

ACCU-Pro 632 SPIN/RELIEF GRINDER

ASSEMBLY and SERVICE MANUAL



WARNING

You must thoroughly read and understand this manual before operating 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 foot wear 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. **REDUCE THE RISK OF UNINTENTIONAL STARTING.** Make sure the switch is OFF before plugging in the Grinder.
16. **USE RECOMMENDED ACCESSORIES.** Consult the manual for recommended accessories. Using improper accessories may cause risk of personal injury.
17. **CHECK DAMAGED PARTS.** A guard or other part that is damaged or will not perform its intended function should be properly repaired or replaced.
18. **KNOW YOUR EQUIPMENT.** Read this manual carefully. Learn its application and limitations as well as specific potential hazards.
19. **KEEP ALL SAFETY DECALS CLEAN AND LEGIBLE.** If safety decals become damaged or illegible for any reason, replace immediately. Refer to replacement parts illustration 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.
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 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 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 manufacturers replacement parts and have any repair work done by a qualified professional.

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

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



Low Voltage Relay

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

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SPECIFICATIONS

Electrical Requirements	115V 50/60 Hz, 20 amp circuit
Net Weight	1490 lbs (676 kg)-Boom Model 1670 lbs (758 kg)-Lift Model
Shipping Weight	1770 lbs (803 kg)-Boom Model 1950 lbs (885 kg)-Lift Model
Maximum Grinding Length	34 inches (86cm)

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 Spin/Relief Grinder. For those without the 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 (0.125kg - m)

No. 8 screws: 20 in. - lbs (0.23 kg - m)

No. 10 screws: 32 in. - lbs (0.37 kg - m)

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

ASSEMBLY INSTRUCTIONS

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



**THE UNIT WEIGHS
1490 LBS. (676 kg).
WITH BOOM OR
1670 LBS (758 kg)
WITH LIFT. USE
POWER EQUIPMENT
TO LIFT MACHINE.**

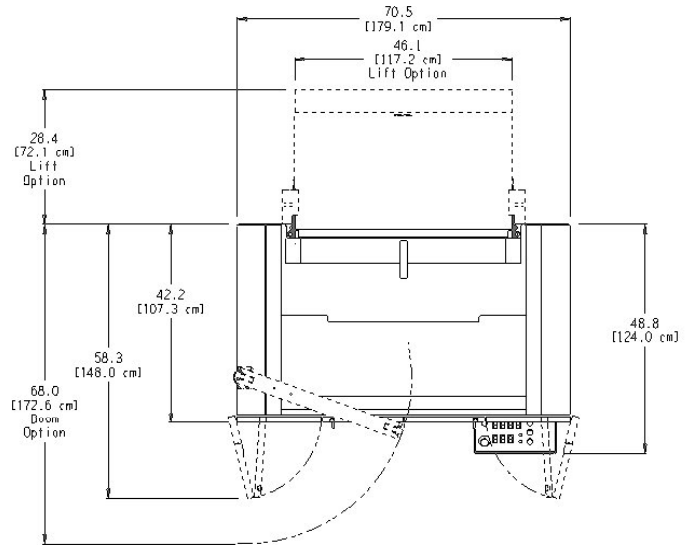


FIG. 1

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

POSITION BASE

The ACCU-Pro Spin/Relief Grinder will require an operating area of about 150" W x 108" D x 87" H (381 x 274 x 221 cm). The mower reel will be lifted from the front of the machine if using the boom and the rear if a lift is installed. The machine operator will operate the unit from the front of the machine. Position the base to allow sufficient operating room in front of the machine (and behind if using the rear lift). See FIG. 1 and 2.

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

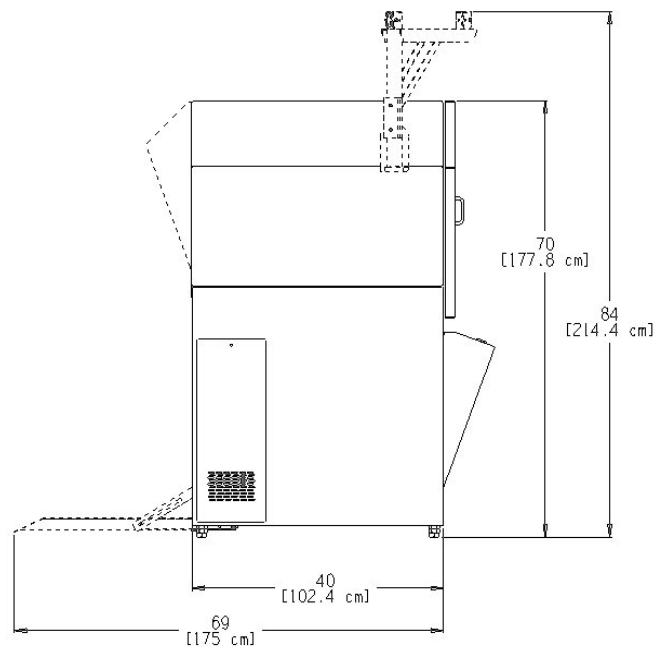
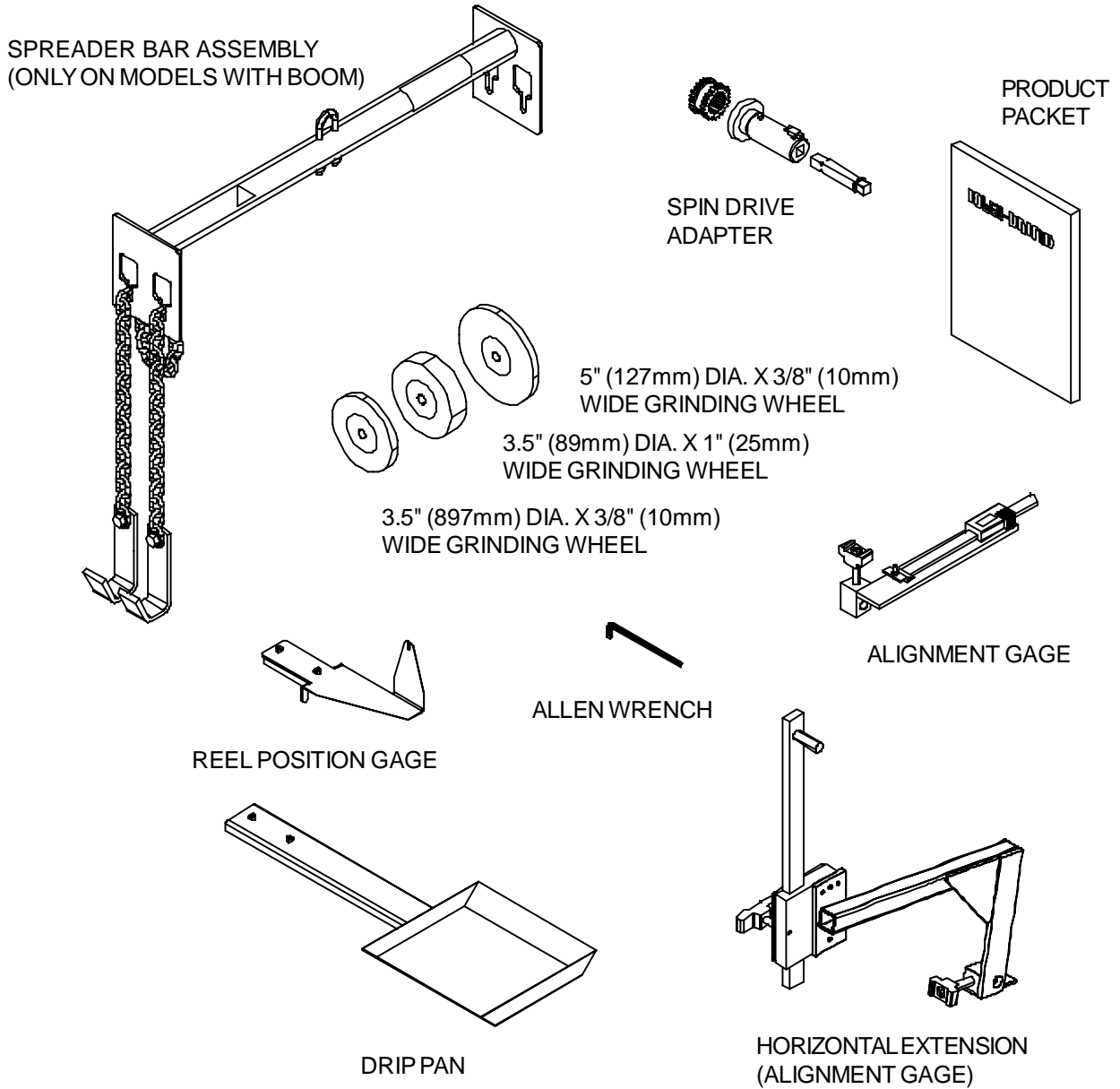


FIG. 2

ASSEMBLY INSTRUCTIONS (Continued)

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



ASSEMBLY INSTRUCTIONS (Continued)

LEVEL BASE

Place level on the top of the table. Adjust the leveling feet as necessary to bring to level. See FIG. 4.

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

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

Recheck with level after locking nuts are firmly tightened.

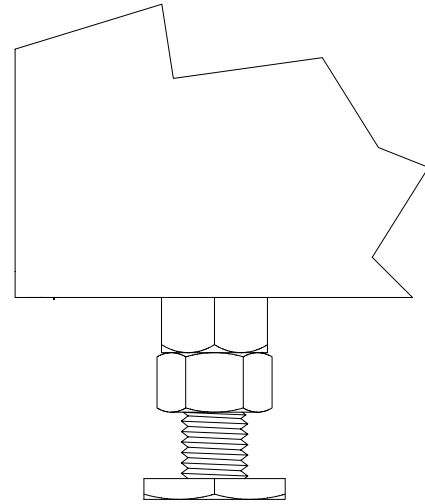


FIG. 3

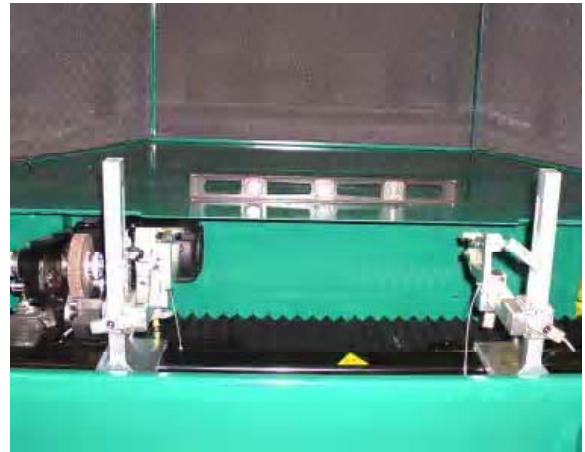


FIG. 4



FIG. 5

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 control box 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. 6320915 or 6320925, which includes a prewired 3 KVA 220V step down to 110V 50-60Hz transformer. See Page 10.

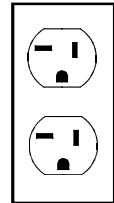


FIG. 7

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



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

DO NOT OPERATE THIS GRINDER WITH AN EXTENSION CORD.



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

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



FOR 20 AMP RATED LARGE MACHINES

Below is a list of required wire size in **your** building.

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 30 Meters from panel to receptacle = Use 4.0mm Wire.

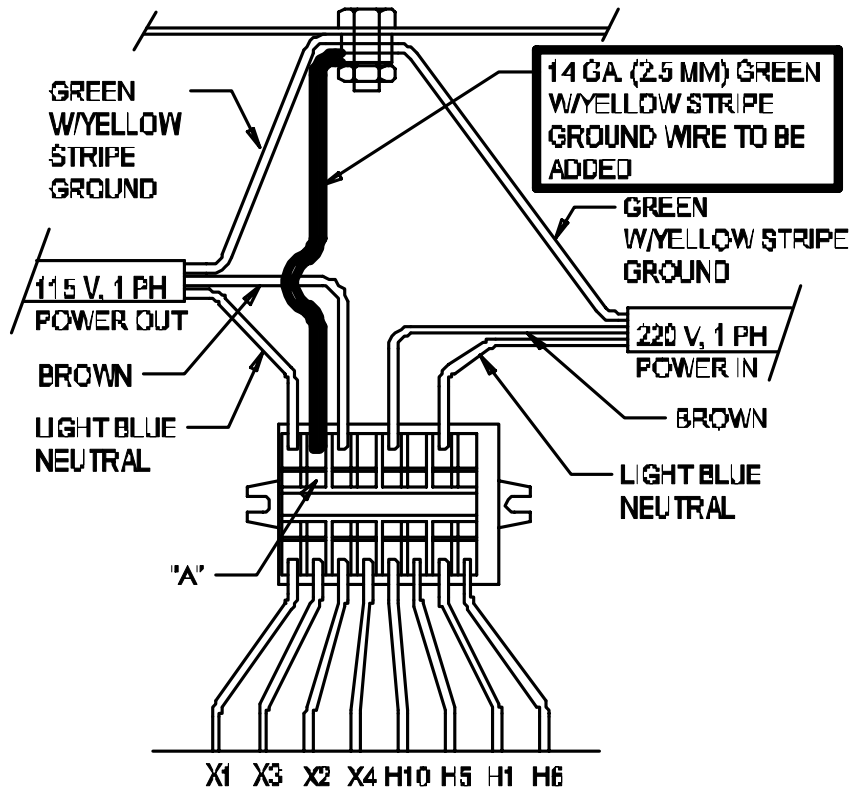
ASSEMBLY INSTRUCTIONS (Continued)

FOR 220 V 50 or 60Hz applications Product No. 6320915 or 6320925 should be ordered.

These models includes a 3 KVA 220V, step down to 110 V 50-60 Hz transformer.

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 of 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 FOR YOUR MACHINE.

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



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

PERIODIC MAINTENANCE

DAILY MAINTENANCE IS SPECIFIED ON PAGE 4 OF THE OPERATOR'S MANUAL, AND IS TO BE PERFORMED BY THE OPERATOR. LISTED BELOW ARE PERIODIC MAINTENANCE ITEMS TO BE PERFORMED BY YOUR COMPANY'S MAINTENANCE DEPARTMENT:

1. Clean the tank and filter of the vacuum system weekly or more often depending on the number of reels ground. **(VACUUM SYSTEM IS OPTIONAL EQUIPMENT)**.
2. Use the grease fitting provided to grease the dove tail with high quality lithium grease monthly. Wipe off excess grease. See FIG. 7.
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. 7.
4. Check the gib adjustment on the Grinding wheel diameter adjustment every 3 months. See FIG. 7.
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. 8.
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.

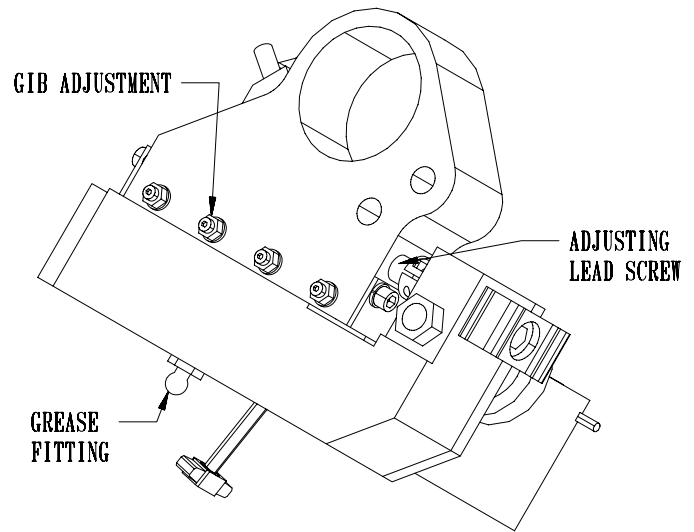


FIG. 7

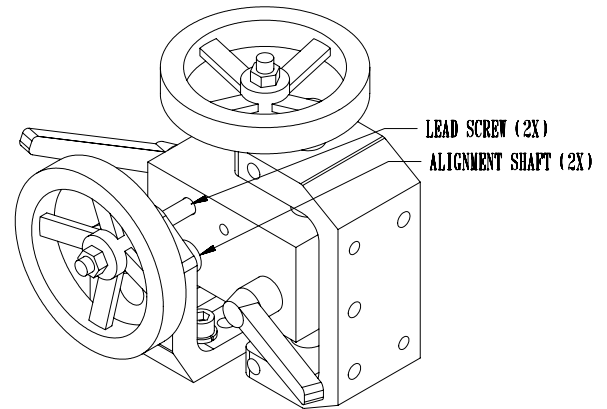


FIG. 8

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. 10 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.

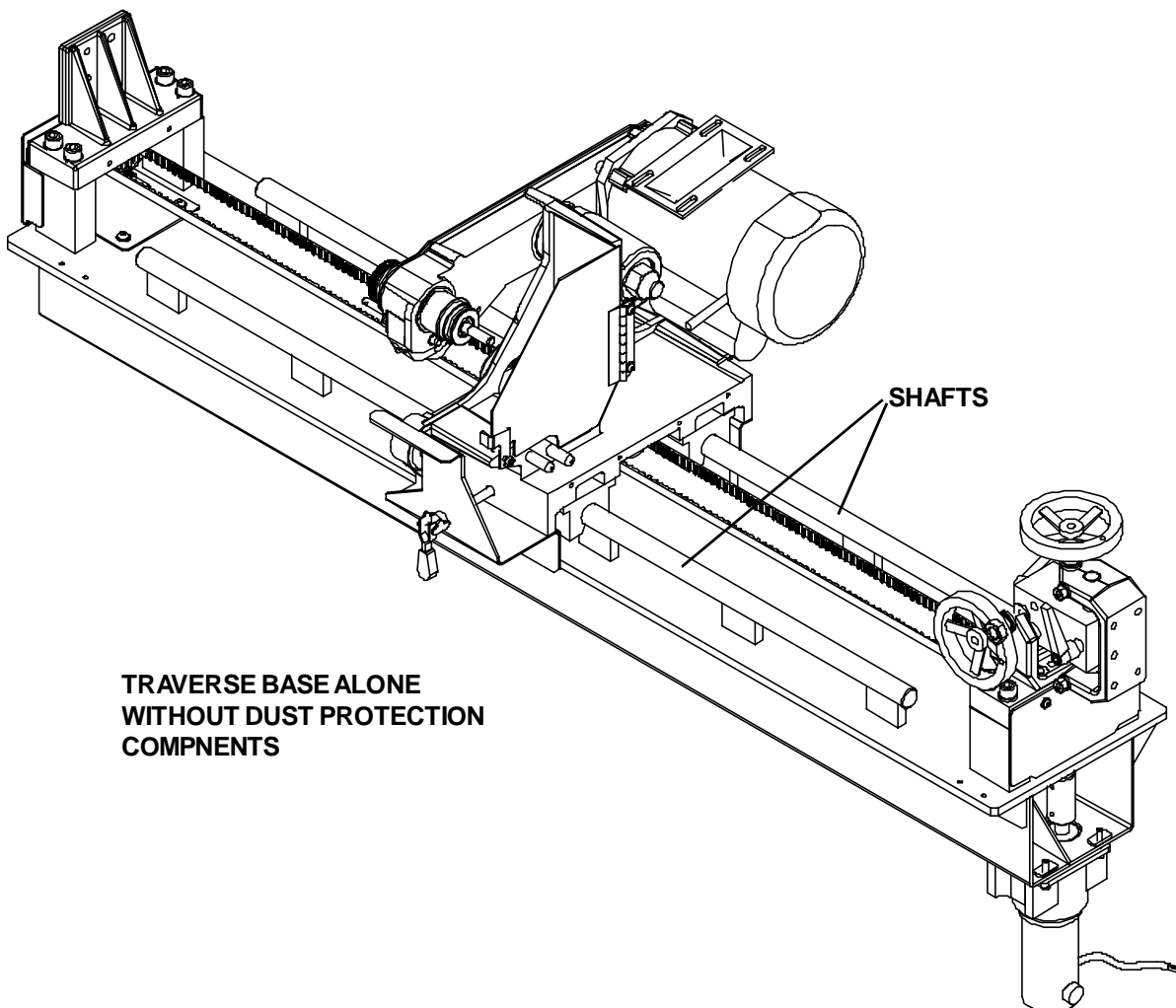


FIG. 10

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.

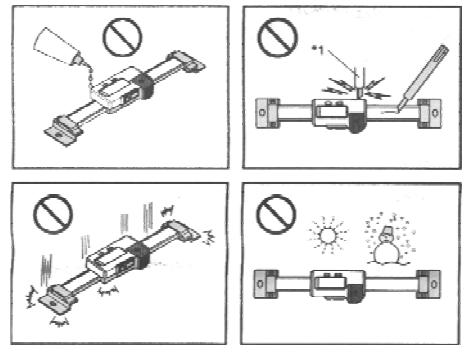
GASOLINE SHOULD NOT BE USED!

MAINTENANCE (Continued)

DIGITAL GAGE

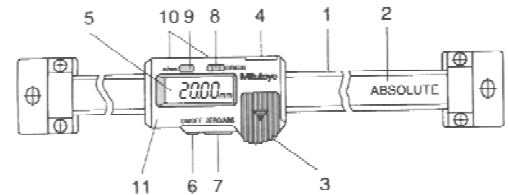
Important

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



Description of Parts

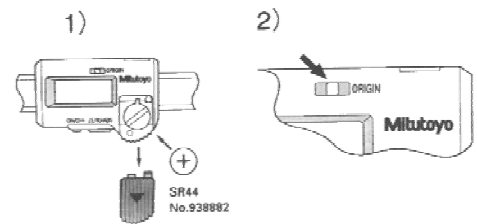
- | | |
|------------------------|----------------------|
| 1. Beam | 2. Main Scale |
| 3. Battery compartment | 4. Output Connection |
| 5. Display | 6. ON/OFF Power |
| 7. ZERO/ABS switch | 8. Origin Switch |
| 9. Inch/mm Switch | 10. Tapped hole |
| 11. Slider | |



Battery Installation and Origin Setting

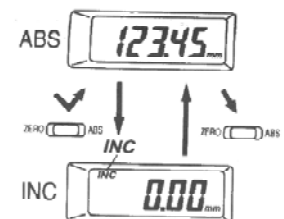
Set the origin of the scale after installing the battery. Otherwise, the error sign("E" at the least significant digit) may appear, resulting in incorrect measurements.

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



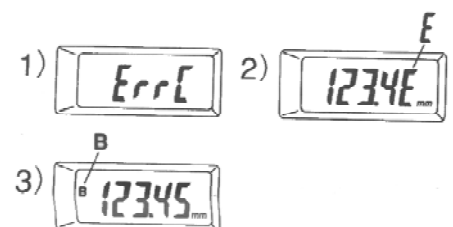
Incremental (INC) & Absolute (ABS) mode

The LCD will 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.



ADJUSTMENTS

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.

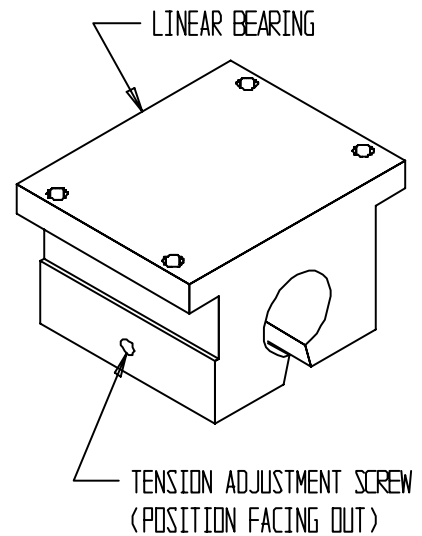


FIG. 14

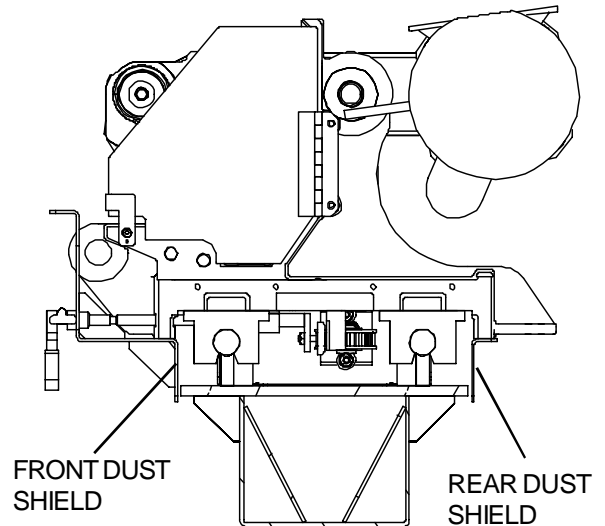


FIG. 15

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 20 lbs. (44kg) 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.

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 two double tube clamps and the belt cover. For grinding motor belt adjustment, loosen the four socket head cap screws that attach the motor. Adjust the grinding motor for proper belt tension by pushing back on the motor 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 the two pulleys with 5 lbs. (2KG) of force and belt movement dimensions to be .12 inches (3mm). 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.

