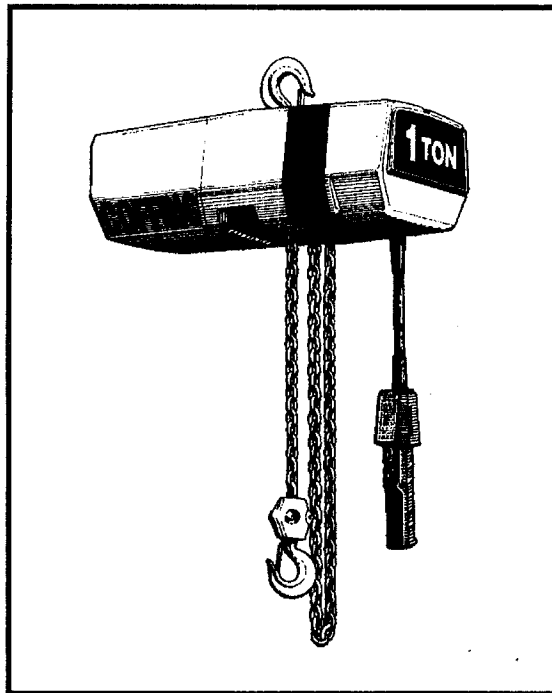


COFFING®

OPERATING & MAINTENANCE HOISTS INSTRUCTIONS WITH PARTS LIST PUBLICATION PART NO. EC-680-5

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
EC-2004	

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

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	1/4
EC-0532	500	32	1/2
EC-0564	500	64	1
EC-1009	1000	9	1/4
EC-1016	1000	16	1/2
EC-1032	1000	32	1
EC-2004	2000	4	1/4
EC-2008	2000	8	1/2
EC-2012	2000	12	3/4
EC-2016	2000	16	1
EC-4006	4000	6	3/4
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°F or above 130°F.

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

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 Coffing 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 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 Coffing 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, COFFING 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

A pressure relief plug (Item 24, Figure 8-1) is provided which will vent excess pressure from the transmission housing.

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.

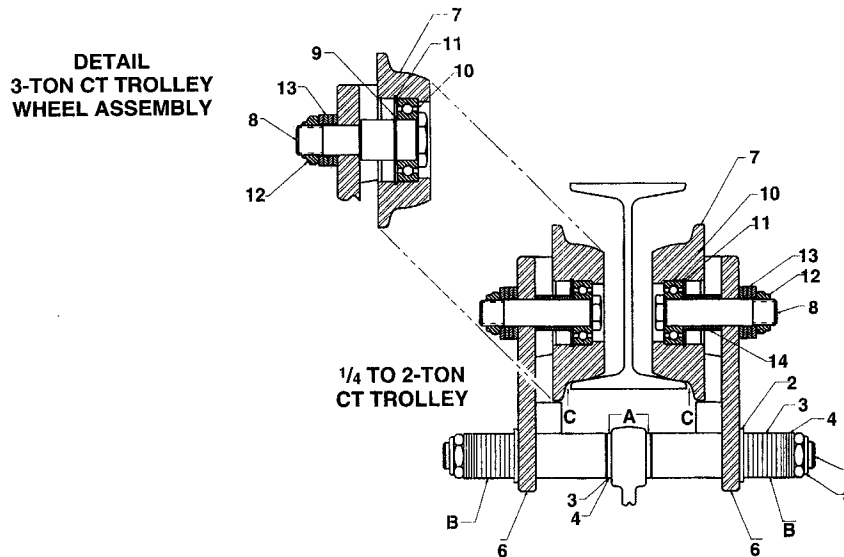


FIGURE 2-1. COFFING CT TROLLEY

TABLE 2-1. PARTS LIST FOR CT TROLLEY

INDEX NO.	PART NAME	PART NUMBERS	
		1/4 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	5KG1	5KG2
7	Wheel	45K1	45K2

INDEX NO.	PART NAME	PART NUMBERS	
		1/4 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

*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.

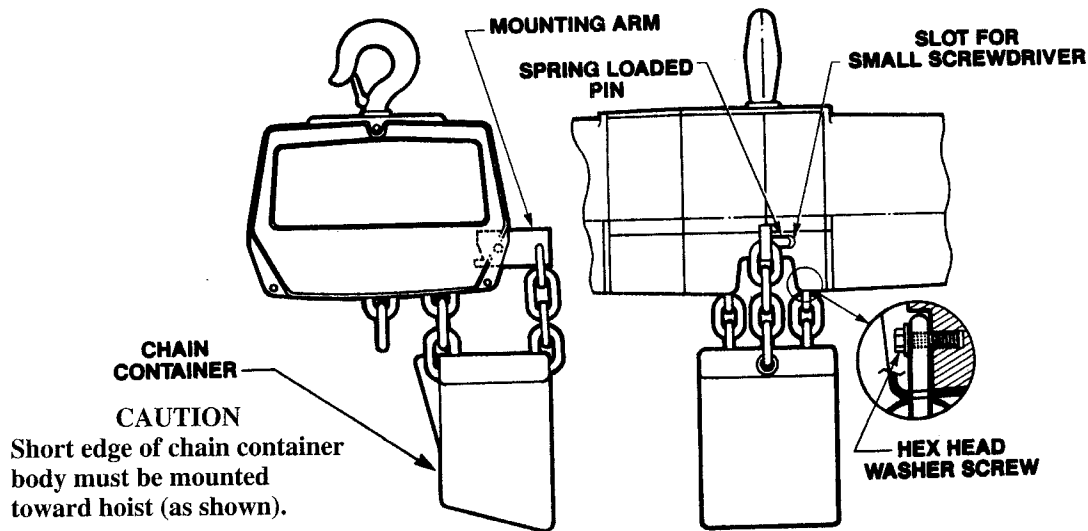


FIGURE 2-2. CHAIN CONTAINER INSTALLATION

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 ANSIB30.16 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.

