

# COFFING<sup>®</sup>

## HOISTS

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### **OPERATING & MAINTENANCE INSTRUCTIONS WITH PARTS LIST**

Publication Part No. WR-3-680-1

## **WR-3 - Large Frame Electric Wire Rope Hoist**

*For Capacities:*

**1 - 3 Ton**

#### **IMPORTANT—CAUTION**

To safeguard against the possibility of personal injury or property damage, follow the recommendations and instructions of this manual. This manual contains important information for the correct installation, operation, and maintenance of this equipment. All persons involved in the installation, operation, and maintenance of this equipment should be thoroughly familiar with the contents of this manual. Keep this manual for reference and further use.

#### **⚠ WARNING**

To prevent personal injury, do not use the equipment shown in this manual to lift, support, or otherwise transport people, or to suspend unattended loads over people.

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## SECTION I INTRODUCTION

### 1-1. GENERAL INFORMATION.

1-2. This manual provides necessary and proper information for persons engaged in the operation, maintenance, and installation of this Coffing WR-3 Series Hoist and Trolley. Any person operating or maintaining this hoist must be familiar with the information contained herein. Adherence to the precautions, procedures and maintenance practices described herein should ensure long and satisfactory use of your hoist with minimum danger to life, limb and property. Major overhaul efforts are not within the scope of this manual; such repairs should be made at an approved service center or by us. If any operating or maintenance information herein seems inadequate for your particular problem, please call or write our service engineers. We solicit your suggestions for improvements to this manual.

1-3. All persons concerned with the installation operation, inspection, and maintenance of this hoist are urged to read American National Standard ANSI B30.16. That standard contains important rules (some mandatory and some of an advisory nature) designed primarily to prevent or minimize injury and otherwise protect life, limb and property. You should especially be aware of the mandatory rules pertaining to inspection requirements and the advisability of maintaining written, dated, and signed inspection reports and records.

### 1-4. GENERAL USAGE INFORMATION.

1-5. This hoist is intended for general industrial use in the lifting and transporting of freely suspended material loads within its rated capacity. 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:

#### 1-6. 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 Electric 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.

#### 1-7. Lifting of Hazardous Loads

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

#### 1-8. Lifting of Guided Loads

This hoist is not recommended for use in the lifting of guided loads, including dumbwaiters and nonriding elevators. Such applications require additional protective devices which are not incorporated into this hoist. Refer to your state and local regulations governing the requirements for elevator and dumbwaiter installations.

### 1-9. HOIST CONSTRUCTION.

1-10. This Coffing Hoist incorporates a steel drum and center frame with malleable and ductile iron castings in load bearing areas. For non-load bearing areas, a strong, lightweight, die case aluminum alloy is used. This combination results in a hoist that has high strength at a minimum weight.

1-11. A strain cable is built into the pushbutton cable and is securely anchored to the pushbutton station and the hoist housing. The pushbutton station may be used to pull the hoist when mounted on a free moving trolley. However, it is recommended that a hand geared or motorized trolley be used when the pulling effort required to move the hoist exceeds 100 pounds or when the application requires frequent horizontal movement of the hoist.

1-12. Automatic limit switches are built into the hoist to protect it against damage resulting from overtravel in either direction. When these switches are properly maintained and adjusted, the operator need not be overly concerned about damaging the hoist due to exceeding the functional travel limits of the hoist. The operator should bear in mind, however, that the limit switches are **safety devices**, and routine or constant use of them to stop hoist travel must be avoided.

### 1-13. CLUTCH DATA.

1-14. This hoist is equipped with a factory calibrated torque limiting device (load equalizer assembly, 36, Figure 7-4). The load equalizer clutch assembly will permit operation of hoist within its rated load capacity limits but will prevent lifting of excessive overloads. If the load to be lifted exceeds the lifting capability of the load equalizer clutch assembly, the hoist motor will continue to run while slipping the load equalizer assembly. This condition will cause overheating of the load equalizer assembly and should be avoided. If this condition occurs, release the "Up" button immediately and reduce the load to within the rated capacity of the hoist. The load equalizer assembly is not to be adjusted or interchanged with other models. To do so voids warranty and may create an unsafe condition.

## 1-15. BASIC HOIST DATA.

1-16. The operator should be aware of the capabilities and capacity of his hoist. He must refrain from overloading. Overloading not only can cause damage to the hoist, but presents serious threats to persons around the hoist. The following basic hoist data is related to general model numbers.

TABLE 1. BASIC HOIST DATA

| Model Number | Rated Load (Lbs.) | Lift Speed At Rated Load (Ft. Per Min) | Motor HP |
|--------------|-------------------|--|----------|
| WR-2028      | 2000              | 28                                     | 2        |
| WR-4014      | 4000              | 14                                     | 2        |
| WR-4021      | 4000              | 21                                     | 3        |
| WR-6010      | 6000              | 10                                     | 2        |
| WR-6014      | 6000              | 14                                     | 3        |

## SECTION II PREPARATION FOR USE

### 2-1. INSPECTION PRIOR TO INITIAL USE.

2-2. Any new or repaired hoist, as well as the working area, shall be carefully inspected prior to initial installation and use. The inspection shall be made by or under the direction of a person familiar with hoist operations and industrial safety standards.

2-3. The following inspection criteria are recommended prior to initial installation and use. Additional inspection items should be added to satisfy local usage and safety requirements. All inspections of any kind should be logged or recorded, dated, signed, and filed for reference.

a. Ensure that the facility power supply is adequate to furnish voltage while the hoist is lifting load within 10 percent of that specified for the hoist. Also, that the facility power is properly fused to protect the hoist from power surges.

b. Ensure that no live part of the electrical system, either facility or hoist, will be exposed to accidental contact under normal operating conditions.

c. Ensure that the hoist is effectively grounded and that the circuit supplying power to the hoist is equipped with a suitable overcurrent device and disconnecting means. If in doubt, reference National Electrical Code ANSI C1.

d. Ensure that the supporting structures are strong enough to carry the intended loads. The supporting structure shall have a safe load rating at least equal to that of the hoist. The supporting structure must be rigid and not subject to weakening due to repeated stresses from the hoist.

e. Ensure that there is adequate working space to permit hoist operation in the hanging position only. Normal operation should not require pulling or tugging around corners or obstructions. Also, there must be adequate space to permit the operator and other persons to stand clear of the load and adjacent structures.

f. Watch out for makeshift or compromising practices either during installation or subsequent operation of the hoist. Sometimes the "temporary" fix remains until an accident occurs.

g. Perform both the daily and the periodic inspections specified herein on a repaired hoist prior to initial use. Perform the daily inspections specified herein on a new hoist prior to initial use.

### 2-4. INSTALLATION.

2-5. Secure the hoist to a suitable supporting structure through mounting holes provided in the suspension (8, Figure 7-5A, or 8, Figure 7-5B). **IMPORTANT:** Use Duff-Norton supplied load pins to assure proper hoist mounting. If substitutions are necessary, use 3/4 inch diameter S.A.E. Grade 5 bolts. On trolley mounted hoists, the trolley should be properly mounted to allow for clearance between trolley wheels and beam flange to avoid binding. The beam should be free of any obstructions, dirt, or grease, providing a free and level plane of movement. See Figures 2-1, 2-2, and 2-3.

### NOTE

All trolley mounted hoists must be mounted with the drum parallel to the beam. This will keep the load point under the centerline of the beam and will minimize off center loading problems.

### 2-6. OIL LEVEL.

2-7. This hoist has an oil filled transmission. For shipping purposes, a non-vented fill plug was installed at the factory. A vented plug (39, Figure 7-4) is located in an envelope attached to the hoist. The vented plug must be installed in place of the non-vented shipping plug before the hoist can be operated. In addition, the transmission oil level should be checked prior to placing hoist in operation. To check oil level, remove level plug (42). Observe if oil is even with or above bottom of tapped hole. If not, add oil as specified on lubrication schedule. Figure 4-7.

## CAUTION

**REPLACE OIL ONLY WITH THAT SPECIFIED IN THIS MANUAL. This lubricant has additives for optimum resistance to chemical change due to heat, and for smooth clutching action of the load brake. The hoist warranty is void if unapproved oil is used.**

### 2-8. LOAD HOOK DIRECTION (PHASING).

2-9. Connect hoist to electrical power source as follows:

#### NOTE

**This hoist must be connected to a 3 phase power supply. The hoists are dual voltage (230/460V) and wired for 460V unless otherwise specified.**

If hoists are to be connected to 230V power supply, proceed with steps a., b., and c. If hoists are to be connected to 460V supply, proceed with step c.

- a. Remove the electrical cover (2, Figure 7-1.)
- b. See Section VI, Wiring, for voltage conversion instructions.
- c. After ascertaining that voltages of the power source and the hoist are the same, make only temporary connections at the power source for THREE PHASE models. Push the "UP" button and observe the direction of the load block. If the hook raises, the phasing is correct and permanent connections may be made at the power source. If the hook lowers, release the button immediately, since the limit switches will not operate to prevent hoist over-travel. To correct the load hook direction (phasing), reverse any two wires (except the green ground wire) at the power source only. **DO NOT CHANGE CONNECTIONS AT ANY OTHER LOCATION.**

2-10. After electrical connections are completed, secure all protective covers over exposed wiring. Test the hoist operation as specified below prior to release for use.

### 2-11. TESTING.

2-12. Before placing hoist in operation, check for proper limit switch operation as follows:

- a. Carefully raise the unloaded load block to upper limit and observe if it stops automatically at the maximum level. (See note in paragraph 2-13.) Do not allow load block to run into hoist drum — or possible damage may result to hoist. If load block does not stop at desired level, see paragraph 4-1 for limit switch adjustment.
- b. Carefully lower the unloaded load block to lower limit and observe if it stops automatically at the maximum level. (See note in paragraph 2-13.) This should occur when 1½ wraps of wire rope are left on the drum. If load block does not stop at desired level, see paragraph 4-1 for limit switch adjustment.

2-13. After limit switch testing is complete **DISCONNECT HOIST FROM POWER SUPPLY** and replace brake cover and control cover. Secure all protective covers over exposed wiring. Re-establish power and continue testing hoist as specified below prior to release for use.

#### NOTE

The upper and lower limit switches are factory set to provide the maximum allowable hook travel and should not be adjusted to increase this travel. They can, however, be adjusted to automatically stop the hoist at points within these maximum limits (see paragraph 4-1 for adjustment procedure).

2-14. Wire rope life can be extended by a short breaking-in period before the hoist is put into service. During this breaking-in period, a small amount of twist may show up in the rope. This twist should be removed as described below. This break-in can be done at the time of hoist testing:

- a. Attach a light load to the hook and run the hoist through its full lift stroke for a few lifting and lowering cycles. Check for hook drift. The hook should not drift more than one inch.
- b. If brake operation is normal with a light load, repeat the above procedure with approximately one-half rated load, again running the hoist through its full lift stroke for a few cycles. Check again for hook drift.
- c. If brake operation is normal with one-half rated load, attach rated load to the hook and continue the break-in procedure. The hoist shall operate smoothly and the brake should prevent hook drift in excess of one inch at rated load. See paragraph 4-5 if motor brake adjustment is required.
- d. Set the load on the floor. Disconnect the dead end of the wire rope by removing the dead end anchor screw (18, Figure 7-5A or 7-5B). Allow the dead end to rotate, in order to remove all twist from the rope. Reconnect the dead end and be sure to replace and tighten the anchor screw.

### 2-15. TROLLEY MOUNTING.

2-16. The Coffing Trolleys can be mounted on standard "T" beams. The trolleys will mount on 6" through 18" depth "T" beams. This is accomplished by properly locating the spacer washers as shown in Tables 2-1, 2-2, and 2-3. Washers should be equally spaced on each side of the hoist suspension so that a clearance of about  $\frac{3}{32}$ " (.094") is obtained between the beam and each wheel flange. Tables 2-1, 2-2, and 2-3 provide an approximate guide to washer placement. Be sure to use the proper Table, based on hoist capacity (tons) and trolley type.

**NOTE**

Beam manufacturing tolerances allow wide variations from handbook flange widths. The particular beam on which your hoist is to be installed should be measured and the trolley spacer washers adjusted as required to achieve a  $\frac{3}{32}$ " clearance. Two thicknesses of washers are provided. This allows fine adjusting to achieve the required spacing.

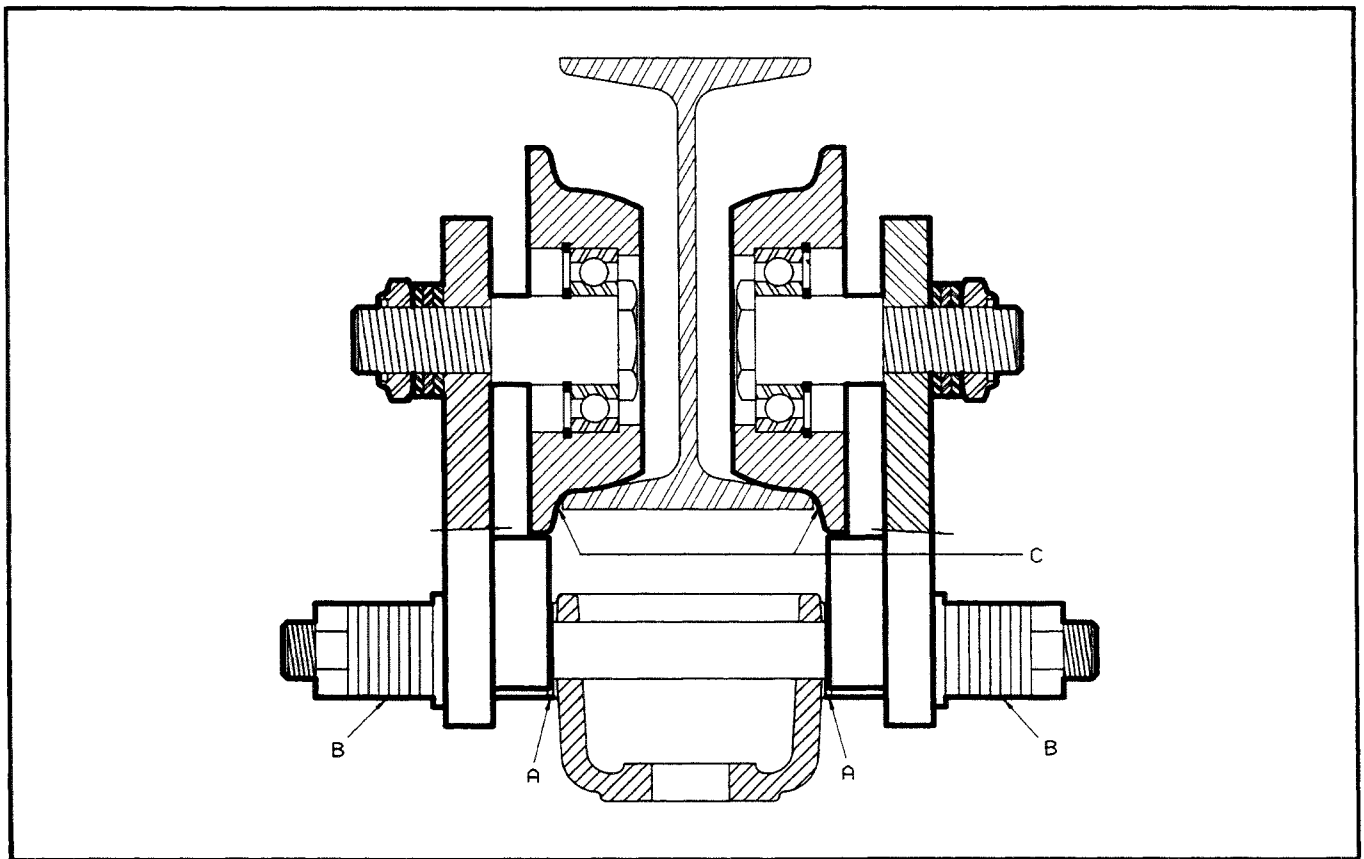
Trolleys can be mounted on beam radii as small as 4 feet. Slightly increased spacing may be required when the trolley is mounted on curved beams to maintain freedom of movement.

2-17. The load pin nuts for the trolleys require a tightening torque of 100 ft. lbs. Refer to Figures 2-1, 2-2, and 2-3 for nut identification.

**CAUTION**

**Make sure all supporting structures are strong enough to hold the full rated load of the trolley with a generous factor of safety.**

**WR-3 HOISTS ON COFFING TROLLEYS  
(1-TON & 2-TON HOISTS, FOUR-WHEEL TROLLEY)**

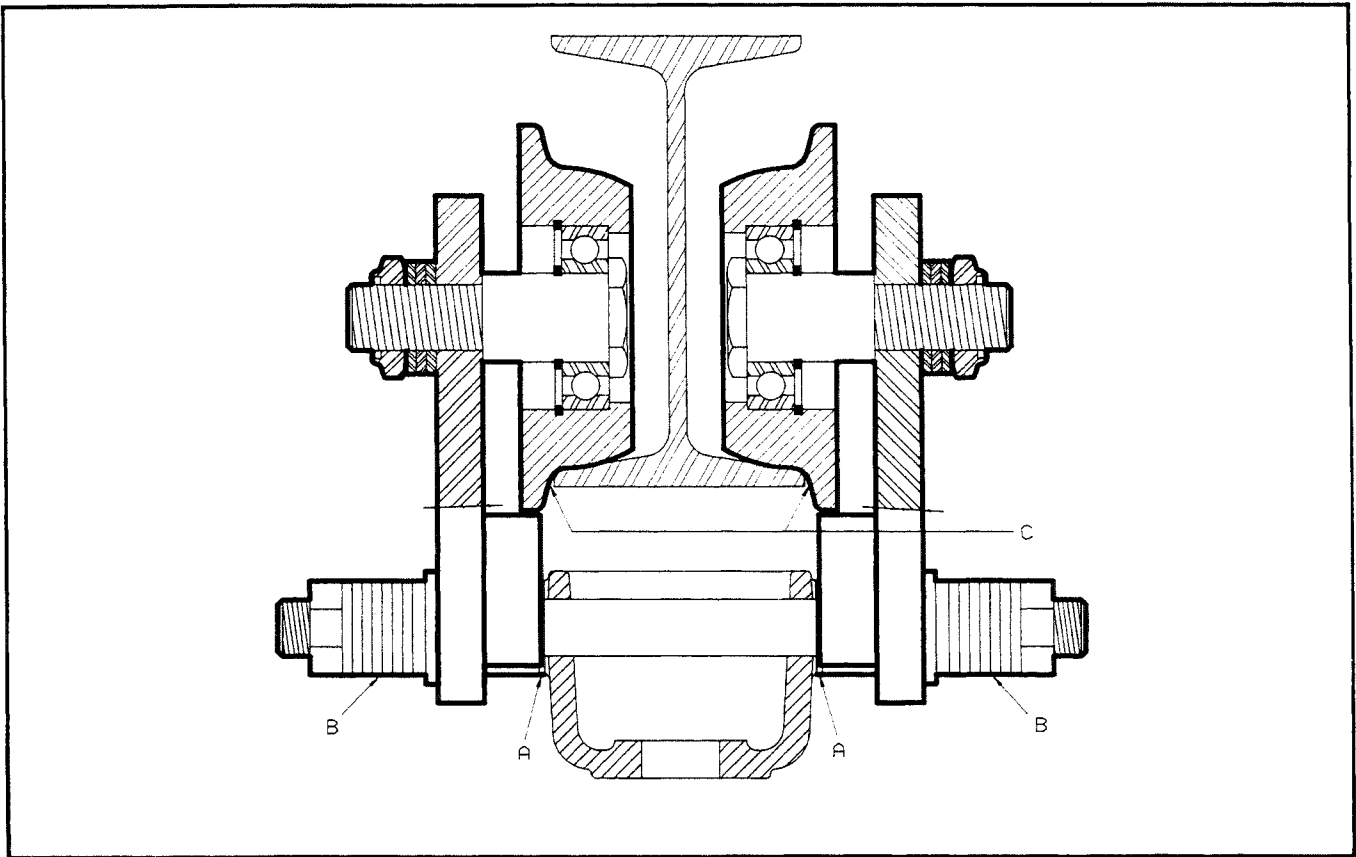


**FIGURE 2-1**

**TABLE 2-1**

|                                 |       | "I" Beam Size |    |     |     |     |     |
|---------------------------------|-------|---------------|----|-----|-----|-----|-----|
|                                 |       | 6"            | 8" | 10" | 12" | 15" | 18" |
| Washers Between Hoist & Trolley | Thick | 0             | 0  | 3   | 6   | 5   | 7   |
|                                 | Thin  | 0             | 5  | 4   | 1   | 6   | 6   |
| Washers Outside Trolley         | Thick | 7             | 7  | 4   | 1   | 2   | 0   |
|                                 | Thin  | 9             | 4  | 5   | 8   | 3   | 3   |

### 3-TON HOIST, FOUR-WHEEL TROLLEY



**FIGURE 2-2**

**TABLE 2-2**

|                                    |       | "I" Beam Size |    |     |     |     |     |
|------------------------------------|-------|---------------|----|-----|-----|-----|-----|
|                                    |       | 6"            | 8" | 10" | 12" | 15" | 18" |
| Washers Between<br>Hoist & Trolley | Thick | 0             | 0  | 3   | 6   | 5   | 7   |
|                                    | Thin  | 0             | 5  | 4   | 1   | 6   | 6   |
| Washers Outside<br>Trolley         | Thick | 7             | 7  | 4   | 1   | 2   | 0   |
|                                    | Thin  | 9             | 4  | 5   | 8   | 3   | 3   |

1-TON, 2-TON OR 3-TON HOIST, TWO-WHEEL TROLLEY

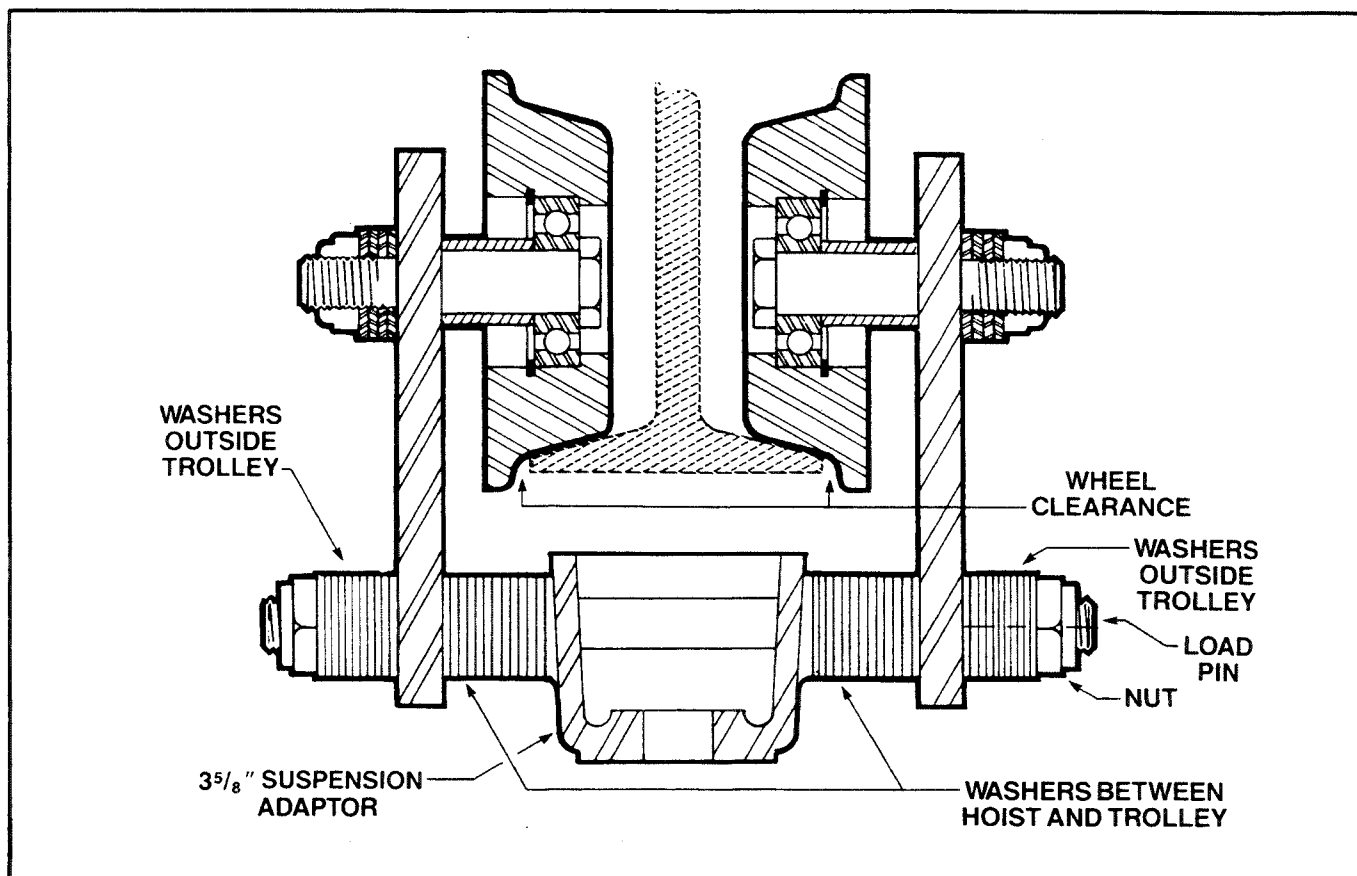


FIGURE 2-3

TABLE 2-3

|                                 |       | "I" Beam Size |    |     |     |     |     |
|---------------------------------|-------|---------------|----|-----|-----|-----|-----|
|                                 |       | 6"            | 8" | 10" | 12" | 15" | 18" |
| Washers Between Hoist & Trolley | Thick | 4             | 7  | 10  | 8   | 11  | 11  |
|                                 | Thin  | 4             | 3  | 2   | 8   | 6   | 9   |
| Washers Outside Trolley         | Thick | 7             | 4  | 1   | 3   | 0   | 0   |
|                                 | Thin  | 6             | 7  | 8   | 2   | 4   | 1   |



## SECTION III OPERATION

### 3-1. SAFETY CONSIDERATIONS.

3-2. This hoist is designed for proper operation within the limits of its rated capacity. The hoist has features designed to minimize the potential for injury due to the failure of the hoist itself. This hoist is intended for use in the vertical lifting of freely suspended material loads. Applications involving the lifting of guided loads, such as dumbwaiters and non-riding elevators require additional safety devices. Before using this hoist in such applications, consult the local, state and federal codes.

Here are some additional pointers which should be followed in order to ensure proper operation.

a. Do not overload the hoist. This hoist is equipped with a torque limiting device (load equalizer assembly, 36, Figure 7-4). This device will prevent lifting of damaging overloads but this feature is not intended to invite, condone or grant permission to lift loads greater than the rated capacity of the hoist, see Table 1.

b. Do not make side pulls with the hoist. Trolley mounted hoists should always be positioned directly over the load before lifting.

c. Operate the hoist only in a hanging position with adequate support. Make sure that the load does not contact any obstructions.

d. 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 wire rope is taut and then double check the rigging before continuing to raise the load. Never use the hoist wire rope in sling fashion around the load.

e. Make sure that the slings and other rigging have sufficient capacity to support the load, and are in good condition.

f. **DO NOT STAND OR WALK BENEATH A LOAD.** Do not move the load in such a manner as to endanger personnel.

g. Never leave a suspended load unattended.

h. Do not lower the load into areas where visibility is obscured unless someone else is guiding the operation.

i. Use common sense at all times when operating a hoist.

j. **DO NOT USE THE HOIST TO LIFT, TRANSPORT, OR OTHERWISE SUPPORT PEOPLE.**

### NOTE

The information herein is directed to the proper use, care and maintenance of the WR-3 Hoist and does not comprise a handbook on the broad subject of rigging. Rigging can be defined as the process of lifting and moving heavy loads using hoists and other mechanical equipment. Skill acquired through specialized experience and study is essential to safe rigging operations. For rigging information, we recommend consulting a standard textbook on the subject.

### 3-3. OPERATION.

3-4. The hoist should be operated by qualified personnel only. Be sure to perform the daily inspections specified herein prior to first use each day. Pay particular attention to the limit switch operation, the brakes, and rope travel onto the drum. Avoid excessive inching and quick reversals as these can cause overheating, accelerated brake wear, and unnecessary stresses. Do not routinely move the hook so as to actuate the limit switches, as these are safety devices only. Avoid swinging the load or hook if the hoist is mounted on a trolley. Do not operate the hoist if it is functioning improperly, has been inadvertently overloaded, or is in obvious need of repair. Always affix a warning or "Out-of-Order" tag to the control station and disconnect hoist from power supply until the proper inspection-repair has been made.

## SECTION IV MAINTENANCE, REPAIR AND LUBRICATION

### 4-1. LIMIT SWITCH ADJUSTMENT.

4-2. Limit switches are provided to protect the hoist against damage resulting from over-travel or to allow setting the hoist travel within a prescribed travel range. For easy identification and association with the proper travel the upper and lower limit switch adjusting nuts (2 and 3, Figure 4-1) are colored red and green respectively. The increment of adjustment is as follows: One complete revolution (ten slots) of either nut is equivalent to approximately 7 $\frac{3}{4}$ " of hook travel on the 1 & 2 Ton hoist or approximately 3 $\frac{7}{8}$ " of hook travel on the 3-Ton hoist. One slot is equivalent to approximately  $\frac{3}{4}$ " of hook travel on the 1 & 2-Ton hoist or approximately  $\frac{3}{8}$ " on the 3-Ton. Movement of the limit switch nuts toward or away from each other increases or decreases the hook travel respectively. Care should be exercised when adjusting either limit of travel.

### CAUTION

**If the wires running to the limit switches are disconnected for any purpose, refer to applicable wiring diagram (Section VI of this manual) for proper location of wires.**

4-3. Adjust Upper Limit (Red Nut) as follows:

a. Carefully raise the load block to a point where the top of it is three inches or more from the hoist drum (or to the limit desired in the particular application, allowing the minimum of three inches).

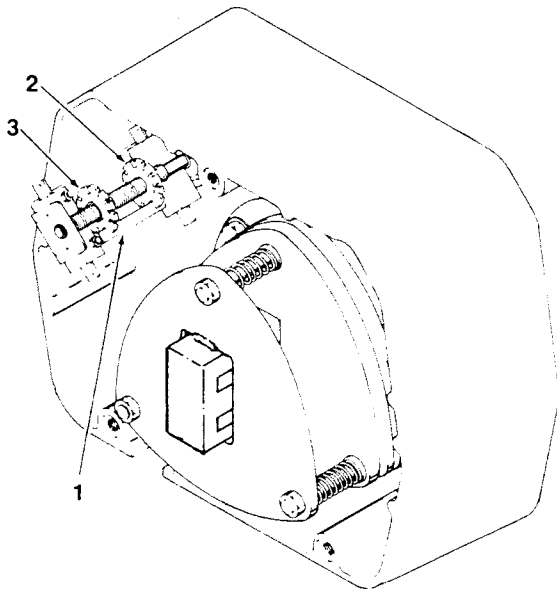


FIGURE 4-1. LIMIT SWITCH ADJUSTMENT

b. DISCONNECT HOIST FROM POWER SUPPLY and remove the brake cover (1, Figure 7-1).

c. With a screwdriver, pry the spring guide plate (1, Figure 4-1) out of the slots in the colored limit switch nuts (2 and 3).

d. Turn the slotted red nut (2) towards its limit switch until the limit switch "clicks";\* then turn two SLOTS further. Release the spring guide plate and be sure it slips back into the slots in the colored limit switch nuts. Do not disturb the other slotted nut if it has been set previously.

e. Replace brake cover and connect hoist to power supply.

f. Verify the limit switch setting by first lowering the load block and then carefully inching it back toward the hoist until the switch is actuated.

4-4. Adjust Lower Limit (Green Nut) as follows:

a. Carefully lower the load block to a point where there is a minimum of 1 $\frac{1}{2}$  wraps of wire rope left on the drum (or to the limit desired in the particular application, allowing the minimum 1 $\frac{1}{2}$  wraps).

b. DISCONNECT HOIST FROM POWER SUPPLY and remove the brake cover (1, Figure 7-1).

c. With a screwdriver, pry the spring guide plate (1, Figure 4-1) out of the slots in the colored limit switch nuts (2 and 3).

d. Turn the slotted green nut (3) towards its limit switch until the limit switch "clicks";\* then turn two SLOTS further. Release the spring guide plate and be sure it slips back into the slots in the colored limit switch nuts. Do not disturb the other slotted nut if it has been set previously.

e. Replace brake cover and connect hoist to power supply.

f. Verify the limit switch setting by first raising the load block and then carefully inching it back toward the lower setting point until the switch is actuated.

\*If difficulty is encountered in detecting the "click" of the limit switch, a continuity testing device should be used to determine the point at which the switch breaks the control circuit.

#### 4-5. MOTOR BRAKE ADJUSTMENT.

4-6. The criteria for the correct brake adjustment is its performance. Properly adjusted, the brake will release promptly when energized; 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 push-button is released (this condition is most noticeable in the lowering direction) or hesitates to lift the load promptly when the push-button is depressed (this condition is most noticeable in the hoisting direction) the brake should be adjusted. If adjustment of the motor brake does not correct the hesitation, the load equalizer assembly may require replacement. See Section V.

4-7. To Adjust Brake, proceed as follows:

- Remove any load and DISCONNECT THE HOIST FROM POWER SUPPLY.
- Remove brake cover (1, Figure 7-1).
- Check the gap between brake armature (A, Figure 4-2) and field (B). The correct gap is 0.015 inch. Adjustment should not be necessary until gap reaches 0.050 inch unless brake chatter is experienced. See Section V.
- Adjust gap by adjusting the three lock nuts (F) and checking with a feeler gauge to be sure gap is the same on both ends of the solenoid.

#### CAUTION

**Be sure the bottom of the armature plate does not bear against the brake adapter (H). As wear occurs and adjustments are made the built in clearance will be reduced. When this clearance is gone REPLACE BRAKE DISCS.**

e. Adjustment is now complete and the brake properly set. Replace the brake cover, reconnect the power supply, and check brake operation per paragraph 2-14. If brake operates improperly, see troubleshooting, Section V.

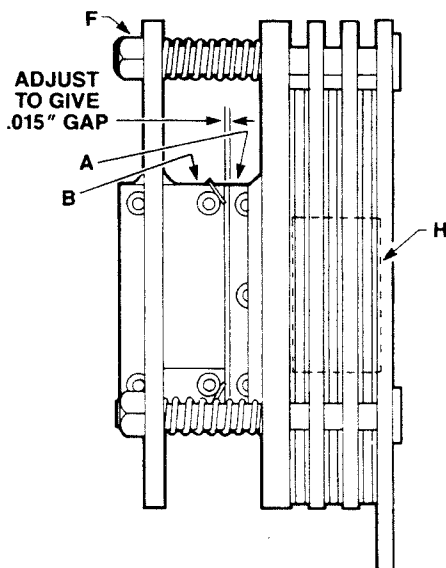


FIGURE 4-2. MOTOR BRAKE ADJUSTMENT

#### 4-8. REPLACEMENT OF WIRE ROPE.

4.9 1 & 2-TON HOISTS, STANDARD HEADROOM MODELS: Refer to Figure 4-3A for parts identification and proper cable reeving.

- Push "Down" button and run old rope out until stopped by lower limit switch.
- Disassemble the load block by removing the two bolts (11, Figure 7-9A) and the large nut (4) on the grease fitting side. Clean and inspect the block, hook, sheave, bearings, and pin for wear, damage, etc. Replace parts as necessary. Do not reassemble the load block at this point.
- DISCONNECT HOIST FROM POWER SUPPLY and remove brake cover (1, Figure 7-1).
- With a screwdriver, push the spring guide plate (1, Figure 4-1) out of the slots in the plastic limit switch nuts. Turn the green slotted nut (3) back to about the center of the screw thread. DO NOT DISCONNECT THE WIRES FROM THE LIMIT SWITCHES.
- With the brake cover off, reconnect the hoist to power supply. Be sure the green ground wire is properly grounded.
- Carefully jog the "Down" button until all old rope is run off and the drum socket opening is accessible.
- Disconnect old rope dead end by removing the dead end anchor screw (18, Figure 7-5A). This requires a  $\frac{5}{16}$ " allen wrench. Lift the eye fitting of the old rope off the anchor pin.
- Slide the sleeve fitting of the rope out of the drum socket. Remove and discard the old rope.
- Place paper on floor to protect the new wire rope from dirt and grit. Stretch the new wire rope out on the paper with the sleeve fitting end toward the hoist. Relieve any twist in the new rope.
- Insert the new rope's sleeve fitting into the drum socket, making sure the fitting is properly seated.

