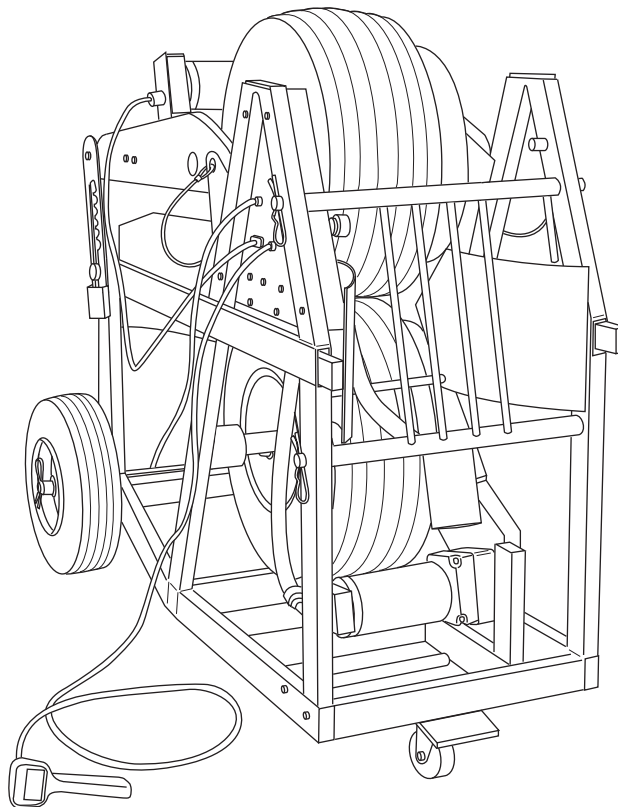


# INSTRUCTION MANUAL



## 6810 Ultra Cable Feeder



**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)

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**Description**

The Greenlee Ultra Cable Feeder is intended to pull cable off of reels to allow feeding the cable into conduit or cable tray.

The Ultra Cable Feeder is not intended to pull cable or rope through conduit.

**Safety**

Safety is essential in the use and maintenance of Greenlee tools and equipment. This instruction 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 instruction manual is intended to familiarize all personnel with the safe operation and maintenance procedures for the Greenlee Ultra Cable Feeder Cable Feeding System.

Keep this manual available to all personnel.

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



**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.





#### **⚠ DANGER**

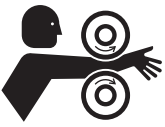
Read and understand all of the instructions and safety information in this manual before operating or servicing this tool.


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


## IMPORTANT SAFETY INFORMATION

|   |                 |
|---|-----------------|
|    | <b>⚠ DANGER</b> |
| <p>Do not use the cable feeder in a hazardous environment. Hazards include flammable liquids, gases, or other materials. Using the cable feeder in a hazardous environment can result in a fire or explosion.</p> <p>Failure to observe these warnings will result in severe injury or death.</p> |                 |

|   |                  |
|---|------------------|
|    | <b>⚠ WARNING</b> |
| <p>Electric shock hazard:</p> <ul style="list-style-type: none"> <li>Inspect the power cord before connecting to a power source. Using a damaged cord can result in electric shock.</li> <li>Disconnect tool from power source before servicing. Electric shock can result.</li> </ul> <p>Failure to observe these warnings could result in severe injury or death.</p> |                  |

|  |                  |
|--|------------------|
|   | <b>⚠ WARNING</b> |
| <p>Crushing hazard:</p> <ul style="list-style-type: none"> <li>Keep all parts of the body away from the tires.</li> <li>Do not wear loose clothing when operating this tool.</li> </ul> <p>Failure to observe this warning could result in severe injury or death.</p> |                  |

|   |                  |
|---|------------------|
|                            | <b>⚠ WARNING</b> |
| <p>Do not remove guards.</p> <p>Failure to observe this warning could result in severe injury or death.</p> |                  |

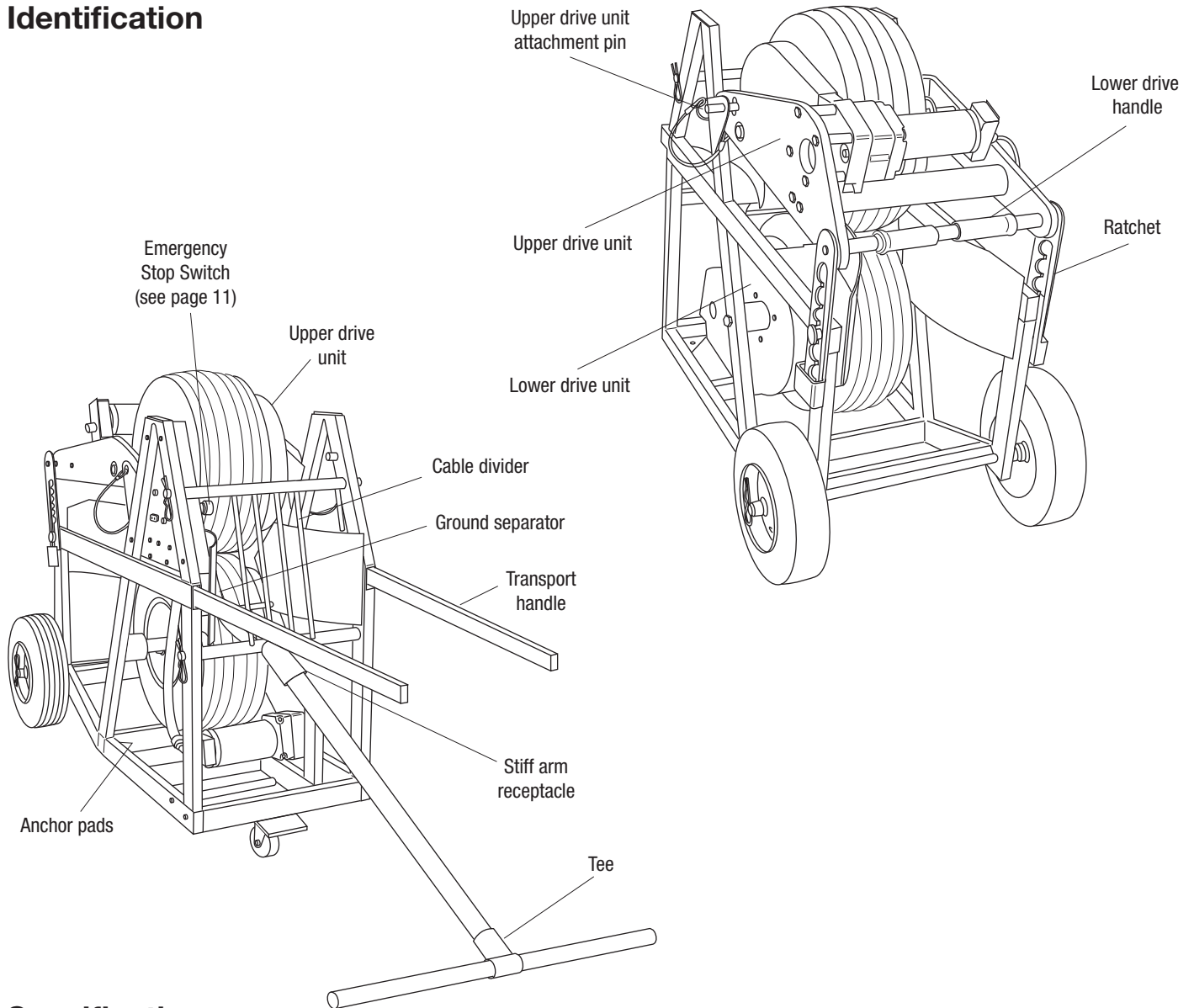
|  |                  |
|--|------------------|
|   | <b>⚠ WARNING</b> |
| <p>This device contains no brake mechanism. Do not use as a cable brake or to raise or lower loads. A runaway condition could occur resulting in severe injury or death.</p> |                  |

|   |  |
|---|--|
| <b>⚠ CAUTION</b>  |  |
| <ul style="list-style-type: none"> <li>Do not load with cables totaling more than 150 mm (6") across. Cables may feed off of the tires, resulting in cable damage.</li> <li>Do not allow sharp objects to contact the tires. Failure to observe this precaution may result in damage to the tire.</li> <li>Inspect the tool before using. Replace worn, damaged or missing parts with Greenlee replacement parts. A damaged or improperly assembled component could break and strike nearby personnel.</li> <li>Use this tool for manufacturer's intended purpose only. Use other than that which is described in this manual can result in injury or property damage.</li> </ul> |  |

|  |  |
|--|--|
| <b>⚠ WARNING</b>   |  |
| <ul style="list-style-type: none"> <li>Disconnect from power when loading cables. Accidental start-up can result in serious injury.</li> <li>Do not attach lifting slings to the upper drive unit. The drive unit will break loose and the cable feeder will fall.</li> </ul> <p>Failure to observe this warning could result in severe injury or death.</p> |  |

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

## Identification



## Specifications

|                           |   |
|---------------------------|---|
| Power Supply .....        | 115 VAC, 15 amps, 60 Hz                         |
| Power Output .....        | 1/2 hp (373 W)                                  |
| Speed .....               | 1.3 m/min to 12 m/min (4 ft/min to 36 ft/min)   |
| Cable Capacity .....      | 152 mm (6")                                     |
| Maximum Tractive Force    |   |
| Single Cable .....        | approx. 890 N (200 lb)                          |
| All Cables .....          | approx. 3560 N (800 lb)                         |
| Total Reel Capacity ..... | approx. 11,300 kg (25,000 lb)                   |
| Mass/Weight .....         | 130 kg (285 lb)                                 |
| Size .....                | 1040 mm x 699 mm x 953 mm (41" x 27.5" x 37.5") |
| Tire Pressure             |   |
| Carlisle Turf Glide ..... | 1.5 bar (22 psi)                                |
| Carlisle USA Trail .....  | 3.8 bar (50 psi)                                |

## Features

- Wide tire grip accommodates:
  - 8 x 250 MCM cable
  - 6 x 500 MCM cable
  - 5 x 750 MCM cable
- Dividers prevent tangling of cables
- Ground Cable Separator ensures traction on smaller diameter cable
- Variable speed control to match the speed of most cable pullers
- Quick Squeeze Adjustment accommodates individual cables from 6.5 mm – 89 mm (1/4" – 3-1/2") diameter
- Top loading or side loading
- Hand-held pendant control switch
- Optional foot control switch
- Twin drive traction wheels for optimum pulling power
- Low-speed DC motors provide quiet operation
- Efficient permanent-magnet motor design requires little power
- Maintenance-free chain drive