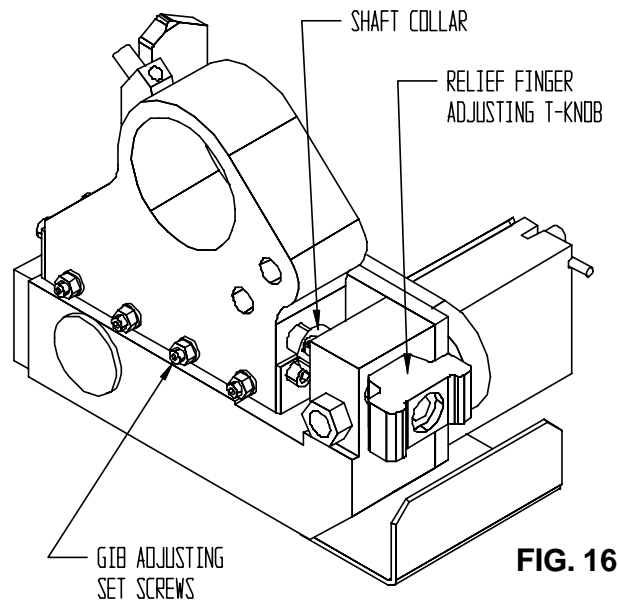


FIG. 16

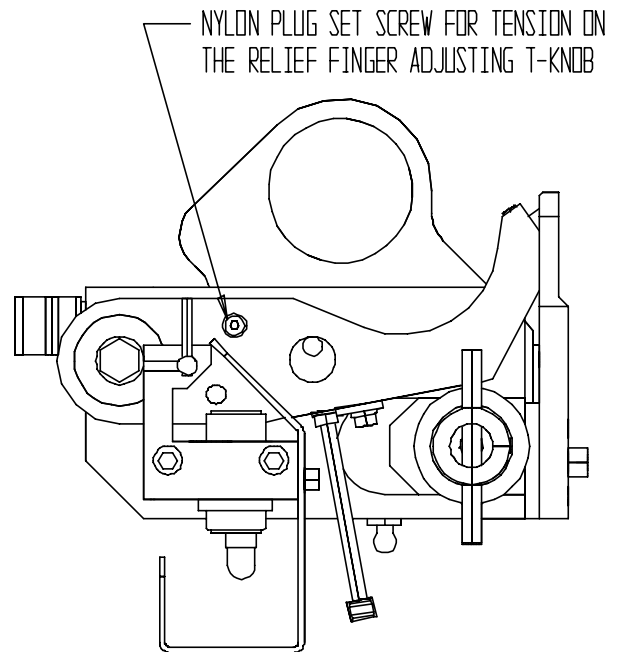


FIG. 17

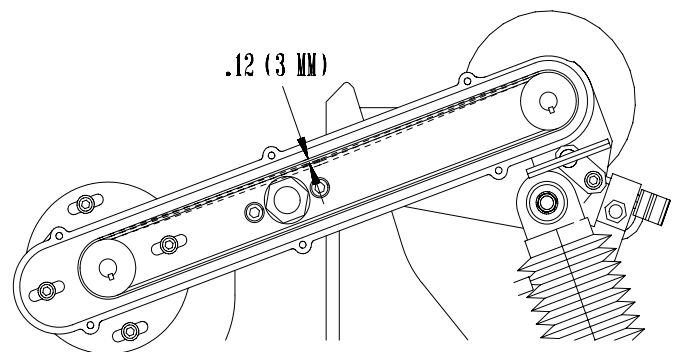


FIG. 18

ADJUSTMENTS (Continued)

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. 19.

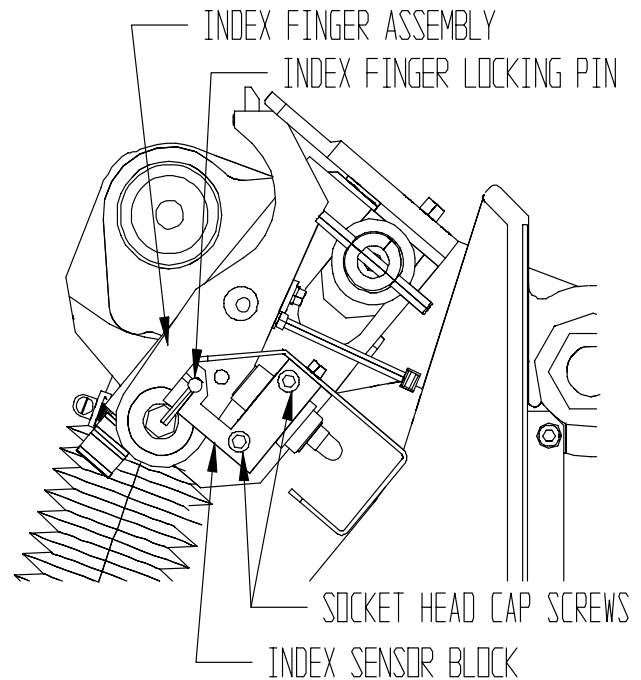


FIG. 19

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. 20.

NOTE: Light on proximity activates when metal crosses in front of switch sensor.

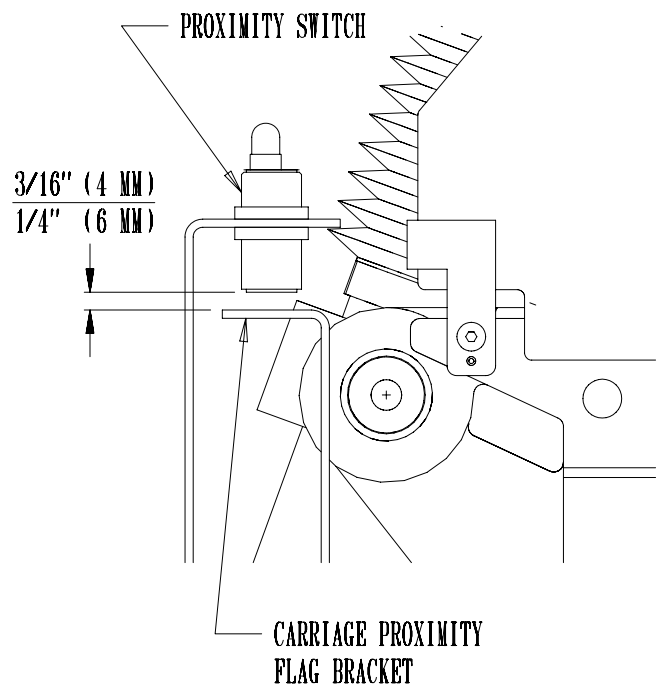


FIG. 20

ADJUSTMENTS (Continued)

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. 21.

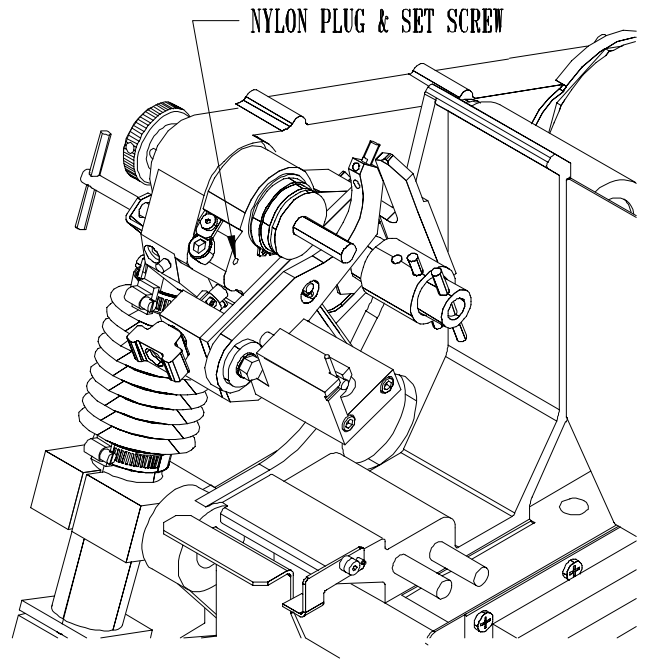


FIG. 21

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). (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.) See FIG. 22.

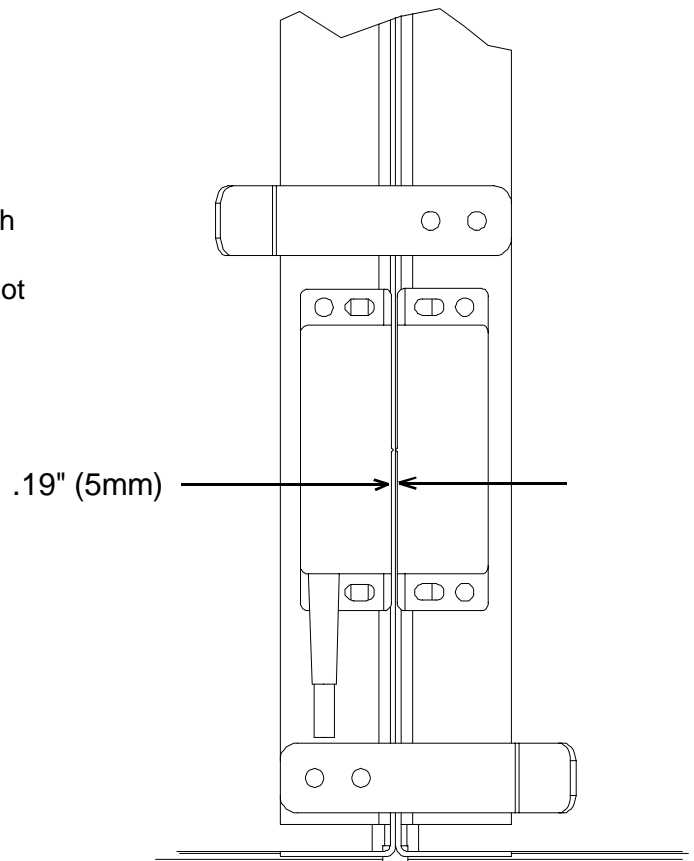


FIG. 22

ADJUSTMENTS (Continued)

SPIN GRINDING ATTACHMENT ADJUSTMENT

If play develops so crank handle wants to rotate in the scissor action on the spin grinding attachment, the play can be eliminated by tightening the set screw identified in FIG. 23.

If there is too much play in the spin drive pivot points, torque down the hex nut tight so conical washer is completely compressed, then back off 1/2 turn. See FIG. 23.

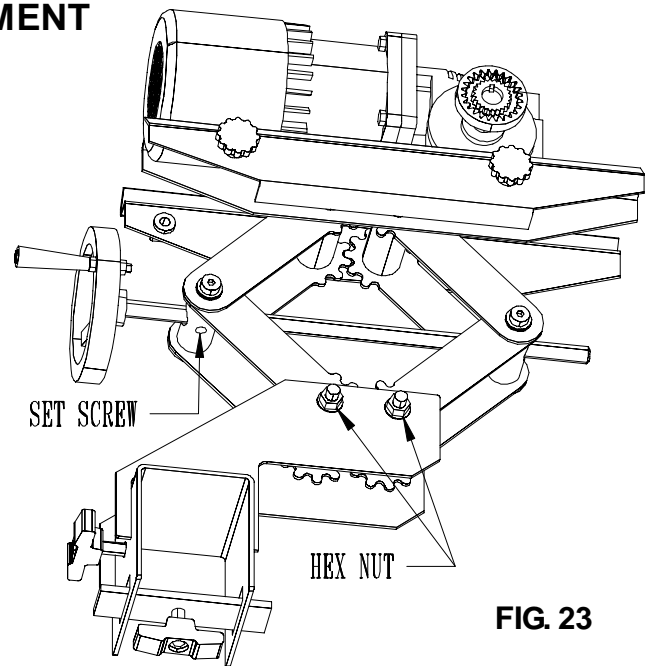


FIG. 23

REDUCER MOTOR ADAPTER TO ACTUATOR DRIVE SCREW CLAMPING COLLAR POSITIONING

The lower clamp collar, next to the reducer motor adapter, is to be positioned flush to the end of the actuator screw shaft and tighten down with 6 ft. lbs (0.8 kg) of torque. See FIG. 25. The top clamp collar is factory adjusted and does not need any further adjustment. There is to be no slippage between the reducer motor adapter shaft and actuator screw when pushing down on grinding head and stalling the reducer motor.

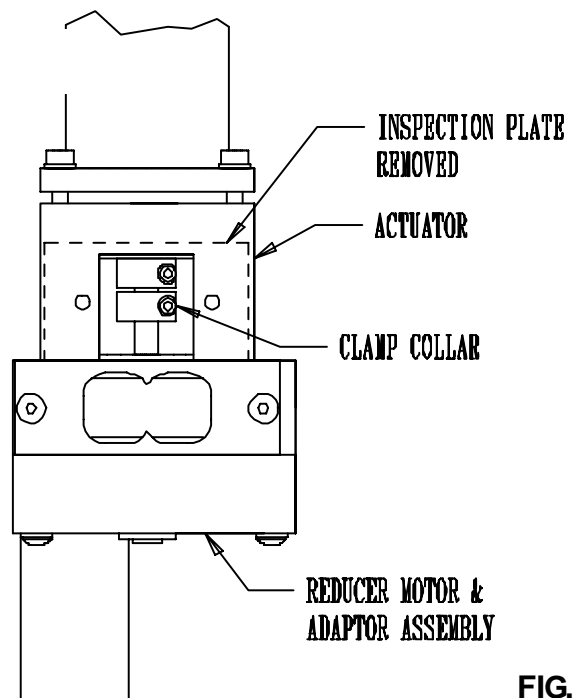


FIG. 24

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 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.

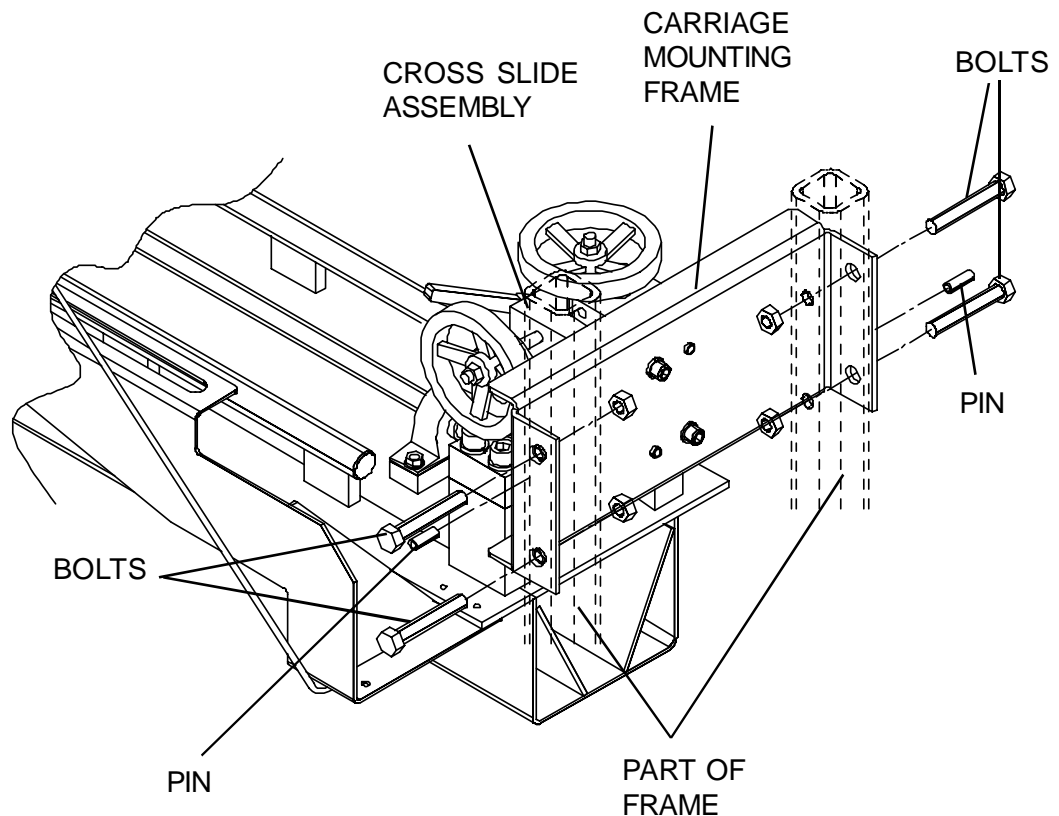
STEP 3--Jack the traversing carriage base up to put a preload on the Cross Slide Assembly.

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 assembly.



ADJUSTMENTS (Continued)

CROSS SLIDE SHAFT REPLACEMENT

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

STEP 1--Use a hydraulic jack to raise the weight off the Cross Slide Assembly.

STEP 2--Loosen the two nuts on the support casting that hold the locking studs and tap with plastic 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.

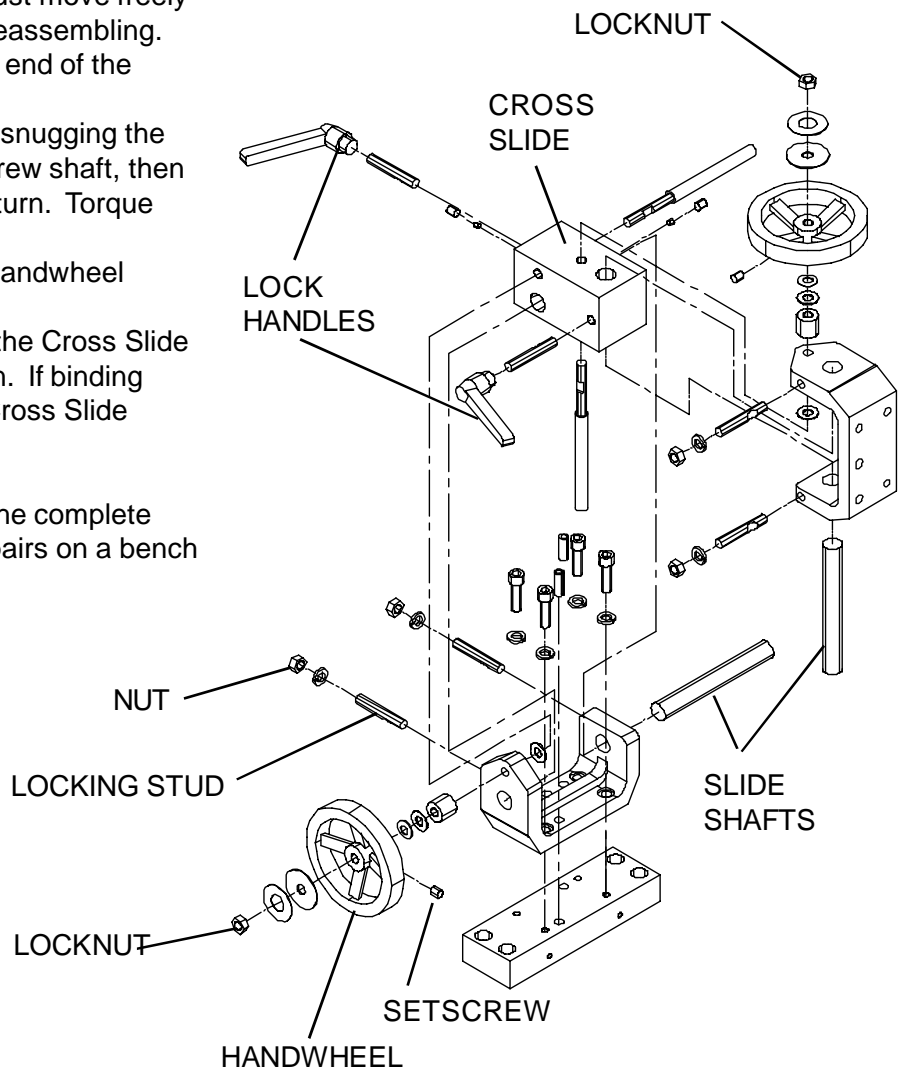
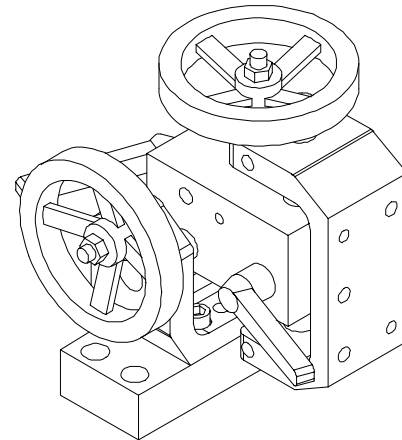
STEP 8--Retightening the nuts at the end of the locking studs to lock shaft in place.

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.



ADJUSTMENTS (Continued)

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.

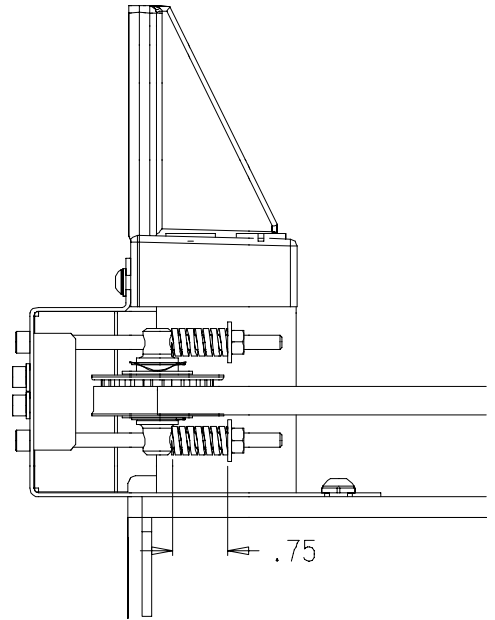


FIG. 25

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.

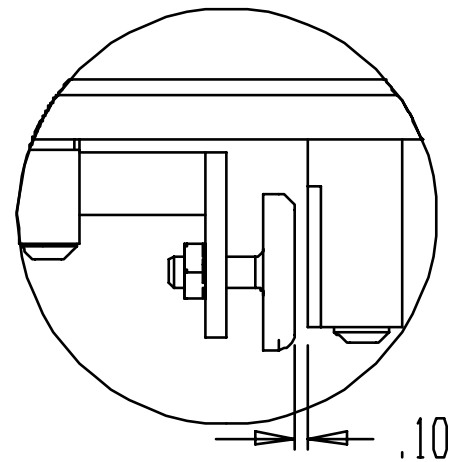
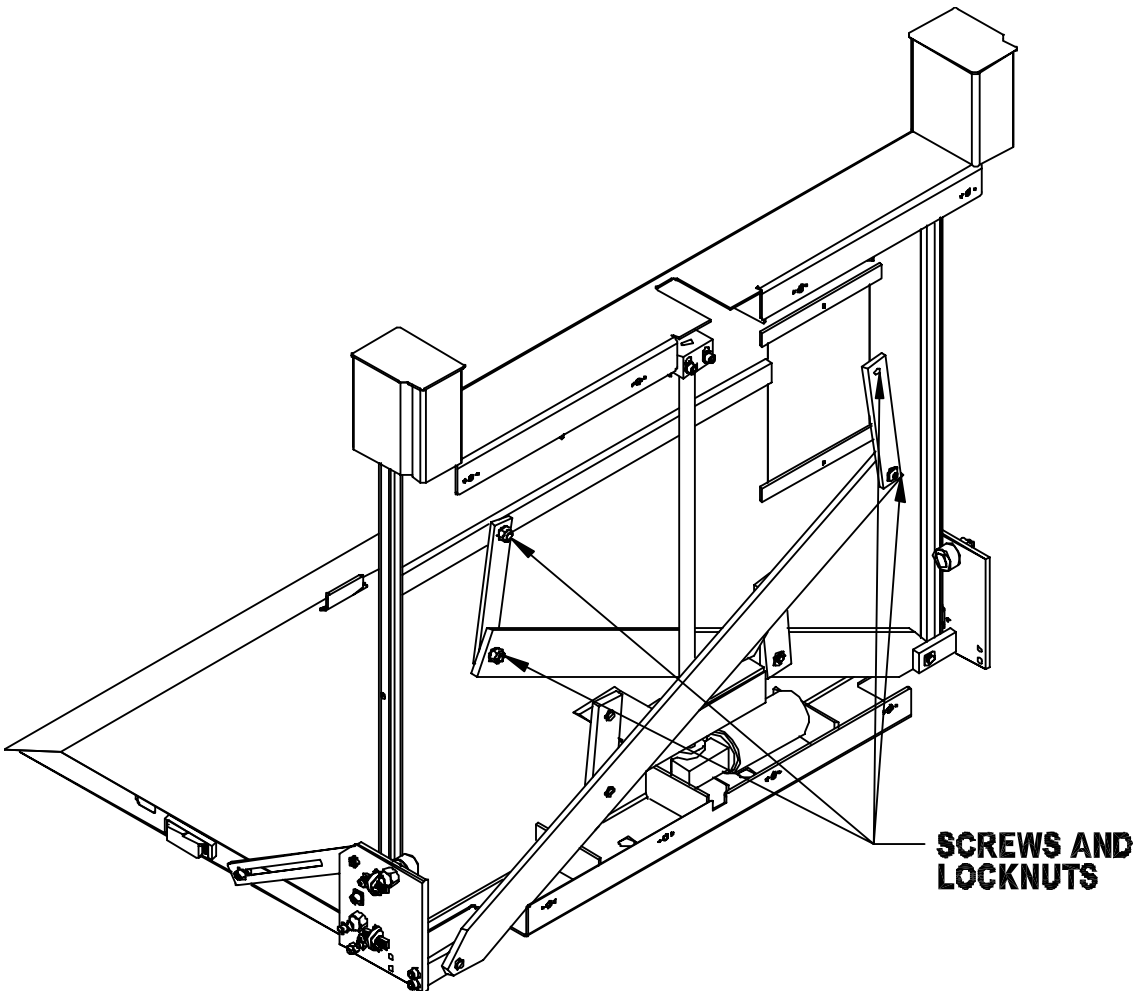


FIG. 26

ADJUSTMENTS (Continued)

REEL LIFT PIVOT BOLTS

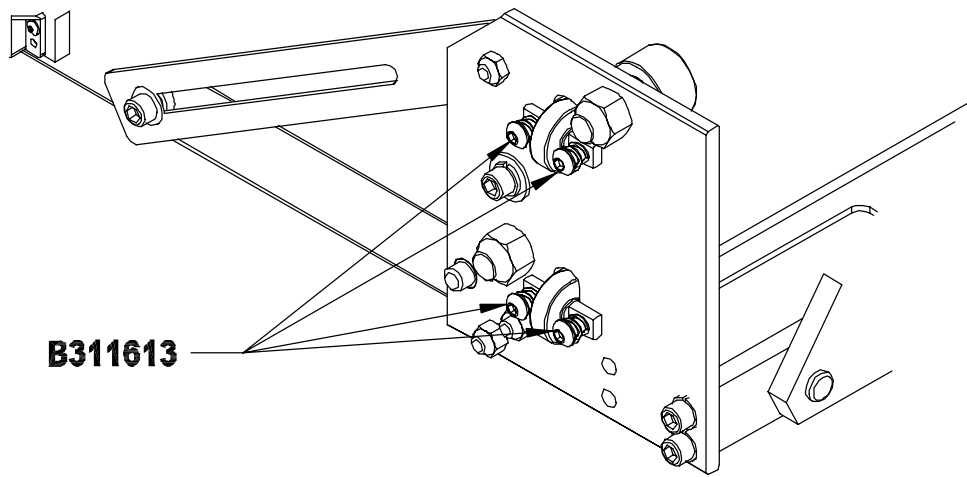
There are four pivot bolts on the reel lift that must be adjusted correctly for proper lift function. Tighten the screws and locknuts and then loosen 1/8 to 1/4 turn until the screw turns freely with fingers when the screw is under no load. See items marked "SCREWS AND LOCKNUTS" below.