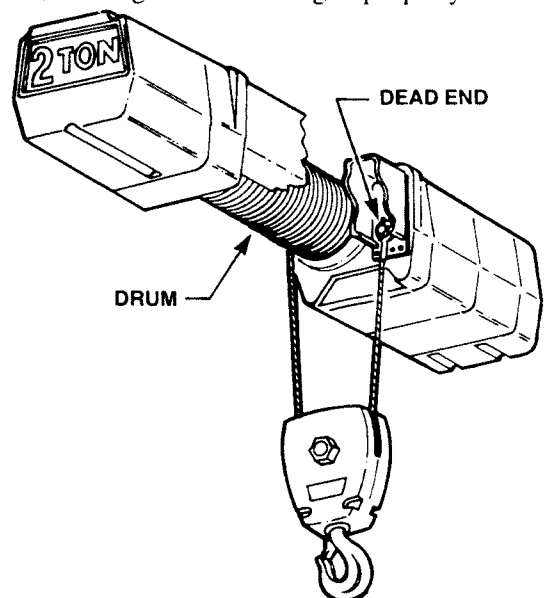


FIGURE 4-3A. WIRE ROPE REEVING  
(1 & 2 TON, STANDARD HEADROOM MODELS)

k. Push the "Up" button until about half of the new rope is wound onto the drum. Apply slight tension to the rope with a gloved hand to wind rope evenly on the drum.

l. Attach the dead end by placing the new rope's eye fitting over the anchor pin. Be sure to replace and tighten the dead end anchor screw, since it serves to prevent the dead end fitting from working itself off the anchor pin.

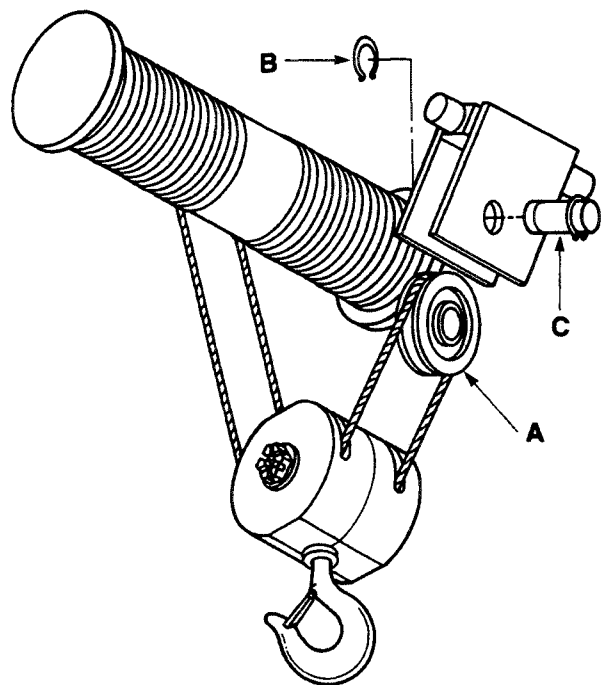
m. Reassemble the load block onto the new wire rope. See Figure 7-9A for aid in reassembly. Refer to Figure 4-3A to make sure that the rope is reeved correctly.

n. Adjust the limit switches per paragraph 4-1.

o. Test the hoist and break-in the wire rope per paragraph 2-14.

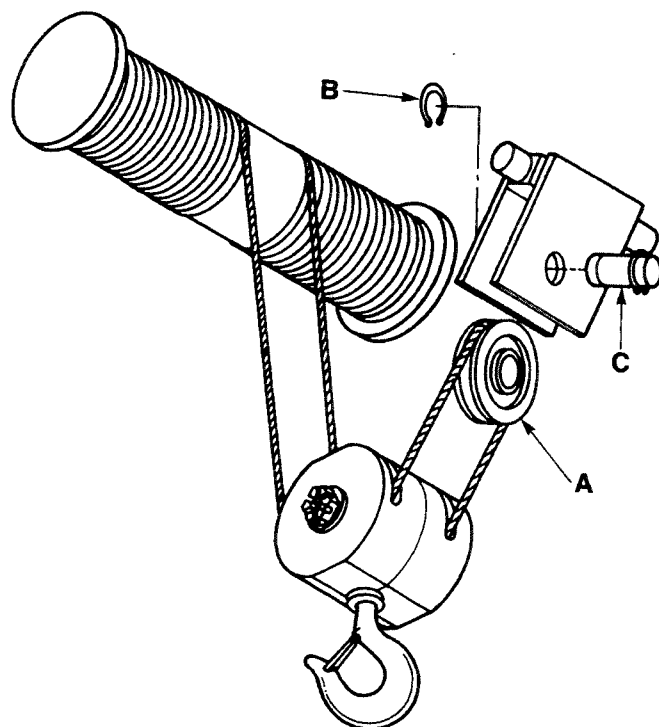
#### 4-10. 1 & 2 TON HOISTS, TRUE VERTICAL & LOW HEADROOM MODELS:

Refer to Figure 4-3B or 4-3C for parts identification and proper rope reeving.



**FIGURE 4-3B. WIRE ROPE REEVING  
(1 & 2 TON, TRUE VERTICAL LIFT MODELS)**

1. Push "DOWN" button and run old rope out until stopped by lower limit switch.
2. Disassemble the load block by removing the spring pins (53, Figure 7-9C) and the slotted nuts (51, Figure 7-9C). The block covers (52, Figure 7-9C) will still be captured by the rope. Clean and inspect the hook, sheaves, bearings and yoke for wear, damage, etc. Replace parts as necessary. Do not reassemble the load block yet.
3. DISCONNECT POWER from the hoist and remove the short end cover.
4. With a screwdriver, push the spring guide plate (1, Figure 4-1) out of the slots in the plastic limit switch nuts. Turn the



**FIGURE 4-3C. WIRE ROPE REEVING  
(1 & 2 TON, LOW HEADROOM MODELS)**

green slotted nut (3) back to about the center of the threaded screw. DO NOT DISCONNECT THE WIRES FROM THE LIMIT SWITCHES.

5. With the end cover off, connect hoist to power supply. Be sure the green wire is grounded.

6. Carefully jog the "DOWN" button until all the old rope is run off and the drum socket openings are accessible.

7. DISCONNECT POWER from the hoist.

8. Remove the equalizer sheave. (A) Figure 4-3 by removing one retaining ring (B) and the sheave pin (C). Clean and inspect these parts.

9. Slide the sleeve fittings out of the drum sockets, and out of the block covers. Remove and discard the old rope.

10. Place paper on the floor to protect the new rope from dirt and grit. Stretch the new rope out in one length and relieve any twist. Then double the rope by bringing the two sleeve fittings together.

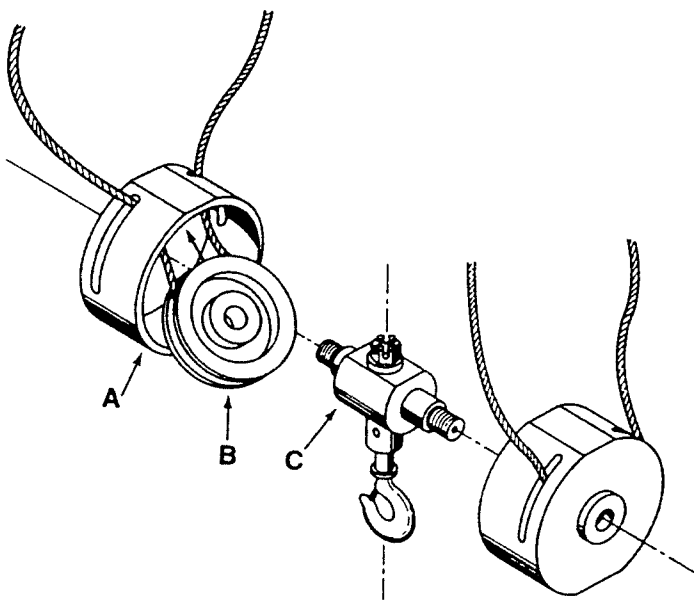
11. Pass each sleeve fitting through the rope openings in the block covers only. The block should remain disassembled at this point.

12. Insert each sleeve fitting into the drum sockets, making sure the fittings are properly seated.

13. Push the "UP" button until a few wraps of rope are wound onto the drum. Apply slight tension to the ropes with gloved hands to wind the rope evenly on the drum..

14. Place the looped end over the equalizer sheave and return the sheave to its frame. Reinstall the sheave pin and retaining ring.

15. At this point, only the block covers will be hanging from the two loops of rope.



**FIGURE 4-4. ASSEMBLY OF LOAD BLOCK—  
TWO PART DOUBLE REEVED**

16. Refer to Figure 4-4 for assembly of load block. Pull a loop of rope to the inside of the block cover (A), and place a sheave (B) in this loop. Angle the top of the sheave into the cover, while keeping the rope seated in the sheave groove. The sheave will now drop to the inside wall of the cover. Place the sheave and cover, as one unit, over the yoke (C), and hand-tighten the slotted nut. Repeat for the other side. Tighten both slotted nuts and install the spring pins. Refer to Figure 4-3B or 4-3C to make sure that the rope is reeved correctly.

17. Adjust the limit switches per paragraph 4-1.

18. Lubricate the wire rope per paragraph 4-23a. Test the hoist and break-in the wire rope per paragraph 2-14.

4-11. 3-TON HOISTS: Refer to Figure 4-3D for parts identification and proper cable reeving.

a. Push “Down” button and run old rope out until stopped by lower limit switch.

b. Disassemble the load block by removing the two bolts (7, Figure 7-9B) and the large nut (9). Clean and inspect the block, hook, sheaves, bearing and pin for wear, damage, etc. Replace parts as necessary. Do not reassemble the load block at this point.

c. **DISCONNECT HOIST FROM POWER SUPPLY** and remove brake cover (1, Figure 7-1).

d. With a screwdriver, push the spring guide plate (1, Figure 4-1) out of the slots in the plastic limit switch nuts. Turn the green slotted nut (3) back to about the center of the screw thread. **DO NOT DISCONNECT THE WIRES FROM THE LIMIT SWITCHES.**

e. With the brake cover off, reconnect the hoist to power supply. Be sure the green ground wire is properly grounded.

f. Carefully jog the “Down” button until all old rope is run off and the drum socket opening is accessible.

g. Remove the center-section covers (22 and 23, Figure 7-1). Remove the drum/idler guard (6, Figure 7-5B). Disconnect old rope dead end by removing the dead end anchor screw (18, Figure 7-5B). This requires a  $\frac{5}{16}$ ” allen wrench. Lift the eye fitting of the old rope off the anchor pin.

h. Slide the sleeve fitting of the rope out of the drum socket. Remove and discard the old rope.

i. Place paper on floor to protect the new wire rope from dirt and grit. Stretch the new wire rope out on the paper with the sleeve fitting end toward the hoist. Relieve any twist in the new rope.

j. Insert the new rope’s sleeve fitting into the drum socket, making sure the fitting is properly seated.

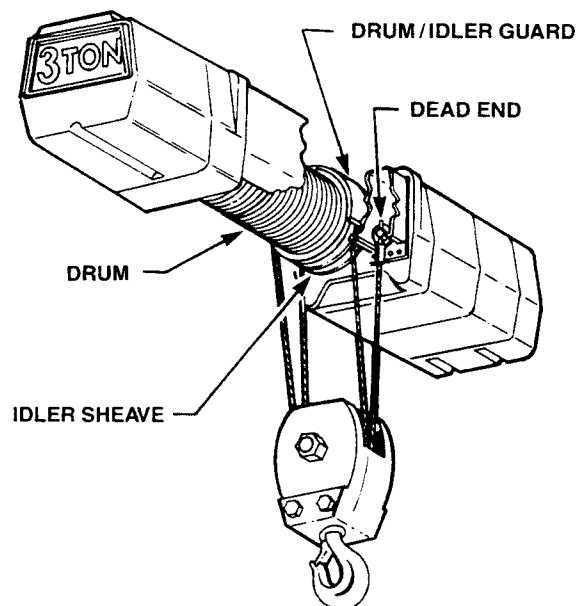
k. Push the “Up” button until about half of the new rope is wound onto the drum. Apply slight tension to the rope with a gloved hand to wind rope evenly on the drum.

l. Pass the eye fitting of the new rope over the idler sheave and attach the dead end by placing the eye fitting over the anchor pin. This should form two loops of rope hanging from the hoist. Be sure to replace and tighten the dead end anchor screw, since it serves to prevent the dead end fitting from working itself off the anchor pin.

m. Reassemble the load block onto the new wire rope. See Figure 7-9B for aid in reassembly. Refer to Figure 4-3D to make sure that the rope is reeved correctly. Replace the drum/idler guard, making sure that the rope is properly seated in the idler sheave, and that the idler sheave rotates freely. Replace the center-section covers.

n. Adjust the limit switches per paragraph 4-1.

o. Test the hoist and break-in the wire rope per paragraph 2-14. Lubricate the wire rope per paragraph 4-23a.



**FIGURE 4-3D. WIRE ROPE REEVING  
(3-TON, STANDARD HEADROOM MODELS)**

## CAUTION

**Do not repair, shorten or substitute other wire rope. Use correct wire rope assembly specified in this manual.**

### 4-12. INSPECTIONS.

4-13. A planned inspection routine should be established for this hoist based upon frequency of use, severity of use, and environmental conditions. (Reference American National Standard ANSI 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 4-5 and 4-6 be used and filed for reference. All inspections should be made by, or under the direction of, a designated inspector. Special inspections should be made following any significant repairs or any operating occurrence leading one to suspect that the hoist's capabilities may have been impaired.

### 4-14. FREQUENT INSPECTIONS.

4-15. Perform the following inspections daily prior to initial use of the hoist.

## CAUTION

**Any unsafe condition disclosed by the inspection shall be corrected before operation of the hoist is resumed. Adjustments and repairs shall be done only by designated personnel.**

- a. Check the operating controls for proper operation.
- b. Check the limit switches for proper operation.
- c. Check the brakes for proper operation.
- d. Inspect the hook for deformations, chemical damage, or cracks. Hooks damaged from chemicals, deformation or cracks or having throat openings greater than that listed in Figure 4-4 must be replaced.

## NOTE

Any hook that is twisted more than 10 degrees from the plane of the unbent hook or has throat openings in excess of that listed in Figure 4-4 indicates abuse or overloading of the hoist. Other load bearing components should be inspected accordingly.

- e. Check that the hook swivels freely.
- f. Check hook latch to see that latch performs function of closing off the hook throat in a secure manner when load is attached.
- g. Check wire rope for wear, twist, distortion or improper dead-ending.

### 4-16. PERIODIC INSPECTIONS.

4-17. It is recommended that the following inspections be performed at one to 12 month intervals. 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 his monthly experience.

## CAUTION

**Any unsafe condition disclosed by the inspection shall be corrected before operation of the hoist is resumed. Adjustments and repairs shall be done only by designated personnel.**

- a. Perform all the frequent inspections listed in paragraph 4-14.
- b. Check nuts, bolts, rivets, and other hardware for looseness, stripped or damaged threads, and corrosion.
- c. Check sheave and drum for distortion, cracks, and excessive wear.
- d. Check housings and load block for cracks (resulting from collision, dropping, etc.) and abnormal openings between housing sections (resulting from overloading).
- e. Check for worn, corroded, cracked or distorted parts such as pins, bearings, bushings, shafts (including splines), couplings and gears.
- f. Check disc brake for glazing, contamination or excessive wear.
- g. Check load brake function. See Figure 4-8.
- h. Make a thorough inspection of the wire rope at least once each month and keep a written, dated and signed report of rope condition on file. Any deterioration, resulting in appreciable loss of original strength, such as described below, shall be carefully noted and determination made as to whether further use of the rope would constitute a safety hazard.
  - (1) Reduction of rope diameter below nominal due to loss of core support, internal or external corrosion or wear of outside wires.
  - (2) A number of broken outside wires and the degree of distribution or concentration of such broken wires.
  - (3) Worn outside wires.
  - (4) Sections of rope which are normally hidden during inspection or maintenance procedures, such as parts passing over sheaves, should be given close inspection as these are points most subject to deterioration.
  - (5) Corroded or broken wires at end connections.
  - (6) Corroded, cracked, bent, worn or improperly applied end connections.
  - (7) Kinking, crushing, cutting or unstranding.

No precise rules can be given for determination of exact time for replacement of wire rope, since many variable factors are involved. Safety in this respect depends largely upon the use of good judgment by an appointed or designated person in evaluating remaining strength in the used rope after allowance for deterioration disclosed by inspection. Safety of rope operation depends upon this remaining strength. Conditions such as the following should be sufficient reason for questioning rope safety and consideration of replacement.

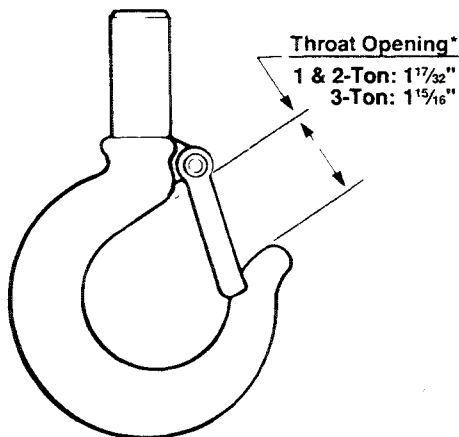
- (1) Twelve randomly distributed broken wires in one rope lay, or four broken wires in one strand in one rope lay.
- (2) Wear of one-third of the original diameter of outside individual wires.
- (3) Kinking, crushing, birdcaging or any other damage resulting in distortion of the rope structure.
- (4) Evidence of any heat damage from any cause.
- (5) Reductions from nominal  $\frac{5}{16}$  inch diameter to  $\frac{1}{4}$  inch.

### CAUTION

**Use only wire rope supplied by our company since replacement rope must be the same size, grade and construction as the original rope.**

A rope which has been idle for a period of a month or more due to shutdown or storage of the hoist, shall be given a thorough inspection before it is placed in service.

- i. Check wire rope end fastenings. When two wires are broken adjacent at the end fastenings, the rope should be replaced.



\*Dimension of throat opening with internal latch.

**NOTE:** If hook is measured without hook latch, add  $\frac{1}{16}$ " to 1 & 2-Ton throat and  $\frac{3}{32}$ " to 3-Ton hook throat.

**FIGURE 4-4. HOOK THROAT OPENING**

- j. Inspect hook for cracking, checking, extreme wear and spreading. Replace hooks showing these signs. Use dye penetrant, magnetic particle or other suitable crack detecting method. If the throat opening is spread wider than that listed in Figure 4-4, the hook has been overstressed and must be replaced.

- k. Inspect hook connections for cracks, bending, stripped threads, and other damage.

- l. Inspect limit switches for signs of looseness or deterioration. Ensure that they are securely mounted and that electrical connections are tight.

- m. Inspect all wiring and terminals for fraying and defective insulation. Check connections for tightness. Inspect crimp and insulation on terminal blocks.

- n. Inspect the supporting structure for continued ability to carry the rated loads.

- o. Inspect all nameplates, decals, and warning labels for security of attachment and legibility.

### 4-18. INSPECTION OF HOIST NOT IN REGULAR USE.

4-19. If a hoist has been idle for one month or more, but not more than six months, perform the inspections listed in paragraph 4-14 prior to use. If the hoist has been idle more than six months, perform the inspections listed in paragraph 4-16.

### 4-20. CLEANING.

4-21. The external surfaces of the hoist should be periodically wiped to remove deposits of dust, oily residue and other foreign material which tend to insulate the hoist from natural dissipation of heat. Be sure that capacity plate (10, Figure 7-1) and warning labels (24, Figure 7-8A; 24, Figure 7-8B; 24, Figure 7-8C; 24, Figure 7-8D; and 24, Figure 7-8E) are clean and legible from the operator's position. Keep wire rope, drum and load block clean at all times. Build up of foreign material or substances in these areas can bind, wear or otherwise restrict the wire rope and other moving parts. During periodic inspection and with hoist disconnected from its power supply, remove the control cover (2, Figure 7-1) and brake cover (1) and remove dust build up caused by electrical arcing and brake wear.

### CAUTION

**If cleaning solvents are used, provide adequate ventilation and be sure that fumes or vapors are safely dissipated before energizing the hoist. Wear protective clothing and avoid prolonged contact with solvent.**

## 4-22. LUBRICATION.

4-23. Proper lubrication is necessary for a long and relatively trouble-free hoist operation. Refer to the following and to Figure 4-7, Recommended Lubrication Schedule, for lubrication points, type of lubricant and frequency of lubrication.

a. **WIRE ROPE.** Lubrication of the wire rope is important. The action within the rope as it moves over the drum or around the sheave is for the strands to slide one against the other. Lubrication will reduce this friction and prevent the entrance of moisture which can cause corrosion. Frequent light applications of lubricant is better than infrequent heavy applications. For best results, use Coffing Wire Rope Lubricant (Part No. 14J49), or other wire rope lubricant. As an alternative, use SAE 30 motor oil.

b. **Gearing:** The gear case of the hoist is filled at assembly with 1 gallon of a gear oil containing special friction-reducing additives.

### WARNING

**The use of gear oils other than that recommended in Figure 4-7 can cause brake chatter or can render the load brake incapable of holding a load. A 1 gallon container of this oil is available from the Duff-Norton Co. (Part No. 14J11).**

a. **To check the oil level,** remove the  $\frac{1}{8}$ " pipe plug from the side of the hoist. With the hoist hanging level, trans-

mission oil should be even with the edge of the tapped plug hole.

b. The length of time between necessary oil changes will depend on the severity of use the hoist receives. In general, the oil should be changed every 12 months of normal operation, or every 200 hours of actual hoist on-time. Very heavy use or operation in high ambient temperatures (over 105°F) will require that oil be changed more often. An indication of the need for oil replacement is load brake noise. If an erratic tapping sound is made when lowering a load, the oil should be changed.

c. **Limit Switch Shaft:** To prevent rust, the threaded limit switch shaft should be given a light coat of grease or sprayed with a general purpose lubricant.

d. **Hook Bearing:** Apply a few drops of SAE 30 oil around the edge of the bearing.

e. **BOTTOM BLOCK SHEAVE BUSHING.** Apply grease through grease fitting in sheave pin (14), Figure 7-9A or (10), Figure 7-9B).

f. **Trolley Gear Box:** At periodic inspections (see Figure 4-5) check grease level by removing end cap (22, Figure 7-12). The gear box should be approximately half full of grease. In general, the trolley gear box lubricant does not require changing.

g. **Trolley Wheel Gears:** Apply a light coat of grease to the pinion and both gears.



**INSPECTION & MAINTENANCE CHECK LIST  
ELECTRIC POWERED OVERHEAD WIRE ROPE 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 |  |    |                 |
|  | DAILY                   | MONTHLY |          |  |    |                 |
| Operating Controls   | *                       | *       | *        | Any deficiency causing improper operation  |    |                 |
| Limit Switches   | *                       | *       | *        | Any deficiency causing improper operation<br>Pitting or deterioration  |    |                 |
| Disc (Motor) Brake   | *                       | *       | *        | Slippage or excessive wear<br>Glazing, contamination or excessive wear   |    |                 |
| Load Brake (Mechanical)  |                         |         | *        | Failure to support load with disc brake open (see Figure 4-8)  |    |                 |
| Hooks  | *                       | *       | *        | Excessive throat opening, bent or twisted more than 10 degrees, damaged hook latch, wear, chemical damage, worn hook bearing<br>Cracks (use dye penetrant, magnetic particle or other suitable detection method) |    |                 |
| Suspension Lug   |                         |         | *        | Cracks, excessive wear or other damage which may impair the strength of the lug<br>Cracks (use dye penetrant, magnetic particle or other suitable detection method)  |    |                 |
| Wire Rope  | *                       | *       | *        | Inadequate lubrication, wear, twist, distortion, improper dead-ending, deposits of foreign substance<br>Deterioration or wear resulting in appreciable loss of original strength                                 |    |                 |
| Suspension Lug Connections   |                         |         | *        | Cracks, bending, stripped threads, damaged suspension studs  |    |                 |
| Pins, Bearings, Bushings, Shafts, Couplings, Gears                       |                         |         | *        | Excessive wear, corrosion, cracks, distortion  |    |                 |
| Nuts, Bolts, Rivets  |                         |         | *        | Looseness, stripped and damaged threads, corrosion   |    |                 |
| Sheave, Drum   |                         |         | *        | 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  |    |                 |
| Contact Block, Magnetic Hoist Control Switch, 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:**

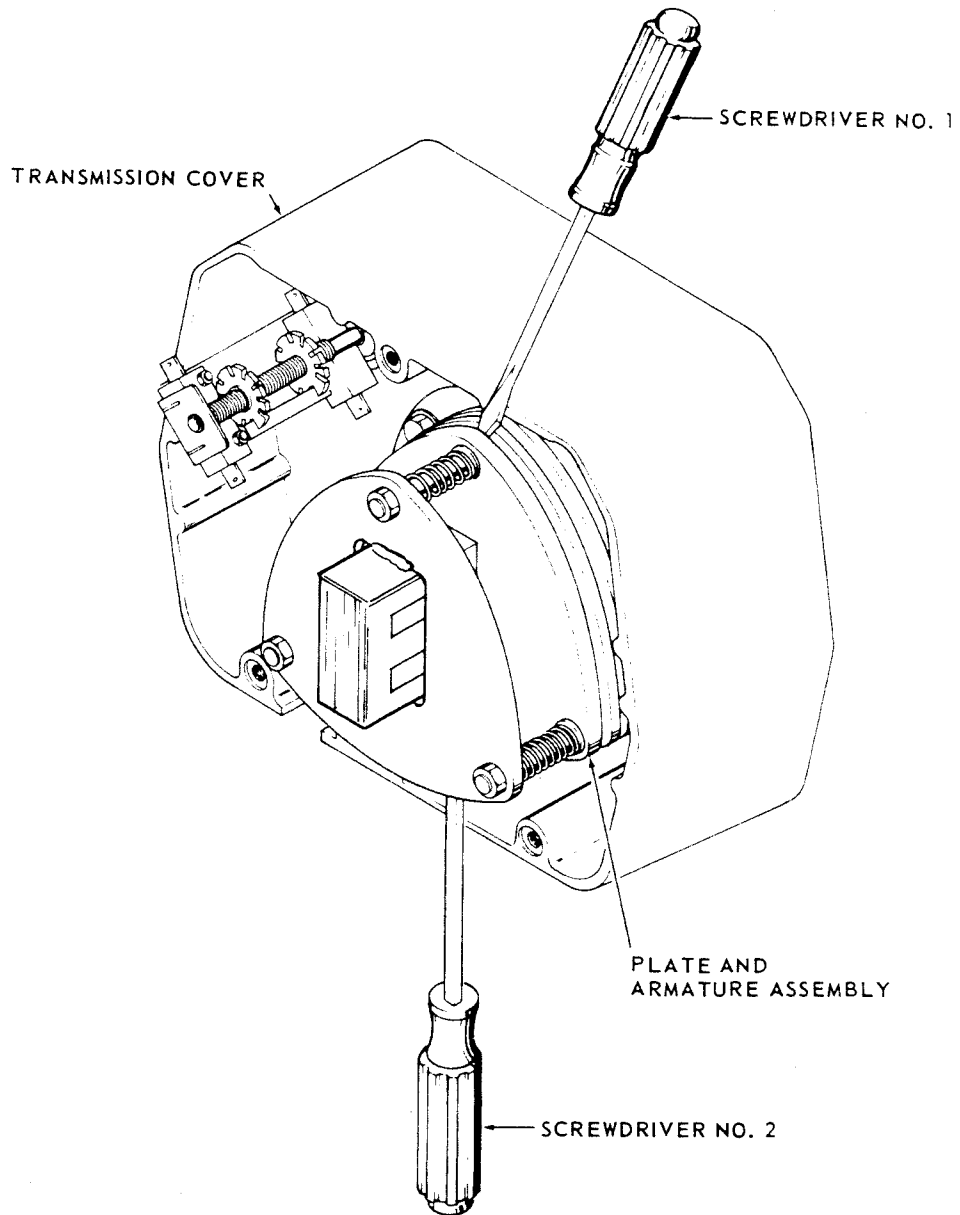
Frequent— Indicates items requiring inspection daily to monthly. Daily inspections may be performed by the operator if properly designated.

Periodic— Indicates items requiring inspection monthly to yearly. Inspections to be performed by or under the direction of a properly designated person. 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 his monthly experience.

**FIGURE 4-5. RECOMMENDED INSPECTION AND MAINTENANCE CHECK LIST**

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





To check function of Load Brake, proceed as follows: Attach a light load to hoist and lift load several inches. DISCONNECT HOIST FROM POWER SUPPLY and remove brake cover (1, Figure 7-1). Referring to illustration above and Figure 7-7, place screwdrivers No. 1 and No. 2 behind the plate and armature assembly and prepare to pry against transmission cover. Do not allow either screwdriver to contact the brake disc (7, Figure 7-7A or 7-7B). Carefully pry open motor brake (close solenoid gap) and observe action of load. If the load descends, the load brake is malfunctioning and must be repaired.

**FIGURE 4-8. LOAD BRAKE FUNCTION CHECK**

## SECTION V TROUBLESHOOTING

### 5-1. GENERAL.

5-2. Use the following table as an aid to troubleshoot the hoist. If you do not have an experienced machinist-electrician to do your repair work, we recommend that

you send your hoist to an approved service center or to us for repairs.

| TROUBLE   | REMEDY   |
|---|--|
| <b>HOOK FAILS TO STOP AT END OF TRAVEL</b>  |  |
| <ol style="list-style-type: none"> <li>1. Motor brake needs adjustment</li> <li>2. Limit switches not operating</li> <br/> <li>3. Plastic limit switch nuts not moving on shaft</li> <li>4. Magnetic reversing switch malfunction</li> <li>5. 3 Phase reversal</li> </ol>           | <ol style="list-style-type: none"> <li>1. See paragraph 4-5.</li> <li>2. Check adjustment. See paragraph 4-1. Check connections against wiring diagram. Tighten loose connections or replace.</li> <li>3. Check for stripped threads or bent nut guide.</li> <li>4. Remove control cover and check reversing switch.</li> <li>5. Reverse any two wires (except the green ground wire) at the power source.</li> </ol>  |
| <b>HOIST DOES NOT RESPOND TO PUSHBUTTON</b>   |  |
| <ol style="list-style-type: none"> <li>1. Power failure in supply lines</li> <li>2. Wrong voltage or frequency</li> <li>3. Improper connections in hoist or pushbutton station</li> <li>4. Motor brake does not release</li> <li>5. Faulty magnetic hoist control switch</li> </ol> | <ol style="list-style-type: none"> <li>1. Check circuit breakers, switches, and connections in power supply lines.</li> <li>2. Check voltage and frequency of power supply against the rating on the nameplate of the hoist.</li> <li>3. Check all connections at line connectors and on terminal block. Check terminal block on dual-voltage hoists for proper voltage connections.</li> <li>4. Check connections to the solenoid coil. Check for open or short circuit. Check for proper adjustment. See paragraph 4-5. Check for burned out coil.</li> <li>5. 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>1. Hoist overloaded</li> <li>2. Motor brake not holding</li> </ol>   | <ol style="list-style-type: none"> <li>1. Reduce load to within rated capacity of hoist.</li> <li>2. Check motor brake adjustment. See paragraph 4-5 and Figure 4-2.</li> </ol>  |
| <b>HOOK MOVES IN WRONG DIRECTION</b>  |  |
| <ol style="list-style-type: none"> <li>1. Three-phase reversal</li> <li>2. Improper connections</li> </ol>  | <ol style="list-style-type: none"> <li>1. Reverse any two wires (except the green ground wire) at the power source (see paragraph 2-8).</li> <li>2. Check all connections against Wiring Diagram.</li> </ol>   |
| <b>HOIST HESITATES TO LIFT WHEN ENERGIZED</b>   |  |
| <ol style="list-style-type: none"> <li>1. Hoist overloaded</li> <li>2. Motor brake requires adjustment</li> <li>3. Worn load equalizer clutch</li> <li>4. Low voltage</li> </ol>  | <ol style="list-style-type: none"> <li>1. Reduce load within rated capacity of hoist.</li> <li>2. Check motor brake adjustment, see paragraph 4-5.</li> <li>3. Replace clutch.</li> <li>4. Check voltage, see paragraph 2-3a.</li> </ol>   |

**TROUBLE****REMEDY****MOTOR BRAKE "NOISE" OR CHATTER**

|   |  |
|---|--|
| <ol style="list-style-type: none"> <li>Needs adjustment</li> <li>Broken shading coil element</li> </ol> | <ol style="list-style-type: none"> <li>Adjust per paragraph 4-5.</li> <li>Replace shading coil element.</li> </ol> |
|---|--|

**HOOK RAISES BUT WILL NOT LOWER**

|   |   |
|---|---|
| <ol style="list-style-type: none"> <li>"Down" circuit open</li> <li>Broken conductor in pushbutton cable</li> <li>Faulty magnetic hoist control switch</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> </ol> |
|---|---|

**HOOK RAISES BUT WILL NOT LOWER WHEN MOTOR IS OPERATING**

**CONSULT FACTORY OR AUTHORIZED DUFF-NORTON WARRANTY REPAIR STATION.**

**HOOK LOWERS BUT WILL NOT RAISE**

|  |   |
|--|---|
| <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 magnetic hoist control switch</li> <li>Worn load equalizer clutch</li> </ol> | <ol style="list-style-type: none"> <li>Reduce load to within rated capacity.</li> <li>Determine cause of low voltage and bring up to within plus or minus 10 per cent of the voltage specified on hoist. Line voltage should be measured while hoist is lifting load.</li> <li>Check circuit for loose connections. Check "UP" limit switch for malfunctions.</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>Replace clutch.</li> </ol> |
|--|---|

**LACK OF PROPER LIFTING SPEED**

|   |  |
|---|--|
| <ol style="list-style-type: none"> <li>Hoist overloaded</li> <li>Motor brake is dragging</li> <li>Low voltage</li> <li>Load equalizer clutch intermittently slipping</li> </ol> | <ol style="list-style-type: none"> <li>Reduce load to within rated capacity of hoist.</li> <li>Check for proper brake adjustment or other defects. See paragraph 4-5.</li> <li>Bring up voltage to plus or minus 10 per cent of voltage specified on hoist. Line voltage should be measured while hoist is lifting load.</li> <li>Replace clutch.</li> </ol> |
|---|--|

**LOAD BRAKE "NOISE" (ERRATIC TAPPING SOUNDS OR SQUEALS)**

|   |   |
|---|---|
| <ol style="list-style-type: none"> <li>Need transmission oil change or improper lubricant has been used</li> <li>Load brake malfunctioning</li> </ol> | <ol style="list-style-type: none"> <li>Change transmission oil. See Figure 4-7. Note: Hoist Warranty is void if unapproved oil is used.</li> <li>Check load brake operation. See Figure 4-8.</li> </ol> |
|---|---|

**EXCESSIVE WIRE ROPE WEAR**

|   |   |
|---|---|
| <ol style="list-style-type: none"> <li>Lack of lubrication</li> <li>Excessive side loading</li> <li>Worn sheaves</li> </ol> | <ol style="list-style-type: none"> <li>Lubricate wire rope.</li> <li>Reduce side loading to allow wire rope to wind smoothly on drum.</li> <li>Check for worn or corrugated sheaves in bottom block or idler sheave in hoist. Replace as needed.</li> </ol> |
|---|---|

## SECTION VI WIRING DIAGRAMS

### Safety Notes

Disconnect power from hoist before removing end covers.

