PARTS AND INSTRUCTION MANUAL

MANUAL #: 11854801 REV. AB

Yale® HOISTS

EW SERIES

Capacities from 10 to 25 Tons

P/N: 117404-24 Rev AA October 2016

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COMMON MODEL NUMBER CODE FOR POWERED HOISTS

B E W 2 X 21 ST 14 D2

Frame Design

Power Source
"E" for "Electric"
"A" for "AIR"

Lifting Medium
"W" for "Wire Rope"

Capacity in Tons

Gear Train Size
X

Lift in Feet

Suspension or Mounting

BM	BASE MOUNTED	PT	PLAIN TROLLEY
CB	CRANE BUILDERS SPECIAL	TL	TOP RUNNER LESS CARRIERS
CM	CEILING MOUNTED WINCH	TB	SPECIAL TOP RUNNING TROLLEY
DM	DECK MOUNTED	RT	MOTORIZED TROLLEY
FM	FOOT MOUNTED WINCH	RPT	RIGHT ANGLE PLAIN TROLLEY
GT	GEARED TROLLEY	TR	TOP RUNNING TROLLEY
LG	LUG MOUNTED	WM	WALL MOUNTED WINCH

Speed in FPM

Reeving

S	STANDARD HEADROOM	X	STD. HEADROOM, SPECIAL RIGHT ANGLE MTG.
S1	ONE PART SINGLE REEVED	X1	ONE PART SINGLE REEVED
S2	TWO PART SINGLE REEVED	X2	TWO PART SINGLE REEVED
S3	THREE PART SINGLE REEVED	X3	THREE PART SINGLE REEVED
S4	FOUR PART SINGLE REEVED	X4	FOUR PART SINGLE REEVED
D	CLOSE HEADROOM	P	CLOSE HEADROOM, SPECIAL PARALLEL MTG.
D1	DOUBLE LINE REEVED	P1	ONE PART DOUBLE REEVED
D2	TWO PART DOUBLE REEVED	P2	TWO PART DOUBLE REEVED
D3	THREE PART DOUBLE REEVED	P3	THREE PART DOUBLE REEVED
D4	FOUR PART DOUBLE REEVED	P4	FOUR PART DOUBLE REEVED
D5	FIVE PART DOUBLE REEVED	P5	FIVE PART DOUBLE REEVED
D6	SIX PART DOUBLE REEVED	P6	SIX PART DOUBLE REEVED

SAFE HOISTING PRACTICES

For your own safety and that of your fellow workers, Material Handling Equipment must be used as recommended by the Manufacturer. Failure to heed the following recommendations could endanger your life. Use good common sense and judgement at all times. Safety is the responsibility of the operator of the equipment. You must be competent and attempt to foresee and avoid all hazardous conditions. To be safe as possible, the hoist must be given proper preventive maintenance and testing as described in the ANSI B30.16 Safety Code For Overhead Hoists and this manual.

BEFORE OPERATING HOIST

1. Do not operate hoist unless you are properly trained, physically fit, and authorized to do so. You must be familiar with all operating controls of the hoist, warnings and instructions on the hoist, the safe hoisting practices listed in this manual, ANSI B30.16 Safety Code For Overhead Hoists, and all pertinent Federal, State, and local regulations before beginning operation.
2. Do not allow unqualified personnel to operate the hoist.
3. Test all controls and limit switches and make sure hoist is well lubricated at beginning of each shift. Make sure needed lubrication, adjustments, or repairs are made by appointed personnel before operations are begun.
4. Be familiar with the equipment and its proper care. Do not operate hoist if adjustments or repairs are necessary, if any damage or undue wear is known or suspected, or if any warning, operating, or capacity instructions normally attached to hoist are damaged, obscured or missing. Report these items promptly to the proper person and also notify next operator when changing shifts.
5. Do not operate hoist if it is functioning improperly.
6. Do not operate hoist with an out-of-order sign attached until sign has been removed by a properly authorized person.
7. Do not adjust or repair hoist unless qualified for maintenance of hoist.
8. Be sure the power supply is disconnected before maintenance and repair procedure is performed.
9. Do not use the wire rope as a ground for welding.
10. Do not touch a welding electrode to the wire rope.

APPLYING THE LOAD

11. Never wrap the wire rope around the load, or allow it to drag under load.
12. Always use slings or other approved devices to attach load.
13. Be sure the sling is properly seated in the saddle of the hook. Do not allow hook latch to support any part of load.
14. Do not apply a load to tip of hook, or in such a way as to cause bending, or prying forces on the hook or hook support block.
15. Be sure wire ropes are not kinked or twisted or that multiple part ropes are not twisted about each other.
16. Do not operate hoist if wire rope is not seated properly in the grooves of the drum or sheaves.
17. Do not load hoist with less than two wraps of rope on the drum, unless a lower limit device is provided, in which case, no less than one wrap shall remain on the drum.
18. Center hoist unit over the load before lifting. Avoid side pull.
19. Never pick up a load beyond the rated capacity appearing on the hoist, except for properly authorized tests.
20. Do not use a load limiting device to measure the maximum load to be lifted. It is a safety device only.

MOVING THE LOAD

21. Do not engage in any activity which will divert your attention while operating hoist.
22. Respond to signals from designated personnel only, except for stop signals.
23. Never lift a load with the hoist until you and all other personnel are clear of load.
24. Make sure load has proper clearance before moving.
25. Inch the hoist slowly into engagement with a load, but avoid excessive plugging, inching, and quick reversals of load.
26. Do not lift load more than a few inches until it is well balanced in the sling or lifting device.
27. Each time a load approaching rated capacity is handled, check load brake action by raising load just clear of supports and continuing only after you are sure brake is operating properly.
28. Do not transport load over personnel.
29. Never carry personnel on the hook or the load.
30. Avoid swinging of load or load hook when traveling the hoist.
31. On trolley mounted hoists, avoid sharp contact between trolleys, or between trolleys and rail stops.
32. Do not use limit devices as a normal means of stopping the hoist. These are emergency devices only.
33. Do not exceed the maximum duty cycle specified by the manufacturer.

PARKING

34. Do not leave load suspended in the air for extended or unattended periods.
35. Keep load block above head level when not in use.

SAFETY LAWS FOR PASSENGER ELEVATORS

⚠ WARNING

Do not use yale hoists or trolleys for passenger elevator applications.

The safety laws for passenger elevators specify construction details that are not incorporated In Yale Hoists. We recommend that passenger elevator operation equipment be used that meets all state and national safety codes. Yale Hoists will not accept responsibility for applications of Yale Hoists on passenger elevators.

INSPECTION, PREVENTIVE MAINTENANCE AND TESTING

A preventive maintenance program should be initiated for this hoist immediately after it is entered into service. The preventive maintenance program should comply with recommendations in the applicable Yale Parts and Instruction Manual, and all pertinent Federal, State and Local regulations. Regular inspections, maintenance and testing required should be followed for the life of the hoist and written inspection records kept as specified. Sample inspection checklists are included in back of this manual. Extra inspection checklists can be obtained from your nearest authorized Yale Distributor.

YALE HOIST DUTY SERVICE CLASSIFICATIONS

Yale Hoist Duty Class	Typical Areas of Application	Operational Time Ratings			
		Uniformly Distributed Work Periods		Infrequent Work Period Hoist Running 50% Time	
		(3) Max. on Time Min./Hr.	(4) Max. No. of Starts/Hr.	(5) Max. Time From Cold Start Min.	(6) Max. No. of Starts
H3	General Machine Shop, fabricating, assembly, storage and warehousing. Where loads and utilization are randomly distributed, with total running time of equipment not exceeding 15-25% of the work period.	15	150	60	200
H4	High volume handling in steel warehousing, general machine shops, fabricating, assembly, mills and foundries. Total running time does not exceed 35% of work period. Loads at or near rated capacity frequently handled.	30	300	30	300
H5	Material bulk handling in combination with buckets, magnets or heavy attachments. Often cab operated. Duty cycle exceeds 35% and approaches continuous operation. User must specify exact details of operation including attachment weights.	Up to continuous	600	Not Applicable	Not Applicable

REPAIR PARTS ORDERING INFORMATION

This parts and instruction manual contains information required to install and maintain your Yale EW Series Electric Hoist. To insure prompt service, each repair parts order should be placed with your local distributor, and must contain the following information:

Please give all information listed below in items 1 through 4. This will enable your distributor to fill your order promptly.

