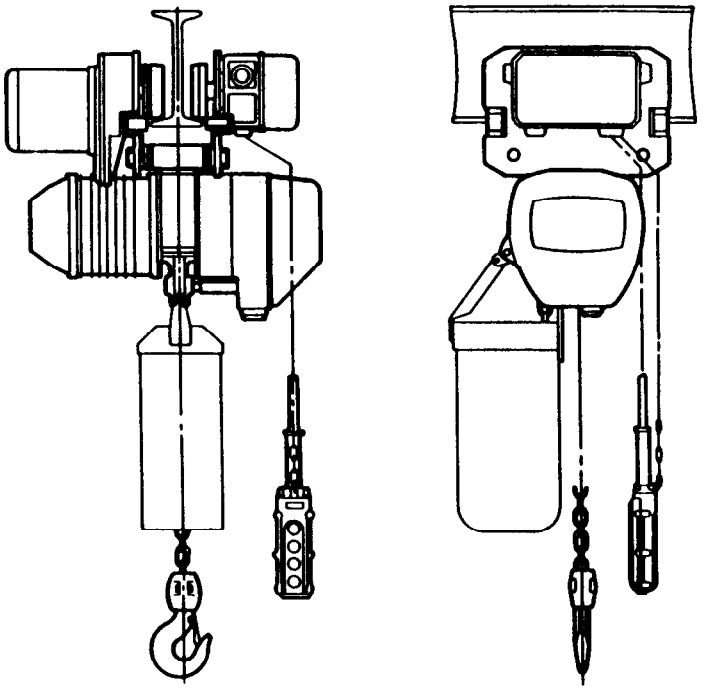
OPERATION AND MAINTENANCE MANUAL
for
"LECTRA LINK" LE SERIES
ELECTRIC CHAIN HOIST



Tons in this manual are metric tons (2,200 lbs.)

READ THIS MANUAL BEFORE USING THESE HOISTS. This manual contains important safety, installation, operation and maintenance information. Make this manual available to all persons responsible for the operation, installation and maintenance of these products.

⚠WARNING

Do not use this hoist for lifting, supporting, or transporting people or lifting or supporting loads over people.

Always operate, inspect and maintain this hoist in accordance with American National Standards Institute Safety Code (ASME B30.16) and any other applicable safety codes and regulations.

Refer all communications to the nearest Ingersoll-Rand Material Handling Products Office or Distributor.

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INGERSOLL-RAND®
MATERIAL HANDLING

BEEBE INTERNATIONAL, INC.

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OPERATION AND MAINTENANCE MANUAL
FOR LECTRA-LINK ELECTRIC CHAIN HOIST

SECTION 1—INTRODUCTION

1.1 General Information

Congratulations, you have just purchased one of the finest quality electric chain hoists in the world.

With proper installation and maintenance, this hoist will provide many years of excellent, trouble-free operation. The purpose of this operation and maintenance manual is to provide you with the installation, maintenance and repair information necessary to obtain those many years of trouble-free operation.

1.2 Pre-Shipment Inspection and Testing

Before shipment, each hoist was thoroughly tested and inspected to insure proper operation, safety and function as follows: (Please see Inspection Sheet and Test Certification enclosed with hoist.)

1. Hoisting and lowering
2. Proper operation of brakes
3. Proper operation of limit switches, locking and safety devices
4. Hoist tested to 125% of load or more
5. Load chain proof-tested to 150% of hoist rated capacity divided by number of chain falls supporting load.

1.3 OSHA Regulations

Contrary to common belief, the Occupational, Safety and Health Act of 1970, as we understand it, generally places the burden of compliance with the user, not the manufacturer. Many OSHA requirements are not concerned or connected with the manufactured product but are, rather, connected with the final installation.

To the best of our knowledge, Beebe hoists are manufacturerd in accordance with our understanding and interpretation of the latest specifications and standards in effect at time of manufacture. Including our understanding and interpretation of ANSI B30.16-1973 (Overhead Hoists) and the Occupational Safety and Health Act of 1970.

Among other regulations, the user should be sure to install the hoist in accordance with the National Electrical Code 1979, ANSI C-1-1975, as approved April 17, 1975. Be sure to check other federal, state and local rules, regulations, standards, etc., which may apply to the installation and use in your particular area.

1.4 Explanation of WARNING, CAUTION, AND NOTE.

WARNING: Highlights a situation or instruction that if not followed or guarded against, can endanger human life or equipment.

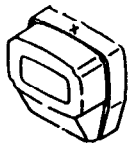
CAUTION: Highlights a situation or instruction that if not followed or guarded against, can possibly damage the hoist.

NOTE: Highlights useful information regarding hoist operation and maintenance.

SECTION 2—PREPARATION FOR USE AND INSTALLATION OF HOIST

CAUTION: Make certain that hoist supporting structures are strong enough to support weight of hoist, weight of maximum rated load, and still have a safety factor of 5:1.

2.1 ADDING LUBRICATION TO GEARBOX (X)



Your Beebe electric chain hoist has no lubricant in the gearbox when shipped. Before using, add lubricant.
Fill per Instructions 4-1

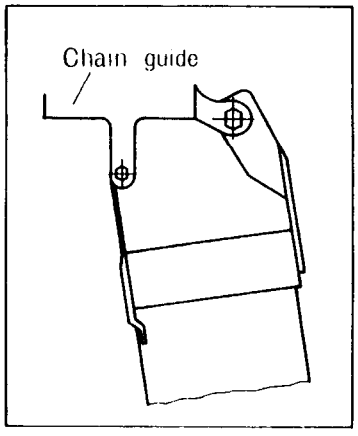
2.2 INSTALLATION OF (OPTIONAL) CHAIN BUCKET

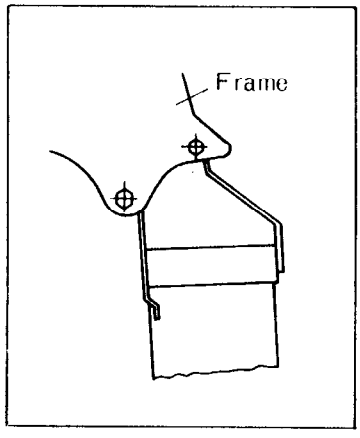
All Beebe hoists can be furnished with chain buckets. To install:

A. Slide chain spring over the chain and attach the stopper to the chain on the 3rd link from the end.

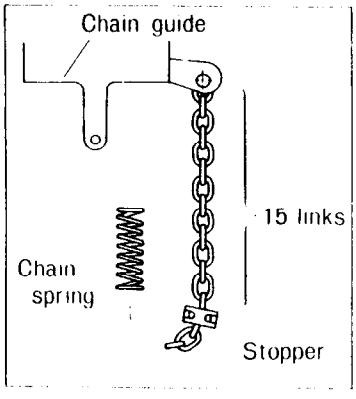
B. Install the chain bucket with the hanger pin and chain pin as shown below. **Note**: Installation may vary by model, but will be similar to one or other of the figures provided.

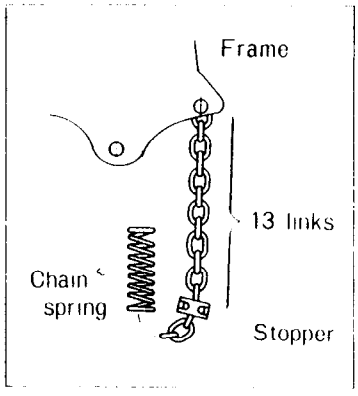
C. Make sure length of load chain is within capacity labeled on chain bucket.





2.3 IF CHAIN BUCKET IS NOT USED, attach free end of chain to hoist per figure below.





2.4 LUBRICATE LOAD CHAIN with BEEBE "Lubri-Link® chain lube per instructions 4.2.

2.5 INSTALLATION OF (LUG MOUNT) HOIST AND MOTORIZED TROLLEY TO I-BEAM

WARNING: Goal of proper installation is to place hoist and load directly beneath center of I-beam and to place trolley wheels as close to the center of beam flange as possible, but still have adequate side running clearance. If hoist and trolley are not properly installed on I-beam, beam flange and trolley can become overloaded or misloaded and cause failure.

NOTE: In most cases, hoist and trolleys will ship separate. However, should you have a hook mount electric chain hoist that you wish to lug mount to a motorized trolley, please see field conversion instructions 4045A and drawing number B-10151 (Page 4).

A. Pre-adjustment of trolley width for I-beam lower flange.

1. Measure beam flange width and compare with measurement between side rollers (22). Side roller spacing measurement should be equal to beam flange width plus 1/8" (+ 1/8"—0"). For curved beam, side roller spacing measurement should be equal to beam flange width plus 3/16" (+ 1/8-0).

2. If spacing measurement is not correct, then adjust side roller spacing by removing suspension shaft nuts (14), adjusting spacers (13), and trolley side plates (1). Then add or subtract an equal number of adjusting spacers (13) to/ from all four suspension shaft studs (4). Replace trolley side plates and add an equal number of spacers to each suspension shaft stud. However, do not tighten suspension shaft nuts.

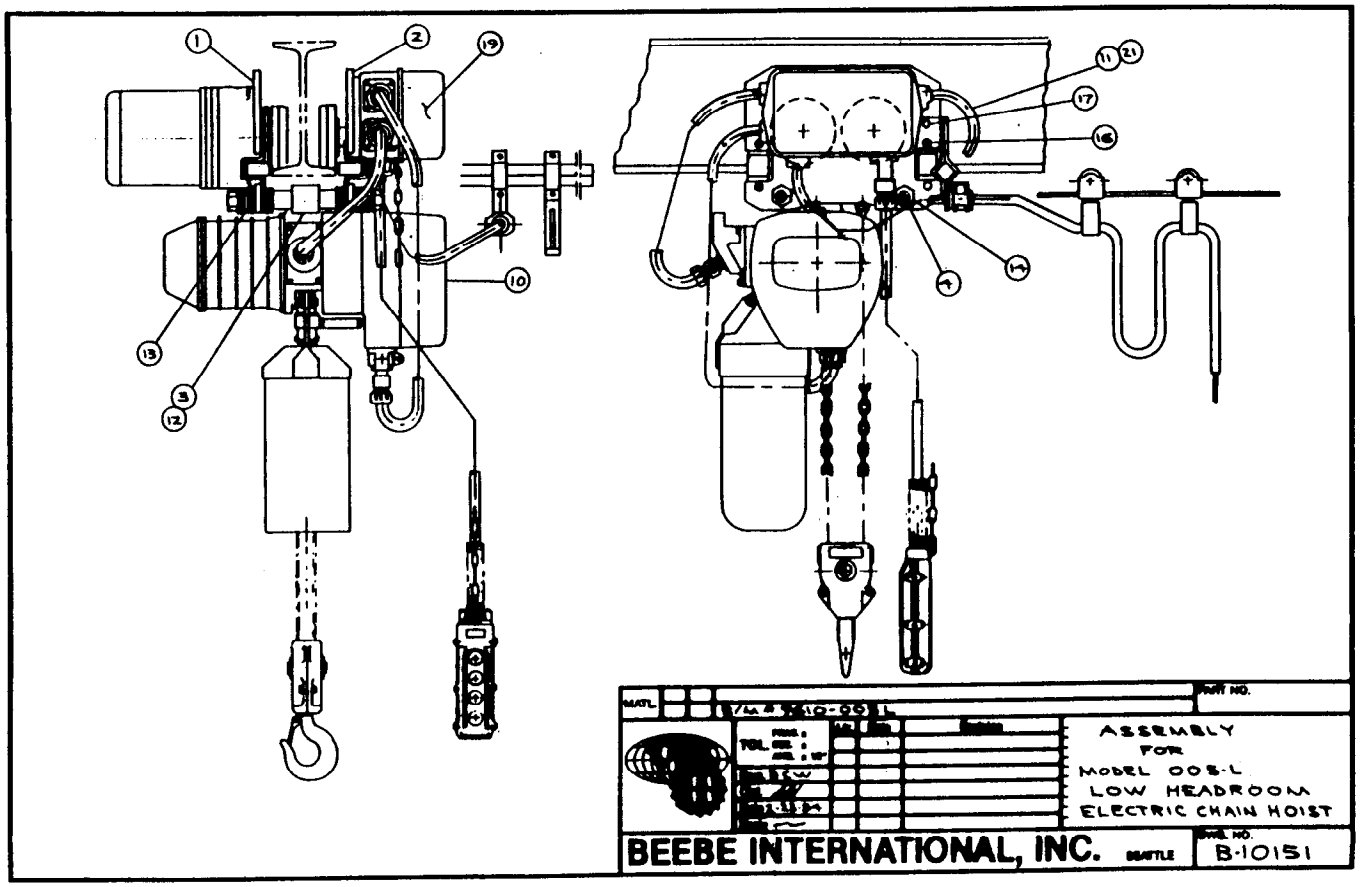
   CAUTION: The number of spacers between the trolley side plate and the suspension shaft shoulder must be the same in all four locations (or each side within 1 spacer of the other side) in order to keep the hoist centered under the I-beam.

