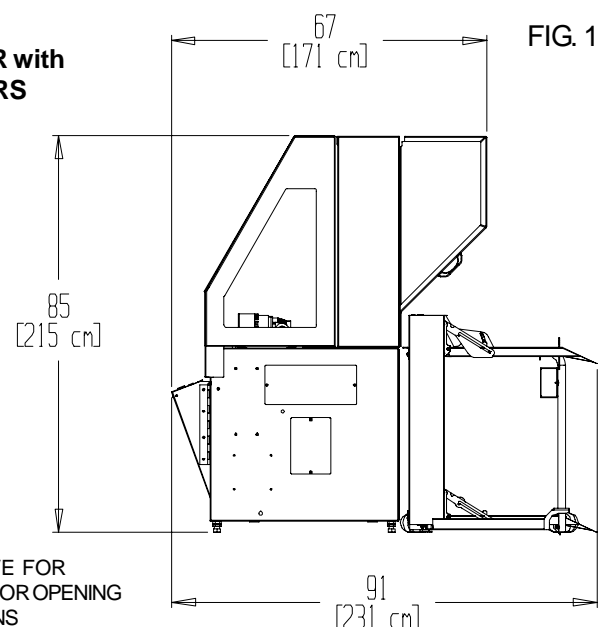
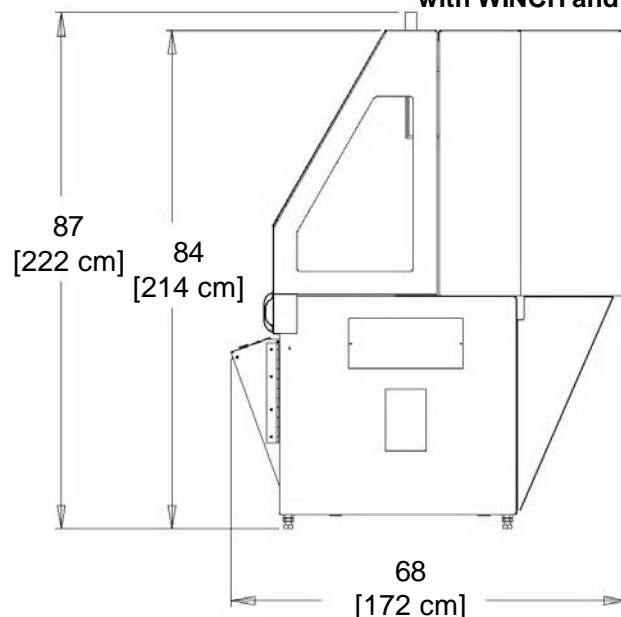
**ACCU-MASTER with  
REAR DOORS**



SEE ABOVE FOR  
FRONT DOOR OPENING  
DIMENSIONS



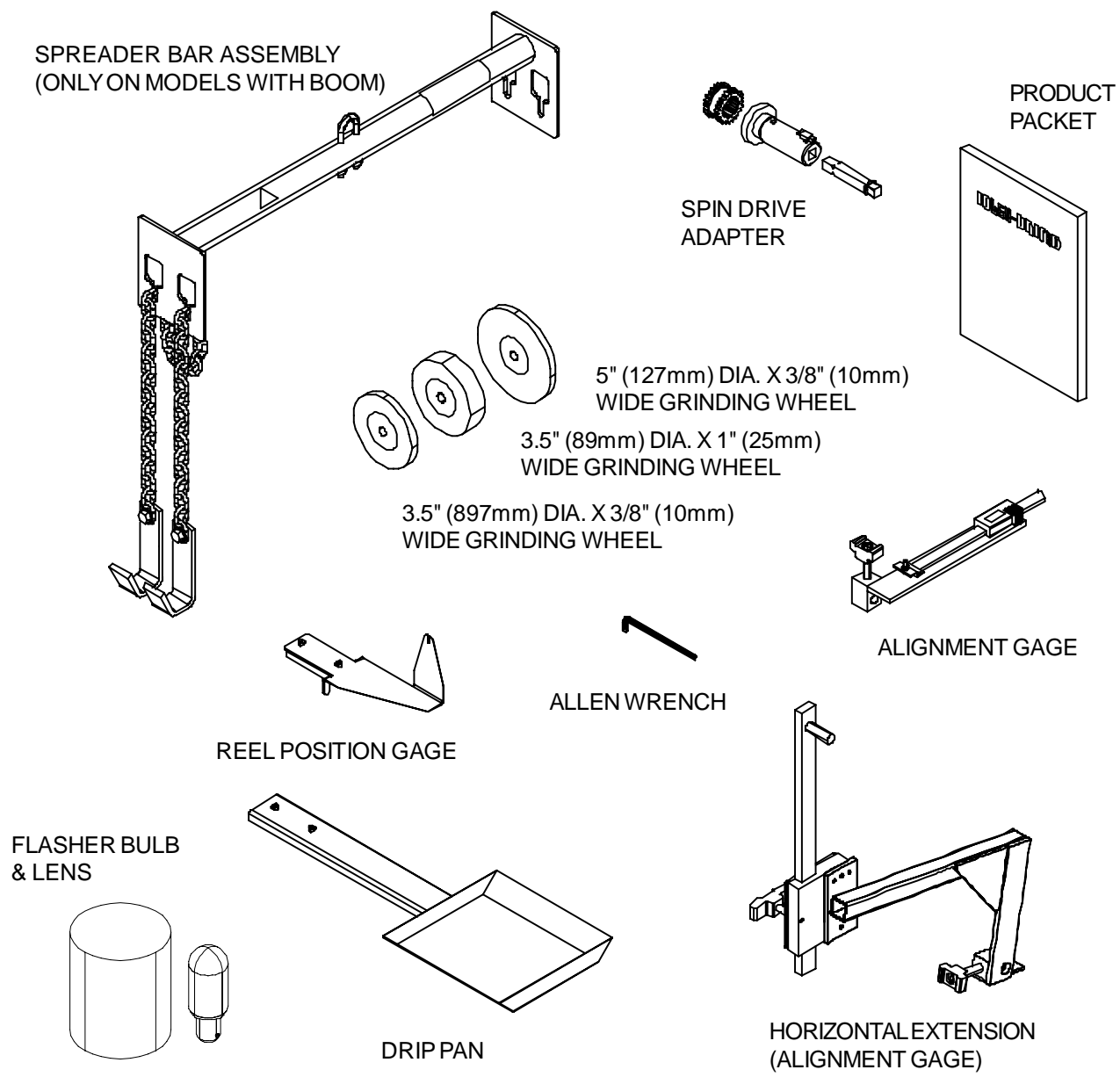
**ACCU-MASTER  
with WINCH and BOOM**



**FIG. 1**

# ASSEMBLY INSTRUCTIONS (Continued)

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



## 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 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.

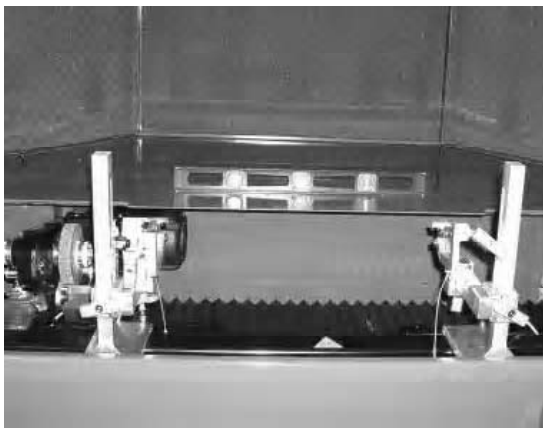


FIG. 4



FIG. 5

### INSTALL THE FLASHER LIGHT

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

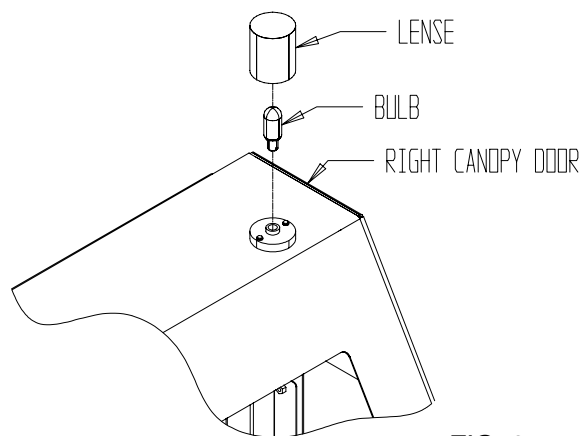


FIG. 6



## ASSEMBLY INSTRUCTIONS (Continued)

### APPLY POWER



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

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

**220 Volt Model Only.** For 220 Volt Applications order Part No. 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 INTERRUPTER (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.

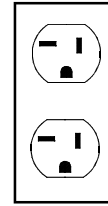


FIG. 7

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)

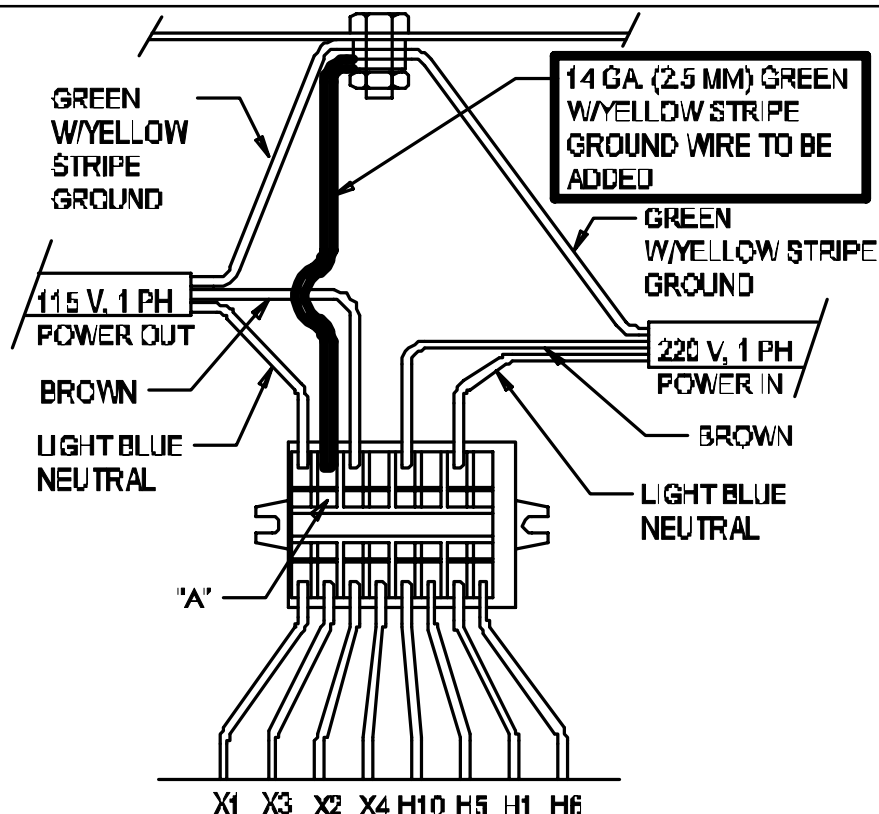
For 220 V 50 or 60Hz applications Product No. 6520916 should be ordered.

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.**



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

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

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

FIG. 8

### IMPORTANT GROUNDING INSTRUCTIONS

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

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

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

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



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

# PERIODIC MAINTENANCE

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

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

1. Clean the tank and filter of the vacuum system weekly or more often depending on the number of reels ground.
2. Use the grease fitting provided to grease the dove tail with high quality lithium grease monthly. Wipe off excess grease. See FIG. 9.
3. Wipe and re-oil with spray lubricant, the grinding wheel diameter adjusting lead screw every three months. Wipe off all excess lubricant. See FIG. 9.
4. Check the gib adjustment on the Grinding wheel diameter adjustment every 3 months. See FIG. 9.
5. Inspect the Grinding wheel Poly-V belt for cracking and adjust the belt tension per procedure called out in the adjustment section every six months.
6. Wipe and relube with never-seez, the vertical and horizontal alignment shafts and lead screws, every six months. See FIG. 10.
7. Lift the bellows and wipe off the bearing rails monthly. Lubricate linear bearing, follow the lubrication procedure on the following pages. Generally, this will be every six months to a year.

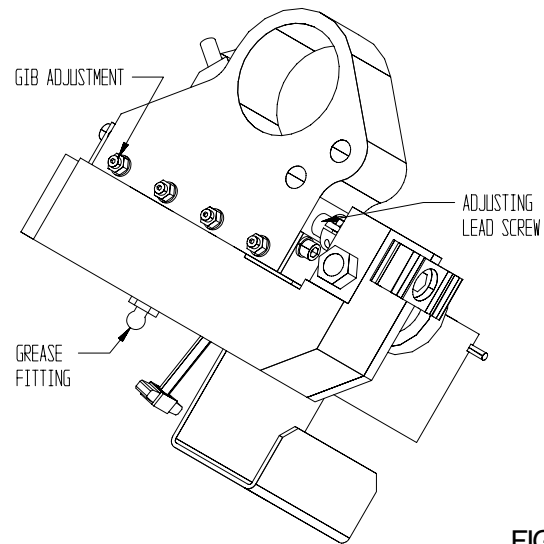


FIG. 9

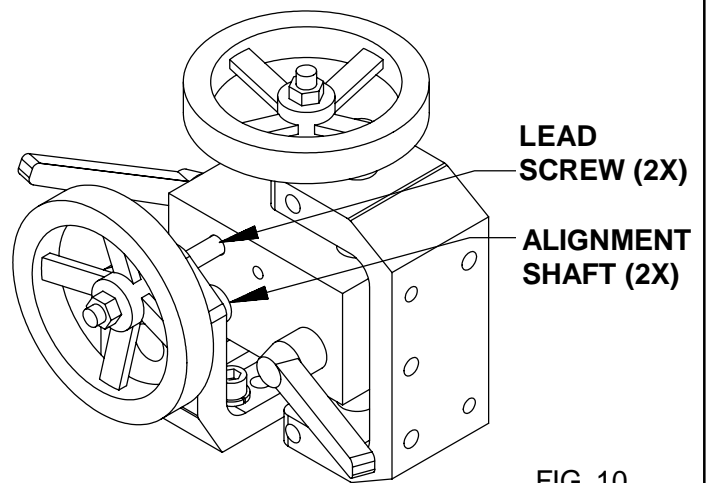


FIG. 10

# STORAGE PROCEDURE

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

## BEFORE STORING THE GRINDER:

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

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

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

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

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

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

## BRINGING THE UNIT BACK INTO SERVICE:

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

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

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

-Check for damaged or missing parts.

# LUBRICATION

## LUBRICATION OF LINEAR BEARINGS

STEP 1--Thoroughly clean the shafts.

STEP 2--Flood spray the two shafts with a spray lubricant (do not use a teflon based lubricant) until the lubricant is dripping off the shafts. See FIG. 11 Then run the carriage back and forth through its range of travel. This will carry the lubricant into the bearings.

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

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

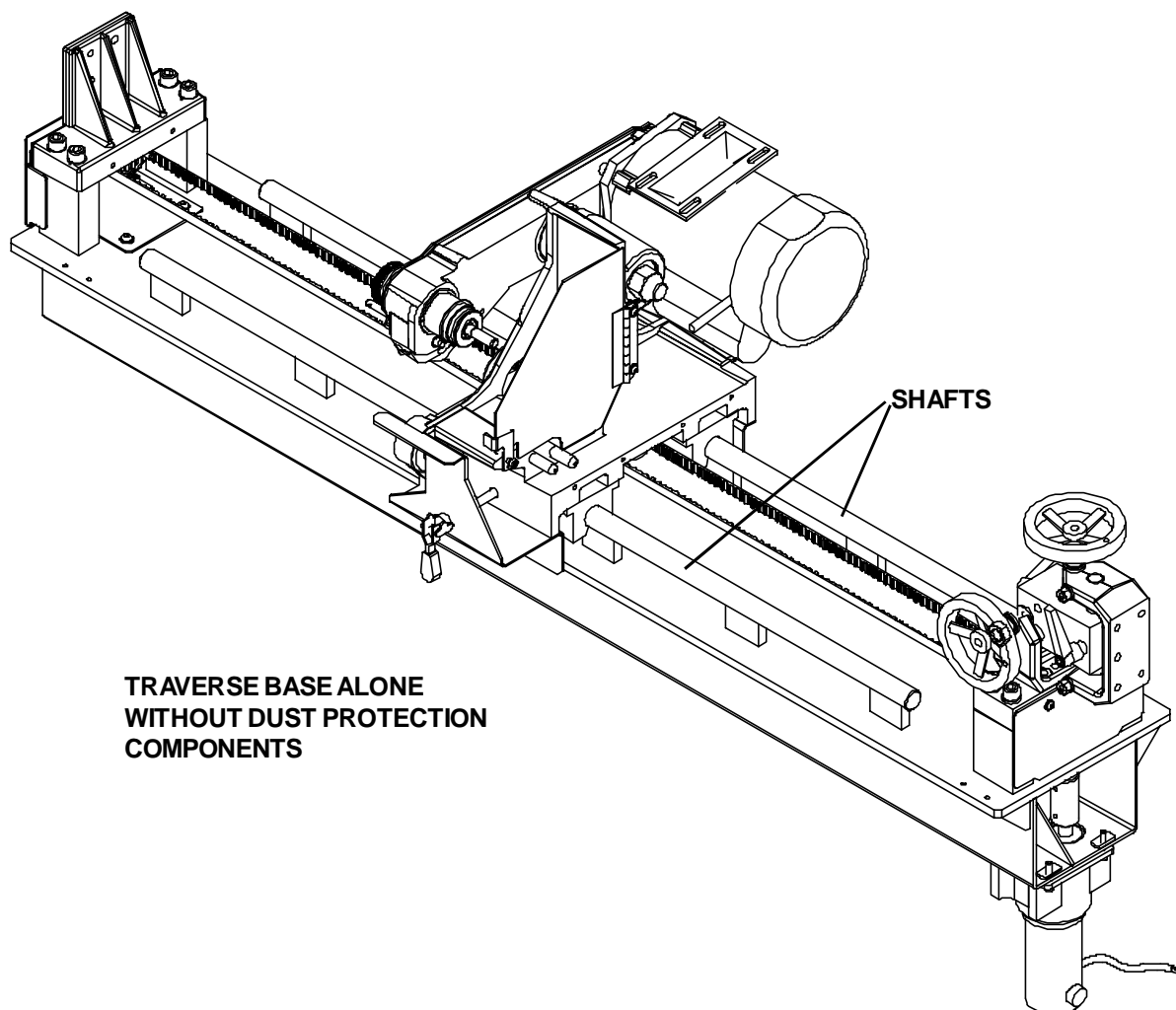


FIG. 11

## MAINTENANCE (Continued)

### 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)

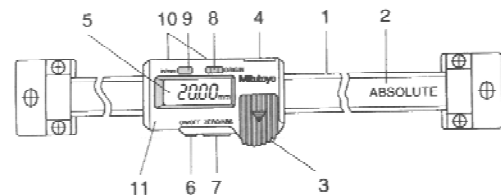
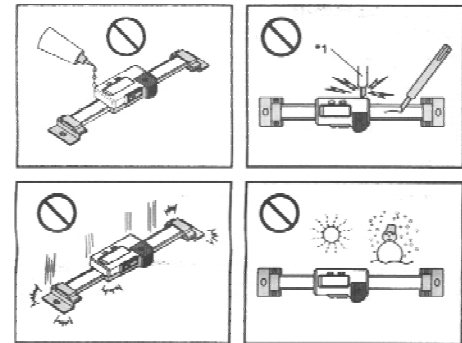
## DIGITAL GAGE

### Important

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

### Description of Parts

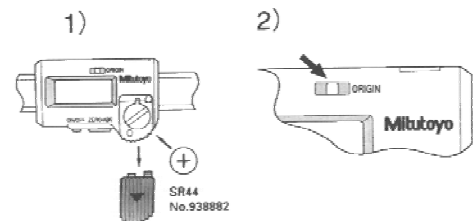
- |                        |                      |
|------------------------|----------------------|
| 1. Beam                | 2. Main Scale        |
| 3. Battery compartment | 4. Output Connection |
| 5. Display             | 6. ON/OFF Power      |
| 7. ZERO/ABS switch     | 8. Origin Switch     |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



### Battery Installation and Origin Setting

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

- 1) To install the battery, remove the compartment lid and install the SR44 battery with its positive side facing up. After the battery is installed, set the origin.
- 2) To set the origin, move the slider to an area you wish to set as your origin. Turn the power on. Hold the ORIGIN switch down for more than one second. The "0.00" display appears, indicating origin setting is complete. The origin will be retained even if the power is turned off.



### Incremental (INC) & Absolute (ABS) mode

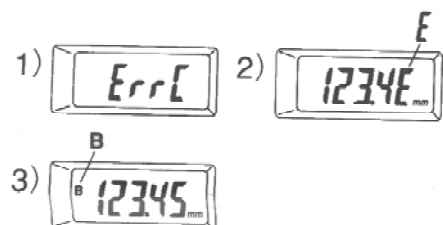
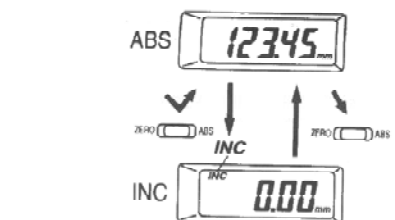
The LCD will display measurements from the origin when turned on (ABS mode). To set the origin see above. The display can be set to zero at any desired position by pressing the ZERO/ABS switch. INC indicator will appear in the display (INC mode), permitting measurements from this zero point. To return to the ABS mode hold the ZERO/ABS button 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.



## ADJUSTMENTS (Continued)

### CARRIAGE LINEAR BEARING REPLACEMENT

**STEP 1**--Detach the bellows mounting brackets from the carriage. Detach front and rear shields. See FIG. 15.

**STEP 2**--Remove the three screws of one linear bearing and slide the linear bearing off the end of the carriage shaft.

**STEP 3**--Insert a new linear bearing onto the end of the carriage shaft with the tension adjustment screw pointing outward. See FIG. 14. Adjust the tension screw of the linear bearing so when you radially rotate the linear bearing around the carriage shaft there should be no free play between the linear bearing and the carriage shaft.

**NOTE: Tension** is too tight if you feel a cogging action when you rotate the linear bearing around the shaft. This cogging is from the skidding of the bearing on the shaft and indicates tension screw is too tight.

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

**!** **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.

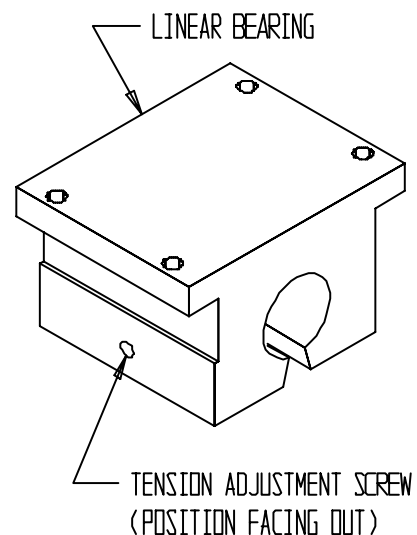


FIG. 14

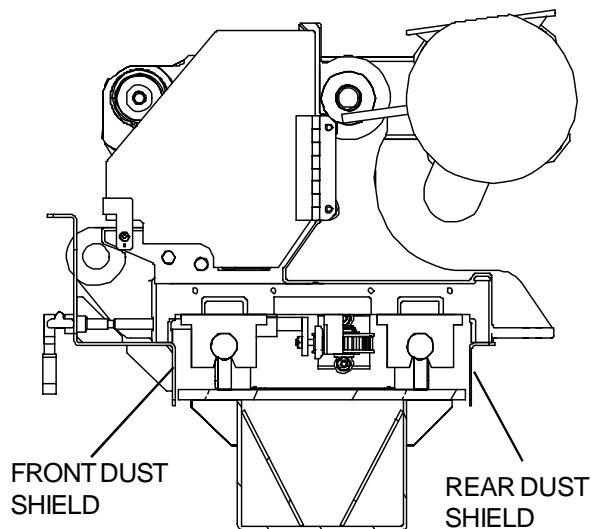


FIG. 15



## 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.

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.