1. Give complete data from hoist nameplate, including hoist serial number, model number, voltage, frequency, and hertz.
2. Give part numbers, description and quantity of parts required.
3. Give correct shipping destination.
4. For ordering motor repair parts, give all data on the hoist and motor nameplates.

HOIST SERIAL NUMBERS

The hoist serial number is stamped in the suspension frame, nameplate and trolley side plate. The nameplates also designate the model number, capacity, speed, current characteristics, and service rating of the hoist or trolley.

RETURN OF PARTS

If it becomes necessary to return the complete hoist or certain parts to the factory, a letter requesting such a return is necessary. This letter should contain an explanation for requesting the return. A return authorization will be issued giving you clearance for returning the hoist or parts to the factory.

INSTALLATION INSTRUCTIONS

Before the unit is shipped from the factory it is rigidly tested and carefully adjusted for proper operation. However, the following points must be checked to insure correct installation and avoid damage to the hoist.

1. SUSPENSION: Suspend the hoist following the installation procedures for the type of suspension used on your hoist.
2. ROPE AND DRUM: Check the hoist rope for any signs of damage and make sure it lies properly in the grooves of the drum and sheaves. Make sure the rope is well lubricated.

   BEFORE OPERATING THE HOIST, REMOVE THE WOODEN SHIPPING WEDGE LOCATED ON TOP OF THE ROPE BETWEEN THE DRUM AND SUSPENSION FRAME.
3. LUBRICATION: Every attempt has been made to ship the hoist with the proper amount of lubricating oil in the gearcase. Before placing the unit-in operation, remove the-level plug in the gear housing and check the oil level. The oil should be level with the level hole. If more oil is needed, consult the Lubrication Chart. Also make sure breather plug hole is cleared.
4. CURRENT SUPPLY: make sure the electric current supply corresponds with the rating listed on the hoist nameplate. Make sure duty cycle capabilities of hoist are fully understood by all operators.
5. ELECTRICAL CONNECTIONS: Open the control box and check all the electrical connections ~ to be sure they are tight and that none of the hardware vibrated loose during shipment.

⚠ CAUTION

The hoist must be grounded. To do this, connect one end of the green wire in the power cord to a solid ground and the other end to the specified grounding lug provided on the hoist.

6. PUSH BUTTON CONTROL:

⚠ WARNING

On polyphase ac hoists, it is impossible to know how to connect the power line for correct direction of the hook travel.

To insure correct operation of the safety limit stops, it is very important that the hook travel is in the hoisting direction when the up button is pressed. If it is not, interchange two of the line wires for 3-phase. If the hoist is operated with incorrect power connections, the safety limit stops will be ineffective and serious hoist damage and dangerous accidents may result.

ADJUSTMENTS OF LIMIT SWITCHES

1. UPPER PLUGGING LIMIT SWITCH: After the hoist is determined to be running in the proper direction, lower the hook to approximately eight feet (8) below the hoist. Check the limit switch by running the hook upward and lifting the rod or weight by hand. When the rod or weight is lifted from one-half inch (1/2) to two inches (2) the hoist should cutoff. Any further lifting of the rod or weight should close the lowering circuit and cause the hook to lower.
2. TRAVELING NUT UPPER AND LOWER LIMIT SWITCH:

⚠ WARNING

Each step outlined below must be followed for protection against electrical shock and injury from moving components.

To adjust the traveling nut switches, or to set them at other levels:

a. Remove all electrical power from the hoist.

b. Loosen the limit switch cover screws and remove the cover.

c. Slide the locking plate from under the traveling nuts and turn both nuts until they meet at the center of the shaft.

d. Replace the locking plate under the traveling nuts.

e. Replace cover and hand tighten cover screws.

f. Apply electrical power to the hoist.

g. Run hoist to the desired lower limit.

⚠ WARNING

At least one wrap of rope must remain on the drum in the lowest position.

h. Remove electrical power from the hoist and remove the switch cover.

i. Slide the locking plate from under the traveling nuts.

j. Rotate the lower nut (the one nearest to a contact) until it contacts. Continue rotating until the microswitch can be heard to trip.

k. Replace locking plate under the nuts. (Slight adjustment of traveling nuts may be necessary).

l. Replace cover and hand tighten cover screws.

m. Apply power and check lower limit switch operation. If minor adjustment is necessary, repeat steps (h) through (m), rotating nut one step at a time until proper adjustment is accomplished.

n. Repeat steps (g) through (m) to adjust the upper limit switch, by substituting upper for lower in steps (g) through (j).

⚠ WARNING

When upper plugging limit switch is used, make sure traveling nut (or geared) limit switch trips first, allowing the rod or weight type switch to act as the backup limit.

3. GEARED TYPE UPPER AND LOWER LIMIT SWITCH:

a. If geared type upper and lower switch is used, see limit switch adjustment and maintenance instructions.

b. Note warnings in paragraph 2 above.

BASIC SUSPENSIONS

The basic hoist suspension types are: lug mounted, frame mounted (various types), plain trolley, hand chain operated trolley, single beam under running motorized trolley, and top running motorized trolley for double rails. Before connecting hoist to supporting structure, or mounting on beam or rail, make sure supporting structure has adequate strength to safely support the loading which will be imposed.

When installing lug mounted or frame mounted types, make sure hoist is bolted securely in place with the proper size bolts, that it is level, that nuts on mounting hole bolts are tightened securely, and the lockwashers, or other means of locking the nuts are used.

Hoist furnished with plain, hand chain operated, or under running motorized trolley, first determine the beam size on which the trolley is to be used, then refer to trolley adjustment instructions for proper spacer arrangements. On top running motorized trolleys, make sure rail size is correct for wheels and that distance between rails is correct for trolley throughout entire rail lengths.

TROLLEY ADJUSTMENT

All Yale under running trolleys are properly adjusted at the factory to fit the I-Beam size stated on the order.

Note: When disassembling the trolley for installation on the I-Beam, take note, of the arrangement of the spacers and washers for correct reassembly.

For installation on I-Beam other than the size preset at the factory, follow the instructions listed below.

Measure the I-Beam flange width and temporarily install the trolley side plates on the hoist before installation to determine the exact distribution of washers.

The distance between track wheel flanges should be 3/16 inches greater than the beam flange width for straight runway beams and 3/16 to 1/4 inches on curved beams. That includes sharp curves. To keep the hoist centered under the I-Beam, the number of washers between the side plates and the hoist lug should be the same or differ only by one (1) washer. The distribution of washers outside the trolley side plates is unimportant except that the total number used must be sufficient to keep the nuts engaged.

Note: When installing hoist and trolley on beam, tighten nuts snugly so that the trolley side plates are parallel and vertical.

⚠ CAUTION

Be sure there is a lockwasher under each nut.

After the hoist and trolley are installed on the I-Beam, operate the trolley over the entire length of the beam with a light load to be sure that adjustment and operation is satisfactory. Then tighten all side plate nuts to maximum standard torque for bolt size used.

PREVENTATIVE MAINTENANCE SCHEDULE

The required periods between inspections will vary due to the wide range of duty cycles and operating conditions encountered with equipment. The following recommended inspection periods are based on duty of specified service rating with single shift operation (40 hours per week) under normal environmental conditions. If the hoist is used under adverse environmental conditions it should be inspected more frequently.

DAILY INSPECTION

Inspect the following items before operating hoist:

1. MANUAL CONTROLS: Check all manual controls for proper operation.
2. ELECTRICAL CONNECTIONS: Check for worn or frayed wires, for loose connections and for damage to, or improper operation of, push button assembly.
3. LIMIT SWITCH: Check the upper and lower limit switch by running the hook without load, and at the slowest speed obtainable, to the maximum up and maximum down positions. Then test with increasing speeds up to maximum. The switch should shut the hoist off before the bottom block contacts the rod or weight type limit switch at the upper extreme. One wrap of rope should remain on the drum at the shut-off point at the lowest extreme. If adjustment is necessary, refer to geared limit switch section.
4. HOOK: Check for cracks or deformation. Check for damaged or missing latch. A bent or twisted hook indicates overloading or abuse of unit. Other load bearing components of the hoist or trolley should be inspected if overloading is apparent or suspected. The bottom hook must swivel freely.
5. WIRE ROPE: Check for proper seating in drum grooves. Check for wear, unstranding, fraying, kinks, or broken wires in the wire rope, and condition of end connections. (If damage is noted, see wire rope instructions under monthly inspection.)
6. HOOK DRIFT: With a load, the hook should stop promptly when the push button is released. Hook drift of more than 2 inches indicates the motor brake is malfunctioning. (See quarterly and annual inspection instructions for more details.)
7. UNUSUAL CONDITIONS: Excessive noise, oil leaks, etc. should be investigated.

