

# Duff-Norton

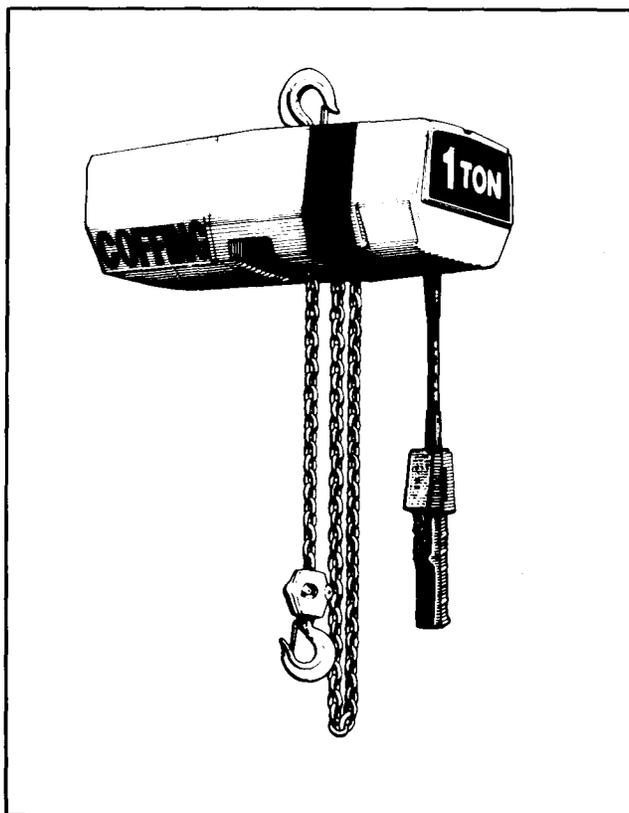
## OPERATING & MAINTENANCE INSTRUCTIONS

WITH PARTS LISTS

PUBLICATION PART NO. EC-680-4

## COFFING<sup>®</sup> HOISTS

### ELECTRIC CHAIN HOISTS



For Model Nos.

EC-0516	EC-2008
EC-0532	EC-2012
EC-0564	EC-2016
EC-1009	EC-4006
EC-1016	EC-4008
EC-1032	EC-6005

### IMPORTANT — CAUTION

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

### WARNING

The equipment shown in this manual is intended for industrial use only and should not be used to lift, support, or otherwise transport people, or to suspend unattended loads over people.

**TABLE OF CONTENTS**

**PAGE**

<b>SECTION I</b>	<b>INTRODUCTION</b>	
1-1	General Information	3
1-2	Safety Standards	3
1-3	Hoist Construction and Features	3
1-4	Basic Hoist Data	3
1-5	Application Information	3
1-6	Warranty	3
<b>SECTION II</b>	<b>INSTALLATION</b>	
2-1	Safety Notes	4
2-2	Hanging the Hoist	4
2-3	Power Supply Connection	4
2-4	Vent Plug	4
2-5	Chain Lubrication	4
2-6	Testing	4
2-7	Trolley Installation	4-5
2-8	Chain Container Installation	6
<b>SECTION III</b>	<b>OPERATION</b>	
3-1	General	6
3-2	Safety Notes	6
3-3	Handling The Load	6
3-4	Overload Limiting Protection	7
<b>SECTION IV</b>	<b>INSPECTION</b>	
4-1	General	7
4-2	Frequent Inspection	7
4-3	Periodic Inspection	7
4-4	Load Brake Function Check	9
4-5	Chain Inspection	9-10
4-6	Hook Throat Opening	10
<b>SECTION V</b>	<b>MAINTENANCE AND REPAIR</b>	
5-1	General	10
5-2	Limit Switch Adjustment	10-11
5-3	Motor Brake Adjustment	11
5-4	Top Suspension Removal and Replacement	11
5-5	Chain Replacement	12
5-6	Lubrication	12-13
<b>SECTION VI</b>	<b>TROUBLESHOOTING</b>	
6-1	General	14-15
<b>SECTION VII</b>	<b>WIRING</b>	
7-1	Voltage Conversion	16
7-2	Wiring Diagrams	16-18
<b>SECTION VIII</b>	<b>ILLUSTRATED PARTS LISTS</b>	
8-1	General	19
8-2	How to Use the Parts List	19
8-3	How to Order Replacement Parts	19
FIGURE 8-1	Basic Hoist	20
FIGURE 8-2	Suspension Assembly Kits	22
FIGURE 8-3A	Motor Parts (Three Phase)	24
FIGURE 8-3B	Motor Parts (Single Phase)	25
FIGURE 8-4A	Controller Area (Single Speed)	26
FIGURE 8-4B	Controller Area (Two Speed)	27
FIGURE 8-5	Transmission	28
FIGURE 8-6	Chaining Parts	30
FIGURE 8-7A	Bottom Block (1/4 & 1/2-ton)	32
FIGURE 8-7B	Bottom Block (1-ton)	32
FIGURE 8-7C	Bottom Block (Double Chain)	32
FIGURE 8-7D	Bottom Block (Triple Chain)	32
FIGURE 8-8A	Standard Limit Switch Parts	34
FIGURE 8-8B	Long Lift Limit Switch Parts	35
FIGURE 8-9	Motor Brake Parts	36
FIGURE 8-10A	Pushbutton (Single Speed Hoist)	38
FIGURE 8-10B	Pushbutton (Two Speed Hoist)	40
FIGURE 8-11	Chain Container Parts	42
<b>SECTION IX</b>	<b>DO'S AND DO NOT'S</b>	43

## SECTION I

## INTRODUCTION

**1-1. General Information**

This manual provides information for the safe operation and maintenance of Coffing® EC-1 Series Hoists. All persons operating or maintaining these hoists should be familiar with the information contained herein. Adherence to the precautions, procedures, and maintenance practices described should ensure long reliable operation. Suggestions for improvements to this manual are solicited.

**1-2. Safety Standards**

All persons concerned with the installation, operation, inspection and maintenance of these hoists are urged to read American National Standard (ANSI) B30.16. That Standard contains valuable guidelines concerning practices designed to minimize hazards associated with the use of overhead hoisting equipment. ANSI B30.16 also contains detailed procedures for establishing hoist inspection and maintenance programs and can be of significant assistance in maintaining compliance with OSHA regulations.

**1-3. Hoist Construction and Features**

Strong, lightweight aluminum alloy die castings provide a compact, protective enclosure for the mechanical and electrical components of Coffing® EC-1 Series Hoists. Heat treated alloy steel gearing operates in an oil bath to provide the most reliable lubrication and effective heat dissipation.

EC-1 Series Hoists incorporate the following features:

- a. Overload limiting clutch.
- b. Completely independent mechanical and electrical brakes.
- c. Adjustable limit switches.
- d. Tough, nylon weatherproof pushbutton stations.
- e. Steel strain cable inside pushbutton cord.
- f. Transformer isolated, low-voltage pushbutton controls.
- g. Quick voltage conversion on dual-voltage units.

**TABLE 1-1. BASIC HOIST DATA**

Model No.	Rated Load (lb)	Lift Speed at Rated Load (ft per min)	Motor HP
EC-0516	500	16	¼
EC-0532	500	32	½
EC-0564	500	64	1
EC-1009	1000	9	¼
EC-1016	1000	16	½
EC-1032	1000	32	1
EC-2008	2000	8	½
EC-2012	2000	12	¾
EC-2016	2000	16	1
EC-4006	4000	6	¾
EC-4008	4000	8	1
EC-6005	6000	5	1

**1-4. Basic Hoist Data**

The basic hoist models covered by this manual are listed in Table 1-1.

**1-5. Application Information**

This hoist is intended for general industrial use in the lifting and transporting of freely suspended material loads within its rated load. Prior to installation and operation, the user should review his application for abnormal environmental or handling conditions and to observe the applicable recommendations as follows:

- a. **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  $-10^{\circ}\text{F}$  or above  $130^{\circ}\text{F}$ .
- b. **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 fail-safe redundant supporting devices which are not incorporated into this hoist.
- c. **Lifting of Guided Loads** This hoist is not recommended for use in the lifting of guided loads, including dumbwaiters and non-riding 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.

**1-6. 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.

## SECTION II

### INSTALLATION

#### 2-1. Safety Notes

- a. Inspect the hoist for any evidence of shipping damage or loose parts.
- b. The supporting structure and load attaching devices should have a load rating at least equal to that of the hoist.
- c. This hoist is not suitable for use in uncovered outdoor locations or areas containing explosive dust, vapors or gases.
- d. The installation area must provide safe operating conditions for the operator, including sufficient room for the operator and other personnel to stand clear of the load at all times.
- e. In areas where slack chain hanging from the hoist may create a hazard, use a chain container (see Figure 2-2).

#### 2-2. Hanging the Hoist

Hook mounted hoists can be used with a variety of trolleys or stationary hangers. It is recommended that a hand-gear or motorized trolley be used when the pulling effort required to move the hoist exceeds 100 pounds or when the application requires frequent movement of the hoist.

- a. Make sure that the hook latch closes after hanging the hoist.
- b. The standard top hook is restrained from rotation by a plate and two screws. The hook can be made to swivel freely by removing the plate, or can be rotated 90° and fixed in that position.
- c. See Figure 2-1 for instructions on adjusting lug-mounted plain trolleys.
- d. Refer to Coffing Motorized Trolley Operating and Maintenance Instructions manual for motorized trolley installation instructions.

#### 2-3. Power Supply Connection

- a. Disconnect power before making connections.
- b. Voltage supplied to the hoist should be within plus or minus 10% of the voltage specified for the hoist. Hoists are tagged at the factory with a tag indicating the voltage for which the hoist is wired. Standard single phase hoists are convertible from 115 to 230 volts. Standard single speed, three phase hoists are convertible from 460 volts to 230 volts. See the Wiring section (paragraph 7-1) for voltage conversion instructions.
- c. National Electrical Code (ANSI C1) and local electrical codes should be consulted and proper disconnects, branch circuit protectors, and wiring provided.
- d. Power cables furnished with the hoist have a green colored ground wire which must be securely connected to the electrical system ground.

- e. When installing a three-phase hoist, make only temporary connections at the power line. Push the "UP" button and observe the direction of the hook. If it raises, the phasing is correct and permanent connections may be made at the power line. If the load block lowers when the "UP" button is pushed, release the button immediately since the limit switches will not operate to protect the hoist from over-travel. Reverse the red and black wires at the power line connection to correct the hook direction.

#### CAUTION

**Do not change connections in the hoist or the pushbutton assembly.**

#### 2-4. Vent Plug

This hoist has an oil-bath transmission. For shipping purposes, a non-vented fill plug (24, Figure 8-1) was installed at the factory. A vented plug is located in an envelope tied to one of the hoist end covers and must be installed in place of the non-vented shipping plug before operating the hoist.

#### 2-5. Chain Lubrication

The hoist chain should be liberally oiled before placing the hoist into operation. For lubrication instructions, see paragraph 5-6.a.

#### 2-6. Testing

- a. Before placing the hoist into operation, check for proper limit switch operation. Push the "UP" button and verify that the hook block stops at least 2 inches from the bottom of the hoist. Run the hoist down to its lower limit. At least 12 links of chain should remain on the slack end. If either switch is not correct, adjust according to the procedure outlined in paragraph 5-2.

#### NOTE

The upper and lower limit switches are factory set to provide the maximum allowable hook travel. **This travel adjustment should not be increased.** However, the switches may be adjusted to stop the hook sooner at either end of its travel.

- b. Attach a light load to the hook and check the hoist for proper operation. The load should stop without noticeable drift when the pushbutton is released. Increase the load to near rated load. The hoist should still lift the load without hesitation and stop with no more than one inch drift.

#### 2-7. Trolley Installation

Coffing® CT Series trolleys can be mounted on American Standard I Beams from 6 to 18 inches high. Adjustment for different beam dimensions is accomplished with the proper placement of spacer washers as described below in paragraph 2-7.a.

a. **"I"-Beam Adjustment.** Adjustment for "I" beam sizes and tolerances is accomplished by locating the spacer washers as shown in Figure 2-1. Normal placement of washers is given in Table 2-2. Refer to Table 2-1 for identification of part names and numbers.

BEAM MANUFACTURING TOLERANCES ALLOW WIDE VARIATIONS FROM HANDBOOK FLANGE WIDTHS, AND SLIGHT CHANGES TO RECOMMENDED WASHER DISTRIBUTION MAY BE NECESSARY TO SUIT SPECIFIC INSTALLATIONS.

The particular beam on which your hoist is to be installed should be measured and trolley spacer washers adjusted as required to achieve a clearance of  $\frac{3}{32}$ " to  $\frac{1}{8}$ ".

b. **Periodic Inspection.** The trolley should be inspected periodically for evidence of excess wear or overload. Parts should be replaced as required.

c. **Lubrication.** Trolley wheels are equipped with sealed, lifetime lubricated, precision ball bearings which should not require lubrication for the normal service of the trolley.

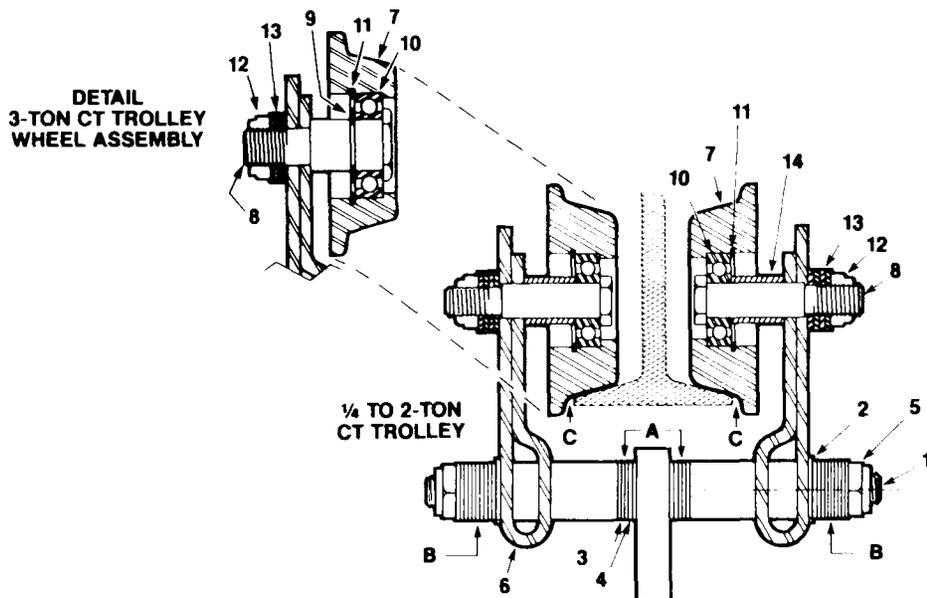


FIGURE 2-1. COFFING CT TROLLEY

TABLE 2-1. PARTS LIST FOR CT TROLLEY

INDEX NO.	PART NAME	PART NUMBERS	
		¼ TO 2-TON	3-TON
1	Load Pin	103K1	103K1
2	Washer (1/8" Thick)	H-4211	H-4211
3	Washer (.135" Thick)	H-4209	H-4209
4	Washer (.075" Thick)	H-4210	H-4210
5	Nut	H-3945	H-3945
6	Side Plate	5K1	5K2
7	Wheel	45K1	45K2

INDEX NO.	PART NAME	PART NUMBERS	
		¼ TO 2-TON	3-TON
8	Axle	102K1	102K2
9	Retaining Ring	Not Req.	H-5530
10	Bearing	500K4	500K5
11	Retaining Ring	H-5528	H-5529
12	Nut (Axle)	H-3945	H-3946
13	Washer	H-4211	H-4212
14	Spacer	200K1	Not Req.

TABLE 2-2. TROLLEY I-BEAM ADJUSTMENT DATA

I-Beam* Size & Weight	Flange Width	Point A Washers Between Susp. Lug & Sleeve		Point B Washers Between Sideplate & Nut		Actual Spacing Susp. Lug to Sleeve	Point C Clearance Wheel to Beam
		.135 Thick	.075 Thick	.135 Thick	.075 Thick		
		6"-12.5 #	3.330	1	0		
6"-17.25 #	3.565	2	0	7	5	.270	.135
8"-18.4 #	4.000	3	1	6	4	.480	.125
8"-23.0 #	4.171	3	2	6	3	.555	.115
10"-25.4 #	4.660	6	0	3	5	.810	.125
10"-35.0 #	4.944	7	0	2	5	.945	.118
12"-31.8 #	5.000	5	4	4	1	.965	.110
12"-35.0 #	5.078	7	1	2	4	1.021	.126
15"-42.9 #	5.500	9	0	0	5	1.215	.110
15"-50.0 #	5.640	9	1	0	4	1.290	.115
18"-54.7 #	6.000	8	5	1	0	1.460	.107
18"-70.0 #	6.250	9	5	0	0	1.590	.111

\*American Standard I-Beam

NOTE: All dimensions are in inches unless otherwise specified.

## 2-8. Chain Container Installation

- Operate hoist in "down" direction until it is stopped by the limit switch. Disconnect the slack end of the chain from the hoist by using a small screwdriver to slide the spring-loaded pin to the left. At least 8 inches of chain should hang from the hoist. If less than 8 inches of slack chain is present, readjust lower limit switch using the procedures detailed in paragraph 5-2.
- Slide the spring-loaded pin aside and slip the mounting arm into the slot until the pin fits through the hole in the plate (see Figure 2-2). Be sure pin passes completely through plate and into the opposite housing.
- Use the two hex washer head screws provided to fasten the two remaining hanger chains into the notches on the lower edges of the hoist housings.
- Be sure the end of the chain is started into the container. Run hoist up until the hook block is even with the bottom of the chain container.
- Reset upper limit switch at this position (see procedure, paragraph 5-2) to prevent the possibility of raising a load into the chain container.

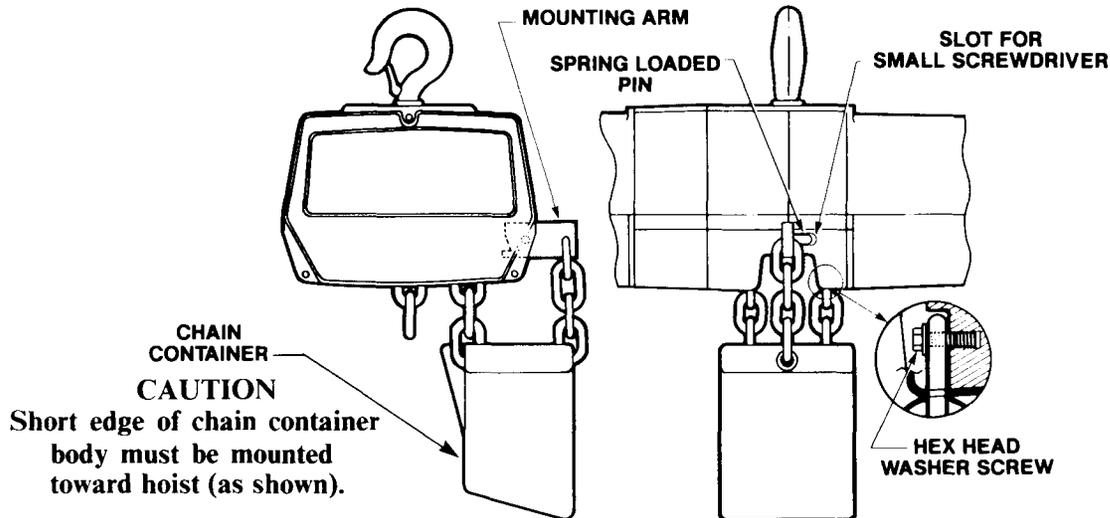


FIGURE 2-2. CHAIN CONTAINER INSTALLATION

## SECTION III OPERATION

### 3-1. General

This section presents information concerning the proper operation of the Coffing® Electric Chain Hoist. It is not intended to serve as a handbook on rigging. Rigging, the process of moving heavy loads using mechanical devices, requires special knowledge and equipment. For information on the safe use of slings and similar rigging gear, users are urged to consult a textbook on rigging.

