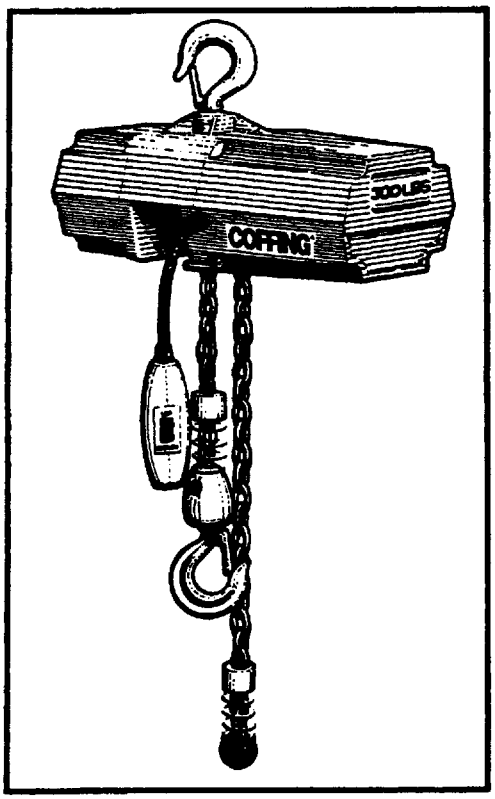
COFFING®

OPERATING, INSPECTION AND MAINTENANCE INSTRUCTIONS

COFFING® HOISTS

WITH PARTS LIST

PUBLICATION PART NO. EMC-680



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.

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Each product manufactured by Duff-Norton is full inspected and produced in accordance with the applicable design and test requirements of OSHA and American National Standards (ANSI) for overhead hoists. **WARNING: When using Duff-Norton hoists and/or trolleys, basic safety precautions should always be followed to reduce risk of personal injury or property damage.**

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.

"Do's and Do Not's" reprinted with the permission of the Hoist Manufacturer's Institute.

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 I

INTRODUCTION

1-1. General Information

This manual provides information for the safe operation and maintenance of COFFING Light Duty Electric Hoists. All persons operating or maintaining these hoists should be familiar with the information presented herein and are urged to read American National Standard (ANSI) B30.16. Safety Standard for Overhead Hoists. Adherence to the precautions, procedures, and maintenance practices described should ensure long, reliable operation.

1-2. Application Information

This electric hoist is designed for lifting freely suspended (unguided) loads, weighing no more than the rated load of the hoist, on an intermittent basis, not for industrial or production applications requiring continuous operation.

1-3. Specifications

Model No.	Rated Load Max. (lb)	Lifting Speed (fpm)	Maximum Lift (ft)	Horsepower (hp)	Power Supply	Amp Draw	Duty Cycle Max	PB Cord Length (ft)	Power Cord Length (in)	Limit Switches	Headroom (in)	Overall Dia. (in)	Net Wt. (lb)
EMC-300C	300	16	10	1/6	115 volts, 1 Phase, 60 Hz	3 Amps	10 minutes per hour	6	13	Upper & Lower	14 1/2	4 5/8 H x 6 W x 14 1/2 L	22
EMC-500C	500	8											27

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. Do not use hoist in or around wet areas.

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.

2-2. Installing the Hoist

a. The hoist is intended for use on a 115 volt, single phase, 60 Hz power supply. Voltage at the hoist should be within plus or minus 10% of 115 volts.

b. The hoist is equipped with a 3-prong, grounding-type plug to minimize shock hazards. It must be plugged into a properly installed and grounded receptacle to maintain this protection.

c. Make sure that the hook latch closes after hanging the hoist.

2-3. Testing

a. **Limit Switch Operation.** Before placing the hoist in operation, check for proper upper limit switch operation. Push the "UP" button and, while the hook is moving upward, raise the limit switch paddle where the chain is entering the hoist (Figure 2, item 33). The hook should stop immediately. Check the "DOWN" limit switch in a similar manner. Do not operate the hoist if the limit switches are not operating properly.

b. **Brake Operation.** Note: Run the hoist with a light load a few times before lifting the rated load. After lifting a light load a few times, test the hoist by lifting rated load. Check for load hook drift with rated load on the hook. If hook does not stop within one or two inches when pushbutton is released, it may be necessary to replace the brake assembly.

