

CHESTER HOIST

ELECTRIC LOW HEADROOM CHAIN HOISTS

EL-680

SECTION A

OPERATING and MAINTENANCE INSTRUCTIONS FOR EL SERIES HOISTS

Users should refer to the ANSI B30.16 American National Standard and ASME HST-1M Performance Standard for Electric Chain Hoists for specific requirements regarding safety practices for the installation, maintenance, and operation of this equipment.

Your Order No. _____

Hoist Serial No. _____

Model No. _____

When ordering parts, please use hoist serial number

CHESTER HOIST

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WARNINGS, CAUTIONS and NOTES are used throughout this manual to emphasize important and critical instructions. For this purpose WARNINGS, CAUTIONS and NOTES are defined as follows:

WARNING: An instruction which, if not properly followed, could result in personal injury or death.

CAUTION: An instruction which, if not properly followed, could result in damage to equipment or property.

NOTE: Instruction which is important to highlight.

WARNING:

Failure to read and follow the instructions contained in this manual could result in unsafe hoisting practices which might lead to personal injury or property damage.

I - SAFETY PRECAUTIONS

This hoist is designed for safe operation within the limits of its rated capacity. There are safety features built into the hoist to protect the operator and others from injury due to failure of the hoist itself. However, listed below are safety pointers which must be followed in order to protect personnel and property.

1. Avoid side pull or end pull at all times.
2. Limit switches are emergency devices. Do not use limit switches to stop the hoist in normal operation. Do not leave load block in contact with limit switch at end of operation.
3. Do not operate hoist with twisted, kinked or damaged chain.
4. Do not operate hoist with a chain that is not properly seated in all pockets.
5. Do not operate a damaged or malfunctioning hoist until necessary adjustments or repairs have been made.
6. Do not use hoist to lift, support or otherwise transport people or to carry loads over people.
7. Make sure all supporting structures are strong enough to hold your intended load.
8. Do not lift more than the rated capacity of the hoist.
9. Do not use the chain as a substitute for slings.
10. Allow only qualified personnel to operate the hoist.
11. Do not leave a load suspended in the air unattended.
12. Avoid jogging controls or quick reversals of load.
13. Always disconnect hoist from power supply before making electrical connections or repairs. The main disconnect to the hoist should be locked out during repairs.
14. Do not use P.B. cable to move either hoist or load along rail.
15. When replacement parts are required, use only parts supplied by the manufacturer.
16. Do not remove or obscure warning labels or capacity labels or tags.

II - INSTALLATION INSTRUCTIONS

1. GENERAL INSTRUCTIONS

- a. The power supply should be within plus or minus 10% of the voltage specified on the hoist nameplate.
- b. Supporting structure, including trolleys, monorail, etc. should have a load rating at least equal to the hoist plus weight of hoist.
- c. Check lubrication level in the gear case and trolley gear case (if supplied with the hoist).
- d. Check chain for damage and improper seating in load or idler sheaves.

2. LOAD HOOK DIRECTION (PHASING)

CAUTION: Failure to follow these instructions may cause immediate and severe damage to this hoist.

When installing your hoist, make only temporary

connections at the power source. Push the "UP" button and observe the direction of the load block. If the load block raises, the phasing is correct and permanent connection may be made at the power source. If the load block lowers, release the button immediately. To correct load block direction, reverse any two wires (except the green ground wire) at the power source only. **DO NOT CHANGE CONNECTIONS AT ANY OTHER LOCATION.**

3. LIMIT SWITCH OPERATION (PADDLE)

Before placing the hoist in operation, check for proper upper limit switch operation. Push the "UP" button and, while the hoist is moving upward, raise the limit switch lever. The hook should stop immediately. **DO NOT OPERATE THE HOIST IF THE LIMIT SWITCH(ES) ARE NOT OPERATING PROPERLY.**

4. BRAKE OPERATION

NOTE: Run in hoist with a light load a few times before lifting the rated load. After lifting a light load a few times, test the hoist per paragraph VI. Check for load block drift with the maximum rated capacity load on the hook. If hook does not stop within one to two inches when push button is released, it may be necessary to adjust the brake. See paragraph V.2a.(3).

5. INSTALLATION ON BEAM (See page 8).

6. CHAIN CONTAINER INSTALLATION (See page 11 for installation instructions.)

7. POST INSTALLATION INSPECTION

After installation, but prior to placing this hoist into service, a post installation inspection should be performed using the checklist on page 10 of this manual.

III - OPERATION

1. OPERATING PERSONNEL

It is recommended that hoist operation be limited to the following personnel:

- a. Appointed operators who have passed a practical operating examination.
- b. Maintenance and test personnel when it is necessary in the performance of their duties.
- c. Inspectors.

