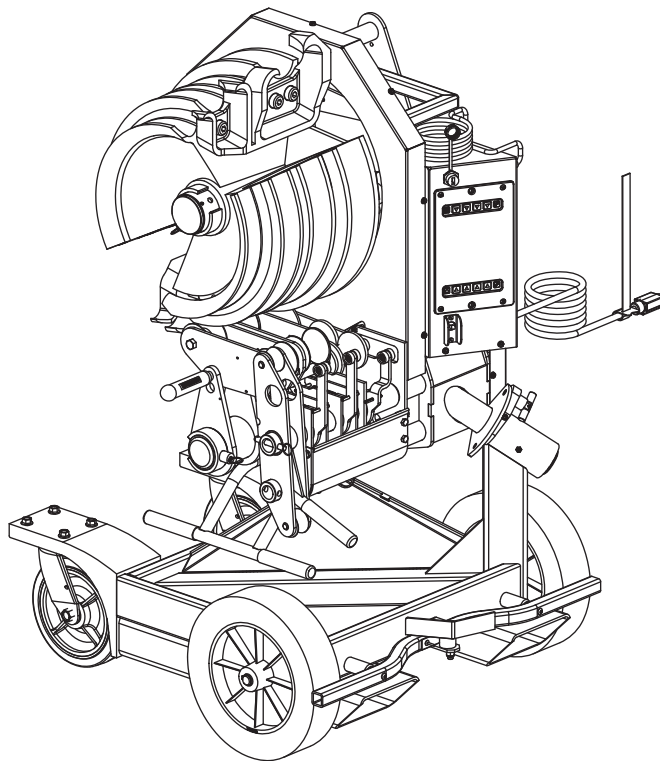


# SERVICE MANUAL



## **855GX IntelliBender<sup>™</sup>** **Electric Bender**



**Read and understand** all of the instructions and safety information in this manual before operating or servicing this tool.

Register this product at [www.greenlee.com](http://www.greenlee.com)

## Table of Contents

Safety .....	2
Purpose of this Manual .....	2
Other Publications .....	2
Important Safety Information .....	3-5
Service Instructions .....	6-15
Illustrations .....	16-19
Parts List .....	20-26
Wiring Diagram .....	27

## Safety

Safety is essential in the use and maintenance of Greenlee tools and equipment. This manual and any markings on the tool provide information for avoiding hazards and unsafe practices related to the use of this tool. Observe all of the safety information provided.

## Purpose of this Manual

This manual is intended to familiarize authorized Greenlee service center personnel with the safe operation and maintenance procedures for the Greenlee 855GX Electric Bender.

Keep this manual available to all personnel.

Replacement manuals are available upon request at no charge at [www.greenlee.com](http://www.greenlee.com).

## Other Publications

Instruction Manual: Publication 52055798



**Do not discard this product or throw away!**

For recycling information, go to [www.greenlee.com](http://www.greenlee.com).

All specifications are nominal and may change as design improvements occur. Greenlee Textron Inc. shall not be liable for damages resulting from misapplication or misuse of its products.

# ***KEEP THIS MANUAL***

## IMPORTANT SAFETY INFORMATION



### SAFETY ALERT SYMBOL

This symbol is used to call your attention to hazards or unsafe practices which could result in an injury or property damage. The signal word, defined below, indicates the severity of the hazard. The message after the signal word provides information for preventing or avoiding the hazard.

#### ⚠️ DANGER

Immediate hazards which, if not avoided, **WILL** result in severe injury or death.

#### ⚠️ WARNING

Hazards which, if not avoided, **COULD** result in severe injury or death.

#### ⚠️ CAUTION

Hazards or unsafe practices which, if not avoided, **MAY** result in injury or property damage.



#### ⚠️ WARNING

Electric shock hazard:

- Connect the power cord to a 120 volt, 20 amp receptacle on a ground fault protected circuit only. Refer to “Grounding Instructions.”
- Do not modify the power cord or plug.
- Inspect the power cord before use. Repair or replace the cord if damaged.
- Disconnect the unit from power before servicing.

Failure to observe this warning could result in severe injury or death.

#### ⚠️ WARNING

For continued protection against risk of fire and electric shock, replace **ONLY** with same manufacturer, type, and rating of fuse. Refer to the “Maintenance” section of the Instruction Manual, which is listed under “Other Publications.”

Failure to observe this warning could result in severe injury or death.



#### ⚠️ DANGER

Read and understand all of the instructions and safety information in this manual before operating or servicing this tool. Refer also to the Instruction Manual, which is listed under “Other Publications.”

Failure to observe this warning will result in severe injury or death.



#### ⚠️ WARNING

- Do not use in dangerous environment. Do not use power tools in damp or wet locations, or expose them to rain. Keep work area well lighted.
- Do not immerse the pendant switch in water or any other liquid.

Failure to observe these warnings could result in severe injury or death.



#### ⚠️ DANGER

Do not use this tool in a hazardous environment. Hazards include flammable liquids, gases, or other materials. Using this tool in a hazardous environment can result in a fire or explosion.

Failure to observe this warning will result in severe injury or death.





#### ⚠️ WARNING


Always use safety glasses. Everyday glasses only have impact resistant lenses; they are **NOT** safety glasses. When using in dusty environment, use face or dust mask.

Failure to wear eye protection could result in serious eye injury from flying debris.


## IMPORTANT SAFETY INFORMATION

  	<p style="text-align: center;"><b>⚠ WARNING</b></p> <ul style="list-style-type: none"> <li>Keep guards in place and in working order.</li> <li>Remove any tools from bender before operating. Form habit of checking to see that all tools are removed from bender before turning it on.</li> </ul> <p>Failure to observe these warnings could result in severe injury or death.</p>
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<p><b>⚠ WARNING</b></p>
<ul style="list-style-type: none"> <li>Reduce the risk of unintentional starting. Make sure switch is in off position before plugging in.</li> <li>Never leave tool running unattended. Turn power off. Do not leave tool until it comes to a complete stop.</li> <li>Disconnect tools before servicing and when changing accessories such as shoes, rollers, and the like. Accidental start-up could result in serious injury.</li> </ul> <p>Failure to observe these warnings could result in severe injury or death.</p>

	<p style="text-align: center;"><b>⚠ WARNING</b></p> <p>Extension cords:</p> <ul style="list-style-type: none"> <li>Use only three-wire, 12 AWG extension cords that have three-prong grounding-type plugs and three-hole receptacles that accept the tool's plug.</li> <li>Do not use extension cords that are longer than 30 m (100').</li> <li>Repair or replace damaged extension cords.</li> </ul> <p>Failure to observe these warnings could result in severe injury or death.</p>
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<p><b>⚠ WARNING</b></p>
<ul style="list-style-type: none"> <li>Never stand on tool. Serious injury could occur if the tool is tipped.</li> <li>Do not overreach. Keep proper footing and balance at all times.</li> </ul> <p>Failure to observe these warnings could result in severe injury or death.</p>

	<p style="text-align: center;"><b>⚠ WARNING</b></p> <p>Pinch points:</p> <ul style="list-style-type: none"> <li>Keep hands away from bending shoe, rollers, and conduit when bender is in use.</li> <li>Support conduit when unloading. Conduit can become loose and fall if not properly supported.</li> </ul> <p>Failure to observe these warnings could result in severe injury or death.</p>
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<p><b>⚠ WARNING</b></p>
<p>Adjust fork spacing to match fork tubes on bender. Ensure brake is engaged before inserting forks into fork tubes.</p> <p>Failure to observe this warning could result in severe injury or death.</p>

<p><b>⚠ CAUTION</b></p>
<ul style="list-style-type: none"> <li>Set the switches to the appropriate conduit size and type before bending.</li> <li>Select the appropriate shoe groove and support roller for the type and size of conduit before bending.</li> <li>Do not bend conduit over 93 degrees. Overbending could result in the other shoe hook colliding with the conduit.</li> </ul> <p>Failure to observe these precautions may result in injury or property damage.</p>

## **IMPORTANT SAFETY INFORMATION**

### **⚠ CAUTION**

- Conduit moves rapidly as it is bent. The path of the conduit must be clear of obstructions. Be sure clearance is adequate before starting the bend.
- Wear proper apparel. Do not wear loose clothing, gloves, neckties, rings, bracelets, or other jewelry which may get caught in moving parts. Nonslip footwear is recommended. Wear protective hair covering to contain long hair.
- Do not force rollers or alter tool. It will do the job better and safer at the rate for which it was designed.
- Use right tool. Do not force tool or attachment to do a job for which it was not designed.
- Use this tool for the manufacturer's intended purpose only. Use other than that which is instructed in this manual can result in injury or property damage.

Failure to observe these precautions may result in injury or property damage.

### **⚠ CAUTION**

- Keep work area clean. Cluttered areas and benches invite accidents.
- Keep children away. All visitors should be kept safe distance from work area.
- Make workshop kid proof with padlocks, master switches, or by removing starter keys.

Failure to observe these precautions may result in injury or property damage.

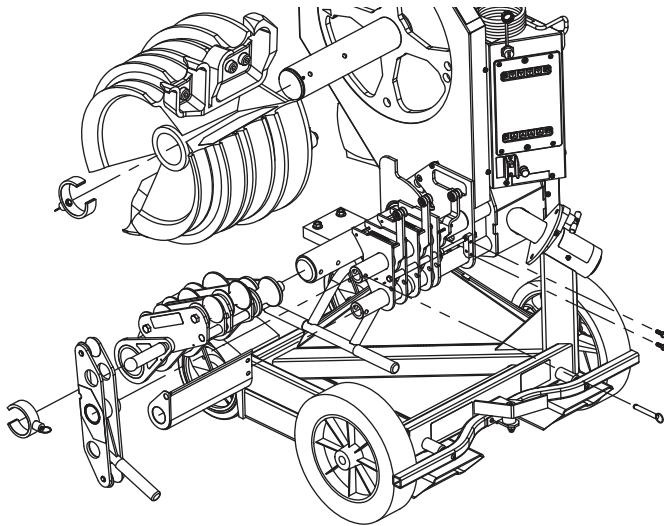
### **⚠ CAUTION**

- Inspect the bender before use. Replace worn, damaged, or missing parts with Greenlee replacement parts. A damaged or improperly assembled component could break and strike nearby personnel.
- Maintain tools with care. Keep tool clean for best and safest performance. Follow instructions for lubricating and changing accessories.
- Check damaged parts. Before further use of the tool, a guard or other part that is damaged should be carefully checked to determine that it will operate properly and perform its intended function. Check for alignment of moving parts, binding of moving parts, breakage of parts, mounting, and any other conditions that may affect its operation. A guard or other part that is damaged should be properly repaired or replaced.
- Use recommended accessories. Consult the instruction manual for recommended accessories. The use of improper accessories may cause risk of injury to persons.
- Some bender parts and accessories are heavy and may require more than one person to lift and assemble.