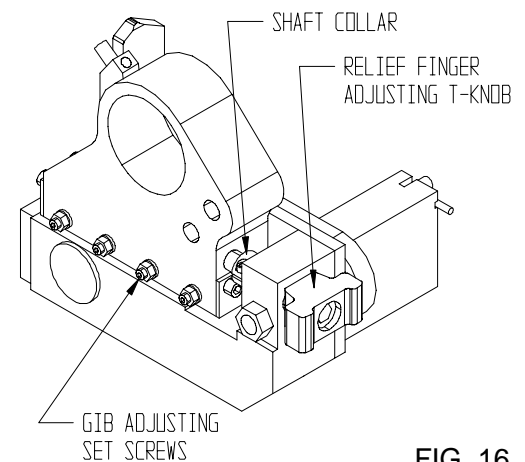


FIG. 16

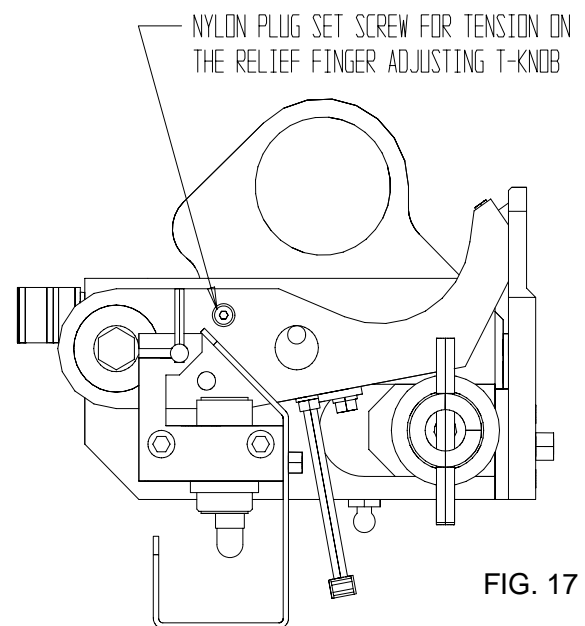


FIG. 17

### 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.

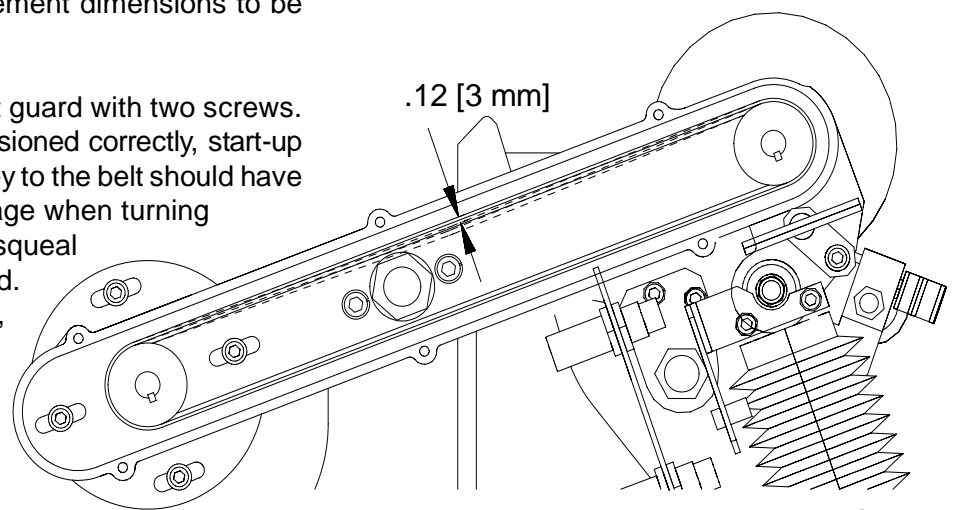


FIG. 18

## 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.

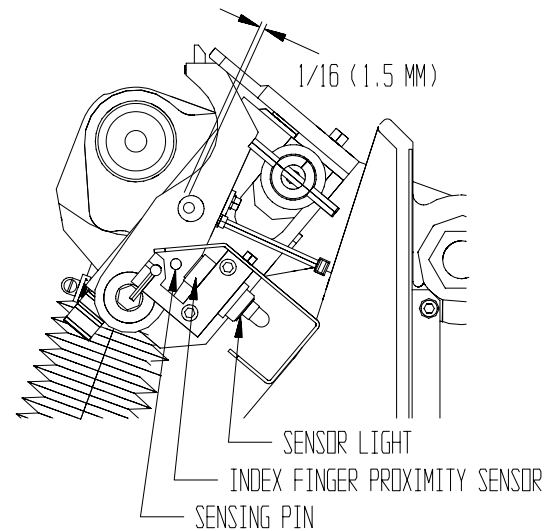


FIG. 19

### STEPPPER INFEEED 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.

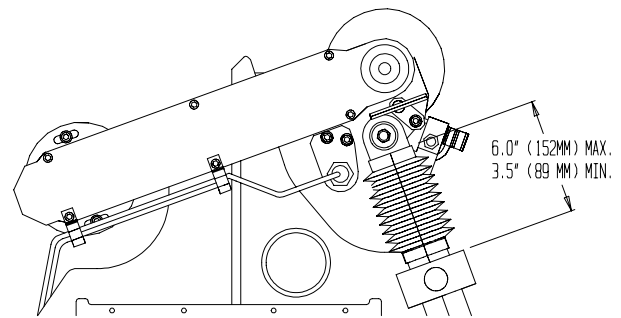


FIG. 20

### 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.

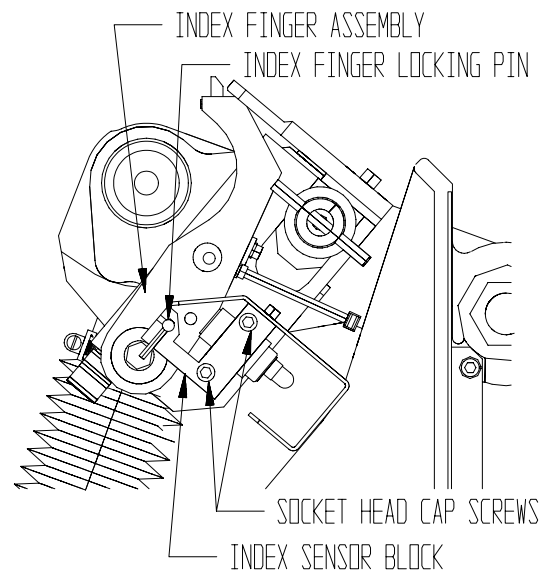


FIG. 21

## 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.

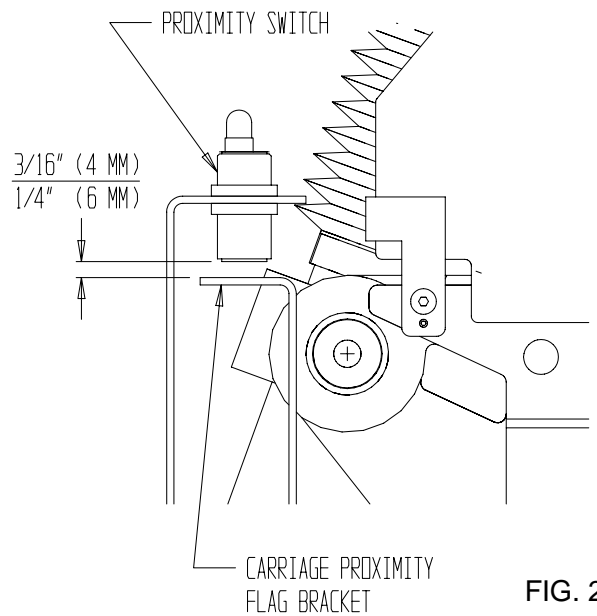


FIG. 22

### 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.

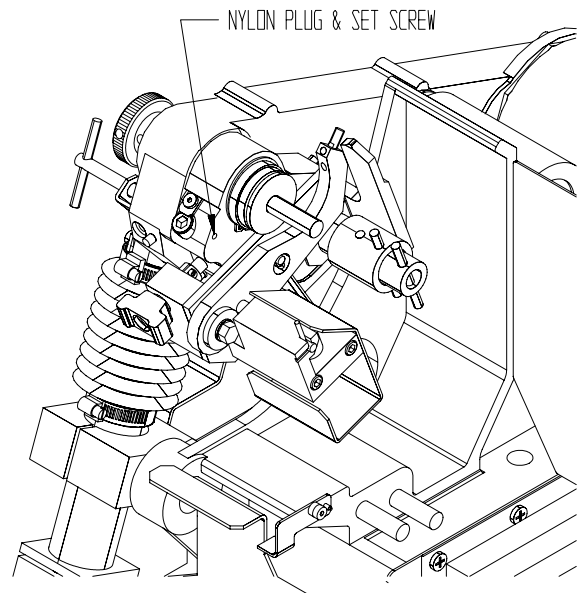


FIG. 23

### 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.)

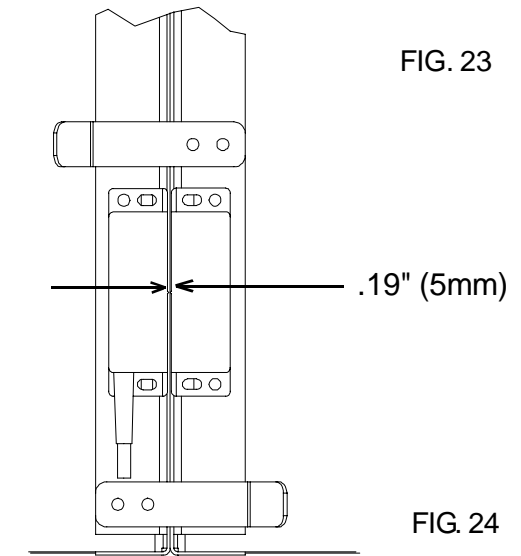


FIG. 24

## 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.

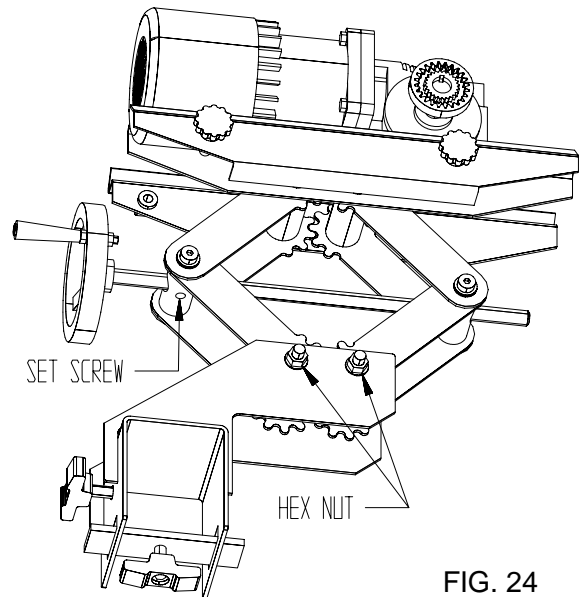


FIG. 24

### 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 compression 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.**

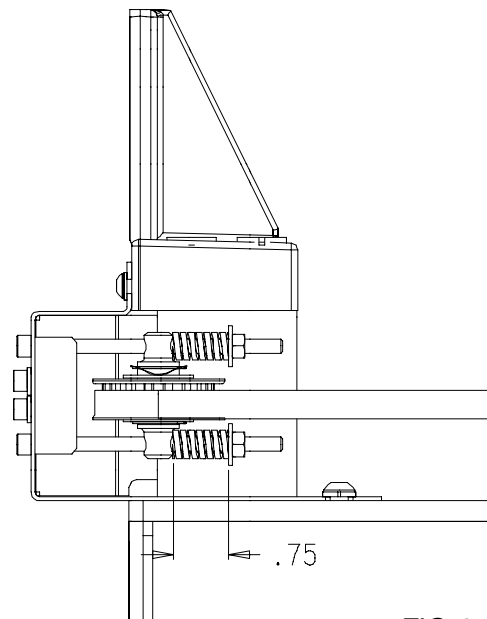


FIG. 25

### 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.**

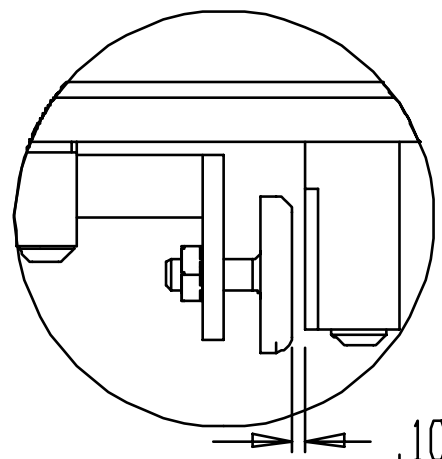


FIG. 26

## 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.

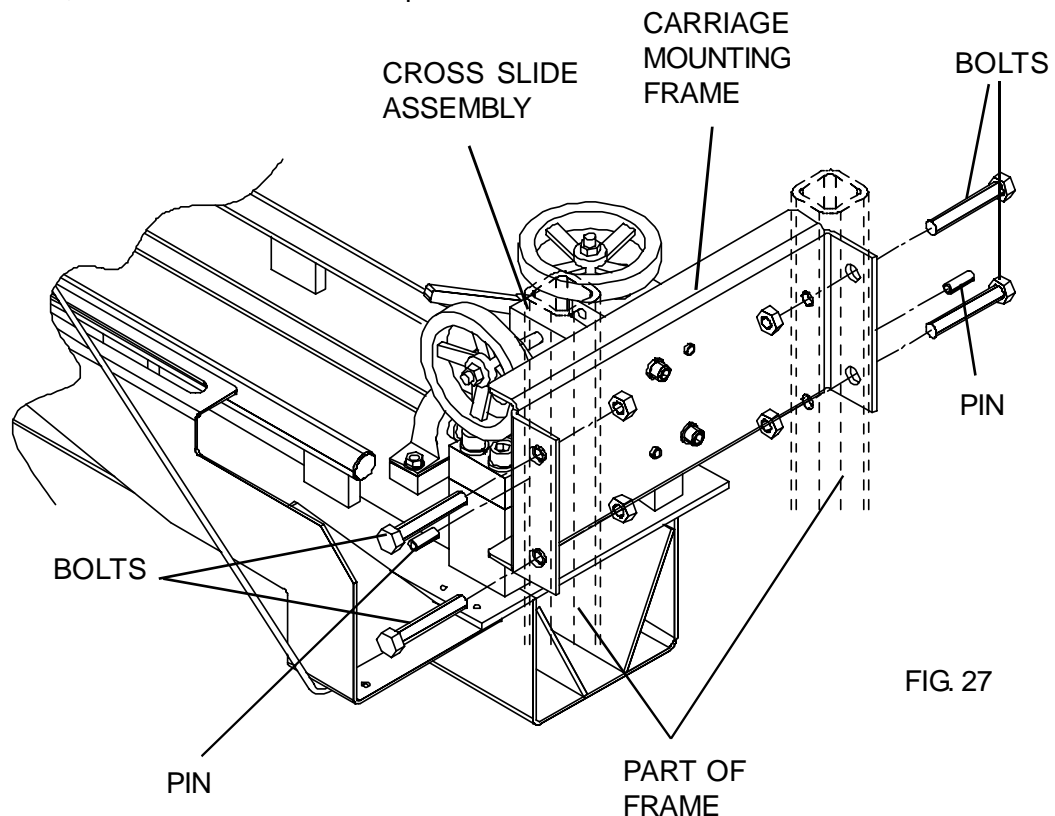


FIG. 27

## 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.

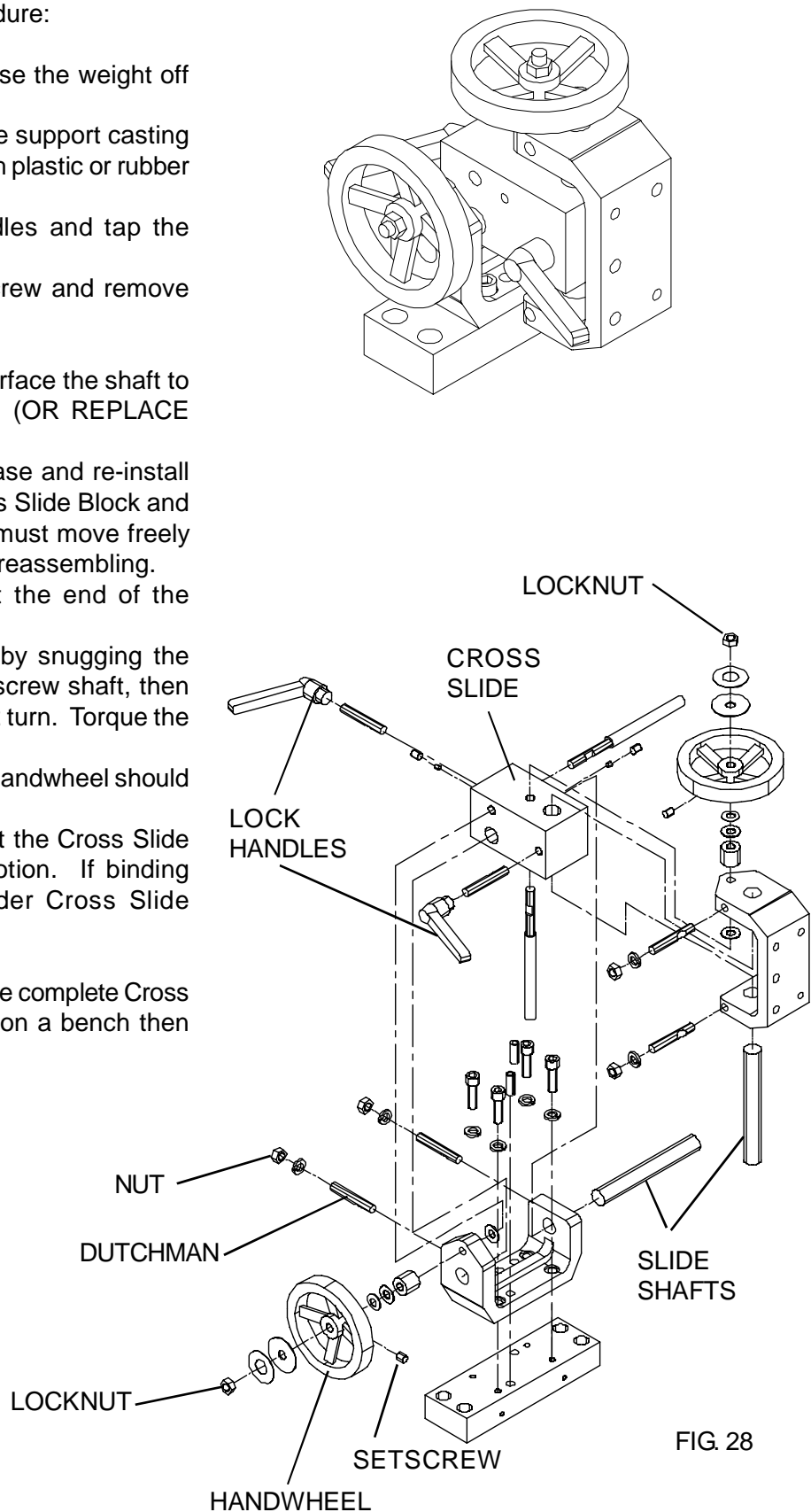
**STEP 8**--Retightening the nuts at the end of the locking studs to lock shaft in place.

**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.



# MACHINE SERVICE

## 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

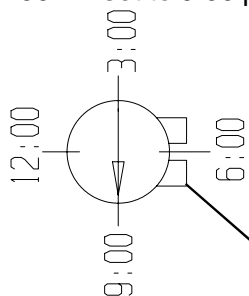
The Reverse Torque setting determines the maximum current limit for driving the motor in the reverse direction. The potentiometer is preset to the 10:30 position. It should not require adjustment.

### Fwd Torque---FWD TQ

The Forward 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.



### Potentiometer Clock Orientation

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

### Minimum Speed---MIN SPD

The potentiometer is factory preset to the minimum full counterclockwise 8:30 position.

### Tach---TACH

The tach potentiometer is not used in this application. It should be at 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.

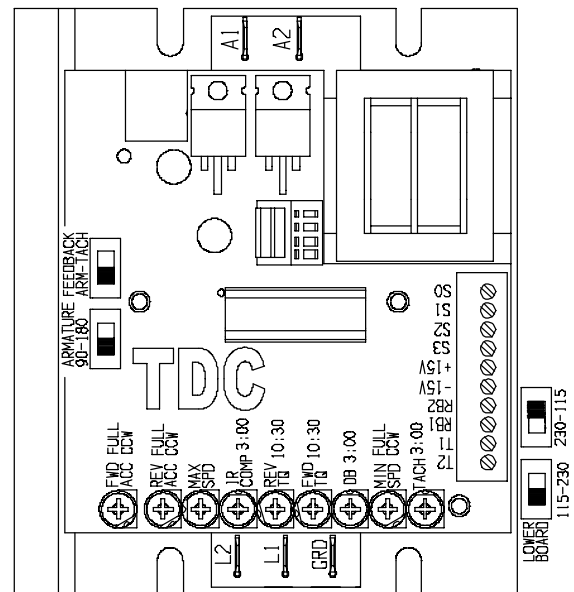


FIG. 29A

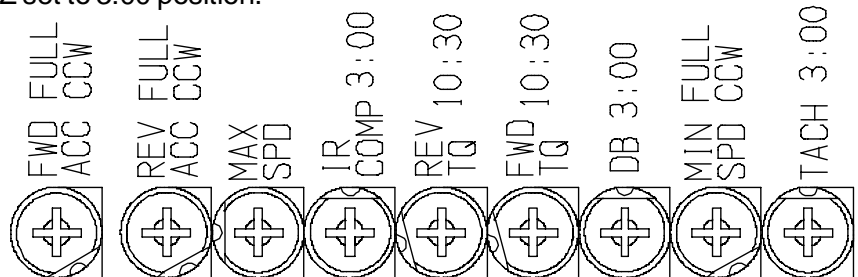


FIG. 29B

## MACHINE SERVICE (Continued)

### 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, switches 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 torque 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 dial 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 disconnected.

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.



## MACHINE SERVICE (Continued)

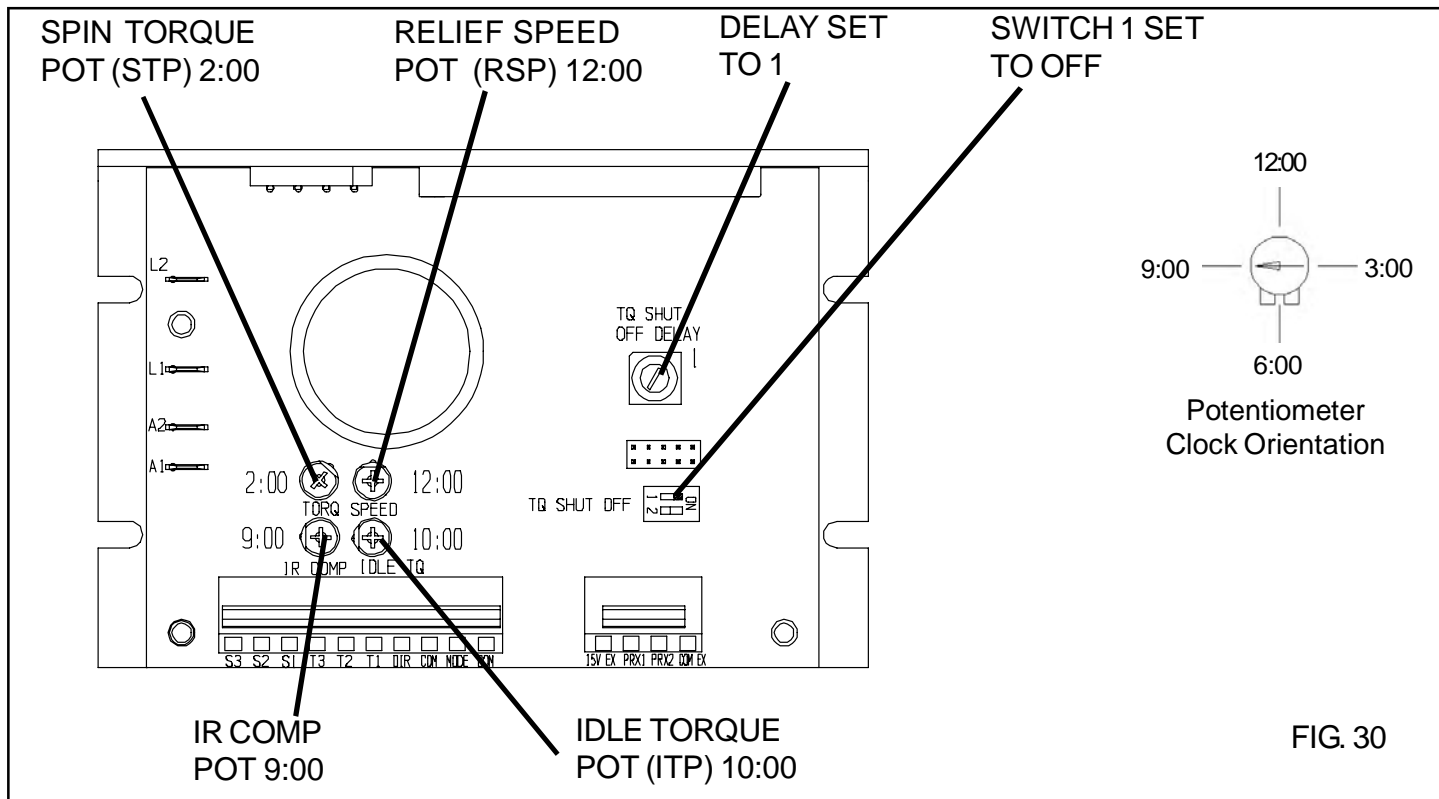


FIG. 30

### STEPPER INFEEED CONTROLLER (SIC)

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

#### Motor Selection Dial-

Set the motor selection Dial to 6. This 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 a setting 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.