⚠ CAUTION

Do not operate the hoist if above inspection indicates that maintenance is needed.

MONTHLY INSPECTIONS

1. ALL ITEMS UNDER DAILY INSPECTION.
2. LUBRICATION: Check the level and condition of the gearcase lubricant. The level must be maintained at the gearcase level plug. If the level is low, check for leaks. Replace gaskets and shaft seals if necessary. An excessively black color lubricant indicates a chemical change in the lubricant caused by excessive heat from the load brake, which in turn is caused by heavy duty cycles. Lubricant that is very black in color must be replaced to prevent shortened life of drive components. Lubricate wire rope and other points as required. Refer to lubrication chart.

⚠ CAUTION

For optimum lubrication and load brake cooling, oil level must be maintained at the level plug.

3. HOOK: Check hook retaining nuts and collars, and means used to secure them. Replace hook if throat opening allows safety latch to disengage from throat opening, or if there is 10 degrees or more twist from normal plane of hook.
4. LOAD BRAKE: Check the function of the load brake by lifting a light load (approximately 25% of rated load) 6 to 12 inches above the floor. Disconnect electrical power and manually open the motor brake. The load may “creep” slowly while the motor brake is held open. This is normal. However, if the load falls to the floor the instant the motor brake is released, the load brake is not functioning properly and should be replaced.
5. CONTACTORS: Check for burned or badly pitted contacts.
6. PUSH BUTTON: Check the ground connections to be sure that the wire cores from the push button cable and the power cord are secured. Tighten the grounding screw and replace the lockwasher if it is missing.
7. BEARINGS: Check all bearings for noisy operation, which is an indication of wear.
8. HARDWARE: Check for loose bolts, nuts and rivets.
9. WIRE ROPE: Check conditions of wire rope using inspection checklist. Refer to wire rope inspection.

⚠ WARNING

Never allow wire rope to operate dry.

10. WARNING LABELS: Check for absence or illegibility of warning decals and tags and replace if necessary.
11. SUPPORTING STRUCTURE OR TROLLEY: If used, should be checked for continued ability to support the imposed loads. Check for loose suspension or support bolts, axle nuts, etc.
12. INSPECTION CHECKLIST: Fill out inspection checklist at the back of this manual, sign, date and file for future reference.

QUARTERLY INSPECTION

1. ALL ITEMS UNDER DAILY AND MONTHLY INSPECTION.
2. MOTOR BRAKE: Check for excessive or uneven disc wear. On direct acting, check for excessive magnet gap. On solenoid actuated, clean solenoid plunger seat and check for uneven seating between the plunger and coil. Lubricate brake cams, pivot studs and linkage as required.

ANNUAL INSPECTION

1. ALL ITEMS UNDER DAILY, MONTHLY AND QUARTERLY INSPECTIONS.
2. Equalize sheave, idler sheave, and pins. Check for cracked or worn sheaves, pins and bearings.
3. HOOKS: Magnetic particle or other suitable crack detecting inspection should be performed if need is indicated by external appearance. Check for loose retaining nuts and collars.
4. LOAD BEARING PARTS: Check for worn, cracked or distorted parts, such as suspension housings, outriggers, clevises, yokes, hook blocks, suspension bolts, shafts, locking devices and bearings on hoist (also on trolley, if so equipped).
5. LOAD BRAKE (for all chassis and duty services except EEWX and FEW: Check load brake for worn discs, check operation of one way holding pawl. If either brake disc is worn 1/16 inches or more replace ratchet and disc assembly. New discs measure 3/16 inches thick.
6. LOAD BRAKE (for EEWX and FEW: Check load brake for worn discs, check operation of one way sprag holding clutch. If either brake disc is worn 1/32 inches or more, replace ratchet and disc assembly. New discs measure 3/16 inches thick.
7. MOTOR BRAKE: Check for excessive or uneven disc wear. On direct acting, check for excessive magnet gap. For solenoid actuated, clean solenoid plunger seat and check for uneven seating between plunger and coil. Lubricate brake cams, studs, and linkage as required.
8. LOAD LIMITING DEVICE: If a load limiting device is used, check device with 150% of rated load. Attempt to raise the load. If the load limiting device is working properly the load should not move, or move only slightly. If the unit raises the load immediately, lower the load, then repair or replace the load limiting device.

⚠ CAUTION

Prior to testing, all supporting structures, anchorages, and/or suspensions must be approved by the appointed person for the test loads used.

9. WIRING AND TERMINALS: See that all connections are tight. Terminals are to be securely crimped to wires and the insulation sound. Bent terminals can usually be straightened to provide a tight fit. Replace terminals or wire if necessary.

10. SHEAVES AND DRUMS: Inspect rope sheaves and drums for excessive wear. When the groove of a sheave or rope drum becomes worn excessively it should be replaced. Worn grooves on the drum or sheave can greatly reduce the useful life of the hoisting rope.
11. BEARING LUBRICATION: The motor, sheave, and outer drum bearings are packed with grease at the factory and normally will not need to be lubricated. If conditions require, repack with grease as needed.
12. INSPECTION CHECKLIST: Fill out inspection checklist at the back of this manual, sign, date and file for future reference.

FUNCTION TESTING AFTER REPAIR

⚠ CAUTION

Prior to testing, all supporting structures, anchorages, and/or suspensions must be approved by the appointed person for the test loads used.

After repair or replacement of parts, function test hoist by operating unloaded hoist into both upper and lower limits, first with slowest speed possible, then with increasing speeds up to maximum. Limit switch mechanisms must be adjusted so they will trip in sufficient time to prevent damage to any part of the hoisting arrangement. See instructions for adjustment of limit switches. Then test operation of hoist and brake by lifting 100% of rated load. (A normal load lifted may be substituted if no load bearing parts were altered.) If the gear train was disassembled, check the load brake as directed in the monthly inspection instructions. If hoist is equipped with a load limiting device, and load bearing parts have been altered, the first test load should be only 100% of rated load. The test should be prepared by the person responsible and kept on file for future reference.

Part	Lubricant	Lubrication Point	Lubrication Instructions	Drain Point
Gear Case	Chevron, Texaco, Unical, Hydraulic Tractor Fluid Mobilfluid 424 or Equal	Fill from vent hole on top of gear case	BEW 1 QT. BEWX & CEW 3 PTS. CEWX & DEW 4 QTS. DEWX & EEW 8 QTS. QEW 8 QTS. REW 8 QTS. SEW 10 QTS.	Socket head plug in bottom of gear case
Gear Case	Chevron Universal Gear Lube 85W-140 or equal Mobilube HD 80W-90		EEW-X & FEW 7 GAL.	
Motor Brake Linkage	Light Machine Oil DTE Oil Heavy Medium	Pivot Linkage	Solenoid Actuated Apply one or two drops on the linkage	
Wire Rope	Chevron 100 CB, or other prepared cable lubricant Mobiltac 325 NC	Wire Rope	Light coat of lubricant	

*All units equipped with load brake unless otherwise specified

PLAIN AND HAND CHAIN OPERATED TROLLEYS

		Lubricant Pour	Temperature Range
Alemite Fittings	Chevron Grease EP No. 2 Mobilith AW 2	Max	-25º -260º
Ball Valve Oil Holes	Light Machine Oil	Hoist Ambient Temp	0° - 120°F

RT AND TR SERIES TROLLEYS

Part	Lubricant	Lubrication Point	Lubrication Instructions	Drain Point
Gear Case	ST, WT, TT - Chevron Dura-Lite EP NLGI 2, Mobilgear 634 or equal TR - Chevron Universal Gear Lube 85W140 RT - Shell Velvata Oil J82 or Equal	Socket head plug in side of gearcase	Fill until lubricant is level with hole	Socket head plug in bottom of gear case
Track Wheel Pinion & Gear Teeth	Chevron Dura-Lite Grease EP No. 2 or equal	Pinion & Gear Teeth	Depending on applications Light coating of grease	

WIRE ROPE INSPECTION

All wire rope should be inspected once a month and a signed and dated inspection report maintained. The inspection checklists at the back of this manual can be used to record these inspections. Wire rope should be replaced if any of the following conditions are noted.