Failure to observe these precautions may result in injury or property damage.

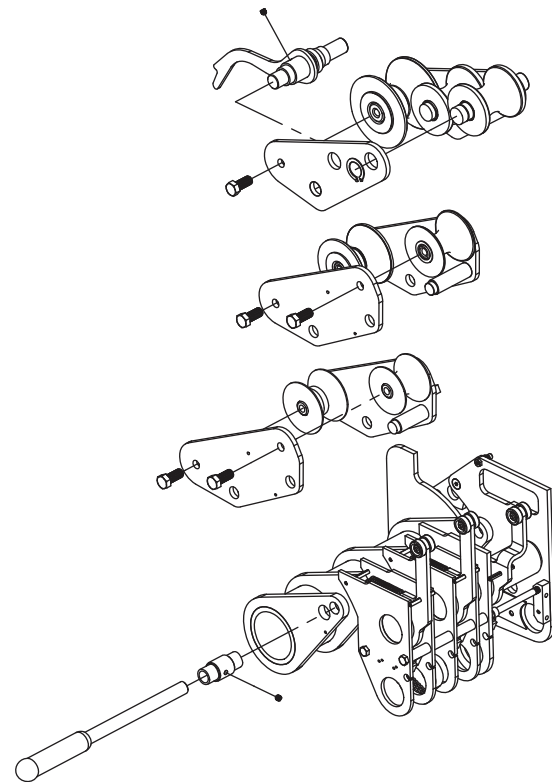
*Note: Keep all decals clean and legible, and replace when necessary.*

## Service Instructions



### Roller Assembly Removal

1. Remove the lock collars that retain the roller assembly and shoe.
2. Remove the shoe.
3. Remove the detent pin and 1" roller support along with handle.
4. Remove the two screws that attach the switch guard and slide the guard off the frame tubes.
5. Disconnect the roller return spring from the roller arm weldment.
6. Disconnect the spring from the 1-1/2" rollers group.
7. Slide the roller assembly and the roller support assembly outward together about an inch until the 2" tail roller shaft is free from the slot in the roller stop plate.
8. Rotate the roller assembly counterclockwise until the roller plates are clear of the support plates.
9. Slide the roller assembly out to remove.
10. Reassemble in reverse order noting the following:  
When sliding the roller assembly onto the support shaft, keep the arm weldment between the 12 and 1 o'clock position to prevent damaging the arm position switch.

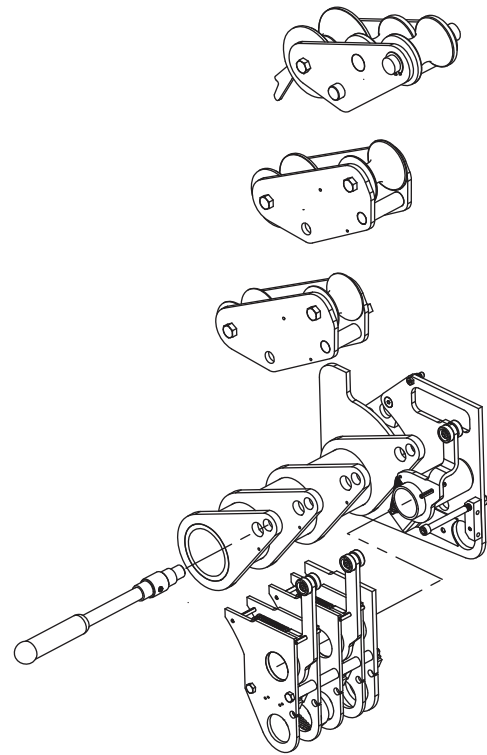


### Roller Assembly Disassembly

1. Loosen the set screw on the collar that secures the roller engagement handle, and pull out the handle, 1-1/4" roller group, and 1-1/2" roller group.
2. Loosen the set screw on the cam release mechanism, pull or drive out the pivot shaft, and remove the 2" roller group.
3. Disassemble the 1-1/4" roller group.
  - a. Remove the two hex screws securing the outer plate and the outer plate.
  - b. Remove the two rollers.
  - c. Reassemble in reverse order noting the following:
    - The slightly larger diameter roller mounts to the left.
    - Apply molybdenum grease to the roller shafts.

## Service Instructions (cont'd)

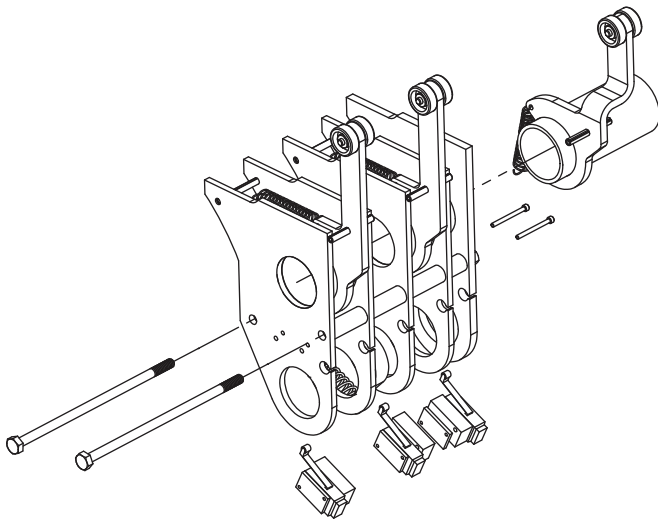
4. Disassemble the 1-1/2" roller group.
  - a. Remove the two hex screws securing the outer plate and the outer plate.
  - b. Remove the tail roller.
  - c. Remove the O-rings, pivot balls, split rollers, and belleville washers noting their orientation.
  - d. Reassemble in reverse order noting the following:
    - Assemble the Belleville washers so they form a "V" open outward.
    - Place the O-rings between the split rollers until both screws have been tightened and then slip them over the split rollers so they form a seal between the rollers and the pivot ball.
    - Apply molybdenum grease to the tail roller shaft and pivot balls.
5. Disassemble the 2" roller group.
  - a. Remove the hex screw, retaining ring, and outer plate.
  - b. Remove the middle roller, middle shaft, tail roller, and tail shaft.
  - c. Remove the O-rings, pivot balls, split rollers, and spacer.
  - d. Reassemble in reverse order noting the following:
    - Place the O-rings between the split rollers until the screw has been tightened and then slip them over the split rollers so they form a seal between the rollers and the pivot ball.
    - Apply molybdenum grease to the middle roller shaft and pivot balls.
6. Reassemble the full assembly in reverse order noting the following:
  - a. The end of the 2" pivot shaft should be flush outside of the adjacent arm.
  - b. The end of the engagement handle should be flush with the inside of the same arm.
  - c. The cam release mechanism should be installed with the spring on the inboard side of the lever.
  - d. The tail of the 1-1/4" roller group must be trapped below the tail of the 1-1/2" roller group.



### Roller Support Assembly Removal

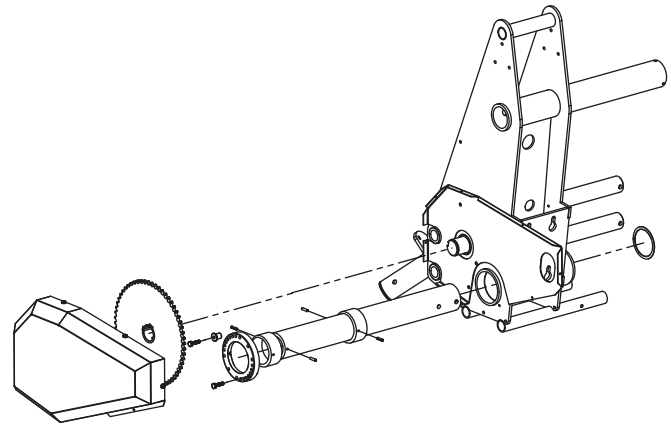
1. Remove the roller assembly (refer to previous instruction).
2. Disconnect the trip switch cable.
3. Slide the roller support assembly off the frame tubes complete with the three trip lever assemblies.
4. Reassemble in reverse order noting the following:
  - a. Make sure that the stop rollpin for the 2" trip lever is butted up against the side of the 2" support plate as the assembly is slid onto the frame tubes to avoid damaging the limit switch.
  - b. Fit the spring retainer with the two springs over the lower frame tube between the second and third support plates (as counted from the outside).



**Service Instructions (cont'd)**

**Roller Support Assembly Disassembly**

1. Remove the two hex nuts securing all the support plates.
2. Remove the 2" trip lever.
3. Remove the two screws securing the 2" trip switch and remove the switch and threaded plate.
4. Pull the limit switch wires out of the fifth support plate keyhole and remove the plate and two short spacers.
5. Remove the two screws securing the 1-1/2" trip switch and remove the switch and threaded plate.
6. Pull the limit switch wires out of the fourth support plate keyhole, pry the plate from the rollpin, and remove the plate, two long spacers, and trip lever.
7. Pull the limit switch wires out of the third support plate keyhole and remove the plate and two long spacers.
8. Remove the two screws securing the 1-1/4" trip switch and remove the switch and threaded plate.
9. Pull the limit switch wires out of the second support plate keyhole, pry the plate from the rollpin, and remove the plate, two long spacers, trip lever, and limit switch wire harness.
10. Remove the screws from the first support plate.
11. Reassemble in reverse order noting the following:
  - a. Slip joint pliers can be used to press the spring anchor rollpins into the support plates by squeezing the plates together over the rollpin.
  - b. Slide the completed assembly onto the frame tubes with the nuts loose and tighten on the frame to ease mounting and future removal.

- c. With the assembly fully pushed in, the tip of the right side 6" screw should fit inside the hex head of the 5/16" screw attached to the roller stop plate. The 2" trip lever should pivot without being pinched between the roller stop plate and roller support assembly. If it is pinched, adjust the 5/16" screw so it is not pinched.