- d. 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 permits lifting loads within rated

capacity and prevents lifting excessive loads which could damage the hoist. If the load exceeds the lifting capability of the overload clutch, the hoist will not lift the load, but the motor will run as long as the "UP" button is pressed. Repeated attempts to lift an excessive load will overheat the overload clutch and cause permanent damage to the clutch.

CAUTION

The overload limiting clutch is an emergency protection device. It should not routinely be used to measure the maximum load to be lifted.

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, semiannually, 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 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.

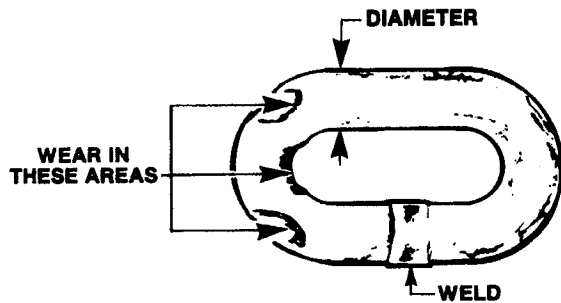


FIGURE 4-4. TYPICAL WEAR ON LINKS

- 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 1 1/2% longer than the unused chain (.015" per inch of chain

measured), then the chain should be replaced. If the chain is worn less than 1 1/2%, check it at several more places along its length. If any section is worn more than 1 1/2%, 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.

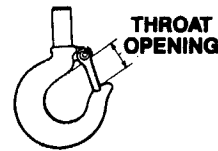


TABLE 4-1. MAXIMUM ALLOWABLE HOOK THROAT OPENING

Hoist Load Rating (ton)	Top Hook* (in.)	Bottom Hook* (in.)
1/4, 1/2 and 1	1 5/16	1 3/16
2	1 5/16	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 brass and zinc respectively. Each limit switch nut has ten slots for adjustment, and the increment of 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.

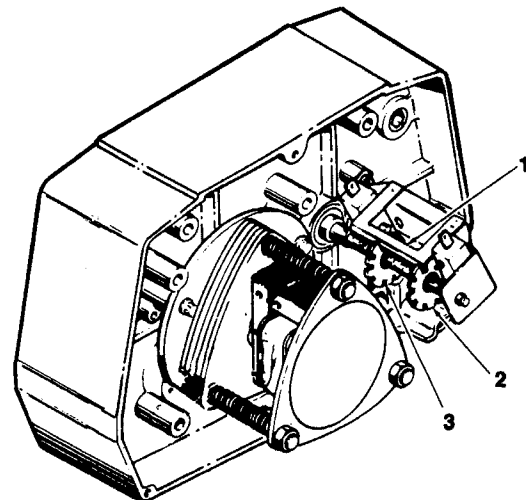


FIGURE 5-1. LIMIT SWITCH ADJUSTMENT

a. Adjusting Upper Limit (Brass 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 brass 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 (Zinc 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 zinc limit switch nut in the same manner described above for the brass 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.

- 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.

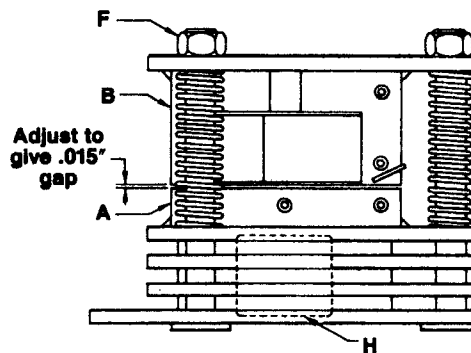


FIGURE 5-2. MOTOR BRAKE ADJUSTMENT

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 limit switch nuts. Turn the brass slotted nut (2) back to about the center of the threaded screw. DO NOT DISCONNECT THE WIRES FROM THE LIMIT SWITCHES.

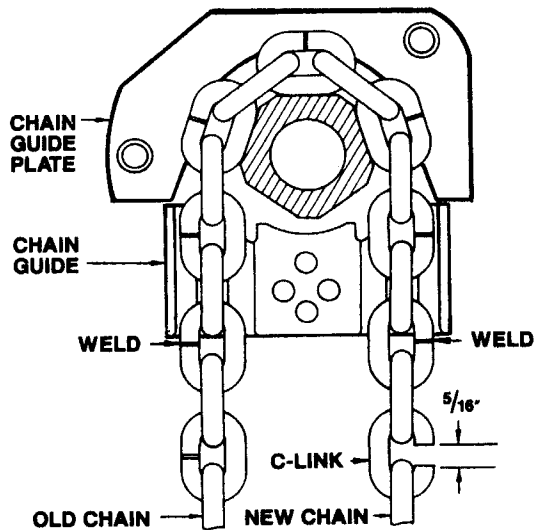


FIGURE 5-3. CHAINING HOIST

- d. Remove the load hook assembly from the old chain.
- 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 $\frac{1}{8}$ " 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 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 be 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.