1. Twelve randomly distributed broken wires in one rope lay, or four broken wires in one strand in one rope lay.
2. Wear of one-third (1/3) of the original diameter of outside individual wires.
3. Kinking, crushing, birdcaging or any distortion of the wire rope structure.
4. Evidence of heat damage.

Broken Wires **Kinked** **Bird Cage**

5. Reductions from nominal diameter of more than the following values:

New Rope Diameter	Maximum Reduction
5/16 inch and under	1/64 inch
3/8 inch through 1/2 inch	1/32 inch
9/16 inch through 3/4 inch	3/64 inch
7/8 inch through 1-1/8 inch	1/16 inch

6. Rope clamps should be checked to ensure bolts are properly torqued.

⚠ CAUTION

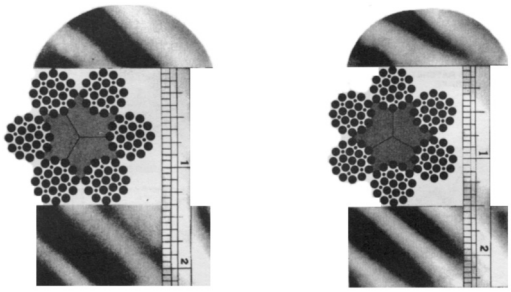
Replacement wire rope should be the same size, grade and construction as the original wire rope. Before replacing wire rope, read reeving procedure. After wire rope replacement check for proper limit switch operation.

⚠ WARNING

Rope pile-on hoisting drum will severely damage the hoisting rope. If this condition is noted, the hoisting rope should be inspected according to the above paragraph on wire rope inspection. If damaged rope is found, check drum and frame members for damage.

HOW TO MEASURE WIRE ROPE

The correct diameter of a wire rope is the diameter of a circumscribed circle which will enclose all the strands. It is the largest cross-sectional measurement. The measurement should be made carefully with calipers. The illustrations below show the correct and incorrect method of measuring the diameter of wire rope.



Wrong Way **Right Way**

GENERAL INSTRUCTIONS

PROCEDURE FOR REEVING WIRE ROPE ON DRUM

DOUBLE REEVED UNITS

Note: Traveling nut lower limit switch must be set for (1) safety wrap.

1. Anchor the rope in the drum on one side. Install rope retainer.
2. Stretch out rope to make sure there are no twists or kinks.
3. Reeve the free end of the rope through the bottom block and all sheaves.
4. Anchor the free end of the rope in the other side of the drum. Install rope retainer.
5. Push the “UP” button to reeve both sides of the drum, making sure there is enough force on the rope to insure proper reeving in all drum grooves.

Note: When the bottom block is raised to the upper limit, the block should be at the midpoint of the ungrooved portion of the drum and even with idler sheave. If this is not so, the unit is reeved incorrectly.

SINGLE REEVED UNITS

1. Anchor the rope in the drum. Install rope retainer.
2. Stretch out rope to make sure there are no twists or kinks.
3. Reeve the free end of the rope through the bottom block.
4. Attach the dead end of the rope to the suspension frame.
5. Push the “UP” button to reeve the drum making sure there is enough force on the rope to insure proper reeving in all drum grooves.

⚠ WARNING

All units with a lower limit switch must have a minimum of one wrap of wire rope on the drum when the bottom block is in the lowest position. All others must have two wraps.

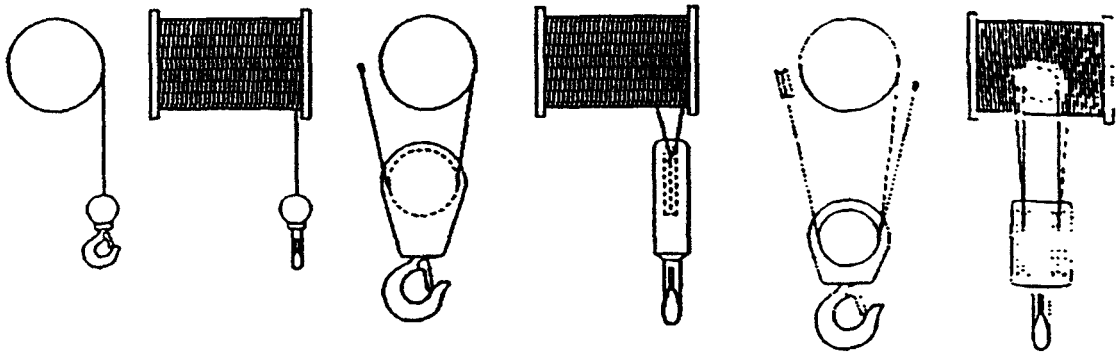
REEVING TYPES

Yale powered wire rope hoists and winches are reeved in various ways to gain desired advantages. Proper reeving insures maximum life of the hoist drum, wire rope, and bottom block assembly while obtaining the best characteristics of capacity, lift, and speed for the basic unit.

Reeving is either “single” or “double”, i.e. one or two ropes coming from the drum. Standard headroom hoists are single reeved, close headroom hoists are double reeved. “Part” designates the number of times the rope runs between the hoist and bottom block. For example: with 2 part single reeving, the rope runs from the rope drum to the bottom block, and back to the hoist frame, indicating 2 “parts” of rope supporting the load. With 2 part double reeving, the rope runs from the rope drum to the bottom block, up to the equalizer sheave, back to the bottom block, then back to the rope drum, indicating 4 “parts” of rope supporting the load.

The drawings below show the characteristics of each principal method of reeving.

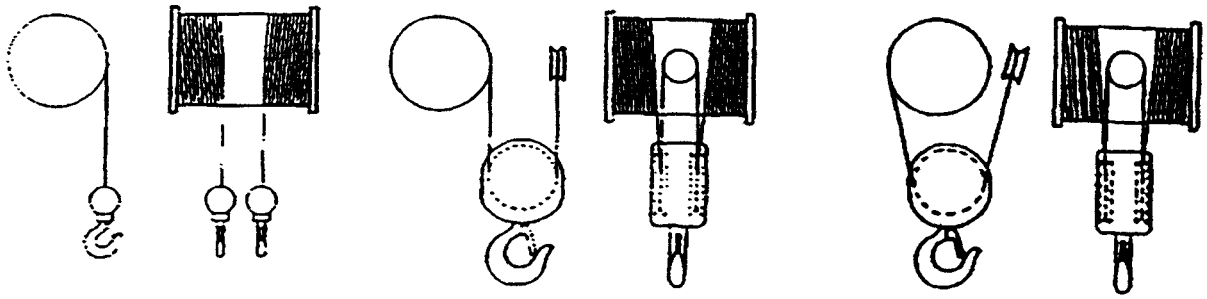
The advantages of single reeved units are fewer ropes and longer lifts from comparable units. Advantages of double reeved units include minimum lateral hook drift (keeping load in the same approximate position in relation to the drum and beam) and a lower hoist headroom requirement.