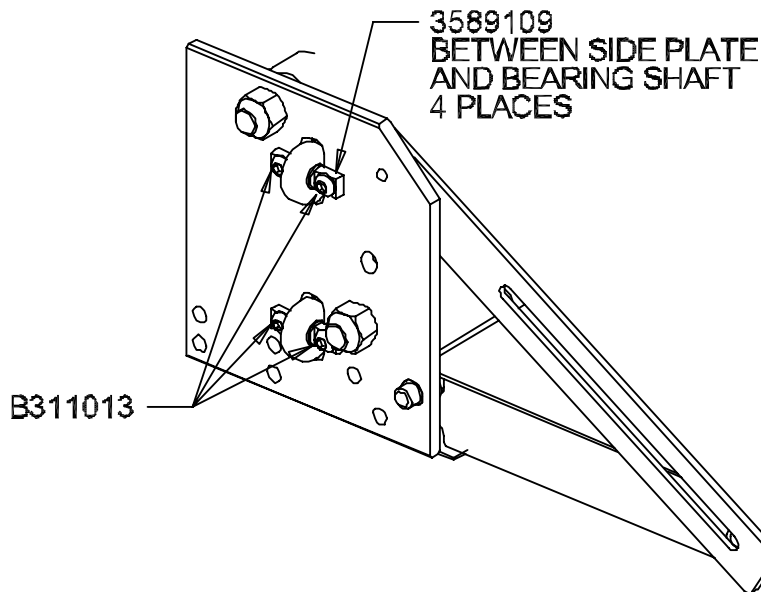
ADJUSTMENTS (Continued)

REEL LIFT SIDE BEARING ASSEMBLIES

There are four side bearing assemblies (two on each side) on the reel lift. The two on the right side looking from the front of the grinder are fixed with screws and washers. The two on the left side looking from the front of the grinder are spring loaded against the lift frame. They must be adjusted correctly for proper lift function. These left side screws can be accessed through two holes on the inside of the vacuum chamber. Remove the vacuum cover and take out the vacuum. There are two plastic plugs on the back wall of the vacuum chamber. Remove these plugs and raise or lower the lift until the spring retainer screws line up with the holes. Tighten the screws until tight (springs solid) with blue loctite no. 242, then back the screws out ONE full turn. See items marked "B311613" below. When complete, reinstall plugs, vacuum and cover.



LEFT SIDE LOOKING FROM FRONT OF GRINDER



RIGHT SIDE LOOKING FROM FRONT OF GRINDER

CONTROL BOARD POTENTIOMETER ADJUSTMENTS (Continued)

SPIN DRIVE CONTROL BOARD (SDC)

The Spin Drive Control Board has three potentiometers on the lower board and two potentiometers on the upper board as shown on FIG. 27 and FIG. 28. These potentiometers have been set at the factory to the positions shown on FIG. 27 and FIG. 28.

In the Relief Grinding Mode--

The remote Relief Speed Pot (RSP) and the Relief Torque Pot (RTP) interact with each other. The (RSP) is located on the upper spin board as a remote speed preset at 9:30. See FIG. 27. The (RTP) is located on the control panel and is for relief torque adjustment.

Remote Relief Speed Pot (RSP) when rotated clockwise will increase maximum spin drive speed when in the relief mode. This speed should never be above the 10:30 setting.

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

In the Spin Grinding Mode--

the remote Spin Torque Potentiometer (STP) and the Spin Speed Pot (SSP) interact with each other. The (STP) is located on the upper spin board as remote torque preset at 2:00 for torque setting. See FIG. 27. The (SSP) is located on the control panel and is for spin speed adjustment.

The remote Spin Torque Pot (STP) controls maximum torque allowable in the spin grinding cycle only. This should never be adjusted past the 2:30 position. If the reel does not turn check that the reel is free turning by hand spinning. The Spin speed Pot (SSP) controls reel spin speed, adjust as required. This controls the spin drive speed for spinning the reel.

POTENTIOMETERS ON THE LOWER BOARD OF THE SPIN DRIVE CONTROL (SDC) See FIG. 28.

Maximum Speed Pot--

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

Minimum Speed Pot--

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

IR Compensation Pot--

The IR Compensation is factory set at 9:00.

Regulation of the spin or relief grind spin motor may be improved by a slight adjustment of the IR COMP pot clockwise from its factory-set position. Overcompensation causes the motor to oscillate or to increase speed when fully loaded. If this occurs turn the IR COMP pot counterclockwise until symptoms disappear.

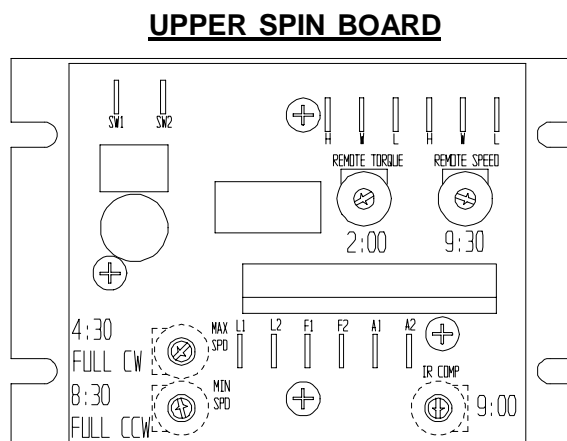


FIG. 27

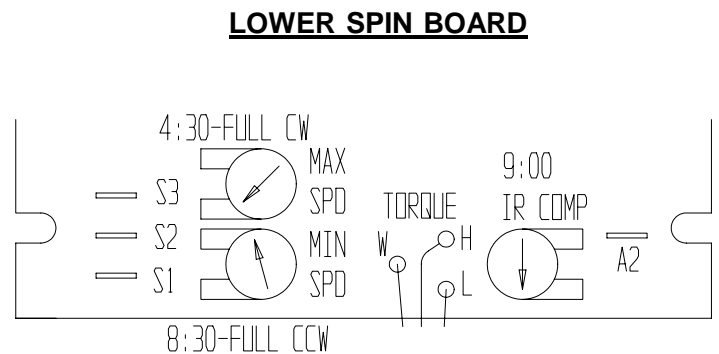


FIG. 28

MACHINE SERVICE (Continued)

REPLACEMENT OF GRINDING HEAD SHAFT & BEARINGS

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

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

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

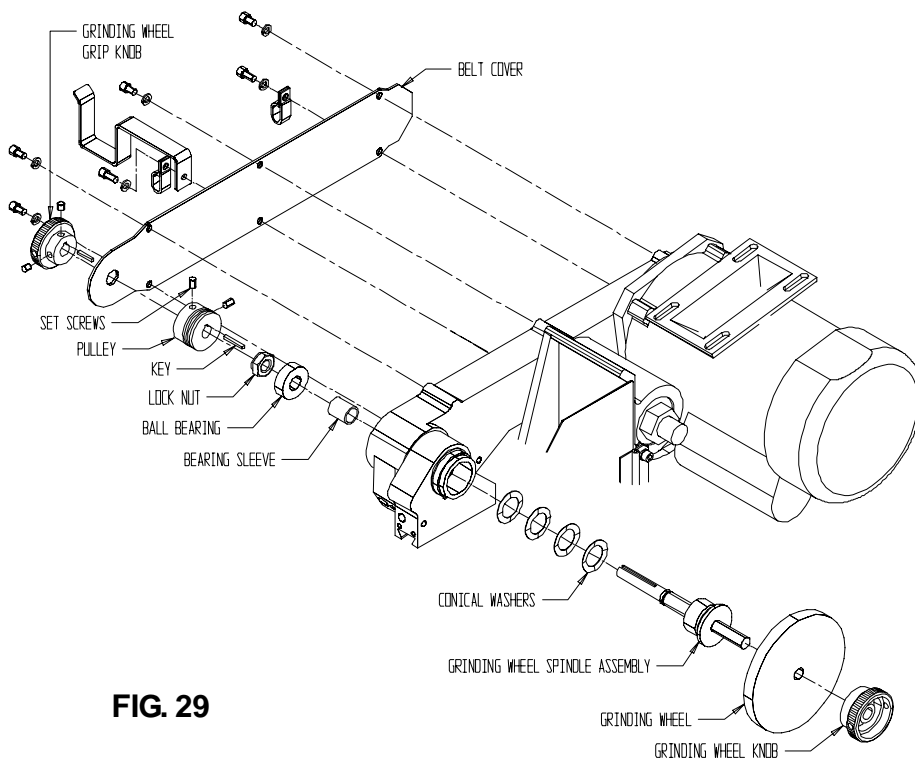


FIG. 29

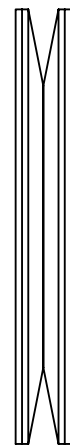
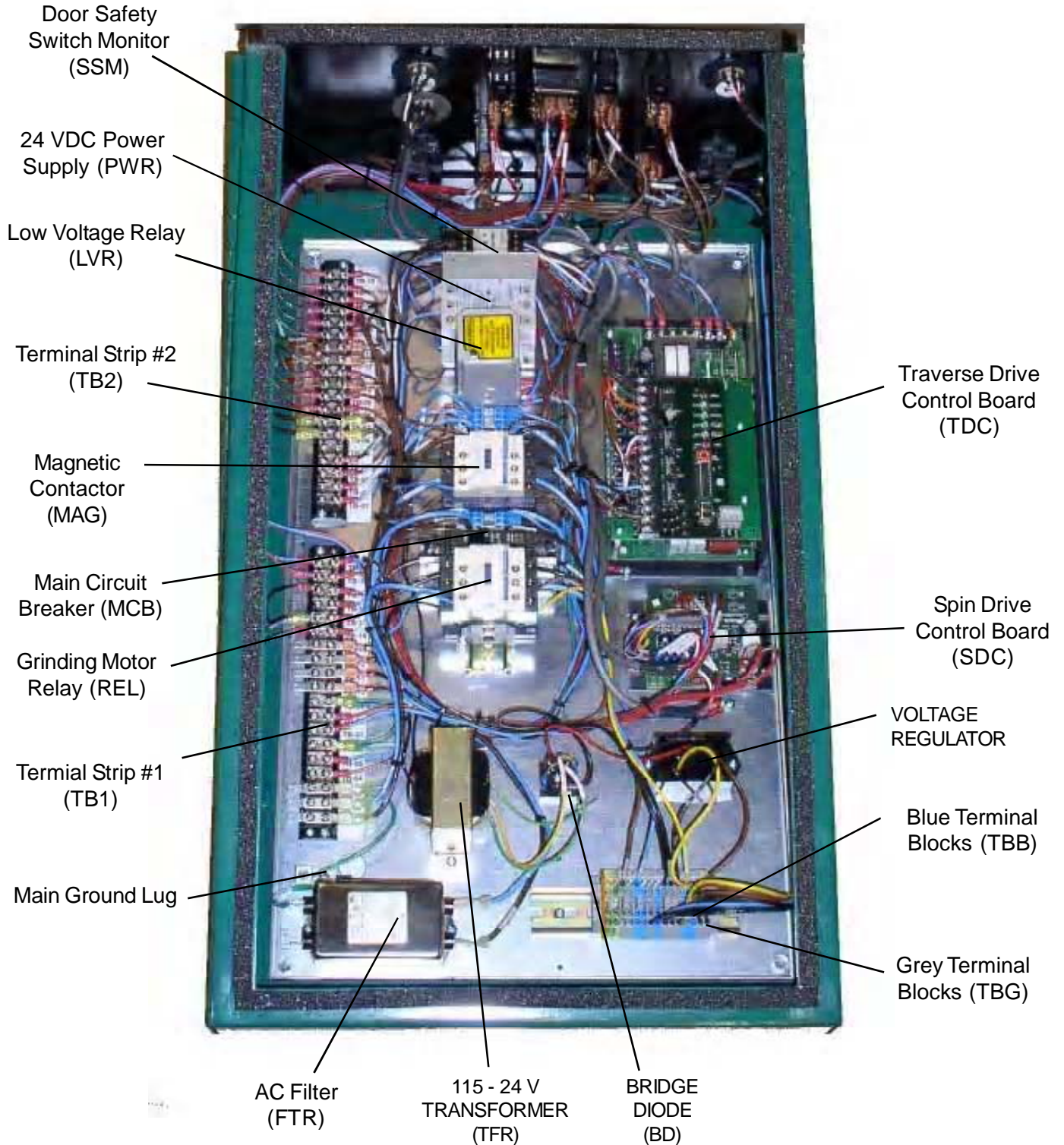


FIG. 30

632 MANUAL 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-Pro 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-Pro have a wire label at each end for troubleshooting. The wire label has a code which tells you wiring information. The wire label has a seven or more position code. The first two or three digits are the wire number: 01-999. The next three numbers or letters are the code for the component to which the wire attaches. Example: GMC for Grind Motor Control. The last two numbers or letters are the number of the terminal on the component to which the wire attaches.

ELECTRICAL TROUBLESHOOTING INDEX

AC Main Power Controls	Page 29-31
Spin Drive Controls in Spin Mode	Page 32-33
Spin Drive Controls in Relief Mode	Page 34-36
Grinding Motor Controls	Page 37-38
Traverse Drive Controls-w/prox.....	Page 39-40
Traverse--stopping and reversing	Page 41-43
Infeed Controls	Page 44-45

ELECTRICAL TROUBLESHOOTING (Continued)

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

Verify all wires shown on the wiring diagram on pages 88 are correct and pull on wire terminals with approximately 3 lbs force to verify there are no loose terminal connections and/or no loose crimps between wire and terminal. If problem persists, test as listed below.

Possible Cause	Checkout Procedure	
Emergency Stop Botton(ESS) is Depressed	A. Pull Up on ESS Button	Machine works Yes--end troubleshooting No--go to Step B. next
You must push the System Start Switch (SSS) to get power to control Panel	B. Listen for the Magnetic Starter (MAG) contacts to pull in with a clunk	Machine works Yes--end troubleshooting No--go to step C. next.
Main Power Cord is not plugged in	C. Plug in main power cord	Machine works Yes--end troubleshooting No--go to step D. next.
Guard doors must be closed and ALL Switches MUST be turned OFF for contactor to pull in.	D. Close guard doors and turn off all switches.	Machine works Yes--end troubleshooting No--go to step E. next.
Main 20 amp outlet circuit breaker has tripped	E. Check circuit breaker in your building and reset if necessary. (Check wall outlet with a light to make sure it works)	Machine works Yes--end troubleshooting No--but light works in outlet--go to Step F. next. No--but light does not work in outlet. You must solve your power delivery problem independent of machine.
No 120 Volts AC power to Filter (FTR)	F. Check for 120V at Cord into FTR (Power Cord #32)	FTR "Line" Terminals for 120 Volts AC Yes--Go to Step G. next. No--Replace Power Cord- 6059054
No 120 Volts AC power out of Filter	G. Check for 120V out of FTR	FTR "Load" Terminals for 120 Volts AC Yes--Go to Step H. next. No--Replace Filter
No 120 Volts AC power to Main Circuit Breaker (MCB)	H. Check for 120V to MCB	MCB Bottom Terminal to Terminal Block 4 (Blue) for 120 Volts AC Yes--Go to Step I. next. No--Check wires & replace if needed.
No 120 Volts AC power from Main Circuit Breaker (MCB)	I. Check for 120V to MCB	MCB Top Terminal to Terminal Block 4 (Blue) for 120 Volts AC Yes--Go to Step J. next. No--Flip Switch on MCB to "ON" - Machine works-- end trouble shooting Machine does not work-- replace MCB

ELECTRICAL TROUBLESHOOTING (Continued)

<u>Possible Causes</u>	<u>Checkout Procedure</u>	
120 Volts AC power not delivered to Terminal Strip	J. Check for 120 Volts AC at terminal strip.	Terminal "11" on Terminal Strip 2 "07TB2-11" to Terminal Block 4 (Blue) for 120 Volts AC Yes--Go to Step K. next. No--Check wires #7 & #3, Check Jumper on Terminal Blocks 1-3.
Grinding Motor Switch (GMS) not working	K. Check for 120 Volts AC at GMS Terminals 1	Measure 120 volts AC from GMS Terminal 1 to Term Block 4(Blue) Yes--Go to Step L. next. No--Flip Switch and check again- Works--Switch is upside down. Does not work-- Check wiring/ Verify Continuity/ Replace Switch
Spin Motor Switch (SMS) not working	L. Check for 120 Volts AC at SMS Terminals 1	Measure 120 volts AC from SMS Terminal 1 to Term Block 4(Blue) Yes--Go to Step M. next. No--Flip Switch and check again- Works--Switch is upside down. Does not work-- Check Wiring/ Verify Continuity/ Replace Switch
Bad Emergency Stop Switch (ESS)	M. Check voltage after the (ESS) MAKE SURE SWITCH IS PULLED UP!	Measure 120 Volts AC from (ESS) term 2 to Term Block 4(Blue) Yes--Go to Step N. next No--Check wire for continuity, then verify switch continuity. If bad replace ESS contactor (NC)
Bad System Start Switch (SSS)	N. Hold in SSS and Check voltage after the (SSS)	Measure 120 Volts AC from (SSS) term 3 to Term Block 4(Blue) Yes--Go to Step O. next No--Check wire for continuity, then verify switch continuity. If bad replace SSS contactor (NO)
Low Voltage Relay (REL) not operating	O. Hold in SSS and Check voltage at LVR. LVR must be installed in 8-pin socket.	Measure 120 Volts AC from LVR term 8 to Term Block 4(Blue) Yes--Go to Step P. next No--Check for 120 Volts AC from LVR term 6 to term 7. Yes--Verify Continuity of term 1 to term 8 on LVR. Replace LVR if bad. No--Verify Continuity of Wires.
Bad Main Contactor (MAG)	P. Hold in SSS and Check voltage at MAG A1 & A2.	Measure 120 Volts AC from MAG Term A1 to Term A2 Yes--MAG Should pull in with clunk, if not replace MAG. No--Verify Continuity of Wires.

ELECTRICAL TROUBLESHOOTING (Continued)

PROBLEM--Machine Shuts off when you turn on Grind motor switch or Spin Motor Switch.

Possible Cause

Checkout Procedure

Guard Doors are Open

A. Close the front doors (and rear ramp - lift model)

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

Door Safety Switches are not working properly

B. Check Alignment of Door Safety Switches on Front doors (and rear ramp - lift model)

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. (Turn switches off and press start switch to pull in MAG before testing voltages)

Measure 24 volts DC from SSM Terminal A1+ to Terminal A2-
Yes--Go to Step **E.** next.
No--Go to Step **D.** next.

No Power into 24 Volt DC Power Supply (PWR)

D. Check PWR for 120 Volts AC. (Turn switches off and press start switch to pull in MAG before testing voltages)

Measure 120 volts AC from PWR Terminal L to Terminal N
Yes--Verify 24 VDC out of PWR (V+ to V-). Replace if no Voltage out; or Check Wiring & Verify Continuity to SSM if there is 24 VDC.
No--Verify Wiring and Continuity from PWR to terminal blocks.

No Power Out to Door Switches

E. Verify 24Volts DC out to Door Switches.

Measure approximately 24 volts DC from Terminal Strip 1 Terminal 17 to Terminal Strip 2 Terminal 3
Yes--Go to Step **F.** next.
No--Verify Continuity of Wires to Terminal strip, Replace SSM if wires check OK.

Rear Ramp Switch is Bad - (Lift Model Skip to next step if boom model.)

F. With Rear Ramp Closed Verify 24Volts DC back form rear Door Switch. (Boom model verify jumper assembly is in place and terminals are on tight.)

Measure approximately 24 volts DC from Terminal Strip 2 Terminal 3 to Terminal Strip 1 Terminals 14 and 15.
Yes--Go to Step **G.** next.
No--Check Alingment of Rear door switch. If no Voltage to Term14 or 15 then replace rear switch. If still not working replace cord.

Front Door Switch is Bad

G. With Front doors Cloded Verify 24Volts DC back form Front Door Switch.

Measure approximately 24 volts DC from Terminal Strip 1 Terminal 17 to Terminal Strip 2 Terminals 2 and 4.
Yes--Replace SSM
No--Check Alingment of Front door switch. If no Voltage to Term2 or 4 then replace front switch.

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

Possible Cause

Checkout Procedure

(MAG) holding contact has failed

A. Check wiring to and from MAG holding contact in. Verify the magnetic starter holding contact is working.

Measure 120 Volts AC at MAG term L3 to Term Block 4(Blue) after SSS is pushed.
Yes--Verify Wiring to LVR
No--Check voltage at T3. If 120 Volts AC Replace MAG. If no 120 Volts AC verify wiring to T3.

ELECTRICAL TROUBLESHOOTING (Continued)

PROBLEM--SPIN DRIVE NOT WORKING IN SPIN MODE.

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


Verify all wires shown on the wiring diagram on pages 88 are correct and pull on wire terminals with approximately 3 lbs force to verify there are no loose terminal connections and/or not loose crimps between wire and terminal. If loose terminals are found, retighten and retest system. If problem persists, test as listed below.

Spin Speed Pot (SSP) set to zero	A. Set (SSP) to 200 on the control panel.	Spin Motor works Yes--end troubleshooting No--go to Step B next
Spin Motor Switch (SMS) is not on	B. Turn (SMS) switch on	Spin Motor works Yes--end troubleshooting No--go to Step C. next
Spin Rotation Switch (SRS) is not on	B. Turn (SRS) switch to direction of reel rotation required. NOTE: CENTER POSITION IS OFF	Spin Motor works Yes--end troubleshooting No--go to Step C. next
Circuit Breaker is Tripped (4 AMP)	C. Reset Circuit Breaker on front of Control Panel. Push in if tripped. If circuit breaker is tripped, verify reel is free spinning.	Spin Motor works Yes--end troubleshooting No--go to Step D. next
Spin Drive Control (SDS) is not working	D. Check (SDS) L1 to L2 for 120 Volts AC	(SDC) Term L1 to term L2 for 120 volts AC Yes--go to Step E. next No--Verify Power to Circuit Breaker, SMS, SRS and continuity of all wires. Replace any components found bad.
	E. Check (SDC) A1 & A2 for approx. 90+ Volts DC (Have Spin Speed Pot set to 400 RPM)	(SDC) Term A1 to A2 for approx 90+ volts DC Yes--go to Step F. next No--go to Step L. next
	F. Check for approx 90+ Volts DC input to (SRS)	(SRS) Term 2 to 3 for approx 90+ Volts DC Yes--go to Step G. next No--replace wires 13 & 14
	G. Check for approx 90+ Volts DC out put from (SRS).	(SRS) Term 6 to 7 for approx 90+ Volts DC Yes--go to Step H. next No--replace (SRS) switch
Spin Drive motor is bad	H. Check spin motor continuity	Remove wires at Terminal Strip 1, Term 4 & 5 check 0 ohms across the black and white wires Yes--end troubleshooting, motor should work (if it does not, replace motor) No--go to Step P. next



Disconnect Power from Machine!

ELECTRICAL TROUBLESHOOTING (Continued)

Possible Cause	Checkout Procedure	
Spin Speed Pot (SSP) is not working	L. (SSP) (10K) on control panel	On (SDC), Remote Speed, check Black wire H terminal to Red wire W terminal for: Pot Full CCW --0 volts DC Pot Full CW--4.4 Volts DC Check White wire L terminal to Red wire W terminal for: Pot Full CCW --4.4 Volts DC Pot Full CW-- DC 0 Volts DC Yes--Go to Step M No--Go to Step N.
Spin Torque Pot (STP) is not set correctly	M. Check (STP) remote torque on the top (SDC) board	(STP) on (SDC) remote torque should be set at 2:00 o'clock position. See Pages 24 and 25. Adjust if incorrect and check Spin Drive Function. Yes--end of troubleshooting No--Replace (SDC)
(SSP) is not working	N. (SSP) (10K) Remove 3 Remote Speed wires. Red wire to term W White wire to term L Black wire to term H	Check for 10,000 ohms Red wire to white wire Full CCW--0 ohms Full CW-10,000 ohms Red wire to black wire Full CCW--10,000 ohms Full CW--0 ohms Yes--replace (SDC) No--replace (SSP)
Worn Motor Brushes	P. Inspect Motor Brushes	Remove the brushes one at a time and maintain orientation for reinsertion. See if brush is worn short 3/8" (10 mm) minimum length. Yes--replace motor brushes No--replace Spin Drive Motor
	 DISCONNECT POWER FROM MACHINE !	

