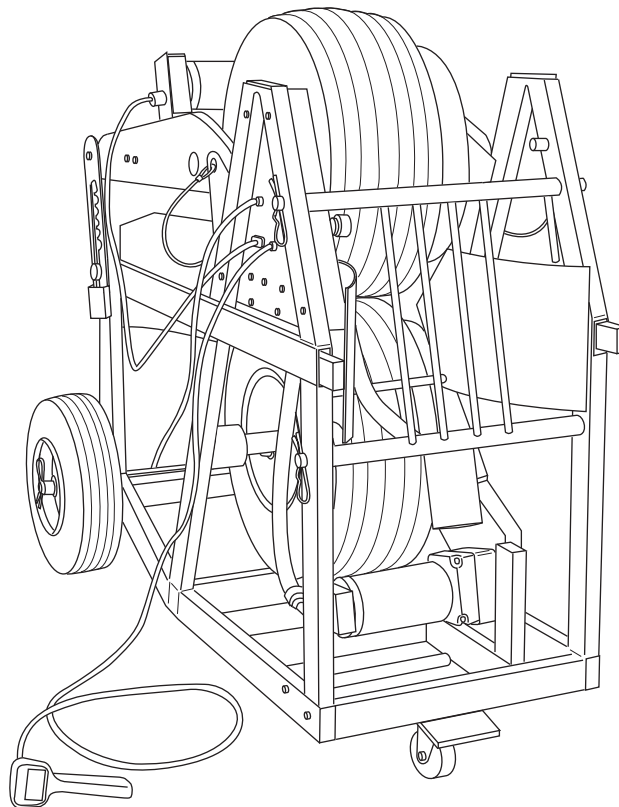


# INSTRUCTION MANUAL



## 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)

## Table of Contents

Description .....	2
Safety .....	2
Purpose of this Manual .....	2
Important Safety Information .....	3-4
Identification .....	5
Specifications .....	5
Features .....	6
Transportation .....	6
Setup .....	7-10
Positioning the Cable Feeder and Cable Reels .....	7
Securing the Cable Feeding System .....	8
Loading the Cable Feeder .....	9
Loading Cable .....	10
Operation .....	11
Tips for Trouble-free Operation .....	11
Troubleshooting .....	12-13
Service .....	14-15
Illustrations and Parts Lists .....	16-25
Wiring Schematic .....	26

## 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 Tools, 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**

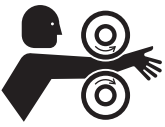
Read and understand all of the instructions and safety information in this manual before operating or servicing this tool.


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>	

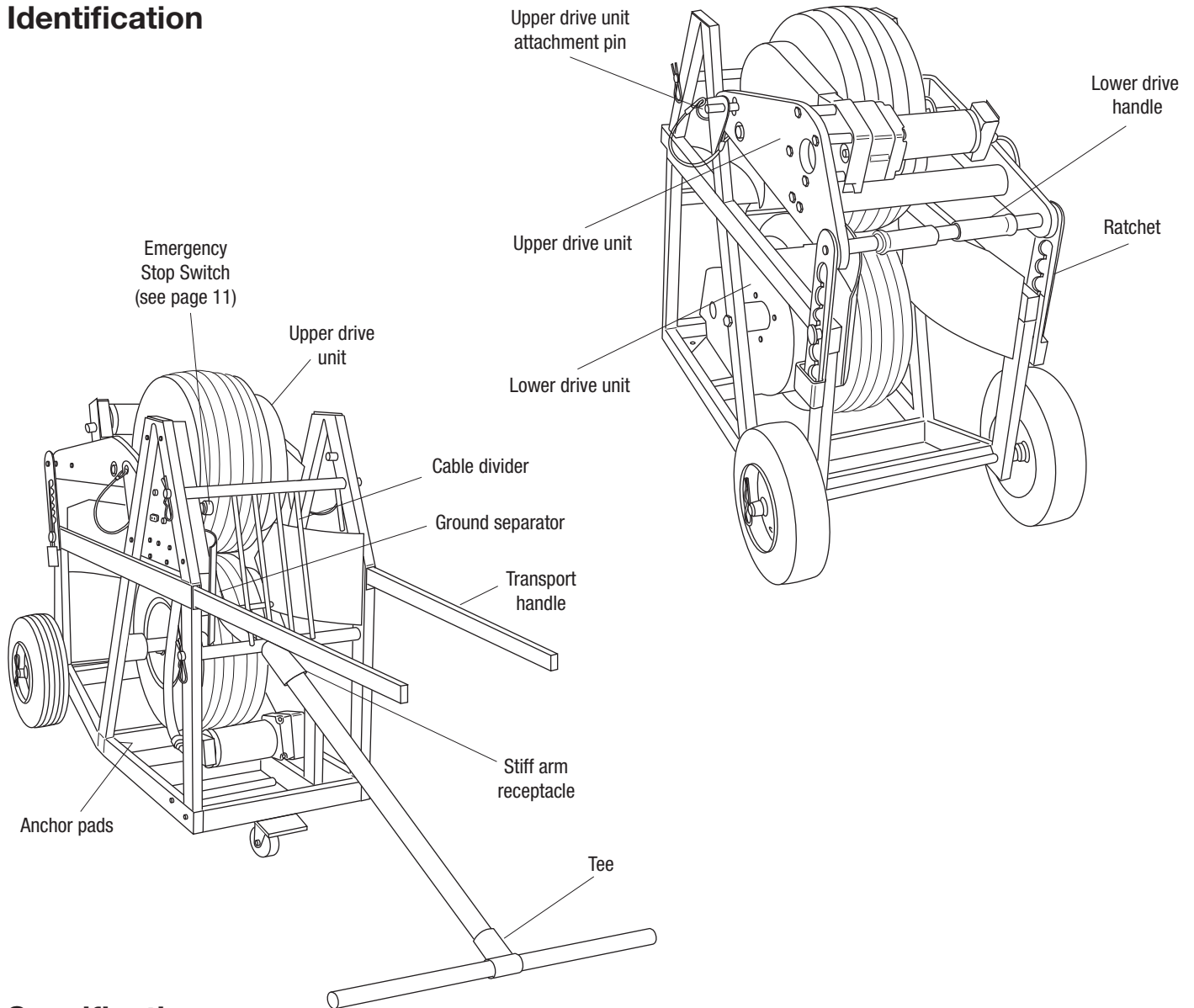
	<b>⚠ WARNING</b>
<p>This device contains no brake mechanism. Do not use as a cable brake or to raise or lower loads. A runaway condition could occur resulting in severe injury or death.</p>	

