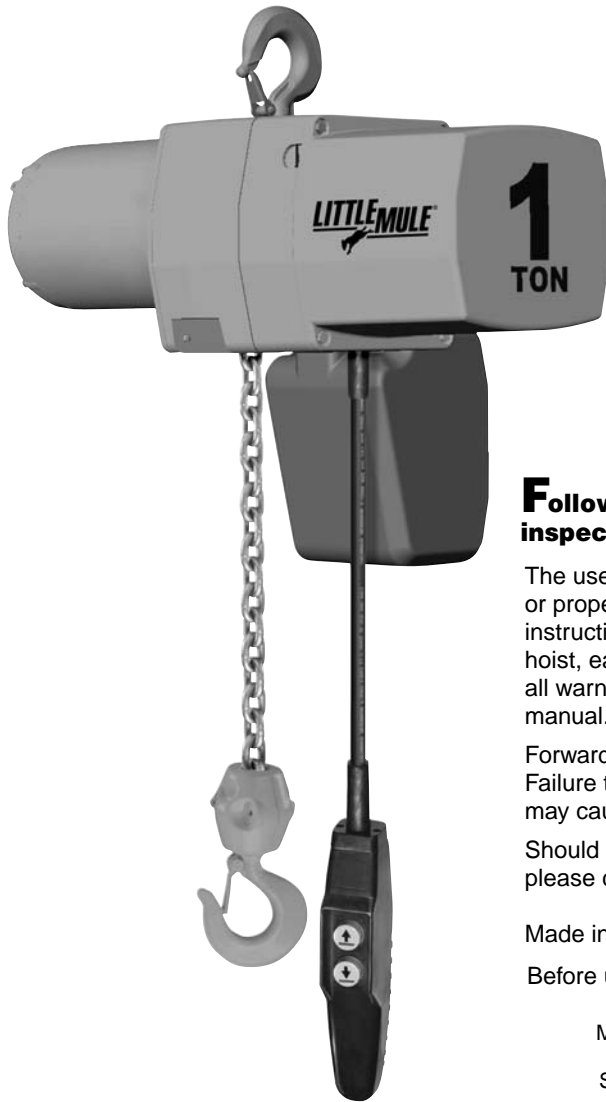


## Operating, Maintenance & Parts Manual

# FLC Series



**1/4 Ton**  
**FLC0516**  
**FLC0532**

**1/2 Ton**  
**FLC1016**  
**FLC1032**

**1 Ton**  
**FLC2016**

**2 Ton**  
**FLC4008**

**Follow all instructions and warnings for inspecting, maintaining and operating this hoist.**

The use of any hoist presents some risk of personal injury or property damage. That risk is greatly increased if proper instructions and warnings are not followed. Before using this hoist, each operator should become thoroughly familiar with all warnings, instructions, and recommendations in this manual. Retain this manual for future reference and use.

Forward this manual to the hoist operator. Failure to operate the equipment as directed in the manual may cause injury.

Should you have any questions regarding this product, please call Little Mule at **(800) 477-5003**.

Made in the U.S.A.

Before using the hoist, fill in the information below:

Model No. \_\_\_\_\_

Serial No. \_\_\_\_\_

Purchase Date \_\_\_\_\_



## SAFETY PRECAUTIONS

Each Little Mule FLC Series Electric Chain Hoist is built in accordance with the specifications contained herein and at the time of manufacture complies with our interpretation of applicable sections of \*American Society of Mechanical Engineers Code (ASME) B30.16 "Overhead Hoists," the National Electrical Code (ANSI/NFPA 70) and the Occupational Safety and Health Act (OSHA). Since OSHA states the National Electrical Code applies to all electric hoists, installers are required to provide current overload protection and grounding on the branch circuit section in keeping with the code. Check each installation for compliance with the application, operation and maintenance sections of these articles.

\*Copies of this standard can be obtained from ASME Order Department, 22 Law Drive, PO Box 2300, Fairfield, NJ 07007-2300, U.S.A., [www.asme.org](http://www.asme.org), 800-843-2763.

### **WARNING**

**Improper operation of a hoist can create a potentially hazardous situation which, if not avoided, could result in death or serious injury. To avoid such a potentially hazardous situation, THE OPERATOR SHALL:**

1. **NOT** operate a damaged, malfunctioning or unusually performing hoist.
2. **NOT** operate the hoist until you have thoroughly read and understood the manufacturer's Operating and Maintenance Instructions or Manuals.
3. **NOT** operate a hoist which has been modified without the manufacturer's approval or without certification that it is in conformity with ANSI/ASME B30 volumes.
4. **NOT** lift more than rated load for the hoist.
5. **NOT** use hoist with twisted, kinked, damaged, or worn load chain.
6. **NOT** use the hoist to lift, support, or transport people.
7. **NOT** lift loads over people.
8. **NOT** operate a hoist unless all persons are and remain clear of the supported load.
9. **NOT** operate unless load is centered under hoist.
10. **NOT** attempt to lengthen the load chain or repair damaged load chain.
11. Protect the hoist's load chain from weld splatter or other damaging contaminants.
12. **NOT** operate hoist when it is restricted from forming a straight line from hook to hook in the direction of loading.
13. **NOT** use load chain as a sling, or wrap chain around load.
14. **NOT** apply the load to the tip of the hook or to the hook latch.
15. **NOT** apply load unless load chain is properly seated in the chain sprocket(s).
16. **NOT** apply load if bearing prevents equal loading on all load supporting chains.
17. **NOT** operate beyond the limits of the load chain travel.
18. **NOT** leave load supported by the hoist unattended unless specific precautions have been taken.
19. **NOT** allow the load chain or hook to be used as an electrical or welding ground.

20. **NOT** allow the load chain or hook to be touched by a live welding electrode.
21. **NOT** remove or obscure the warnings on the hoist.
22. **NOT** operate a hoist on which the safety placards or decals are missing or illegible.
23. **NOT** operate a hoist unless it has been securely attached to a suitable support.
24. **NOT** operate a hoist unless load slings or other approved single attachments are properly sized and seated in the hook saddle.
25. Take up slack carefully - make sure load is balanced and load holding action is secure before continuing.
26. Shut down a hoist that malfunctions or performs unusually and report such malfunction.
27. Make sure hoist limit switches function properly.
28. Warn personnel of an approaching load.

### **CAUTION**

**Improper operation of a hoist can create a potentially hazardous situation which, if not avoided, could result in minor or moderate injury. To avoid such a potentially hazardous situation, THE OPERATOR SHALL:**

1. Maintain firm footing or be otherwise secured when operating the hoist.
2. Check brake function by tensioning the hoist prior to each lift operation.
3. Use hook latches. Latches are to retain slings, chains, etc. under slack conditions only.
4. Make sure the hook latches are closed and not supporting any parts of the load.
5. Make sure the load is free to move and will clear all obstructions.
6. Avoid swinging the load or hook.
7. Make sure hook travel is in the same direction as shown on the controls.
8. Inspect the hoist regularly, replace damaged or worn parts, and keep appropriate records of maintenance.
9. Use Little Mule recommended parts when repairing the unit.
10. Lubricate load chain per hoist manufacturer's recommendations.
11. **NOT** use the hoist's overload limiting clutch to measure load.
12. **NOT** use limit switches as routine operating stops. They are emergency devices only.
13. **NOT** allow your attention to be diverted from operating the hoist.
14. **NOT** allow the hoist to be subjected to sharp contact with other hoists, structures, or objects through misuse.
15. **NOT** adjust or repair the hoist unless qualified to perform such adjustments or repairs.

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## HOIST SPECIFICATIONS

Little Mule FLC series electric chain hoists are rugged, portable hoists that provide quick, precise lifting. The hoists are constructed of tough, but lightweight, die cast aluminum alloy housings. An oil bath transmission, equipped with heat-treated, alloy steel gears and an overload limiting clutch, provides smooth and reliable operation. With a pushbutton station that fits comfortably in one hand, the operator can safely control the hoist while the other hand is free to guide the load. The electrical controls, which are readily accessed under the electrical cover, utilize quick-connect terminals for easy voltage conversions and a 24V control circuit for added safety.

**Table 1 - Hoist Specifications**

| Model*    | Capacity (lbs) | Lifting Speed (fpm) | HP  | Reeving        | Voltage  | Full Load Motor Amps* |
|-----------|----------------|---------------------|-----|----------------|----------|-----------------------|
| FLC0516-1 | 1/4            | 16                  | 1/4 | Single-chained | 115/230V | 4.3/2.15              |
| FLC0516-3 | 1/4            | 16                  | 1/4 | Single-chained | 230/460V | .9/.45                |
| FLC0532-1 | 1/4            | 32                  | 1/2 | Single-chained | 115/230V | 7.6/3.8               |
| FLC0532-3 | 1/4            | 32                  | 1/2 | Single-chained | 230/460V | 2/1                   |
| FLC1016-1 | 1/2            | 16                  | 1/2 | Single-chained | 115/230V | 7.6/3.8               |
| FLC1016-3 | 1/2            | 16                  | 1/2 | Single-chained | 230/460V | 2/1                   |
| FLC1032-1 | 1/2            | 32                  | 1   | Single-chained | 115/230V | 14/7**                |
| FLC1032-3 | 1/2            | 32                  | 1   | Single-chained | 230/460V | 3.2/1.6               |
| FLC2016-1 | 1              | 16                  | 1   | Single-chained | 115/230V | 14/7**                |
| FLC2016-3 | 1              | 16                  | 1   | Single-chained | 230/460V | 3.2/1.6               |
| FLC4008-1 | 2              | 8                   | 1   | Double-chained | 115/230V | 14/7**                |
| FLC4008-3 | 2              | 8                   | 1   | Double-chained | 230/460V | 3.2/1.6               |

\*At full load, it is not unusual for the hoist to draw in excess of the values listed when lifting. It is critical to ensure that the voltage at the hoist contactor does not drop below 10% of the nominal voltage of the hoist while it is lifting a load. Low voltage will result in higher amp draw, damage to the hoist, and potential fire hazards. Little Mule is not responsible for any damages caused by an inadequate power source.

Other features that ensure the safe operation of Little Mule electric chain hoists include a magnetic disc brake that delivers sure stopping and secure holding of the load. Adjustable upper and lower limit switches regulate the load travel. As a standard, hooks are supplied with safety latches. For additional safety, a chain stop is attached to the slack end of the load chain.

Little Mule electric chain hoists are designed and tested in accordance with the American Society of Mechanical Engineers Code B30.16, "Safety Standard for Overhead Hoists." Hoists are built in compliance with CSA, file number LR 44484. Made in U.S.A.

\*\*The 1HP, 115/230V models must have a dedicated power circuit rated for at least 20A, 125V when they are wired for 115V. It is not unusual for these models to draw up to 20 amps at 115V when lifting at rated capacity.

## **WARNING**

**Failure to comply with Safety Precautions outlined throughout this manual can result in serious injuries or death. Before using this hoist, each operator should become thoroughly familiar with all warnings, instructions and recommendations in this manual.**

## **APPLICATION INFORMATION**

This hoist is intended for general industrial use for lifting and transporting freely suspended material loads within its rated capacity. Little Mule cannot be responsible for applications other than those for which Little Mule equipment is recommended. Prior to installation and operation, we caution the user to review his application for abnormal environmental or handling conditions and to observe the applicable recommendations as follows:

### **ADVERSE ENVIRONMENTAL CONDITIONS**

Do not use the hoist in areas containing flammable vapors, liquids, gases or any combustible dusts or fibers. Refer to Article 500 of the National Electrical Code. Do not use this hoist in highly corrosive, abrasive or wet environments. Do not use this hoist in applications involving extended exposure to ambient temperatures below -10°F or above 130°F.

### **LIFTING OF HAZARDOUS LOADS**

This hoist is not recommended for use in lifting or transporting hazardous loads or materials which could cause widespread damage if dropped. The lifting of loads which could explode or create chemical or radioactive contamination if dropped requires fail-safe redundant supporting devices which are not incorporated into this hoist.

### **LIFTING OF GUIDED LOADS**

This hoist is not recommended for use in the lifting of guided loads, including dumbwaiters and elevators. Such applications require additional protective devices which are not incorporated into this hoist. For such applications, refer to the requirements of applicable state and local codes, and the American National Safety Code for elevators, dumbwaiters, escalators and moving walks (ASME A17.1).

## **SAFETY INFORMATION**

1. Follow all local electrical and safety codes, as well as the National Electrical Code (NEC) and the Occupational Safety and Health Act (OSHA) in the United States.
2. Hoist must be securely and adequately grounded. Hoist power cable is provided with an additional lead (green) for grounding purposes.

## **WARNING**

**Always disconnect power source before working on or near a hoist or its connected load. If the power disconnect point is out of sight, lock it in the open position and tag to prevent unexpected application of power.**

3. Be careful when touching the exterior of an operating motor; it may be hot enough to be painful or cause injury. With modern motors this condition is normal if operated at rated load and voltage (modern motors are built to operate at higher temperatures).
4. Protect the power cable and control cable from coming in contact with sharp objects.
5. Do not kink power cable and control cable and never allow the cable to come in contact with oil, grease, hot surfaces, or chemicals.
6. Make certain that the power source conforms to the requirements of your equipment.
7. Inspect the unit daily before operating the hoist.
8. Cluttered areas and benches invite accidents.
9. The operator should not engage in any practice which will divert his attention while operating the hoist.
10. Before using the hoist, the operator should be certain that all personnel are clear.
11. Do not operate hoist with loads exceeding its rated capacity.
12. Supporting frames or beams used as a hoist hanger must have a greater load capacity than the hoist.
13. Do not attempt to operate the hoist beyond normal maximum lift range.
14. Align hoist for a straight line pull. Avoid side pull or end pull.
15. Do not operate hoist with twisted or damaged chain.
16. Do not operate a damaged or malfunctioning hoist until necessary adjustments or repairs have been made.
17. Do not use hoist to lift people or to carry loads over people.
18. Do not leave a load suspended in the air unattended.
19. Always remove load before making repairs.
20. Do not remove or obscure capacity or warning decals.

## **INSTALLATION**

1. Before installing the hoist, check the following:
  - a. Make sure all supporting structures and attaching devices are strong enough to hold your intended loads. If in doubt, consult a qualified structural engineer.
  - b. Provide proper branch circuit protection for the hoist as recommended in the National Electrical Code.
  - c. The power supply should be plus or minus 10% of the voltage specified on the motor nameplate. It is critical to use adequate sized power cables, especially with 1-phase hoists (**See Table 5, page 11**). Be sure dual voltage hoists are connected or wired to correspond with your power supply (See WIRING, page 9).
  - d. Installation area must provide operating conditions for the operator including sufficient room for the operator and other personnel to stand clear of the load at all times.
  - e. For installations where the slack chain hanging from the unit may be objectionable or hazardous, the use of a chain container is recommended (See CHAIN CONTAINER, page 5).

2. Before operating the hoist, be sure to observe the following:
  - a. ALWAYS DISCONNECT HOIST FROM POWER SUPPLY before removing electrical cover or when making any electrical connection in the hoist or pushbutton station.
  - b. The ground wire (green colored) of the power cable should always be connected to a suitable ground by means of a screw or clamp. An alligator clip does not make a safe ground connection.
  - c. When installing a three-phase hoist, make only temporary connections at the power source. Push the "UP" button and observe the direction of the load block. If it raises, the phasing is correct and permanent connections may be made at the power source. If the load block lowers when the "UP" button is pushed, release the button immediately since the limit switches will not operate to protect the hoist from over-travel. Reverse any two wires (except the green ground wire) at the power source to correct the load hook direction (phasing). Do not change connections in the hoist or pushbutton assembly.
  - d. Make sure load chain is not twisted as it travels into the hoist.
  - e. Operate hoist in a hanging position only. Hoist should be permitted to align itself for a straight line pull. Do not attempt to pull around corners.
  - f. Read ASME-B30.16 Safety Code for Hoists.
3. Lubricate the chain if necessary, see LUBRICATION, page 9.
4. Check the function of the limit switches. Before placing hoist in operation, check limit switch settings. Operate pushbutton until near stop point and inch into stop limit, both top and bottom. If either switch is not correct, adjust according to LIMIT SWITCH ADJUSTMENT, page 8.

## CHAIN CONTAINER (Optional Accessory)

Refer to Table 4.

For installations where the slack chain hanging from the hoist may be objectionable or hazardous, the use of a chain container is recommended.

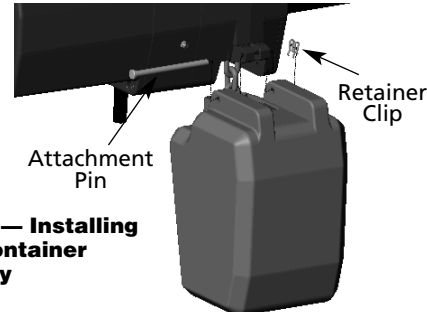
Available chain containers include the standard containers designed for lifts of up to 50 ft on single-chained hoists and 25 ft on double-chained hoists. For longer lifts, the JLC927-5 container is available. For applications where a fabric bag is preferred, the JLC927-20F, JLC927-40F and the JLC927-70F are all options.

Instructions are provided with each of these chain containers and must be adhered to closely to ensure a proper installation. To install the long lift chain container or a fabric chain container, you must follow instruction sheets provided with the chain container. The following instructions are for the standard metal chain containers only.

### Installation of Standard Chain Containers (JLC927-1)

Refer to Figure 1.

1. Remove retaining clip and attachment pin and let the slack chain hang free.
2. Run load hook down to its lowest position. Place the slack end of chain in chain container. Do not remove the chain stop.
3. Place chain container flush against housing with chain stripper between top lugs. Insert long attachment pin and replace retaining clip.