### 3-2. Safety Notes

- Inspect the hoist for any sign of loose, broken, or malfunctioning parts (see Section IV). Any malfunctioning hoist should be tagged as "out of order" and removed from service until the defect is corrected.
- Before starting the hoist, the operator should be certain that all personnel are clear.
- Do not lift more than the rated load of the hoist.
- Do not lift people or loads over people.
- Avoid jogging controls or quick reversals of suspended loads.
- Do not leave a suspended load unattended.
- The operator should have a clear view of the load

anytime it is moving and should be sure that the load does not contact any obstructions.

- Read ANSI B30.16 Safety Standard for Overhead Hoists.

### 3-3. Handling The Load

- Align hoist directly over load. Avoid side pull.
- The hoist chain should not be wrapped around the load. Use proper slings.
- Be sure there are no twists in the load chain as it enters the hoist.

### CAUTION

This condition should be constantly checked on double or triple chain hoists because it is possible for the load block to be "capsized" or flipped over one or more times, putting twist in the chain. The presence of twist may not be obvious when the hook block is in the lowered position but can cause serious chain binding when the hook block is in its fully raised position.

- Bring the hook into engagement with the load and make sure it is well seated before proceeding to lift

the load. On multiple reeved hoists, be sure that the load is equalized on all supporting chains.

- e. Lift the load just clear of its supports and stop the hoist to check for proper brake operation.
- f. Avoid letting the hook or load swing excessively while moving a trolley suspended hoist.

### 3-4. Overload Limiting Protection

This hoist is equipped with a factory-calibrated overload limiting clutch, which will permit the lifting of loads within its load rating, but will prevent the lifting of damaging overloads while the hoist is being operated. If the load being lifted exceeds the lifting capability of the overload clutch, the hoist motor will continue to

run, causing overheating of both the clutch and the motor. This condition should be avoided by immediately releasing the "UP" button and reducing the load to within the hoist load rating.

### CAUTION

**The overload limiting clutch is an emergency protective device and should not be used to measure the maximum load to be lifted, or to sense the overload imposed by a constrained load. Manufacturing tolerances require that the clutch be set somewhat above the load rating of the hoist. The fact that the hoist will pick up loads in excess of its load rating does not in any way sanction the use of the hoist in an overloaded condition.**

## SECTION IV INSPECTION

### 4-1. General

A scheduled inspection routine should be established for this hoist based upon severity of use and environmental conditions. Some inspections should be made frequently (daily to monthly) and others periodically (monthly to yearly). It is suggested that an Inspection and Maintenance Check List and an Inspector's Report similar to those shown in Figures 4-1 and 4-2 be used and filed for reference. All inspections should be made by a designated inspector. Special inspections should be made after any significant repairs or any situation causing suspicion that the hoist may have been damaged. Any hoist which has been removed from service for an extended time should receive an inspection as described under Periodic Inspections. ANSI B30.16, Safety Standard for Overhead Hoists, provides guidelines for hoist operation and inspection.

### CAUTION

**Any unsafe condition disclosed by any inspection must be corrected before operation of the hoist is resumed.**

### 4-2. Frequent Inspection

- a. Check pushbutton station, brake, and limit switches for proper operation.
- b. Check hooks for deformation, chemical damage, or cracks. Bent hooks or hooks damaged from chemicals, deformation, cracks, or having excessive throat opening (see paragraph 4-6) should be replaced. Visible deformation of any hook may be evidence of hoist abuse and overloading and indicates that a thorough inspection of the complete hoist should be made.
- c. Check that bottom hook swivels freely.
- d. Check for missing, bent or otherwise damaged hook latches.
- e. Check pushbutton and power cord for cuts or other damage.

### 4-3. Periodic Inspection

The exact period for the following inspections will

depend on the anticipated severity of hoist use. Determination of this period should 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 inspection experience.

- a. Clean hoist of any dirt or foreign material. Inspect bottom block for accumulation of debris.
- b. Perform all frequent inspections listed above.
- c. Check for loose bolts, screws and nuts.
- d. Check housings, load block, and other parts for wear, corrosion, cracks or distortion. Check for abnormal openings between housing sections.
- e. Check motor brake for worn discs, oil contamination or excessive clearance (see paragraph 5-3).
- f. Check mechanical load brake function (see Figure 4-3).
- g. Inspect the entire length of chain for gouges, nicks, weld spatter, corrosion, distortion and wear. See CHAIN INSPECTION, paragraph 4-5.
- h. Inspect hooks and suspension parts for cracks, distortion or extreme wear.
- i. Inspect hooks for cracks using magnetic particle, dye penetrant or other crack detecting methods.
- j. Check limit switch set points and reset if necessary (see paragraph 5-2).
- k. Inspect all wiring for defective insulation, and check to be sure all electrical connections are tight. Check motor reversing contactor or relay for burned contacts.
- l. Inspect for oil leaks. Check oil level.
- m. Inspect for missing or illegible capacity or warning labels.
- n. Inspect the supporting structure for continued ability to support the hoist rated load.

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

Type of Hoist \_\_\_\_\_  
 Location \_\_\_\_\_  
 Manufacturer \_\_\_\_\_

Capacity (Tons) \_\_\_\_\_  
 Original Installation Date \_\_\_\_\_  
 Manufacturer's Serial No \_\_\_\_\_

Item	Frequency of Inspection			Possible Deficiencies	OK	Action Required
	Frequent		Periodic 1-12 Mo			
	Daily	Monthly				
Operating Controls	●	●	●	Any deficiency causing improper operation		
Limit Switches	●	●	●	Any deficiency causing improper operation Pitting or deterioration		
Disc (Motor) Brake	●	●	●	Slippage or excessive wear Glazing, contamination or excessive wear		
Load Brake (Mechanical)			●	Failure to support load with disc brake open (see paragraph 4-3 f)		
Hooks	●	●	●	Excessive throat opening, bent or twisted more than 10 degrees, damaged hook latch, wear, chemical damage, worn hook bearing ● Cracks (use dye penetrant, magnetic particle or other suitable detection method)		
Suspension Lug (if used)			●	Cracks, excessive wear or other damage which may impair the strength of the lug ● Cracks (use dye penetrant, magnetic particle or other suitable detection method)		
Chain	●	●	●	Inadequate lubrication, excessive wear or stretch, cracked, damaged or twisted links, corrosion or foreign substance		
Hook and Suspension Lug Connections			●	Cracks, bending, stripped threads, loose mounting screws		
Pins, Bearings, Bushings, Shafts Couplings, Chain Guides			●	Excessive wear, corrosion, cracks, distortion		
Nuts, Bolts, Rivets			●	Looseness, stripped and damaged threads, corrosion		
Sheaves			●	Distortion, cracks, and excessive wear 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 inspections 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 4-1. RECOMMENDED INSPECTION AND MAINTENANCE CHECK LIST**



- b. Inspect each link for wear to the diameter of the link (see Figure 4-4). The nominal link diameter is 0.250 inch for chain on models up to EC-2008 and 0.281 inch for chain on models EC-2012 and above. If the diameter of any link of 0.250 chain is worn to less than 0.200, or the diameter of any link of 0.281 chain is worn to less than 0.225, the entire chain must be replaced.

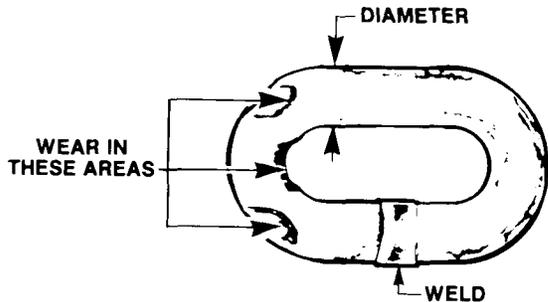


FIGURE 4-4. TYPICAL WEAR ON LINKS

- c. 1.) Check the chain for overall wear or stretch by selecting an unworn, unstretched length of chain (at the slack end, for example). Let the chain hang vertically with a light load (about 20 lbs.) on the chain to pull it taut. Use a large caliper to measure the outside length of a convenient number of links (about 12 inches). Measure the same number of links in a used section of chain and calculate the percentage increase in length of the worn chain.
- 2.) If the length of the worn chain is more than 1½% longer than the unused chain (.015" per inch of chain measured), then the chain should be replaced. If the

chain is worn less than 1½%, check it at several more places along its length. If any section is worn more than 1½%, the chain should be replaced.

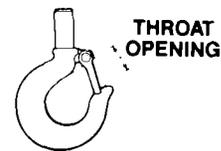
- d. The chain used in this hoist is accurately calibrated to operate over the load sprocket and is very carefully heat treated for maximum wear life and strength.

**WARNING**

1. Do not weld or join hoist load chain.
2. Do not substitute another manufacturer's chain in this hoist.
3. Damage or wear, beyond the stated limits, to any portion of the chain requires that the entire length be replaced.

**4-6. Hook Throat Opening**

Use Table 4-1 (below) to check hook throat opening.



**TABLE 4-1. MAXIMUM ALLOWABLE HOOK THROAT OPENING**

Hoist Load Rating (ton)	Top Hook* (in)	Bottom Hook* (in)
¼, ½ and 1	1 5/16	1 3/16
2	1 3/16	1 5/16
3	1 17/32	1 17/32

\*Figures given are for hook with latch. Add 1/16" if measured without hook latch.

**SECTION V**

**MAINTENANCE AND REPAIR**

**5-1. General**

This section provides instructions for the most common routine maintenance and adjustments. Major repairs are not within the scope of this manual and should be referred to qualified service facilities.

**SAFETY NOTE**

Always remove load and disconnect hoist from power supply before removing end covers or making repairs.

**5-2. Limit Switch Adjustment**

Limit switches are provided to protect the hoist against damage resulting from overtravel. For easy identification the upper (No. 2, Figure 5-1) and lower (No. 3, Figure 5-1) limit switch adjusting nuts are colored red and green respectively. Each limit switch nut has ten slots for adjustment, and the increment of adjustment

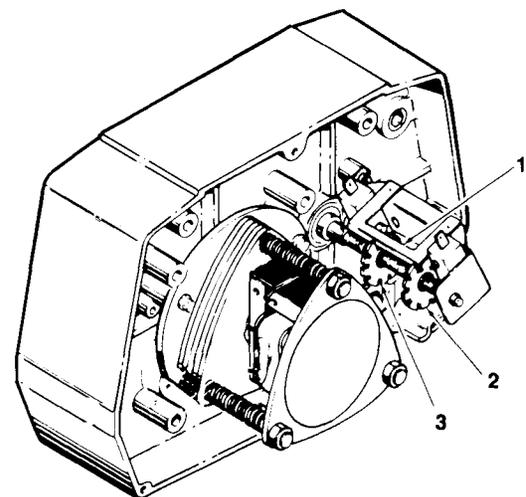


FIGURE 5-1. LIMIT SWITCH ADJUSTMENT

is such that one slot is equivalent to one link of chain travel. Care should be exercised when adjusting either limit of travel. When a geared type limit switch is furnished (long lift hoists) each adjustment is equal to 3 links of chain, or 30 links per revolution.

**a. Adjusting Upper Limit (Red Nut).**

- 1.) Carefully raise the load block to a point where its top is 2" or more from the hoist housing.
- 2.) DISCONNECT POWER from the hoist and remove the short end cover.
- 3.) With a screwdriver, pry the spring guide plate (No. 1, Figure 5-1) out of the slots in the colored limit switch nuts (Nos. 2 and 3).
- 4.) Turn the slotted red nut (No. 2) toward its limit switch until the switch clicks.
- 5.) Release the spring guide plate and be sure it snaps back into the slots in both nuts. Do not disturb the other slotted nut if it has been previously set.
- 6.) Replace the short end cover and reconnect power to the hoist.
- 7.) Carefully raise the load block to its upper limit and observe to see if it stops automatically at the desired point. Do not allow the load block to run into the hoist housing. The stopping point should be at least 2" below the hoist housing.

**b. Adjusting Lower Limit (Green Nut)**

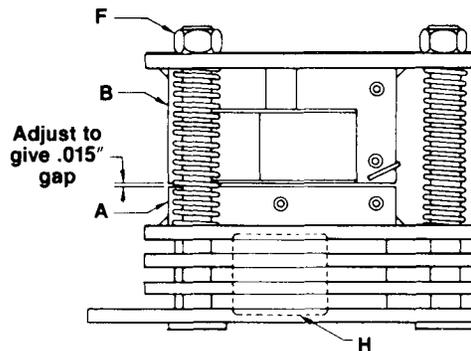
- 1.) Carefully lower the load block to a point where at least 12 links of slack chain hang down from the hoist housing.
- 2.) DISCONNECT POWER from the hoist and remove the short end cover.
- 3.) Adjust the green limit switch nut in the same manner described above for the red nut.
- 4.) Replace the short end cover and reconnect power to the hoist.
- 5.) Carefully lower the load block to its lower limit and observe if it stops automatically at the desired level. Do not run chain out of hoist or allow the slack end loop to become taut against the hoist housing. At least 12 links of slack chain should hang from the hoist.

**NOTE**

If upper and lower limits are not operating satisfactorily, repeat adjustment.

**5-3. Motor Brake Adjustment**

When properly adjusted, the multiple disc motor brake should release promptly, operate without noticeable chatter, and stop the load with no more than one inch of drift. If the hoist hesitates to lift the load promptly when the pushbutton is depressed, the brake should be adjusted per the following procedure.



**FIGURE 5-2. MOTOR BRAKE ADJUSTMENT**

- a. Remove any load and DISCONNECT POWER from hoist.
- b. Remove the short end cover.
- c. Referring to Figure 4-2, check the gap between armature (A) and frame (B). The correct gap is .015".
- d. Adjust the gap by turning the three lock nuts (F) and check with a feeler gauge to be sure the gap is the same on both ends of the solenoid.

**CAUTION**

Be sure the bottom of the armature does not touch the splined adapter (H). As wear occurs, the original clearance will be reduced. When this clearance is gone, THE BRAKE DISCS MUST BE REPLACED.

- e. Replace short end cover and reconnect power. If the brake still chatters or is hesitant to release, refer to Section VI, Troubleshooting.

**5-4. Top Suspension Removal and Replacement**

A number of different top suspension assemblies are available to accommodate different methods of hanging the hoist. If it should be necessary to change top suspensions, proceed as follows:

- a. DISCONNECT POWER from hoist and move the hoist to a safe working area. If necessary, remove trolley and/or rotate suspension lug to gain access to the socket head cap screws bolting the top suspension yoke to the frame of the hoist.
- b. Remove socket head screws (7/16" hex) and lift out the suspension assembly.
- c. Install new suspension assembly and tighten socket head screws to 75 ft-lbs torque.

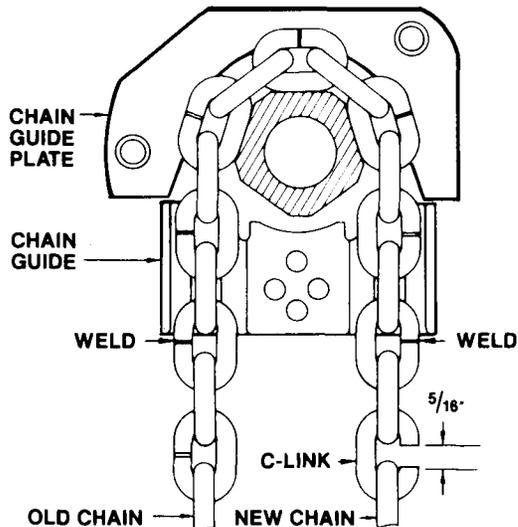
**NOTE**

Due to the off-center hook or lug hole, the suspension yoke can be installed in the hoist in two different ways. With the hoist level, the hook or lug must always be directly over the bottom hook. Refer to Figure 5-4 for the proper yoke orientations for single, double and triple chain hoists.

### 5-5. Chain Replacement (Old chain still in hoist)

Refer to Figure 5-4, Chaining and Suspension Diagrams and proceed as follows:

- a. Run the load block up to its top limit.
- b. **DISCONNECT POWER** from the hoist and remove the short end cover.
- c. With a screwdriver, push the spring guide plate (No. 1, Figure 5-1) out of the slots in the plastic limit switch nuts. Turn the red slotted nut (2) back to about the center of the threaded screw. **DO NOT DISCONNECT THE WIRES FROM THE LIMIT SWITCHES.**
- d. Remove the load hook assembly from the old chain.



**FIGURE 5-3. CHAINING HOIST**

- e. Make a "C"-shaped chain link by grinding through one side of the end link of either the old or new chain. See Figure 5-3.
- f. Hook the special "C" link to the end link of both chains thus joining them. **BE SURE** the welds of the upstanding links of the new chain are out away from the load sheave, and that proper orientation is observed for attachment of the slack end in paragraph j. below.

#### **NOTE**

On triple chain hoists be sure all welds are aligned like the welds on the old chain. It may be necessary to cut a link from one or both ends of the chain to accomplish this.

- g. With the end cover off, connect the hoist to power supply. Be sure the green ground wire is properly grounded.
- h. Carefully jog the "UP" button and run the joined pieces of chain into the hoist until about 12 inches of the new chain comes out the other side.
- i. **DISCONNECT POWER** from the hoist.
- j. Remove both the "C" link and the old chain from the slack end pin (No. 28, Figure 8-6). This can be

accomplished by depressing the pin against the slack end spring (29) with a small screwdriver. Remove the soft split link (23) from the old chain and attach the link to the new chain. Depress the slack end pin and install the split link observing proper orientation of the slack end of the chain when secured. Avoid twists in the chain.

- k. Adjust the lower limit switch per paragraph 5-2.b.
- l. Attach the bottom hook on single-chained hoists to the loose end of the chain. On double-chained hoists, feed the loose end of the chain through the load block (welds of the upstanding links will be in towards the sheave) and fasten the end of the chain to the dead end lug (No. 18, Figure 8-6).

#### **NOTE**

On triple chain hoists, feed the loose end of the chain through the load block (welds away from sheave), around the idler sheave in the hoist, and to the center of the load block.

- m. Adjust the upper limit switch per paragraph 5-2.a.
- n. Lubricate the new chain per paragraph 5-6.a and perform an operation test of the hoist.

### 5-6. Lubrication

Proper lubrication is necessary for long, trouble-free hoist operation. Refer to the following and to Table 5-1, Recommended Lubrication Schedule, for lubrication points, type of lubricant, and frequency of lubrication.