## Transportation

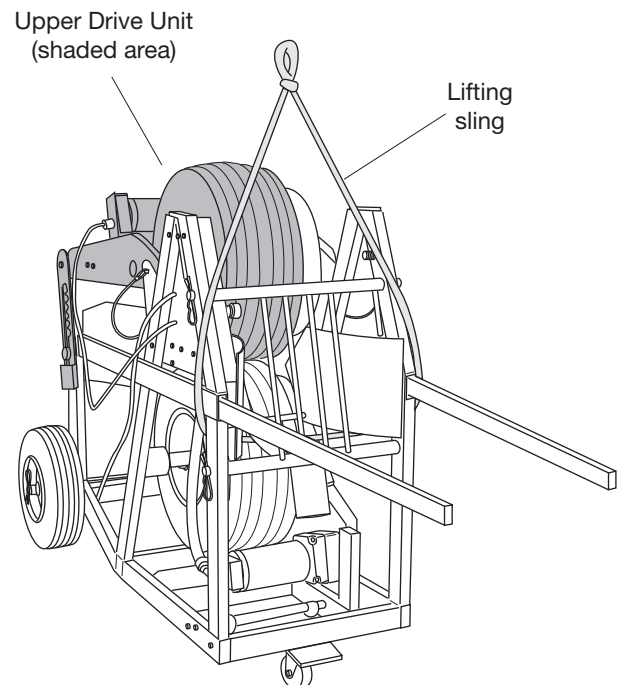
To transport the cable feeder, pull the telescoping handles out until they stop. If transporting over a smooth surface, lift up on the handles to extend the retractable caster. Quickly set the feeder down after the caster swings out. To retract the caster, lift up on the handles and quickly set the feeder down after the caster swings back in.

If hoisting, attach slings only to the main frame. Feed lifting sling all the way through the frame underneath the front cable guides as shown.

### **WARNING**

Do not attach lifting slings to the upper drive unit. The drive unit will break loose and the cable feeder will fall.

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



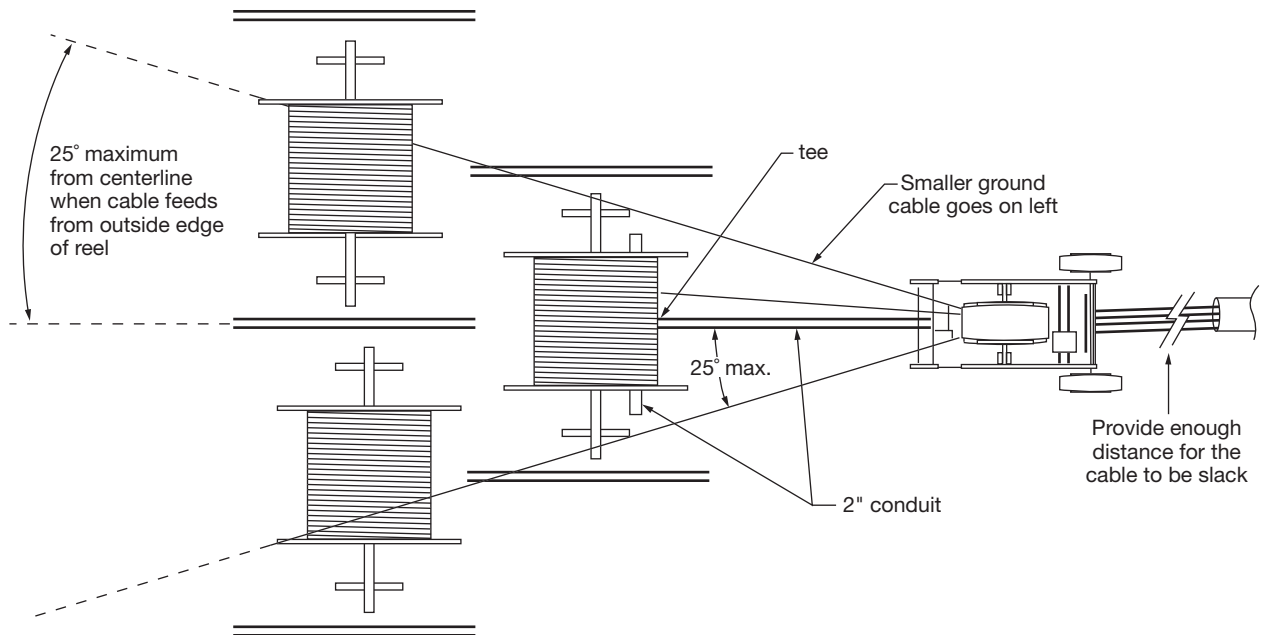
## Setup

### Positioning the Cable Feeder and Cable Reels

Locate the cable feeder and cable reels so that:

- the cable can be slack between the cable feeder and the conduit or tray.
- the cables approach the cable feeder at a maximum angle of 25° from centerline.
- a reel with smaller ground cable is to the left of the other reels.
- the cable insulation will not be damaged.

*Note: The cable can feed from the top or the bottom of the reel.*



## Setup (cont'd)

### Securing the Cable Feeding System

Select either the Stiff-Arm Boom method or the Anchor method to secure the cable feeder.

#### Stiff-Arm Boom Method

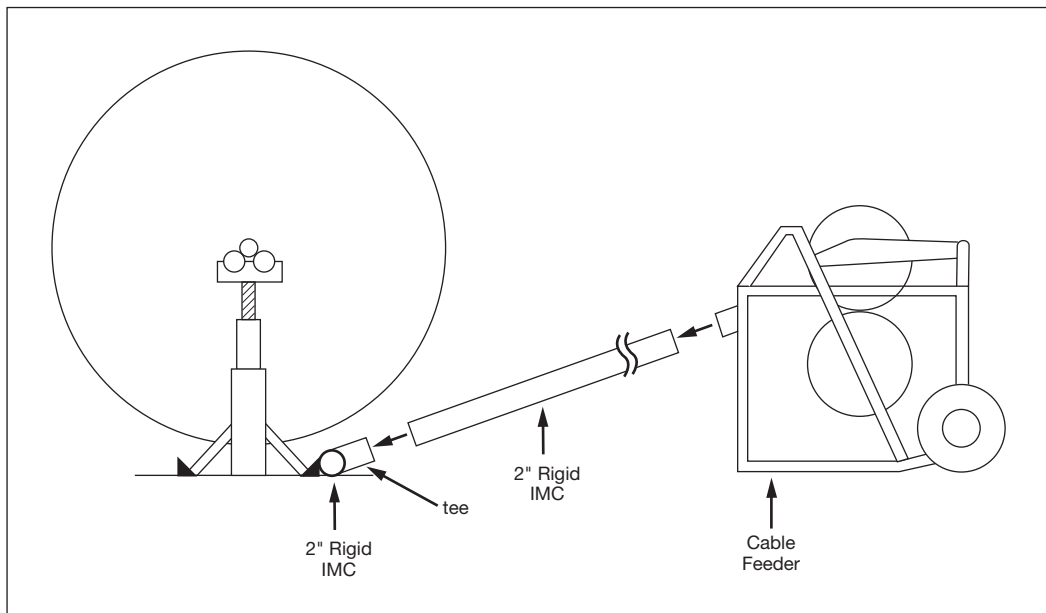
Insert one end of a length of 2" rigid or IMC conduit into the receptacle on the back of the cable feeder. Slip the tee (supplied with the cable feeder) over the other end of the conduit. Slide a second length of 2" rigid or IMC through the tee. Push the cable feeder and stiff-arm boom up against the reel stands.

*Note: If feeding cable has been removed from the reels, set the stiff-arm boom against a step, curb, door threshold, stake driven into ground, etc.*

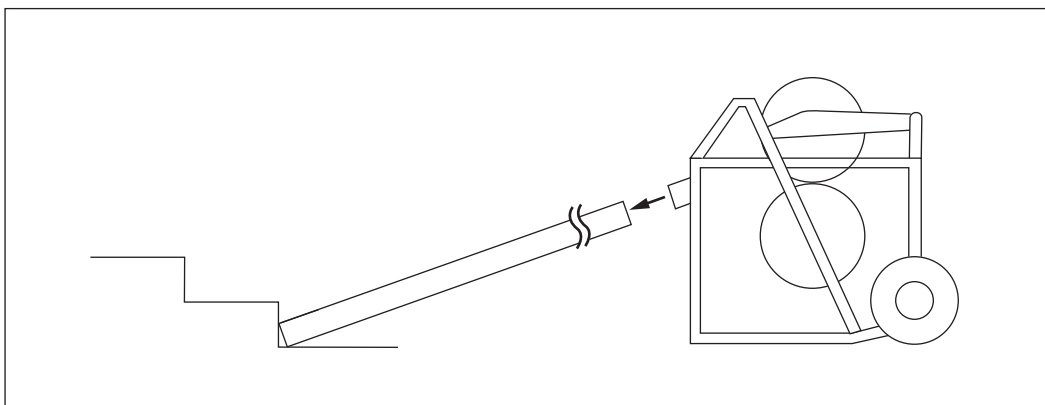
#### Anchor Method

Use 3/8" - 1/2" anchors (purchased separately) through the four anchor pads to stabilize the cable feeder.

#### Stiff-arm Boom Against Reel Stand



#### Stiff-arm Boom Against Step





## Setup (cont'd)

### Loading the Cable Feeder

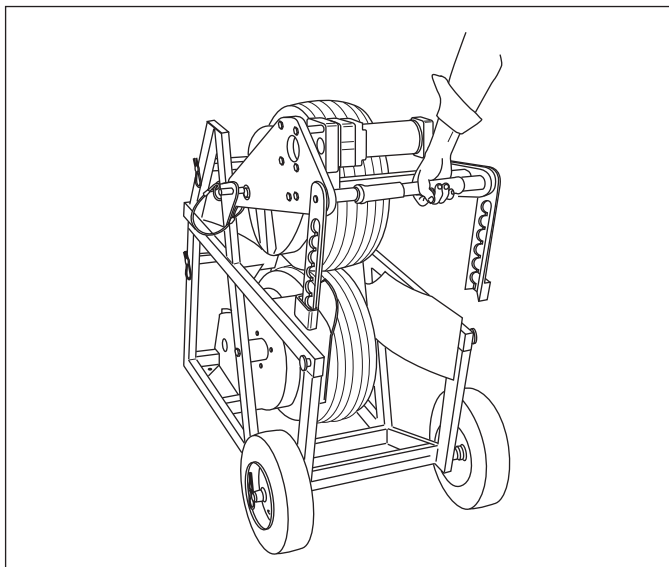
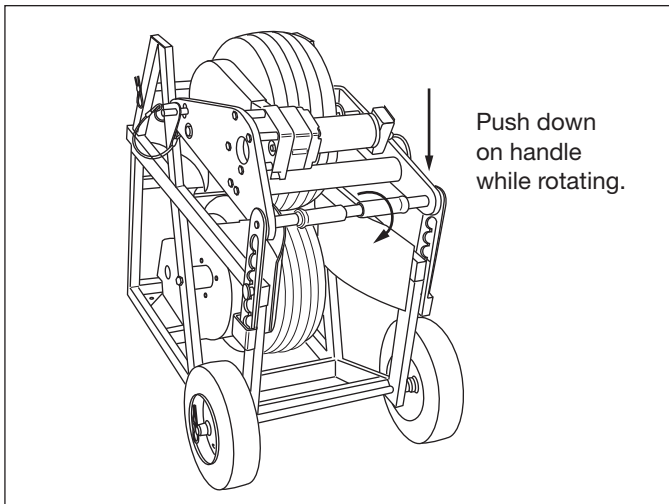
Select either End Loading Method or Side Loading Method. Then proceed to Loading Cable.