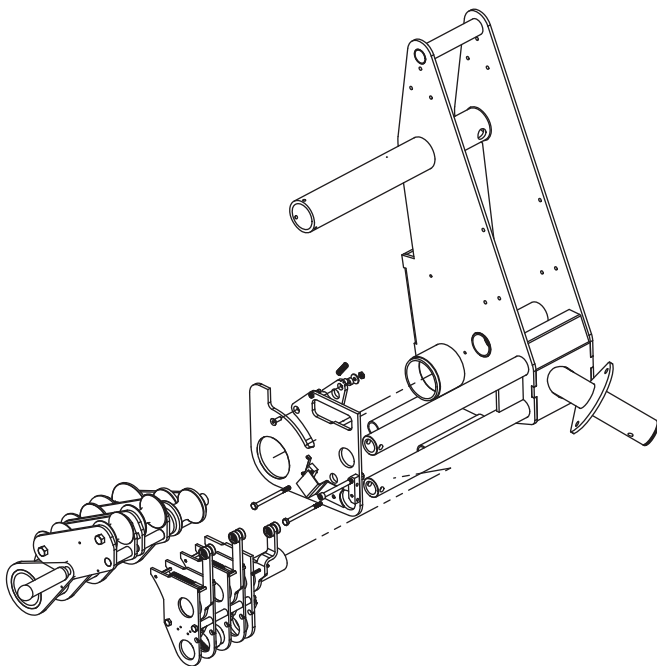

**Eccentric Roller Shaft**

1. Remove the roller assembly (refer to previous instruction).
2. Remove the fiber thrust washer from the front of the shaft.
3. Remove seven screws and rear chain guard.
4. Remove two screws securing squeeze adjuster and the retainer on the top screw. Note which hole the lower screw is in.
5. Remove the adjuster.
6. Remove the rollpins by driving them into the ID of the shaft.
7. Pull out the shaft from the front and the rear eccentric from the rear.
8. Remove the front eccentric same as the rear if needed.
9. Reassemble in reverse order noting the following:
  - a. Slide the front eccentric over the shaft so the 3/16" holes are closest to the rear.
  - b. Drive the rollpins into the holes so that they do not protrude.
  - c. Lubricate the eccentrics with molybdenum grease.
  - d. Insert the shaft into the frame from the front.
  - e. Insert the rear eccentric into the frame and over the shaft so the 3/16" holes are visible.
  - f. Align the holes in the eccentric and shaft together, making sure that thick part of both eccentrics are oriented together.



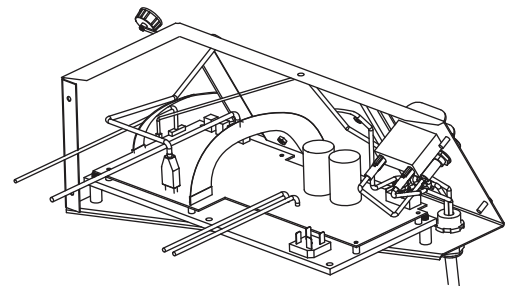
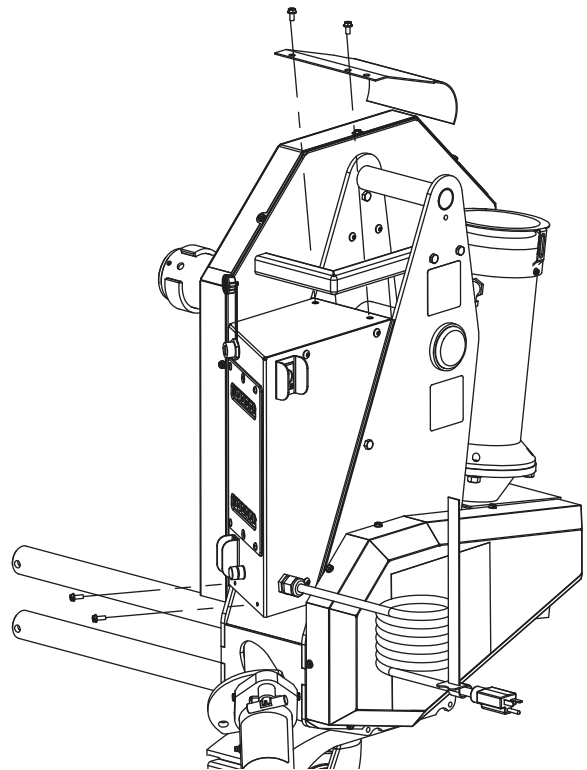
## Service Instructions (cont'd)

- g. Drive the rollpins into the holes leaving 1/4" protruding on both sides.
- h. Orient the shaft so that the thick part of the eccentric is at 3 o'clock as viewed from the rear of the bender.
- i. Place the adjuster over the rear eccentric so that the original hole used is on the right side.
- j. Insert the hex screw through the retainer so screw head abuts the flange and screw into the top hole.
- k. Insert the second screw into the original hole and rotate the shaft until the screw can be threaded into its hole.



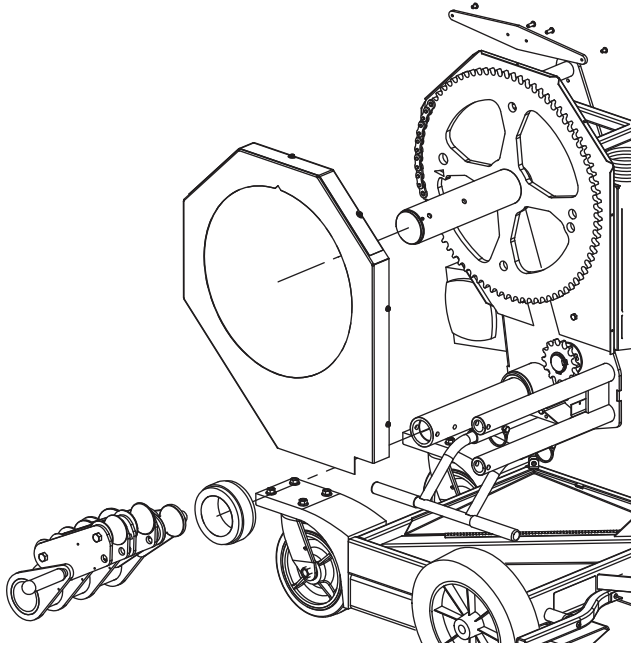
### Roller Stop Plate

1. Remove the roller assembly (refer to previous instruction).
2. Remove the roller support assembly (refer to previous instruction).
3. Remove the two screws and nuts securing the roller stop plate.
4. Slide the roller stop plate off the shafts.
5. Remove the cam spring.
6. Remove the flat head screw, nut, washer, spacer, and cam.
7. Reassemble in reverse order.

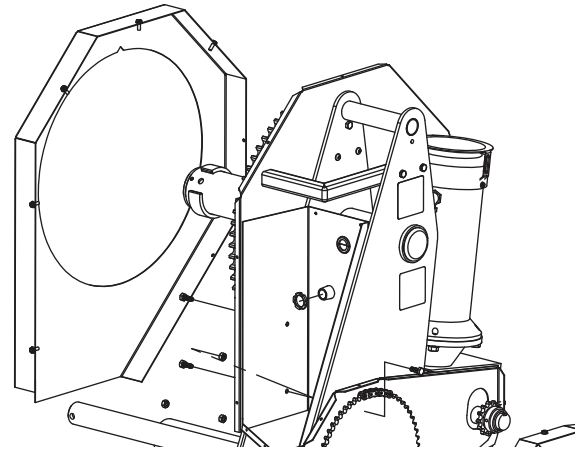


### Outer Control Box

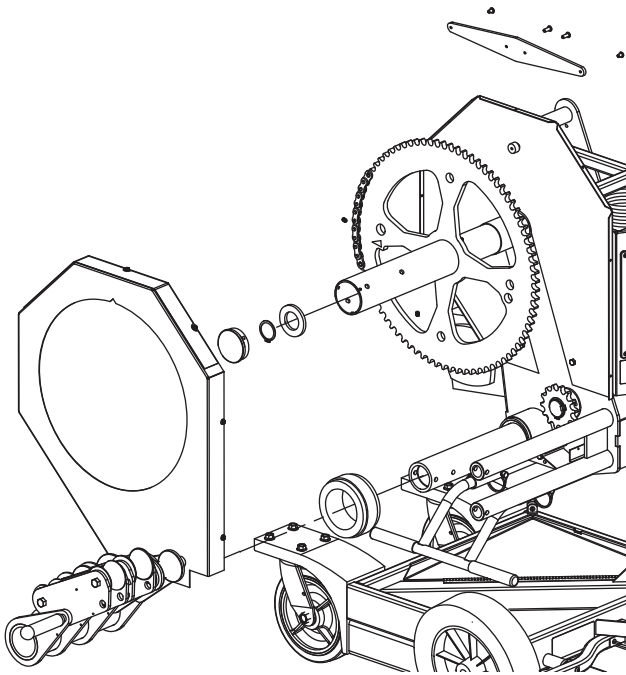
1. Remove the two screws at the bottom front of the control box (right side of bender).
2. Remove the two screws at the top rear of the control box and remove the wire cover.
3. Lift the outer control box up and outward.
4. Pull off the two motor leads from the circuit board noting their orientation.
5. Pull off the encoder cable from the circuit board.
6. Pull off the trip switch wire harness.
7. Reassemble in reverse order noting the following:  
Connect motor leads to same tabs as removed from.

**Service Instructions (cont'd)****Front Drive Chain**

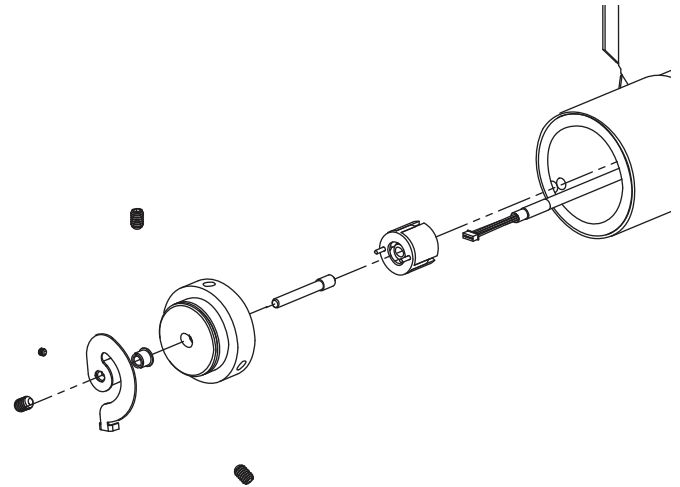
1. Remove the roller stop plate (refer to previous instruction).
2. Remove the seven screws and the front guard.
3. Position the chain master link between the 10 and 11 o'clock position.
4. Remove the plastic chain stay roller.
5. Remove the two center screws securing the chain guard stiffener along with the three screws securing the back guard, and remove back guard.
6. Remove the master link and chain.
7. Reassemble in reverse order noting the following:
  - a. Use new cotter pins to attach the drive chain.
  - b. A new chain will be tight. Place one end of the chain at 10–11 o'clock position and wrap the remainder over the top of the big sprocket, down and around the drive sprocket, and back up to the big sprocket. Ensure that there is no slack anywhere and hold the chain against the outside of the sprocket. Force the chain into the sprocket teeth at the point where it first contacts the sprocket. (A rubber hammer may be used to persuade the chain.) While holding the chain in the sprocket teeth, fit the rest of the chain onto the sprocket. Fit the connecting link.