3. If Trolleys can be mounted on to I-beam end (space permitting? removable I-beam end stops?), then A) Tighten suspension shaft nuts (14) to 100 ft-lbs on 1 & 2 ton trolleys, 150 ft-lbs on a 2-1/2 ton trolley, 200 ft-lbs on a 5 ton trolley, 250 ft-lbs on a 10 ton trolley. Make sure "locking" portion of nut is engaged. B) Remove I-beam end stop, lift hoist/ trolley assembly to I-Beam using lifting holes in the trolley side plates, roll trolley onto end of I-beam, and replace I-beam end stop. C) Check trolley "fit" against parameters given in paragraph 1. D) Check that trolley side plates are vertical and parallel. E) Disregard step 4.

4. If trolleys must be assembled over beam mid-section, then A) loosen all four suspension shaft nuts (14) until only two or three threads remain engaged. B) Spread trolley side plates out to clear lower beam flange (be careful not to damage suspension shaft (4) threads). C) Lift hoist/trolley to beam level using lifting holes in trolley side plate [if not possible see NOTE below]. D) Reposition trolley side plates against adjusting spacers (13). E) Tighten suspension shaft nuts (14) to 100 ft-lbs on 1 & 2 ton trolleys, 150 ft-lbs on a 2-1/2 ton trolley, 200 ft-lbs on a 5 ton trolley, 250 ft-lbs on a 10 ton trolley. Make sure "locking" portion of nut is engaged. F) Check trolley "fit" against parameters given in paragraph 1. G) Check that trolley side plates are vertical and parallel.

NOTE: If you are not able to spread trolley wheels wide enough to clear lower beam flange, then you have a wider than standard I-beam. In this case, please contact factory representative to order new trolley suspension shafts for wide flanged or "H" beam. Please advise factory representative of bottom flange dimension and hoist capacity.

NOTE: If trolley is mounted on curved beam, the service life of wheels and runway beam can be substantially lengthened if a small amount of grease is applied to wheel track of lower flange.



2.6 INSTALLATION OF HOOK MOUNT HOIST

A. Suspend hoist from supporting member by use of top hook. Make sure hoist hangs from saddle of the hook and is centered directly beneath the support member. Also make sure hook safety latch is closed and that hoist does not cant to one side or the other.

2.7 CONNECTING THE ELECTRICAL CONTROL SYSTEM (IF NOT FACTORY ASSEMBLED)

WARNING: Make sure electric power supply to hoist circuit is disconnected.

A. Hook Mount Type Electric Chain Hoist

1. Install the two button type pendant to the chain hoist per Figure below. **Note:** Installation varies by model; select Figure which most closely resembles your unit.

   a. Insert 5 pin plug of push button cord into 5 pin socket and screw coupling tight.

   b. For Figure 3 hoists, place cord chain in clevis of socket holder B and fasten with cord chain pin and cotter pin.

   c. For Figure 4 hoists, insert cord chain stopper into tip of cord chain and secure chain stopper to socket holder B with machine screw.

2. To connect power supply cable, plug in 4 pin plug of the power supply cable into 4 pin socket and screw tight per Figure 3. [Attach cable clamp arm to socket holder A with bolts. Do not twist cable.]

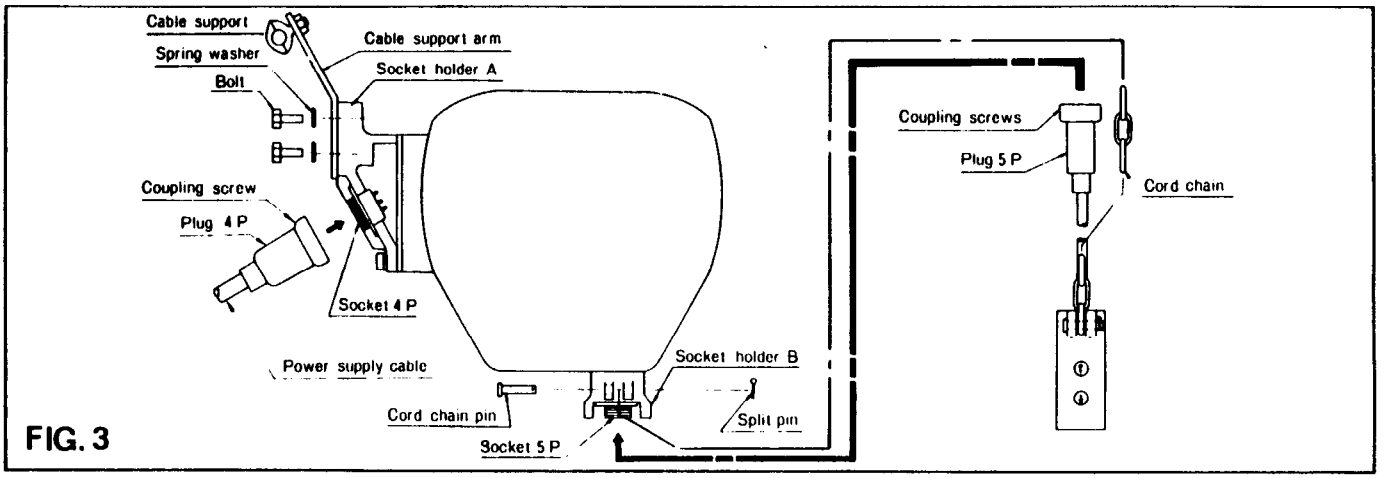


FIG. 3

B. Motorized Trolley Mount Electric Chain Hoist

1. Install 4-button type pendant per Figure 5.

   a. Insert 8 pin plug of push button cord into the 8 pin socket of the switch box and screw coupling tight.

   b. Insert cord chain stopper into tip of the cord chain and secure chain stopper to socket holder B with machine screws.

2. Connect motorized trolley switch box and electric chain hoist per Figure 5.

   a. Insert 4 and 5 pin plugs into the 4 and 5 pin sockets of the electric chain hoist and screw coupling tight.

3. Wiring instructions for power supply cable (see Figures 5 and 6).

   a. Remove the switch box cover.

   b. Attach the cable holder to the switch box with machine screws.

   c. Connect the red, black and white conductors of the four conductor wire to the 14 lug terminal strip. See Figure 6.

   d. The green and yellow stripped conductor is the ground wire. Connect the ground wire to the location marked ground.

   e. Check all connections for correctness and install switch box cover.

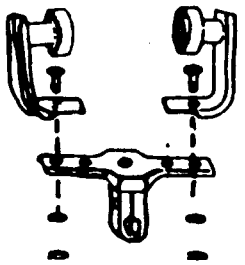
   f. Install dust seal on switch box.

C. Power Supply Cable Spooling System (Optional)

Two systems are generally used; one is a messenger wire system used on straight I-beams, the other is a cable trolley system used on curved beams.

1. The messenger wire system is most commonly used, most economical and works best on short spans (50′ or less). 1/8″ to 1/4″ wire rope is used.

2. The cable trolley system is used on curved beams. Power supply cable is carried by hose trolleys which ride on cable trolley installation is approximately 3′ for a curved beam. For assembly see drawing on right. The interval of the beam with a 5′ swing radius.



Please consult Factory Representative for recommendation of other systems.

2.8 CONNECTING THE POWER SUPPLY

A. Check for adequate circuit breakers or fuses.

B. Connect and ground in accordance with National Electric Code ANSI-C1-1975.

C. Check voltage and convert if necessary as follows:

1. Remove control cover and rewire per schematic shown in manual or inside control cover.

2. For motorized trolley, rewire per schematic shown inside trolley motor control cover and inside junction box on side of trolley motor.

3. Doublecheck for correct line voltage.

D. Terminal box should be installed at an appropriate location and be connected firmly with power supply lead wires. A disconnect switch should be installed in the branch circuit supplying the trolley and hoist. This circuit should have either slow blow fuses or circuit breakers as specified by the National Electric Code and be correctly grounded.

E. Make sure connections are secure. Improper connections cause overheating and possible motor burn out.

F. SPECIAL NON-REVERSING RELAY PROTECTS THE HOIST FROM DAMAGE DUE TO INCORRECT CONNECTIONS OF POWER SUPPLY. If the three conductors of power supply are connected wrong or if the motor is wired single phase, the motor will not start. Reverse any two of the three for proper connection, or check for single phase wiring.