SET MOTOR  
DIAL TO 6

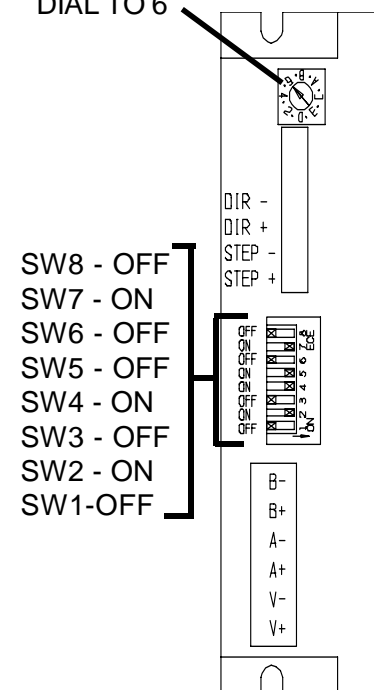


FIG. 31

## 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 section of 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.

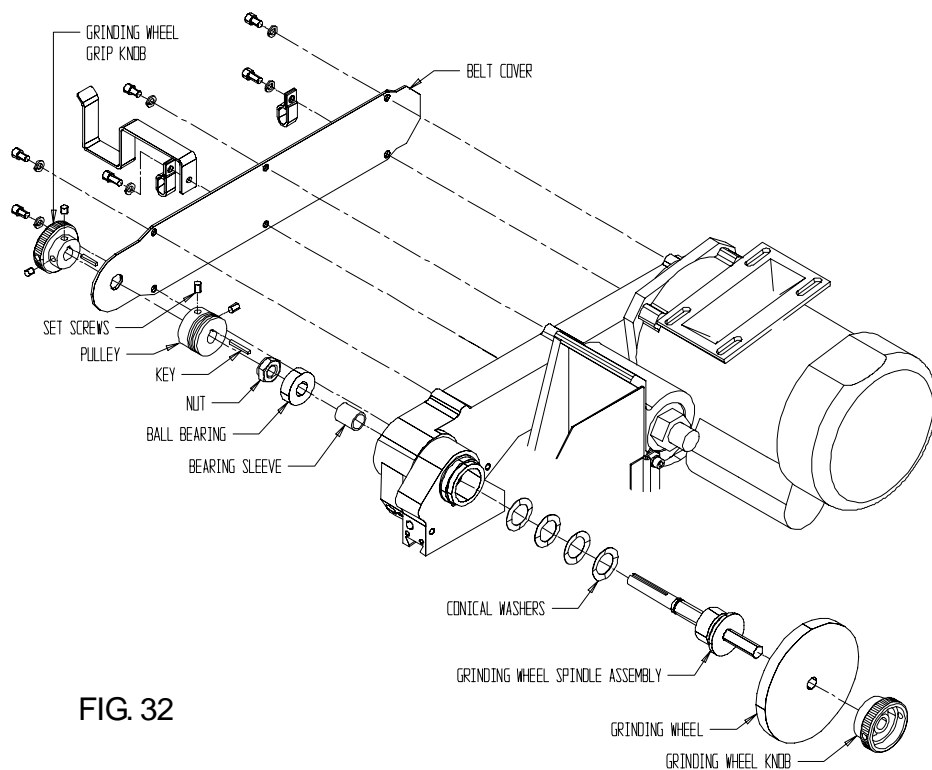


FIG. 32

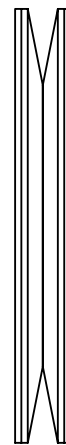
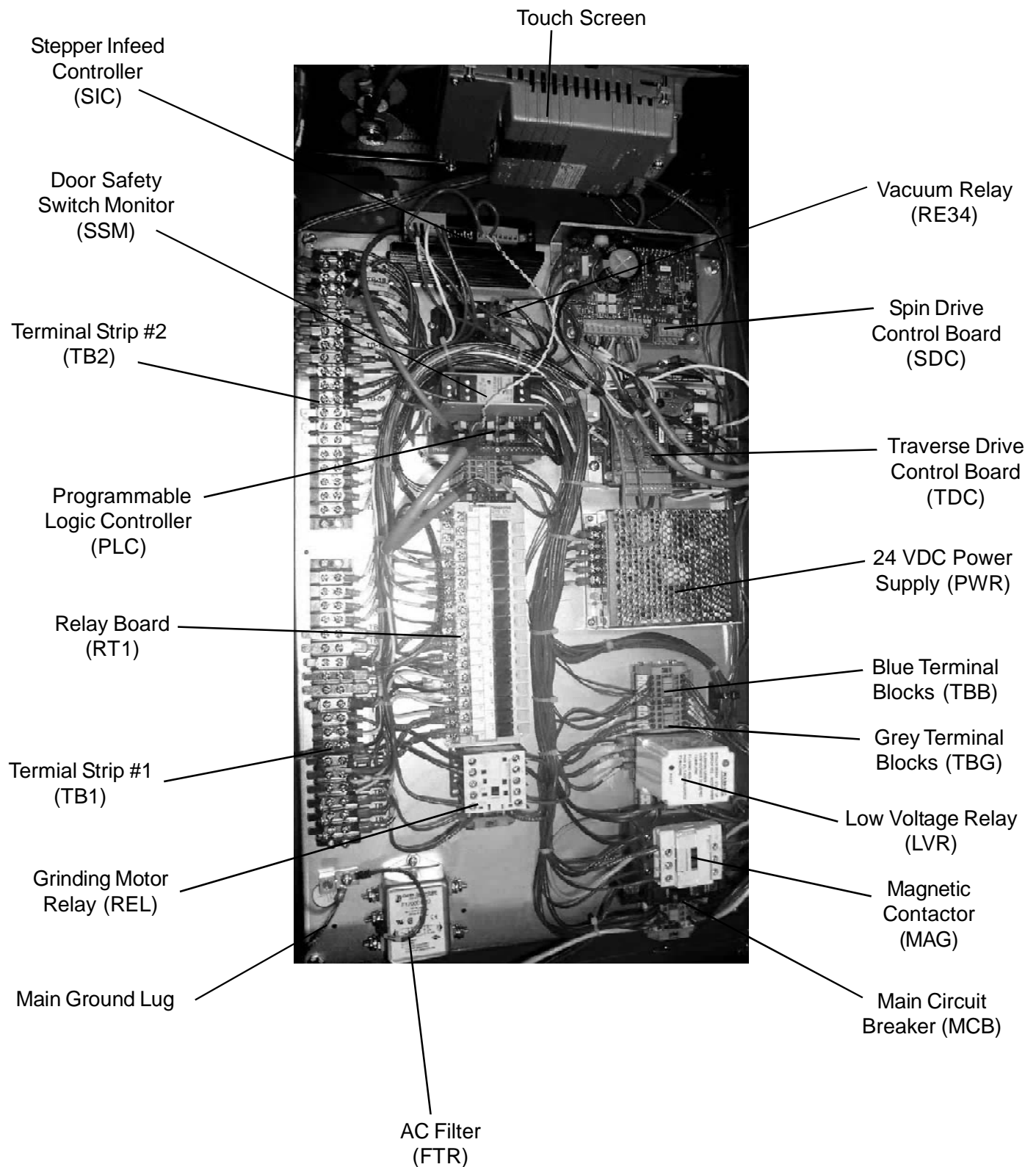


FIG. 33

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

## ACCU-TOUCH CONTROL PANEL



# ELECTRICAL TROUBLESHOOTING

## 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

|  |            |
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| E-Stop .....                             | Page 31    |
| Spin Drive Controls in Spin Mode .....   | Page 32-33 |
| Spin Drive Controls in Relief Mode ..... | Page 34-35 |
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| System Error Messages .....              | Page 44-47 |
| Flashing Light .....                     | Page 48    |

## ELECTRICAL TROUBLESHOOTING (Continued)

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

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

| Possible Cause   | Checkout Procedure   |   |
|--|--|---|
| You must turn ON the Switch on the top of the control panel.     | <b>A.</b> Look for Touch screen to come on.  | Machine works<br>Yes--end troubleshooting<br>No--go to Step <b>B.</b> next  |
| Main Power Cord is not plugged in                                | <b>B.</b> Plug in main power cord  | Machine works<br>Yes--end troubleshooting<br>No--go to Step <b>C.</b> next  |
| Main 20 amp outlet circuit breaker has tripped in building panel | <b>C.</b> Check circuit breaker and reset if necessary. (Check wall outlet with a light to make sure it works) | Machine works<br>Yes--end troubleshooting<br>No--but a light works in outlet--go to Step <b>D.</b> next<br>No--but light does not work in outlet.<br>You must solve your power delivery problem independent of machine. |
| Main 20 amp circuit breaker has tripped in machine panel         | <b>D.</b> Check circuit breaker and reset if necessary.  | Machine works<br>Yes--end troubleshooting<br>No----go to Step <b>E.</b> next  |
| No 115 Volts AC to Main Circuit Breaker                          | <b>E.</b> 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.<br>Yes--go to Step <b>F.</b> next<br>No--Verify Filter function, check wiring.   |
| No 115 Volts AC power from 2-Amp Circuit Breaker                 | <b>F.</b> 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.<br>Yes--go to Step <b>H.</b> next<br>No--Check continuity of CB and replace.  |
| No 115 Volts AC power from Power Switch (PSW)                    | <b>H.</b> Check for 115 Volts AC from Power Switch   | Check 115 Volts AC from PSW terminal #3 to Blue Terminal Block TBB17.<br>Yes--go to Step <b>I.</b> next<br>No--Check continuity of Switch and replace   |
| No 24 Volts DC power from Power Supply                           | <b>I.</b> Check for 24 Volts DC from Power Supply (PWR)  | Check 24 Volts DC from PWR V+ to V-<br>Yes--Verify wiring to Touch Screen<br>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) | <b>A.</b> Listen for magnetic contactor (MAG) to pull in with a clunk.                                      | Machine works<br>Yes--end troubleshooting<br>No--go to Step <b>B.</b> next   |
| Pull red e-stop button out                         | <b>B.</b> Repeat push the green button (SSS) again.   | Machine works<br>Yes--end troubleshooting<br>No--go to Step <b>C.</b> next   |
| 115V power not delivered to MAG coil               | <b>C.</b> 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<br>Yes--replace magnetic starter if not pulling in with click.<br>No--go to Step <b>D.</b> next          |
| Controller E-stop output relay on                  | <b>D.</b> Check on relay board (RT1) for light on for output "F" (farthest light to right)                  | Light is:<br>Off-- Controller software corrupt or missing, or Relay Board not working.<br>On-- go to step <b>E.</b> next                       |
| Controller E-stop relay no continuity              | <b>E.</b> With the machine power on, Relay light on, measure across relay contacts.                         | (RT1) terminals F+ to F- for 115 Volts AC<br>Yes-- Replace output relay F in (RT1)<br>No-- go to step <b>F.</b> next                           |
| (SSS) Is bad                                       | <b>F.</b> With the machine power on, measure across normally open contacts of (SSS)                         | (SSS) Term #3 to #4 for 115 Volts AC<br>(SSS) not pushed, "0" Volts AC (SSS) pushed.<br>No-- Replace (PSS)<br>Yes-- go to step <b>G.</b> next  |
| (ESS) Is bad                                       | <b>G.</b> With the machine power on, measure across normally closed contacts of (ESS)                       | (ESS) Term #1 to #2 for "0" Volts<br>(ESS) pulled out, 115 Volts AC (ESS) pressed in.<br>No-- Replace (ESS)<br>Yes-- go to step <b>H.</b> next |
| Bad wires  | <b>H.</b> With the machine power off, verify continuity of wires and connections.                           | Measure continuity of wires #11, 12, 15, 22, 35, 37, 50, 59, 60, 146, 147, 148, 149, & 150. Replace any bad wires or repair loose connections. |

# ELECTRICAL TROUBLESHOOTING (Continued)

## PROBLEM--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                | <b>A.</b> Set (SSP) to 200 on the control panel.  | Spin Motor works<br>Yes--end troubleshooting<br>No--go to Step <b>B.</b> next   |
| Spin Motor Switch not on on Touch Screen        | <b>B.</b> Turn spin drive switch on (touch green area) from SPIN MANUAL screen.                                   | Spin Motor works<br>Yes--end troubleshooting<br>No--go to Step <b>C.</b> next   |
| Door is open                                    | <b>C.</b> Alarm on screen should indicate that the door must be closed for the spin drive to operate. Close door. | Spin Motor works<br>Yes--end troubleshooting<br>No--go to step <b>D.</b> next   |
| Circuit breaker 42 is tripped (4A)              | <b>D.</b> Reset circuit breaker switch (Tripped by current overload) check that reel is free spinning             | Spin Motor works<br>Yes--end troubleshooting<br>No--go to step <b>E.</b> next   |
| No Power to (SDC)                               | <b>E.</b> Power Light on (SDC) next to "PWR" should be ON.  | PWR light is ON:<br>Yes--Skip to step <b>I.</b><br>No-- go to Step <b>F.</b> next   |
| Relay 9 (RT1) is not working verify Light is on | <b>F.</b> Check (RT1) for light #9 to be on (Door must be closed and spin drive switch on)                        | Light #9 is ON:<br>Yes--go to Step <b>G.</b> next<br>No--Bad PLC, RT1, cables, or Software.   |
| Verify Continuity of relay 9 in RT1             | <b>G.</b> With light #9 on, Check 115V AC into (RT1) relay 9.   | Verify 115 VAC from (RT1) Term 9- to 02FTRBU (Filter blue wire) .<br>Yes--got to Step <b>H.</b> next<br>No--Check 4amp-Circuit Breaker (CB42) Remove wires, verify continuity (ohms) Replace CB if bad. |
| Spin Drive Controller (SDC) not functioning.    | <b>H.</b> With light #9 on, Check 115V AC into (SDC)  | Remove wires L1 & L2 at (SDC) and check for 115 AC between wires.<br>Yes-- Replace (SDC)<br>No-- Replace (RT1) Relay 9  |
| Drive is not in Relief Mode.                    | <b>I.</b> 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.<br>Yes--skip to Step <b>L.</b> next<br>No--If "TQ" light is on then board is in Torque "Relief" mode. go to Step <b>J.</b> next                                     |



## ELECTRICAL TROUBLESHOOTING (Continued)

| Possible Cause                      | Checkout Procedure   |   |
|-------------------------------------|--|---|
| Relay #4 is bad                     | <b>J.</b> Check (RT1) for light #4 to be on<br>Insure that Spin Drive switch has been pressed on from SPIN MANUAL screen at least once | Light is:<br>On-- go to Step <b>K.</b> next<br>Off-- Unplug machine to reset, if problem is still there contact factory.  |
|                                     | <b>K.</b> With light #4 on, verify continuity  | Remove one of the wires at Terminal 4, measure (RT1) 4+ to 4- for "0" Ohms<br>Yes--Replace (SDC)<br>No--replace Relay 4 (RT1)   |
| No Power out of (SDC)               | <b>L.</b> Check (SDC) output. Have Spin speed pot (SSP) set at 400   | (SDC) term A1 to term A2 measure approx 90 Volts DC<br>Yes--go to step <b>M.</b> Next<br>No-- Skip to step <b>O.</b>  |
| Reversing relay(s) bad (RT1)        | <b>M.</b> Measure voltage at spin motor  | (RT1) Term A+ to term D+ should read the same 90 Volts DC measured at step <b>L.</b><br>Note polarity<br>Yes--Skip to Step <b>P.</b><br>No-- go to Step <b>N.</b> next  |
|                                     | <b>N.</b> Reverse direction of spin motor from SPIN MANUAL touch screen  | (RT1) Term A+ to term D+ should read the same 90 Volts DC measured at step <b>K.</b> , but opposite polarity<br>Yes--Skip to Step <b>P.</b><br>No--Replace relays A, B, C, & D in (RT1)   |
| Spin Speed Pot (SSP) is not working | <b>O.</b> (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<br>Pot full CCW                      Pot Full CW<br>10,000 Ohms                      0 Ohms<br>White wire of (SSP)- L to Red wire of (SSP)-W<br>Pot full CCW                      Pot Full CW<br>0 Ohms                      10,000 Ohms<br>Yes-- Replace (SDC)<br>No-- Replace (SSP) |
|                                     |  |   |
| Spin Drive motor is bad             | <b>P.</b> With machine power off, Check spin motor continuity  | At (RT1) Term A+ and B+ or C+ and D+ check approx. 0 ohms across the black and white wires<br>Yes-- Motor should work, end trouble-shooting.<br>No--go to Step <b>Q.</b> next   |
| Worn motor brushes                  | <b>Q.</b> 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.<br>Yes-- replace motor brushes<br>No-- replace Spin Drive motor   |

## ELECTRICAL TROUBLESHOOTING (Continued)

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

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

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

| Possible Cause                                  | Checkout Procedure  |   |
|---|---|---|
| Relief Torque Pot (RTP) set to zero             | <b>A.</b> Set (SSP) to 20 on the control panel.   | Spin Motor works<br>Yes--end troubleshooting<br>No--go to Step <b>B.</b> next   |
| Spin Motor Switch not on on Touch Screen        | <b>B.</b> Turn spin drive switch on (touch green area) from RELIEF MANUAL screen.                                 | Spin Motor works<br>Yes--end troubleshooting<br>No--go to Step <b>C.</b> next   |
| Door is open                                    | <b>C.</b> Alarm on screen should indicate that the door must be closed for the spin drive to operate. Close door. | Spin Motor works<br>Yes--end troubleshooting<br>No--go to step <b>D.</b> next   |
| Circuit breaker 42 is tripped (4A)              | <b>D.</b> Reset circuit breaker switch (Tripped by current overload) check that reel is free spinning             | Spin Motor works<br>Yes--end troubleshooting<br>No--go to step <b>E.</b> next   |
| No Power to (SDC)                               | <b>E.</b> Power Light on (SDC) next to "PWR" should be ON.  | PWR light is ON:<br>Yes--Skip to step <b>I.</b><br>No-- go to Step <b>F.</b> next   |
| Relay 9 (RT1) is not working verify Light is on | <b>F.</b> Check (RT1) for light #9 to be on (Door must be closed and spin drive switch on)                        | Light #9 is ON:<br>Yes--go to Step <b>G.</b> next<br>No--Bad PLC, RT1, cables, or Software.   |
| Verify Continuity of relay 9 in RT1             | <b>G.</b> With light #9 on, Check 115V AC into (RT1) relay 9.   | Verify 115 VAC from (RT1) Term 9- to 02FTRBU (Filter blue wire) .<br>Yes--got to Step <b>H.</b> next<br>No--Check 4amp-Circuit Breaker (CB42)<br>Remove wires, verify continuity (ohms)<br>Replace CB if bad. |
| Spin Drive Controller (SDC) not functioning.    | <b>H.</b> With light #9 on, Check 115V AC into (SDC)  | Remove wires L1 & L2 at (SDC) and check for 115 AC between wires.<br>Yes-- Replace (SDC)<br>No-- Replace (RT1) Relay 9  |
| Drive is not in Relief Mode.                    | <b>I.</b> 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.<br>Yes--skip to Step <b>L.</b><br>No--If "SPD" light is on then board is in Speed "Spin" mode. go to Step <b>J.</b> next   |

## ELECTRICAL TROUBLESHOOTING (Continued)

| Possible Cause                         | Checkout Procedure  |   |
|--|---|---|
| Relay 4 (RT1) not working              | <b>J.</b> Check (RT1) for light #4 to be off<br>Insure that Spin Drive switch has been pressed on from RELIEF MANUAL screen at least once | Light is:<br>Off-- go to Step <b>K.</b> next<br>On-- Contact factory  |
| Relay #4 is bad                        | <b>K.</b> With light #4 on, verify continuity   | Remove one of the wires at Terminal 4, measure (RT1) 4+ to 4- for "0" Ohms<br>Yes--Replace relay 4 (RT1)<br>No--replace (SDS)   |
| Spin Drive Controller is bad (SDC)     | <b>L.</b> Check (SDC) output. Have Relief Torque pot (RTP) set at Red Line  | (SDC) term A1 to term A2 measure approx 13 Volts DC<br>Yes--go to step <b>M.</b> Next<br>No-- Skip to step <b>O.</b>  |
| Reversing relay(s) bad (RT1)           | <b>M.</b> Measure voltage at (RT1)  | (RT1) Term A+ to term D+ should read the same 13 Volts DC measured at step <b>L.</b><br>Note polarity<br>Yes--Skip to Step <b>P.</b><br>No-- go to Step <b>N.</b> next  |
|  | <b>N.</b> 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 <b>H.</b> , but opposite polarity<br>Yes--Skip to Step <b>P.</b><br>No--Replace relays A, B, C, & D in (RT1)   |
| Relief Torque Pot (RTP) is not working | <b>O.</b> (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<br>Pot full CCW                      Pot Full CW<br>10,000 Ohms                      0 Ohms<br>White wire of (RTP)- L to Red wire of (RTP)-W<br>Pot full CCW                      Pot Full CW<br>0 Ohms                      10,000 Ohms<br>Yes-- Replace (SDC)<br>No-- Replace (RTP) |
| Spin Drive motor is bad                | <b>P.</b> With machine power off, Check spin motor continuity   | At (RT1) Term A+ and B+ or C+ and D+ check approx. 0 ohms across the black and white wires<br>Yes-- Motor should work, end troubleshooting.<br>No--go to Step <b>Q.</b> next  |
| Worn motor brushes                     | <b>Q.</b> 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.<br>Yes-- replace motor brushes<br>No-- replace Spin Drive motor   |

## ELECTRICAL TROUBLESHOOTING (Continued)

### PROBLEM--Machine light is not working

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

#### Possible Cause

#### Checkout Procedure

Light switches are not turned on or there is a bad bulb

**A.** Turn on machine light toggle switch on light. Check the light bulb in another light fixture or replace with a new bulb. Plug a different light that is known to work into light plug.

Light works  
Yes--end troubleshooting  
No--go to Step **B.** next

Wire cord is bad

**B.** Check for 115 Volts AC at Terminal Strip

Check for 115 Volts AC across terminals # 6 & 7 on Terminal Strip 2 (TB2)  
Yes--replace cord for light  
No--go to Step **C.** next

Wiring is bad

**C.** Check continuity of wiring from MAG to Terminal Block

Check wiring and tighten or replace any damaged or loose parts.