#### 6-1. Voltage Conversion

Standard single speed three phase units are convertible from 460 to 230 volts. Conversion to the alternate voltage can be accomplished with the following procedure.

- a. Be sure power is disconnected from hoist. Remove long end cover.
- b. Transfer leads T4, T5, T6, T7, T8, T9, H2, H3, S1, and S2 per the appropriate terminal block schematic.

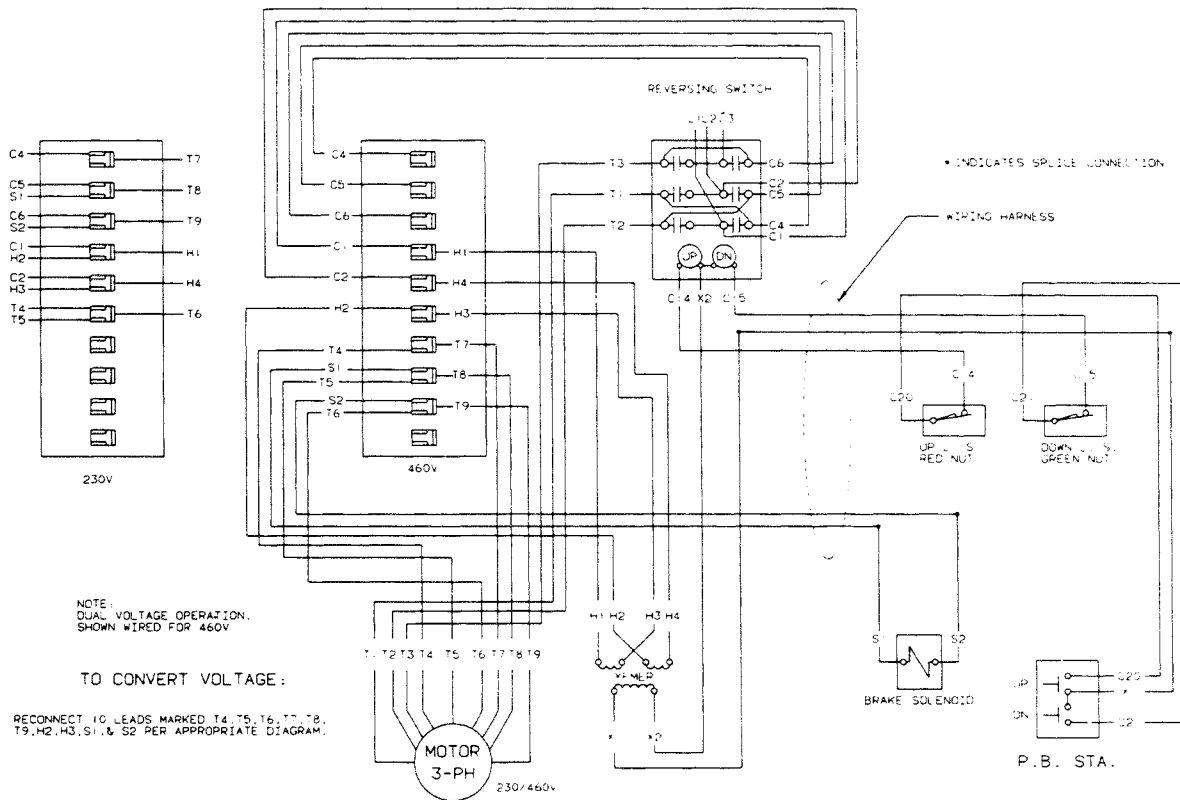
### CAUTION

Do not move any wires or make any changes to the wiring except at the terminal block.

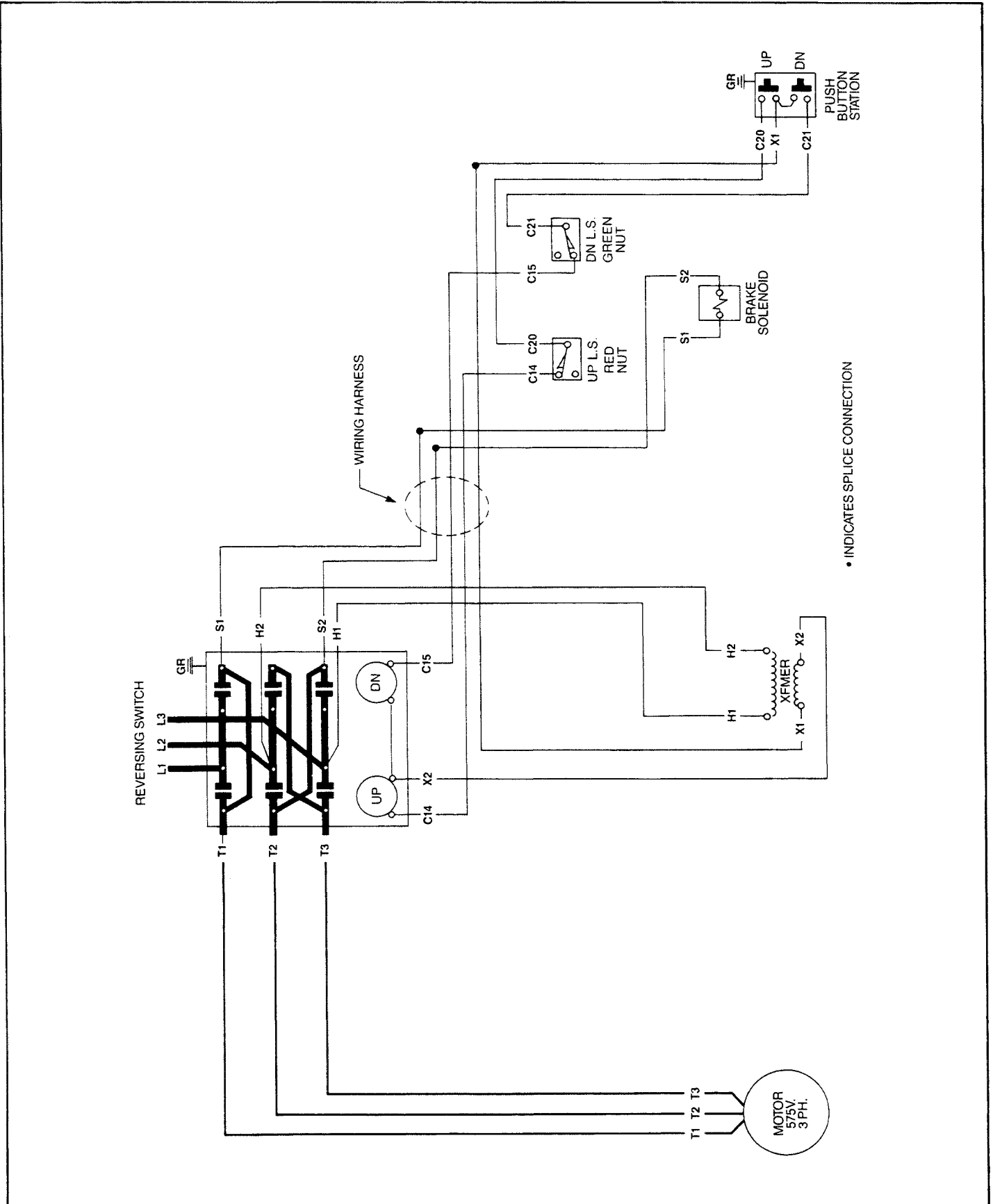
- c. After converting voltage, check for proper phasing of three phase units and check for proper limit switch operation.

#### 6-2. Wiring Diagrams

The wiring diagrams for standard hoist models are reproduced on the following pages. In addition, every hoist should have a wiring diagram located inside the long end cover.



**FIGURE 6-1. WIRING DIAGRAM  
230/460V, 3 Phase, Single Speed Hoist  
983EC44C**



**FIGURE 6-2. WIRING DIAGRAM**  
**575V, 3 Phase, Single Speed Hoist**  
**983EC45**



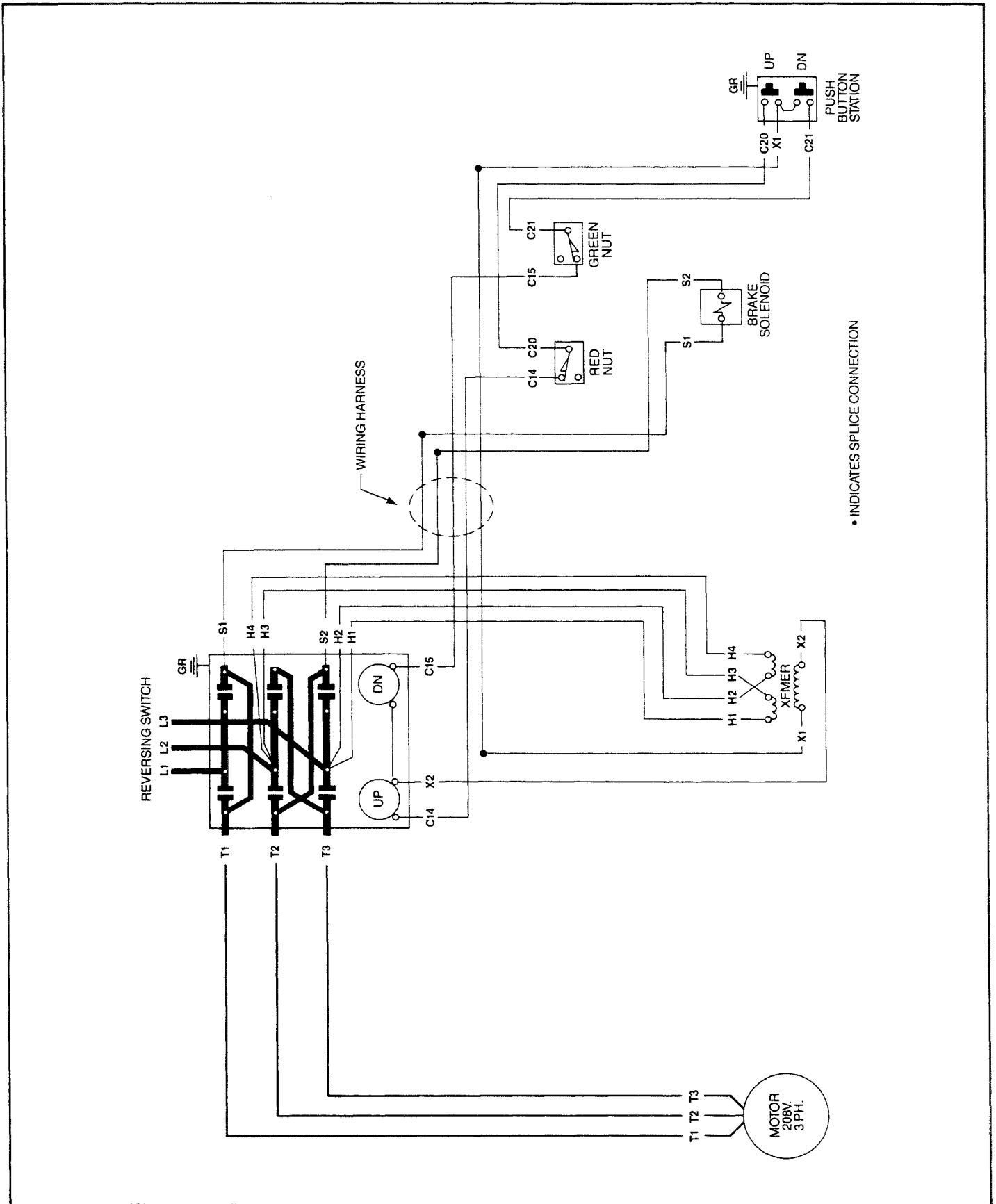
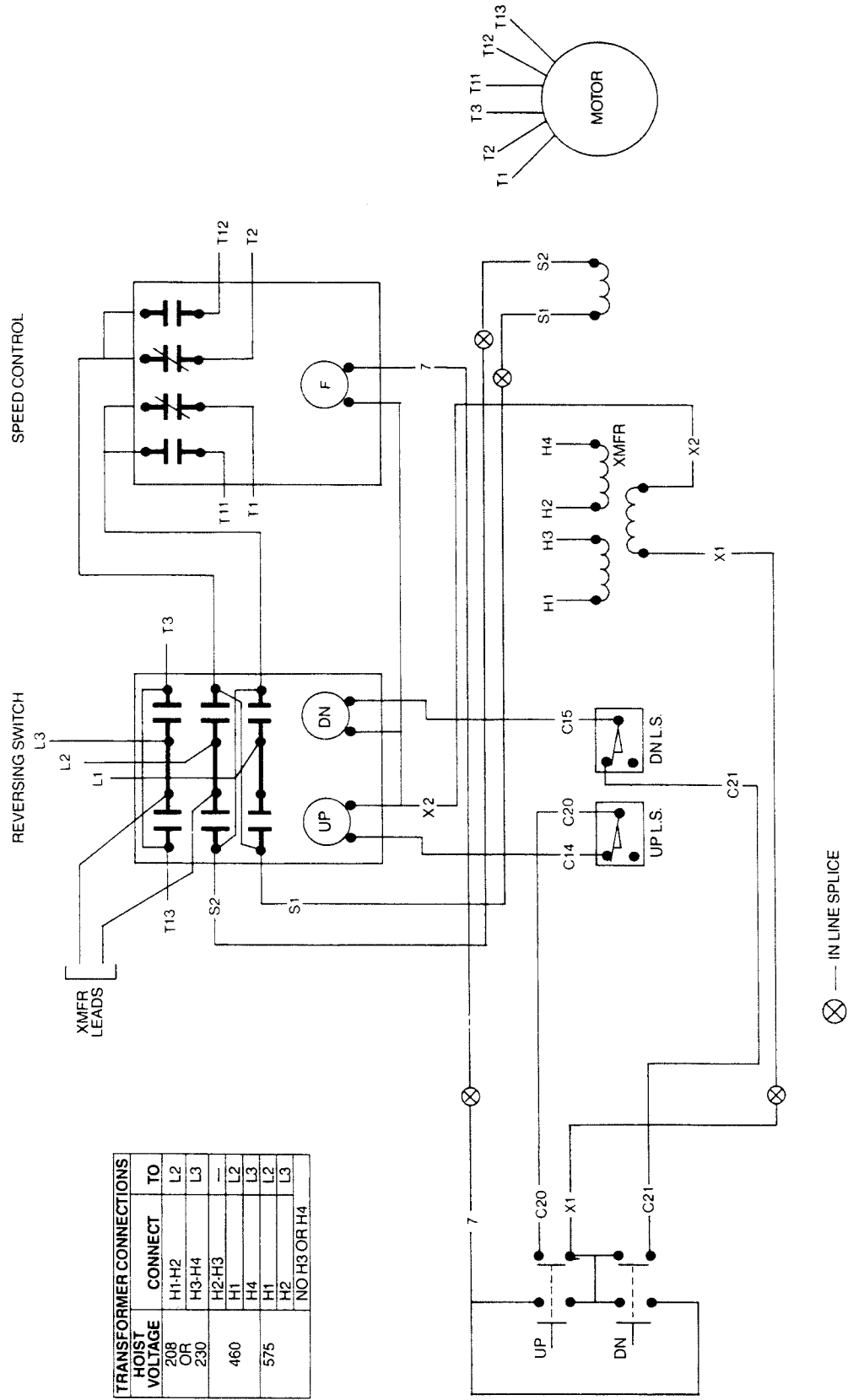
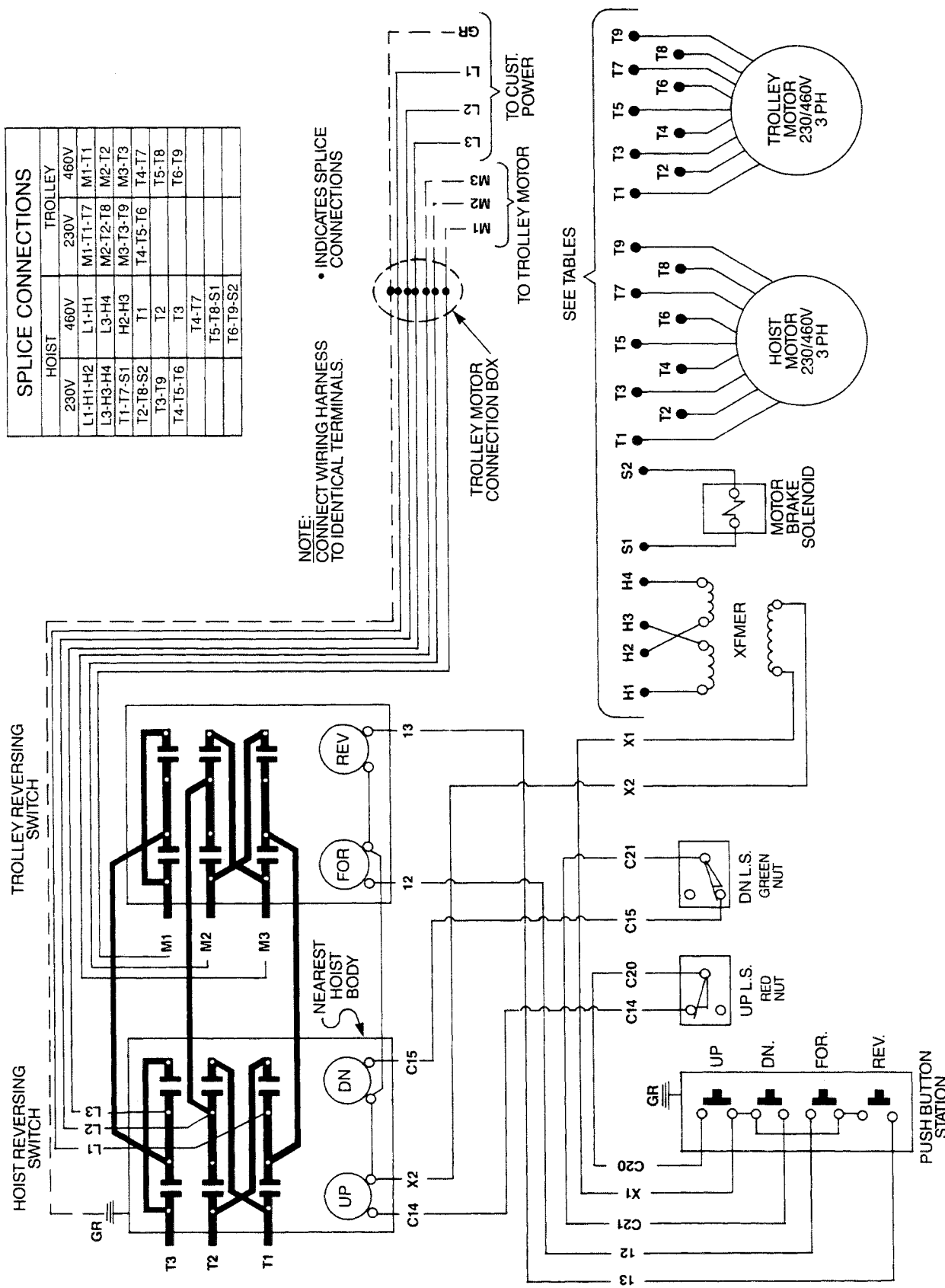


FIGURE 6-3. WIRING DIAGRAM  
208V, 3 Phase Single Speed Hoist  
983EC48

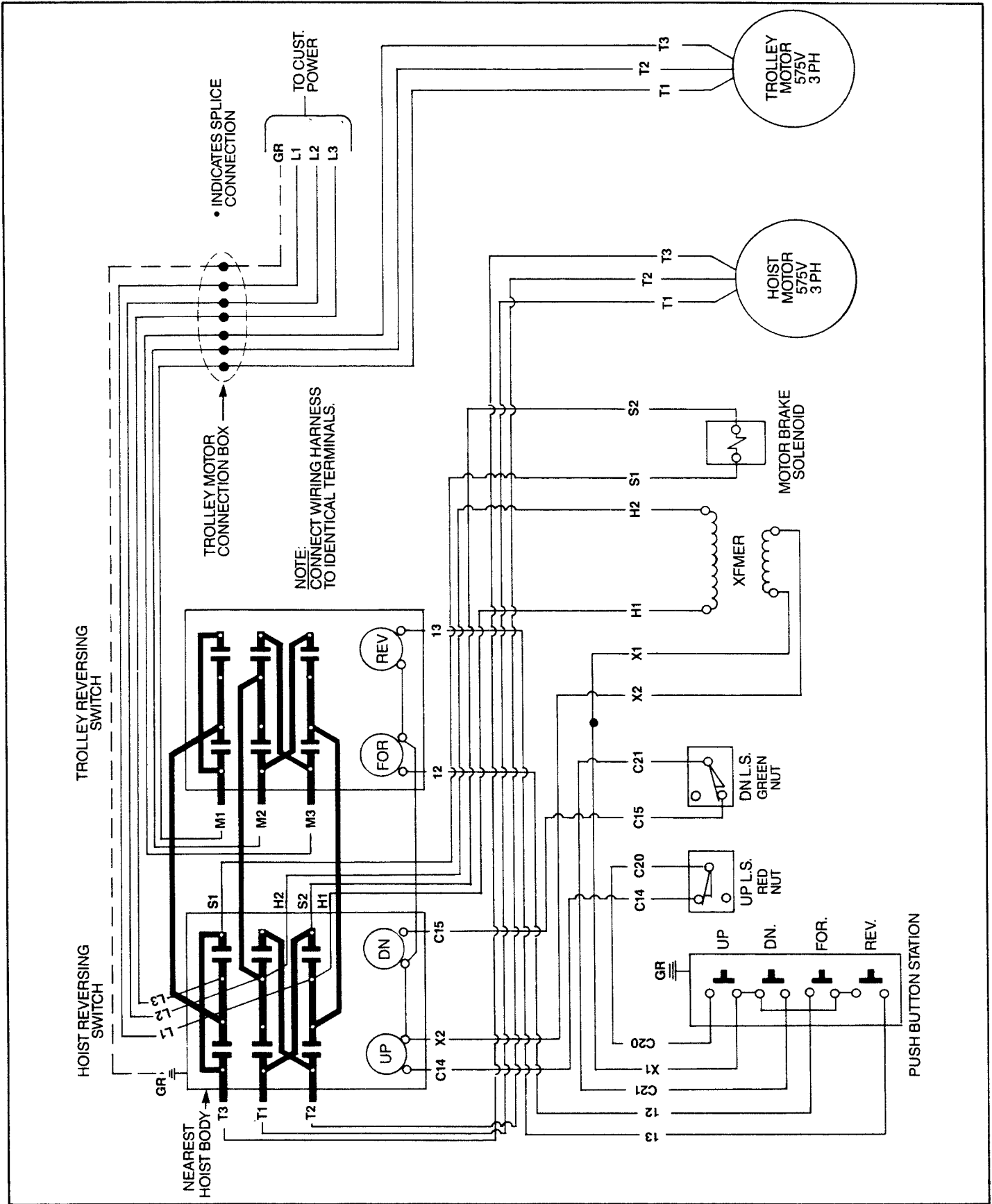


| TRANSFORMER CONNECTIONS |            |
|-------------------------|------------|
| HOIST VOLTAGE           | CONNECT TO |
| 208<br>OR<br>230        | H1-H2 L2   |
|                         | H3-H4 L3   |
| 460                     | H2-H3 L2   |
|                         | H1 L3      |
| 575                     | H1 L2      |
|                         | H2 L3      |
| NO H3 OR H4             |            |

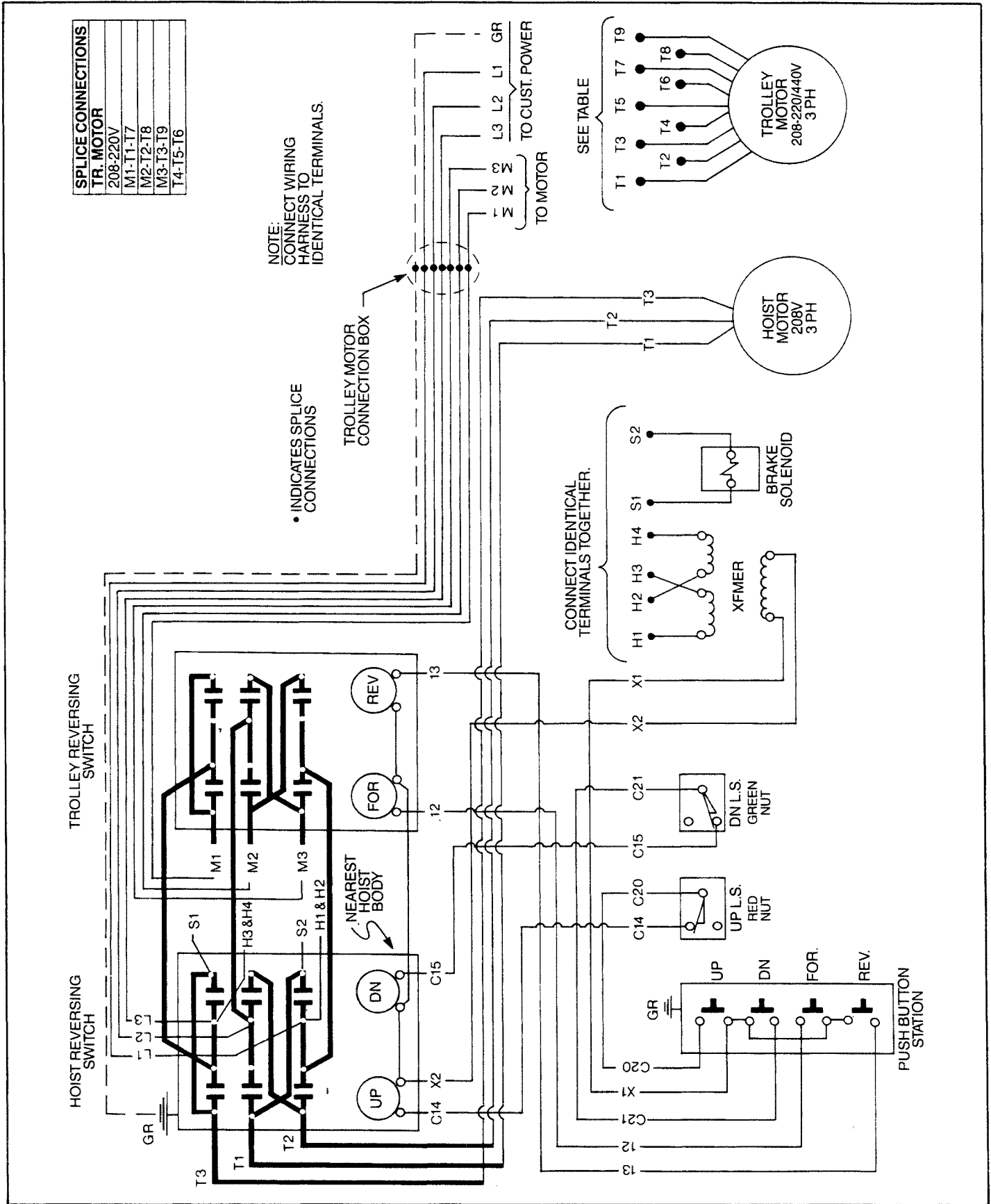
**FIGURE 6-4. WIRING DIAGRAM**  
**230, 460, 575 & 208V, 3 Phase**  
**Two Speed Hoist**  
**983EC141**



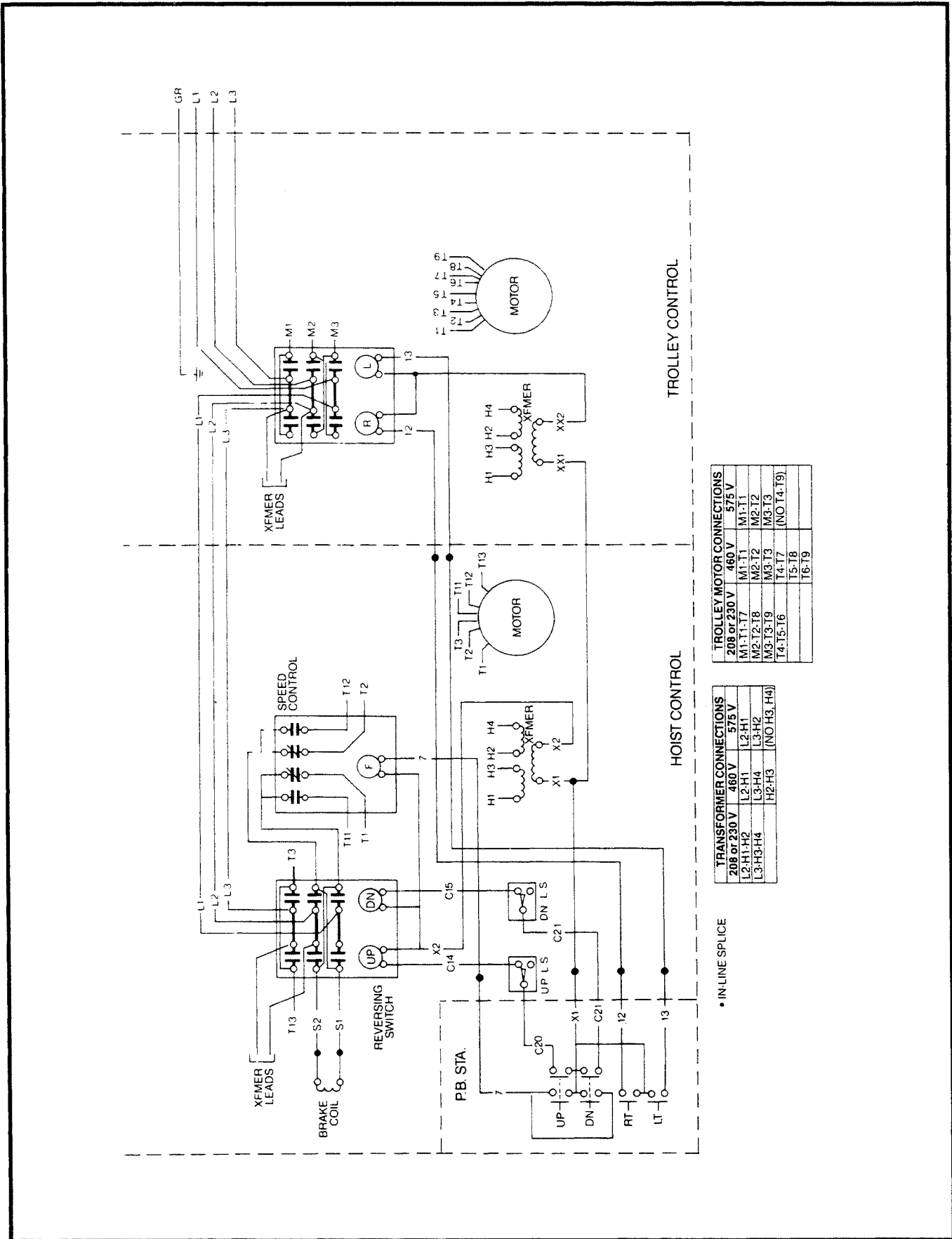
**FIGURE 6-5. WIRING DIAGRAM**  
 230/460 V, 3 Phase Single Speed Hoist & Single Speed Trolley  
 983ECMT1



**FIGURE 6-6. WIRING DIAGRAM**  
**575V, 3 Phase, Single Speed Hoist & Single Speed Trolley**  
**983ECMT2**



**FIGURE 6-7. WIRING DIAGRAM**  
**208V, 3 Phase Single Speed Hoist & Single Speed Trolley**  
**983ECMT27**

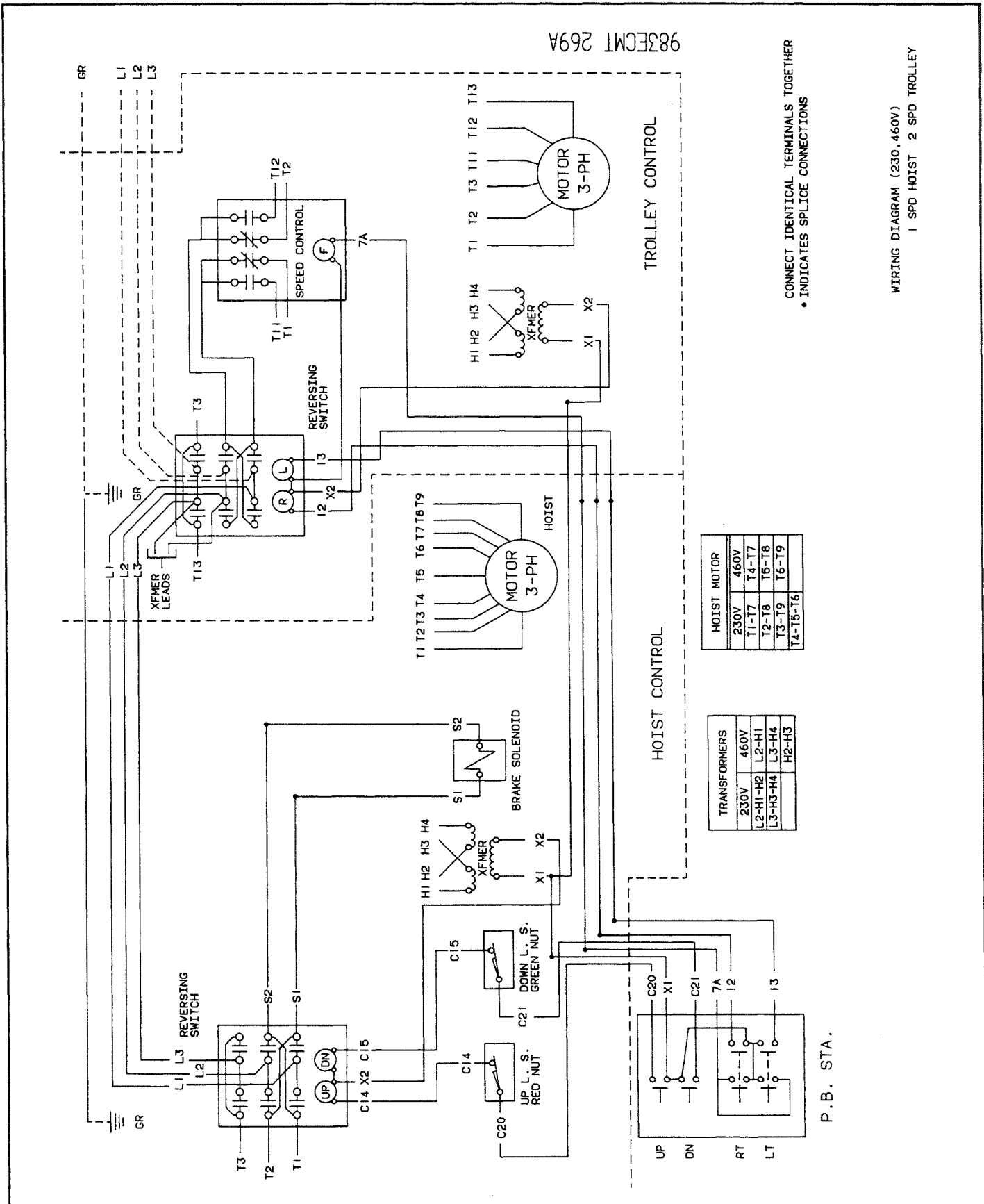


| TROLLEY MOTOR CONNECTIONS |            |
|---------------------------|------------|
| 208 or 230 V              | 460 V      |
| M1-T1-T7                  | M1-T1      |
| M2-T2-T8                  | M2-T2      |
| M3-T3-T9                  | M3-T3      |
| T4-T5-T6                  | (NO T4-T9) |
| T5-T8                     |            |
| T6-T9                     |            |

| TRANSFORMER CONNECTIONS |             |
|-------------------------|-------------|
| 208 or 230 V            | 460 V       |
| L2-H1-H2                | L2-H1       |
| L3-H3-H4                | L3-H2       |
| H2-H3                   | (NO H3, H4) |

• IN-LINE SPLICE

**FIGURE 6-8. WIRING DIAGRAM**  
**230, 460, 575 & 208V, 3 Phase**  
**Two Speed Hoist & Single Speed Trolley**  
**983ECMT268**