**Figure 1 — Installing Chain Container Assembly**

## **CAUTION**

**Do not attempt to store more chain in chain container than that specified in the table below or serious damage to hoist may result and hazardous conditions may be created.**

**Table 4 - Optional Chain Containers**

| Chain Container Model | Recommended for Use With: Hoist Capacity | Maximum Lift (ft) | Container Material                | Dimensions in Inches          |                               |                                |
|-----------------------|--|-------------------|-----------------------------------|-------------------------------|-------------------------------|--------------------------------|
|                       |  |                   |                                   | Width                         | Length                        | Depth                          |
| JLC927-1              | 1 Ton & Under                            | 20                | Molded Container                  | 6 <sup>7</sup> / <sub>8</sub> | 6 <sup>1</sup> / <sub>2</sub> | 10 <sup>1</sup> / <sub>2</sub> |
|                       | 2 Ton                                    | 10                |                                   |                               |                               |                                |
| JLC927-2              | 1 Ton & Under                            | 35                | Molded Container                  | 6 <sup>1</sup> / <sub>2</sub> | 6 <sup>1</sup> / <sub>2</sub> | 16                             |
|                       | 2 Ton                                    | 17                |                                   |                               |                               |                                |
| JLC927-3              | 1 Ton & Under                            | 50                | Molded Container                  | 6 <sup>1</sup> / <sub>2</sub> | 6 <sup>1</sup> / <sub>2</sub> | 20 <sup>1</sup> / <sub>4</sub> |
|                       | 2 Ton                                    | 25                |                                   |                               |                               |                                |
| JLC927-4              | 1 Ton & Under                            | 143               | Steel or Molded Container         | *                             | *                             | *                              |
|                       | 2 Ton                                    | 71                |                                   |                               |                               |                                |
| JLC927-20F            | 1 Ton & Under                            | 20                | Open Weave Vinyl Coated Polyester | 7 <sup>1</sup> / <sub>2</sub> | 7 <sup>1</sup> / <sub>2</sub> | 10                             |
|                       | 2 Ton                                    | 10                |                                   |                               |                               |                                |
| JLC927-40F            | 1 Ton & Under                            | 40                | Open Weave Vinyl Coated Polyester | 7 <sup>1</sup> / <sub>2</sub> | 7 <sup>1</sup> / <sub>2</sub> | 16                             |
|                       | 2 Ton                                    | 20                |                                   |                               |                               |                                |
| JLC927-70F            | 1 Ton & Under                            | 70                | Open Weave Vinyl Coated Polyester | 7 <sup>1</sup> / <sub>2</sub> | 7 <sup>1</sup> / <sub>2</sub> | 20                             |
|                       | 2 Ton                                    | 35                |                                   |                               |                               |                                |

\* Dimensions depend on length of lift. Contact Factory.

4. Feed the remainder of chain into container by operating hoist in the "UP" direction to the top limit. This will permit the chain to pile freely and prevent the chain from kinking, which may occur if the chain is placed in the container by hand.

## CAUTION

**Do not allow load to come in contact with the chain container. If this situation exists reset the "UP" limit switch so that the hook block stops below the chain container (See LIMIT SWITCH ADJUSTMENT, page 8).**

## OPERATION

This hoist is designed for safe operation within the limits of its rated capacity. It is controlled by the "UP" and "DOWN" buttons of the pushbutton station. Two-speed models utilize 2-step buttons, the first step for operating the slow speed and the second for the fast speed. Although the Little Mule FLC is built with many features to ensure safety, it is a requirement that a hoist operator understands safe lifting practices. The following points must be observed.

1. Do not overload the hoist.
2. Do not make extreme side pulls with the hoist.
3. Operate the hoist only in a hanging position with adequate support.
4. Do not "sling" the load hook and chain around the load. Use an approved sling.
5. **Be sure there are no twists in the load chain** as it travels into the hoist housing. This condition should be constantly checked on double chain hoists because it is possible for the load block to be "capsized" or turned over one or more times.

## WARNING

**Do not use hoist to lift, support or otherwise transport people.**

6. Before raising a load, always check to see that it is held securely in the hook or sling chains, etc. Raise the load only until the load chain is taut and then double check the rigging before continuing to raise the load.
7. Do not stand beneath a load! Do not move a load in such a manner as to endanger personnel.
8. Don't lower into areas where visibility is obscured unless someone else is guiding the operation.
9. Use common sense at all times when operating a hoist.
10. Do not operate if direction of hook travel is not the same as indicated on button being pushed.
11. Do not operate unless hook travel limit devices function. Test without load each shift.
12. Do not operate when hoist is not centered over load.
13. Do not operate if chain is not seated properly in sprockets or sheave grooves.
14. Do not operate damaged or malfunctioning hoist.

## OVERLOAD LIMITING PROTECTION

This hoist is equipped with a factory-calibrated overload limiting clutch that will permit the lifting of loads within its rated capacity, but will prevent the lifting of damaging overloads while the hoist is being operated. If the load being lifted exceeds the lifting capability of the overload clutch, the hoist motor will continue to run, causing overheating of both the clutch and hoist motor. This condition should be avoided by immediately releasing the "UP" button and reducing the load to within the rated capacity of the hoist. See GEARING, page 10, for additional instructions on this device.

## CAUTION

**The overload limiting clutch is an emergency protective device and should not be used to measure the maximum load to be lifted, or to sense the overload imposed by a constrained load. While the overload limiting clutch will protect the hoist from damaging overloads, it will not ensure that a load is within the rated capacity of the hoist.**

## MAINTENANCE

### INSPECTIONS

A planned inspection routine should be established for this hoist based upon frequency of use, severity of use, and environmental conditions (Reference ASME Standard B30.16). Some inspections should be made frequently (daily to monthly) and others periodically (monthly to yearly). It is strongly recommended that an Inspection and Maintenance Check List and an Inspector's Report, similar to those shown in Figures 10A and 10B, be used and filed for reference. All inspections should be performed or overseen by a designated inspector. Special inspections should be made following any significant repairs or any operating occurrence leading one to suspect that the hoist's capability may have been impaired.

### LOWERING WITHOUT POWER

If the power fails with a load suspended, the hoist will automatically stop. In an emergency the load can be lowered without power as follows:

1. DISCONNECT HOIST FROM POWER SUPPLY AND REMOVE ELECTRICAL COVER.
2. Refer to Figure 5. Open disc brake manually by using two screwdriver blades, one on each side of the brake at a point close to the brake spring posts. Apply pressure to the underside of the armature plate (points "X") to close the solenoid and release the brake.

## WARNING

**Do not allow screwdriver blades to touch rotating friction disc "C".**

## CAUTION

**Do not allow the load to descend rapidly. This causes the motor to race and serious damage may result.**

3. Use several quick releases instead of holding brake open continuously. Do not exceed normal lowering speed.

## HOOKS

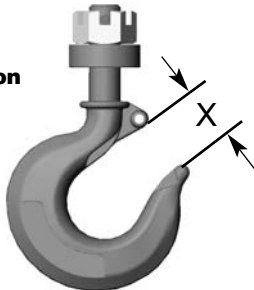
Refer to Figure 2.

1. Inspect hooks once daily for cracking, extreme wear or spreading. Replace hooks showing any of these signs. If the throat openings are spread wider than the maximum permissible 15% increase listed here, the hooks have been overstressed and must be replaced. Any hook that is bent or twisted more than 10 degrees from the plane of an unbent hook must also be replaced.
2. The hook latches should be inspected to ensure that they close the hook throat opening in a secure manner when a load is applied. Inspect the hook shank and nut for any stripping of the threads or other damage. The hook nut should be fully restrained by the retaining pin.
3. In addition to above, load hooks should be inspected for cracks by the magnetic particle, dye penetrant or other suitable crack testing inspection method. This should be done at least once a year.

| Hoist Capacity | "X" Dimension*                    |                                   |
|----------------|-----------------------------------|-----------------------------------|
|                | Top Hook                          | Bottom Hook                       |
| 1 Ton & Under  | 1 <sup>11</sup> / <sub>32</sub> " | 1 <sup>7</sup> / <sub>32</sub> "  |
| 2 ton          | 1 <sup>11</sup> / <sub>32</sub> " | 1 <sup>11</sup> / <sub>32</sub> " |

(\*) Maximum permissible throat opening of hook.

Figure 2 — Hook Inspection



## CHAIN

Chain is to be kept clean and lubricated (See LUBRICATION, page 9). Visually check chain every time hoist is used. Hoist must not be operated when chain is twisted or kinked. An important phase of hoist maintenance is chain inspection. Check individual links and check for chain elongation.

1. Check the chain for overall wear or stretch by selecting an unworn, unstretched length of chain (at the slack end for example). Let the chain hang vertically with a light load (about 20 pounds) on the chain to pull it taut. Use a large caliper to measure the outside length of a convenient number of links (about 12 inches). Measure the same number of links in a used section of chain and calculate the percentage increase in length of the worn chain.
2. If the length of the worn chain is more than 1½% longer than the unused chain (0.015" per inch of chain measured), then the chain should be replaced. If the chain is worn less than 1½%, check it at several more places along its length. If any section is worn more than 1½%, the chain should be replaced.

## CAUTION

The chain used on this hoist has very carefully controlled dimensions and has been heat treated. Do not attempt to substitute other manufacturer's chain.

## Chain Replacement with Chain in Hoist

Refer to Figures 3 & 4.

1. Run hook up to its top limit.
2. DISCONNECT HOIST FROM POWER SUPPLY and remove the electrical cover.
3. Using a screwdriver, pry the spring guide plate out of the slots in the limit switch nuts (See Figure 3). Turn the gold nut back to about the center of the threaded screw. Do not disconnect the wires from the limit switches.
4. Remove the load block assembly from the old chain. On double-chained hoists detach the chain from the chain support and pull it through the load block assembly (See Figure 4).
5. Make a "C" shaped chain link by grinding through the end link on the load end of the old chain.
6. Using the "C" link, attach the new chain to the load end of the old chain. Be sure that the welds of the upstanding links of the new chain will face outward from the load sheave. The end links must be oriented for attachment to the dead-end screw and the chain support (double-chained only) without any twist in the chain.
7. With the electrical cover off, connect the hoist to the power supply. Be sure that the green ground wire is properly grounded (See INSTALLATION, page 4).
8. Carefully jog the "UP" button and run the joined pieces of chain into the hoist until about 15" of the new chain comes out the other side.
9. DISCONNECT HOIST FROM POWER SUPPLY.
10. Remove the "C" link and the old chain. Remove the chain stop by prying off its retaining ring with a flathead screwdriver. If attached, remove the old chain from the chain stripper by removing the retainer clip and attachment pin.
11. Attach the chain stop to the slack end of the new chain by capturing the 12th link with the two stop halves positioned with their tapered ends pointing towards the hoist. Slide the sleeve over the halves and attach the retaining ring. If you are not using a chain container, attach the slack end of the new chain to the side of the hoist using the attachment pin and retainer clip. DO NOT allow twists in the chain.
12. Adjust the lower limit switch (See ADJUSTING LOWER LIMIT, page 8).

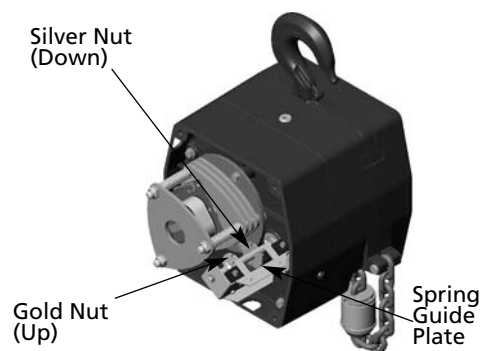
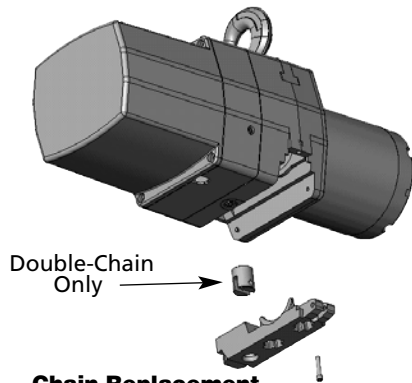


Figure 3 — Limit Switch Assembly



**Figure 4 — Chain Replacement Diagram**

13. Attach the bottom block on single-chained hoists using a new load block screw (See Figure 21). On double-chained hoists, feed the chain through the load block (welds of the upstanding links will be in towards the sheave) and fasten the end of the chain to the chain support using a new chain support pin (See Figure 21). **Be sure there are no twists in the chain.**
14. Adjust the upper limit switch (See ADJUSTING UPPER LIMIT, page 8).

**Chain Replacement with No Chain in Hoist**

Refer to Figure 4.

1. DISCONNECT HOIST FROM POWER SUPPLY and move hoist to a work table. Remove the electrical cover, electrical panel and the electric brake assembly.
2. Detach the chain stripper from the bottom of the hoist.
3. Insert the new chain between the load sheave and the chain guide. Feed the chain into the hoist by manually turning the brake hub. Allow about 15" of chain below the hoist on the slack end. Be sure the welds of the upstanding links are out away from the load sheave and that proper orientation is observed for attachment of the slack end. Also be sure the load hook assembly (if already attached to the chain) is toward the center of the hoist or to your right looking from the transmission end.

**CAUTION**

**There are wires running through the hoist. Carefully ease the hoist sections apart. Do not jerk them apart.**

4. Reinstall the chain stripper (with the chain anchor on double-chained hoists, See Figure 4) observing proper chain alignment and avoiding any twist in the chain.
5. Follow steps 11 through 14 in previous section, CHAIN REPLACEMENT WITH CHAIN IN HOIST, to complete the chain replacement procedure.

**NOTE:** Inspect chain guides and load sheave for wear, replace as needed.

**LIMIT SWITCH ADJUSTMENT**

**IMPORTANT:** Before placing hoist in operation, check the limit switch adjustment. Limit switches are provided to protect the hoist against damage resulting from overtravel or to allow setting the hook travel within the factory-set limits of travel. The standard limit switch is designed for lifts of 50 ft or less on single-chained hoists and 25 ft or less on the 2 ton, double-chained models. The long lift limit switch allows for the maximum amount of lift, which is 134 ft on 1/2 ton and under models, 143 ft on the 1 ton models, and 71 ft on the 2 ton models.

The upper and lower limit switch adjusting nuts are color-coded gold and silver respectively. Each limit nut has 10 slots for fine adjustment, and the increment of adjustment is such that one slot is equivalent to approximately one link of chain travel with the standard limit switch. Movement of the limit switch nuts toward or away from each other increases or decreases the hook travel respectively.

**Adjusting Upper Limit (Gold Nut)**

Refer to Figure 3.

1. Suspend the hoist. For single chain models raise the load block until there is a minimum clearance of 2" from the hoist housing and the top of the block. Double chain models require a minimum clearance of 1" from the chain support to the top of the load block.
2. DISCONNECT HOIST FROM POWER SUPPLY and remove the electrical cover.
3. With a screwdriver, pry the spring guide plate out of the slots in the limit switch nuts.
4. Turn the slotted gold nut toward its limit switch until the switch "clicks" then turn two slots farther. Release the spring guide plate and be sure it slips back into the slots in both limit switch nuts. Do not disturb the silver slotted nut if it has been set previously.

**Adjusting Lower Limit (Silver Nut)**

Refer to Figure 3.

1. Suspend the hoist. Carefully lower the load block to a point where the slack-end loop of the chain hangs down 6" or more from the hoist housing (or the limit desired in any particular application allowing the minimum 6"). There should be a minimum clearance of 1½" between the chain stop and bottom of hoist.
2. DISCONNECT HOIST FROM POWER SUPPLY and remove the electrical cover.
3. With a screwdriver, pry the spring guide plate out of the slots in the limit switch nuts.
4. Turn the slotted silver nut toward its limit switch until the switch "clicks," then turn two slots farther. Release the spring guide plate and be sure it slips back in the slots in both limit switch nuts. Do not disturb the gold slotted nut if it has been set previously.

**CAUTION**

**If the wires running to the limit switches are ever disconnected for any purpose, be sure to replace wires in accordance with the correct wiring diagram (See Figures 9A & 9B).**



### Check Both Upper and Lower Limits

1. Connect the hoist to the power supply. Be sure the green ground wire is properly grounded (See INSTALLATION 2-b, page 5).
2. Check load hook direction (See INSTALLATION 2-c, page 5).
3. Carefully raise load block to upper limit and observe if it stops automatically at desired level. Do not allow load block to run into hoist housing — this will damage the hoist. Maintain a minimum clearance of 2" from the hoist housing and the top of the load block on single-chained models and 1" from the chain support to the top of the load block on double-chained models.
4. Carefully lower load block to lower limit and observe if it stops automatically at the desired level. Do not allow slack-end loop of chain to become taut against hoist housing. This will damage the hoist. There should be a minimum clearance of 1½" between the chain stop and the bottom of the hoist.
5. If upper and lower limits operate satisfactorily, hoist is ready for use. If they are not as desired, repeat adjustment.

### BRAKE

Properly adjusted, this brake will release promptly when energized. It is capable of both smoothly stopping and securely holding the rated capacity of the hoist. If the hoist develops either undesirable over-travel after the pushbutton is released (this condition is most noticeable in the lowering direction) or hesitates to lift the load promptly when the pushbutton is depressed (this condition is most noticeable in the hoisting direction), the brake should be adjusted.

#### Brake Adjustment

Refer to Figure 5.

1. DISCONNECT HOIST FROM POWER SUPPLY and remove the electrical cover.
2. With reference to Figure 5, the gap between the brake armature "A" and the field "B" should be checked. The correct gap is 0.015". Adjustment should not be necessary until gap reaches 0.040".
3. Adjust the gap using a 9/16" socket on the 3 locknuts "F". Check with a feeler gauge to be sure the gap is the same on both ends of the solenoid.
4. Adjustment is now complete and the brake properly set. Replace the electrical cover, reconnect the power supply, and check hoist brake action.