<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

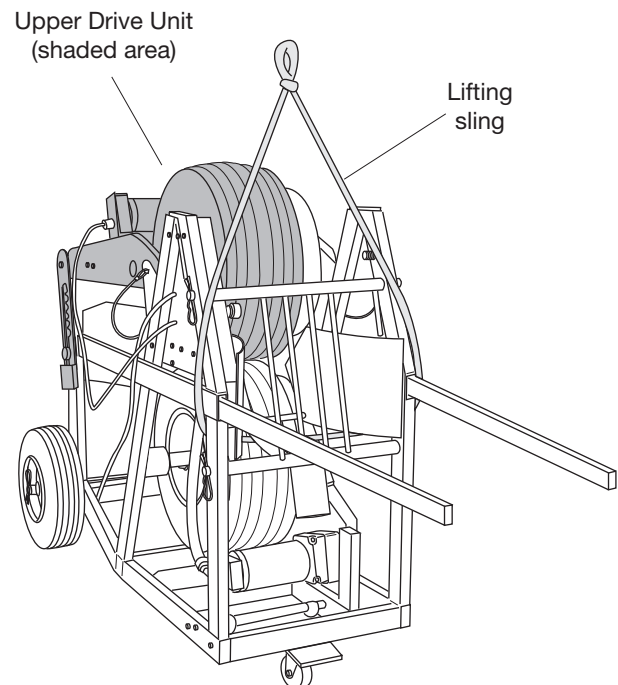
To transport the cable feeder, pull the telescoping handles out until they stop. If transporting over a smooth surface, lift up on the handles to extend the retractable caster. Quickly set the feeder down after the caster swings out. To retract the caster, lift up on the handles and quickly set the feeder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



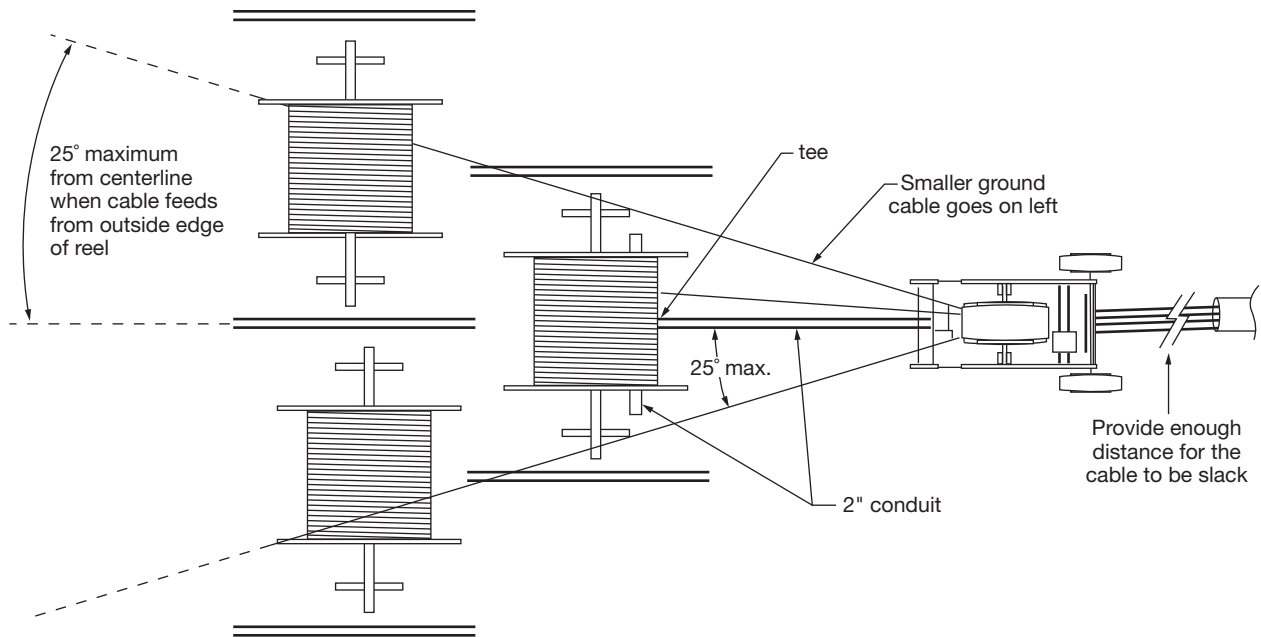
## Setup

### 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

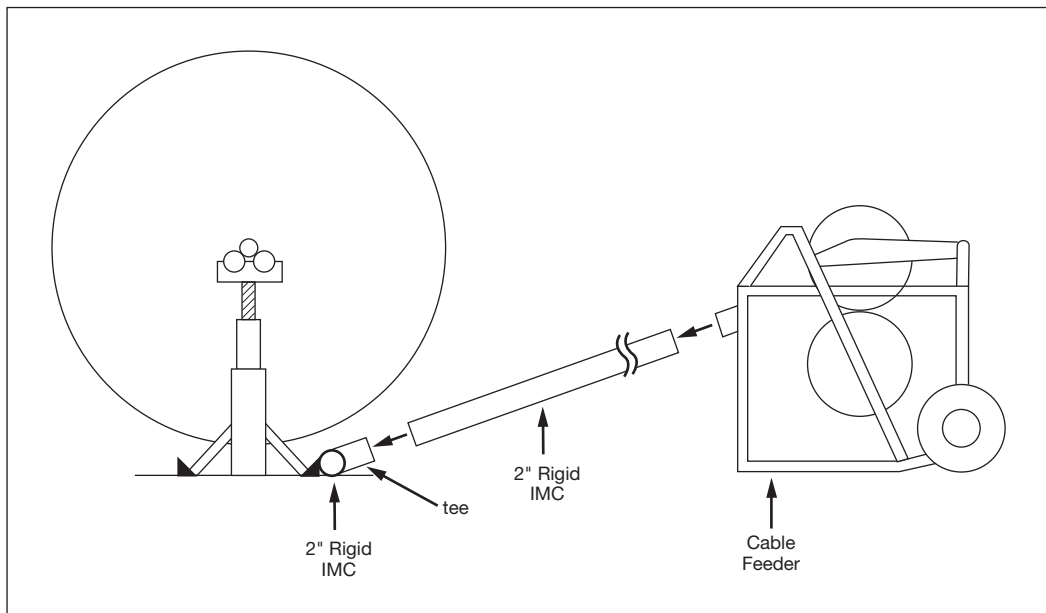
Insert one end of a length of 2" rigid or IMC conduit into the receptacle on the back of the cable feeder. Slip the tee (supplied with the cable feeder) over the other end of the conduit. Slide a second length of 2" rigid or IMC through the tee. Push the cable feeder and stiff-arm boom up against the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