SECTION III
OPERATION

3-1. Safety Notes

a. Inspect the hoist for any sign of loose, broken, or malfunctioning parts. A malfunctioning hoist should be tagged as "out of order" and removed from service until the defect is corrected.

b. Before operating the hoist, the operator should be certain that all personnel are clear.

c. Do not lift more than the rated load of the hoist.

d. Do not lift people or loads over people.

e. Do not leave a suspended load unattended.

f. The operator should have a clear view of the load anytime it is moving and should not engage in any practice which will divert his attention while operating the hoist.

g. Be sure that the direction of the load hook movement is correct in relation to the pushbutton operated, i.e., up when the "UP" button is pushed.

3-2. Operating Recommendations

The hoist is designed for intermittent duty only. Total on-time should not exceed ten minutes per hour. The hoist motor is protected from extreme overheating by a thermal cut-off. The thermal cut-off will reset automatically when the motor ha cooled sufficiently. Operation of the hoist can then be resumed.

3-3. Handling The Load

a. Align hoist directly over load. Avoid side pull.

b. The hoist chain should not be wrapped around the load. Use proper slings.

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

d. Lift the load just clear of its supports and stop the hoist to check for proper brake action.

e. Lift and lower the load smoothly, avoiding jogging of the controls or quick reversals.

f. Stand clear of the load at all times.

g. The limit switch is an emergency device. Do not use the limit switch to stop the hoist in normal operation.

SECTION IV
INSPECTION AND MAINTENANCE

4-1. Safety Notes

Remove load and disconnect power from hoist before making repairs.

4-2. Inspection

Inspection procedures are divided into three general classifications based upon the intervals at which inspection should be performed. Deficiencies should be carefully examined and corrected. The intervals between inspection will vary due to operating conditions. If the hoist is used more than 40 hours per week or under adverse environmental conditions, it should be inspected more frequently.

a. **Daily Inspection.** Inspect the following items daily before operating hoist.
   1) Check pushbutton station, brake, and limit switch for proper operation (See paragraph 2-3).
   2) Check hooks for deformation, cracks, or chemical damage. Hooks having more than 1-inch throat opening (See Figure 1) should be replaced.
   3) Check for bent or otherwise damaged hook latches.
   4) Check chain for wear or damage (See 4-2d).
   5) Check pushbutton cord and power cord for cuts or other damage.

b. **Quarterly Inspection.** Inspect the following items at 90-day intervals.
   1) Check all items under daily inspection.
   2) Check for loose bolts, screws, and nuts.
   3) Inspect for worn, corroded, cracked, or distorted parts.
   4) Check electrical parts, limit switch, and pushbutton station.

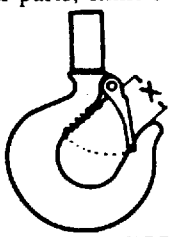


FIGURE 1. HOOK REPLACEMENT

NORMAL "X"	REJECT "X"
7/8"	1"

c. **Annual Inspection.** Inspect the following items annually.
   1) Check all items under daily and quarterly inspection.
   2) Check hooks for cracks by means of a magnetic particle test or other crack detecting test.
   3) Inspect for worn, corroded, cracked, or distorted par including pins, bearings, shafts, keys, and gears.
   4) Inspect supporting structure and trolley (if used) for continued ability to support the imposed loads.

5) Check for worn brake disc. Brake gap larger than .010″ may cause chatter or failure to release.

d. **Chain Inspection.**

1) Check each link for gouges, nicks, weld spatter, and distortion.

2) Inspect each link for wear to the link diameter. If any portion is worn to less than 0.175″ the chain must be replaced.

3) Check the chain for overall wear by selecting an unworn length of chain (at one end for example). Let the chain hang vertically with a light load on it to pull it taut. Use a large caliper to measure the outside length of a convenient number of links. Measure the same number of links in a used section of chain and calculate the percentage increase in length of the worn chain.

4) If the length of worn chain is more than 1½% longer than the unused chain (.015″ per inch of chain measured), then the chain should be replaced.