- a. **Load Chain** Clean the load chain with a non-acid and non-caustic solvent and coat with SAE 90 gear oil. Wipe excess oil to prevent dripping. If the hoist is used in an atmosphere containing abrasive dust, the chain should be cleaned and oiled more frequently. Never apply grease to the chain.
- b. **Gearing** The gear case of the hoist is filled at assembly with 46 oz. of a gear oil containing special friction-reducing additives.

#### **WARNING**

The use of gear oils other than that recommended in Table 5-1 can cause brake chatter or can render the load brake incapable of holding a load. A 46 oz. container of this oil is available from the Duff-Norton Co. (Part No. 14J1).

- a. To check the oil level, remove the 1/8" pipe plug from the side of the hoist. With the hoist hanging level, transmission 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

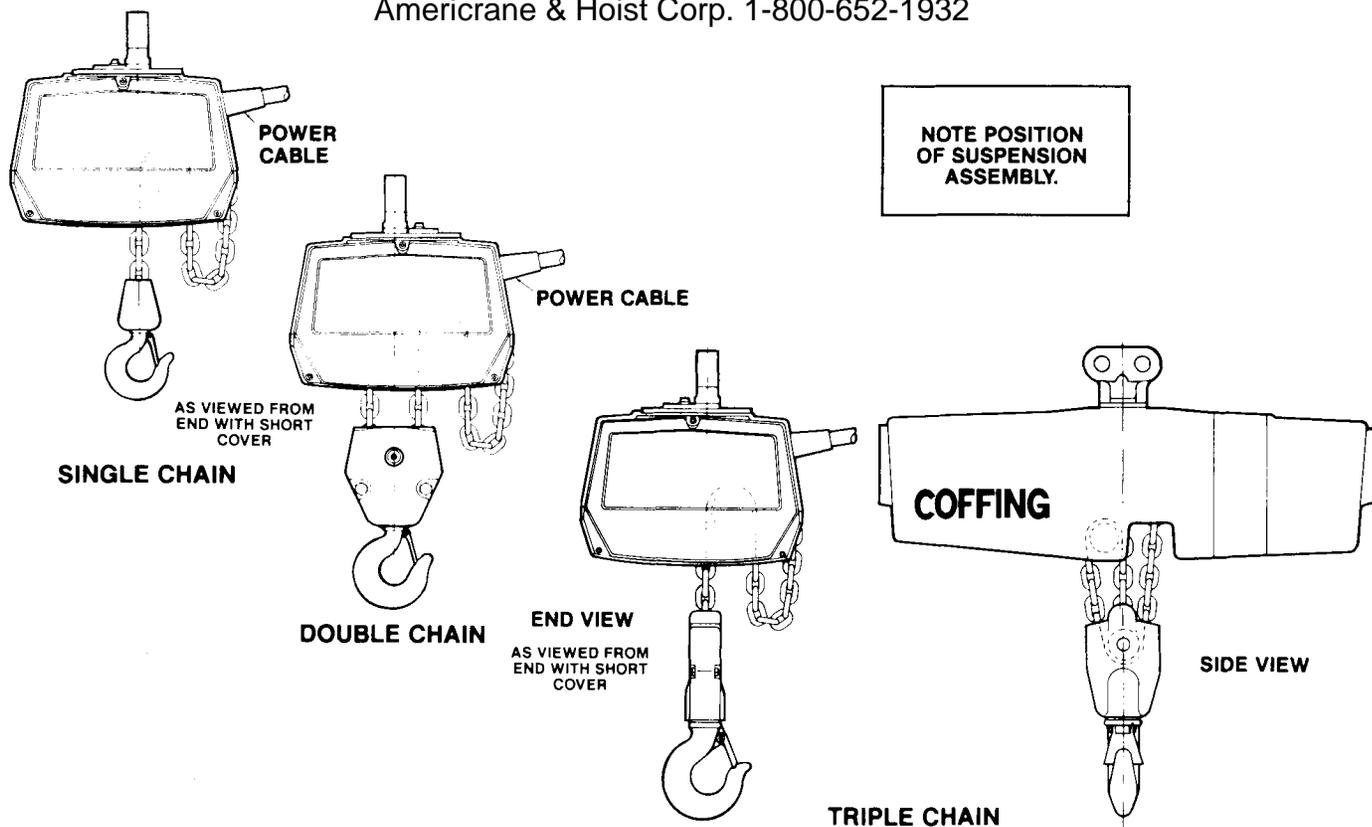


FIGURE 5-4. CHAINING AND SUSPENSION DIAGRAMS

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. **Idler Sheave Bearing (double and triple chain models only)** Use a grease gun to put about a teaspoon of

grease through the grease fitting in the bottom block shaft. Avoid pumping an excessive amount of grease into the bottom block. On triple chain hoists, use a grease gun to lubricate the idler sheave in the hoist until fresh grease pumps from the end of the sheave bearing.

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

TABLE 5-1. RECOMMENDED LUBRICATION SCHEDULE\* MODEL EC ELECTRIC CHAIN HOIST

Figure And Index No.	Component	Type of Lubricant	Type of Service And Frequency of Lubrication		
			Heavy	Normal	Infrequent
Figure 8-6, No. 7	Load Chain	SAE 90 Gear Oil	Daily	Weekly	Monthly
Figure 8-5	Gearing	Coffing No. H-7813 transmission oil (Kit No. 14J1 contains quantity of oil sufficient for one oil change).	At periodic inspection (see Figure 4-1, paragraph 5-6-2).		
Figure 8-8A, No. 9; Figure 8-8B, No. 7	Limit Switch Shaft	"WD-40" or general purpose spray lubricant.	Monthly	Yearly	Yearly
Figure 8-6, No. ___ & No. ___	Load Hook Bearing	SAE 30 Gear or Motor Oil	Weekly	Monthly	Yearly
Figure 8-2, Nos. 1, 3, 4 & 5	Top Hook or Suspension Lug Bearing Surfaces	SAE 30 Gear or Motor Oil	Monthly	Yearly	Yearly
Figure 8-7C, No. 11 Figure 8-7D, No. 11	Idler Sheave Bearing (Bushing)	NLGI #2 multi-purpose lithium base grease (Coffing No. H-7610)	At periodic inspection (see Figure 4-1).		

NOTE: All bearings except hook and idler sheave bearings are prelubricated and sealed.

\*This lubrication schedule is based on a hoist operating in normal environmental conditions. Hoists operating in adverse atmospheres containing excessive heat, corrosive fumes or vapors, abrasive dust, etc., should be lubricated more frequently.

**SECTION VI**

**TROUBLESHOOTING**

**6-1. General**

Use the following table as an aid to troubleshoot your 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 for repairs.

TROUBLE	REMEDY
<b>Hook Fails To Stop At End Of Travel.</b>	
<ol style="list-style-type: none"> <li>1. Limit switches not operating.</li> <li>2. Plastic limit switch nuts not moving on shaft.</li> <li>3. Magnetic reversing switch malfunction.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check adjustment. See paragraph 5-2. Check connections against wiring diagram. Tighten loose connections or replace.</li> <li>2. Check for stripped threads or bent nut guide.</li> <li>3. Remove electrical cover and check reversing switch.</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 5-3.</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. 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 5-3) and load brake (figure 4-3).</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 2-3).</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 overload limiting clutch.</li> <li>4. Low voltage.</li> <li>5. Faulty SINPAC starting switch or start capacitor (single phase hoists only).</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 Figure 5-3.</li> <li>3. Replace clutch.</li> <li>4. Check voltage at hoist power cord with hoist starting. Voltage should be no less than 90% of voltage specified on hoist.</li> <li>5. Replace faulty component.</li> </ol>
<b>Hook Raises But Will Not Lower. (Motor not running)</b>	
<ol style="list-style-type: none"> <li>1. "Down" circuit open.</li> <li>2. Broken conductor in pushbutton cable.</li> <li>3. Faulty magnetic hoist control switch.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check circuit for loose connections. Check "Down" limit switch for malfunction.</li> <li>2. Check each conductor in the cable. If one is broken, replace entire cable.</li> <li>3. Check coils for open or short circuit. Check all connections in control circuit. Check for burned contacts. Replace as needed.</li> </ol>

TROUBLE	REMEDY
---------	--------

**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>1. Hoist overloaded.</li> <li>2. Low voltage.</li> <li>3. "UP" circuit open.</li> <li>4. Broken conductor in pushbutton cable.</li> <li>5. Faulty magnetic hoist control switch.</li> <li>6. Faulty capacitor (single-phase hoists only).</li> <li>7. Worn overload limiting clutch.</li> </ol>	<ol style="list-style-type: none"> <li>1. Reduce load to within rated capacity.</li> <li>2. Determine cause of low voltage and bring up to at least 10% of the voltage specified on hoist. Line voltage should be measured while holding or lifting load.</li> <li>3. Check circuit for loose connections. Check "UP" limit switch for malfunction.</li> <li>4. Check each conductor in the cable. If one is broken, replace entire cable.</li> <li>5. Check coils for open or short circuit. Check all connections in control circuit. Check for burned contacts. Replace as needed.</li> <li>6. Check starting capacitor in motor. Replace if necessary.</li> <li>7. Replace clutch.</li> </ol>
--	---

**Lack Of Proper Lifting Speed.**

<ol style="list-style-type: none"> <li>1. Hoist overloaded.</li> <li>2. Motor brake is dragging.</li> <li>3. Low voltage.</li> <li>4. Overload limiting clutch intermittently slipping.</li> </ol>	<ol style="list-style-type: none"> <li>1. Reduce load to within rated capacity of hoist.</li> <li>2. Check for proper brake adjustment or other defects. See paragraph 5-3.</li> <li>3. Bring up voltage to plus or minus 10% of voltage specified on hoist. Line voltage should be measured while hoist is lifting load.</li> <li>4. Replace clutch.</li> </ol>
--	--

**Load Brake "Noise". (Erratic tapping sounds or squeals)**

<ol style="list-style-type: none"> <li>1. Need transmission oil change or improper lubricant has been used.</li> <li>2. Load brake malfunctioning.</li> </ol>	<ol style="list-style-type: none"> <li>1. Change transmission oil. See Table 5-1. Note: Hoist Warranty is void if unapproved oil is used.</li> <li>2. Check load brake operation. See Figure 4-3.</li> </ol>
---	--

**Motor Brake Noise Or Chatter. (While starting hoist)**

<ol style="list-style-type: none"> <li>1. Brake needs adjustment.</li> <li>2. Low voltage.</li> </ol>	<ol style="list-style-type: none"> <li>1. Adjust as per paragraph 5-3.</li> <li>2. Check voltage at hoist power cord with hoist starting. Voltage should be no less than 90% of the voltage specified. 115 volt hoists are particularly subject to voltage drop problems due to their high current draw. Conversion to 230 volt operation is suggested in extreme cases.</li> </ol>
---	---

**Motor Brake "Buzz". (Anytime hoist is running)**

<ol style="list-style-type: none"> <li>1. Brake needs adjustment.</li> <li>2. Broken shading coil on brake frame.</li> </ol>	<ol style="list-style-type: none"> <li>1. Adjust as per paragraph 5-3.</li> <li>2. Replace shading coil or complete brake frame assembly.</li> </ol>
--	--

**SECTION VII**

**WIRING**

**Safety Notes**

Disconnect power from hoist before removing end covers.

**7-1. Voltage Conversion**

Standard single phase units are convertible from 115 to 230 volts and 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. SINGLE PHASE HOISTS (with SINPAC® switch): Transfer leads 2, H2, H3, T2, S1, and T3 per the appropriate terminal block schematic.

- c. THREE PHASE HOISTS: Transfer leads T4, T5, T6, T7, T8, T9, H2, H3, S1, and S2 per the appropriate terminal block schematic.

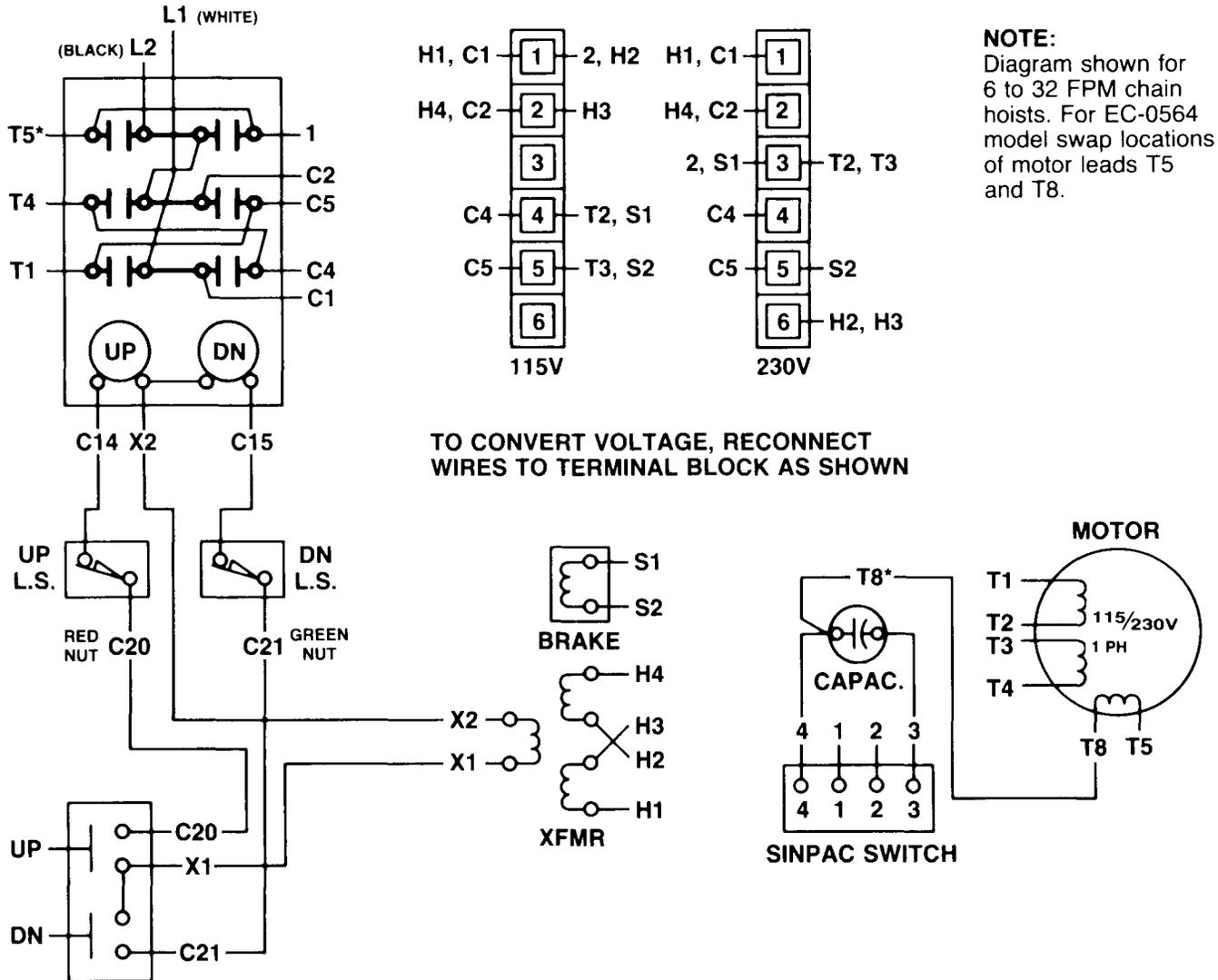
**CAUTION**

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

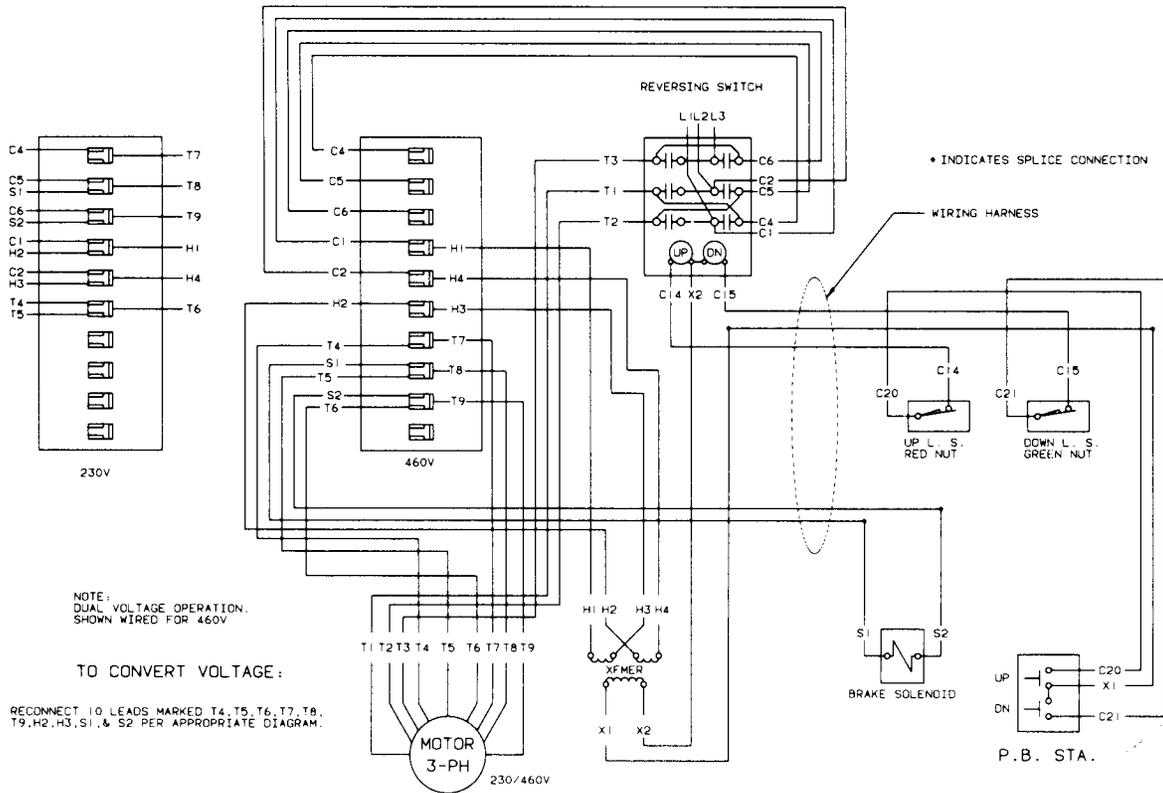
- d. After converting voltage, check for proper phasing of three phase units and check for proper limit switch operation.