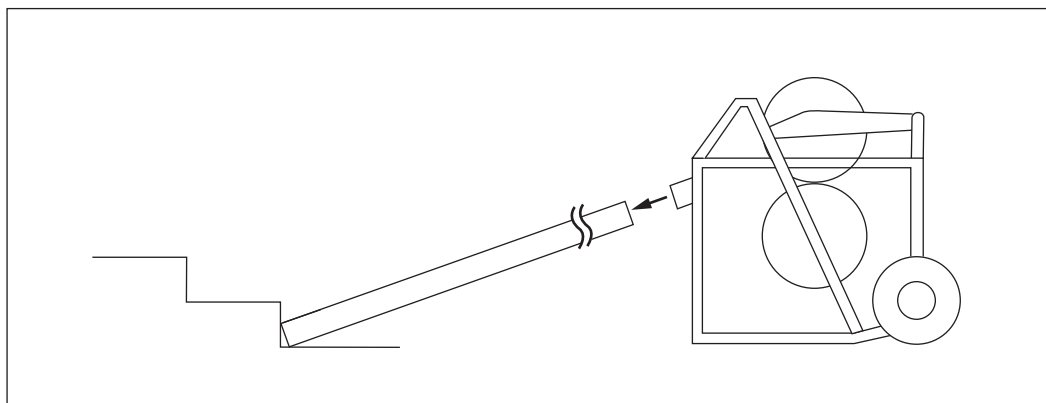
#### Anchor Method

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

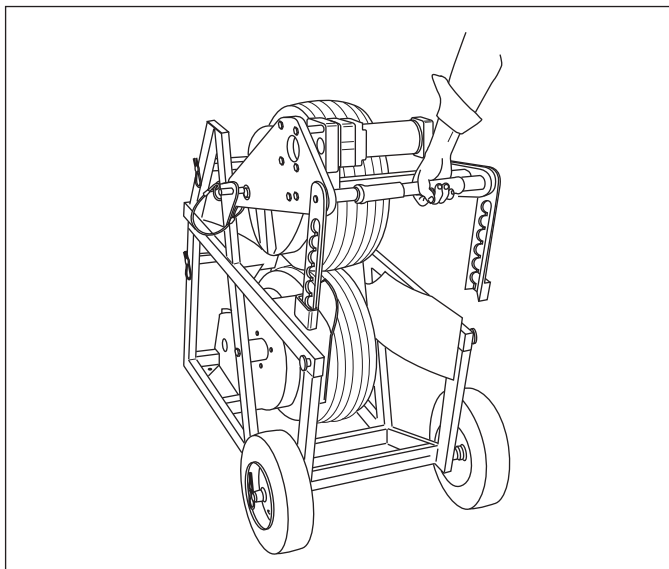
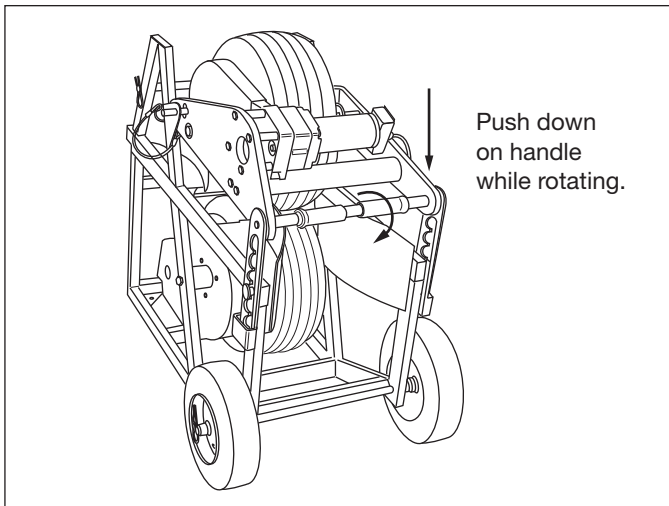
Select either End Loading Method or Side Loading Method. Then proceed to Loading Cable.

#### 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

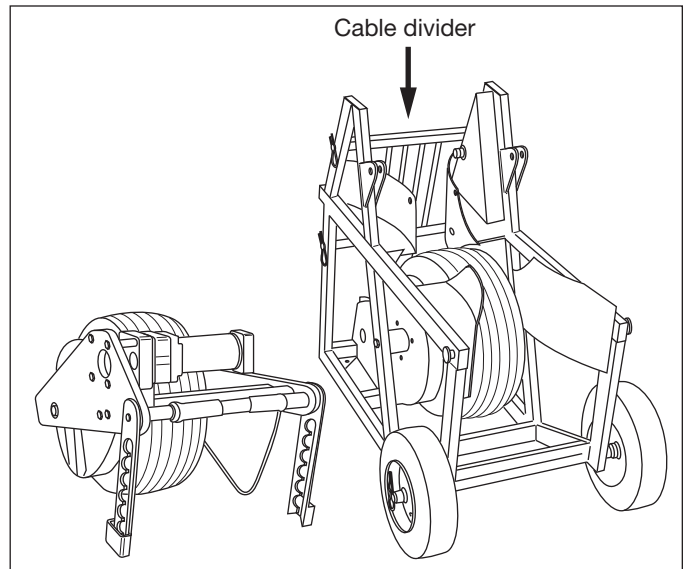
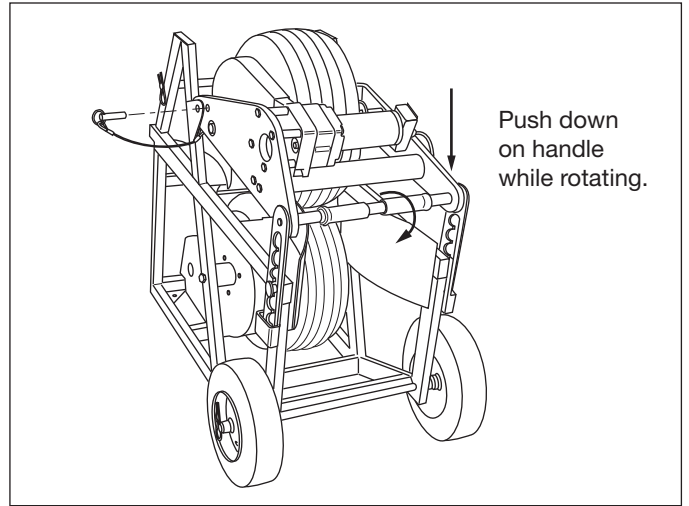
1. Release the ratchet mechanism by pushing down on the upper drive handle while rotating the top of the handle toward you.
2. Remove the two clevis pins.
3. Unplug the upper drive unit motor.