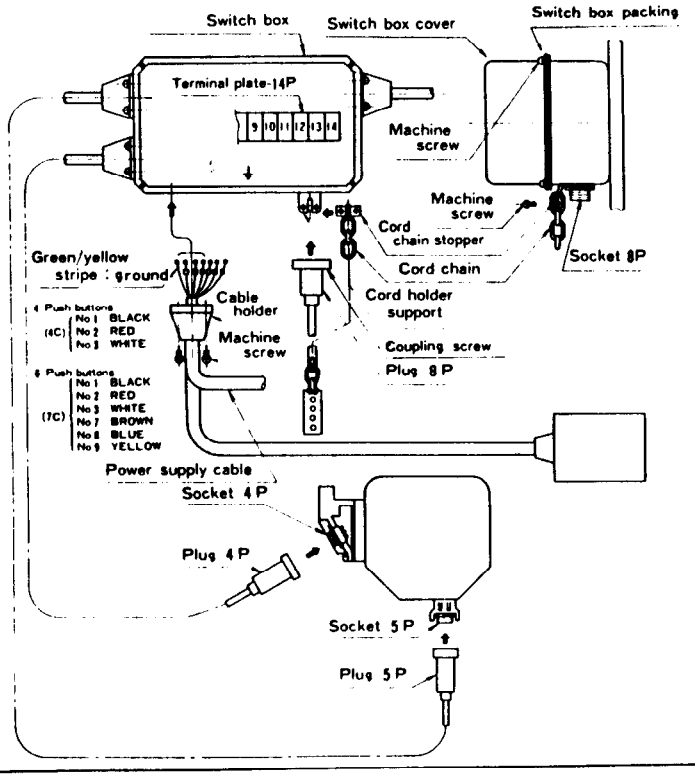
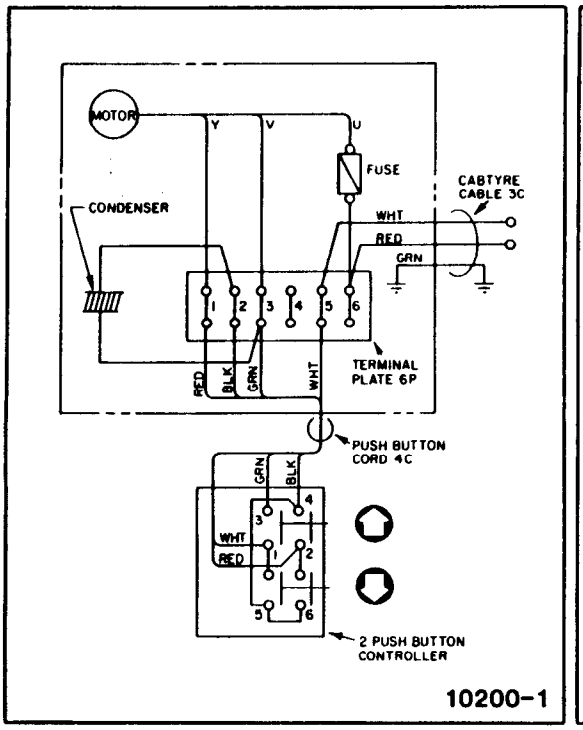
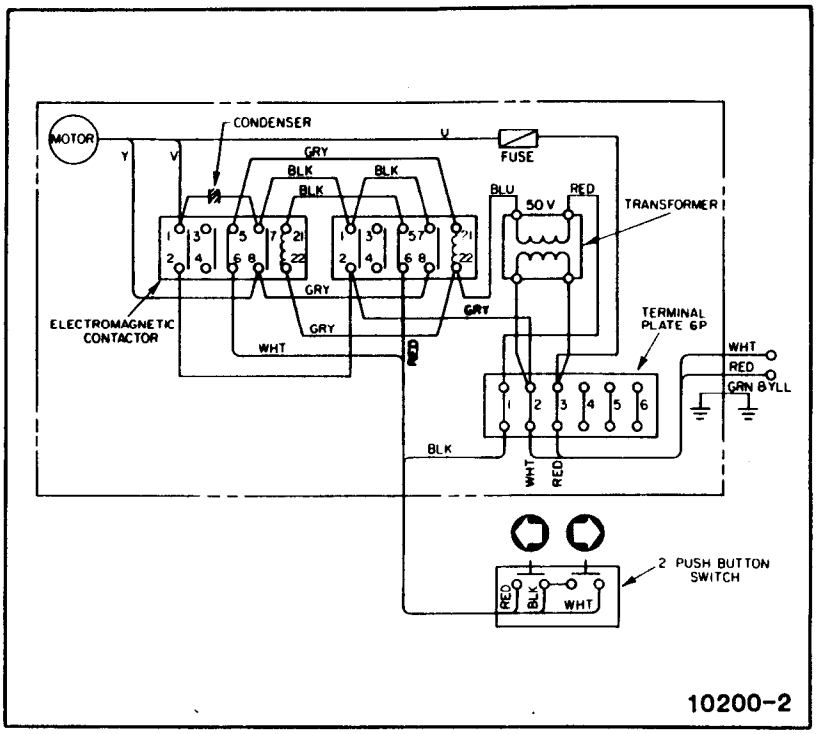


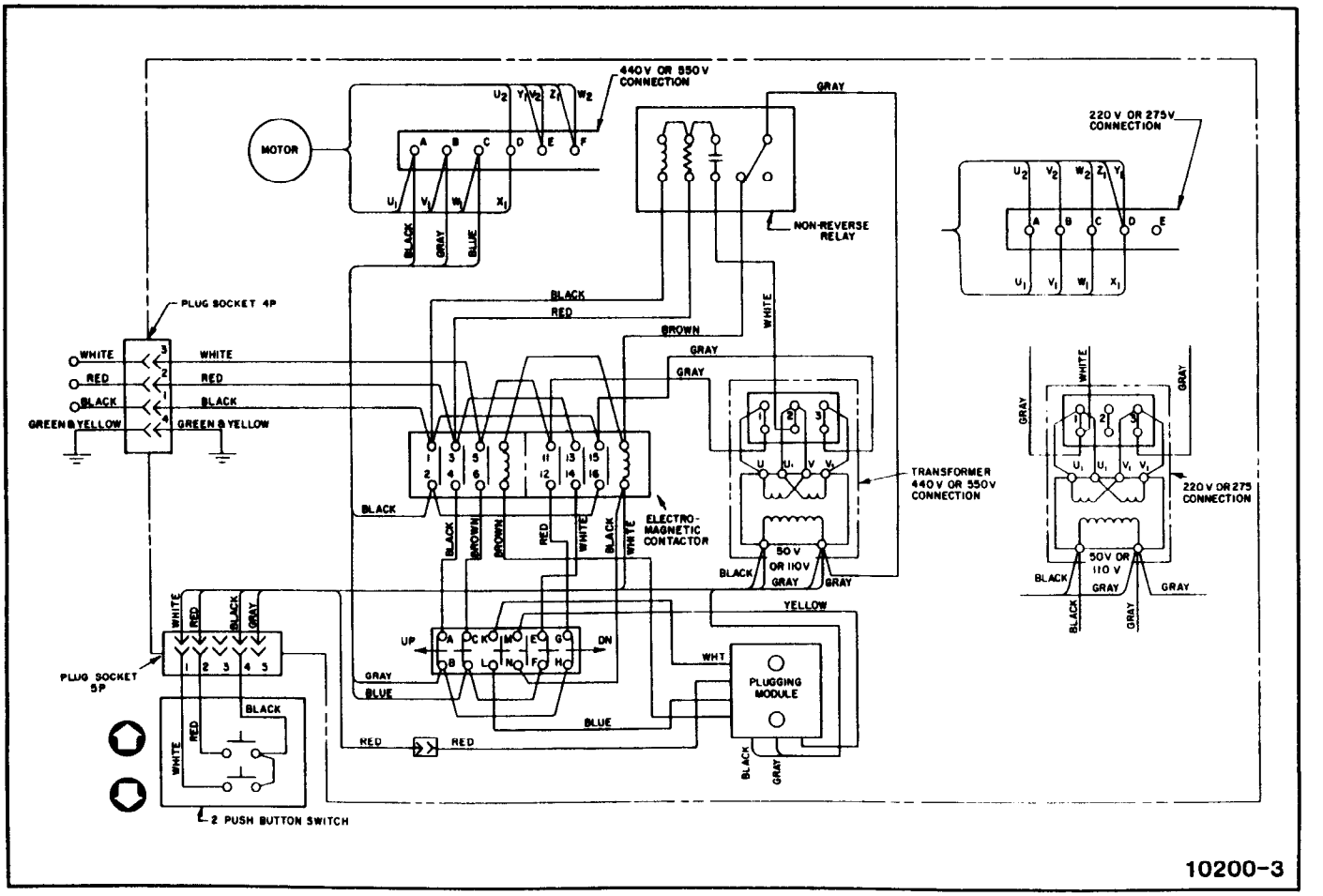
FIG. 5



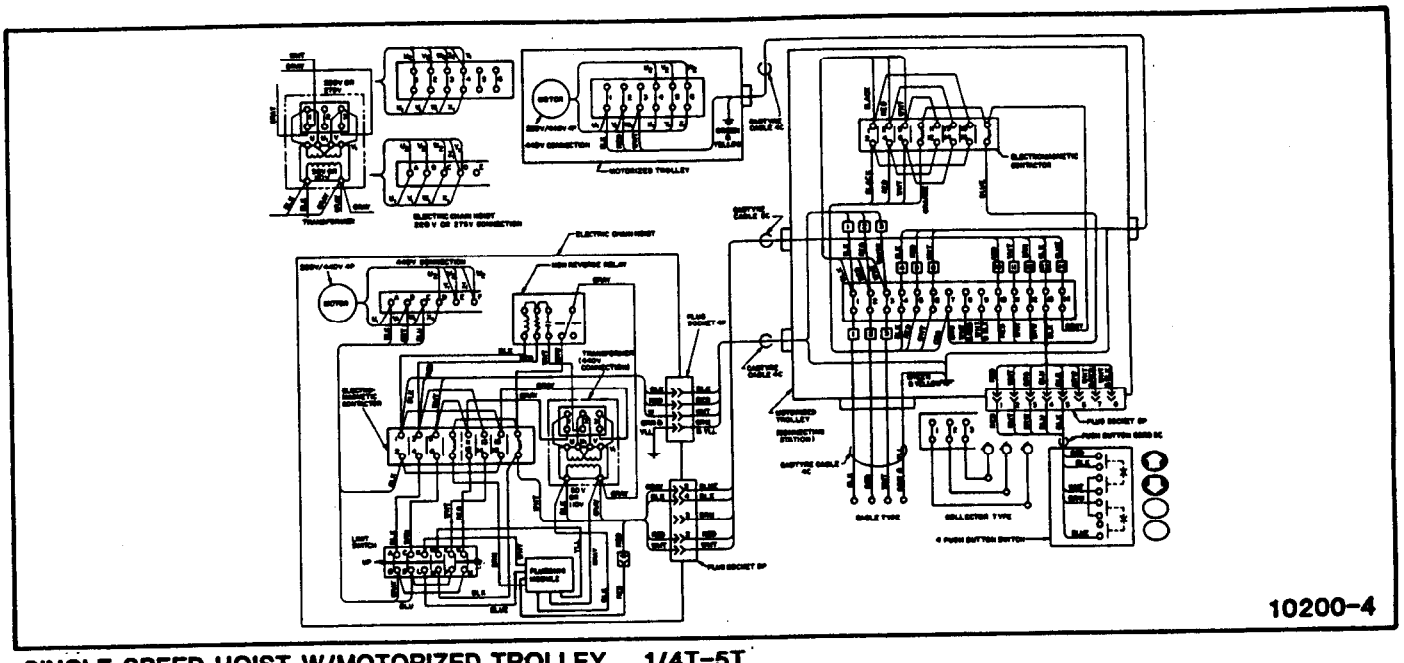
SINGLE PHASE HOIST 1/4T-2T-L (110 VOLTAGE)



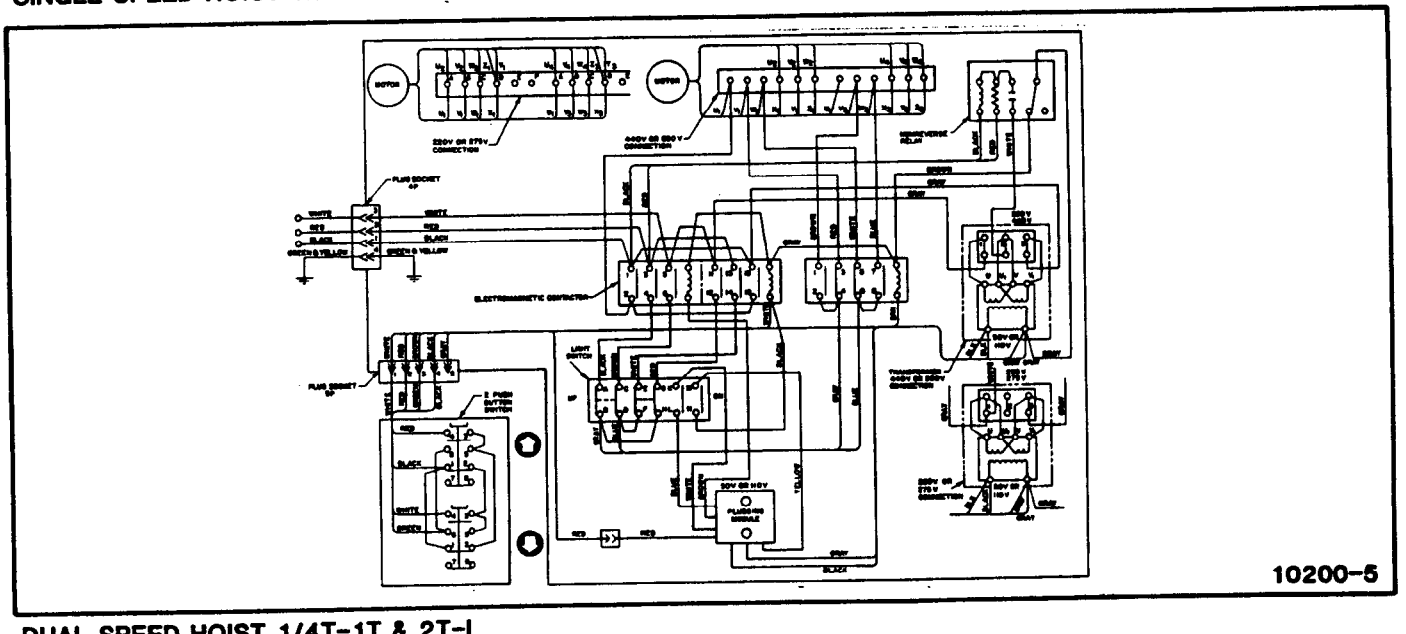
SINGLE PHASE HOIST 1/4T-2T-L (220 VOLTAGE)