2. GOOD OPERATING PRACTICES

- a. The operator should not engage in any practice which will divert his attention while engaged in operating the hoist.
- b. When an "out-of-order" sign is on the starting controls, the operator should not power the unit or start operations until the sign has been removed by a designated person.
- c. Before starting the hoist, the operator should be certain that all personnel are clear.
- d. The operator should familiarize himself with the equipment and its proper care. If adjustments or repairs are necessary or any damage

known, or suspected, he should report the same promptly to the appointed person and should also notify the next operator of the damage upon changing shifts.

- e. All controls, such as push button stations, brakes and limit switch(es) should be tested by the operator before beginning a shift. If any controls do not operate properly, they should be adjusted or repaired before operations are started.

3. HANDLING THE LOAD

- a. Size of Load
Do not load the hoist beyond the rated load, except for properly authorized tests.
- b. Attaching the Load
 - (1) The hoist chain should not be wrapped around the load.
 - (2) The load should be attached to the hook by means of slings or other approved devices.
 - (3) The slings or other approved devices shall be seated properly in the saddle of the hook before operation.
- c. Moving the Load
 - (1) The load should not be moved or lifted more than a few inches until it is well-balanced on a sling or lifting device.
 - (2) Care should be taken in hoisting to be certain that:
 - (a) Hoist chain is not kinked or twisted.
 - (b) Load does not contact any obstructions.
 - (c) Multiple part chains are not twisted about each other.
 - (3) No hoist should be operated until the hoist unit is centered over the load.
 - (4) The operator should test the brake each time a load approaching the rated load is handled by raising the load just enough to clear the floor or supports, and check for brake action. The lift should be continued after the operator is assured the brake is operating properly.
 - (5) The operator should inch the hoist into engagement with a load, and avoid unnecessary stops and starts.

IV - 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 and amount of use. The following inspection intervals are based on intermittent use under normal environmental conditions. If the hoist is used more than intermittently or under adverse environmental conditions, it should be inspected more frequently.

1. DAILY INSPECTION

Inspect the following items daily before operating hoist:

- a. Check all controls and operating mechanisms for proper operation.
- b. Check limit switches and brake for proper operation.
- c. Check hooks for deformations, chemical damage or cracks. Replace any hook showing any of these signs.

NOTE: Any hook that is twisted or has throat opening in excess of normal, indicates abuse or overloading of the hoist. When a hook is found to be in this condition, other load bearing components of the hoist should be inspected for damage.

- d. Check chain for wear, twist or distortion.
- e. Check for damaged or improperly working safety latch.

2. QUARTERLY INSPECTION

Inspect the following items at 90-day intervals:

- a. Check all items under daily inspection.
- b. Check for loose bolts, screws and nuts.
- c. Inspect load chain wheels for cracks and excessive wear.
- d. Inspect for worn, corroded, cracked or distorted parts.
- e. Check for proper operation of brake. See paragraph II.4.
- f. Inspect for excessive wear of chain. See paragraph V.4.
- g. Check electrical parts for signs of pitting or any deterioration of controls, limit switches and push button station.
- h. Check chain container (See page 11.)

3. ANNUAL INSPECTION

Inspect the following items annually:

- a. Check all items under daily and 90-day interval inspection.
- b. Check hooks for cracks by means of a magnetic particle test or other suitable crack detecting test.
- c. Inspect supporting structure and trolleys (if used) for continued ability to support the imposed loads.
- d. Check brake for worn linings and discs. See paragraph V.2.a.(2).

NOTE: A hoist which has been idle for a period of one month or more, but less than six months, should be given an inspection of those items listed under paragraphs IV.1 and IV.2. A hoist which has been idle for a period of six months or more, should be given a complete inspection.