**Inner Control Box**

1. Remove or loosen roller stop plate (refer to previous instruction for removal or to pull roller assembly and roller support assembly outward about an inch).
2. Remove outer control box (refer to previous instruction).
3. Remove seven screws and rear chain guard.
4. Remove seven screws and front chain guard.
5. Remove the conduit nut securing the SealTite conduit to the control box.
6. Pull the encoder and trip switch cables out through the bushing.
7. Remove the hex nut inside the chain guard, and back out the screws holding the control box.
8. Slide out the inner control box.
9. Reassemble in reverse order.

**Service Instructions (cont'd)**

**Front Sprocket Assembly**

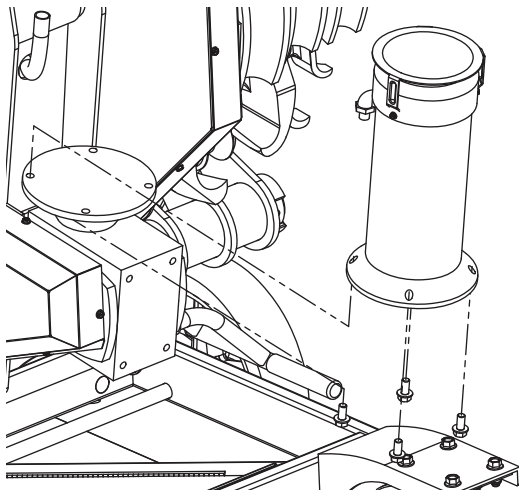
1. Remove the front drive chain (refer to previous instruction).
2. Screw in the three set screws securing the spindle cap about four turns and pull off the cap.
3. Push the sprocket fully inward to gain access to the retaining ring.
4. Remove the retaining ring and large washer.
5. Slide the sprocket weldment off the bender.
6. Reassemble in reverse order noting the following:
  - a. With the sprocket pushed back against the frame, press the outer part of the torque arm into the slot of the spindle cap along the axis of the spindle. Slide the sprocket fully outward while fitting the cap into the spindle.
  - b. Do not tighten the set screws so they protrude beyond the outer diameter of the spindle.


**Encoder Assembly**

1. Remove front sprocket assembly (refer to previous instruction).
2. Remove the outer control box (refer to previous instruction).
3. Disconnect the encoder cable and pull cable out of inner control box bushing.
4. Screw in the three set screws securing the encoder mount about four turns and pull out the mount complete with encoder and cable. Feed the cable through the spindle while pulling the encoder mount out.
5. Pull off the encoder cable.
6. Remove the encoder cover by prying out the plastic locking tabs.
7. Remove the two socket head screws securing the encoder case.
8. Pull the encoder magnet off the shaft.
9. Loosen the set screw securing the torque arm and remove it and the thrust washer.
10. Pull out the encoder shaft.
11. Reassemble in reverse order noting the following:
  - a. Press the magnet onto the shaft 0.002" from the base.
  - b. After securing the torque arm to the shaft, ensure that the shaft turns freely.
  - c. Pry the decorative cap from the rear end of the spindle shaft to gain access for feeding the encoder cable through the grommet to the control box.

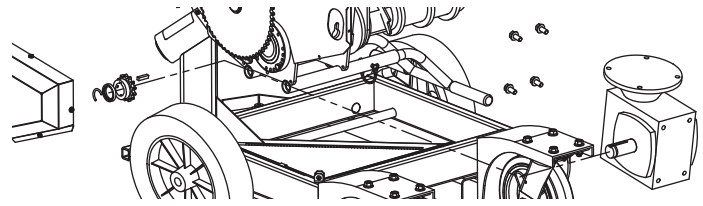
## Service Instructions (cont'd)

- d. Re-zero the bender after bender assembly is complete minus the shoe:
  - Position the drive sprocket so that the spoke with two holes is around the three o'clock position
  - Accurately align the hole now at the 12 o'clock position with the round centering hub behind the sprocket.
  - Set the zero point to memory by pressing and holding the CLEAR button on the pendant and then pressing the JOG button simultaneously.



### Motor

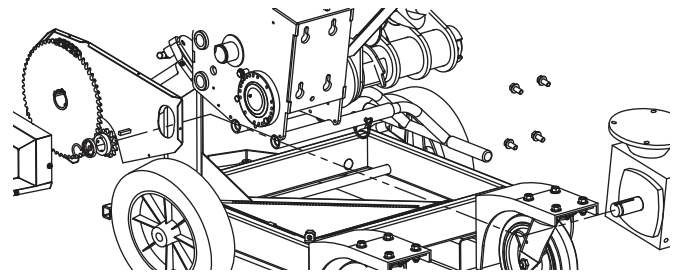
1. Remove the outer control box (refer to previous instruction).
2. Pull off the two motor leads from the circuit board noting their orientation.
3. Disconnect the SealTite connector at the motor.
4. Remove the four screws attaching the motor to the gearbox. (If access to the front inside screw is not attainable with a 7/16" flex socket or stubby wrench, access can be gained by removing the front sprocket assembly and the front guard backing plate.)
5. Pull off the motor while feeding the motor leads out of the SealTite conduit.
6. Reassemble in reverse order noting the following:
  - a. Fitting the keyway between the motor and gearbox may require staking it to keep it in place.
  - b. For easiest fitting of the SealTite connector, rotate the motor into the connector before fitting the motor mounting screws.



### Gearbox (Option 1)

1. Remove seven screws and rear chain guard.
2. Remove connecting link and rear chain.
3. Loosen the two set screws securing the drive sprocket on the gearbox and push the sprocket inward.
4. Slide the collar inward and pry off the C clip.
5. Remove the collar and sprocket.
6. Loosen the four screws securing the gearbox to the frame.
7. Slide the gearbox downward (gravity may have already done this) and remove it by pulling the screw heads through the keyholes in the frame.
8. Reassemble in reverse order noting the following:  
Slide the gearbox fully upward after installing the chain and tighten the mounting screws to tension the chain.

*Note: The gearbox and motor can be removed as a unit by removing the two inner motor mounting screws and following the instructions for disconnecting the motor at the control box.*



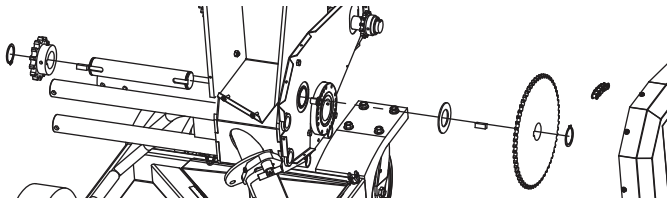
### Gearbox (Option 2)

1. Remove seven screws and rear chain guard.
2. Remove connecting link and rear drive chain.
3. Loosen the two set screws securing the drive sprocket on the gearbox and push the sprocket inward.
4. Slide the collar inward and pry off the C clip.
5. Remove the collar and sprocket.
6. Remove the inner chain guard (refer to previous instruction).
7. Support the gearbox, remove the four screws securing the gearbox, and remove it.

## Service Instructions (cont'd)

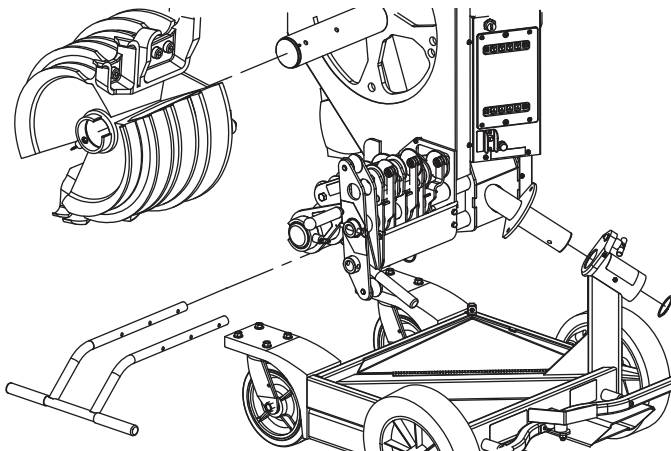
8. Reassemble in reverse order noting the following:  
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*Note: The gearbox and motor can be removed as a unit by following the instructions for disconnecting the motor at the control box.*



### Countershaft

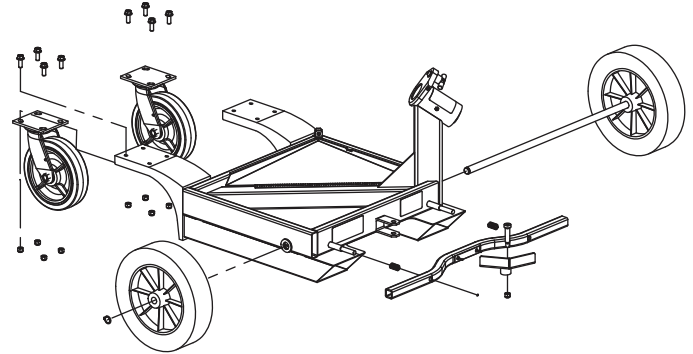
1. Remove seven screws and rear chain guard.
2. Remove connecting link and rear drive chain.
3. Remove the front drive chain (refer to previous instruction).
4. Remove a retaining ring from the countershaft.
5. Pull off the sprocket, key, and thrust washer.
6. Pull out the countershaft from the opposite side.
7. Remove the other thrust washer, sprocket, and key.
8. Reassemble in reverse order.



### Wheeled Base Removal

1. Remove the bending shoe.
2. Remove the transport handle.
3. Remove the retaining ring at the end of the bender pivot shaft.
4. Use a hoist to lift the bender head while sliding the wheeled base off the pivot shaft.

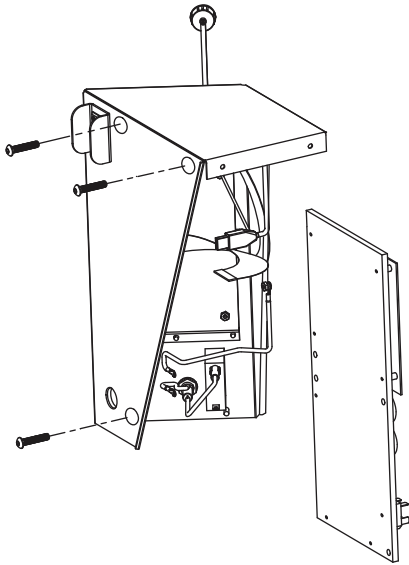
5. Set the bender head down gently on the transport handle receptacle tubes using wood 2x4s for support.
6. Reassemble in reverse order noting the following:  
Apply molybdenum grease to the pivot shaft.