ELECTRICAL TROUBLESHOOTING (Continued)

PROBLEM--Spin Drive not working in relief mode.

Assuming (SSS) System Start Switch is on with 115 volts AC to control panel and all other functions are working.

Verify all wires shown on the wiring diagram on pages 88 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	
Relief Torque Pot (RTP) set to zero	A. Set (RTP) to 20 on the control panel.	Spin Motor works Yes--end troubleshooting No--go to Step B. next
Spin Motor Switch (SMS) is not on	B. Turn (SMS) switch on	Spin Motor works Yes--end troubleshooting No--go to Step C. next
Spin Rotation Switch (SRS) is not on	C. Turn (SRS) switch to direction of reel rotation required. NOTE: center position is off	Spin Motor works Yes--end troubleshooting No--go to step D. next
Circuit Breaker is Tripped (4 AMP)	D. Reset Circuit Breaker on front of Control Panel. Push in if tripped.	Spin Motor works Yes--end troubleshooting No--go to step E. next
Spin Drive Control (SDS) is not working	E. Check (SDS) L1 to L2 for 120 Volts AC	(SDC) Term L1 to term L2 for 120 Volts AC Yes--go to Step F. next No--Verify Power to Circuit Breaker and SMS and continuity of wires. Replace CB or SMS if needed.
	F. Check (SDC) A1 & A2 for approx. 20 Volts DC (Have Relief Torque set to Red Line)	(SDC) Term A1 to A2 for approx 20 Volts DC Yes--go to Step G. next No--go to Step L. next
	G. Check for approx 20 Volts DC input to (SRS)	(SRS) Term 2 to 3 for approx 20 Volts DC Yes--go to Step H. next No--replace wires 13 & 14
	H. Check for approx 20 Volts DC out put from (SRS).	(SRS) Term 6 to 7 for approx 20 Volts DC Yes--go to Step I. next No--replace (SRS) switch
Spin Drive motor is bad	I. Check spin motor continuity	Remove wires at Terminal Strip 1, Term 4 & 5 check 0 ohms across the black and white wires Yes--end troubleshooting, motor should work (if it does not, replace motor) No--go to Step P. next



DISCONNECT POWER FROM THE MACHINE

ELECTRICAL TROUBLESHOOTING (Continued)

Possible Cause

Checkout Procedure

(RTP) Relief Torque Pot is not working

L. Check (RTP) (50K) on control panel (check voltage with pots at fully clockwise and counterclockwise positions)

On(SDC), Remote Torque check Black wire H terminal to Red wire W terminal for:

Pot CCW-- 0 volts DC

Pot CW-- .2 Volts DC

Check White wire L terminal to Red wire W terminal for:

Pot CCW-- .2 Volts DC

Pot CW-- DC 0 Volts DC

Yes--go to Step **M.** next

No--go to Step **N.** next

Relief Speed Pot (RSP) is not set correctly.

M. Check (RSP) remote speed (10k) on (SDC) top board (this is preset to 9:30)

(RSP) to the top (SDC) board should be set at 9:30. See pages 24 and 25. Adjust if incorrect and check Relief Torque function.

Yes--end of troubleshooting

No--replace (SDC)

(RTP) is not working

N. (RTP) (50K) Remove 3 Remote Torque Wires
red wire to term W
white wire to term L.
black wire to term H.

Check for 50,000 ohms

Red wire to white wire

Full CCW--0 ohms

Full CW--50,000 ohms

Red wire to black wire

Full CCW--50,000 ohms

Full CW--0 ohms

Yes--Replace (SDC)

No--replace (RTP)

Worn Motor Brushes



P. Inspect Motor Brushes

DISCONNECT POWER FROM MACHINE !

Remove the brushes one at a time and maintain orientation for reinsertion. See if brush is worn short 3/8" (10 mm) minimum length

PROBLEM : Spin drive speed goes at one speed only.

Possible Cause

Remedy

Wiring hookup to potentiometer is improper. (If components have been replaced)

A. Check potentiometer wiring for proper hookup. See that speed pot is wired per electrical diagram

If wiring is wrong, correct and test.

Yes--end of troubleshooting
No--Go to Step B. next

Defective spin speed control (SSP) potentiometer.

B. (SSP) 10K Remove 3 remote speed wires.
red wire to term W
white wire to term L
black wire to term H

Check for 10,000 ohms
Red wire to white wire
Full CCW--0 ohms
Full CW--10,000 ohms
Red wire to black wire
Full CCW--10,000 ohms
Full CW--0 ohms

Yes-- Go to Step C. next
No--Replace (SSP)

Main circuit board dial pot settings not correct. (If board has been replaced)

C. Check all pot settings on both boards as of the (SDC) shown on Pages 24 and 25. (See Adjustment Section Spin Drive Control [SDC] Board Setting).

Yes-- end of troubleshooting
No--replace (SDC)

PROBLEM: Spin drive motor speed varies

IR Comp trim pot not adjusted properly.

A. See adjustment section for trim pot setting on Page 24.

Original adjustment was not set properly

Torque to rotate the reel too high.

B. Readjust bearing preload for the reel. Maximum torque load 25 in./lb to rotate reel.

Too much load on drive motor will cause motor to hunt and vary speed.

Check all terminal connections for tightness.

C. When .250 female spade terminals are not tight, remove and crimp slightly together. When reinstalling, push on pressure should have increased for good contact.

When connections are not tight the control board varies voltage to the DC motor which then varies speed.

ELECTRICAL TROUBLESHOOTING (Continued)

PROBLEM-- Grinding motor not working.

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

Verify all wires shown on the wiring diagram on pages 74-76 are correct and pull on wire terminals with approximately 3lbs force to verify there are no loose terminal connections and/or no loose crimps between wire and terminal. If loose terminals are found, retighten and retest system. If problem persists, test as listed below.

Possible Cause	Checkout Procedure	
Grinding Motor Switch (GMS) is not on	A. Turn switch on	Grinding Motor works Yes--end troubleshooting No--go to Step B. next
Guard doors are not closed	B. Close Front guard doors (and rear ramp - lift option)	Grinding Motor works Yes--end troubleshooting No--go to Step C. next
10 Amp Circuit Breaker (CB) is tripped	C. Check 10 amp CB on front of Control panel. Press in if tripped.	Grinding Motor works Yes--end troubleshooting No--go to Step D. next
GMS not working	D. Check for power to GMS	GMS term 5 to Terminal Block 4 (Blue) for 120 Volts AC Yes--go to Step E. next No--With power off, check continuity of wires to GMS.
	E. Check for power from GMS	GMS Term 6 to Terminal Block 4 (Blue) for 120 Volts AC Yes--Go to Step F. next No--replace GMS
Grinding Motor Relay not working	F. Check for power to relay Coil (Relay should click when GMS is turned on.)	Check for 120 Volts (AC) from A1 to A2 of Grinding motor Relay. Yes--Go to Step G. next No-- check continuity of wires to Grinding motor Relay.
No Power to Relay Contacts	G. Verify Power to Relay Contacts	(REL) Term L1 to Term L2 for 120 Volts (AC) Yes--Go to Step H. next No--Check wires to REL Term L1 & L2

ELECTRICAL TROUBLESHOOTING (Continued)

Possible Cause	Checkout Procedure	
Bad Contacts in Grinding motor Relay	H. Verify power out of Grinding Motor Relay.	(REL) Term T1 to Term T2 for 120 Volts (AC) Yes--Go to Step I. next No--Replace Grinding Motor Relay
Bad Circuit Breaker	I. Verify Power out of Circuit Breaker.	Check for 120 Volts (AC) from terminals TB2-6 to Terminal Block 4 (Blue) Yes--Go to Step J. next No--Check circuit breaker for continuity. Verify wiring and replace if needed.
Bad Grinding Motor	J. Verify Power to Grinding motor Cord.	Verify wiring at terminals 1, 2 & 3 on Terminal Strip 1. Check TB1-1 to TB1-2 for 120 Volts (AC). Yes-- Check terminals on motor cord. If tight replace motor. No-- Check wires from Grinding Motor Relay and Circuit Breaker to Terminal Strip 1.

ELECTRICAL TROUBLESHOOTING (Continued)



PROBLEM--Traverse Drive not working.

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

Verify all wires shown on the wiring diagram on pages 88 are correct and pull on wire terminals with approximately 3lbs force to verify there are no loose terminal connections and/or no loose crimps between wire and terminal. If loose terminals are found, retighten and retest system. If problem persists, test as listed below.

Possible Cause	Checkout Procedure	
Traverse Motor Switch (TMS) is not on	A. Turn on (TMS)	Traverse works Yes--end troubleshooting No--got to Step B. next
Traverse Speed Pot (TSP) set to zero	B. Set (TSP) to 35 on the control panel	Traverse works Yes--end troubleshooting No--go to Step C. next
Fuse on Traverse Drive Control (TDC) has failed	C. Check fuse and replace if failed. See Page 23. Too heavy a grind causes grinding head traverse motor to overload and blow the fuse, NOTE: Fuse can not be checked visually. Use Ohm test to check fuse. If needs replacing MUST use a 3 amp slo-blo fuse. Part Number 3707546.	Traverse works Yes--end troubleshooting No--go to Step D. next
Traverse Drive Control (TDC) is bad	D. Check for 120 Volts (AC) incoming to (TDC)	On (TDC) Terminal L1 to L2 for 120 Volts AC Yes--Go to Step F. next No--Go to Step E. next
Bad Traverse Motor Switch (TMS)	E. Check for 120 Volts AC at (TMS). (Make certain (TMS) is on)	Measure 120 volts AC from TMS Terminal 5 to Term Block 4(Blue) Yes--Go to Step L. next. No--Flip Switch and check again- Works--Switch is upside down. Does not work-- Check wiring/Verify Continuity/ Replace Switch

ELECTRICAL TROUBLESHOOTING (Continued)

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

ELECTRICAL TROUBLESHOOTING (Continued)

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

Possible Cause Checkout Procedure

Gap between flag and prox is incorrect.

A. Gap between flag and prox should be 3/16 to 1/4" (4-6 mm). Prox LED does not light when flag is under prox.

If incorrect, adjust per adjustment section of manual.
 Yes--end troubleshooting
 No--go to Step B. next

Proximity Switch is bad.

B. Proximity switch is not working properly or wire connections are loose.

First check to see if proximity light comes on. When the light is on, it means that there is electricity coming to proximity switch. Actuate prox switches with steel tool to take measurements.

The light coming on shows the proximity is getting electrical contact.

Left proximity (PROX 1) check Traverse drive Control (TDC) between terminals #13 (black wire) and #15 (brown wire).

Proximity light on- 0 Volts DC
 Proximity light off- 12 Volts DC

Right proximity (PROX) check #14 (black wire) and #15 (brown wire).

Proximity light on- 0 Volts DC
 Proximity light off- 12 Volts DC

Replace proximity switch if the voltages do not read as above.

ELECTRICAL TROUBLESHOOTING (Continued)

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

Possible Cause

Checkout Procedure

Defective speed control potentiometer

A. Check potentiometer on control panel.

Traverse Drive Control Pin #8 to 7
 Pot full CCW Pot Full CW
 0 VDC 9.75 VDC
 Pin #8 to 9
 Pot full CCW Pot Full CW
 9.75 VDC 0 VDC
 Yes--Pot is OK
 No--Go to Step **B.** next

B. Check potentiometer for 10,000 ohms.
 Remove three wires from Traverse Drive Control red from term #8 white from term #7 black from term #9

Check for 10,000 ohms
 Red to White wires
 Full CCW - 0 ohms
 Full CW - 10,000 ohms
 Red to Black wires
 Full CCW - 10,000 ohms
 Full CW - 0 ohms
 Yes--Go to Step **C.** next
 No--replace potentiometer.
 Wiper inside of potentiometer controls speed. Wiper may be bad and not making contact.

Wiring hookup to potentiometer is improper.
 (If components have been replaced.)

C. Check potentiometer wiring for proper hookup. See that speed pot is wired per electrical diagram

Wrong wire hookup effects traverse control. Reversing red and orange wires to potentiometer to the D C motor will run at zero speed but maximum will be too slow. Reversing red and white wires does not affect speed control. Check for Proper function.
 Yes--end troubleshooting
 No--Go to Step **D.** next

Main circuit board dial pot settings not correct.
 (If board has not been replaced.)

D. Check all pot settings on circuit board as shown in wiring diagram. (See adjustment section Traverse Motor Control Board Settings.)

Minimum and maximum pot settings effect traverse speed.

ELECTRICAL TROUBLESHOOTING (Continued)

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

Possible Cause	Remedy	Reason
Proximity switch is not working properly or wire connections are loose	First check to see if proximity light comes on. When the light is on, it means that there is electricity coming to proximity switch. Actuate prox switches with steel tool to take measurements.	The light coming on shows the proximity is getting electrical contact.
	Left proximity (PROX1) check Traverse drive Control (TDC) between terminals #14 (black wire) and #15 (brown wire).	Proximity light on- 0 Volts DC Proximity light off- 12 Volts DC
	Right proximity (PROX) check (TDC) between terminals #13 (black wire) and #15 (brown wire).	Proximity light on- 0 Volts DC Proximity light off- 12 Volts DC
		Replace proximity switch if the voltages do not read as above.

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

The dwell time on the traverse drive control not set properly.	Reset dwell time as required. One increment increases Dwell time by 1/2 second.
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PROBLEM--Traverse changes directions erratically while running in traverse cycle.

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

PROBLEM--Infeed motor not working.

Assuming (SSS) System Start Switch is on with 115 Volts AC to control panel and all other functions are working.

Possible Cause	Checkout Procedure	
Infeed Jog Switch (IJS) is not held to on position	A. (IJS) Hold switch on in either direction	Infeed motor works Yes--end troubleshooting No--go to Step B. next
Infeed Speed Switch (IJS) is not on high speed	B. Put (IJS) on high speed for ease of checkout. (Note: Infeed motor will always be in low if the grinding motor switch is on.)	High speed works Yes--end troubleshooting No--go to Step C. next
Infeed motor/reducer drive coupling is loose	C. Open infeed motor coupling inspection plate to check for loose coupling. Retighten coupling to drive actuator screw. See adjustment section of manual.	Infeed works-- Yes--end troubleshooting No--go to Step D. next
No DC voltage to Grinding Wheel Infeed Motor (GIM)	D. Check for 12+ Volts DC across terminals labeled 2 and 5 of the (IJS) with (IJS) held on.	Check term 2 & 5 of (IJS) for 12+ Volts DC. Yes--go to Step E. next No--go to Step G. next
Infeed Motor/Reducer will not function	E. Check for 12 Volts DC at the (GIM) terminals	Check for 12 Volts DC at Term marked 73 GIMBL and 3 GIMRD. You will need jumpers to check. Yes--Go to Step F. next No--Replace cord wire no. 94
	F. Disconnect (GIM) from the infeed actuator and check (GIM) function under no load.	Check (GIM) function when disengaged from Infeed Actuator. Yes--Replaced Infeed Actuator No--Replace (GIM)
Switch (IJS) is bad	G. Check for 12+ Volts to (IJS).	Check for 12+ Volts DC at Term 6 & 4 and 3 & 1 of (IJS). Yes--Replace (IJS) No--go to Step H. next.
No DC Voltage from the Voltage Regulator.	H. Check for 12 volts DC at Bridge Diode output.	Check for 12 Volts DC at term 120BD+ and 133BD-- Yes--Replace Voltage Regulator No--Go to Step I. next.

ELECTRICAL TROUBLESHOOTING (Continued)

PROBLEM--Infeed motor not working.

Assuming (SSS) System Start Switch is on with 115 volts AC to control panel and all other functions are working

Possible Cause

Checkout Procedure

Bad Bridge Diode

I. Verify voltage to bridge diode.

Check 12.6 Volts AC at input of Bridge Diode (BD1) Term (~) to Term (~)

Yes--Replace Bridge Diode BD1
No--Go to Step **J.** next

No AC Voltage to the input side of transformer

J. Check for 115 Volts AC at transformer input black wires.

Check for 115 Volts AC at Term. TBW-13 and TBG-9.

Yes-- Replace Transformer
No-- Follow separate trouble shooting procedure on AC main power.

MECHANICAL TROUBLESHOOTING (Continued)

Possible Cause

Checkout Procedure

PROBLEM--Reels ground have high/low blades

Traverse Speed set too 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 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 causing 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.

Belt is slipping

Belt Clamp may have moved. See manual adjustment section for Traverse Clamp Force.

Traverse Belt tension to loose

Check the spring length on left side of traverse belt. See manual adjustment section for Traverse Belt Tension.

MECHANICAL TROUBLESHOOTING (Continued)

Possible Cause

Checkout Procedure

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

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

Traverse speed should be set lower approximately 12 ft/min. (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 Operators Manual for NORMAL HELIX AND REVERSE HELIX.

PROBLEM-- Traverse speed is too slow.

Possible Cause

Remedy

Reason

Lineal bearing in the carriage are set too tight.

A. Readjust bearings for proper tension. (for more detail see lineal bearing replacement in the adjustment section of the manual.)

When bearing preload is too tight, it causes excessive loading to drive the carriage.
When traverse belt is disengaged, the proper traverse load is 2 to 3 lbs. Use a tension scale to check. (A general guide only.)

PROBLEM--Spin Drive cranks up and down too hard.

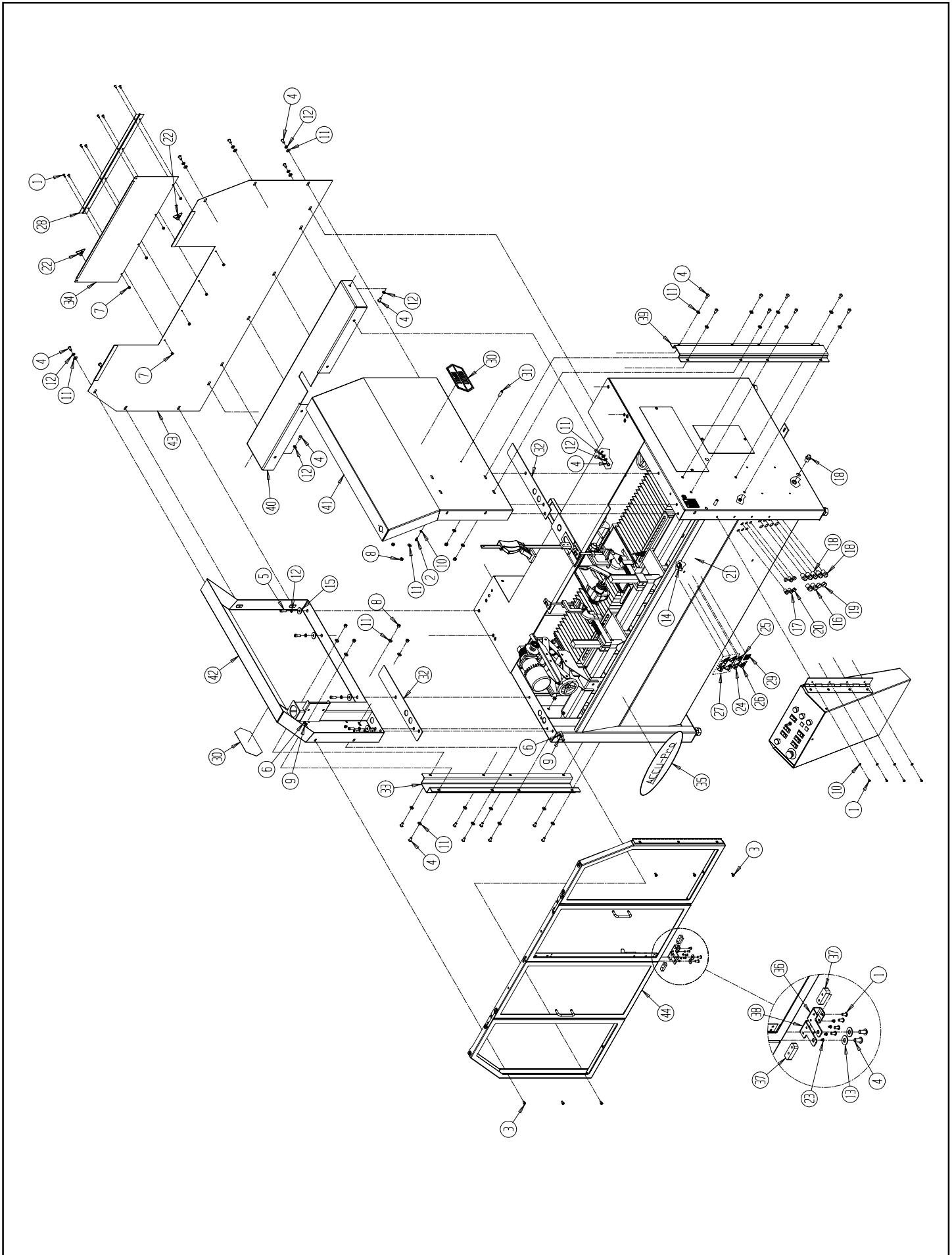
The two top and two bottom pivot screws are compressing the conical washer too tight.

A. Tighten down the locknut until it bottoms out and back off 1/2 turn. Check to see if there is a cone shape to the washer. Four (4) pivot points.

Have enough play so the crank turns snugly but during operation it is free.

Check screw adjustment tension on nylon plug riding against the screw thread.

B. Loosen set screw and check. (See adjustment section.)



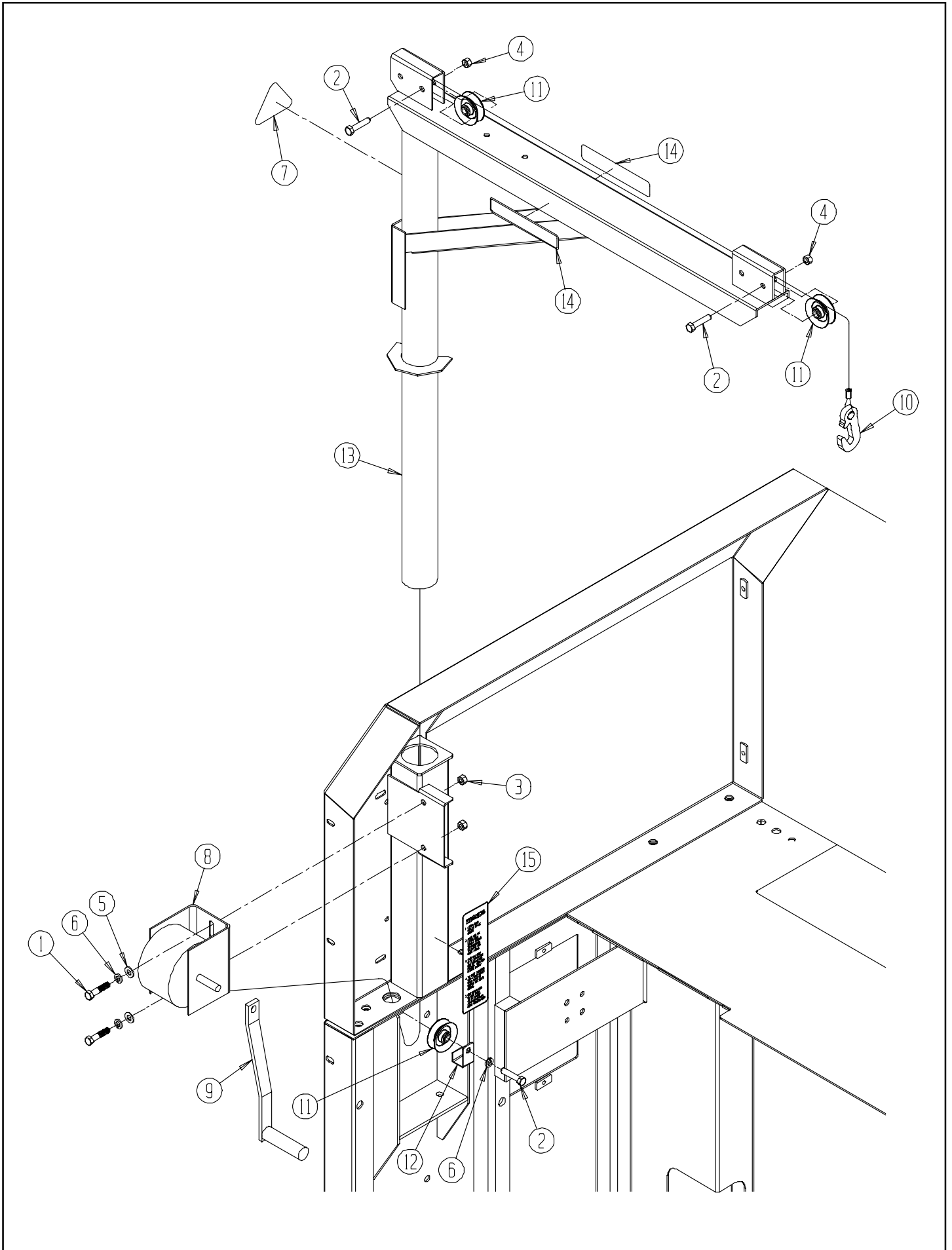
PARTS LIST

6329532 CANOPY ASSEMBLY - WINCH & BOOM MODEL

<u>DIAGRAM NUMBER</u>	<u>PART NUMBER</u>	<u>DESCRIPTION</u>
1	B250816	Button Head Cap Screw 1/4-20 x 1/2 Long
2	B251001	Hex Head Cap Screw 1/4-20 x 5/8 Long
3	B250801	Hex Head Cap Screw 1/4-20 x 1/2 Long
4	B371216	Button Head Cap Screw 3/8-16 x 3/4 Long
5	B371611	Socket Head Cap Screw 3/8-16 1 Long
6	J257000	1/4-20 Nylon Jam Locknut
7	J257100	1/4-20 Nylon Locknut
8	J377000	3/8-16 Nylon Jam Locknut
9	K250001	1/4 Flat Washer
10	K251501	1/4 Split Lockwasher [Gage Holder]
.....	R000536	Internal Tooth Lock Washer 1/4 [Control Panel]
11	K370001	3/8 Flat Washer SAE
12	K371501	3/8 Split Lockwasher
13	R000454	Flat Washer (1 OD x .44 ID)
14	09394	2 Prong Knob
15	3589106	Flat Washer (1.38 OD x .39 ID)
16	3707009	Liquid Tight Strain Relief .27-.47 Wire
17	3707029	Liquid Tight Strain Relief .19-.30 Wire
18	3707093	Liquid Tight Strain Relief .43-.55 Wire
19	3707595	7/8 Hole Plug
20	3707597	5/8 Hole Plug
21	3708448	Electrical Warning Decal
22	3708458	Sharp Warning Decal
23	3708521	Plastic Rivet
24	3708605	Respirator Warning Decal
25	3708606	Hearing Protection Warning Decal
26	3708612	No Fuel Warning Decal
27	3708703	Multiple Safety Symbols Decal
28	3708869	Spring Hinge
29	3708872	Patent Decal
30	3709990	Foley United Decal
31	6309039	Gage Mounting Pin
32	6329022	Side Frame Spacer Plate
33	6329024	Canopy Boom Support Bracket
34	6329029	Hinged Walker Panel
35	6329053	ACCUPro Decal
36	6329047	Door Guide Bracket RH
37	6329048	Door Slide
38	6329049	Door Guide Bracket LH
39	6329059	Canopy Support Bracket
40	6329503	Rear Top Filler Weldment
41	6329505	Guard Weldment RH
42	6329506	Guard Weldment - Boom LH
43	6329520	Rear Panel Weldment
44	6329533	Front Guard Door Assembly (see page 60)