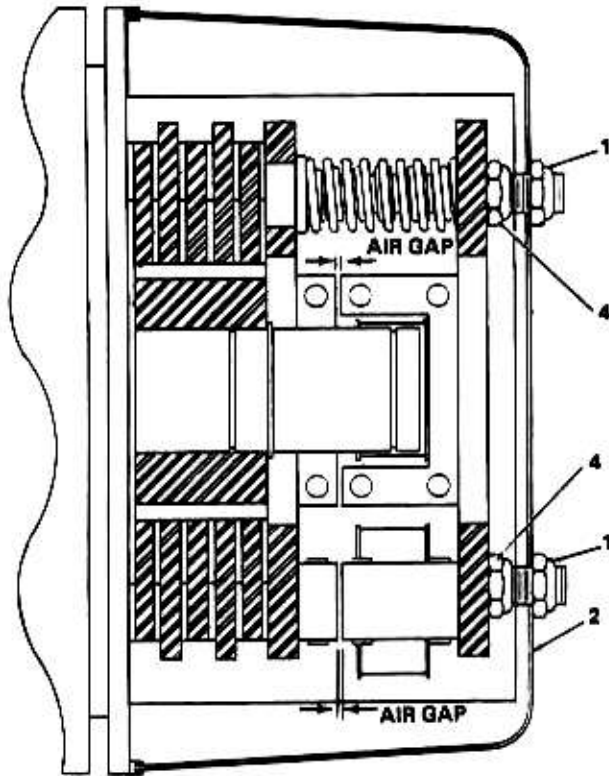
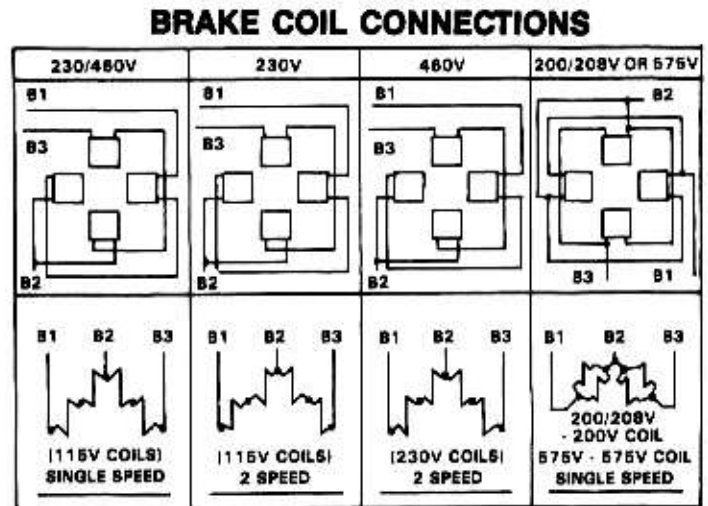


FIGURE 1. BRAKE ADJUSTMENT



NOTE: These instructions are for the Chester Hoist brake only. For other brakes, see manufacturer's information provided in the parts manual.

V. MAINTENANCE

A preventive maintenance program based on the following should be established for the hoist. It is recommended that detailed records be kept and made available to appointed personnel.

NOTE: Only parts obtained from Chester Hoist should be used in maintenance of the hoist.

1. MAINTENANCE PROCEDURE

Before adjustments and repairs are started on the hoist, the following precautions should be taken:

- a. The main or emergency switch on the line feeding the hoist should be locked in the open position or the power disconnected.
- b. Warning or "out-of-order" signs should be placed on the hoist. These signs should be placed and removed only by designated personnel.

2. ADJUSTMENTS AND REPAIRS

Any unsafe conditions disclosed by inspection should be corrected before operation of the hoist is resumed. Adjustments and repairs should be accomplished only by qualified personnel.

a. Adjustments

Adjustments should be made to assure correct functioning of components after replacements or when malfunctions are detected.

(1) Geared Limit Switch

Adjust geared limit switch according to instructions contained in the maintenance and parts sheets included in the illustrated parts breakdown.

NOTE: The lower limit switch should be set so that a small loop of loose chain remains when the geared limit switch prevents further travel. The paddle limit switch only acts if this switch fails.

(2) Brake Adjustment (See Figure 1).

- (a) Remove nuts (1), and cover (2).
- (b) Adjust air gap adjusting nuts (4) until the air gap at all four coils is 0.020 inch for single disc brakes or 0.035 inch for double disc brakes and 0.050 inch for triple disc brakes.
- (c) Replace cover (2) and nuts (1).
- (d) For brakes not of Chester Hoist manufacture, see attached parts sheets.

b. Repairs or Replacements

Repairs or replacements should be provided promptly as needed for correct operation. The following are examples:

- (1) Replace all critical parts which are cracked, broken, bent or excessively worn.

- (2) Replace pitted or burned electrical contacts in sets only.
- (3) Keep push button control stations clean and function labels legible.
- (4) Replace hooks showing defects described in paragraph IV.1.c.
- (5) Replace chain showing defects described in paragraph V.4.
- (6) Replace missing or illegible warning labels.
- (7) Replace brake linings when worn excessively.

3. LUBRICATION

Lubricate the hoist according to Table 2.

4. CHAIN MAINTENANCE

- a) Load chain must be kept well lubricated and free of foreign matter to insure proper service.
- b) See Table 2 for specific lubricants.
- c) Load chain shall not be used as a ground for welding.

5. CHAIN INSPECTION

- a) Daily the chain should be checked for wear, twists, broken or damaged links.
- b) Chain should be clean and free of foreign material or rust.
- c) Chain should be properly lubricated.

6. CHAIN REPLACEMENT

- a) When replacing load chain, the two chains must be exactly the same length.
- b) The starting chain link on each chain must be

simultaneously fed into two lifting load sheaves.