1 part single
S1

2 part single
S2

4 part single
S4

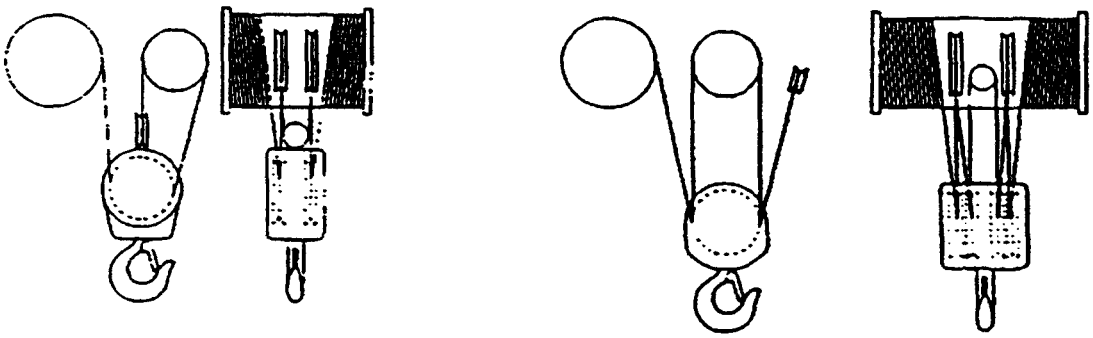


twin rope (1 part double)
D1

2 part double
D2

2 part double
D2

Reeving on FEW and all TR models



3 part double
D3

4 part double
D4

DISASSEMBLY (FOR ALL CHASSIS AND DUTY SERVICE EXCEPT EEW X & FEW)

⚠ CAUTION

Before doing maintenance work on this hoist, read the following instructions thoroughly. Refer to the replacement parts section for parts identification.

To completely disassemble the hoist, follow the disassembly procedures in the order listed.

To disassembly any one specific part of the hoist, follow the instructions for that specific section.

REMOVE HOIST ROPE, BOTTOM BLOCK OR BOTTOM HOOK.

1. Standard Headroom Hoist
   a. Remove or readjust traveling nut or geared limit to negate lower limit (see instructions (a) through (f)).
   b. Operate hoist in down direction until no cable remains on the drum. Remove rope retainers and pull rope sockets from the drum.
   c. Remove power from the hoist.
   d. Disassemble bottom block and remove hoist rope.
   e. Remove limit switch weight from the hoist cable.
   f. Remove pin holding the cable in the hoist frame.
2. Low Headroom Hoist
   a. Follow procedures in 1.a. - 1), 2) and 3).
   b. Remove pin holding equalizer sheave yoke in hoist frame.
   c. Remove axle holding the sheave in the yoke and remove cable.

REMOVE MOTOR BRAKE (DIRECT ACTING).

⚠ CAUTION

Disconnect all power to the hoist by disconnecting the power feed line before attempting service or repair.

1. Remove cover screws and cover. Disconnect coil wire leads.
2. Remove four socket head screws holding brake to gear case. Remove brake.
3. Remove hub retaining ring from shaft. Remove hub.

REMOVE GEAR CASE.

1. If possible, run hoist in down direction and clear all rope from the hoist drum.
2. Follow procedure in 2 to remove motor brake.
3. Before removing gear case, the hoist rope drum must be securely restrained within the suspension frame. (Note that the hoist motor does not have to be removed at this time, but must be removed before the gear case can be reassembled to the hoist.)
4. Pry the gear case from the frame side plate.

⚠ CAUTION

The gear case assemblies can be very heavy. If possible, it is best to support their weight prior to removal.

REMOVE HOIST MOTOR, MOTOR ADAPTER AND DRIVE SHAFT.

1. If possible, run hoist in down direction and clear all rope from the hoist drum.
2. Remove all power from the hoist.
3. Disconnect motor leads in control box.
4. Disconnect flex conduit from motor to control box or junction box.
5. Remove bolts and lockwashers holding motor to motor adapter.
6. Pry the motor from the motor adapter.
7. Before removing the motor adapter the hoist drum must be securely restrained within the suspension frame.
8. Remove the bolts and lockwashers holding the motor adapter to the frame side plate.
9. Pry the motor adapter from the frame side plate.
10. Remove drum bearing and pull drive shaft out.

⚠ CAUTION

The motors and motor adapters can be very heavy. Support their weight prior to removal .

REMOVE HOIST ROPE DRUM.

1. Follow procedures in 1, 2, 3 and 4 to remove gear case and drive shaft, motor, and motor adapter.
2. Remove rope drum from suspension frame.

REMOVE LIMIT SWITCH, TRAVELING NUT OR GEARED

1. Geared Upper and Lower Limit Switch
   a. Disconnect all power from hoist.
   b. Remove the cover from the limit switch and disconnect the wiring. Note the color coding or tag the wires so they can be reconnected correctly. Loosen the cord fitting and remove the cord.
   c. Remove the bolts and lockwashers that hold the limit switch assembly to the gear case. Remove the limit switch assembly from the gear case.
2. Lever Operated Upper Limit Switch
   a. Disconnect all power from hoist.
   b. Remove the bolts holding the limit switch bracket to the hoist and remove the limit switch assembly.
   c. Loosen the clamping screw holding the hub on the limit switch shaft and remove the hub and lever assembly. Note its position carefully so it can be reinstalled correctly.
   d. Remove the screws holding the limit switch to the bracket.
   e. Remove the limit cover and disconnect the wiring. Note the color coding or tag the wires so they can be reconnected correctly. Loosen the cord fitting and remove the cord from the limit switch.
3. Weight Operated Upper Limit Switch
   a. Disconnect all power from the hoist.
   b. Remove the clamping screws holding operating weight around the wire rope and remove the weight.
   c. Remove bolts holding the limit switch bracket to the hoist and remove the limit switch assembly.
   d. Loosen the clamping screw holding the hub on the limit switch shaft and remove the hub and lever assembly. Note its position carefully so it can be reinstalled correctly.
   e. Remove the screws holding the limit switch to the bracket.
   f. Remove the limit cover and disconnect the wiring. Note the color coding or tag the wires so they can be reconnected correctly. Loosen the cord fitting and remove the cord from the limit switch.

REMOVE CONTROLS OR CONTROL BOX.

1. Remove all power from the hoist.
2. Disconnect and tag all wires coming into the control box.
3. Remove nuts, bolts and lockwashers holding control panel in the box.
4. Remove control panel.
5. Disconnect all flex conduit, limit switch cord, push-button cord and power leads from control box.

6. Remove nuts and lockwashers holding control box and remove. Control box may be heavy and should be supported before removing.

REMOVE LOAD BRAKE ASSEMBLY.

1. Follow procedures in 1 and 2 for removing motor brake.
2. Remove drain plug at the bottom of gearcase cover and drain the oil into suitable container. DO NOT REMOVE PAWL STOP PLUG.
3. Remove nuts, bolts, and lockwashers from the gear case - gear case cover flange.
4. Pry gearcase cover away from gear case.
5. Lift out intermediate gear and slow speed pinion shaft.
6. Remove pawl pin, pawl, spring and retainers. (Note that the D chassis has a cotter pin through the pawl and pin. It will be necessary to remove this cotter pin first.)
7. Cover the ratchet pawl with a rag to prevent losing the retainers which are spring loaded.
8. Rotate the load brake assembly until the pawl clears the load brake and the retainers pop out of the pawl.
9. Remove the retainers and spring.
10. Lift the load brake assembly out of the gear case cover.

REASSEMBLY (FOR ALL CHASSIS AND DUTY SERVICE EXCEPT EEW X & FEW)

The assembly sequence is basically the reverse of the disassembly sequence previously described. The following special instructions should be observed during reassembly.

1. Before the gear case is assembled, all internal parts should be inspected for damage or excessive wear. Replace parts as required.
2. Be sure the splines in the drum are free of paint or other material which would interfere with installation. Lubricate the splines before assembly to prevent wear. The hoist drum must be centered between the large bores in the suspension frame side plates. (Suspend the drum in a sling or support it on blocks.)
3. Install the gear case assembly by sliding the splined gear case shaft into the drum splines. Push the gear case into the large bore in the suspension frame and bolt together.
4. Inspect the universal joints and the drive shaft. Replace if damaged. (If the covering on the universal joints was removed, masking tape can be used to hold the joints rigid.) Slide the drive shaft through the end of the drum and line up the splines and push the drive shaft on the driving pinion. (The drive shaft can be supported with a length of angle iron while installing it on the driving pinion.) When piloting the drive shaft on to the driving pinion, rotating the gear case pinion (where the motor brake mounts) can help to line up the splines.
5. Inspect the drum support bearing. Replace if damaged. The end of the drive shaft must be lifted to go into the drum bearing and motor adapter. (A length of small diameter pipe can be used for this.) Install the drum bearing and then the motor adapter. Bolt the adapter to the frame.
6. Inspect the motor shaft spline for nicks or other damage which would interfere with assembly into the drive shaft yoke. Correct damage if necessary. When piloting the motor splines into the drive shaft, rotating the gearcase pinion (where the motor brake mounts) can help to line up the splines. Bolt the motor to the adapter.
7. Be sure the motor brake is properly adjusted before it is installed on the gear case.