### ⚠ CAUTION

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

Failure to observe this precaution may result in injury.

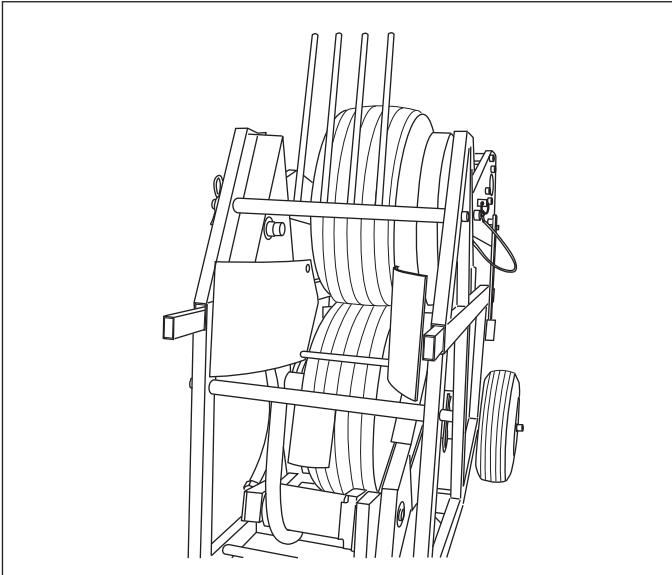
4. Lift the upper drive unit out of the cable feeder.
5. Remove the cable divider.



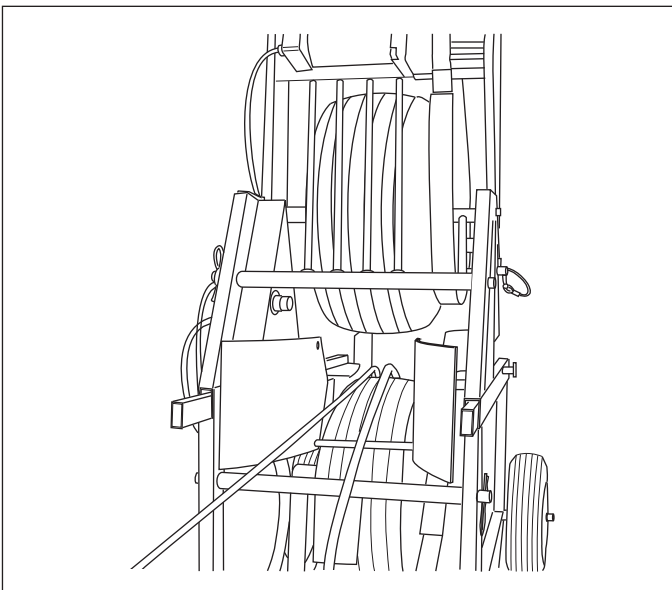
## Setup (cont'd)

### Loading Cable

1. Rotate the ground separator out and down.

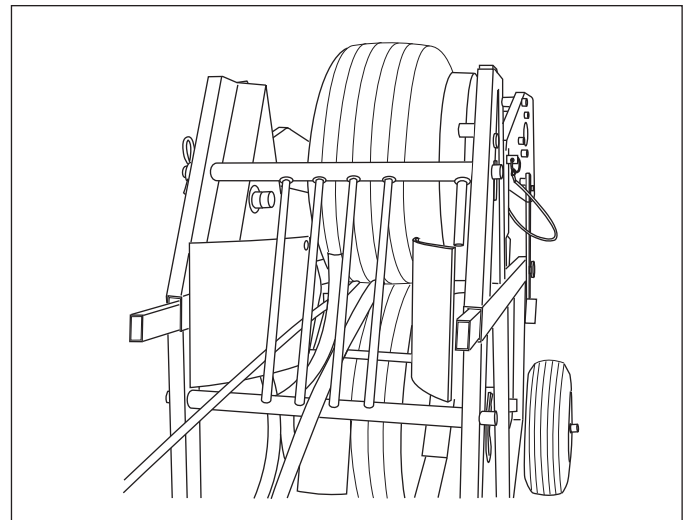


2. Feed the cables over the lower traction wheel.
  - Do not cross the cables.
  - If pulling a smaller diameter ground cable, feed it in at the leftmost side of the cable feeder.



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.*

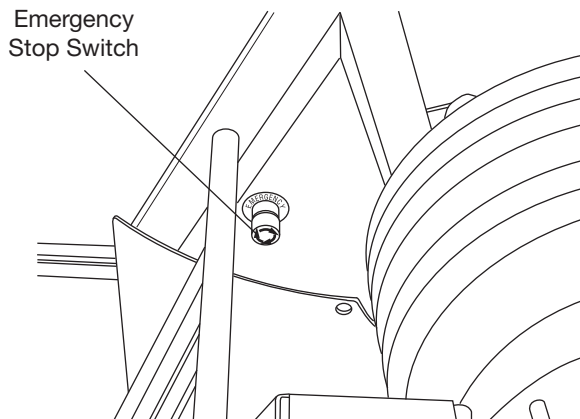


## Operation

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

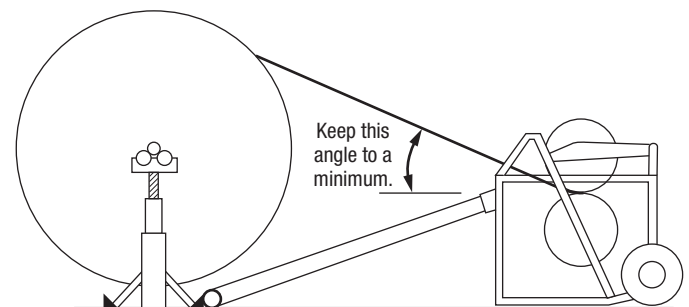
When the pull is finished, turn the main power switch OFF.