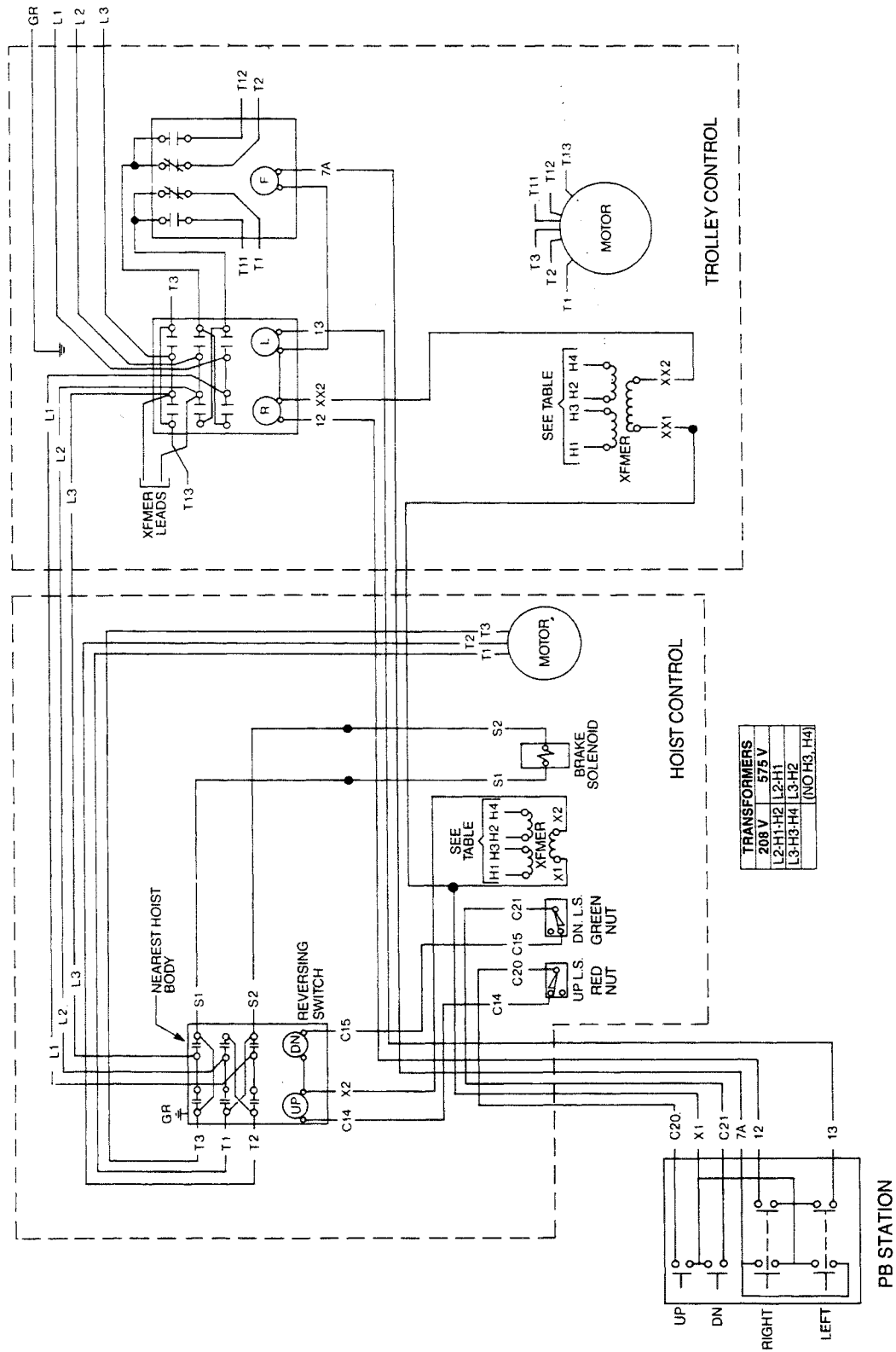
CONNECT IDENTICAL TERMINALS TOGETHER  
 • INDICATES SPLICE CONNECTIONS

WIRING DIAGRAM (230, 460V)  
 1 SPD HOIST 2 SPD TROLLEY

| HOIST MOTOR |          |
|-------------|----------|
| 230V        | 460V     |
| T1-T7       | T4-T7    |
| T2-T8       | T5-T8    |
| T3-T9       | T6-T9    |
| T4-T5-T6    | T4-T5-T6 |

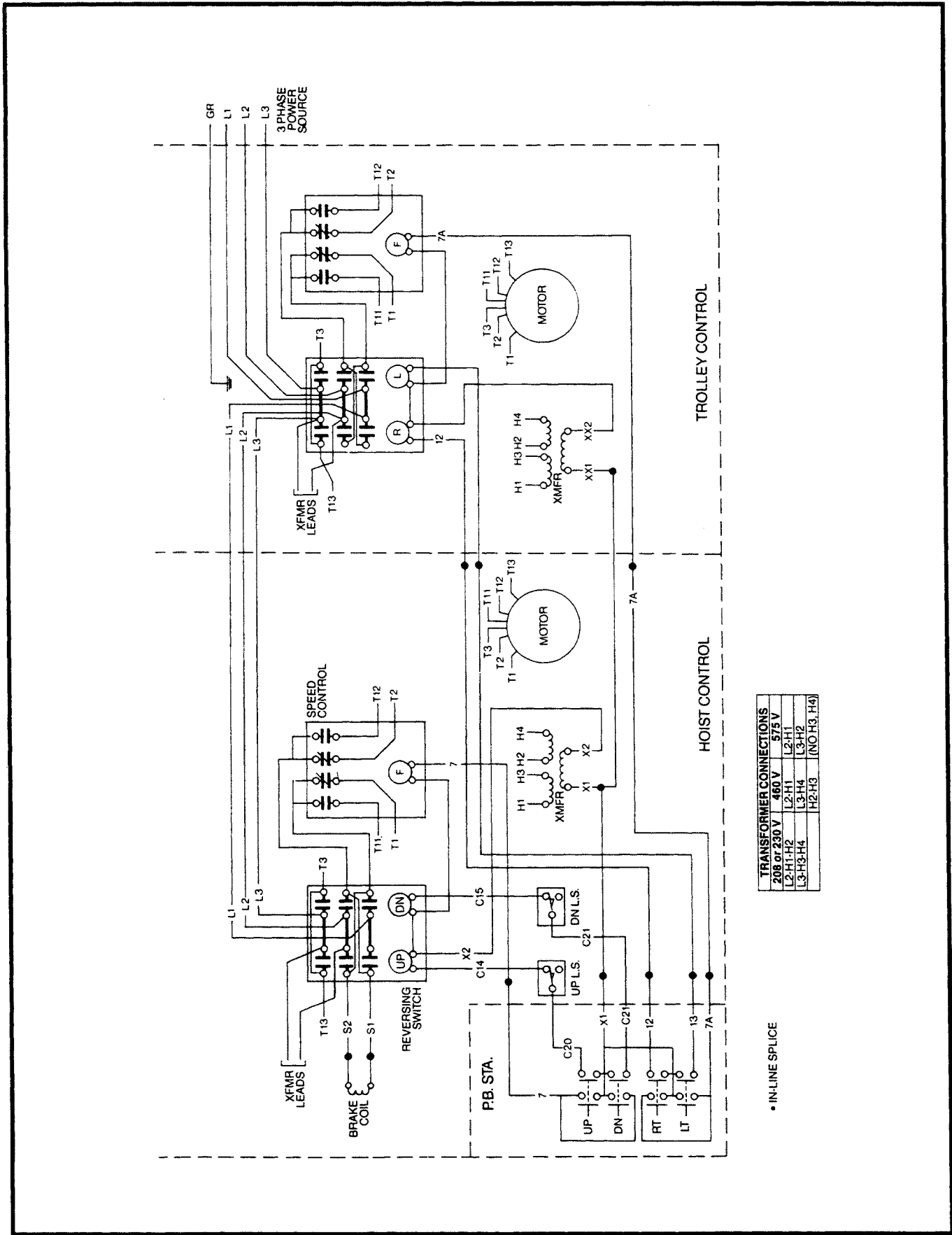
| TRANSFORMERS |       |
|--------------|-------|
| 230V         | 460V  |
| L2-H1-H2     | L2-H1 |
| L3-H3-H4     | L3-H4 |
| H2-H3        | H2-H3 |

**FIGURE 6-9. WIRING DIAGRAM**  
**230, 460V, 3 Phase, Single Speed Hoist & Two Speed Trolley**  
**983ECMT269A**



**FIGURE 6-10. WIRING DIAGRAM**  
**208, 575V, 3 Phase, Single Speed Hoist & Two Speed Trolley**  
**983ECMT270**





**TRANSFORMER CONNECTIONS**

|             |             |       |
|-------------|-------------|-------|
| 208 or 230V | 460V        | 575V  |
| L2-H1-H2    | L2-H1       | L2-H1 |
| L3-H3-H4    | L3-H4       | L3-H2 |
| H2-H3       | [NO H3, H4] |       |

• IN-LINE SPLICE

**FIGURE 6-11. WIRING DIAGRAM**  
**230, 460, 575 & 208V, 3 Phase, Two Speed Hoist & Two Speed Trolley**  
**983ECMT271**

## SECTION VII ILLUSTRATED PARTS LISTS

### 7-1. GENERAL.

7.2. The illustrated parts lists that follow are designed to help you identify the parts of your Coffing hoist and trolley. Several different models of hoists and trolleys are covered by this manual and differences will be noted between your hoist and the illustrations contained herein. However, the parts list will show the correct replacement part for your model hoist.

### 7-3. HOW TO USE THE PARTS LISTS.

7.4. To identify a part from your hoist, locate the figure which illustrates that area of the hoist where your part is located. Example: The brake coil would be located in the Motor Brake Figures. At this time, it may be necessary to take into consideration certain characteristics of your hoist. Due to configuration differences, it was necessary to divide this area according to hoist motor horsepower. Therefore, when determining the figure in which your

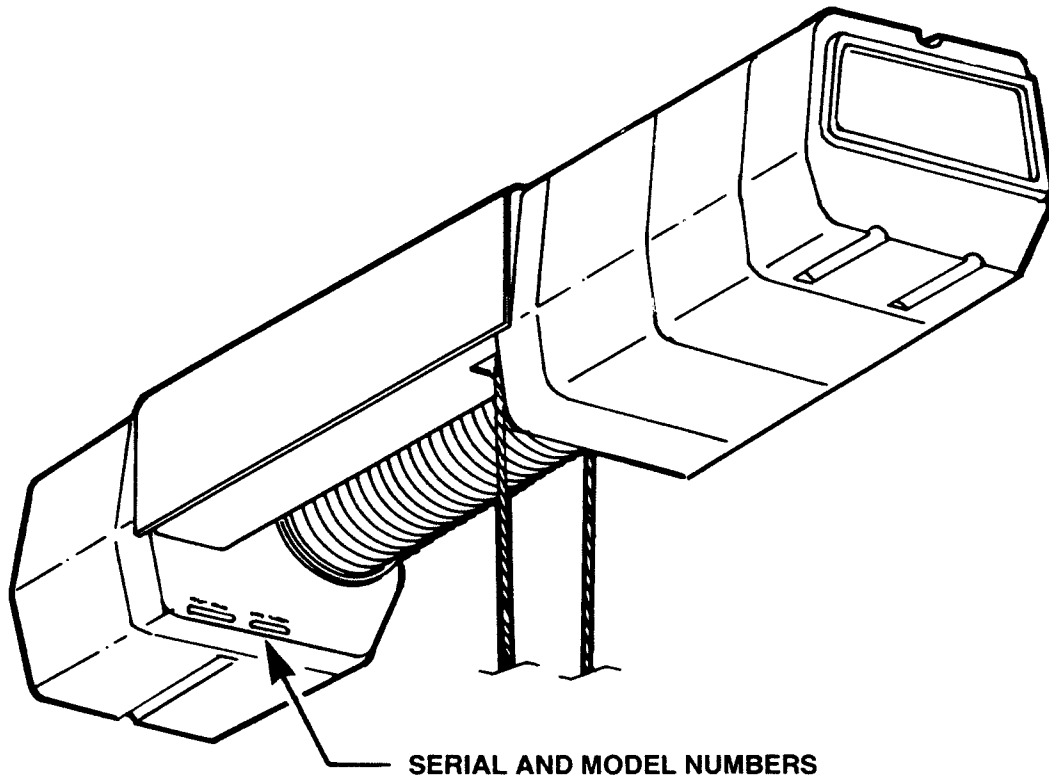
part would be illustrated, be sure the figure applies to **your** hoist or trolley. Study the illustration and locate the part you wish to find. A number will be found adjacent to the part; this number, which is the index number, will be found in the accompanying parts list with the part name and part number.

When ordering parts, please give the following information:

1. Model and serial number of your hoist.
2. Total lift of your hoist.
3. Your power supply (voltage, phase, cycles).
4. Desired part number and part name.

The serial and model numbers for your hoist are permanently stamped on the motor adaptor casting.

See the illustration below.



#### EXAMPLE:

**Serial Number: WR3-B-101-SFD**

**Model Number: WR-4021**

## **7-5. WARRANTY.**

Every hoist is thoroughly inspected and tested prior to shipment from the factory. Should any problems develop, return the complete hoist prepaid to your nearest Duff-Norton Authorized Warranty Repair Station. If inspection reveals that the problem is caused by defective workmanship or material, repairs will be made without charge and the hoist will be returned, transportation prepaid.

This warranty does not apply where: (1) deterioration is caused by normal wear, abuse, improper or inadequate power supply, eccentric or side loading, overloading, chemical or abrasive actions, improper maintenance or excessive heat; (2) problems resulted from repairs,

modifications or alterations made by persons other than factory or Duff-Norton Authorized Warranty Repair Station personnel; (3) the hoist has been abused or damaged as a result of an accident; (4) repair parts or accessories other than those supplied by Duff-Norton are used on the hoist. Equipment and accessories not of the seller's manufacture are warranted only to the extent that they are warranted by the manufacturer. EXCEPT AS STATED HEREIN, DUFF-NORTON MAKES NO OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

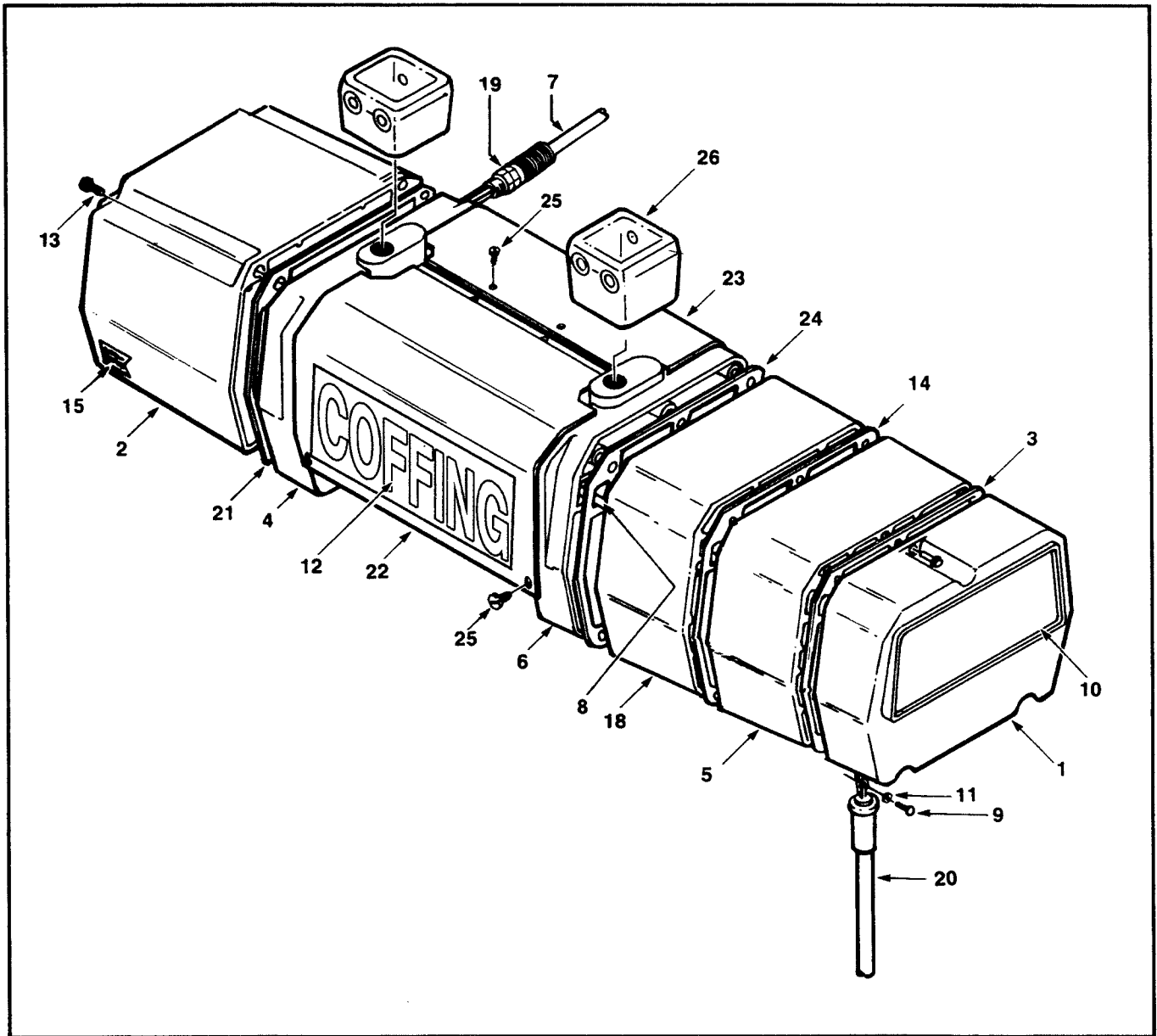
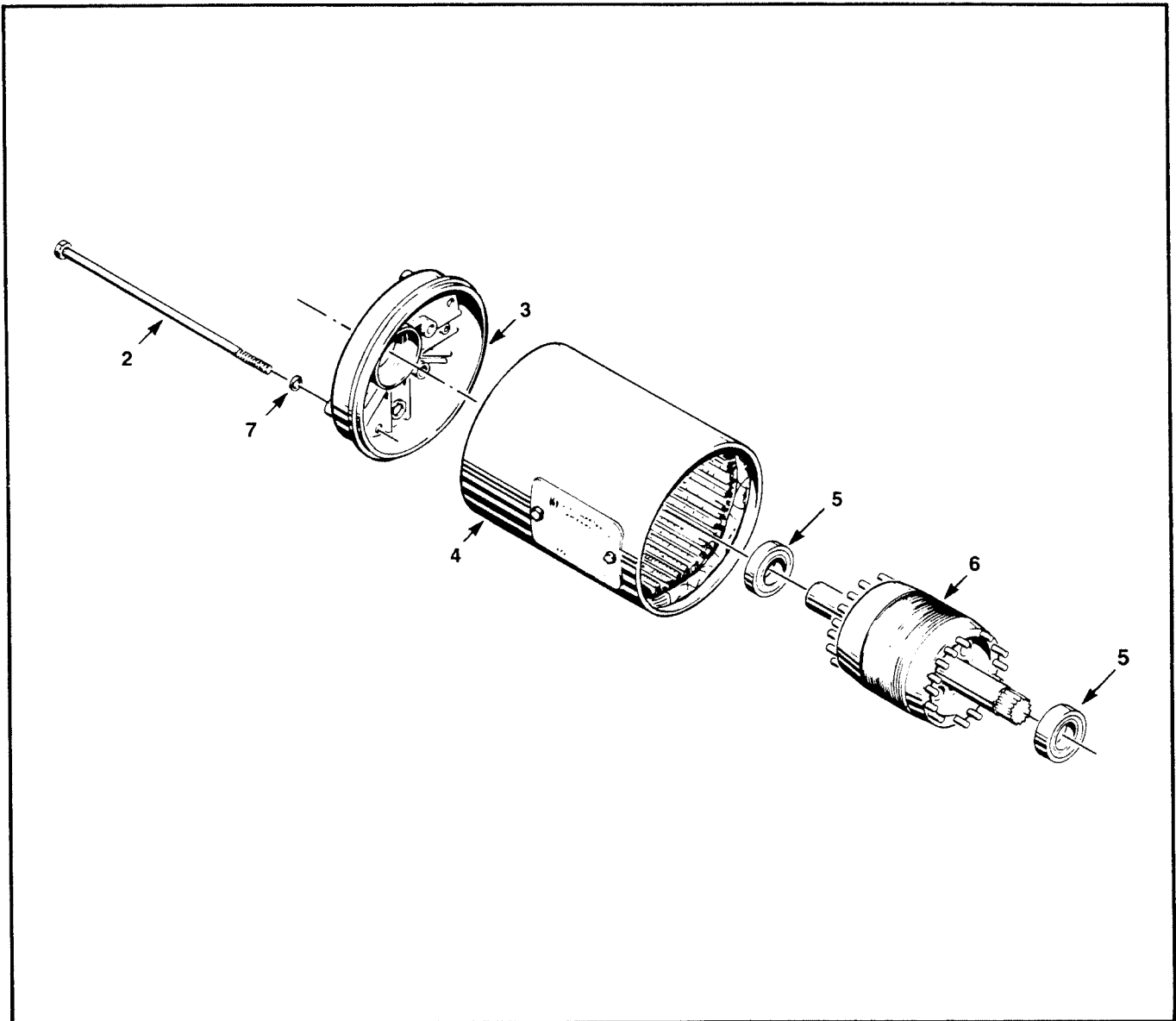


FIGURE 7-1. BASIC HOIST

| Index No. | Part Name  | Part No.           | Index No. | Part Name                                     | Part No.         |
|-----------|--|--------------------|-----------|---|------------------|
| 1         | Brake Cover  | 36J4               | 13        | Screw, End Covers                             | H-2987-P         |
| 2         | Control Cover  | 36J3               | 14        | Gasket, Transmission Cover                    | 560J6            |
| 3         | Gasket, Brake Cover  | 560J2              | 15        | Decal, Duff-Norton                            | 676J2B           |
| 4         | Motor Adapter:<br>1 & 2-Ton                                | 39J4-2             | 16*       | Decal, Power Requirements:<br>230/460V        | 679J2            |
|           | 3-Ton  | 39J4               |           | 230V  | 679J3            |
| 5         | Transmission Cover   | 34J2               |           | 460V  | 679J4            |
| 6         | Transmission Adapter:<br>1 & 2-Ton                         | 37J7-2             |           | 575V  | 679J5            |
|           | 3-Ton  | 37J7               |           | 208V  | 679J6            |
| 7         | Power Cable Assembly<br>(15 foot length)                   | 953KG2-15          | 18        | Transmission Housing                          | 35J3             |
|           |  |                    | 19        | Cord Grip                                     | H-7961           |
| 8         | Wiring Harness:<br>1 & 2-Ton, 22 Ft. Lift, Single<br>Speed | 940J7              | 20        | Pushbutton Cable<br>(See Fig. 7-8)            |                  |
|           | 1 & 2-Ton, 35 Ft. Lift, Single<br>Speed                    | 940J8              | 21        | Gasket, Control Cover                         | 560J3            |
|           | 1 & 2-Ton, 44 Ft. Lift, Single<br>Speed                    | 940J9              | 22        | Cover (Tube Side):<br>1 & 2-Ton, 22 Ft. Lift, | 270J4-1          |
|           | 3-Ton, 22 Ft. Lift, Single<br>Speed                        | 940J9              |           | 1 & 2-Ton, 35 Ft. Lift                        | 270J4-2          |
|           | 1 & 2-Ton, 22 Ft. Lift, Two Speed                          | 940J7-1            |           | 1 & 2-Ton, 44 Ft. Lift                        | 270J4-3          |
|           | 1 & 2-Ton, 35 Ft. Lift, Two Speed                          | 940J8-1            |           | 3 Ton, 22 Ft. Lift                            | 270J4-3          |
|           | 1 & 2-Ton, 44 Ft. Lift, Two Speed                          | 940J9-1            |           | Any Other Lift                                | Not<br>Available |
|           | 3-Ton, 22 Ft. Lift, Two Speed                              | 940J9-1            | 23        | Cover (Drum Side):<br>1 & 2-Ton, 22 Ft. Lift  | 270J3-1          |
|           | Any Other Lift   | Consult<br>Factory |           | 1 & 2-Ton, 35 Ft. Lift                        | 270J3-2          |
| 9         | Screw  | H-2981-P           |           | 1 & 2-Ton, 44 Ft. Lift                        | 270J3-3          |
| 10        | Decal, Capacity:<br>1-Ton                                  | 675J3B             |           | 3 Ton, 22 Ft. Lift                            | 270J3-3          |
|           | 2-Ton  | 675J5              | 24        | Any Other Lift                                | Not<br>Available |
|           | 3-Ton  | 675J6              | 25        | Gasket, Transmission Adapter                  | 560K15           |
| 11        | Washer, Plain  | H-4002-P           | 26        | Screw, Cover                                  | H-2970           |
| 12        | Decal, Coffing   | 677J2              |           | Suspension Box<br>(See Fig. 7-5)              |                  |

\*Not Illustrated

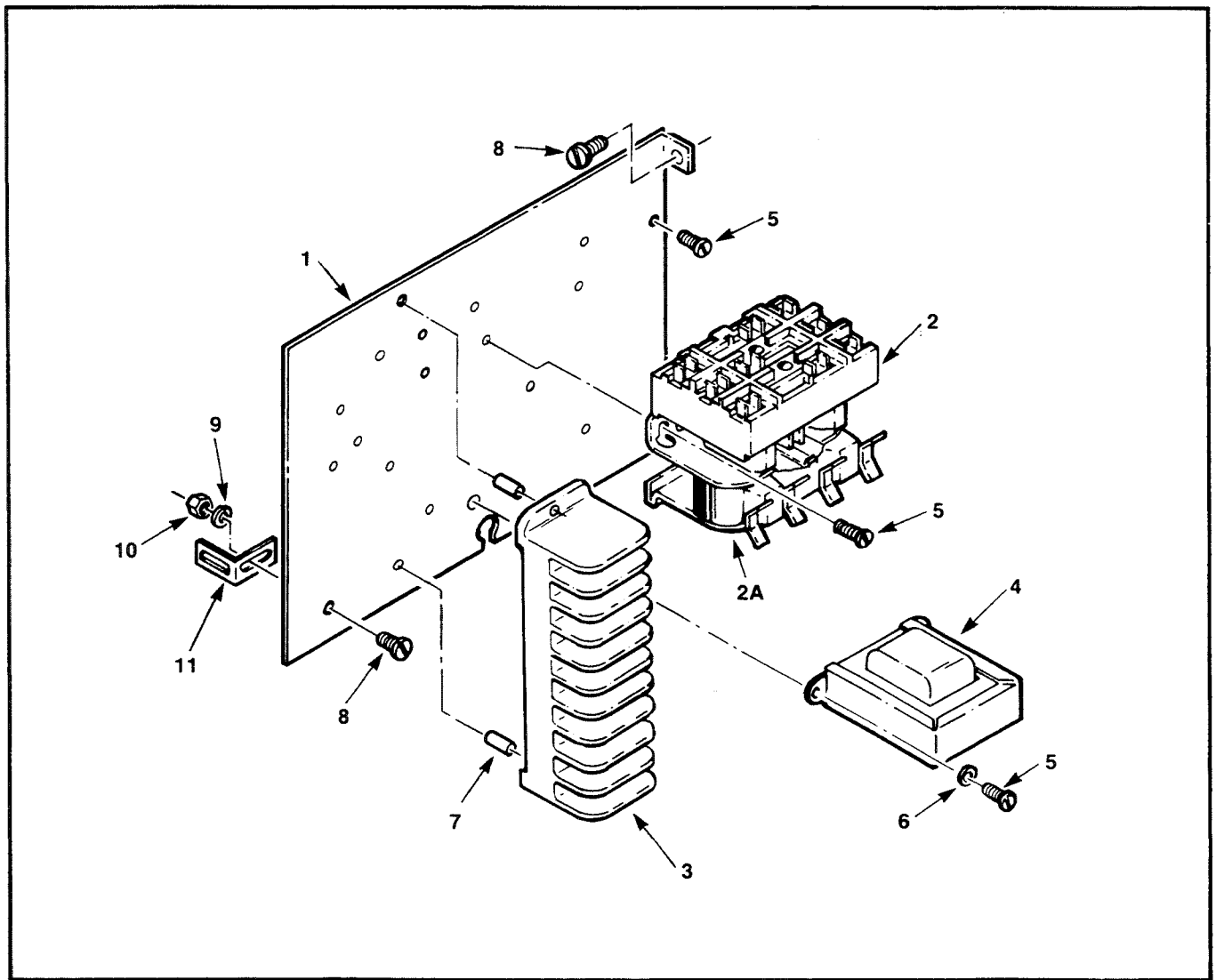
FIGURE 7-1. BASIC HOIST



| Index No. | Part Name               | Part No. | Index No. | Part Name                  | Part No. |
|-----------|-------------------------|----------|-----------|----------------------------|----------|
| 1         | Motor Complete:         |          |           | Single Speed - 208V        | 863J406  |
|           | 2 H.P. Motor            |          |           | Two Speed - 230V           | 873J402  |
|           | Single Speed - 230/460V | 863J401  |           | Two Speed - 460V           | 873J404  |
|           | Single Speed - 575V     | 863J403  |           | Two Speed - 575V           | 873J406  |
|           | Single Speed - 208V     | 863J405  |           | Two Speed - 208V           | 873J408  |
|           | Two Speed - 230V        | 873J401  | 2         | Thru Bolt                  | *        |
|           | Two Speed - 460V        | 873J403  | 3         | End Shield                 | *        |
|           | Two Speed - 575V        | 873J405  | 4         | Stator                     |          |
|           | Two Speed - 208V        | 873J407  |           | (Not available separately) | *        |
|           | 3 H.P. Motor            |          | 5         | Bearing                    | *        |
|           | Single Speed-230/460V   | 863J402  | 6         | Rotor & Shaft Assembly     | *        |
|           | Single Speed - 575V     | 863J404  | 7         | Lock Washer                | *        |

\*For individual motor parts, contact your Duff-Norton Distributor and supply complete motor nameplate data.

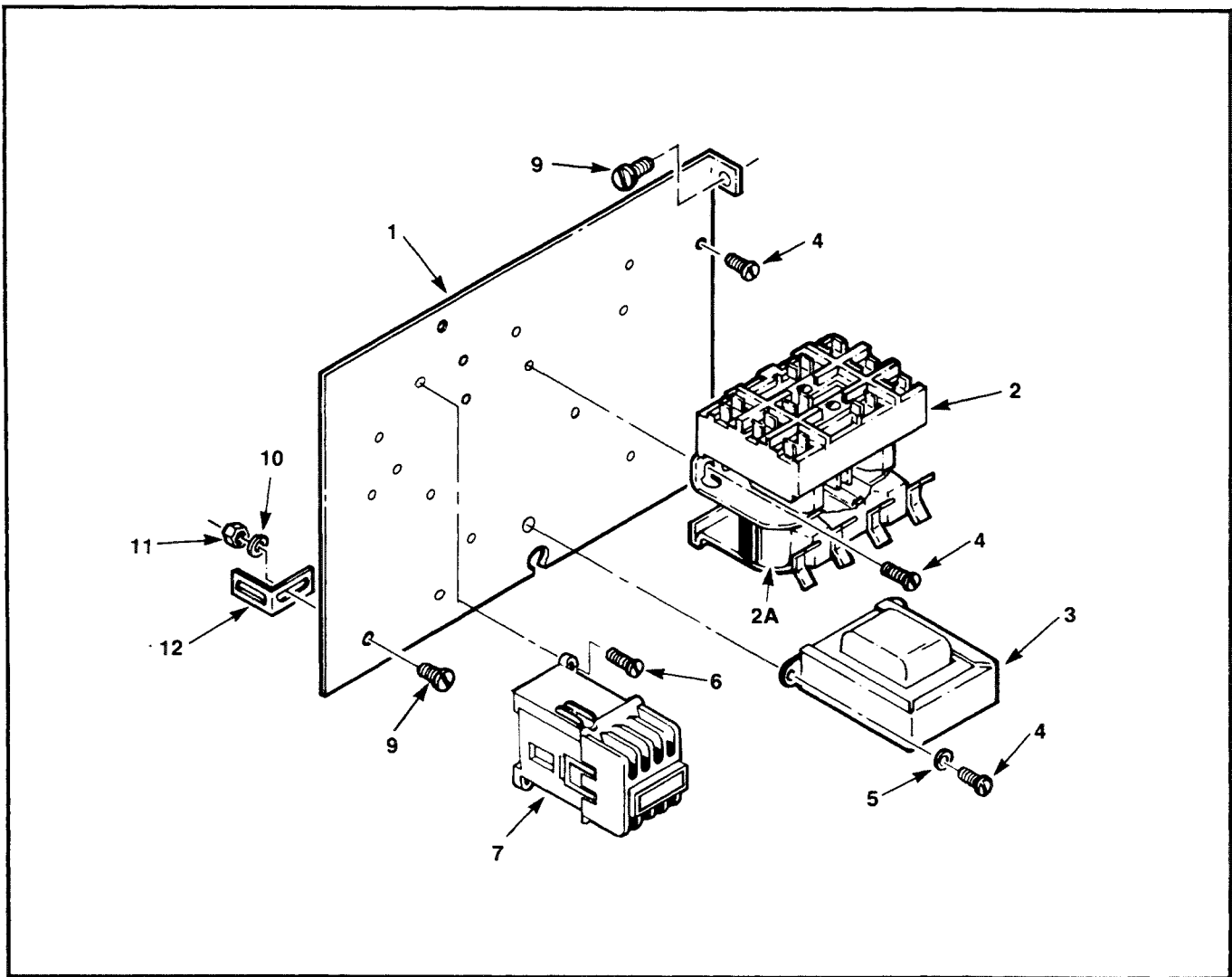
**FIGURE 7-2. HOIST MOTOR PARTS**



| Index No. | Part Name  | Part No. | Index No. | Part Name                                   | Part No. |
|-----------|--|----------|-----------|---|----------|
| 1         | Control Panel  | 257J1A   |           | Pri. 230/460, 208V,<br>Sec. 115V, 50/60 Hz. | JF-821   |
| 2         | Magnetic Reversing Switch<br>24V Control   | 820K2    |           | Pri. 575V, Sec. 24V,<br>50/60 Hz            | JF-821-9 |
|           | 115V Control   | 820K317  |           | Pri. 575V, Sec. 115V,<br>50/60 Hz           | JF-821-2 |
| 2A        | Coil (24V)   | 820K301  |           |   |          |
|           | Coil (115V)  | 820K302  |           |   |          |
| 2B*       | Replacement Contact Kit<br>(Includes stationary &<br>movable contacts and<br>springs for one magnetic<br>reversing switch) | 820K300  | 5         | Screw                                       | H2751    |
|           |  |          | 6         | Lock Washer                                 | H-4158   |
|           |  |          | 7         | Eyelet                                      | H-4972   |
|           |  |          | 8         | Screw                                       | H-2981-P |
| 3         | Terminal Block   | 909JG-4  | 9         | Lock Washer                                 | H-4082-P |
| 4         | Transformer: (10 VA.)<br>Pri. 230/460, 208V,<br>Sec. 24V, 50/60 Hz.  | JF-821-3 | 10        | Nut (Retainer)                              | H-3862   |
|           |  |          | 11        | Retainer                                    | 285J7    |
|           |  |          | 12*       | Splice Connector                            | H-5757   |