PARTS LIST

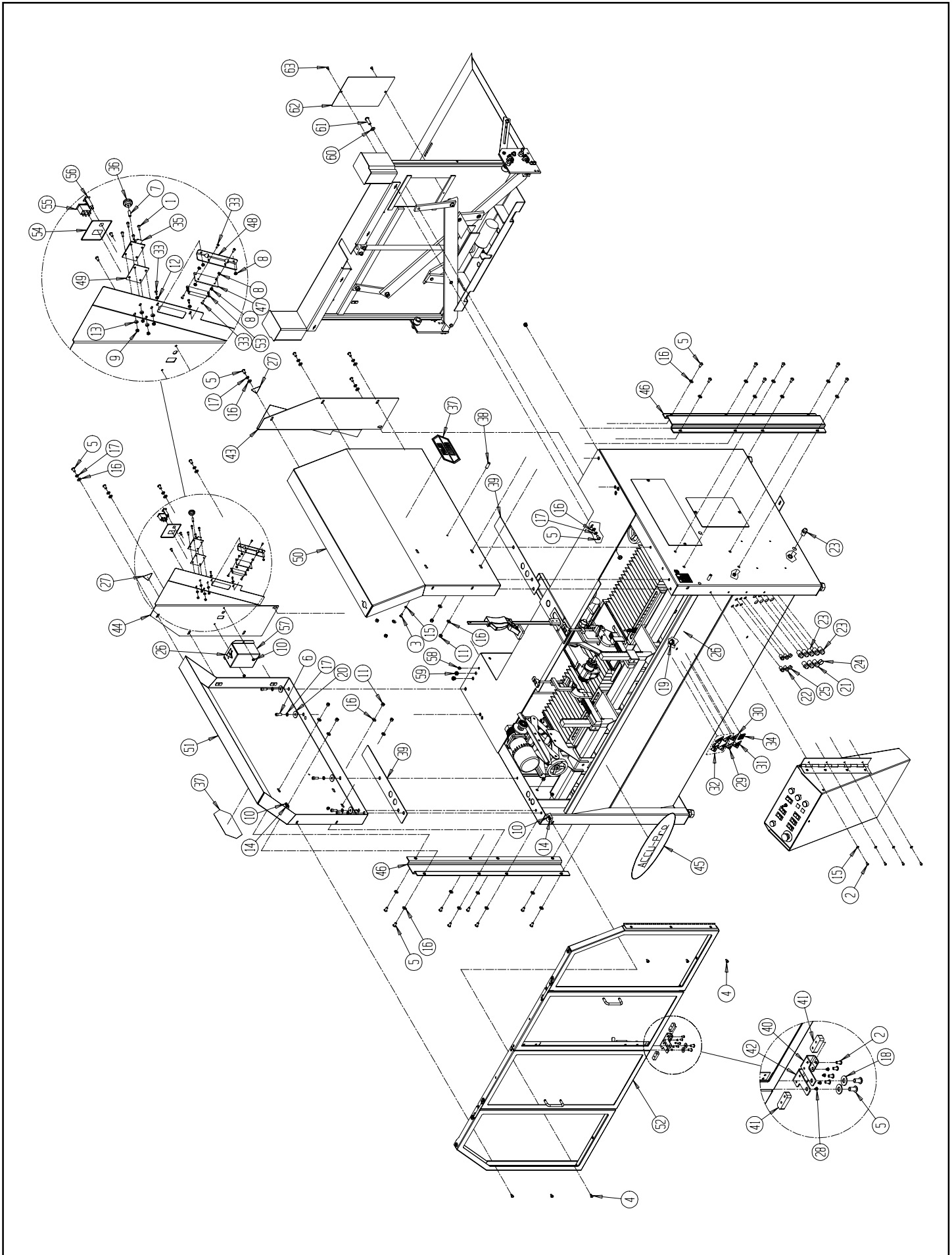
6059526 WINCH AND BOOM ASSEMBLY (Optional)



PARTS LIST (Cont.) 6059526 WINCH AND BOOM ASSEMBLY (Optional)

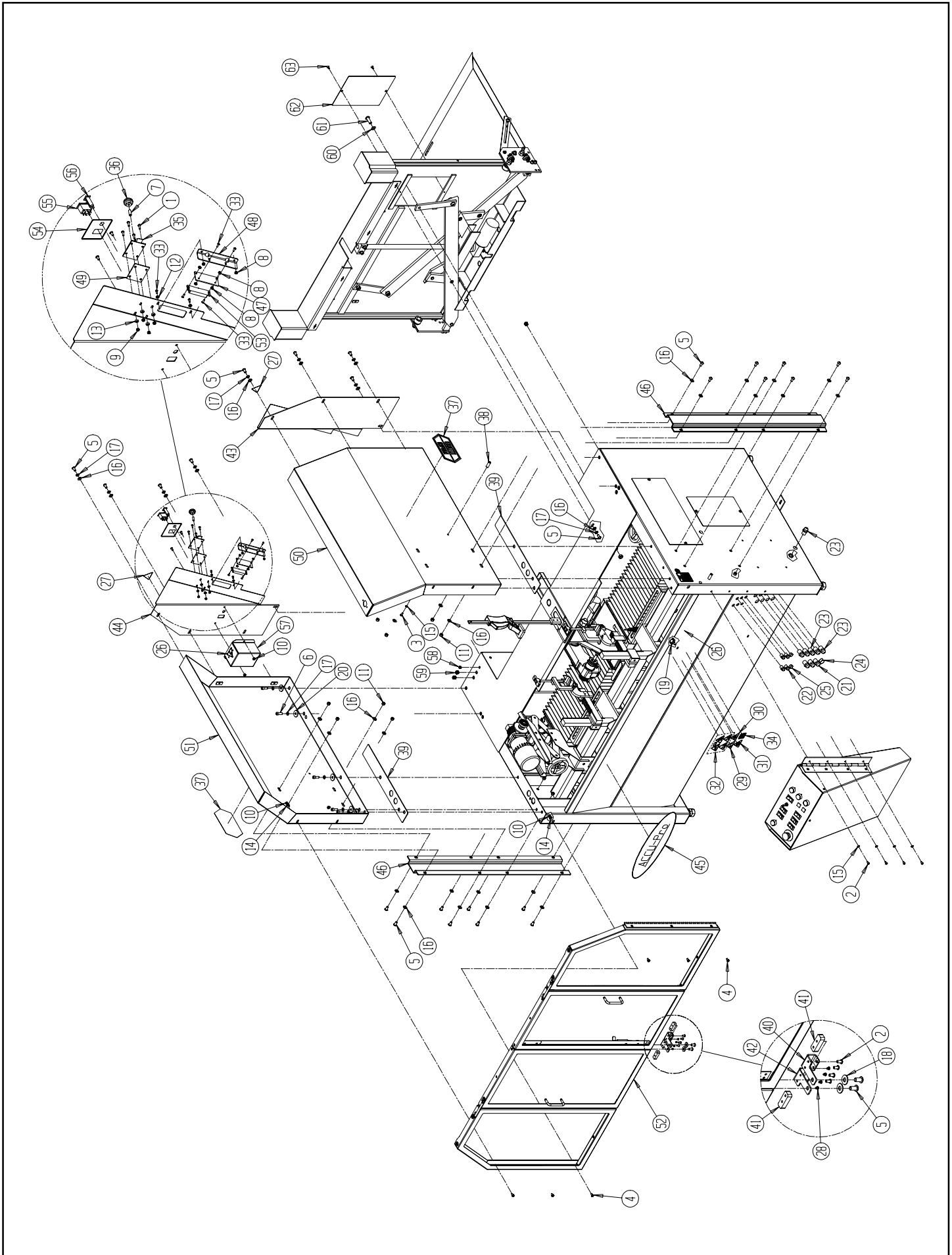
<u>DIAGRAM NUMBER</u>	<u>PART NUMBER</u>	<u>DESCRIPTION</u>
1	B371601	Hex Head Cap Screw 3/8-16 x 1Long
2	B372801	Hex Head Cap Screw 3/8-16 x 1 3/4 Long
3	J371000	3/8-16 hex Nut
4	J377100	3/8-16 Nylon Locknut
5	K370001	3/8 Flat Washer
6	K371501	3/8 Split Lockwasher
7	3708456	Warning Decal - Boom Capacity
8	3708578	Winch
9	3708647	7" Winch Handle
10	3709407*	Hook and Cable Assembly
11	3709795	Pulley
12	6059003	Pulley Guard Bracket
13	6059527	Boom Weldment
14	6309036	Boom Capacity Decal
15	6309037	Winch Warning Decal

* Hook & Cable Assembly is packed in carton assembly. Install as shown (cable runs down middle of boom tube).



PARTS LIST**6329534 CANOPY ASSEMBLY -REAR LIFT OPTION**

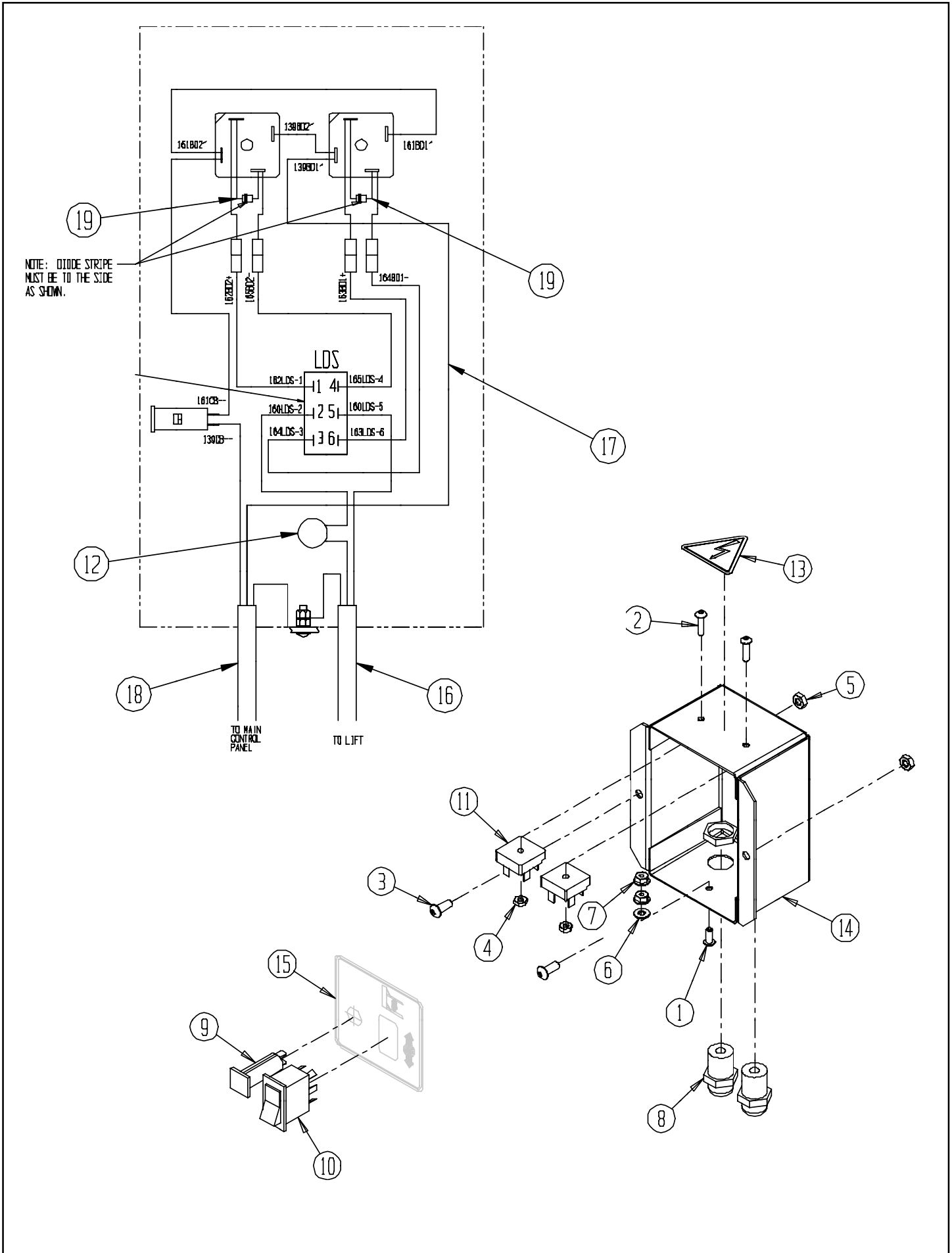
<u>DIAGRAM NUMBER</u>	<u>PART NUMBER</u>	<u>DESCRIPTION</u>
1	B191213	Button Head Cap Screw #10-24 x 3/4 Long
2	B250816	Button Head Cap Screw 1/4-20 x 1/2 Long
3	B251001	Hex Head Cap Screw 1/4-20 x 5/8 Long
4	B250801	Hex Head Cap Screw 1/4-20 x 1/2 Long
5	B371216	Button Head Cap Screw 3/8-16 x 3/4 Long
6	B371611	Socket Head Cap Screw 3/8-16 1 Long
7	C311620	Socket Set Screw Cup Pt. 5/16-18 x 1 Long
8	J167000	#8-32 Nylon Jam Locknut
9	J197100	#10-24 Nylon Locknut
10	J257000	1/4-20 Nylon Jam Locknut
11	J377000	3/8-16 Nylon Jam Locknut
12	K160001	#8 Flat Washer
13	K190001	#10 Flat Washer
14	K250001	1/4 Flat Washer
15	K251501	1/4 Split Lockwasher [Gage Mount]
.....	R000536	Internal Tooth Lock Washer 1/4 [Control Panel]
16	K370001	3/8 Flat Washer SAE
17	K371501	3/8 Split Lockwasher
18	R000454	Flat Washer (1 OD x .44 ID)
19	09394	2 Prong Knob
20	3589106	Flat Washer (1.38 OD x .39 ID)
21	3707009	Liquid Tight Strain Relief .27-.47 Wire
22	3707029	Liquid Tight Strain Relief .19-.30 Wire
23	3707093	Liquid Tight Strain Relief .43-.55 Wire
24	3707595	7/8 Hole Plug
25	3707597	5/8 Hole Plug
26	3708448	Electrical Warning Decal
27	3708458	Sharp Warning Decal
28	3708521	Plastic Rivet
29	3708605	Respirator Warning Decal
30	3708606	Hearing Protection Warning Decal
31	3708612	No Fuel Warning Decal
32	3708703	Multiple Safety Symbols Decal
33	3708820	Button Head Safety Screw #8-32 x 1/2 Long
34	3708872	Patent Decal
35	3708882	Spring Latch
36	3709788	Knob
37	3709990	Foley United Decal
38	6309039	Gage Mounting Pin
39	6329022	Side Frame Spacer Plate
40	6329047	Door Guide Bracket RH



<u>DIAGRAM NUMBER</u>	<u>PART NUMBER</u>	<u>DESCRIPTION</u>
41	6329048	Door Slide
42	6329049	Door Guide Bracket LH
43	6329050	Rear Panel RH - Lift
44	6329051	Rear Panel LH - Lift
45	6329053	ACCUPro Decal
46	6329059	Canopy Support Bracket
47	6329083	Door Switch Mounting Plate
48	6329084	Door Switch Mounting Bracket
49	6329085	Latch Spacer Plate
50	6329505	Guard Weldment RH
51	6329519	Guard Weldment - Lift LH
52	6329533	Front Guard Door Assembly (see page xx)
53	3707607	Door Safety Switch Assembly
.....	6329097	Rear Door Switch Cord
54	6209102	Lift Control Decal
55	3707428	Rocker Switch
56	3707156	6-Amp Circuit Breaker
57	6209101	Lift Control Box
58	3707066	Strain Relief .22-.25 Wire
59	3707273	Strain Relief .33-.36 Wire
60	3709019	Thrust Washer .94 OD x .50 ID
61	80048	Button Head Cap Screw 1/2-13 x 1 1/2 Long
62	6209100	Lift Access Panel
63	B250805	Flat Head Cap Screw 1/4-20 x 1/4 Long

PARTS LIST

6200720 REEL LIFT ASSEMBLY (Optional)

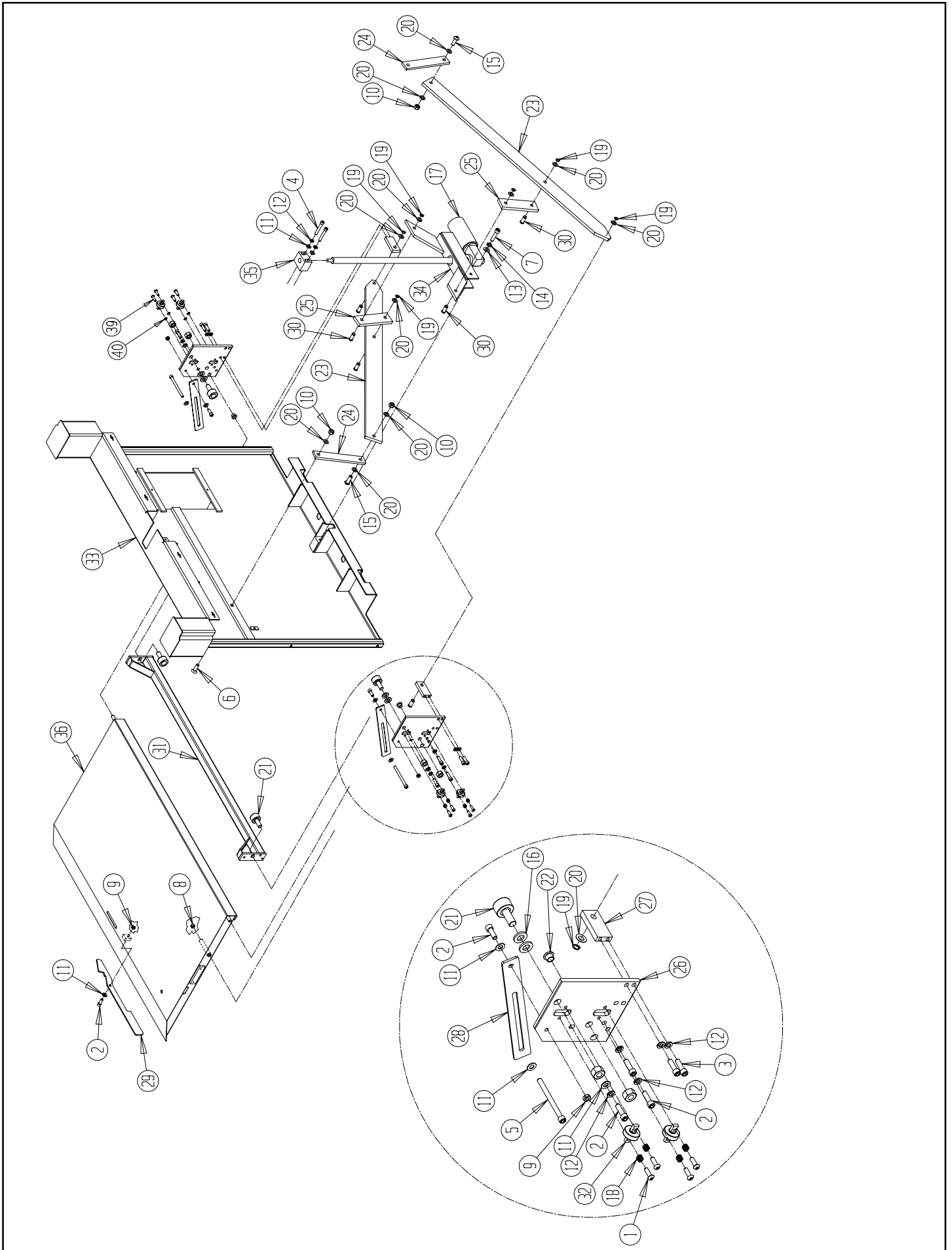


PARTS LIST**6200720 REEL LIFT ASSEMBLY (Optional)**

<u>DIAGRAM NUMBER</u>	<u>PART NUMBER</u>	<u>DESCRIPTION</u>
1	B190813	Button Head Cap Screw #10-24 x 1/2 Long
2	B191213	Button Head Cap Screw #10-24 x 3/4 Long
3	B251016	Button Head Cap Screw 1/4-20 x 5/8 Long
4	J197000	#10-24 Nylon Jam Locknut
5	J257100	1/4-20 Nylon Locknut
6	R000483	#10 Lockwasher
7	R000553	#10-24 Kep Nut
8	3707009	Liquid Tight Strain Relief .27-.47 Wire
9	3707648	6-Amp Circuit Breaker
10	3707428	Rocker Switch Momentary on-off-on
11	3707526	25-Amp Bridge Diode
12	3707644	Thermistor Assembly
13	3708448	Electrical Warning Decal
14	6209101	Lift Electrical Control Box
15	6209102	Lift Control Decal
16	6209110	Lift Actuator Cord
17	6209111	Lift Controls Harness
18	6329082	Lift Power Cord
19	6309134	Diode Jumper Assembly