4-3. Maintenance

a. **Routine Maintenance.** Regular inspection and lubrication are the only routine maintenance items required.

b. **Brake Repair.** When the brake does not function properly as described in paragraph 2-3, replace the entire brake assembly (Figure 2, item No. 69).

c. **Disassembly Note.** Output gear (Ref. No. 12) must be turned so that key is horizontal before shaft (Ref. No. 15) can be withdrawn from frame.

4-4. Chain Replacement

The chain is specially constructed for use with this hoist. Do not substitute another make or type. Never attempt to weld or otherwise splice hoist load chain. If chain replacement is necessary, proceed as follows.

a. Remove the lower hook block and the chain end ball (Ref. No. 59).

b. Line the new chain up end to end with the old chain so that link welds are oriented the same. (Welds toward outside of sheave.)

c. Use a piece of string or small wire to tie the chains together so that the ends are exactly 9/32″ apart. This will let the chain pass smoothly through the hoist.

d. Operate the hoist to pull the new chain into the hoist. Refit springs (Ref. No. 6), lower hook (Ref. No. 18), and end ball (Ref. No. 59).

4-5. Lubrication

a. **Gears.** The gear housing is adequately lubricated at assembly with 1/3 pound of NLGI #1 grease. If relubrication becomes necessary, use approximately 3/4 cup of a light semi-fluid grease.

CAUTION

Keep brake surface and brake lining free of grease.

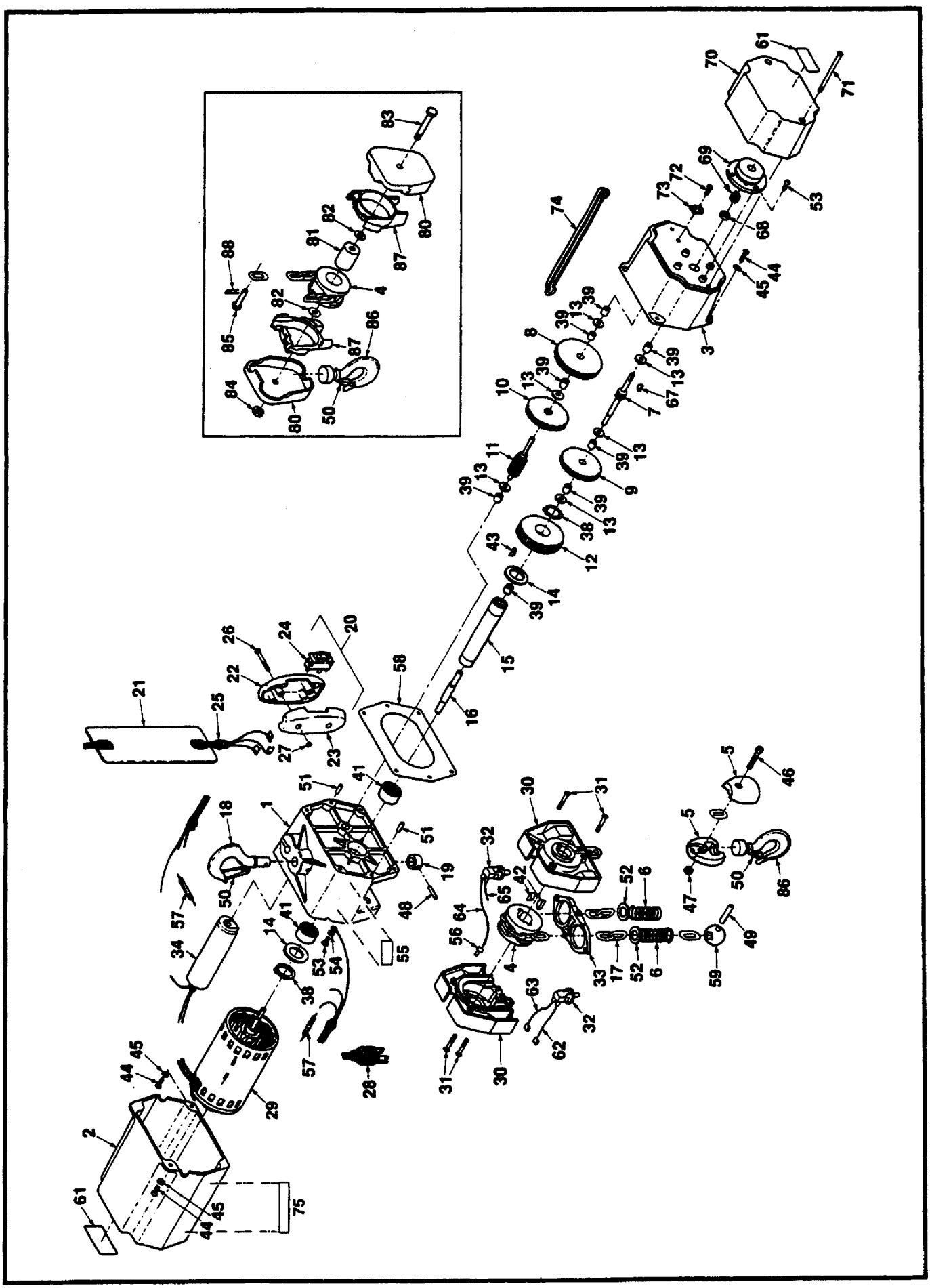
b. **Drum.** Apply a small amount of grease to sheave shaft bearings (Figure 2, item No. 41).