#### End Loading Method

### ⚠ CAUTION

Pinch points. Grasp the middle of the handle.  
Failure to observe this precaution may result in injury.

1. Release the ratchet mechanism by pushing down on the upper drive handle while rotating the top of the handle toward you.
2. Lift and pivot the upper drive unit back until it contacts the stops.
3. Rotate the cable divider out and up.



#### Side Loading Method

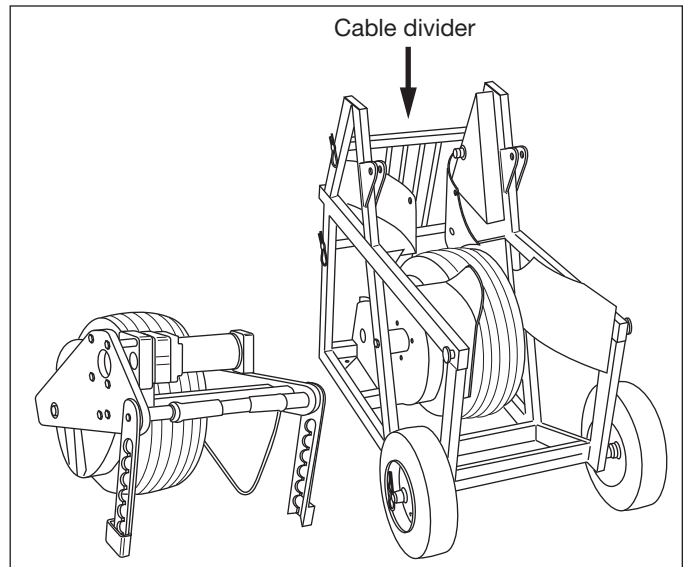
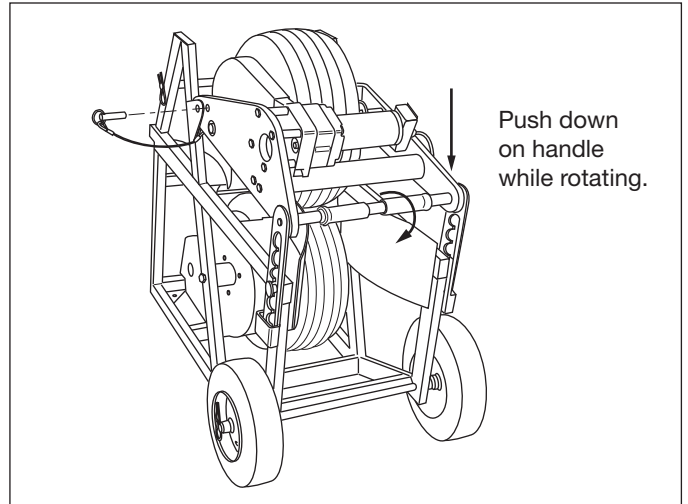
1. Release the ratchet mechanism by pushing down on the upper drive handle while rotating the top of the handle toward you.
2. Remove the two clevis pins.
3. Unplug the upper drive unit motor.

### ⚠ CAUTION

The upper drive unit is heavy and requires more than one person to lift.

Failure to observe this precaution may result in injury.

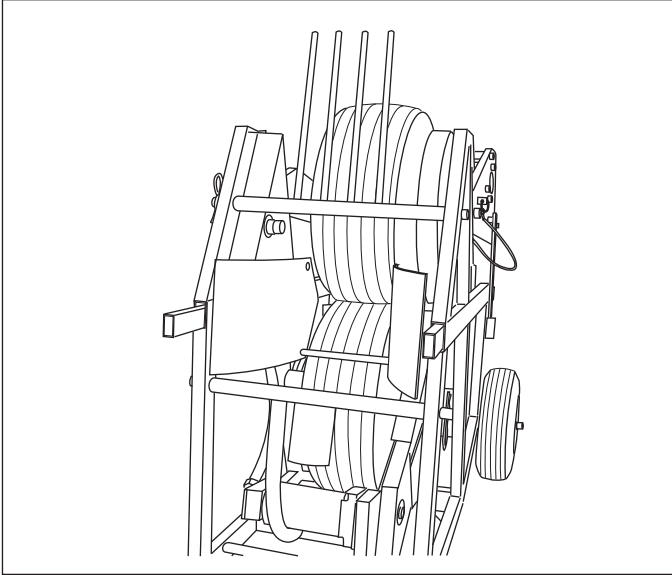
4. Lift the upper drive unit out of the cable feeder.
5. Remove the cable divider.



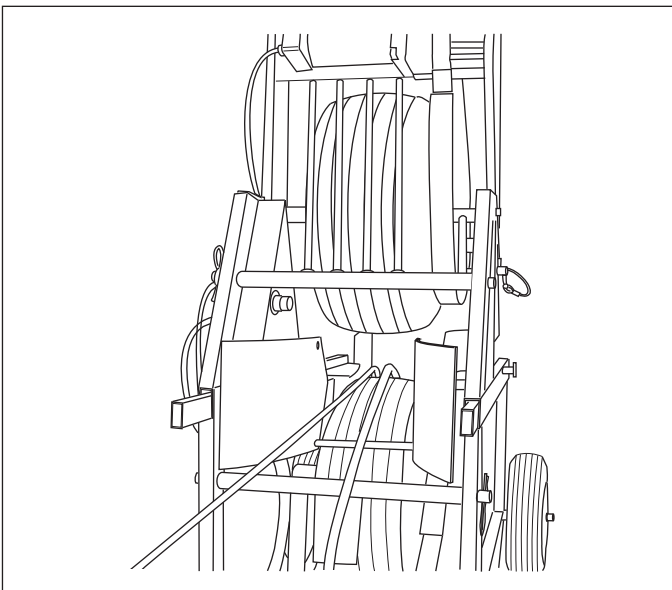
## Setup (cont'd)

### Loading Cable

1. Rotate the ground separator out and down.

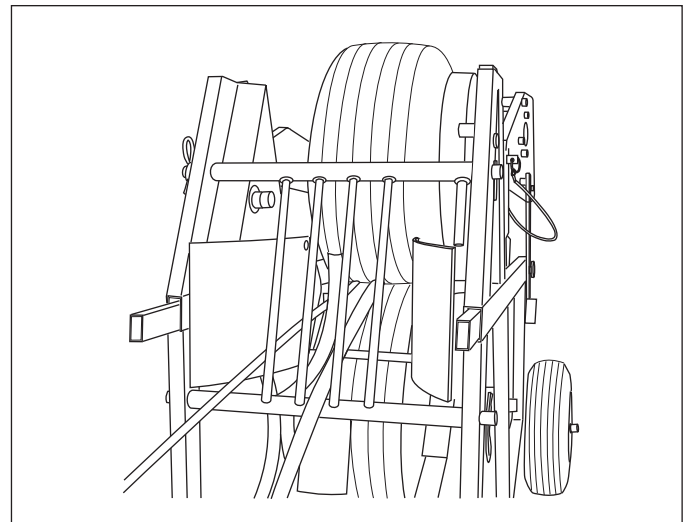


2. Feed the cables over the lower traction wheel.
  - Do not cross the cables.
  - If pulling a smaller diameter ground cable, feed it in at the leftmost side of the cable feeder.



3. Lower or remount the upper drive unit by lifting up on the catch located near the clevis pin on the control box side of the unit while lowering the upper drive unit.
4. Push down on the ratchet handle with a moderate amount of force. Engage the catches.
5. Rotate the ground separator and cable divider into place, if desired. If pulling more than five cables, place two cables in one section of the cable divider. Make sure the cable divider is fully seated against the Stiff Arm Shaft.

*Note: If pulling cable larger than 600-volt 1000 MCM, do not use the cable divider.*

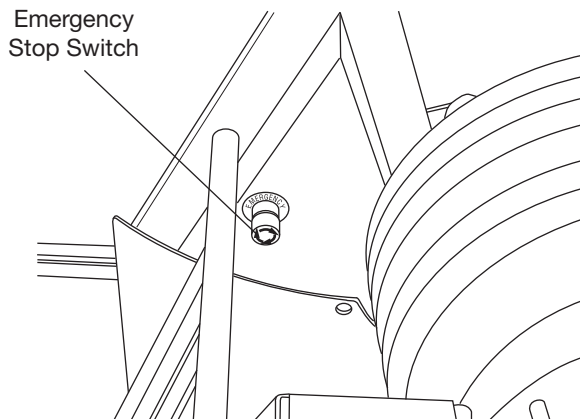


## Operation

1. Be sure the main power switch is OFF.
2. Plug the cable feeder into the power source.  
*Note: If using Greenlee Model 445 Foot Switch, plug the cable feeder into the foot switch. Then plug the foot switch into the power source.*
3. Turn the speed control knob to the 10 o'clock or 11 o'clock position.
4. Turn the cable feeder ON by doing one of the following:
  - Press the momentary switch on the pendant control.
  - Turn on the main switch.
  - Turn on the main switch and press down on the foot switch.
5. Rotate the knob on the control box:
  - clockwise to increase speed
  - counterclockwise to decrease speed

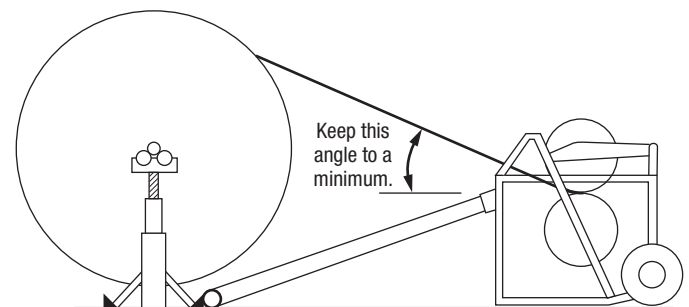
When the pull is finished, turn the main power switch OFF.