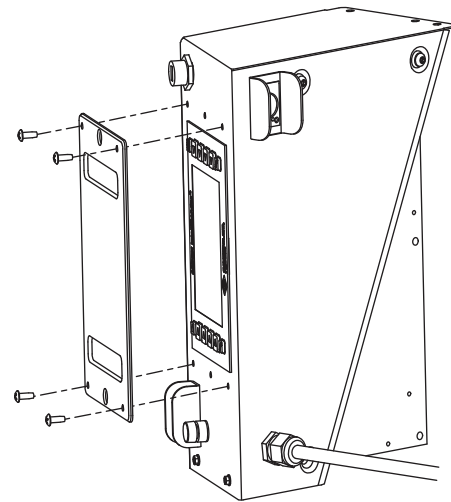
### Wheeled Base Disassembly

1. Pull off the pivot detent bracket by loosening one set screw.
2. Remove a retaining ring from the axle and pull off the wheel axle and second wheel.
3. Remove the four screws and nuts for each swivel caster and the caster wheels.
4. Unlock the brake.
5. Remove the nut at the bottom the shoulder screw retaining the brake pedal and remove the screw.
6. Remove the brake pedal, brake bar, and two springs.
7. Disassemble the pivot detent bracket by driving out the rollpin securing the "T" handle and remove the detent pin and spring.
8. Reassemble in reverse order noting the following:
  - a. If the brake does not fully engage or disengage, an additional wear plate can be added or removed from the brake bar.
  - b. The bender head can be leveled using the two set screws on the pivot detent bracket. One turn approximates 1°.

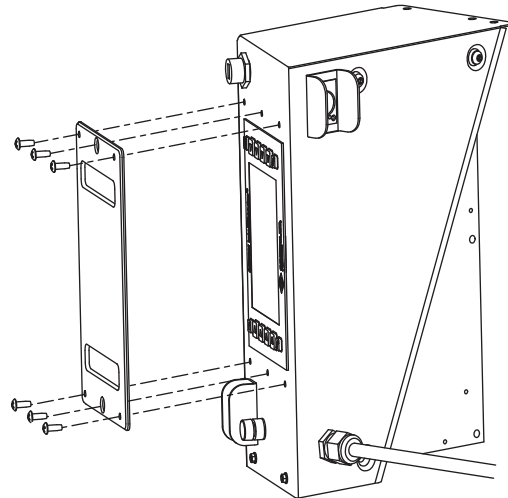


**Service Instructions (cont'd)**

**Control Board Unit**

1. Remove outer control box (refer to previous instruction).
2. Disconnect the power connections to the board from the circuit breaker and power cord.
3. Disconnect the pendent receptacle cable.
4. Disconnect the USB port cable.
5. Disconnect the LCD cable.
6. Disconnect the membrane switch cable.
7. Remove the three button head screws attaching the control board assembly to the enclosure, and remove the control board assembly.
8. Reassemble in reverse order.


**LCD Protective Cover**

1. Remove the four corner screws that secure the cover.
2. Remove the cover.
3. Replace in reverse order.

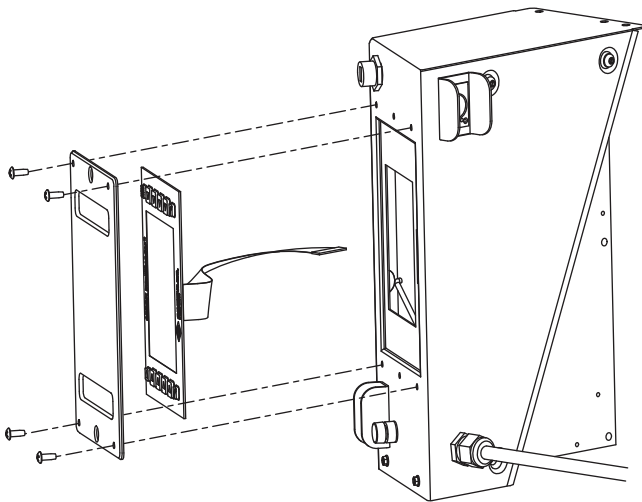

**Liquid Crystal Display**

1. Remove outer control box (refer to previous instruction).
2. Unplug the ribbon LCD cable from the control board.
3. Remove the LCD protective cover (refer to previous instruction).
4. Remove the two remaining screws that secure the LCD mounting plate and remove the plate.
5. Remove the four screws that attach the LCD to the mounting plate.



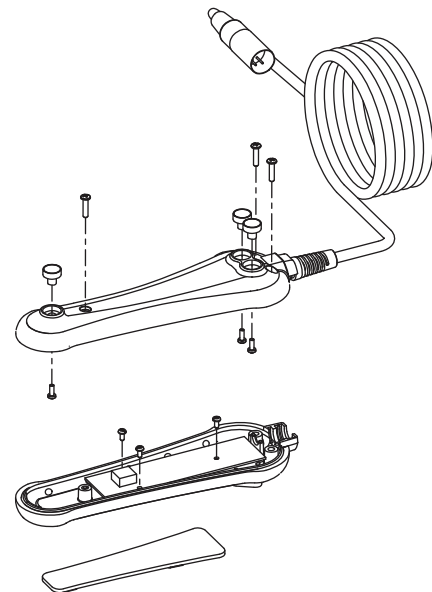
## Service Instructions (cont'd)

6. Reassemble in reverse order noting the following:
  - a. If installing a new LCD, take the protective film off the screen.
  - b. The bottom of the mounting plate has the notch.
  - c. The light bar should be on the right.
  - d. The cable should exit out the top.



### LCD Keypad Switch

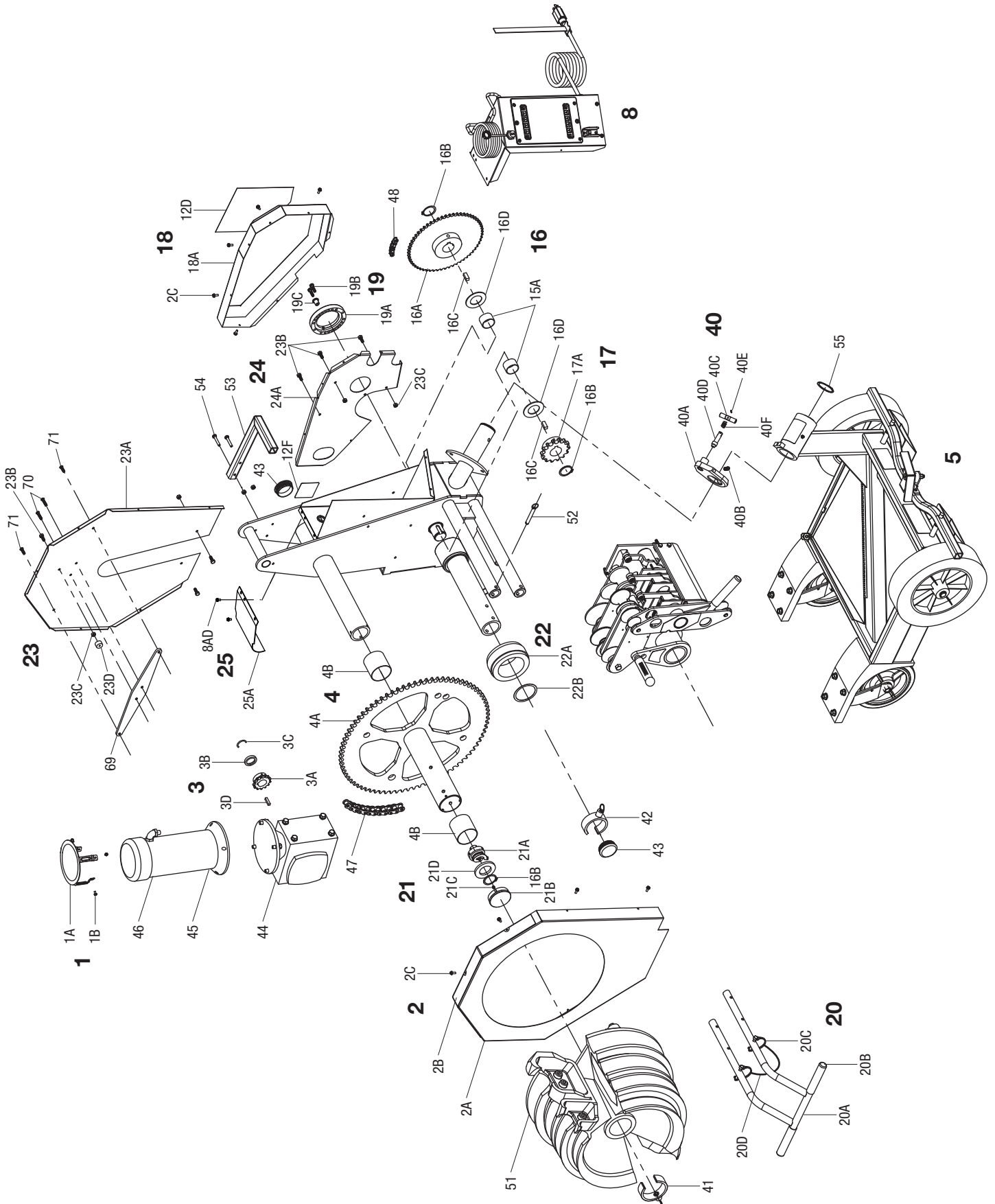
1. Remove the LCD protective cover (refer to previous instruction).
2. Remove the outer control box (refer to previous instruction).
3. Unplug the keypad switch from the control board.
4. Peel the keypad membrane from the enclosure.
5. Reassemble a new keypad switch in reverse order noting the following:
  - a. Clean all residue from the mounting surface.
  - b. Center the switch in the recess.
  - c. Remove the protective film from the screen.