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

## ELECTRICAL TROUBLESHOOTING (Continued)

**PROBLEM--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              | <b>A.</b> Turn switch on from either SPIN MANUAL screen or RELIEF MANUAL screen   | Grinding Motor works<br>Yes--end troubleshooting<br>No--go to Step <b>B.</b> next  |
| Circuit Breaker (CB28) 15A is tripped        | <b>B.</b> Reset circuit breaker switch (tripped by current overload)  | Grinding Motor works<br>Yes--end troubleshooting<br>No--go to step <b>C.</b> next  |
| Grinding Motor Relay is not working (REL)    | <b>C.</b> Check for (REL) incoming 115 Volts AC   | (REL) Term #L1 to #L2 for 115 Volts AC<br>Yes--go to step <b>D.</b> next<br>No--Verify wiring, replace Circuit Breaker (CB28)                              |
|  | <b>D.</b> Check for (REL) output voltage of 115 Volts AC  | (REL) Term #T1 to #T2 for 115 Volts AC<br>Yes-- Verify 115 VAC at TB1-1 & TB1-2, Check terminals, replace Grind motor.<br>No--go to step <b>E.</b> next    |
| Relay (REL) coil or contacts are not working | <b>E.</b> 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<br>Yes--Replace (REL)<br>No--Skip to Step <b>F.</b>   |
| Relay 5 (RT1) is not working                 | <b>F.</b> (RT1) check that the light is on for relay 5, make sure grind drive switch is on                                    | Light is:<br>On-- Go to Step <b>I.</b> next<br>Off--Contact Factory  |
|  | <b>I.</b> Light is on for Relay 5, check continuity   | (RT1) Term 5+ to 5-, measure DC voltage<br>0 Volts DC-- Check wiring, Relay (REL) should work, end troubleshooting.<br>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)                 | <b>A.</b> Turn on switch located on top of Vacuum in the back right of corner of the machine. | Dust Collector works--<br>Yes--end troubleshooting<br>No--go to Step <b>B.</b> next  |
| Dust Collector Switch (Vacuum) on touch screen is not on | <b>B.</b> Turn switch on from SPIN MANUAL or RELIEF MANUAL screen.                            | Dust Collector works--<br>Yes--end troubleshooting<br>No--go to Step <b>C.</b> next  |
| Vacuum not working                                       | <b>C.</b> Check for 115 Volts AC at the receptacle plug by plugging in a hand drill or light. | Light works<br>Yes--Replace Vacuum<br>No--go to Step <b>D.</b> next  |
| (RT1) relay E is not working                             | <b>D.</b> With Vacuum switch on, Check for (RT1) Relay E on                                   | Light is on:<br>Yes--go to step <b>E.</b> next<br>No--Contact Factory  |
|  | <b>E.</b> (RT1) Relay E, verify continuity  | (RT1) Term #E+ to #E- for 115 Volts AC<br>Yes--replace Relay E (RT1)<br>No--go to Step <b>F.</b> next                                  |
| Circuit Breaker (CB32) is not working (3-amp)            | <b>F.</b> Check for power out of circuit breaker (CB32)                                       | Terminal Block 17 (light blue wire) #02 to (CB32) (brown) #156 for 115 Volts AC<br>Yes--go to Step <b>G.</b> next<br>No--replace (CB2) |
| Relay 34 (RE34) is not working                           | <b>G.</b> Check for (RE34) input of 115 Volts AC at coil.                                     | (RE34) Term 0 to term 1 for 115 Volts AC<br>Yes-- go to Step <b>H.</b> next<br>No--Check continuity of wires.                          |
|  | <b>H.</b> Check for (RE34) input of 115 Volts AC at contacts                                  | (RE34) Term 8 to term 4 for 115 Volts AC<br>Yes--go to Step <b>I.</b> next<br>No--Check continuity of wires.                           |
|  | <b>I.</b> Check for (RE34) output of 115 Volts AC at contacts                                 | (RE34) Term 6 to term 2 for 115 Volts AC<br>Yes--Replace Plug<br>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 | <b>A.</b> Reason: Check for a lifting overload condition or wiring shorted to ground. Reset breaker located at end of winch motor. | Winch works--<br>Yes--end troubleshooting<br>No--go to Step <b>B.</b> next  |
|   |  |   |
| No voltage to motor                             | <b>B.</b> Check that motor coil cord from DC motor is plugged in   | Winch works--<br>Yes--end troubleshooting<br>No--go to Step <b>C.</b> next  |
|   | <b>C.</b> Check for 115 Volts AC at the plug end winch cord wire #6 by plugging in a hand drill                                    | Drill works--<br>Yes--replace winch<br>No-- go to Step <b>D.</b> next   |
|   | <b>D.</b> Check for Machine is plugged in<br>Start button is pressed. (Red E-Stop Screen must not be up)                           | Winch works--<br>Yes--end troubleshooting<br>No--go to Step <b>E.</b> next  |
|   | <b>E.</b> Verify wiring from MAG to Terminal Strip 2.  | Measure 115 Volts AC from TB2-6 to TB2-7.<br>Yes--replace cord to winch<br>No--Verify power out of mag. Replace bad wiring. |

## ELECTRICAL TROUBLESHOOTING (Continued)

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

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

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

| Possible Cause                                 | Checkout Procedure   |   |
|--|--|---|
| Traverse Speed Pot (TSP) set to zero           | <b>A.</b> Set (TSP) to 35 on the control panel   | Traverse works<br>Yes--end troubleshooting<br>No--go to step <b>B.</b> next   |
| Traverse Belt Clamp release lever released     | <b>B.</b> Insure release lever is in adjusted properly. See Adjustments section of this manual.                        | Traverse works<br>Yes--end troubleshooting<br>No--go to Step <b>C.</b> next   |
| Circuit Breaker 32 (CB32) (3 amp) tripped      | <b>C.</b> Too heavy a grind causes grinding head traverse motor to overload and trip the circuit breaker. Reset (CB32) | Traverse works<br>Yes--end troubleshooting<br>No--go to Step <b>D.</b> next   |
| Traverse Drive Control (TDC) do not have power | <b>D.</b> 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<br>Yes--Skip to Step <b>H.</b><br>No--go to Step <b>E.</b> next   |
| Relay 8 (RT1) is bad                           | <b>E.</b> Check for relay 8 (RT1) light on (insure traverse right or left has been pressed at least once)              | Light is:<br>On-- go to Step <b>F.</b> next<br>Off-- Contact Factory  |
|  | <b>F.</b> Check relay 8 for continuity, Insure relay 8 light is on   | (RT1) Term 8+ to 8- read 115 Volts AC<br>Yes-- Replace Relay 8 (RT1)<br>No-- go to Step <b>G.</b> next  |
| Circuit Breaker 32 (CB32) bad                  | <b>G.</b> 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:<br>No-- Replace CB32<br>Yes-- Verify continuity 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 | <b>H.</b> Check for 90 Volts DC across (TDC) terminals A1 to A2 this voltage drives the DC traverse motor.<br>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<br>Yes--go to step <b>I.</b> next<br>No--go to Step <b>J.</b> next<br><br>Note: If voltage is less than 90 VDC verify pots on TDC. See page 24                 |
| Traverse Motor is bad                           | <b>I.</b> Check traverse motor continuity  | Remove wires from terminals A1 & A2 0 ohms across the black and white wires<br>Yes--go to Step <b>J.</b> next<br>No--go to Step <b>N.</b>   |
| Check Relays 2 and 3                            | <b>J.</b> (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:<br>On-- go to step <b>K.</b> next<br>Off-- Skip to step <b>L.</b>  |
| (TSP) (10K) is bad                              | <b>K.</b> Check (TSP) for 10,000 ohms<br>Remove three wires from (TDC)<br>red from term S2<br>white from term S0<br>black from inline connector (Wire 39)  | Check for 10,000 ohms red to white wires<br>Full CCW--0 ohms<br>Full CW--10,000 ohms<br>Red to black wires<br>Full CCW--10,000 ohms<br>Full CW--0 ohms<br>Yes--go to Step <b>L.</b> next<br>No--replace (TSP) |
| Gap between flag and prox is incorrect.         | <b>L.</b> Gap between flag and Prox should be 3/16" to 1/4" [4-6mm].<br>Prox light does not light when flag is under prox.   | If incorrect, adjust per adjustment section of manual.<br>Traverse works--<br>Yes-- End troubleshooting<br>No-- go to step <b>M.</b> next   |
| Proximity switch is bad                         | <b>M.</b> From the Touch screen, Enter "HELP" screen from main menu.   | Follow instructions on screen to verify traverse proximity switches are ok.<br>Switch is<br>Good-- Replace (TDC)<br>Bad-- Replace switch  |
| Worn motor brushes                              | <b>N.</b> Inspect Motor Brushes  | Remove the brushes one at a time and maintain orientation for reinsertion.<br>See if brush is worn short, 3/8" [10 mm] minimum length.<br>Yes--replace motor brushes<br>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   | <b>A.</b> Hold switch on in either direction   | Stepper motor works<br>Yes--end troubleshooting<br>No--go to Step <b>B.</b> next   |       |   |                          |  |                         |  |                               |  |                               |  |                              |  |                    |  |                               |  |                              |  |
| Actuator is at physical limit  | <b>B.</b> Move stepper in opposite direction   | Stepper Motor works<br>Yes--end troubleshooting<br>No--go to step <b>C.</b> next   |       |   |                          |  |                         |  |                               |  |                               |  |                              |  |                    |  |                               |  |                              |  |
| Circuit Breaker (CB13) is tripped (2 amp)  | <b>C.</b> Reset circuit breaker switch (tripped by current overload)<br>Grinding head stepper infeed mechanism jammed causing overload   | Stepper Motor works<br>Yes--end troubleshooting<br>No--go to step <b>D.</b> next   |       |   |                          |  |                         |  |                               |  |                               |  |                              |  |                    |  |                               |  |                              |  |
| High Low Switch is not on high speed   | <b>D.</b> Put switch on high speed (rabbit) for ease of checkout of Stepper Infeed Control (SIC)   | High speed works<br>Yes--end troubleshooting<br>No--go to Step <b>E.</b> next  |       |   |                          |  |                         |  |                               |  |                               |  |                              |  |                    |  |                               |  |                              |  |
| Stepper motor drive coupling is loose  | <b>E.</b> 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--<br>Yes--end troubleshooting<br>No--go to Step <b>F.</b> next   |       |   |                          |  |                         |  |                               |  |                               |  |                              |  |                    |  |                               |  |                              |  |
| Inccorect DC voltage to Stepper Infeed Control (SIC)   | <b>F.</b> Look at LEDs on SIC:   | (SIC) LED code:<br>Flashing Green- go to step <b>G.</b> next<br>Flashin Red-- Machine in E-stop (verify other functions work). If other function work replace SIC.<br>1 Green, 6 Red-- check motor wiring, replace motor assembly.<br>Other -- Check for 24 VDC to terminals V+ and V-. If voltage is not correct replace Power Supply, if voltage is correct replace SIC. |       |   |                          |  |                         |  |                               |  |                               |  |                              |  |                    |  |                               |  |                              |  |
|  | <table><tr><th>Code</th><th>Error</th></tr><tr><td> solid green</td><td>no alarm, motor disabled</td></tr><tr><td> flashing green</td><td>no alarm, motor enabled</td></tr><tr><td> flashing red</td><td>configuration or memory error</td></tr><tr><td> 1 green, 4 red</td><td>power supply voltage too high</td></tr><tr><td> 1 green, 5 red</td><td>over current / short circuit</td></tr><tr><td> 1 green, 6 red</td><td>open motor winding</td></tr><tr><td> 2 green, 3 red</td><td>internal voltage out of range</td></tr><tr><td> 2 green, 4 red</td><td>power supply voltage too low</td></tr></table> | 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 |  |
| 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                  | <b>G.</b> 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)<br>YES--Go to Step <b>H.</b> next<br>NO-- Replace infeed stepper motor.   |
| No Step pulse from PLC            | <b>I.</b> Check light Y0 on PLC. While pressing up or down it should light (pressing down Y1 will also light)               | Light comes on:<br>Yes-- go to step <b>J.</b> next<br>No-- check continuity of wires from PLC to SIC. If OK, replace PLC.  |
| No V+ to Step or Direction of SIC | <b>J.</b> 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<br>YES-- If both measure 24VDC then check continuity of wires from PLC to SIC. If OK, replace PLC.<br>NO-- Check wire 60, replace if bad. |

## ELECTRICAL TROUBLESHOOTING (Continued)

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

| <b>System Error Message</b>            | <b>Checkout Procedure</b>  | <b>Message Status</b>  |
|--|--|--|
| STORE FINGER FOR SPIN GRIND            | <b>A.</b> Rotate index finger assembly to spin position              | Clears--Proceed to next system error message you have or continue running.<br>Remains--go to Step <b>B.</b> next |
|  | <b>B.</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        | <b>A.</b> Rotate grind head assmbly down                             | Clears--Proceed to next system error message you have or Continue running.<br>Remains--go to Step <b>B.</b> next |
|  | <b>B.</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 | <b>A.</b> Jog Grind head to right prox with touch screen controls    | Clears--Proceed to next system error message you have or Continue running.<br>Remains--go to Step <b>B.</b> next |
|  | <b>B.</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        | <b>A.</b> Rotate grind head assmbly up                               | Clears--Proceed to next system error message you have or Continue running.<br>Remains--go to Step <b>B.</b> next |
|  | <b>B.</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          | <p><b>A.</b> Release finger. Make sure that the finger is allowed to come forward at least once.</p> <p><b>B.</b> Check (PLC) input from Door Saftey Switch</p>  | <p>Clears--Proceed to next system error message you have or continue running.</p> <p>Remains--go to Step <b>B.</b> next</p> <p>From "Help" Screen verify Finger Stored / Down prox input is working. Follow instructions on screen.</p> |
| ENTER NUMBER OF BLADES             | <p><b>A.</b> Blade count is required to run Relief grind. Count blades and enter the number under the Blade # Field.</p>   | <p>Clears--Proceed to next system error message you have or continue running.</p>   |
| LOW VOLTAGE DETECTED               | <p><b>A.</b> Input line voltage has dropped below 100V. Plug machine into a better source of power. See Power requirements at front of manual.</p>   | <p>Clears--Proceed to next system error message you have or continue running.</p>   |
| DOOR MUST BE CLOSED TO OPERATE     | <p><b>A.</b> For safety reasons, door must be closed to operate spin and / or grind motors. Close and latch door.</p> <p><b>B.</b> Check (PLC) input from Door Saftey Switch</p>   | <p>Clears--Proceed to next system error message you have or continue running.</p> <p>Remains--go to Step <b>B.</b> next</p> <p>From "Help" Screen verify Head in Relief Pos. prox input is working. Follow instructions on screen.</p>  |
| INCREASE TORQUE KNOB SETTING       | <p><b>A.</b> An excessive amount of time has passed between blade indexes or at the start of a relief cycle. Increase the Relief Torque Pot.</p>   | <p>Clears--Proceed to next system error message you have or continue running.</p>   |
| TORQUE KNOB LOW OR DIRECTION WRONG | <p><b>A.</b> 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.</p> | <p>Clears--Proceed to next system error message you have or continue running.</p>   |

## ELECTRICAL TROUBLESHOOTING (Continued)

### 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) | <p><b>A.</b> 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.</p> <p><b>B.</b> Check (PLC) input from Finger Stored/Down prox</p> | <p>Clears--Proceed to next system error message you have or continue running.</p> <p>Remains--go to Step <b>B.</b> next</p> <p>From "Help" Screen verify Finger Stored/Down prox input is Working. Follow instructions on screen.</p> |
| MOVE NOT POSSIBLE IN PAUSE MODE                   | <b>A.</b> 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            | <b>A.</b> Machine was left in pause mode after last cycle. Press "resume" on touch screen.  | Clears--Proceed to next system error message you have or Continue running.  |
| DOOR OPENED WHILE GRIND AND / OR SPIN ON          | <b>A.</b> 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                    | <b>A.</b> 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              | <b>A.</b> An excessive amount of time has passed during a traverse cycle. Increase Traverse Speed pot or verify that carriage assembly is not released or hitting an obstruction.   | Clears--Proceed to next system error message you have or Continue running.  |

## ELECTRICAL TROUBLESHOOTING (Continued)

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



# ELECTRICAL TROUBLESHOOTING (Continued)

**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 Switches 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 continuti of wires from SSM to PLC. [components involved: input ribbon cable (6529030), Wires not properly connected in terminal block below PLC, or bad wire #69 from SSM to terminal block (69INP-xO).]

# MECHANICAL TROUBLESHOOTING

## Possible Cause

## Checkout Procedure

### **PROBLEM--Reels ground have high/low blades.**

Traverse Speed set to fast.

Check roundness using a magnetic base dial indicator. Traverse speed should be set approximately 12 ft/min [4 meters/min] if roundness is varying.

Lineal bearings for the grinding head carriage are out of adjustment (loose) or have grit buildup causing uneven traversing load.

Relubricate and adjust linear bearings per adjustment section. If problem persists, replace lineal bearings on the carriage base. Check for any holes in the bellows that would permit any grinding grit penetration. See adjustment section for lineal bearing replacement.

### **PROBLEM--Excessive grinding stock being removed when traversing to the right in the relief grinding mode.**

Gib adjustment for the relief finger assembly is loose so reel finger has movement. When traversing to the right minimum grinding stock removal should be seen as compared with heavy stock removal when traversing to the left.

Tighten the set screws for the gib adjustment. See procedure in the adjustment section in the manual.

### **PROBLEM--Grinding stock removal from reel is irregular during spin grinding.**

Lineal bearings on the grinding head carriage are too loose.

The lineal bearing must be preloaded to the traverse shafts with no vertical movement. See manual adjustment section for carriage linear bearing adjustments.

### **PROBLEM--Carriage traversing varies speed while grinding.**

Lineal bearings in the carriage do not rotate freely.

Check for grinding grit getting into the lineal bearings and cause excessive driving torque of carriage. Abrasive noise is detectable when excessive grit is in the lineal bearings. Replace the four lineal bearings in the main carriage. Check bellows for holes and replace if necessary.

Traverse Belt is slipping.

Check the spacing of the clamp to the support block. Clamp tip may need to be adjusted if the belt is slipping. The belt may also be too loose. See Adjustments section for proper measurements of clamp gap and belt tension.

## MECHANICAL TROUBLESHOOTING (Continued)

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

#### **Possible Cause**

Traverse speed set to high causing a heavy burr on the reel blade when spin grinding.

#### **Checkout Procedure**

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.

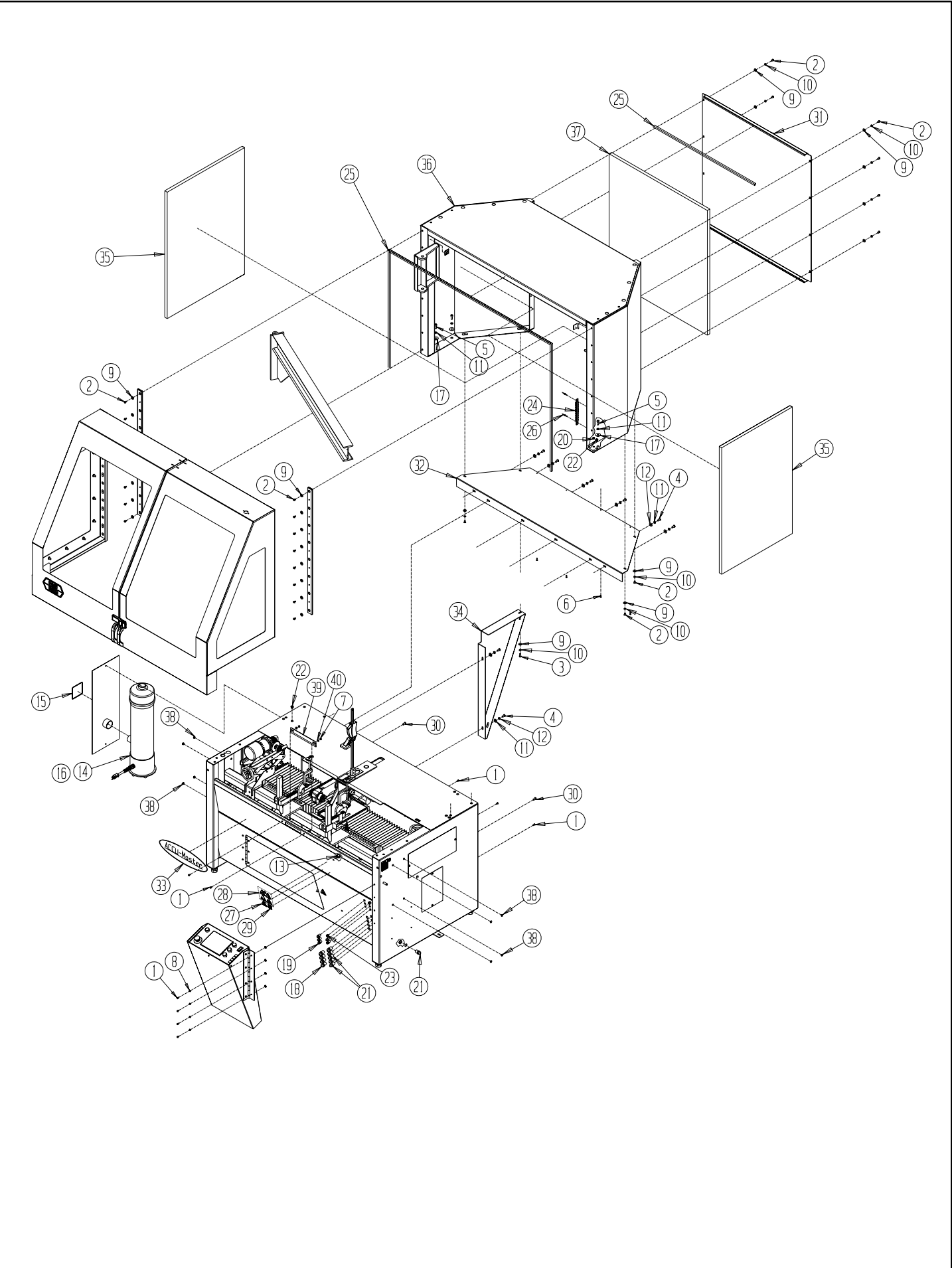
Grinding head travel was not setup parallel to the reel center shaft in vertical and horizontal planes. See Align the Reel Section in Operator's Manual.

### **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)**

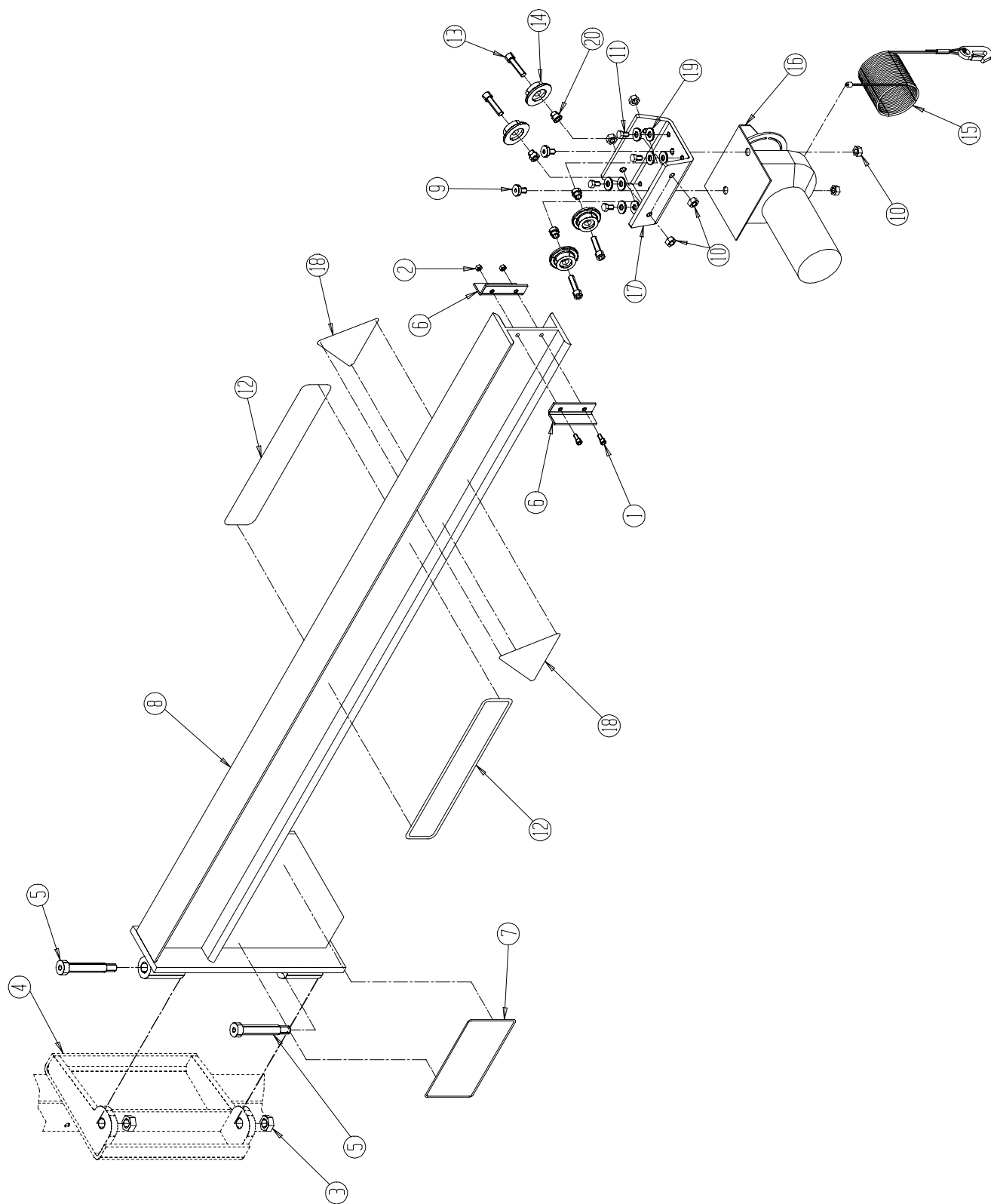


**PARTS LIST****6529546 CANOPY ASSEMBLY (WINCH & BOOM MODEL)**

| <b><u>DIAGRAM<br/>NUMBER</u></b> | <b><u>PART<br/>NUMBER</u></b> | <b><u>DESCRIPTION</u></b>                |
|----------------------------------|-------------------------------|--|
| 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                       |
| 15 .....                         | 6529054 .....                 | Vacuum Warning Decal                     |
| 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                         |
| 27 .....                         | 3708612 .....                 | No Fuel Warning Decal                    |
| 28 .....                         | 3708703 .....                 | Multiple Safety Symbols Decal            |
| 29 .....                         | 3708872 .....                 | Patent Decal                             |
| 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                          |