*Note: You can turn off the cable feeder at any time by pressing the red emergency stop switch. To reset it, twist it clockwise.*



## Tips for Trouble-free Operation

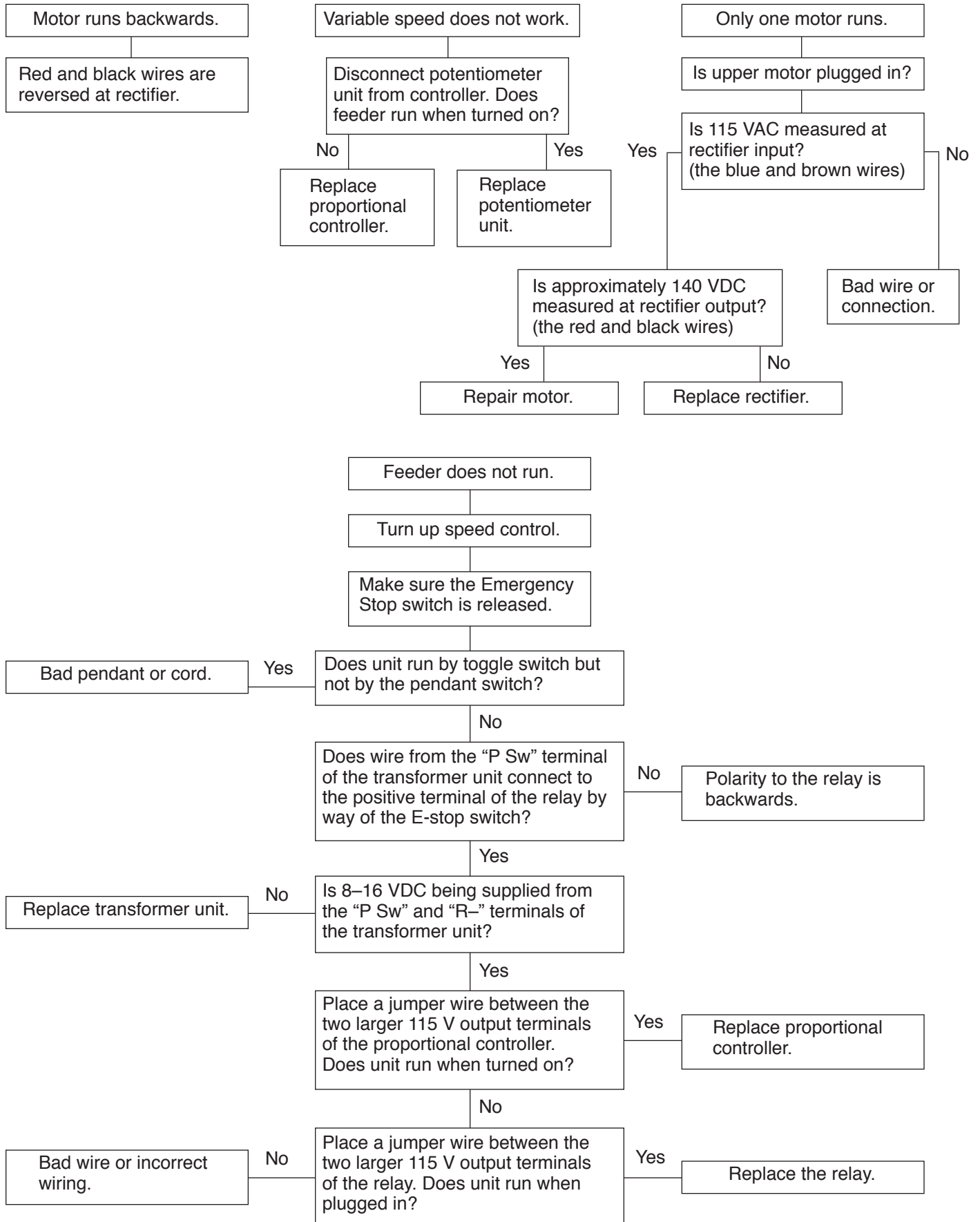
- Take up slack between the reels and the cable feeder before starting the pull.
- Start at a slow setting.
- Switch the cable feeder on and off as little as possible during the pull. Use the speed control to match the puller's speed.
- Use the speed control to prevent the cable between the cable feeder and the conduit from becoming taut. Allow that portion of cable to remain slack.
- If pulling a smaller diameter cable, the tires will contact it at a larger radius than the other cables. This may cause the ground cable to feed out faster than the other cables. To compensate for this, pull the ground cable back as follows:
  - (1) Increase the speed until you have built up a 15-second buffer of cable slack.
  - (2) Loosen the ratchet mechanism and pull back the extra ground cable.
  - (3) Tighten the ratchet. Return the feeder to its previous speed and continue pulling.
- If the ground cable slips excessively, place it and the next cable between the first and second bars of the cable divider. Place the other cables to the right.
- If any of the incoming cables approaches the cable feeder at too steep an angle, the cable feeder may lift upward. If this happens, move the feeder away from the reels, anchor the feeder to the ground, or feed the cable from underneath the reels.



## Troubleshooting

| <b>Problem</b>   | <b>Probable Cause</b>                             | <b>Probable Remedy</b>  |
|--|---|---|
| Will not run.  | Speed control off.                                | Turn speed control clockwise.   |
|  | E-stop engaged.                                   | Twist switch button clockwise to reset.   |
| Cables slip.   | Too little pinching force.                        | Engage ratchets another notch.  |
|  | Too little tire pressure.                         | Inflate tires to maximum recommended pressure listed on tire sidewall.  |
|  | Upper drive unit unplugged.                       | Plug in upper drive unit.   |
|  | Reel(s) hanging up or dragging.                   | Inspect cable reels for free unobstructed operation.  |
| Motor runs, but tire does not turn.                    | Broken chain.                                     | Replace.  |
| Front end of feeder lifts off ground during operation. | Angle of cable from reels to feeder is too steep. | Use longer stiff-arm boom to place feeder further from reel(s) and reduce angle. Anchor feeder to ground. Feed cable(s) from under reels. |

**Troubleshooting (cont'd)**



## Service

### Upper Drive Chain Removal

Pry off the edge guard (26). Remove the 4 screws securing the chain guard (22) and insert guard (25) that are in line with the 4 holes in the motor mount arm. Pull the chain guard out towards the motor mount arm. Slowly run the feeder until the chain-connecting link is accessible in the space between the tire and the upper motor guards. Turn off and unplug the feeder. Pry off the connecting link C-clip and remove the link. Pull the chain away from the motor sprocket and remove.

Reassemble in the reverse order noting the following: The 2 legs of the chain will straddle the single stand off that is directly between the 2 sprockets. Loosening the 4 bolts that attach the motor may ease fitting the new connecting link. The C-clip should be placed so the open end faces away from the direction of travel (counter-clockwise rotation).

### Lower Drive Chain Removal

Remove the 2 screws securing the insert guard (25), the 5 screws securing the chain guard (22) and the 4 screws securing the lower motor guard (27). Slowly run the feeder until the chain-connecting link is accessible in the space between the tire and the frame. Turn off and unplug the feeder. Pry off the connecting link C-clip and remove the link.

Reassemble in the reverse order noting the following: Loosen the 4 bolts that attach the motor and rotate it clockwise. Temporarily retighten one of the top bolts until the chain is fitted and then rotate the motor back until the chain is taut. Retighten the motor bolts. The C-clip should be placed so the open end faces away from the direction of travel (clockwise rotation).

### Motor Drive Sprocket Removal

Remove the drive chain. Loosen the 2 set screws that secure the sprocket. Pull off the sprocket and key.

Reassemble in the reverse order noting the following: Locate the sprocket with the hub facing outwards and the inside face of the sprocket about 1/4" from the upper motor guard or lower motor mounting plate.

### Upper Motor Removal

Unplug the upper motor. Remove the upper drive chain. Remove the 4 bolts attaching the upper motor while supporting the motor. Remove the motor (28), motor guard (21), short standoffs (15), second motor guard (21), long standoffs (20) and the bolts.

Reassemble in the reverse order.

### Lower Motor Removal

Remove the lower drive chain. Remove the 4 bolts attaching the motor (28) and pull out the motor. Remove the 4 screws attaching the motor electrical box (41) and pull off the box. Pull off the red and black motor leads from the rectifier. Remove the screw (47), nut (48) and lock washer (49) securing the ground wires.

Reassemble in the reverse order noting the following: The lock washer is placed against the electrical box. Before attaching the electrical box, make sure the motor is oriented properly. Inserting the motor mount screw through the frame hole first will make aligning the 3 other screws easier.

### Rectifier Removal

Remove the 4 screws attaching the motor electrical box (41) and pull off the box. Remove the 4 leads to the rectifier. Remove the screw (61) and nut (62) attaching the rectifier (46).

Reassemble in the reverse order noting the following: On the upper motor the black wire connects to the positive terminal of the rectifier and the red wire connects diagonally opposite. On the lower motor, the red wire connects to the positive terminal of the rectifier and the black wire diagonally opposite. The positive terminal of the rectifier is the one 90° different that the other 3. The blue and brown wires are interchangeable on the remaining 2 terminals.

### Control Unit Removal

Unplug the upper motor. Remove the lower motor electrical box as described in rectifier removal. Unplug the blue and brown wires from the rectifier and disconnect the ground wires. Remove the 6 screws securing the control unit. Pull out the top of the control unit. Remove the 2 black wires from the emergency stop switch by loosening the set screws and pulling out the wires. Remove the control unit.

Reassemble in the reverse order.

(If replacing individual components of the control unit, pay close attention to the proper wiring shown in the electrical diagrams, especially the polarity of the low voltage connections at the relay.)

### Main Electrical Box Removal

Remove the control unit. (The wires to the lower motor can be disconnected at the control unit instead of at the lower motor to save effort.) Unscrew the nut attaching the flexible conduit to the electrical box and pull the conduit away. Pull out the electrical box while lifting it up and keeping it square to the frame. Pull off the contact assembly from the emergency stop switch. Unscrew the lock nut and remove the switch.

Reassemble in the reverse order.

### Upper Traction Wheel Removal

Remove the upper drive unit from the feeder. Remove the 3 screws that attach the bearing retainer (16) to the arm (3). Remove the 2 bolts securing the arm to the cross bar (14). Pull the arm off the axle bearing and rotate it out of the way. Remove the 4 flat head screws attaching the wheel and lift off the wheel.