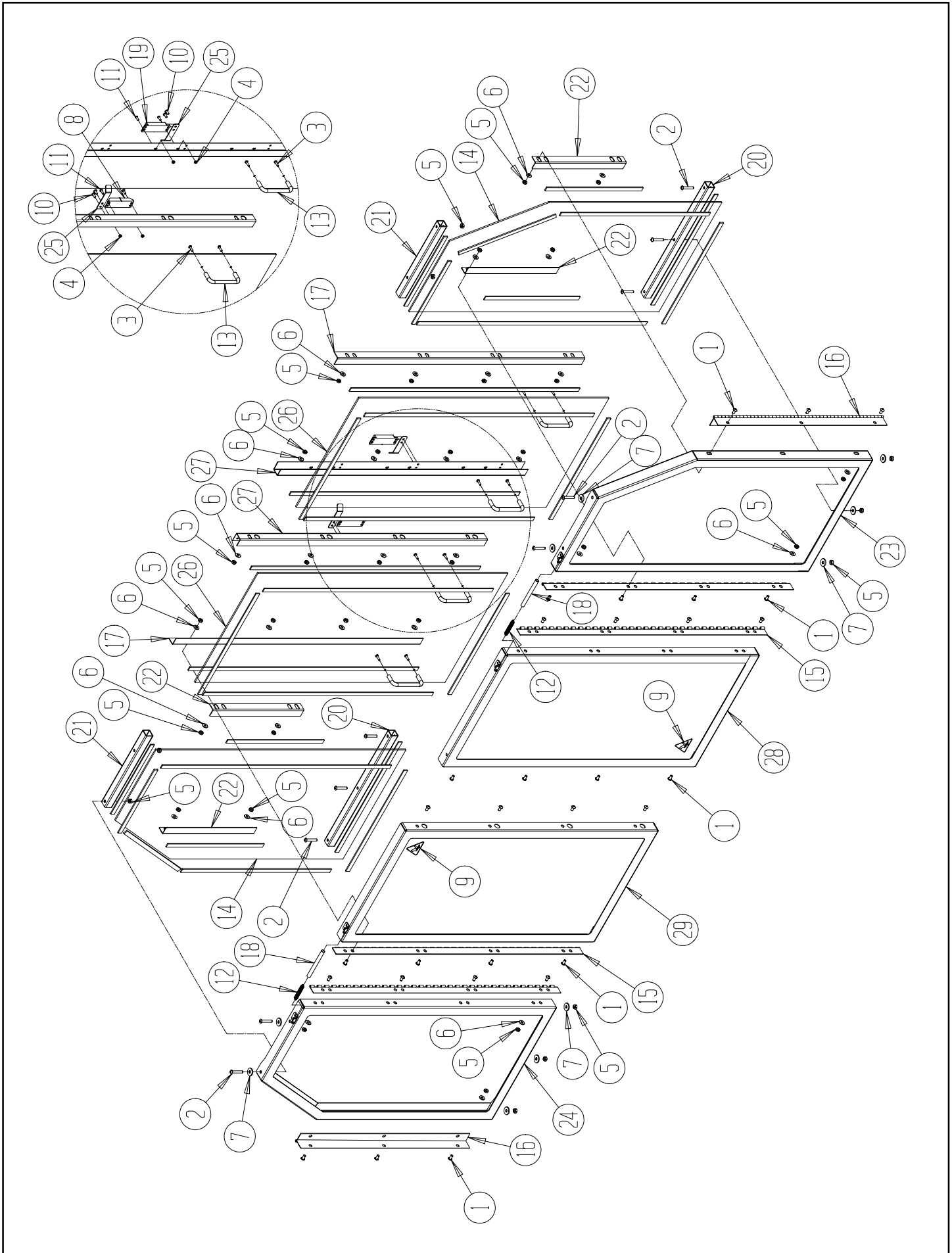
PARTS LIST

6200720 REEL LIFT ASSEMBLY (Optional)



PARTS LIST**6200720 REEL LIFT ASSEMBLY (Optional)**

<u>DIAGRAM NUMBER</u>	<u>PART NUMBER</u>	<u>DESCRIPTION</u>
1	B190813	Button Head Cap Screw #10-24 x 1/2 Long
2	B371611	Socket Head Cap Screw 3/8-16 x 1 Long
3	B372011	Socket Head Cap Screw 3/8-16 x 1 1/4 Long
4	B374011	Socket Head Cap Screw 3/8-16 x 2 1/2 Long
5	B377211	Socket Head Cap Screw 3/8-16 x 4 1/2 Long
6	B502405	Flat Head Cap Screw 1/2-13 x 1 1/2 Long
7	B503211	Socket Head Cap Screw 1/2-13 x 2 Long
8	J377100	3/8-16 Nylon Locknut
9	J377000	3/8-16 Nylon Jam Locknut
10	J507000	1/2-13 Nylon Locknut
11	K370001	3/8 Flat Washer
12	K371501	3/8 Split Lockwasher
13	K500001	1/2 Flat Washer
14	K501501	1/2 Split Lockwasher
15	80048	Button Head Cap Screw
16	3599029	Flat Washer
17	3707373	Electro Mechanical Actuator
.....	3707663	Motor - Service Electro Mechanical Actuator
18	3708868	Compression Spring
19	3708870	External Snap Ring
20	3709019	Thrust Washer
21	3709700	Cam Follower
22	3709702	Flanged Bronze Bushing
23	6209070	Lift Long Arm
24	6209071	Lift Swing Arm
25	6209072	Lift Short Arm
26	6209073	Bearing Plate
27	6209074	Bearing Plate Arm Block
28	6209089	Ramp Support Strap
29	6209095	Anti-Rollback Plate
30	6209097	Pivot Pin
31	6209116	Lift Cross Support
32	6209507	Lift Bearing Assembly
33	6209570	Lift Frame Weldment
34	6209572	Load Carrier Weldment
35	6209573	Actuator Top Block Assembly
36	6209574	Ramp Weldment
37	3708456	Capacity Warning Decal (Not Shown)
38	6309036	Capacity Warning Decal - Text (Not Shown)
39	B311013	5/16-18 x 5/8 Button Head Socket Cap Screw
40	3589109	Flat Washer .315 ID x .50 OD x .035 Thick

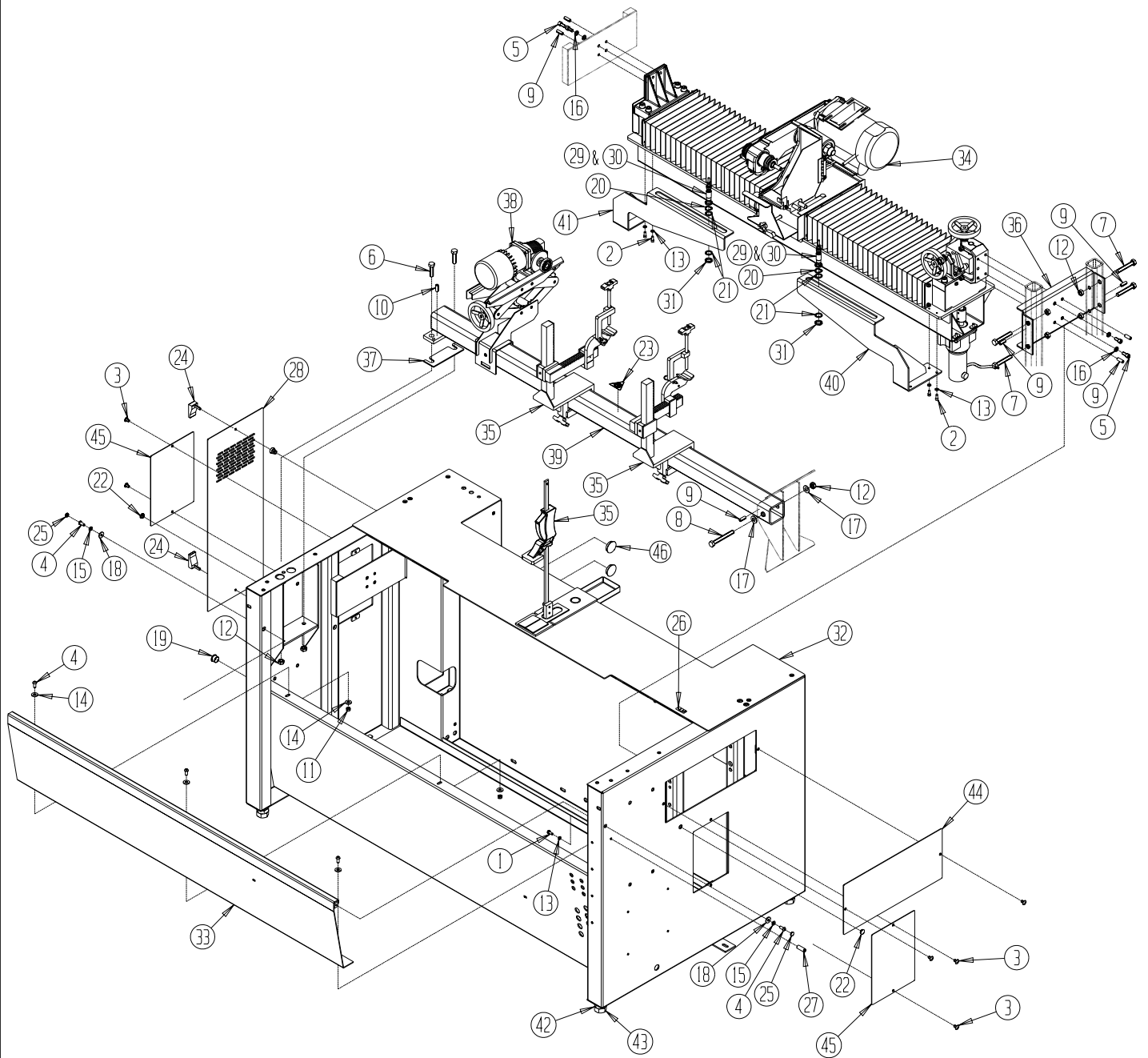


PARTS LIST**6329533 FRONT GUARD DOOR ASSEMBLY**

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

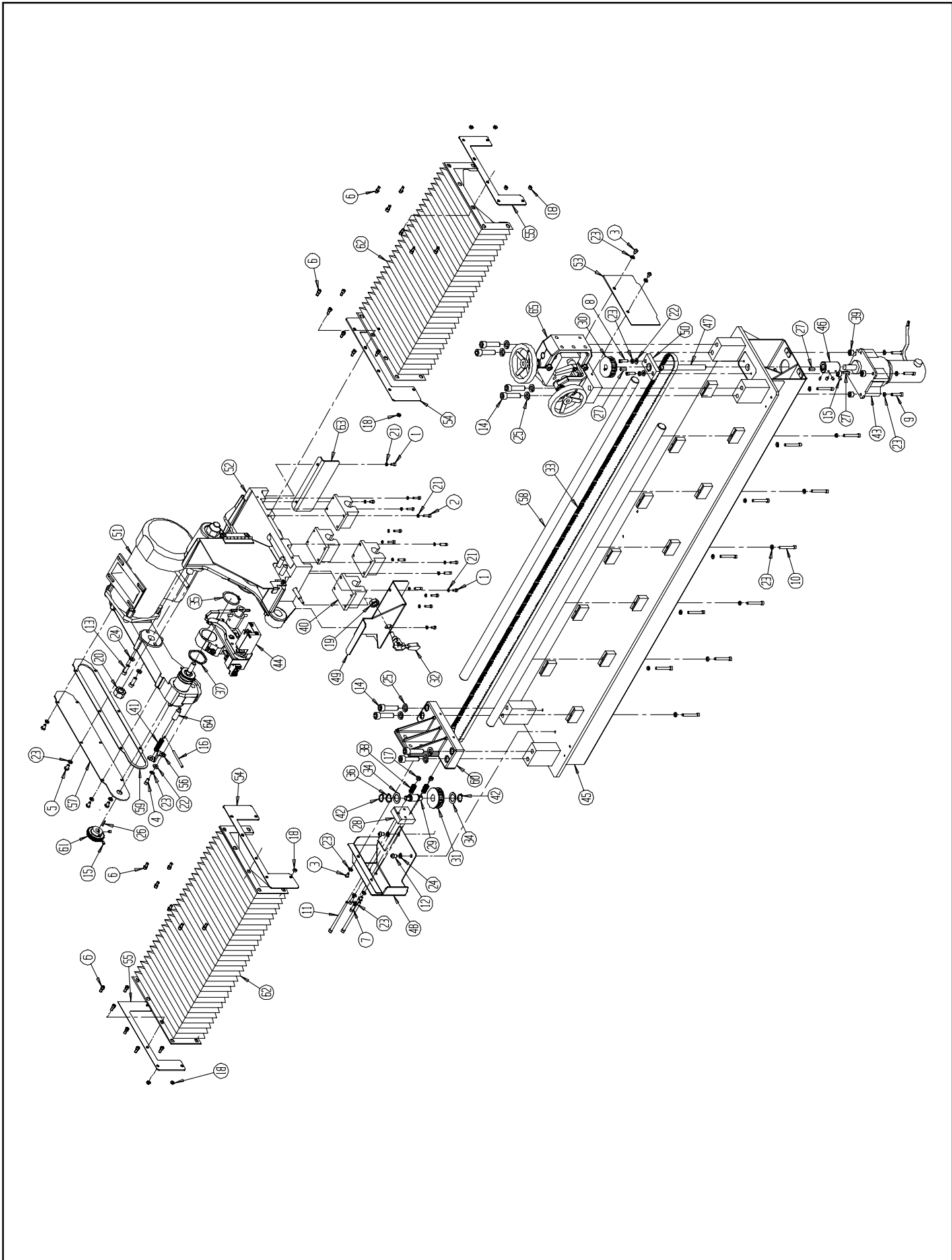
PARTS LIST

6329530 MAIN CABINET ASSEMBLY



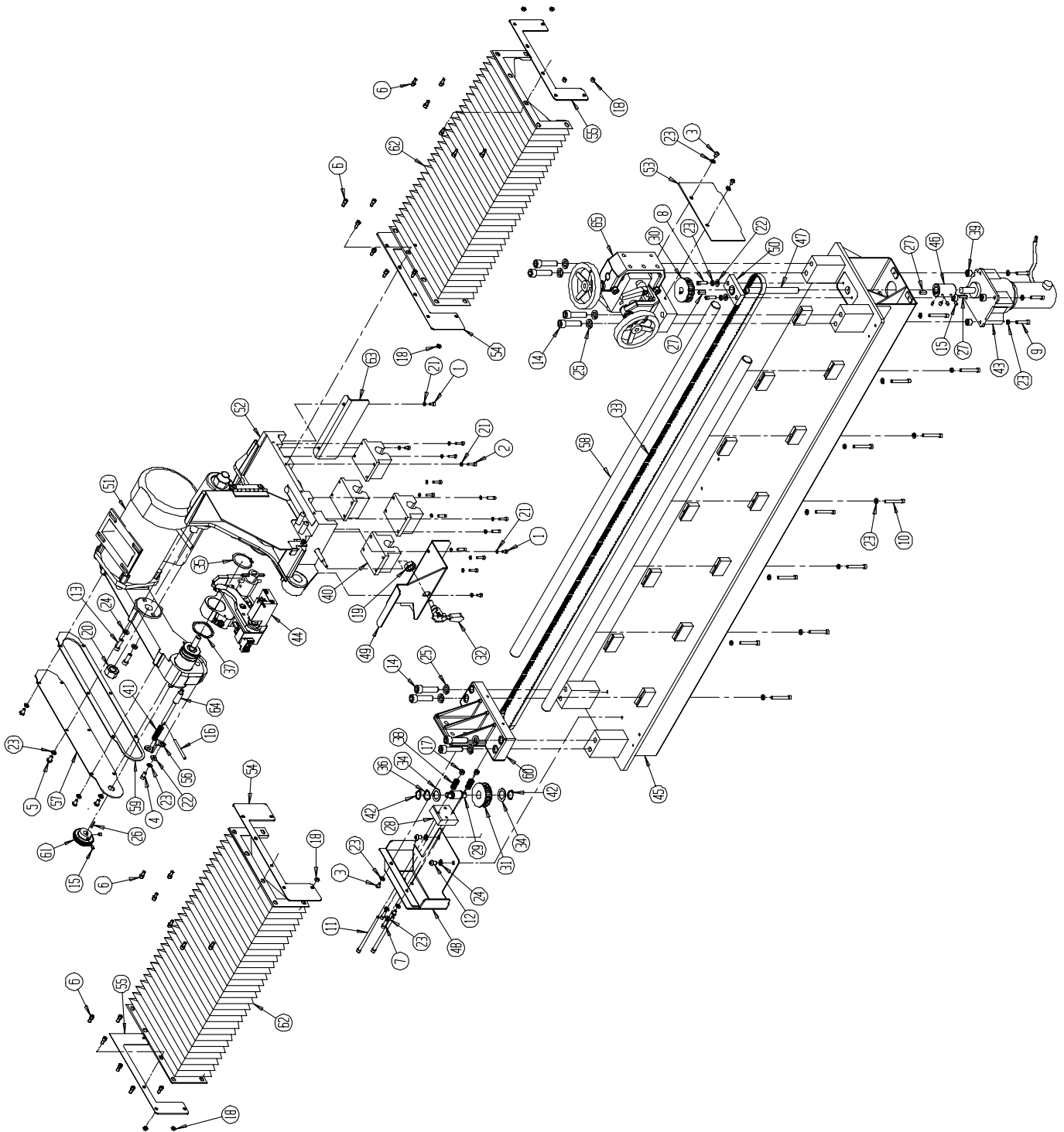
PARTS LIST**6329530 MAIN CABINET ASSEMBLY**

<u>DIAGRAM NUMBER</u>	<u>PART 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	6309039	Gage Pin Mounting
28	6329098	Vac Door
29	3707601	Proximity Switch Head
30 a.....	6329075	LH Traverse Proximity Switch Cord
30 b.....	6329076	RH Traverse Proximity Switch Cord
31	3707459	Proximity Switch Nut
32	6329501	Cabinet Weldment
33	6329504	Front Panel Weldment
34	6329525	Traverse Base Assembly (see page 64)
35	6329535	Mower Support Assembly (see page 78)
36	6509035	Cross slide Mount
37	6509389	Tooling Bar Shim
38	6509465	Spin Drive Assembly (see page 80)
39	6509510	Tooling Bar Weldment
40	6509560	Proximity Switch Bracket Weldment RH
41	6509561	Proximity Switch Bracket Weldment LH
42	J992000	1-8 Hex Jam Nut
43	A993201	Adjustable Leveling Bolt
44	6509039	Right-Hand Access Panel
45	6509040	Left-Hand Access Panel - Small
46	80400	Hole Plug - 1.75 Diameter

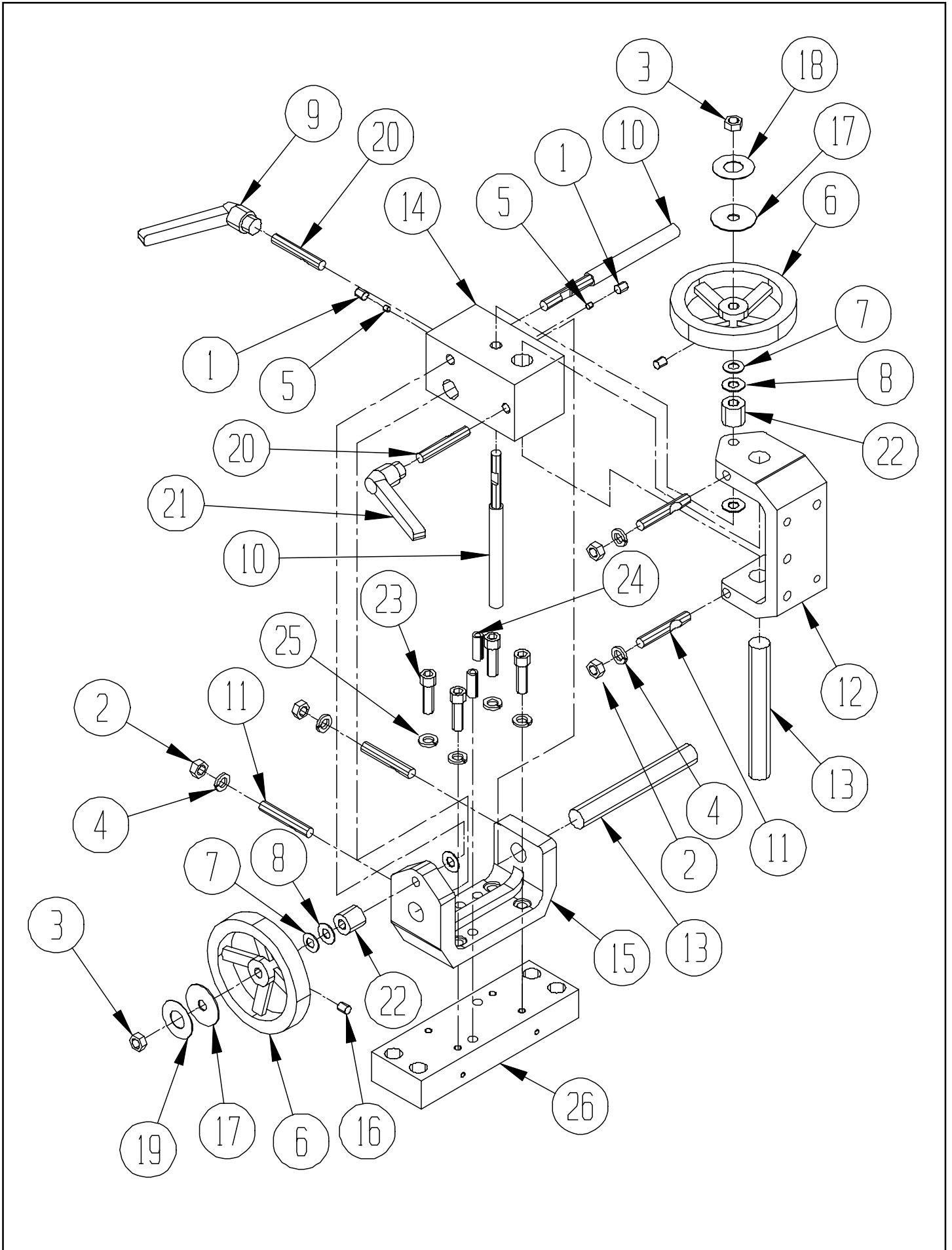


PARTS LIST**6329525 TRAVERSE BASE ASSEMBLY**

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

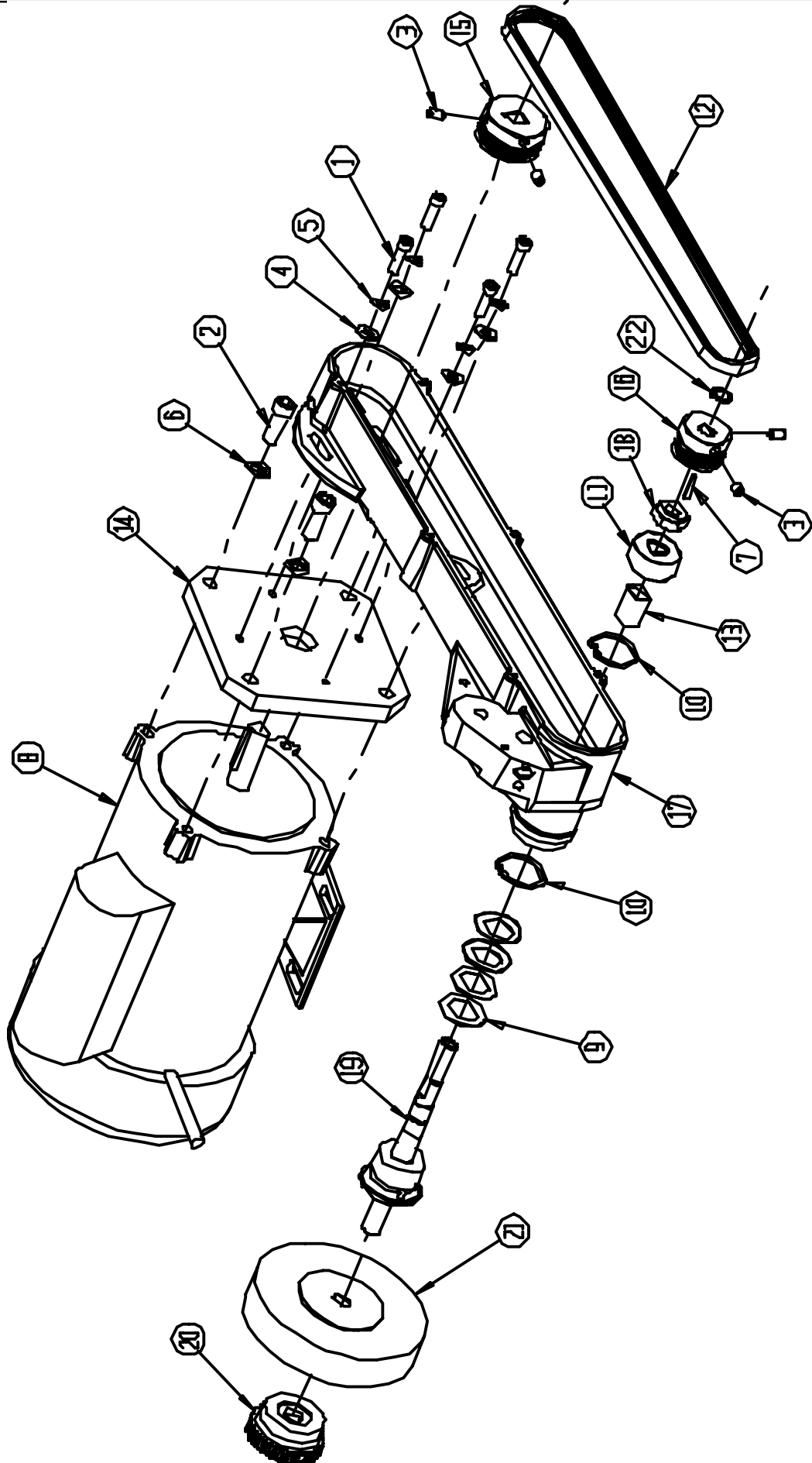


<u>DIAGRAM NUMBER</u>	<u>PART NUMBER</u>	<u>DESCRIPTION</u>
41	3709072	Compression Spring
42	3709331	External Retaining Ring
43	6059062	Traverse Motor Assembly
44	6309573	Finger & Body Assembly (see page 74)
45	6329032	Traverse Base
46	6329034	5/8 Shaft Coupler
47	6329035	Motor Extension Shaft
48	6329036	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)