- c) The starting links must pass over the top of the load sheave in a horizontal position to permit end attachment without twisting the chain.
- d) The second link of chain will be a standing link of chain; this link should have the weld furthest away from the center of the load sheave.
- e) See Figure 2 for chain reeving.
- f) Use only chain supplied by Chester Hoist.
- g) See page 11 for instructions for loading chain into a chain container.

7. LOAD SHEAVE TIMING

- a) Refer to Figure 3.
- b) To enable the two independent chains to lift the bottom block evenly, the large gears and load sheaves must first be timed as illustrated. Then both gears must be timed simultaneously with the shaft pinions. This timing procedure is only necessary when the gears have been disengaged during disassembly, Fig. 3.

VI - FUNCTION TESTING

After load sustaining parts have been altered, replaced or repaired, the hoist should be load tested. The hoist should be tested using 100 percent of rated load.

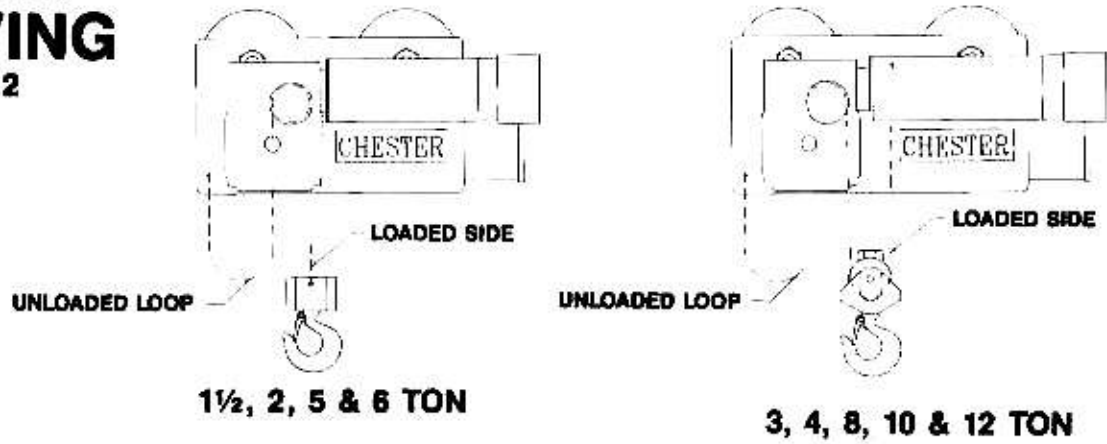
TABLE 2. LUBRICATION

PART TO BE LUBRICATED	LUBRICANT	INSTRUCTIONS	FREQUENCY
Transmission	Mobilgear #634 or equivalent (See parts manual for quantity)	Drain from drain plug in bottom of housing. Fill to level plug on side of housing.	After initial 50 hours operation, then every 3 months or 500 hours.
Motorized Trolley Gear Box	Mobilgear #634 or equivalent (See parts manual for quantity)	Drain by means of drain plug in bottom of housing. Fill to level plug on side of housing.	
Load Block	NLGI No. 2 Grease	Lubrication is required only when sheave pin contains grease fittings	30 days
Load Chain	Intermediate oils preferably with E.P. Additives	Immerse in oil or swab with oil soaked rag. Wipe off excess oil. Maintain chain rust-free.	Daily
	Bonded Lubricants such as Dow Molykote M-88	Use in place of oil, if oil residue is objectionable.	Daily
*Trolley Wheels	NLGI No. 2 Grease	Wheels will have grease fittings. (See note below)	After prolonged use or reassembly
Spur Gears	NLGI No. 2 Grease	Brush on exposed gears	Weekly

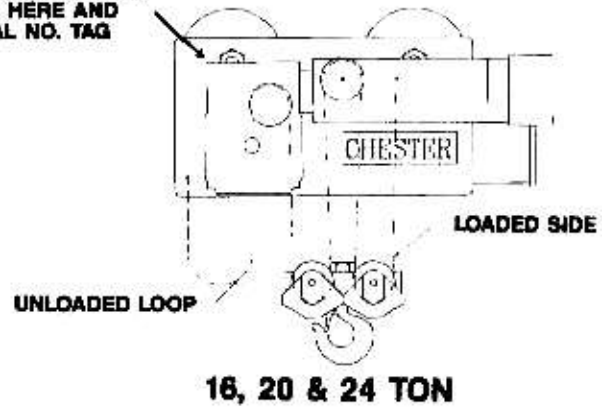
* Not required on units equipped with sealed ball bearings. (Wheels will not have grease fittings.)