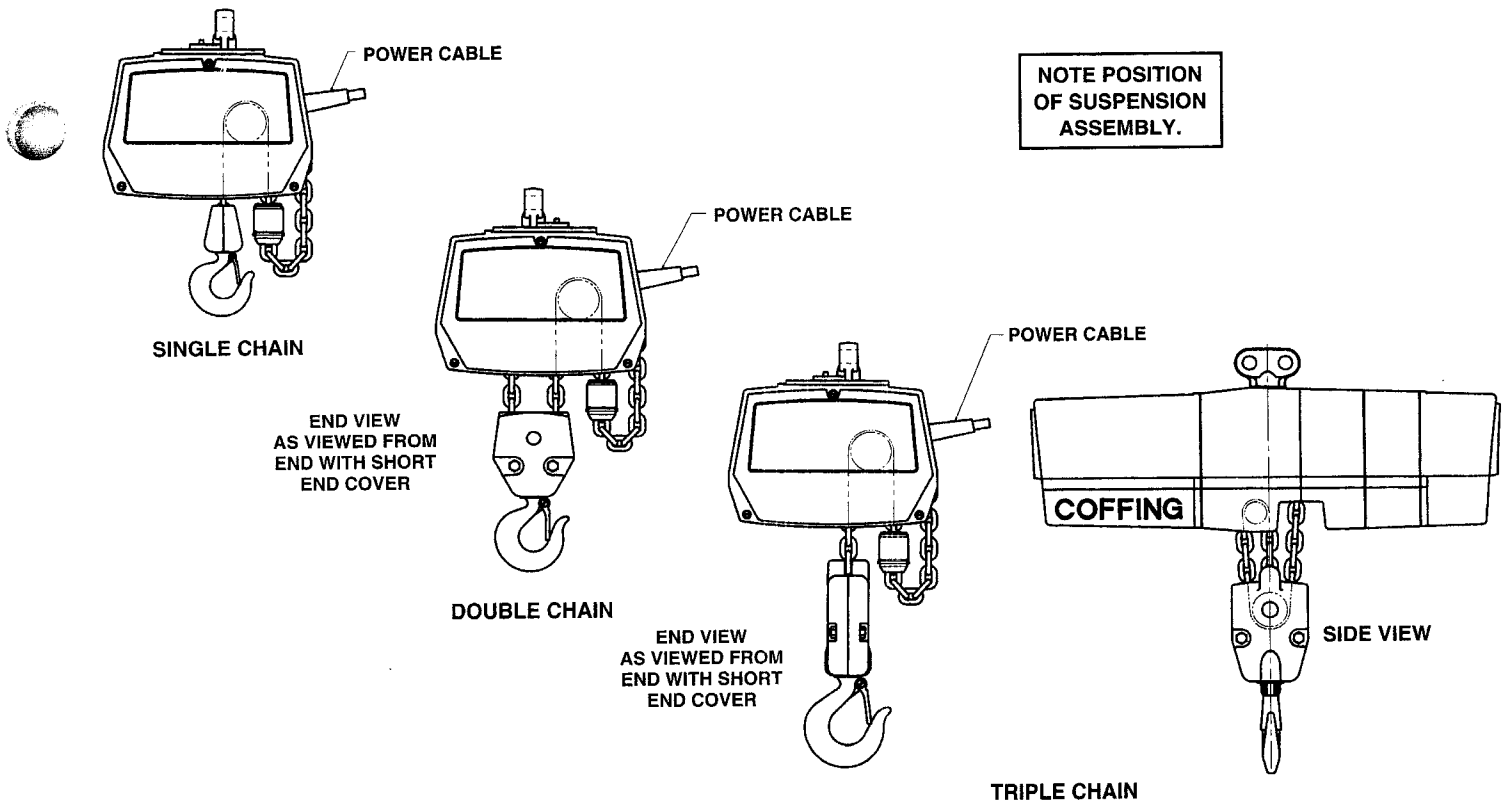


FIGURE 5-4. CHAINING AND SUSPENSION DIAGRAMS

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
Hook Fails to Stop at End of Travel.	
<ol style="list-style-type: none"> 1. Limit switches not operating. 2. Limit switch nuts not moving on shaft. 3. Magnetic reversing switch malfunction. 	<ol style="list-style-type: none"> 1. Check adjustment. See paragraph 5-2. Check connections against wiring diagram. Tighten loose connections or replace. 2. Check for stripped threads or bent nut guide. 3. Remove electrical cover and check reversing switch.
Hoist Does Not Respond to Pushbutton.	
<ol style="list-style-type: none"> 1. Power failure in supply lines. 2. Wrong voltage or frequency. 3. Improper connections in hoist or pushbutton station. 4. Motor brake does not release. 5. Faulty magnetic hoist control switch. 	<ol style="list-style-type: none"> 1. Check circuit breakers, switches and connections in power supply lines. 2. Check voltage and frequency of power supply against the rating on the nameplate of the hoist. 3. Check all connections at line connectors and on terminal block. Check terminal block on dual-voltage hoists for proper voltage connections. 4. Check connections to the solenoid coil. Check for open or short circuit. Check for proper adjustment. See paragraph 5-3. 5. Check coils for open or short circuit. Check all connections in control circuit. Check for burned contacts. Replace as needed.
Hook Does Not Stop Promptly.	
<ol style="list-style-type: none"> 1. Hoist overloaded. 2. Brake not holding. 	<ol style="list-style-type: none"> 1. Reduce load to within rated capacity of hoist. 2. Check motor brake adjustment (see paragraph 5-3) and load brake (Figure 4-3).
Hook Moves in Wrong Direction.	
<ol style="list-style-type: none"> 1. Three-phase reversal. 2. Improper connections. 	<ol style="list-style-type: none"> 1. Reverse any two wires (except the green ground wire) at the power source (see paragraph 2-3). 2. Check all connections against Wiring Diagram.
Hoist Hesitates to Lift When Energized.	
<ol style="list-style-type: none"> 1. Hoist overloaded. 2. Motor brake requires adjustment. 3. Worn overload limiting clutch. 4. Low voltage. 5. Faulty SINPAC starting switch or start capacitor (single phase hoists only). 	<ol style="list-style-type: none"> 1. Reduce load within rated capacity of hoist. 2. Check motor brake adjustment. See Figure 5-3. 3. Replace clutch. 4. Check voltage at hoist power cord with hoist starting. Voltage should be no less than 90% of voltage specified on hoist. 5. Replace faulty component.
Hook Raises But Will Not Lower. (Motor not running)	
<ol style="list-style-type: none"> 1. "Down" circuit open. 2. Broken conductor in pushbutton cable. 3. Faulty magnetic hoist control switch. 	<ol style="list-style-type: none"> 1. Check circuit for loose connections. Check "Down" limit switch for malfunction. 2. Check each conductor in the cable. If one is broken, replace entire cable. 3. Check coils for open or short circuit. Check all connections in control circuit. Check for burned contacts. Replace as needed.