Reassemble in the reverse order.

## Service (cont'd)

### Lower Traction Wheel Removal

Raise or remove the upper drive unit. Remove the 6 screws and nuts attaching the cable guide weldments (38) to the frame. Loosen but do not remove the 4 flat head screws attaching the traction wheel. Remove the lower drive chain. Remove the 2 bolts that attach the traction wheel assembly while supporting the wheel to prevent thread damage. Remove the wheel assembly. Remove the 4 flat head screws attaching the wheel and lift off the wheel.

Reassemble in the reverse order noting the following: Before tightening the 1/2" bolt on the sprocket side of the feeder, fully assemble all the guards.

### Upper Axle Bearing Replacement

Remove the upper drive unit. Remove the 3 screws that attach the bearing retainer (16) to the arm (3). Remove the 3 screws that attach the bearing retainer (16) to the motor mount arm (4). Remove the upper drive chain. Pull the wheel assembly off the motor mount arm. If desired, the wheel (1) and chain guard (22) can be removed. Remove the retaining rings. Press the axle out of the bearings (34).

Reassemble in the reverse order noting the following: If the guard carrier weldment (23) and thrust bearing (24) were removed, they must be reinstalled before the bearings are pressed on. Always use new bearings.

Do not pound or press on the outside of the bearing, only contact the inner race. In a pinch, an axle spacer (37) can be used for fully seating the bearings. Before setting the axle with bearing into the motor mount arm, make sure the chain guard is correctly oriented towards the motor; the standoffs will interfere with rotating the guard into position afterwards.

### Lower Axle Bearing Replacement

Remove the lower traction wheel assembly as described in lower traction wheel removal. Remove the bearing housing weldment (2) and bearing housing (18). Press the axle out of the bearings (34).

Reassemble in the reverse order noting the following: Always use new bearings. Do not pound or press on the outside of the bearing, only contact the inner race. In a pinch, an axle spacer (37) can be used for fully seating the bearings.

### Ratchet Weldment Removal

Remove the 2 bolts that attach the right ratchet weldment (30) and left ratchet weldment (31) to the arm handle shaft (9).

Reassemble in the reverse order noting the following: Use the catches on the frame that the ratchet weldments normally latch onto to align the ratchets when tightening the bolts to assure they are parallel.

### Caster Wheel Disassembly

Remove the 2 cotter pins securing the frame shafts

(60) to the frame. Pull out the shafts. Lift up the feeder and remove the caster wheel assembly from underneath. Remove 1 cotter pin from the arm weldment (55) and remove the lead shaft (58) and the arm weldment. Remove 1 bolt and washer securing the lead arm weldment (57) and remove the trailing shaft (59) and lead arm weldment. Remove the 4 nuts and bolts attaching the caster wheel (54) to the plate weldment (56).

Reassemble in the reverse order noting the following: The caster wheel (54) mounts on the same side of the plate weldment (56) as the welded tubes. The arm weldment (55) attaches to the plate weldment tube closest to the caster wheel. The lead arm weldment (57) attaches to the other tube oriented as shown in the parts breakdown. The lead arm weldment attaches to the inner most set of holes in the frame.

### Commutator Brush Replacement

Remove the motor. Remove the motor electrical box. Mark a line between the commutator end assembly (28) and the magnet housing (24) for future alignment. Remove the 2 nuts (27) securing the commutator end and pull off the end bell. Note the orientation of the red and black wires to the brushes. Remove wire strain relief. Remove the commutator brushes (29 and 30).

Reassemble in the reverse order noting the following: Orient the brushes as before for proper polarity. The end of the brush with the wire attached fits into the brush holder first with the wire exiting outward. Make sure the commutator will not contact the brush wires. Hold the commutator brushes back while the end assembly is fitted over the armature bearing. Make sure your previous alignment marks are aligned before tightening the nuts.

### Armature Replacement

Remove the commutator end assembly as described in commutator brush replacement. Remove the magnet housing. Remove the armature (22).

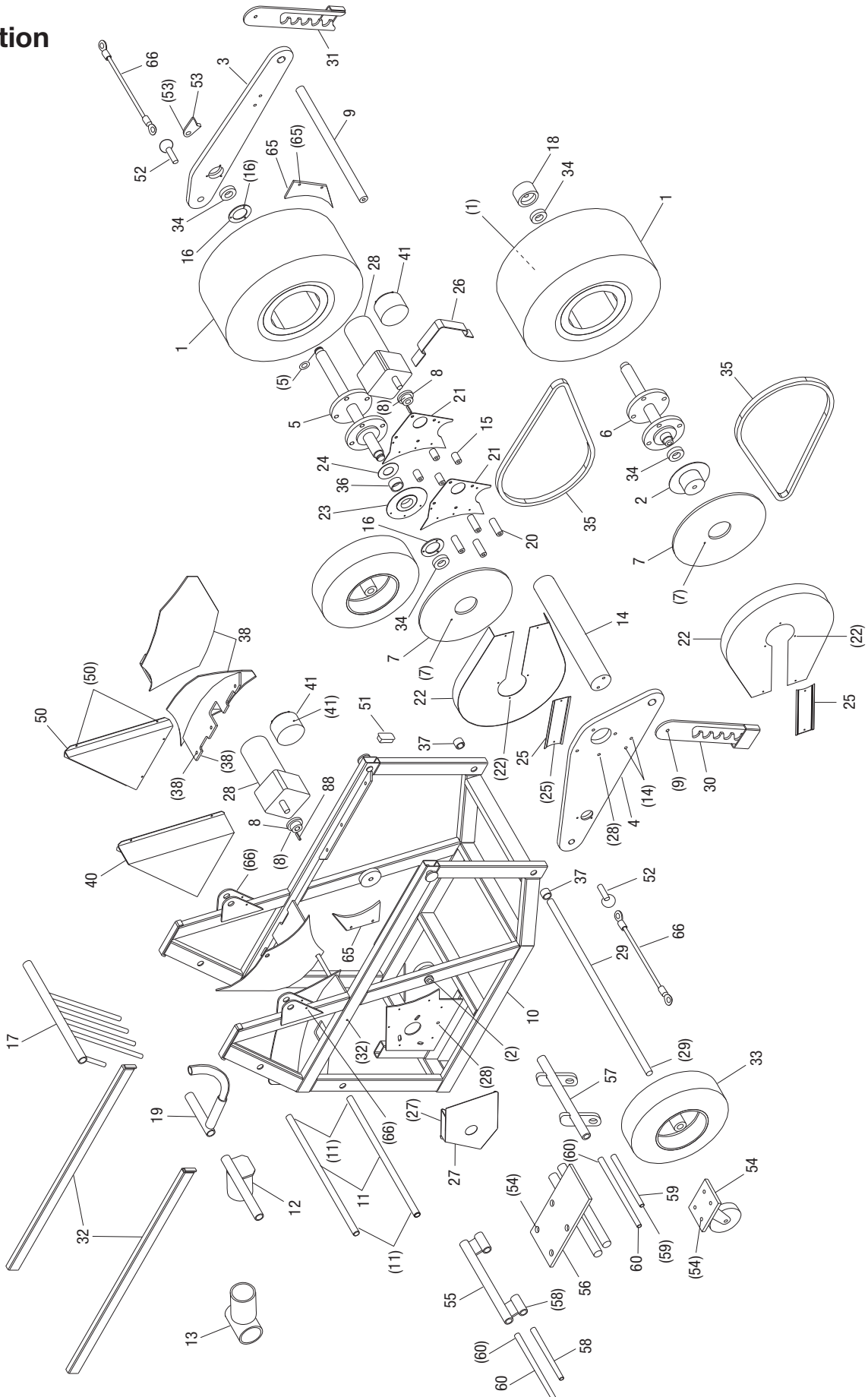
Reassemble in the reverse order noting the following: If removed, fit the bevil washers so they contact each other at their inside diameter. Make sure one of the mounting studs passes through the alignment slot between the magnets when replacing the magnet housing.

### Gearbox Disassembly

Remove the armature. Remove the sprocket. Remove the 4 hex socket cap screws (16). Separate the 2 halves of the gearbox. Pull out the 1st stage reduction (15). Pull out the 2nd stage reduction (17). Press out the output shaft assembly (7). Remove the snap ring (12). Drive out the ball bearing (13). Use a blind hole bearing puller to remove any defective needle bearings (4, 5 and 14).

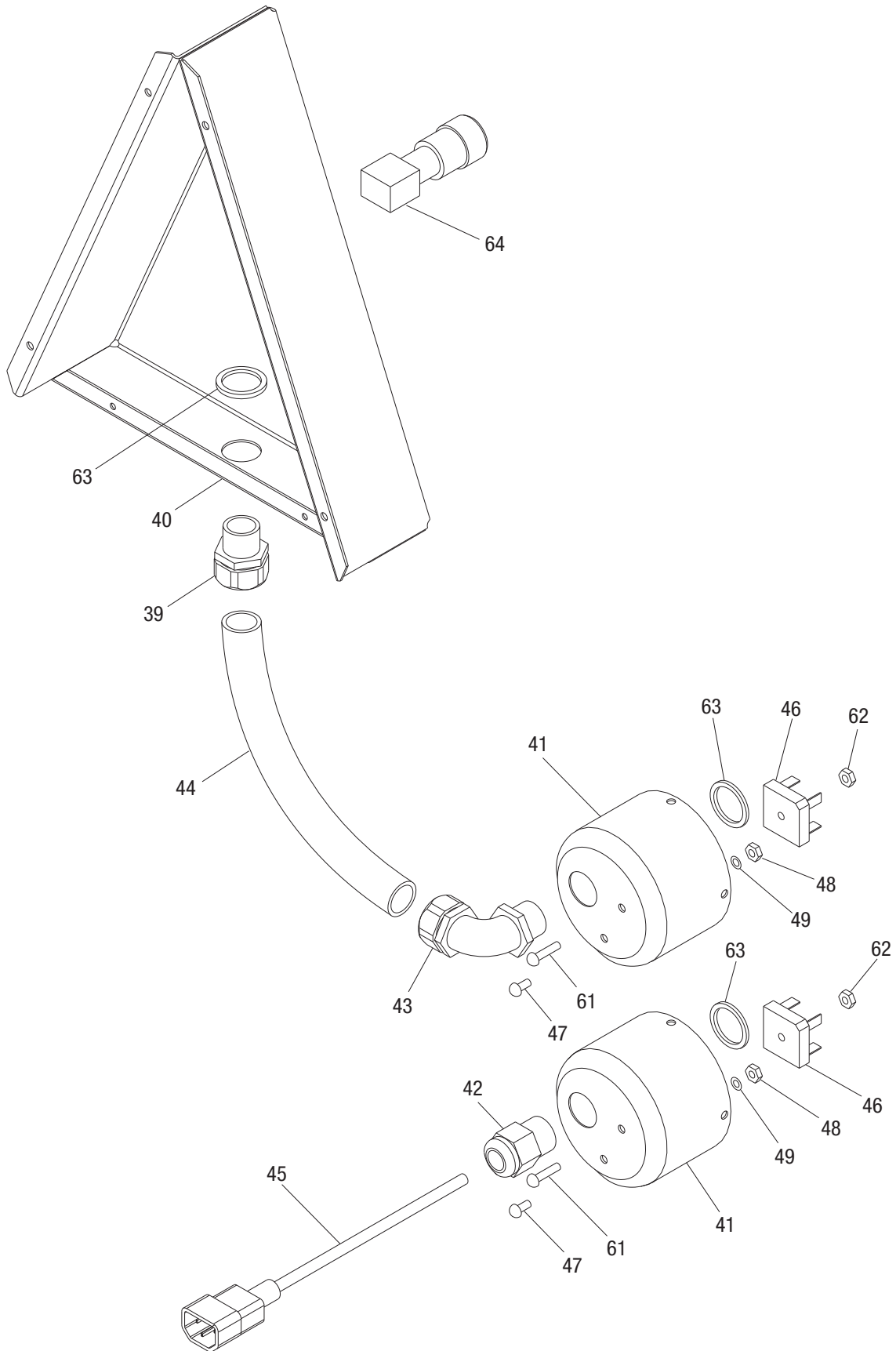
Reassemble in the reverse order noting the following: Replace any needle bearings that have been removed with new ones.