c. **Idler shaft.** Apply a small amount of grease to the bore of the idler sheave. (Figure 2, item No. 4) in the bottom block.

d. **Chain.** Wipe clean with a cloth periodically and apply a coat of 90 weight gear oil.

SECTION V
TROUBLESHOOTING

Problem	Remedy
Hoist cuts off after several minutes of operation, but will run again after several minutes.	Thermal protector opening due to excessive duty. Reduce duty cycle.
Brake will not hold, load drifts down.	Brake worn out or oil contaminated. Replace brake assembly.
Brake chatters.	Check for gap greater than .010″. Check rectifier for open or shorted legs.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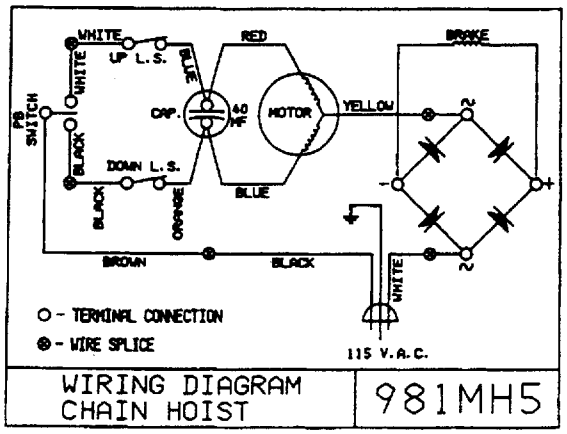