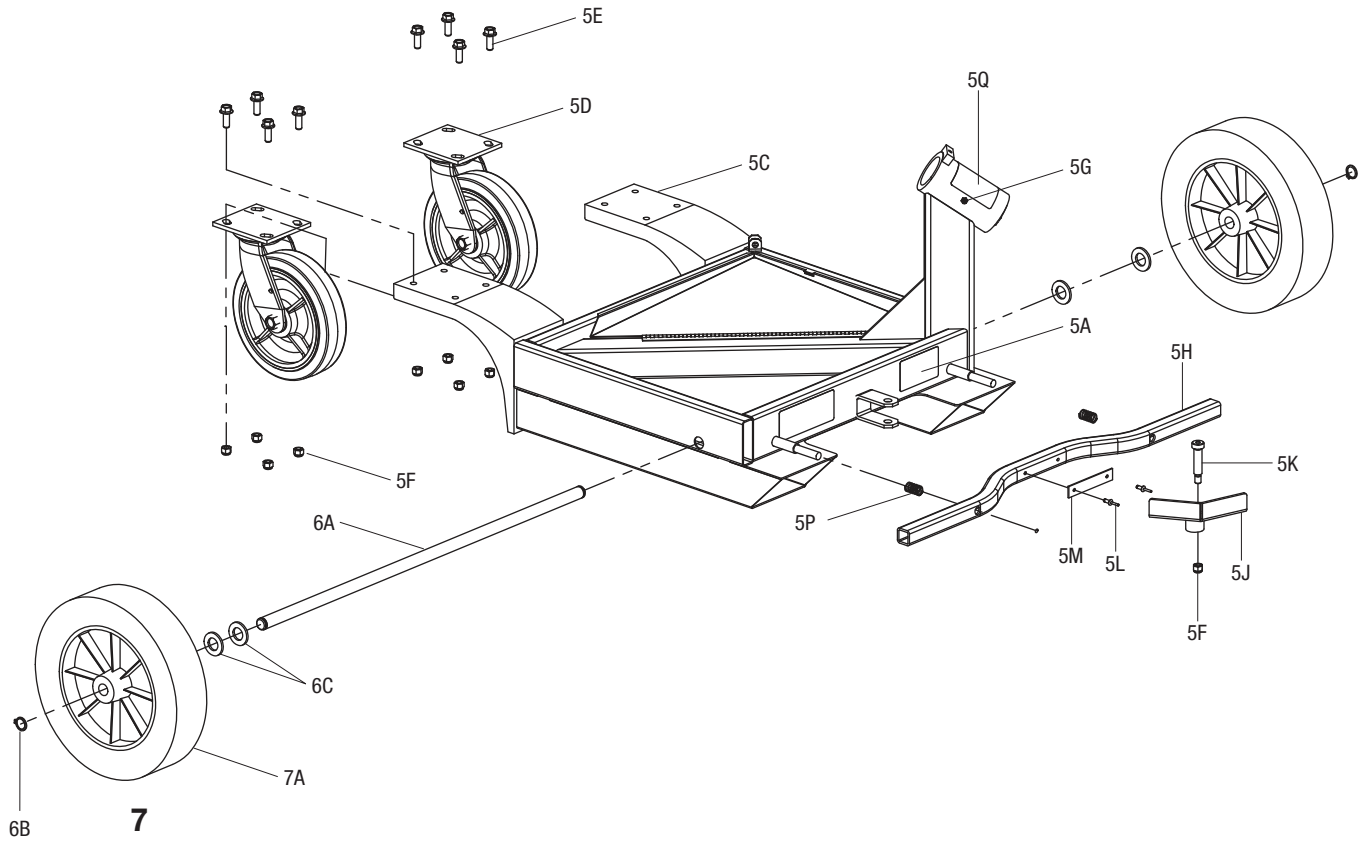
### Pendant Switch

1. Remove three screws holding the housing halves together and separate.
2. Unplug the pendant cord from the circuit board and remove strain relief from housing.
3. Remove the three screws and the circuit board.
4. Unplug the keypad from the circuit board.
5. Remove the three screws from the bottom housing to remove the magnets.
6. Peel the keypad membrane from the top housing.
7. Reassemble in reverse order noting the following:  
Clean all residue from the mounting surface.

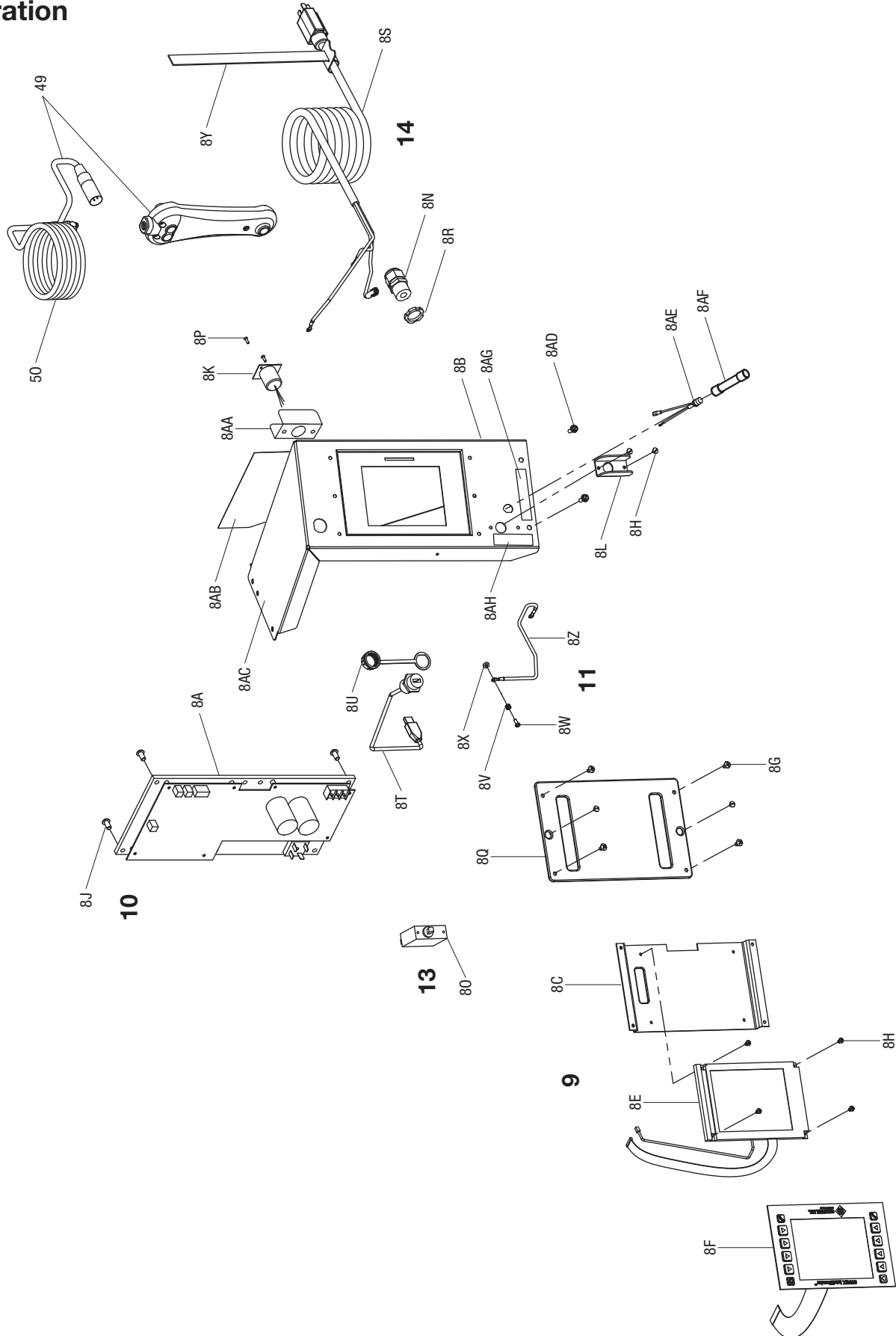
**Illustration**



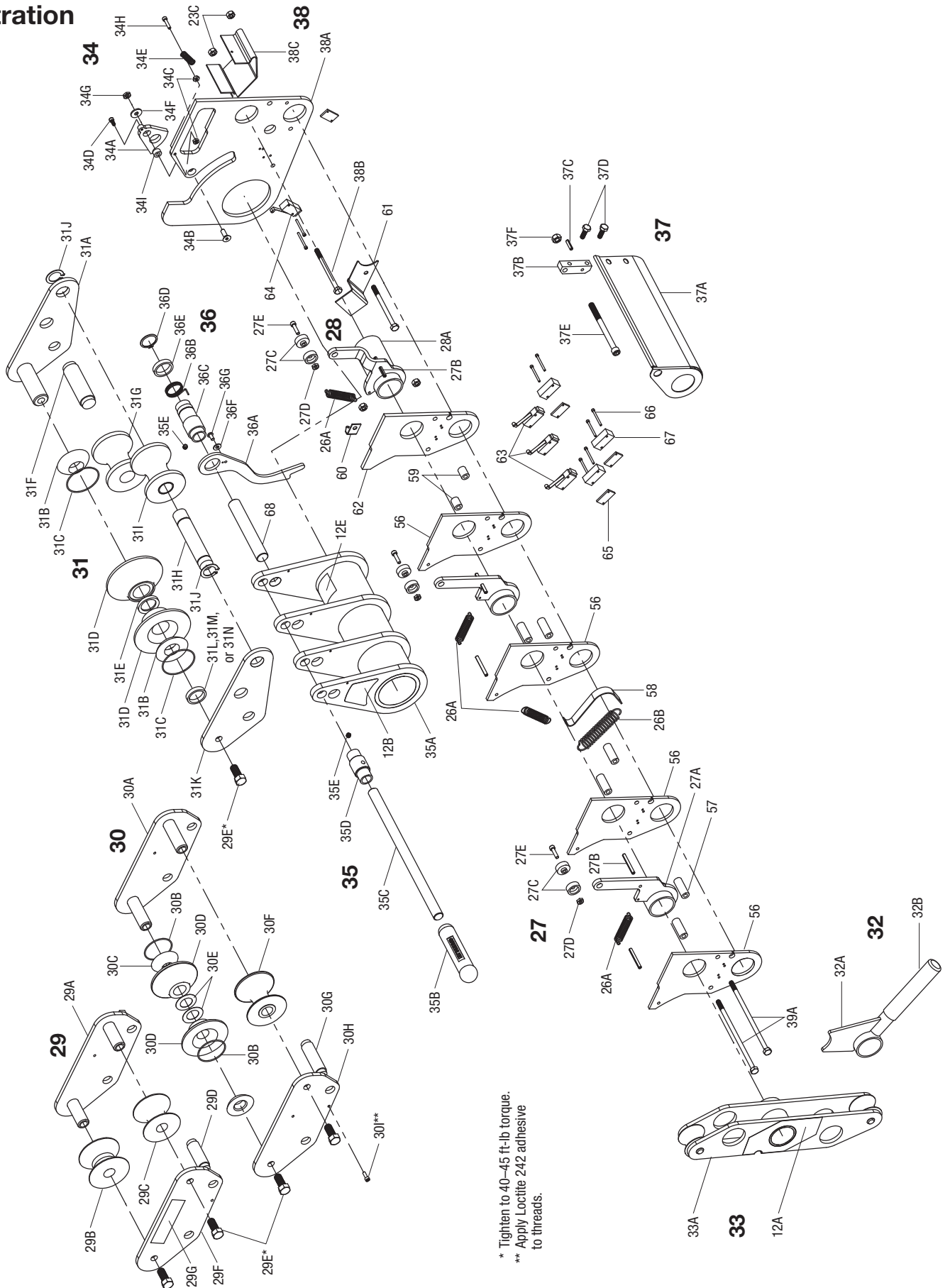
**Illustration—Base**



**Illustration**



**Illustration**



\* Tighten to 40–45 ft-lb torque.  
 \*\* Apply Loctite 242 adhesive to threads.