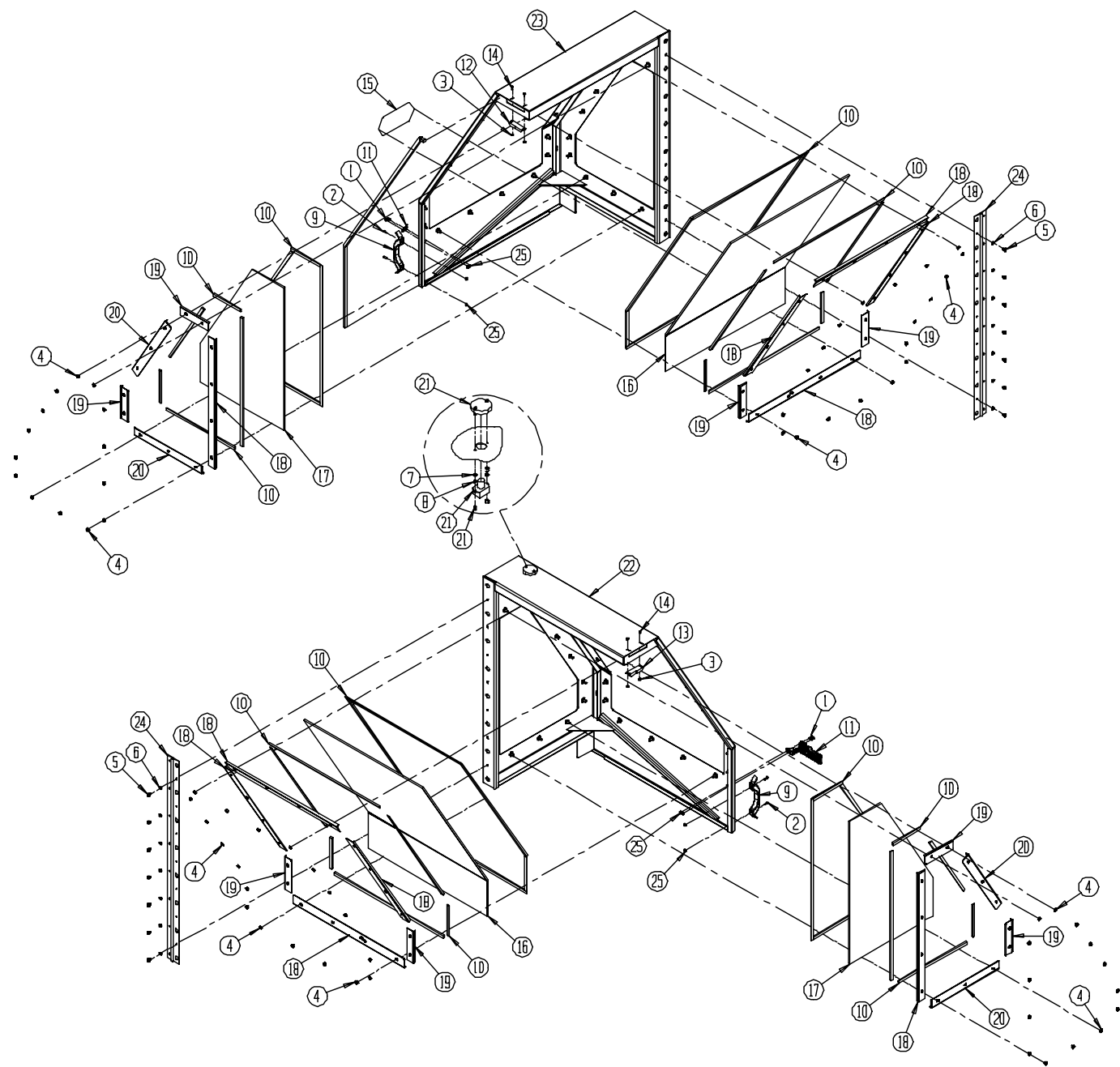
**ITEMS NOT SHOWN**

|       |               |                                 |
|-------|---------------|---------------------------------|
| ..... | 6529038 ..... | Winch Cord Receptacle W139      |
| ..... | 6529041 ..... | Front Door Switch Cord Assembly |
| ..... | 3708448 ..... | Electrical Warning Decal        |



**PARTS LIST****6509526 WINCH AND BOOM ASSEMBLY (BOOM MODEL)****DIAGRAM****NO.****PART. NO.****DESCRIPTION**

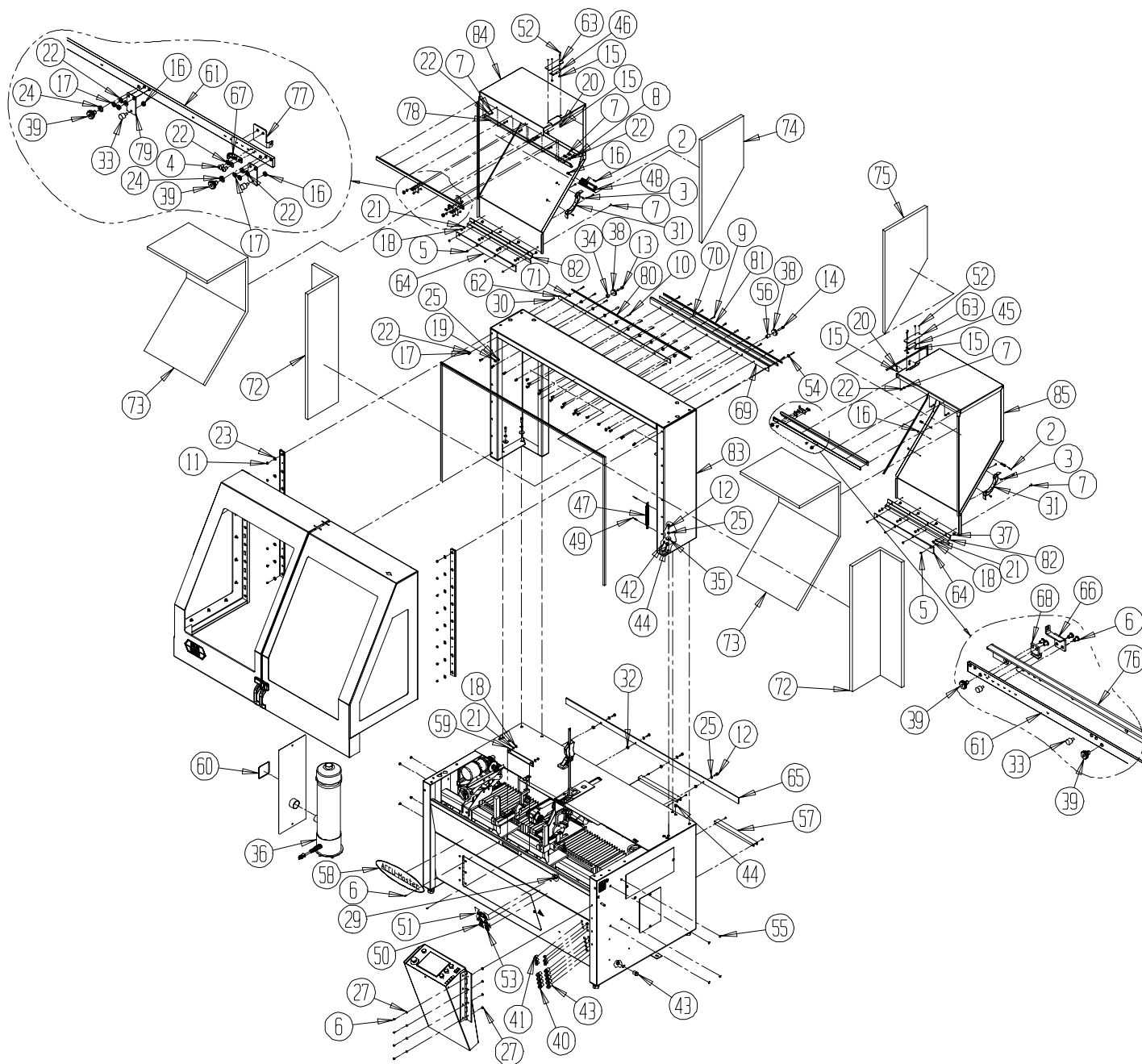
|    |         |   |
|----|---------|---|
| 1  | B251611 | Socket Head Cap Screw 1/4-20 x 1 Long         |
| 2  | J257100 | 1/4-20 Nylok Locknut                          |
| 3  | J627100 | 5/8-11 Locknut                                |
| 4  | 6509541 | Canopy Frame Weldment                         |
| 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                        |





**PARTS LIST****6529532 - CANOPY DOORS ASSEMBLY**

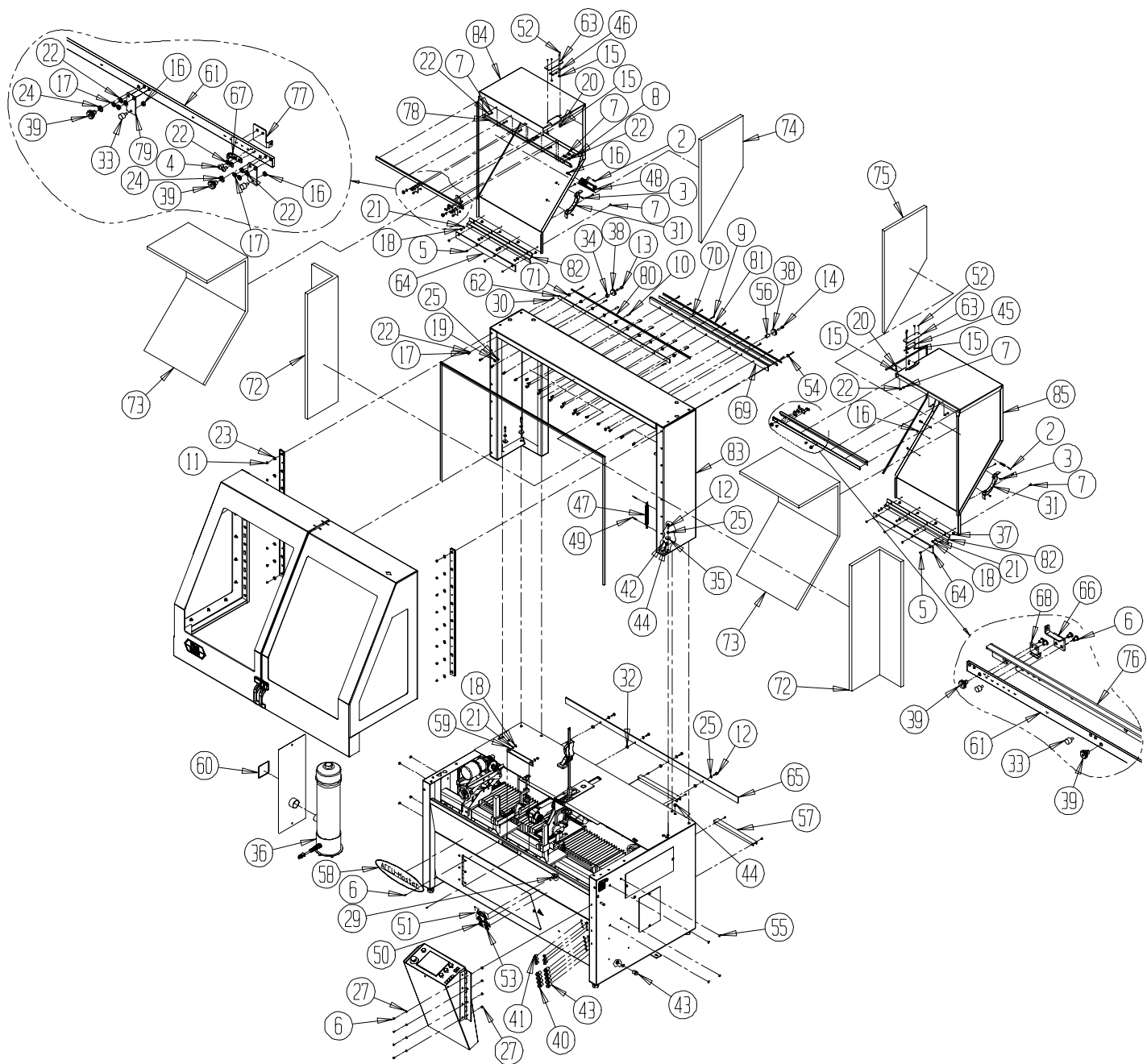
| <b><u>DIAGRAM<br/>NUMBER</u></b> | <b><u>PART<br/>NUMBER</u></b> | <b><u>DESCRIPTION</u></b>                 |
|----------------------------------|-------------------------------|---|
| 1 .....                          | B190811 .....                 | Socket Head Cap Screw #10-24 x 1/2 Long   |
| 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 Weldment                       |
| 23 .....                         | 6529506 .....                 | Left Door Weldment                        |
| 24 .....                         | 6509099 .....                 | Hinge                                     |
| 25 .....                         | J197100 .....                 | #10-24 Nylon Locknut                      |



**PARTS LIST****6529548 - CANOPY ASSEMBLY(REAR DOORS MODEL)**

| <b><u>DIAGRAM<br/>NUMBER</u></b> | <b><u>PART<br/>NUMBER</u></b> | <b><u>DESCRIPTION</u></b>                 |
|----------------------------------|-------------------------------|---|
| 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   |
| 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 .....                         | 3708612 .....                 | No Fuel Warning Decal                     |

**PARTS LIST      6529548 - CANOPY ASSEMBLY(REAR DOORS MODEL)**



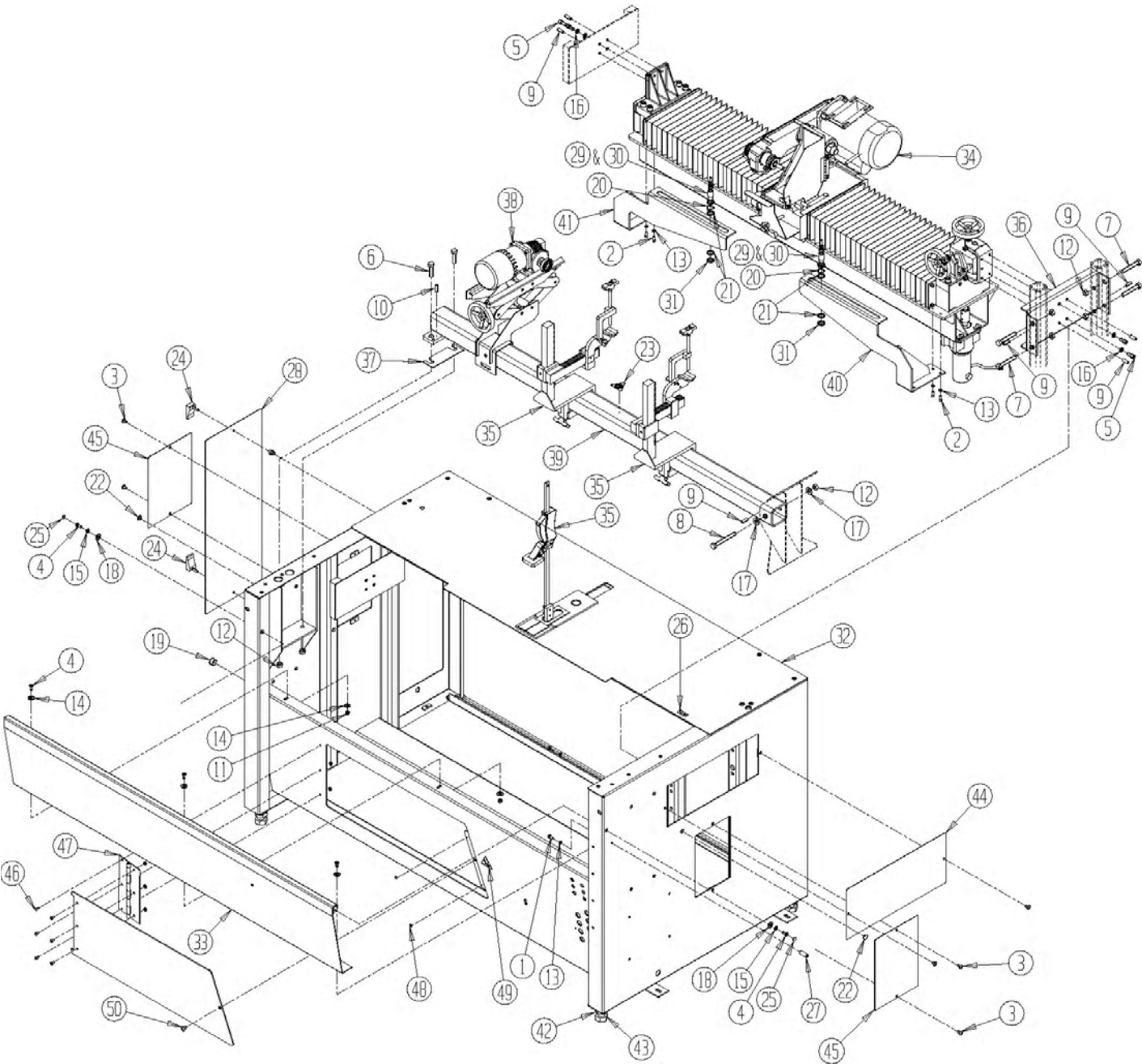
| <u>DIAGRAM<br/>NUMBER</u> | <u>PART<br/>NUMBER</u> | <u>DESCRIPTION</u> |
|---------------------------|------------------------|--------------------|
|---------------------------|------------------------|--------------------|

--CONTINUED FROM PREVIOUS PAGE--

|          |               |  |
|----------|---------------|--|
| 51 ..... | 3708703 ..... | Multiple Safety Symbols Decal            |
| 52 ..... | 3708820 ..... | 8-32 x .50 Long Button Head Safety Screw |
| 53 ..... | 3708872 ..... | Patent Decal                             |
| 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 ..... | 6529054 ..... | Vacuum Warning Decal                     |
| 61 ..... | 6529075 ..... | Door Support Bar                         |
| 62 ..... | 6529076 ..... | Rail Spacer Bar                          |
| 63 ..... | 6529077 ..... | Door Switch Bracket                      |
| 64 ..... | 6529078 ..... | Lower Door Slide                         |
| 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

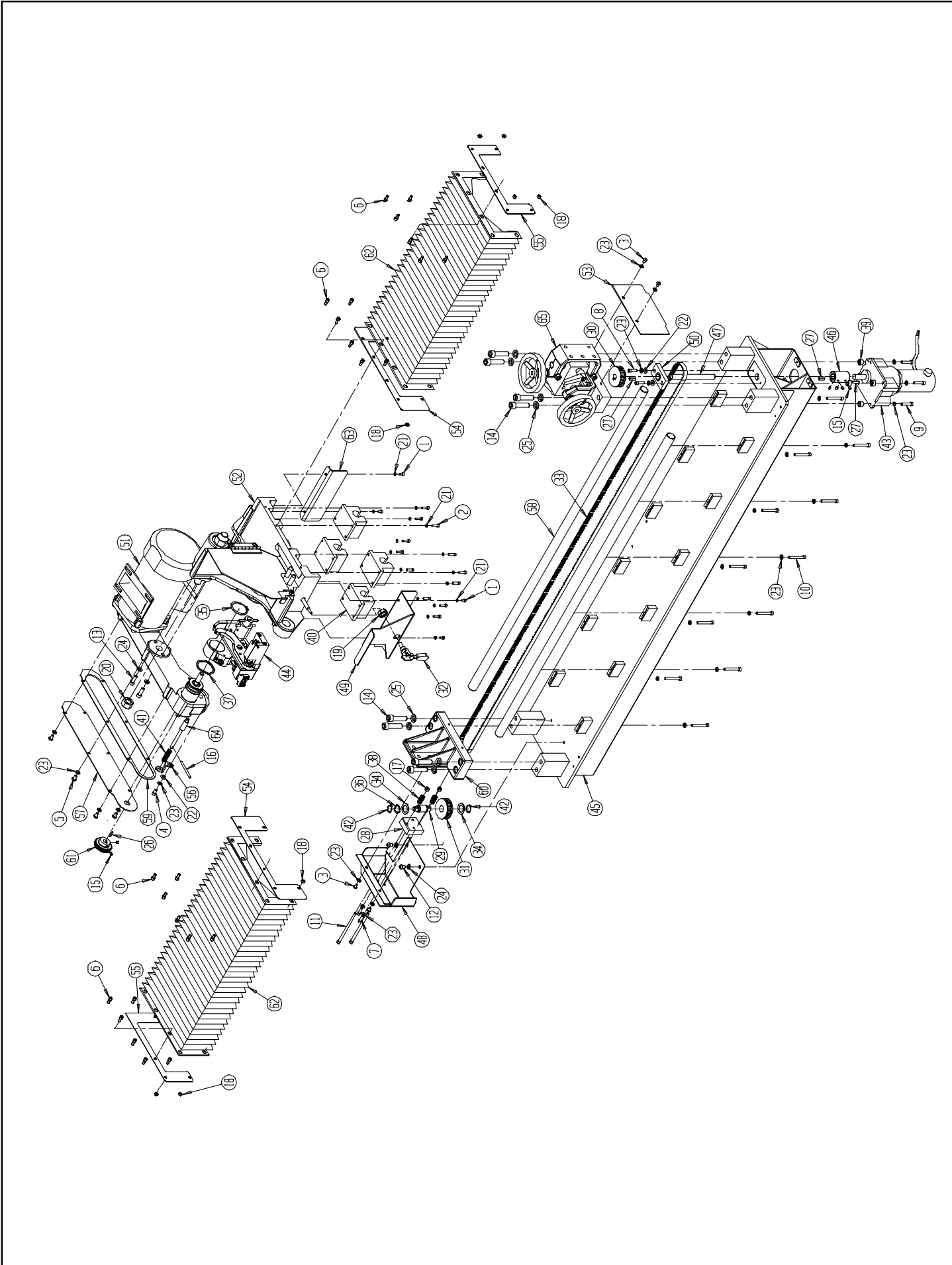
|       |               |                                    |
|-------|---------------|------------------------------------|
| ..... | 6529074 ..... | Front Door Switch Cord             |
| ..... | 6529044 ..... | Rear Door Switch Cord              |
| ..... | 3706065 ..... | Wire Cable Assembly for Rear Doors |
| ..... | 3708448 ..... | Electrical Warning Decal           |



# PARTS LIST

# 6329545 MAIN CABINET ASSEMBLY

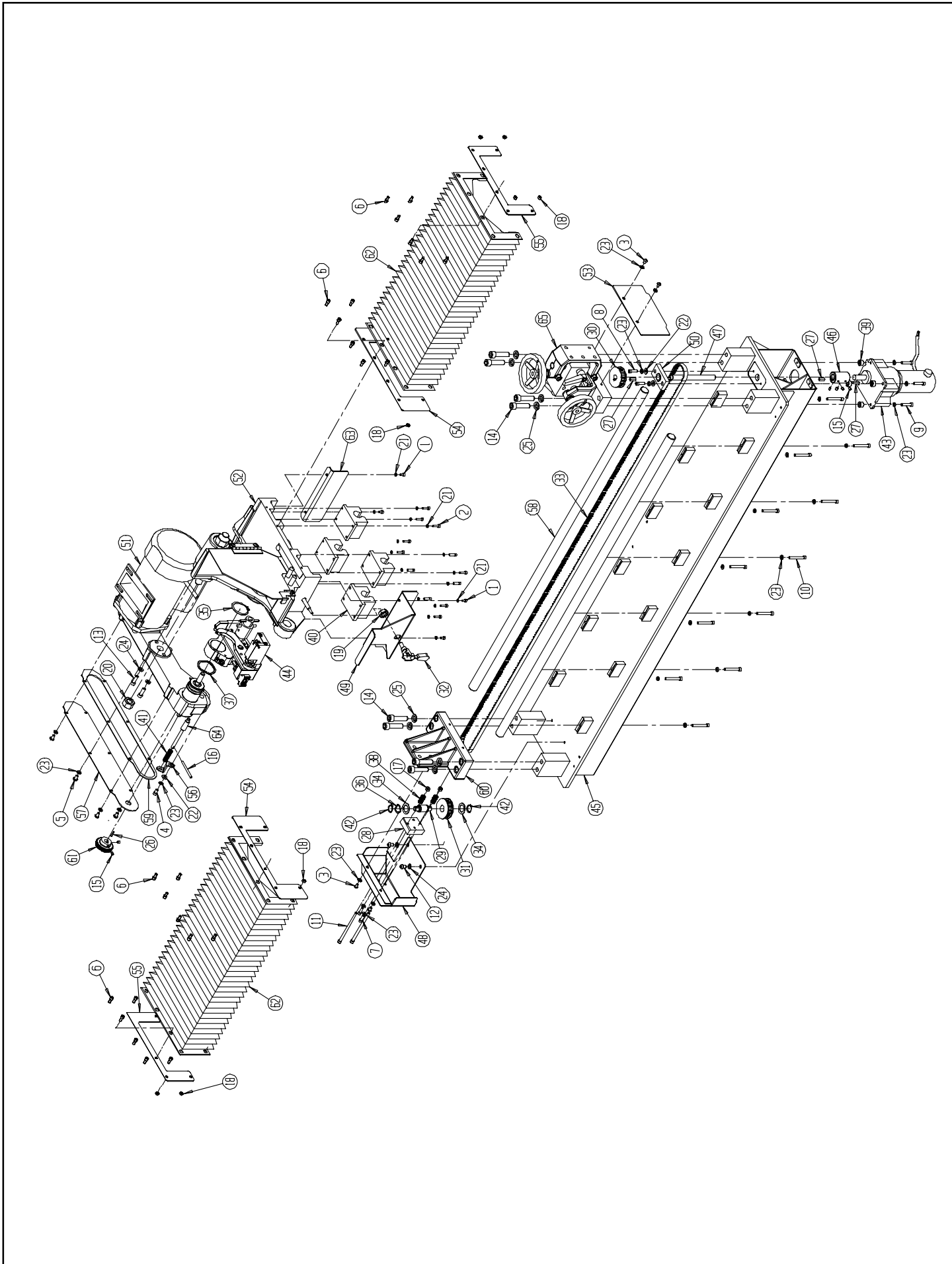
| <u>DIAGRAM<br/>NUMBER</u> | <u>PART<br/>NUMBER</u> | <u>DESCRIPTION</u>                         |
|---------------------------|------------------------|--|
| 1 .....                   | B251001 .....          | Hex Head Cap Screw 1/4-20 x 5/8            |
| 2 .....                   | B251011 .....          | 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  |