\*Not Illustrated

**FIGURE 7-3A. CONTROLLER AREA (SINGLE SPEED HOIST)**

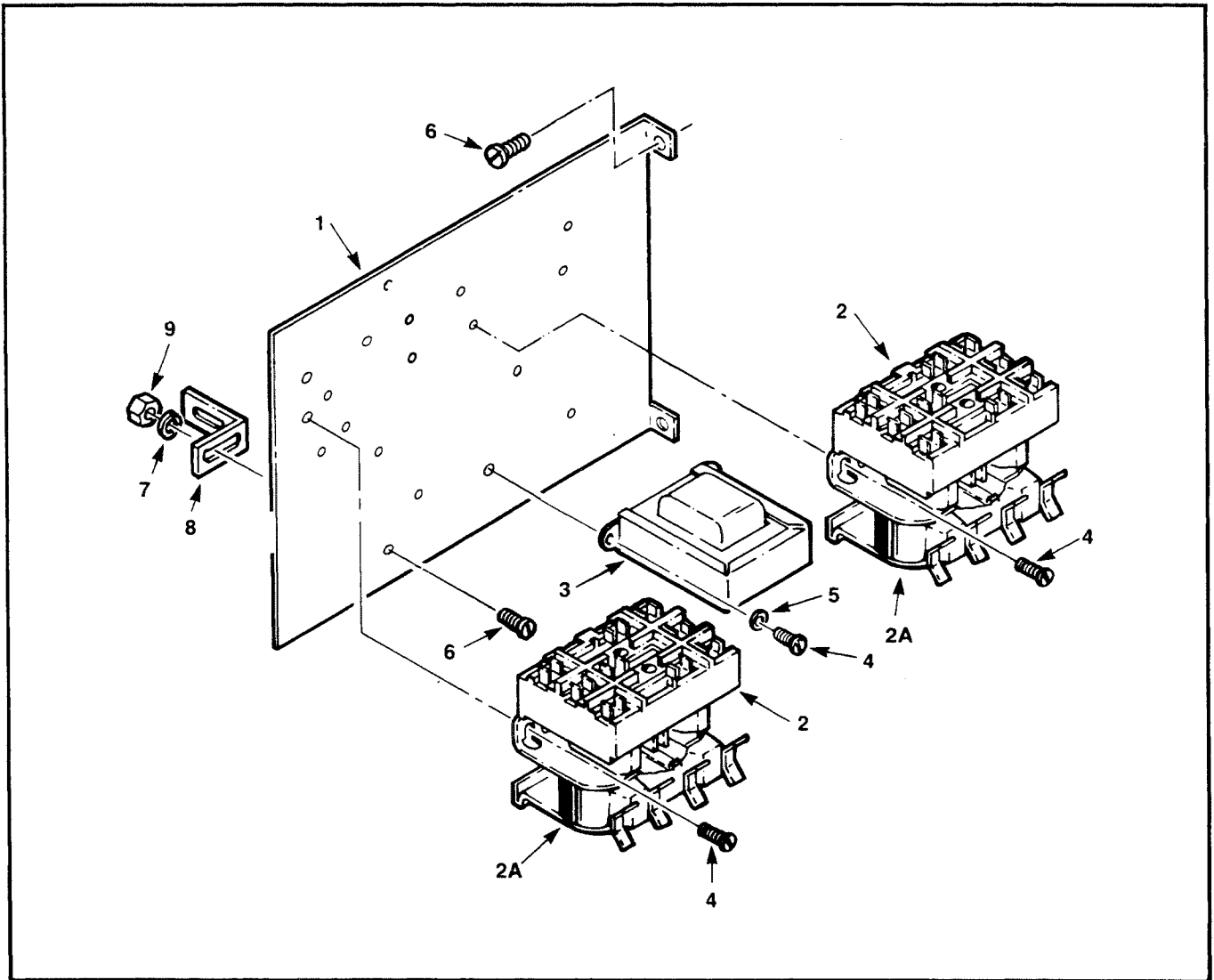


| Index No. | Part Name  | Part No.  | Index No. | Part Name                           | Part No.  |
|-----------|--|-----------|-----------|-------------------------------------|-----------|
| 1         | Control Panel  | 257J1A-1  |           | Pri. 575V, Sec. 24V,<br>50/60 Hz    | JF-821-16 |
| 2         | Magnetic Reversing Switch<br>24V Control   | 820K2     |           | Pri. 575V, Sec. 115V,<br>50/60 Hz   | JF-821-20 |
|           | 115V Control   | 820K317   | 4         | Screw                               | H-2751    |
| 2A        | Coil (24V)   | 820K301   | 5         | Lock Washer                         | H-4158    |
|           | Coil (115V)  | 820K302   | 6         | Screw                               | H-1901    |
| 2B*       | Replacement Contact Kit<br>(Includes stationary &<br>movable contacts and<br>springs for one magnetic<br>reversing switch) | 820K300   | 7         | Speed Control Relay:<br>24V Control | 820J3     |
|           |  |           |           | 115V Control                        | 820J4     |
| 3         | Transformer: (20 VA.)<br>Pri. 208, 230/460V, 208V,<br>Sec. 24V, 50/60 Hz.  | JF-821-15 | 8*        | Splice Connector                    | H-5757    |
|           | Pri. 208, 230/460V,<br>Sec. 115V, 50/60 Hz   | JF-821-17 | 9         | Screw                               | H-2981-P  |
|           |  |           | 10        | Lock Washer                         | H-4082-P  |
|           |  |           | 11        | Nut                                 | H-3862    |
|           |  |           | 12        | Retainer                            | 285J7     |

\*Not Illustrated

**FIGURE 7-3B. CONTROLLER AREA (TWO SPEED HOIST)**





| Index No. | Part Name   | Part No.  | Index No. | Part Name   | Part No.  |
|-----------|---|-----------|-----------|---|-----------|
| 1         | Control Panel   | 257J1A    |           | Pri. 208, 230/460V, 208V,<br>Sec. 115V, 50/60 Hz. | JF-821-17 |
| 2         | Magnetic Reversing Switch<br>24V Control  | 820K2     |           | Pri. 575V, Sec. 24V,<br>50/60 Hz                  | JF-821-16 |
|           | 115V Control  | 820K317   |           |   |           |
| 2A        | Coil (24V)  | 820K301   |           | Pri. 575V, Sec. 115V,<br>50/60 Hz                 | JF-821-20 |
|           | Coil (115V)   | 820K302   |           |   |           |
| 2B*       | Replacement Contact Kit<br>(Includes stationary &<br>movable contacts and<br>spring for one magnetic<br>reversing switch) | 820K300   | 4         | Screw   | H2751     |
|           |   |           | 5         | Lock Washer                                       | H-4158    |
|           |   |           | 6         | Screw   | H-2981-P  |
|           |   |           | 7         | Lock Washer                                       | H-4802-P  |
|           |   |           | 8         | Retainer  | 285J7     |
| 3         | Transformer: (20 VA.)<br>Pri. 208, 230/460V, 208V,<br>Sec. 24V, 50/60 Hz.   | JF-821-15 | 9         | Nut (Retainer)                                    | H-3862    |
|           |   |           | 10*       | Splice Connector                                  | H-5757    |

\*Not Illustrated

**FIGURE 7-3C. CONTROLLER AREA  
(SINGLE SPEED HOIST, SINGLE SPEED TROLLEY)**

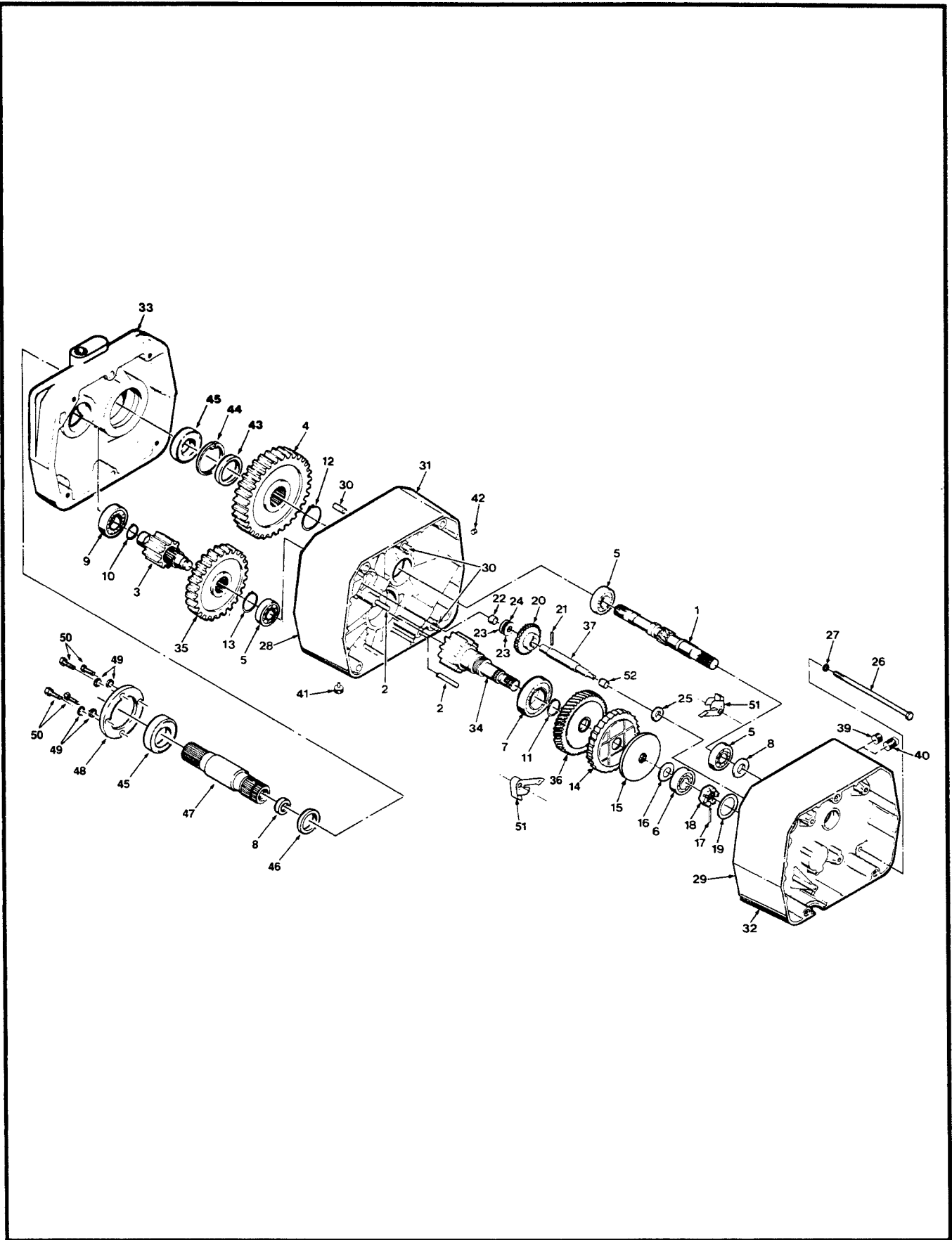
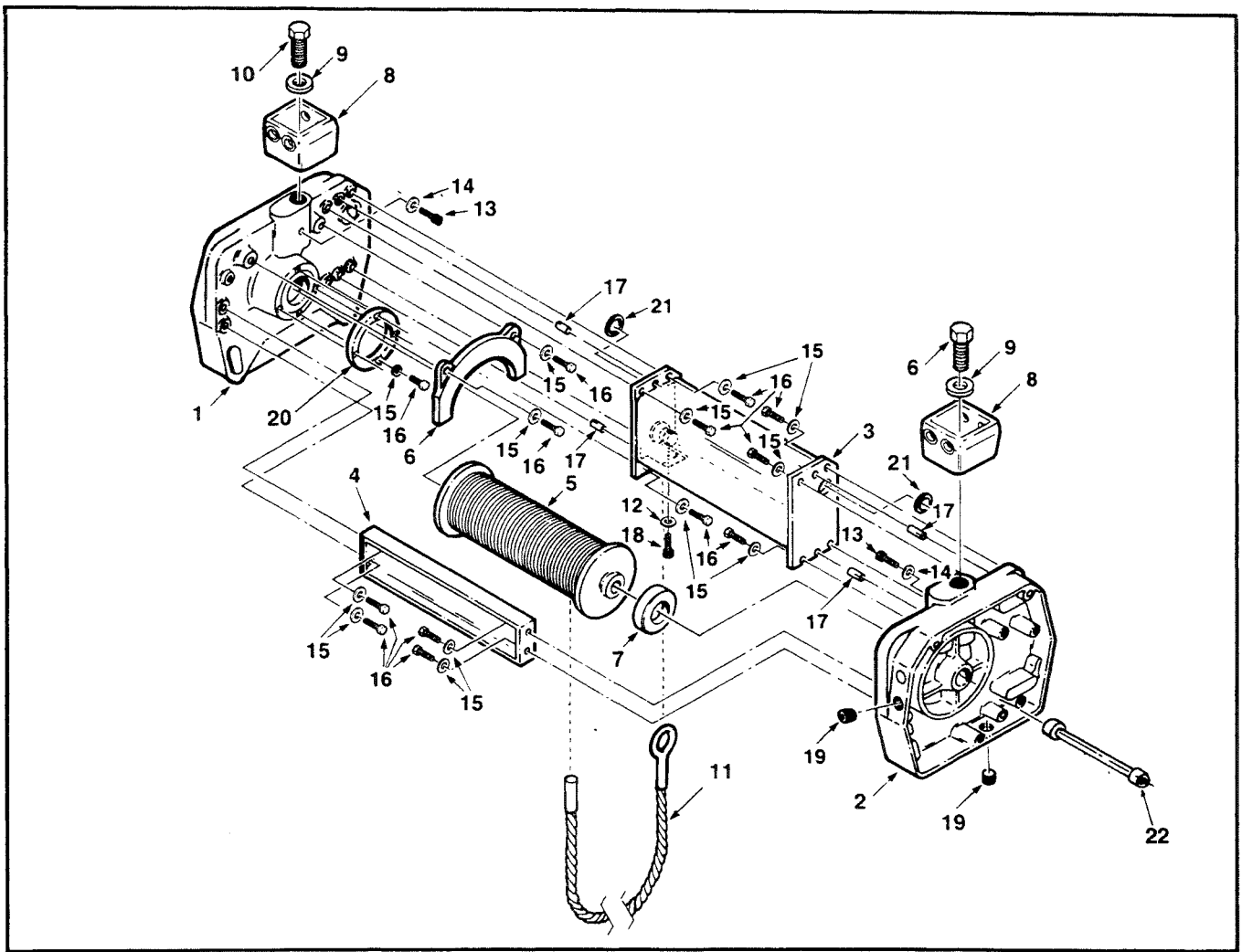


FIGURE 7-4. HOIST TRANSMISSION

| Index No. | Part Name                                      | Part No. | Index No. | Part Name                | Part No. |
|-----------|--|----------|-----------|--------------------------|----------|
| 1         | High Speed Pinion                              | 400J8    | 34        | Intermediate Pinion:     |          |
| 2         | Dowel Pin                                      | H-5493   |           | WR-2028                  | 402J12   |
| 3         | Output Pinion                                  | 404J2    |           | WR-4014                  | 402J10   |
| 4         | Output Gear                                    | 405K3    |           | WR-4021                  | 402J11   |
| 5         | Bearing  | 500K13   |           | WR-6010                  | 402J11   |
| 6         | Bearing  | 500K14   |           | WR-6014                  | 402J12   |
| 7         | Bearing  | 500K15   | 35        | Intermediate Gear:       |          |
| 8         | Seal   | 561K18   |           | WR-2028                  | 403J7    |
| 9         | Bearing  | 500K16   |           | WR-4014                  | 403K4    |
| 10        | Retaining Ring                                 | H-5530   |           | WR-4021                  | 403K5    |
| 11        | Retaining Ring                                 | H-5539   |           | WR-6010                  | 403K5    |
| 12        | Retaining Ring                                 | H-5541   |           | WR-6014                  | 403J7    |
| 13        | Retaining Ring                                 | H-5540   | 36        | Load Equalizer Assembly: |          |
| 14        | Ratchet Assembly                               | 7JG16-1  |           | (See Paragraph 1-8)      |          |
| 15        | Pressure Plate                                 | 5J9      |           | WR-2028                  | 591JG18  |
| 16        | Thrust Washer                                  | 255K11   |           | WR-4014                  | 591JG18  |
| 17        | Drive-Lok Pin                                  | H-5219   |           | WR-4021                  | 591JG19  |
| 18        | Lock Nut                                       | 130J8    |           | WR-6010                  | 591JG28  |
| 19        | Spring Washer                                  | H-7834   |           | WR-6014                  | 591JG19  |
| 20        | Limit Switch Gear                              | 428J1    | 37        | Limit Switch Drive Shaft | 140J1    |
| 21        | Spring Pin                                     | H-5232   | 38*       | Transmission Replacement |          |
| 22        | Bushing  | 530J24   |           | Oil Kit                  | 14J11    |
| 23        | Thrust Washer                                  | 255J19   | 39        | Vented Plug              | H-6257   |
| 24        | Thrust Bearing                                 | 511J17   | 40        | Shipping Plug            | H-6272   |
| 25        | Seal   | 561K17   | 41        | Drain Plug               | H-6268   |
| 26        | Bolt   | H-2333   | 42        | Level Plug               | S-25-9   |
| 27        | Lock Washer                                    | H-4157   | 43        | Spacer (Gear)            | 200J10   |
| 28        | Gasket, Transmission Adapter<br>(See Fig. 7-1) | 560K15   | 44        | Retaining Ring           | H-5557   |
| 29        | Gasket, Transmission Cover<br>(See Fig. 7-1)   | 560J6    | 45        | Bearing                  | 500K12   |
| 30        | Dowel Pin                                      | H-5387   | 46        | Seal                     | 561K26   |
| 31        | Transmission Housing<br>(See Fig. 7-1)         | 35J3     | 47        | Output Shaft             | 132J17   |
| 32        | Transmission Cover<br>(See Fig. 7-1)           | 34J2     | 48        | Bearing Retainer:        |          |
| 33        | Transmission Adapter:                          |          |           | 1 & 2-Ton                | 250J6    |
|           | 1 & 2-Ton                                      | 37J7-2   |           | 3-Ton                    | 250J9    |
|           | 3-Ton  | 37J7     | 49        | Lock Washer              | H-4066-P |
|           |  |          | 50        | Screw                    | H-2304   |
|           |  |          | 51        | Pawl Ass'y               | 25JG4-2  |
|           |  |          | 52        | Flanged Bearing          | 530J29   |

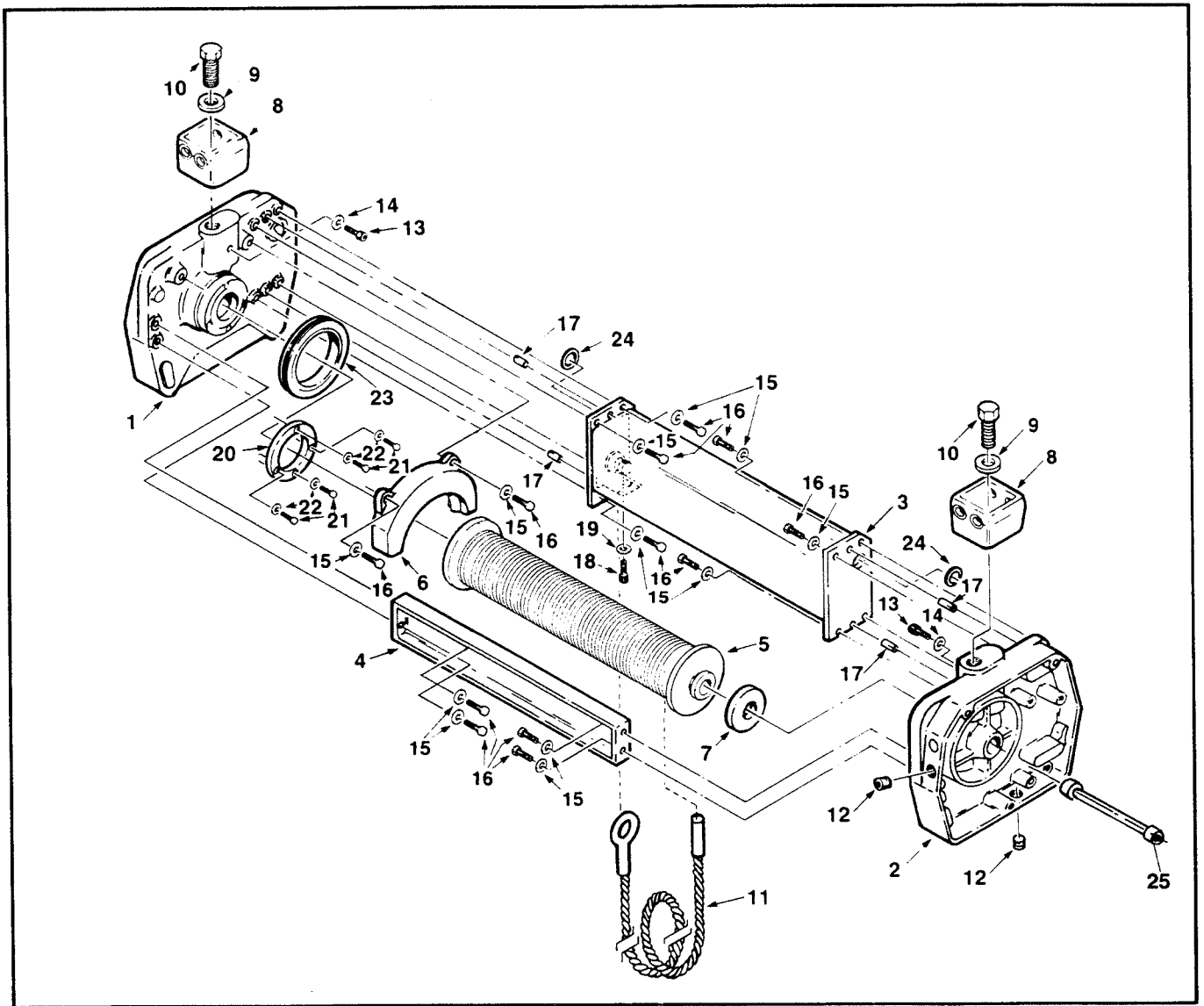
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**FIGURE 7-4. HOIST TRANSMISSION**



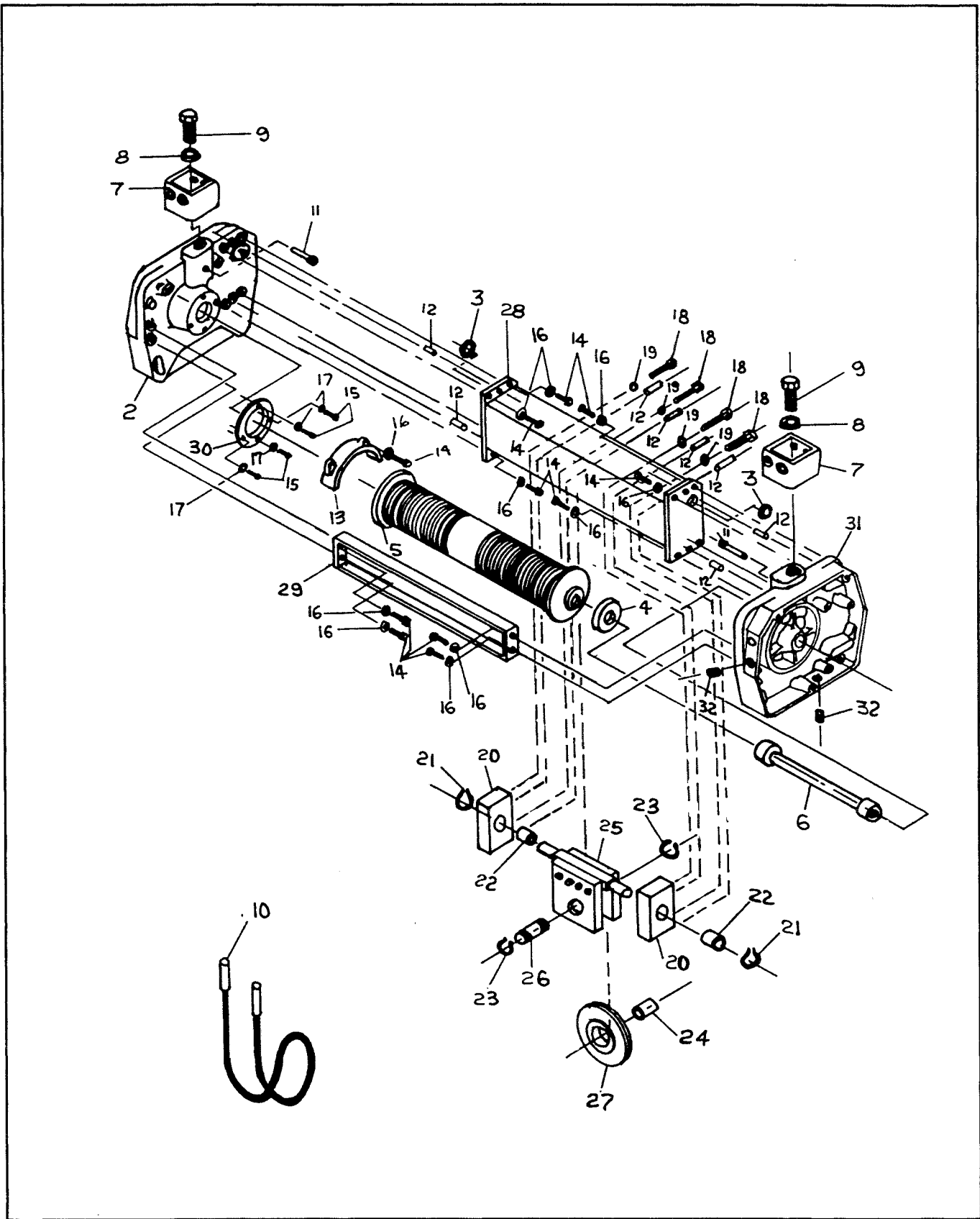
| Index No. | Part Name            | Part No.  | Index No. | Part Name                     | Part No. |
|-----------|----------------------|-----------|-----------|-------------------------------|----------|
| 1         | Transmission Adapter | 37J7-2    | 10        | Suspension Stud               | 50J36    |
| 2         | Motor Adapter        | 39J4-2    | 11        | Wire Rope Assembly:           |          |
| 3         | Tube Assembly:       |           |           | 22 Ft. Lift                   | 19J202   |
|           | 22 Ft. Lift          | 200JG12-1 |           | 35 Ft. Lift                   | 19J203   |
|           | 35 Ft. Lift          | 200JG13-1 |           | 44 Ft. Lift                   | 19J204   |
|           | 44 Ft. Lift          | 200JG11-1 |           | 70 Ft. Lift                   | 19J206   |
|           | 70 Ft. Lift          | 200JG30-1 | 12        | Lock Washer                   | H-4136   |
| 4         | Channel Assembly:    |           | 13        | Suspension Stud Locking Screw | S-49-10  |
|           | 22 Ft. Lift          | 206JG2-1  | 14        | Lock Washer                   | H-4084-P |
|           | 35 Ft. Lift          | 206JG3-1  | 15        | Lock Washer                   | H-4063-P |
|           | 44 Ft. Lift          | 206JG1-1  | 16        | Screw                         | S-44-47  |
|           | 70 Ft. Lift          | 206JG7-1  | 17        | Driv-Lok Pin                  | H-5230-5 |
| 5         | Drum Assembly:       |           | 18        | Screw (Dead End)              | S-49-22  |
|           | 22 Ft. Lift          | 16JG17-2  | 19        | Pipe Plug                     | H-6276   |
|           | 35 Ft. Lift          | 16JG17-3  | 20        | Bearing Retainer              |          |
|           | 44 Ft. Lift          | 16JG17-1  |           | (Reference Fig. 7-4)          | 250J6    |
|           | 70 Ft. Lift          | 16JG17-7  | 21        | Gasket                        | 560J13   |
| 6         | Drum Guard:          |           | 22        | Coupling Assembly:            |          |
|           | 22 Ft.; 35 Ft. Lift  | 230J5     |           | 22 Ft. Lift                   | 107JG8-2 |
|           | 44 Ft.; 70 Ft. Lift  | 230J4     |           | 35 Ft. Lift                   | 107JG8-3 |
| 7         | Bearing              | 500K12    |           | 44 Ft. Lift                   | 107JG8-1 |
| 8         | Suspension Box       | 50J44A    |           | 70 Ft. Lift                   | 107JG8-6 |
| 9         | Washer               | 255K25    |           |                               |          |

FIGURE 7-5A. DRUM AREA (1 & 2 TON) STANDARD HEADROOM MODELS



| Index No. | Part Name            | Part No.  | Index No. | Part Name                                    | Part No. |
|-----------|----------------------|-----------|-----------|--|----------|
| 1         | Transmission Adapter | 37J7      |           | 35 Ft. Lift                                  | 19J205   |
| 2         | Motor Adapter        | 39J4      | 12        | Pipe Plug                                    | H-6276   |
| 3         | Tube Assembly:       |           | 13        | Screw  | S-49-10  |
|           | 22 Ft. Lift          | 200JG11-1 | 14        | Lock Washer                                  | H-4084-P |
|           | 35 Ft. Lift          | 200JG30-1 | 15        | Lock Washer                                  | H-4063-P |
| 4         | Channel Assembly:    |           | 16        | Screw  | S-44-47  |
|           | 22 Ft. Lift          | 206JG1-1  | 17        | Driv-Lok Pin                                 | H-5230-5 |
|           | 35 Ft. Lift          | 206JG7-1  | 18        | Screw  | S-49-22  |
| 5         | Drum Assembly:       |           | 19        | Lock Washer                                  | H-4136   |
|           | 22 Ft. Lift          | 16JG17-1  | 20        | Bearing Retainer                             | 250J9    |
|           | 35 Ft. Lift          | 16JG17-7  | 21        | Screw  | H-2304   |
| 6         | Drum Guard           | 230J4     | 22        | Lock Washer                                  | H-4066-P |
| 7         | Bearing              | 500K12    | 23        | Sheave Assembly<br>(Includes Sleeve Bearing) | 28JG8    |
| 8         | Suspension Box       | 50J44A    | 24        | Gasket                                       | 560J13   |
| 9         | Washer               | 255K25    | 25        | Coupling Assembly                            |          |
| 10        | Suspension Stud      | 50J36     |           | 22 Ft. Lift                                  | 107JG8-1 |
| 11        | Wire Rope Assembly:  |           |           | 35 Ft. Lift                                  | 107JG8-6 |
|           | 22 Ft. Lift          | 19J201    |           |  |          |

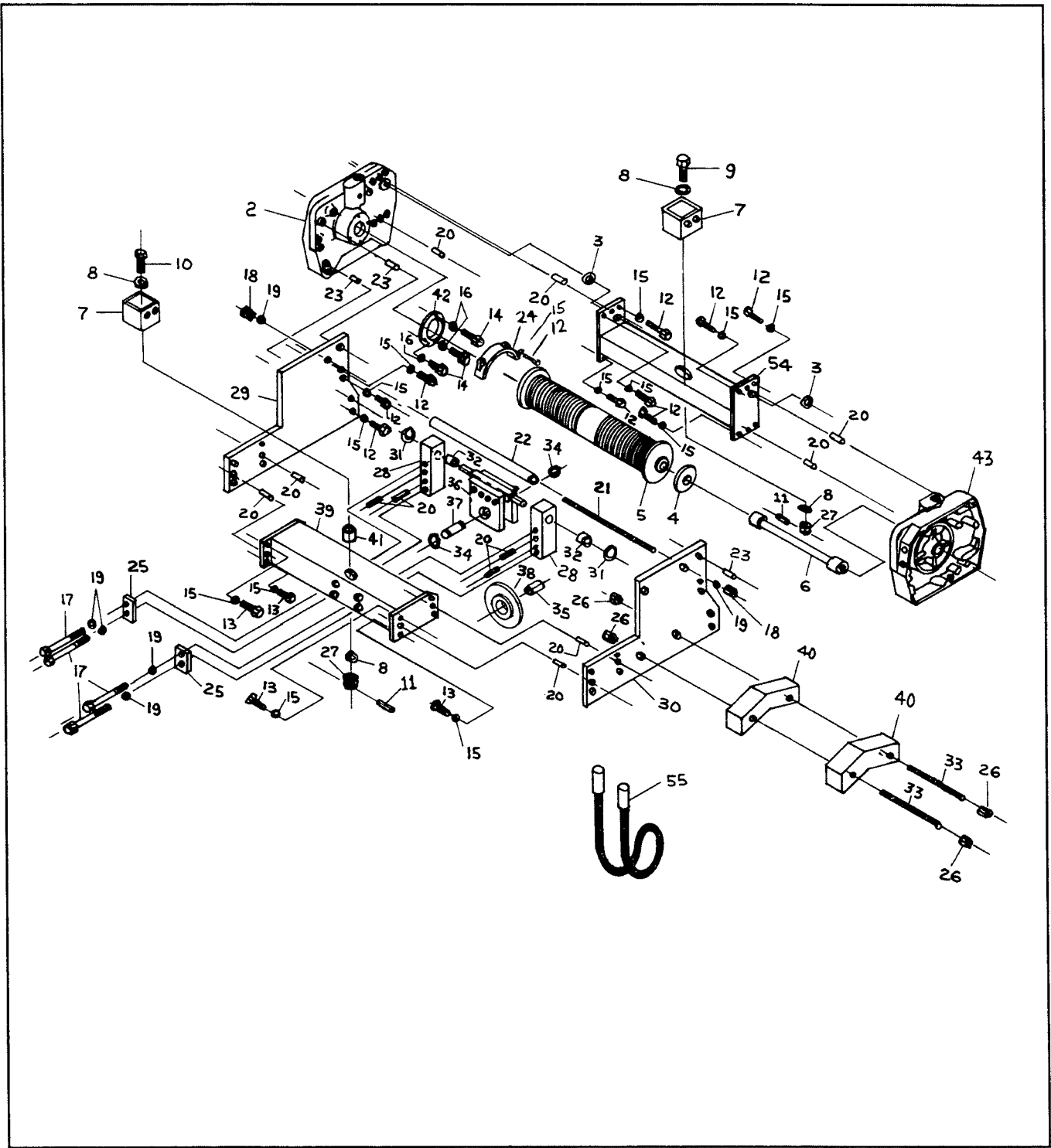
FIGURE 7-5B. DRUM AREA (3 TON) STANDARD HEADROOM MODELS



**FIGURE 7-5C. DRUM AREA  
(1 & 2 TON, TRUE VERTICAL LIFT MODELS)**

| Item No. | Part Name      | Part No. | Item No. | Part Name        | Part No.           |
|----------|----------------|----------|----------|------------------|--------------------|
| 2        | Trans. Housing | 37J7-1   | 17       | Lock Washer      | H-4066P            |
| 3        | Gasket         | 560J13   | 18       | Screw            | S-49-29            |
| 4        | Bearing        | 500K12   | 19       | Lock Washer      | H-4083P            |
| 5        | Drum Ass'y     |          | 20       | Pillow Block     | 503J7              |
|          | 15 Ft. Lift    | 16JG17-8 | 21       | Ret. Ring        | H-5543             |
|          | 25 Ft. Lift    | 16JG17-5 | 22       | Bushing          | 530K26             |
|          | 35 Ft. Lift    | 16JG17-6 | 23       | Ret Ring         | H-5530             |
| 6        | Coupling       |          | 24       | Bushing          | MA-533             |
|          | 15 Ft. Lift    | 107JG8-9 | 25       | Equalizer        | 113JG1             |
|          | 25 Ft. Lift    | 107JG8-4 |          | Sheave           | (Includes Items    |
|          | 35 Ft. Lift    | 107JG8-8 |          | Ass'y            | #23, 24, 26, & 27) |
| 7        | Susp. Box      | 50J44A   | 26       | Sheave Pin       | 122J21             |
| 8        | Washer         | 255K25   | 27       | Sheave           | 28J15              |
| 9        | Susp. Stud     | 50J36    | 28       | Tube Ass'y       |                    |
| 10       | Cable Ass'y    |          |          | 15 Ft. Lift      | 200JG34-4          |
|          | 15 Ft. Lift    | 19J303   |          | 25 Ft. Lift      | 200JG34-2          |
|          | 25 Ft. Lift    | 19J302   |          | 35 Ft. Lift      | 200JG34-1          |
|          | 35 Ft. Lift    | 19J304   | 29       | Channel Ass'y    |                    |
| 11       | Locking Screw  | 700J8    |          | 15 Ft. Lift      | 206JG11-1          |
| 12       | Driv-Lok Pin   | H-5230-5 |          | 25 Ft. Lift      | 206JG9-1           |
| 13       | Drum Guard     | 230J4    |          | 35 Ft. Lift      | 206JG8-1           |
| 14       | Screw          | S44-47   | 30       | Bearing Retainer | 250J6              |
| 15       | Screw          | H-2304   | 31       | Motor Adapter    | 39J4-2             |
| 16       | Lock Washer    | H-4063P  | 32       | Pipe Plug        | H-6276             |