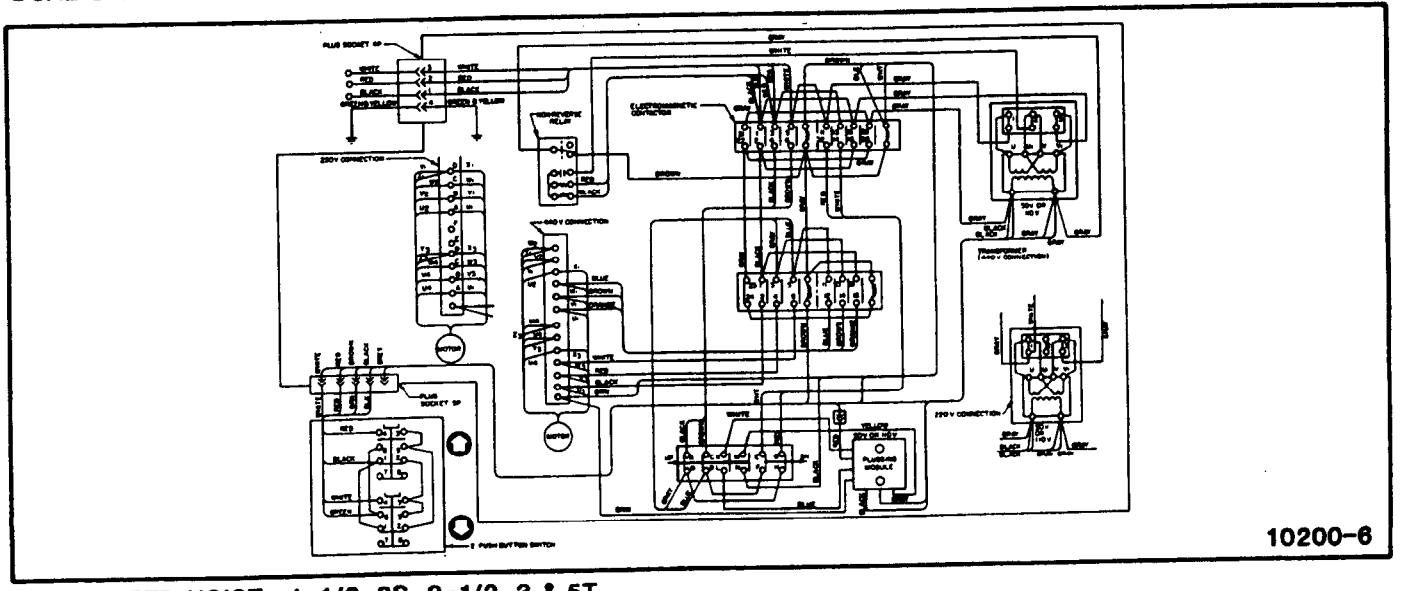
SINGLE SPEED HOIST 1/4T-5T



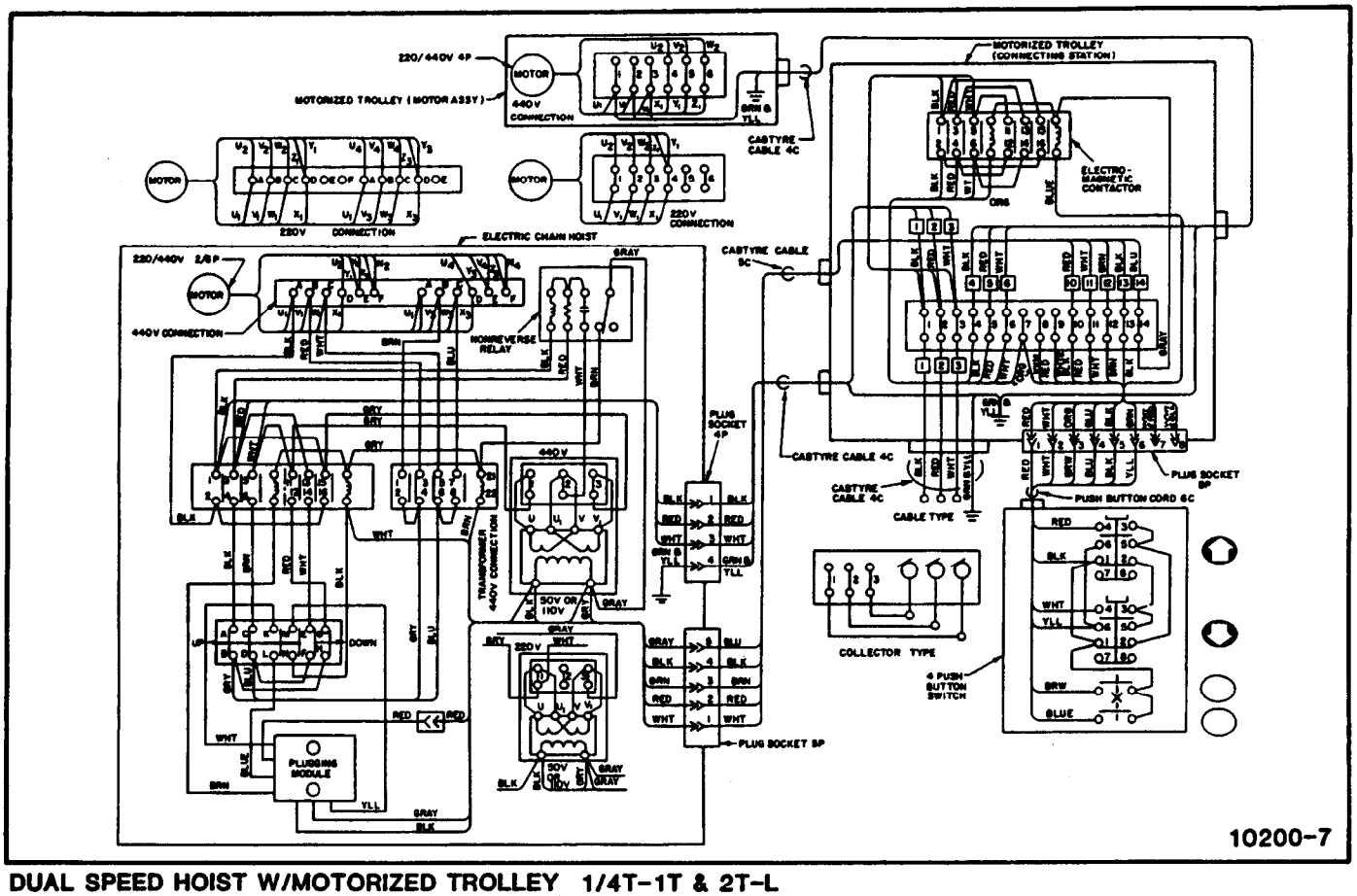
SINGLE SPEED HOIST W/MOTORIZED TROLLEY 1/4T-5T



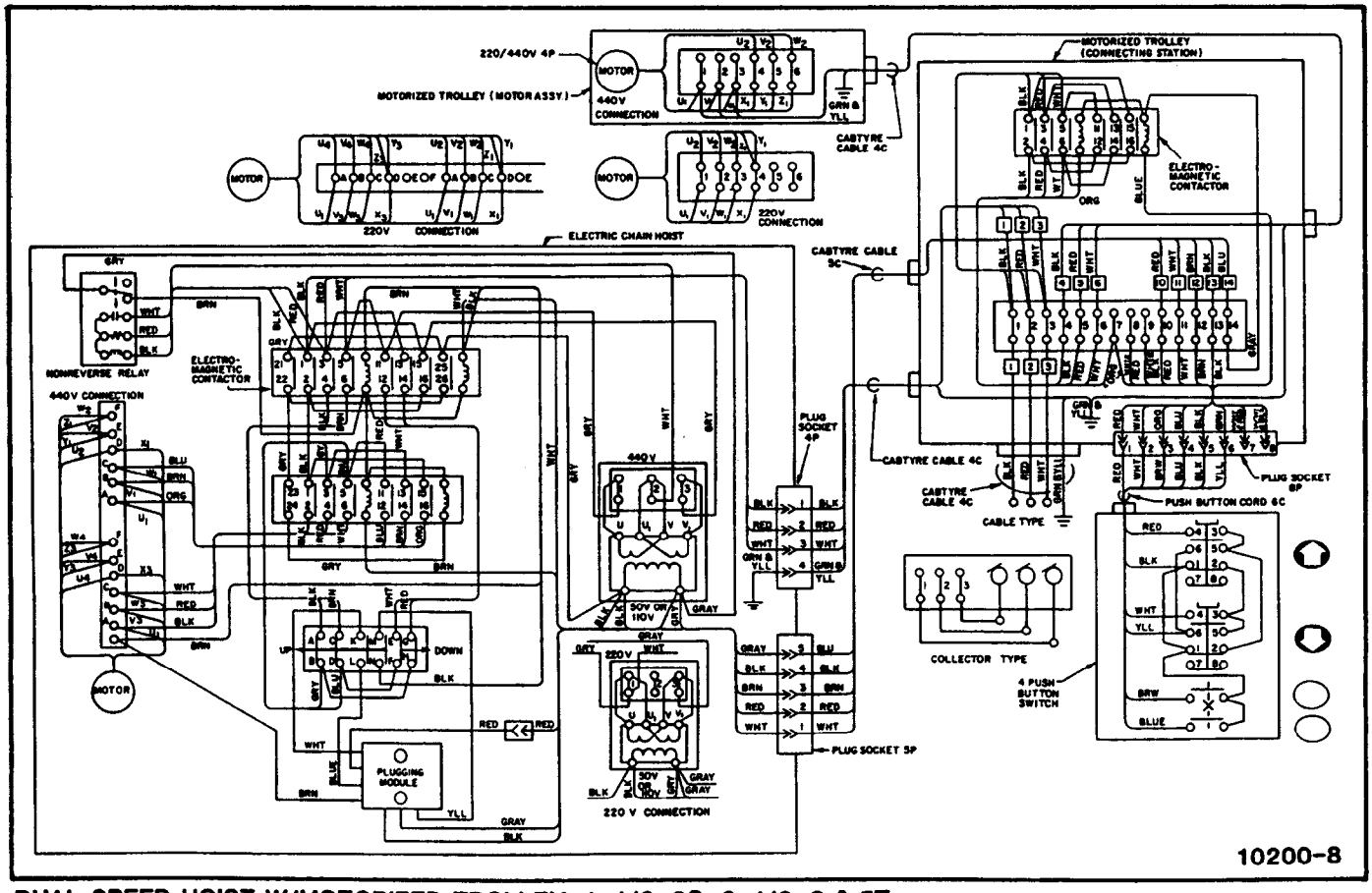
DUAL SPEED HOIST 1/4T-1T & 2T-L



DUAL SPEED HOIST 1-1/2, 2S, 2-1/2, 3 & 5T



DUAL SPEED HOIST W/MOTORIZED TROLLEY 1/4T-1T & 2T-L



DUAL SPEED HOIST W/MOTORIZED TROLLEY 1-1/2, 2S, 2-1/2, 3 & 5T

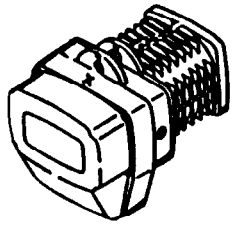
3.1 Pre-Operation Tests and Inspection

Before putting a new electric chain hoist into regular operation, check following (and periodically re-check):

Note: These tests should be made under no-load conditions before hoist is used to handle the load.