*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

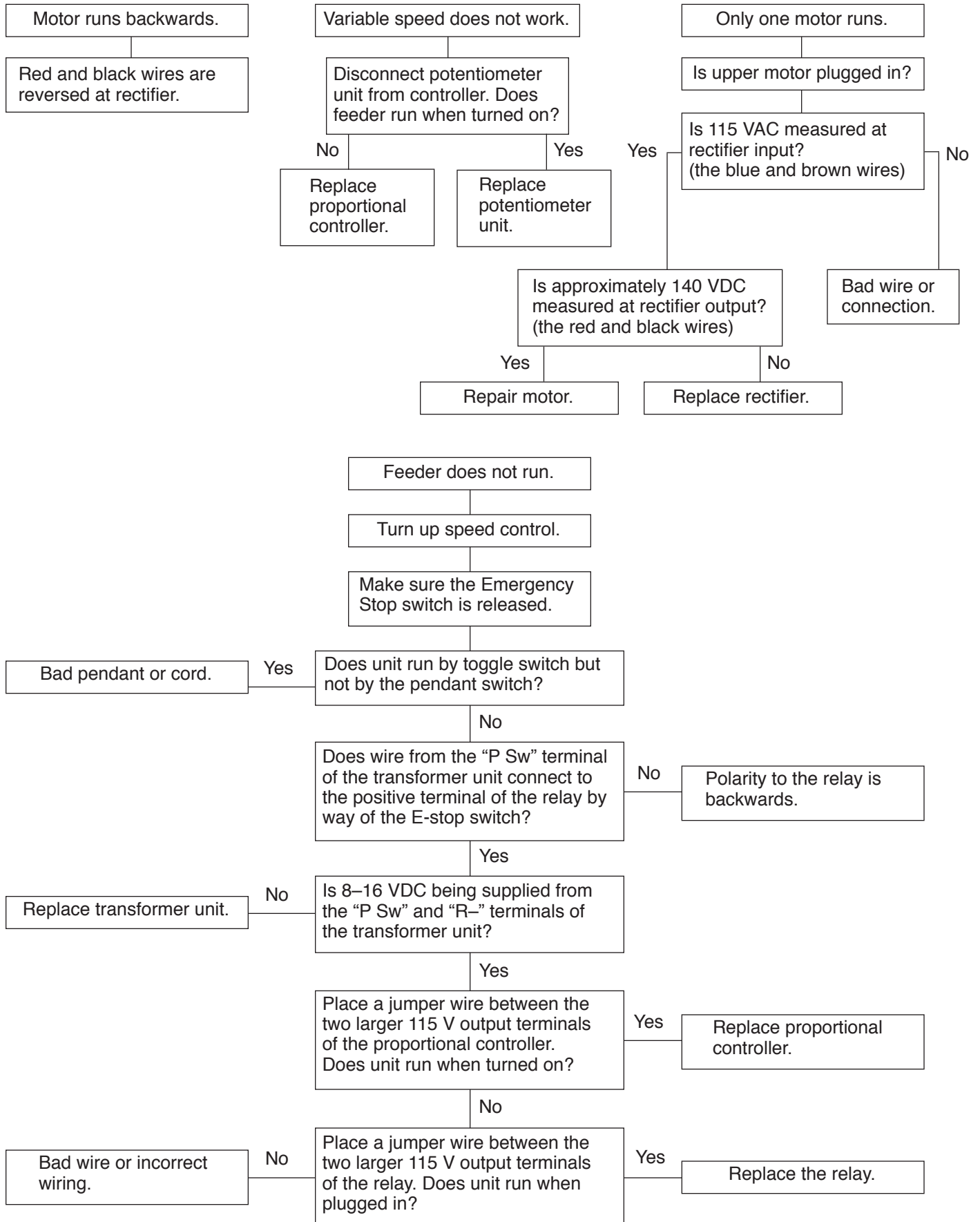
- Take up slack between the reels and the cable feeder before starting the pull.
- Start at a slow setting.
- Switch the cable feeder on and off as little as possible during the pull. Use the speed control to match the puller's speed.
- Use the speed control to prevent the cable between the cable feeder 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).

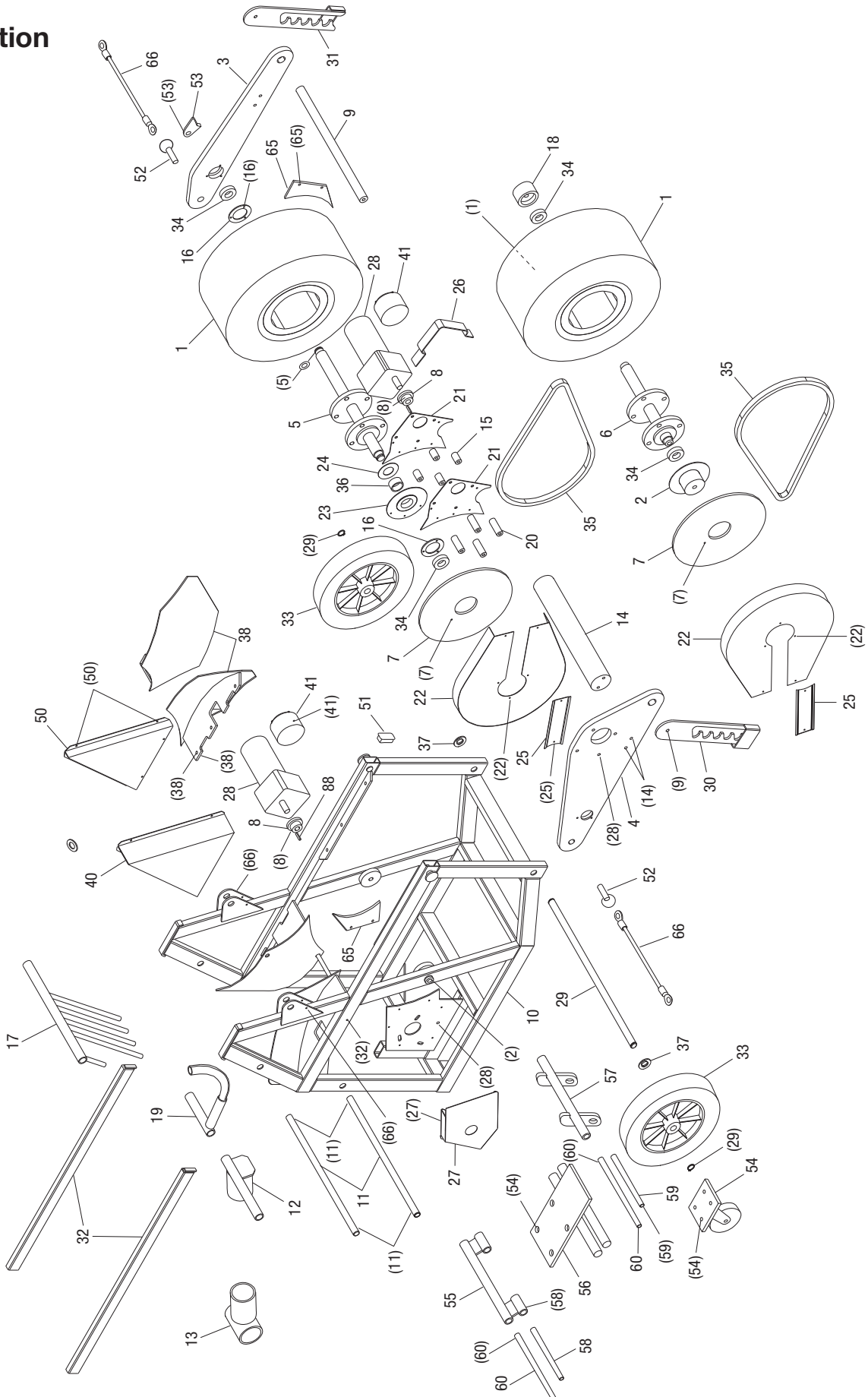
Reassemble in the reverse order noting the following: If removed, fit the bevil washers so they contact each other at their inside diameter. Make sure one of the mounting studs passes through the alignment slot between the magnets when replacing the magnet housing.