CHAIN REEVING

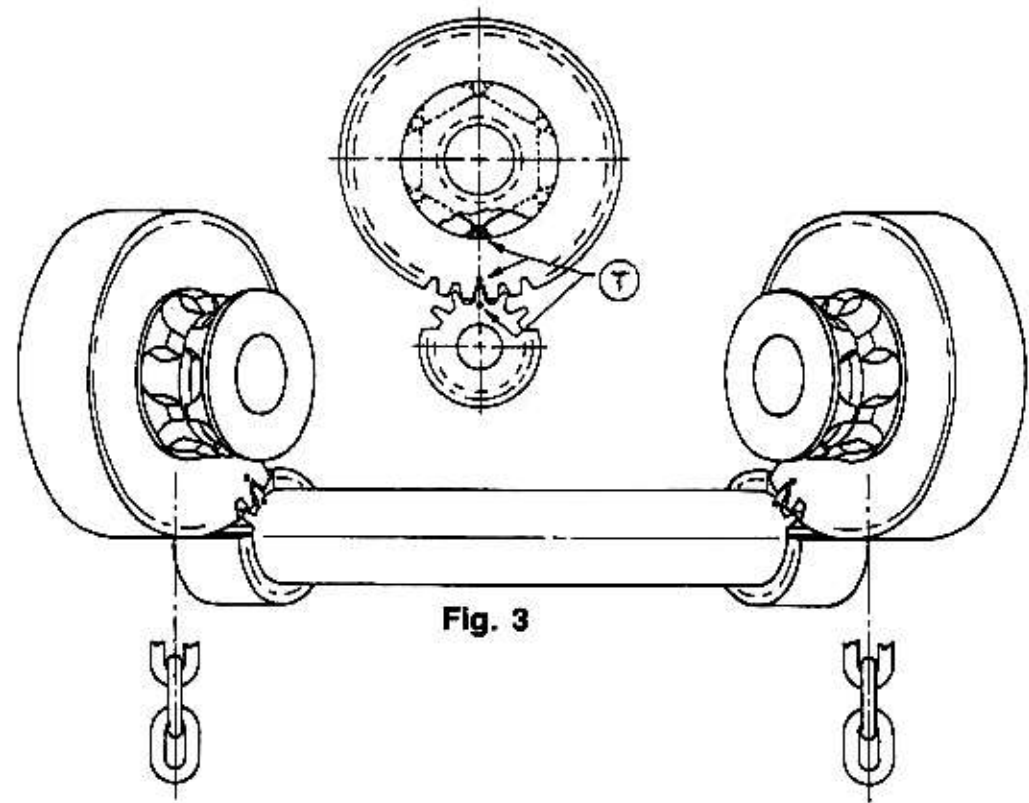
Fig. 2



HOIST SERIAL NUMBER STAMPED HERE AND ON SERIAL NO. TAG

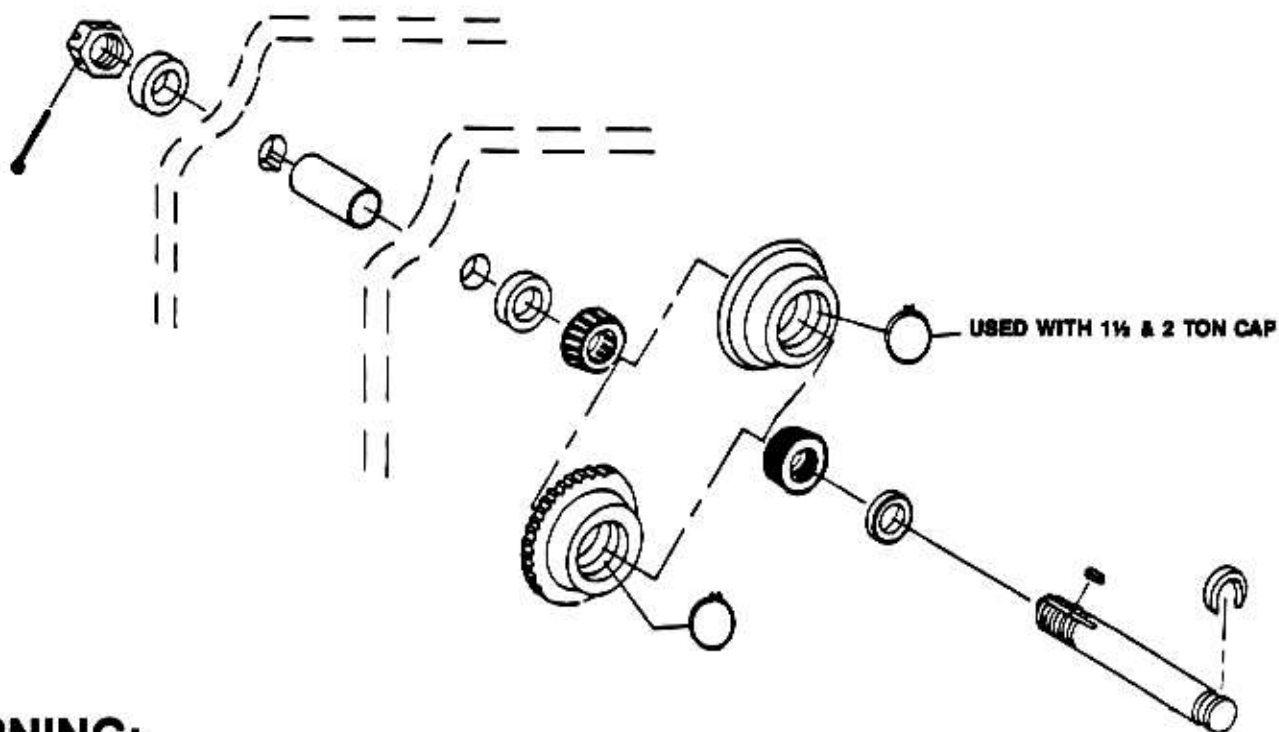


NOTE: LOOKING AT HOIST MOTOR SIDE



Ⓣ Indicates three timing marks in alignment

Wheel Assembly



WARNING:

Before installing this trolley hoist, make certain that the trolley wheel contour is correct for the type of beam the unit will operate on and that the trolley wheel spacing is correct for the beam flange width. Flat flange beams should have flat tread or universal tread wheels and tapered flange beams should have tapered or universal tread wheels.

INSTALLATION

The hoisting unit is custom sized at the factory to fit on a specific beam size. Most units are slipped over the end of the supporting rail or beam; however, removable wheels* are provided which enables the unit to be fitted on a beam with obstructed ends.

See parts breakdown above for additional information regarding disassembly.

The distance between trolley wheel flanges (measured at the tread diameter) should be 1/8" to 3/16" greater than the beam flange width for proper running clearance. This clearance should be checked before operating the hoist under load. The hoist should be traversed the entire length of the beam to check for beam interference points, proper side clearance and effectiveness of the beam stops. If everything is satisfactory, the procedure should be repeated with a capacity load as a functional installation test.

WARNING:

Always make sure all end stops are securely in place before operating a hoist on a runway beam to prevent the hoist from falling from the open beam end.

**Feature not available on units operating on patented monorail tracks.*

TABLE 3. TROUBLESHOOTING

TROUBLE	CAUSE	REMEDY
Hook Fails to Stop End of Travel	<ol style="list-style-type: none"> 1. Improperly adjusted brake. 2. Worn brake linings. 3. Magnetic reversing controller malfunction. 	<ol style="list-style-type: none"> 1. Adjust per para. V.2.a.(2). 2. Replace when worn excessively 3. Check out reversing controller.