**Parts List**

Group	Key	Part No.	Description	Qty
1		<b>52056409</b>	<b>Cap kit, motor</b>	
	1A		Cap, motor .....	1
	1B		Screw, #10-32 x 5/16, hex head slotted .....	3
2		<b>52056623</b>	<b>Guard kit, front main sprocket</b>	
	2A		Guard, front chain .....	1
	2B		Decal, stub and offset .....	1
	2C		Screw, #10-16 x 1/2, thread-forming .....	7
3		<b>52056411</b>	<b>Sprocket kit, gearbox output</b>	
	3A		Sprocket, #40-13 tooth .....	1
	3B		Collar .....	1
	3C		Ring, retaining, round .....	1
	3D		Key, square, .249 x 1.06 .....	1
4		<b>52056624</b>	<b>Sprocket kit, main</b>	
	4A		Sprocket weldment .....	1
	4B		Bearing, fiberglide .....	2
5		<b>52056625</b>	<b>Base kit</b>	
	5A		Decal, fork lifting .....	1
	5B		Decal, brake .....	1
	5Q		Decal, bender pivot .....	1
	5C		Trunnion weldment .....	1
	6A		Axle .....	1
	5D		Caster, 8 swivel .....	2
	5E		Screw, flange, 3/8-16 x 1.00 .....	8
	5F		Nut, lock, hex, 3/8-16 .....	9
	7A		Wheel, rubber (12 x 3) .....	2
	6B		Ring, retaining, .750 Truarc #5160 EX .....	2
	5G		Fitting, grease, 1/4 alemite #1743-B .....	1
	5H		Bar, brake .....	1
	5J		Pedal .....	1
	5K		Screw, shoulder .....	1
5L		Rivet, pop, 3/16 x .440 dome head .....	2	
5M		Bar, wear .....	1	
5P		Spring .....	2	
	6C		Washer, .81 x 1.50 x .14 .....	4
6		<b>52056626</b>	<b>Axle kit, wheel</b>	
	6A		Axle .....	1
	6B		Ring, retaining, .750 Truarc #5160 EX .....	2
	6C		Washer, .81 x 1.50 x .14 .....	4
7		<b>52056417</b>	<b>Replacement kit, wheel</b>	
	7A		Wheel, rubber (12 x 3) .....	2



**Parts List (cont'd)**

Group	Key	Part No.	Description	Qty
8		<b>52056627</b>	<b>Box kit, control</b>	
	8A		Control board assembly.....	1
	8B		Cover, box.....	1
	8C		Mount plate, LCD.....	1
	8E		LCD.....	1
	8F		Keypad.....	1
	8G		Screw, slftpg, #10-16 x .500 phillips pan.....	6
	8H		Screw, #6-32 x 1/4, phillips pan head.....	6
	8J		Screw, 1/4-20 x .50 btn head skt.....	3
	8K		Receptacle unit, cannon.....	1
	8L		Guard, switch.....	1
	8N		Bushing, strain relief.....	1
	8O	91863856	Circuit breaker.....	1
	8P		Screw, 4-40 x .50 flat head, Taptite II.....	2
	8Q		Lens, LCD protective.....	1
	8R		Locknut, 1/2" conduit steel.....	1
	8S		Cord unit, power.....	1
	8T		Wire assembly, USB.....	1
	8U		Cap, USB.....	1
	8V		Washer, lock, internal, #6.....	2
	8W		Screw, #6-32 x 3/8 phillips pan head.....	1
	8X		Nut, #6-32 nylon lock.....	1
	8Y		Strap, velcro.....	1
	8Z		Wire assembly.....	1
	8AA		Guard, pendant cord.....	1
	8AB		Decal, identification.....	1
	8AC		Decal, operating instructions.....	1
8AD		Screw, #10-32 x 5/16, hex head slotted.....	2	
8AE		Holder, fuse.....	1	
8AF	52056934	Fuse (package consisting of 5 fuses).....	1	
8AG		Decal, fuse.....	1	
8AH		Decal, circuit breaker.....	1	
9		<b>52056628</b>	<b>LCD kit</b>	
	8Q		Lens, LCD protective.....	1
	8F		Keypad.....	1
	8E		LCD screen.....	1
	8C		Mount plate, LCD.....	1
	8G		Screw, slftpg, #10-16 x .500 phillips pan.....	6
8H		Screw, #6-32 x 1/4, phillips pan head.....	4	
10		<b>52056629</b>	<b>Assembly kit, control board</b>	
	8A		Control board assembly.....	1
	8J		Screw, cap, 1/4-20 x .50 btn skt head.....	3

**Parts List (cont'd)**

Group	Key	Part No.	Description	Qty
11		<b>52056422</b>	<b>Screw kit, ground</b>	
	8Z		Wire assembly (ground) .....	1
	8W		Screw, #6-32 x 3/8 phillips pan head machine.....	1
	8X		Nut, hex, #6-32 lock .178 thk zp.....	1
	8V		Washer (#6 star, intern, CZ/ST).....	2
12		<b>52056630</b>	<b>Decal kit</b>	
	12A		Decal, 1" IMC/rigid roller.....	1
	5A		Decal, fork lifting .....	1
	12B		Decal, engage rollers .....	1
	8AC		Decal, operating instructions .....	1
	8AB		Decal, identification.....	1
	5B		Decal, brake .....	1
	5Q		Decal, bender pivot.....	1
	12D		Decal, squeeze.....	1
	12E		Decal, cam release.....	1
	12F		Decal, lifting .....	1
	2B		Decal, stub and offset .....	1
	8AG		Decal, fuse .....	1
	8AH		Decal, circuit breaker .....	1
	29G		Decal, cam .....	1
13	<b>80</b>	<b>91863856</b>	<b>Breaker, circuit</b> .....	1
14		<b>52056426</b>	<b>Cord unit, power</b>	
	8S		Power cord unit.....	1
	8N		Bushing, strain relief.....	1
	8Y		Strap, velcro.....	1
	8R		Nut, lock, 1/2" conduit .....	1
15		<b>52056427</b>	<b>Bearing kit</b>	
	15A		Bearing, phenolic .....	2
	4B		Bearing, fiberglide .....	2
16		<b>52056428</b>	<b>Sprocket kit, #40B60</b>	
	16A		Sprocket, #40 60T (includes 2 set screws) .....	1
	16B		Ring, retaining, 1.50 Truarc #5100 EX.....	1
	16C		Key, countershaft .....	1
	16D		Bearing, thrust, 1.50 x 2.62 x .093.....	1
17		<b>52056429</b>	<b>Sprocket kit, #60BS14</b>	
	17A		Sprocket, #60 14T (includes 2 set screws) .....	1
	16B		Ring, retaining, 1.50 Truarc #5100 EX.....	1
	16C		Key, countershaft .....	1
	16D		Bearing, thrust, 1.50 x 2.62 x .093.....	1
18		<b>52056631</b>	<b>Guard kit, rear chain</b>	
	18A		Guard, rear .....	1
	2C		Screw, thread-forming, #10-16 x .50 .....	7
	12D		Decal, squeeze arrow.....	1

**Parts List (cont'd)**

Group	Key	Part No.	Description	Qty
19		<b>52056431</b>	<b>Adjustment kit, squeeze cam</b>	
	19A		Adjuster, squeeze.....	1
	19B		Screw, cap, 1/4-20 x 1.00 hex head.....	2
	19C		Guide, adjuster.....	1
20		<b>52056432</b>	<b>Handle kit, replacement</b>	
	20A		Handle weldment.....	1
	20B		Grip.....	2
	20C		Pin, safety snap.....	2
	20D		Lanyard.....	1
21		<b>52056433</b>	<b>Encoder kit</b>	
	21A		Encoder, sub-assembly.....	1
	21B		Cap, encoder.....	1
	21C		Screw, set, 1/4-20 x .375 skt.....	3
	16B		Ring, retaining, 1.50 Truarc #5100 EX.....	1
	21D		Retainer.....	1
22		<b>52056434</b>	<b>Idler kit, chain</b>	
	22A		Stay, chain.....	1
	22B		Washer, flat, 2.50 x 3.00 x .031 fiber.....	1
23		<b>52056633</b>	<b>Rear guard kit, main sprocket</b>	
	23A		Guard, chain, back.....	1
	23B		Screw, cap, 1/4-20 x .750 hex head.....	3
	23C		Nut, hex, 1/4-20.....	1
	23D		Hub, centering.....	1
24		<b>52056436</b>	<b>Back guard kit, rear chain</b>	
	24A		Guard, back, rear.....	1
	23C		Nut, hex, 1/4-20.....	2
	23B		Screw, cap, 1/4-20 x .750 hex head.....	3
25		<b>52056437</b>	<b>Guard kit, top frame</b>	
	25A		Cover, wire.....	1
	8AD		Screw, #10-32 x 5/16, hex head slotted.....	2
26		<b>52056632</b>	<b>Spring kit, roller</b>	
	26A		Spring, lever.....	4
	26B		Spring, return.....	1
27		<b>52056151</b>	<b>Arm kit, 1-1/4"-1-1/2" sensor</b>	
	27A		Lever weldment, short.....	1
	27B		Pin, roll, .187 x 1.62.....	1
	26A		Spring, lever.....	1
	27C		Roller, trip lever.....	2
	27D		Nut, hex, 10-32.....	1
	27E		Screw, cap, #10-32 x .750 skt head bk-ox.....	1