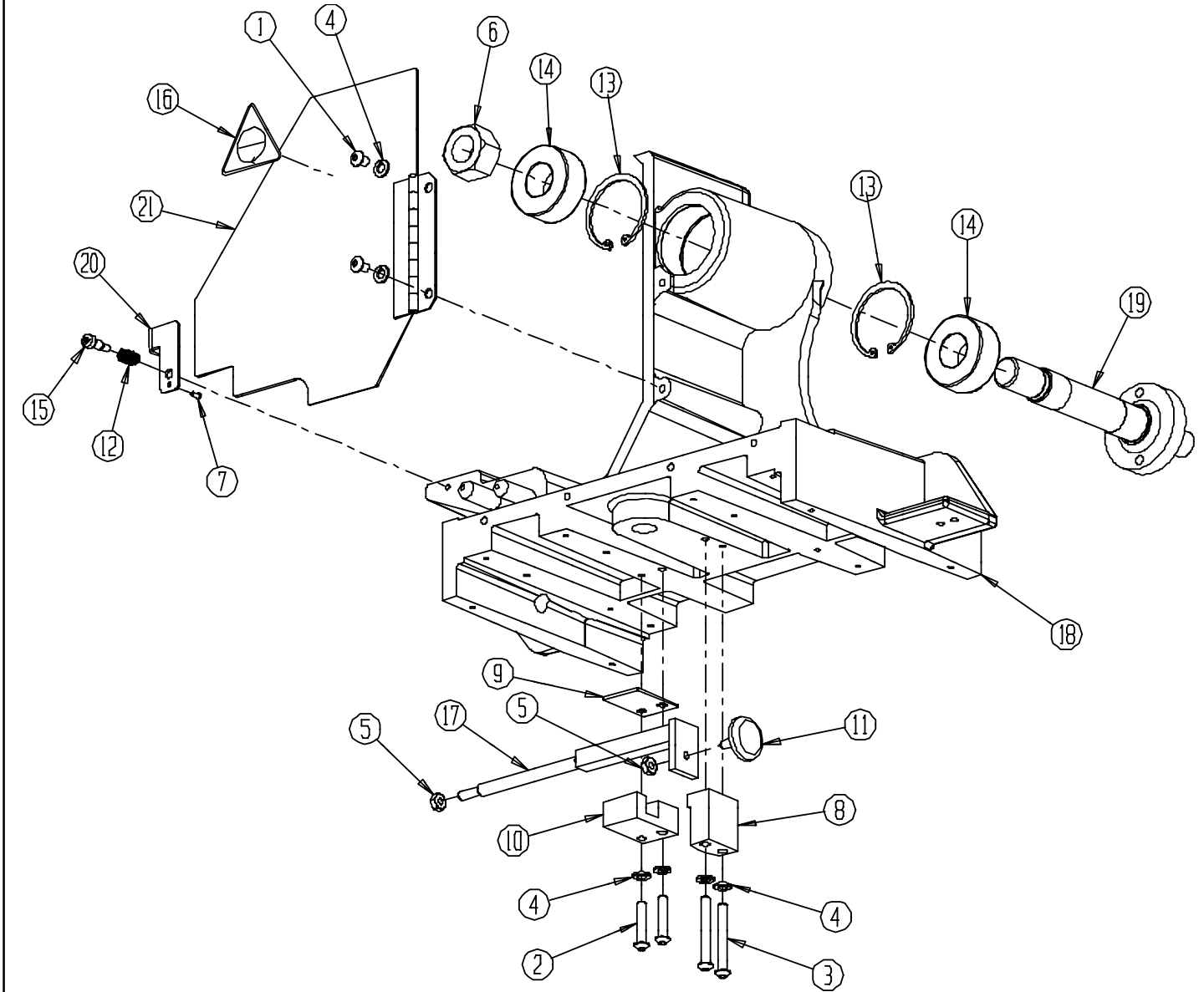
PARTS LIST**6509565 CROSS SLIDE ASSEMBLY**

<u>DIAGRAM NUMBER</u>	<u>PART NUMBER</u>	<u>DESCRIPTION</u>
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**

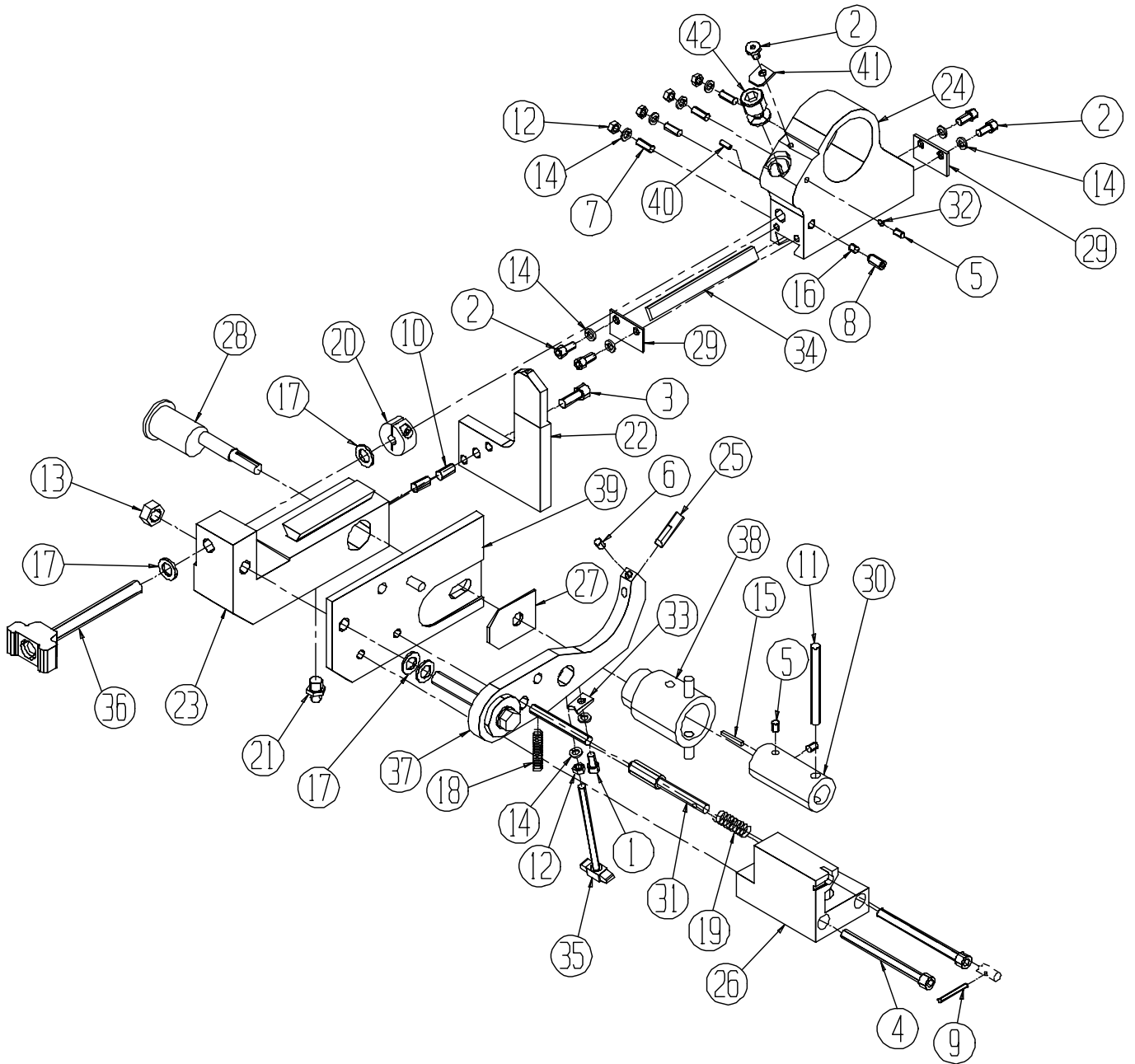
<u>DIAGRAM NUMBER</u>	<u>PART NUMBER</u>	<u>DESCRIPTION</u>
1	B251411	Socket Head Cap Screw 1/4-20 x 7/8 Long
2	B371611	Socket Head Cap Screw 3/8-16 x 1 Long
3	C250627	Socket Set Screw Cup Pt 1/4-20 x 3/8 Long - Lock Patch
4	K250001	1/4 Flat Washer SAE
5	K251501	1/4 Split Lockwasher
6	K371501	3/8 Split Lockwasher
7	R000376	Square Key 1/8 x 3/4 Long
8	3707690	1 HP 120 VAC Motor
9	3708193	Conical Washer 1.36 OD x .88 OD
10	3708194	Internal Retaining Ring
11	3708204	Double Row Ball Bearing
12	3708202	Poly-V Belt
13	6329089	Bearing Sleeve
14	6329041	Motor Mount Plate
15	6329042	Pulley - Poly V 1.80 Diameter
16	6329100	Pulley - Poly V 1.44 Diameter
17	6509018	Grinding Head Housing
18	J567200	9/16-18 Locknut Nylon Insert Jam
19	6329523	Grinding Head Spindle Assembly
20	6509237	Grinding Wheel Knob
21		Grinding Wheel (see page 83)
22	3708870	Retaining Ring - External .50 Shaft Heavy Duty



<u>DIAGRAM NUMBER</u>	<u>PART 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

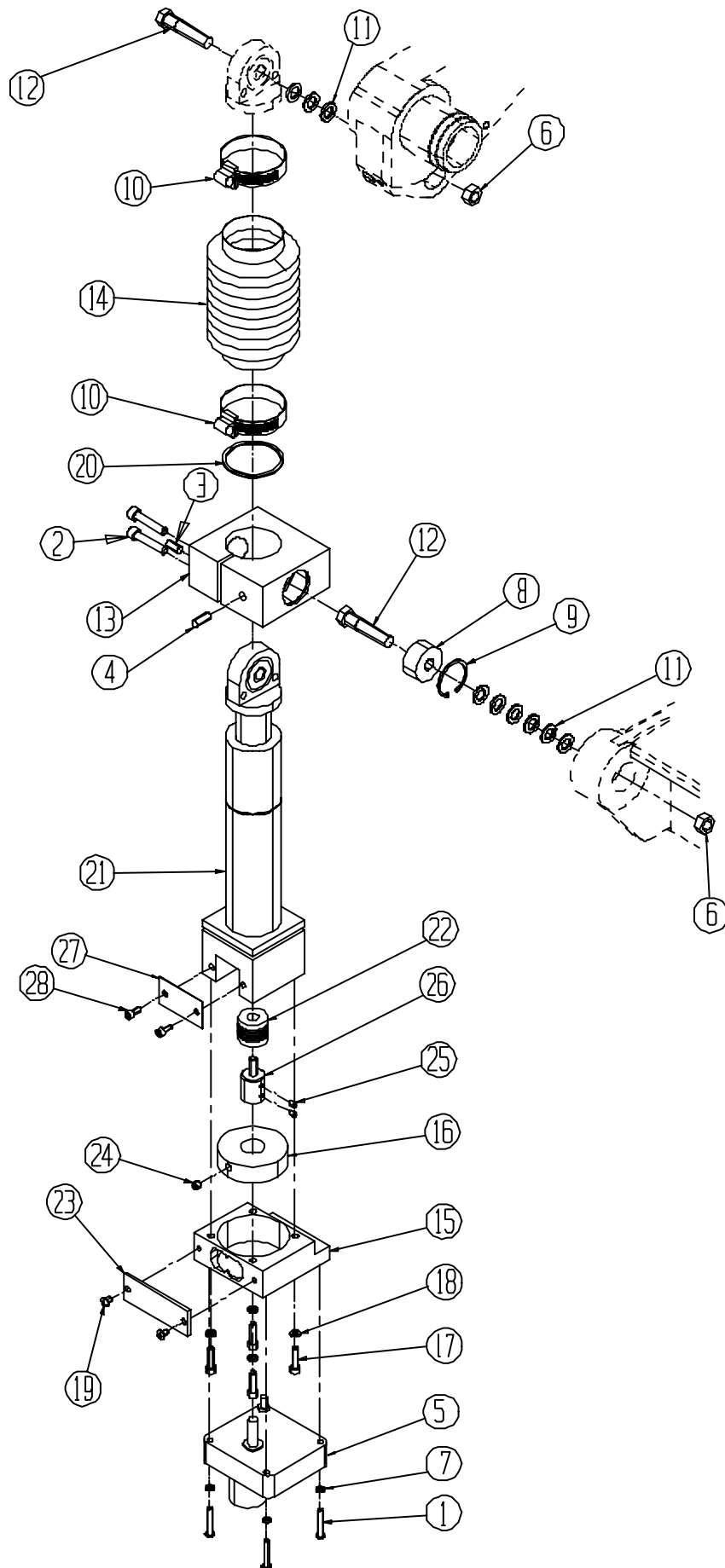
PARTS LIST

6309573 FINGER AND BODY ASSEMBLY



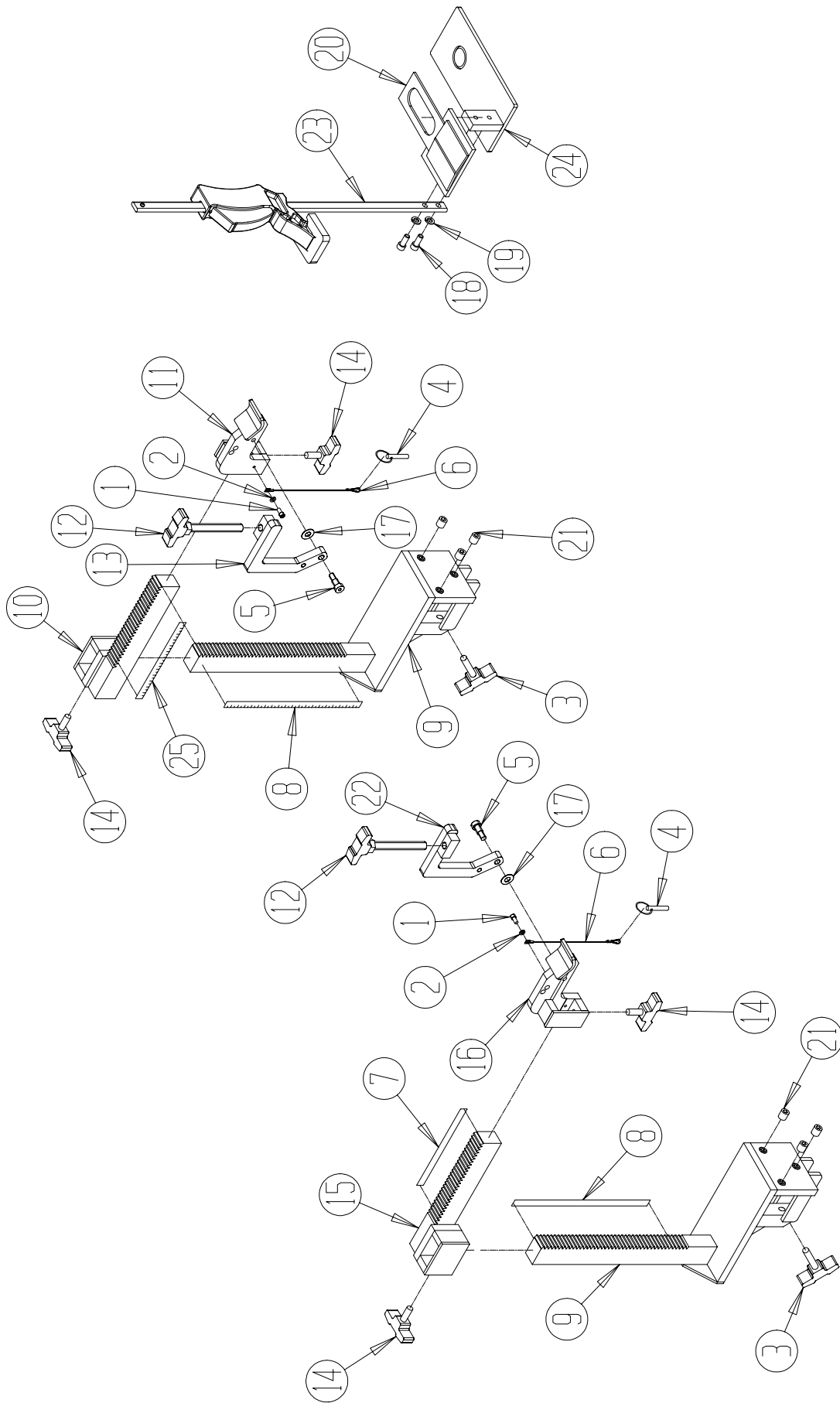
PARTS LIST**6309573 FINGER AND BODY ASSEMBLY**

<u>DIAGRAM NUMBER</u>	<u>PART NUMBER</u>	<u>DESCRIPTION</u>
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
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



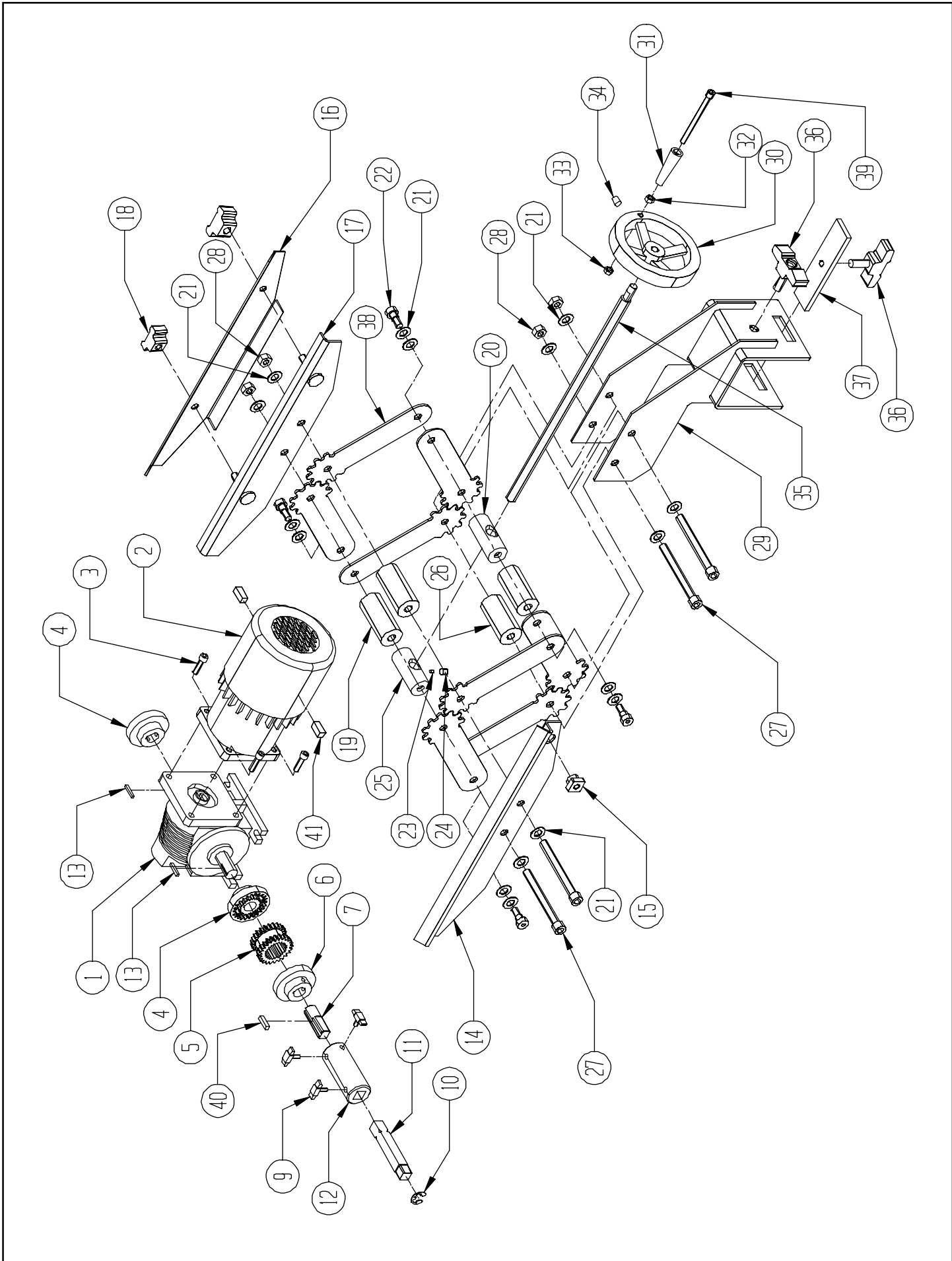
PARTS LIST**6309574 STEPPER & MOUNTING ASSEMBLY**

<u>DIAGRAM NUMBER</u>	<u>PART NUMBER</u>	<u>DESCRIPTION</u>
1	B161811	Socket Head Cap Screw 8-32 x 1 1/8 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	6309500	DC Motor/Reducer Assembly
6	J377200	3/8-24 Nylok Jam Locknut
7	K161501	#8 Split Lockwasher
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	6309052	Actuator Motor Mounting Bracket
16	6309053	Calibration ring
17	B191611	Socket Head Cap Screw 10-24 x 1" Long
18	K191501	#10 Lockwasher
19	B160407	8-32 x 1/4 Button Head Socket Cap Screw
20	3708424	Retaining Ring Ext. 1.75
21	6509384	Infeed Stepper Assembly
22	3708629	Split Shaft Collar .25 I.D.
23	6309055	Window
24	C250420	1/4-20 x 1/4 Socket Set Screw
25	C160420	8-32 x 1/4 Socket Set Screw
26	6309040	Adapter
27	6509381	Base Cover Plate
28	B190613	Socket Head Cap Screw 10-24x 3/8 Long



PARTS LIST**6329535 MOWER SUPPORT ASSEMBLY**

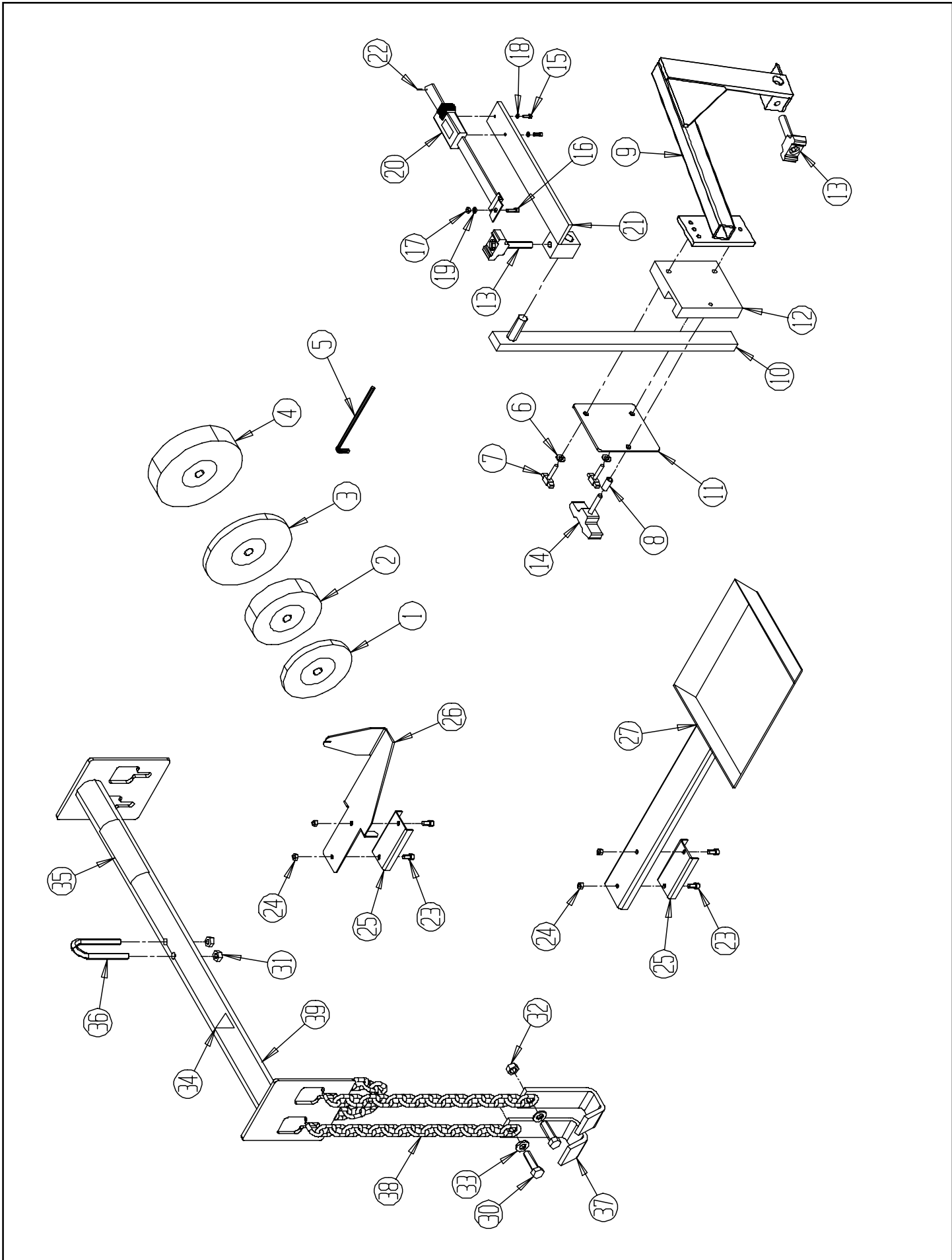
<u>DIAGRAM NUMBER</u>	<u>PART NUMBER</u>	<u>DESCRIPTION</u>
1	B190614	Pan Head Machine Screw 10-24 x 3/8 Long
2	K191501	No.10 Lockwasher
3	6009577	Knob Assembly
4	3708364	Quick Release Pin .31 Dia.
5	3708158	Shoulder Bolt .375 Dia. x .50 Long
6	3708366	6" type B Lanyard
7	6509128	Horizontal Scale Decal 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

<u>DIAGRAM NUMBER</u>	<u>PART NUMBER</u>	<u>DESCRIPTION</u>
1	3708391	Reducer: 10:1 Ratio
2	6329069	Motor, DC .20 HP TEFC
3	B251411	Socket Head Cap Screw 1/4-20 x 7/8 Long
4	3709586	Flange Coupler .50
5	3709585	Sleeve Coupler
6	3709584	Flange Coupler 5/8
7	6009217	Drive Coupling Adapter
9	09394	Tee Knob Assembly
10	3709073	Retaining Ring
11	6009051	Drive Adapter 1/2 Square
12	6009052	Adapter
13	R000376	Square Key 1/8 x .75 Long
14	6009078	Gearbox Slide Bracket
15	3707279	Strain Relief Wire
16	6009079	Gearbox Clamp Bracket
17	6009580	Gearbox Slide Weldment Bracket
18	3708262	T-Knob - 5/16-18
19	6009045	Linkage Spacer 2.29 Long
20	6009046	Linkage Spacer R.H. Thread
21	3709062	Belleville .75 Dia. x .35 T
22	3709809	Shoulder Bolt .375 Dia. x .375 Long
23	3709705	Nylon Ball 5/32 Dia.
24	C310420	Socket Set Screw 5/16-18 x 1/4
25	6009047	Linkage spacer L. H. Thread
26	6009048	Linkage Spacer 2.5 Long
27	B375611	Socket Head Cap Screw
28	J377100	Nylok Hex Locknut 3/8-16
29	6509519	Support Bracket Weldment
30	3708148	Handwheel 4.5 Dia.
31	3709370	Handle
32	J252000	Hex Jam Nut 1/4-20
33	J257000	1/4-20 Nylok Locknut
34	C310620	Socket Set Screw 5/16-18 x 3/8 Long
35	6009076	Double Thread Rod
36	6009555	Knob Assembly
37	6509114	Spin Drive Plate Lock
38	6009067	Geared Linkage
39	B255011	Socket Head Cap Screw 1/4-20 x 3 1/8 Long
40	R000377	Square Key 3/16 x .75 Long
41	3707623	DC Motor Brush