A. **CAUTION**: Power supply must be the same voltage and frequency as stated on the tag attached to the hoist. Unless otherwise specified by customer, all hoists are shipped from factory with the motor and controls connected for operation on 440V, 3 phase, 60 Hz current. If a hoist motor wired for operation on 200 or 220 volt current is wired for 440 volt power supply, the motor will burn out. If a hoist motor wired for 440 volt current is connected to 220 volt power supply, the motor will operate very slowly and **The brake will not release properly.**

B. Check gear box lubrication by removing oil check plug. If low, fill per instructions 4.1.



C. Inspect and lubricate load chain. Inspect chain for twists per instructions below. Apply Beebe "Lubri-Link®" chain lubricant to load chain as described per instructions 4.2.

D. Test to see that hoisting, lowering and trolley travel are in the same direction as arrow on push button (by depressing and quickly releasing push button).

Raise Load: ⬡
Lower Load: ▽
Travel right: ▷
Travel left: ◁

The push button control is **mechanically** interlocked so that it will not operate if buttons are simultaneously pushed.

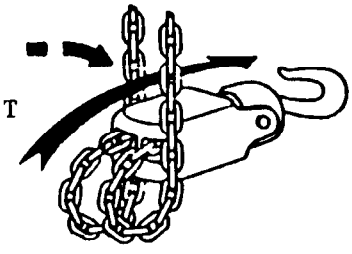
CAUTION: If hoist does not operate when pendant button is depressed, check wiring at terminal box. Special Beebe non-reversing relays protect hoist from damage due to incorrect connections of power supply. If three conductors of power supply are connected wrong, or if the motor is wired single phase, THE MOTOR WILL NOT START. Reverse any two of the three conductors (not green & yellow striped ground) at the terminal box for proper connection, or check for single phase wiring. If hoist operates slowly, see 3.1.A above.

E. Test limit switch operation by pressing "Up' button thereby lifting hook into limit switch. Hoist should shut off. If not, call a Beebe Representative. Test lower limit switch operation as above.

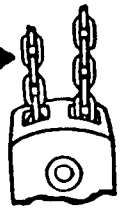
F. Test brake by running a few lifting and lowering cycles with a light load attached. If hook drifts more than one inch, brake needs adjustment. If brake functions properly, test as above with rated load and then with 25% overload.

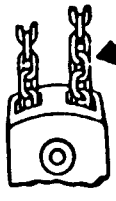
WARNING

INSURE THAT THE BOTTOM HOOK BLOCK HAS NOT BEEN FLIPPED THROUGH CHAIN WITH RESULTANT TWIST



CHAIN THAT HAS NOT BEEN TWISTED





CHAIN THAT HAS BEEN TWISTED

3.2 Safe Operating (Operator) Practices

A. Subject hoist to regular inspection and maintenance procedure. (See Section 4)

B. Allow only qualified (trained in safety and operation) and physically competent (good hearing, vision and depth perception) personnel to operate hoist.

C. Each operator should be instructed on the material contained in this manual before using hoist.

D. The operator should familiarize himself with all equipment and its proper care. If adjustments or repairs are necessary, they should be reported promptly to someone properly authorized and they should notify the next operator upon changing shifts.

E. All controls should be tested by the operator at the beginning of each shift. If any controls are not operating in the proper manner, they should be repaired before using.

F. The operator should test the brakes each time a load approaching the rated load is handled by raising a sufficient distance to clear the floor and check for brake action. The lift should be continued only after the operator is sure the brake system is proper.

G. The operator should carry out daily inspection of hoist (hooks, chain, brakes, lubricant and support structure) and should report worn or damaged parts.

H. Do not engage in any practice which would divert the operator's attention while using the hoist.

I. When an out of order sign is on the controls, the hoist operator should not power the hoist or start operation until the sign has been removed by designated personnel.

J. Before starting the hoist be sure all personnel are clear of the area.

K. Do not operate hoist for handling people or handling loads over people.

L. Before operating, be sure hands are clear from all moving parts.

M. Do not lower load into areas where visibility is obscured unless someone is guiding the operation. Be sure to use proper crane and hoist hand signals.

3.3 Safe Hoist Operation

Beebe electric hoists are designed for normal hoisting service. To insure long and safe use, please observe the following:

A. Use only within the rated capacity—DO NOT OVERLOAD—overloading may cause motor burn out, shortened hoist life, or other problems.

B. Avoid sudden reversing from down to up direction. Hoisting operation should be stopped completely before reversing. If not, the motor may be overloaded and gearing, drive train, etc. shocked.

C. Inch hoist into engagement with the load to avoid shock.

D. The load should not be moved or lifted until load is well balanced in sling or lifting device.

E. Stop operation when there is any indication of jamming, overloading, binding, etc.

F. If the motor hums, it is not working even though button is pushed. Release the button immediately and examine for the following:

Overloading
Low voltage condition
Incorrect wiring
Loose connection
Limit switches tripped
Motor brake malfunction

G. Do not use for lifting, lowering or moving persons. Never lift loads over people.

H. Do not leave the load suspended in the air unattended unless other precautions such as safety lines, etc. are taken.

I. Do not use limit switches as a means of stopping hoist. These are for emergency use only.

J. Do not bump rail stop with trolley.

K. On the plain-type trolley, do not use the hoist control cord for pulling the trolley. Instead, use the load chain of the hoist which may be pulled when unloaded but should be pushed when the load is suspended. On geared-type trolleys, pull the hand chain in a downward motion only.

L. Do not allow load to hit load chain bucket.

M. Follow gearbox chain lubrication instructions as per instructions 2.1.

N. Never operate a hoist with twisted, kinked or damaged chain. This condition must be constantly checked on multiple chain models (1, 2, 3, 5, & 10 ton, etc.) because it is possible for the bottom hook to become 'capsized'.

O. Be certain the electrical power is shut off before performing maintenance work on the hoist.

P. Avoid swinging the load when moving the hoist.

Q. Keep the load block overhead when not in use.

R. Properly secure an outdoor hoist before leaving unattended.

S. Do not allow unqualfied personnel to operate hoist.

T. Do not do anything you believe may be unsafe.

U. Do not lift load that will come in to contact with an obstruction or that needs to be pulled around an object.

V. Do not lift load that can become jammed.

3.4 Safe Hook and Chain Care—Safe Rigging Practices

A. See Inspection for Capsized Chain, Section 3.1C.

B. Do not operate hoist with multiple parts of chain twisted around each other.

C. Check to make sure chain is properly seated in pocket of load sheave and bottom block sheave.

D. Keep load chain clean and well lubricated. Do not drag chain or hook on the floor.

E. Do not use load chain as a ground for welding. Do not touch a welding electrode to a hoist or sling chain.

F. Never splice chain by inserting a bolt between links, or by any other means.

G. Do not force a chain or hook into place by hammering.

H. Do not insert the point of the hook into a chain link.

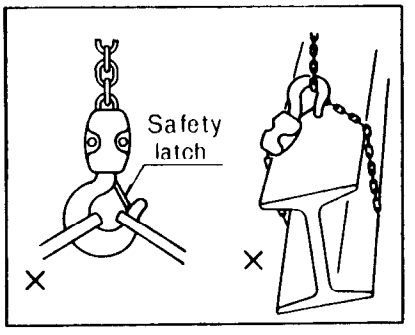
I. Derate loads applied to chain in freezing temperatures and do not apply sudden loads to a cold chain.

J. Do not attempt to repair load chain or hooks. Replace when worn or damaged.

K. Make sure the slings and other rigging have sufficient capacity to support the load and are in good condition.

L. Never run the chain over a sharp edge.

M. Do not reach around corners or load hooks in the manner as illustrated below. Such loading can cause damage to the hook assembly, chain and hoist.



N. Avoid using two hoists to handle one load unless necessary. If this is necessary, it is important that the load is supported by a larger capacity hoist than the load required, and also that the load is in balance.

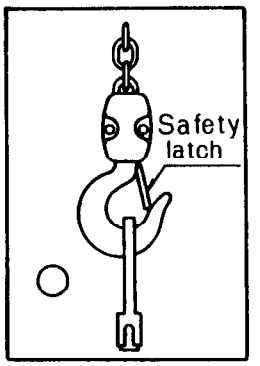
O. Do not use hoist chain or hoist hooks as slings or chokers.

P. Hooks are furnished with safety latches. Make certain the safety latches are correct before use.

Q. Hoisting chain should not be wrapped around the load. The load should be attached only to the hook or slings so that it pulls in a straight line on the load hook. Do not tip load hook.

R. Never operate hoist when the load is not centered under the hook. Pull in straight line only. Do not 'side pull'.

S. Be certain the load is properly seated in the saddle of the hook. Do not tip-load the hook as this leads to spreading and eventual failure of the hook.



3.5 Normal Operation

1. Hook travels in direction of pendant control arrows. The push button control is electrically interlocked so that it will not operate if buttons are simultaneously pushed or if wired wrong.

2. If the hoist is furnished with a load brake, it is normal when the bottom hook is raised to hear a clicking sound of the load brake mechanism; when the hook is lowered no clicking is heard.

3.6 Emergency Lowering of Load Without Power

Cannot lower load with electric chain hoist. Must use alternate hoist such as a Beebe lever chain hoist or manual chain hoist.

SECTION 4—LUBRICATION

CAUTION: Your Beebe Electric Chain Hoist has no lubricant in the gear box when shipped; add lubricant as described below.

NOTE: Proper lubrication is necessary for optimal hoist operation. Refer to the following lubrication instructions and lubrication chart.

4.1 Lubrication of Hoist Gear Box

Check the oil in the gear box at least every three months; if low, replenish. Change oil according the frequency chart.

A. See lube chart for type of lubricant.

B. Remove oil fill plug and oil check plug.

C. Add oil to oil fill plug, until oil fills to the oil check plug

D. Replace oil plugs.

E. See Table 1 for oil capacity of hoist gearbox

Table 1. Amount of Gear Oil

	AMOUNT OF OIL (QT.)	
Capacity (Ton)	Standard Hoist	Hoist with Mechanical Brake
L1E thru L2E	0.4	0.6
L3E	0.6	1.0
L4E thru L5E	1.0	2.0 (1.0x2)

Recommended gear oil: **Texaco Meropa 320**

4.2 Load Chain Lubrication

A. **Note:** Load chain and its attachment pins must be kept clean and well lubricated at all times. Unlubricated chain can wear out with very few lifts. Failure to maintain clean and well lubricated chain will void the manufacturer's warranty and cause chain wear which can make operation of the hoist hazardous.