**7-2. Wiring Diagrams**

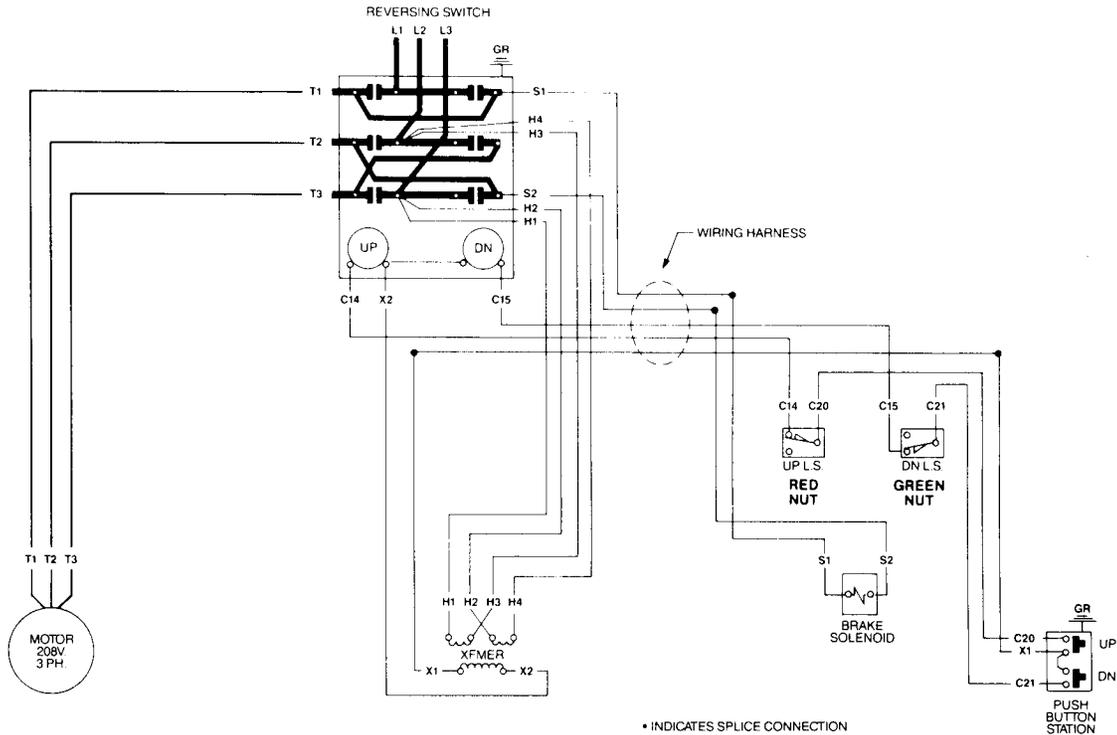
The wiring diagrams for standard hoist models are reproduced on the following pages. In addition, every hoist should have a wiring diagram located inside the long end cover.



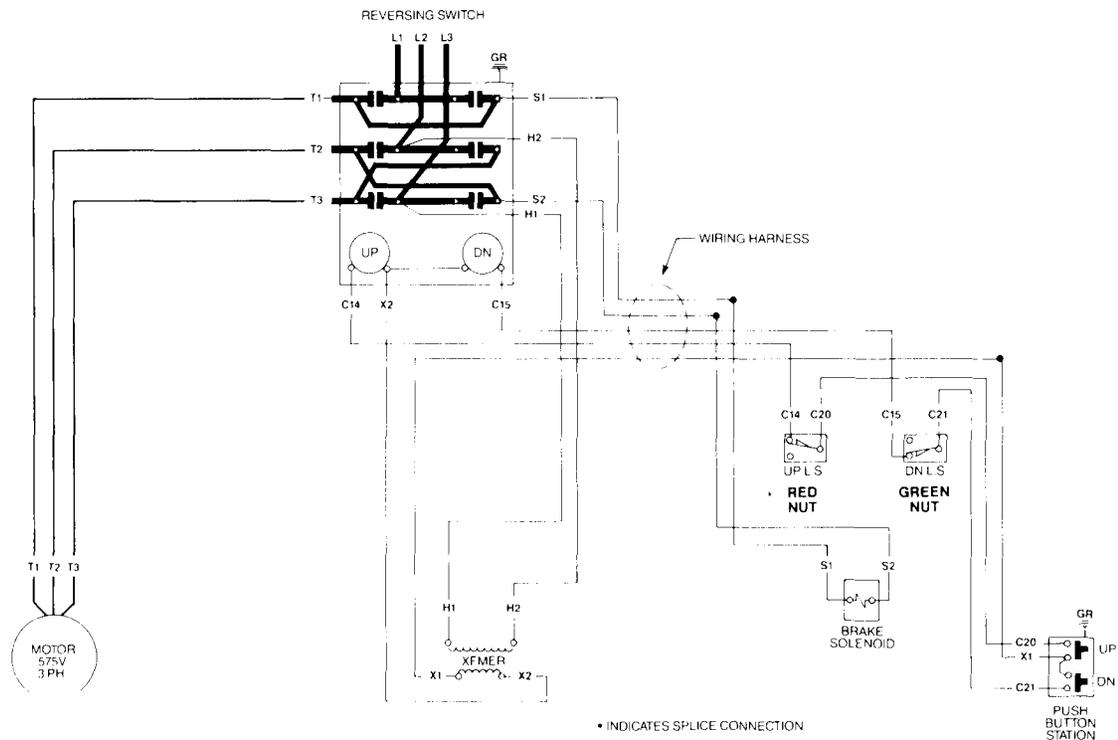
**FIGURE 7-1. WIRING DIAGRAM**  
115/230V, 1 Phase, Single Speed Hoist with SINPAC® switch  
981 EC 50



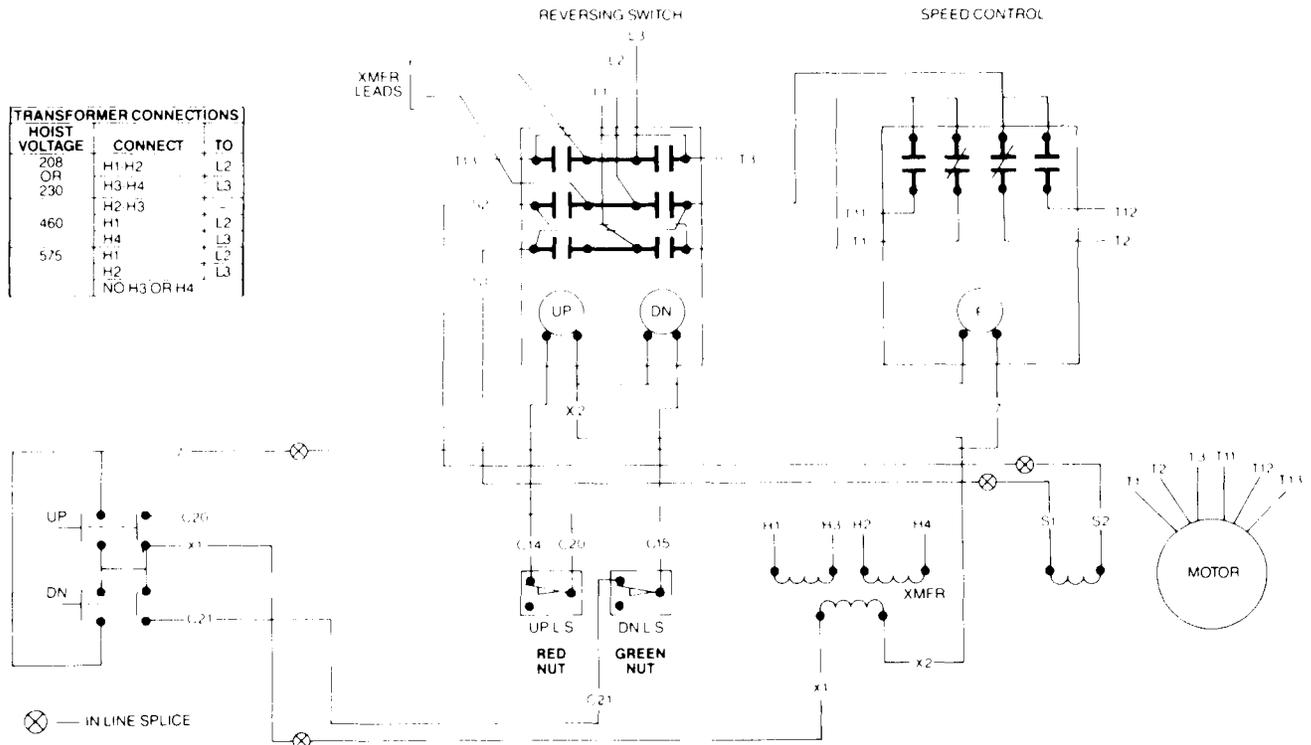
**FIGURE 7-2. WIRING DIAGRAM  
230/460V, 3 Phase, Single Speed Hoist  
983 EC 44C**



**FIGURE 7-3. WIRING DIAGRAM  
208V, 3 Phase, Single Speed Hoist  
983 EC 48**



**FIGURE 7-4. WIRING DIAGRAM**  
**575V, 3 Phase, Single Speed Hoist**  
**983 EC 45**



**FIGURE 7-5. WIRING DIAGRAM**  
**230, 460, 575 & 208V, 3 Phase, Two Speed Hoist**  
**983 EC 141**

**SECTION VIII**

**ILLUSTRATED PARTS LIST**

**8-1. General**

The following exploded drawings provide a complete list of parts used in the standard EC hoist models (shown in Table 1-1, page 3). Since several different models of hoists are covered by this manual, differences may be noted between the appearance of your hoist part and the reference illustration. If this is the case, the parts list will show several different part numbers with sufficient information to allow the selection of the correct part number.

**8-2. How To Use The Parts List**

a. The parts list consists of four columns as follows:

1) Index Number

2) Usage Code—This column may contain a code relating to the model numbers of, or other data relating to the hoist in which the part is used. Usage codes are as follows:

- A- Single Phase Hoists (Single Speed)
- B- Three Phase Hoists (Single Speed)
- C- Three Phase Hoists (Two Speed)
- D- Hoists with 1/4 in. Load Chain (Models EC-0516, EC-0532, EC-0564, EC-1008, EC-1009, EC-1016, EC-1032 and EC-2008)
- E- Hoists with 3/32 in. Load Chain (Models EC-2012, EC-2016, EC-4006, EC-4008 and EC-6005)
- F- Single Chain Hoists (Models EC-0516, EC-0532, EC-0564, EC-1009, EC-1016, EC-1032)
- G- Double Chain Hoists (Models EC-2008, EC-4006, EC-4008)
- H- Single Chain Hoists (Models EC-2012, EC-2016)
- J- Triple Chain Hoists (Model EC-6005)

3) Part Number

4) In addition to basic part name, this column contains descriptions which are essential for choosing the correct part number when more than one is listed.

b. How to determine proper part number:

- 1) Locate the index number in the corresponding figure of the parts list.
- 2) If only one part number is listed for the index number, that part number should be ordered.
- 3) If more than one usage code and part number is listed for that index number, choose the correct usage code by comparing the model number or electrical characteristics of your hoist with the usage codes above.

**EXAMPLE A**

INDEX NO.	USAGE CODE	PART NO.	PART NAME
6	E	35J1	Transmission Housing
	D	35J2	Transmission Housing

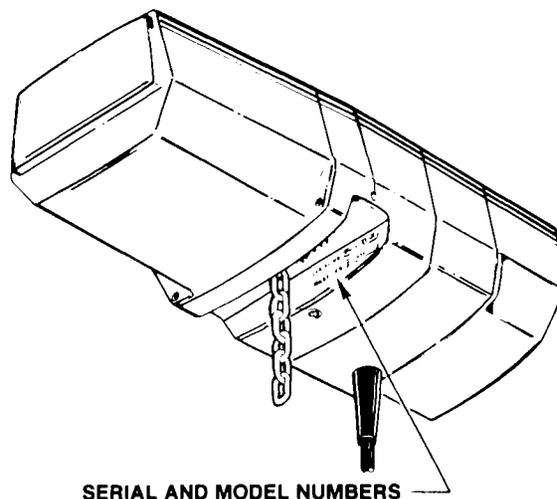
4) If more than one part number is listed with the same usage code, the information under "part name" will determine the correct part number. This is also the case if no usage code is listed and more than one part number is listed for the index number.

**EXAMPLE B**

INDEX NO.	USAGE CODE	PART NO.	PART NAME
4	B	JF-821-3	Transformer (Pri. 208, 230/460 V Sec 24 V 50/60 Cy)
	B	JF-821-9	Transformer (Pri. 575 V Sec 24 V 50/60 Cy)

**8-3. How To Order Replacement Parts**

When ordering parts or requesting information concerning your EC hoist, always include the hoist model number and serial number. Both numbers are permanently stamped on the transmission housing casting near the chain entrance area. See index No. 6, Figure 8-1 and illustration below.



**When ordering motor parts, please provide complete motor nameplate data, including motor "ref." number or model number.**

**NOTE**

Repair parts are available only from Coffing distributors or authorized repair facilities. It is recommended that repair part orders be directed to the authorized repair facility nearest you.

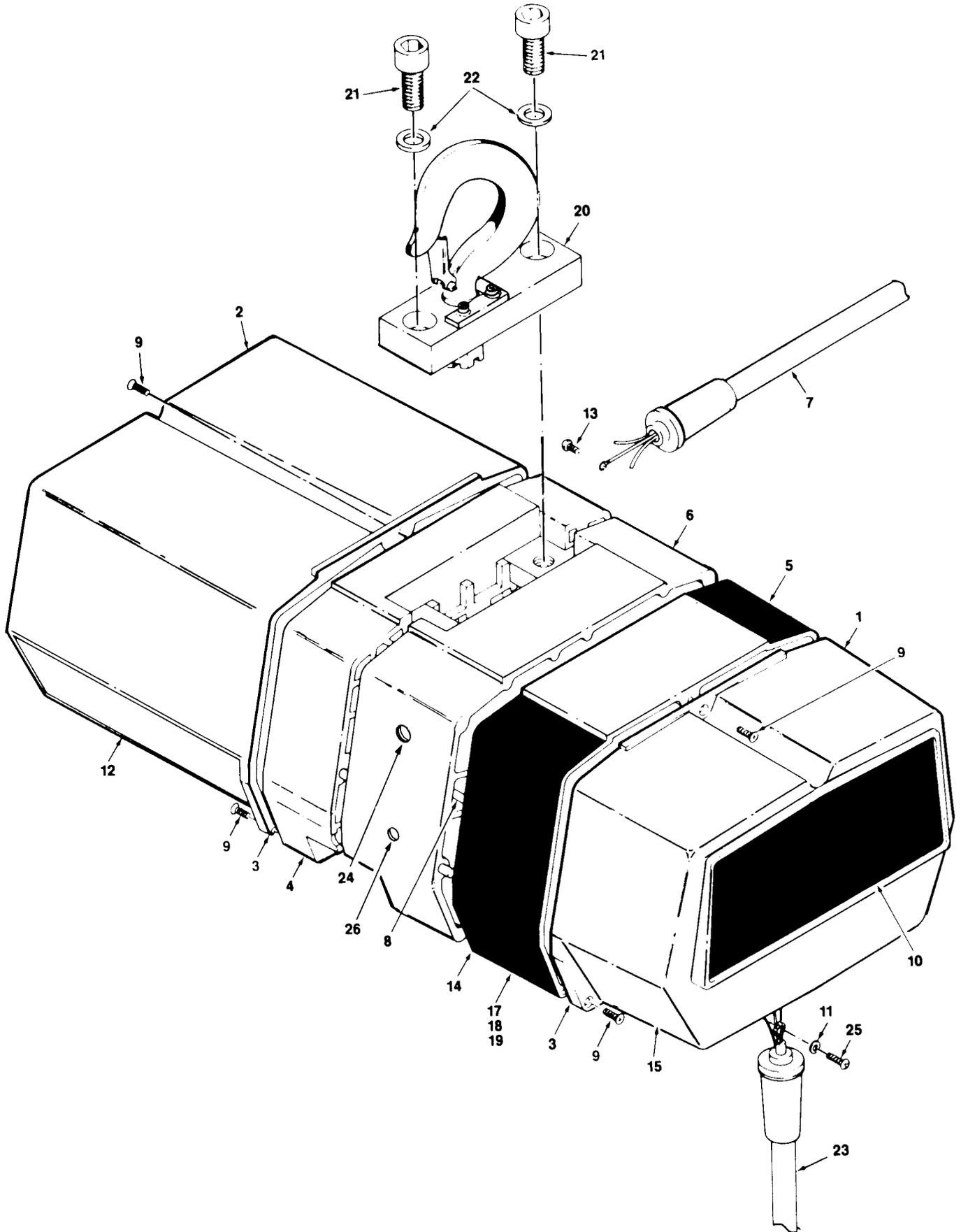


FIGURE 8-1. BASIC HOIST

**PARTS LIST FOR BASIC HOIST**

INDEX NO.	USAGE CODE	PART NO.	PART NAME
1		36J1	Brake Cover
2		36J2	Electrical Cover
3		560J4	Gasket, Brake & Electrical Covers
4	A&C	33J1	Sheave Housing (Models EC-2012, EC-2016, EC-4006 & EC-4008)
	B	33J1	Sheave Housing (Models EC-2016 & EC-4008)
	B	33J1-1	Sheave Housing (Models EC-2012 & EC-4006)
	A,B,C	33J2	Sheave Housing (Models EC-0564 & EC-1032)
	A,B,C	33J2-1	Sheave Housing (Models EC-0516, EC-0532, EC-1008, EC-1016, EC-2008 & EC-1009)
	J	33J19	Sheave Housing (Model 6005)
5		34JG1	Transmission Cover (includes 2 oil seals)
		34J1K	Transmission Cover (older hoists only, has fill plug inside cover)
6	E	35JG1	Transmission Housing
	D	35JG2	Transmission Housing
7	A	951J1	Power Cable
	B	953J1	Power Cable
8	A&B	940J1	Wiring Harness
	C	940J1-36	Wiring Harness
9		H-2923-P	Screw (slotted hex head)
		H-2980-P	Screw (older hoists only, Phillips head)
10		675J1B	Decal, Capacity (1/4 Ton)
		675J2B	Decal, Capacity (1/2 Ton)

INDEX NO.	USAGE CODE	PART NO.	PART NAME
10		675J3B	Decal, Capacity (1 Ton)
(cont.)		675J4B	Decal, Capacity (2 Ton)
		675J11	Decal, Capacity (3 Ton)
11		H-4002-P	Flat Washer
12		677J1	Decal, Coffing
13		H-2981	Screw
14		560J5	Gasket, Transmission
15		676J2B	Decal, Duff Norton
16	A	679J1	Decal, Power Requirements (115/230 V)
	B	679J2	Decal, Power Requirements (230/460 V)
	A,B,C	679J3	Decal, Power Requirements (230 V)
	B&C	679J4	Decal, Power Requirements (460 V)
	B&C	679J5	Decal, Power Requirements (575 V)
17		679J9	Decal, Right
18		679J10	Decal, Left
19		679J11	Decal, Bottom
20			Suspension Assembly Kit (Ref. #1, 3, 4 & 5, Figure 8-2)
21		703J1	Screw (Included in all Suspension Assembly Kits)
22		H-4086-P	Lock Washer (Included in all Suspension Assembly Kits)
23			Pushbutton Cable (Ref. Figure 8-10A & 8-10B)
24		H-6258	Fill Plug
25		H-2970	Screw
26		S-25-13	Level Plug