TROUBLE	REMEDY
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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"> 1. Hoist overloaded. 2. Low voltage. 3. "UP" circuit open. 4. Broken conductor in pushbutton cable. 5. Faulty magnetic hoist control switch. 6. Faulty capacitor (single-phase hoists only). 7. Worn overload limiting clutch. 	<ol style="list-style-type: none"> 1. Reduce load to within rated capacity. 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. 3. Check circuit for loose connections. Check "UP" limit switch for malfunction. 4. Check each conductor in the cable. If one is broken, replace entire cable. 5. Check coils for open or short circuit. Check all connections in control circuit. Check for burned contacts. Replace as needed. 6. Check starting capacitor in motor. Replace if necessary. 7. Replace clutch.
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Lack of Proper Lifting Speed.

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

<ol style="list-style-type: none"> 1. Need transmission oil change, or improper lubricant has been used. 2. Load brake malfunctioning. 	<ol style="list-style-type: none"> 1. Change transmission oil. See Table 5-1. Note: Hoist Warranty is void if unapproved oil is used. 2. Check load brake operation. See Figure 4-3.
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Motor Brake Noise or Chatter. (While starting hoist)

<ol style="list-style-type: none"> 1. Brake needs adjustment. 2. Low voltage. 	<ol style="list-style-type: none"> 1. Adjust as per paragraph 5-3. 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.
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Motor Brake "Buzz." (Anytime hoist is running)

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

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.

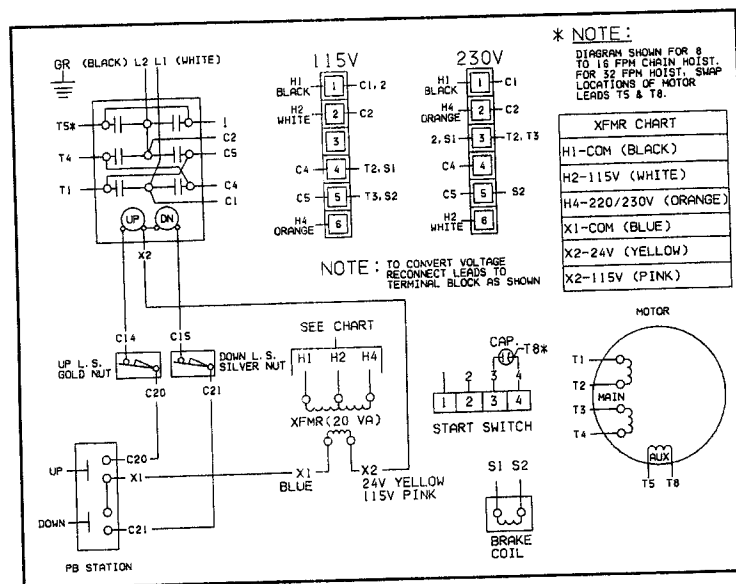


FIGURE 7-1. 115/230V, SINGLE PHASE (6-WIRE MOTOR)