B. Whether the hoist is operated in a clean atmosphere, an atmosphere contaminated with abrasive grit or dust, or in a corrosive environment, the use of Beebe Lubri-Link® chain lube is recommended. (Never apply grease to chain)

1. When operating hoist in an atmosphere containing abrasive grit, chain must be cleaned and lubricated more frequently.

2. When operating hoist in a corrosive environment, chain should be re-lubricated more frequently. Chain should not be cleaned (unless rust or abrasive dust build-up must be removed) thus, allowing each additional application to add more corrosion protection. See lubrication chart for frequency of application.

   NOTE: BEEBE LUBRI-LINK® chain lubricant is a specially engineered lubricant (containing synthetic wax and colloidal molybdenum disulfide) for load chain. It has proven superior to other available lubricants.

3. To clean chain, use an acid free solvent. Either dip entire chain into a bucket of solvent and brush clean or liberally apply solvent to chain with a brush. Thoroughly wipe solvent from chain and blow dry with an air gun.

4. Lubricate load chain with BEEBE LUBRI-LINK® as follows:

   1. Remove any load from chain.

   2. Shake lubricant well before using.

   3. Hold can upright, 8" to 10" away from chain.

   4. Apply thin, uniform film. Make sure Lubri-Link penetrates between chain links: use extension tube if necessary.

   5. Allow 2 minutes for solvent to evaporate.

4.3 Bottom Block and Idler Sheave Bearings

Apply Shell Alvania EP2 (grease) or equal when bottom block is disassembled. (See disassembly instructions.)

4.4 Top Hook or Suspension Lug

Apply grease to pin.

4.5 Limit Switch Shaft

4.6 Motorized Trolley Lubrication

A. Gear Case

B. Drive Wheel Pinion and Gear Teeth

Apply lubricant to gear and pinion.

C. Lower Flange of I-Beam

When operating trolley on curved I-beam, light application of grease to I-beam track reduces wear on trolley wheels and flange.

D. Roller Pin

SECTION 5—INSPECTIONS

5.1 Inspection Schedule:

A hoist inspection schedule should be established according to operating environment, type and frequency of use (See American National Standard ANSI B30.16). When the hoist is used in heavier applications or under abrasive environmental conditions, it should be inspected more frequently.

The inspection schedule should include daily, monthly and yearly inspections. We recommend the use of the Beebe hoist Inspection and Maintenance Check List (back cover). Also, all inspections should be made by qualified operators and special inspections should be made if routine inspections reveal abnormal or improper operation.

5.2 Daily Inspection:

Inspect the following items daily prior to operating hoist & trolleys (for items #1-3 see instructions 3.4-3.6):

CAUTION: Any abnormal or improper operation revealed by the inspection must be corrected immediately by qualified personnel.

A. Check all operating controls for proper operation.

B. Check limit switches for proper operation

C. Check brake for proper operation.

D. Inspect load chain per instructions 3.4.

E. Check hooks for cracks, deformation, elongation and twisting. If hook safety latch no longer contacts hook tip, then hook has been deformed from being over loaded and should be replaced. Also, if the hook is twisted more than 10 degrees, it must be replaced.

CAUTION: Any hook that is twisted or stretched indicates overloading. Other load bearing components should be inspected.

F. Check that safety latches properly close-off hook.

G. Check that bottom hook swivels freely.

H. Electrical connections: check for worn or frayed wires, and loose connections

5.3 Monthly Inspection:

A. *Perform all daily inspections listed above.*

B. *Inspect chain as per instructions.*

C. Inspect hooks and suspension lug signs of wear and damage.

D. Make sure limit switches and linkage are secure.

E. Check chain guide for wear. If worn, replace to prevent chain from jamming.

F. Check nuts, bolts, pins, and other hardware for corrosion, stripped or damaged threads and tightness.

G. Check hoist for all worn or damaged parts such as pins, shafts, gears, bushings, bearings, etc.

H. Check housing and support section for cracks, dents, wear and openings between sections.

I. Check sheaves for excessive wear, cracks and incorrect wear. Worn sheaves will greatly reduce life of chain.

J. Check motor brake adjustment per **5.8**

K. Check all bearings for noisy operation. Noise is an indication of wear.

L. Check gear box lubrication every 3 months depending on use.

M. Inspect all wiring and terminals for fraying and defective insulation. Check for loose connections. Inspect terminal box.

N. Check Klixon control contactors for pitting.

O. Check all gaskets and seals between housings.

P. Inspect all hoist nameplates, decals, warning labels and capacity ("stickers") for legibility and continued attachment.

5.4 Yearly Inspection:

A. Perform all daily and monthly inspection items.

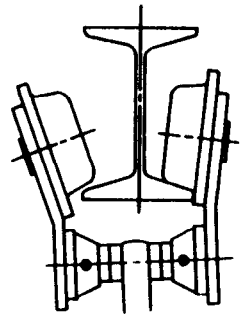
B. Hooks: Perform crack detecting inspection (dye penetrant, x-ray, magnetic particle, etc.)

C. Support Structure: Check for damage and continued ability to support rated load.

D. Trolley (if used): Inspect trolley.

TROLLEY INSPECTION

1. Check for loose or missing fasteners.
2. Check for distorted or worn trolley parts.
3. Make sure plates are parallel and vertical.



Note: Failure to correct may cause a serious accident.

E. Load Brake (if used): Test load brake according to instructions 3.1.F and check brake adjustment per instructions page 16.

5.5 Inspection of Hoist Not in Regular Use:

A. If a hoist has been idle for one to six months, perform the daily inspection.

B. If a hoist has been idle for over six months, perform the monthly inspection.

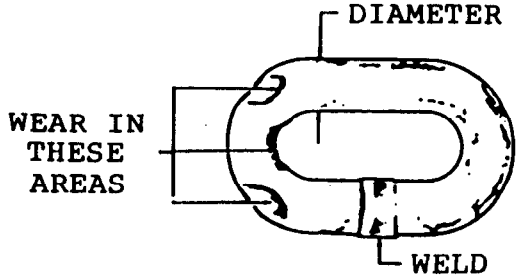
5.6 LOAD CHAIN INSPECTION

A. **Daily**: visually inspect load chain for wear, twists, distortion, nicks, gouges and corrosion.

B. **Monthly**: Perform visual inspection above on portion of chain that regularly passes over the top chain sheave because that portion receives the most wear. Also, slacken chain and inspect for wear at the contact points.

If wear or stretching is noticed, measure chain as follows:

1. Do not remove chain from hoist.
2. Select an unworn, unstretched length of chain near slack end. Suspend chain or stretch chain taut on work table and measure outside length of at least 5 links with a caliper gauge.
3. Measure the same number of links in worn portion of chain.



TYPICAL WEAR ON LINKS

4. If used section of chain measure 1.5% longer than unused section, chain should be replaced.

CAUTION: Never attempt to add on or piece together additional chain, even with "connecting" link. Replace worn chain only with Beebe load chain. Beebe chain and load sheaves are specially manufactured to fit together with very close tolerances. Substitute chain can damage the load sheave and cause hoist failure.

C. Inspecting Chain for Twists

When the bottom hook block is suspended by two chain falls, care must be taken to ensure that the bottom block does not "capsize". See Figure 3.1C. If chain is twisted, the bottom block has been capsized and must be restored to normal. Never suspend a load on twisted chain.

5.7 INSTALLATION OF NEW CHAIN:

NOTE: Do not remove the old chain from the hoist. Old chain is used to feed new chain through hoist.

A. Run load block to lowest limit.

B. Remove chain bucket (if used).

C. Remove free end (no load end) of chain from hoist if attached.

D. Make a "C" link in **NEW** chain by grinding through one side of the end link. (if old chain was installed correctly, this assures that end link will be in correct alignment).

E. Hook "C" link to old chain thus joining both chains. **BE SURE WELDS** of "standing" links on the new chain are facing away from the hoist load sheave. See Figure 9.

F. If two chain fall unit, make sure first link of new chain is started such that it will correctly attach to top hook bracket. See Figure 10.

G. Carefully "jog" the down button until the new chain runs sufficiently out the other side (approximately 12" for single chain fall and 24" to 36" for two chain fall models).

H. If single chain fall model, remove bottom block from old chain and attach to new chain. Disregard steps I & J.

I. If double chain fall model, pull new chain through bottom block with old chain.

J. Attach end of chain to top hook chain anchor.
Make certain that chain is not twisted. (Remove one link if required.)

K. If chain bucket is not used, attach other end of chain to hoist without twisting chain.

L. Attach chain stopper 15 links from end on L1E through L2E capacities and 13 links from end on L3E through L5E capacities. See Figure 2.3.

M. Lubricate load chain per instructions, Section 4.2.

N. Attach (optional) chain bucket per instructions, page 3.

CAUTION: The use of a cutting torch to cut chain is not recommended as the heat could anneal and weaken the adjacent chain link(s).

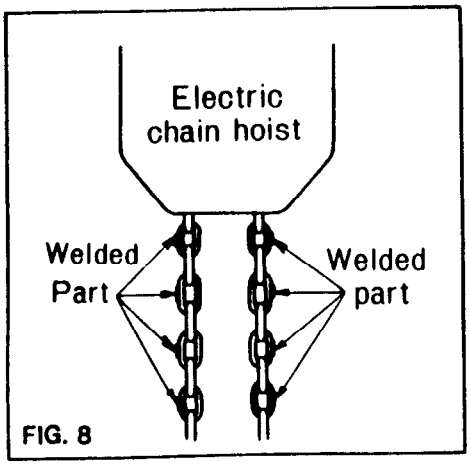


FIG. 8

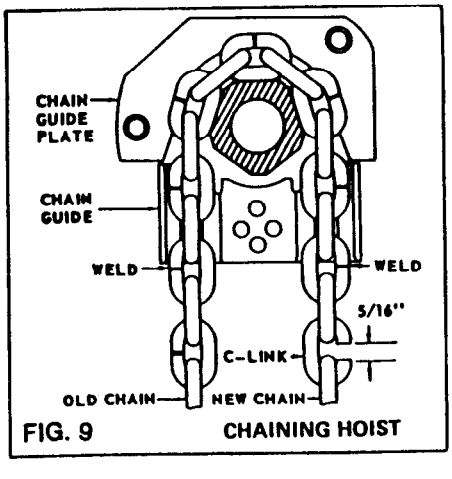


FIG. 9 CHAINING HOIST

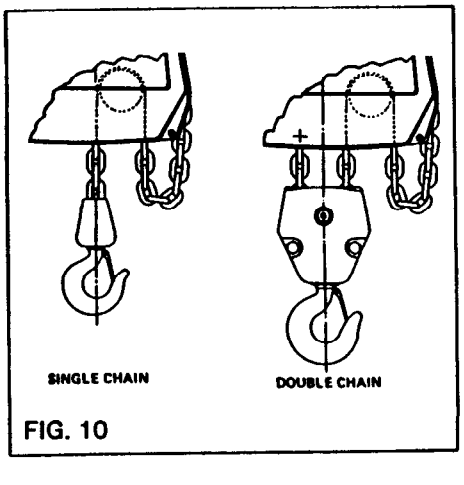


FIG. 10

CHAINING DIAGRAMS

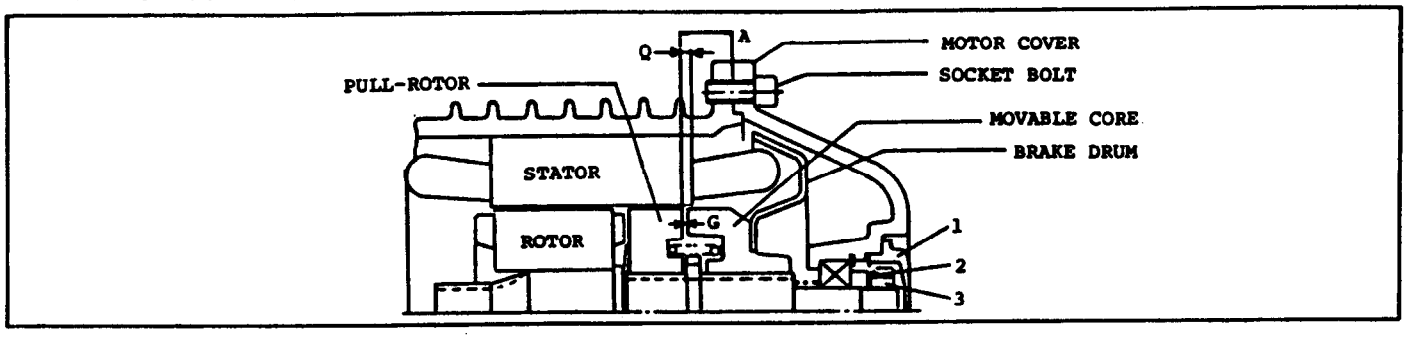
5.8 MOTOR BRAKE INSPECTION

Procedures for inspection and adjustment of motor brakes for single speed and dual speed models.