**FIGURE 7-5C. DRUM AREA  
(1 & 2 TON, TRUE VERTICAL LIFT MODELS)**



**FIGURE 7-5D. DRUM AREA  
(1 & 2 TON, LOW HEADROOM MODELS)**



| Item No. | Part Name      | Part No. | Item No. | Part Name        | Part No.    |
|----------|----------------|----------|----------|------------------|-------------|
| 2        | Trans. Housing | 37J7-2   | 24       | Drum Guard       | 230J4       |
| 3        | Gasket         | 560J13   | 25       | Backing Plate    | 46J16       |
| 4        | Bearing        | 500K12   | 26       | Nut              | H-3947      |
| 5        | Drum Ass'y     |          | 27       | Nut              | H-3928-P    |
|          | 15 Ft. Lift    | 16JG17-8 | 28       | Pillow Block     | 503J5       |
|          | 25 Ft. Lift    | 16JG17-5 | 29       | Side Frame       | 48J6        |
|          | 35 Ft. Lift    | 16JG17-6 | 30       | Side Frame       | 48J7        |
| 6        | Coupling       |          | 31       | Ret. Ring        | H-5543      |
|          | 15 Ft. Lift    | 107JG8-9 | 32       | Bushing          | 530K26      |
|          | 25 Ft. Lift    | 107JG8-4 | 33       | Thr'd Rod        | 103J11      |
|          | 35 Ft. Lift    | 107JG8-8 | 34       | Ret. Ring        | H-5530      |
| 7        | Susp. Box      | 50J33    | 35       | Bushing          | MA-533      |
| 8        | Washer         | H4012-P  | 36       | Equalizer        | 113JG1      |
| 9        | King Bolt      | 700J7    |          | Sheave           | (Includes   |
| 10       | King Bolt      | 700J6    |          | Ass'y            | Items #34   |
| 11       | Pin            | H-5221   |          |                  | 35, 37, 38) |
| 12       | Screw          | S44-47   | 37       | Sheave Pin       | 122J21      |
| 13       | Screw          | S44-40   | 38       | Sheave           | 28J15       |
| 14       | Screw          | H-2304   | 39       | Tube Ass'y       |             |
| 15       | Lock Washer    | H-4063P  |          | 15 Ft. Lift      | 200JG27-3   |
| 16       | Lock Washer    | H-4066P  |          | 25 Ft. Lift      | 200JG27-2   |
| 17       | Bolt           | H-3187   |          | 35 Ft. Lift      | 200JG27-1   |
| 18       | Nut            | H-3725P  | 40       | Ct. Weight       | 52J3        |
| 19       | Lock Washer    | H-4083   | 41       | Spacer           | 200J29      |
| 20       | Pin            | H-5230-P | 42       | Bearing Retainer | 250J6       |
| 21       | Tie Rod        |          | 43       | Motor Adaptor    | 39J4-2      |
|          | 15 Ft. Lift    | 931J1-5  | 54       | Tube Ass'y       |             |
|          | 25 Ft. Lift    | 931J1-2  |          | 15 Ft. Lift      | 200JG25-3   |
|          | 35 Ft. Lift    | 931J1-1  |          | 25 Ft. Lift      | 200JG25-2   |
| 22       | Tie Rod Spacer |          |          | 35 Ft. Lift      | 200JG25-1   |
|          | 15 Ft. Lift    | 200J28-5 | 55       | Cable Ass'y      |             |
|          | 25 Ft. Lift    | 200J28-2 |          | 15 Ft. Lift      | 19J303      |
|          | 35 Ft. Lift    | 200J28-1 |          | 25 Ft. Lift      | 19J302      |
| 23       | Pin            | H5392    |          | 35 Ft. Lift      | 19J304      |

**FIGURE 7-5D. DRUM AREA  
(1 & 2 TON, LOW HEADROOM MODELS)**

| Index No. | Part Name  | Part No.   |
|-----------|--|------------|
| 1         | Limit Switch and Shaft Assembly (Consists of Index Nos. 3 thru 12) | 918JG7     |
| 4         | Limit Switch Bracket Assembly (Includes Index No. 5)               | JF-900-3   |
| 5         | Limit Switch Bushing   | JF-531-4   |
| 6         | Microswitch, Limit   | 815J1      |
| 7         | Screw  | H-1402-P   |
| 8         | Nut  | H-3944     |
| 9         | Limit Switch Shaft   | JF-117-3   |
| 10        | Limit Switch Shaft (Red)   | JF-751-3-R |
| 11        | Limit Switch Nut (Green)   | JF-751-3G  |
| 12        | Retaining Ring   | H-5520     |
| 13        | Spring   | JF-343-3   |
| 14        | Screw  | H-2981-P   |

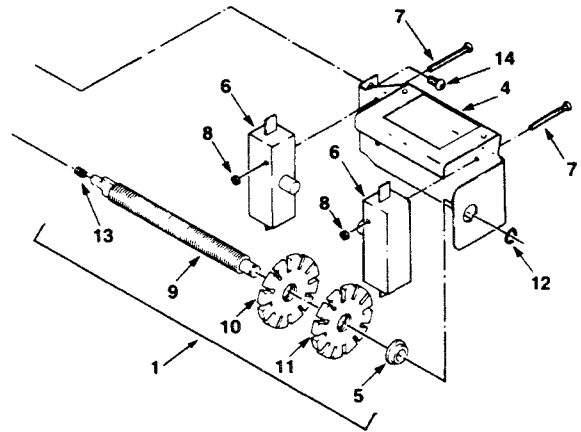


FIGURE 7-6. LIMIT SWITCH PARTS

| Index No. | Part Name   | Part No.  |
|-----------|---|-----------|
| 1         | Long Lift Limit Switch Assembly (all items except No. 19) | 944JG6WR  |
| 2         | Mounting Plate  | 129J1     |
| 3         | Thrust Washer   | 255K16    |
| 4         | Spring  | PB-287    |
| 5         | Green Nut   | JF-751-3G |
| 6         | Red Nut   | JF-751-3R |
| 7         | Shaft and Gear Assembly                                   | 117JG2    |
| 8         | Bushing   | JF-531-4  |
| 9         | End Plate   | 258J8     |
| 10        | Lock Washer   | H-4158    |
| 11        | Screw   | H-2741-P  |
| 12        | Switch  | 815J1     |
| 13        | Locknut   | H-3944    |
| 14        | Drive Pinion  | 427J1     |
| 15        | Frame and Guide Assembly                                  | 258JG7    |
| 16        | Screw   | H-1402-P  |
| 17        | Screw   | 854823    |
| 18        | Retaining Ring  | H-5520    |
| 19        | Mounting Screw  | H-2981-P  |
| 20        | Flat Head Screw   | H-1210    |
| 21        | Post  | 110J14    |

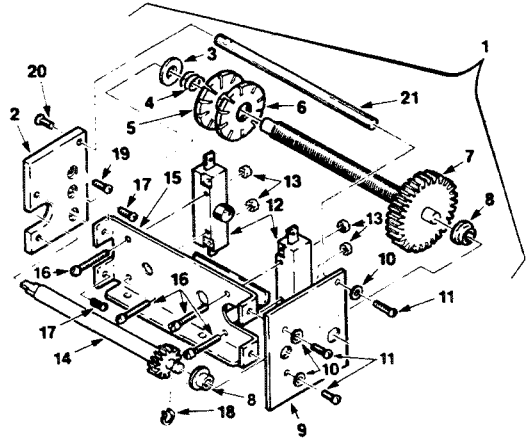
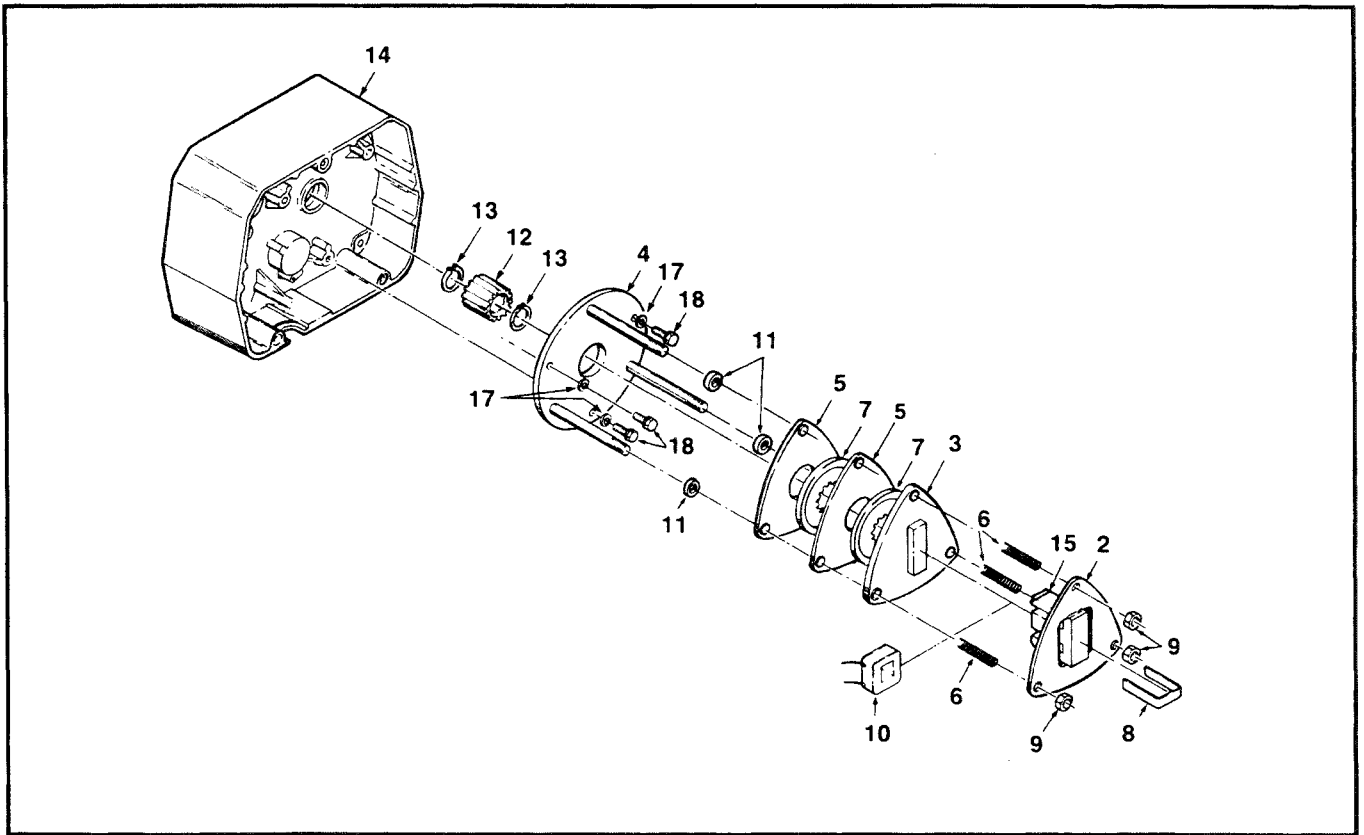


FIGURE 7-6A.  
LONG LIFT LIMIT SWITCH  
1 & 2 TON W/70 FT. LIFT AND 3 TON W/35 FT. LIFT ONLY

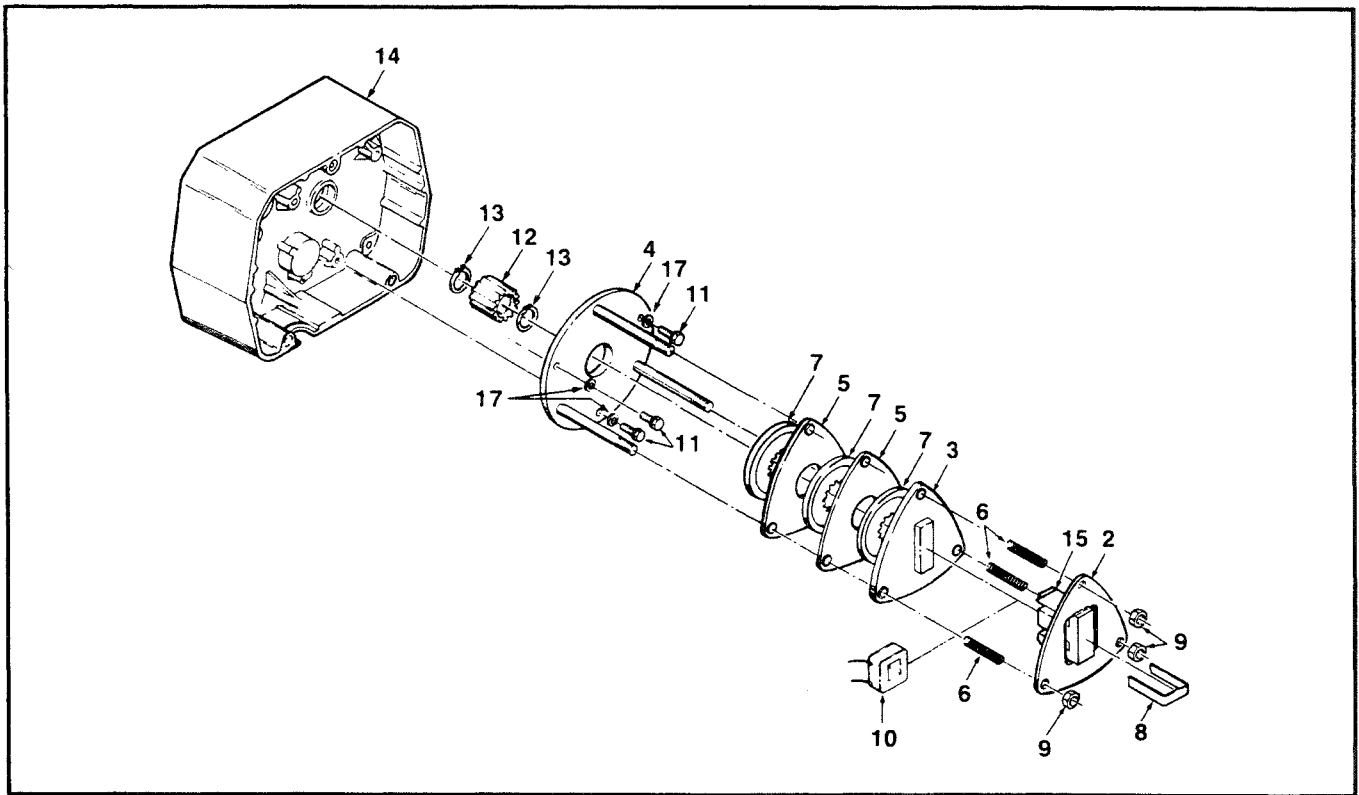


| Index No. | Part Name   | Part No.  | Index No. | Part Name   | Part No.                                     |
|-----------|---|---|-----------|---|--|
| 1         | Disc Brake Assembly:<br>(Single Speed)<br>230/460V, 3-PH, 60 Hz<br>575V, 3-PH, 60 Hz<br>208V, 3-PH, 60 Hz<br><br>(Two Speed)<br>230V, 3-PH, 60 Hz<br>460V, 3-PH, 60 Hz<br>575V, 3-PH, 60 Hz<br>208V, 3-PH, 60 Hz<br>(Consists of Items 2 thru 11) | 854JG24<br>854JG26<br>854JG27<br><br>854JG24<br>854JG25<br>854JG26<br>854JG27 | 10        | Coil:<br>230V, 60 Hz (For Brake<br>854JG24)<br>460V, 60 Hz (For Brake<br>854JG25)<br>575V, 60 Hz (For Brake<br>854JG26)<br>208V, 60 Hz (For Brake<br>854JG27) | JF-853-2<br>JF-853-3<br>JF-853-4<br>JF-853-5 |
| 2         | Plate and Frame Assembly  | 29IJG8  | 11        | Spacer  | 200J15                                       |
| 3         | Plate and Armature Assembly   | 29IJG9  | 12        | Brake Adapter   | 142J2  |
| 4         | Plate and Stud Assembly   | 290JG4  | 13        | Retaining Ring  | H-5527                                       |
| 5         | Brake Plate   | 29IJ10  | 14        | Transmission Cover<br>(See Fig. 7-1)  | 34J2   |
| 6         | Spring  | 344J4   | 15**      | Shading Coil Element<br>(Must be attached to frame<br>with H-7812 adhesive)   | 860J1  |
| 7         | Brake Disc Assembly   | 581JG2  | 16*       | Adhesive (1 oz. Tube)   | H-7812                                       |
| 8         | Retainer  | JF-710  | 17        | Lock Washer   | H-4063-P                                     |
| 9         | Lock Nut  | H-3949  | 18        | Screw   | H-2988-P                                     |

\*Not Illustrated

\*\*Replacement requires use of adhesive

**FIGURE 7-7A. MOTOR BRAKE PARTS  
(2 HP) MODELS**



| Index No. | Part Name   | Part No.  | Index No. | Part Name   | Part No.                                     |
|-----------|---|---|-----------|---|--|
| 1         | Disc Brake Assembly:<br>(Single Speed)<br>230/460V, 60 Hz, 3-PH<br>575V, 60 Hz, 3-PH<br>208V, 60 Hz, 3-PH<br><br>(Two Speed)<br>230V, 60 Hz, 3-PH<br>460V, 60 Hz, 3-PH<br>575V, 60 Hz, 3-PH<br>208V, 60 Hz, 3-PH<br>(Consists of Items 2 thru 10) | 854JG20<br>854JG22<br>854JG23<br><br>854JG20<br>854JG21<br>854JG22<br>854JG23 | 10        | Coil:<br>230V, 60 Hz (For Brake<br>854JG20)<br>460V, 60 Hz (For Brake<br>854JG21)<br>575V, 60 Hz (For Brake<br>854JG22)<br>208V, 60 Hz (For Brake<br>854JG23) | JF-853-2<br>JF-853-3<br>JF-853-4<br>JF-853-5 |
| 2         | Plate and Frame Assembly  | 29IJG8  | 11        | Screw   | H-2988-P                                     |
| 3         | Plate and Armature Assembly   | 29IJG9  | 12        | Brake Adapter   | 142J2  |
| 4         | Plate and Stud Assembly   | 290JG4  | 13        | Retaining Ring  | H-5527                                       |
| 5         | Brake Plate   | 29IJ10  | 14        | Transmission Cover  | 34J2   |
| 6         | Spring  | 344J4   | 15**      | Shading Coil Element<br>(Must be attached to frame<br>with H-7812 adhesive)   | 860J1  |
| 7         | Brake Disc Assembly   | 581JG2  | 16*       | Adhesive (1 oz. Tube)   | H-7812                                       |
| 8         | Retainer  | JF-710  | 17        | Lock Washer   | H-4063-P                                     |
| 9         | Lock Nut  | H-3949  |           |   |  |

\*Not Illustrated

\*\*Replacement requires use of adhesive

**FIGURE 7-7B. MOTOR BRAKE PARTS  
(3 HP) MODELS**

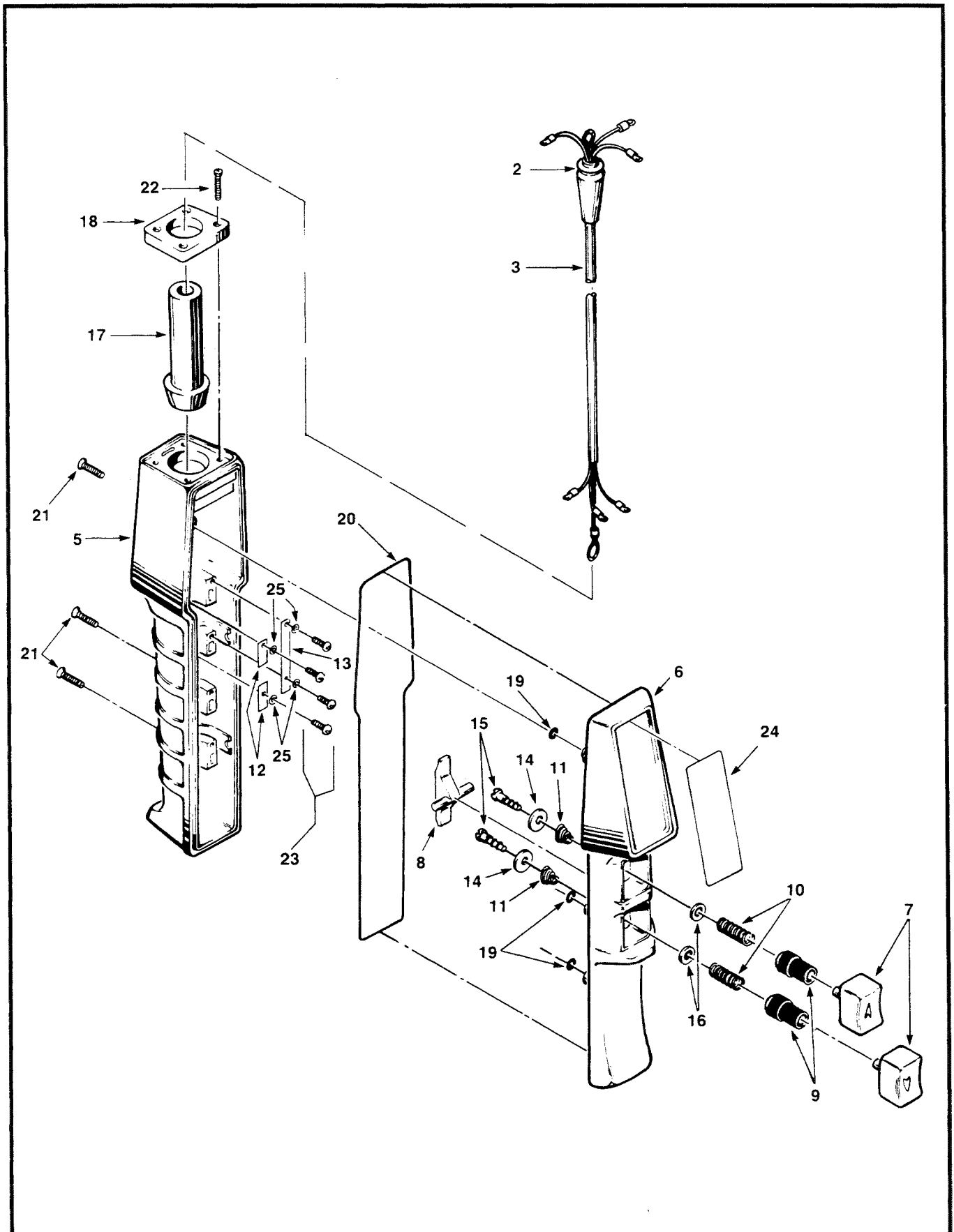


FIGURE 7-8A. PUSHBUTTON  
(SINGLE SPEED HOISTS)

| Index No. | Part Name   | Part No.  |
|-----------|---|---|
| 1         | Pushbutton and Cable Assembly: (Consists of Index Nos. 2 thru 25)<br>PB Drop<br>11 Ft.<br>18 Ft.<br>21 Ft.<br>26 Ft.<br>31 Ft.<br>40 Ft.<br>66 Ft.<br>Special PB Drop | PB-299-11B<br>PB-299-16B<br>PB-299-21B<br>PBS-299-26B<br>PB-299-31B<br>PBS-299-40B<br>PBS-299-66B<br>PBS-299-*B |
| 2         | Rubber Grommet  | JF-761  |
| 3         | Pushbutton Cable Assembly:<br>PB Drop In Feet:<br>11 Ft.<br>18 Ft.<br>21 Ft.<br>26 Ft.<br>31 Ft.<br>40 Ft.<br>66 Ft.<br>Special PB Drop                               | PB-299-11<br>PB-299-18<br>PB-299-21<br>PBS-299-26<br>PB-299-31<br>PBS-299-40<br>PBS-299-66<br>PBS-299-*         |
| 4         | Pushbutton Assembly:<br>(Consists of Index Nos. 5 thru 25)  | 534K97-B  |
| 5         | Enclosure   | PB-282-4  |
| 6         | Cover   | PB-298  |
| 7         | Pushbutton  | PB-284-2  |
| 8         | Interlock   | PB-285  |
| 9         | Boot  | PB-286  |
| 10        | Spring, Compression   | PB-287  |
| 11        | Spring, Conical   | PB-288  |
| 12        | Contact Plate   | PB-289  |
| 13        | Contact Plate, Common   | PB-290  |
| 14        | Washer, Contact   | PB-291  |
| 15        | Screw   | PB-301  |
| 16        | Washer, Boot  | PB-293  |
| 17        | Grommet   | PB-294-1  |
| 18        | Cap, Enclosure  | PB-295  |
| 19        | "O" Ring  | X-6477-1  |
| 20        | Rubber Seal   | H-7851  |
| 21        | Screw   | H-2991  |
| 22        | Screw   | H-2992  |
| 23        | Screw   | H-2993  |
| 24        | Warning Tag   | PB-296  |
| 25        | Lock Washer   | H-4160  |

(\*Equal to P.B. Drop)

**FIGURE 7-8A. PUSHBUTTON  
(SINGLE SPEED HOISTS)**

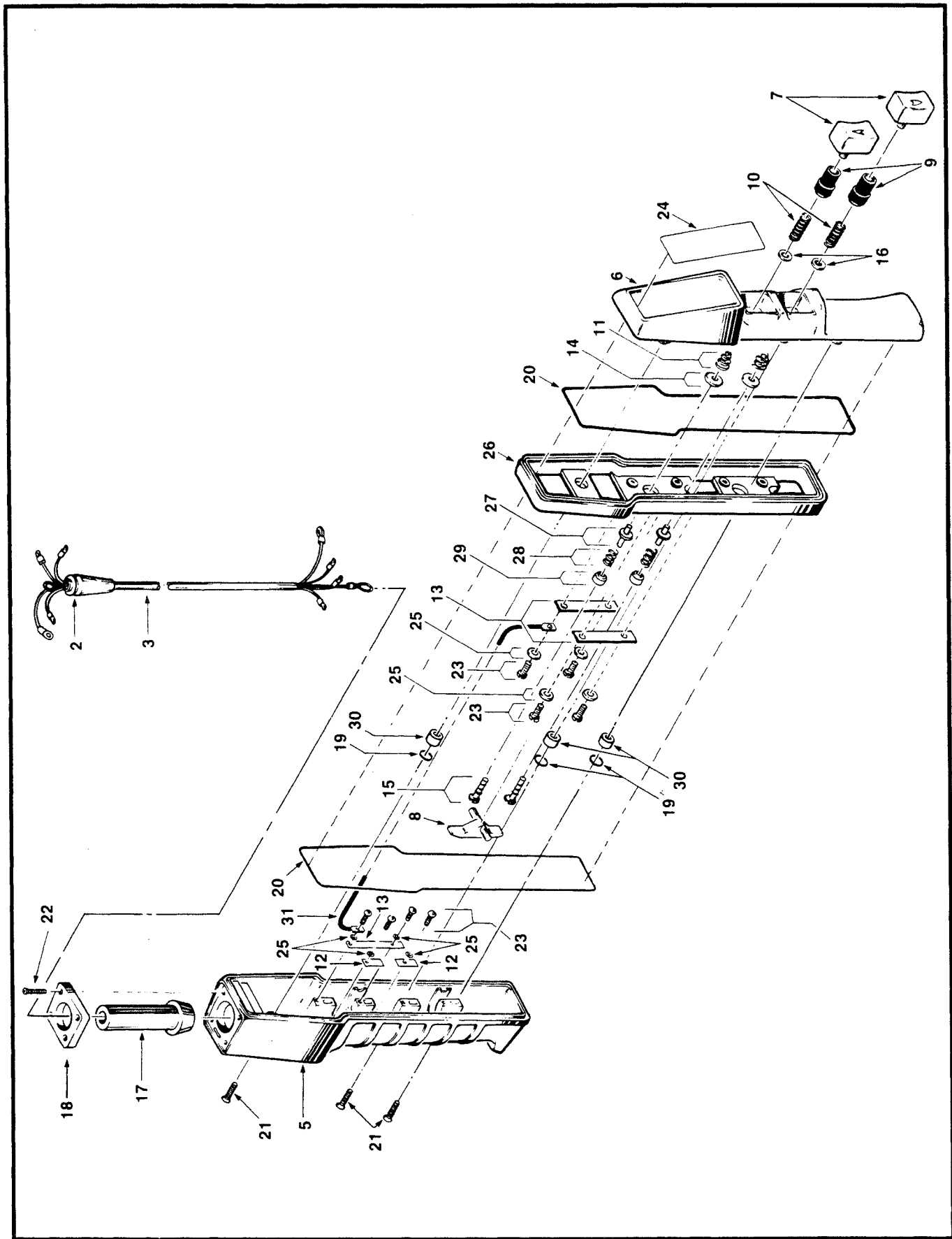


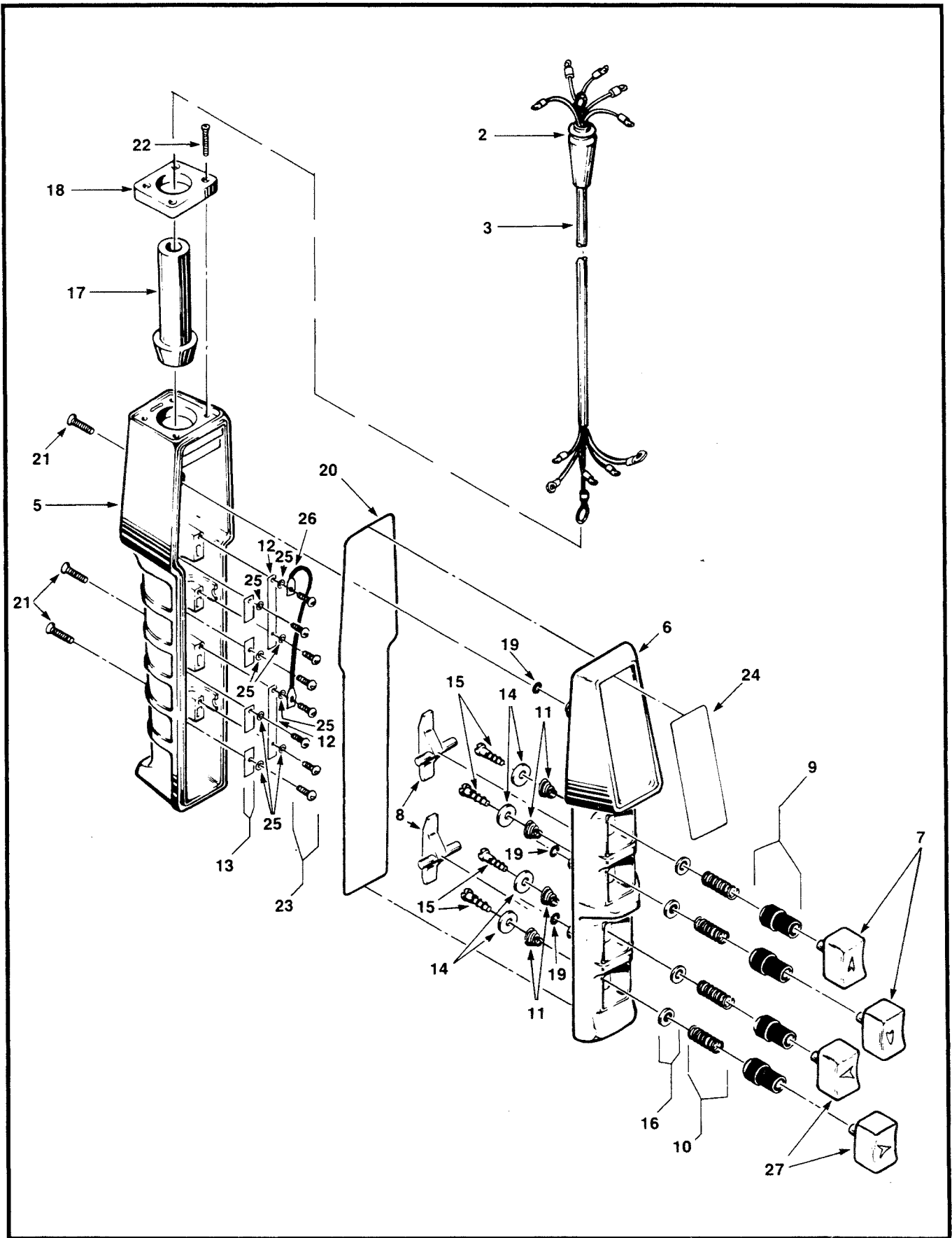
FIGURE 7-8B. PUSHBUTTON  
(TWO SPEED HOISTS)

| Index No. | Part Name   | Part No.   |
|-----------|---|------------|
| 1         | Pushbutton and Cable Assembly: (Consists of Index Nos. 2 thru 31)<br>PB Drop In Feet: |            |
|           | 11 Ft.  | 534JG4-11  |
|           | 18 Ft.  | 534JG4-18  |
|           | 21 Ft.  | 534JG4-21  |
|           | 26 Ft.  | 534JG4-26  |
|           | 31 Ft.  | 534JG4-31  |
|           | 40 Ft.  | 534JG4-40  |
|           | 66 Ft.  | 534JG4-66  |
|           | Special PB Drop   | 534JG4-*   |
| 2         | Rubber Grommet  | JF-761     |
| 3         | Pushbutton Cable Assembly:<br>PB Drop In Feet:  |            |
|           | 11 Ft.  | PB-300-11  |
|           | 18 Ft.  | PB-300-18  |
|           | 21 Ft.  | PB-300-21  |
|           | 26 Ft.  | PBS-300-26 |
|           | 31 Ft.  | PB-300-31  |
|           | 40 Ft.  | PBS-300-40 |
|           | 66 Ft.  | PBS-300-66 |
|           | Special PB Drop   | PBS-300-*  |
| 4         | Pushbutton Assembly:<br>(Consists of Index Nos. 5 thru 31)                            | 534JG4     |
| 5         | Enclosure   | PB-282-4   |
| 6         | Cover   | PB-298     |
| 7         | Pushbutton  | PB-284-22  |
| 8         | Interlock   | PB-285-1   |
| 9         | Boot  | PB-286     |
| 10        | Spring, Compression   | PB-287     |
| 11        | Spring, Conical   | PB-288     |
| 12        | Contact Plate   | PB-289     |
| 13        | Contact Plate, Common   | PB-290     |
| 14        | Washer, Contact   | PB-291     |
| 15        | Screw   | H-1852-P   |
| 16        | Washer, Boot  | PB-293     |
| 17        | Grommet   | PB-294-1   |
| 18        | Cap, Enclosure  | PB-295     |
| 19        | "O" Ring  | X-6477-1   |
| 20        | Rubber Seal   | H-7851     |
| 21        | Screw (Enclosure)   | H-2925     |
| 22        | Screw (Cap)   | H-2992     |
| 23        | Screw (Plates)  | H-2993     |
| 24        | Warning Tag   | PB-296     |
| 25        | Lock Washer   | H-4160     |
| 26        | 2-Speed Adapter   | PB-308     |
| 27        | Insulating Bushing  | 755J1      |
| 28        | Spring, Lower   | 344J5      |
| 29        | Contact Button  | 201J1      |
| 30        | Bushing   | 200J16     |
| 31        | Jumper Wire   | JF-940-42  |

(\*Equal to P.B. Drop)