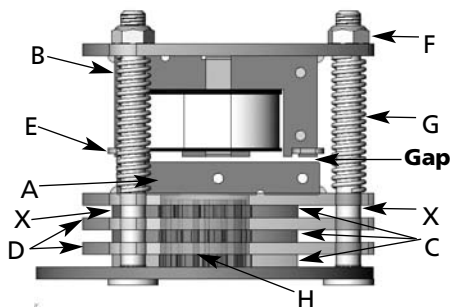


Figure 5 — Brake Assembly

## CAUTION

**Be sure the bottom of the armature does not bear against the splined adapter "H". As adjustments are made, the built-in clearance will be reduced. When this clearance is gone REPLACE BRAKE DISCS. Minimum allowable disc thickness is .162".**

### HOIST CONTROLS

Both the pushbutton and the reversing contactor are mechanically interlocked to prevent shorting the circuit and causing serious damage. As part of maintenance, always check for proper closure of contact points as well as for burned contacts. If replacement is necessary, see Figure 16 for replacement parts.

### WIRING

Refer to Figures 9A & 9B.

Single-phase units (115/230V) are shipped wired for 115V and the 1-speed, 230/460V-3 phase units are wired for 460V unless otherwise specified when ordered. Conversion of dual-voltage hoists to either the higher or lower voltage can be done simply and quickly as follows:

1. DISCONNECT HOIST FROM POWER SUPPLY and remove the electrical cover.
  2. Each dual-voltage hoist has a terminal block assembly for the interconnection of the electrical components of the hoist. To convert the voltage, reconnect the leads to the terminal blocks according to the wiring diagram located inside the electrical cover or Figures 9A and 9B.
- DO NOT move any wires or make any changes to the electrical circuit except at the terminal block assembly. Tug on wires to ensure they are securely connected.**
3. After converting the voltage, recheck phasing and limit switch operation (See INSTALLATION 2-c & 4, page 5).

**IMPORTANT:** Always refer to the wiring diagram located on the inside of the electrical cover or Figures 9A and 9B when performing electrical repairs. Make sure all connections are secure and check for damaged insulation. It is also imperative that the power circuit has conductors of adequate size (See Table 5).

### LUBRICATION

Refer to Figure 11.

Proper lubrication is necessary for a long and relatively trouble-free hoist operation. Refer to the following and the RECOMMENDED LUBRICATION SCHEDULE for lubrication points, type of lubricant, and frequency of lubrication.

#### Load Chain

Clean the load chain with acid-free solvent and coat with SAE 90 gear oil. Wipe excess oil to prevent dripping. Never apply grease to the chain.

#### Gearing

The gear case of this hoist is filled at assembly with approximately 1½ pints of SAE 90 EP gear oil. Check oil level by removing the oil level check plug from the side of the hoist. With the hoist hanging level, gear oil should be even with the hole. Change oil periodically depending on the severity of the application and the environmental conditions (at least every 200 hours of run time).

## Bearings

All bearings except hook and idler sheave bearings are lubricated at the factory and should not require additional lubrication. Noisy or worn bearings should be replaced.

### Limit Switch Shaft

Remove any dirt accumulation and spray with a general purpose lubricant.

### Hook Bearing

Apply a few drops of SAE 30 gear or motor oil around the edge of the bearing.

### Idler Sheave Bearing (Bushing)

Disassemble load block and apply a light coat of NLGI #2 grease, or equivalent, inside of bearing.

## HOIST REPAIRS

1. For major repairs or when the hoist is to be sectioned in the suspension area, it will be necessary to move the hoist to a workbench or table.
2. For repairs which can be done by removing the electrical cover only, the hoist need not be moved. Lowering the hoist to a convenient working level is desirable.

**NOTE:** If you do not have an experienced mechanic to do your repair work, we recommend that you send your hoist to an approved service station for repairs. Use authorized repair parts only.

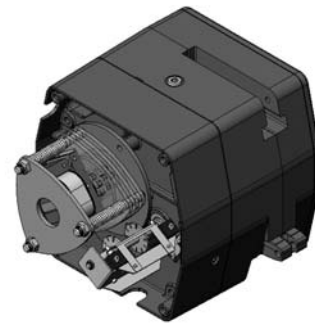
## ⚠ WARNING

**Remove load and disconnect hoist from power supply before starting to do any repairs or to take any sections apart.**

The following repair instructions will help you in understanding repair procedures, when related to the Replacement Parts List starting on page 18. For clarity these are broken down into areas.

### Electrical Parts and Brake

1. Refer to Figures 15 and 16. Remove the cover to access the controls. Single-phase models also have a starting switch and capacitor mounted on the panel as shown in Figure 16. The terminal blocks and end clamps snap off of the rails on the plate using a small screwdriver. **DO NOT SLIDE THE END CLAMPS.**  
  
The reversing contactor can be slid off the rail, but it must be snapped on. Where the contactor fits the rail, one side has springs or pads that apply pressure against the edge of the rail. By pressing against that side at the base of the contactor, you can snap the part on or off using a rotating action. Note the numbers that label the terminals on the contactor and orient the part as shown in Figures 9A & 9B. Single-phase contactors have a small jumper that is not present on the 3-phase (note the 3 and 5 terminals on the reversing contactor in Figure 9A).
2. Remove the electrical panel by removing the stand-off screws (See Figure 16). The limit switch and brake are now accessible as shown in Figure 6.
3. Remove the transformer bolted to the back of the panel plate if it requires replacement.
4. Refer to Figure 15 to disassemble the brake. See BRAKE ADJUSTMENT on page 9 to properly set the brake.



**Figure 6 - Electrical Panel Removed**

5. Refer to Figures 20 and 21 to disassemble the limit switch. See LIMIT SWITCH ADJUSTMENT on page 8 to properly set the upper and lower limits of travel.
6. Refer to Figure 17 for repairs on the pushbutton station. Also refer to the wiring diagram inside the electrical cover or Figures 9A and 9B for wiring instructions.

### Motor

Refer to Figures 12, 13 and 14.

The hoist motor is located on the opposite end to that of the electrical parts, but the two are tied together with electrical leads running through the housing.

1. If it is necessary to replace or repair the motor, **DISCONNECT THE HOIST FROM THE POWER SUPPLY** and remove the electrical cover.
2. Loosen the screw clamps on the terminal blocks and reversing contactor to disconnect the motor leads (See Figure 16).
3. Remove the four motor mounting bolts attaching the motor to the housing. It will come loose at the motor coupling.
4. Inspect the motor coupling, motor shaft and all the bearings. Replace as necessary.
5. Install new or repaired motor according to the wiring diagram located inside the electrical cover or Figures 9A and 9B.

### Gearing

Refer to Figures 7, 12 and 20.

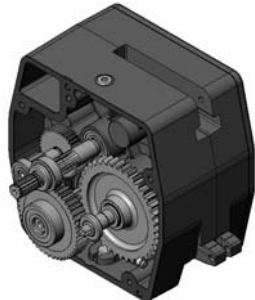
As disassembly is extensive for gearing, disconnect the hoist and move it to a workbench.

1. Remove the electrical cover.
2. Remove the electrical panel.
3. Remove the brake assembly and the limit switch assembly.
4. Drain the oil from the transmission.
5. Remove the four screws that attach the transmission cover to the gear housing and remove the transmission cover. The limit switch drive shaft will come along with the cover.

## ⚠ CAUTION

**Do not disassemble or readjust the clutch, or replace it with a clutch assembly from another hoist. Doing so will void the warranty and may create an unsafe condition. If replacement is needed due to wear or loss of adjustment, always use a new clutch assembly.**

6. Inspect gears for broken or severely worn teeth and inspect all bearings. Replace as necessary. The overload slip clutch is factory calibrated and must not be disassembled or readjusted.
7. Reassemble in reverse order of disassembly, making sure that the gasket is in place and in good condition. Coat gasket with Permatex® or other gasket cement. Extreme care should be taken to avoid damage to oil seals.
8. Check all wire terminals to be sure that they are properly seated and in accordance with the correct wiring diagram. Before placing the hoist back into service, check the brake adjustment and limit switch settings.



**Figure 7 - Assembled Gearing**

**Suspension**

Refer to Figures 8A & 8B.

The hoist sections must be separated at the top hook line in order to inspect the load sheave and chain guides. See CHAIN REPLACEMENT WITH NO CHAIN IN HOIST, page 8.

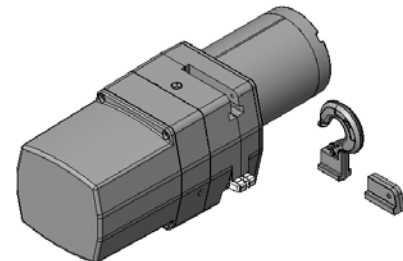
While this section is apart, check the following:

- Load Sheave
- Chain
- Chain guides and plates
- Bearings
- Chain support (on 2 ton models)

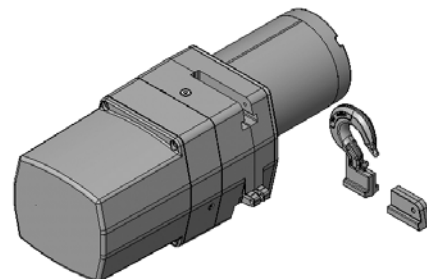
Replace parts as necessary including screws, lockwashers, etc. When reassembled, recheck the limit switch settings. See LIMIT SWITCH ADJUSTMENT, page 8.

Periodic inspections of the top suspensions can be made without disassembly. For more extensive inspections the lug may be removed as follows:

1. Disconnect the hoist and remove it to workbench.
2. Remove the lug retaining screw.
3. Remove the lug retainer.
4. Remove the lug.



**Figure 8A - Single Chain Lug Orientation**



**Figure 8B - Double Chain Lug Orientation**

Care must be taken during reassembly to have the hook in proper orientation. Refer to figures 8A & 8B for proper orientation. The transmission must be disassembled in order to inspect load sheave and chain guide (see CHAIN REPLACEMENT WITH NO CHAIN IN HOIST, page 8). When reassembled, recheck the limit switch settings (See LIMIT SWITCH ADJUSTMENT, page 8).

**POWER CORD PRECAUTIONS WITH 1-PHASE HOISTS**

Electric hoists require a sufficient power supply. It is especially important with single-phase voltage to ensure that the conductors running to the hoist from the power source are adequate in size to handle the power requirements of the hoist. Inadequate **power cables** and **branch circuits** will cause low voltage, high amperage, damage to the hoist, and potential fire hazards. Such problems can be minimized by using 230V power on 115/230V hoists. The following are recommendations for the conductor gage size depending on the length, horsepower, and voltage.

**Table 5 - Recommended Conductor Sizes for 1-Phase Hoists**

| HP  | Voltage<br>(1-Phase) | Maximum Length of Power Cord in Feet |        |        |       |
|-----|----------------------|--------------------------------------|--------|--------|-------|
|     |                      | 14 AWG                               | 12 AWG | 10 AWG | 8 AWG |
| 1/4 | 115V                 | 75                                   | 120    | 190    | 300   |
|     | 230V                 | 350                                  | 560    | 900    |       |
| 1/2 | 115V                 | 40                                   | 60     | 100    | 150   |
|     | 230V                 | 200                                  | 330    | 520    | 810   |
| 1   | 115V                 | 0                                    | 30     | 50     | 75    |
|     | 230V                 | 120                                  | 190    | 310    | 490   |

## TROUBLE SHOOTING

Always disconnect unit from the power supply system before removing hoist covers or the back cover of control station.



## WARNING

**Failure to follow proper lockout/tagout procedures may present the danger of electrical shock.**

**TO AVOID INJURY:  
Disconnect power and lockout/tagout disconnecting means before removing cover or servicing this equipment.**