**Illustration**





**Illustration—Motor Box**



**Parts List**

| Key  | Part No. | Description  | Qty |
|------|----------|--|-----|
| 1    | 50055895 | Wheel unit, traction .....                                   | 2   |
| (1)  | F015972  | Screw, 1/2"-20 UNF x 1.00 lg. flat head socket.....          | 8   |
| 2    | 50055909 | Bearing housing weldment .....                               | 1   |
| (2)  | 90551141 | Screw, 1/2"-20 UNF x 2.50 lg. hex head .....                 | 2   |
| 3    | 50055950 | Arm.....   | 1   |
| 4    | 50055976 | Arm, motor mount.....  | 1   |
| 5    | 50055992 | Upper axle unit.....   | 1   |
| (5)  | 90551133 | Retaining ring, Waldes Tru-Arc #5100-78 .....                | 2   |
| 6    | 50056085 | Lower axle unit.....   | 1   |
| 7    | 50056093 | Sprocket, 72 tooth .....                                     | 2   |
| (7)  | 90551931 | Screw, 1/2"-20 UNF x 1.00 lg. button head.....               | 8   |
| 8    | 50056115 | Sprocket, 10 tooth .....                                     | 2   |
| (8)  | 90508815 | Screw, 1/4"-28 UNF x .25 lg. cup point socket set .....      | 2   |
| 9    | 50056131 | Shaft, arm handle.....                                       | 1   |
| (9)  | 90504542 | Screw, 3/8"-24 UNF x 1.00 lg. hex head .....                 | 2   |
| 10   | 50056204 | Frame weldment .....   | 1   |
| 11   | 50056395 | Shaft, stiff arm.....  | 2   |
| (11) | 90503023 | Hitch pin.....   | 2   |
| (11) | 90507002 | Roll pin, 3/16" x 1.50 lg.....                               | 2   |
| 12   | 50056409 | Stiff arm weldment.....                                      | 1   |
| 13   | 50056450 | Tee weldment .....   | 1   |
| 14   | 50056468 | Cross bar, arm.....  | 1   |
| (14) | 90505247 | Screw, 5/16"-18 UNC x 1.50 lg. hex head.....                 | 4   |
| 15   | 50056476 | Stand-off, short.....  | 4   |
| 16   | 50056484 | Retainer, bearing .....                                      | 2   |
| (16) | 90551150 | Screw, #10-24 UNC x .37 lg. hex head cap.....                | 6   |
| 17   | 50056492 | Divider weldment .....                                       | 1   |
| 18   | 50056522 | Housing, bearing.....  | 1   |
| 19   | 50056530 | Ground separator weldment.....                               | 1   |
| 20   | 50056573 | Stand-off, long .....  | 4   |
| 21   | 50056581 | Guard, upper motor .....                                     | 2   |
| 22   | 50056590 | Guard, chain.....  | 2   |
| (22) | 90516559 | Screw, #10 x .50 lg. self-tapping hex head.....              | 10  |
| 23   | 50056603 | Guard carrier weldment .....                                 | 1   |
| 24   | 50056646 | Thrust bearing.....  | 1   |
| 25   | 50056654 | Guard, insert .....  | 2   |
| (25) | 90516559 | Screw, #10 x .50 lg. self-tapping hex head.....              | 4   |
| 26   | 50056662 | Guard, edge .....  | 1   |
| 27   | 50056670 | Guard, lower motor .....                                     | 1   |
| (27) | 90516559 | Screw, #10 x .50 lb. self-tapping hex head.....              | 4   |
| 28   | 91869200 | Motor.....   | 2   |
| (28) | F010701  | Screw, 5/16"-18 UNC x 4.50 hex head cap (top motor).....     | 4   |
| (28) | 90529324 | Screw, 5/16"-18 UNC x .75 socket head cap (lower motor)..... | 4   |
| 88   | 50056816 | Key, 3/16" square x 1" lg. ....                              | 2   |

**Parts List (cont'd)**

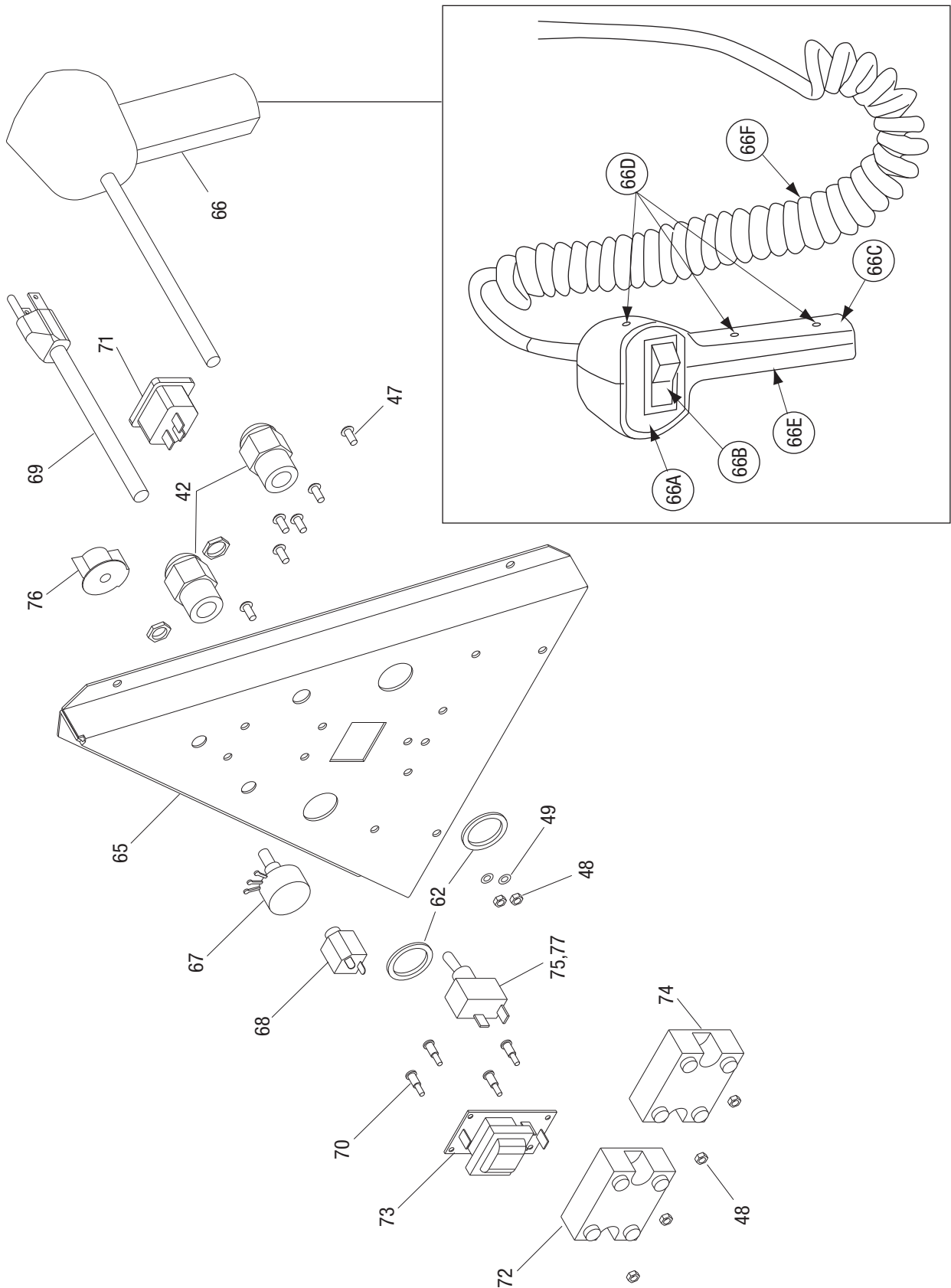
| <b>Key</b> | <b>Part No.</b> | <b>Description</b>                                     | <b>Qty</b> |
|------------|-----------------|--|------------|
| 29         | 50056697        | Axle .....   | 1          |
| (29)       | 90503023        | Hitch pin.....   | 2          |
| 30         | 50056700        | Right ratchet weldment.....                            | 1          |
| 31         | 50056727        | Left ratchet weldment .....                            | 1          |
| 32         | 50063987        | Handle weldment .....                                  | 2          |
| (32)       | 90507002        | Roll pin, 3/16" x 1.50 lg.....                         | 2          |
| 33         | 90548396        | Wheel .....  | 2          |
| 34         | 90551117        | Bearing, Fafnir #204PP.....                            | 4          |
| 35         | 90551095        | Chain, UST #RSD40 Lamda (98 pitches).....              | 2          |
| 36         | 90551125        | Bearing, plastic .....                                 | 1          |
| 37         | 50320262        | Spacer, wheel.....                                     | 2          |
| 38         | 50056220        | Cable guide weldment .....                             | 2          |
| (38)       | 90505220        | Screw, 5/16-18 x 3/4" hex head .....                   | 6          |
| (38)       | 90506383        | Nut, 5/16-18 nut.....                                  | 6          |
| 39         | 90551109        | Connector, flex conduit.....                           | 1          |
| 40         | 50056832        | Box, electrical .....                                  | 1          |
| 41         | 50056859        | Box, motor electrical.....                             | 2          |
| (41)       | 90551150        | Screw, #10-24 UNC x .37 lg. hex head cap.....          | 8          |
| 42         | 90541243        | Strain relief .....                                    | 1          |
| 43         | 91852145        | Elbow, Sealtite .....                                  | 1          |
| 44         | 90545494        | Conduit, Sealtite .....                                | 1          |
| 45         | 50058070        | Cord, motor power.....                                 | 1          |
| 46         | 91859972        | Rectifier .....  | 2          |
| 47         | 90539559        | Screw, #8-32 x 3/8 long button head .....              | 2          |
| 48         | 90524349        | Nut, #8-32 hex .....                                   | 2          |
| 49         | 90516494        | Washer, internal tooth lock.....                       | 2          |
| 50         | 50058142        | Control unit (includes all items on pages 21-23) ..... | 1          |
| (50)       | 90516559        | Screw, #10 x .50 lg. self-tapping hex head.....        | 6          |
| 51         | 90550544        | Plug.....  | 5          |
| 52         | 90550536        | Clevis pin, 3/4 dia. x 1.5 long.....                   | 2          |
| 53         | 50058495        | Catch.....   | 1          |
| (53)       | 90550528        | Screw, 3/8 dia. x 3/8 long shoulder .....              | 1          |
| 54         | 90551273        | Wheel, swivel caster .....                             | 1          |
| (54)       | 90505301        | Screw, 3/8-16 UNC x 1.00 hex head .....                | 4          |