DISASSEMBLY OF HOIST EEW X & FEW

⚠ CAUTION

Before doing maintenance work on this hoist, read the following instructions thoroughly. Refer to the replacement parts section for parts identification.

To completely disassemble the hoist, follow the disassembly procedures in the order listed.

To disassemble any one specific part of the hoist, follow the instructions for that specific section.

TO REMOVE WIRE ROPE AND BOTTOM BLOCK:
Operate push button pendant in lowering direction until lower limit switch stops hoist motor. Turn off power feed line to hoist. Remove screws from cover of traveling nut or geared type limit switch. Back cam or traveling nut away from switch that has made contact. Apply power to hoist. Operate push button in down mode to the point where no wraps of wire rope remain on hoist drum. Remove rope socket or sockets from hoist drum. Remove anchor pin from suspension frame if hoist has single reeving drum.

⚠ CAUTION

Before continuing with the disassembly procedures, cut off all power to the hoist by disconnecting the power feed line. Remove yoke(s) and/or idler sheave pin(s) to free wire rope, sheave(s) and bottom block from hoist.

Never disassemble the hoist in 'dirty' surroundings, nor allow dirt, grit or any other foreign material to get on the working areas of these parts.

TO DRAIN OIL FROM HOIST:
Remove the drain plug from bottom of gearcase. See lubrication chart when replacing oil in gearcase.

TO REMOVE THE MOTOR BRAKE ASSEMBLY (SOLENOID ACTUATED):

1. Turn brake release knob counter clockwise until it can be completely removed. On 105 ft. lb. Brakes, remove slotted screws from cover. On 125 ft. lb. Brake and larger, remove 5/16 inch allen head screws. Brake cover can now be removed.

⚠ CAUTION

Brake cover may be heavy and should be supported during removal.

2. To prevent brake from losing adjustment, pull solenoid plunger to seated position and set brake release.
3. Remove two coil wires.
4. Remove 7/16 inch hex head machine screws at outside edge of support plate and remove support plate.
5. Pressure plate, friction plate, and brake disc can be removed by pulling outward.
6. Remove brake hub or drive block by turning allen set screw counter clockwise.
7. Remove remaining four allen head screws. Motor brake is now disassembled.

TO REMOVE BRAKE ADAPTER:
Remove hex head bolts.

TO REMOVE COVER PLATES FROM GEARBOX:
Remove hex head screws from each cover to be removed.

TO REMOVE HOIST MOTOR:
Disconnect all motor leads from terminal blocks. Remove conduit nut on outside of control box. Pull wires through the conduit fitting. Using lifting eye on motor, prepare to support weight of motor. Remove 1-1/8 inch hex head bolts, and pull motor outward.

TO REMOVE GEARBOX FROM SUSPENSION FRAME:
Prepare to support weight of wire rope drum and gear box. Remove three 1 inch hex head bolts. Pull outward on gearbox until drive shaft is out of hoist.

Note: To reassemble gearbox and drive shaft, drive shaft must be supported and aligned with motor adapter and motor shaft hole.

TO REMOVE DRIVE SHAFT:
Unscrew 5/16 inch hex head bolts from spider and bearing assembly on gearcase end, and unscrew 9/16 inch hex head bolts from end of driving pinion.

TO DISASSEMBLE GEARCASE:

1. Remove 1/4 inch hex head screws from the output shaft bearing cover and retainer.
2. Remove large retaining ring from the smaller end of output shaft which is inside the gearcase. This will allow the output shaft, driving pinion and third reduction gear to be removed from gearcase.
3. Remove traveling nut or geared type limit switch by removing 5/16 inch hex head screws. Switch can now be lifted off.
4. Remove third reduction pinion and second reduction gear. This is done by removing 1/4 inch hex head screws from third reduction pinion, bearing, and retainer cover. Cover, bearings, pinion, gear and spacer can now be removed.
5. Remove sprag clutch. This can be done by removing 1/2 inch hex head bolts from end of sprag clutch inner race which is outside the gearcase. Inner race, gear and spacer can now be removed by applying pressure to the smaller end of inner race inside the gearcase.
6. Remove load brake assembly, first reduction gear and second reduction pinion. This can be done by removing 1/4 inch hex screws from plate outside gearcase. This will free bearing retainer cover plate. To remove pinion, rotate high speed gear to the left, holding pinion. This will push the pinion out of load brake assembly. The pinion may now be pulled the rest of the way out of load brake. Bearings, discs, load brake gears and high speed gears can now be removed from gearcase.

Note: To remove bearing and seal from output shaft, remove retainer snap ring.

TO DISASSEMBLE MOTOR ADAPTER FROM SUSPENSION FRAME:
Prepare to support weight of wire rope drum and motor adapter. Remove 1 inch hex head bolts and nuts. This will allow adapter to be pulled away from frame and drum.

TO REMOVE WIRE ROPE DRUM FROM HOIST:
Motor adapter and gearcase must be removed from the suspension frame before drum can be removed. (See steps 7 and 10.)

⚠ CAUTION

Drum is heavy and must be supported before removing motor adapter and gearcase.

TO REMOVE CONTROLS OR CONTROL BOX:
Remove all power from hoist. Disconnect and tag all wires coming into control box. Remove nuts, bolts and lockwashers holding panel in box. Remove control panel. Disconnect all flexible conduit, limit switch, cord, push button cord, and power leads from control box. Remove nuts, bolts and lockwashers holding control box to the hoist, and remove control box. Control box may be heavy and should be supported.

TO DISASSEMBLE BOTTOM BLOCK:
Use normal disassembly procedures and refer to applicable bottom block parts pages to remove hook, sheaves, etc. from bottom block.

ASSEMBLY OF HOIST

TO REASSEMBLE HOIST EEW X & FEW:
Reverse preceding disassembly procedures. Make sure all parts are properly adjusted and lubricated per applicable instructions. Replace bearings and gaskets if they have been damaged. (See lubrication chart for type of oil when refilling.)

Note: To assemble load brake, the high speed gear, inner bearing race and spacer must be aligned. If possible, the inboard side of the gearcase should be laid flat on a table during reassembly. This will make it easier to align holes. If gear box is standing upright, the housing must be held in position to assemble the load brake.

⚠ CAUTION

If the load brake is disassembled with the gearbox on the hoist, rotating of drum must be prevented.

Note: After assembly, the hoist must be function tested in accordance with instructions.

TROUBLESHOOTING (FOR ALL CHASSIS AND DUTY SERVICE EXCEPT EEW X & FEW)

⚠ CAUTION

Always disconnect power circuit before working on electrical components.

Problem	Possible Cause	Remedy
Unit Noisy	1. Nicked Gears	1. Examine teeth for nicks and burrs. Remove with honing stone, replace if teeth are severly damaged.
	2. No Oil	2. Fioll to oil level hole
	3. Defective Bearing	3. Replace
Oil Seepage	1. Fill plug loose	1. Tighten
	2. Gearcase cover loose	2. Tighten screws
	3. No hole in vent plug	3. Replace with vent plug
	4. Defective Seals	4. Check lips of seal for worn or rough edges. Replace as necessary.
Load Drifts or Drops	1. Motor brake slipping	1. Adjust brake. Check for oil on brake discs.
	2. Motor brake not closing	2. Adjust for proper clearance. See brake instructions.
	3. Retainer or retainer spring missing or broken	3. Replace
	4. Load Brake disc worn or glazed	4. If standard duty brake discs are not worn to less than 1/8 inch thick, rough brake disc surface (and surfaces that contact discs) with coarse emery cloth. Wash thoroughly and reassemble. If not effective or if discs are less than 1/8 inch thick, replace ratchet and disc assembly.
	5. Load Brake Pawl not operating	5. Check for tight fitting pawl or retainer tight in pawl. Replace if necessary.
	6. Load brake not closing	6. Check for burrs on thread of intermediate pinion or high speed gear. Hone or replace. Mating parts must rotate easily.
	7. Ratchet installed backwards	7. Turn Around
Brake Coil Burned out	1. Wrong coil	1. Replace with proper voltage coil.
	2. Motor brake too tight	2. Adjust brake. See brake instructions
Hoist does not Operate	1. Blown or loose fuse	1. Replace or tighten fuse
	2. Tripped breaker	2. Reset breaker
	3. Lose terminal screws	3. Check and tighten all loose screws
	4. Low voltage	4. Check voltage at line side of reversing switch
	5. Low voltage or no voltage to push button circuit	5. Check voltage at output side of transformer. Wrong voltage tap may have been selected. For example: 460 volt tap used when line voltage is 230 volt. Check control circuit fuse.
	6. Defective push button	6. Check contact points at push button to see if points touch. If not, replace.
	7. Defective push button cord. (Wire may be pinched, broken or bare.)	7. Check for lack of continuity or short to ground.
	8. Burned coil in reversing contactor.	8. Replace
	9. Burned contact tips	9. Replace contactor
	10. Motor brake coil burned	10. Replace. Check to make sure coil is proper coil for voltage applied.
	11. Defective stator	11. Rewind stator
	12. Rotor loose on shaft	12. Replace