— Probable Cause —

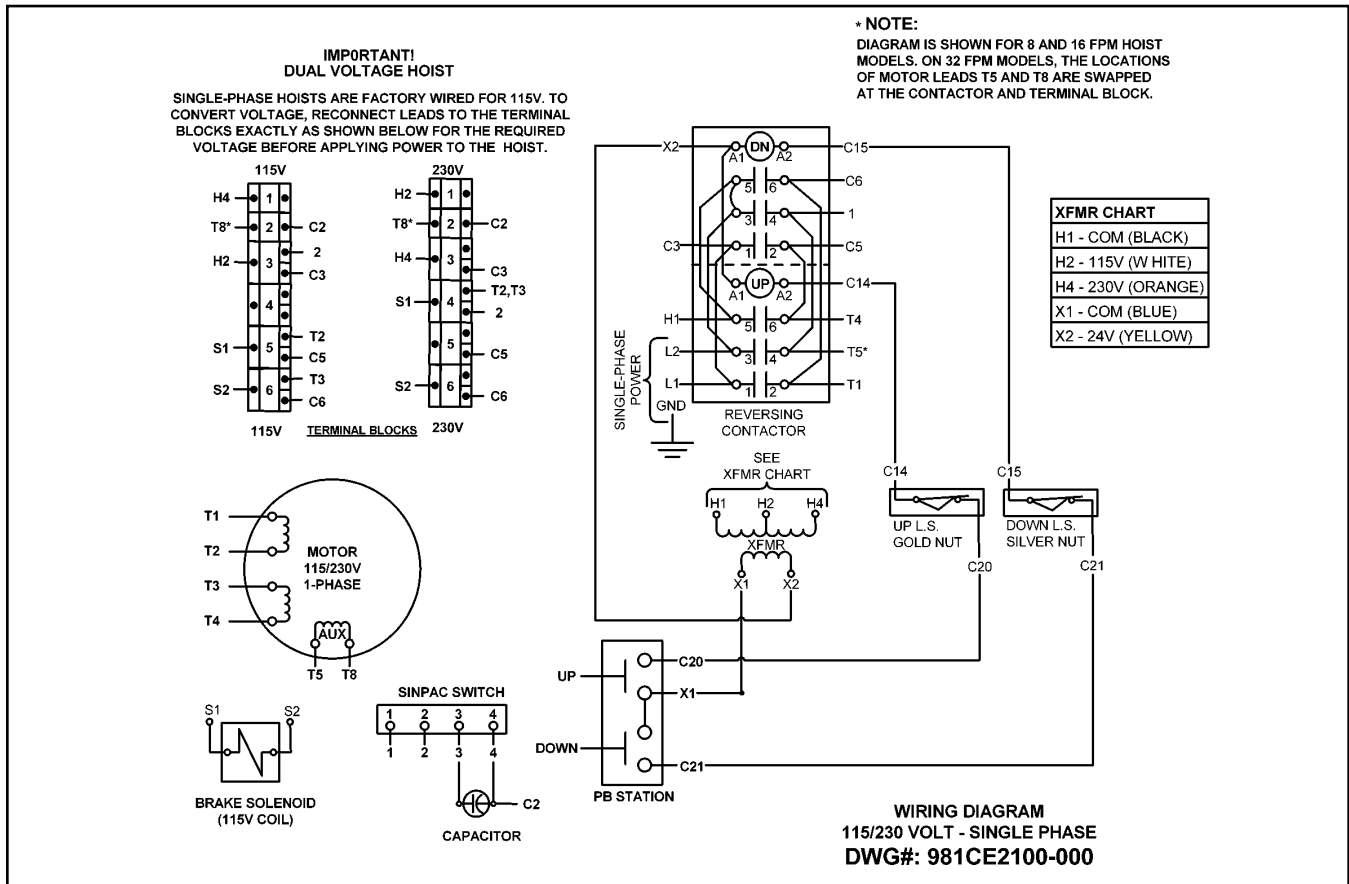
— Remedy —

| Probable Cause  | Remedy  |
|---|---|
| <b>Hook fails to stop at end of travel</b>  |   |
| <ol style="list-style-type: none"> <li>Limit switch not operating</li> <li>Brass limit switch nuts not moving on shaft</li> <li>Hoist reversing contactor malfunctioning</li> </ol>   | <ol style="list-style-type: none"> <li>Check adjustment (See LIMIT SWITCH ADJUSTMENT, page 8). Check connections against wiring diagram. Tighten loose connections or replace.</li> <li>Check for stripped threads or bent nut guide.</li> <li>Remove electrical cover and check reversing contactor.</li> </ol>  |
| <b>Hoist does not respond to pushbutton</b>   |   |
| <ol style="list-style-type: none"> <li>Power failure in supply lines</li> <li>Wrong voltage or frequency</li> <li>Improper connections in hoist or pushbutton station</li> <li>Brake does not release</li> <li>Faulty hoist reversing contactor</li> </ol>  | <ol style="list-style-type: none"> <li>Check circuit breakers, switches and connections in power supply lines.</li> <li>Check voltage and frequency of power supply against the rating on the nameplate of the motor.</li> <li>Check all connections at line connectors and on terminal block. Check terminal block on dual voltage hoists for proper voltage connections.</li> <li>Check connections to the solenoid coil. Check for open or short circuit. Check for proper adjustment (See BRAKE ADJUSTMENT, page 9).</li> <li>Check coils for open or short circuit. Check all connections in control circuit. Check for burned contacts. Replace as needed.</li> </ol>   |
| <b>Hook does not stop promptly</b>  |   |
| <ol style="list-style-type: none"> <li>Hoist overloaded</li> <li>Brake not holding</li> </ol>   | <ol style="list-style-type: none"> <li>Reduce load to within rated capacity of hoist.</li> <li>Check brake adjustment (See BRAKE ADJUSTMENT, page 9). It may be necessary to replace discs.</li> </ol>  |
| <b>Hook moves in wrong direction</b>  |   |
| <ol style="list-style-type: none"> <li>Three phase reversal</li> <li>Improper connections</li> </ol>  | <ol style="list-style-type: none"> <li>Reverse any two wires (except the green ground wire) at the power source (See INSTALLATION 2c, page 5).</li> <li>Check all connections against wiring diagram.</li> </ol>  |
| <b>Hoist hesitates to lift when energized</b>   |   |
| <ol style="list-style-type: none"> <li>Hoist overloaded</li> <li>Motor brake requires adjustment</li> <li>Worn overload limiting clutch</li> <li>Low voltage</li> <li>Faulty SINPAC® starting switch or start capacitor (single phase hoists only)</li> </ol>   | <ol style="list-style-type: none"> <li>Reduce load within rated capacity of hoist.</li> <li>Check motor brake adjustment (See BRAKE ADJUSTMENT, page 9).</li> <li>Replace clutch.</li> <li>Determine cause of low voltage and bring up to within plus or minus 10% of the voltage specified on the motor. Measure voltage at the hoist reversing contactor while lifting a load.</li> <li>Replace faulty component.</li> </ol>  |
| <b>Hook raises but will not lower</b>   |   |
| <ol style="list-style-type: none"> <li>"DOWN" circuit open</li> <li>Broken conductor in pushbutton cable</li> <li>Faulty hoist reversing contactor</li> <li>Loose screw clamps</li> </ol>   | <ol style="list-style-type: none"> <li>Check circuit for loose connections. Check "DOWN" limit switch for malfunction.</li> <li>Check each conductor in the cable. If one is broken, replace entire cable.</li> <li>Check coils for open or short circuit. Check all connections in control circuit. Check for burned contacts. Replace as needed.</li> <li>Ensure that screw clamps are tightened on the terminal blocks and reversing contactor.</li> </ol>   |
| <b>Hook lowers but will not raise</b>   |   |
| <ol style="list-style-type: none"> <li>Hoist overloaded</li> <li>Low voltage</li> <li>"UP" circuit open</li> <li>Broken conductor in pushbutton cable</li> <li>Faulty hoist reversing contactor</li> <li>Faulty capacitor (single phase hoist only)</li> <li>Worn overload limiting clutch</li> <li>Loose screw clamps</li> </ol> | <ol style="list-style-type: none"> <li>Reduce load to within rated capacity of hoist.</li> <li>Determine cause of low voltage and bring up to within plus or minus 10% of the voltage specified on the motor. Measure voltage at the hoist reversing contactor while lifting a load.</li> <li>Check circuit for loose connections. Check "UP" limit switch for malfunction.</li> <li>Check each conductor in the cable. If one is broken, replace entire cable.</li> <li>Check coils for open or short circuit, check all connections in control circuit. Check for burned contacts. Replace as needed.</li> <li>Check starting capacitor on motor. Replace if necessary.</li> <li>Replace overload clutch assembly.</li> <li>Ensure that screw clamps are tightened on the terminal blocks and reversing contactor.</li> </ol> |
| <b>Motor overheats</b>  |   |
| <ol style="list-style-type: none"> <li>Excessive load</li> <li>Low voltage</li> <li>Extreme external heating</li> <li>Frequent starting or reversing</li> <li>Brake dragging</li> </ol>   | <ol style="list-style-type: none"> <li>Reduce load to within rated capacity of hoist.</li> <li>Determine cause of low voltage and bring up to within plus or minus 10% of the voltage specified on the motor. Measure voltage at the hoist reversing contactor while lifting a load.</li> <li>As the ambient temperature rises towards the 130°F limitation of the unit, frequency of the hoist operation must be limited to avoid overheating of the motor. See ADVERSE ENVIRONMENTAL CONDITIONS, page 4.</li> <li>Excessive inching, jogging or reversing should be avoided since this type of operation will drastically shorten the life of motor, contactor and brake.</li> <li>Check brake adjustment (See BRAKE ADJUSTMENT, page 9).</li> </ol>  |

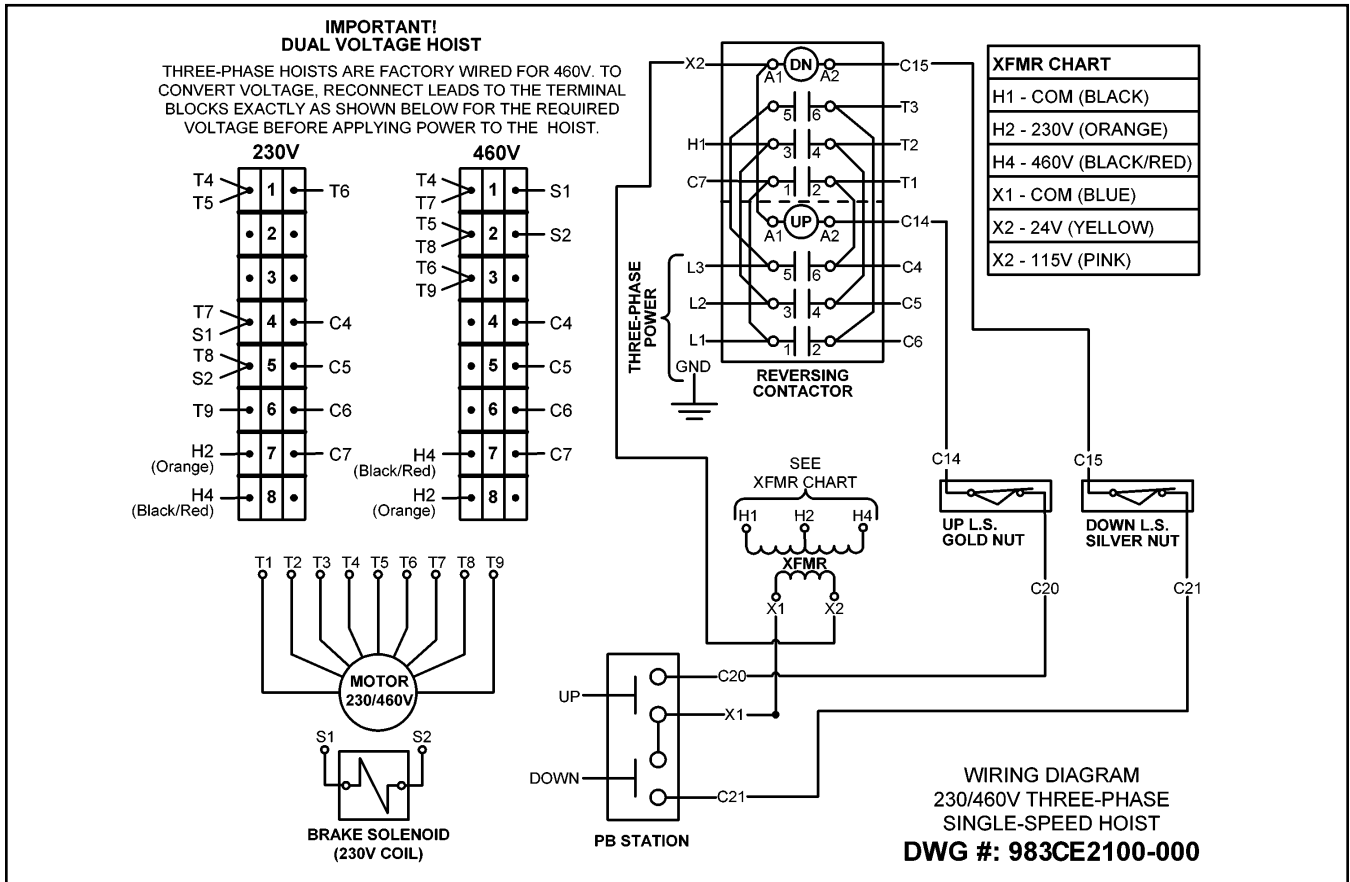
## TROUBLE SHOOTING CONTINUED

|   |  |
|---|--|
| <b>Lack of proper lifting speed</b>   |  |
| 1. Hoist overloaded<br>2. Brake dragging<br>3. Low voltage<br>4. Overload limiting clutch intermittently slipping | 1. Reduce load to within rated capacity of hoist.<br>2. Check for proper brake adjustment or other defects.<br>3. Ensure that the voltage at the reversing contactor is within $\pm 10\%$ of the nominal voltage while lifting a load.<br>4. Replace overload clutch assembly. |
| <b>Motor brake noise or chatter (while starting hoist)</b>  |  |
| 1. Brake needs adjustment<br>2. Low voltage   | 1. See BRAKE ADJUSTMENT, page 9.<br>2. Ensure that the voltage at the reversing contactor is within $\pm 10\%$ of the nominal voltage while lifting a load.  |
| <b>Motor brake "buzz" (anytime hoist is running)</b>  |  |
| 1. Brake needs adjustment<br>2. Broken shading coil on brake frame  | 1. See BRAKE ADJUSTMENT, page 9.<br>2. Replace shading coil or complete brake frame assembly.  |

## NOTES



**Figure 9A — Wiring Diagram for 115/230V - 1 Phase Models**



**Figure 9B — Wiring Diagram for 1-Speed, 230/460V - 3 Phase Models**

**INSPECTION AND MAINTENANCE CHECK LIST  
ELECTRIC POWERED OVERHEAD CHAIN HOIST**

Type of Hoist \_\_\_\_\_ Capacity (Tons) \_\_\_\_\_  
Location \_\_\_\_\_ Original Installation Date \_\_\_\_\_  
Manufacturer \_\_\_\_\_ Manufacturer's Serial No. \_\_\_\_\_

| Item  | Frequency of Inspection |         |                      | Possible Deficiencies  | OK | Action Required |
|---|-------------------------|---------|----------------------|--|----|-----------------|
|   | Frequent                |         | Periodic<br>1-12 Mo. |  |    |                 |
|   | Daily                   | Monthly |                      |  |    |                 |
| Operating Controls                                    | *                       | *       | *                    | Any deficiency causing improper operation  |    |                 |
| Limit Switches  | *                       | *       | *                    | 1. Any deficiency causing improper operation<br>2. Pitting or deterioration  |    |                 |
| Brake Mechanism                                       | *                       | *       | *                    | 1. Slippage or excessive drift<br>2. Glazing, contamination or excessive wear  |    |                 |
| Hooks   | *                       | *       | *                    | Excessive throat opening 15% bent or twisted more than 10 degrees, damaged hook latch, wear, chemical damage, worn hook bearing, Cracks (use dye penetrant, magnetic or other suitable detection method) |    |                 |
| Suspension Lug (if used)                              | *                       | *       | *                    | Cracks, excessive wear or other damage which may impair the strength of the lug. Cracks (use dye penetrant, magnetic particle or other suitable detection method)  |    |                 |
| Chain   | *                       | *       | *                    | Inadequate lubrication, excessive wear or stretch, cracked, damaged or twisted links, corrosion or foreign substance   |    |                 |
| Hook and Suspension Lug Connections                   |                         |         | *                    | Cracks, bending, stripped threads  |    |                 |
| Pins, Bearings, Bushings Shafts, Couplings            |                         |         | *                    | Excessive wear, corrosion, cracks, distortion  |    |                 |
| Nuts, Bolts, Rivets                                   |                         |         | *                    | Looseness, stripped and damaged threads, corrosion   |    |                 |
| Sheaves   |                         |         | *                    | Distortion, cracks, and excessive wear.<br>Build-up of foreign substances  |    |                 |
| Housings, Load Block                                  |                         |         | *                    | Cracks, distortion. Excessive wear, internal build-up of foreign substances  |    |                 |
| Wiring and Terminals                                  |                         |         | *                    | Fraying, defective insulation  |    |                 |
| Hoist Reversing Contactor, other Electrical Apparatus |                         |         | *                    | Loose connections, burned or pitted contacts   |    |                 |
| Supporting Structure and Trolley (if used)            |                         |         | *                    | Damage or wear which restricts ability to support imposed loads  |    |                 |
| Nameplates, Decals, Warning Labels                    |                         |         | *                    | Missing, damaged or illegible  |    |                 |
| Transmission Lubricant                                |                         |         | *                    | Low level requires changing  |    |                 |

**NOTE:** Refer to Maintenance and Inspection Sections of the Hoist-Maintenance Manual for further details.

**FREQUENCY OF INSPECTION**

Frequent — Indicates items requiring inspection daily to monthly. Daily inspections may be performed by the operator if properly designated.

Periodic — Indicates items requiring inspection monthly to yearly. Inspections to be performed by or under the direction of a properly designated period. The exact period of inspection will depend on frequency and type of usage. Determination of this period will be based on the user's experience. It is recommended that the user begin with a monthly inspection and extend the periods to quarterly, semi-annually or annually based on user's monthly experience.

**Figure 10A — Recommended Inspection and Maintenance Check List**

**NOTE:** This inspection and maintenance check list is in accordance with our interpretation of the requirements of the Safety Standard for Overhead Hoists ASME B30.16. It is, however, the ultimate responsibility of the employer/user to interpret and adhere to the applicable requirements of this safety standard.



| INSPECTOR'S REPORT    |  |             |      |
|-----------------------|--|-------------|------|
| ITEM                  | REMARKS (LIST DEFICIENCIES AND RECOMMENDED ACTION) |             |      |
|                       |  |             |      |
|                       |  |             |      |
|                       |  |             |      |
|                       |  |             |      |
|                       |  |             |      |
|                       |  |             |      |
|                       |  |             |      |
|                       |  |             |      |
|                       |  |             |      |
|                       |  |             |      |
| Inspector's Signature | Date Inspected                                     | Approved by | Date |

**Figure 10B — Recommended Inspector's Report**

| RECOMMENDED LUBRICATION SCHEDULE*<br>LITTLE MULE ELECTRIC POWERED CHAIN HOIST |   |   |  |         |            |
|---|---|---|--|---------|------------|
| PAGE AND REFERENCE NO.  | COMPONENT                               | TYPE OF LUBRICANT                                   | TYPE OF SERVICE AND FREQUENCY OF LUBRICATION |         |            |
|   |   |   | HEAVY  | NORMAL  | INFREQUENT |
| Pages 28 & 29<br>Ref. No. 8   | Load Chain                              | SAE 90 gear oil                                     | Daily  | Weekly  | Monthly    |
| Pages 26 & 27   | Gearing                                 | SAE 90 extreme pressure (EP) gear oil               | At periodic inspection (see Figure 10A)      |         |            |
| Pages 24 & 25<br>Ref. Nos. 9 & 7  | Limit Switch Shaft                      | Multi-purpose oil or general purpose spray          | Monthly                                      | Yearly  | Yearly     |
| Pages 28 & 29<br>Ref. No. 18, 30  | Load Hook Bearing                       | SAE 30 gear oil or motor oil                        | Weekly                                       | Monthly | Yearly     |
| Pages 28 & 29<br>Ref. No. 27  | Idler Sheave Bearing (Bushing) Assembly | Multi-purpose lithium base bearing grease - NLGI #2 | At periodic inspection (see Figure 10A)      |         |            |

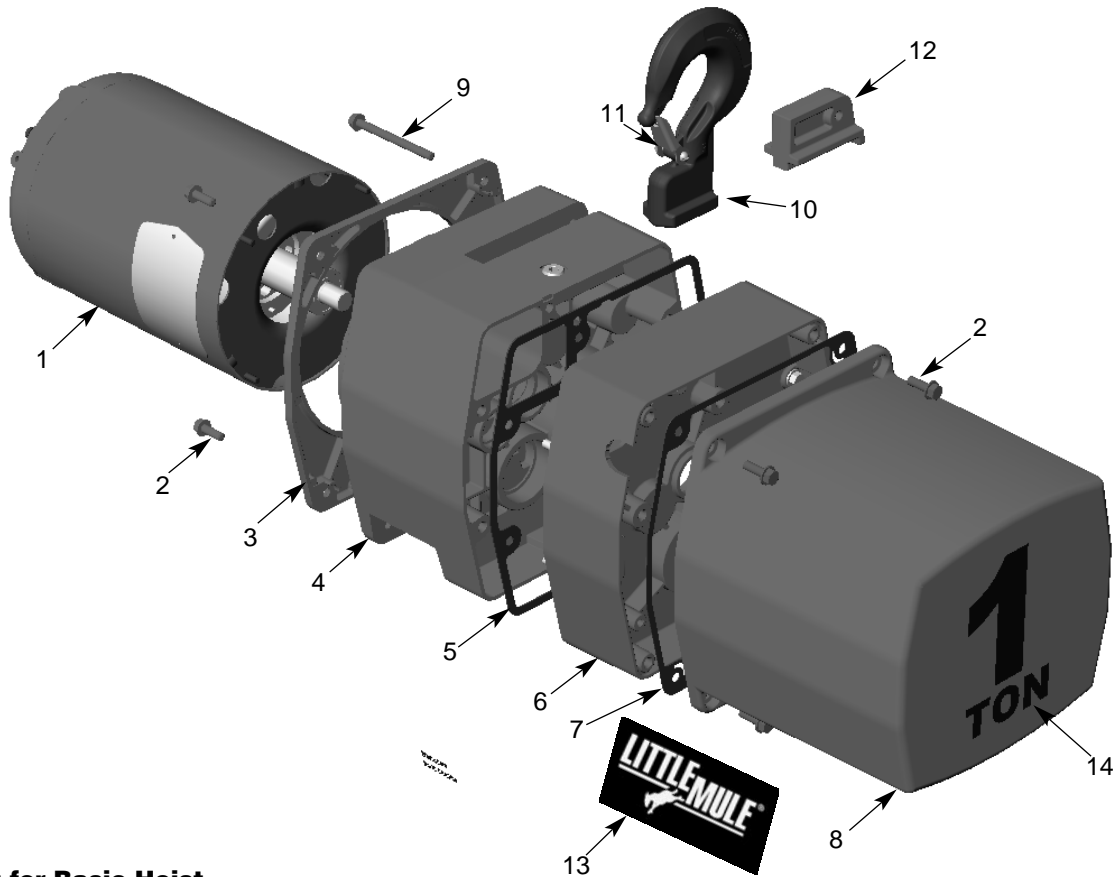
**NOTE:** All bearings except hook and idler sheave bearings are prelubricated and sealed.  
(\*) This lubrication schedule is based on a hoist operating in normal environment conditions. Hoists operating in adverse atmospheres containing excessive heat, corrosive fumes or vapors, abrasive dust, etc., should be lubricated more frequently.