A. BEFORE INSPECTION:

1. Make sure that power supply is off.
2. Make sure that hoist is not loaded.
3. Fix load chain with tie wire so that when motor brake is disassembled, load chain will not fall out of hoist.

B. STRUCTURE OF BRAKE UNIT



C. CORE GAP "G"

Core pull-in performance decreases when core gap exceeds .080 inch or near .080 inch. In such a case, restore proper brake gap according to the following procedures.

1. Remove socket bolts fixing motor cover.
2. Remove motor cover, brake drum and rotor assembly in a set from hoist.
3. Remove rubber cover 1.
4. Raise outer tooth of lock washer 3 which fixes nut 2.
5. Loosen nut, exchange lock washer for a new one, and then assemble.
6. Turn nut and adjust brake gap "G" properly as shown in Table 1 below with thickness gauge.

D. WEAR DIMENSION "A"

1. In addition to the above mentioned "G" dimension, the "Q" dimension shown in Figure 11 also affects core pull-in performance.
2. The specified "Q" dimension shall be .039 inch min. Measure "A" dimension in Figure 11 to confirm "Q" dimension.
3. In case the measurement result satisfies "A" dimension in Table 1 below, then "Q" dimension is within the specified dimension and the hoist may be used as it is.

   NOTE: In case the measurement result does not satisfy "A" dimension in the above table, exchange motor cover or brake drum for a new one, and start again from Item 2.

E. SECURING ADJUSTMENT NUT

1. Make sure that any one of the four grooves of nut 2 meshes any one of the outer teeth of lock washer 3.

   NOTE: In case the positions do not mesh, turn nut to right, and stop where any of the grooves mesh any tooth first.

2. Bend meshing tooth of lock washer into the nut groove.
3. Install rubber 1 on motor cover.

F. ASSEMBLING

1. Install the adjusted set (mentioned in the preceding item) in the hoist, taking care not to damage coil or stator.
2. Apply Loctite 222 to motor cover socket bolts and tighten bolts securely.

Motor Brake Adjustment

(See Hoist Housing and Motor Parts Drawing in manual MHD56023)

⚠ CAUTION

• To avoid having the load chain fall out of the hoist when the motor and brake is disassembled, secure the position of the load chain with a tie wire.

1. Remove socket bolts (10) from motor cover (9).
2. Remove motor cover (9) with drake drum and rotor assembly attached.
3. Remove rubber cover (1) to access brake adjustment nut (2).
4. Bend down outer tooth of lockwasher (3) to free brake adjustment nut (2).
5. If lockwasher (3) is damaged, remove nut (2) and replace lockwasher (3). Make sure inner tooth on lockwasher (3) is inserted in the keyway on motor shaft (18).
6. Measure brake gap 'G' with a feeler gauge and adjust if necessary by turning the brake adjustment nut (2). See Dimension Table for Gap 'G'. Clockwise decreases the gap and counterclockwise increases the gap.

NOTICE

• Pressing down on the motor cover (9) releases the spring tension, making it easier to turn nut (2). When nut (2) will no longer turn by hand, place the tip of a screwdriver in a groove on the nut (2) and tap gently on the handle to turn nut (2).

Dimension Table for Gap 'G'

Model Number	'G' dimension	
	in	mm
LE1	0.02 - 0.031	0.51 - 0.79
LE2		
LE3	0.031 - 0.043	0.79 - 1.09
LE4		
LE5		

7. After the brake has been properly adjusted, secure the position of nut (2) by aligning one of the four grooves on nut (2) with one of the outer teeth on lockwasher (3). If the positions do not align, rotate nut (2) clockwise. Bend the tooth up into the groove to secure nut (2).
8. Install rubber cover (1) over the brake adjustment nut (2).
9. Install motor cover, brake drum and rotor assembly into the motor frame with stator (19). Secure with socket bolts (10). Use Loctite® 242 or equivalent on the bolt threads.

Hoist Brake Lining Measurement

(See Hoist Housing and Motor Parts Drawing in manual MHD56023)

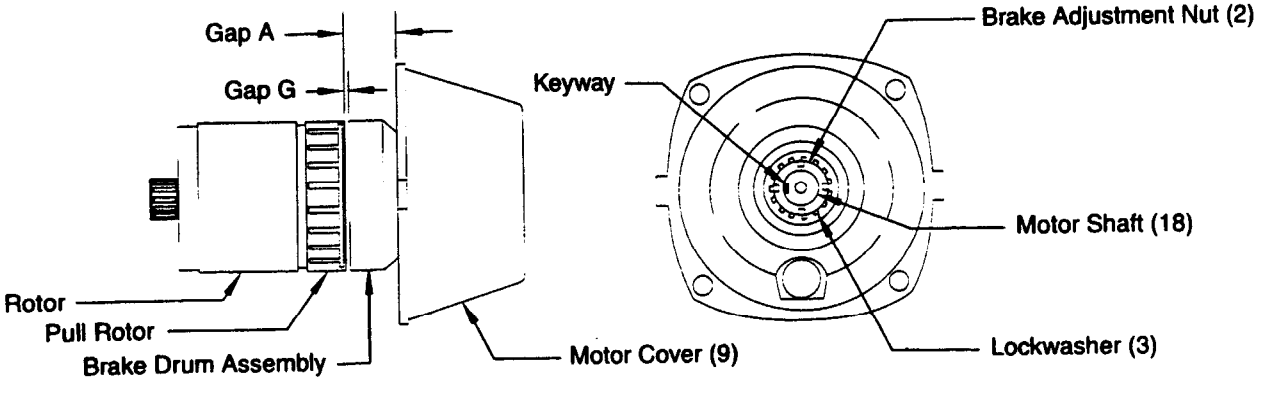
With the brake adjusted properly per "Motor Brake Adjustment " under "SECTION 5 - INSPECTION", measure dimension 'A'. If 'A' is smaller than the value specified in the table for dimension 'A', the brake lining must be replaced. Replace the motor cover (6) on model **LE1** and the brake drum assembly (12) on models **LE2** through **LE5**.

Table for Dimension 'A'

Model Number	'A' dimension	
	in	mm
LE1	0.71	18.0
LE2	0.67	17.0
LE3	0.62	15.8
LE4	0.57	14.5
LE5		

NOTICE

• One method of measuring 'A' is to place a steel rule between the pull rotor and the movable core. Measure the distance between the steel rule and the edge of the motor cover.



(Dwg. MHP0003)

SECTION 6 TROUBLE SHOOTING

	TROUBLE (Probable Cause)	REMEDY
)IST WILL NOT OPERATE:		
1.	No power to hoist	Check connections, circuit breakers switches in power supply lines.
2.	Hoist is wired wrong or phasing is reversed causing nonreversing relay to stop hoist	Interchange any two power supply leads (see instructions 2.8F) to change phasing of hoist.
3.	Blown fuse	Install regular fuse (never use ordinary wire or oversized fuse)
4.	Incorrect voltage or frequency	Check voltage and frequency rating on hoist nameplate against power supply. Also check wiring. Check for voltage drop at hoist power supply conection while hoist is operating under load.
5.	Loose or broken connections in hoist, power supply or push button	Disconnect hoist from power source. Remove control cover & push button cover. Check all connections & check continuity of each wire.
6.	Contactor failure	Check contactors for wear or burn marks.
7.	Defective transformer	Check for open or shorted coil winding.
8.	Hoist is overloaded	Check weight of load
9.	Motor is burned out	Replace motor
10.	Motor brake is not releasing. (Motor will hum but not rotate.)	Motor brake lining is "frozen" in drum. Remove motor end cover and remove rust, etc., from brake.
' OAD DOES NOT STOP WHEN HOIST IS STOPPED:		
1.	Motor brake is slipping.	See instructions 5.8.
2.	Hoist is overloaded	Reduce load to within rated capacity.
HOIST WILL NOT LIFT LOAD, IS OVER HEATING, AND/OR DOES NOT LIFT AT RATED SPEED:		
1.	Hoist is overloaded	Reduce load to within rated capacity
2.	Rotor is dragging in stator	Check for worn motor bearings.
3.	Motor brake is too tight	See adjustment instructions 5.8.
4.	Low voltage	Check voltage at hoist power source connections with hoist under load. Raise voltage to within 10% of specified hoist voltage.
5.	Excessive jogging	Reduce frequency of jogging
6.	Motor brake is not releasing	See Section 5.8.
HOOK RAISES BUT WILL NOT LOWER:		
1.	Down circuit is open	Check circuit for loose connections. Check down limit switch for proper operation
2.	Broken or loose conductor in push-button cable or control.	Disconnect power supply. Check each conductor in cable. If loose, tighten. If broken, replace cable.
3.	Faulty hoist control switch	If controller contactor does not activate after steps 1 and 2 above, then check for open or short in controller coil winding. If controller contactor does activate, then check connection and wiring to motor for discontinuity. Check for open or short in motor winding.

HOOK LOWERS BUT WILL NOT RAISE:

1. Hoist is overloaded	Reduce load to within rated capacity
2. Low voltage	Check voltage at hoist power source connection with hoist under load. Raise voltage to within 10% of specified hoist voltage.
3. Up circuit is open	Check circuit for loose connections. Check up per limit switch for proper operation
4. Broken or loose conductor in push-button cable or control.	Disconnect power supply. Check each conductor in cable. If loose, tighten, If broken, replace cable.
5. Faulty hoist control switch.	See NOT LOWER #3 above.

MOTOR BRAKE NOISE:

1. Motor brake needs adjustment.	See instructions 5.8
2. Broken brake lining.	Replace with new lining.

LOAD CHAIN JUMPS ON SHEAVE OR IS MAKING A SNAPPING SOUND:

1. Worn or rusted chain. See instructions 5.6 to determine allowable wear.	Replace only with Beebe load chain.
2. Incorrect Chain.	Replace with correct Beebe chain.
3. Worn sheave or chain guide.	Replace with authentic Beebe parts.
4. No oil on load chain.	Lubricate with Beebe "Lubri-link" chain lube.

TROLLEY WON'T STOP OR TROLLEY WHEELS SLIP:

1. Poor braking (motorized trolley)	Repair & adjust brake.
2. Angulation of beam.	Check & correct beam angulation.
3. Oil or grease on track of beam.	Clean oil or grease from beam.
4. Load off center.	Center load under beam.