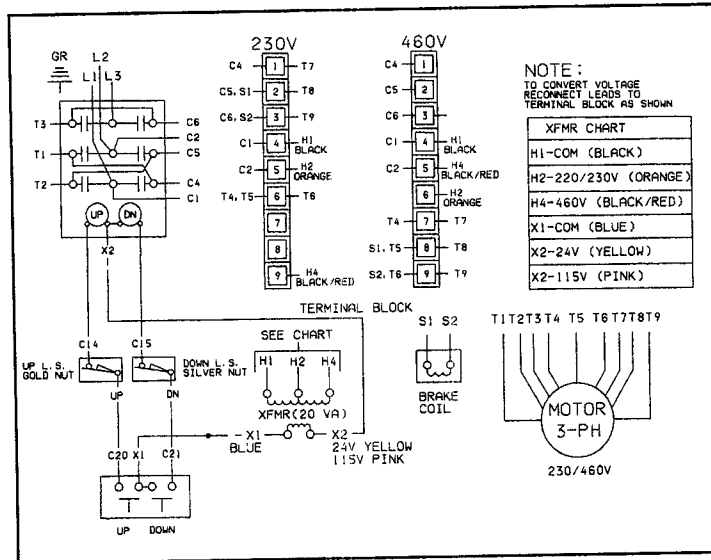


FIGURE 7-2. 230/460V, THREE PHASE

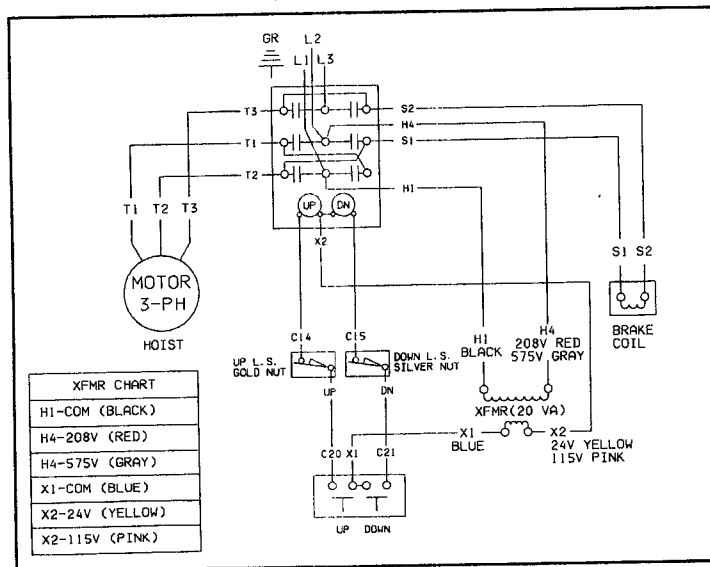


FIGURE 7-3. 208V or 575V, THREE PHASE

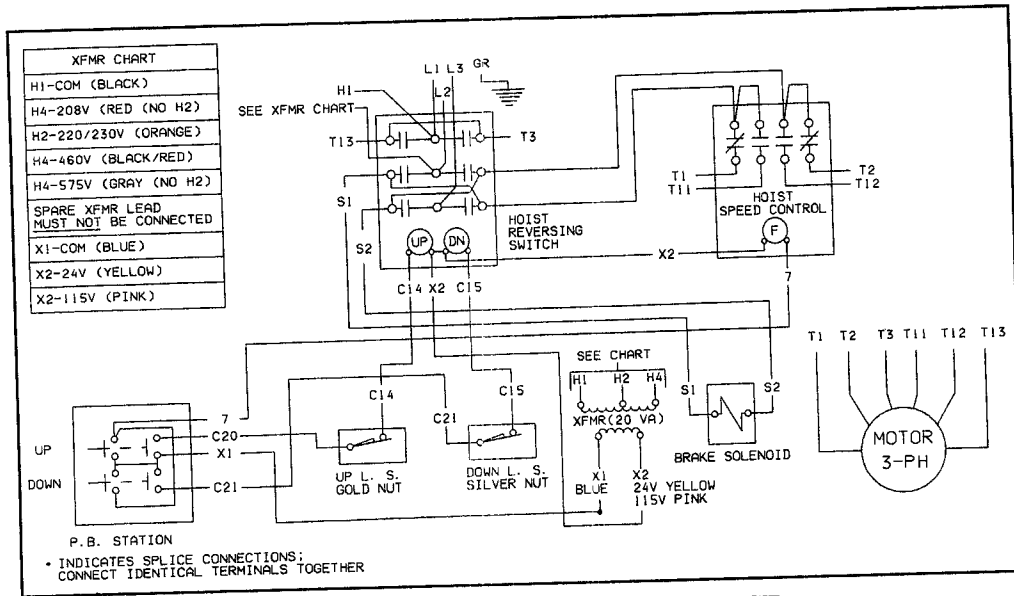


FIGURE 7-4. 2-SPEED, THREE PHASE

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, EC-2004 and EC-2008)
 - E- Hoists with 9/32 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-2004, 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

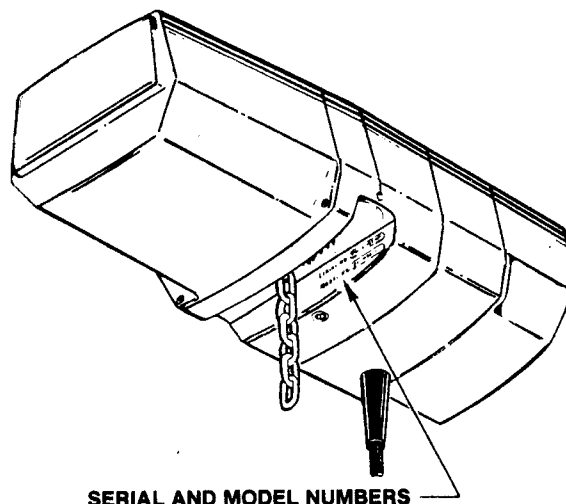
4) If more than one part number is listed with the same usage code, the information under "part name" will determine the correct part number. This is also the case if no usage code is listed and more than one part number is listed for the index number.

EXAMPLE B

INDEX NO.	USAGE CODE	PART NO.	PART NAME
5	B	JL-821-232	Transformer (Pri. 230/460V, Sec. 24V)
	B	JL-821-231	Transformer (Pri. 230/460V, Sec. 115V)

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.