**Figure 11 — Recommended Lubrication Schedule**



Contact your nearest Little Mule Service Center for parts and service. For a complete list, see pages 30 and 31. Please have the hoist model number, serial number, and part number with description available for reference.

## Figure 12 - Basic Hoist



### Parts List for Basic Hoist

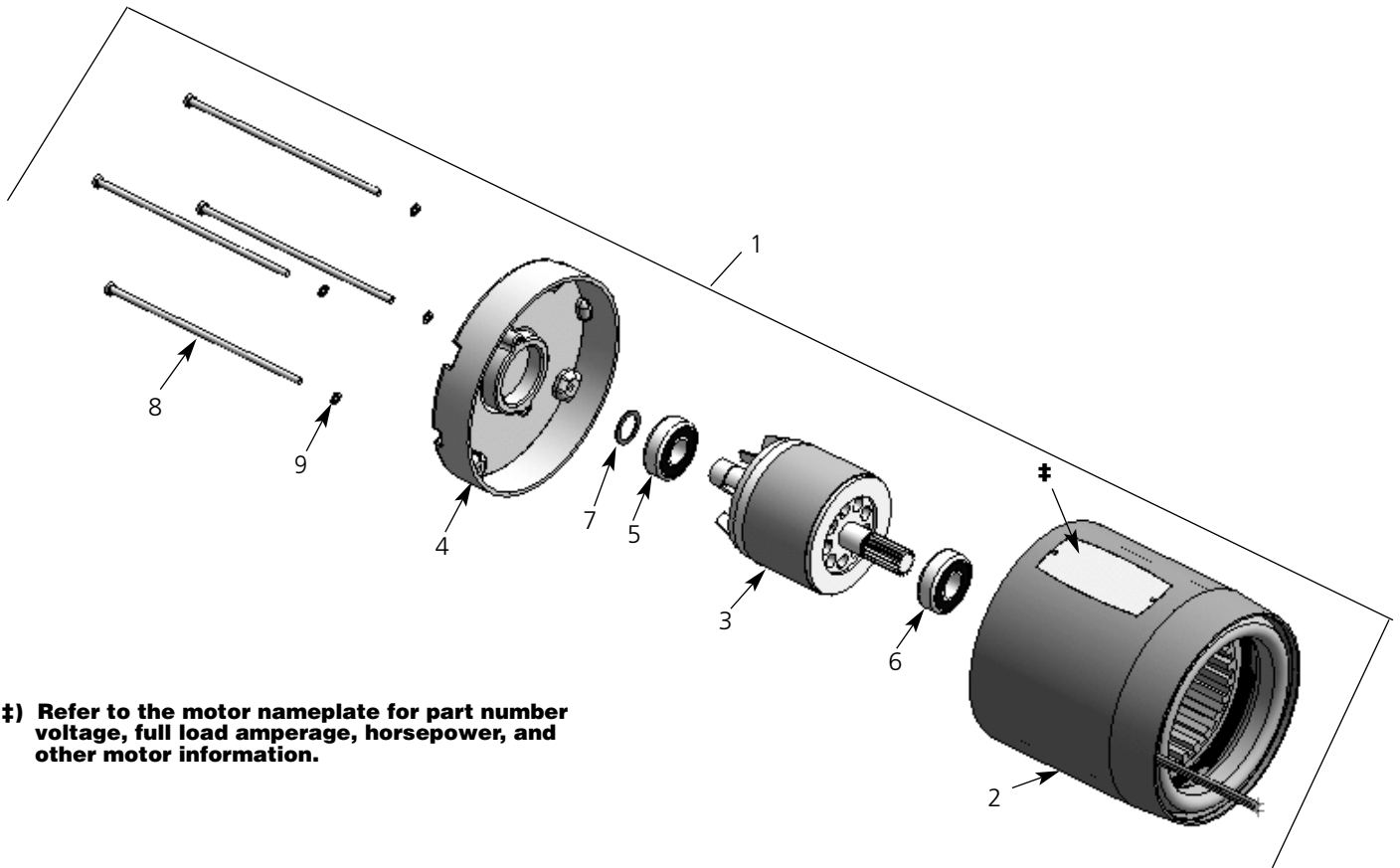
| Ref No. | Description                    | Part No.  | Qty | Ref No. | Description     | Part No.   | Qty |
|---------|--------------------------------|-----------|-----|---------|-----------------|------------|-----|
| 1       | Motor<br>(See Figures 13 & 14) | —         | 1   | 14      | Capacity Decal  |            |     |
| 2       | Cover Screw                    | H2976P    | 7   |         | 1/4 ton         | JLC675K-02 | 1   |
| 3       | Trim Cover                     | JM37      | 1   |         | 1/2 ton         | JLC675K-05 | 1   |
| 4       | Transmission Housing           | JM3533    | 1   |         | 1 ton           | JLC675K-10 | 1   |
| 5       | Transmission Case Gasket       | JM560     | 1   |         | 2 ton           | JLC675K-20 | 1   |
| 6       | Transmission Cover             | JM34      | 1   | △       | Nylon Cover     |            |     |
| 7       | Electrical Cover Gasket        | JM563     | 1   |         | †1/8 ton        | 08770W     | 1   |
| 8       | Electrical Cover               | JM36      | 1   |         | †1/4 ton        | 08771W     | 1   |
| 9       | Hook Retainer Screw            | H2709P    | 1   |         | †1/2 ton        | 08772W     | 1   |
| 10      | Top Hook Assembly with Latch   |           |     |         | †1 ton          | 08773W     | 1   |
|         | Rigid Hook (std.)              | 3M405A01S | 1   |         | †2 ton          | 08774W     | 1   |
|         | †Swivel Hook                   | 51JM1     | 1   | △       | Chain Container | 08348W     | 1   |
| 11      | Latch Kit Assembly             | 4X1305    | 1   |         |                 |            |     |
| 12      | Hook Retainer                  | JM285     | 1   |         |                 |            |     |
| 13      | Little Mule Decal              | LMS677    | 2   |         |                 |            |     |

(△) Not Shown

(†) Optional

Contact your nearest Little Mule Service Center for parts and service. For a complete list, see pages 30 and 31. Please have the hoist model number, serial number, and part number with description available for reference.

## Figure 13 - Hoist Motor, 115/230V - 1 Phase



(#) Refer to the motor nameplate for part number voltage, full load amperage, horsepower, and other motor information.

### Parts List for Hoist Motor, 115/230V - 1 Phase

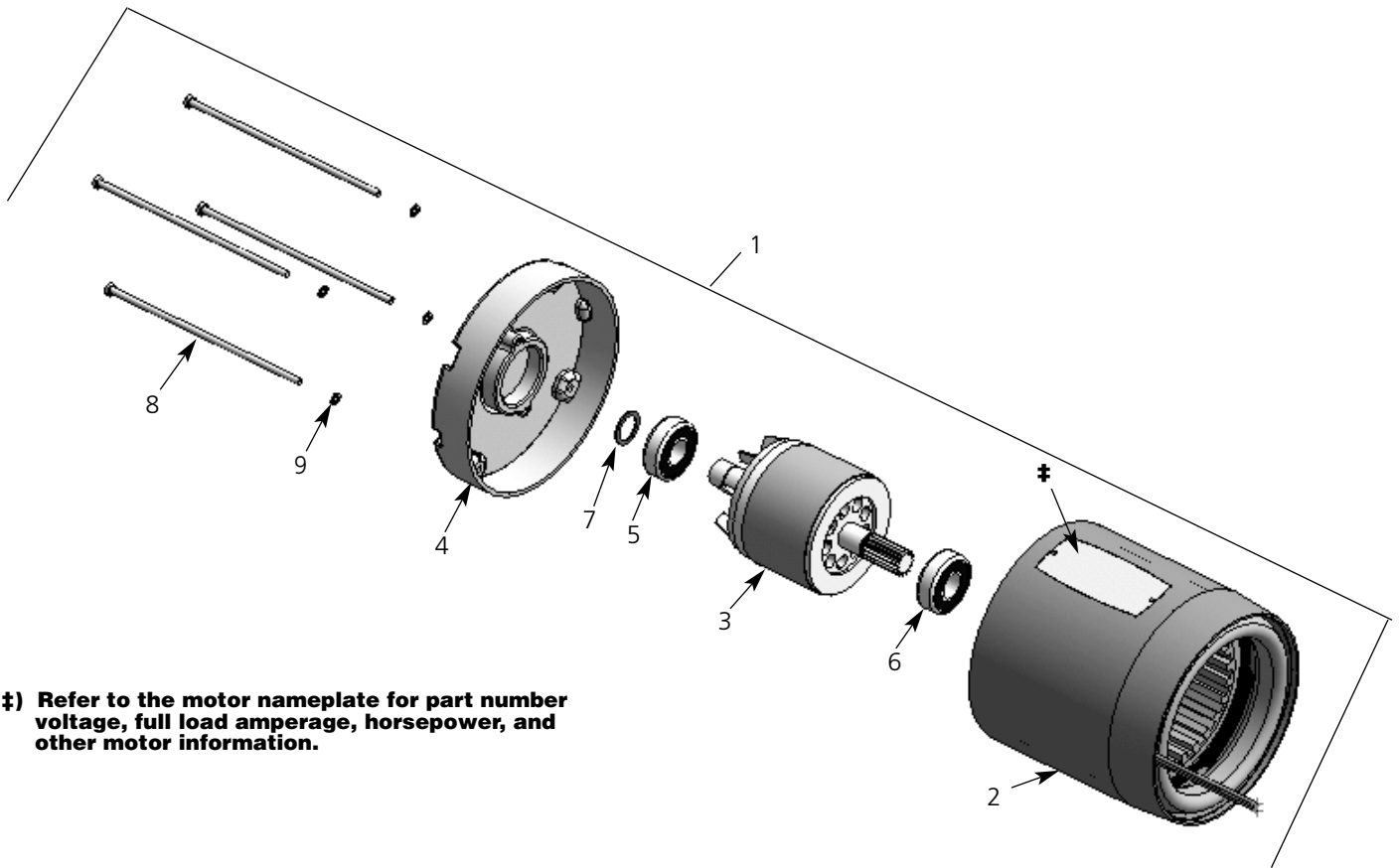
| Ref No. | Description          | Part No.    | Qty |
|---------|----------------------|-------------|-----|
| 1       | Hoist Motor          |             |     |
|         | 1/4 hp, 115/230V-1Ph | 861JM11     | 1   |
|         | 1/2 hp, 115/230V-1Ph | 861JM12     | 1   |
|         | 1 hp, 115/230V-1Ph   | 861JM14     | 1   |
| 2       | Stator Assembly      | *           | 1   |
| 3       | Rotor Assembly       | *           | 1   |
| 4       | End Shield           | 35EP3100D09 | 1   |
| 5       | Rear Bearing         | 500K3       | 1   |

| Ref No. | Description           | Part No.  | Qty |
|---------|-----------------------|-----------|-----|
| 6       | Front Bearing         | 732012C   | 1   |
| 7       | Shim Washer           | JL4301-01 | 1   |
| 8       | Thru Bolt             | HA3100A56 | 4   |
| 9       | #10 Spring Lockwasher | H4082P    | 4   |

\* Not available as an individual part.

Contact your nearest Little Mule Service Center for parts and service. For a complete list, see pages 30 and 31. Please have the hoist model number, serial number, and part number with description available for reference.

## Figure 14 - Hoist Motor, 3 Phase



(‡) Refer to the motor nameplate for part number voltage, full load amperage, horsepower, and other motor information.

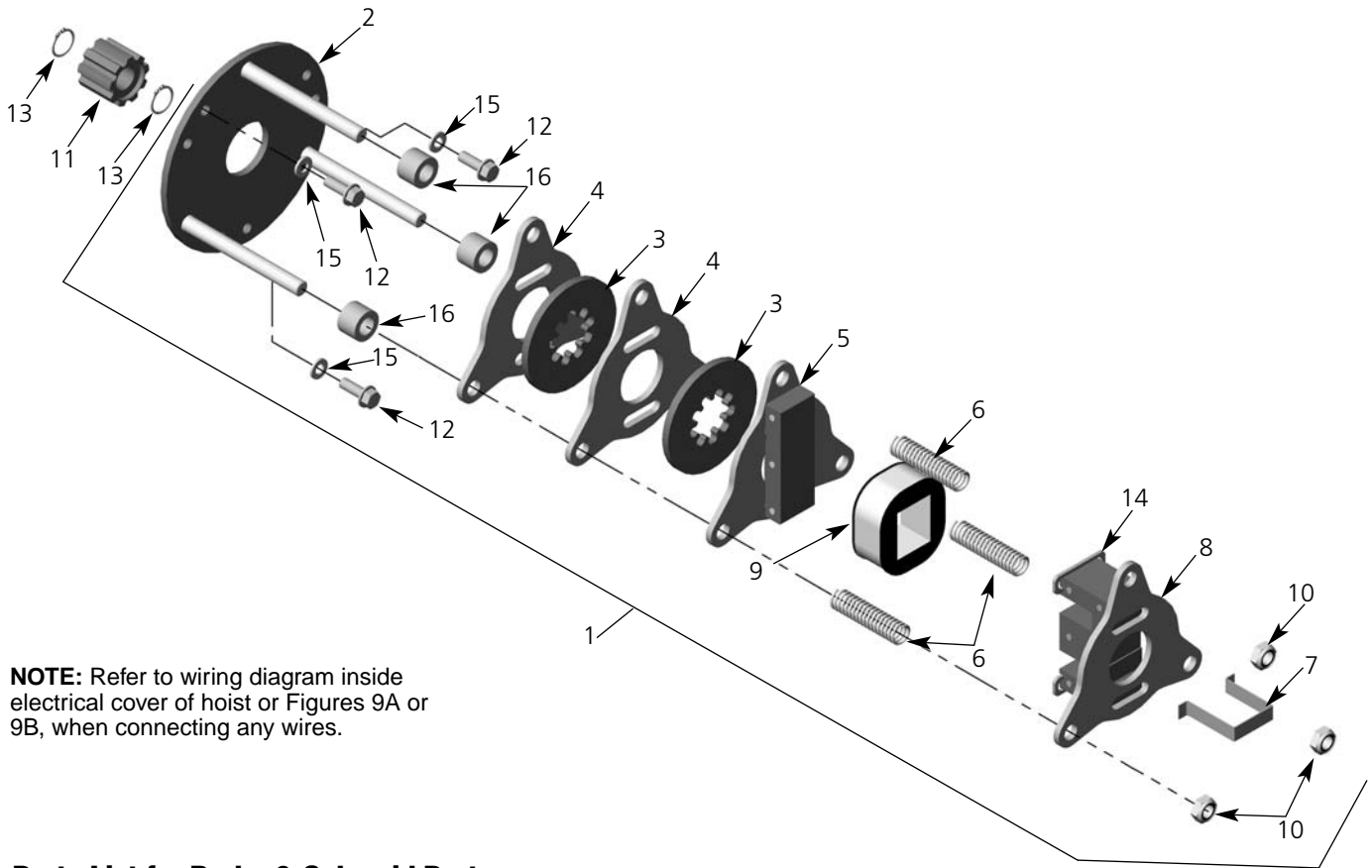
### Parts List for Hoist Motor, 3 Phase

| Ref No. | Description               | Part No.    | Qty | Ref No. | Description           | Part No.  | Qty |
|---------|---------------------------|-------------|-----|---------|-----------------------|-----------|-----|
| 1       | Hoist Motor               |             |     | 6       | Front Bearing         | 732012C   | 1   |
|         | 1/4 hp, 230/460V-3Ph-60Hz | 863JM1      | 1   | 7       | Shim Washer           | JL4301-01 | 1   |
|         | 1/2 hp, 230/460V-3Ph-60Hz | 863JM2      | 1   | 8       | Thru Bolt             | HA3100A56 | 4   |
|         | 1 hp, 230/460V-3Ph-60Hz   | 863JM4      | 1   | 9       | #10 Spring Lockwasher | H4082P    | 4   |
| 2       | Stator Assembly           | *           | 1   |         |                       |           |     |
| 3       | Rotor Assembly            | *           | 1   |         |                       |           |     |
| 4       | End Shield                | 35EP3100D09 | 1   |         |                       |           |     |
| 5       | Rear Bearing              | 500K3       | 1   |         |                       |           |     |

\* Not available as an individual part.

Contact your nearest Little Mule Service Center for parts and service. For a complete list, see pages 30 and 31. Please have the hoist model number, serial number, and part number with description available for reference.