TROUBLESHOOTING (CONTINUED)

Motor Overheats, Excessive Amperage Draw	1. Defective stator	1. Replace or rewind stator
	2. Worn motor bearings	2. Replace
	3. Bent rotor shaft	3. Replace
	4. Rotor dragging in stator	4. Tighten motor bolts. Check for foreign matter between rotor and stator. Check for worn motor bearings.
	5. Stator loose in frame	5. Rewind stator if necessary. Reposition and anchor in accordance with motor manufacturers instructions.
	6. Low voltage	6. Check with local utility company and/or increase wire size.
Motor Noisy	1. Motor bolts loose	1. Tighten
	2. Rotor dragging in stator	2. Check for bent rotor shaft or worn bearings. Replace worn or damaged parts.
	3. Motor bearings loose	3. Replace bearings
Transformer Overheats or Burns Out	1. Wrong tap used on primary side	1. Replace transformer if necessary. Primary tap must match line voltage.
	2. Shorted transformer	2. Replace
	3. Shorted control circuit	3. Correct short
Reversing Contactor Coil Burned Out	1. Wrong coil used	1. Replace coil. Be sure coil conforms to voltage of circuit it is used on.
	2. Jammed plunger	2. Disassemble and clean. Do not lubricate plunger or coil.
	3. Shorted coil	3. Replace
Hoist Shocks Operator	1. Hoist not grounded	1. Ground hoist
	2. Power leads or control wires shorted to hoist frame.	2. Repair or replace
	3. Grounded motor	3. Replace
	4. Slight electrical leakage from any of the electrical components on hoist.	4. Make sure hoist is properly grounded.

TROUBLESHOOTING (FOR EEW X & FEW))

⚠ CAUTION

Always disconnect power circuit before working on electrical components.

Problem	Possible Cause	Remedy
Unit Noisy	1. Nicked Gears	1. Examine teeth for nicks and burrs. Remove with honing stone, replace if teeth are severly damaged.
	2. No Oil	2. Fioll to oil level hole
	3. Defective Bearing	3. Replace
	4. Slow speed gear upside down	4. Turn over. Chamfer on splined hole must face gear case
Oil Seepage	1. Fill plug loose	1. Tighten
	2. Gearcase cover loose	2. Tighten screws
	3. No hole in vent plug	3. Replace with vent plug
	4. Defective Seals	4. Check lips of seal for worn or rough edges. Replace as necessary.
Load Drifts or Drops	1. Load Brake disc worn or glazed	1. If standard duty brake discs are not worn to less than 1/8 inch thick, rough brake disc surface (and surfaces that contact discs) with coarse emery cloth. Wash thoroughly and reassemble. If not effective or if discs are less than 1/8 inch thick, replace ratchet and disc assembly.
	2. One-way (Sprag) clutch not operating	2. Repair or replace clutch
	3. Load brake not closing	3. Check for burrs on thread of intermediate pinion or high speed gear. Hone or replace. Mating parts must rotate easily.
	4. Motor brake slipping	4. Replace brake discs. Check for oil on discs.
Brake Coil Burned out	1. Wrong coil Two speed motors require line voltage brake coil	1. Replace with proper voltage coil.
Hoist does not Operate	1. Blown or loose fuse	1. Replace or tighten fuse
	2. Tripped breaker	2. Reset breaker
	3. Lose terminal screws	3. Check and tighten all loose screws
	4. Low voltage	4. Check voltage at line side of reversing switch
	5. Low voltage or no voltage to push button circuit	5. Check voltage at output side of transformer. Wrong voltage tap may have been selected. For example: 460 volt tap used when line voltage is 230 volt. Check control circuit fuse.
	6. Defective push button	6. Check contact points at push button to see if points touch. If not, replace.
	7. Defective push button cord. (Wire may be pinched, broken or bare.)	7. Check for lack of continuity or short to ground.
	8. Burned coil in reversing contactor.	8. Replace
	9. Reversing contactor plunger jammed in switch	9. Check for burned coil. Disassemble and replace defective components. Do not lubricate.
	10. Burned contact tips	10. Replace contactor
	11. Motor brake coil burned	11. Replace. Check to make sure coil is proper coil for voltage applied.
	12. Defective stator	12. Rewind stator
	13. Rotor loose on shaft	13. Replace

TROUBLESHOOTING (FOR EEW X & FEW))

Motor Overheats, Excessive Amperage Draw	1. Defective stator	1. Replace or rewind stator
	2. Worn motor bearings	2. Replace
	3. Bent rotor shaft	3. Replace
	4. Rotor dragging in stator	4. Tighten motor bolts. Check for foreign matter between rotor and stator. Check for worn motor bearings.
	5. Stator loose in frame	5. Rewind stator if necessary. Reposition and anchor in accordance with motor manufacturers instructions.
	6. Low voltage	6. Check with local utility company and/or increase wire size.
Motor is Erratic, Stop-Start, Etc.	1. Faulty limit switch	1. Disassemble limit switch. Grit or chips of plastic may be betweencontact points. Clean thoroughlywith carbon tetrachloride, cleaningfluid or lighter fluid. Reassemble.Replace switch if this fails to correcttrouble or if switch is cracked.Check for proper adjustment.
Hoist Operates in Wrong Direction	1. Motor out of phase with power source	1. Interchange any two line wires for 3-phase
Hoist Operates in One Direction	1. Push button circuit wired wrong	1. Check wiring and reposition wires
	2. Contact tips burned	2. Replace
	3. Loose screws or wires	3. Tighten
	4. Defective limit switch	4. Repair or replace
Motor Noisy	1. Motor bolts loose	1. Tighten
	2. Rotor dragging in stator	2. Check for bent rotor shaft or worn bearings. Replace worn or damaged parts.
	3. Motor bearings loose	3. Replace bearings
Transformer Overheats or Burns Out	1. Wrong tap used on primary side	1. Replace transformer if necessary. Primary tap must match line voltage.
	2. Shorted transformer	2. Replace
	3. Shorted control circuit	3. Correct short
Reversing Contactor Coil Burned Out	1. Wrong coil used	1. Replace coil. Be sure coil conforms to voltage of circuit it is used on.
	2. Jammed plunger	2. Disassemble and clean. Do not lubricate plunger or coil.
	3. Shorted coil	3. Replace
Hoist Shocks Operator	1. Hoist not grounded	1. Ground hoist
	2. Power leads or control wires shorted to hoist frame.	2. Repair or replace
	3. Grounded motor	3. Replace
	4. Slight electrical leakage from any of the electrical components on hoist.	4. Make sure hoist is properly grounded.

REPAIR PARTS LIST

⚠ WARNING

Using “Commercial” or other manufacturer’s parts to repair the Yale Hoists may cause load loss.

TO AVOID INJURY:
Use only Yale supplied replacement parts. Parts may look alike but Yale parts are made of specific materials or processed to achieve specific properties

PARTS STAR™ BY COLUMBUS McKINNON

ORDERING INSTRUCTIONS

The following information must accompany all correspondence orders for replacement parts:

1. Hoist Model Number from identification plate.
2. Serial number of the hoist stamped below identification plate.
3. Voltage, phase, hertz from the identification plate.
4. Length of lift.
5. Part number of part from parts list.
6. Number of parts required.
7. Part name from parts list.