Hoist Does Not Respond to Push Button	<ol style="list-style-type: none"> 1. Power failure in supply lines. 2. Wrong voltage or frequency. 3. Brake does not release. 4. Improper connections in hoist or push button station. 5. Faulty magnetic controller. 	<ol style="list-style-type: none"> 1. Check circuit breakers, switches and connections in power lines. 2. Check voltage and frequency of power supply against the rating on the hoist nameplate. 3. Check brake adjustment. (See para. V.2.a.(2). Check connections to brake coils for open or short circuit. 4. Check all connections at line connectors and on terminal block. 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 brake adjustment (see V.2.a.(2)). Check brake linings for wear. See para. V.2.b.(7).
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. 2. Check all connections against Wiring Diagram.
Hook Raises But Will Not Lower	<ol style="list-style-type: none"> 1. "Down" circuit open. 2. Broken conductor in push button cable. 3. Faulty magnetic controller. 	<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.
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 push button cable. 5. Faulty magnetic controller 	<ol style="list-style-type: none"> 1. Reduce load to within rated capacity. 2. Determine cause of low voltage and bring up to within plus or minus 10% of the voltage specified on the hoist. 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.
Lack of Proper Lifting Speed	<ol style="list-style-type: none"> 1. Hoist overloaded. 2. Brake not releasing fully. 3. Low Voltage. 	<ol style="list-style-type: none"> 1. Reduce load to within rated capacity of hoist. 2. Check brake adjustment. See para. V.2.a.(2). 3. Bring up voltage to plus or minus 10% of voltage specified on hoist.

VII - ILLUSTRATED PARTS LIST

GENERAL

The illustrated parts list that follow are designed to help you identify replacement parts for your Chester hoist. In addition to exploded illustrations which cover a large part of your hoist, some manufacturers' sheets are included for such items as geared limit switches, magnetic reversing controllers, relays and other items. If assistance is required please contact your Chester representative.