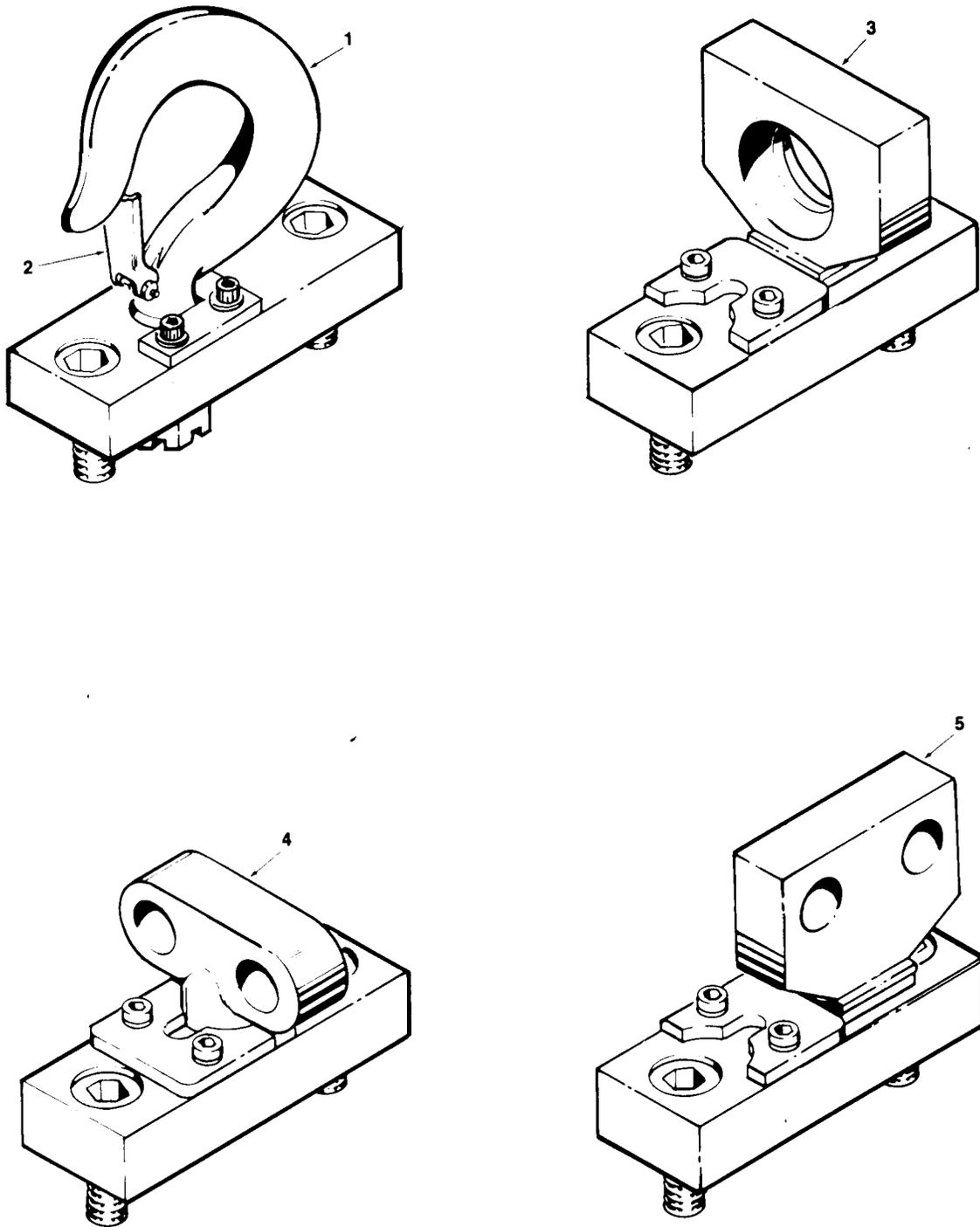


FIGURE 8-2. SUSPENSION ASSEMBLY KITS

**PARTS LIST FOR SUSPENSION ASSEMBLY KITS**

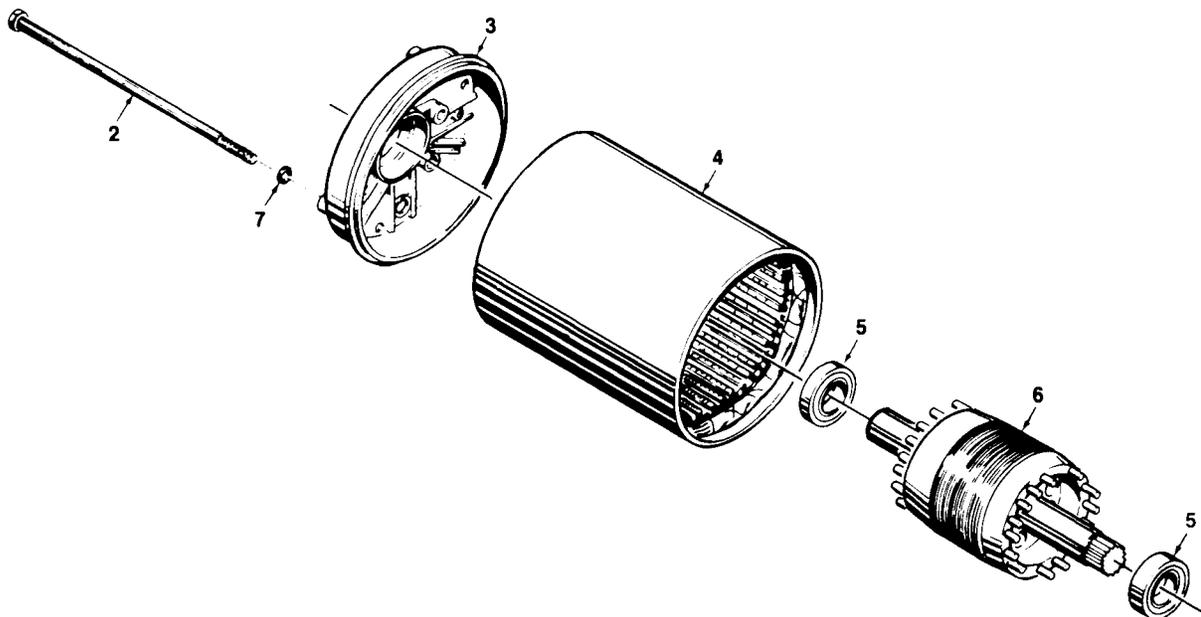
INDEX NO.	USAGE CODE	PART NO.	PART NAME
1	F,G,H	14J25	Hook Assembly Kit, Swivel
	F,G,H	14J26	Hook Assembly Kit, Rigid
2	J	3JG23	Rigid Hook Assembly
	F,G,H	H-7540	Latch Kit
	J	H-7544	Latch Kit
3	F,G,H	50JG22	Multi-purpose Lug Assembly
4	F,G,H	14J3	Trolley Lug Assembly Kit, Plain Trolley, Parallel Mount Motorized Trolley

INDEX NO.	USAGE CODE	PART NO.	PART NAME
4 (cont.)	J	50JG53	Trolley Lug Assembly Kit, Plain Trolley
5	F,G,H	14J4	Trolley Lug Assembly Kit, Motorized Trolley, Cross Mount
	J	50JG54	Trolley Lug Assembly Kit, Motorized Trolley

Americrane & Hoist Corp. 1-800-652-1932

**PARTS LIST FOR THREE PHASE, SINGLE AND TWO SPEED MOTOR**

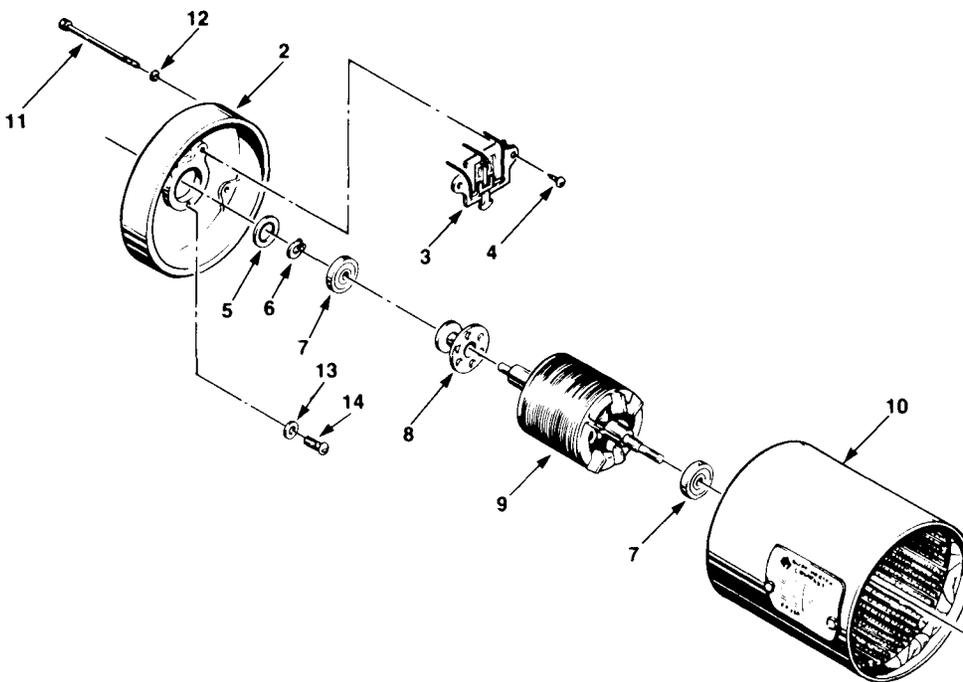
INDEX NO.	USAGE CODE	PART NO.	PART NAME	INDEX NO.	USAGE CODE	PART NO.	PART NAME
1	B	863J207	Motor (1/4 HP, 208 V, 60 Hz)	1	C	873J201	Motor (.25/.08 HP, 230 V, 60 Hz)
	B	863J208	Motor (1/2 HP, 208 V, 60 Hz)	(cont.)	C	873J202	Motor (.50/.17 HP, 230 V, 60 Hz)
	B	863J209	Motor (3/4 HP, 208 V, 60 Hz)		C	873J103	Motor (.75/.25 HP, 230 V, 60 Hz)
	B	863J109	Motor (1 HP, 208 V, 60 Hz)		C	873J104	Motor (1/.33 HP, 230 V, 60 Hz)
	C	873J211	Motor (.25/.08 HP, 208 V, 60 Hz)		C	873J204	Motor (.25/.08 HP, 460 V, 60 Hz)
	C	873J209	Motor (.50/.17 HP, 208 V, 60 Hz)		C	873J205	Motor (.50/.17 HP, 460 V, 60 Hz)
	C	873J116	Motor (.75/.25 HP, 208 V, 60 Hz)		C	873J107	Motor (.75/.25 HP, 460 V, 60 Hz)
	C	873J115	Motor (1/.33 HP, 208 V, 60 Hz)		C	873J108	Motor (1/.33 HP, 460 V, 60 Hz)
	B	863J201	Motor (1/4 HP, 230/460 V, 60 Hz)		C	873J207	Motor (.25/.08 HP, 575 V, 60 Hz)
	B	863J202	Motor (1/2 HP, 230/460 V, 60 Hz)		C	873J208	Motor (.50/.17 HP, 575 V, 60 Hz)
	B	863J203	Motor (3/4 HP, 230/460 V, 60 Hz)		C	873J111	Motor (.75/.25 HP, 575 V, 60 Hz)
	B	863J104	Motor (1 HP, 230/460 V, 60 Hz)		C	873J112	Motor (1/.33 HP, 575 V, 60 Hz)
	B	863J204	Motor (1/4 HP, 575 V, 60 Hz)	2	Contact factory with length required.		Thru Bolt End Shield
	B	863J205	Motor (1/2 HP, 575 V, 60 Hz)	3	Contact factory.		
	B	863J206	Motor (3/4 HP, 575 V, 60 Hz)	4	Not available separately		Stator
	B	863J108	Motor (1 HP, 575 V, 60 Hz)	5	1500K3		Bearing
				6	Contact factory with complete motor nameplate data for availability.		Rotor Shaft Lock Washer
				7	H-4082-P		



**FIGURE 8-3A. MOTOR PARTS  
(THREE PHASE)**

**PARTS LIST FOR SINGLE PHASE HOIST MOTOR (INTERNAL SWITCH)**

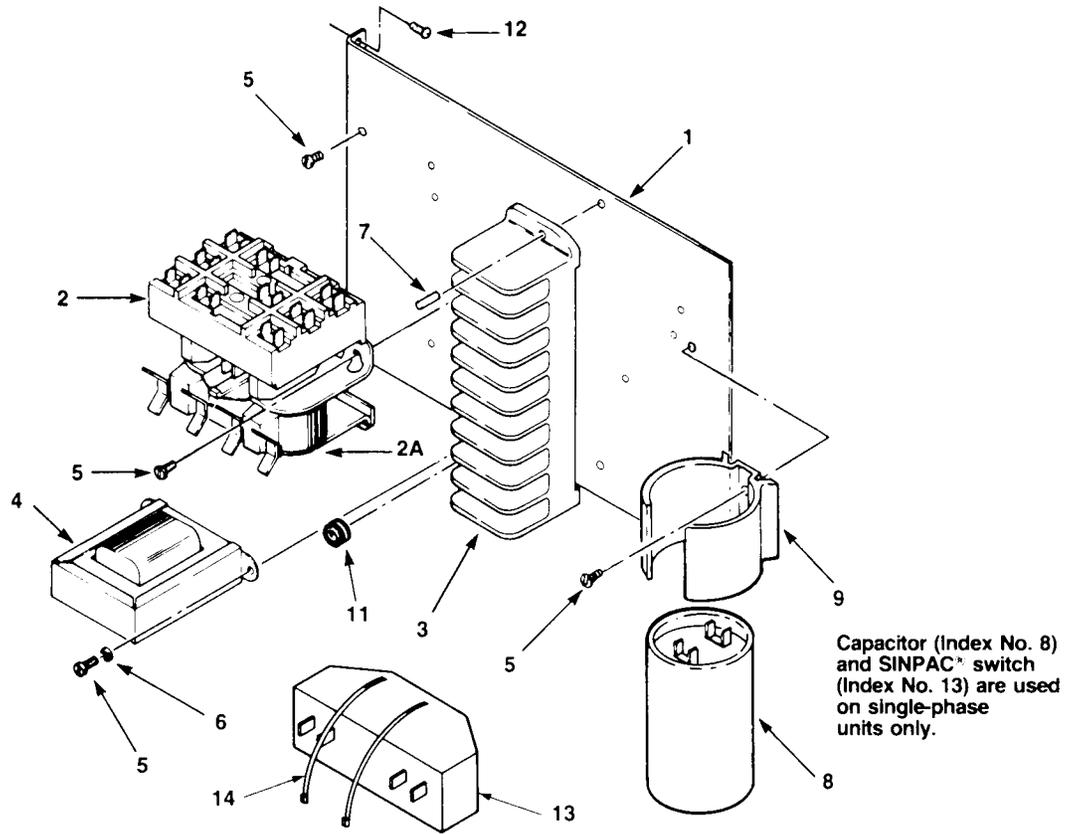
Index No.	Part Name	Part No.	Index No.	Part Name	Part No.
1	Motor, Complete: ¼ HP, 115/230 Volt ½ HP, 115/230 Volt ¾ HP, 115/230 Volt 1 HP, 115/230 Volt	861J201 861J202 861J103 861J104	8	Switch, Rotating Rotor & Shaft	JFA-8647-02 <small>Contact Factory with complete nameplate data for availability.</small>
2	End Shield	Contact Factory	9		<small>Not available separately</small>
3	Switch, Stationary: Doerr, ¼ & 1 HP	JFA-8447	10	Stator	Contact Factory with length required.
	Doerr, ¼ & ½ HP; All Leeson	EC002775-01	11	Thru Bolt	H-4082-P
4	Screw (for aluminum end shield)	S-31-84	12	Lock Washer	S-3-8
5	Washer, Shim	JFA-324	13	Washer	H-2881
6	Retaining Ring	JF-5100-66	14	Screw	
7	Bearing	500K3			



**PARTS LIST FOR SINGLE PHASE HOIST MOTOR (SINPAC® SWITCH)**

Index No.	Part Name	Part No.	Index No.	Part Name	Part No.
1	Motor, Complete: ¼ HP, 115/230 Volt ½ HP, 115/230 Volt ¾ HP, 115/230 Volt 1 HP, 115/230 Volt	861J221 861J222 861J123 861J124	10	Stator	<small>Not available separately</small>
2	End Shield	Contact Factory	11	Thru Bolt	Contact Factory with Length Required.
7	Bearing	500K3	12	Lockwasher	H-4082-P
9	Rotor & Shaft	Contact Factory with complete nameplate data for availability			

FIGURE 8-2B. HOIST MOTOR PARTS (1 PHASE)



Index No.	Part Name	Part No.
1	Control Panel	257J1A
2	Reversing Contactor:	
	Essex, 24 V Coil	820J1
	Essex, 120 V Coil	820J2
	Square D, 24 V Coil	820K2
	Square D, 120 V Coil	820K317
2A	Coil:	
	Essex, 24 V	820J301
	Essex, 120 V	820J302
	Square D, 24 V	820K301
	Square D, 120 V	820K302
2B*	Replacement Contact Kit:	
	Essex	820J300
	Square D	820K300
3	Terminal Block:	
	20 position	909JG2
	10 position	909JG4
	6 position	909J1
4	Transformer:	
	115/230 V - 24 V	JF-821-4
	208, 230/460 V - 24 V	JF-821-3
	575 V - 24 V	JF-821-9
	115/230 V - 120 V	JF-821-19
	208, 230/460 V - 120 V	JF-821
	575 V - 120 V	JF-821-2

Index No.	Part Name	Part No.
5	Screw	H-2751
6	Lock Washer	H-4158
7	Eyelet (3 Phase Units)	H-4972
	Screw (1 Phase Units)	H-2752
8	Capacitor, 216-259 mfd., 1 1/16 Dia.	JL-810-3
	Capacitor, 400-480 mfd., 1 1/16 Dia.	JL-810-4
	Capacitor, 230 mfd., 1 1/16 Dia.	JL-810-3
	Capacitor, 375 mfd., 2 1/16 Dia.	810K3
	Capacitor, 534 mfd., 2 1/16 Dia.	810K4
	Capacitor, 455 mfd., 2 1/16 Dia.	810K5
9	Capacitor Bracket:	
	1 1/16 Dia.	811J1
	2 1/16 Dia.	811J2
10*	Splice Connector	H-5757
11	Grommet	H-7906
12	Screw	H-2981-P
13	SINPAC® Switch	839J2
14	Cable Tie	H-9006

\*Not illustrated.