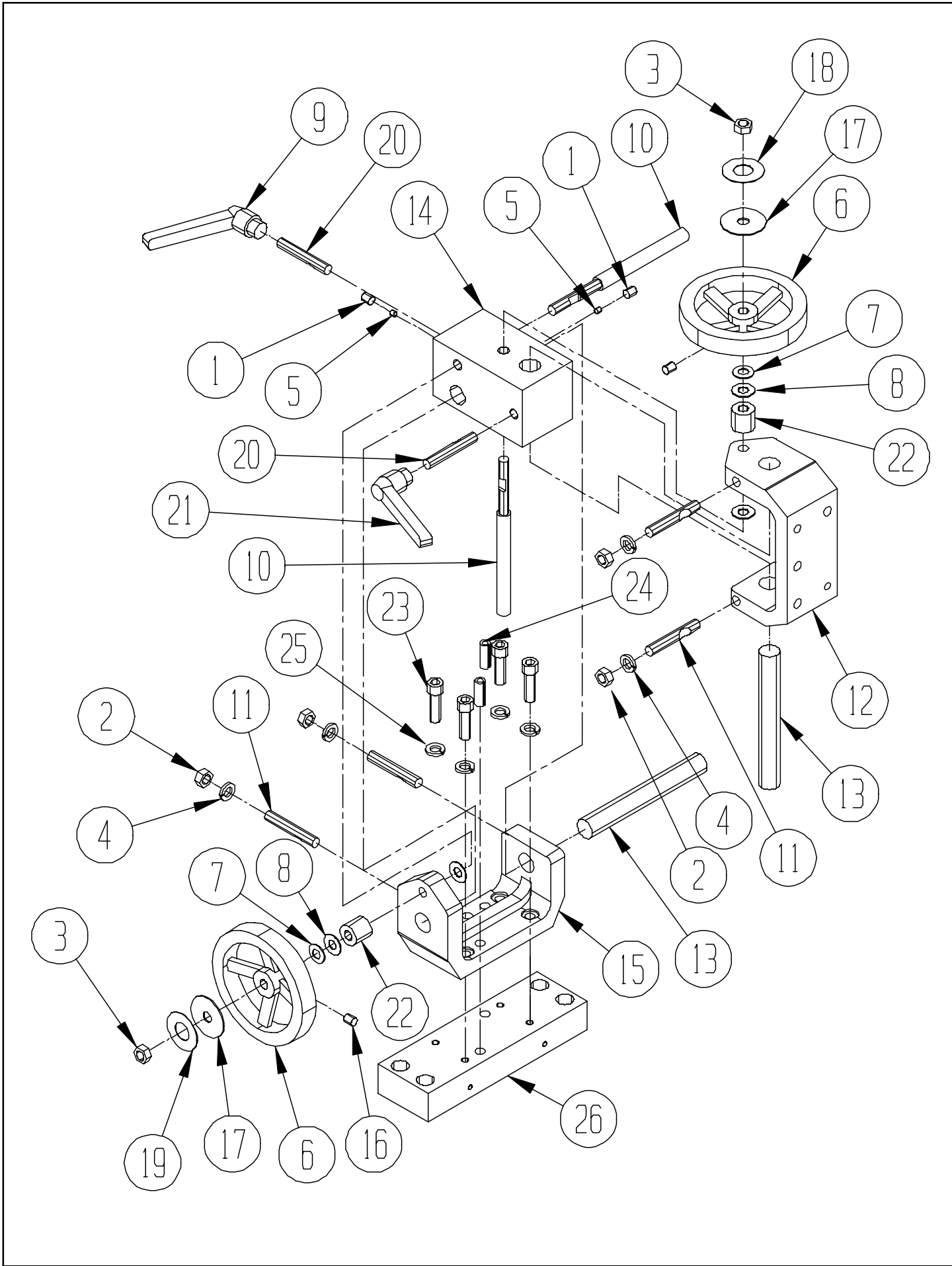


**PARTS LIST****6329525 TRAVERSE BASE ASSEMBLY**

| <b><u>DIAGRAM<br/>NUMBER</u></b> | <b><u>PART<br/>NUMBER</u></b> | <b><u>DESCRIPTION</u></b>                         |
|----------------------------------|-------------------------------|---|
| 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                               |

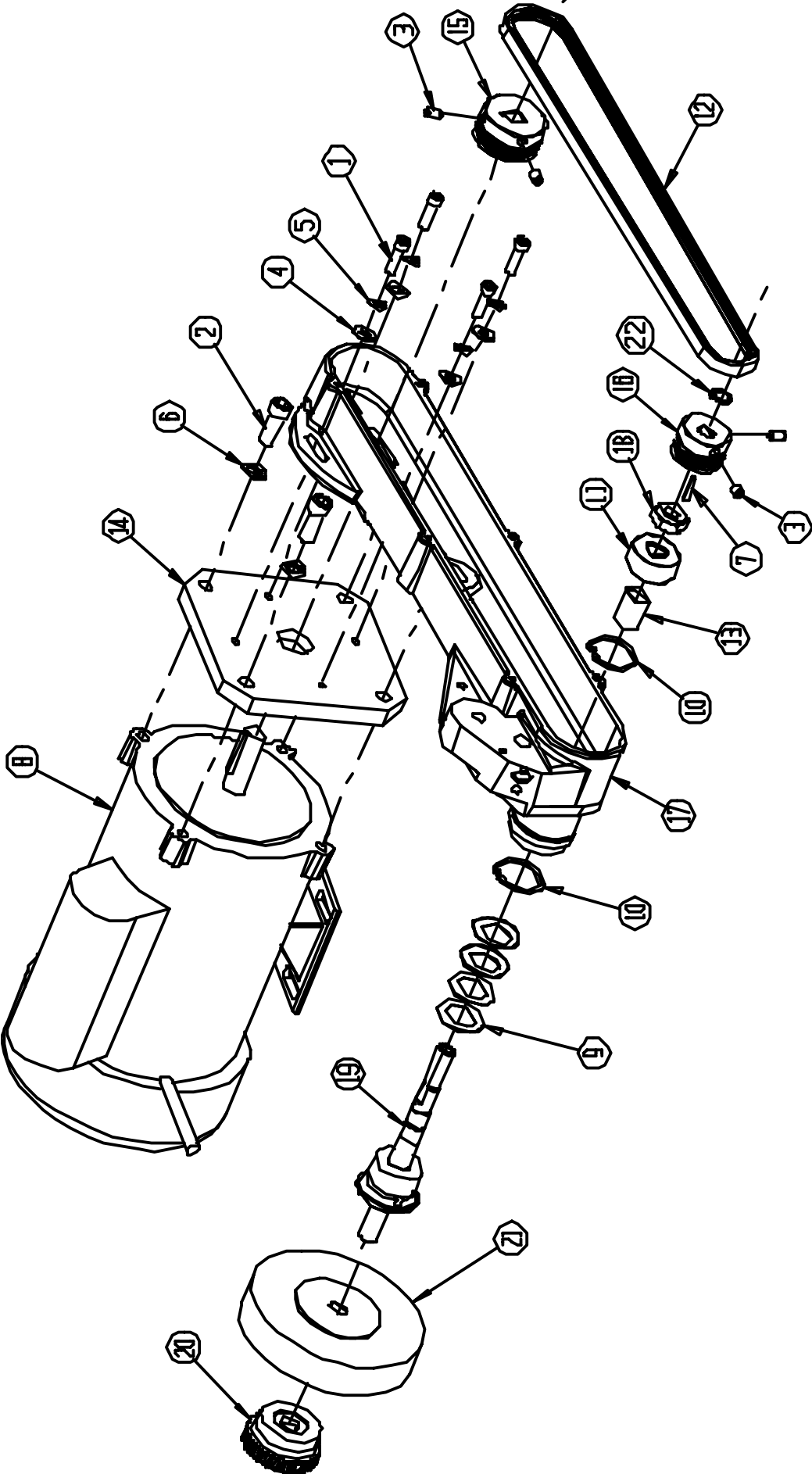


| <u>DIAGRAM<br/>NUMBER</u> | <u>PART<br/>NUMBER</u> | <u>DESCRIPTION</u>                              |
|---------------------------|------------------------|---|
| 41 .....                  | 3709072 .....          | Compression Spring                              |
| 42 .....                  | 3709331 .....          | 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)              |



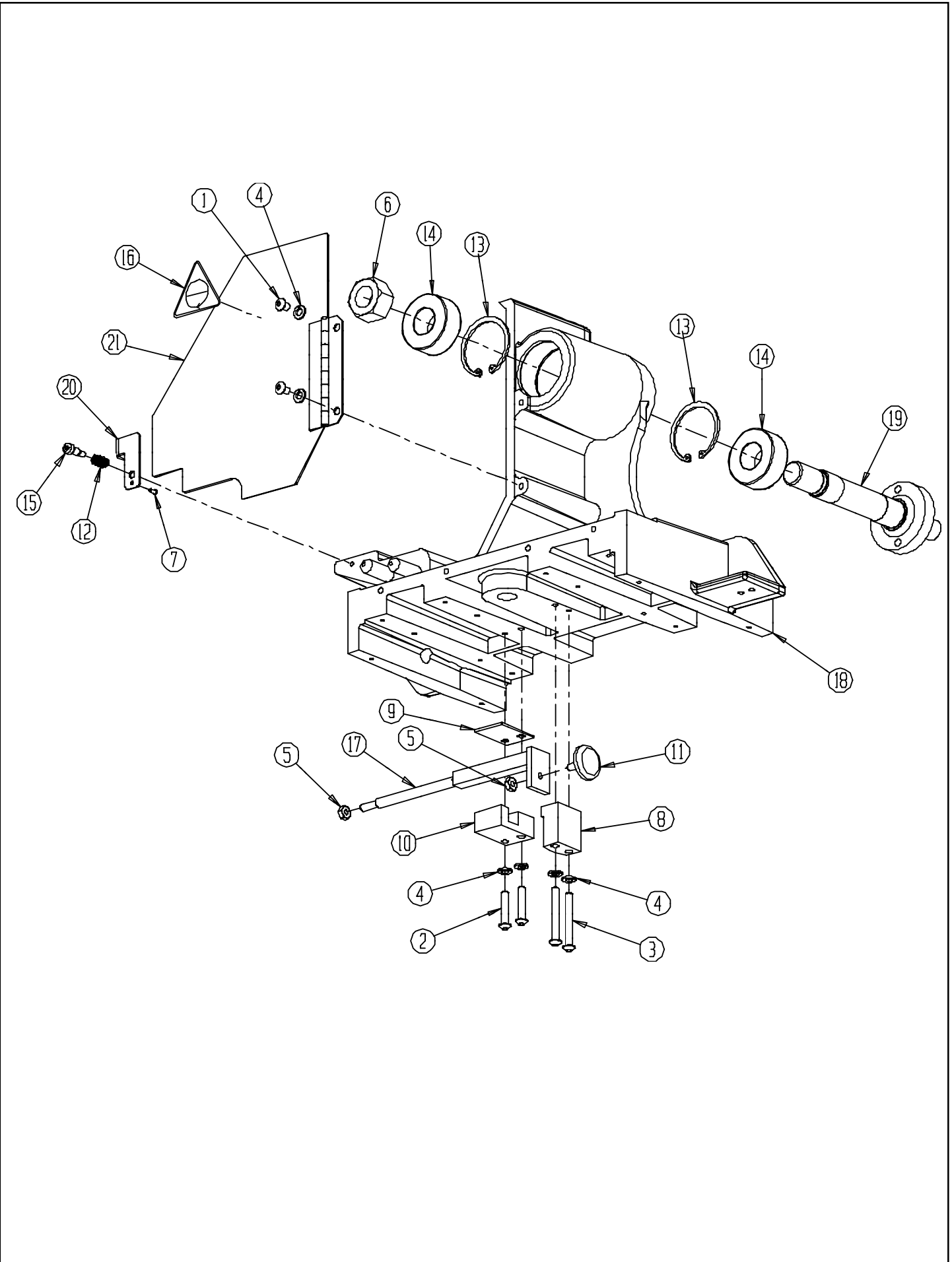
**PARTS LIST****6509565 CROSS SLIDE ASSEMBLY**

| <b><u>DIAGRAM<br/>NUMBER</u></b> | <b><u>PART<br/>NUMBER</u></b> | <b><u>DESCRIPTION</u></b>                 |
|----------------------------------|-------------------------------|---|
| 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            |



**PARTS LIST****6329526 GRINDING HEAD ASSEMBLY**

| <b><u>DIAGRAM<br/>NUMBER</u></b> | <b><u>PART<br/>NUMBER</u></b> | <b><u>DESCRIPTION</u></b>                              |
|----------------------------------|-------------------------------|--|
| 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 .....                         | 6509237 .....                 | Grinding Wheel knob                                    |
| 21 .....                         |                               | Grinding Wheel (see page 93)                           |
| 22 .....                         | 3708870 .....                 | Retaining Ring - External .50 Shaft Heavy Duty         |

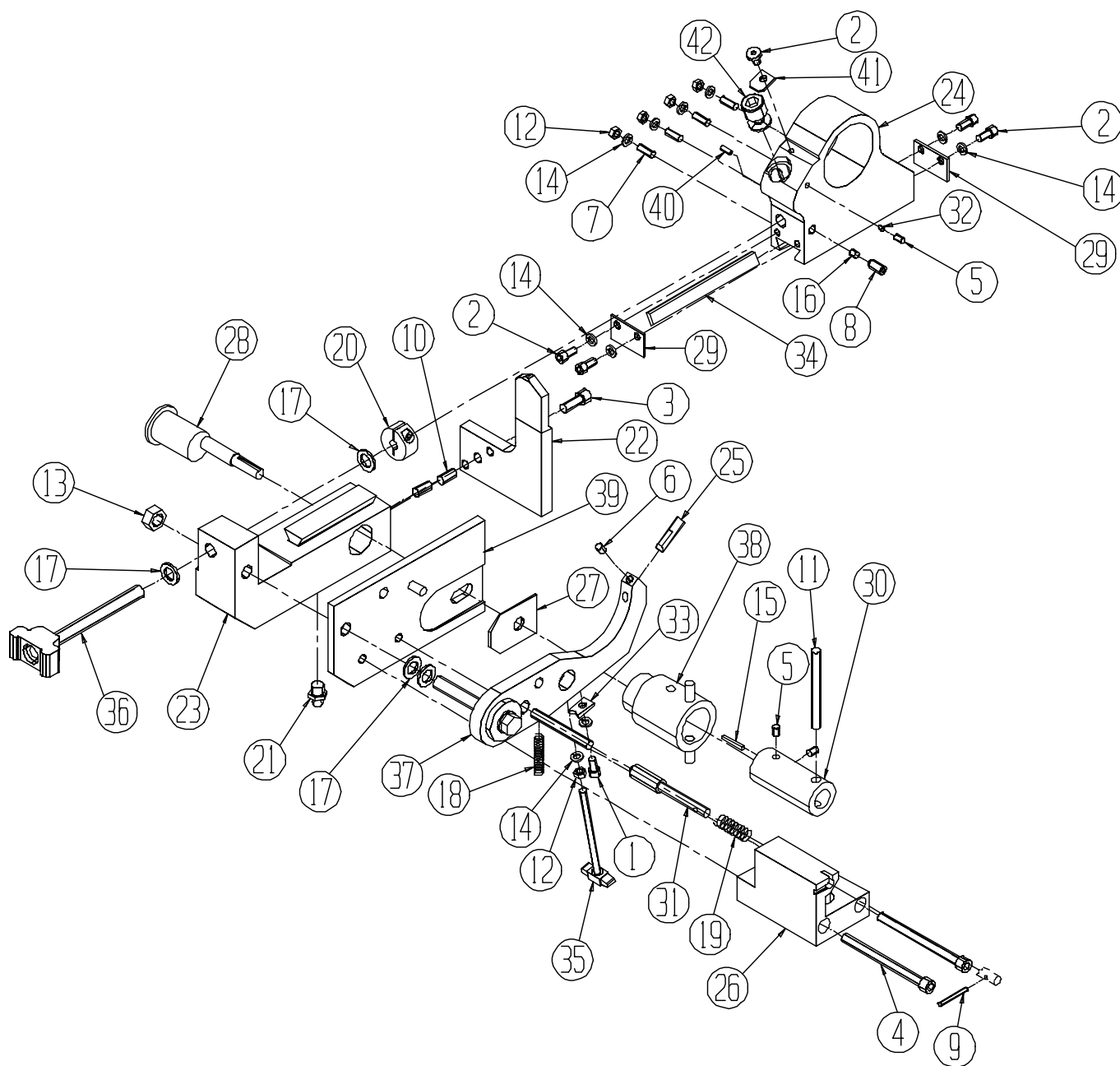




| <u>DIAGRAM<br/>NUMBER</u> | <u>PART<br/>NUMBER</u> | <u>DESCRIPTION</u>                        |
|---------------------------|------------------------|---|
| 1 .....                   | B250616 .....          | Button Head Cap Screw 1/4-20 x 3/8 Long   |
| 2 .....                   | B252016 .....          | 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                       |

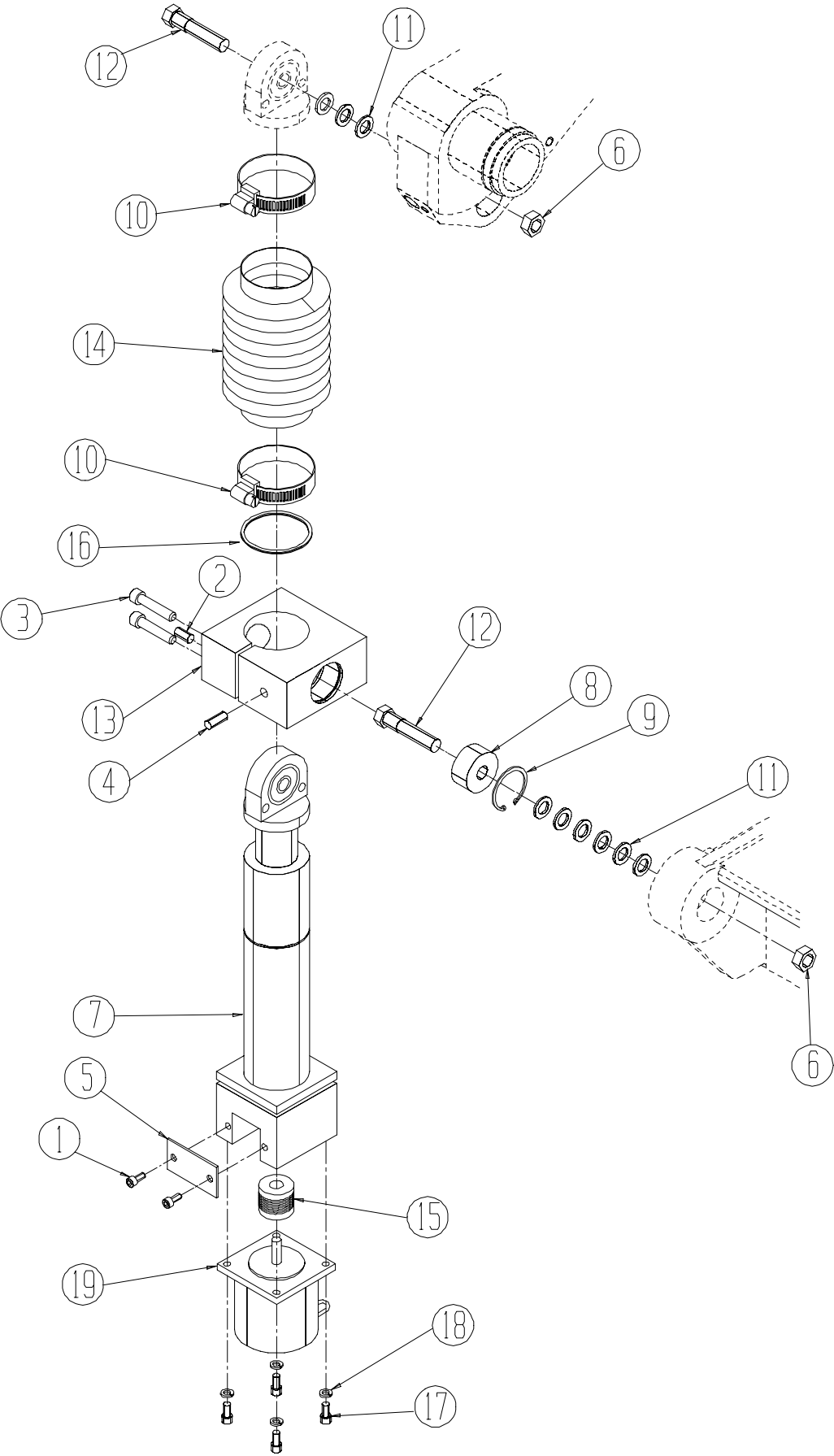
## PARTS LIST

## 6309573 FINGER AND BODY ASSEMBLY



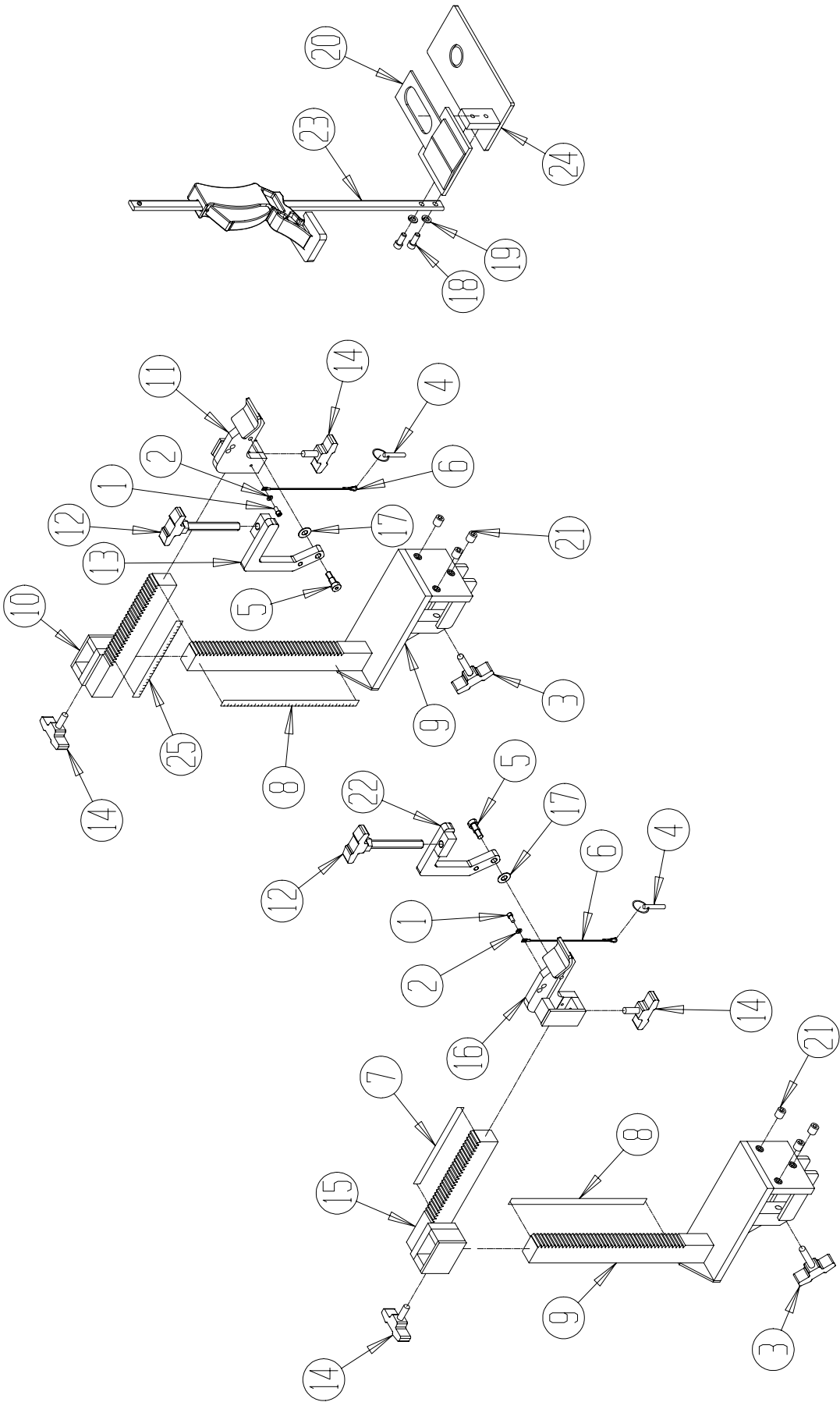
**PARTS LIST****6309573 FINGER AND BODY ASSEMBLY**

| <b><u>DIAGRAM<br/>NUMBER</u></b> | <b><u>PART<br/>NUMBER</u></b> | <b><u>DESCRIPTION</u></b>                     |
|----------------------------------|-------------------------------|---|
| 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                      |