### 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).

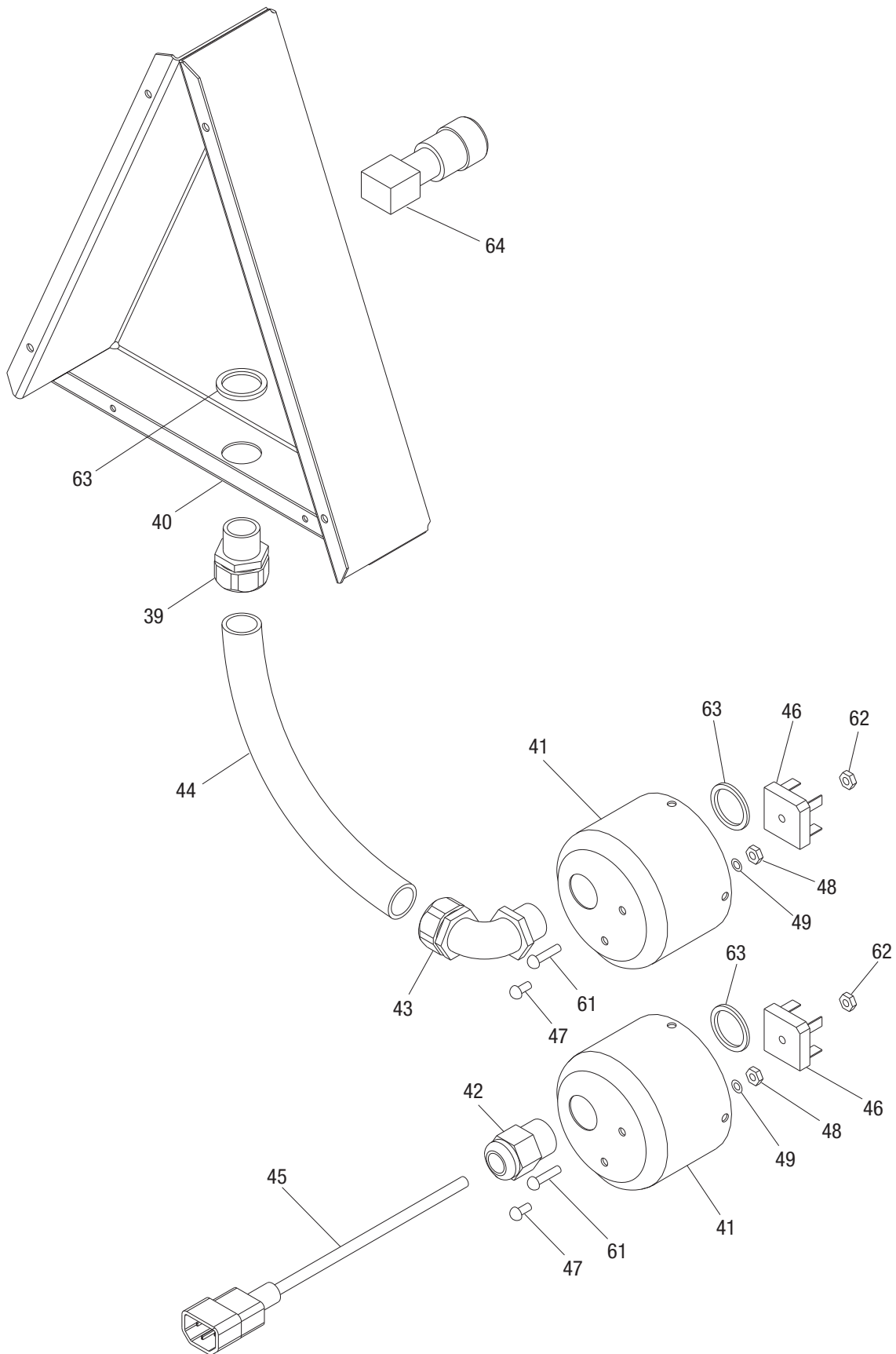
Reassemble in the reverse order noting the following: Replace any needle bearings that have been removed with new ones.