**FIGURE 7-8B. PUSHBUTTON (TWO SPEED HOISTS)**



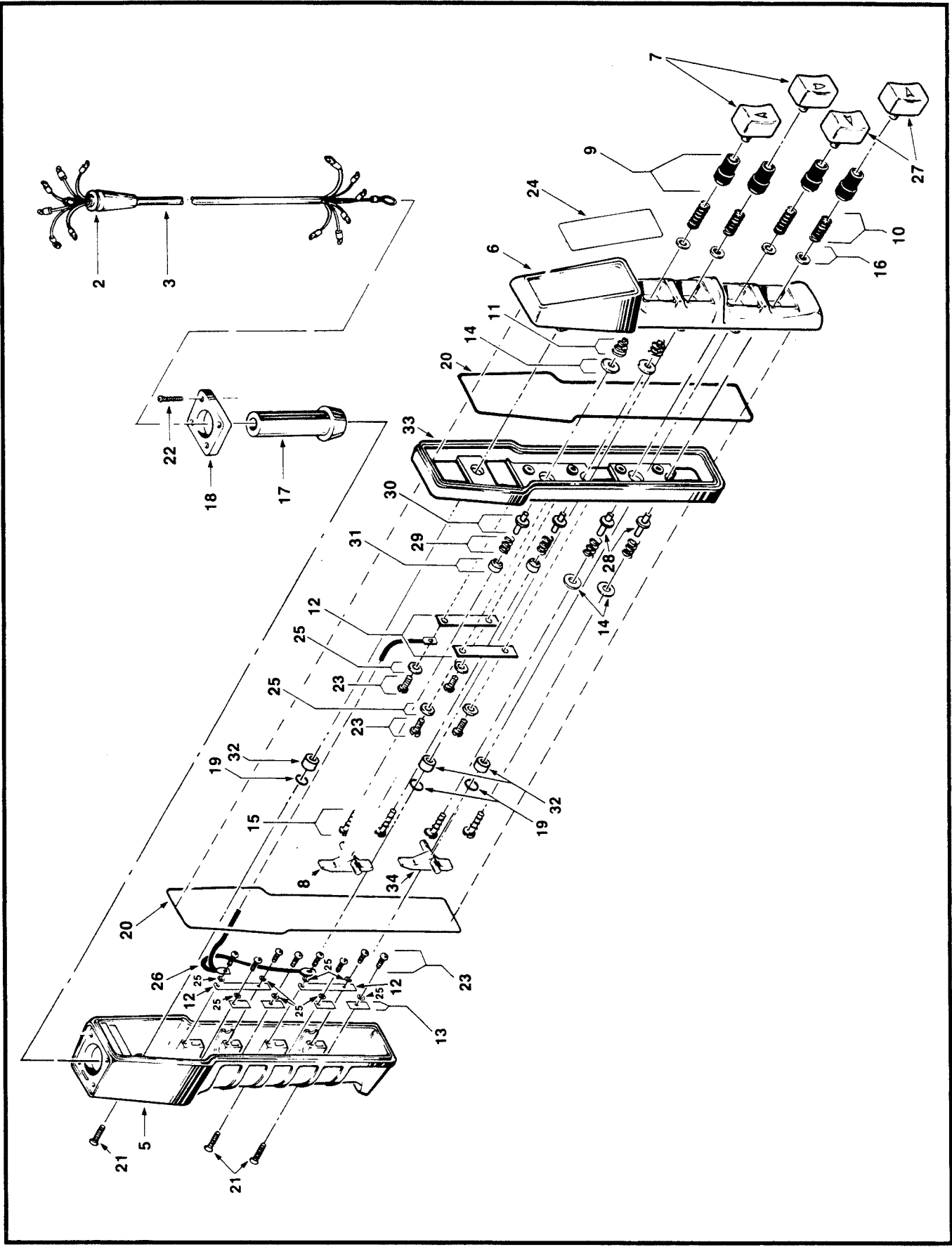


**FIGURE 7-8C. PUSHBUTTON  
 (SINGLE SPEED HOIST - SINGLE SPEED TROLLEY)**

| Index No. | Part Name  | Part No.  |
|-----------|--|---|
| 1         | Pushbutton and Cable Assembly: (Consists of Index Nos. 2 thru 27)<br>PB Drop In Feet:<br>11 Ft.<br>18 Ft.<br>21 Ft.<br>26 Ft.<br>31 Ft.<br>40 Ft.<br>66 Ft.<br>Special PB Drop | PB-300-11A<br>PB-300-18A<br>PB-300-21A<br>PBS-300-26A<br>PB-300-31A<br>PBS-300-40A<br>PBS-300-66A<br>PBS-300-*A |
| 2         | Rubber Grommet   | JF-761  |
| 3         | Pushbutton Cable Assembly:<br>PB Drop In Feet:<br>11 Ft.<br>18 Ft.<br>21 Ft.<br>26 Ft.<br>31 Ft.<br>40 Ft.<br>66 Ft.<br>Special PB Drop  | PB-300-11<br>PB-300-18<br>PB-300-21<br>PBS-300-26<br>PB-300-31<br>PBS-300-40<br>PBS-300-66<br>PBS-300-*         |
| 4         | Pushbutton Assembly:<br>(Consists of Index Nos. 5 thru 27)   | 534K98  |
| 5         | Enclosure  | PB-282-4  |
| 6         | Cover  | PB-283  |
| 7         | Pushbutton (Hoist)   | PB-284-2  |
| 8         | Interlock  | PB-285  |
| 9         | Boot   | PB-286  |
| 10        | Spring, Compression  | PB-287  |
| 11        | Spring, Conical  | PB-288  |
| 12        | Contact Plate, Common  | PB-290  |
| 13        | Contact Plate  | PB-289  |
| 14        | Washer, Contact  | PB-291  |
| 15        | Screw  | PB-301  |
| 16        | Washer, Boot   | PB-293  |
| 17        | Grommet  | PB-294-2  |
| 18        | Cap, Enclosure   | PB-295  |
| 19        | "O" Ring   | X-6477-1  |
| 20        | Seal   | H-7851  |
| 21        | Screw  | H-2991  |
| 22        | Screw  | H-2992  |
| 23        | Screw  | H-2993  |
| 24        | Warning Tag  | PB-296  |
| 25        | Lock Washer  | H-4160  |
| 26        | Jumper (Common)  | JF-940-42   |
| 27        | Pushbutton (Trolley)   | PB-284-1  |

(\*Equal to P.B. Drop)

**FIGURE 7-8C. PUSHBUTTON  
(SINGLE SPEED HOIST - SINGLE SPEED TROLLEY)**



**FIGURE 7-8D. PUSHBUTTON  
 (TWO SPEED HOIST, SINGLE SPEED TROLLEY;  
 SINGLE SPEED HOIST, TWO SPEED TROLLEY)**

| Index No. | Part Name   | Part No.   | Index No. | Part Name   | Part No.   |
|-----------|---|------------|-----------|---|------------|
| 1         | Pushbutton and Cable Assembly: (Consists of Index Nos. 2 thru 34) |            | 4         | Pushbutton Assembly: (Consists of Index Nos. 5 thru 34) |            |
|           | Two Speed Hoist, Single Speed Trolley                             |            |           | Two Speed Hoist, Single Speed Trolley                   | 534JG5     |
|           | PB Drop In Feet:  |            |           | Single Speed Hoist, Two Speed Trolley                   | 534JG6     |
|           | 11 Ft.  | 534JG5-11  |           | Enclosure   | PB-282-4   |
|           | 18 Ft.  | 534JG5-18  | 5         | Cover   | PB-283     |
|           | 21 Ft.  | 534JG5-21  | 6         | Pushbutton (Hoist)                                      | PB-284-22  |
|           | 26 Ft.  | 534JG5-26  | 7         | Interlock (Black)                                       | PB-285-1   |
|           | 31 Ft.  | 534JG5-31  | 8         | Boot  | PB-286     |
|           | 40 Ft.  | 534JG5-40  | 9         | Spring, Compression                                     | PB-287     |
|           | 66 Ft.  | 534JG5-66  | 10        | Spring, Conical   | PB-288     |
|           | Special PB Drop   | 534JG5-*   | 11        | Contact Plate, Common                                   | PB-290     |
|           | Single Speed Hoist, Two Speed Trolley                             |            | 12        | Contact Plate   | PB-289     |
|           | PB Drop In Feet:  |            | 13        | Washer, Contact   | PB-291     |
|           | 11 Ft.  | 534JG6-11  | 14        | Screw   | H-1852-P   |
|           | 18 Ft.  | 534JG6-18  | 15        | Washer, Boot  | PB-293     |
|           | 21 Ft.  | 534JG6-21  | 16        | Grommet   | PB-294-2   |
|           | 26 Ft.  | 534JG6-26  | 17        | Cap, Enclosure  | PB-295     |
|           | 31 Ft.  | 534JG6-31  | 18        | "O" Ring  | X-6477-1   |
|           | 40 Ft.  | 534JG6-40  | 19        | Seal  | H-7851     |
|           | 66 Ft.  | 534JG6-66  | 20        | Screw   | H-2925     |
|           | Special PB Drop   | 534JG6-*   | 21        | Screw   | H-2992     |
| 2         | Rubber Grommet  | JF-761-1   | 22        | Screw   | H-2993     |
| 3         | Pushbutton Cable Assembly:  |            | 23        | Warning Tag   | PB-296     |
|           | PB Drop In Feet:  |            | 24        | Lock Washer   | H-4160     |
|           | 11 Ft.  | PB-309-11  | 25        | Jumper  | JF-940-III |
|           | 18 Ft.  | PBS-309-18 | 26        | Pushbutton (Trolley)                                    | PB-284-21  |
|           | 21 Ft.  | PBS-309-21 | 27        | Spacer  | 755J2      |
|           | 26 Ft.  | PBS-309-26 | 28        | Spring, Lower   | 344J5      |
|           | 31 Ft.  | PB-309-31  | 29        | Insulating Bushing                                      | 755J1      |
|           | 40 Ft.  | PBS-309-40 | 30        | Lower Contact   | 201J1      |
|           | 66 Ft.  | PBS-309-66 | 31        | Bushing   | 200J16     |
|           | Special PB Drop   | PBS-309-*  | 32        | Two-Speed Adapter                                       | PB-308     |
|           |   |            | 33        | Interlock (Red)   | PB-285     |
|           |   |            | 34        |   |            |

(\*Equal to P.B. Drop)

**FIGURE 7-8D. PUSHBUTTON  
(TWO SPEED HOIST, SINGLE SPEED TROLLEY;  
SINGLE SPEED HOIST, TWO SPEED TROLLEY)**

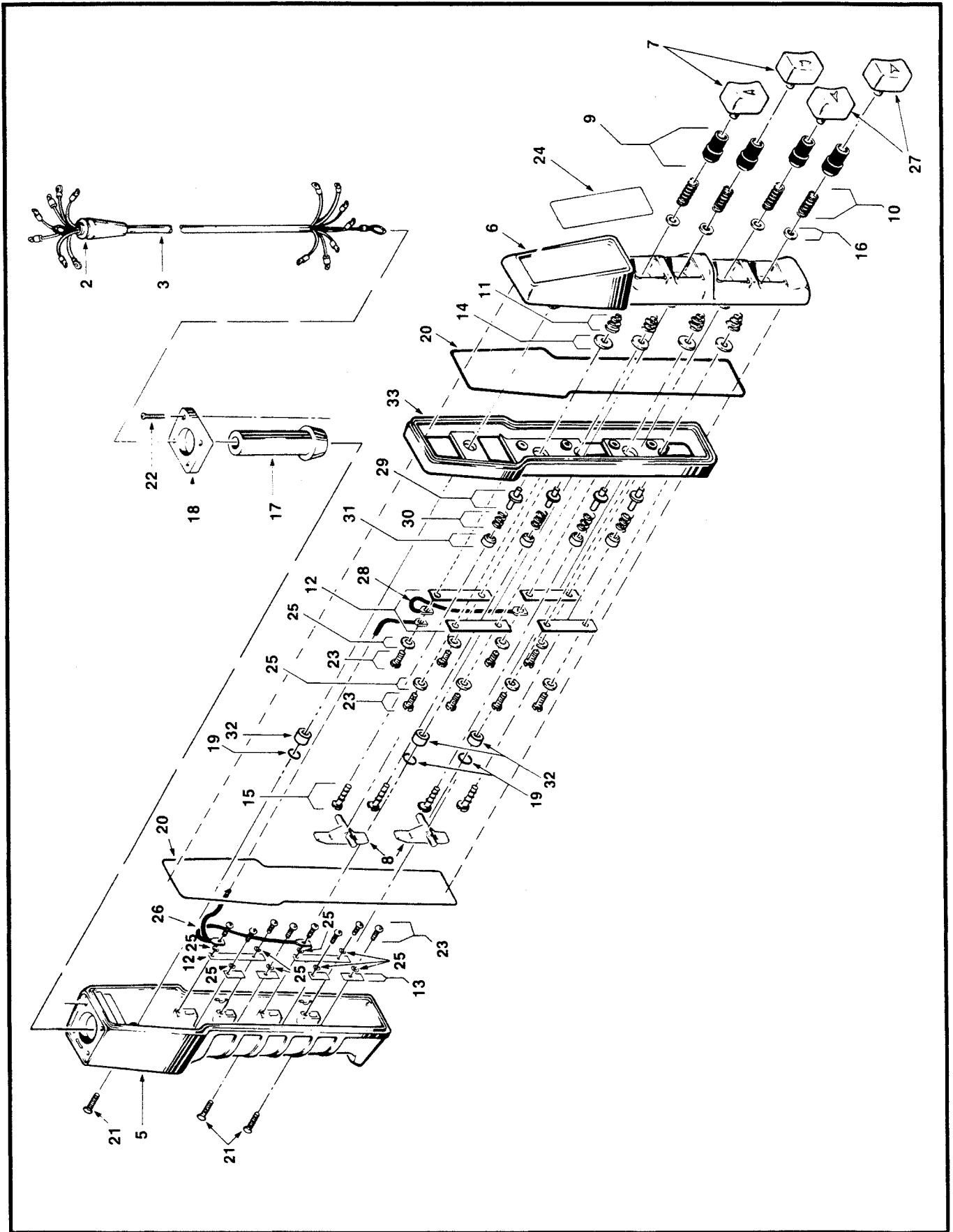
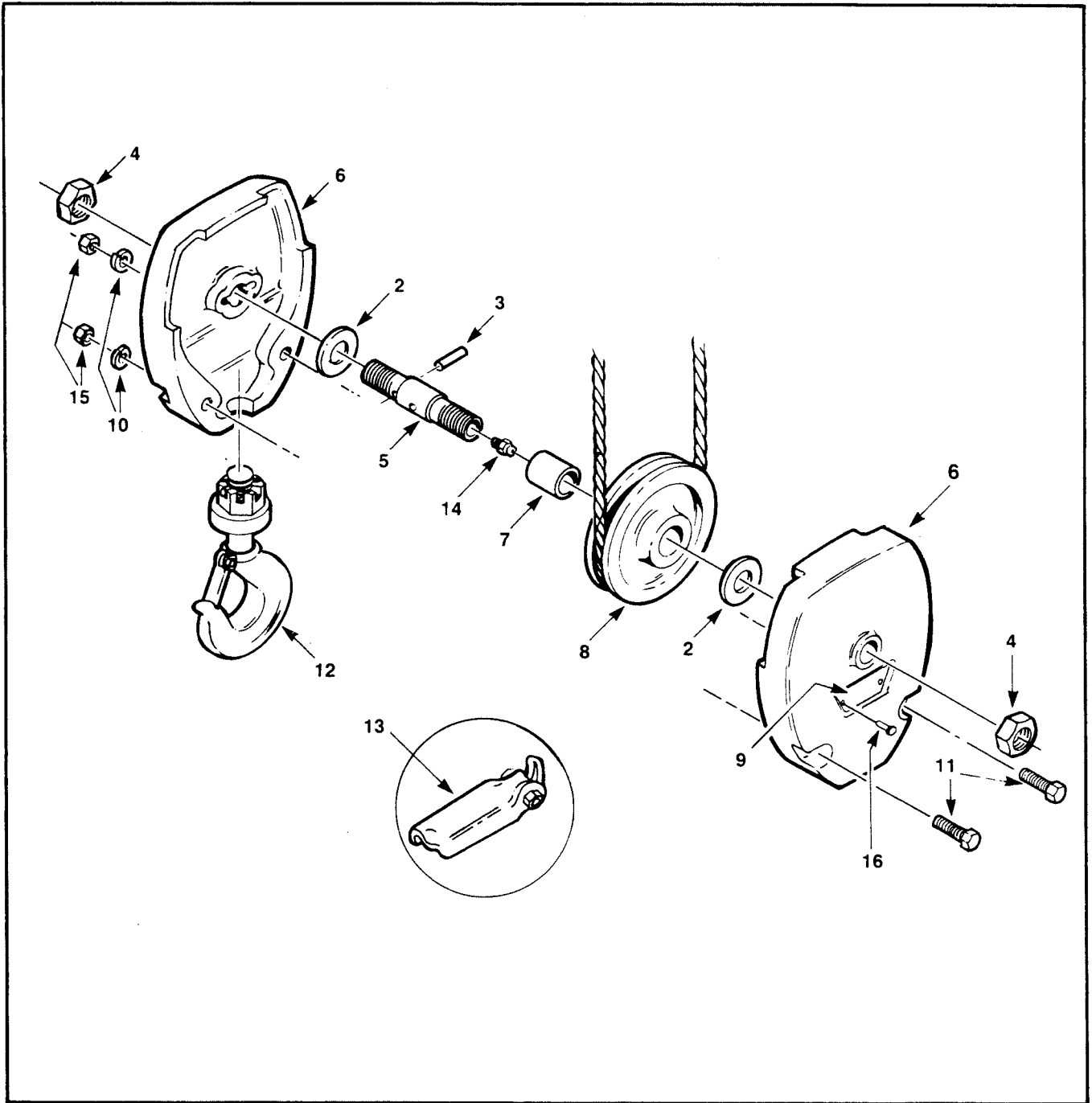


FIGURE 7-8E. PUSHBUTTON  
(TWO SPEED HOIST, TWO SPEED TROLLEY)

| Index No. | Part Name   | Part No.   | Index No. | Part Name                 | Part No.   |
|-----------|---|------------|-----------|---------------------------|------------|
| 1         | Pushbutton and Cable Assembly: (Consists of Index Nos. 2 thru 33) |            | 7         | Pushbutton (Hoist)        | PB-284-22  |
|           | PB Drop In Feet:  |            | 8         | Interlock                 | PB-285-1   |
|           | 11 Ft.  | 534JG7-11  | 9         | Boot                      | PB-286     |
|           | 18 Ft.  | 534JG7-18  | 10        | Spring, Compression       | PB-287     |
|           | 21 Ft.  | 534JG7-21  | 11        | Spring, Conical           | PB-288     |
|           | 26 Ft.  | 534JG7-26  | 12        | Contact Plate, Common     | PB-290     |
|           | 31 Ft.  | 534JG7-31  | 13        | Contact Plate             | PB-289     |
|           | 40 Ft.  | 534JG7-40  | 14        | Washer, Contact           | PB-291     |
|           | 66 Ft.  | 534JG7-66  | 15        | Screw                     | H-1852-P   |
|           | Special PB Drop   | 534JG7-*   | 16        | Washer, Boot              | PB-293     |
| 2         | Rubber Grommet  | JF-761-1   | 17        | Grommet                   | PB-294-2   |
| 3         | Pushbutton Cable Assembly:  |            | 18        | Cap, Enclosure            | PB-295     |
|           | PB Drop In Feet:  |            | 19        | "O" Ring                  | X-6477-1   |
|           | 11 Ft.  | PB-309-11  | 20        | Seal                      | H-7851     |
|           | 18 Ft.  | PBS-309-18 | 21        | Screw                     | H-2925     |
|           | 21 Ft.  | PBS-309-21 | 22        | Screw                     | H-2992     |
|           | 26 Ft.  | PBS-309-26 | 23        | Screw                     | H-2993     |
|           | 31 Ft.  | PB-309-31  | 24        | Warning Tag               | PB-296     |
|           | 40 Ft.  | PBS-309-40 | 25        | Lock Washer               | H-4160     |
|           | 66 Ft.  | PBS-309-66 | 26        | Jumper                    | JF-940-111 |
|           | Special PB Drop   | PBS-309-*  | 27        | Pushbutton (Trolley)      | PB-284-21  |
| 4         | Pushbutton Assembly: (Consists of Index Nos. 5 thru 33)           | 534JG7     | 28        | Jumper (Two-Speed Common) | JF-940-42  |
| 5         | Enclosure   | PB-282-4   | 29        | Insulating Bushing        | 755J1      |
| 6         | Cover   | PB-283     | 30        | Spring, Lower             | 344J5      |
|           |   |            | 31        | Lower, Contact            | 201J1      |
|           |   |            | 32        | Bushing                   | 200J16     |
|           |   |            | 33        | 2-Speed Adapter           | PB-308     |

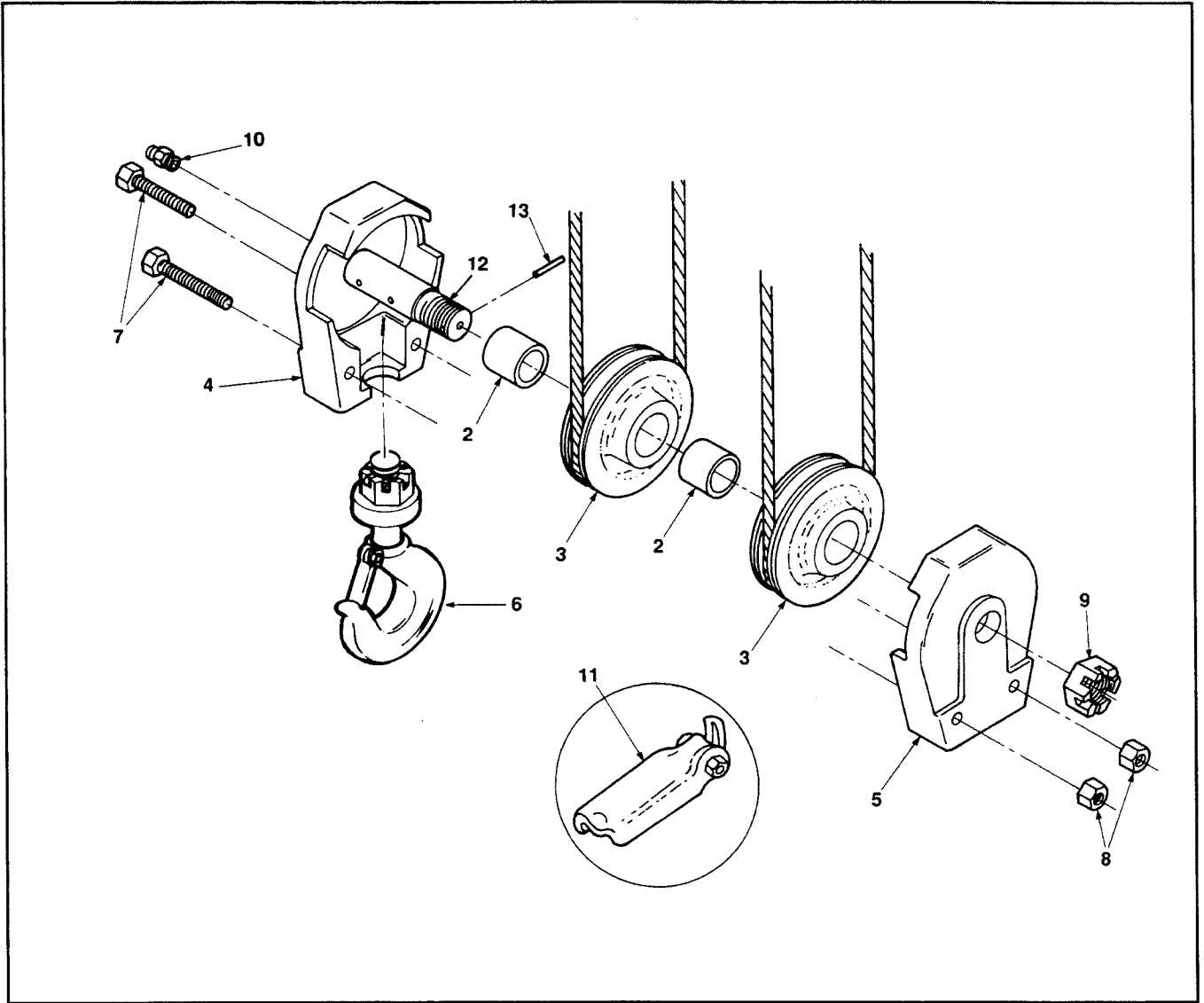
(\*Equal to P.B. Drop)

**FIGURE 7-8E. PUSHBUTTON  
(TWO SPEED HOIST, TWO SPEED TROLLEY)**



| Index No. | Part Name   | Part No. | Index No. | Part Name                        | Part No.         |
|-----------|---|----------|-----------|----------------------------------|------------------|
| 1         | Bottom Block Assembly<br>(Capacity Plate and<br>Drive Rivet Not Included) | 914JG17  | 9         | Capacity Plate<br>1 Ton<br>2 Ton | 675K28<br>675K30 |
| 2         | Washer  | CB-252-2 | 10        | Lock Washer                      | H-4063-P         |
| 3         | Driv-Lok Pin  | H-5211   | 11        | Screw                            | S44-45           |
| 4         | Lock Nut  | H-3940   | 12        | Hook Assembly with Latch         | 3JG14S           |
| 5         | Sheave Pin  | 122J9    | 13        | Latch Kit                        | H-7544           |
| 6         | Side Plate  | 30J18    | 14        | Grease Fitting                   | H-7818           |
| 7         | Bushing   | F-1-A    | 15        | Nut                              | H-3563           |
| 8         | Sheave  | 28J9     | 16        | Drive Rivet                      | H-2861-P         |

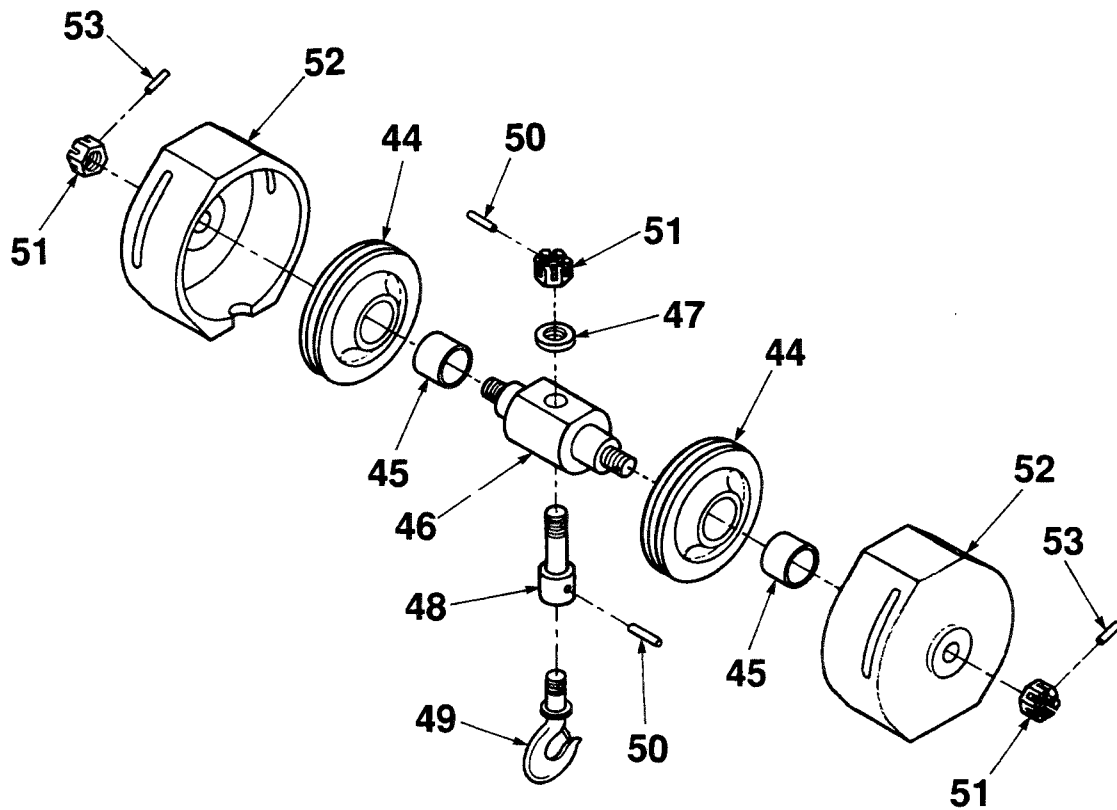
**FIGURE 7-9A. BOTTOM BLOCK (1 & 2 TON)  
STANDARD HEADROOM MODELS**



| Index No. | Part Name   | Page No. |
|-----------|---|----------|
| 1         | Bottom Block Ass'y<br>(Consists of Index Nos. 2-13) | 914JG22  |
| 2         | Bushing   | 530K10   |
| 3         | Sheave  | 28J13    |
| 4         | Bottom Block Half<br>(Grease Fitting Side)          | 30J22    |
| 5         | Bottom Block Half<br>(Nut Side)                     | 30J22-1  |
| 6         | Hook Assembly                                       | 3JG8S    |
| 7         | Screw   | H-2431   |
| 8         | Lock Nut  | H-3966P  |
| 9         | Slotted Nut   | H-3925P  |
| 10        | Grease Fitting                                      | SK974-32 |
| 11        | Latch Kit   | H-7545   |
| 12        | Sheave Pin  | 122J17   |
| 13        | Roll Pin  | H-5256   |

**FIGURE 7-9B BOTTOM BLOCK (3-TON)  
STANDARD HEADROOM MODELS**





| Item No. | Part Name   | Part No. |
|----------|---|----------|
| 43       | Bottom Block Ass'y.<br>(Consists of Index<br>No's. 44-53) | 914JG28  |
| 44       | Sheave  | 28J14    |
| 45       | Bushing   | 530K10   |
| 46       | Yoke  | 122J18   |
| 47       | Bearing   | CB-510   |
| 48       | Shank Ext.  | 124J10   |
| 49       | Hook & Latch  | 3J14S    |
| 50       | Pin   | H-5219   |
| 51       | Nut   | H-3922P  |
| 52       | Cover   | 30J23    |
| 53       | Pin   | H-5234   |

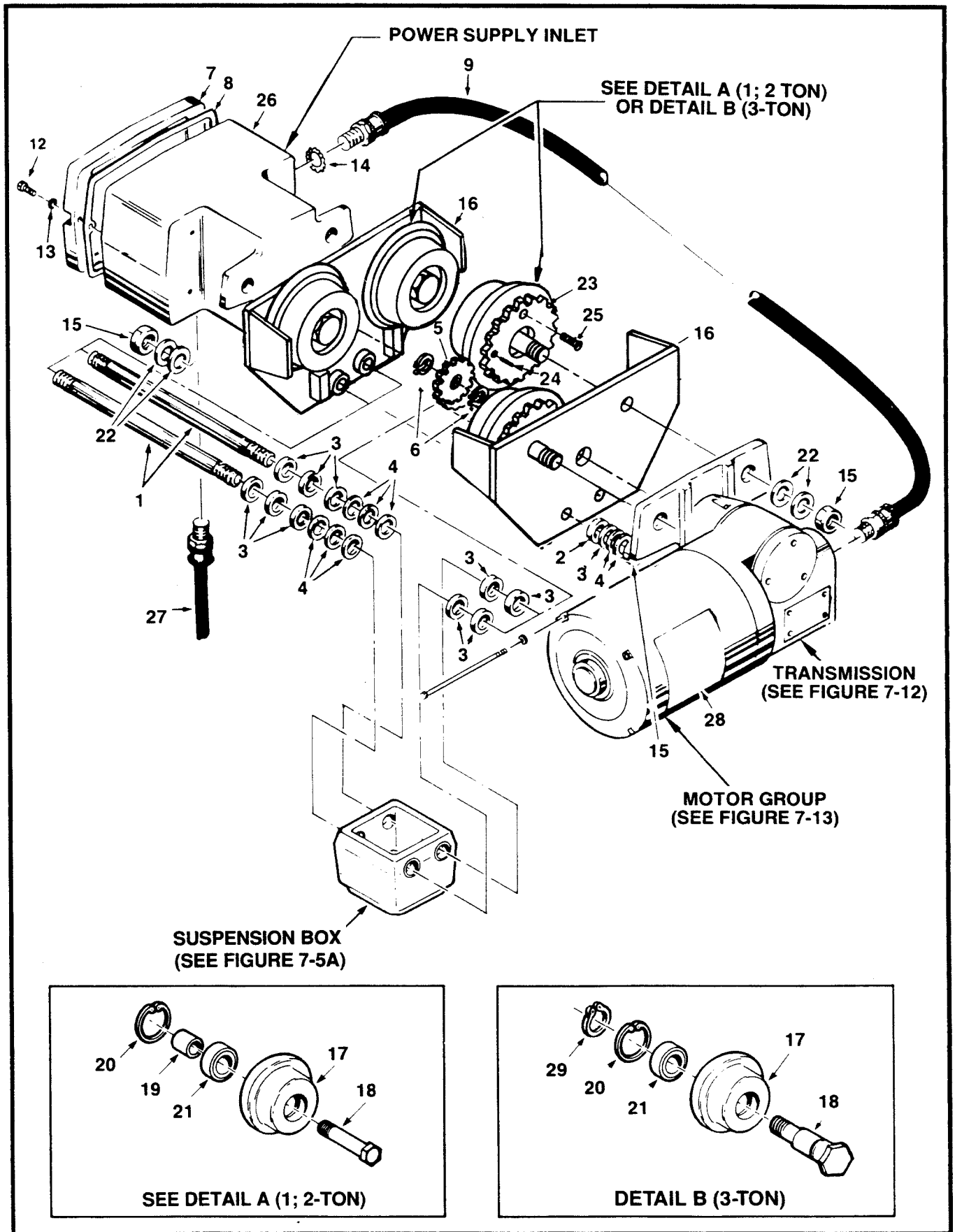
**FIGURE 7-9C BOTTOM BLOCK (1 & 2 TON)  
LOW HEADROOM & TRUE VERTICAL LIFT MODELS**



| <b>Index No.</b> | <b>Part Name</b>            | <b>Part No.</b>    |
|------------------|-----------------------------|--------------------|
| 1                | Load Pin                    | 103K1              |
| 2                | Washer (1/8 Thick)          | H-4211             |
| 3                | Washer (.135 Thick)         | H-4209             |
| 4                | Washer (.075 Thick)         | H-4210             |
| 5                | Pinion                      | 420K1              |
| 6                | Retaining Ring              | H-5501             |
| 7                | Tie Cable Assembly:         |                    |
|                  | 1 & 2-Ton, 22 Ft. Lift      | 955JG37            |
|                  | 1 & 2-Ton, 35 Ft. Lift      | 955JG30            |
|                  | 1 & 2-Ton, 44 Ft. Lift      | 955JG38            |
|                  | 3-Ton, 22 Ft. Lift          | 955JG38            |
|                  | Any Other Lift              | Consult<br>Factory |
| 8*               | Splice Cap                  | H-7519             |
| 9*               | Insulator, Splice Cap       | H-7520             |
| 10               | Nut, Elastic Stop           | H-3945             |
| 11               | Wheel:                      |                    |
|                  | Plain (1 & 2-Ton)           | 45K10              |
|                  | Plain (3-Ton)               | 45K20              |
|                  | Drive (1 & 2-Ton)           | 45K1               |
|                  | Drive (3-Ton)               | 45K2               |
| 12               | Axle:                       |                    |
|                  | 1 & 2-Ton                   | 102K1              |
|                  | 3-Ton                       | 102K2              |
| 13               | Spacer (1 & 2-Ton Only)     | 200K1              |
| 14               | Bearing:                    |                    |
|                  | 1 & 2-Ton                   | 500K4              |
|                  | 3-Ton                       | 500K5              |
| 15               | Retaining Ring:             |                    |
|                  | 1 & 2-Ton                   | H-5528             |
|                  | 3-Ton                       | H-5530             |
| 16               | Washer (1/8 Thick)          | H-4211             |
| 17               | Gear                        | 420K2              |
| 18               | Dowel Pin                   | H-5384             |
| 19               | Screw                       | H-1204             |
| 20               | Decal                       | 677J7              |
| 21               | Cable Connector             | H-7609             |
| 22               | Side Plate Weldment:        |                    |
|                  | 1 & 2-Ton                   | 5KG4               |
|                  | 3-Ton                       | 5KG31              |
| 23               | Retaining Ring (3-Ton only) | H-5529             |