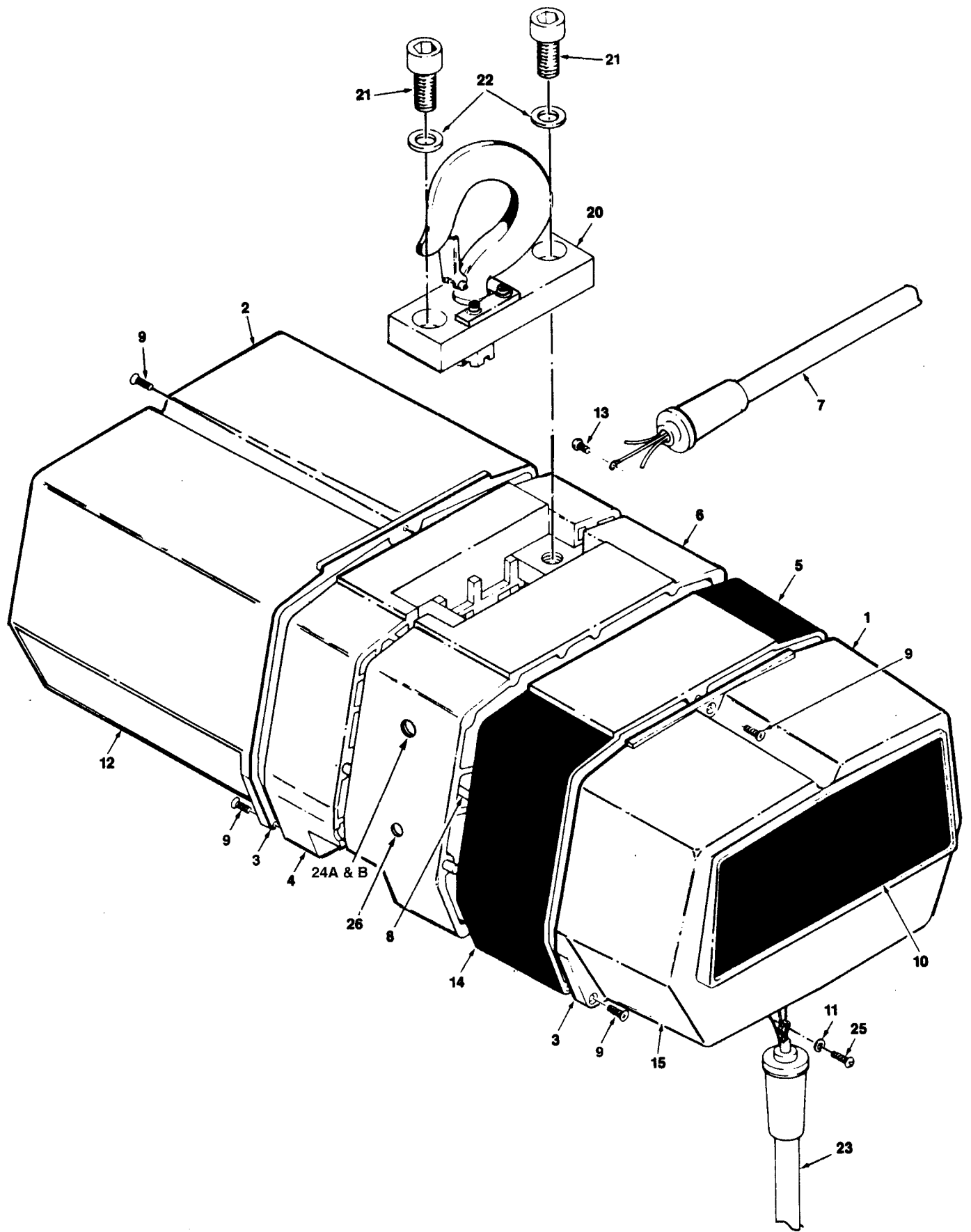


FIGURE 8-1. BASIC HOIST

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-2004, 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		677J2	Decal, Coffing
13		H-2981-P	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)
	B&C	679J36	Decal, Power Requirements (208 V)
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)
24A		H-6293	Reducer Bushing
24B		SK1912-21W	Pressure Relief Plug
25		H-2970	Screw
26		S-25-13	Level Plug

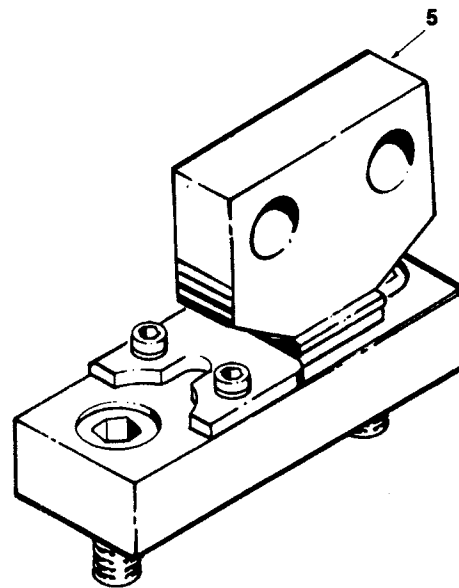
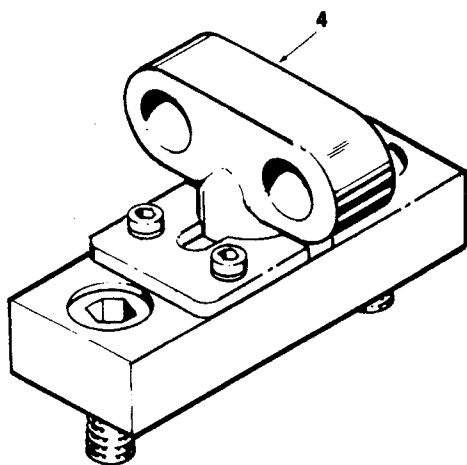
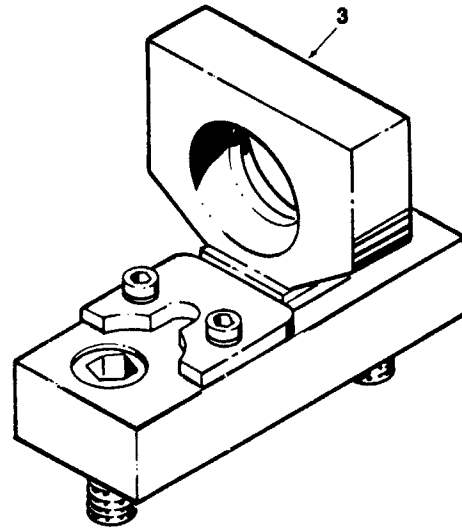
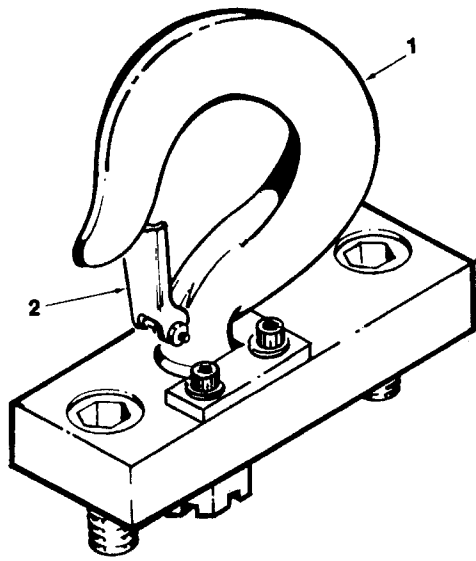


FIGURE 8-2. SUSPENSION ASSEMBLY KITS

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
	J	3JG23	Rigid Hook Assembly
2	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

PARTS LIST FOR THREE PHASE, SINGLE AND TWO SPEED MOTOR

INDEX NO.	USAGE CODE	PART NO.	PART NAME
1	B	863J207	Motor (1/4 HP, 208 V, 60 Hz)
	B	863J208	Motor (1/2 HP, 208 V, 60 Hz)
	B	863J209	Motor (3/4 HP, 208 V, 60 Hz)
	B	863J109	Motor (1 HP, 208 V, 60 Hz)
	C	873J211	Motor (.25/.08 HP, 208 V, 60 Hz)
	C	873J209	Motor (.50/.17 HP, 208 V, 60 Hz)
	C	873J116	Motor (.75/.25 HP, 208 V, 60 Hz)
	C	873J115	Motor (1/.33 HP, 208 V, 60 Hz)
	B	863J201	Motor (1/4 HP, 230/460 V, 60 Hz)
	B	863J202	Motor (1/2 HP, 230/460 V, 60 Hz)
	B	863J203	Motor (3/4 HP, 230/460 V, 60 Hz)
	B	863J104	Motor (1 HP, 230/460 V, 60 Hz)
	B	863J204	Motor (1/4 HP, 575 V, 60 Hz)
	B	863J205	Motor (1/2 HP, 575 V, 60 Hz)
	B	863J206	Motor (3/4 HP, 575 V, 60 Hz)
	B	863J108	Motor (1 HP, 575 V, 60 Hz)