## Figure 15 - Brake & Solenoid Parts



**NOTE:** Refer to wiring diagram inside electrical cover of hoist or Figures 9A or 9B, when connecting any wires.

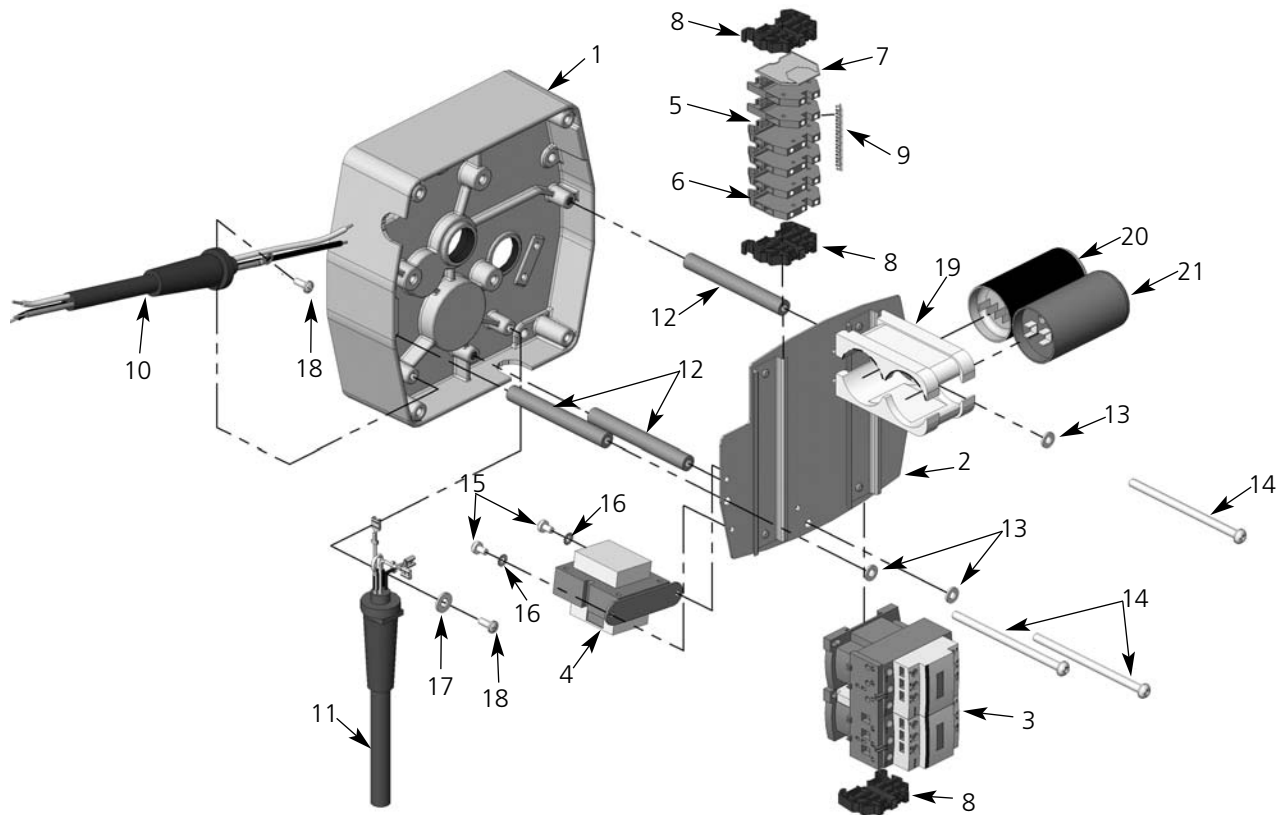
### Parts List for Brake & Solenoid Parts

| Ref No. | Description               | Part No. | Qty | Ref No. | Description             | Part No. | Qty |
|---------|---------------------------|----------|-----|---------|-------------------------|----------|-----|
| 1       | Disc Brake Assembly*      |          |     | 9       | Brake Coil              |          |     |
|         | 1 hp, 115 Volt            | 854JM1   | 1   |         | 115/230V*               | 853JL1   | 1   |
|         | 1/4 & 1/2 hp, 115 Volt    | 854JM12  | 1   |         | 230/460V*               | 853JL2   | 1   |
|         | 1 hp, 230 Volt            | 854JM2   | 1   | 10      | Locknut                 | H3978    | 3   |
|         | 1/4 & 1/2 hp, 230 Volt    | 854JM22  | 1   | 11      | Adapter                 | JL142    | 1   |
| 2       | Plate & Stud Assembly     | 859JG1   | 1   | 12      | Screw                   | H2976P   | 3   |
| 3       | Brake Disc                |          |     | 13      | Retaining Ring          | H5501    | 2   |
|         | 1/4 & 1/2 hp              | 581J1A   | 2   | 14      | Shading Coil            | 860J1    | 2   |
|         | 1 hp                      | 581J1A   | 3   |         | Shading Coil Adhesive   | H7812    | 1   |
| 4       | Brake Plate               | JF291    | 2   | 15      | Lockwasher              | H4134    | 3   |
| 5       | Plate & Armature Assembly | JF858    | 1   | 16      | Spacer for 1/4 & 1/2 hp | 141J2    | 3   |
| 6       | Spring                    | 344J6    | 3   |         |                         |          |     |
| 7       | Retainer                  | JF710    | 1   |         |                         |          |     |
| 8       | Plate & Frame Assembly    | JF857    | 1   |         |                         |          |     |

\* **Dual-voltage 115/230V models use 115V Brake Assembly and Coil.**  
**Dual-voltage 230/460V models use 230V Brake Assembly and Coil.**

Contact your nearest Little Mule Service Center for parts and service. For a complete list, see pages 30 and 31. Please have the hoist model number, serial number, and part number with description available for reference.

## Figure 16 - Electrical Parts



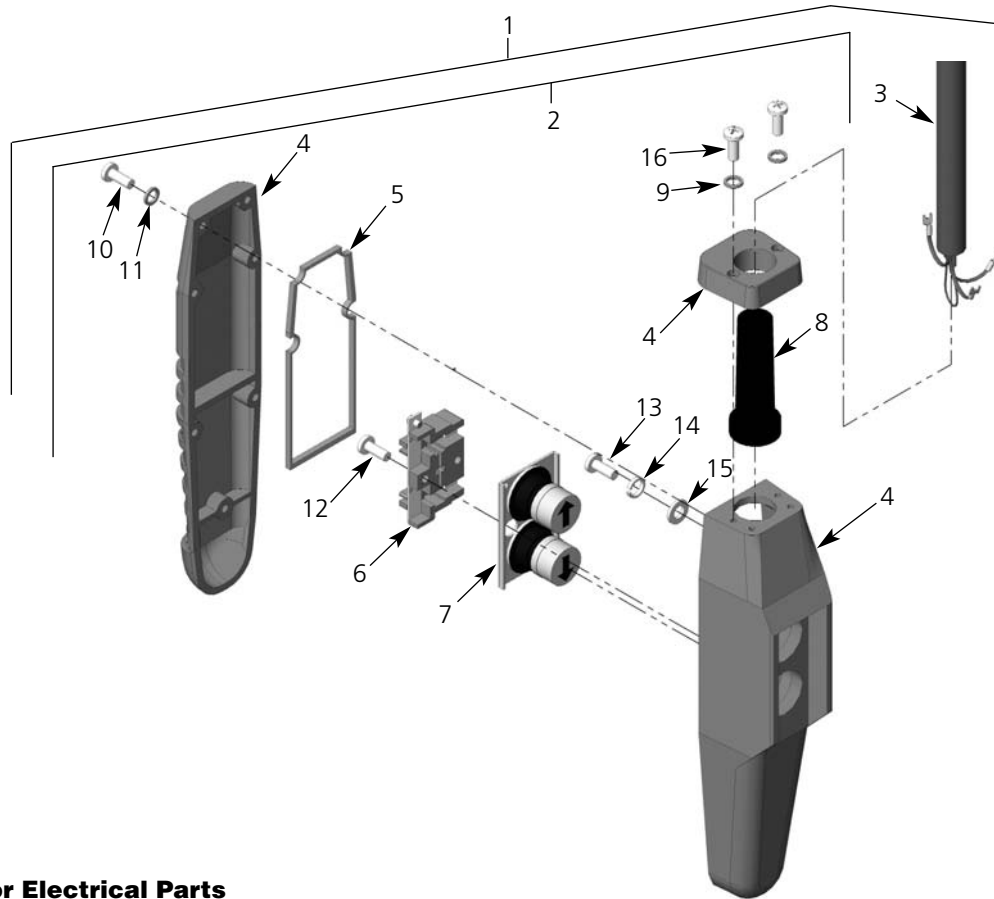
### Parts List for Electrical Parts

| Ref No. | Description                | Part No. | Qty | Ref No. | Description                    | Part No. | Qty |
|---------|----------------------------|----------|-----|---------|--------------------------------|----------|-----|
| 1       | Transmission Cover         | JM34     | 1   | 8       | End Clamp                      |          |     |
| 2       | Panel Plate                | 257JM200 | 1   |         | 115/230V & 230/460V            | 909J13   | 3   |
| 3       | Reversing Contactor*       |          |     |         | Single Voltage Models          | 909J13   | 1   |
|         | 1/2 hp & under:            |          |     | 9       | Marking Strip                  | 909J11   | 1   |
|         | 24V Coil                   | 28860    | 1   | 10      | 15 ft Power Cord Assembly      |          |     |
|         | 115V Coil                  | 24799    | 1   |         | 115/230V, 1/2 hp (3 cond.)     | 951JM1   | 1   |
|         | 1 hp, 1-Phase:             |          |     |         | 115/230V, 1 hp (3 cond.)       | 952JM1   | 1   |
|         | 24V Coil                   | 24791    | 1   |         | 3-Phase (4 cond.)              | 953JM1   | 1   |
|         | 115V Coil                  | 28905    | 1   | 11      | PB & Cable Assembly            |          |     |
|         | 1 hp, 3-Phase:             |          |     |         | (See Figure 17)                |          | 1   |
|         | 24V Coil                   | 25943    | 1   | 12      | Panel Standoff Spacer          | 200J4    | 3   |
|         | 115V Coil                  | 24729    | 1   | 13      | 1/4" Internal-tooth Lockwasher | H4134    | 3   |
| 4       | Transformer*               |          |     | 14      | 1/4-20UNC X 4" Screw           | H1027P   | 3   |
|         | Pri.: 115/230V, Sec.: 24V  | 821J412  | 1   | 15      | 8-32UNC X 5/16" Screw          | H2751    | 2   |
|         | Pri.: 115/230V, Sec.: 115V | 821J411  | 1   | 16      | #8 External-tooth Lockwasher   | H4158    | 2   |
|         | Pri.: 230/460V, Sec.: 24V  | 821J432  | 1   | 17      | 1/4" Flatwasher                | H4002P   | 1   |
|         | Pri.: 230/460V, Sec.: 115V | 821J431  | 1   | 18      | 10-24UNC X 1/2" Screw          | H2970    | 1   |
| 5       | Terminal Block             |          |     | 19†     | Can Mounting Bracket           | JM811    | 2   |
|         | 115/230V                   | 909J10   | 1   | 20†     | SINPAC® Starting Switch        | 839J3    | 1   |
|         | 230/460V                   | 909J10   | 8   | 21†     | Capacitor                      | JL810-4  | 1   |
| 6       | Terminal Block             |          |     |         |                                |          |     |
|         | 115/230V                   | 909J14   | 4   |         |                                |          |     |
| 7       | End Plate                  |          |     |         |                                |          |     |
|         | 115/230V                   | 909J15   | 1   |         |                                |          |     |
|         | 230/460V                   | 909J12   | 1   |         |                                |          |     |

\* Coil voltage of the contactor and the secondary voltage of the transformer are the same. This is referred to as the control voltage. Standard units are supplied with 24V Control. (†)Single Phase units only.

Contact your nearest Little Mule Service Center for parts and service. For a complete list, see pages 30 and 31. Please have the hoist model number, serial number, and part number with description available for reference.

## Figure 17 - Pushbutton Station



### Parts List for Electrical Parts

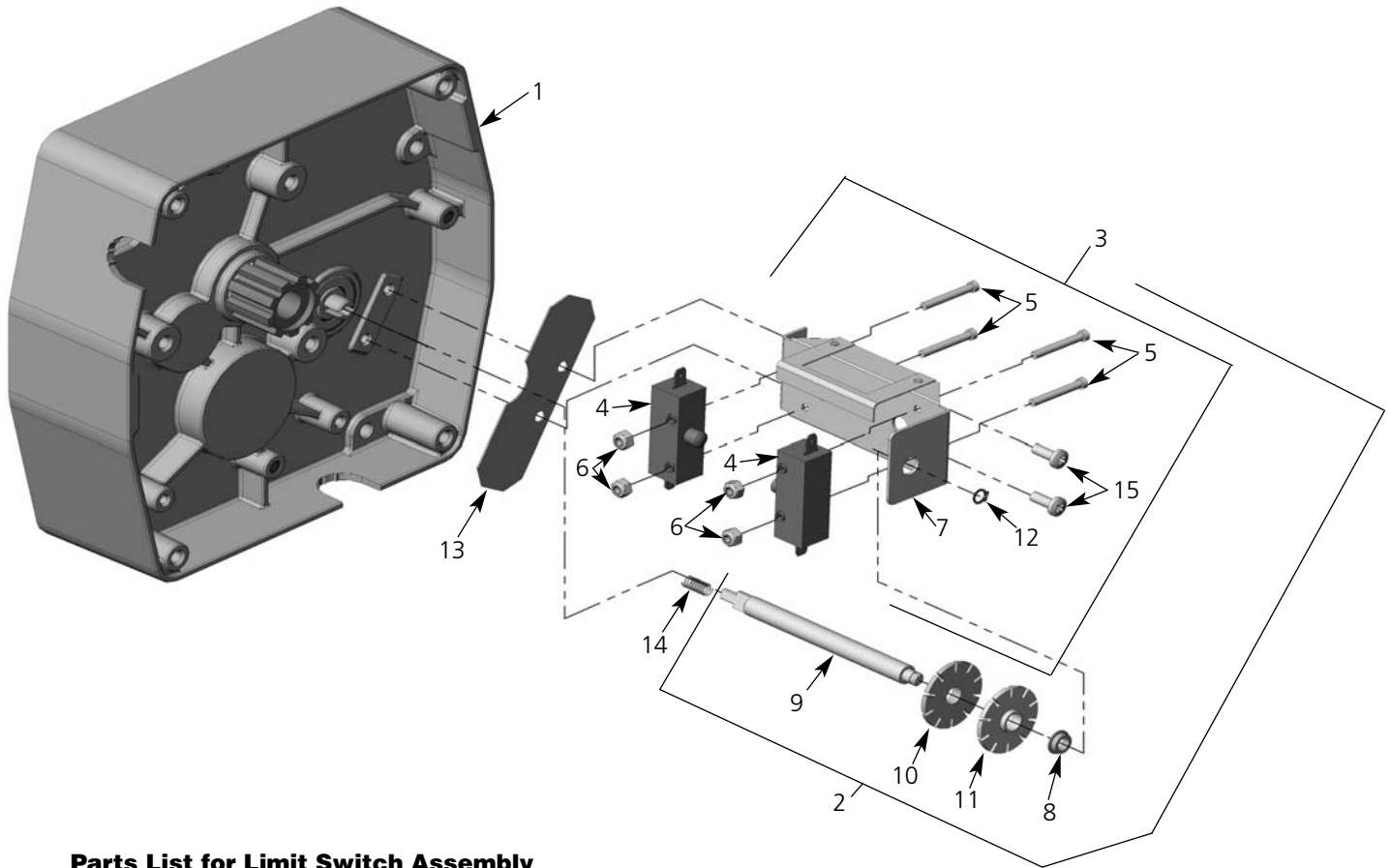
| Ref No. | Description                                 | Part No.   | Qty | Ref No. | Description             | Part No. | Qty |
|---------|---|------------|-----|---------|-------------------------|----------|-----|
| 1       | Pushbutton Station & Control Cable Assembly |            |     | 4       | Enclosure               | 36998    | 1   |
|         | 6 ft Cable Length                           | PB2100-6   | 1   | 5       | Gasket                  | 36986    | 1   |
|         | 11 ft Cable Length                          | PB2100-11  | 1   | 6       | Contact Assembly        | 36987    | 1   |
|         | 16 ft Cable Length                          | PB2100-16  | 1   |         | (Includes item 7)       |          |     |
|         | Special Drop                                | PB2100-S†  | 1   | 7       | Button Assembly         | 36988    | 1   |
| 2       | Pushbutton Station Assembly                 | 36900R     | 1   | 8       | Grommet                 | 36989    | 1   |
| 3       | Control Cable Assembly                      |            |     | *       | Hardware Kit            | 36939    | 1   |
|         | 6 ft Cable Length                           | PBC2100-6  | 1   |         | (Includes items 9 - 16) |          |     |
|         | 11 ft Cable Length                          | PBC2100-11 | 1   | △       | Warning Tag             | 687K3W   | 1   |
|         | 16 ft Cable Length                          | PBC2100-16 | 1   |         |                         |          |     |
|         | Special Drop                                | PBC2100-S† | 1   |         |                         |          |     |

(†) Equal to cable length (pushbutton drop).

(△) Not shown.

Contact your nearest Little Mule Service Center for parts and service. For a complete list, see pages 30 and 31. Please have the hoist model number, serial number, and part number with description available for reference.