**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)**

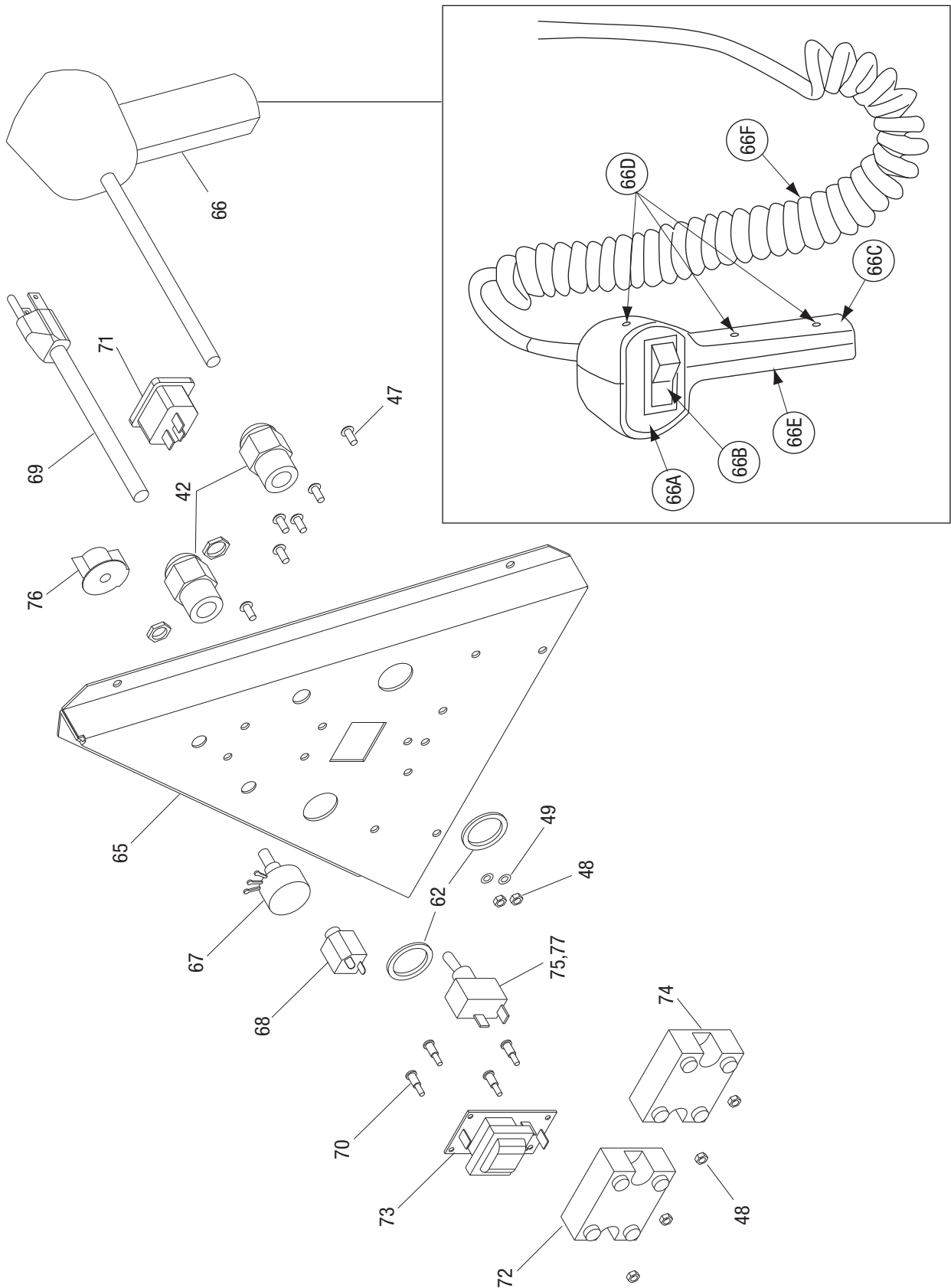
<b>Key</b>	<b>Part No.</b>	<b>Description</b>	<b>Qty</b>
29		Axle .....	1
(29)		Retaining ring, #5160 EX.....	2
30	50056700	Right ratchet weldment.....	1
31	50056727	Left ratchet weldment .....	1
32	50063987	Handle weldment .....	2
(32)	90507002	Roll pin, 3/16" x 1.50 lg.....	2
33		Wheel .....	2
34	90551117	Bearing, Fafnir #204PP.....	4
35	90551095	Chain, UST #RSD40 Lamda (98 pitches).....	2
36	90551125	Bearing, plastic .....	1
37		Washer, flat, 13/16 x 1-1/2 x 9/64.....	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)**

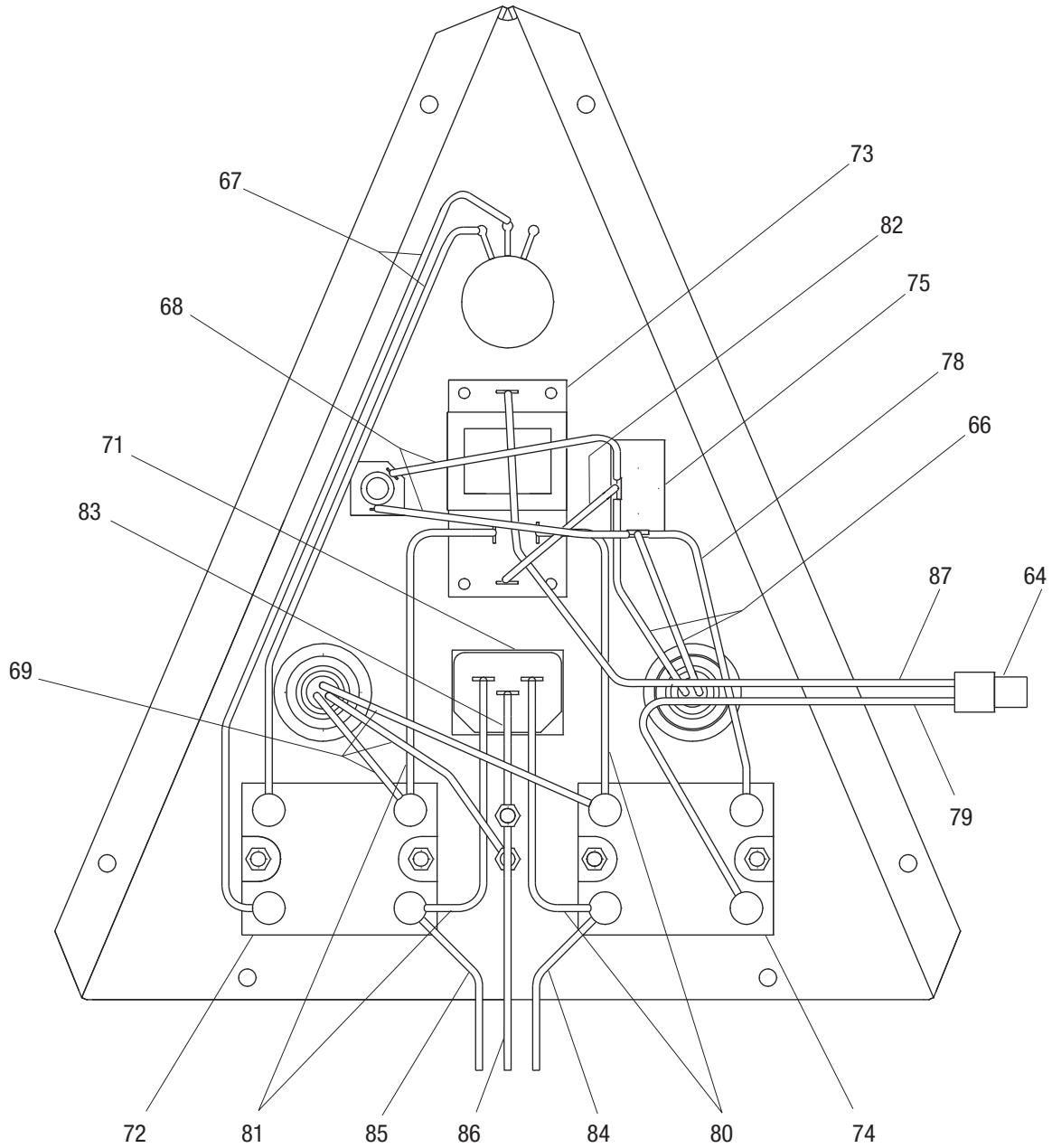
<b>Key</b>	<b>Part No.</b>	<b>Description</b>	<b>Qty</b>
(54)	90526465	Nut, 3/8-16 UNC hex lock.....	4
55	50057871	Arm weldment.....	1
56	50057880	Plate weldment .....	1
57	50057898	Lead arm weldment .....	1
58	50057847	Shaft, lead .....	1
(58)	90506553	Pin, 1/8 cotter .....	2
59	50057855	Shaft, trailing.....	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
<b>Not Shown:</b>			
	90527879	Masterlink, #40 chain.....	1
	50057766	Decal, warning .....	2
	50057782	Decal, E-stop .....	1
<b>Kit</b>			
	52068501	Wheel kit (includes 29, 33, and 37)	