HOW TO USE THE PARTS LISTS

To identify a part from your hoist, locate the illustration for the affected section of the hoist. Study the illustration and locate the part you wish to find. An arrow will be pointing to the part from a number. This figure number will be found in the accompanying parts list with the part name, part number and quantity required.

When ordering parts, please send the following information:

1. Serial Number of your hoist (see Figure 2 for location).
2. Your power supply (voltage, phase and cycles).
3. Title of illustration (for example, 3 - 4 Ton bottom block assembly).
4. Figure Number, Part Name, Quantity Required and Part Number.
5. Any additional information required by notes at the bottom of parts lists.

MAINTENANCE AND OPERATING PROCEDURES: (USER'S RESPONSIBILITY)

All equipment should be inspected, tested, operated, and maintained according to the manufacturer's recommendations and the applicable sections of ASME/ANSI B30.16, B30.11 and B30.17. Consideration should also be given to pertinent federal, state and local regulations.

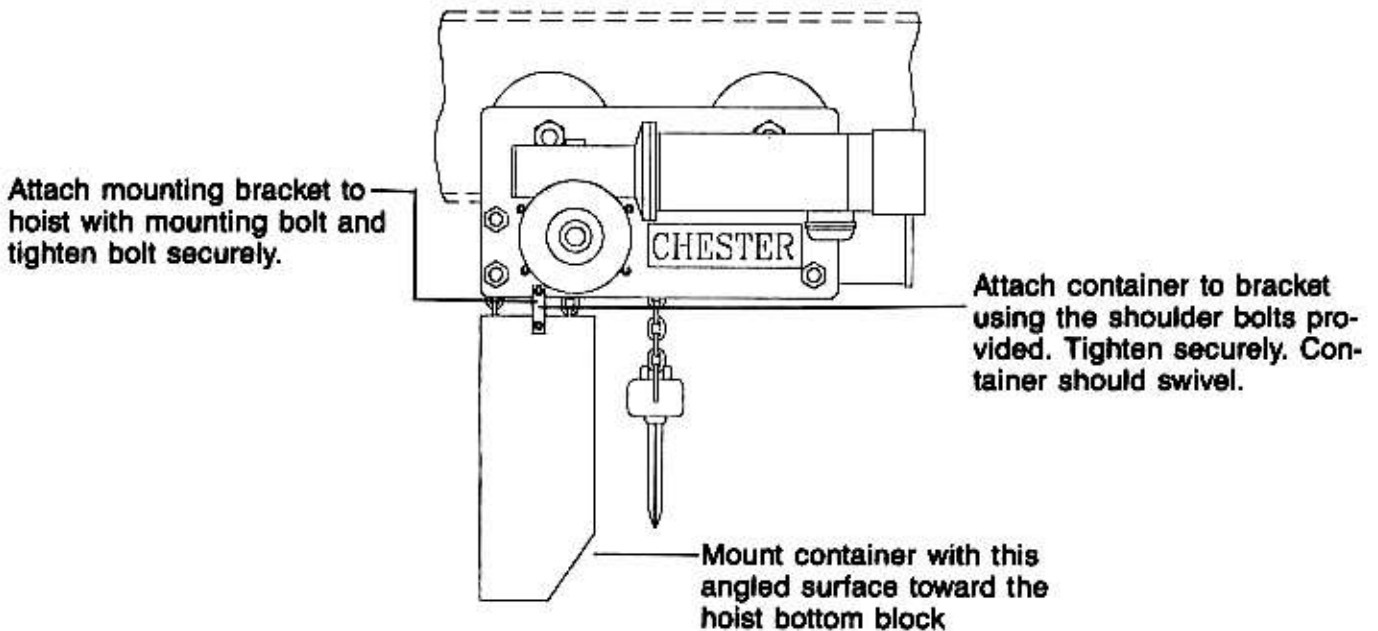
POST INSTALLATION INSPECTION CHECK LIST

After installation the following items should be checked:

- (a) hoist hook motion and trolley motion for agreement with control indication direction and prompt return of actuators to the OFF position.
- (b) hoist load chain free from twists, damage, and improper seating in pockets.
- (c) lift and travel limiting devices for proper operation.
- (d) braking system for proper operation.
- (e) load chain for proper lubrication.
- (f) hoist and trolley for proper lubrication.

CHAIN CONTAINER INSTALLATION NOTES:

The chain container for this hoist has been shipped loose. Follow these instructions to install the container and to load the chain into the container.



CHAIN LOADING NOTE:

Lower load block as far as possible. After installing the chain container run the load block up allowing the hoist mechanism to fill the container. Verify the chain is loading properly into the container.