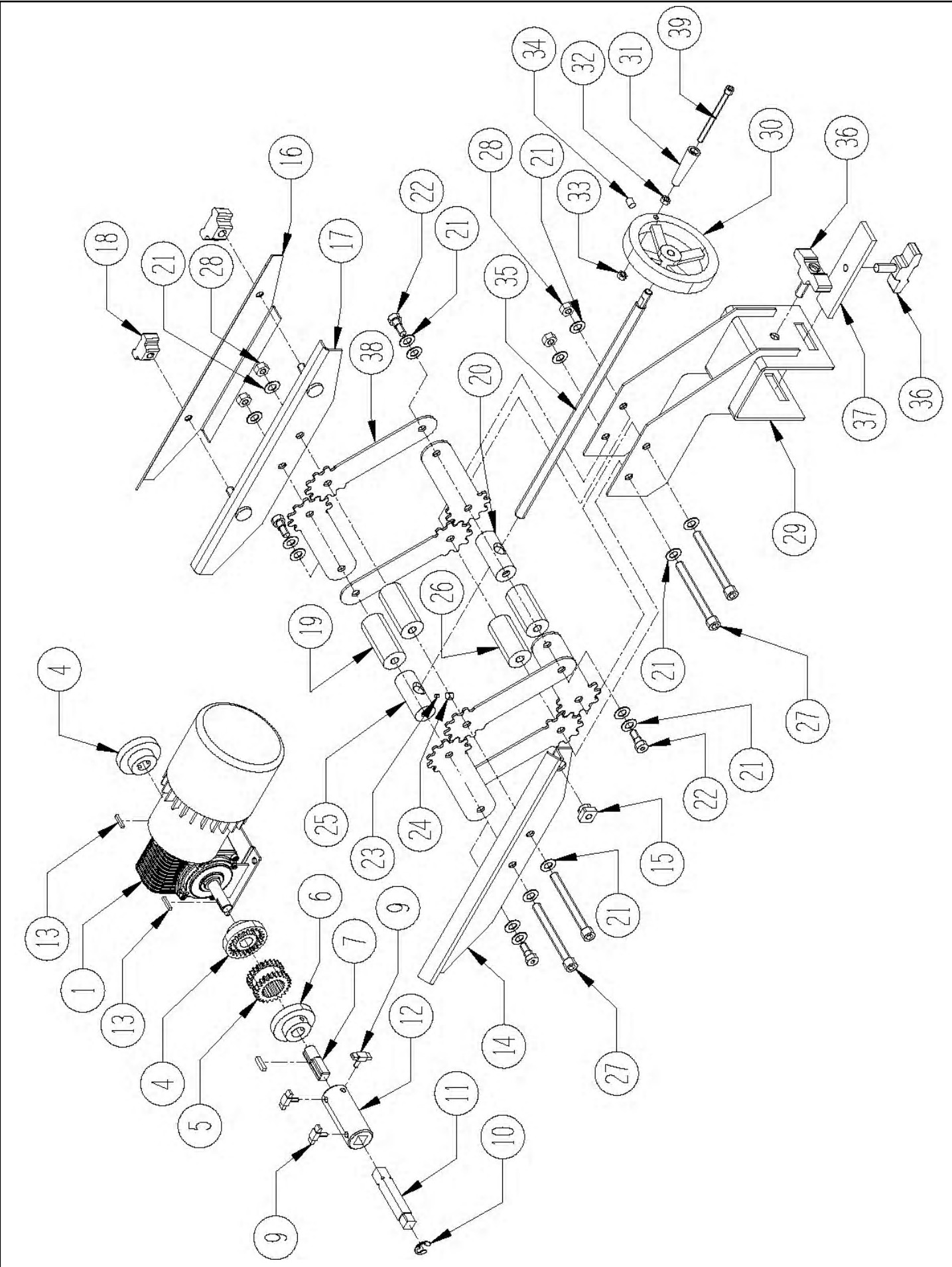


**PARTS LIST (Continued)****6509574 STEPPER & MOUNTING ASSEMBLY**

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



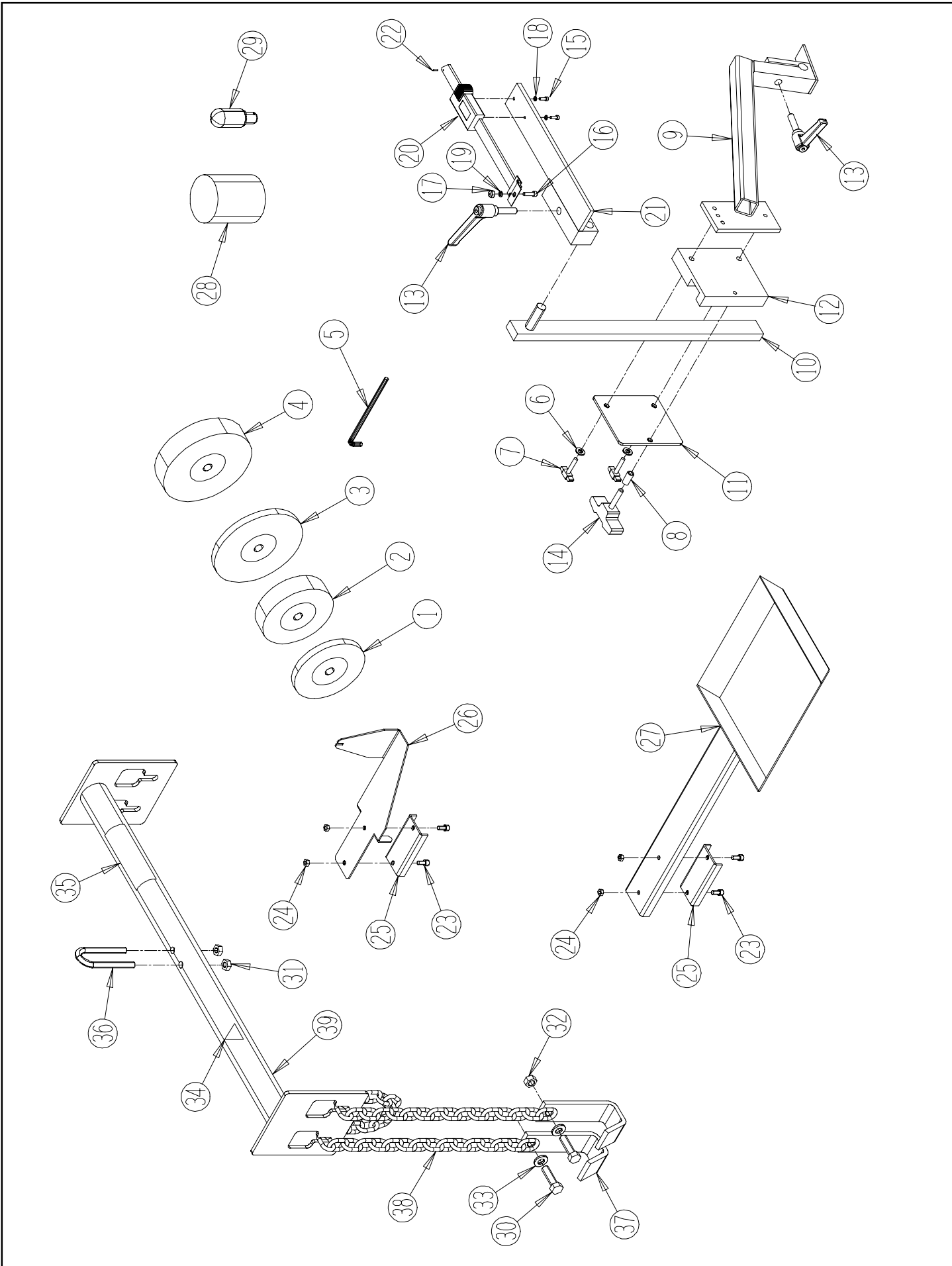
| <u>DIAGRAM<br/>NUMBER</u> | <u>PART<br/>NUMBER</u> | <u>DESCRIPTION</u>                         |
|---------------------------|------------------------|--|
| 1 .....                   | B190614 .....          | Pan Head Machine Screw 10-24 x 3/8 Long    |
| 2 .....                   | K191501 .....          | 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. Weldment 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                  |





**PARTS LIST (Continued)****6509465 SPIN DRIVE ASSEMBLY**

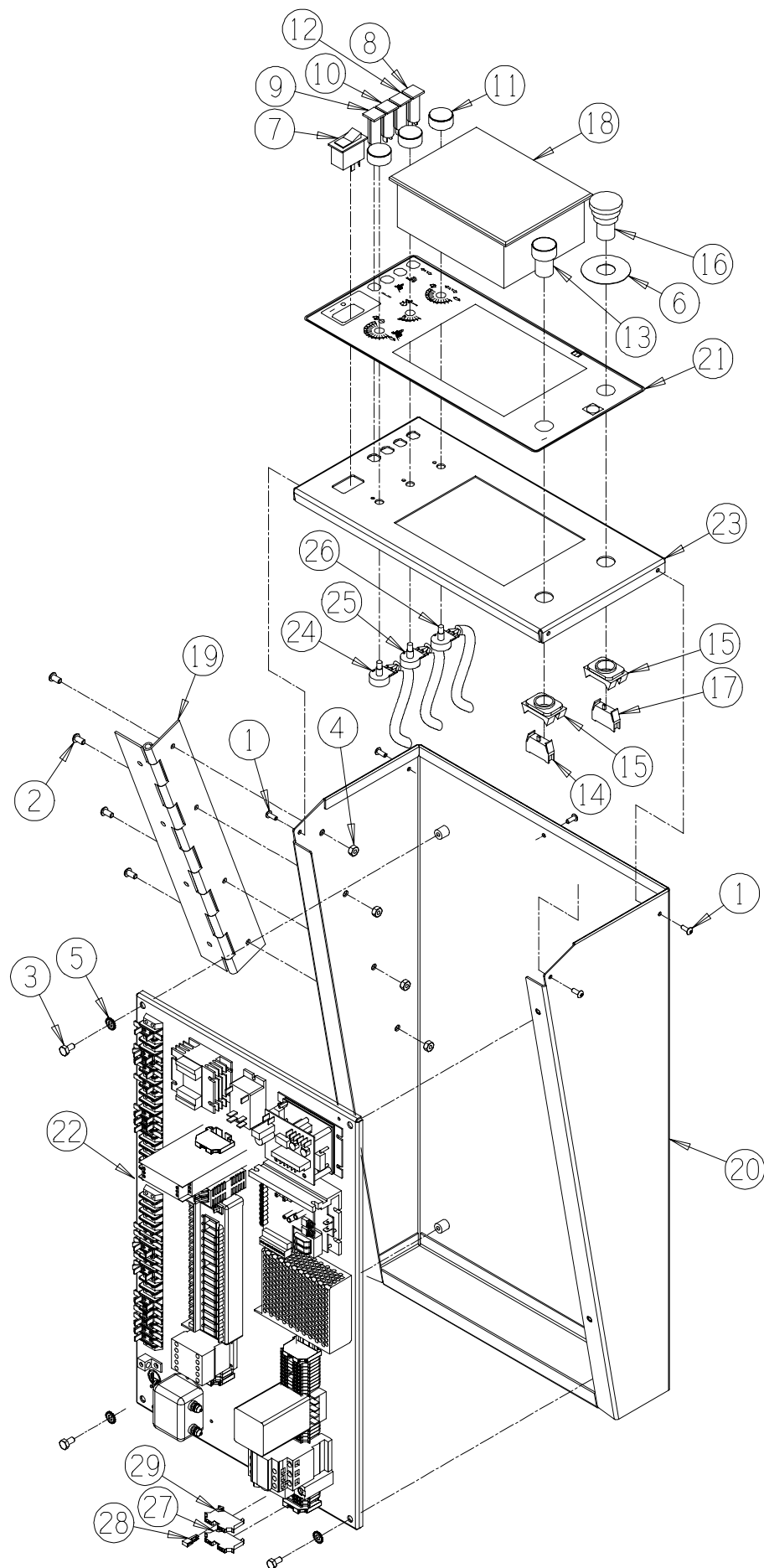
| <b><u>DIAGRAM<br/>NUMBER</u></b> | <b><u>PART<br/>NUMBER</u></b> | <b><u>DESCRIPTION</u></b>                 |
|----------------------------------|-------------------------------|---|
| 1 .....                          | 6329160 .....                 | Gearmotor, DC (Spin)                      |
| 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                |



**PARTS LIST (Continued)****6329529 MISCELLANEOUS PARTS**

| <b><u>DIAGRAM<br/>NUMBER</u></b> | <b><u>PART<br/>NUMBER</u></b> | <b><u>DESCRIPTION</u></b>                  |
|----------------------------------|-------------------------------|--|
| 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 .....                 | Socket 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                      |

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



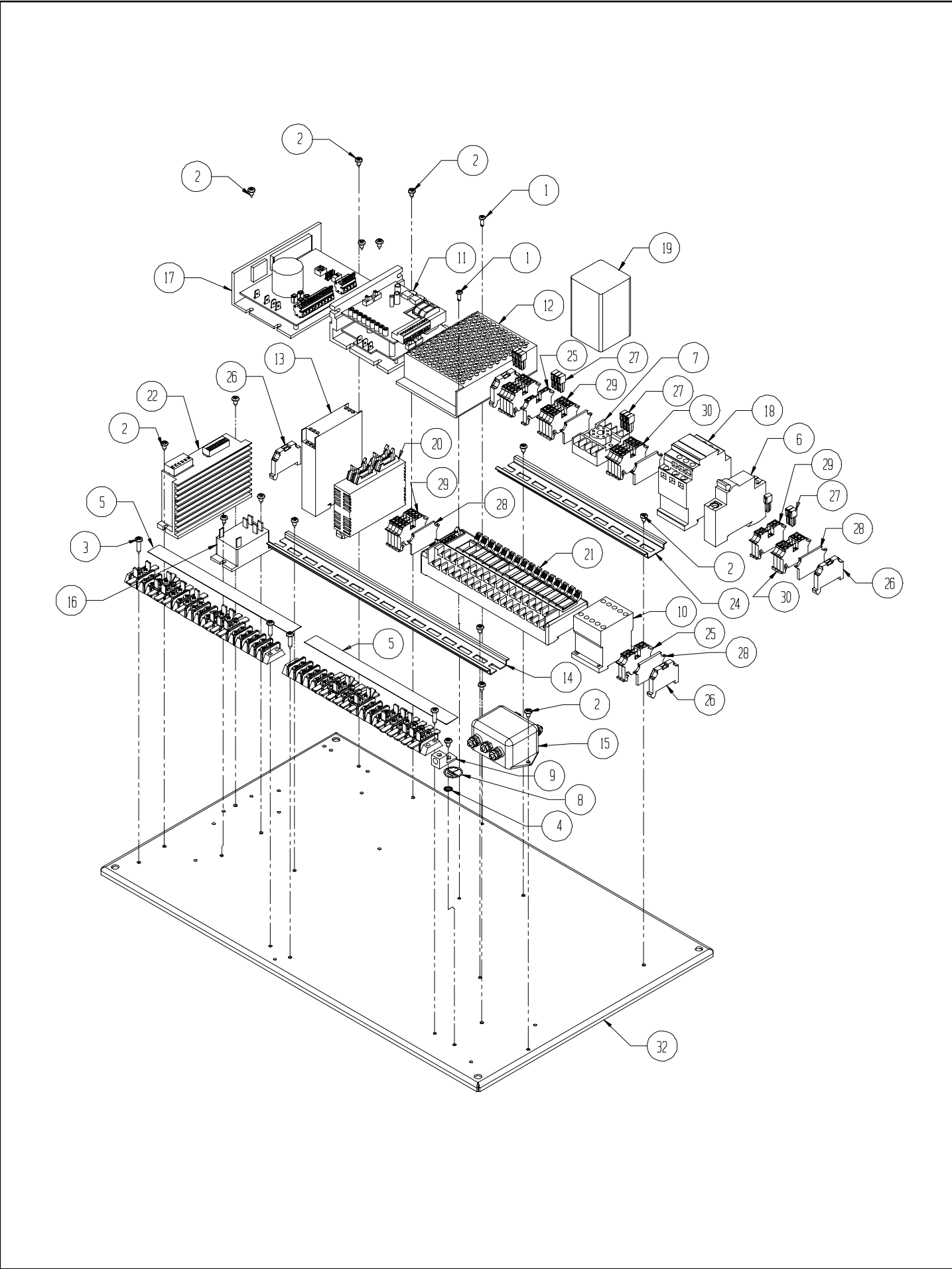
## PARTS LIST

## 6529525 CONTROL PANEL ASSEMBLY

| <u>DIAGRAM<br/>NUMBER</u> | <u>PART<br/>NUMBER</u> | <u>DESCRIPTION</u>                      |
|---------------------------|------------------------|---|
| 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 .....                  | 6529526 .....          | Electrical Panel Sub-Assembly           |
| 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  |



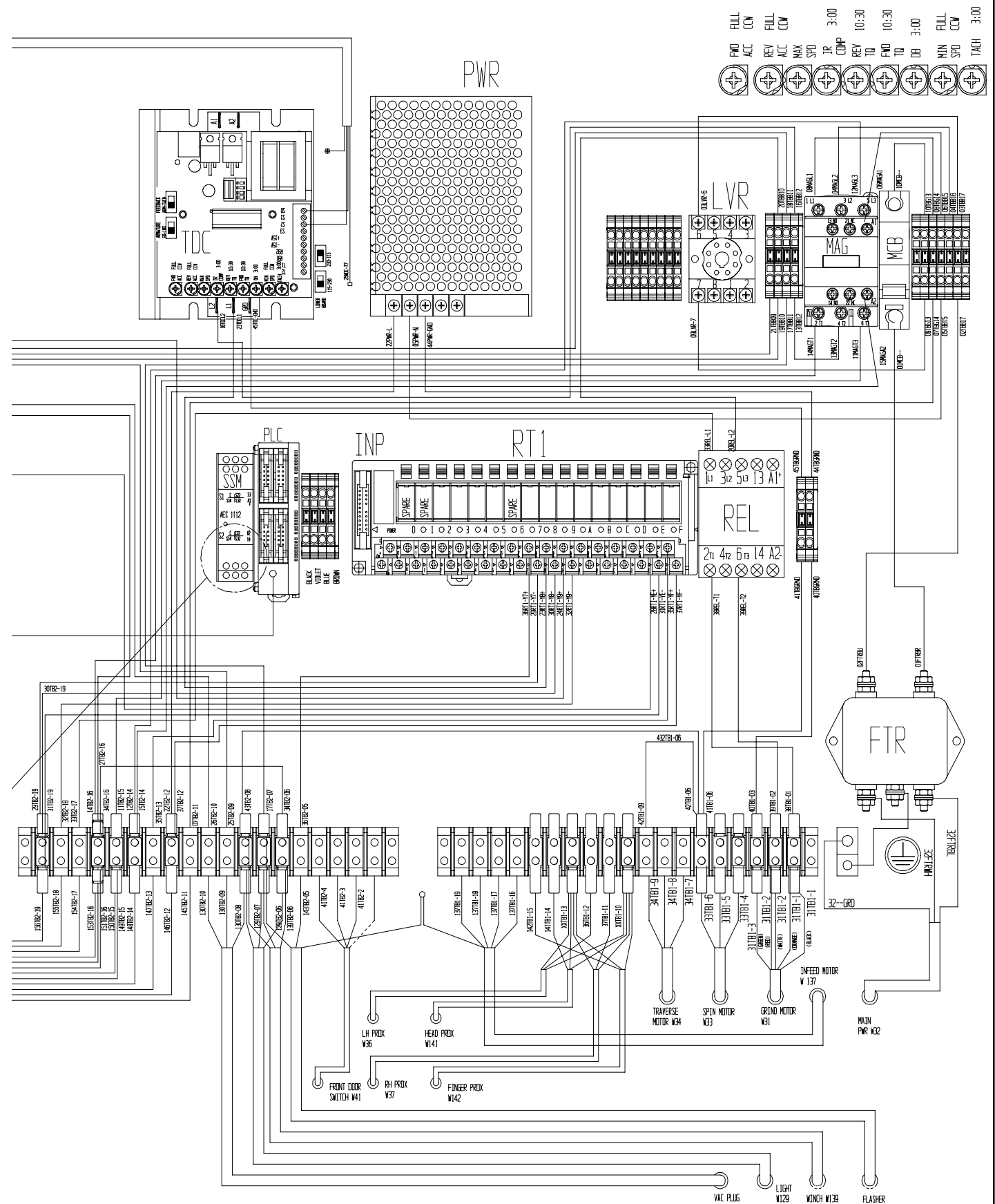
**PARTS LIST****6529526 CONTROL PANEL SUB-ASSEMBLY**

| <b><u>DIAGRAM<br/>NUMBER</u></b> | <b><u>PART<br/>NUMBER</u></b> | <b><u>DESCRIPTION</u></b>                 |
|----------------------------------|-------------------------------|---|
| 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 .....                         | 3707322 .....                 | 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 .....                         | 3707571 .....                 | Output Block with Relays                  |
| .....                            | 3707574 .....                 | 5-amp 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 Block 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         |
| 32 .....                         | 6529031 .....                 | Electrical Sub Panel                      |
| .....                            | 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                       |