**Parts List (cont'd)**

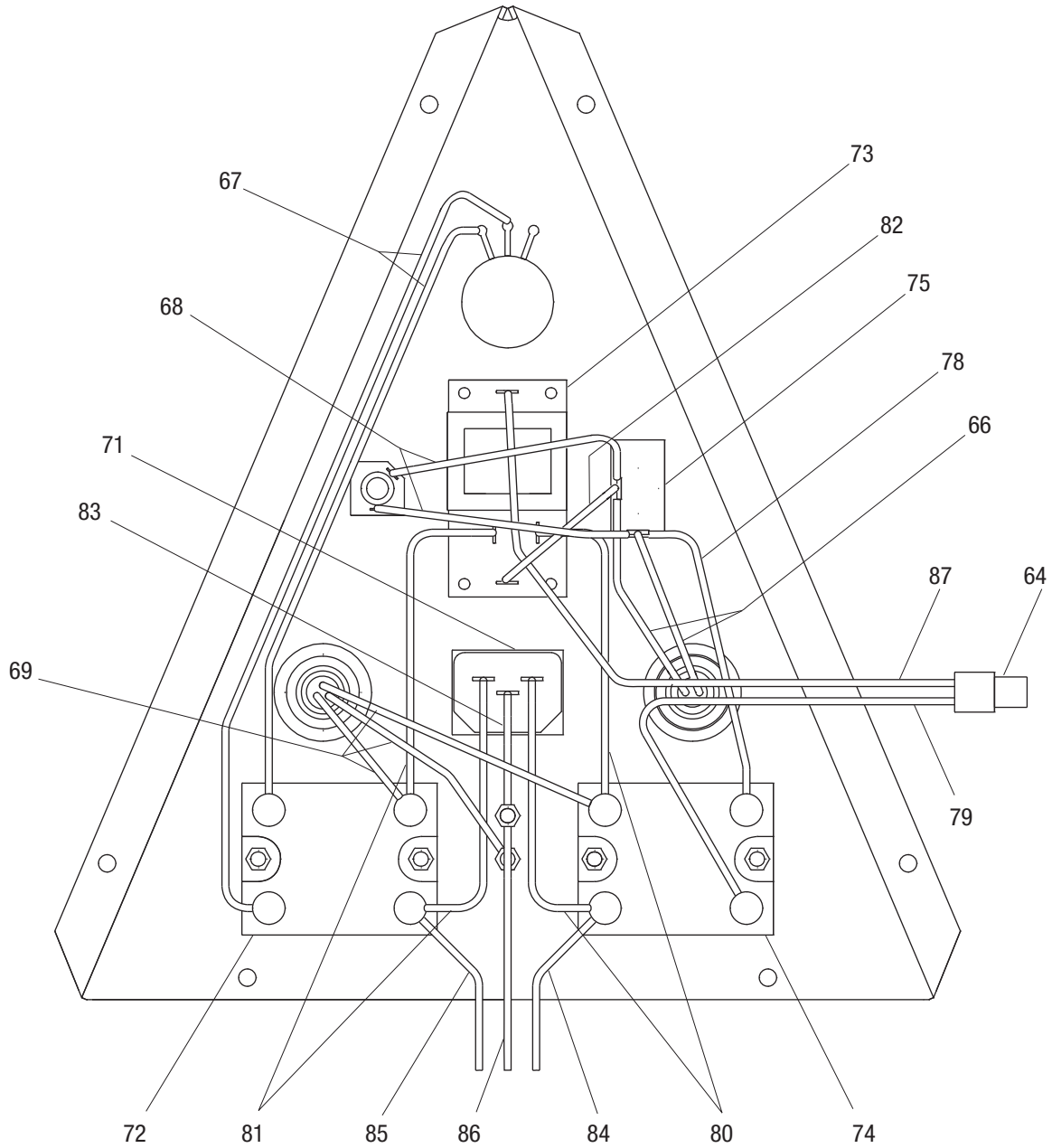
| Key        | Part No. | Description                                     | Qty |
|------------|----------|---|-----|
| (54)       | 90526465 | Nut, 3/8-16 UNC hex lock.....                   | 4   |
| 55         | 50057871 | Arm weldment.....                               | 1   |
| 56         | 50057880 | Plate weldment .....                            | 1   |
| 57         | 50057898 | Lead arm weldment .....                         | 1   |
| 58         | 50057847 | Shaft, lead .....                               | 1   |
| (58)       | 90506553 | Pin, 1/8 cotter .....                           | 2   |
| 59         | 50057855 | Shaft, trailing.....                            | 1   |
| (59)       | 90500598 | Screw, 1/4-20 UNC x .50 hex head .....          | 2   |
| (59)       | 90521250 | Washer, flat.....                               | 2   |
| 60         | 50057910 | Shaft, frame.....                               | 2   |
| (60)       | 90506553 | Pin, 1/8 cotter .....                           | 2   |
| 61         | 90524918 | Screw, #10-24 x 3/4 round head.....             | 2   |
| 62         | 90533453 | Nut, #10-24 .....                               | 2   |
| 63         | 91862639 | Nut, 1/2" conduit lock .....                    | 3   |
| 64         | 50066820 | Switch unit, emergency stop .....               | 1   |
| 65         | 50062883 | Guard, back .....                               | 2   |
| (65)       | 90516559 | Screw, #10 x .50 lg. self-tapping hex head..... | 4   |
| 66         | 50013971 | Lanyard .....                                   | 2   |
| (66)       | 90507002 | Roll pin, 3/16" x 1.50 lg.....                  | 2   |
| 67         | 50069209 | Decal, product name.....                        | 1   |
| 68         | 50069217 | Decal, Greenlee ID .....                        | 1   |
| Not Shown: |          |   |     |
|            | 90527879 | Masterlink, #40 chain.....                      | 1   |
|            | 50057766 | Decal, warning .....                            | 2   |
|            | 50057782 | Decal, E-stop .....                             | 1   |

*Note: Key numbers in parenthesis denote unshown hardware used to attach items of the same key number.*