NOTE: When ordering replacement parts, it is recommended that consideration be given to the need for also ordering such items as gaskets, fasteners, insulators, etc. These items may be damaged or lost during disassembly or just unfit for future use because of deterioration from age or service.

RECOMMENDED SPARE PARTS FOR YOUR YALE CRANE

Certain parts of your crane will, in time, require replacement under normal wear conditions. It is suggested that the following parts be purchased for your crane as spares for future use.

- Hook
- Latch Kit
- Hook Nut
- Bottom Block Sheave
- Bottom Block Sheave Bearing
- Wire Rope Assembly
- Driver Wheel
- Trailer Wheel
- Wheel Bearing

Note: When ordering parts always furnish the part number and the manufacturer's serial number.

WARRANTY

LIMITATION OF WARRANTIES, REMEDIES AND DAMAGES

Note: When ordering parts, always furnish Rated Load, Voltage, Phase, Hertz and Serial Number of hoist on which the parts are to be used. For the location of the nearest Repair Station, see the list located on the inside front cover.

THE WARRANTY STATED BELOW IS GIVEN IN PLACE OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR OTHERWISE, NO PROMISE OR AFFIRMATION OF FACT MADE BY ANY AGENT OR REPRESENTATIVE OF SELLER SHALL CONSTITUTE AWARRANTY BY SELLER OR GIVE RISE TO ANY LIABILITY OR OBLIGATION.

Seller warrants that on the date of delivery to carrier the goods are free from defects in workmanship and materials.

SELLER'S SOLE OBLIGATION IN THE EVENT OF BREACH OF

WARRANTY OR CONTRACT OR FOR NEGLIGENCE OR OTHERWISE WITH RESPECT TO GOODS SOLD SHALL BE EXCLUSIVELY LIMITED TO REPAIR OR REPLACEMENT, F.O.B. SELLER'S POINT OF SHIPMENT, OF ANY PARTS WHICH SELLER DETERMINES TO HAVE BEEN DEFECTIVE or if Seller determines that such repair or replacement is not feasible, to a refund of the purchase price upon return of the goods to Seller.

Any action against Seller for breach of warranty, negligence or otherwise, must be commenced within one year after such cause of action occurs.

NO CLAIM AGAINST SELLER FOR ANY DEFECT IN THE GOODS SHALL BE VALID OR ENFORCEABLE UNLESS BUYER'S WRITTEN NOTICE THEREOF IS RECEIVED BY SELLER WITHIN ONE YEAR FROM THE DATE OF SHIPMENT. Seller shall not be liable for any damage, injury or loss arising out of the use of the goods if, prior to such damage, injury or loss, such goods are (1) damaged or misused following Seller's delivery to carrier; (2) not maintained, inspected, or used in compliance with applicable law and Seller's written instructions and recommendations; or (3) installed, repaired, altered or modified without compliance with such law, instructions or recommendations.

UNDER NO CIRCUMSTANCES SHALL SELLER BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES AS THOSE TERMS ARE DEFINED IN SECTION 2-715 OF THE UNIFORM COMMERCIAL CODE.

INDEMNIFICATION AND SAFE OPERATION

Buyer shall comply with and require its employees to comply with directions set forth in instructions and manuals furnished by Seller and shall use and require its employees to follow such instructions and manuals and to use reasonable care in the use and maintenance of the goods. Buyer shall not remove or permit anyone to remove any warning or instruction signs on the goods. In the event of personal injury or damage to property or business arising from the use of the goods, Buyer shall within 48 hours thereafter give Seller written notice of such injury or damage. Buyer shall cooperate with Seller in investigating any such injury or damage and in the defense of any claims arising therefrom.

If Buyer fails to comply with this section or if any injury or damage is caused, in whole or in part, by Buyer's failure to comply with applicable federal or state safety requirements, Buyer shall indemnify and hold Seller harmless against any claims, loss or expense for injury or damage arising from the use of the goods.

CMCO Warranty (HOISTS)

A. Columbus McKinnon Corporation ("Seller") warrants to the original end user ("Buyer") that, for a period of one (1) year from the date of Seller's delivery of the goods (collectively, the "Goods") to the carrier, the Goods will be free from defects in workmanship and materials.

B. IN THE EVENT OF ANY BREACH OF SUCH WARRANTY, SELLER'S SOLE OBLIGATION SHALL BE EXCLUSIVELY LIMITED TO, AT THE OPTION OF SELLER, REPAIR OR REPLACEMENT, F.O.B. SELLER'S POINT OF SHIPMENT, OF ANY GOODS THAT SELLER DETERMINES TO HAVE BEEN DEFECTIVE OR, IF SELLER DETERMINES THAT SUCH REPAIR OR REPLACEMENT IS NOT FEASIBLE, TO A REFUND OF THE PURCHASE PRICE UPON RETURN OF THE GOODS TO SELLER. NO CLAIM AGAINST SELLER FOR ANY BREACH OF

(i) SUCH WARRANTY WITH RESPECT TO THE ELECTRICAL COMPONENTS OF ANY GOOD SHALL BE VALID OR ENFORCEABLE UNLESS BUYER'S WRITTEN NOTICE THEREOF IS RECEIVED BY SELLER WITHIN ONE (1) YEAR FROM THE DATE OF SELLER'S DELIVERY TO THE CARRIER AND (ii) SUCH WARRANTY WITH RESPECT TO THE MECHANICAL COMPONENTS OF ANY GOOD SHALL BE VALID OR ENFORCEABLE UNLESS BUYER'S WRITTEN NOTICE THEREOF IS RECEIVED BY SELLER WITHIN ONE (1) YEAR FROM THE DATE THE DATE ANY ALLEGED CLAIM ACCRUES. EXCEPT FOR THE WARRANTY SET FORTH ABOVE, SELLER MAKES NO OTHER WARRANTIES WITH RESPECT TO THE GOODS, WHETHER EXPRESSED OR IMPLIED, INCLUDING ANY WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, QUALITY AND/OR THOSE ARISING BY STATUTE OR OTHERWISE BY LAW OR FROM ANY COURSE OF DEALING OR USE OF TRADE, ALL OF WHICH ARE HEREBY EXPRESSLY DISCLAIMED.

C. IN NO EVENT SHALL SELLER BE LIABLE TO BUYER OR ANY THIRD PARTY WITH RESPECT TO ANY GOOD, WHETHER IN CONTRACT, TORT OR OTHER THEORY OF LAW, FOR LOSS OF PROFITS OR LOSS OF USE, OR FOR ANY INCIDENTAL, CONSEQUENTIAL, SPECIAL, DIRECT OR INDIRECT DAMAGES, HOWSOEVER CAUSED. SELLER'S MAXIMUM LIABILITY TO BUYER WITH RESPECT TO THE GOODS SHALL IN NO EVENT EXCEED THE PRICE PAID BY BUYER FOR THE GOODS THAT ARE THE SUBJECT OF THE APPLICABLE CLAIM.

D. Seller shall not be liable for any damage, injury or loss arising out of the use of the Goods if, prior to such damage, injury or loss, such Goods are: (1) damaged or misused following Seller's delivery to the carrier; (2) not maintained, inspected, or used in compliance with applicable law and Seller's written instructions and recommendations; or (3) installed, repaired, altered or modified without compliance with such laws, instructions or recommendations.

E. This warranty is limited and provided only to the original end user. Each Good must be registered within sixty (60) days of receipt of each product to establish eligibility. Please register at www.cmworks.com/hoist-warranty-registration or submit registration card via US mail.

F. Any action against Seller for breach of warranty, negligence or otherwise must be commenced by Buyer within one (1) year after: (a) the date any alleged claim accrues; or (b) the date of delivery of the Goods to Buyer, whichever is earlier.

⚠ WARNING

Alterations or modifications of equipment and use of non-factory repair parts can lead to dangerous operation and injury.

TO AVOID INJURY:

- Do not alter or modify equipment.
- Do use only factory replacement parts.

COLUMBUS McKINNON
CORPORATION

FAMILY OF BRANDS

USA: Ph: (800) 888.0985 • (716) 689.5400 • Fax: (716) 689.5644 • www.cmworks.com
CANADA: Ph: (877) 264.6478 • Fax: (877) 264.6477 • www.cmworks.com

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