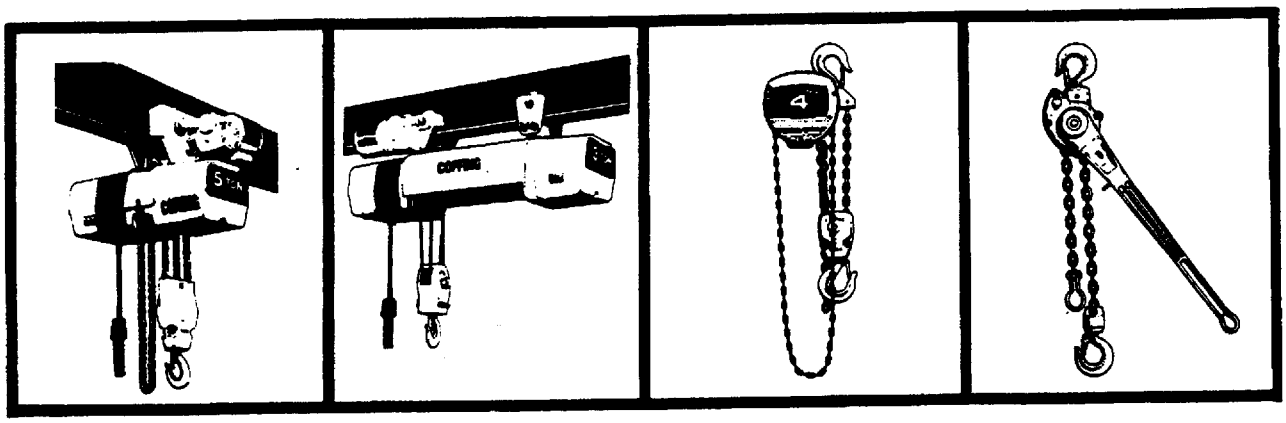
FIGURE 3 WIRING DIAGRAM

REPLACEMENT PARTS LIST

Ref. No.	Description	Qty. Req.	Part Number
1	Suspension Frame	1	33K4-6
2	Control Cover	1	36K9-2
3	Transmission Cover	1	35K4
4	Sheave	1	16J10
5	Swivel Frame	2	20J1
6	Spring	2	344J3
7	High Speed Pinion	1	400K8
8	High Speed Cluster Gear	1	406K1
9	Intermediate Cluster Gear	1	406K2
10	Intermediate Gear	1	403K10
11	Output Pinion	1	404K6
12	Output Gear	1	405K5
13	Thrust Washer	6	255K1
14	Thrust Washer	2	255K2
15	Sheave Shaft	1	132J4
16	Drive Coupling	1	107K27
17	Chain	Per Ft.	19J5
18	Hook With Latch	1	3K3S
19	Hook Collar	1	124K2
20	Pushbutton Assembly (Consists of Items Nos. 21 thru 27.)	1	MH-534-1
21	Warning Label	1	687K3
22	Pushbutton Enclosure	1	MH-48-R
23	Pushbutton Enclosure	1	MH-48-L
24	Rocker Switch	1	4K1
25	Pushbutton Cord Assembly	1	936JG9
26	Screw (P.B.)	2	H-2967
27	Flexloc Nut (P.B.)	2	H-3972
28	Power Cord Assembly	1	951KG2
29	Motor	1	861K350A
30	Chain Guide	2	250K2
31	Screw	4	H2745
32	Switch (L.S.)	2	815J4
33	Paddle (L.S.)	1	24J2
34	Capacitor	1	810K1A
38	Retaining Ring	2	H-5543
39	Bearing	8	521K3
41	Load Bearing	2	521K4
42	Woodruff Key (Sheave)	2	H-4358
43	Woodruff Key (Output Gear)	1	H4356
44	Screw	6	H-1841-P
45	Lockwasher	6	H-4061-P
46	Screw (Bottom Block)	1	B-55-S
47	Nut	1	H-3969-P
48	Pin (Hook)	1	H-5159
49	Roll Pin	1	H-5259
50	Latch Kit	2	H-7549
51	Dowel Pin	2	H-5383
52	Washer	2	H-4018
53	Screw	5	H-2742-P
54	Washer	1	H-4004-P
55	Nameplate 300 lb.	1	MH-674-11
	500 lb.	1	MH-674-12
56	Pigtail Splice	2	H-5800
57	Splice Connector	4	H-5757
58	Gasket	1	MH-560
59	End Ball	1	75J1
60	Lubricant (/lb.) (Not Shown)		H-7653
61	Capacity Label (300 lb.)	2	MH-675-1
	(500 lb.)	2	MH-675-2
62	Jumper Wire (Black)	1	940J101
63	Jumper Wire (Orange)	1	940J102
64	Jumper Wire (White)	1	940J103
65	Jumper Wire (Blue)	1	940J104
67	Woodruff Key	1	H-4362
68	Oil Seal	1	561K29
69	Brake with/Hub (Round Brake)	1	MH-854-1
	(Square Brake)	1	MH-854
70	Brake Cover	1	36K206
71	Screw	2	H-1303
72	Screw	1	H-2752
73	Rectifier	1	840J1
74	Wire Channel	1	MH-270
75	Coffing Label	2	677K18
80	Bottom Block	2	30J13
81	Idler Shaft	1	122J10
82	Star Washer	2	H-4161
83	Screw	1	H-2444
84	Locknut	1	H-3968-P
85	Clevis Pin	1	18J14
86	Hook with Latch	1	3J21S
87	Idler Guide	2	250J8
88	Hairpin Clip	1	H-5044
*	Chain Container Optional — (Not Shown)		

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 Company. **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 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.

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Printed in U.S.A.
1M 10/94