**Parts List (cont'd)**

Group	Key	Part No.	Description	Qty
28		<b>52056152</b>	<b>Arm kit, 2" sensor</b>	
	28A		Lever weldment, long.....	1
	27B		Pin, roll, .187 x 1.62 .....	1
	26A		Spring, lever .....	1
	27C		Roller, trip lever .....	2
	27D		Nut, hex, 10-32 .....	1
	27E		Screw, cap, #10-32 x .750 skt head bk-ox .....	1
29		<b>52056635</b>	<b>Roller assembly kit, 1-1/4"</b>	
	29A		Support weldment, 1-1/4" .....	1
	29B		Roller, lead, 1-1/4" .....	1
	29C		Roller, tail, 1-1/4" .....	1
	29D		Shaft, support, 1-1/4" .....	1
	29E		Screw, cap, hex head, 7/16-14 x 1.00 .....	2
	29F		Plate, 1-1/2" outer roller.....	1
29G		Decal, cam .....	1	
30		<b>52056636</b>	<b>Roller assembly kit, 1-1/2"</b>	
	30A		Support weldment, 1-1/2" .....	1
	30B		O-ring, 1.50 x 1.62 x .062 nitrile.....	2
	30C		Ball, half, 1-1/2" .....	2
	30D		Roller, 1-1/2" .....	2
	30E		Washer, belleville, .803 x 1.362 x .043 .....	2
	30F		Roller, 1-1/2" IMC .....	1
	30G		Shaft, support, 1-1/2" .....	1
	30H		Plate, 1-1/2" outer roller.....	1
	29E		Screw, cap, hex head, 7/16-14 x 1.00 .....	2
	30I		Screw, cap, #8-32 x .500 skt head .....	1
31		<b>52056637</b>	<b>Roller assembly kit, 2"</b>	
	31A		Support weldment, 2" .....	1
	31B		Ball, 2" half.....	2
	31C		O-ring, 1.75 x 1.87 x .062 nitrile.....	2
	31D		Roller, 2" .....	2
	31E		Spacer, roller, 2" .....	1
	29E		Screw, cap, hex head, 7/16-14 x 1.00 .....	1
	31F		Shaft, 2" middle roller .....	1
	31G		Roller, 2" tail .....	1
	31H		Shaft, tail, 2".....	1
	31I		Roller unit, 2" .....	1
	31J		Ring, retaining, .875 .....	2
	31K		Plate, 2" outer roller .....	1
	31L		Washer, shim, 1.00 x 1.50 x .032 steel .....	1
31M		Washer, flat, .625 x 1.00 x .031 (shim) .....	1	
31N		Washer, flat, .625 x 1.00 x .062 (shim) .....	1	
32		<b>52056638</b>	<b>Handle kit, lift</b>	
	32A		Handle weldment, grab .....	1
	32B		Grip .....	1

**Parts List (cont'd)**

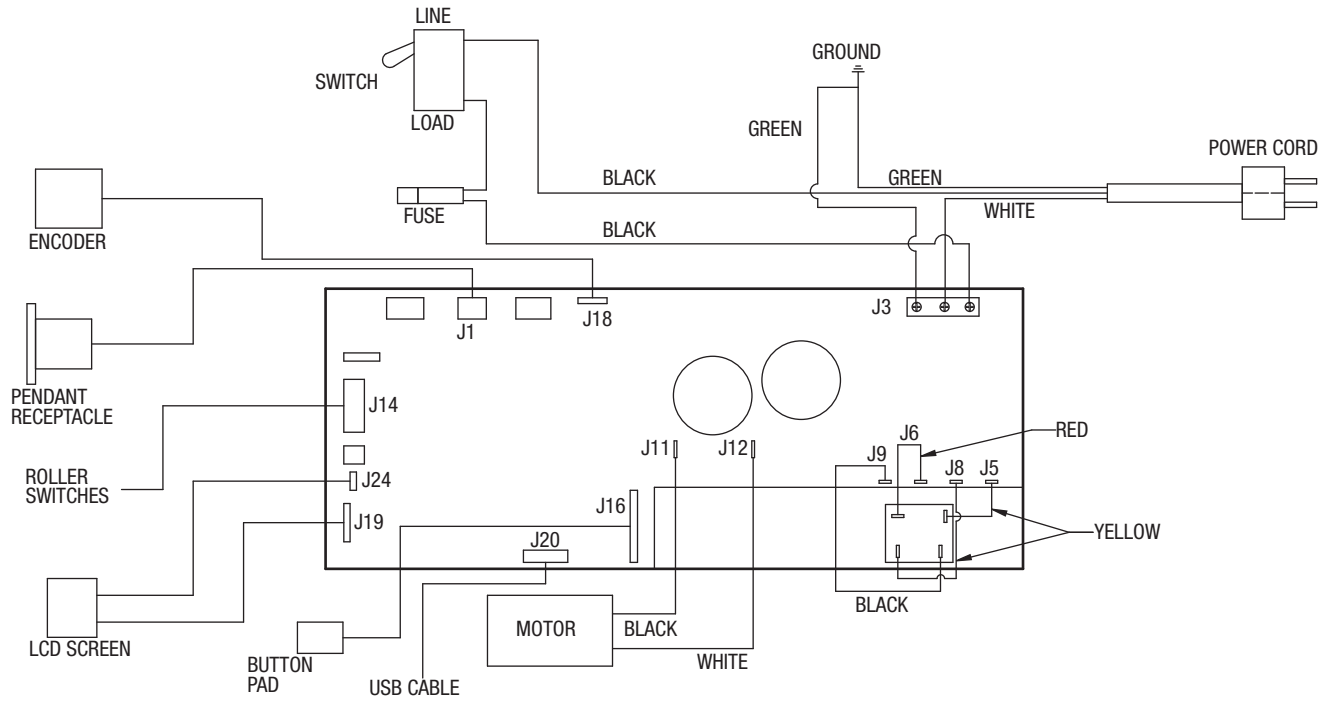
Group	Key	Part No.	Description	Qty
<b>33</b>		<b>52056639</b>	<b>Roller kit, 1"</b>	
	33A		Support weldment, 1" .....	1
	12A		Decal, 1" IMC/rigid roller.....	1
<b>34</b>		<b>52056640</b>	<b>Cam kit</b>	
	34A		Cam.....	1
	34B		Screw, cap, 1/4-20 x .750 skt flat head .....	1
	34C		Nut, hex, #8-32 .....	2
	34D		Screw, button head, 8-32 x 3/8 .....	1
	34E		Spring, cam.....	1
	34F		Washer, flat, .253 x .725 x .070.....	1
	34G		Nut, hex, 1/4-20 jam zp .....	1
	34H		Screw, cap, #8-32 x .750 skt head .....	1
	34I		Bushing .....	1
<b>35</b>		<b>52056641</b>	<b>Arm kit, roller</b>	
	35A		Arm weldment.....	1
	35B		Grip, rubber.....	1
	35C		Handbar .....	1
	35D		Sleeve, pivot, 1-1/2" .....	1
	35E		Screw, set, 1/4-28 x .250 skt .....	1
	12B		Decal, engage rollers .....	1
	12E		Decal, cam release.....	1
<b>36</b>		<b>52055878</b>	<b>Lever assembly, release</b>	
	36A		Lever .....	1
	36B		Spring, clutch.....	1
	36C		Collar.....	1
	36D		Ring, retaining, 1.00 Truarc #5100 EX.....	1
	36E		Spacer.....	1
	35E		Screw, set, 1/4-28 x .250 skt .....	1
	36F		Washer, flat #10.....	1
36G	Screw, #10-32 x .375 skt btn head cap.....	1		
<b>37</b>		<b>52056643</b>	<b>Guard kit, switch</b>	
	37A		Guard, limit switch .....	1
	37B		Mount, switch guard .....	1
	37C		Pin, roll, .187 x .750 .....	1
	37D		Screw, cap, 1/4-20 x .750 hex head .....	2
	37E		Screw, 5/16-18 x 4.00 skt head cap .....	1
	37F		Nut, hex, 5/16-18 full .....	1
<b>38</b>		<b>52056644</b>	<b>Stop kit, roller</b>	
	38A		Plate, switch.....	1
	38B		Screw, cap, 1/4-20 x 3.500 hex head .....	2
	38C		Guard, lower spacer.....	1
	23C		Nut, hex, 1/4-20 .....	2

**Parts List (cont'd)**

Group	Key	Part No.	Description	Qty
39		<b>52056645</b>	<b>Hardware kit, roller</b>	
	39A		Screw, cap, 1/4-20 x 6.00 hex head .....	2
	29E		Screw, cap, hex head, 7/16-14 x 1.00 .....	5
	38B		Screw, cap, 1/4-20 x 3.500 hex head .....	2
	23C		Nut, hex , 1/4-20 .....	4
	37F		Nut, hex , 5/16-18 full .....	1
40		<b>52056642</b>	<b>Release kit, pivot</b>	
	40A		Bracket weldment, detent .....	1
	40B		Screw, 1/4-28 x 1 oval point set .....	2
	40C		Handle, detent.....	1
	40D		Piston, trunnion lock .....	1
	40E		Pin, roll, .125 x .500 .....	1
	40F		Spring, comp, .502 x .600 x .625.....	1
<b>Individual Items</b>				
	41	52044571	Lock collar assembly, large .....	1
	42	52044514	Lock collar assembly, small .....	1
	43	52047945	Cap, plastic, 2" .....	2
	44	90523881	Reductor .....	1
	45	52057563	Motor, 120V, bender .....	1
	46	91864208	Brushes .....	2
	47	90542509	Chain, roller, #60 (92 pitches) with connecting link.....	1
	48	52055855	Chain, #40 (86 pitches) with connecting link .....	1
	49	52055021	Switch unit, pendant .....	1
	50	52054423	Cord assembly .....	1
	51	52055834	Shoe unit .....	1
	52	52020192	Pin, hitch, short .....	1
	53	52055242	Handle .....	1
	54		Screw, 1/4-20 x 1.5 hex head cap .....	2
	55	90544625	Ring, retaining, Truarc #5100-200.....	1
	56	52044547	Support, tail roller .....	4
	57	52044526	Spacer .....	6
	58	52046799	Retainer, spring .....	1
	59	52044527	Spacer, short .....	2
	60	52044664	Anchor, spring .....	1
	61	52055238	Cover, switch.....	1
	62	52044548	Support, 2" tail roller .....	1
	63	52056593	Switches and wire harness (rollers).....	1
	64	52056594	Switch unit, sensor.....	1
	65	52055436	Plate, switch retainer.....	4
	66		Screw, #4-40 x 1-1/4 socket head cap.....	8
	67	52055500	Spacer, switch.....	4
	68	52044584	Shaft, release .....	1
	69		Bar, guard stiffener.....	1
	70		Screw, 1/4-20 x 5/8 button head cap .....	2
	71		Screw, 1/4-20 x 3/8 button head cap .....	2



**Wiring Diagram**





4455 Boeing Drive • Rockford, IL 61109-2988 • USA • 815-397-7070  
An ISO 9001 Company • Greenlee Textron Inc. is a subsidiary of Textron Inc.

[www.greenlee.com](http://www.greenlee.com)

**USA** Tel: 800-435-0786  
Fax: 800-451-2632

**Canada** Tel: 800-435-0786  
Fax: 800-524-2853

**International** Tel: +1-815-397-7070  
Fax: +1-815-397-9247