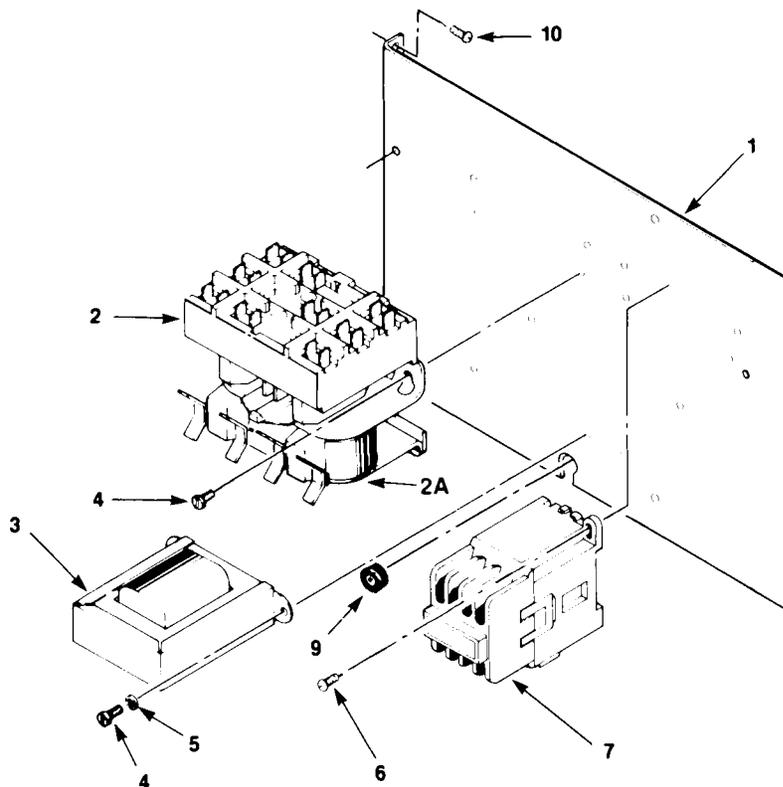
FIGURE 8-3A. CONTROLLER AREA (SINGLE SPEED HOIST)

**CONTROLLER AREA PARTS LIST (TWO SPEED)**

INDEX NO.	USAGE CODE	PART NO.	PART NAME
1		257J1A1	Control Panel
2		820J1	Reversing Contactor (Essex, 24 V Coil)
		820J2	Reversing Contactor (Essex, 120 V Coil)
		820K2	Reversing Contactor (Square D, 24 V Coil)
		820K317	Reversing Contactor (Square D, 120 V Coil)
2A		820J301	Coil (Essex, 24 V)
		820J302	Coil (Essex, 120 V)
		820K301	Coil (Square D, 24 V)
		820K302	Coil (Square D, 120 V)
2B		820J300	Replacement Contact Kit (Essex)
		820K300	Replacement Contact Kit (Square D)

INDEX NO.	USAGE CODE	PART NO.	PART NAME
3	C	JF-821-15	Transformer (208, 230/460 V - 24 V)
	C	JF-821-16	Transformer (575 V - 24 V)
	C	JF-821-17	Transformer (208, 230/460 V - 120 V)
	C	JF-821-20	Transformer (575 V - 120 V)
4		H-2751	Screw
5		H-4158	Lock Washer
6	C	H-1853	Screw
7	C	820J3	Speed Control Relay (24 V Coil)
	C	820J4	Speed Control Relay (120 V Coil)
8		H-5757	Splice Connector
9		H-7906	Grommet
10		H-2981-P	Screw

Americrane & Hoist Corp. 1-800-652-1932



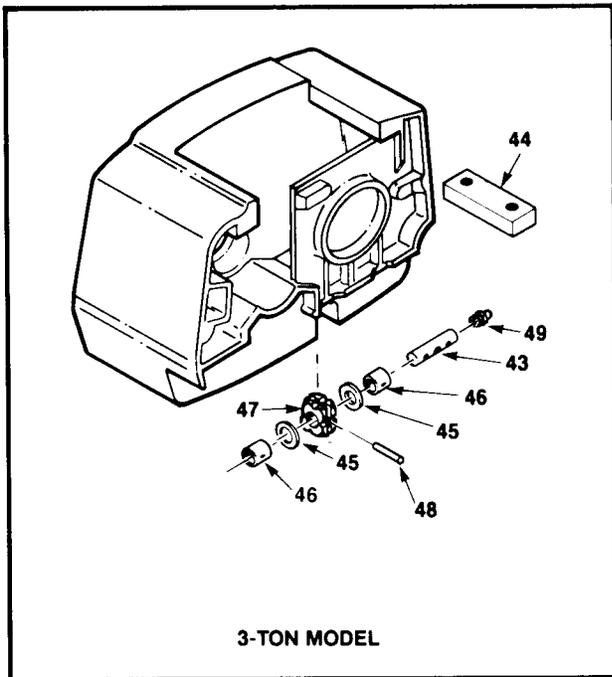
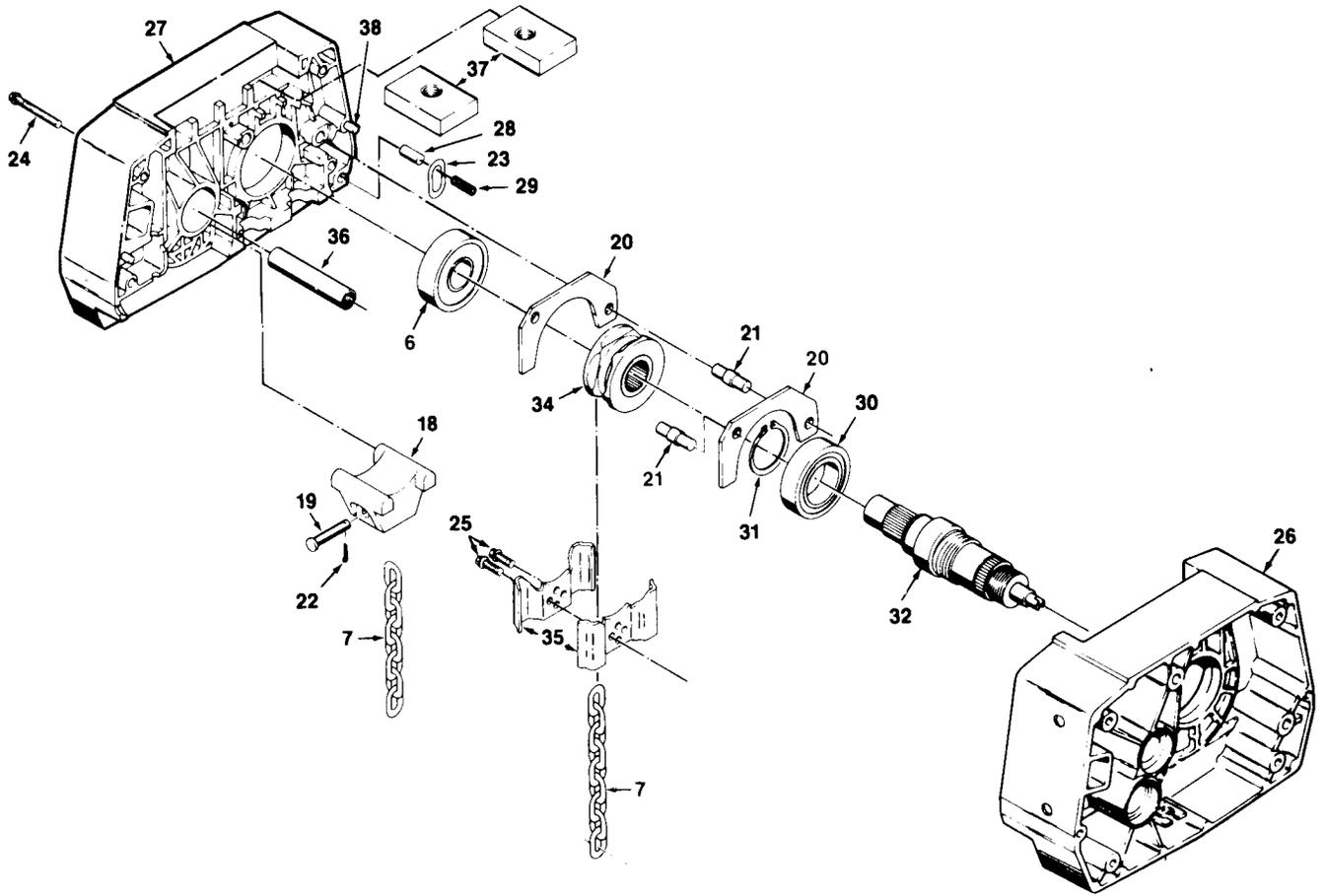
**FIGURE 8-4B. CONTROLLER AREA  
(TWO SPEED)**



**PARTS LIST FOR TRANSMISSION**

INDEX NO.	USAGE CODE	PART NO.	PART NAME
1		34JG1	Transmission Cover
2		561K2	Seal
3		MA-562	Seal
4		404J1	Output Pinion
5		407JG25	Output Gear Assembly
6		580J8	Brake Disc (all models except EC-0564)
7		5J6	Pressure Plate
8		130J3	Nut
9		7JG15-1	Ratchet (all models except 0564)
		7J14	Spacer (EC0564 only)
10		H-2255	Screw
11		H-4133	Lock Washer
12		H-5382	Dowel Pin
13		H-2978-P	Screw
14		H-5503	Retaining Ring
15		H-6258	Fill Plug, Vented
16		S-25-13	Level Plug
17		560J5	Gasket (Ref. #14, Figure 7-1)
18		H-6268	Drain Plug
19	E	35JG1	Transmission Housing
	D	35JG2	Transmission Housing
20		500K7	Bearing
21		400J1	Input Pinion (Models EC-2012, EC-2016, EC-4006, EC-4008 & EC-6005)
		400J2	Input Pinion (Models EC-0516, EC-1008, EC-1016 & EC-2008)
		400J3	Input Pinion (Models EC-0532 & EC-1032)
		400J4	Input Pinion (Model EC-0564)
		400J9	Input Pinion (Model EC-1009)
22		401J1	Input Gear (Models EC-2012 & EC-4006)
		401J2	Input Gear (Models EC-0516, EC-1008, EC-1016 & EC-2008)
		401J3	Input Gear (Models EC-0532 & EC-1032)
		401J5	Input Gear (Models EC-2016, EC-4008 & EC-6005)
		401J9	Input Gear (Model EC-1009)
23		591JG1	Slip Clutch Assembly (Models EC-0516 & EC-1008)
		591JG2	Slip Clutch Assembly (Model EC-0532)

INDEX NO.	USAGE CODE	PART NO.	PART NAME
23		591JG3	Slip Clutch Assembly (Model EC-0564)
(cont.)		591JG4	Slip Clutch Assembly (Models EC-1016 & EC-2008)
		591JG5	Slip Clutch Assembly (Model EC-1032)
		591JG6	Slip Clutch Assembly (Models EC-2012 & EC-4006)
		591JG7	Slip Clutch Assembly (Models EC-2016, EC-4008 & EC-6005)
		591JG20	Slip Clutch Assembly (Model EC-1009)
24		402J1	Intermediate Pinion (Models EC-2012, EC-4006 & EC-1009)
		402J2	Intermediate Pinion (Models EC-0516, EC-1008, EC-1016, EC-2008, EC-2016, EC-4008 & EC-6005)
		402J3	Intermediate Pinion (Models EC-0532 & EC-1032)
25		H-5549	Retaining Ring (Models EC-0516, EC-1008, EC-1016, EC-2008, EC-2016, EC-4008 & EC-6005)
		H-5553	Retaining Ring (Models EC-2012, EC-4006 & EC-1009)
		H-5530	Retaining Ring (Models EC-0532 & EC-1032)
26		14J1	Transmission Oil Replacement Kit, Includes Oil Required for One Oil Change
28	D	132JG22	Sheave Shaft Assembly
	E	132JG21	Sheave Shaft Assembly
29		500K29	Bearing
30		H-5539	Retaining Ring
31		H-5493	Dowel Pin, Ratchet Ring
32		14J2	Seal Kit, Includes Three 561K2 Seals, One MA-562 Seal and One 560J5 Gasket
33		340J7	Spring
34		25J2	Pawl
35		141J14	Spacer



*BEFORE END  
STOP  
75 5G 6K 7/32  
75 5G 7K 1/2*

FIGURE 8-6. CHAMING PARTS

**CHAINING PARTS LIST**

INDEX NO.	USAGE CODE	PART NO.	PART NAME
6	D	500K28	Bearing
	E	500K5	Bearing
7	D	JL19B	Load Chain (1/4 in. Chain)
	E	JL19-1	Load Chain (9/32 in. Chain)
18	G	4J3	Dead End Lug
19	G	18J1	Dead End Pin
20	E	272J1	Chain Guide Plate (9/32 in. Chain)
	D	272J2	Chain Guide Plate (1/4 in. Chain)
21		127J1	Spacer, Chain Guide Plate
22	G	H-5025-P	Cotter Pin
23		H-7596	Split Chain Link
24	F,G,H	H-2978-P	Screw
	J	H-2232	Screw
25		H-2976-P	Screw
26			Transmission Housing (Ref. #6, Figure 8-1)
27			Sheave Housing (Ref. #4, Figure 8-1)
28		H-5490-P	Pin, Slack End
29		23J2	Spring, Slack End

INDEX NO.	USAGE CODE	PART NO.	PART NAME
30		500K29	Bearing (Ref. #29, Figure 8-5)
31		H-5539	Retaining Ring (Ref. #30, Figure 8-5)
32			Sheave Shaft
34	D	16J2	Sheave (1/4 in. Chain)
	E	16J1	Sheave (9/32 in. Chain)
35	D	JF-250-3	Chain Guide (1/4 in. Chain)
	E	JF-254-3	Chain Guide (9/32 in. Chain)
36	F,G,H	107J1	Drive Coupling
	J	107JG7-4	Drive Coupling
37	F,G,H	170J1	Retainer Block
38		H-5382	Dowel Pin
39	H	18J8	Dead End Pin
43	J	122JG16	Idler Shaft
44	J	170J4	Retainer Block
45	J	255K31	Washer
46	J	530J35	Sleeve Bearing
47	J	28J12	Idler Sheave
48	J	H-5219	Grooved Pin
49	J	H-7818	Grease Fitting

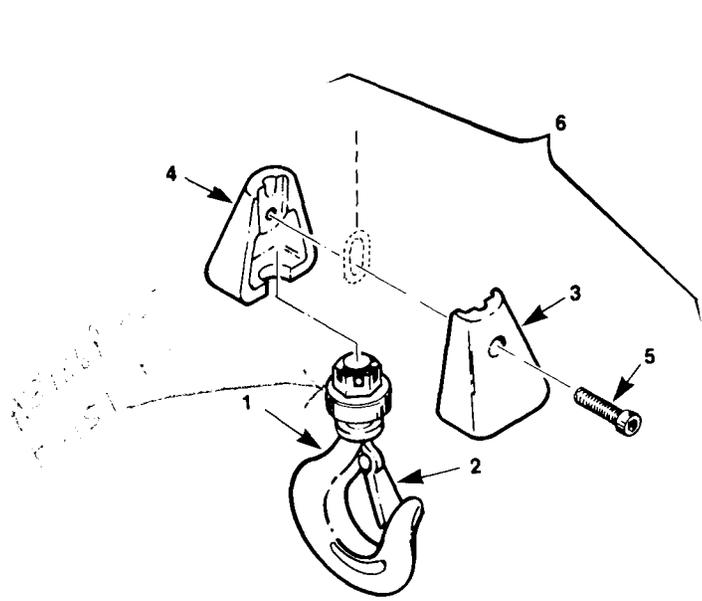


FIGURE 8-7A. BOTTOM BLOCK  
1/4 & 1/2-TON HOISTS

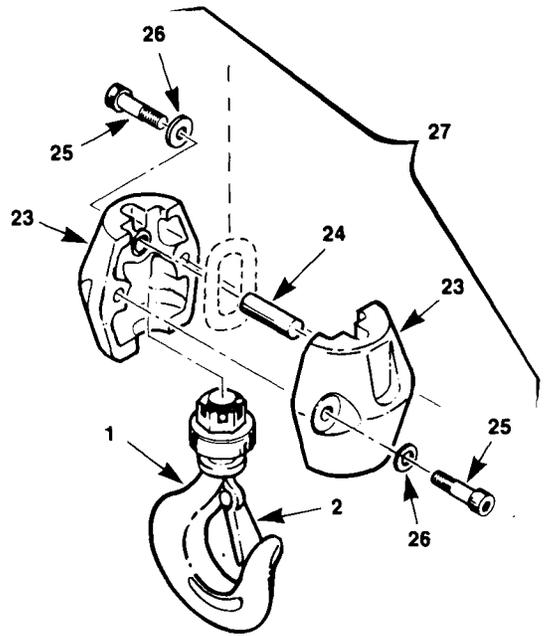


FIGURE 8-7B. BOTTOM BLOCK  
ONE-TON HOISTS

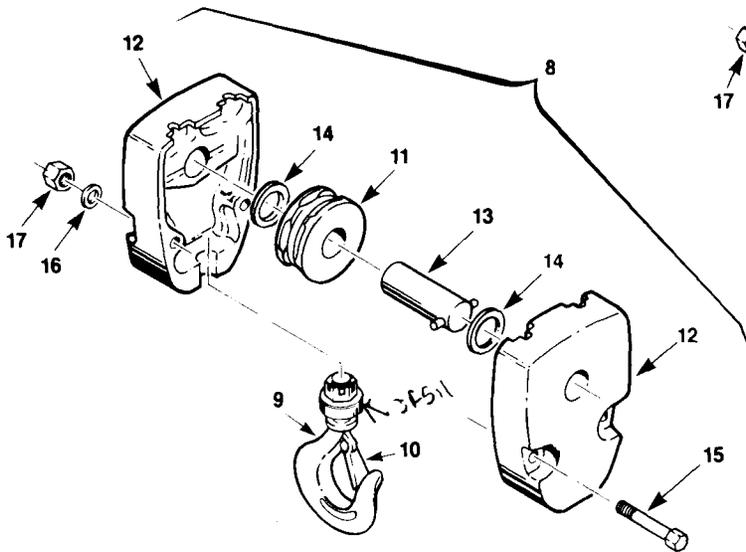


FIGURE 8-7C. BOTTOM BLOCK  
DOUBLE CHAIN HOISTS

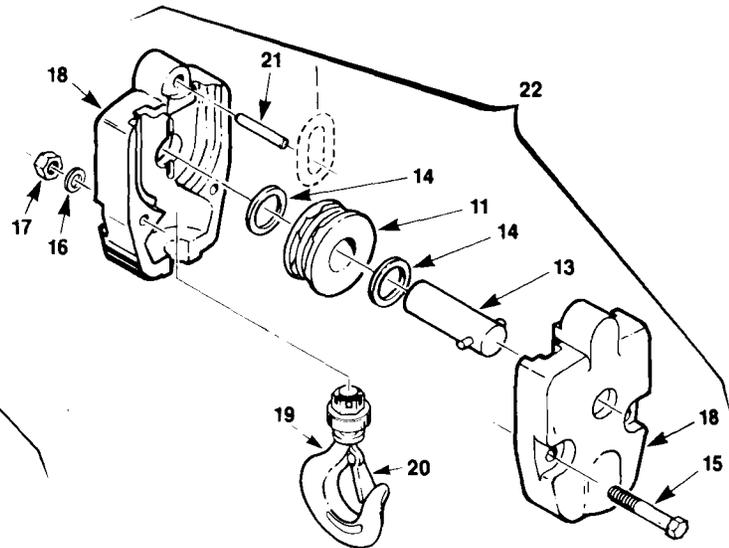


FIGURE 8-7D. BOTTOM BLOCK  
TRIPLE CHAIN HOISTS

**PARTS LIST FOR BOTTOM BLOCK ASSEMBLIES**

INDEX NO.	USAGE CODE	PART NO.	PART NAME
1	F,H	3JG20S	Hook and Latch Assembly
2	F,H	H-7540	Latch Kit
3	F	JF-20-2	Load Block Frame
4	F	JF-20-3	Load Block Frame
5	F	JF-700	Screw
6	F	913JG4AS	Bottom Block Assembly
8	G	914JG2	Bottom Block Assembly (Model EC-2008)
	G	914JG4	Bottom Block Assembly (Models EC-4006 & EC-4008)
9	G	3KG1	Hook and Latch Assembly (Models EC-4006 & EC-4008)
	G	3KG6	Hook and Latch Assembly (Model EC-2008)
10	G	H-7540	Latch Kit <i>new style</i>
11	G	16JG7	Sheave and Bearing Assembly (Model EC-2008)