INDEX NO.	USAGE CODE	PART NO.	PART NAME
1	C	873J201	Motor (.25/.08 HP, 230 V, 60 Hz)
(cont.)	C	873J202	Motor (.50/.17 HP, 230 V, 60 Hz)
	C	873J103	Motor (.75/.25 HP, 230 V, 60 Hz)
	C	873J104	Motor (1/.33 HP, 230 V, 60 Hz)
	C	873J204	Motor (.25/.08 HP, 460 V, 60 Hz)
	C	873J205	Motor (.50/.17 HP, 460 V, 60 Hz)
	C	873J107	Motor (.75/.25 HP, 460 V, 60 Hz)
	C	873J108	Motor (1/.33 HP, 460 V, 60 Hz)
	C	873J207	Motor (.25/.08 HP, 575 V, 60 Hz)
	C	873J208	Motor (.50/.17 HP, 575 V, 60 Hz)
	C	873J111	Motor (.75/.25 HP, 575 V, 60 Hz)
	C	873J112	Motor (1/.33 HP, 575 V, 60 Hz)
2			Contact factory with length required.
3			Contact factory.
4			Not available separately.
5		500K3	Bearing
6			Contact factory with complete motor nameplate data for availability.
7		H-4082-P	Lock Washer

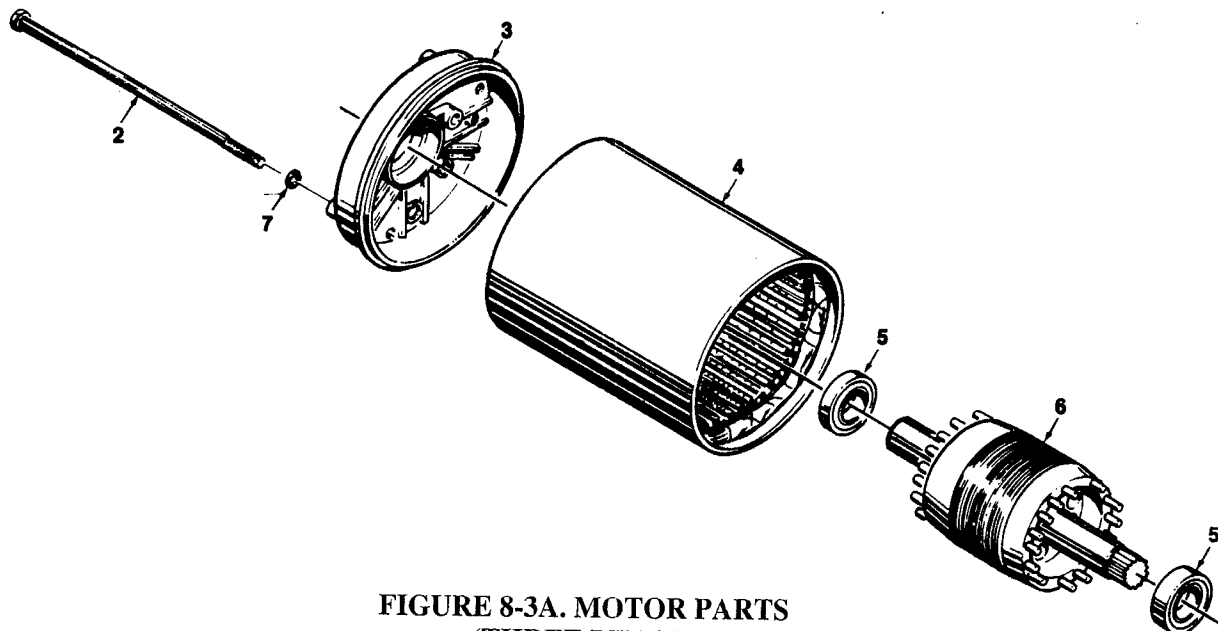
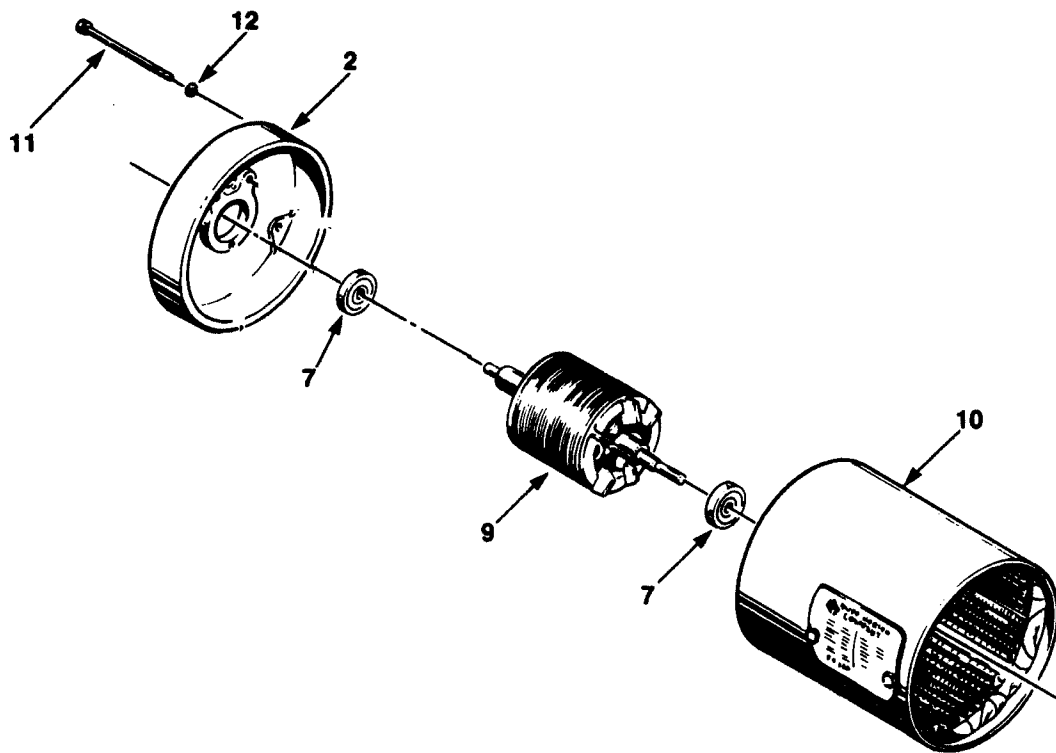