*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**

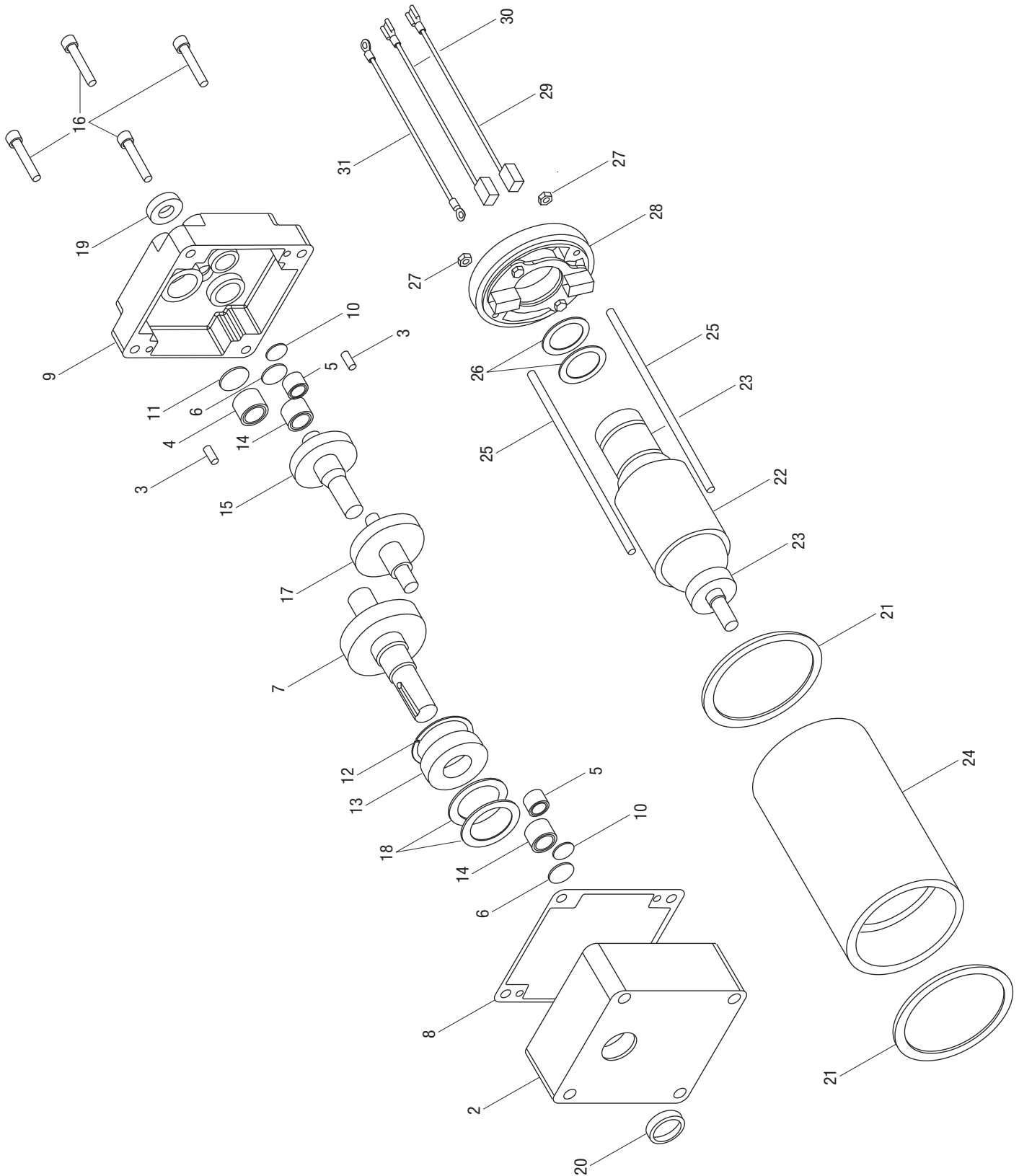
Key	Part No.	Description	Qty
42	90541243	Strain relief .....	2
47	90539559	Screw, #8-32 x 3/8 long button head .....	6
48	90524349	Nut, #8-32 hex .....	6
49	90516494	Washer, internal tooth lock.....	2
62	91862630	Nut, 1/2" conduit lock.....	2
64	50066820	Switch unit, emergency stop .....	1
65	50056840	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**