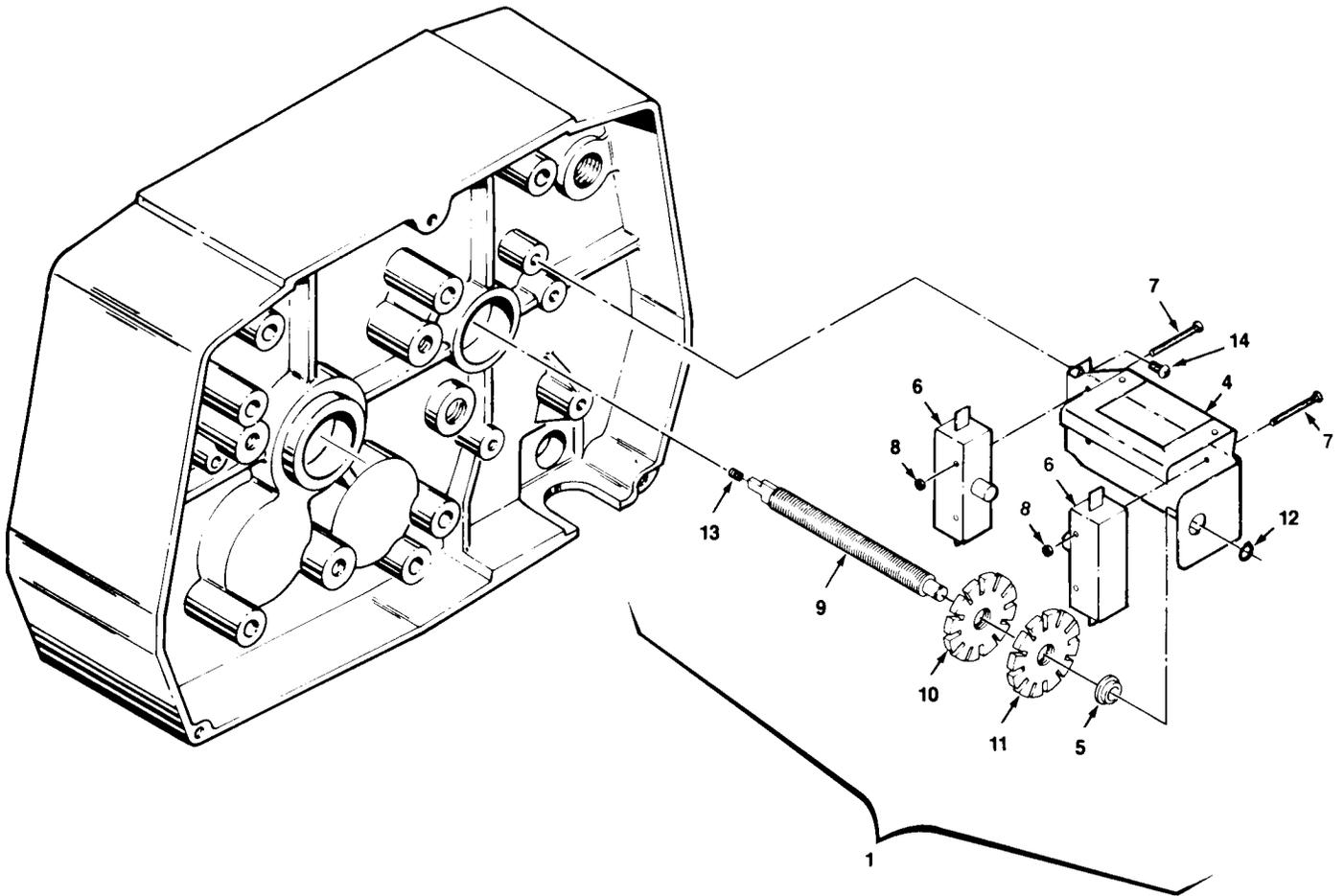
INDEX NO.	USAGE CODE	PART NO.	PART NAME
11 (cont.)	G,J	16JG6	Sheave and Bearing Assembly (Models EC-4006, EC-4008 & EC-6005)
12	G	30J2	Frame (Model EC-2008)
	G	30J4	Frame (Models EC-4006 & EC-4008)
13	G,J	122JG3	Shaft Assembly
14	G,J	255K2	Washer
15	G,J	H-2403-P	Screw
16	G,J	H-4085-P	Lock Washer
17	G,J	H-3473-P	Hex Nut
18	J	30J20	Frame
19	J	3JG14S	Hook and Latch Assembly
20	J	H-7544	Latch Kit
21	J	18J15	Dead End Pin
22	J	914JG23	Bottom Block Assembly
23	H	30J14	Frame
24	H	18J8	Dead End Pin
25	H	S-49-77	Screw
26	H	H-4134	Lock Washer
27	H	913JG3AS	Bottom Block Assembly

**PARTS LIST FOR STANDARD LIMIT SWITCH**

INDEX NO.	PART NO.	PART NAME
1	918JG4	Limit Switch and Shaft Assembly (Consists of Index Nos. 4 thru 12)
4	JF900-3	Limit Switch Bracket Assembly (Includes Index No. 5)
5	JF-531-4	Limit Switch Bushing
6	815J1	Microswitch, Limit

INDEX NO.	PART NO.	PART NAME
7	H-1402-P	Screw
8	H-3944	Nut
9	JF-117-3	Limit Switch Shaft
10	JF-751-3-G	Limit Switch Nut (Green)
11	JF-751-3-R	Limit Switch Nut (Red)
12	H-5520	Retaining Ring
13	JF-343-3	Spring
14	H-2981-P	Screw

Americrane & Hoist Corp. 1-800-652-1932



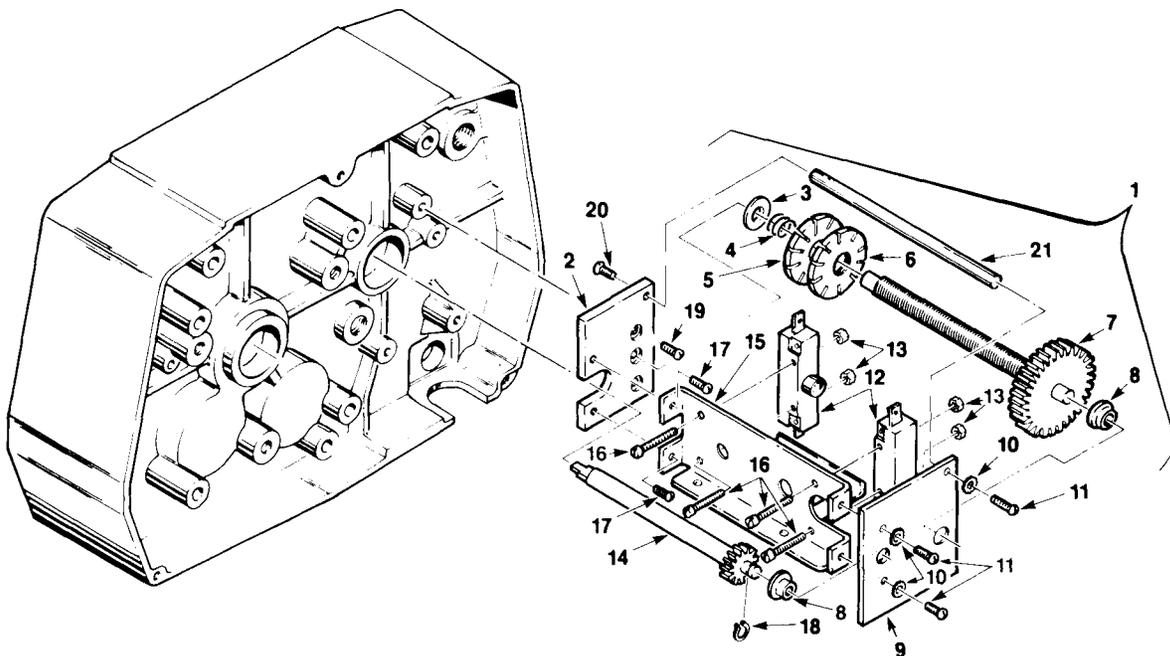
**FIGURE 8-8A. STANDARD LIMIT SWITCH PARTS**

**PARTS LIST FOR LONG LIFT LIMIT SWITCH**

INDEX NO.	PART NO.	PART NAME
1	944JG6	Long Lift Limit Switch Assembly (all items except No. 19)
2	129J1	Mounting Plate
3	255K16	Thrust Washer
4	PB-287	Spring
5	JF-751-3R	Red Nut
6	JF-751-3G	Green Nut
7	117JG2	Shaft and Gear Assembly
8	JF-531-4	Bushing
9	258J8	End Plate
10	H-4158	Lock Washer

INDEX NO.	PART NO.	PART NAME
11	H-2741-P	Screw
12	815J1	Switch
13	H-3944	Locknut
14	427J1	Drive Pinion
15	258JG7	Frame and Guide Assembly
16	H-1402-P	Screw
17	854823	Screw
18	H-5520	Retaining Ring
19	H-2981-P	Mounting Screw
20	H-1210	Flat Head Screw
21	110J14	Post

Americrane & Hoist Corp. 1-800-652-1932



**FIGURE 8-8B. LONG LIFT LIMIT SWITCH PARTS**

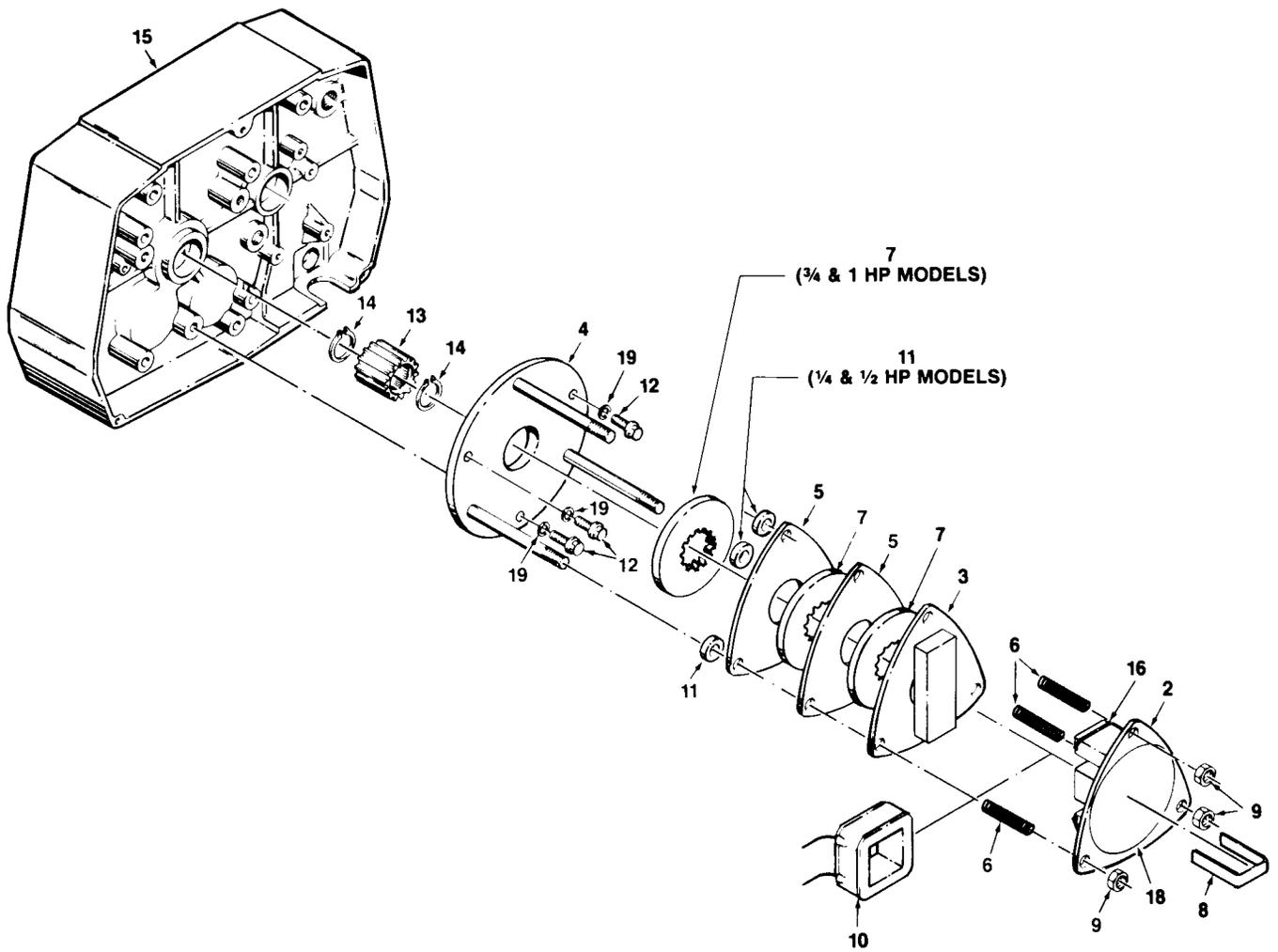


FIGURE 8-9. MOTOR BRAKE PARTS

**MOTOR BRAKE PARTS LIST**

INDEX NO.	USAGE CODE	PART NO.	PART NAME
1	A	854JG6	Disc Brake Assembly (1/4 & 1/2 HP, 115/230 V Hoists)
	A	854JG1	Disc Brake Assembly (3/4 & 1 HP, 115/230 V Hoists)
	B	854JG7	Disc Brake Assembly (1/4 & 1/2 HP, 230/460 V Hoists)
	B	854JG2	Disc Brake Assembly (3/4 & 1 HP, 230/460 V Hoists)
	C	854JG7	Disc Brake Assembly (1/4 & 1/2 HP, 230 V Hoists)
	C	854JG2	Disc Brake Assembly (3/4 & 1 HP, 230 V Hoists)
	C	854JG8	Disc Brake Assembly (1/4 & 1/2 HP, 460 V Hoists)
	C	854JG3	Disc Brake Assembly (3/4 & 1 HP, 460 V Hoists)
	B,C	854JG9	Disc Brake Assembly (1/4 & 1/2 HP, 575 V Hoists)
	B,C	854JG4	Disc Brake Assembly (3/4 & 1 HP, 575 V Hoists)
	B,C	854JG10	Disc Brake Assembly (1/4 & 1/2 HP, 208 V Hoists)
	B,C	854JG5	Disc Brake Assembly (3/4 & 1 HP, 208 V Hoists)
2		857JG1	Plate and Frame Assembly
3		858JG1	Plate and Armature Assembly

INDEX NO.	USAGE CODE	PART NO.	PART NAME
4		859JG1	Plate and Stud Assembly
5		291J1	Brake Plate
6		JF-344	Spring
7		581J1A	Brake Disc
8		JF-710	Retainer
9		H-3978	Locking Nut
10	A	JF-853-1	Coil (115 V, 60 Hz, For Brake 854JG6, 854JG1)
	B&C	JF-853-2	Coil (230 V, 60 Hz, For Brake 854JG7, 854JG2)
	C	JF-853-3	Coil (460 V, 60 Hz, For Brake 854JG8, 854JG3)
	B&C	JF-853-4	Coil (575 V, 60 Hz, For Brake 854JG9, 854JG4)
	B&C	JF-853-5	Coil (208 V, 60 Hz, For Brake 854JG10, 854JG5)
11		141J2	Spacer (1/4 & 1/2 HP models only)
12		H-2982-P	Screw
13		142J1	Brake Adapter
14		H-5501	Retaining Ring
15		34JG1	Transmission Cover (Ref. #5, Figure 8-1)
16		JF-860	Shading Coil Element (Must be attached to frame with H-7812 Adhesive)
17		H-7812	Adhesive (1 Oz. Tube)
18		676J1	Decal, Load Equalizer
19		H-4134	Lock Washer

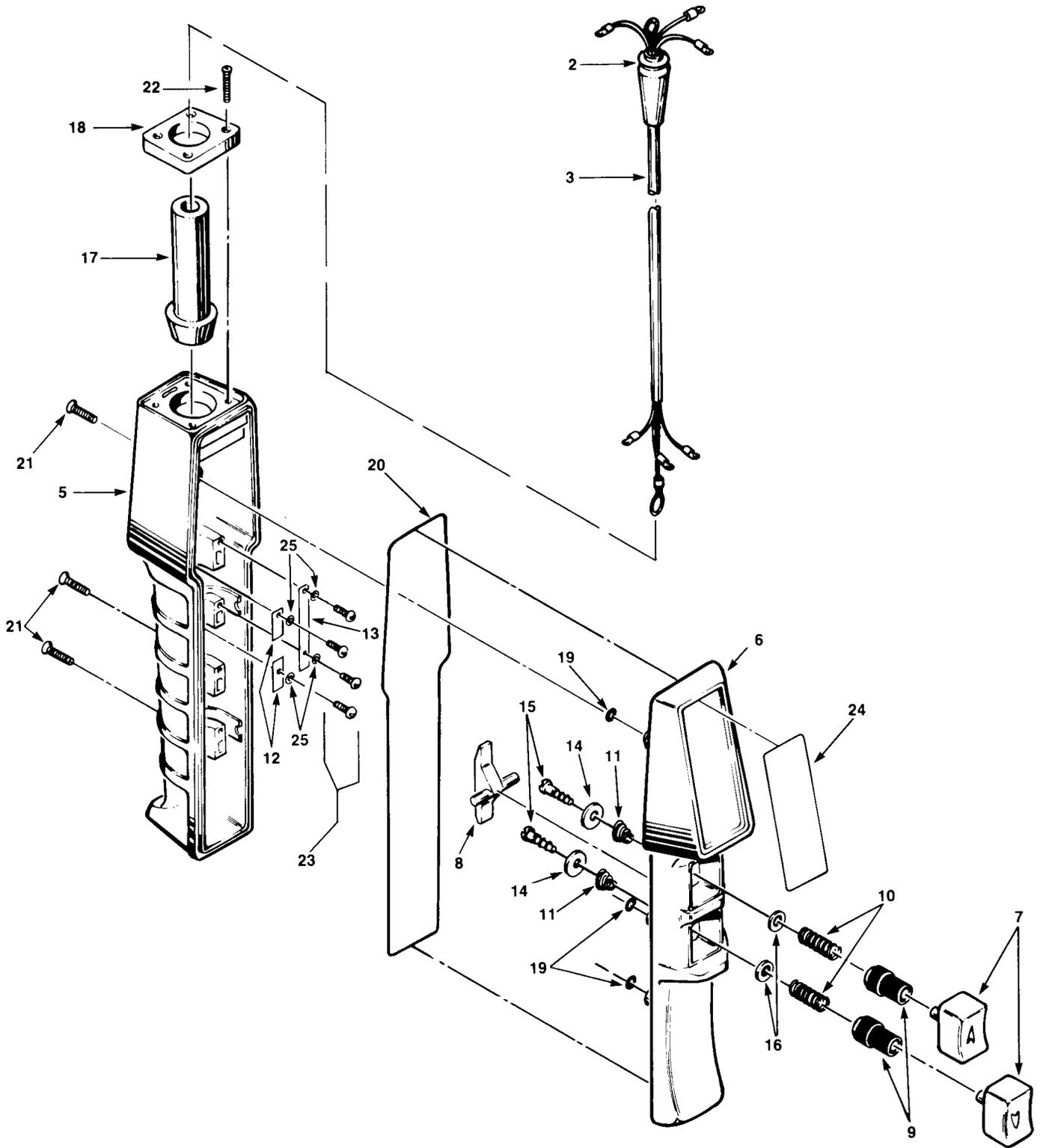


FIGURE 8-10A. PUSHBUTTON  
(SINGLE SPEED HOISTS)