ELECTRICAL LEAK:

1. Poor grounding.	Correct grounding.
2. Track of beam is painted causing poor grounding.	Remove paint.
3. Foreign matter or moisture is deposited on electrical parts.	Dry or remove foreign material.
4. Leak in power supply system	Check all switches, connections, and circuit breakers in power supply line for damaged insulation or open contact with hoist frame part.

OIL LEAK:

1. Improper oil plug.	Install proper oil plug with gasket.
2. Oil plug is loosened.	Tighten plug.
3. No oil plug gasket.	Install new gasket.
4. If leak occurs at place other than oil plug.	a) Check for loose bolts and tighten. b) Disassemble hoist & check thoroughly for cause. Repair or replace with new gaskets and seals and reassemble.

BEEBE ELECTRIC CHAIN HOIST
LUBRICATION CHART AND RECOMMENDED LUBRICATION SCHEDULE*

Figure & Index No.	Component (Part)	Type of Lubricant		Frequency of Lubrication According to Type of Operation Heavy	Normal	Infrequent
	Load Chain	Beebe Lubri-Link Chain link	Clean Atmosphere	Daily	Weekly	Monthly
			Abrasive Atmosphere	Daily	Bi-Weekly	Monthly
			Corrosive Atmosphere	Daily Daily	Bi-Weekly Bi-Weekly	Bi-Monthly Bi-Monthly
	Hoist Gear Case	**Texaco Meropa 320**		Bi-annually or as user experience indicates	1-2 yrs	2 years
	Bottom Block and Idler Sheave Bearings	Shell Alvania EP2 or Equal			**As needed**	
	Top Hook or Suspension lug	**Multi-purpose heavy grease**			**As needed**	

MOTORIZED TROLLEY LUBRICATION CHART

	Gear Case	**Texaco Meropa 320**	**As needed**
	Drive Wheel pinion and gear teeth	Grease or Dry moly Lube for Abrasive Environs	**As needed**
	Roller Pin	Machine or gear oil	**As needed**

(Hand and Geared Trolleys—See operation and maintenance manual supplied w/trolley)

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

BEEBE INTERNATIONAL, INC.
ELECTRIC OVERHEAD HOIST INSPECTION CHECK LIST

Hoist Model:_____ Serial Number_____ Capacity_____

Installation Date:_____

Location:_____

Item Deficiency	Frequency* D	M	Y	OK	Repair
HOIST OPERATION	X				
Controls	X				
HOOKS (or suspension lug)	X				
Retaining Hardware	X				
Loose	X				
Cracks	X				
Excessive Wear	X				
Bent-Twisted	X				
Spreading	X				
Freely Rotate	X				
Latch Damaged	X				
Dye Penetrant or other			X		
BRAKES					
Motor Brake Worn/ Not Operating	X				
Excessive Load Brake Drift/Backlash			X		
Excessive Disc Wear			X		
LIMIT SWITCHES					
Operating Properly	X				
HOUSING					
Distorted		X			
Cracks		X			
Loose Retaining Hdwe		X			
SUPPORTING STRUCTURE					
Continued Ability to Support Imposed Loads			X		
Worn or Distorted Trolley Parts			X		
WARNING LABELS					
Missing		X			
Illegible		X			
WIRING					
Loose Connections		X			
Frayed		X			
Damaged		X			
Proper Grounding		X			

Item Deficiency	Frequency* D	M	Y	OK	Repair
OVERLOAD DEVICE					
Operating Properly (limit clutch)	X				
OPERATIONS CONTROLS					
Contactor Pitting		X			
Operating Properly	X				
Damaged Push Button Housing	X				
LUBRICATION					
Oil Dark or Low		X			
Oil Leaks		X			
All Points Lubricated per Lube Chart		X			
LOAD CHAIN					
Lubricated	X				
Binding	X				
Cracked		X			
Twisted	X				
Distorted	X				
Corroded		X			
Excessive Wear		X			
Worn Chain Guides		X			
LOAD & IDLER SHEAVES					
Worn Excessively		X			
Cracked/Scored		X			
Bearing Noise		X			
COLLECTORS (Klixon)					
Binding		X			
Excessive Wear		X			
PINS, BEARINGS, BUSHINGS, SHAFTS, COUPLINGS, CHAIN GUIDE, NUTS, BOLTS, RIVETS					
Excessive Wear		X			
Corrosion		X			
Cracks		X			
Distortion		X			
Looseness		X			
Stripped		X			

***Frequency (of Inspection)**

D = Daily
M = Periodic (include all daily inspections)
Y = Yearly (include all daily and monthly inspections)

INSPECTOR: _____

DATE: _____

The use of other than **Ingersoll-Rand** Material Handling replacement parts may adversely affect hoist operation and may invalidate the warranty. For prompt service and genuine **Ingersoll-Rand** Material Handling parts, provide your nearest Distributor with the following:

1. Complete hoist model number and serial number as it appears on the nameplate.
2. Part number and part description as shown in this manual.
3. Quantity required.

For your convenience and future reference it is recommended that the following information be recorded.

Hoist Model Number _____

Hoist Serial Number _____

Date Purchased _____

Return Goods Policy

Ingersoll-Rand will not accept any returned goods for warranty or service work unless prior arrangements have been made and written authorization has been provided from the location where the goods were purchased. Hoists returned with opened, bent or twisted hooks, or without chain and hooks, will not be repaired or replaced under warranty.

NOTICE

• Using other than genuine Ingersoll-Rand Material Handling parts may void the warranty.

• Continuing improvement and advancement of design may cause changes to this hoist which are not included in this manual. Manuals are periodically revised to incorporate changes. Always check the manual edition number on the front cover for the latest issue.

Disposal

When the life of the hoist has expired, it is recommended that the hoist be disassembled, degreased and parts separated as to materials so that they may be recycled.

⚠WARNING

• Mineral based oils are recyclable, however, some oils such as glycols may be extremely toxic and must be identified and disposed of at an approved waste or disposal site in accordance with all local, state and federal laws and regulations.

For additional information contact:

Ingersoll-Rand Material Handling
2724 Sixth Avenue South
Seattle, Wa 98124 USA
Phone: (206) 624-0466
Fax: (206) 624-6265

or

Ingersoll-Rand Material Handling
Samiia, Douai Operations
111, avenue Roger Salengro
59450 Sin Le Noble, France
Phone: (33) 27-93-08-08
Fax: (33) 27-93-08-00

HOIST AND WINCH LIMITED WARRANTY

Ingersoll-Rand Company (**I-R**) warrants to the original user its Hoists and Winches (Products) to be free of defects in material and workmanship for a period of one year from the date of purchase. **I-R** will repair, without cost, any Product found to be defective, including parts and labor charges, or at its option, will replace such Products or refund the purchase price less a reasonable allowance for depreciation, in exchange for the Product. Repairs or replacements are warranted for the remainder of the original warranty period.

If any Product proves defective within its original one year warranty period, it should be returned to any Authorized Hoist and Winch Service Distributor, transportation prepaid with proof of purchase or warranty card.

This warranty does not apply to Products which **I-R** has determined to have been misused or abused, improperly maintained by the user, or where the malfunction or defect can be attributed to the use of non-genuine **I-R** parts.

I-R makes no other warranty, and all implied warranties including any warranty of merchantability or fitness for a particular purpose are limited to the duration of the expressed warranty period as set forth above. I-R's maximum liability is limited to the purchase price of the Product and in no event shall I-R be liable for any consequential, indirect, incidental, or special damages of any nature rising from the sale or use of the Product, whether based on contract, tort, or otherwise.

Note: Some states do not allow limitations on incidental or consequential damages or how long an implied warranty lasts so that the above limitations may not apply to you.

This warranty gives you specific legal rights and you may also have other rights which may vary from state to state.

IMPORTANT NOTICE

It is our policy to promote safe delivery of all orders.

This shipment has been thoroughly checked, packed and inspected before leaving our plant and receipt for it in good condition has been received from the carrier. Any loss or damage which occurs to this shipment while enroute is not due to any action or conduct of the manufacturer.

Visible Loss or Damage
If any of the goods called for on the bill of lading or express receipt are damaged or the quantity is short, do not accept them until the freight or express agent makes an appropriate notation on your freight bill or express receipt.

Concealed Loss or Damage
When a shipment has been delivered to you in apparent good condition, but upon opening the crate or container, loss or damage has taken place while in transit, notify the carrier's agent immediately.

Damage Claims
You must file claims for damage with the carrier. It is the transportation company's responsibility to reimburse you for repair or replacement of goods damaged in shipment. Claims for loss or damage in shipment must not be deducted from the **Ingersoll-Rand** invoice, nor should payment of **Ingersoll-Rand** invoice be withheld awaiting adjustment of such claims as the carrier guarantees safe delivery.

You may return products damaged in shipment to us for repair, which services will be for your account and form your basis for claim against the carrier.

United States Office Locations

For Order Entry and Order Status

Ingersoll-Rand Distribution Center
P.O. Box 618
510 Hester Drive
White House, TN 37188
Phone: (615) 672-0321
Fax: (615) 672-0801

For Technical Support

Ingersoll-Rand Material Handling
P.O. Box 24046
2724 Sixth Avenue South
Seattle, WA 98124-0046
Phone: (206) 624-0466
Fax: (206) 624-6265

Regional Sales Offices

Chicago, IL
888 Industrial Drive
Elmhurst, IL 60126
Phone: (708) 530-3800
Fax: (708) 530-3891

Detroit, MI
23192 Commerce Drive
Farmington Hills, MI 48335
Phone: (810) 476-6677
Fax: (810) 476-6670

Houston, TX
Suite 150
2500 East T.C. Jester
Houston, TX 77008
Phone: (713) 864-3700
Fax: (713) 864-2244

Los Angeles, CA
11909 E. Telegraph Road
Santa Fe Springs, CA 90670
Phone: (310) 948-4189
Fax: (310) 948-1828

Philadelphia, PA
P.O. Box 425
900 E. 8th Ave., Suite 103
King of Prussia, PA 19406
Phone: (610) 337-5930
Fax: (610) 337-5912

International Office Locations

Offices and distributors in principal cities throughout the world. Contact the nearest **Ingersoll-Rand** office for the name and address of the distributor in your country or write/fax to:

Ingersoll-Rand Material Handling
P.O. Box 24046
2724 Sixth Avenue South
Seattle, WA 98124-0046
USA
Phone: (206) 624-0466
Fax: (206) 624-6265

Canada
National Sales Office
Regional Warehouse
Toronto, Ontario
51 Worcester Road
Rexdale, Ontario
M9W 4K2
Phone: (416) 675-5611
Fax: (416) 213-4510
Order Desk
Fax: (416) 213-4506

Regional Sales Offices

Calgary, Alberta
44 Harley Road S.E.
Calgary, Alberta
T2V 3K3
Phone: (403) 252-4180
Fax: (403) 252-4462

Edmonton, Alberta
1430 Weber Center
5555 Calgary Trail N.W.
Edmonton, Alberta
T6H 5G8
Phone: (403) 438-5039
Fax: (403) 437-3145

Montreal, Quebec
3501 St. Charles Blvd.
Kirkland, Quebec
H9H 4S3
Phone: (514) 695-9040
Fax: (514) 695-0963

British Columbia
201-6351 Westminster Hwy
Richmond, B. C.
V7C 5C7
Phone: (604) 278-0459
Fax: (604) 278-1254

Latin America Operations
Ingersoll-Rand Production Equipment Group
730 N.W. 107 Avenue
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33172-3107
Phone: (305) 559-0500
Fax: (305) 559-7505

Europe, Middle East and Africa
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59450 Sin Le Noble, France
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