\*Not Illustrated

**FIGURE 7-10A. TROLLEY GENERAL ASSEMBLY  
(SINGLE SPEED HOIST, SINGLE SPEED TROLLEY)**

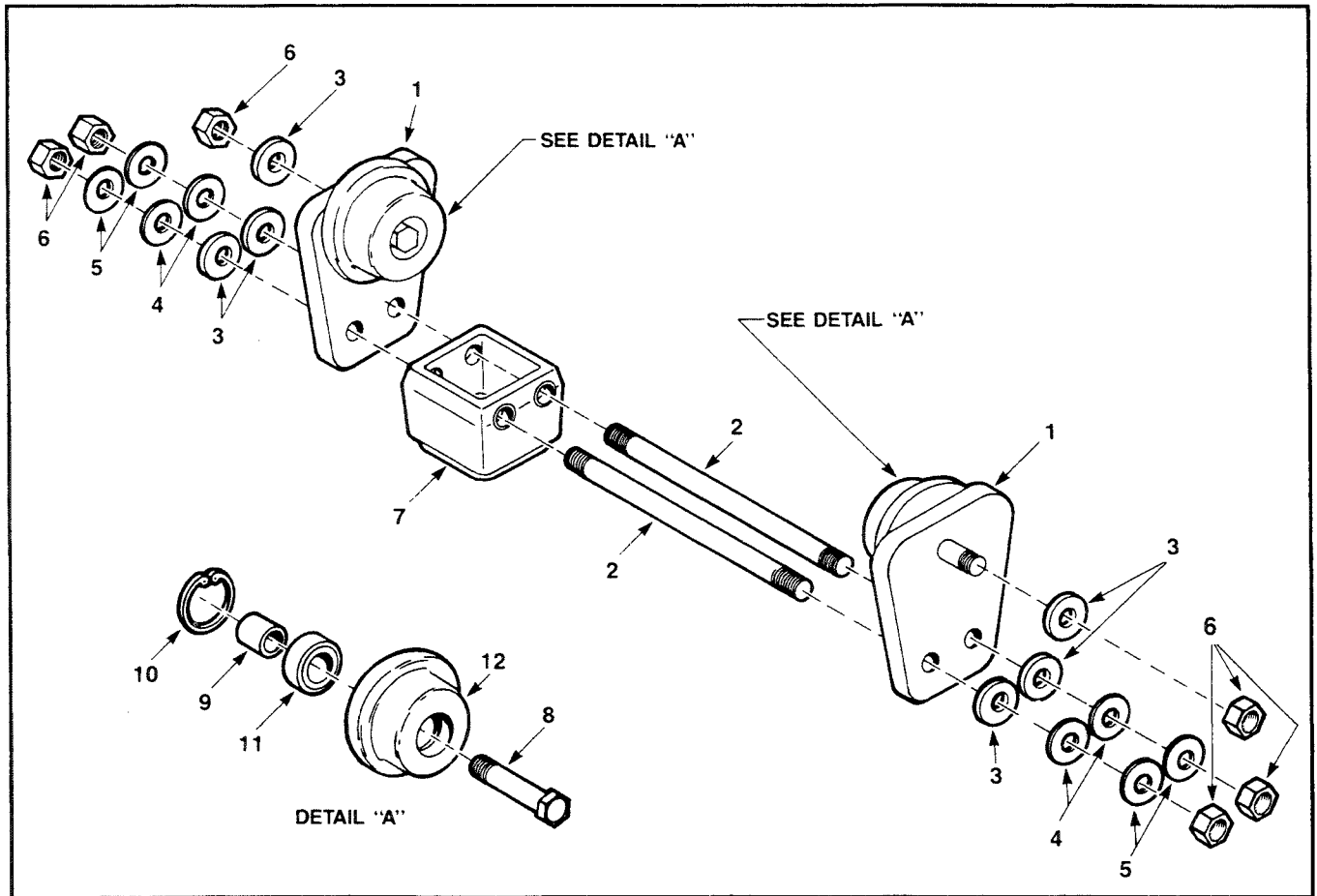


**FIGURE 7-10B. TROLLEY GENERAL ASSEMBLY  
(SINGLE SPEED HOIST, TWO SPEED TROLLEY,  
TWO SPEED HOIST, SINGLE SPEED TROLLEY,  
TWO SPEED HOIST, TWO SPEED TROLLEY)**

| Index No. | Part Name              | Part No. | Index No. | Part Name                   | Part No. |
|-----------|------------------------|----------|-----------|-----------------------------|----------|
| 1         | Load Pin               | 103K1    | 21        | Bearing:                    |          |
| 2         | Washer (1/8 Thick)     | H-4211   |           | 1 & 2-Ton                   | 500K4    |
| 3         | Washer (.135 Thick)    | H-4209   |           | 3-Ton                       | 500K5    |
| 4         | Washer (.075 Thick)    | H-4210   | 22        | Washer (1/8 Thick)          | H-4211   |
| 5         | Pinion                 | 420K1    | 23        | Gear                        | 420K2    |
| 6         | Retaining Ring         | H-5501   | 24        | Dowel Pin                   | H-5384   |
| 7         | Cover, Control Box     | 36K3     | 25        | Screw                       | H-1204   |
| 8         | Gasket                 | 560K4    | 26        | Control Box:                |          |
| 9         | Tie Cable Assembly:    |          |           | 1 & 2 Ton                   | 36K1     |
|           | Two Speed Hoist,       |          |           | 3-Ton                       | 36K2     |
|           | One Speed Trolley      | 955KG3   | 27        | Interconnection Cable       |          |
|           | One Speed or           |          |           | Assembly (1 & 2-Ton)        |          |
|           | Two Speed Hoist,       | 955KG4   |           | Two Speed Hoist, One Speed  |          |
|           | Two Speed Trolley      |          |           | Trolley (22 Ft. Lift)       | 954KG18  |
| 10*       | Splice Cap             | H-7519   |           | One Speed or Two Speed      |          |
| 11*       | Insulator, Splice Cap  | H-7520   |           | Hoist, Two Speed Trolley    |          |
| 12        | Screw                  | S-44-4   |           | (22 Ft. Lift)               | 954KG19  |
| 13        | Lock Washer            | H-4084-P |           | Two Speed Hoist, One Speed  |          |
| 14        | Lock Nut               | H-7569   |           | Trolley (35 Ft. Lift)       | 954KG20  |
| 15        | Nut, Elastic Stop      | H-3945   |           | One Speed or Two Speed      |          |
| 16        | Side Plate Weldment:   |          |           | Hoist, Two Speed Trolley    |          |
|           | 1; 2-Ton               | 5KG4     |           | (35 Ft. Lift)               | 954KG21  |
|           | 3-Ton                  | 5KG31    |           | Any Other Lift              | Consult  |
| 17        | Wheel:                 |          |           | Interconnection Cable       | Factory  |
|           | Plain (1; 2 Ton)       | 45K10    |           | Assembly (3-Ton):           |          |
|           | Plain (3-Ton)          | 45K20    |           | Two Speed Hoist, One Speed  |          |
|           | Drive (1; 2-Ton)       | 45K1     |           | Trolley (22 Ft. Lift)       | 955KG22  |
|           | Drive (3-Ton)          | 45K2     |           | One Speed or Two Speed      |          |
| 18        | Axle:                  |          |           | Hoist, Two Speed Trolley    | 955KG23  |
|           | 1; 2-Ton               | 102K1    |           | (22 Ft. Lift)               | Consult  |
|           | 3-Ton                  | 102K2    |           | Any Other Lift              | Factory  |
| 19        | Spacer (1; 2-Ton Only) | 200K1    |           | Decal                       | 677J7    |
| 20        | Retaining Ring:        |          | 28        | Retaining Ring (3-Ton only) | H-5529   |
|           | 1; 2-Ton               | H-5528   | 29        |                             |          |
|           | 3-Ton                  | H-5530   |           |                             |          |

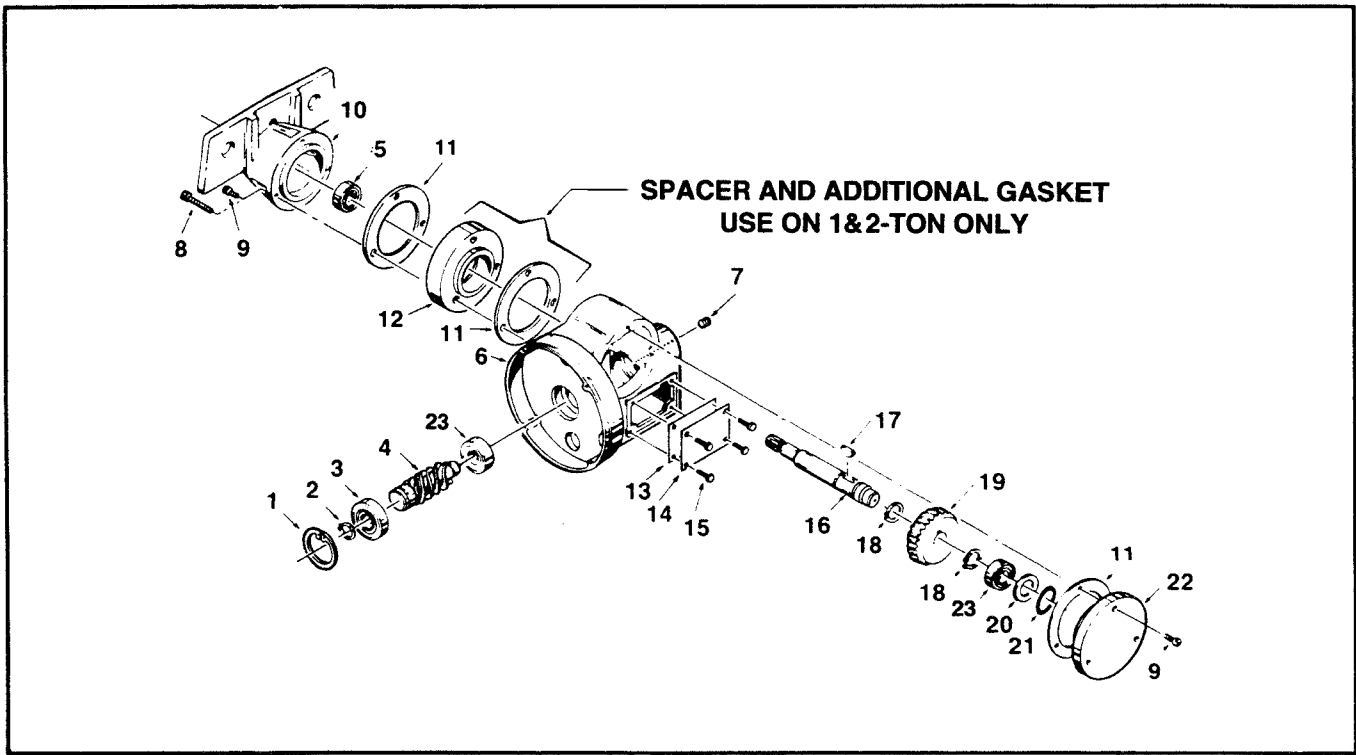
\*Not Illustrated

**FIGURE 7-10B. TROLLEY GENERAL ASSEMBLY  
(SINGLE SPEED HOIST, TWO SPEED TROLLEY,  
TWO SPEED HOIST, SINGLE SPEED TROLLEY,  
TWO SPEED HOIST, TWO SPEED TROLLEY)**



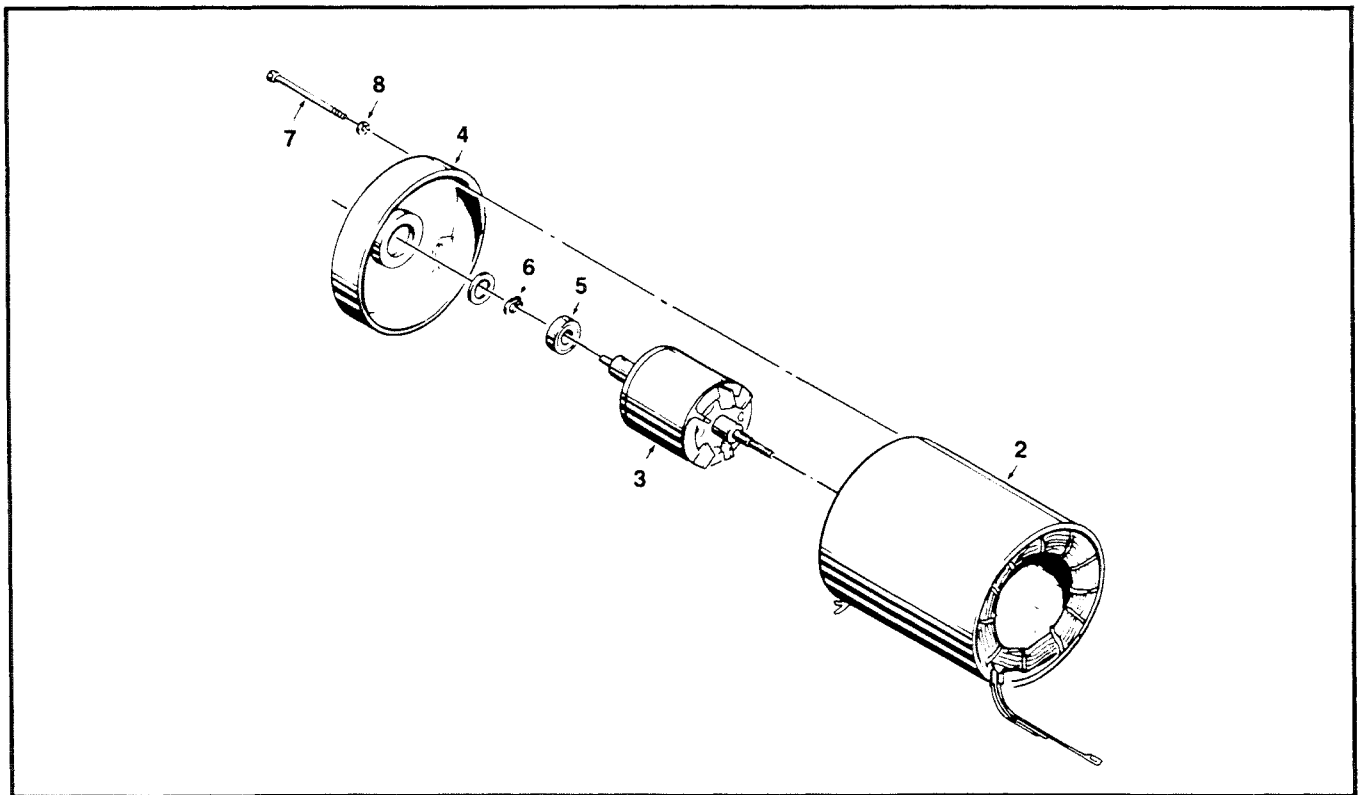
| Index No. | Part Name                                | Part No. | Index No. | Part Name      | Part No. |
|-----------|--|----------|-----------|----------------|----------|
| 1         | Side Plate                               | 5K56     | 8         | Axle           | 102K1    |
| 2         | Load Pin                                 | 103K1    | 9         | Spacer         | 200K1    |
| 3         | Washer ( $\frac{1}{8}$ Thick)            | H-4211   | 10        | Retaining Ring | H-5528   |
| 4         | Washer (.135 Thick)                      | H-4209   | 11        | Bearing        | 500K4    |
| 5         | Washer (.075 Thick)                      | H-4210   | 12        | Wheel          | 45K7     |
| 6         | Nut                                      | H-3945   |           |                |          |
| 7         | Suspension Box<br>(Ref. See Figure 7-5A) | 50J44A   |           |                |          |

**FIGURE 7-11. PLAIN TROLLEY  
(TWO WHEEL)**



| Index No. | Part Name                    | Part No. | Index No. | Part Name                     | Part No. |
|-----------|------------------------------|----------|-----------|-------------------------------|----------|
| 1         | Retaining Ring               | SK2658-6 | 12        | Spacer (Used on 1&2-Ton only) | 201K13   |
| 2         | Retaining Ring               | H-5549   | 13        | Gasket                        | 560K3    |
| 3         | Bearing                      | JF-504-2 | 14        | Splice Plate                  | 295K1    |
| 4         | Worm:                        |          | 15        | Screw                         | H-1009-P |
|           | 35 FPM                       | 485K21   | 16        | Shaft:                        |          |
|           | 75 FPM                       | 485K22   |           | 1&2-Ton                       | 100K13   |
| 5         | Bearing                      | 500K3    |           | 3-Ton                         | 100K12   |
| 6         | Gear Housing                 | 39K22    | 17        | Woodruff Key                  | S-23-15  |
| 7         | Plug                         | S-25-13  | 18        | Retaining Ring                | H-5527   |
| 8         | Screw (Used on 1&2-Ton only) | S-49-3   | 19        | Worm Gear:                    |          |
| 9         | Screw                        | H-2215   |           | 35 FPM                        | 487K4    |
| 10        | Adapter Housing:             |          |           | 75 FPM                        | 487K3    |
|           | 1&2-Ton                      | 38K60A   | 20        | Shim Washer                   | 202K1    |
|           | 3-Ton                        | 38K61A   | 21        | "O" Ring                      | H-5609   |
| 11        | Gasket                       | 560K2    | 22        | End Cap                       | 32K3     |
|           |                              |          | 23        | Bearing                       | 500K7    |

FIGURE 7-12. TROLLEY TRANSMISSION

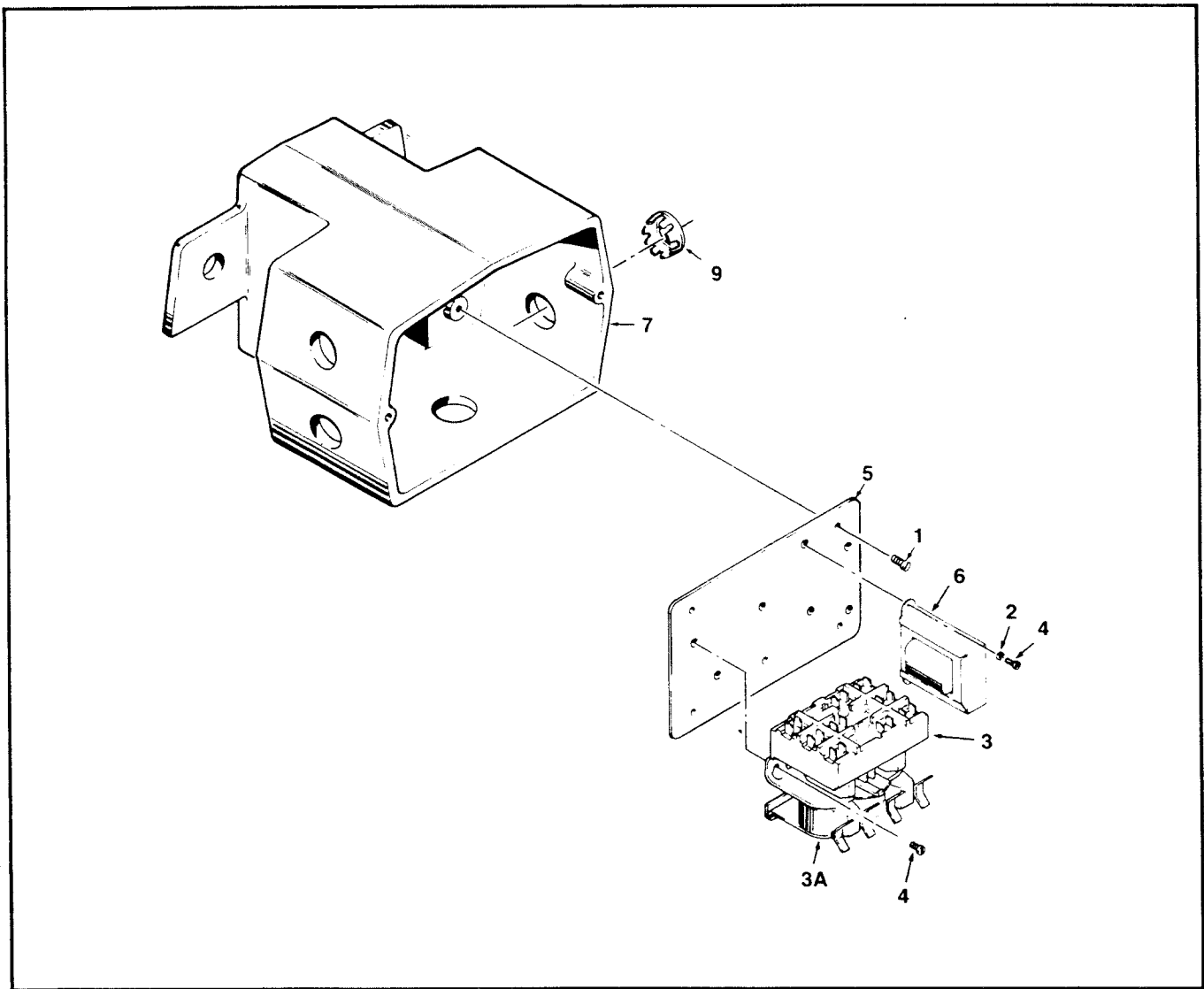


| Index No. | Part Name                    | Part No.  | Index No. | Part Name                         | Part No.   |
|-----------|------------------------------|-----------|-----------|-----------------------------------|------------|
| 1         | Motor Complete:              |           |           | (Two Speed,                       |            |
|           | (Single Speed, 35 FPM, ¼ HP) | JL-863-1M |           | 75/25 FPM, ½ HP)                  | JL-873-2M  |
|           | 208, 230/460V, 3 PH          | JL-863-5M |           | 208, 230V, 3 PH                   | JL-873-6M  |
|           | 575V, 3 PH                   |           |           | 460V, 3 PH                        | JL-873-10M |
|           | (Single Speed, 75 FPM, ½ HP) | JL-863-2  | 2         | 575V, 3 PH                        | *          |
|           | 208, 230/460V, 3 PH          | JL-863-6  | 3         | Stator (Not available separately) | *          |
|           | 575V, 3 PH                   |           | 4         | Rotor & Shaft                     | *          |
|           | (Two Speed,                  |           | 5         | End Shield                        | *          |
|           | 35/12 FPM, ¼ HP)             | JL-873-1M | 6         | Bearing                           | *          |
|           | 208, 230V, 3 PH              | JL-873-5M | 7         | Retaining Ring                    | *          |
|           | 460V, 3 PH                   | JL-873-9M | 8         | Screw, Motor Mount                | *          |
|           | 575V, 3 PH                   |           |           | Lock Washer                       | *          |

\*For individual motor parts, contact your Duff-Norton Distributor and supply complete motor nameplate data.

**FIGURE 7-13. TROLLEY MOTOR PARTS**

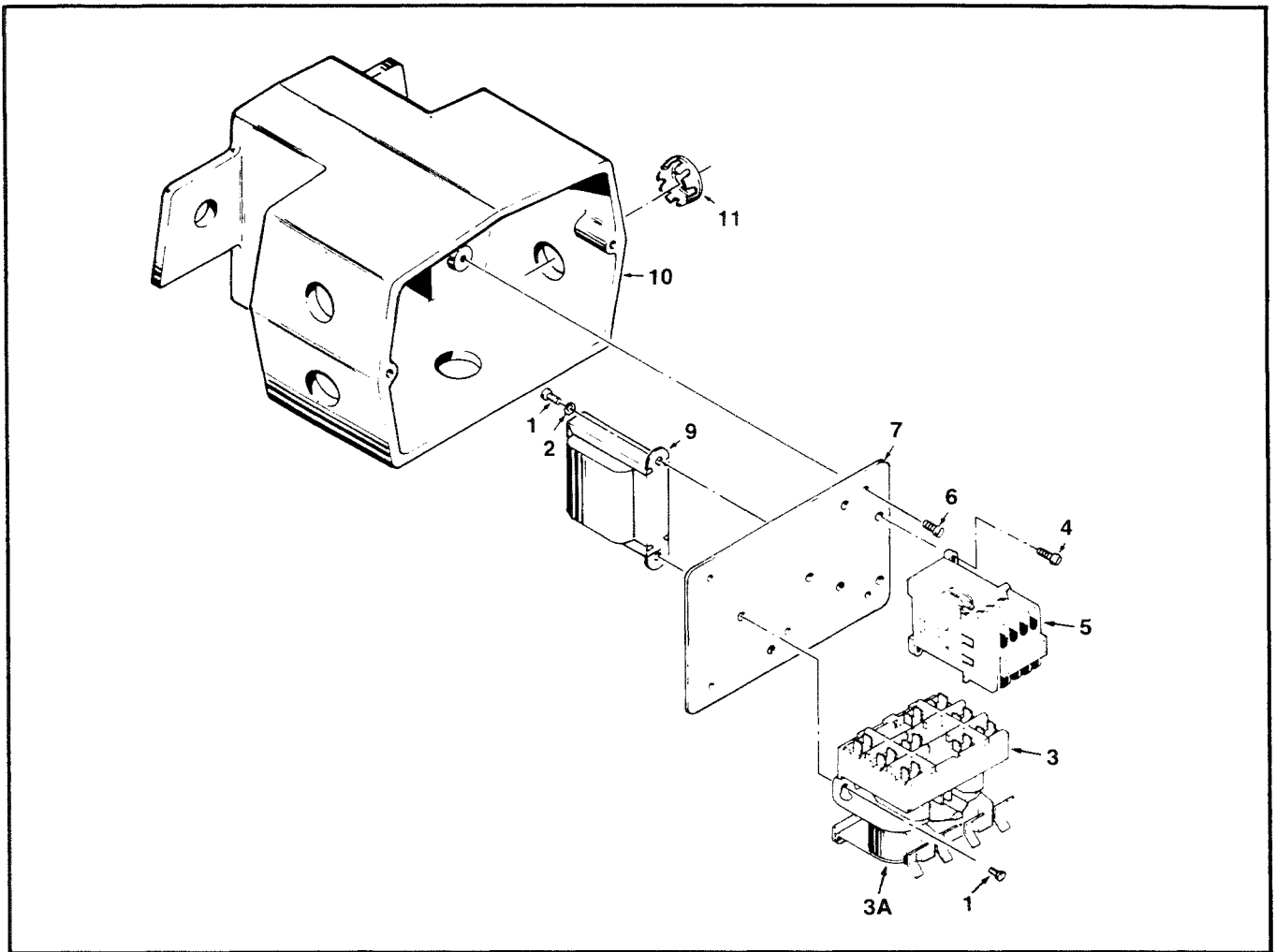




| Index No. | Part Name                  | Part No. | Index No. | Part Name            | Part No. |
|-----------|----------------------------|----------|-----------|----------------------|----------|
| 1         | Screw                      | H-1005-P | 6         | Transformer: (10 VA) |          |
| 2         | Lock Washer                | H-4158   |           | Pri. 208, 230/460V,  |          |
| 3         | Magnetic Reversing Switch: |          |           | Sec. 24V, 50/60 Hz   | JF-821-3 |
|           | 24V Control                | 820K2    |           | Pri. 208, 230/460V,  |          |
|           | 115V Control               | 820K317  |           | Sec. 115V, 50/60 Hz  | JF-821   |
| 3A        | Coil:                      |          |           | Pri. 575V,           |          |
|           | 24V                        | 820K301  |           | Sec. 24V, 50/60 Hz   | JF-821-9 |
|           | 115V                       | 820K302  |           | Pri. 575V,           |          |
| 3B*       | Replacement Contact Kit    |          |           | Sec. 115V, 50/60 Hz  | JF-821-2 |
|           | (Includes stationary and   |          | 7         | Control Box:         |          |
|           | movable contacts and       |          |           | 1; 2-Ton             | 36K1     |
|           | springs for one magnetic   |          |           | 3-Ton                | 36K2     |
|           | reversing switch)          | 820K300  | 8*        | Jumper Wire          | JF-940-7 |
| 4         | Screw                      | H-2751   | 9         | Hole Plug            | H-6286   |
| 5         | Panel Plate                | 257K267  |           |                      |          |

\*Not Illustrated

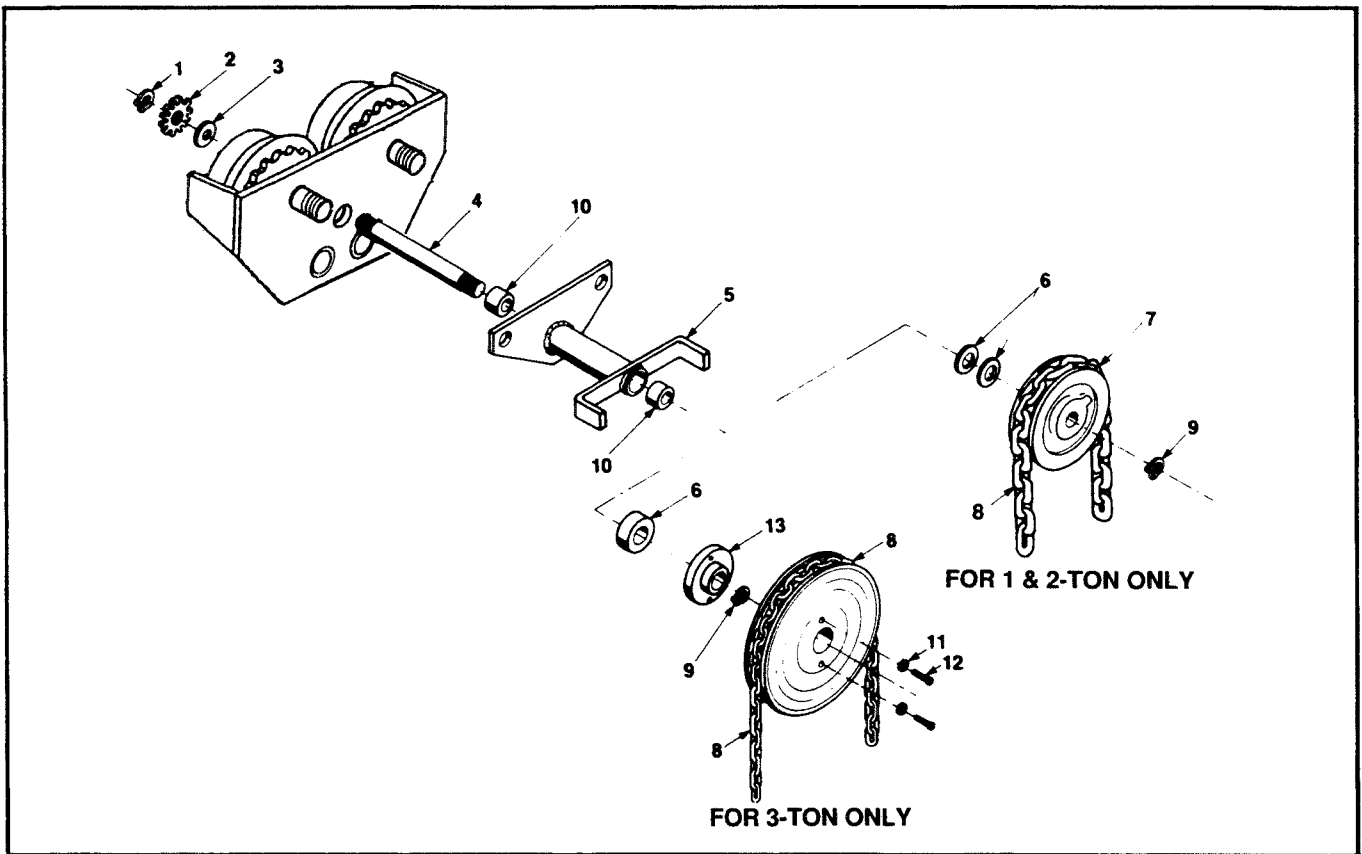
**FIGURE 7-14A. TROLLEY CONTROL, SINGLE SPEED  
(SINGLE SPEED TROLLEY, TWO SPEED HOIST)**



| Index No. | Part Name  | Part No.           | Index No. | Part Name   | Part No.               |
|-----------|--|--------------------|-----------|---|------------------------|
| 1         | Screw  | H-2751             | 6         | Screw   | H-1005-P               |
| 2         | Lock Washer  | H-4158             | 7         | Panel Plate   | 257K267                |
| 3         | Magnetic Reversing Switch:<br>24V Control<br>115V Control  | 820K2<br>820K317   | 8*        | Jumper Wire   | JF-940-7               |
| 3A        | Coil:<br>24V<br>115V   | 820K301<br>820K302 | 9         | Transformer: (20 VA)<br>Pri. 208, 230/460V,<br>Sec. 24V, 50/60 Hz<br>Pri. 208, 230/460V,<br>Sec. 115V, 50/60 Hz | JF-821-15<br>JF-821-17 |
| 3B*       | Replacement Contact Kit<br>(Includes stationary and<br>movable contacts and<br>springs for one magnetic<br>reversing switch) | 820K300            | 10        | Pri. 575V,<br>Sec. 24V, 50/60 Hz<br>Pri. 575V,<br>Sec. 115V, 50/60 Hz   | JF-821-16<br>JF-821-20 |
| 4         | Screw  | H-1901             |           | Control Box:<br>1; 2-Ton<br>3-Ton   | 36K1<br>36K2           |
| 5         | Speed Control Relay:<br>24V Control<br>115V Control  | 820J3<br>820J4     | 11        | Hole Plug   | H-6286                 |

\*Not Illustrated

**FIGURE 7-14B. TROLLEY CONTROL, TWO SPEED  
(TWO SPEED TROLLEY WITH ONE OR TWO SPEED HOIST)**



| Index No. | Part Name                    | Part No. | Index No. | Part Name                   | Part No. |
|-----------|------------------------------|----------|-----------|-----------------------------|----------|
| 1         | Retaining Ring               | H-5501   | 7         | Hand Chain Wheel:           |          |
| 2         | Pinion                       | 420K1    |           | 1 & 2-Ton                   | 33K23    |
| 3         | Spacer Bearing (1/16 Thick)  | 525K2    |           | 3-Ton                       | 33K13    |
| 4         | Gear Shaft                   | 100K14   | 8         | Hand Chain (Specify length) | 53A      |
| 5         | Sleeve and Adapter Assembly: |          | 9         | Retaining Ring              | H-5527   |
|           | 1 & 2-Ton                    | 51KG1    | 10        | Sleeve Bushing              | 530K6    |
|           | 3-Ton                        | 51KG2    | 11        | Washer                      | H-4138   |
| 6         | Spacer Bearing (1/8 Thick)   | 525K1    | 12        | Bolt                        | H-2304   |
|           |                              |          | 13        | Hub Adapter                 | 51K4     |

**FIGURE 7-16. GEARED TROLLEY**

# COFFING<sup>®</sup> HOISTS

## WARRANTY

**E**very hoist is thoroughly inspected and tested prior to shipment from the factory. Should any problem develop, return the complete hoist prepaid to your nearest Coffing Hoists Authorized Warranty Repair Station. If inspection reveals that the problem is caused by defective workmanship or material, repairs will be made without charge and the hoist will be returned, transportation prepaid. This warranty does not apply where: **(1)** deterioration is caused by normal wear, abuse, improper or inadequate power supply, eccentric or side loading, overloading, chemical or abrasive actions, improper maintenance, or excessive heat; **(2)** problems resulted from repairs,

modifications, or alterations made by persons other than factory or Coffing Authorized Warranty Repair Stations personnel; **(3)** the hoist has been abused or damaged as a result of an accident; **(4)** repair parts or accessories other than those supplied by Coffing Hoists are used on the hoist. Equipment and accessories not of the seller's manufacture are warranted by the manufacturer.

**Except as stated herein, Coffing Hoists makes no other warranties, express or implied, including warranties or 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.

**Coffing Hoists • Country Club Road • P.O. Box 779 • Wadesboro, NC 28170 USA**  
**Customer Service: Tel. (800) 477-5003 (704) 694-2156 • FAX (800) 374-6853 (704) 694-6829**