**PARTS LIST FOR PUSHBUTTON (Single Speed Hoists)**

INDEX NO.	PART NO.	PART NAME
1		Pushbutton & Cable Assembly (Consists of Index Nos. 2 thru 25)
	PB-299-6B	6 ft. cable length
	PB-299-11B	11 ft. cable length
	PB-299-16B	16 ft. cable length
	PBS-299*-B	Special Drop (*Equal to P.B. Drop)
2	JF-761	Rubber Grommet
3		Pushbutton Cable Assembly:
	PB-299-6	6 ft. cable length
	PB-299-11	11 ft. cable length
	PB-299-16	16 ft. cable length
	PBS-299*-	Special Drop (*Equal to P.B. Drop)
4	534K97B	Pushbutton Assembly (Consists of Index Nos. 5 thru 25)
5	PB-282-4	Enclosure
6	PB-298	Cover

INDEX NO.	PART NO.	PART NAME
7	PB-284-2	Pushbutton
8	PB-285	Interlock (Single speed, Red)
9	PB-286	Boot
10	PB-287	Spring, Compression
11	PB-288	Spring, Conical
12	PB-289	Contact Plate
13	PB-290	Contact Plate, Common
14	PB-291	Washer, Contact
15	PB-301	Screw
16	PB-293	Washer, Boot
17	PB-294-1	Grommet
18	PB-295	Cap, Enclosure
19	X-6477-1	"O" Ring
20	H-7851	Rubber Seal
21	H-2991	Screw
22	H-2992	Screw
23	H-2993	Screw
24	PB-296	Warning Tag
25	H-4160	Lock Washer

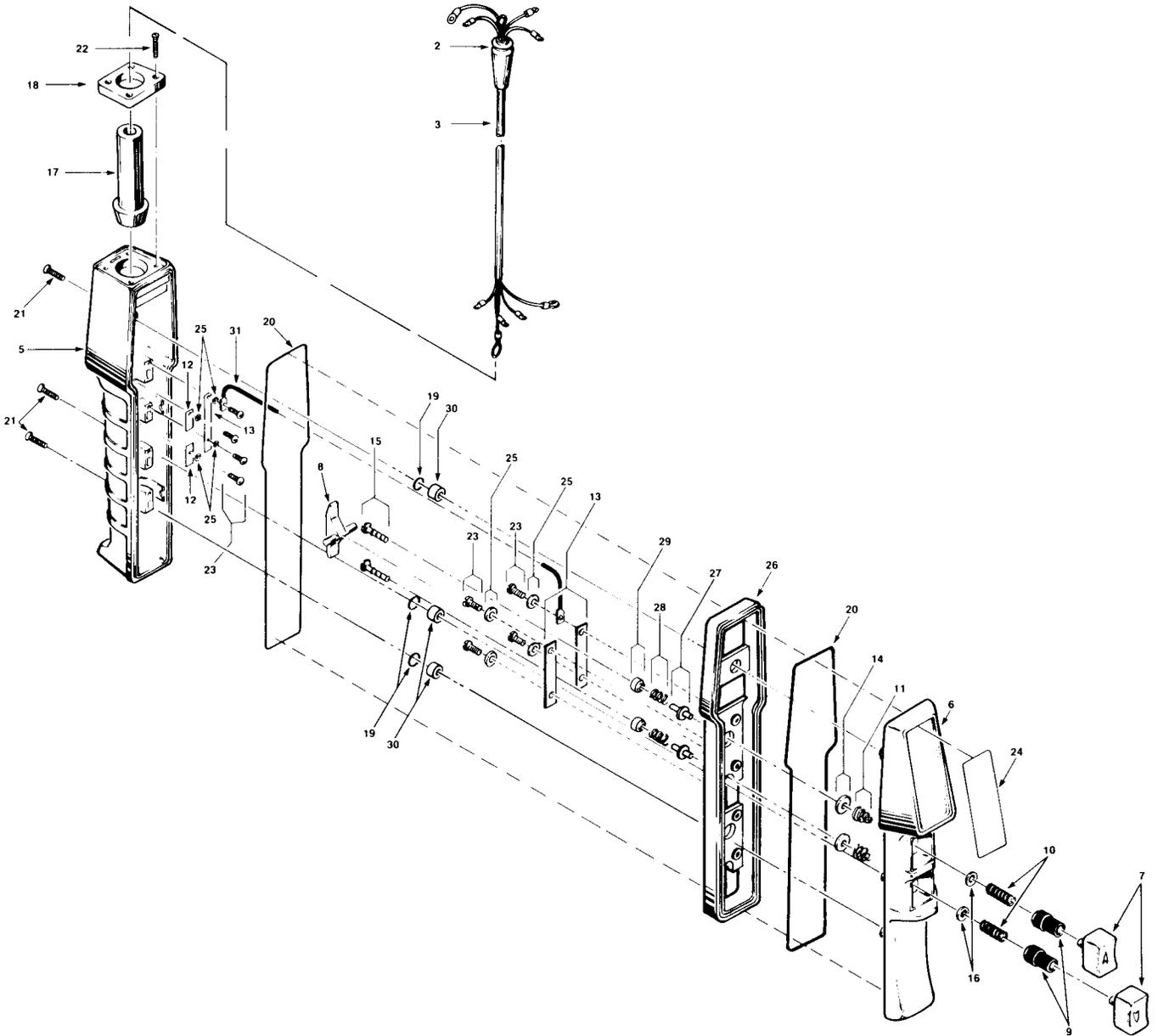


FIGURE 8-10B. PUSHBUTTON (TWO SPEED HOIST).

**PARTS LIST FOR PUSHBUTTON (Two Speed Hoists)**

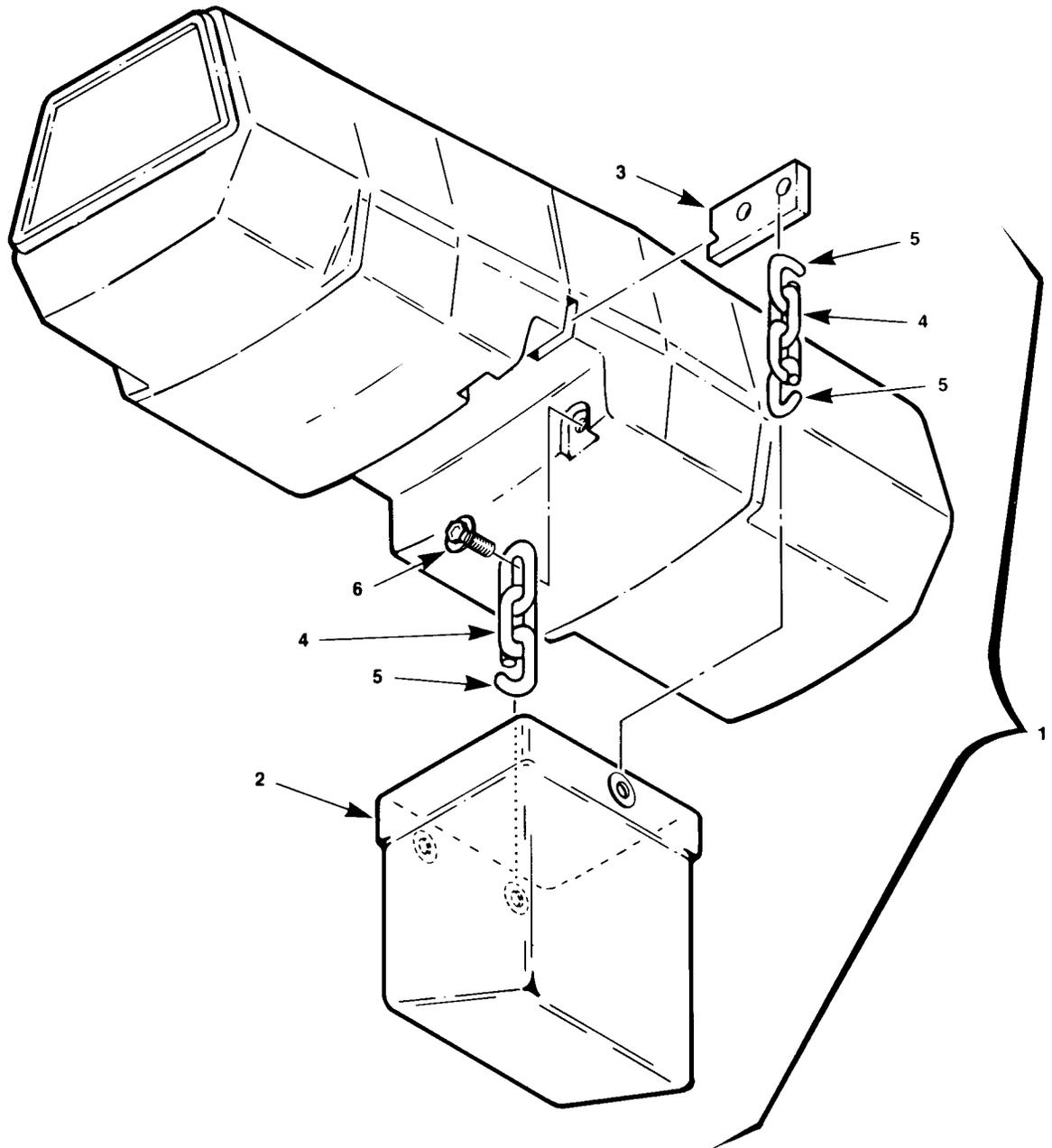
INDEX NO.	PART NO.	PART NAME
1		Pushbutton & Cable Assembly (Consists of Index Nos. 2 thru 30)
	534JG4-6	6 ft. cable length
	534JG4-11	11 ft. cable length
	534JG4-16	16 ft. cable length
	534JG4-*	Special Drop (*Equal to P.B. Drop)
2	JF-761	Rubber Grommet
3		Pushbutton Cable Assembly:
	PB-300-6	6 ft. cable length
	PB-300-11	11 ft. cable length
	PB-300-16	16 ft. cable length
	PBS-300-*	Special Drop (*Equal to P.B. Drop)
4	534JG4	Pushbutton Assembly (Consists of Index Nos. 5 thru 31)
5	PB-282-4	Enclosure
6	PB-298	Cover
7	PB-284-22	Pushbutton
8	PB-285-1	Interlock (Two-speed, Black)

INDEX NO.	PART NO.	PART NAME
9	PB-286	Boot
10	PB-287	Spring, Compression
11	PB-288	Spring, Conical
12	PB-289	Contact Plate
13	PB-290	Contact Plate, Common
14	PB-291	Washer, Contact
15	H-1852-P	Screw
16	PB-293	Washer, Boot
17	PB-294-1	Grommet
18	PB-295	Cap, Enclosure
19	X-6477-1	"O" Ring
20	H-7851	Rubber Seal
21	H-2925	Screw (Enclosure)
22	H-2992	Screw (Cap)
23	H-2993	Screw (Plates)
24	PB-296	Warning Tag
25	H-4160	Lock Washer
26	PB-308	2-Speed Adapter
27	755J1	Insulating Bushing
28	344J5	Spring, Lower
29	201J1	Contact Button
30	200J16	Bushing
31	JF-940-42	Jumper Wire

**CHAIN CONTAINER PARTS LIST**

INDEX NO.	PART NO.	PART NAME
1	927JG17	Chain Container Kit (20 feet chain max.)
	927JG18	Chain Container Kit (25 feet chain max.)
	927JG19	Chain Container Kit (35 feet chain max.)
	927JG20	Chain Container Kit (50 feet chain max.)

INDEX NO.	PART NO.	PART NAME
2	927J17	Container (20 feet chain max.)
	927J18	Container (25 feet chain max.)
	927J19	Container (35 feet chain max.)
	927J20	Container (50 feet chain max.)
3	267J3	Mounting Arm
4	53J4	Chain Section
5	H-7929	Split Link
6	H-2349	Screw



**FIGURE 8-11. CHAIN CONTAINER PARTS**

## SECTION IX DO'S AND DO NOT'S

### Electric and Air Powered Hoists

The following warnings and operating practices have been taken from American National (Safety) Standard ANSI B30.16 and are intended to avoid unsafe hoisting practices which might lead to personal injury or property damage.

These recommendations apply to all electric and air powered hoists for vertical lifting service involving material handling of freely suspended unguided loads.

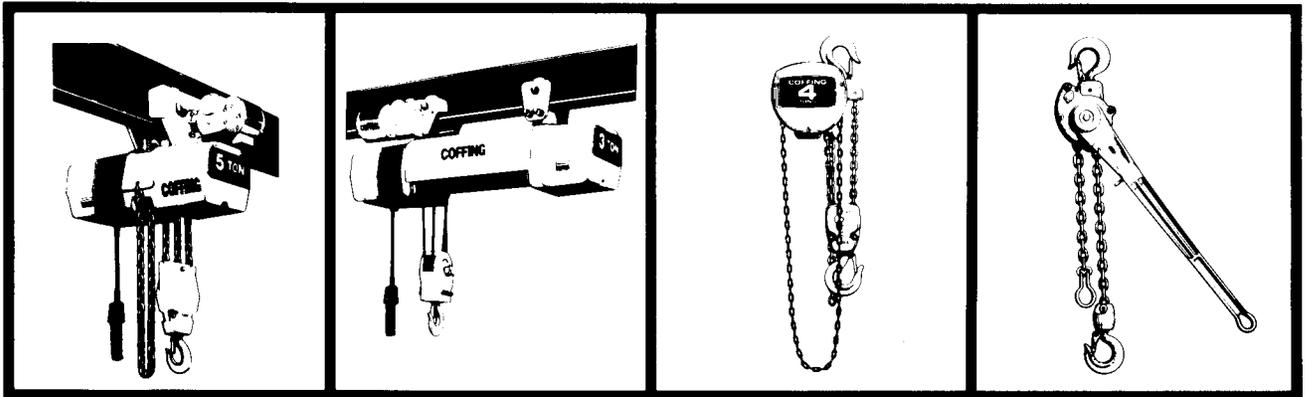
### WARNING: TO AVOID INJURY

1. DO read ANSI B30.16 Safety Standard for Overhead Hoists and Hoist Manufacturer's Operating and Maintenance Instructions.
2. DO be familiar with hoist operating controls, procedures and warnings.
3. DO make sure hook travel is in the same direction as shown on controls.
4. DO make sure hoist limit switches function properly.
5. DO maintain firm footing when operating hoist.
6. DO make sure that load slings or other approved sling attachments are properly sized and seated in the hook saddle.
7. DO make sure that the hook latch, if used, is closed and not supporting any part of the load.
8. DO make sure that load is free to move and will clear all obstructions.
9. DO take up slack carefully, check load balance, lift a few inches and check load holding action before continuing.
10. DO avoid swinging of load or load hook.
11. DO make sure that all persons stay clear of the suspended load.
12. DO warn personnel of an approaching load.
13. DO protect wire rope and load chain from weld spatter or other damaging contaminants.
14. DO promptly report any malfunction, unusual performance, or damage of the hoist.
15. DO inspect hoist regularly, replace damaged or worn parts, and keep appropriate records of maintenance.
16. DO use the hoist manufacturer's recommended parts when repairing a hoist.
17. DO use hook latches wherever possible.
18. DO apply lubricant to the wire rope or load chain as recommended by the hoist manufacturer.
19. DO NOT lift more than rated load.
20. DO NOT use the hoist load limiting device to measure the load.
21. DO NOT use damaged hoist or hoist that is not working correctly.
22. DO NOT use the hoist with twisted, kinked, damaged or worn wire rope or chain.
23. DO NOT lift a load unless wire rope is properly seated in its groove(s) or unless chain is properly seated in chain wheel(s) or sprocket(s).
24. DO NOT use load rope or load chain as a sling or wrap rope or chain around the load.
25. DO NOT lift a load if any binding prevents equal loading on all supporting ropes or chains.
26. DO NOT apply the load to the tip of the hook.
27. DO NOT operate unless load is centered under hoist.
28. DO NOT allow your attention to be diverted from operating the hoist.
29. DO NOT operate the hoist beyond limits of load rope or load chain travel.
30. DO NOT use limit switches as routine operating stops unless recommended. They are emergency devices only.
31. DO NOT use hoist to lift, support or transport people.
32. DO NOT lift loads over people.
33. DO NOT leave a suspended load unattended unless specific precautions have been taken.
34. DO NOT allow sharp contact between two hoists or between hoist and obstructions.
35. DO NOT allow the rope, chain or hook to be used as a ground for welding.
36. DO NOT allow the rope, chain or hook to be touched by a live welding electrode.
37. DO NOT remove or obscure the warnings on the hoist.
38. DO NOT adjust or repair a hoist unless qualified to perform hoist maintenance.
39. DO NOT attempt to lengthen the load rope or chain or repair damaged load rope or chain.

# DUFF-NORTON HAS ALL YOU NEED TO HANDLE A VARIETY OF TOUGH INDUSTRIAL, MAINTENANCE AND CONSTRUCTION LIFTING JOBS.

Coffing® is America's first name in quality, industrial hoisting equipment. Nowhere else can you find such a broad range of hoists with such consistent high-quality construction and durability. A detailed

product catalog is available from your local Coffing hoist distributor, Duff-Norton District Sales Manager, or by writing directly to Duff-Norton. **Ask for Catalog 201, it includes:**



#### Coffing® Electric Chain Hoists

Load ratings from ¼ to 5 tons. More standard features than any comparable hoist. Two-speed options available; 47 models to choose.

#### Coffing® Electric Wire Rope Hoists.

Low headroom units with load ratings from ½ to 3 tons. Choice of rigid hook or lug suspensions, plus plain, geared or motorized trolleys. Single or two speed options and variety of standard lifts. 35 models.

#### Coffing® Hand Chain Hoists.

Designed for light weight and long life with minimum maintenance. Optional capacity limiter available in some models. 99 models in rated loads from ½ to 25 tons.

#### Coffing® Lever Hoists.

A variety of mechanisms and rated loads from ¼ to 15 tons; in 36 models for both conventional and special purpose applications.

**WARNING: The hoisting equipment described in this manual is intended for industrial use only and should not be used to lift, support, or otherwise transport people, or lift loads over people.**

**AVAILABLE FROM YOUR LOCAL  
DUFF NORTON COFFING®/DUFF  
LYNX® HOIST DISTRIBUTOR:**

**Duff-Norton**

P.O. Box 7010  
Charlotte, NC 28241-7010

Customer Service (800) 477-5003  
Parts Service (800) 477-5004  
FAX (704) 588-8466

Duff-Norton Manufactures:  
Duff-Norton Actuators® • Mechanical Jacks • Rotary Unions • Coffing® Hoists • Duff Lynx® Hoists  
Yale® Hoists, Shop King Hoists • Little Mule® Products and American Lifts

EC 680-4  
Printed In USA  
500 10/93