## Figure 18 - Limit Switch Assembly



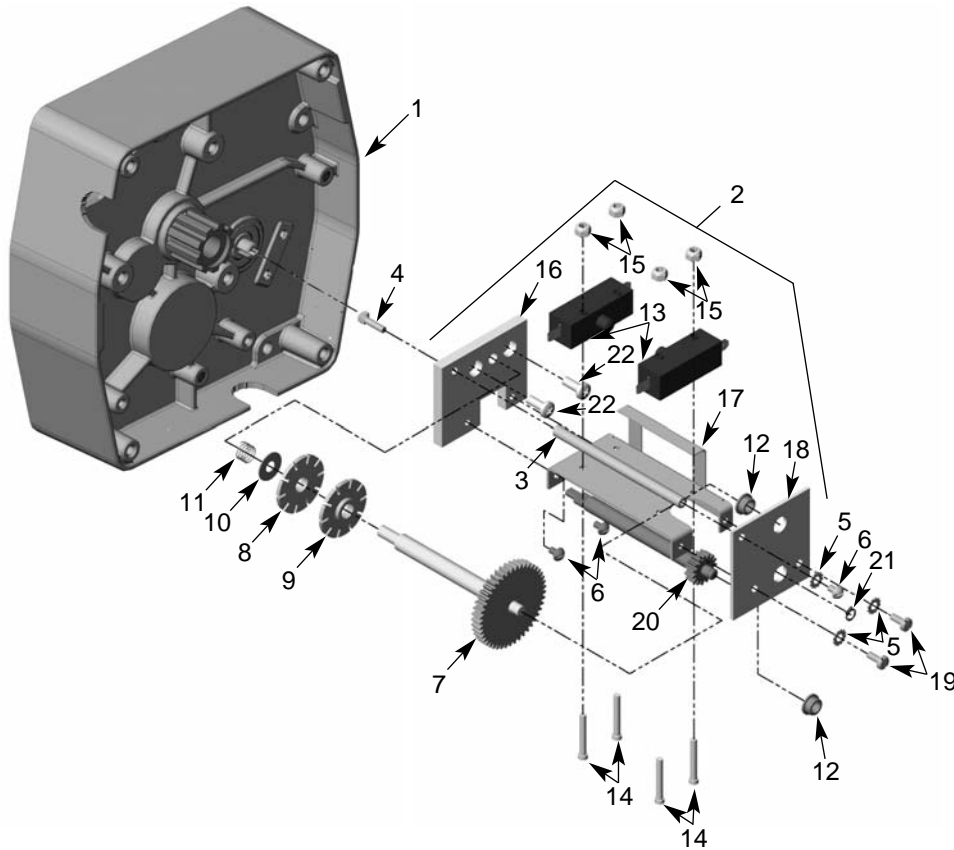
### Parts List for Limit Switch Assembly

| Ref No. | Description   | Part No. | Qty | Ref No. | Description               | Part No.   | Qty |
|---------|---|----------|-----|---------|---------------------------|------------|-----|
| 1       | Transmission Cover                                    | JM34     | 1   | 8       | Bushing                   | JF531-4    | 1   |
| 2       | Limit Switch Assembly<br>(Includes items 4-12)        | 918JG4   | 1   | 9       | Limit Switch Shaft        | JF117-3S   | 1   |
| 3       | Limit Switch Bracket Assembly<br>(Includes items 4-8) | 918JG3   | 1   | 10      | Limit Switch Nut (silver) | SK6000-63Z | 1   |
| 4       | Switch  | 815J1    | 2   | 11      | Limit Switch Nut (gold)   | SK6000-63W | 1   |
| 5       | 6-32UNC X 1" Screw                                    | H1402P   | 4   | 12      | Retaining Ring            | H5520      | 1   |
| 6       | 6-32UNC Elastic Locknut                               | H3944    | 4   | 13      | Insulator                 | JF754      | 1   |
| 7       | Limit Switch Bracket<br>(Includes item 8)             | JF900-3  | 1   | 14      | Spring                    | JF343-3    | 1   |
|         |   |          |     | 15      | 10-24UNC X 1/2" Screw     | H2970      | 2   |



Contact your nearest Little Mule Service Center for parts and service. For a complete list, see pages 30 and 31. Please have the hoist model number, serial number, and part number with description available for reference.

## Figure 19 - Long Lift Limit Switch Parts

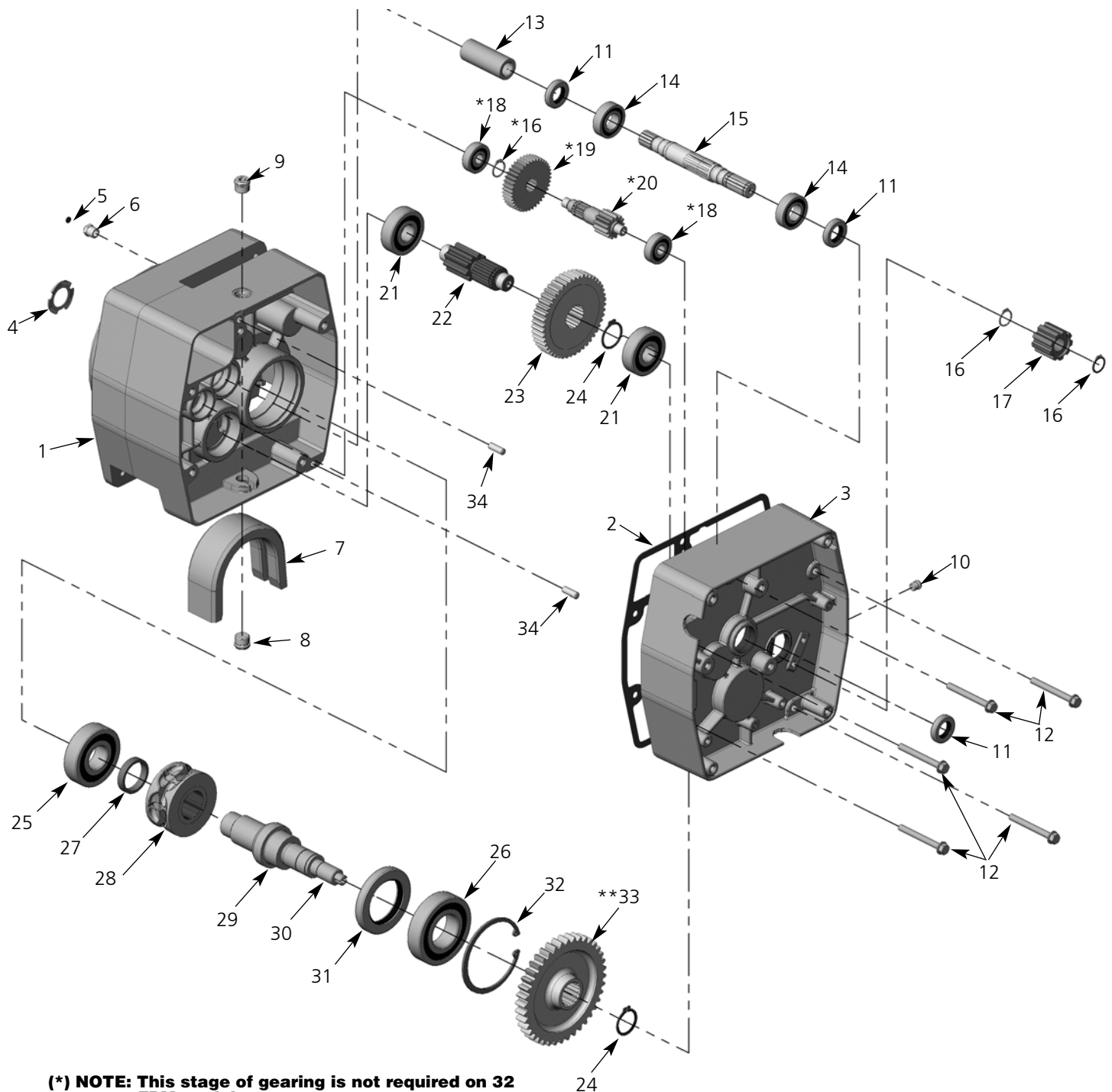


### Parts List for Long Lift Limit Switch Parts

| Ref No. | Description                                    | Part No.   | Qty | Ref No. | Description              | Part No. | Qty |
|---------|--|------------|-----|---------|--------------------------|----------|-----|
| 1       | Transmission Cover                             | JM34       | 1   | 13      | Switch                   | 815J1    | 2   |
| 2       | Limit Switch Assembly<br>(Includes items 3-21) | 944JG6     | 1   | 14      | 6-32UNC X 1" Screw       | H1402P   | 4   |
| 3       | Post   | 110J14     | 1   | 15      | 6-32UNC Elastic Locknut  | H3944    | 4   |
| 4       | 8-32UNC X 1/2" Screw                           | H1210      | 1   | 16      | Mounting Plate           | 129J1    | 1   |
| 5       | #8 External-tooth Lockwasher                   | H4158      | 3   | 17      | Frame and Guide Assembly | 258JG7   | 1   |
| 6       | 8-32UNC X 1/4" Screw                           | 854823     | 3   | 18      | End Plate                | 258J8    | 1   |
| 7       | Limit Switch Shaft & Gear                      | 117JG2     | 1   | 19      | 8-32UNC X 3/8" Screw     | H2741P   | 2   |
| 8       | Limit Switch Nut (gold)                        | SK6000-63W | 1   | 20      | Drive Pinion             | 427J1    | 1   |
| 9       | Limit Switch Nut (silver)                      | SK6000-63Z | 1   | 21      | Retaining Ring           | H5520    | 1   |
| 10      | Thrust Washer                                  | 255K16     | 1   | 22      | 10-24UNC X 3/8" Screw    | H2981P   | 2   |
| 11      | Spring   | PB287      | 1   |         |                          |          |     |
| 12      | Bushing  | JF531-4    | 2   |         |                          |          |     |

Contact your nearest Little Mule Service Center for parts and service. For a complete list, see pages 30 and 31. Please have the hoist model number, serial number, and part number with description available for reference.

## Figure 20 - Transmission



Contact your nearest Little Mule Service Center for parts and service. For a complete list, see pages 30 and 31. Please have the hoist model number, serial number, and part number with description available for reference.

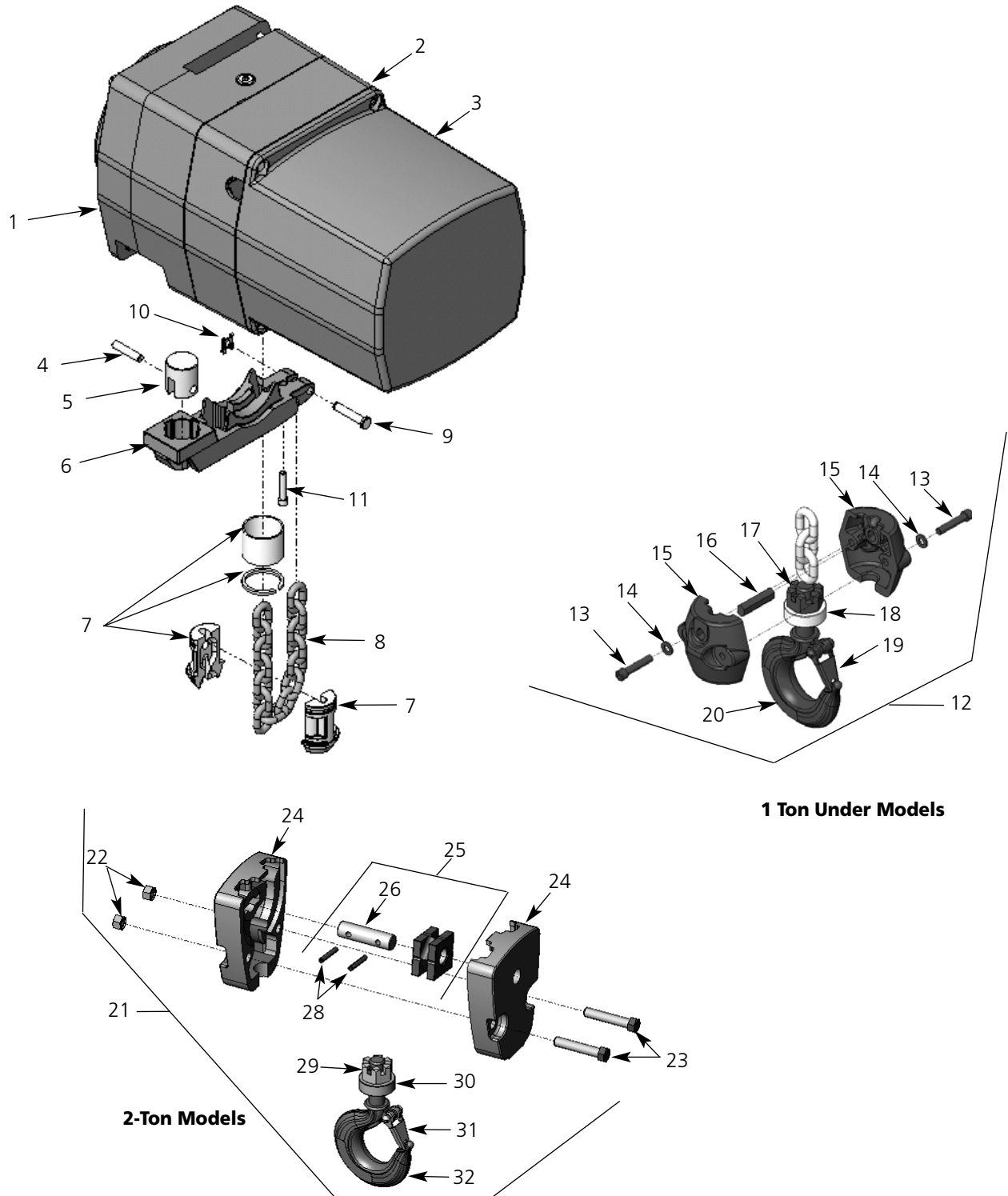
### Parts List for Transmission

| Ref. No. | Description                                  | Part No.   | Qty      |
|----------|--|------------|----------|
| 1        | Sheave Housing                               | JM3533     | 1        |
| 2        | Transmission Gasket                          | JM560      | 1        |
| 3        | Transmission Cover<br>(Includes Oil Seals)   | JM34       | 1        |
| 4        | Spring Washer                                | 360J1      | 1        |
| 5        | O-ring                                       | H5605      | 1        |
| 6        | Pressure Relief Fitting                      | SK1912-21W | 1        |
| 7        | Chain Guide                                  | JM273      | 1        |
| 8        | Oil Plug - Drain                             | H6297      | 1        |
| 9        | Oil Plug - Fill                              | H6296      | 1        |
| 10       | Oil Plug - Level                             | H6295      | 1        |
| 11       | Oil Seal                                     | 561K2      | 3        |
| 12       | Screw, HWH Self-threading                    | H2693P     | 5        |
| 13       | Motor Coupling                               | JM107      | 1        |
| 14       | Bearing                                      | 500K33     | 2        |
| 15       | Input Pinion<br>8 & 16 fpm                   | JL400B     | 1        |
|          | 32 fpm                                       | JL400-1    | 1        |
| 16       | Retaining Ring                               | H5501      | 3        |
| 17       | Brake Adapter                                | JL142      | 1        |
| 18       | Bearing for 8 & 16 fpm                       | 500K34     | 2        |
| 19       | High Speed Pinion for 8 & 16 fpm             | JL426      | 1        |
| 20       | Intermediate Pinion<br>1/4 & 1/2 ton, 16 fpm | JL402A     | 1        |
|          | 1 & 2 ton                                    | JL403A     | 1        |
| 21       | Bearing                                      | 500K39     | 2        |
| 22       | Output Pinion                                | JL401      | 1        |
| 23       | Overload Clutch Assembly<br>1/4 ton, 16 fpm  | 591JG25    | 1        |
|          | 1/4 ton, 32 fpm                              | 591JG22    | 1        |
|          | 1/2 ton, 16 fpm                              | 591JG16    | 1        |
|          | 1/2 ton, 32 fpm                              | 591JG21    | 1        |
|          | 1 & 2 ton                                    | 591JG17    | 1        |
| 24       | Retaining Ring                               | H5503      | 2        |
| 25       | Bearing                                      | 500K28     | 1        |
| 26       | Bearing                                      | P003255    | 1        |
| 27       | Spacer - Load Sheave                         | JM127      | 1        |
| 28       | Load Sheave-9/32" Chain                      | JF16-3     | 1        |
| 29       | Load Sheave Shaft                            | JM132      | 1        |
| 30       | Stub Shaft - Limit Switch Drive              | JM140      | 1        |
| 31       | Oil Seal                                     | 011612800  | 1        |
| 32       | Retaining Ring                               | H5598      | 1        |
| 33       | Output Gear                                  | JL421      | 1        |
| 34       | Dowel Pin                                    | H5382      | 2        |
| *        | Gear Oil                                     | H7642      | 1½<br>pt |

\* Not Shown

Contact your nearest Little Mule Service Center for parts and service. For a complete list, see pages 30 and 31. Please have the hoist model number, serial number, and part number with description available for reference.

## Figure 21 - Chaining Parts



Contact your nearest Little Mule Service Center for parts and service. For a complete list, see pages 30 and 31. Please have the hoist model number, serial number, and part number with description available for reference.