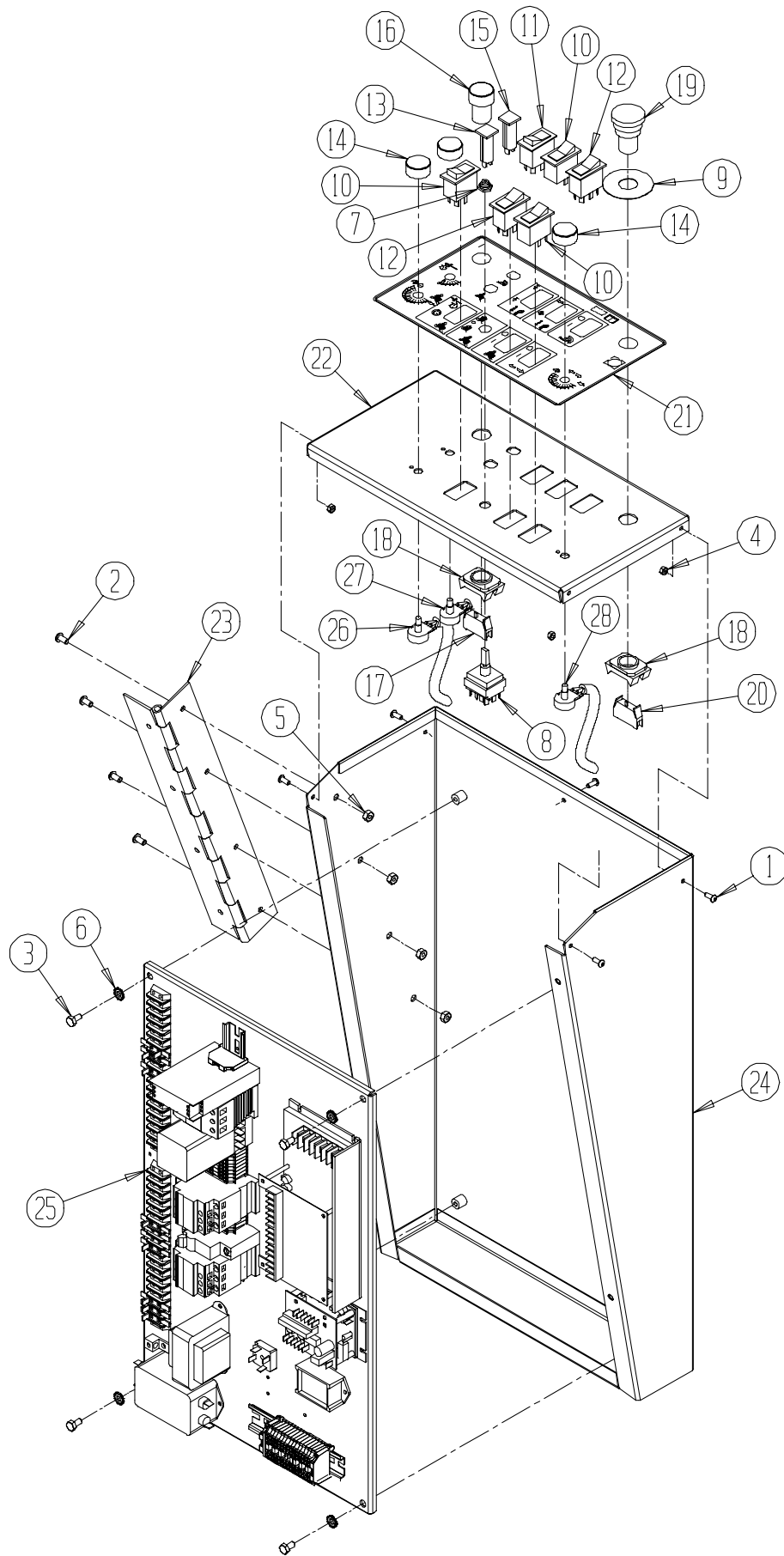


PARTS LIST (Continued)

6329529 MISCELLANEOUS PARTS

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

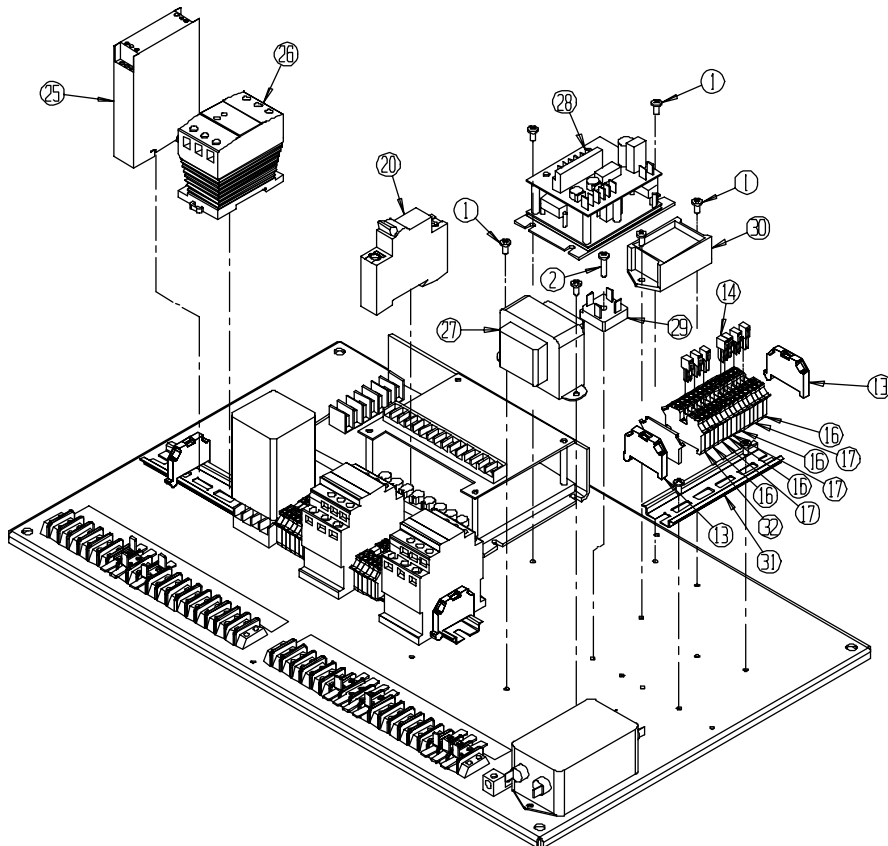
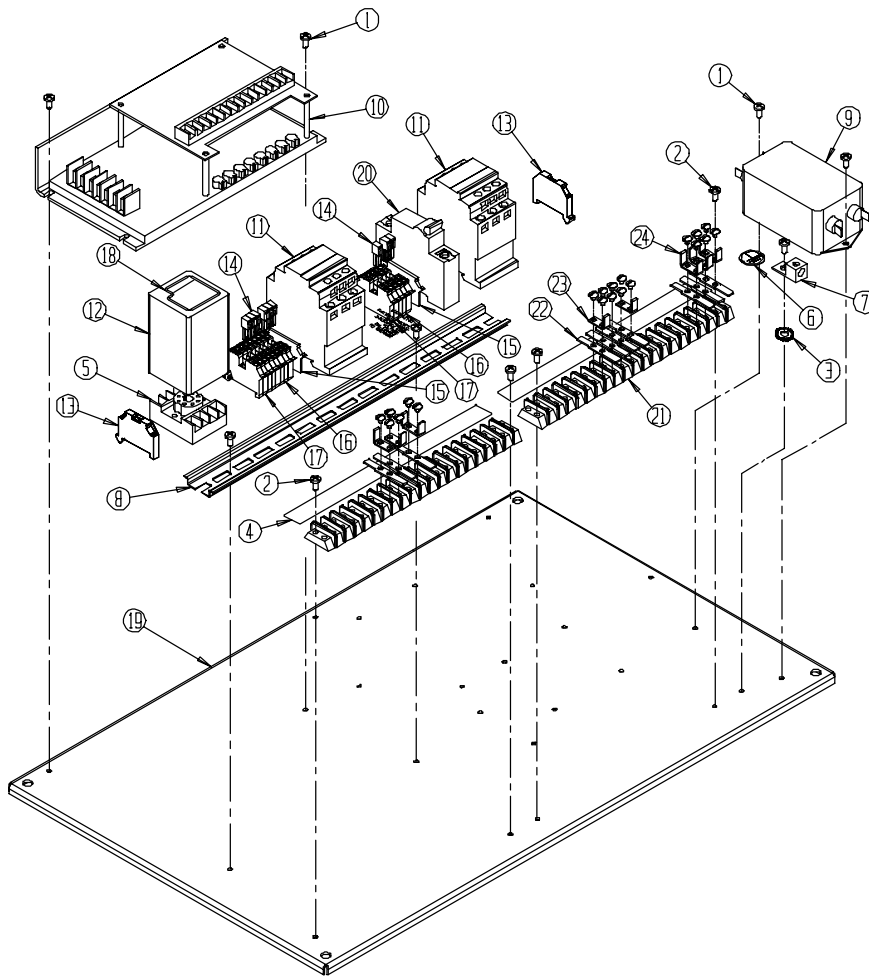


PARTS LIST**6329531 CONTROL PANEL ASSEMBLY**

<u>DIAGRAM NUMBER</u>	<u>PART 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
5	J257000	1/4-20 Nylon Jam Locknut
6	R000536	1/4 Lock Washer
7	3707075	Toggle Switch Boot
8	3707080	Toggle Switch
9	3707342	Yellow Emergency Stop Ring
10	3707367	Rocker Switch DPST
11	3707428	Rocker Switch Momentary (On-Off-On)
12	3707429	Rocker Switch DPDT
13	3707443	4-Amp Circuit Breaker
14	3707446	Potentiometer Knob
15	3707547	15-Amp Circuit Breaker
16	3707564	Green Start Push-button
17	3707565	Normally Open Contact Block
18	3707566	Switch Mounting Latch
19	3707567	Push/Pull Red Emergency Stop Button
20	3707568	Normally Closed Contact Block
21	6329054	Control Panel Decal
22	6329528	Control Panel Top Weldment
23	6329070	Hinge
24	6329509	Control Box Weldment
25	6329516	Electrical Panel Sub-Assembly
26	6509446	Potentiometer Assembly - Spin Speed
27	6509447	Potentiometer Assembly - Relief Torque
28	6059050	Potentiometer Assembly - Traverse Speed

Cords Not Shown

.....	6329078	Main Power Cord
.....	6329079	Infeed Motor Cord
.....	6329080	Light Receptacle
.....	6329081	Dust Collector Receptacle
.....	3707224	Cable Tie Mount (used throughout machine)
.....	3707225	Cable Tie 6.5 Long x .18 Wide
.....	3707255	Cable Tie 4.0 Long x .10 Wide

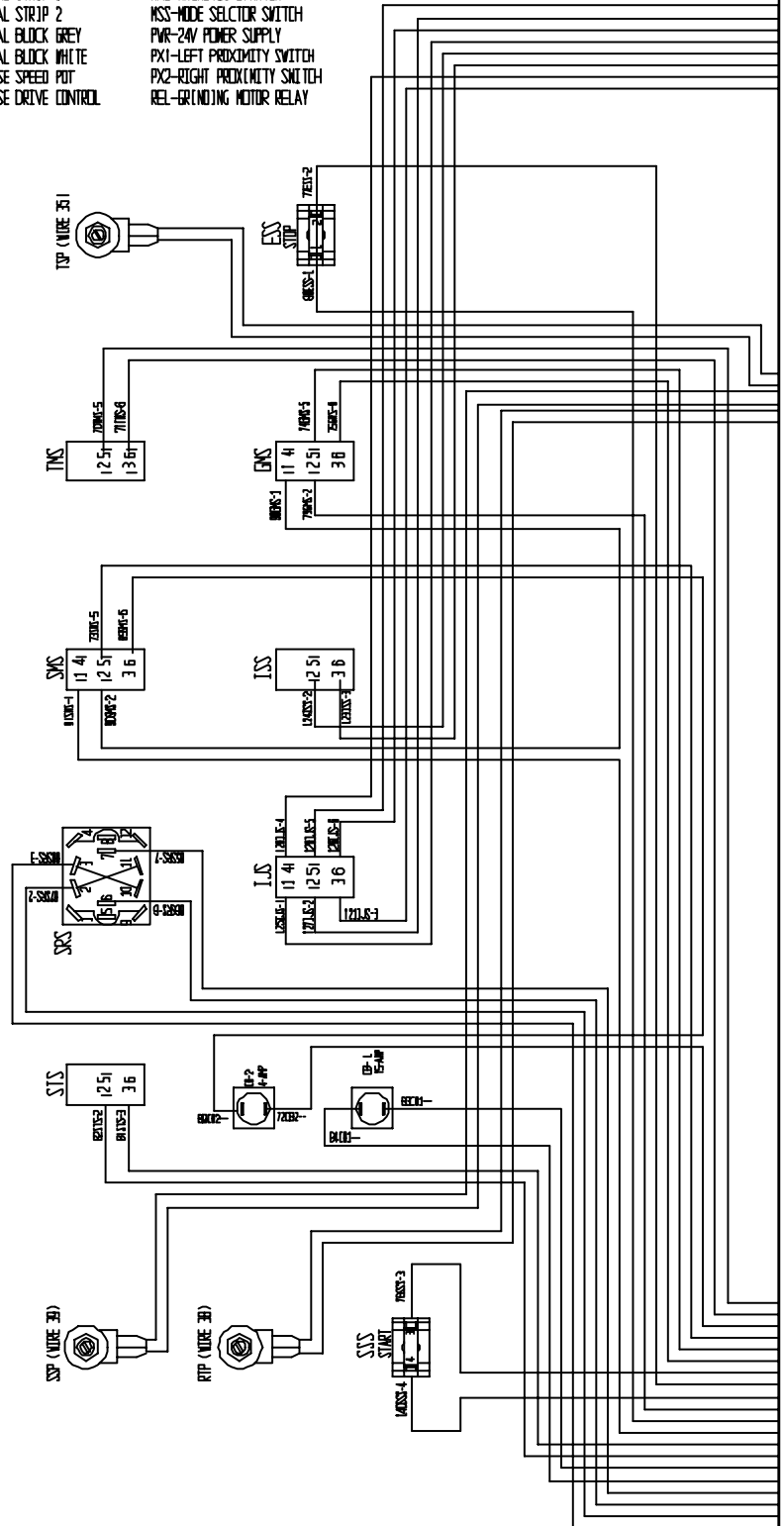


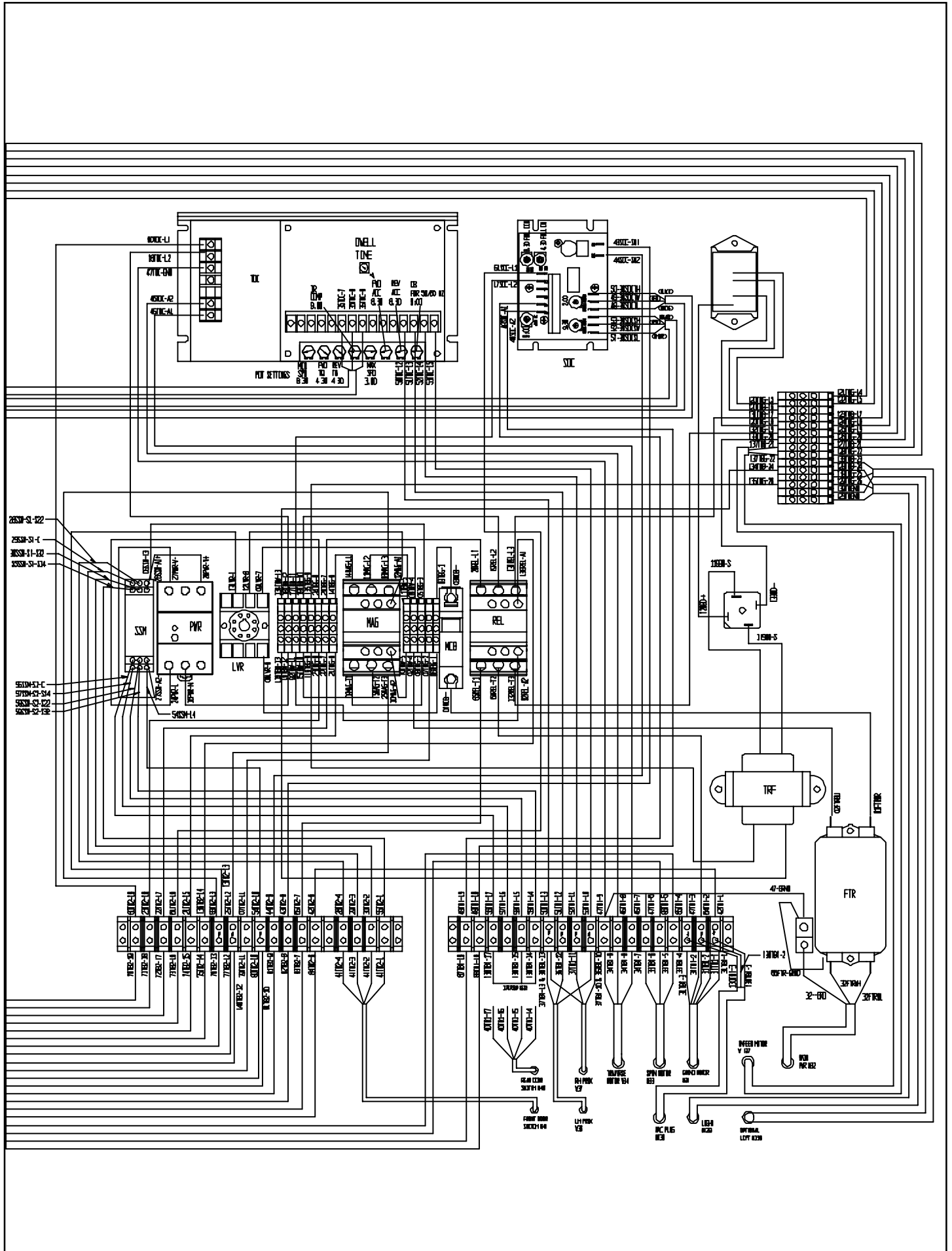
PARTS LIST**3707375 & 6329516 CONTROL PANEL SUB-ASSEMBLY**

<u>DIAGRAM NUMBER</u>	<u>PART NUMBER</u>	<u>DESCRIPTION</u>
1	D160666	Pan Head Self-Tapping Screw #8 x 3/8 Long
2	D161266	Pan Head Self-Tapping Screw #8 x 3/4 Long
3	R000480	#8 Lockwasher
4	55223	Terminal Strip Decal
5	3707073	8-Pin socket
6	3707163	Primary Ground Decal
7	3707164	Primary Ground Lug
8	3707378	14" Din Rail
9	3707403	Power Line Filter
10	3707550	Traverse Control Board
11	3707556	Magnetic Starter
12	3707558	Low Voltage Sensor Relay
13	3707625	Screwless Terminal Block End Stop
14	3707626	Terminal Block Jumper
15	3707627	Terminal Block End Plate
16	3707628	2-Conductor Terminal Block - Grey
17	3707629	2-Conductor Terminal Block - Blue
18	3708826	Low Voltage Warning Decal
19	6009270	Electrical Sub Panel
20	80259	20-Amp Circuit Breaker
21	3707706	19 Pole Terminal Strip
22	3707707	Double Spade Terminal
23	3707709	Single Spade Terminal 90°
24	3707708	Double Spade Terminal 90°
25	3707328	Door Safety Switch Monitor
26	3707333	24VDC Power Supply
27	3707389	Transformer Assembly
28	3707524	Spin/Relief Control Board
29	3707526	25-Amp Bridge Diode
30	3707594	Voltage Regulator Assembly
31	3707602	6" Din Rail
32	3707624	Ground Terminal Block

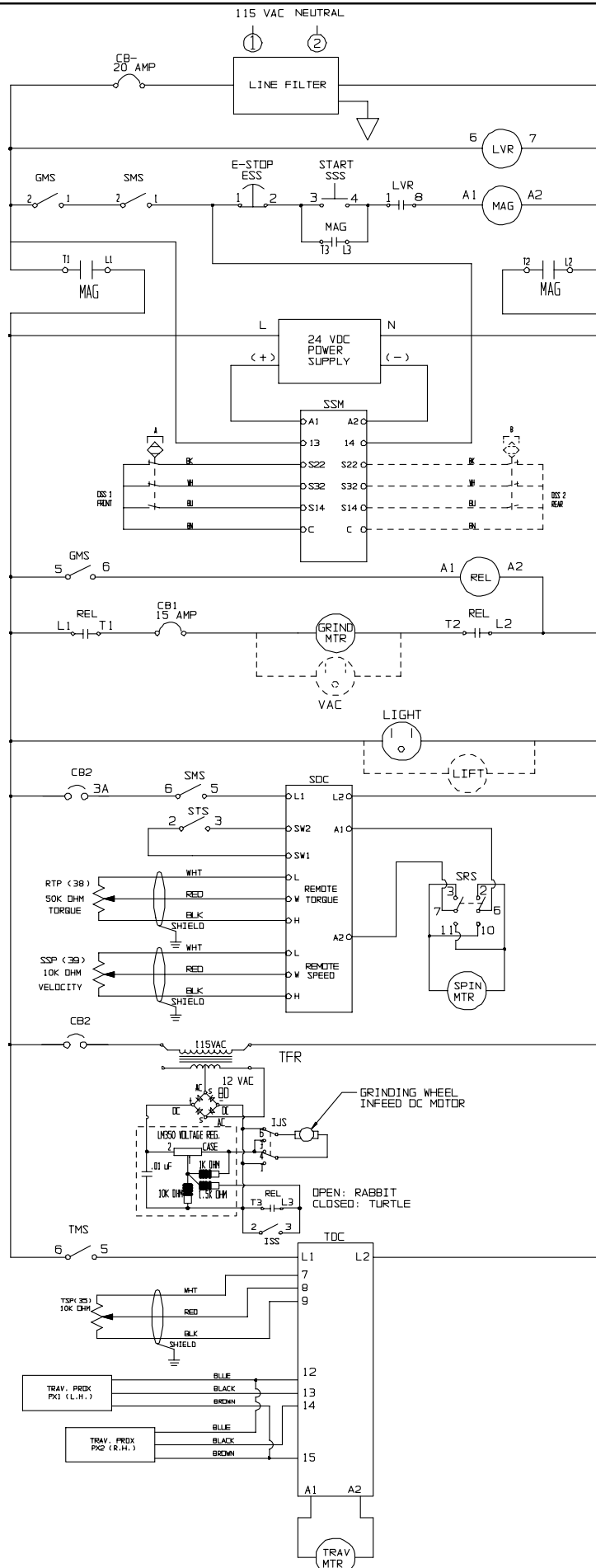
6324531 WIRING DIAGRAM

- | | |
|---------------------------------|-------------------------------|
| RTP-RELIEF TORQUE POT | CB1-CIRCUIT BREAKER 1 |
| SDC-SPIN DRIVE CONTROL | CB2-CIRCUIT BREAKER 2 |
| SMS-SPIN MOTOR SWITCH | DSS1-FRONT DOOR SAFETY SWITCH |
| SRS-SPIN ROTATION SWITCH | DSS2-REAR DOOR SAFETY SWITCH |
| SSM-SAFETY SWITCH MONITOR | ESS-EMERGENCY STOP SWITCH |
| SSP-SPIN SPEED POT | FTR-LINE FILTER |
| SSS-SYSTEM START SWITCH | GMS-GRINDING MOTOR SWITCH |
| STS-SPIN/TORQUE SELECTOR SWITCH | LVR-LOW VOLTAGE RELAY |
| TB1-TERMINAL STRIP 1 | MAG-MAGNETIC STARTER |
| TB2-TERMINAL STRIP 2 | KSS-MODE SELECTOR SWITCH |
| TB6-TERMINAL BLOCK GREY | PWR-24V POWER SUPPLY |
| TB7-TERMINAL BLOCK WHITE | PX1-LEFT PROXIMITY SWITCH |
| TSP-TRAVERSE SPEED POT | PX2-RIGHT PROXIMITY SWITCH |
| TDC-TRAVERSE DRIVE CONTROL | REL-GRINDING MOTOR RELAY |





632 WIRING SCHEMATIC



- CB1-CIRCUIT BREAKER 1
- CB2-CIRCUIT BREAKER 2
- DSS1-FRONT DOOR SAFETY SWITCH
- DSS2-REAR DOOR SAFETY SWITCH
- ESS-EMERGENCY STOP SWITCH
- LVR-LOW VOLTAGE RELAY
- MAG-MAGNETIC STARTER
- MSS-MODE SELECTOR SWITCH
- PX1-LEFT PROXIMITY SWITCH
- PX2-RIGHT PROXIMITY SWITCH
- REL-GRINDING MOTOR RELAY
- RTP-RELIEF TORQUE POT
- SMS-SPIN MOTOR SWITCH
- SRS-SPIN ROTATION SWITCH
- SSM-SAFETY SWITCH MONITOR
- SSP-SPIN SPEED POT
- SSS-SYSTEM START SWITCH
- STS-SPIN/TORQUE SELECTOR SWITCH
- TSP-TRAVERSE SPEED POT
- TDC-TRAVERSE DRIVE CONTROL