FIGURE 8-3A. MOTOR PARTS (THREE PHASE)

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

INDEX NO.	PART NAME	PART NO.
1	Motor, Complete 1/4 HP, 115/230 Volt 1/2 HP, 115/230 Volt 3/4 HP, 115/230 Volt 1 HP, 115/230 Volt	861J221 861J222 861J123 861J124
2	End Shield	Contact Factory.
7	Bearing	500K3
9	Rotor & Shaft	Contact Factory with complete nameplate data for availability.

INDEX NO.	PART NAME	PART NO.
10	Stator	Not available Separately.
11	Thru Bolt	Contact Factory with Length Required.
12	Lockwasher	H-4802-P

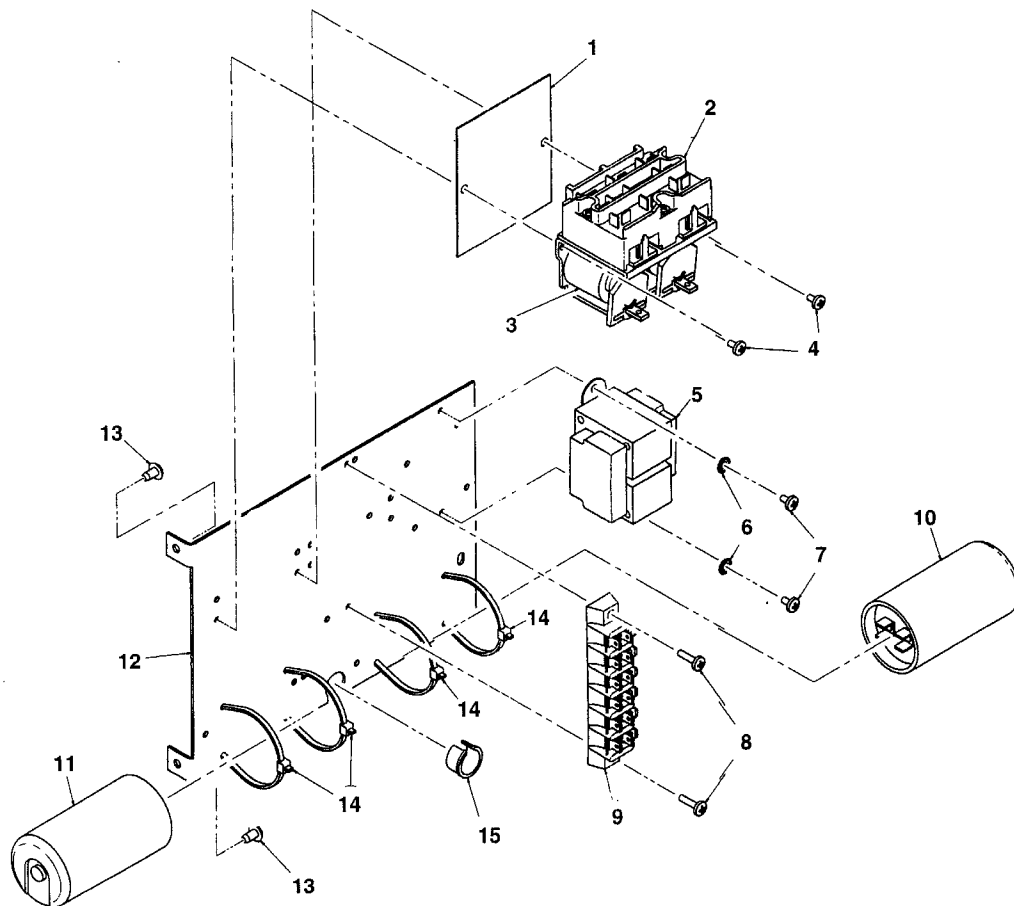


**FIGURE 8-3B. HOIST MOTOR PARTS
(ONE PHASE)**

PARTS LIST FOR SINGLE PHASE HOIST CONTROLLER AREA

INDEX NO.	PART NAME	PART NO.
1	Insulator	JF-759-3
2	Reversing Contactor 24V. Coils	JF-829-1
	Reversing Contactor 115V. Coils	JF-829
3	Coil (24V.)	JF-37916-25
	Coil (115V.)	JF-37916-32
4	Screw	H-2742
5	Transformer:	
	Pri.: 115/230V., Sec.: 24V.	JL-821-212
	Pri.: 115/230V., Sec.: 115V.	JL-821-211
6	Lockwasher	H-4158
7	Screw	H-2751

INDEX NO.	PART NAME	PART NO.
8	Screw	H-2752
9	Terminal Block	909K6
10	Capacitor, 216-259 mfd. (1 ¹³ / ₁₆ Dia.)	JL-810-3
	Capacitor, 400-480 mfd. (1 ¹³ / ₁₆ Dia.)	JL-810-4
11	SINPAC® Switch	839J2
12	Panel Plate	257J1B
13	Screw	H-2981-P
14	Cable Tie	H-9006
15	Bushing	H-7956



**FIGURE 8-4A. CONTROLLER AREA
(SINGLE PHASE ONLY)**