### Parts List for Chaining Parts

| Ref No. | Description                                      | Part No. | Qty | Ref No. | Description                  | Part No. | Qty |
|---------|--|----------|-----|---------|------------------------------|----------|-----|
| 1       | Housing  | JM3533   | 1   | 20      | Bottom Hook Assembly         |          |     |
| 2       | Transmission Cover                               | JM34     | 1   |         | with Latch for 1 Ton & Under | 3JG20S   | 1   |
| 3       | Electrical Cover                                 | JM36     | 1   | 21      | Bottom Block Assembly        |          |     |
| 4       | Anchor Pin (2 ton only)                          | JM111    | 1   |         | for 2 Ton                    | JF914-6  | 1   |
| 5       | Anchor (2 ton only)                              | JM109    | 1   | 22      | 3/8-24 Hex Locknut           | H3964P   | 2   |
| 6       | Chain Stripper                                   | JM254    | 1   | 23      | Load Block Screw             | H2403P   | 2   |
| 7       | Chain Stop Kit                                   | 75JG6K   | 1   | 24      | Load Block Frame             | JF30-1   | 2   |
|         | (Kits include halves, sleeve and retaining ring) |          |     | 25      | Sheave Shaft Assembly        | JF917-1  | 1   |
| 8       | Load Chain                                       | JL19-1   | •   | 26      | Sheave Shaft                 | JF122-1  | 1   |
| 9       | Attachment Pin                                   | JM18-1   | 1   | 27      | Sheave & Bearing Assembly    | JF916    | 1   |
| 10      | Retaining Clip                                   | H5597    | 1   | 28      | Roll Pin                     | H5234    | 2   |
| 11      | 1/4-20UNC x 1 1/4"                               |          |     | 29      | 3/8-24 Hex Locknut           | H3991P   | 1   |
|         | Socket Head Cap Screw                            | S49-77   | 1   | 30      | Bearing                      | JF511    | 1   |
| 12      | Bottom Block Assembly                            |          |     | 31      | Latch Kit                    | 4X1305   | 1   |
|         | 1 ton & Under                                    | 913JG3AS | 1   | 32      | Bottom Hook Assembly         |          |     |
| 13      | 1/4-20UNC x 1 1/4"                               | S49-77   | 2   |         | with Latch for 2 Ton         | 3KG1W    | 1   |
|         | Socket Head Cap Screw                            |          |     |         |                              |          |     |
| 14      | 1/4" Internal-tooth                              |          |     |         |                              |          |     |
|         | Lockwasher                                       | H4134    | 2   |         |                              |          |     |
| 15      | Load Block Frame                                 | 30J14    | 2   |         |                              |          |     |
| 16      | Load Block Pin                                   | 18J8     | 1   |         |                              |          |     |
| 17      | Slotted Hex Nut                                  | H3986P   | 1   |         |                              |          |     |
| 18      | Bearing  | JF510    | 1   |         |                              |          |     |
| 19      | Latch Kit  | 4X1304   | 1   |         |                              |          |     |

\* Replacement chain is sold by the foot. For single-chained models, add 2 ft to the lift for the total amount of feet. For double-chained models, double the lift and add 3 ft.

## LITTLE MULE® AUTHORIZED WARRANTY REPAIR CENTERS AND PARTS DEPOTS

As a Little Mule user, you are assured of reliable repair and parts services through a network of Master Parts Depots and Service Centers that are strategically located across the United States, its territories and Canada. These facilities have been selected on the basis of their demonstrated ability to handle all parts and repair requirements promptly and efficiently.

Below is a list of the Little Mule Authorized Warranty Repair Centers and Parts Depots located in United States, its territories and Canada. To quickly obtain the name of a Service Center located nearest you, call (800) 477-5004. Fax: (800) 374-6853. In the following list, the Canadian Service Centers are indicated.

### UNITED STATES

#### ALABAMA

\*\*TOOL SMITH CO.  
1300 4th Ave. S.  
Birmingham AL 35233  
(205) 323-2576 or (800) 317-8665  
Fax (205) 323-9060

#### ARKANSAS

\*\*HI-SPEED HOIST & CRANE  
701 N. Maple St.  
N. Little Rock AR 72114  
(501) 375-9178 Fax (501) 375-4254

\*\*HANDLING SYSTEMS & CONVEYORS INC  
10909 East Otter Creek Rd.  
Mabelville AR 72103  
(501) 455-5898 Fax (501) 455-6179

#### ARIZONA

\*\*MECHANICS TOOL SERVICE  
1301 E. Apache Park Place  
Tucson AZ 85714  
(520) 889-8484 AZ only (800) 372-6700  
Fax (520) 889-6668

#### CALIFORNIA

\*\*ARROW CRANE HOIST CORP.  
12714 South Carmenita Road  
Santa Fe Springs CA 90670  
(562) 921-8328 Fax (562) 921-9307

\*\*IDG. CALIFORNIA  
6842 Walker Street  
LaPalma CA 90623  
(714) 994-6960 or (800) 464-5669  
Fax (714) 521-0105

\*\*CRANWORKS, INC.  
2585 Nicholson Street  
San Leandro CA 94577  
(510) 357-4000 Fax (510) 357-4099

\*\*KIMMERLE BROTHERS, INC.  
12060 East Florence St.  
Santa Fe Springs CA 90670  
(562) 946-6771 Fax (562) 944-3473

\*\*KIMMERLE BROTHERS, INC.  
226 11th St.  
San Francisco CA 94103  
(415) 431-1163 Fax (415) 431-1693

\*\*KIMMERLE BROTHERS, INC.  
337 "M" St.  
Fresno CA 93721  
(559) 233-1278 Fax (559) 233-4678

#### COLORADO

\*\*CRANE REPAIR CO.  
3718 Norwood Drive  
Littleton CO 80125  
(303) 791-7918 or (800) 878-7918  
Fax (303) 791-7179

#### FLORIDA

\*\*J. HERBERT CORP.  
1751 S. John Young Parkway  
Kissimmee FL 32741  
(407) 846-0588 or (800) 255-0588  
Fax (407) 846-8042

\*\*MATERIAL HANDLING SYSTEMS  
720 S.W. 4th Court  
Dania FL 33004  
(954) 921-1171 or (888) 424-6478  
Fax (954) 921-7117

#### GEORGIA

\*\*ACE INDUSTRIES INC.  
6295 McDonough Drive  
Norcross GA 30093  
(770) 441-0898 or (800) 733-2231  
Fax (800) 628-3648

\*GAFFEY INC.  
471 Sessions St.  
Marietta GA 30060  
(770) 939-6443 or (800) 820-6443  
Fax (770) 422-2255

#### ILLINOIS

\*\*INDUSTRIAL TOOL PRODUCTS  
919 N. Central Ave.  
Woodale IL 60191  
(630) 766-4040 or (800) 525-9654  
Fax (630) 766-4166

\*S & K AIR POWER  
Rt. 316 E., Box 1279  
Mattoon IL 61938  
(217) 258-8500 (IL only-800-955-8501)  
Fax (217) 258-8571

\*\*SIEVERT ELECTRIC SERVICE  
1230 South Hannah  
Forest Park IL 60130  
(708) 771-1600 or (800) 322-9144  
Fax (708) 771-3124

#### INDIANA

\*\*BREHOB CORP.  
1334 S. Meridian St.  
Indianapolis IN 46225  
(317) 231 8080 or (800) 632-4451  
Fax (317) 231-8072

\*\*MATERIALS HANDLING EQUIPMENT  
7433 US 30 East  
Fort Wayne IN 46803  
(219) 749-0475 or (800) 443-6432  
Fax (219) 749-0481

#### IOWA

\*\*ALTER & SONS, INC.  
514 S. Howell St.  
Davenport IA 52808  
(563) 323-3601 or (800) 553-1111  
Fax (563) 324-0138

#### KENTUCKY

\*\*ADVANCED SHERMAN  
330 North Spring St.  
Louisville KY 40206  
(502) 896-2166 (KY only-800-633-8186)  
Fax (502) 897-9837

#### LOUISIANA

\*\*RENTAL SERVICE  
3301 Cities Service Hwy  
West Lake LA 70669  
(337) 882-6011  
Fax (337) 882-0527

\*\*DRILLCO  
12649 S. Choctaw Dr.  
Baton Rouge LA 70815  
(225) 272-8251 or (800) 851-3821  
Fax (800) 315-9225

#### MASSACHUSETTS

\*\*ABEL DISTRIBUTORS INC.  
50 Parker St.  
Newbury Port MA 01950  
(978) 463-0700  
Fax (978) 463-5200

#### MICHIGAN

\*COMMERCIAL GROUP  
9955 Grand River  
Detroit MI 48204  
(313) 931-6100 or (800) 931-7701  
Fax (313) 491-1753

\*\*CONTINENTAL CRANE & SERVICE CO.  
33681 Groesbeck Hwy.  
Fraser MI 48026  
(586) 293-3870 Fax (586) 293-0017

\*\*STEWART ENGINEERING & SALES  
2140 Aurora Ave.  
Muskegon MI 49442  
(231) 767-2140 Fax (231) 767-2233

#### MINNESOTA

\*\*ELECTRIC MOTOR REPAIR, INC.  
2010 N. 4th St.  
Minneapolis MN 55411  
(612) 522-3318 or (800) 345-0198  
Fax (612) 588-1617

\*\*J & B EQUIPMENT  
8200 Grand Avenue South  
Bloomington MN 55420  
(952) 884-2040 Fax (952) 346-1139

\*\*\*PERFECTION CRANE & HOIST INC.  
201 DeGraff Ave.  
Swanville MN 56382  
(320) 547-2401 or (800) 253-6829  
Fax (800) 353-2254

\*\*TOTAL TOOL SUPPLY  
315 N. Pierce St.  
St. Paul MN 55104  
(952) 646-4055 or (800) 444-4899  
Fax (952) 646-8610

#### MISSOURI

\*\*HERTZ EQUIPMENT RENTAL & SUPPLY  
800 E. 18th St.  
Kansas City MO 64108  
(816) 221-7788 or (800) 669-7788  
Fax (816) 221-0817

\*\*HANDLING SYSTEMS INC.  
11678 Gravois Rd.  
St. Louis MO 63126  
(314) 842-7263 Fax (314) 842-5041

\*\*ZELLER ELECTRIC  
4250 Hoffmeister  
St. Louis MO 63125  
(314) 638-9641 (Outside MO (800) 530-5810)  
Fax (314) 638-6318

#### MONTANA

\*\*POWER SERVICE OF MONTANA, INC.  
4025 1st Ave.  
Billings Montana 59101  
(406) 252-8114 or (800) 823-8665  
Fax (406) 259-3956

UNITED STATES

**NEW JERSEY**

\*\*SISSCO  
186 Route 206 South  
Hillsborough NJ 08844  
(908) 359-9767 or (800) 392-0146  
Fax (908) 359-9773

**NEW YORK**

\*\*ABC ELECTRIC  
24-25 46th Street.  
Long Island City NY 11103  
(718) 956-0000 or (N.Y. only-800-562-1919)  
FAX (718) 956-4455

\*\*BEATON INDUSTRIAL, INC.  
6083 Trenton Rd.  
Utica NY 13502  
(315) 797-9346 (N.Y. only-800-724-4052)  
Fax (315) 797-9321

\*\*VOLLAND ELECTRIC EQUIPMENT CO.  
75 Innsbruck Drive  
Buffalo NY 14227  
(716) 656-9900 Fax (716) 656-8899

**NORTH CAROLINA**

\*\*CAROLINA HOIST  
3310 E. Wendover Avenue  
Greensboro NC 27405  
(336) 375-6050 or (800) 326-3655  
Fax (336) 375-6053

\*\*SOUTHERN ELECTRIC SERVICE  
2225 Freedom Drive  
Charlotte NC 28266  
(704) 372- 4832 or (800) 487-3726  
Fax (704) 342-2604

**OHIO**

\*\*CRANE AMERICA - H. W. HOUSE  
920 Deneen Avenue  
Monroe OH 45050  
(513) 539-9770 or (800) 331-5326  
Fax (513) 539-9577

\*\*AMERICRANE & HOIST CORP.  
13224 Enterprise Avenue  
Cleveland OH 44135  
(216) 267-9100 or (800) 652-1932  
Fax (216) 267-9131

\*SAMSEL SUPPLY CO.  
1285 Old River Road  
Cleveland OH 44113  
(216) 241-0333 or (800) 892-8012  
Fax (216) 241-3426

**OKLAHOMA**

\*\*GAFFEY INC.  
9655 E. 522 Road  
Claremore OK 74017  
(918) 343-1191 or (800) 331-3916  
Fax (918) 343-7304

**OREGON**

\*\*GENERAL TOOL & SUPPLY CO.  
2705 N.W. Nicolai  
Portland OR 97210  
(503) 226-3411 or (800) 783-3411  
Fax (503) 778-5518

**PENNSYLVANIA**

\*\*AMERICRANE  
1558 Myers Road  
Indiana PA 15701  
(888) 963-9900 or (724) 479-9100

\*\*GLOBE ELECTRIC CO.  
200 23rd Street  
Pittsburgh PA 15215  
(412) 781-2677 or (800) 850-4440  
Fax (412) 781-1812

**PENNSYLVANIA (cont'd)**

\*\*KEYSTONE CRANE & HOIST CO.  
861 S. Washington Road  
McMurray PA 15317  
(724) 746-5080 Fax (724) 746-5082

\*\*MCDAL CORP.  
475 East Church Road  
King of Prussia PA 19406  
(610) 277-5484 or (800) 626-2325  
Fax (610) 277-4690

\*\*MORRIS MATERIAL HANDLING  
Tinicum Ind. Park Building E  
10 Industrial Highway MS 80  
Lester PA 19113  
(800) 346-2098  
Fax (610) 521-5907

\*\*REPAIR UNLIMITED  
1730 Rockwell Road  
Abington PA 19001  
(215) 657-3335 or (800) 369-5891  
Fax (215) 784-0343

**RHODE ISLAND**

\*\*MOTORS, HOIST & CONTROLS INC.  
179 Railroad Street  
Woonsocket RI 02895  
(401) 767-4568 Fax (401) 767-4567

**SOUTH CAROLINA**

\*\*ENGINEERED SYSTEMS, INC.  
1121 Duncan-Reidville Road  
Duncan SC 29334  
(864) 879-7438 or (800) 879-7438  
Fax (864) 848-3143

**TENNESSEE**

\*\*HOIST & CRANE CO.  
2508 Perimeter Place  
Nashville TN 37214  
(615) 242-3383 or (888) 464-7811  
Fax (615) 255- 4379

\*\*HI-SPEED ELECTRICAL CO.  
3013 Thomas Street  
Memphis TN 38127  
(901) 357-6231 Fax (901) 357-6238

**TEXAS**

\*\*ABEL EQUIPMENT CO., INC.  
3710 Cavalier Drive  
Garland TX 75042  
(972) 272-7706 Fax (800) 272-2235

\*\*GAFFEY, INC.  
4301 Garland Drive  
Ft. Worth TX 76117  
(817) 281-1994 or (800) 284-4233  
Fax (817) 581-7831

\*\*GAFFEY, INC.  
4003 S. County Road 1297  
Odessa TX 79765  
(915) 563-2897 or (800) 733-0006  
Fax (915) 563-4703

\*\*GAFFEY, INC.  
1436 N. Duck Creek Road  
Cleveland TX 77327  
(281) 443-6690 or (800) 233-8179  
Fax (281) 592-6984

\*\*HYDRAULIC EQUIPMENT SER.  
1021 N. San Jacinto Street  
Houston TX 77002  
(713) 228-4073 Fax (713) 228-0931

**UTAH**

\*\*ROCKY MOUNTAIN WIRE ROPE & RIG.  
2421 South 2570 West  
Salt Lake City UT 84119  
(801) 972-4972 or (800) 615-3193  
Fax (801) 974-0621

**VIRGINIA**

\*\*FOLEY MATERIAL HANDLING CO.  
11327 Va. Crane Drive  
Ashland VA 23005  
(804) 798-1343 Fax (804) 798-7843

**WISCONSIN**

\*\*ALFERI INDUSTRIAL SALES & SERVICE  
346 Smith Street  
Neenah WI 54956  
(920) 722-6483 Fax (920) 722-6489

**LIFT INC.**

6667 W. Mill Road  
Milwaukee WI 53218  
(414) 353-5353 or (800) 728-5438  
Fax (414) 353-4444

\*TRESTER HOIST & EQUIPMENT  
W136 N4863 Campbell Dr. Suite 4  
Menomonee Falls WI 53051  
(262) 790-0700 or (800) 234-6098  
Fax (262) 790-1009

CANADA

**ALBERTA**

\*\*KRISTIAN ELECTRIC  
4215-64 Avenue SE  
Calgary Alberta T2C 2C8  
(403) 292-9111

**BRITISH COLUMBIA**

\*\*\*AIR BRAKE REPAIR  
144 W. 5th Avenue  
Vancouver British Columbia V5Y 1H7  
(604) 879-7754

**MANITOBA**

\*\*\*B & B DYNAMO  
575 McTavish Street  
Winnipeg Manitoba R2J 2W5  
(204) 237-6066

**ONTARIO**

\*\*TORONTO ELECTRIC  
72 Crockford Blvd  
Scarborough Ontario M1R 3C4  
(416) 755-7716

\*\*PRO-CRANE HOIST REPAIRS INC.  
2050 Speers Road, Unit 2  
Oakville Ontario L6L 2X8  
(905) 825-2586

**QUEBEC**

\*\*LEGER  
7995 17th Avenue  
Montreal Quebec H1Z 5R2  
(514) 376-3050

\*\*UPTOWN LTEE  
460 Hubert Street  
Laval Quebec H7G 2Y9  
(514) 667-1859

\*PARTS DEPOT & REPAIR CENTERS

\*\*PARTS DEPOT & WARRANTY REPAIR CENTER

\*\*\*PARTS DEPOT

# LITTLE MULE®



## WARRANTY

Every hoist is thoroughly inspected and performance tested prior to shipment from the factory. If any properly installed, maintained and operated hoist as outlined in the applicable accompanying Little Mule® manual develops a performance problem due to defective materials or workmanship as verified by Little Mule®, repair or replacement of the hoist will be made to the original purchaser without charge and the hoist will be returned, transportation prepaid. This warranty does not apply where deterioration is caused by normal wear, abuse, improper or

inadequate power supply, improper or inadequate maintenance, eccentric or side loading, overloading, chemical or abrasive actions, excessive heat, unauthorized modifications or repairs, or use of non-Little Mule® repair parts. **EXCEPT AS STATED HEREIN, LITTLE MULE® MAKES NO OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.**

### **WARNING**

#### **Overloading and Improper Use Can Result In Injury**

##### **To Avoid Injury:**

- Do not exceed working load limit, load rating, or capacity.
- Do not use to lift people or loads over people.
- Use only alloy chain and attachments for overhead lifting.
- Read and follow all instructions.



**Little Mule** • Country Club Road • P.O. Box 779 •  
Wadesboro, North Carolina 28170 USA  
**Tel:** 800.477.5003 • **Fax:** 800.374.6853 • 704.694.6829  
**[www.coffinghoists.com](http://www.coffinghoists.com)**