**6524525 - AC**

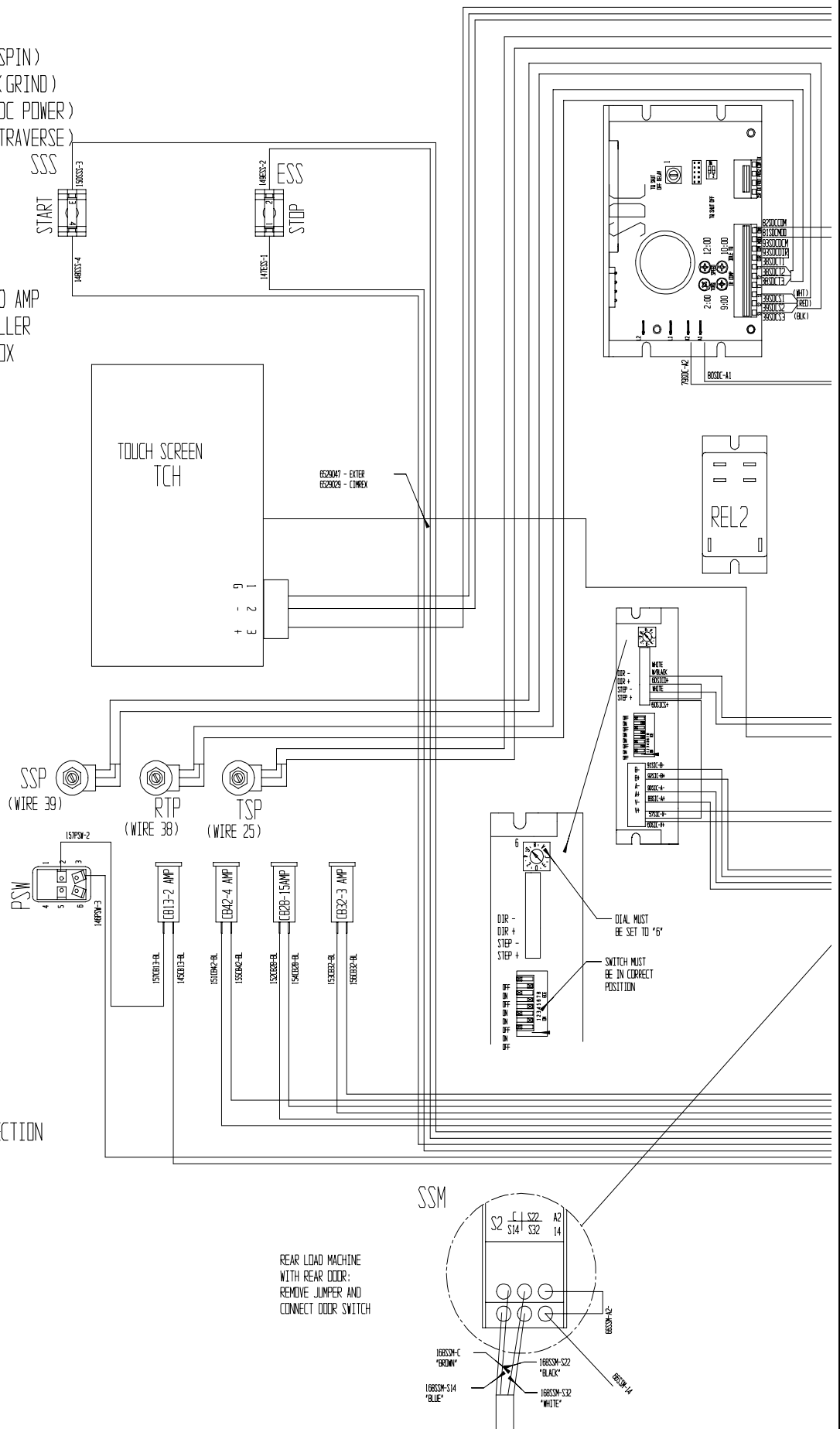




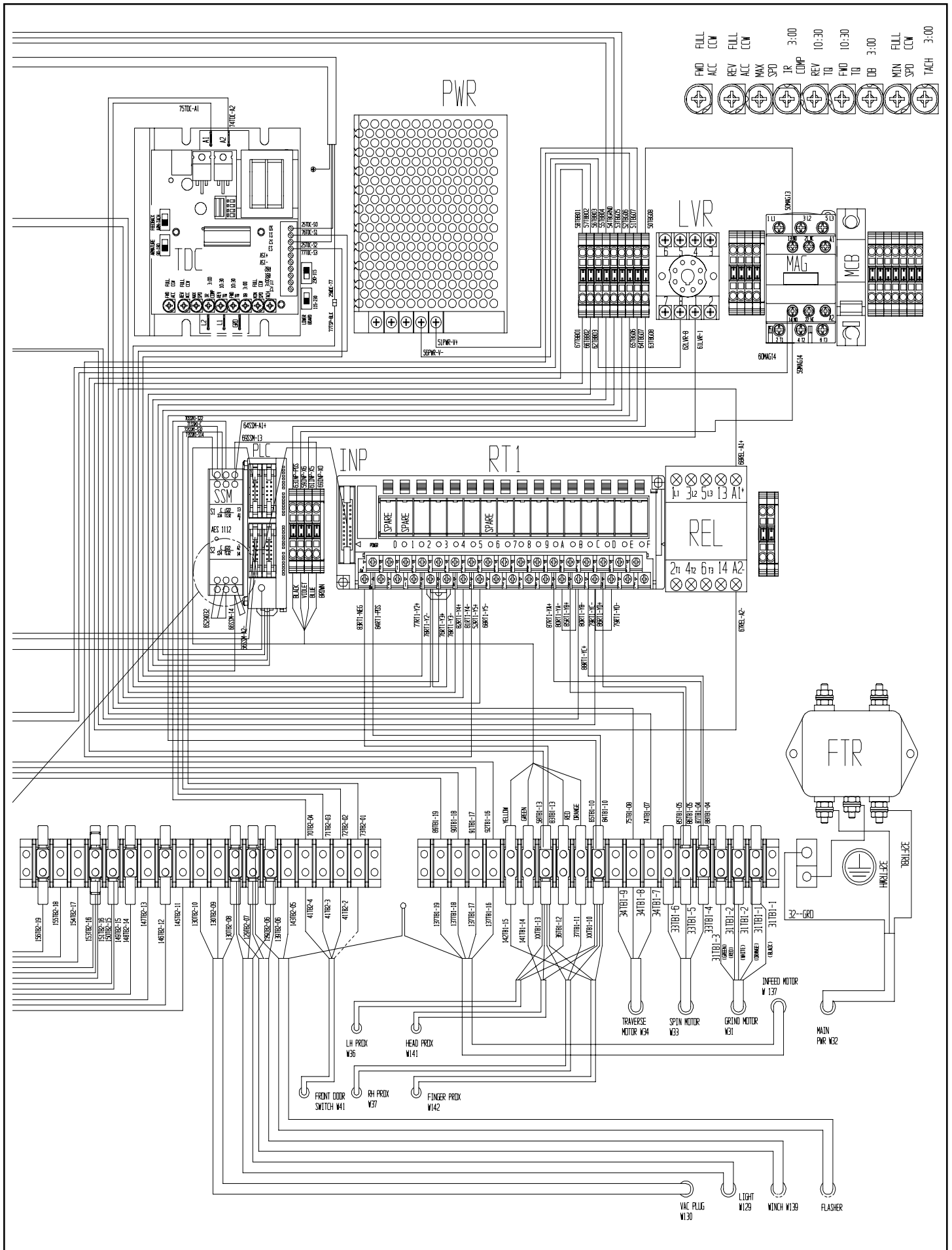


- CB42- 4-AMP CIRCUIT BREAKER (SPIN)  
 CB28- 15-AMP CIRCUIT BREAKER (GRIND)  
 CB13- 2-AMP CIRCUIT BREAKER (DC POWER)  
 CB32- 3-AMP CIRCUIT BREAKER (TRAVERSE)  
 ESS - EMERGENCY STOP SWITCH  
 FTR - FILTER  
 INP- INPUT TERMINAL BLOCK  
 LVR- LOW VOLTAGE RELAY  
 MAG - MAGNETIC STARTER  
 MCB - MAIN CIRCUIT BREAKER 20 AMP  
 PLC- PROGRAMABLE LOGIC CONTROLLER  
 PSW- POWER SWITCH - CONTROL BOX  
 PWR- DC POWER SUPPLY  
 REL - GRIND MOTOR RELAY  
 REL2 - VACUUM RELAY  
 RT1- RELAY TERMINAL BLOCK 1  
 RTP - RELIEF TORQUE POT  
 SDC - SPIN DRIVE CONTROL  
 SIC - STEPPER INFEEED 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



**6524525 - DC**



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BRN  
POWER CORD  
120 VAC 1 PH  
GRN  
BLU  
GROUND LUG  
(2)

GRN  
BLU  
FTR8  
LINE  
LOAD  
(1)  
N11  
GROUND LUG  
(1)

MCB11  
20A  
(1)

CB13  
2A  
(1)

PSW13  
(1)

YF  
(1)

ESS13  
(1)

SSS13  
(1)

MAG13  
(1)

EMERGENCY STOP  
RELAY  
1-13, 1-24, 3-118

24VDC CONTROL  
POWER SUPPLY

PWR16  
L1  
L2  
+  
24VDC  
-  
(1)

100  
101  
TO LINE  
3-101

LVR20  
6  
7  
1  
8  
(1)

213  
101  
TO LINE  
4-213

MAG13  
(1)

LOW VOLTAGE RELAY

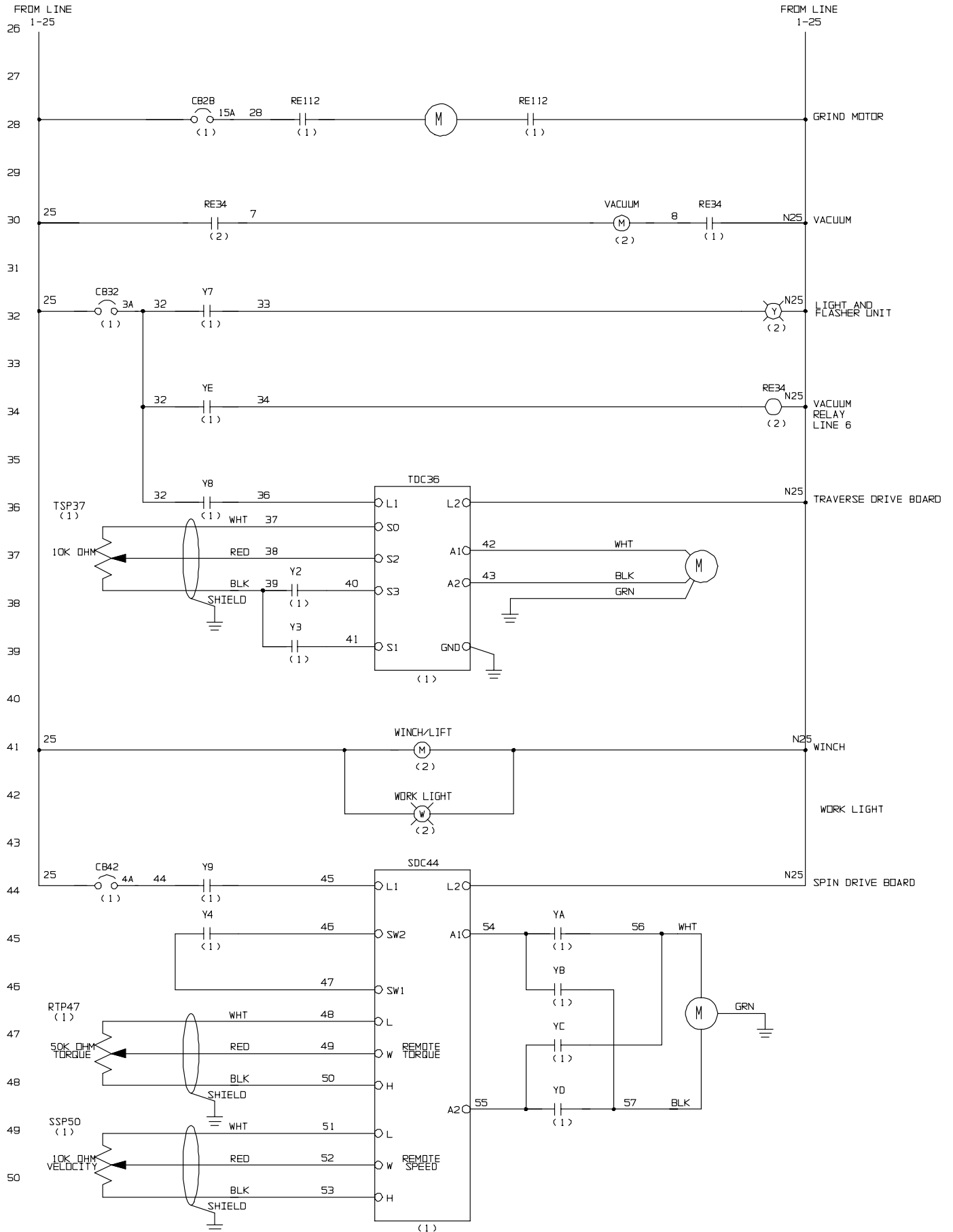
MAG13  
(1)

TO LINE  
2-26

N25

# WIRING SCHE-

2



101 100 (+) 10K (-)

102 100 101 CMX65 65 TOUCH SCREEN

103

104 RS-232 (1)

105

106 COMMUNICATION CABLE AF150M03-USB-M

107

108 100 101 ARDAT FPD PLC

109 RED GRN Y0-7 Y0-F (1)

110 FROM LINE 4-201 Y2-YF TO LINE 5-301 Y0 TO LINE 3-124 Y1

111

112 100 112 Y5 (1) RE112 101 (2) GROUND DRIVE POWER RELAY LINE 28

113

114 100 TO LINE 3-01, 1-1B 101 ARDAT FPD PLC INPUTS

115 100 TO LINE 3-01, 1-1B 101 ARDAT FPD PLC OUTPUTS

116 100 101 SSM SAFETY MONITOR

117 TO LINE 4-203 203 A1 A2 13 14 S22 S22 S32 S32 S14 S14 C C

118 118 M4513 (1) BK WH BLU BN OSS 1 FRONT OSS 2 REAR

119

120 118 TO LINE 4-215

121

122 118 101 S1C122 INFEED STEPPER

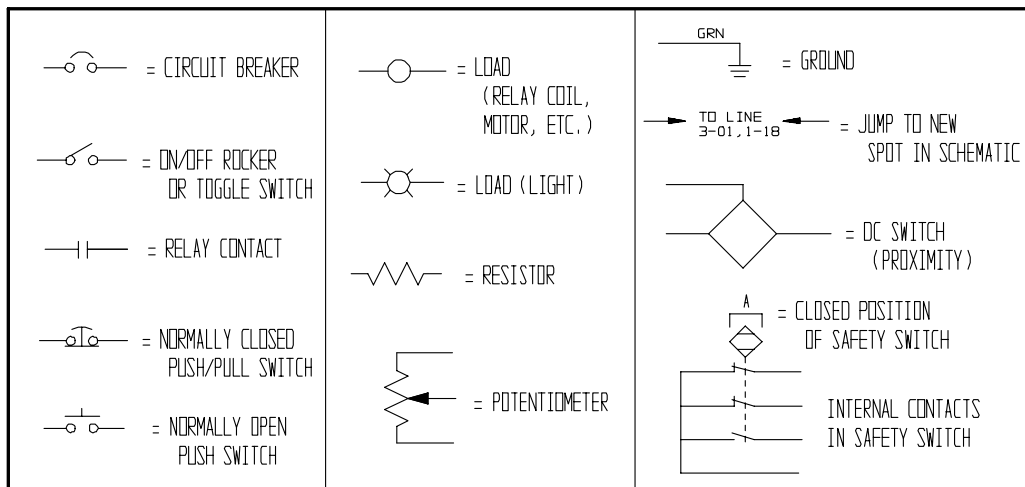
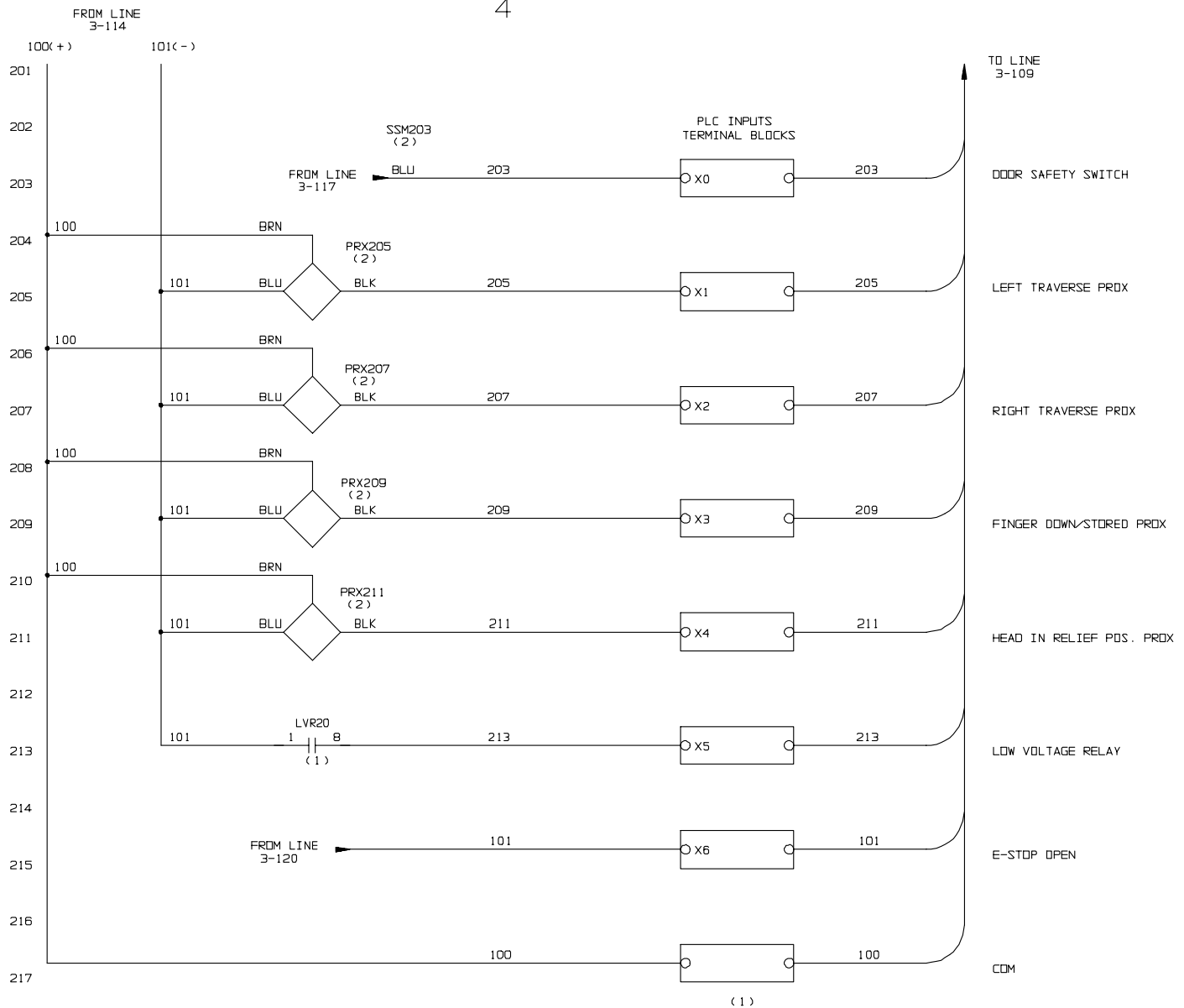
123 123 STEP + 131 Y0 FROM LINE 3-111 STEP- 124 DIR + 132 Y1 FROM LINE 3-111 DIR- 125

124

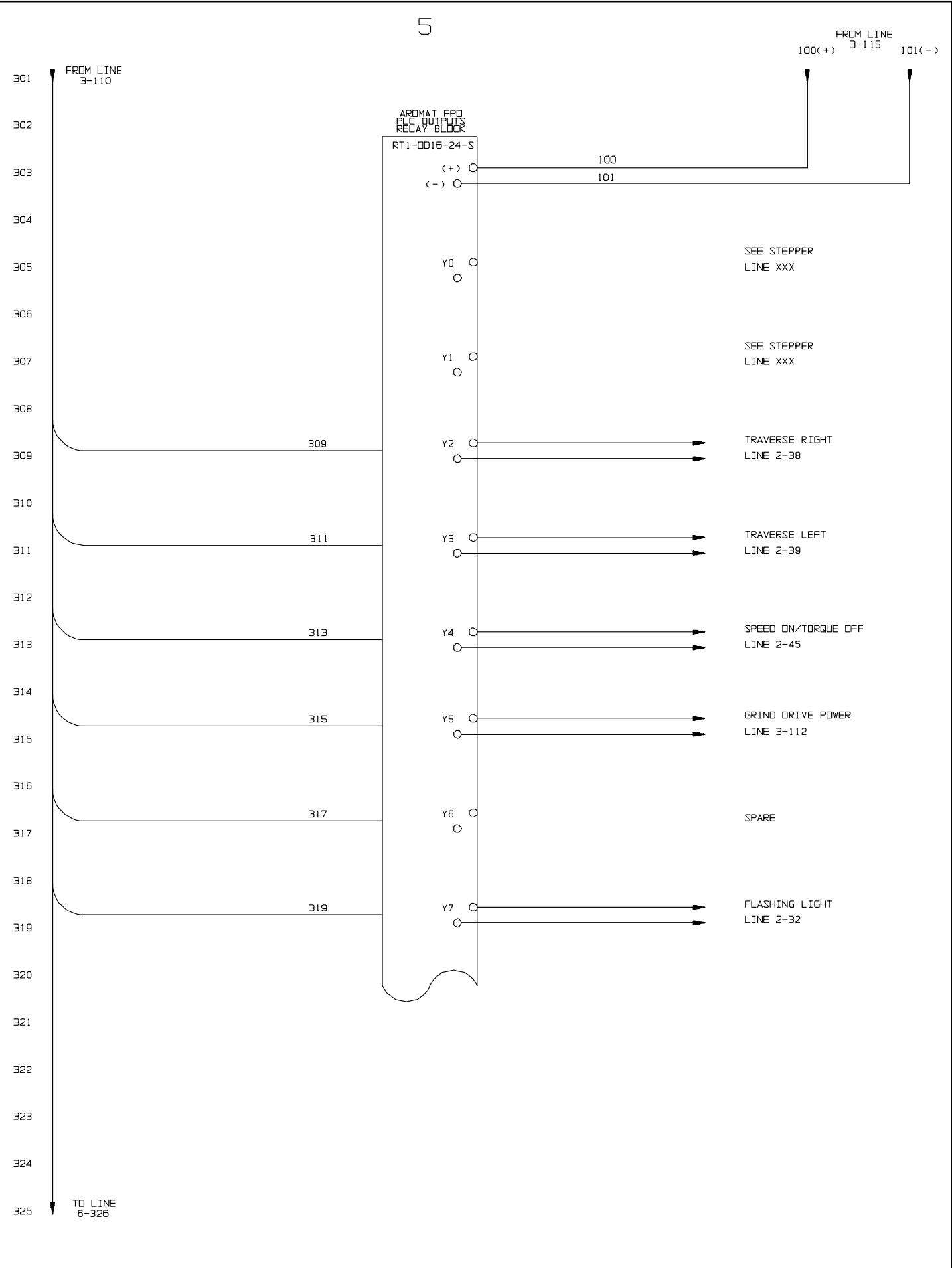
125 125 126 127 128 A A- B B SHIELD 125 126 127 128 BLK ORG YEL RED STEPPER MOTOR (2) 129 WHI/BLK 130 WHI/YEL 130 WHI/RED

# WIRING SCHEMATIC

4

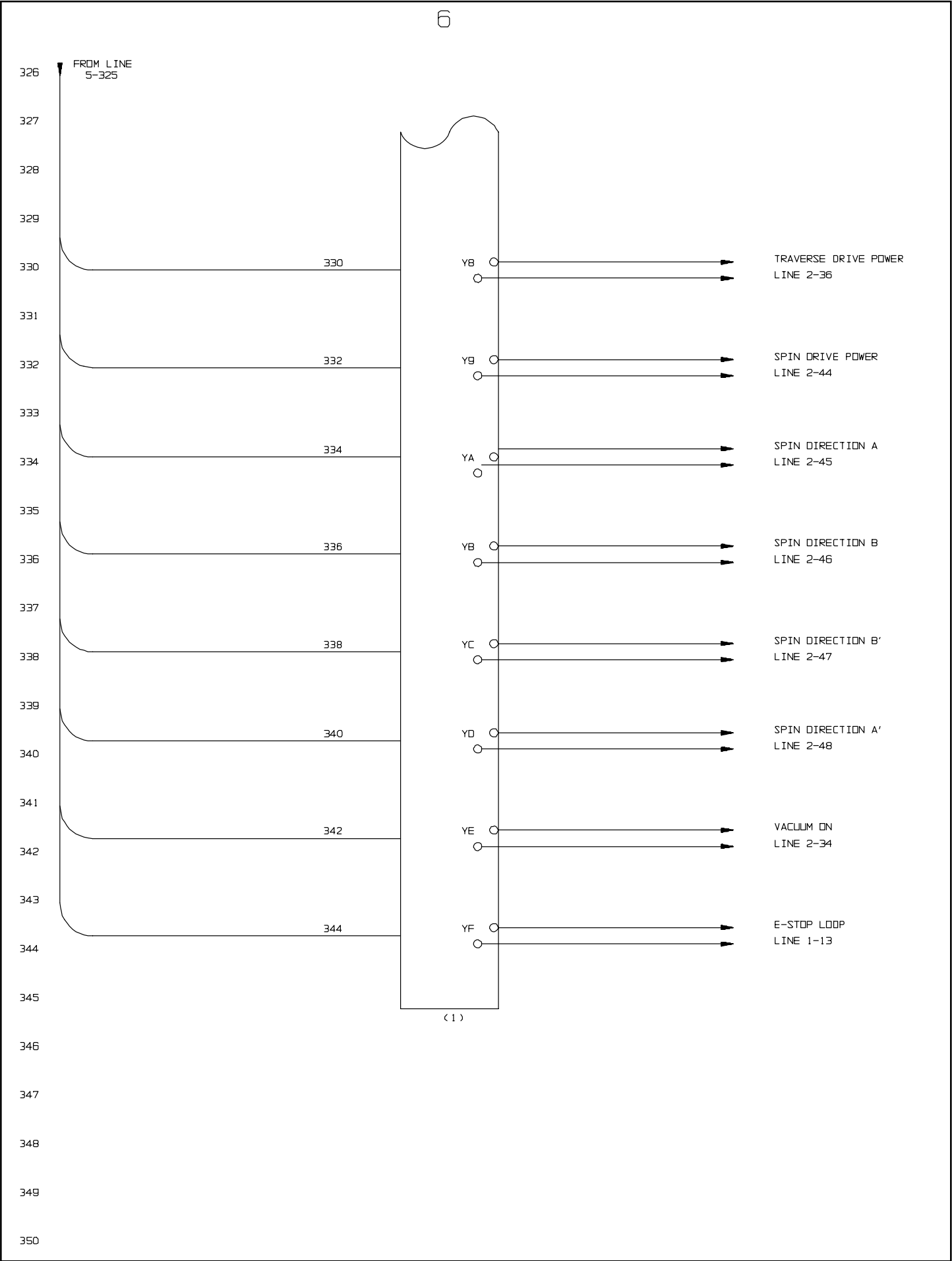


WIRING SCHEMATIC





WIRING SCHEMATIC



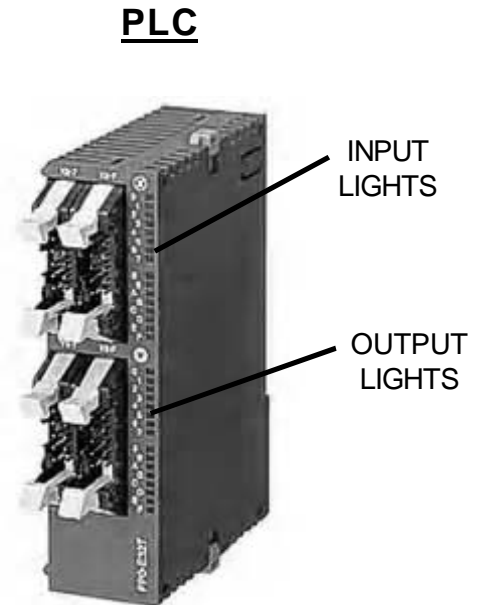
# PLC INPUT AND OUTPUT LIGHTS

## 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 OUTPUT LIGHTS

- Y0 STEP SIGNAL TO INFEEED DRIVE  
LIT WHEN INFEEED MOVING (DIM)
- Y1 DIRECTION SIGNAL TO INFEEED 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 OUTPUTING
- 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



### OUTPUT TERMINAL STRIP LIGHTS

- Y0 SPARE  
( PLC SIGNAL GOES DIRECTLY TO STEPPER DRIVE)
- Y1 SPARE  
( PLC SIGNAL GOES DIRECTLY TO STEPPER DRIVE)
- 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 OUTPUTING
- 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