**Illustration—Control Unit**



**Control Unit Wiring**



**Parts List—Control Unit**

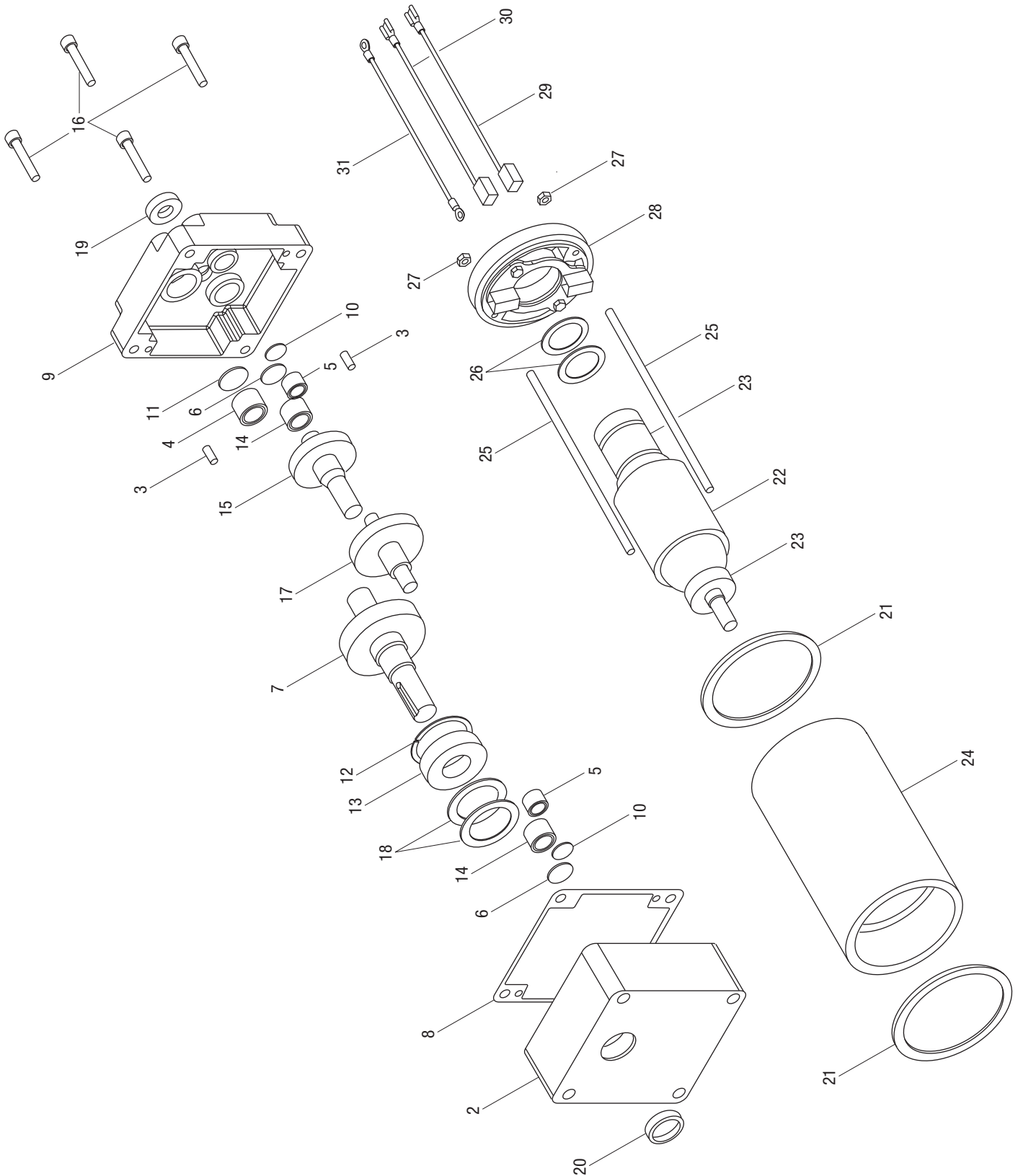
| Key | Part No. | Description                               | Qty |
|-----|----------|---|-----|
| 42  | 90541243 | Strain relief .....                       | 2   |
| 47  | 90539559 | Screw, #8-32 x 3/8 long button head ..... | 6   |
| 48  | 90524349 | Nut, #8-32 hex .....                      | 6   |
| 49  | 90516494 | Washer, internal tooth lock.....          | 2   |
| 62  | 91862630 | Nut, 1/2" conduit lock.....               | 2   |
| 64  | 50066820 | Switch unit, emergency stop .....         | 1   |
| 65  | 50056840 | Panel, electrical.....                    | 1   |
| 66  | 50323636 | Pendant unit.....                         | 1   |
| 66A | 50323709 | Faceplate decal.....                      | 1   |
| 66B | 91862655 | Switch .....                              | 1   |
| 66C | 50319027 | Handle, right half.....                   | 1   |
| 66D | 90534417 | Self-tapping screw, #6-20 x 5/8" .....    | 3   |
| 66E | 50319019 | Handle, left half.....                    | 1   |
| 66F | 50323628 | Cord .....                                | 1   |
| 67  | 50058096 | Potentiometer unit (with wires).....      | 1   |
| 68  | 50058100 | Phone jack unit (with wires) .....        | 1   |
| 69  | 50058088 | Cord, power .....                         | 1   |
| 70  | 91869196 | Stand-off .....                           | 4   |
| 71  | 91869170 | Outlet, upper motor.....                  | 1   |
| 72  | 91869188 | Controller .....                          | 1   |
| 73  | 50337335 | Transformer unit.....                     | 1   |
| 74  | 91862922 | Relay .....                               | 1   |
| 75  | 91863198 | Switch .....                              | 1   |
| 76  | 90541510 | Knob.....                                 | 1   |
| 77  | 91868904 | Ring, locking .....                       | 1   |
| 78  | 50056867 | Wire, black switch-relay.....             | 1   |
| 79  | 50057995 | Wire, black relay-estop switch.....       | 1   |
| 80  | 50058002 | Wire, brown outlet.....                   | 2   |
| 81  | 50058045 | Wire, blue outlet.....                    | 2   |
| 82  | 50058053 | Wire, black switch-transformer.....       | 1   |
| 83  | 50058061 | Wire, green/yellow outlet ground .....    | 1   |
| 84  | 50058116 | Wire, brown motor .....                   | 1   |
| 85  | 50058126 | Wire, blue motor.....                     | 1   |
| 86  | 50058134 | Wire, green/yellow motor ground.....      | 1   |
| 87  | 50057804 | Wire, black trans-estop switch .....      | 1   |

## Not Shown:

|          |                         |   |
|----------|-------------------------|---|
| 50057774 | Decal, control box..... | 1 |
|----------|-------------------------|---|

*Note: Key numbers in parenthesis denote unshown hardware used to attach items of the same key number.*

**Illustration—Motor Breakdown**

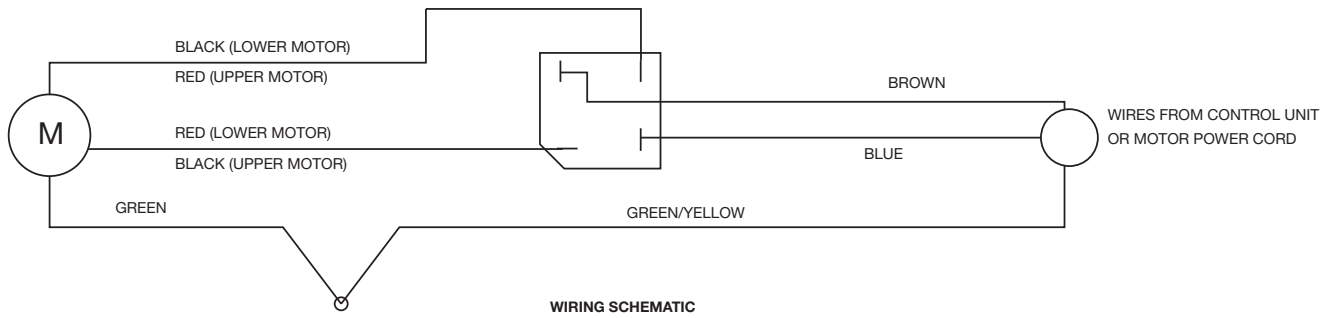
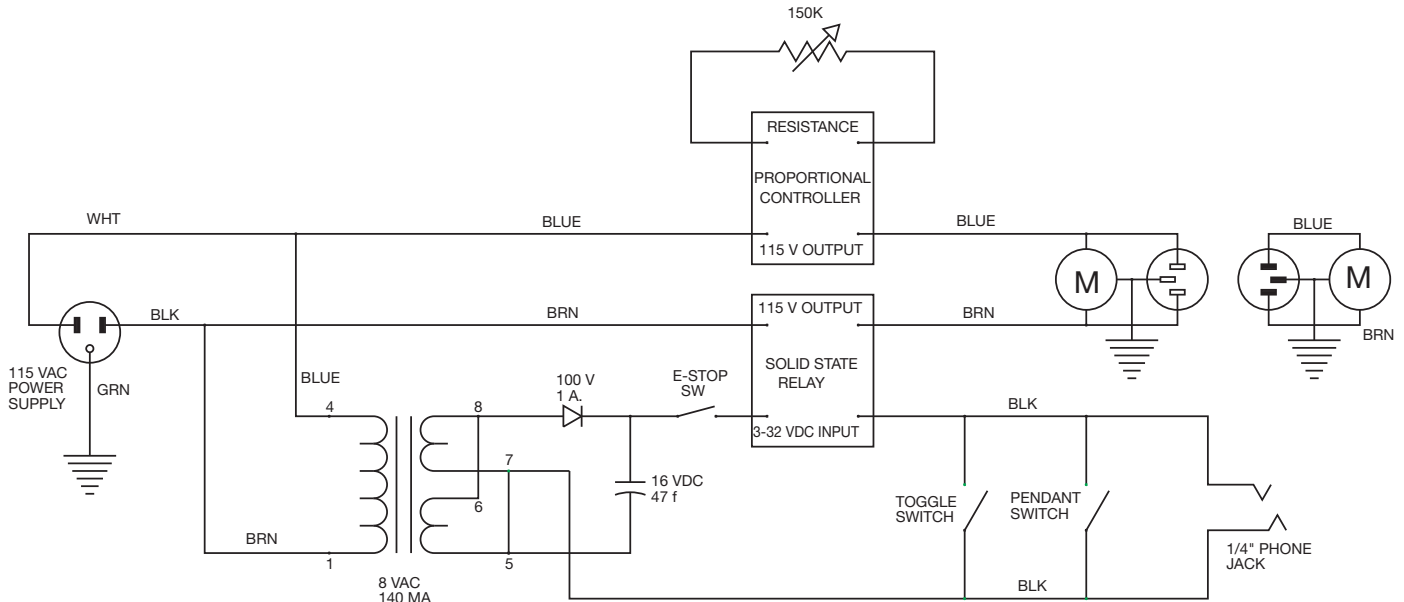




**Parts List—Motor Breakdown**

| Key | Part No. | Description                                  | Qty |
|-----|----------|--|-----|
| 1   | 91869412 | Gearbox assembly (includes keys 2–20).....   | 1   |
| 2   | 52024077 | Output gear housing .....                    | 1   |
| 3   | 52024078 | Dowel pin .....                              | 2   |
| 4   | 90551621 | Needle bearing .....                         | 1   |
| 5   | 90551630 | Needle bearing .....                         | 2   |
| 6   | 90551648 | Thrust washer .....                          | 2   |
| 7   | 91869439 | Output shaft assembly .....                  | 1   |
| 8   | 91869447 | Gasket.....                                  | 1   |
| 9   | 91869455 | Input gear housing .....                     | 1   |
| 10  | 90551656 | Thrust washer .....                          | 2   |
| 11  | 90551664 | Thrust washer .....                          | 1   |
| 12  | 52024079 | Snap ring.....                               | 1   |
| 13  | 52024080 | Ball bearing .....                           | 1   |
| 14  | 90551699 | Needle bearing .....                         | 2   |
| 15  | 91869463 | Gear, first stage.....                       | 1   |
| 16  | 90551702 | Screw, 1/4-20.....                           | 4   |
| 17  | 91869471 | Gear, second stage.....                      | 1   |
| 18  | 52024081 | Bevil washer.....                            | 2   |
| 19  | 90551729 | Oil seal .....                               | 1   |
| 20  | 52024059 | Oil seal .....                               | 1   |
| 21  | 91869480 | Gasket.....                                  | 2   |
| 22  | 91869498 | Armature assembly (includes bearings).....   | 1   |
| 23  | 90551745 | Ball bearing .....                           | 2   |
| 24  | 91869501 | Magnet housing .....                         | 1   |
| 25  | 90551753 | Studs.....                                   | 2   |
| 26  | 90551761 | Bevil washer.....                            | 2   |
| 27  | 90551770 | Nut, hex head.....                           | 2   |
| 28  | 91869510 | Commutator end assembly (with brushes) ..... | 1   |
| 29  | 91869528 | Positive commutator brush wire .....         | 1   |
| 30  | 91869536 | Negative commutator brush wire.....          | 1   |
| 31  | 91869544 | Ground wire unit.....                        | 1   |

**Wiring Schematic**



WIRING SCHEMATIC



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