WARNING!!

Never load chain into the container by hand!!! Hand loading will cause the chain to tangle which will jam and damage the hoist.

INSPECTION NOTE:

The mounting bolts for the container should be checked each time the hoist is inspected to ensure they remain tight. The mounting holes on the container and bracket should be checked each time the hoist is inspected to ensure they are not elongating and weakening the container or bracket.

WARRANTY

All goods sold by SELLER hereunder are sold with only the following warranty: SELLER warrants that the goods shall be free from defects in material and workmanship under normal use and service. SELLER'S obligation under this warranty is limited to reworking or replacing at its option, any goods, which, within the time stated herein, shall be returned to it at its place of business at the address set forth herein with two-way packaging and shipping costs prepaid, and which upon examination and determination by SELLER, shall be found to have been thus defective. The rework, repair or replacement of defective goods under this warranty will be made without charge for material or labor. This warranty shall remain in force and be valid on goods manufactured by SELLER, or manufactured by others to SELLER'S detailed design for 12 months from the date of shipment by SELLER to BUYER. THE WARRANTY PROVIDED IN THIS ARTICLE 1, THE OBLIGATIONS AND LIABILITIES OF SELLER HEREUNDER AND THE RIGHTS AND REMEDIES OF BUYER HEREUNDER ARE EXCLUSIVE AND IN SUBSTITUTION FOR, AND BUYER HEREBY WAIVES, ALL OTHER WARRANTIES, GUARANTEES, OBLIGATIONS, LIABILITIES, RIGHTS AND REMEDIES, EXPRESSED OR IMPLIED, ARISING BY LAW OR OTHERWISE, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTY OF MERCHANTABILITY, ANY IMPLIED WARRANTY ARISING FROM COURSE OR PERFORMANCE, COURSE OF DEALING OR USAGE OF TRADE, ANY IMPLIED WARRANTY OF FITNESS AND ANY OBLIGATION OR LIABILITY OF SELLER ARISING FROM TORT, OF FOR LOSS OF USE, REVENUE OR PROFIT, OR FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES. SELLER SHALL NOT BE LIABLE UNDER ANY CIRCUMSTANCES FOR MORE THAN THE REPLACEMENT

OR REFUND OF THE PURCHASE PRICE ON DEFECTIVE GOODS. Goods which are allegedly defective may not be returned to SELLER without prior written approval of SELLER. SELLER, at its option, may first request samples for inspection purposes. The provisions of this warranty shall not apply to, nor is any other warranty given on, goods which have not been used or maintained in accordance with SELLER'S instructions or which have been subject to misuse, negligence or accident or which have been repaired, altered or modified in any way by anyone other than the SELLER. SELLER makes no warranty, expressed or implied (including without limiting the generality of the foregoing, any warranties of merchantability or fitness) with respect to any (accessory) goods not manufactured by SELLER. With respect to any such goods sold by SELLER to BUYER hereunder, including purchased goods incorporated in goods manufactured by SELLER, BUYER agrees to look solely to the manufacturer of such goods for any warranty. BUYER waives all claims other than claims based on SELLER'S expressed warranty or the added cost of replacement due to SELLER'S failure to deliver the goods purchased hereunder. Such waived claims shall include but not be limited to claims based on strict tort liability and other economic losses such as loss of profits, loss of business opportunity and loss of goodwill. Upon request, SELLER will furnish such technical advice or assistance as it has available in reference to the use of the goods; however, it is expressly understood that (i) SELLER assumes no obligation or liability for the advice or assistance given or results obtained, (ii) all such advice or assistance is given and accepted at BUYER'S risk, and (iii) such advice or assistance shall not increase or alter SELLER'S liability as herein defined and limited.

Authorization for return must be received from Chester Hoist before returning any equipment for inspection or warranty repair.

IMPORTANT NOTICE

Use of chain or replacement parts other than as supplied as original equipment on Chester hoists may lead to dangerous operation. Accordingly, Chester Hoist cannot be responsible in such cases and our warranty would be voided.

"CAUTION: Some of the hoists and trolleys manufactured by Chester Hoist can be adjusted to fit various sizes of runway beams. Others of our hoists and trolleys are built to fit a runway specified by our customers. Regardless, it is the customer's responsibility to apply such engineering calculations or tests as may be necessary to satisfy itself that the runway beam flanges are capable of carrying the loads expected to be handled."

*** ⚠ WARNING**

Overloading and improper use can result in injury.

To avoid injury:

- Do not exceed working load limit, load rating or capacity.
- Do not use to lift people or loads over people.
- Use only alloy chain and attachments for overhead lifting.
- Read and follow all instructions.
- Do not use to lift, support or transport molten metal.